DEMONSTRATING AN APPROACH FOR MODELING CROP GROWTH AND HYDROLOGY USING SWAT 2009 IN KANOPOLIS LAKE WATERSHED, KANSAS

by

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A REPORT

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Abstract

According the U.S. Environmental Protection Agency's (EPA) website, our planet is at risk of global warming due to greenhouse gas emissions. The earth's average temperature has been reported to have risen by 1.4°F over the last century. This seemingly small increase in average planetary temperature has been linked to devastating floods, severe heat waves, and dangerous and unpredictable shifts in our climate (US EPA, 2013a). In the 2012 report, the Intergovernmental Panel on Climate Change states that bioenergy has the potential to significantly mitigate greenhouse gases as long as this is produced in a sustainable manner (Chum, et al., 2011). In light of these facts, research into the sustainable production of bioenergy sources in the United States is currently underway.

To ensure that the correct biofuel crop is selected for a given region and to investigate any secondary effects of changing our nation's agricultural practices to include biofuels, computer models can be very useful. The Soil Water Assessment Tool (SWAT) is a robust, continuous time step model that was developed by the USDA Agricultural Resource Service that can simulate changes in land use and land management and the effect this has on erosion, water quality, and other important factors.

This paper describes the preliminary work to create a model of the Kanopolis Lake Watershed that is part of the Kansas River Basin using SWAT 2009. Data pertaining to weather, topography, land use, management, stream flow, and reservoirs was gathered and incorporated into the SWAT model. This was then simulated to obtain the uncalibrated data. SWAT produced unacceptable statistics for both crop yields and for stream flow using the Nash-Sutcliffe Efficiency equation and using percent bias. This suggests that the model must be calibrated to be

of use in understanding both the current and future land use scenarios. Once the model is calibrated and validated, it can be used to simulate different biofuel cropping scenarios.

Table of Contents

List of Figures

List of Tables

Acknowledgements

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I would also like to thank my husband Joe, my family, and friends for all the support they have given. Without them to encourage me and help me when I was struggling, I could not have achieved this goal.

Chapter 1 - Overview

1.1 Justification

According the U.S. Environmental Protection Agency's (EPA) website, our planet is at risk of global warming due to greenhouse gas emissions. The earth's average temperature has been reported to have risen by 1.4°F over the last century. This seemingly small increase in average planetary temperature has been linked to devastating floods, severe heat waves, and dangerous and unpredictable shifts in our climate (US EPA, 2013a). Vast amounts of research have been and are in the process of searching for the solution to this global problem. One group, the Intergovernmental Panel on Climate Change (IPCC), produces a document of the latest literature and progress of climate change. In the 2012 report, the IPCC states that bioenergy has the potential to significantly mitigate greenhouse gases as long as this is produced in a sustainable manner (Chum, et al., 2011). Due in part to reports such as these, the pursuit of bioenergy is becoming more and more important to the countries of the world and especially the United States. In his 2010 State of the Union Address, President Barack Obama stated that "by 2035, 80% of America's electricity will come from clean energy sources," and in his 2013 State of the Union Address he reiterated his desire that America find a way to "shift our cars and trucks off oil for good". In light of these facts, research into the sustainable production of bioenergy sources in the United States is currently underway. The question to then be asked is: "what is standing in the way of our current agricultural practices of being sustainable and how do we mitigate or eliminate them?"

To understand what things could be inhibiting our current practices from contributing sustainably to biofuel, we must first understand a little about biofuel. There are two types of biofuel. The first has been termed “1st Generation” and includes biofuels produced from food crops such as bioethanol, biodiesel, bio-methane, etc. (Sims, et al., 2009). This type of fuel is what we currently can purchase at the gas station. It is usually mixed with conventional gasoline or diesel in varying amounts. Since it is not used alone, but must be mixed with oil products, this is of limited use when trying to attain long-term sustainability. The second type of biofuel is termed “2nd Generation” and includes biofuel produced from non-food biomass, often residues and woody biomass (Sims, et al., 2009). This involves the conversion of lingo-cellulosic residues and feed stocks to biofuel. Currently, there are technical barriers that must be met for this type of biofuel to enter into production, but most agree that these difficulties could be resolved within the near future (Sims, et al., 2009).

Since 2nd Generation Biofuels hold the most promise for being truly sustainable while meeting our energy needs, research should be completed to head off any potential long term problems with changing our production to accommodate 2nd Generation fuels. Two of the largest concerns with changing our cropping systems to biofuel production are changes to soil erosion and changes to water quality.

Soil erosion is caused by two forces. One force is the wind. Wind can erode the top soil when it has sufficient velocity to pick up the particles of soil and suspending them in the air and moving them to another location. This is more likely in soils that are dry, do not have stable aggregates, and do not have very much vegetative cover as in tilled fields (USDA NRCS, 2001). Soil can also be eroded by water. This occurs when water has enough kinetic energy to detach and transport soil. This can be on a small scale with raindrop erosion or on a larger scale as with stream channel erosion (Fangmeier, et al., 2006).

Soil erosion could become a problem for two main reasons. The first reason is that some of the more promising plants for 2nd Generation biofuels have not been grown commercially. Some of them are wild varieties such as switchgrass (*Panicum virgatum*), big blue stem (*Andropogon gerardii*), algae, cyanobacteria, etc. (Miesel, et al., 2012; Papini and Simeone, 2010). Other possible biofuel candidates have been commercially grown in the past, but at a much smaller scale than what would be needed to provide for the energy needs of the country. These could be quick growing trees such as poplar or willow, or sunflowers, or canola, etc (Papini and Simeone, 2010). Since there hasn't been large scale production of these crops, the effects of these plants on the landscape, and more importantly on the soil are as yet unknown. The second main reason is that to harvest feedstocks for biofuel, crop residues and/or native grasses are removed from the field. This could increase soil erosion because it removes the wind barrier that inhibits the movement of soil, it can decrease the amount of organic material maintaining soil aggregate stability, and it decreases the amount of soil moisture which allows for easier movement of the soil (USDA NRCS, 2001). There is research to suggest that switching to a biofuel crop will have a detrimental impact on the amount of soil erosion if mismanaged (Cruse and Herndl, 2009; Lal, 2009; USDA NRCS 2006; Xue, et al., 2011). How much erosion is possible? Is it more or less than current practices? What are the best management practices? These questions need to be answered before biofuels can truly become sustainable.

Another major concern with biofuel production is the impact it could have on water quality. Water quality refers to the "physical, chemical, biological, and organoleptic (taste-related) properties of water," (Glossary of Environmental Statistics, 1997). Many things can lower the quality of water such as chemical contaminants, biological contaminants, physical contaminants (sediment), etc (Fangmeier, 2006). Biofuel crops could potentially add some or all of these contaminants if mismanaged (Cruse and Herndl, 2009; Demissie, et al., 2012). For example, if a biofuel crop was planted, then fertilized with nitrogen or phosphorus, and then there was a storm event before the crop could sufficiently fix the fertilizer, then the rain could was the fertilizer out of the field and into the channel. This could travel to streams and then to major rivers. This is how problems such as the enlarged hypoxic zone of the Gulf of Mexico occurred (Cruse, and Herndl, 2009; USDOI USGS, 2013b). This leads to questions such as: “Will there be an increase in nitrogen in water ways after planting biofuel crops?”, “Will there be an increase or decrease in the amount of sediment in rivers if we change our cropping systems?”, “Is there a way to improve the management of our agricultural areas to allow for increased biofuel production and improving water quality?”.

To try to answer these questions about soil erosion and water quality, we have two main options. First, we could physically carry out the experiment and record all the data and simply adapt from there. This would involve changing all available cropping systems across the country to biofuel crops, and then continue the process for a few years to generate a set of multiple data points for multiple years, and then running the statistics to discover how these changes affected erosion and water quality. This option, while it would generate actual data, would create several new and significant problems. First, a biofuel crop or set of crops would need to be selected. Currently, there are many different types of biofuel crops being researched to determine the suitability of that crop to both the environment and the energy needs of the country. Assuming that a selection was made based on a set of criteria, and then all the producers would need to be convinced to plant these crops. This interferes with the livelihood of that producer. If the wrong crop is selected against that producer’s will, then the crop will fail and the farmer will lose revenue. Last, this experimental approach would need to be tested for several years to gain adequate data for statistical analysis. If there were several cropping options and only one was selected, then the entire process would need to be repeated for each cropping option. This would take enormous amounts of time and research that is simply not feasible on a large scale.

The second option involves some form of modeling, whether this is computer modeling or modeling done by hand. This option incorporates data available on a national scale regarding current topography, climate, crop management, crop yields, etc. to make a calculated guess on the effect of proposed changes in cropping choices. These models can be further improved if there are experimental plots that are incorporated into the model to allow for better calibration of the model. Since this option does not interfere with the producers' decisions or livelihood, does not require massive amounts of resources, and can easily be duplicated with changes in management and cropping scenarios, this option is the better of the two.

1.2 Computer Models

Model selection is a very important process. There are several main criteria to consider when selecting the most appropriate model. One of the first things that must be defined relates to the direction of the research-what is the question(s) that the research is trying to answer? This includes the subject matter, the accuracy, the scale, and the key processes of the question. First, the subject of the question and the subject of the model must be the same. Perhaps the research is trying to answer the question "How does the rate of growth of *E. coli* change with changes to the growing media?" In this case, it would be inappropriate to use a model that explains how the amount of soil erosion due to wind is affected by particle size. This model would not answer the question of the research because it is not the same subject as the research.

Choosing a model based on accuracy is also of great concern. The researcher must ask himself/herself, “How accurate do my results need to be to answer my research question?” If the question can be answered with a relatively low degree of accuracy, then a model that yields highly accurate results would be unnecessary. For example, a research team wants to understand the change in precipitation trends over a 100 year time scale due to increased human activity to the nearest inch. A model that gives hourly precipitation data to the nearest 100^{th} of an inch would not be appropriate even though it is the same subject matter. The degree of accuracy is too high for the question of the research. The opposite is also true. If the model is not very accurate, only gives percentage change rather than values to the nearest decimal, then it is also inappropriate to use.

The model must also be in agreement of scale as the research question. For example, if the research was interested in the climate effects on the hydrologic cycle of three adjacent farms, then a model that is only able to refine to the state level is not acceptable due to incorrect scale.

A model must also utilize the correct processes for the research. Suppose there are three different ways to model the key process governing leaf growth patterns, A, B, and C. The research is interested in testing process B since it has the least amount of research and it’s assumptions more closely match the data available, it would be useless to use a model based on process A or C. Another aspect of this component is determining which key process is appropriate for the research. Sometimes this is dictated by the nature of the question (i.e. how does Process A handle Change C?) or by the agency doing the research (i.e. the FDA requires that Process A be utilized in all research regarding X). Sometimes it is up to the researcher to determine which process is most suitable. This can be determined by what appears to match the circumstances more accurately, what data is needed and available for the model, and the complexity of the model. Sometimes the environment where the research takes places will change the processes that are appropriate. For example, if a precipitation model uses process appropriate for convective storms, then this model is not using appropriate process for areas that predominately have monsoon type storms.

Once the model has been matched to the research question, then the data must be considered. Each model requires different amounts and types of data for the input. Some models require very little data or the data is easily accessible to the public. Some models require large amounts of data that can be hard to acquire or occasionally not accessible to the public due to security concerns. A model can be extremely accurate, answer all the research questions, but still be inappropriate because it requires data not available to the researcher and nothing can be substituted.

The output data is also of concern. Models are created to fit a general profile/general scenario. To be helpful in research, models must be calibrated so that they match the circumstances of the research. This requires actual data to compare to the model data to determine how similar they are. The more similar the model is to the actual data, the more accurate it will be at predicting changes in that area. This can limit the model selection because there may not be anything to compare with the results of the model. Then the model cannot be calibrated and the researcher has no idea if the model is accurate or not. This model is now inappropriate for the research.

Another thing to consider is the appropriateness of the model. Some models are highly accurate, answer the research questions, have the appropriate storm systems, but were not developed for the area under question. The question then becomes, “Is this model still appropriate for this research?” It is possible that the research is trying to determine this answer.

If it is not, then the model should be reevaluated. Another aspect of this is the success of the model. Some models are more accurate than others even without calibration. This would be highly beneficial if there is limited time to calibrate the model.

Another criterion to examine is the deadline of the research. Some models require large amounts of time to properly calibrate and validate. If the deadline is in two weeks, but the calibration will take a minimum of four months, then this model would become unacceptable. This can be due to the inexperience of the researcher or the processing capabilities of the computer being used. This could also play a role in a multifaceted research project. For example, if the model plays only an initial role in the research, then spending large amounts of time calibrating it are inappropriate.

The last thing to consider is the peripheries of the model, i.e. the model availability, the cost, and the technical support. Some models are open domain and easily downloaded from the internet. If the model is not readily available or easily accessible, then another model should be considered. The cost of the model can be of huge concern as well. Some models are free while others cost thousands of dollars. If the research budget is $100, but the model costs $1,000, then it is not the correct model to use. The processing power required to run the model can also factor into the cost. For example, the model may cost less than $50, but it requires the latest high speed processor which is $5,000. The model is now inappropriate. The technical support can also limit the model selection. There may be little explanation as to how the model physically works (where is the data inputted, which sequence of commands is necessary, how are the results accessed, etc.). This can make it nearly impossible for a user to work with a new model. Also, if there are errors within the program or it doesn't work as expected, then a lack of support results in failure of the model. It can be impossible to isolate a problem with a computer model without any technical support.

1.3 Model Selection in This Study

There are many different types of models that simulate different portions of the agricultural cycle. A few common hydrology models were selected and compared. While this is by no means an exhaustive comparison, it was helpful in selecting a model appropriate for the study. The models that were selected and compared are: Soil Water Assessment Tool (SWAT), Hydrologic Simulation Program-Fortran (HSPF), Water Erosion Prediction Project (WEPP), Spreadsheet Tool for Estimating Pollutant Load (STEPL), Agricultural Non-Point Source (AGNPS), Annualized Agricultural Non-Point Source (AnnAGNPS), and Areal Nonpoint Source Watershed Environment Response Simulation (ANSWERS-2000).

SWAT was developed for the USDA Agricultural Research Service (ARS) with Texas A&M University. It is a physically based, continuous time step model that incorporates features of other previous models such as Chemicals, Runoff, and Erosion from Agricultural Management Systems (CREAMS), Erosion-Productivity Impact Calculator (EPIC), and the Groundwater Loading Effects on Agricultural Management Systems (GLEAMS). The first version of SWAT was completed in the 1990’s and has had several upgrades with the most recent being in 2009 (Neitsch, et al., 2011).

HSPF was partially developed in the 1960’s as the “Stanford Watershed Model” and was later augmented by adding the Agricultural Runoff Management (ARM) model, the Hydrologic Simulation Program (HSP) model, and the Nonpoint-Source Runoff (NPS) model. It is currently used by the U.S. Environmental Protection Agency (EPA) and by the U.S. Geological Survey (USGS) (Bicknell, et al., 1997; Migliaccio and Srivastava, 2007). It is a continuous time step model that emphasizes water quality and hydrological processes (Migliaccio and Srivastava, 2007).

WEPP was first created in 1985 by the USDA ARS program to better predict water erosion. It is a physically based model that was originally designed to simulate hill slope erosion and has since been expanded to include small (500 ha or less) watershed modeling (Flanagan et al., 2007; Migliaccio and Srivastava, 2007). It is used in the United States and abroad for issues regarding physical processes of soil erosion, infiltration, runoff, plant growth, etc. (Flanagan et al., 2007).

STEPL is a simple, single rainfall event model that was developed for the US EPA by Tetra Tech, Inc. It was developed to simulate simple best management practices (BMP), land use changes, pollutant sources, and animal influences. It uses the Universal Soil Loss Equation (USLE) to model sediment transport (Tetra Tech, Inc., 2011).

AGNPS is a product of USDA ARS program based at the North Central Conservation Research Laboratory in Morris, Minnesota. It was developed in the late 1980's and revised several times in the 1990's. It is a single rainfall event that is capable of simulating hydrology, soil erosion and transportation of nutrients and sediment from nonpoint and point sources (Borah and Bera, 2003).

AnnAGNPS is a continuous model with a daily time step that was designed by the USDA ARS program based on AGNPS. It combines elements of other models such as the CREAMS, GLEAMS, and EPIC models and can model pollution movement, soil erosion, hydrology, etc. for larger watersheds (Bingner et al., 2011).

ANSWERS-2000 is a continuous model developed by Purdue University, Virginia Polytechnic Institute, and Virginia State University. It was designed for systems where overland flow is dominate and is well suited to evaluate differing management systems that relate to sediment loss, nitrogen and phosphorus loss, and runoff. It does not currently accommodate for groundwater, interflow, deep percolation, or stream base flow (Migliaccio and Srivastava, 2007).

Several comparative studies have been done between the different models. In comparing HSPF to SWAT, Van Liew et al. (2003) found that while HSPF performed better during calibration, SWAT out performed in validation. The authors felt that this was most likely caused by HSPF being based on more physical parameters versus SWAT using empirical formulas such as the SCS Curve Number method. Also, the team noted that some differences could be attributed to differences in routing methods. In HSPF, the storage routing method was selected, while in SWAT the Muskingum method was used. This team also found that the user interface with SWAT was much easier than in HSPF and that it was much easier to input data and change calibration parameters in SWAT (Van Liew et al., 2003). Another study found that if the most important calibration parameters were known and the calibration method was very careful, then HSPF produced better results. It was found that when data was not available, that SWAT tended to produce results that were comparable to HSPF and that SWAT was generally more efficient in that the model fits were less varied (Xie and Lian, 2013). Another study found that SWAT and HSPF can perform very similarly if given enough data to calibrate with. It was found that HSPF was designed to be better suited to mixed agricultural and urban land while SWAT performed better with less urban areas (Borah and Bera, 2004).

In a paper researching the ability of the WEPP and SWAT models to simulate soil erosion in the Three Gorges Reservoir region in China, Shen et al. (2009) found that WEPP had consistently better simulation of sediment yield and runoff than SWAT. Research suggests that the reason that WEPP consistently outperformed SWAT was due to differences in the types of equations used in determining runoff and sediment (Shen et al., 2009). For runoff, WEPP uses the GAML equation to simulate rainfall excess and both a modified Rational equation similar to EPIC model and the Chemcials, Runoff, and Erosion from Agricultural Management Systems (CREAMS) model (Flanagan et al., 1995). SWAT uses the SCS Curve Number method. The GAML method retains more water in the soil profile and was better able to predict the runoff for the watershed. For sediment, WEPP uses a steady-state erosion model based on a sediment continuity equation while SWAT relies on the MUSLE method. While both can give acceptable values for expected sediment, WEPP was better able to predict sediment values (Shen et al., 2009). While WEPP produces more accurate sediment and runoff predictions, it is not as robust as SWAT. SWAT is able to accommodate nutrient loading, bacteria simulation, groundwater mechanisms, and plant growth for large scale watersheds (Neitsch et al., 2011). WEPP was developed to model sediment and runoff on hill slopes and has since been expanded to include climate, irrigation, hydrology, soils, plant growth, etc. for small scale watersheds (Migliaccio and Srivastava, 2007). When choosing between them, it would matter greatly on the exact process of interest and on the size of the area being modeled.

STEPL is a simple, spreadsheet based modeling tool used by the US EPA for single rainstorm events. This model requires only basic information about land cover, land management, routing, and topography. In a study performed by Nejadhashemi et al. (2011) STEPL was compared with SWAT for a watershed in Kansas. The study found that STEPL predicted higher total nitrogen and total phosphorus loads and lower sediment loads when compared to a calibrated SWAT model of the same area. It also found that STEPL was unable to accurately identify high-priority pollution areas. The study recommended that STEPL was able to provide general information regarding the relative impacts of different land uses and land management (Nejadhashemi et al., 2011). STEPL can still be useful in a preliminary screening of different land management options, but if more detailed information is required, then a more in depth model such as SWAT would be more appropriate.

AGNPS is a single storm event model that was originally designed to simulate runoff, transport of nitrogen and phosphorus, sediment, and chemical oxygen demand. In comparing several continuous models such as SWAT and the continuous version of AGNPS (AnnAGNPS), research found that single storm models were better able to predict the sediment and nutrient loading caused by a single severe storm event (Borah and Bera, 2003). AGNPS can be effective for small subwatersheds and for Total Maximum Daily Load (TMDL) of nutrient studies, but it is not well suited for modeling large watersheds or for more than a single storm event. This is due to AGNPS using a uniform rainfall throughout the watershed and for being a single storm event (Borah et al., 2006).

AnnAGNPS is a version of AGNPS that is a continuous model. In addition to being continuous, programming was added that allows AnnAGNPS to simulate irrigation, snow melt, tile drain flow, feedlots, subsurface flow, and gullies with a continuous daily or subdaily time step. For runoff, the parent equation is the SCS Curve Number method and for sediment it is the Revised Universal Soil Loss Equation (RUSLE). It is a physically and empirically based model that is suitable for sediment and TMDL of nutrients (Borah et al., 2006). In comparing AnnAGNPS with SWAT, it was found that both models were fairly good at simulating runoff and sediment, but there was difference in the ability of the models to predict phosphorus loads. SWAT was better able to predict phosphorus loads while AnnAGNPS was only able to rate from unsatisfactory-very good depending on the watershed in question (Parajuli et al., 2008). This would suggest that the selection between the SWAT and AnnAGNPS models is based on the parameters of the area in question.

ANSWERS-2000 is a continuous model designed to predict sediment loss, nutrient transport, and runoff in agricultural watersheds. It is most suited to areas where overland flow is dominant (Migliaccio and Srivastava, 2007). ANSWERS-2000 can also be used in applications involving TMDLs (Borah et al., 2006). While useful in modeling sediment, nutrient transport, runoff, and TMDL research, it is not applicable in all watersheds or for all applications. SWAT has several components to model lateral flow, deep percolation, groundwater, plant growth, bacteria, etc. (Neitsch et al., 2011).

After comparing the different available models and the data available, SWAT was chosen as the best model for this research. A continuous model was needed to understand long term effects on the Kanopolis Lake Watershed. This excluded the use of single storm models such as STEPL and AGNPS. The Kanopolis Lake Watershed is also quite large which prohibits the use of the WEPP model. In choosing between HSPF and SWAT, the difference in calibration time and the possible lack of needed information lead to the choice of SWAT, even though HSPF can sometimes produce better results with all needed information. AnnAGNPS was not chosen because more than simple sediment and runoff simulation was needed and there was a possibility of researching nutrient transport which is not well simulated in AnnAGNPS. Since overland flow was not known to be dominant and more parameters than allowed in the model, ANSWERS-2000 was also deemed inappropriate for this study.

In summary, SWAT answered the research questions about modeling crop growth and hydrology. The accuracy of the model is appropriate to the research since it is a continuous time step, results in annual crop yields, and runoff data that is at the daily, monthly, and yearly scale.

The processes used in the model, which will be explained in the following section, are appropriate to the Kanopolis Lake Watershed and best match the circumstances of the research. The data required for the input and the calibration are readily available from mainly public sources. The model is reasonably flexible to the timeline of the research. The model also was already available, had good technical support available, and the computers were able to handle the model's processing needs. All of these factors supported the decision to use the SWAT 2009 model for this research.

1.4 Study Goal and Objectives

The goal of this project was to learn and understand how SWAT 2009 models crop growth and hydrologic processes so I could demonstrate how to properly apply a model to a large agricultural watershed with the hope of aiding future decision making. To accomplish this main goal, there were three main objectives. The first objective was to understand and present the process that SWAT 2009 uses to model a large agricultural watershed. The second objective was to explain crop growth processes in SWAT and explain how they interact with the hydrology processes. The last objective was to explore the importance of accuracy in modeling both crop growth and hydrology processes in SWAT modeling studies, not just the hydrological components.

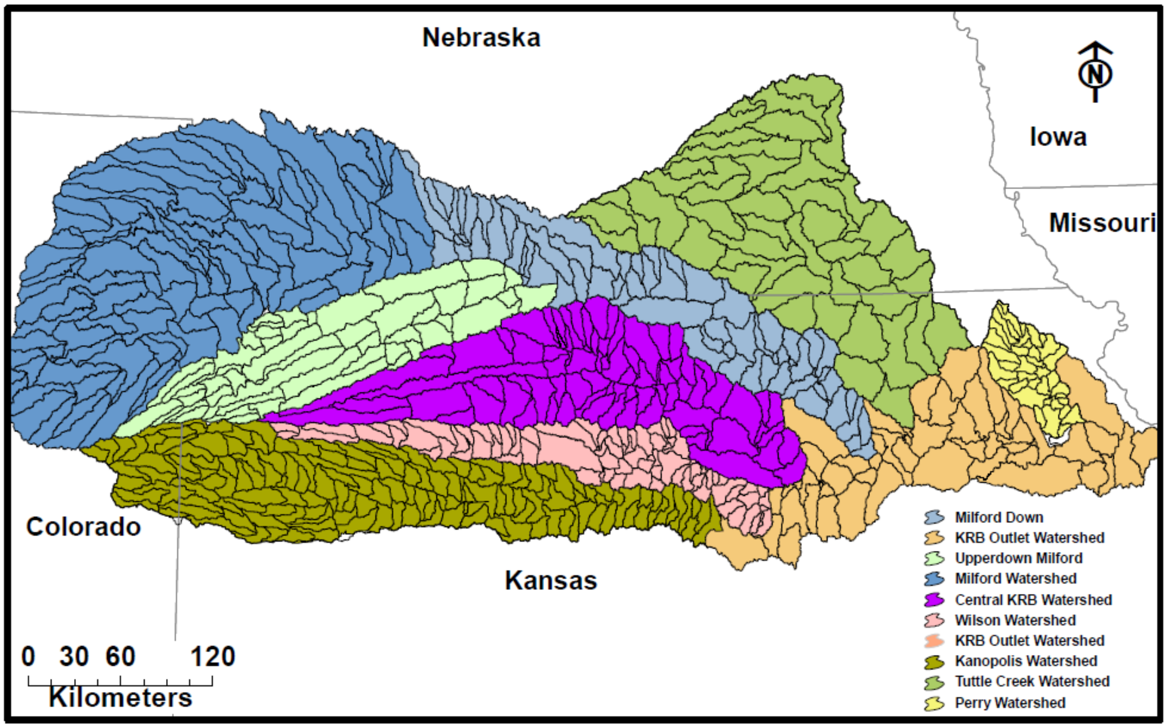
Chapter 2 - Study Area Description

2.1 Kansas River Basin

This study was formed as part of the Biofuels and Climate Change: Farmer's Land Use Decisions (BACC: FLUD) project. The aim of BACC: FLUD is to research farmers' decisions about growing biofuel feedstock crops and how the farmers' plan to adapt to climate change. This project is part of the Experimental Program to Stimulate Competitive Research (EPSCoR) to help areas that traditionally receive lower amounts of funding from the National Science Foundation (NSF) (KU IPSR, 2012). Sumathy Sinnathamby, Ph.D. student at Kansas State University and Lindsey Witthaus, Ph.D. student at the University of Kansas, worked collaboratively to build the nine subwatersheds.

The study focused on the Kansas River Basin. The basin was split into to nine separate subwatersheds due to computer processing demands. The division was based on either federal reservoirs or U.S.G.S stream gage locations as outlets for the watersheds. The subwatersheds were designated Milford Down, Upperdown Milford, Milford, Central Kansas River Basin, Wilson, Perry Lake Watershed, Tuttle Creek Reservoir, Kanopolis Lake Watershed, and The Kansas River Basin Outlet Watershed.

Figure 1 Kansas River Basin with Subbasins (S. Sinnathamby, 2013, personal communication)



The Kansas River Basin covers an area of approximately 60,000 mi^2 (155,000 km^2). It ranges across western Colorado, southern Nebraska, and the northern half of Kansas. It is one of two major river basins in Kansas. The SWAT models of this basin have a total of 425 subbasins (See Figure 1). As seen in Figure 2, there are 238 STATSGO unique soil categories and 22 landuse individual categories.

Figure 2 Kansas River Basin with Land Use/Land Cover (S. Sinnathamby, 2013, personal communication)

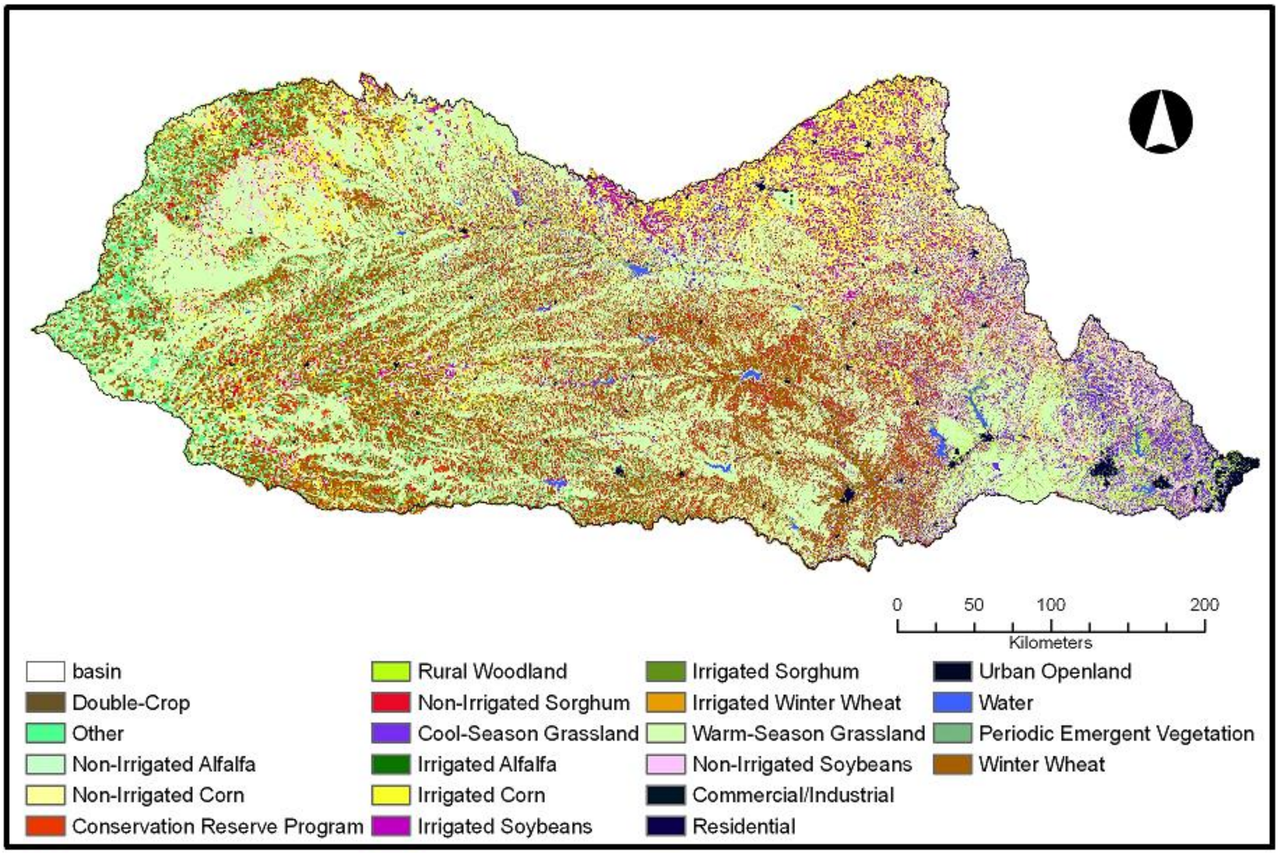
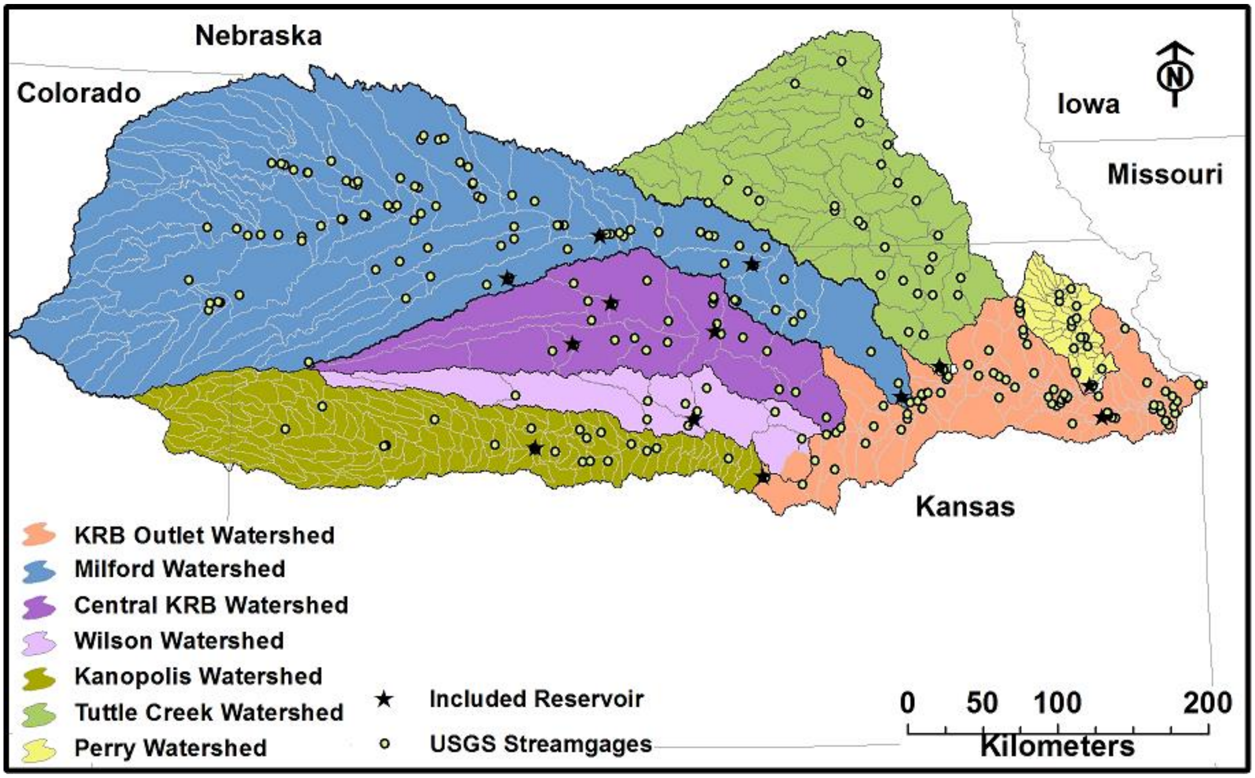
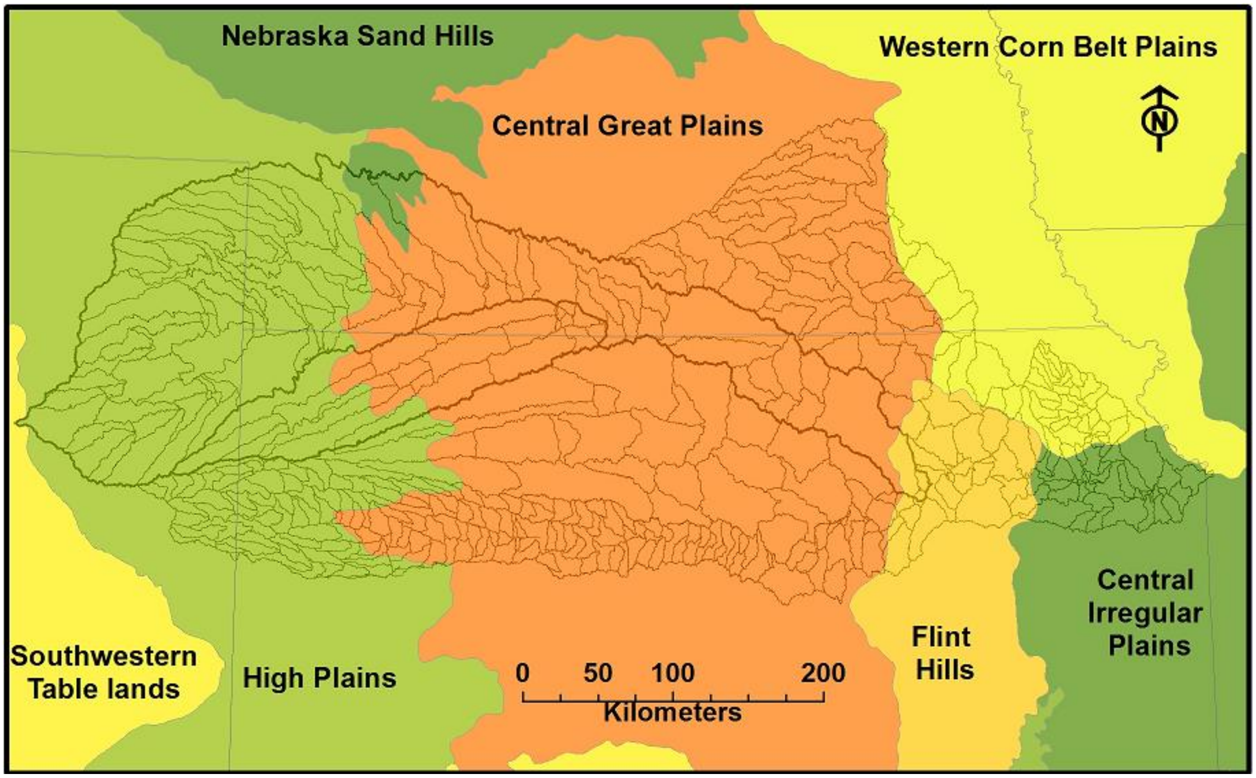


Figure 3 Kansas River Basin with Reservoirs and U.S.G.S. Stream Gages (S. Sinnathamby, 2013, personal communication)



The Kansas River Basin has thirteen reservoirs (See Figure 3). It contains 5 Level III ecoregions See Figure 4 (S. Sinnathamby, 2013, personal communication).

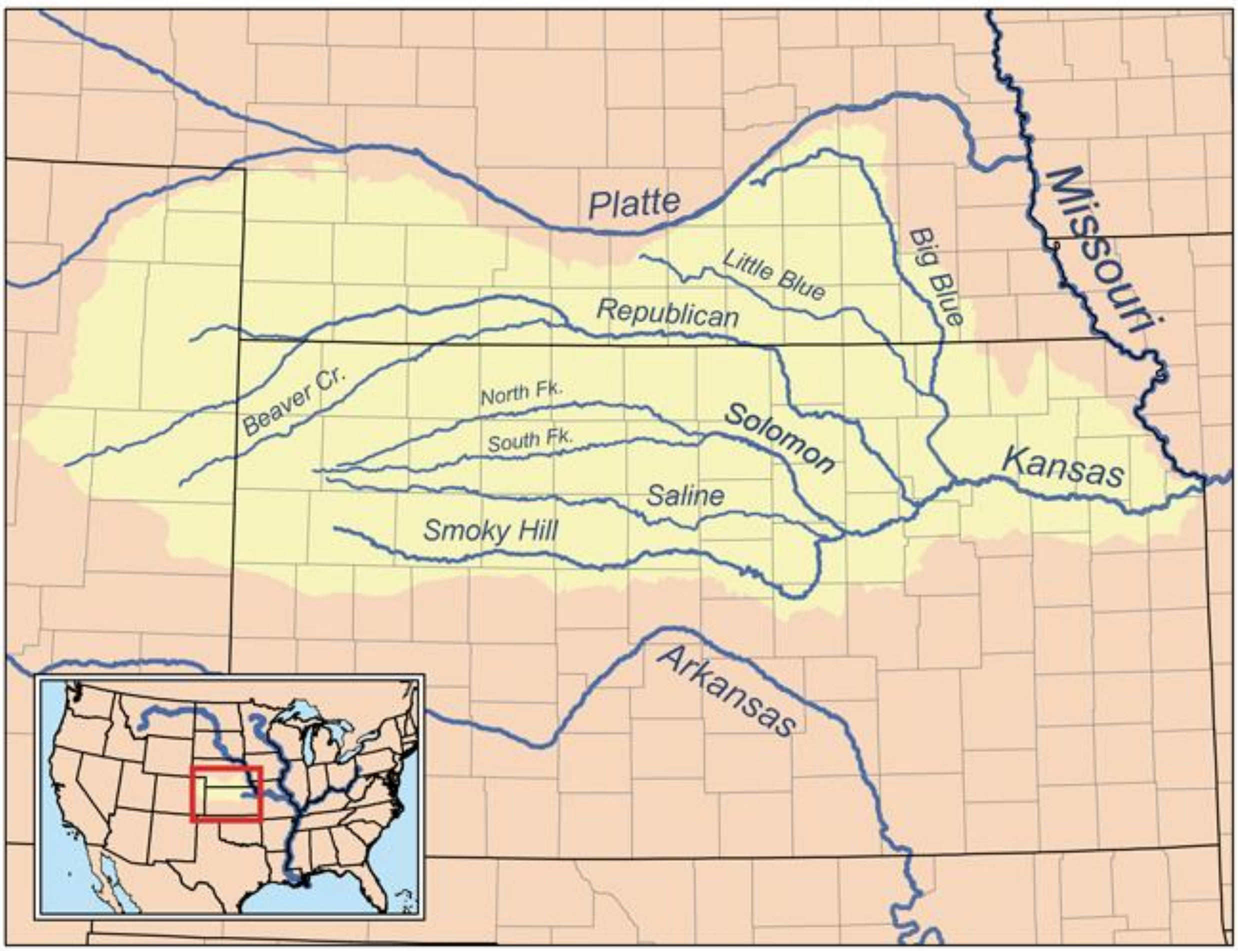
Figure 4 Kansas River Basin with Level III EcoRegions (S. Sinnathamby, 2013, personal communication)



There are very few major urban areas within this watershed. The largest urban area is located at the outlet of the river basin where the Kansas River joins the Missouri River at Kansas City, KS.

The U.S. Geological Survey categorizes rivers and streams into discrete units with different levels of hierarchy called Hydrologic Unit Codes. The entire U.S. including Alaska, Hawaii, and the Puerto Rico have been divided into a total of 21 major units that represent the largest river networks that occupy those areas. Then, each major unit is split into successively smaller subunits that represent smaller river and stream networks until the smallest tributary unit is reached. Each level of division is assigned an even digit code. The highest level has a two digit code, the next subunit has a four digit code and so on. There are four Hydrologic Unit Codes (HUC) Level 6 river basins: The Republican River, Smoky Hill River, the Big Blue River, and the Kansas River excluding the Big Blue and Smoky Hill Rivers. These four main basins are further split into a total of 43 HUC Level 8 digit codes (USDOI USGS, 2013a and USDOI USGS, 2013c). Other important smaller rivers are the Saline River, the North, South and main forks of the Solomon River, Beaver Creek, and the Little Blue River.

Figure 5 Kansas River Basin with Major Rivers (K. Musser, 2008)



2.2 Kanopolis Lake Watershed

For my study, I focused on the Kanopolis Lake Watershed because it was one of the first out of the nine watersheds to be completed and I was somewhat familiar with this area and hoped that I would be able to notice any gross inconsistencies between reality and what the model simulated. This watershed covers an area of approximately 20291km^2. As can be seen from

Figure 5.2, the portion of this watershed in Kansas includes parts of Barton, Ellis, Ellsworth, Greeley, Gove, Lane, Lincoln, Logan, Ness, Rush, Russell, Scott, Sheridan, Sherman, Thomas, Trego, Wallace, and Wichita Counties as well as part of Colorado. This study was further focused on the seven counties of Ellis, Ellsworth, Gove, Logan, Russell, Trego, and Wallace since the major portion of the state was within the watershed boundaries. This area of the state has few urban areas with the majority of land in agricultural production. The average precipitation ranges from approximately 51cm to 71cm (Angell et al.; 1978, Barker and Dodge, 1989; Bell et al., 1964; Glover et al., 1975; Hamilton et al., 1986; Jantz et al., 1982; Watts et al., 1990). The model for this watershed contained a total of 14,353 HRUs, 1085 of which were in irrigated areas. There were 33 different STATSGO soil types and all four hydrologic soil groups were represented as well. As can be seen from Figure 6, there are 148 subbasins that each contains a reach, or flow path of water that enters the main channel. There are 18 different landuse categories with dry land and irrigated crops being considered two different landuse categories. As can be seen from Figure 7, this watershed also contains the Cedar Bluff Reservoir near the center of the watershed and Kanopolis Lake Watershed at the outlet.

Figure 6 Kanopolis Lake Watershed

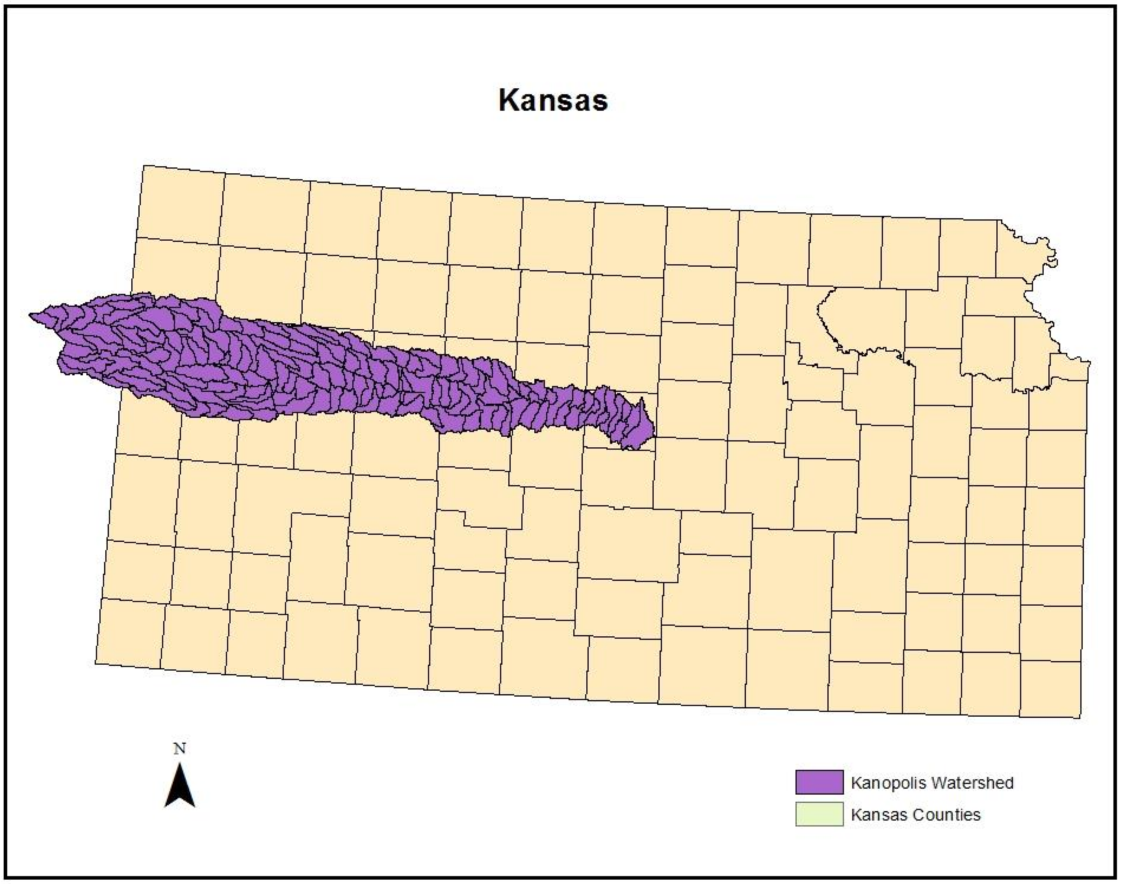
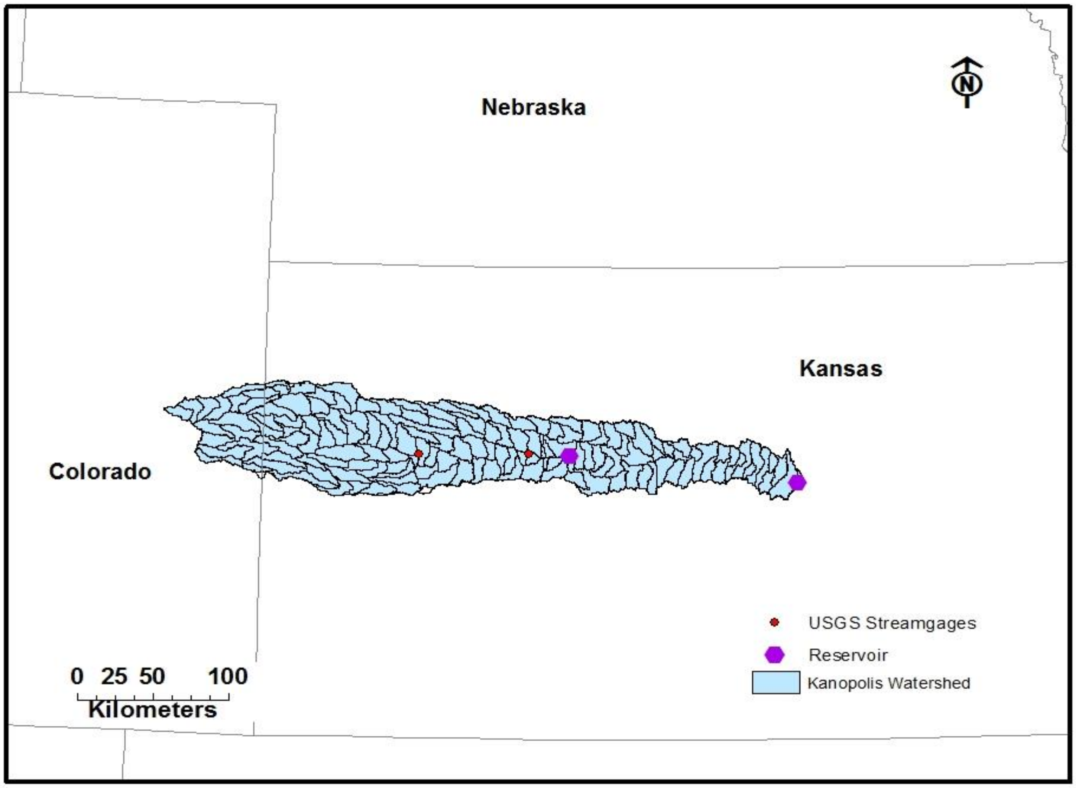


Figure 7 Kanopolis Lake Watershed with Reservoirs and U.S.G.S. Stream Gages Number 06860000, 068661000, & 06864500



2.3 Input Data

To create the SWAT models, data for weather, geography, land use, management, stream gages, and reservoirs needed to be assembled and used in ArcGIS using the ArcSWAT2009 as the SWAT interface. The weather data came from the National Climatic Data Center (NCDC) in a daily time step (NOAA NCDC, 2013a). The soil information came from the State Soil Geographic Database (STATSGO) that can be downloaded from the Web Soil Survey (USDA NRCS, 2013). The geography was described with a 30m resolution digital elevation map (DEM) obtained from the National Elevation Dataset (USDOI USGS, 2013d). The land use/land cover was created using the 2005 Kansas Level 4 Map available at the Kansas Applied Remote Sensing (KARS) website (Peterson and Whistler, 2009). This map was also used to identify the regions to be irrigated in the management file. For management schemes, Ms. Sinnathamby and Ms. Witthaus obtained guidance from Dr. Nathan Nelson of the Kansas State University Agronomy Extension Department. To determine the major crop rotations, the National Agricultural Statistics Service (NASS) maps from 2006-2008 were examined (USDA NASS, 2013). The major crop rotations for the Kansas River Basin were found to be continuous corn, continuous soybeans, continuous grain sorghum, continuous winter wheat, continuous alfalfa, winter wheat-corn rotation, and winter wheat-grain sorghum rotation.

To validate stream flow, daily data from the U. S. Geological Survey (USGS) was used (USDOI USGS, 2013g). For reservoir information such as depth and discharge, data was obtained from the U.S. Army Corps of Engineers (USACE) (USACE, 2013). This data was available on a monthly time scale from 1975-1987 and then on a daily time scale from 1988-current. The reservoir function in SWAT was utilized to simulate the behavior of the two reservoirs in the Kanopolis Lake Watershed. Point source data was added based on records from the Kansas Department of Health and Environment (KDHE) and from the Environmental Protection Agency (EPA) for Colorado and Nebraska (KDHE, 2013; US EPA, 2013b). This included information about lagoons, feedlots, etc., with National Pollutant Discharge Elimination System (NPDES) information for nitrogen and phosphorus (Sinnathamby and Witthaus, Personal communication, 4 April 2013).

2.4 Stream Gage Selection

To calibrate stream flow for the watershed, two factors needed to be considered. The first factor to be examined was the location of the United States Geologic Survey (USGS) stream gage stations. These data were used for the observed data. Stations with complete data for the time of the model (1996 – 2009) were needed. The second factor that needed to be considered was the location of the reservoirs and the effects of the reservoirs on the watershed. The Kanopolis Lake was located at the outflow of the reservoir and did not affect the stream flow within the watershed (U.S. Geological Survey, 2012). The Cedar Bluff Reservoir was located in Subbasin 96 and regulated downstream flow. There was concern about the effect this would have on the validation process, so using the USGS gage stations and the SWAT output file, a location(s) needed to be chosen that was upstream of the reservoir so as to avoid interference of the reservoir on the stream flow. Two U.S. stream gages were found to have daily stream flow measurements within the time period desired and were located upstream of Cedar Bluff Reservoir. These gages are Smoky Hill River at Elkader (stream gage number 06860000) in Subbasin 69 and Smoky Hill River near Arnold, KS (stream gage number 06861000) in Subbasin 89 (Figure 7). To determine the effect the reservoir had on the downstream watershed, another U.S. stream gage was chosen that was upstream of the backwater of the Kanopolis Lake. This gage was located in Subbasin 148 and was called Smoky Hill River at Ellsworth, KS (stream gage number 06864500). The marker for this stream gage is shown as the marker for Kanopolis Lake in Figure 7.

Chapter 3 - SWAT Model

The Soil & Water Assessment Tool (SWAT) was developed by Texas A&M University and the Agricultural Research Service (Neitsch et al., 2011). It is a robust computer modeling program that can simulate many different processes occurring in a watershed or river basin such as nutrient transport, bacteria transport, sediment loading, etc. It is a physically based model that is can compute time continuously to allow for long term modeling (Neitsch et al., 2011). For this report, focus was placed on the model's ability to simulate climate, crop growth and yield, and on stream flow.

3.1 General Description

Once a watershed is selected for study, it is split into subunits called subbasins or subwatersheds. The subbasins are all spatially related to one another so that water flows from one into another until it reaches the outlet of the watershed. The delineation of the subbasins can be accomplished one of two ways. It can be divided by topography such that the entire area within the subbasin flows into the outlet of the subbasin. It can also be delineated based on grid cell boundaries. Grid cell boundaries are common inputs for data such as digital elevation maps (DEM), land use land cover data (LULC), etc. This makes this a common and appealing choice. The only concern with this is that routing paths are not preserved as in the first option. The only criteria for a subbasin are that it contains at least one hydrologic response unit (HRU), a main channel, and at least one tributary channel. Other features such as impoundments can be added if desired (Arnold et al., 2011).

HRUs are areas of land with unique combinations of soil, land management, and land use. This describes not just a particular field, but all areas within the subbasin that share this unique combination. These individual pieces of land are lumped together into one unit that becomes the HRU. All the processes in SWAT are then calculated for each HRU individually and summed at the outlet of the subbasin. This implies that there is no interaction between neighboring HRUs. While the use of HRUs can improve accuracy, if it is known that there are interactions between certain HRUs, it is recommended that separate subbasins be created to accommodate this interaction (Arnold et al., 2011).

Once the watershed has been delineated and HRUs formed, the model can proceed with the many physical processes.

3.2 Climate

The main driving force for hydrology, crop growth, and everything in the natural world is climate. Precipitation, thermal energy, and solar radiation are all included in climate. While SWAT is able to model additional processes, for the purpose of this study, only precipitation and temperature will be discussed in detail.

3.2.1 Temperature

In SWAT, daily air temperatures can be either entered into the model by the user or generated by the model. A daily maximum and minimum are required by the program. Hourly temperatures are calculated by assuming that the maximum temperature is at 3:00 p.m. and the minimum occurs at 3:00 a.m. and the rest of the day is a sinusoidal relationship between the two. Once daily air temperature is determined, soil and water temperatures can be derived (Neitsch et al., 2011).

3.2.1.1 Soil Temperature

Soil temperature fluctuates not only over a day, but also over a season and over a depth. There are several interesting things about the change in soil temperature. The change in soil temperature due to seasonal change follows a sinusoidal pattern similar to the pattern seen throughout the day (Neitsch et al., 2011). The interesting thing occurs with increased depth. As depth increases, the degree in temperature fluctuation decreases and the date of the maximum and minimum temperature starts to differ from that of the soil surface. While there is an equation to calculate the annual soil temperature variation, it requires data that is very difficult to acquire and very hard to estimate with any reasonable degree of certainty. Therefore, SWAT uses an equation that finds the soil temperature at the center of each layer as a function of the soil temperature of the day prior. This equation is (Neitsch et al., 2011):

$$T_{soil}(z, d_n) = l * T_{soil}(z, d_n - 1) + [1.0 - l][df * [\bar{T}_{AAair} - T_{ssurf}] + T_{ssurf}] \quad (3.1)$$

where:

$T_{soil}(z, d_n)$ is the soil temperature at depth z (mm) and day of the year d_n (°C)

l is the lag coefficient

$T_{soil}(z, d_n-1)$ is the soil temperature at depth z for the day prior (°C)

df is the depth factor

$\bar{T}_{AAair}$ is the average annual air temperature (°C)

T_{ssurf} is the soil surface temperature on the day

SWAT sets the lag coefficient to 0.80, but it can range from 0.0 – 1.0. The depth factor relates the depth of the center of the layer to the damping depth (Neitsch et al., 2011). The damping depth is a characteristic of the graph of the sinusoidal wave that represents the change in the annual soil temperature. It is when the temperature amplitude of the graph equals approximately (1/e^0.37) of the amplitude of the soil surface temperature curve (Hillel, 2004). In other words, as depth increases, the soil temperature will approach 5% of the average annual air temperature (Neitsch et al., 2011).

Water content of the soil and the cover of the soil will greatly affect the soil temperature, especially the soil surface temperature. To account for this, SWAT uses the following to calculate the soil surface temperature which is then used to find the soil temperatures for the rest of the soil profile (Neitsch et al., 2011):

$$T_{ssurf} = bcv * T_{soil}(1, d_n - 1) + (1 - bcv) * T_{bare} \quad (3.2)$$

where:

T_{ssurf} is the soil surface temperature (°C)

bcv is the weighting factor for the soil cover

$T_{soil}(1, d_n -1)$ is the soil temperature of the soil for the day prior (°C)

T_{bare} is the soil temperature without any vegetative cover (°C)

For additional information regarding soil temperature, please see the 2009 SWAT Theoretical Manual.

3.2.1.2 Water Temperature

Water temperature is very important for biological processes and is greatly influenced by climate. To find the average daily water temperature, SWAT uses (Neitsch et al., 2011):

$$T_{water} = 5.0 + 0.75 * \bar{T}_{av} \quad (3.3)$$

where:

T_{water} is the water temperature (°C)

$\bar{T}_{av}$ is the average air temperature(°C)

To use this equation developed by Stefan and Preud'homme, SWAT has to make a few assumptions. The first assumption is that the stream is well mixed. If the stream was not well mixed, then there would be layers of water with differing temperatures that would be difficult to calculate. Second, SWAT assumes that the lag time between changes in air and water temperature is less than 1 day. While this is a good assumption for many streams and smaller rivers, it should be noted that for very large rivers the lag time can increase up to a week due to the increase in depth. Last, SWAT also assumes that the interactions between the river, solar radiation, wind speed, ground water additions, sediment, relative humidity, etc. are negligible (Neitsch et al., 2011).

3.2.2 Precipitation

Precipitation is one of the main driving forces of life and the hydrologic cycle. The amount, timing, temperature, intensity, etc. all affect the environment in different and important ways. In SWAT, there are two ways to generate precipitation data. The first method is to use the weather generator in SWAT to create precipitation data. The second method is to input the data manually from a file containing rain gage data. The latter method is much preferred since it will more accurately reflect the area under study (Neitsch et al., 2011).

3.2.2.1 Half-Hour Maximum Rainfall

One value required by SWAT is the maximum half-hour rainfall. This value is needed to calculate peak runoff which affects many other aspects of the hydrologic cycle and soil erosion. If sub-daily data is given to the model, then SWAT will simply calculate the maximum half-hour rainfall value. If, as is the place in this study, only daily values are given, then SWAT must calculate the value using either a triangular distribution of monthly maximum half-hour rainfall data or the user can choose to use the monthly maximum half-hour rainfall for all days in the month (Neitsch et al., 2011).

For monthly data, the user provides the model with maximum half-hour rain that has occurred over the entire time period of concern. Then, SWAT calculates a representative maximum half-hour rainfall fraction by first smoothing the values and then using the following (Neitsch et al., 2011):

$$\alpha_{0.5\mathrm{mon}} = \mathrm{adj}_{0.5\alpha} * \left[1 - e^{\left[\frac{R_{0.5sm(mon)}}{\mu_{mon} * \ln\left(\frac{0.5}{yrs * days_{wet}}\right)}\right]}\right] \tag{3.4}$$

where:

$\alpha_{0.5mon}$ is the average monthly half-hour rainfall fraction

$adj_{0.5\alpha}$ is the adjustment factor

$R_{0.5sm(mon)}$ is the smoothed monthly half-hour rainfall amount (mm H_2O)

μ_{mon} is the monthly mean daily rainfall (mm H_2O)

yrs is the number of years of rainfall data

$days_{wet}$ is the number of wet days in the month

Once the monthly value has been determined, SWAT can then calculate the daily maximum half-hour rain value. To use the triangular distribution method, four inputs are required: maximum value for half-hour rainfall fraction allowed per month, minimum value for half-hour rainfall fraction allowed per month, the average monthly half-hour rainfall fraction, and a random number between 0.0-1.0 (Neitsch et al., 2011). Once this data has been given to SWAT, an upper limit and a lower limit are then calculated. The upper limit is found using (Neitsch et al., 2011):

$$\alpha_{0.5U} = 1 - e^{\left[\frac{-125}{R_{day}+5}\right]} \tag{3.5}$$

where:

$\alpha_{0.5U}$ is the upper limit for the daily half-hour fraction

R_{day} is the amount of daily precipitation (mm H_2O)

The lower limit is set to 0.02083. Once these numbers are found, SWAT uses two equations to find the maximum daily half-hour rainfall fraction (Neitsch et al., 2011):

If

$$rnd_1 \leq \left(\frac{\alpha_{0.5mon} - \alpha_{0.5L}}{\alpha_{0.5U} - \alpha_{0.5L}}\right) \tag{3.6}$$

Then

$$\alpha_{0.5} = \alpha_{0.5mon} * \left(\frac{\alpha_{0.5L} + [rnd_1 * (\alpha_{0.5U} - \alpha_{0.5L}) * (\alpha_{0.5mon} - \alpha_{0.5L})]^{0.5}}{\alpha_{0.5mean}}\right) \tag{3.7}$$

If

$$rnd_1 > \left(\frac{\alpha_{0.5mon} - \alpha_{0.5L}}{\alpha_{0.5U} - \alpha_{0.5L}}\right) \tag{3.8}$$

Then

$$\alpha_{0.5} = \alpha_{0.5mon} * \left[\frac{\alpha_{0.5U} - (\alpha_{0.5U} - \alpha_{0.5mon}) * \left[\frac{\alpha_{0.5U} * (1 - rnd_1) - \alpha_{0.5L} * (1 - rnd_1)}{\alpha_{0.5U} - \alpha_{0.5mon}}\right]^{0.5}}{\alpha_{0.5mean}}\right] \tag{3.9}$$

where:

rnd_1 is the random number generated for that day

$\alpha_{0.5mon}$ is the average monthly maximum half-hour rainfall fraction

$\alpha_{0.5U}$ is the upper limit of the half-hour rainfall fraction

$\alpha_{0.5L}$ is the lower limit of the half-hour rainfall fraction

$\alpha_{0.5}$ is the maximum daily half-hour rainfall fraction

$\alpha_{0.5mean}$ is the average of the upper limit, the lower limit, and the average monthly maximum half-hour rainfall fraction

3.2.2.2 Snow

Precipitation can either be rain or snow in SWAT. This is decided by the daily air temperature. A boundary temperature is defined by the user and if the daily temperature is below that, then any precipitation that falls is defined as snow by SWAT (Neitsch et al, 2011). Snow will accumulate on the ground in a snow pack or a pile of slow melting packed snow (Merriam-Webster, 2013). The water content that is stored in the snow pack is found using the mass balance (Neitsch et al., 2011):

$$SNO = SNO + R_{day} - E_{sub} - SNO_{mlt} \tag{3.10}$$

where:

SNO is the daily water content of the snow pack (mm H_2O)

R_{day} is the daily precipitation (mm H_2O)

E_{sub} is the daily amount of sublimation (mm H_2O)

SNO_{mlt} is the daily amount of snow melt (mm H_2O)

Due to factors such as topography, shading, drifting, etc., snow cover is rarely uniform. This changes the rate of melt of the snow pack. SWAT is able to adjust for this using areal depletion curves. There is also a threshold of snow that the user can define where there is 100% covering of snow. This threshold is based on factors such as ground cover, topography, wind affects, etc. If the volume of water in the snow pack is more than the threshold value, then the snow cover is assumed to be uniform. Also, if the threshold value is very small then the areal depletion curve will have little impact on the snow melt (Neitsch et al., 2011). For more information, please see the 2009 SWAT Theoretical manual (Neitsch et al., 2011).

The melting of the snow is controlled by the temperature of the snow pack and the air temperature. SWAT assumes that snow melting is a linear function based on the snow pack-maximum air temperature and the threshold temperature for snow melt. To find the amount of snow melt on a given day, SWAT uses (Neitsch et al., 2011):

$$SNO_{mlt} = b_{mlt} * sno_{cov} * \left[\frac{T_{snow} + T_{mx}}{2} - T_{mlt}\right] \tag{3.11}$$

where:

SNO_{mlt} is the daily amount of snow melt (mm H_2O)

b_{mlt} is the daily melt factor(mmH_2O/day-°C)

sno_{cov} is the fraction of the HRU area covered with snow

T_{snow} is the daily snow pack temperature (°C)

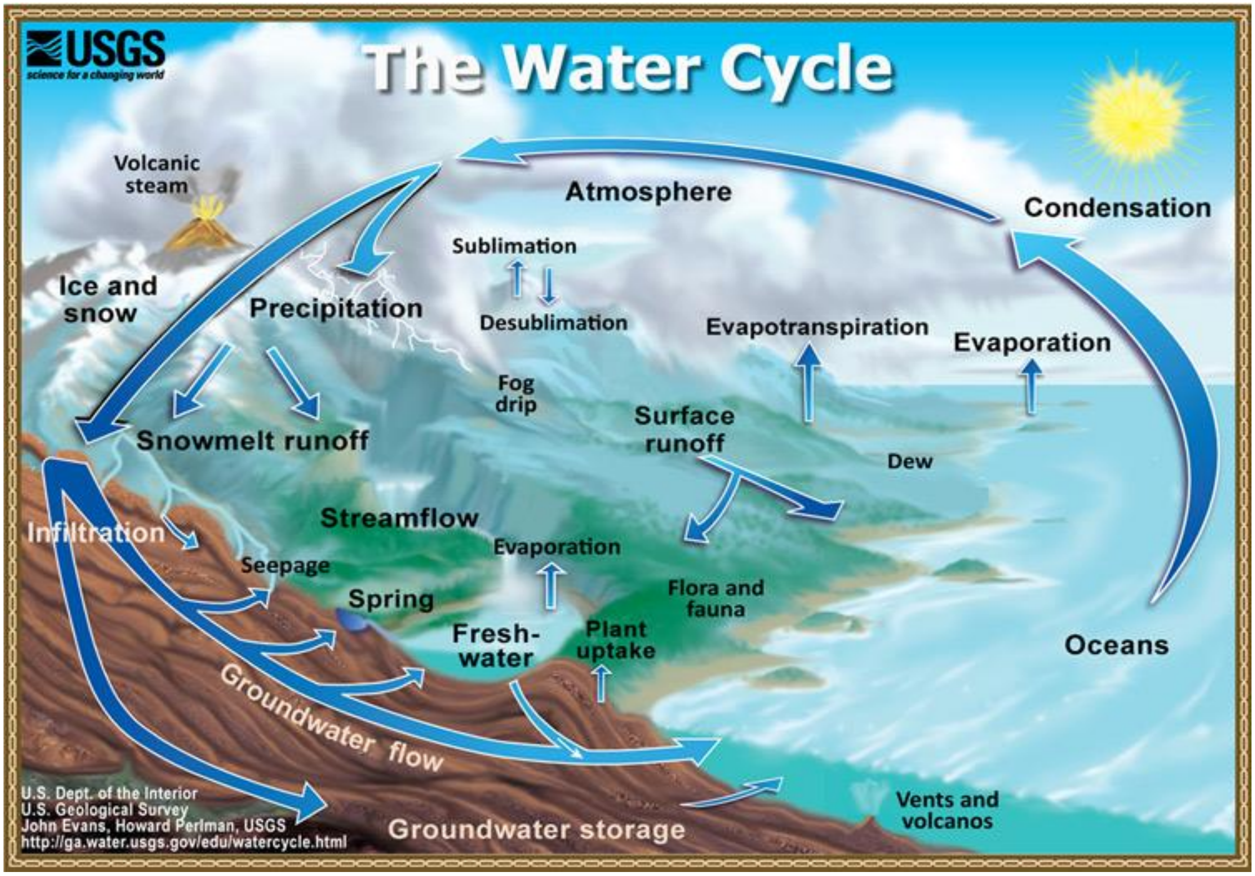
T_{mx} is the daily maximum air temperature (°C)

T_{mlt} is the threshold temperature above which snow melt occurs (°C)

For more information regarding snow melt modeling, please see 2009 SWAT Theoretical Manual (Neitsch et al., 2011).

3.3 Hydrology

Figure 8 Hydrologic Cycle (USDOI USGS, 2013f)



Hydrology, as defined by the Merriam-Webster dictionary is, "a science dealing with the properties, distribution, and circulation of water on and below the earth's surface and in the atmosphere" (Merriam-Webster, 2013). In SWAT, the land part of the hydrologic cycle is calculated using a water balance (Neitsch et al., 2011):

$$SW_t = SW_0 + \sum_{i=1}^{t}(R_{day} - Q_{surf} - E_a - w_{seep} - Q_{gw}) \qquad (3.12)$$

where:

SW_t is the final soil water content (mm H_2O)

SW_0 is the initial soil water content (mm H_2O)

t is the time (days)

R_{day} is the amount of precipitation on day i (mm H_2O)

Q_{surf} is the amount of surface runoff on day i (mm H_2O)

E_a is the amount of evapotranspiration on day i (mm H_2O)

w_{seep} is the amount of percolation and bypass flow that seeps into the soil profile bottom on day (mm H_2O)

Q_{gw} is the amount of return flow on day i (mm H_2O)

3.3.1 Initial Soil Water Content

The initial soil water content that SWAT first uses is a expressed as a fraction of field capacity water content. It can vary from 0.0 – 1.0 and all soils in the watershed will be set to this initial value. Once this has been set, SWAT will then calculate the following soil water content values as functions of precipitation. To ensure the best representation of the soil water content, it is recommended that SWAT simulate the watershed for at least 1 year prior to the time of interest. This lets the model set the water cycle properly before the user makes any comparisons between simulated and actual data. If this is used, then the initial soil water content value will not impact the model results (Arnold, J. G., et al., 2011).

3.3.2 Rain

The amount of rain on a given day can be either generated by the model or it can be read from an input file provided by the user (Neitsch et al., 2011). This model had weather information obtained from the National Climatic Data Center (NCDC) weather stations added by Ms. Sumathy Sinnathamby and Ms. Lindsey Witthaus (personal communication, 2013). For more on the processes SWAT uses regarding precipitation, please see the section on climate and the 2009 SWAT Theoretical Manual.

3.3.3 Surface Runoff

Surface runoff occurs when the rate of water applied to the soil surface is greater than the rate of infiltration (Fangmeier et al., 2006). Infiltration is the rate of water entering the soil profile and moving down in the profile to deeper soil depths (Hillel, 2004). In SWAT, there are two methods available to determine the surface runoff. One option is the Green & Ampt method and the other is the Soil Conservation Service (SCS) curve number method. Since the Green & Ampt method require subdaily precipitation data, this method was not selected for this project. See the SWAT Theoretical Documents for more on the Green & Ampt method.

The SCS curve number method is an empirical model developed by the Soil Conservation Service (now the Natural Resource Conservation Service). To determine the SCS curve number, SWAT uses (Neitsch et al, 2011):

$$Q_{surf} = \frac{(R_{day} - I_a)^2}{(R_{day} - I_a - S)} \tag{3.13}$$

where:

Q_{surf} is the runoff in (mm H_2O)

R_{day} is the rainfall depth (mm H_2O)

I_a is the initial abstractions such as surface storage (mm H_2O)

S is the retention parameter (mm H_2O)

This equation is then used to find the curve number (CN) with two additional pieces of information. The first piece is that I_a is approximately equal to 0.2S. The second is that S is found using (Neitsch et al., 2011):

$$S = 25.4 * \left(\frac{1000}{CN} - 10\right) \tag{3.14}$$

Runoff will occur if $R_{day} > I_a$ which means that the precipitation for that day needs to fill all available storage that abstracts water (Neitsch et al., 2011).

The CN is a description of the ease that water can travel over a given surface with larger numbers indicating that it is easier for water to flow over a surface (ex. CN for pavement is 98 vs.58 for pasture in good condition for soil group B). This is affected by the soil, land use, slope, and antecedent soil water conditions (Fangmeier et al., 2006).

The NRCS has classed soils into four hydrologic soil groups (HSGs) based on field testing. The groups are A, B, C, and D. Group A is made of soils that have low runoff potential when wet and water infiltrates easily. The soils generally are composed of more than 90% sand or gravel. Soils in Group B have moderately low runoff when wet and infiltration is unimpeded. These soils have 10 – 20% clay and 50-90% sand content. Group C have moderately high runoff potential and infiltration is moderately impeded. These soils have about 20-40% clay and less than 50% sand. Group D have high runoff potential and infiltration is restricted. These soils have more than 40% clay and less than 50% sand (Mockus et al., 2009). SWAT will classify all the soils into either one of these four groups or hybrid groups A/D, B/D, or C/D for soils that can be adequately drained. In the dual groups, the first letter corresponds to the drained condition while the second letter corresponds to the undrained condition. This only applies to soils that are rated D naturally are eligible for this dual classification (Neitsch et al., 2011).

Antecedent soil moisture can affect the SCS Curve Number. Three different moisture conditions have been defined. Condition I is dry or at wilting point. Condition II is the average moisture and Condition III is wet or at field capacity. The lowest CN value that SWAT can use is the Condition I value while the highest CN value is the Condition III value. This method of including antecedent soil moisture was originally designed for a 5% slope. While SWAT does not adjust for slope, the user can change the curve numbers prior to entering the curve numbers in the management file (Neitsch et al., 2011). Please see the SWAT 2009 Theoretical Manual for more details.

The retention parameter, S, can be calculated in two different manners that the modeler may choose from. The first method is to let the parameter vary with the water content of the soil profile. The other method is to allow the variable to change according to accumulated plant evapotranspiration (ET). This was added after observing that SWAT consistently predicted too much runoff in shallow soils. By choosing the second method, the curve number is more dependent on the climate and less on the soil storage capacity (Neitsch et al., 2011). Please see the SWAT 2009 Theoretcial Manual for more information.

3.3.4 Peak Runoff Rate

Once the runoff for a given point in time is found, the peak runoff rate is then examined. The peak runoff rate is the maximum runoff flow rate that is generated during a single storm. This will contribute the most erosive energy to a system and is used to determine the amount of sediment loss. A modified rational method is used in SWAT to determine the peak runoff rate (Neitsch et al., 2011). The rational method assumes (Hayes and Young, 2006):

1. Precipitation is uniform over the entire basin
2. Precipitation does not vary with time or space
3. Storm duration is equal to the time of concentration
4. Design storm of a specified frequency produces the design flood of the same frequency
5. Basin area increases roughly in proportion to increase in length
6. Time of concentration is relatively short and independent of storm intensity
7. Runoff coefficient does not vary with storm intensity or antecedent soil moisture
8. Runoff is dominated by overland flow

9. Basin storage effects are negligible

The rational formula is (Neitsch et al., 2011):

$$q_{peak} = \frac{C*i\ Area}{3.6} \tag{3.15}$$

where:

q_{peak} is the peak runoff rate (m^3/sec)

C is the runoff coefficient

i is the rainfall intensity (mm/hr)

Area is the subbasin area (km^2)

3.6 is a conversion factor

3.3.4.1 Runoff Coefficient

The runoff coefficient is ratio of inflow rate to outflow rate found with (Neitsch et al., 2011):

$$C = \frac{Q_{surf}}{R_{day}} \tag{3.16}$$

where:

Q_{surf} is the surface runoff (mm H_2O)

R_{day} is the rainfall (mm H_2O)

3.3.4.2 Rainfall Intensity

The last factor to find the peak discharge is the rainfall intensity, i. The rainfall intensity is the average rainfall during the time of concentration (Fangmeier et al., 2006). It can be found using the following (Neitsch et al., 2011):

$$i = \frac{R_{tc}}{t_{conc}} \tag{3.17}$$

where:

R_{tc} is the amount of rain during the time of concentration (mm H_2O)

t_{conc} is the time of concentration (hr)

It was found after examining rainfall data that the amount of rain falling during the time of concentration is proportional to the amount of rain during a 24-hr period. This allows for the following relationship (Neitsch et al., 2011):

$$R_{tc} = \alpha_{tc} * R_{day} \tag{3.18}$$

where:

R_{tc} is the amount of rain during the time of concentration (mm H_2O)

α_{tc} is the fraction of rain during the time of concentration

R_{day} is the amount of rain for the 24-hr period (mm H_2O)

The fraction of rain during the time of concentration, α_{tc}, varies according to the storm duration. This will approach the maximum (1.00) for shorter duration storms. The minimum fraction would be found in a storm that is 24 hours long with a uniform intensity. SWAT can accommodate the variation of rainfall during the time of concentration with several equations detailed in the Theoretical Manual (Neitsch et al, 2011).

3.3.4.3 Time of Concentration

The time of concentration is the time required for the entire basin to contribute to runoff at the outlet (Hayes and Young, 2006). Swat calculates this using (Neitsch et al., 2011):

$$t_{conc} = t_{ov} + t_{ch} \tag{3.19}$$

where:

t_{conc} is the time of concentration (hr)

t_{ov} is the time of concentration for overland flow (hr)

t_{ch} is the time of concentration for channel flow (hr)

The slope of both the overland and channel portion of the flow, the velocity of the flow, the channel shape and size, and the roughness of the land that the water travels over are all taken into account when calculating the time of concentration. The roughness is found using the Manning's roughness coefficient (n) (Neitsch et al., 2011). Please see the SWAT 2009 Theoretical Manual for further information.

Once all of these variables have been calculated, then SWAT uses the modified rational formulas to find the peak runoff rate (Neitsch et al., 2011):

$$q_{peak} = \frac{\alpha_{tc} * Q_{surf} * Area}{3.6 * t_{conc}} \tag{3.20}$$

where:

q_{peak} is the peak runoff rate (m^3/sec)

α_{tc} is the fraction of daily rainfall curing time of concentration

Q_{surf} is the surface runoff (mm H_2O)

Area is the subbasin area (km^2)

t_{conc} is the time of concentration (hr)

3.6 is for unit conversion

3.3.4.4 Surface Runoff Delay

In large subbasins, the time of concentration can be larger than one day. This means that only a portion of the runoff generated by a storm reaches the outlet on the day that it rained. To accommodate this feature, SWAT added an equation to delay a portion of the runoff that is released into the main channel. The equation is (Neitsch et al., 2011):

$$Q_{surf} = \left(Q'_{surf} + Q_{stor,i-1}\right) * \left(1 - e^{\left[\frac{-surlag}{t_{conc}}\right]}\right) \tag{3.21}$$

where:

Q_{surf} is the amount of surface runoff discharged into the main channel (mmH_2O)

Q'_{surf} is the amount of surface runoff generated in the subbasin (mmH_2O)

$Q_{stor,i-1}$ is the amount of surface runoff stored/lagged from the day prior (mmH_2O)

surlag is the surface runoff lag coefficient

t_{conc} is the time of concentration (hrs)

The surface runoff lag coefficient, surlag, describes how much water is stored and then released after a delay. For a constant time of concentration, as the surlag increases, there will be less water held in storage (Neitsch et al., 2011).

3.3.4.5 Transmission Losses

Another factor that affects the peak discharge is transmission losses. Transmission losses occur in semiarid regions where banks can be dry prior to discharge. When there is runoff, some of the flow is infiltrated into the bed, band and flood plain of the dry stream channel. These losses are called transmission losses (Mockus et al., 2007). The Soil Conservation Service (SCS) developed a method to estimate the transmission losses that is incorporated in SWAT (Neitsch et al., 2011). This method assumes (Mockus et al., 2007):

- Water is lost in the channel
- No streams gain water
- Infiltration and other channel properties are uniform with distance and width
- While sediment concentration, antecedent flow, and temperature affect transmission losses, the equations represent average conditions
- Channel reach is short enough that the average width and duration represent the width and duration for the entire channel reach

- Once threshold volume has been satisfied, outflow volumes are linearly proportional to inflow
- For volume and peak discharge, lateral inflow is assumed to occur during the same time as upstream inflow

The estimated runoff volume after transmission losses is (Mockus et al., 2007; Neitsch et al., 2011):

$$vol_{Qsurf,f} = \begin{cases} 0 & vol_{Qsurf,i} \leq vol_{thr} \\ a_x + b_x * vol_{Qsurf,i} & vol_{Qsurf,i} > vol_{thr} \end{cases} \tag{3.22}$$

where:

$vol_{Qsurf,\,f}$ is the volume of runoff after transmission losses (m^3)

a_x is the regression intercept for a channel of length L and width W (m^3)

b_x is the regression slope for a channel of length L and width W

$vol_{Qsurf,\,i}$ is the volume of runoff prior to transmission losses (m^3)

vol_{thr} is the threshold volume for channel of length L and width W (m^3)

This is then used to modify the peak runoff rate. It is found with (Neitsch et al., 2011):

$$q_{peak,f} = \frac{1}{(3600 * dur_{flw})} * \left[a_x - (1 - b_x) * vol_{Qsurf,i}\right] + b_x * q_{peak,i} \tag{3.23}$$

where:

$q_{peak,f}$ is the peak rate after transmission losses (m^3/sec)

dur_{flw} is the duration of flow (hr)

a_x is the regression intercept for a channel with length L and width W (m^3)

b_x is the regression slope for a channel with length L and width W

$vol_{Qsurf,i}$ is the volume of runoff prior to transmission losses (m^3)

$q_{peak,i}$ is the peak rate before transmission losses (m^3/sec)

It should be noted that all transmission losses are assumed to percolate into the shallow aquifer in SWAT (Neitsch et al., 2011). Please see the SWAT 2009 Theoretical Manual for more information.

3.3.5 Evapotranspiration

Evapotranspiration is "the transfer of water from its liquid state in the soil-plant system to the atmosphere as vapor. It includes evaporation from the soil surface and transpiration from the canopies of plants. The two processes are simultaneous and interactive," (Hillel, 2004). To calculate Evapotranspiration, SWAT has three options: the Penman-Monteith Method, the Priestley-Taylor Method, and the Hargreaves Method. The Penman-Monteith Method requires air temperature, solar radiation, wind speed, and relative humidity. The Priestly-Taylor Method requires solar relative humidity, solar radiation, and air temperature. The Hargreaves Method requires only air temperature (Neitsch et al., 2011). Since all the data required for the Penman-Monteith and Priestly-Taylor Methods was not available, this project selected the Hargreaves Method to calculate potential Evapotranspiration (PET).

3.3.5.1 Potential Evapotranspiration

To calculate the PET using the Hargreaves Method, SWAT uses the following (Neitsch et al., 2011):

$$\lambda * E_0 = 0.0023 * H_0 * (T_{mx} - T_{mn})^2 * (\bar{T}_{av} + 17.8) \qquad (3.24)$$

where:

λ is the latent heat of vaporization (MJ/kg)

E_0 is the potential evapotranspiration (mm/day)

H_0 is the extraterrestrial radiation (MJ/m-day)

T_{mx} is the maximum air temperature (°C)

T_{mn} is the minimum air temperature (°C)

$\bar{T}_{av}$ is the mean air temperature (°C)

3.3.5.2 Actual Evapotranspiration

Once potential evapotranspiration is found (PET), SWAT must calculate actual evapotranspiration (AET). To find AET, SWAT will first evaporate water that is held in the plant canopy, then, find the maximum amount of transpiration and amount of sublimation/soil evaporation, and last it will find the actual amount of soil evaporation and sublimation (Neitsch et al., 2011).

3.3.5.2.1 Water Intercepted in the Canopy

To find the amount of evaporation of intercepted water (water held in the canopy that is readily available for evaporation), SWAT uses two equations depending on the amount of potential evapotranspiration, E_0 (Neitsch et al., 2011):

If $E_0 < R_{INT}$, then:

$$E_a = E_{can} = E_0 \qquad (3.25)$$

$$R_{INT(f)} = R_{INT(i)} - E_{can} \qquad (3.26)$$

where:

E_a is the actual amount of evapotranspiration (mm H_2O)

E_{can} is the amount of evaporation from water held in the canopy (mm H_2O)

E_0 potential evapotranspiration (mm H_2O)

$R_{INT(f)}$ is the final amount of water held in the canopy (mm H_2O)

$R_{INT(i)}$ is the initial amount of water held in the canopy (mm H_2O)

If $E_0 > R_{INT}$, then:

$$E_{can} = R_{INT(i)} \tag{3.27}$$

$$R_{INT(f)} = 0 \tag{3.28}$$

Once SWAT evaporates the water held in the canopy, any evaporative water demand that remains will be met by the vegetation and snow/soil (Neitsch et al., 2011).

3.3.5.2.2 Maximum Transpiration

Next, SWAT calculates the maximum amount of transpiration that could happen on a given day. This number represents the amount of water a plant will use under ideal growing conditions. The actual amount of transpiration will be less than this because there will be a lack of available water in the soil profile. To calculate the maximum amount of transpiration, SWAT has two options. If the Penman-Monteith Method was selected earlier, then transpiration was calculated earlier with this method. If one of the other two methods was chosen, then SWAT uses one of these two equations (Neitsch et al., 2011):

$$E_t = \frac{E_0' * LAI}{3.0} \qquad 0 \leq LAI \leq 3.0 \tag{3.29}$$

$$E_t = E_0' \qquad LAI > 3.0 \tag{3.30}$$

where:

E_t is the maximum transpiration on a given day (mmH_2O)

E_0’ is the potential evapotranspiration adjusted for evaporation of water in the canopy (mmH_2O)

LAI is the leaf area index

3.3.5.2.3 Maximum Sublimation and Soil Evaporation

Once SWAT has calculated the maximum amount of transpiration, it next calculates the maximum amount of sublimation and evaporation from the soil. Soil evaporation and sublimation are directly affected by the amount of shading on the ground. Sublimation is when water changes from solid to vapor without the intermediate state of liquid. This only occurs if there is snow on the ground. If there is no snow, then evaporation will occur from the soil. To find the maximum amount of sublimation/soil evaporation, SWAT uses (Neitsch et al., 2011):

$$E_s = E_0' * cov_{sol} \tag{3.31}$$

where:

E_s is the maximum amount of sublimation/soil evaporation (mm H_2O)

E_0' is the potential evapotranspiration adjusted for evaporation of water in the canopy (mm H_2O)

cov_{sol} is the soil cover index

It should be noted that if the snow water content is greater than 0.5 mm. Then SWAT sets the soil cover index to 0.5 (Neitsch et al., 2011). During high plant water use periods (e.g. growing season), the maximum amount of sublimation/soil evaporation is reduced using a relationship between the maximum sublimation/soil evaporation, the potential evapotranspiration adjusted for evaporation of water from the canopy, and the transpiration. When the amount of transpiration is low, the maximum sublimation/soil evaporation adjusted for plant water use (E_s') will approach the maximum amount of sublimation/soil evaporation (E_s) (Neitsch et al., 2011).

3.3.5.2.4 Actual Sublimation and Soil Evaporation

After SWAT finds the maximum amount of sublimation/soil evaporation, SWAT will then find the actual amount of sublimation that occurs. There are two sets of equations to find the amount of sublimation that is occurring based on water content of the snowpack. If the water content of the snowpack is greater than the maximum amount of sublimation/soil evaporation demand, then (Neitsch et al., 2011):

$$E_{sub} = E_s' \tag{3.32}$$

$$SNO_{(f)} = SNO_{(i)} - E_s' \tag{3.33}$$

$$E_s'' = 0 \tag{3.34}$$

where:

E_{sub} is the amount of sublimation (mm H_2O)

E_s' is the maximum sublimation/soil evaporation adjusted for plant water use (mm H_2O)

$SNO_{(i)}$ is the amount of water in the snowpack on the day prior to sublimation (mm H_2O)

$SNO_{(f)}$ is the amount of water in the snow pack on the day after sublimation (mm H_2O)

E_s" is the maximum soil water evaporation (mm H_2O)

If the water content of the snowpack is less than the maximum amount of sublimation/soil evaporation demand, then (Neitsch et al., 2011):

$$E_{sub} = SNO_{(i)} \tag{3.35}$$

$$SNO_{(f)} = 0 \tag{3.36}$$

$$E_s'' = E_s' - E_{sub} \tag{3.37}$$

If there is no snow and there is an evaporation demand exists, then SWAT will distribute the demand between different layers of soil. It should be noted that SWAT does not allow another soil layer to compensate for the inability of one soil layer to meet its evaporation demand. It simply reduces the actual evapotranspiration for that HRU. To allow the user to modify the depth distribution to meet the soil evaporation demand, a variable was incorporated into the evaporation demand for a given soil layer equation (Neitsch et al., 2011):

$$E_{soil,ly} = E_{soil,zl} - E_{soil,zu} * esco \tag{3.38}$$

where:

$E_{soil,ly}$ is the evaporation demand for layer ly (mm H_2O)

$E_{soil,zl}$ is the evaporation demand for the lower boundary of layer ly (mm H_2O)

$E_{soil,zu}$ is the evaporation demand for the upper boundary of layer ly (mm H_2O)

esco is the soil evaporation compensation coefficient

As esco decreases, the SWAT is able to meet more of the evaporation demand from lower soil levels.

Another thing that SWAT takes into account is whether a soil layer is at or below field capacity. As stated before, field capacity is the amount of water in the soil profile after the soil has been allowed to drain by gravity, which is typically at 48 hrs (Hillel, 2004). If the soil is at or above field capacity, then the evaporation demand adjusted for water content for layer ly is equal to the evaporative demand for layer ly found earlier. If the soil layer is below field capacity, then SWAT reduces the demand for that layer with an equation that relates evaporative demand adjusted for water content of the layer, the evaporation demand for the layer, the soil water content of the layer, and the water contendt of the layer at permanent wilting point (Neitsch et al., 2011). SWAT also limits the maximum amount of water that can be evaporated at any one time to 80% of the plant available water (Neitsch et al., 2011). Please see the SWAT 2009 Theoretical Manual for more details.

3.3.6 Water Seepage

The next factor is the amount of percolation and bypass flow that seeps into the soil profile (w_{seep}). Water that enters the soil has several different pathways available. The main pathway that accounts for the majority of water removed from the soil profile is through plant uptake. Water can also evaporate from the soil, or it can drain into the lower layers and percolate into the aquifer, or it can move laterally and enter into stream flow (Neitsch et al., 2011).

In SWAT, percolation is calculated for each layer in the soil profile. Water is allowed to percolate only if the water content is greater than the field capacity for that layer and the layer is not saturated. Also, if the layer is frozen, then there is no water flow out of that layer. To find the amount of water that actually percolates into the next layer, SWAT uses (Neitsch et al., 2011):

$$w_{perc,ly} = SW_{ly,excess} * \left(1 - e^{\left[\frac{-\Delta t}{TT_{perc}}\right]}\right) \tag{3.39}$$

where:

$w_{perc,ly}$ is the amount of water percolating to the layer beneath it (mm H_2O)

$SW_{ly,excess}$ is the drainable volume of water in the soil layer (mm H_2O)

Δt is the length of the time step (hrs)

TT_{perc} is the travel time for percolation (hrs)

Percolation can be adjusted in SWAT for HRUs that have seasonal high water tables. This describes a situation where the water table is only high during certain parts of the year. When this occurs, SWAT modifies the amount of percolation using a relationship between the water content of the underlying soil layer, the water content of the underlying soil layer at field capacity, and the amount of water at saturation of the underlying soil layer. Using this relationship, the water will either percolate or be ponded in the upper soil layer depending on the current height of the water table (Neitsch et al., 2011).

When water percolates out of the lowest soil layer, it enters the vadose zone which is the unsaturated zone between the soil profile and an aquifer (Neitsch et al., 2011).

3.3.6.1 Bypass Flow

SWAT can also model unique infiltration scenarios that arise from particular soil morphologies. One of these unique scenarios is caused by soils that shrink and swell due to weather conditions such as Vertisols. In these scenarios, SWAT can calculate bypass flow which is when water moves vertically through macropores through unsaturated soil layers due to cracks formed during shrink (Neitsch et al., 2011). These soils are not common in Kansas so this did not play a role in this model. For more information, please see the SWAT Theoretical Manual (Neitsch et al., 2011).

3.3.6.2 Perched Water Tables

Another feature of SWAT is that it can model perched water tables. This is when an HRU has a seasonal high water table and becomes saturated. When this happens, percolation becomes inhibited and water ponds in the soil profile thus creating a perched water table. If it is known that there is a perched water table or if there is a known impervious layer SWAT allows the user to define where the impervious layer is relative to the soil profile. If the impervious layer is within the soil profile, then water is not allowed to percolate out of the soil profile and into the aquifer. If the impervious layer is at the bottom of the soil profile, then SWAT adjusts the amount of percolation leaving the soil with (Neitsch et al., 2011):

$$w_{perc,btm} = w_{perc,orig} * \frac{depth_{diff}}{depth_{diff} + e^{\left[8.833 - 2.598 * depth_{diff}\right]}} \tag{3.40}$$

where:

$w_{perc,btm}$ is the amount of water percolating out of the soil profile with the impervious layer (mm H_2O)

$w_{perc,orig}$ is the amount of water percolating out of the soil calculated without an impervious layer (mm H_2O)

$depth_{diff}$ is the distance from the bottom of the soil profile to the impervious layer (m)

When there is an impervious layer at the bottom of the soil profile, water will accumulate from the bottom, moving upward as each successive layer reaches saturation. This is then the perched water table. SWAT can also determine the height of the perched water table if desired (Neitsch et al., 2011).

3.3.6.3 Lateral Flow

Lateral flow is when water from one layer in a soil profile moves laterally to another soil layer along a hill slope. This occurs often when there is a soil with high hydraulic conductivity and an impermeable/semipermeable layer near the surface. To account for this, SWAT uses a kinematic storage model that is based on the mass continuity equation. In this model, a hill slope segment is used to define a control volume. This hill slope segment has length of L_{Hill} and a depth of permeable layer (depth to impermeable layer) of D_{perm}. The hill slope is also at an angle, α_{hill} , from the horizontal. It is assumed that lateral flow is parallel to the impermeable boundary and that the hydraulic gradient equals the slope of the bed (Neitsch et al., 2011). The net discharge of the hill slope at the outlet can then be calculated with (Neitsch et al., 2011):

$$Q_{lat} = 0.024 * \left(\frac{2 * SW_{ly,excess} * K_{sat} * slp}{\varphi_d * L_{hill}}\right) \tag{3.41}$$

where:

Q_{lat} is the water discharged from the hill slope at the outlet (mm H_2O / day)

$SW_{ly,excess}$ is the drainable volume of water stored in the saturated soil layer per unit area (mm H_2O)

K_{sat} is the saturated hydraulic conductivity (mm/hr) slp is the slope of the hill

φ_d is the drainable porosity of the soil (mm/mm)

L_{hill} is the hill slope length (m)

In large subbasins, it is common for a lag to occur between the precipitation event and the water exiting the subbasin at the outlet. SWAT will also accommodate this in lateral flow by releasing only a portion of the lateral flow into the main channel. This is found using (Neitsch et al., 2011):

$$Q_{lat} = \left(Q'_{lat} + Q_{latstor,i-1}\right) * \left(1 - e^{\left[\frac{-1}{TT_{lag}}\right]}\right) \tag{3.42}$$

where:

Q_{lat} is the amount of lateral flow entering the main channel (mm H_2O)

Q_{lat}' is the total amount of lateral flow generated by a precipitation event (mm H_2O)

$Q_{latstor,i-1}$ is the lateral flow stored or lagged from the day prior (mm H_2O)

TT_{lag} is the travel time for lateral flow (day)

In areas that do not have tile drains, such as Kansas, the travel time for lateral flow is found simply using a ratio of the hill slope length and the highest saturated hydraulic conductivity in the soil profile (Neitsch et al., 2011).

3.3.7 Groundwater

Groundwater is water that is held in the soil under pressure that is greater than atmospheric pressure. It accumulates in the soil mainly through percolation, but it can also come from water seeping into the soil from large water bodies. The stored water collects into what is termed an aquifer. SWAT is able to model two aquifers in each subbasin. If the aquifer is unconfined, meaning it shares a boundary with the water table, then it can contribute to the flow in the main channel. If the aquifer is confined, meaning it is bounded by two geological formations that do not allow easy passage of water, then it is assumed that any contribution to streamflow occurs outside the watershed (Neitsch et al., 2011).

3.3.7.1 Shallow Aquifer

The movement of water through the soil profile into the shallow and deep aquifers is dependent on the conductivity of the different soil layers, the topography, and the depth of the water table. This can cause a delay from water exiting the soil profile and entering the shallow aquifer. SWAT accommodates this delay using a delay function that allows for recharge that is greater than 1 day. Once this is found, SWAT uses the following water balance to describe the processes of the shallow aquifer (Neitsch et al., 2011):

$$aq_{sh,i} = aq_{sh,i-1} + w_{rchrg,sh} - Q_{gw} - w_{revap} - w_{pump,sh} \tag{3.43}$$

where:

$aq_{sh,i}$ is the daily amount of stored water in the shallow aquifer (mm H_2O)

$aq_{sh,i-1}$ is the amount of water stored in the shallow aquifer on the day prior (mm H_2O)

$w_{rchrg,sh}$ is the daily amount of recharge entering the shallow aquifer (mm H_2O)

Q_{gw} is the daily amount of groundwater flow into the main channel (mm H_2O)

w_{revap} is the daily amount of water entering the soil profile due to water deficiencies (mm H_2O)

$w_{pump,sh}$ is the daily amount of water removed by pumping (mm H_2O)

If the user specifies that the source of irrigation is the shallow aquifer, then SWAT will allow for water to be pumped from the aquifer until it is depleted. The height of the groundwater is updated daily in the model (Neitsch et al., 2011). For more information, please see the 2009 SWAT Theoretical Manual.

3.3.7.2 Groundwater Flow

Water from the shallow aquifer can contribute to groundwater flow, which water that flows from the shallow aquifer into the main channel. This occurs when the amount of water in the shallow aquifer reaches a threshold that has been specified by the user. To find the amount of groundwater flow entering the channel, SWAT uses the following (Neitsch et al., 2011):

$$Q_{gw,i} = Q_{gw,i-1} * e^{[-\alpha_{gw*} \Delta t]} + w_{rchrg,sh} * \left(1 - e^{[-\alpha_{gw*} \Delta t]}\right) \tag{3.44}$$

where:

$Q_{gw,i}$ is the daily amount of groundwater flow into the main channel (mm H_2O)

$Q_{gw,i-1}$ is the amount of groundwater flow into the main channel on the day prior (mm H_2O)

α_{gw} is the baseflow recession constant

Δt is the time step (day)

$w_{rchrg,sh}$ is the daily amount of recharge entering the shallow aquifer (mm H_2O)

3.3.7.3 Revap

Water can move from the shallow aquifer upwards into the soil profile if the soil layers are unsaturated or by plants with deep roots. SWAT models this process as a function of water demand due to evapotranspiration. To avoid confusion, this has been termed revap. This can play a significant role in watersheds with shallow aquifers near the surface or with deep-rooted plants. Revap occurs only if a threshold storage value for the shallow aquifer has been crossed. This threshold value, $aq_{shthr,rvp}$, is set by the user. To determine the amount of water exiting the shallow aquifer on a given day due to revap, SWAT must first determine the maximum amount of revap possible (Neitsch et al., 2011):

$$w_{revap,mx} = \beta_{rev} * E_0 \tag{3.45}$$

where:

$w_{revap,mx}$ is the maximum amount of revap possible (mm H_2O)

β_{rev} is the revap coeffiecient

E_0 is the daily potential evapotranspiration (mm H_2O)

Once the maximum revap is found, then the actual amount of revap can be determined using the following set of equations (Neitsch et al., 2011):

If

$$aq_{shthr,rvp} < aq_{sh} < \left(aq_{shthr,rvp} + w_{revap,mx}\right) \quad (3.46)$$

Then

$$w_{revap} = w_{revap,mx} - aq_{shthr,rvp} \quad (3.47)$$

If

$$aq_{sh} \geq \left(aq_{shthr,rvp} + w_{revap,mx}\right) \quad (3.48)$$

Then

$$w_{revap} = w_{revap,mx} \quad (3.49)$$

where:

$aq_{shthr,rvp}$ is the threshold value for revap to occur (mm H_2O)

aq_{sh} is the daily amount of water in the shallow aquifer (mm H_2O)

$w_{revap,mx}$ is the maximum amount of revap possible (mm H_2O)

w_{revap} is the actual amount of revap (mm H_2O)

3.3.8 Water Routing

Once stream flow occurs, SWAT then uses two routing options to describe the process of water moving through the channel to the outlet. These routing options are either the Muskingum or variable storage routing method. SWAT also uses Manning's Equation to determine the flow rate and the velocity. To determine the routing information, the channel characteristics must first be determined.

3.3.8.1 Channel Dimensions

In SWAT, it is assumed that the main channel has a trapezoidal shape with the user defining the width and depth of the channel when it is completely filled with water, the channel length, overall channel slope, and the Manning's roughness coefficient, "n". SWAT will then assume a channel sides have a 0.5 slope and the bottom width is found using (Neitsch et al., 2011):

$$W_{btm} = W_{bnkfull} - \left(2 * z_{ch} * depth_{bnkfull}\right) \tag{3.50}$$

where:

W_{btm} is the bottom width of the channel (m)

$W_{bnkfull}$ is the top width of the channel when completely filled with water (m)

z_{ch} is the inverse of the channel side slope

$depth_{bnkfull}$ is the depth of water when it is completely filled (m)

It should be noted that it is possible for the bottom width to be calculated to zero if the inverse of the channel side slope, z_{ch}, is assumed to be 2. If this occurs, then SWAT simply sets the bottom width to half the top width of the channel when completely filled with water (0.5* $W_{bnkfull}$) and then solving the previous equation for z_{ch} instead of the bottom width of the channel (Neitsch et al., 2011).

The volume of the water held in the channel can be determined with (Neitsch et al., 2011):

$$V_{ch} = 1000 * L_{ch} * A_{ch} \tag{3.51}$$

where:

V_{ch} is the volume of water stored in the channel (m^3)

A_{ch} is the cross-sectional flow area (m^2)

L_{ch} is the length of the channel (m)

If the volume of the water in the channel exceeds the capacity of the channel, the excess water will spread outward across the flood plain. SWAT assumes that the flood plain is trapezoidal in shape with a side slope of 0.25, z_{fld} = 4, and will calculate the bottom width of the flood plain using (Neitsch et al., 2011):

$$W_{btm,fld} = 5 * \ W_{bnkfull} \qquad (3.52)$$

where: $W_{btm,fld}$ is the bottom width of the flood plain (m)

If there is also flow during the flooding event, SWAT simply sums the values for the channel and the flood plain to find the total depth, cross-sectional flow area, and wetted perimeter (Neitsch et al., 2011).

3.3.8.2 Flow Rate and Velocity

Once the channel characteristics have been defined, SWAT then uses Manning's Equation for Uniform Channel Flow to find the flow rate and the flow velocity (Neitsch et al., 2011):

$$q_{ch} = \frac{A_{ch} * R_{ch}^{2/3} * slp_{ch}^{1/2}}{n} \qquad (3.53)$$

$$v_c = \frac{R_{ch}^{2/3} * slp_{ch}^{1/2}}{n} \qquad (3.54)$$

where:

q_{ch} is the flow rate in the channel (m^3/sec)

A_{ch} is the cross-sectional flow area (m^2)

R_{ch} is the hydraulic radius (m)

slp_{ch} is the slope along the channel length (m/m)

n is Manning's Roughness Coefficient

v_c is the flow velocity (m/sec)

3.3.8.3 Routing Through Channel Network

SWAT has two options available for routing flow through the channel network. The default option is the Variable Storage Method (Arnold et al., 2011). The other option is the Muskingum Method. This method requires the user to define three different weighting factors (Arnold et al., 2011). Since this was not the default and there were no specified weighting factor values, the Variable Storage Method was selected.

3.3.8.3.1 Variable Storage Method

SWAT uses a modified continuity equation to determine the final out flow volume of water in the channel. This equation factors the inflow volume, the outflow volume, the transmission losses, the evaporation loss, and the loss of water due to diversions. It is represented as (Neitsch et al., 2011):

$$V_{stored,2} = V_{stored,1} + V_{in} - V_{out} - tloss - E_{ch} + div + V_{bnk} \tag{3.55}$$

where:

$V_{stored,2}$ is the final volume of water in the channel (m^3 H_2O)

$V_{stored,1}$ is the initial volume of water in the channel (m^3 H_2O)

V_{in} is the volume of water flowing into the channel during the time step (m^3 H_2O)

V_{out} is the volume of water flowing out of the channel during the time step (m^3 H_2O)

tloss is the volume of water lost due to transmission through the channel bed (m^3 H_2O)

E_{ch} is the volume of water lost due to evaporation from the channel (m^3 H_2O)

div is the volume of water added/removed from the channel due to diversions (m^3 H_2O)

V_{bnk} is the volume of water added to the channel due to flow from the bank storage (m^3 H_2O)

3.3.8.3.1.1 Transmission Losses

When the weather is very dry and there is no groundwater contributions to the channel, water will exit the channel and infiltrate into the sides and bottom of the stream channel. (This water is assumed to enter the bank storage or deep aquifer.) This is called transmission loss and can be found using (Neitsch et al., 2011):

$$tloss = K_{ch} * TT * P_{ch} * L_{ch} \tag{3.56}$$

where:

tloss is the transmission losses for the channel (m^3 H_2O)

K_{ch} is the effective hydraulic conductivity of the channel (mm/hr)

TT is the flow travel time (hr)

P_{ch} is the wetted perimeter of the channel (m)

L_{ch} is the length of the channel (km)

3.3.8.3.1.2 Evaporation Loss

The evaporation losses are when water evaporates directly from the channel. It is calculated with (Neitsch et al., 2011):

$$E_{ch} = coef_{ev} * E_0 * L_{ch} * W * fr_{\Delta t} \tag{3.57}$$

where:

E_{ch} is the evaporation loss from the channel (m^3 H_2O)

$coef_{ev}$ the evaporation coefficient

E_0 is the potential evaporation (mm H_2O)

L_{ch} is the channel length (km)

W is the channel width at water level (m)

$fr_{\Delta t}$ is the fraction of the time step when water is flowing in the channel

The evaporation coefficient can be modified by the user and varies from 0.0 to 1.0. The fraction of the time step is found by dividing the travel time by the time step (Neitsch et al., 2011).

3.3.8.3.1.3 Bank Storage

Bank storage is the amount of water that is stored in the channel bank. Water held in bank storage can contribute to the water in the channel. The amount of water entering the channel from the bank storage can be found with (Neitsch et al., 2011):

$$V_{bnk} = bnk * \left(1 - e^{[-\alpha_{bnk}]}\right) \tag{3.58}$$

where:

V_{bnk} is the volume of water entering the channel from bank storage (m^3 H_2O)

bnk is the total amount of water in the bank storage (m^3 H_2O)

α_{bnk} is the bank flow recession constant

Another function of bank storage is to meet the water demands of adjacent unsaturated soil layers. This is especially prevalent in areas with saturated soil layers near the surface or where deep-rooted plants are growing. SWAT models this movement as a function of evapotranspiration. To avoid confusion with soil evapotranspiration, this process has been renamed revap (Neitsch et al., 2011). For more information, see the 2009 SWAT Theoretical Manual.

3.3.9 Reservoirs

SWAT is also able to simulate the effects of large water storage areas such as ponds, wetlands, potholes, and reservoirs. Kansas has over 20 major reservoirs and lakes with the study area of Kanopolis Lake Watershed having 2 waterbodies – Kanopolis Lake and Cedar Bluff

Reservoir (USDOI USGS, 2012). SWAT calculates the water balance for the reservoir using the following (Neitsch et al., 2011):

$$V = V_{stored} + V_{flowin} - V_{flowout} + V_{pcp} - V_{evap} - V_{seep} \tag{3.59}$$

where:

V is the volume of water in the reservoir (m^3 H_2O)

V_{stored} is the initial volume of water stored in the reservoir (m^3 H_2O)

V_{flowin} is the volume of water entering the reservoir (m^3 H_2O)

$V_{flowout}$ is the volume of water exiting the reservoir (m^3 H_2O)

V_{pcp} is the volume of precipitation falling on the reservoir (m^3 H_2O)

V_{evap} is the volume of water removed from the reservoir by evaporation (m^3 H_2O)

V_{seep} is the volume of water lost from the reservoir by seepage (m^3 H_2O)

3.3.9.1 Surface Area of the Reservoir

To begin to solve for the water balance of the reservoir, the surface area of the reservoir must be known. This will affect such processes as evaporation, amount of precipitation falling on the reservoir, and seepage. The surface area of the reservoir changes based on the volume of water stored. SWAT calculates the surface area daily with (Neitsch et al., 2011):

$$SA = \beta_{sa} * V^{expsa} \tag{3.60}$$

where:

SA is the surface area of the reservoir (ha)

β_{sa} is a coefficient

V is the volume of water in the reservoir (m^3 H_2O)

expsa is an exponent

Information regarding the principle and emergency spillways is used by SWAT to calculate the coefficient and the exponent (Neitsch et al., 2011).

3.3.9.2 Precipitation

Once the surface area of the reservoir has been calculated, SWAT can then find the amount of precipitation falling on the surface of the reservoir using (Neitsch et al., 2011):

$$V_{pcp} = 10 * R_{day} * SA \tag{3.61}$$

where:

V_{pcp} is the volume of water falling as precipitation on the reservoir (m^3 H_2O)

R_{dat} is the amount of precipitation on a given day (mm H_2O)

SA is the surface area of the reservoir (ha)

3.3.9.3 Evaporation

The amount of water that evaporates from the surface of the reservoir can also be found with (Neitsch et al., 2011):

$$V_{evap} = 10 * \eta * E_0 * SA \tag{3.62}$$

where:

V_{evap} is the volume of water removed from the reservoir due to evaporation (m^3 H_2O)

η is an evaporation coefficient (0.6)

E_0 is the potential evapotranspiration (mm H_2O)

SA is the surface area of the reservoir (ha)

3.3.9.4 Seepage

The amount of water that exits the reservoir due to seepage can be found using (Neitsch et al., 2011):

$$V_{seep} = 240 * K_{sat} * SA \tag{3.63}$$

V_{seep} is the volume of water lost from the reservoir due to seepage (m^3 H_2O)

K_{sat} is the effective saturated hydraulic conductivity of the reservoir bottom (mm/hr)

SA is the surface area of the reservoir (ha)

3.3.9.5 Outflow

There are four different options to calculate outflow for a reservoir that the user must choose. The options are: average annual release rate for uncontrolled reservoir, controlled outflow with target release, measured monthly outflow, and measured daily outflow. The method selection is based on the data available. In this study, daily outflow data was available from U.S. Army Corps of Engineers for the time period of the study, so the measured daily outflow method was selected (Sinnathamby and Witthaus, 2013). To select this method, the user must set IRESCO = 3 in the SWAT input.res file (Arnold et al., 2011). Once this is selected, SWAT calculates the volume of outflow from the reservoir using (Neitsch et al., 2011):

$$V_{flowout} = 86400 * q_{out} \tag{3.64}$$

where:

$V_{flowout}$ is the volume of water flowing out of the reservoir (m^3 H_2O)

q_{out} is the outflow rate (m^3/sec)

3.4 Crop Growth

Plant growth in SWAT is based on the EPIC model without the micronutrient cycling, detailed root growth, simultaneous growth of multiple plant species, and toxicity responses that EPIC can simulate (Neitsch et al., 2011).Generally, SWAT simulates plant growth based on heat units. Heat units describe the amount of heat above the minimum or base temperature for the plant. This is calculated by taking the mean temperature and subtracting the base temperature of the plant. This is a heat unit (Neitsch et al., 2011). For example, if a wheat plant has a base temperature of 10°C and the mean temperature for a given day was 25°C, then the heat units for that day would be found:

$$25°C - 10°C = 15 \text{ heat units} \tag{3.65}$$

In SWAT, plant growth is assumed to be directly proportional to the increase in temperature until the plant reaches the amount of heat units necessary to reach maturity and then the plant waits until harvest or conversion to residue. This method alone is not able to account for extremely high temperatures having a deleterious effect on crop growth unless a maximum plant temperature is added (Neitsch et al., 2011). For management of crops, two options are available in SWAT: schedule based on heat units or on calendar day. The advantage to scheduling based on heat units is that models involving areas with either little planting/harvesting data is known or when the area is large enough to have a temperature gradient can be modeled using a central file that can adjust the management of each HRU based on the temperature. The disadvantage comes when using heat units to schedule pesticide and fertilizer applications. The user will be unable to know if the weather that triggered the application of the fertilizer/pesticide was caused by rain. It is not common practice to apply during storms since this would cause a lot of nutrient loss due to runoff (Neitsch et al., 2011). The other option allows for more control of crop management including application of fertilizer and pesticides.

For perennial crops, cool season annuals, and trees, SWAT will also include the dormancy cycle based on the day length (Neitsch, et al., 2011).

Two factors are combined to produce the final plant growth of the simulation: optimal growth vs. actual growth. Optimal growth describes the maximum amount of plant growth that could happen if all the plant's needs were met. Actual growth takes into account stresses that could impede the growth of the plant. To gain a full understanding of the manner in which SWAT simulates crop growth, optimal growth will be examined first and then actual growth.

3.4.1 Optimal Growth

In SWAT, one of the first things to be determined in the optimal growth is the amount of solar radiation that is intercepted by the plant on a daily basis. This is found using Beer's Law which relates the amount of intercepted photosynthetically active radiation (light in the 400-700nm range) to the amount incident photosynthetically active radiation, the light extinction coefficient and the leaf area index. This explains how much energy is intercepted and available to the plant for growth. Each plant can utilize this energy with different degrees of efficiency. This radiation use efficiency (RUE) is unique to each plant type and predetermined in the SWAT database (Neitsch et al., 2011). The RUE is affected by changes in atmospheric CO_2 and the vapor pressure deficit (Neitsch et al., 2011). Vapor pressure deficit is the difference between the partial pressure at dry bulb temperature and the partial pressure of water vapor in air (Kirkham, 2013). SWAT can simulate these changes. For more information see the SWAT Theoretical Documentation (Neitsch et al., 2011).

3.4.1.1 Initial Optimal Growth

For canopy height and leaf area growth, SWAT uses three stages. The first stage is the initial growth phase, then steady state at maturity, and then either harvest or senescence. Initial growth is controlled by the optimal leaf area development curve (Neitsch et al., 2011):

$$fr_{LAImx} = \frac{fr_{PHU}}{fr_{PHU} + e^{(l_1 - l_2 * fr_{PHU})}} \tag{3.66}$$

where:

fr_{LAImx} is the fraction of plant's maximum leaf area index for a given fraction of potential heat units

fr_{PHU} is the fraction of potential heat units

l_1 and l_2 are shape coefficients which correspond to the first and second points of the optimal leaf area development curve

Once the fraction of the plant's maximum leaf area index is found, the canopy height on a given day can be found using the following equation (Neitsch et al., 2011):

$$h_c = h_{c,mx} * \left(\sqrt{fr_{LAImx}}\right) \tag{3.67}$$

where:

h_c is the canopy height for a given day (m)

$h_{c,mx}$ is the maximum canopy height possible for the plant

fr_{LAImx} is the fraction of the plant's maximum leaf area index

This equation is stating that canopy height for a given day during the day is a fraction of the maximum growth ($h_{c,mx}$) for that plant. Once the maximum height is reached, SWAT will keep the height constant until harvest (Neitsch et al., 2011).

The leaf area index (LAI) is the area of the leaves in relationship to the ground (Food and Agriculture Organization of the United Nations, 2001). To determine the LAI for a given day, the following is used (Neitsch et al., 2011):

$$LAI_i = LAI_{i-1} + \Delta LAI_i \tag{3.68}$$

where:

LAI_i is the leaf area index for day i

LAI_{i-1} is the leaf area index for the day prior to day i

ΔLAI_i is the leaf area added on day i

3.4.1.2 Senescence

Once the plant has reached the maximum canopy height and leaf area index, the plant enters the steady state of maturity. This is when there is no net growth and the plant does not transpire or take up water and nutrients. This occurs at fr_{PHU} of 1.

To model tree growth, separate yet similar equations were developed and included in SWAT. Since this research focused on field crops, the equations for trees were not included in this report. See the SWAT Theoretical Documentation (Neitsch et al, 2011) for more data.

3.4.1.3 Root Growth

To fully model plant growth and development, the root growth must also be taken into consideration. The roots of plants play a large role in nutrient cycling, as well as plant water use, erosion, etc. To simulate this, SWAT uses two main equations. The first equation describes the daily root biomass fraction. The daily root biomass fraction begins at 0.40 at emergence of the plant from the soil to 0.20 at plant maturity and is calculated using (Neitsch et al., 2011):

$$fr_{root} = 0.40 - 0.20 * fr_{PHU} \tag{3.69}$$

where:

fr_{root} is the fraction of total biomass of the roots for a given day

fr_{PHU} is the fraction of potential heat units for that day.

This is then taken to find the root depth for a given day using the following (Neitsch et al., 2011):

$$z_{root} = 2.5 * \ fr_{PHU} * \ z_{root,mx}\ ,\ if\ fr_{PHU}\ \leq 0.40 \tag{3.70}$$

$$z_{root} = z_{root,mx}\,, \quad if\ fr_{PHU} > 0.40 \tag{3.71}$$

where:

z_{root} is the depth of root for a given day (mm)

fr_{PHU} is the fraction of potential heat units on a given day

$z_{root,mx}$ is the maximum root depth for a plant in a given soil (mm)

The maximum root depth is found by comparing the maximum potential root depth for the plant as defined in the plant growth database (RDMX in input.crop.dat) and the maximum potential depth for a soil as defined in the soil input file (SOL_ZMX in the input.sol) or the deepest depth for the soil profile if there isn't a value for the potential depth for that soil. SWAT will choose the shallower of the two maximum values to be used as the $z_{root,mx}$ (Neitsch et al., 2011).

3.4.2 Actual Growth

Once optimal growth is established, SWAT will then determine the actual growth. This differs from optimal growth by accounting for less than optimal conditions such as nutrient stress, water stress, high temperature, etc. (Neitsch et al., 2011). The main stress that will be examined in this report are water and temperature stress.

3.4.2.1 Water Stress

Water stress varies from 0.0 to 1.0 as the soil becomes dryer. To simulate water stress, SWAT compares actual and potential plant transpiration which is the when water moves from the soil, into the roots, and exits the leaves (USDOI USGS, 2013e). The following formulas are used to define this (Neitsch et al., 2011):

$$strs = 1 - \frac{E_{t,act}}{E_t} = 1 - \frac{w_{actualup}}{E_t} \tag{3.72}$$

where:

wstrs is the water stress on a given day

$E_{t,act}$ is the actual amount of transpiration on a given day (mm H_2O)

E_t is the maximum transpiration of a given day (mm H_2O)

$w_{actualup}$ is the total plant water uptake on a given day (mm H_2O)

3.4.2.2 Temperature Stress

Temperature stress describes the reaction of the plant to deviations from the optimal growth temperature. The following set of equations governs temperature stress (Neitsch et al., 2011):

$$tstrs = 1\,,\ when\ \bar{T}_{av}\ \leq\ T_{base}\ or\ when\ \bar{T}_{av}\ > (2 * T_{opt} -\ T_{base}) \tag{3.73}$$

$$tstrs = 1 -\ e^{\left[\frac{\left(-0.1054*\left(T_{opt}-\bar{T}_{av}\right)^2\right)}{\left(\bar{T}_{av}-T_{base}\right)^2}\right]},\quad when\ T_{base}\ <\ \bar{T}_{av}\ \leq\ T_{opt} \tag{3.74}$$

$$tstrs = 1 -\ e^{\left[\frac{\left(-0.1054*\left(T_{opt}-\bar{T}_{av}\right)^2\right)}{\left(2*T_{opt}-\bar{T}_{av}-T_{base}\right)^2}\right]},\ when\ T_{opt}\ <\ \bar{T}_{av}\ \leq 2 *\ T_{opt} -\ T_{base} \tag{3.75}$$

where:

tstrs is the temperature stress for a given day

$\bar{T}_{av}$ is the mean air temperature (°C)

T_{base} is the base or minimum temperature for growth for that plant (°C)

T_{opt} is the optimal temperature for that plant (°C)

Once the stresses have been determined, SWAT then combines them into the variable γ_{reg} which is the plant growth factor that can range from 0.0 to 1.0. This is found using the following (Neitsch et al., 2011):

$$\gamma_{reg} = 1 - \max(wstrs, trstrs, nstrs, pstrs) \tag{3.76}$$

where:

γ_{reg} is the plant growth factor

wstrs is the water stress on a given day

trstrs is the temperature stress on a given day

nstrs is the nitrogen stress on a given day

pstrs is the phosphorus stress on a given day

Once the plant growth factor has been determined, then the actual plant biomass and the actual leaf area index can be determined. The actual change in biomass is found by multiplying the potential change in biomass by the plant growth factor. The actual change in LAI is found by multiplying the potential change in LAI by the square root of the plant growth factor.

It should be noted that if desired, the actual biomass can be specified by the user and the actual growth equations are modified to represent the change. See equation 5:3.2.4 in the SWAT Theoretical Documentation for more details.

3.4.3 Actual Yield

Once the actual growth has been established and SWAT simulates the plant reaching maturity, actual yield can then be calculated. There are two options available in plant management in SWAT. The first is a kill option. This is when all biomass is converted to residue (Neitsch et al., 2011). This option would be selected for cover crops and other similar scenarios. The other option is the harvest option. This option allows for a portion of the biomass to be removed from the field and a portion to remain. SWAT uses a variable called the Harvest Index (HI) to describe the amount of the biomass removed. For most crops, the desired portion of the plant is above ground so the HI varies between 0.0 and 1.0. For plants that produce fruit below ground, such as potatoes, carrots, etc., the HI can be greater than 1.0 (Neitsch et al., 2011).

To determine the actual crop yield in kg/ha, SWAT uses the following (Neitsch et al., 2011):

$$yld = bio_{ag} * HI , \qquad when\ HI \leq 1.00 \qquad (3.77)$$

$$yld = bio * \left(1 - \frac{1}{(1+HI)}\right), \ when\ HI > 1.00 \qquad (3.78)$$

where:

yld is the crop yield (kg/ha)

bio_{ag} is the above ground biomass at harvest (kg/ha)

bio is the total biomass at harvest (kg/ha)

HI is the harvest index

The amounts or nitrogen and phosphorus that are removed at harvest can be determined as a function of the yield and the fraction of the nutrient in the plant. Details can be found in the SWAT Theoretical Document (Neitsch et al., 2011).

3.5 SWAT Files

While the physical processes of SWAT are very important, it is also helpful to know which files in the program to access to alter a parameter. SWAT generates many different files that are classified as either input or output files.

3.5.1 Input Files

The way in which SWAT divides the data that is both entered into the program and computed as outputs is unique and worth discussing. The input is categorized into several different levels of detail which include the watershed level, the subbasin level, the HRU level, and a few unique levels for things such as point sources, reservoirs, etc. This is done to help organize how wide an effect is a change in input applied to. For example, a watershed level change is applied to the entire watershed, such as selecting which process to use to model evapotranspiration. An HRU level change would be something that affects only a single HRU or group of HRUs such as a management scheme for HRUs with corn only (Arnold et al., 2010).

There are a total of 37 different input files available for SWAT. A summary of the names and brief descriptions have been provided below in Table 1 (Arnold et al., 2010).

Table 1 SWAT Input Files with Descriptions

	File Name	Description
Watershed Level	input.file.cio; Master Watershed File	Master file with file names and printing parameters
	input.fig; Watershed Configuration File	Defines routing network and lists file names for watershed
	input.bsn; Basin Input File	Defines values and options for processes of enire watershed
	input.pcp; Precipitation Input File	Contains daily measured precipitation values from gage stations
	input. tmp; Temperature Input File	Contains daily maximum and minimum temperature values from gage stations
	input.slr; Solar Radiation Input File	Contains daily solar radiation values from gage stations
	input. wnd; Wind Speed Input File	Contains daily average wind speed values from gage stations
	input.hmd; Relative Humidity Input File	Contains daily relative humidity values from gage stations
	input.pet; Potential Evapotranspiration Input File	Contains daily PET values
	input.cst; Weather Forecast Input File	Generates representative daily climatic data during forecast period
	input.cal; Auto-Calibration Input File	Operates the automatic calibration algorithms
	input.crop.dat; Land Cover/Plant Growth Database File	Contains plant growth parameters
	input.till.dat; Tillage Database File	Contains mixing information caused by tillage
	input.pest.dat; Pesticide Database File	Contains information about degradation and mobility of all pesticides
	input.fert.dat; Fertilizer Database File	Contains information about chemical make-up of all fertilizers and manures
	input.urban.dat Urban Database File	Contains information about runoff from urban areas
	input.septic.dat; Septic Database File	Contains information about septic systems
	input.wwq; Watershed Water uality Input File	Models QUAL2E transformations in main channel
Subbasin	input.sub; Subbasin Input File	Defines number and types of HRUs in subbasins, tributary channel attributes, and climatic inputs
	input.wgn; Weather Generator Input File	Generates representative daily climatic data for a subbasin
	input.pnd; Pond/Wetland Input File	Contains information regarding impoundments in subbasin
	input.wus; Water Use Input File	Contains information regarding water consumption
	input. rte; Main Channel Input File	Defines water and sediment movement in main channel
	input.sep; Septic Input File	Contains information about septic systems in subbasin

	input.swq; Stream Water Quality Input File	Models QUAL2E and pesticide transformations in main channel of subbasin
HRU	input.hru; HRU Input File	Contains any unspecified HRU parameters
	input.mgt; Management Input File	Contains all management and land cover information in HRU
	input.sol; Soil Input File	Contains information about soil and its physical characteristics
	input.chm; Soil Chemical Input File	Contins information about initial nutrient and pesticide levels in soil
	input.gw; Groundwater Input File	Contains information about shallow and deep aquifers
Reservoir	input.res; Reservoir Input File	Contains information about parameters regarding water and sediment movement in reservoir
	input.lwq; Lake Water Quality Input File	Contains information about movement of pesticides and nutrients through reservoir/lake
Point Source	input.rechour.data	Contain information about point source loadings of channel network
	input.recday.dat	
	input.recmon.dat	
	input.recyear.dat	
	input.reccnst.dat	

3.5.2 Output Files

Once the SWAT model has been allowed to simulate the watershed in question, five different output files are created. These files are summarized in Table 2 (Arnold et al., 2010):

Table 2 SWAT Output Files with Descriptions

File Name	**File Description**
input.std; Summary Input File	Contains summary of important input values
output.std; Summary Output File	Contains summary of average annual/monthly/daily loading of streams by HRUs
output.hru; HRU Output File	Contains summary information about each HRU
output.sub; Subbasin Output File	Contains summary for each subbasin
output.rch; Reach Output File	Contains summary for each routing reach in watershed

Chapter 4 - SWAT and Biofuels

There have been many different studies regarding biofuels and the different crops that could potentially be used for biofuels. One thing that makes this research more difficult is that use of an organic source for energy necessitates the consideration of the requirements of the plant, not just the energy requirements of a society. For example, a tropical plant species that can be converted to biofuels is not suitable for production in areas with arid climates. The water required to grow that crop would make the production vastly inefficient. It is the responsibility of the engineering and science community to find different plants that are suitable for biofuel production that are also suitable for a given climate. In light of this, any potential biofuel crop that is considered for Kansas should be able to adapt to Kansas climate.

Kansas climate can be quite varied with cold winters and hot summers. The temperatures of Kansas have been recorded as low as -40°C (-40°F) and as high as 49.4°C (121°F) (NOAA NCDC, 2013). The average precipitation for Kanopolis Lake Watershed ranges from approximately 51cm to 71cm (Angell et al., 1978; Barker and Dodge, 1989; Bell et al., 1964; Glover et al., 1975; Hamilton et al., 1986; Jantz et al., 1982; Watts et al., 1990). This type of weather will dictate the type of crops suitable for Kansas. Some possible biofuel crop candidates that are also suitable for production in Kansas are switchgrass (*Panicum virgatum*), miscanthus (*Miscanthus x giganteus*), and sweet sorghum (*Sorghum bicolor*).

Switchgrass is a North American warm-season perennial grass that grows well on marginal land areas. It has a rapid growth rate and has been found to be fairly drought tolerant. One study found that switchgrass only showed stress to low water was during high water stress conditions (Sun et al., 2012). Miscanthus is a non-native perennial grass that has high water and nutrient use efficiencies that can give higher yields than switchgrass (Ling Ng et al., 2010). Since it is non-native, additional steps would be required to properly manage it as a crop while preventing it from becoming an invasive species. Sweet sorghum is a cereal crop that is well adapted to semi-arid regions and has shown high drought and salinity tolerance (Sher et al., 2013; Xie and Su, 2012).

To try to predict the effects of growing these crops, models such as SWAT can be very helpful. Some potential biofuel crops are already programmed into the model such as corn, soybeans, sorghum, etc. Other potential biofuel crops are not directly in the model such as miscanthus and switchgrass. To simulate these plants, either a close surrogate crop needs to be chosen that is similar in growth rate, behavior, water use, etc. or programming needs to be added to the model to accommodate the new potential crop. One group modeling miscanthus was able to approximate the crop parameters using prior studies and inputted into SWAT to model the approximate effect changing the cropping schemes to include miscanthus in the Salt Creek watershed in Illinois (Ling Ng et al., 2010). This demonstrates that it is possible to add new crop data if the needed parameters are known. Research would need to be conducted to determine these parameters for any crop that is not included in the SWAT model.

Other studies have used SWAT to predict the effects of different biofuel production. One study examined the effects of increasing the production of oil palm, cassava, and sugar cane in the Khlong Phlo watershed in Thailand. The study tried scenarios with different amounts of expansion of the crops and the impact on sediment, nutrient loading, and water use. The study found that cassava had the lowest water footprint. It did reveal that planting cassava resulted in higher runoff which increased the amount of sediment and nutrient loading in the watershed. The authors recommended that cassava be used in more arid regions where water is scarce and that oil palm was an appropriate substitute for existing orchards with little change due to the substitution (Babel et al., 2011).

Another study in Michigan considered water quality impacts of planting various potential bioenergy crops on both traditional and marginal agricultural land and comparing the results to current practice. The bioenergy crops considered were canola, cereal rye, miscanthus, corn, corn stover, soybeans, switchgrass, sorghum, and native grasses. The researchers also tailored the marginal land rotations based on recommendations from the Michigan State University Extension to develop a realistic cropping scenario for marginal lands. The research found that traditional intensive row crops such as corn, soybeans, sorghum increased sediment and nitrogen loads. The authors do not recommend sorghum for this area since it had the maximum increase in sediment loading and nitrogen increase. The study found that perennial grasses reduced sediment, phosphorus, and nitrogen loads, except for miscanthus which was found to raise the nitrogen load slightly. It was also determined that if canola was added to a corn-soybean rotation then sediment, nitrogen, and phosphorus loads all increased. If rye was added, then all loads were decreased. The authors concluded that the suitability for the individual crop and the crop rotation for a given area greatly depended on the requirement of the specific land use and what system the new biofuel system replaced (Love and Nejadhashemi, 2011).

One study considered water quality impacts on the Upper Mississippi River Basin with an increase in corn yield, harvesting a portion of the corn stover, and converting land to switchgrass production. This study found that if there was an increase in nitrogen use efficiency by the corn, and then there was a reduction in nitrogen loading, but a slight increase in phosphorus loading. The team also found that with an increase in the removal of corn stover, there was an increase in evapotranspiration which resulted in less runoff. With less runoff, stover removal could potentially result in a reduction of sediment, nitrogen, and phosphorus loading. The authors did state that if there was a change to the soil properties such as the saturated hydraulic conductivity (K_{sat}) resulted in soil erosion. When pasture was converted to switchgrass production an increase in the water loss due to evapotranspiration and a decrease in the surface runoff was seen. Soil erosion was also greatly reduced which resulted in decreased amounts of nitrogen and phosphorus loading for areas converted to switchgrass. The team also recommended careful investigation of the effects of specific biofuel crop production prior to conversion, especially for areas that have limited rainfall (Wu et al., 2012).

A study in the Iowa River Basin, a tributary of the Upper Mississippi River Basin, considered the long term impacts of different removal rates of corn stover and the conversion of native grassland to biofuel crops such as switchgrass and miscanthus. This study determined that while an increase of corn stover removal rate reduced the total nitrogen concentration in the soil, the biomass production levels could be maintained with appropriate fertilizer application. There was also a slightly negative effect on the water yield due to increase in soil evaporation and a dramatic increase in sediment yield due to less soil cover. The research suggested that some conversion from corn fields to biofuel crops could be beneficial in reducing the sediment loads from those areas, but miscanthus was found to generate a secondary problem. Miscanthus has a large amount of biomass production which required a large amount of water use and fertilizer use than switchgrass. The conversion of current native grassland to bioenergy crop also resulted in a decrease in water quantity due to higher evapotranspiration in the growing season and higher soil evaporation in the non-growing season caused partially by low soil cover. The study concluded that switchgrass was a promising biofuel for this area, but that more research would be required before a decision was made regarding the conversion of the area to biofuel production (Wu and Liu, 2012).

These studies all suggest that there is a place and management scheme to best suit a given biofuel crop. Since these studies all recommend site specific testing, then to determine the best biofuel for Kansas, biofuel production in the Kansas River Basin must be simulated. This study was initiated to create a model that could be used to simulate different biofuel cropping scenarios and make decisions based on the results of these simulations.

Chapter 5 - Calibration and Validation

In order to simulate the natural world, a computer model must be calibrated so it closely matches the environment it models. The data that SWAT generates at the end of a simulation regarding the amount of runoff seen at the outlet of subbasins and the watershed, the yield of crops grown in the watershed, the amount of sediment and nutrients found at the outlet of both the watershed and the subbasins, etc., must be compared to the actual data that has been physically sampled and recorded at these locations. If the model data does not match the actual data, then the model must be calibrated until it matches (or very nearly matches) the actual data. Otherwise, the data that is computed by the model will not be overly helpful for decision making.

For the SWAT model, calibration and validation are imperative since this is partially based on empirical equations that may or may not accurately reflect the watershed under study (Borah and Bera, 2003). Many studies report that an iterative calibration process for SWAT is used and give a list of parameters that were altered, but few give details regarding the process that was used to determine the parameters listed (Arnold et al., 2010; Ficklin et al., 2009; Kim et al., 2010; Luo et al., 2008; Parajuli et al., 2009). A few studies state the use of the sensitivity analysis tool that is available in the SWAT program and use this as a guide in selecting appropriate parameters for calibration (Gassman et al., 2007; Luo et al., 2008). Once the parameters were selected either based on a literature review, on the sensitivity analysis, or a combination of the two, then a few studies describe a stepwise method to calibrate the model. The most common was to select a single parameter from a list of parameters to be calibrated, adjusting that parameter to find a local maximum, and then proceeding to the next parameter on the list. If there was an effect on the first parameter when the second parameter was maximized, then the first parameter was revised using the maximized second parameter (Anand et al., 2007; Douglas-Mankin et al., 2010; White and Chaubey, 2005).

For example, let us assume that a sensitivity analysis was performed to determine which parameters had the greatest effect on evapotranspiration. The analysis ranked CANMX first, then ESCO, and then EPCO. This means that a small change in value of CANMX will have the largest effect on the amount of evapotranspiration and that ESCO would have the second largest effect, and so on. Therefore, the first parameter to be adjusted would be CANMX. It would be changed until the simulated evapotranspiration value approached the actual recorded data without exceeding it. This would be the local maximum for CANMX. Once this was found, then ESCO would next be evaluated. The value for ESCO would be changed until the simulated value for evapotranspiration reached even closer to the actual value, but not exceeding it. Once the value for ESCO was determined, the value for CANMX would be reevaluated to see if it had changed due to the changes in ESCO. If it had, then the value for ESCO would be retained and the value for CANMX would be readjusted until the values were for evapotranspiration were again as close to actual values without going over as possible. This would be the new local maxima for both CANMX and ESCO. If there was no change in the value of CANMX caused by the changes in ESCO, then both values would be retained as the local maxima for the two variables. The process would be repeated for EPCO.

In addition to using the sensitivity analysis function in SWAT, White and Chaubey (2005) also developed an equation to help maximize the parameters by balancing the number of calibration sites, the number of years, the number of variables evaluated yearly, the number of months, and the number of variables evaluated monthly. This equation was developed so that no single calibration site, time step, or parameter was given more precedence than another (White and Chaubey, 2005). It is interesting to note that a study completed by Srinivasan et al. (2010) found promising results in using an uncalibrated SWAT model to predict the hydrology and the crop yield in the Upper Mississippi River Basin. This study found that the ungaged SWAT model was able to predict yearly stream flow with fairly good accuracy. The percent bias (PBIAS) was less than 10%, the coefficient of determination (R^2) ranged from 0.78-0.99, and the Nash-Sutcliffe Efficiency (NSE) ranged from 0.29-0.81. The model did display poorer results for monthly stream flow data. The model was also able to predict the corn and soybean yields with a PBIAS less than 20% (Srinivasan et al., 2010). According to Moriasi et al. (2007) the PBIAS for the stream flow was rated very good, the NSE ranged from unsatisfactory to very good, and the crop yield PBIAS was satisfactory (Moriasi et al., 2007). This is surprisingly good considering the lack of calibration. This would suggest that SWAT can be used for an acceptable general guideline when it is uncalibrated. For more precise results and for stream flow information at a monthly or daily scale, calibration would be required to achieve acceptable statistical parameters.

It is also interesting to note the order of the parameters that were used in calibration (when specified). In general, it is most common for the hydrology parameters to be calibrated first and then any other parameters that affect the area of interest (Chiang et al., 2010; Douglas-

Mankin et al., 2010; Ficklin et al, 2009; Gassman et al., 2007; Kim et al., 2010; Parajuli et al., 2009; Sheshukov et al., 2011). This is consistent with studies that are interested in runoff, sediment, and nutrient transport. There is not as much data available on the validity of calibrating something like crop yield and then calibrating runoff parameters. This study begins the research into the importance of determining crop growth parameters by performing an initial analysis on the uncalibrated Kanopolis Lake Watershed.

5.1 Statistical Analysis

To gauge how well or how poorly the model simulated the crop yields, the Nash-Sutcliffe Efficiency and the Percent Bias were calculated as recommended by Moriasi et al. (2007). The equation for the Nash-Sutcliffe Efficiency (NSE) is:

$$NSE = 1 - \left(\frac{\Sigma\left(\left(Y_i^{obs} - Y_i^{sim}\right)^2\right)}{\Sigma(Y_i^{obs} - Y^{mean})^2}\right) \tag{5.1}$$

where:

Y_i^{obs} is the ith observed value for constituent being evaluated

Y_i^{sim} is the ith simulated value for constituent being evaluated

Y^{mean} is the mean of observed data for constituent being evaluated

The range for NSE is from negative infinity to one (-∞ - 1) where one describes a perfect fit between the observed and simulated data. The positive range is also acceptable (Moriasi et al., 2007).

The equation for Percent Bias (PBIAS) is:

$$PBIAS = \left(\frac{\Sigma\left(\left(Y_i^{obs} - Y_i^{sim}\right)*(100)\right)}{\Sigma\, Y_i^{obs}}\right) \tag{5.2}$$

where:

Y_i^{obs} is the i^{th} observed value for constituent being evaluated

Y_i^{sim} is the i^{th} simulated value for constituent being evaluated

The range of PBIAS is from negative to positive infinity ($-\infty$ - $+\infty$). This describes the distance between the simulated and observed values. Positive values for PBIAS indicate that the model is underestimating the data values and negative values for PBIAS indicate that the model is overestimating the data values (Moriasi et al., 2007).

Moriasi et al. (2007) recommends using the following table as a guide in rating performance of monthly data:

Table 3 Monthly Performance Rating Chart (Moriasi et al., 2007)

Performance Ratings for a Monthly Time Step				
		PBIAS (%)		
Performance Rating	NSE	Stream flow	Sediment	N, P
Very Good	0.75 < NSE ≤ 1.00	PBIAS < ±10	PBIAS < ±15	PBIAS < ±25
Good	0.65 < NSE ≤ 0.75	±10 ≤ PBIAS < ±15	±15 ≤ PBIAS < ±30	±25 ≤ PBIAS < ±40
Satisfactory	0.50 < NSE ≤ 0.65	±15 ≤ PBIAS < ±25	±30 ≤ PBIAS < ±55	±40 ≤ PBIAS < ±70
Unsatisfactory	NSE ≤ 0.50	PBIAS ≥ ±25	PBIAS ≥ ±55	PBIAS ≥ ±70

While it is not possible to have crop yields on a monthly time step, the table can still be used to gauge the performance of the SWAT model

Chapter 6 - Study Area Validation

6.1 Crop Validation

While calibration is very important in modeling studies, this author did not have time to complete a proper calibration of the watershed for this study. Thus, the goal of this report was to determine if an uncalibrated SWAT model could reasonably estimate crop growth and hydrologic processes in a watershed of this size. For purposes of this study, this will be called a validation of an uncalibrated model. To validate the watershed model, several questions needed to be answered. Since the SWAT program was originally designed to simulate hydrological processes, I was curious about how it modeled crop growth. Crop growth was incorporated into the SWAT model (as discussed in the chapter on SWAT processes) since it has great effects on the hydrologic cycle, but since there had been little interest in calibrating and validating crop yields in other studies, there was less documentation about where the crop data were stored, how SWAT labeled the different crops and rotations, what units the yields were reported in, the processing required to determine crop yields from the raw data that the SWAT program produced, etc. It was found that the crop yields were reported in the output.hru file in a table at approximately a third of the way down the file. The outputs were reported in metric tons per hectare. There were some oddities about how SWAT chose to label the different HRUs. This needed to be investigated further so that validation could proceed.

To begin validation, the data from the output.hru file needed to be processed. In order to process the data correctly, several important questions had to be answered. The first question that needed to be examined was how did SWAT calculate the HRUs that had crop rotations? Did it change the crop in the output file correctly? Was some careful manipulation required? To answer this, a few HRUs were chosen to examine how SWAT dealt with the management placed on them. One HRU was chosen that had continuous corn (HRU 133, in Subbasin 3) and one HRU in the same subbasin was chosen that had a corn-winter wheat rotation (HRU 127). The number code assigned to these specific HRUs were used to confirm the identity. In the output.std file, it was observed that the HRUs with continuous corn rotations were always labeled “corn” and therefore the yields were always properly labeled. The rotation HRU was discovered to be misnamed. It was usually named for the crop produced after the two year skip. This raised concerns that the yields would be misrepresented as well. In the output.hru file, the same HRUs were located to determine if the yields were incorrect. It was discovered that in the output.hru file, SWAT correctly labeled the yields of both the continuous and rotation HRUs.

A second question that was raised was how to distinguish between irrigated and non-irrigated crops (dry-land crops). To accommodate this distinction, five additional land use codes were added to the SWAT database. These new land use codes were: IRCN (irrigated corn), IRGS (irrigated grain sorghum), IRWW (irrigated winter wheat), IRSB (irrigated soybeans), and IRAL (irrigated alfalfa).Any crops not designated with one of these five new land use codes are non-irrigated or dry land crops. For the HRUs with crops designated as irrigated, auto-irrigation was added in the management file. It needed to be confirmed that SWAT was modeling and designating these crops correctly. The management file was examined and it was shown that the crops were being irrigated. Then the output.hru file was examined to determine if the crops were being correctly identified. It was discovered that all but the irrigated corn were being correctly identified. The irrigated corn was being labeled the same as the dry-land corn (i.e., corn). This meant that all the yields were actually a combination of the two different crops. To accurately compare the results, the HRUs needed to be separated. A list of the irrigated corn was generated to allow for later manipulation of data. This was accomplished in Microsoft Excel using the following steps:

6.1.1 Generating Irrigated Corn List

1. Open SWAT project
2. Access “Edit SWAT Input” tab
3. Select “Edit Subbasin Inputs”
4. Select “Management” (.Mgt) in “SWAT Input Table” drop down menu
5. Select Subbasin
6. Select “IRCN” for “Land Use” drop down menu
7. Select soil and slope
8. Create list of all available combination of soil and slopes for IRCN in each Subbasin
9. Record “HRU_GIS” information and “HRU_ID” information to identify from output data.

For table of irrigated corn identification, see Appendix A. It should be noted that the HRU_GIS information is a number assigned to the HRU that is at least five digits long and is a combination of the subbasin number and the number of that HRU in that subbasin. For example, HRU_GIS #30009 is the 9th HRU in subbasin 3. The HRU_ID is the number of the HRU out of the total amount of HRUs. This means that HRU_ID #34 is the 34th HRU out of the entire watershed.

A third question that needed to be addressed before final data processing was the need to accurately compare the SWAT output to the observed average county yields. The average county yields were obtained from Dr. Jason Bergtold (personal communication, 2013) an associate professor of Agricultural Economics as Kansas State University. The observed yields were reported in bushels/acre. The simulated SWAT yields were reported in metric tons/hectare. To accomplish this, several assumptions were made. First, it was assumed the difference in moisture content of the observed yields and the simulated yields was negligible. Second, it was assumed that corn and grain sorghum weighed 56 lb/bushel and that soybeans, wheat, and alfalfa weighed 60 lb/bushel (Murphy, 1993). Then, the following procedures were used to convert the observed yields which were in bushels/acre to metric ton/hectare (Weiland and Smith, 2007):

<u>For Corn & Grain Sorghum:</u>

$$\left(Observed\ Yield\ \frac{metric\ ton}{Hectare}\right) = \left(Observed\ Yield\ \frac{Bushel}{acre}\right) * \left(\frac{56lb}{bushel}\right) * \left(\frac{1\ US\ ton}{2000lb}\right) * \left(\frac{0.9072\ metric\ ton}{US\ ton}\right) * \left(\frac{1\ acre}{0.405\ hectare}\right) \tag{6.1}$$

<u>For Soybeans, Wheat, and Alfalfa:</u>

$$\left(Observed\ Yield\ \frac{metric\ ton}{hectare}\right) = \left(Observed\ Yield\ \frac{Bushel}{acre}\right) * \left(\frac{60lb}{bushel}\right) * \left(\frac{1\ US\ ton}{2000lb}\right) * \left(\frac{0.9702\ metric\ ton}{US\ ton}\right) * \left(\frac{1\ acre}{0.405\ hectare}\right) \tag{6.2}$$

In the table of observed yields, an additional column was added beside each observed yield to display the conversions. It was noticed that the observed data did not distinguish between irrigated and non-irrigated alfalfa yields. To accommodate this, the simulated SWAT outputs for irrigated and non-irrigated alfalfa were summed so as to compare to the observed data. For table of observed crop yields with conversions, see Appendix D.

The final question to be addressed was how to accurately compare the SWAT subbasin yields to the county annual averages. Each county contained multiple subbasins, but not necessarily the entire subbasin. To account for this discrepancy, the following equation was used:

$$\left(\frac{Annual\ Yield\ of\ County}{Area\ of\ County}\right) = \frac{\sum\left(\frac{Annual\ Yield\ of\ Subbasin}{Area\ of\ Subbasin\ in\ County}\right)}{\sum Area\ of\ Subbasins\ in\ County}$$

(6.3)

To determine the area of each subbasin that is in a given county the following steps were used:

6.1.2 Subbasin Areas in County Determination

1. Download Kansas County GIS layer from the State of Kansas GIS Data Access & Support Center (TIGER/Line Shapefiles, 2010).
2. Change source to match subbasin layer:
    a. Geographic Coordinate System: GCS_North_American_1983
    b. Datum: D_North_American_1983
    c. Prime Meridian: Greenwich
    d. Angular Unit: Degree
3. Add the subbasin layer from the shape file in the Model Watershed file.
4. Use ArcGIS tool "Union" with the subbasin layer and county layer
5. Open attribute table of union layer
6. Record Subbasin Number, Area in County, County Name

Once all these questions were answered the data processing could begin. The following steps were used to validate the SWAT output.hru file data using Microsoft Excel:

6.1.3 Data Processing Procedure

The output data for the crop yields was a very large file. In order to process it, Microsoft Excel functions were used to simplify the process and reduce the time. The information was first copied from the output.hru file into Excel. Then, any extra data that was not needed was hidden so as not to confuse the process. Next, the columns were selectively added based on the year and the crop. For example, all continuous winter wheat for 1996 was added together to get a total for that year. This was completed for each crop for each year for each subbasin. Special care was taken to separate irrigated and non-irrigated corn as the HRUs had been mislabeled by the SWAT program. Once the yearly totals were created for each subbasin, the data had to be converted to represent each county. This was accomplished by creating a list of the subbasins within each county of interest and noting the area of the subbasin within that county. This area was multiplied to the crop yield of the subbasin in that county to find a weighted yield to represent that subbasin's contribution to the county yield and then divided by the sum of all the subbasin areas in that county. For example, assume 10 hectares of Subbasin 3 are in County Clare and Subbasin 3 produced 5 metric tons of corn. To find the amount of crop yield that Subbasin 3 contributed to County Clare, multiply 10 ha X 5 metric ton and divide by the sum of areas all subbasins. This gives the crop yield on a county level for each year. Last, the Nash-Sutcliffe Efficiency and Percent Bias are found for each crop to determine how well the model simulated the Kanopolis Lake Watershed compared to the actual values measured. What follows is a step by step method to create this procedure in Microsoft Excel.

1. Copy and paste output.hru information into Excel file with each page corresponding to one subbasin. Result: 148 pages representing 148 subbasins
2. Converted text data to excel data with manual separations for GIS, HRU, MON (date).
3. Hide all columns except: LULC, HRU, GIS, SUB, MGT, MON, AREA, BIOM, LAI, YLD.
4. Next to imported data, create second data set with a column for year, Corn Total, CornDry, CornIrr, GrnSorg Dry, GrnSorgIrr, WinterWheatDry, WinterWheatIrr, Soybean Dry, SoybeanIrr, Alfalfa Dry, and AlfalfaIrr.
5. Fill in Year column from 1996-2009

6. For all columns except CornTotal, CornDry and CornIrr, use the “sumifs” command with the “sum_range” (column to be added) is the yield (YLD), “criteria_range1” is “mon” (year), “criteria1” is the specific year desired (e.g., 1996), “criteria_range2” is “LULC”, “criteria2” is specific crop (e.g., IRGS).
    a. For CornTotal, use step 6 with “CORN” as “criteria2”. This represents the total corn production
    b. For CornIrr use generated list of irrigated corn HRUs and use a sum of “sumifs” commands where “criteria2” is the specific HRU designated by the GIS column.
    c. To determine CornDry, subtract the value of CornIrr from CornTotal
7. Excel file will be too large at this point to accomplish further processing of data. So must create new file-designate as “Output Summary”
8. Optional: Copy the second data set with yield summaries into a single page for each subbasin-for ease of operation only.
9. For each county (Wallace, Logan, Gove, Trego, Ellis, Russell, and Ellsworth) create a separate sheet.
10. Copy subbasin summaries for each subbasin that is within each county (e.g. Wallace county has subbasin 3, 5, 6, etc.) leaving out CornTotal as this is an intermediate step
11. Add columns with area in meters and convert to area in hectares
12. Insert columns beside each crop data column and label as [crop]*Area (e.g., Corn*A)
13. Multiply the crop column by the area in hectare column to find the yield per area of the subbasin that is within the specified county
14. To the side of subbasin data, determine the sum of areas of the subbasins.
15. To create the summary of the simulated crop outputs for the county:

a. Create columns labeled Year, CornDry, CornIrr, GrnSorgDry, GrnSorgIrr, WWhtDry, WWhtIrr, SoybDry, SoybIrr, AlfalfaDry, AlfalfaIrr, AlfalfaSum
b. Fill out Year column with 1996-2009
c. For each crop for each year:
    i. Use "sumifs" command with "sum_range" as "Crop*A" (e.g., SoybIrr*A), "criteria_range1" as "Year", and "criteria1" as the specific year (e.g. 1996)
    ii. Divide by the sum of the area.

16. Copy Observed Data for each county from Modified Bergtold Data and paste beneath the county summary table.
17. Find Averages of grain yield in metric ton/hectare
18. Find Sum of grain yield in metric ton/hectare.

For table of county simulated crop data and the summary of the simulated crop data, see Appendix B and C.

6.1.4 Statistical Analysis

To determine the NSE and the PBIAS, the following steps were followed using Microsoft Excel:

6.1.4.1 NSE and PBIAS Determination for Crop Yields

1. Beside County Summary table create Nash-Sutcliffe Efficiency Input table.
2. For each year and each crop, create one column with (observed yield – simulated yield) ^2 and one column with (observed yield – mean of observed yield) ^2.
3. Sum each column.

4. Find the Nash-Sutcliffe Efficiency for each crop by dividing the sum of the (observed yield – simulated yield) ^2 by the sum of the (observed yield – mean of observed yield) ^2 and subtract this value from 1.
5. Below the Nash-Sutcliffe Input table, create Percent Bias (PBIAS) Input table.
6. For each year and each crop, create one column with (observed yield – simulated yield)*100.
7. Sum each column of (observed yield – simulated yield)*100.
8. To determine PBIA for each crop, divide (observed yield – simulated yield)*100 by the sum of the observed yields for that crop.
9. aIn spare space on sheet, graph each simulated crop and observed crop vs. year (simulatedCornDry vs. Year and ObservedCornDry vs. Year).

For table of Statistical Inputs, see Appendix E and F.

6.1.4.2 Results of Uncalibrated Crop Yields

The summary of the uncalibrated results of the NSE and PBIAS for each crop for each county to are presented in Table 4 as follows:

Table 4 Crop Statistics by County

				Ellis County					
	CORN	**IRCN**	**GRSG**	**IRGS**	**WWHT**	**IRWW**	**SOYB**	**IRSB**	**ALFA**
NSE	-441.26	-8.50	-702.79	-5.19	-2937.78	-3.023	-262.22	-2.17	-469050.52
PBIAS	-455.3	94.2	-1287.3	100.0	-1559.4	100.0	-927.4	96.3	-17077.9
				Ellsworth County					
	CORN	**IRCN**	**GRSG**	**IRGS**	**WWHT**	**IRWW**	**SOYB**	**IRSB**	**ALFA**
NSE	-268.71	0.06	-437.35	-1.28	-659.90	-0.23	-353.75	-3.50	-850675.145
PBIAS	-553.2	-0.9	-1768.4	100.0	-1093.1	100.0	-902.7	85.6	-20594.2
				Gove County					
	CORN	**IRCN**	**GRSG**	**IRGS**	**WWHT**	**IRWW**	**SOYB**	**IRSB**	**ALFA**

NSE	-116.94	-14.13	-186.69	-3.82	-1078.90	-9.36	-80.35	-1.86	-1093.72
PBIAS	-237.2	-261.2	-755.3	86.3	-1054.3	100.0	-810.6	-15.5	-3495.3
Logan County									
	CORN	**IRCN**	**GRSG**	**IRGS**	**WWHT**	**IRWW**	**SOYB**	**IRSB**	**ALFA**
NSE	-170.22	-8.87	-157.71	-4.14	-2565.22	-7.90	-29.18	-1.18	-352.04
PBIAS	-328.0	-95.2	-469.2	93.3	-1504.6	100.0	-462.4	79.7	-648.5
Russell County									
	CORN	**IRCN**	**GRSG**	**IRGS**	**WWHT**	**IRWW**	**SOYB**	**IRSB**	**ALFA**
NSE	-232.55	-0.18	-585.64	-0.26	-941.77	-0.25	-135.62	-24.32	-809639.02
PBIAS	-800.1	-81.7	-2018.4	100.0	-1110.1	100.0	-1452.8	-1435.3	-15843.2
Trego County									
	CORN	**IRCN**	**GRSG**	**IRGS**	**WWHT**	**IRWW**	**SOYB**	**IRSB**	**ALFA**
NSE	-250.90	-133.36	-413.89	-5.38	-2201.80	-7.80	-170.97	-0.63	-106855.91
PBIAS	-369.9	-476.8	-1068.6	99.5	-1551.5	100.0	-848.2	20.4	-12014.5
Wallace County									
	CORN	**IRCN**	**GRSG**	**IRGS**	**WWHT**	**IRWW**	**SOYB**	**IRSB**	**ALFA**
NSE	-33.80	-9.22	-648.31	-3.89	-228.47	-8.06	#DIV/0!	-0.15	-1710.08
PBIAS	-5.9	-898.7	-480.7	100.0	-1132.0	100.0	#DIV/0!	58.1	-1282.9

It is interesting to note that there are some major concerns with the results of the crop yield statistics. First, there are several instances of a “division by zero” result for soybeans for NSE or PBIAS. This occurred because there was no observed data for that county. Since the denominator for both equations is based on observed data, this led to a “division by zero”. The second thing to note is the large negative numbers, especially for alfalfa. This indicates that the model is greatly overestimating the amount of crop produced. In several places, the model over predicted the amount of alfalfa produced by over a factor of 10. This could be caused by land being incorrectly assigned a crop or by the recorded values underestimating the total amount produced. As can be seen, the simulated results are currently producing unsatisfactory NSE and

PBIAS values according to the performance rating chart developed by Moriasi et al (2007). This model needs to be fully calibrated before improvement would be seen in these statistical values.

One pattern that emerged was that the crop yields were almost always overestimated except for irrigated crops which were almost always underestimated. This is most likely caused by one of three things. The first possible cause is that the reported county yields were incorrect in distributing the yields for irrigating and non-irrigating crops. The second possible cause is that the 2005 Level 4 KS Map (KARS) incorrectly assigned crop types to irrigated land. In other words, the map mislabeled what should have been irrigated corn as irrigated alfalfa or some other combination. The third possible cause is that the parameters used to simulate crop growth and grain yield are misapplied resulting in over production in some areas and under production in others. All the crop growth parameters are preset in the “input.crop.dat” file. These preset parameters may or may not be accurate representations of the crops grown in this watershed. Perhaps the parameters used were for a strain of crop common in the eastern United States, but does not grow as well in Kansas so a different variety was chosen for these fields. One way to overcome this problem would be to simply combine the irrigated and non-irrigated crop values and see if this improves the statistics. This would result in a loss of detail since there would be no manner to distinguish if errors occur due to irrigation issues or precipitation issues. Irrigation also affects the reservoir volume and channel flow which are very important. By removing the distinction between irrigated and non-irrigated land, it is no longer feasible to screen the possible location of the errors encountered. The other solution would be to calibrate parameters related to crop growth and crop yield to achieve the correct observed yields.

6.1.5 Stream Flow Validation

The next thing that needed to be validated was the stream flow. The stream gages at Smoky Hill River at Elkader,at Smoky Hill River near Arnold, KS, and Smoky Hill River at Ellsworth, KS were selected for use as validation data for reasons stated prior. Once this data was collected the following steps were followed to validate the stream flow data:

6.1.5.1 Determination of Stream Flow Statistics

1. Identify USGS stream gages that have daily stream flow data from 1996-2009.
2. Identify subbasins where USGS stream gages are located
3. Select for subbasins upstream of reservoir to avoid flow disturbances due to reservoir
4. Convert stream gage data from ft^3/sec to m^3/sec.
5. Save as comma separated file(.csv file)
6. Use K-State Calibration Utility for ArcSWAT Version 0.2 (Sheshukov, 2012).
7. Input subbasin number where stream gage is located
8. Select the project geodatabase
9. Select the .csv file of observed stream gage data
10. Select time period to compare.
11. Select compare command

The Calibration Utility automatically calculates several statistics for the stream flow as well as generates several graphs of the observed and simulated data based on the daily, monthly, and annual time step.

The statistics for the Smoky Hill River at Elkader USGS stream gage are summarized in Table 5:

Table 5 Stream Flow Statistics for U.S.G.S. Stream Gage at Smoky Hill River at Elkader, KS

	R2	NSE	pBias	RMSE	RSR	Median Sim	Median Obs	Mean Sim	Mean Obs
Daily	0.004	**-38.880**	**-395.331**	7.240	6.314	0.000	0.009	0.684	0.138
Monthly	0.034	**-13.421**	**-393.905**	1.678	3.786	0.078	0.020	0.680	0.138
Yearly	0.226	**-10.009**	**-395.468**	0.692	3.197	0.603	0.040	0.684	0.138

The statistics for the Smoky Hill River near Arnold, KS USGS stream gage are summarized in Table 6:

Table 6 Stream Flow Statistics for U.S.G.S. Stream Gage at Smoky Hill River Near Arnold, KS

	R2	NSE	pBias	RMSE	RSR	Median Sim	Median Obs	Mean Sim	Mean Obs
Daily	0.026	**-7.687**	**-39.964**	7.227	2.947	0.000	0.065	0.684	0.489
Monthly	0.078	**-1.025**	**-39.016**	1.738	1.419	0.078	0.124	0.680	0.489
Yearly	0.261	**0.151**	**-40.018**	0.645	0.888	0.603	0.299	0.684	0.489

The statistics for the Smoky Hill River at Ellsworth, KS USGS stream gage are summarized in Table 7:

Table 7 Stream Flow Statistics for U.S.G.S. Stream Gage at Smoky Hill River at Ellsworth, KS

	R2	NSE	pBias	RMSE	RSR	Median Sim	Median Obs	Mean Sim	Mean Obs
Daily	0.002	**-0.648**	**99.368**	171.261	1.284	0.000	71.000	0.684	108.284
Monthly	0.086	**-1.544**	**99.372**	137.646	1.590	0.078	84.759	0.680	108.284
Yearly	0.166	**-3.864**	**99.368**	120.598	2.125	0.603	108.509	0.684	108.271

When compared to the performance chart created by Moriasi et al. (2007), the NSE and PBIAS are well outside the acceptable range. This could be caused by many different factors affecting stream flow including the uncalibrated crop yields discussed previously. The stream flow would need to be calibrated to within satisfactory values.

There are some interesting trends in the statistics. First, all of the NSE values are negative except for the yearly value for the Smoky Hill River near Arnold, KS. While it is still not an acceptable value, it is much closer than all the other values. Another interesting thing is that the stream gage Smoky Hill at Ellsworth, KS is the only stream gage with positive PBIAS values. This would indicate that the model is underestimating the stream flow values. This could potentially mean that the influence of the Cedar Bluff Reservoir on downstream flow is over emphasized. It could also mean that there are smaller streams that do not connect to the main channel until after the Cedar Bluff Reservoir. It could also indicate that the plant growth in this area is using more water than it should be for some reason.

A graphical representation of the mean flow (m^3/sec) per time in Subbasin 69 (Smoky Hill River at Elkader Stream Gage) is presented in Figure 9, 10, and 11:

Figure 9 Mean Annual Flow vs. Time for Smoky Hill River at Elkader, KS Stream Gage

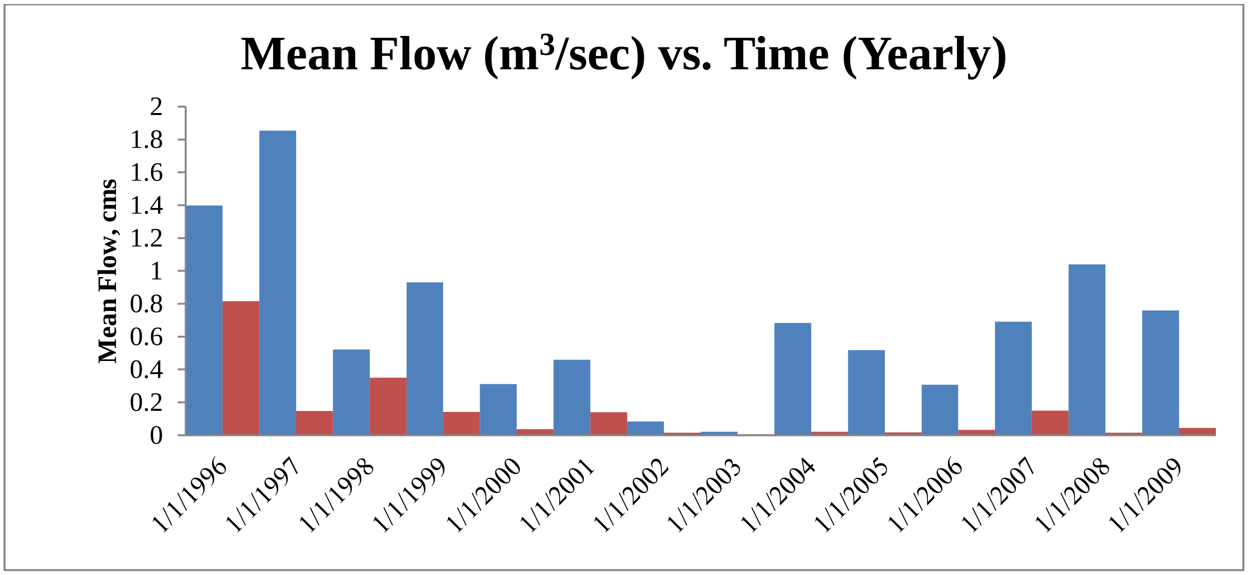


Figure 10 Mean Monthly Flow vs. Time for Smoky Hill River at Elkader, KS Stream Gage

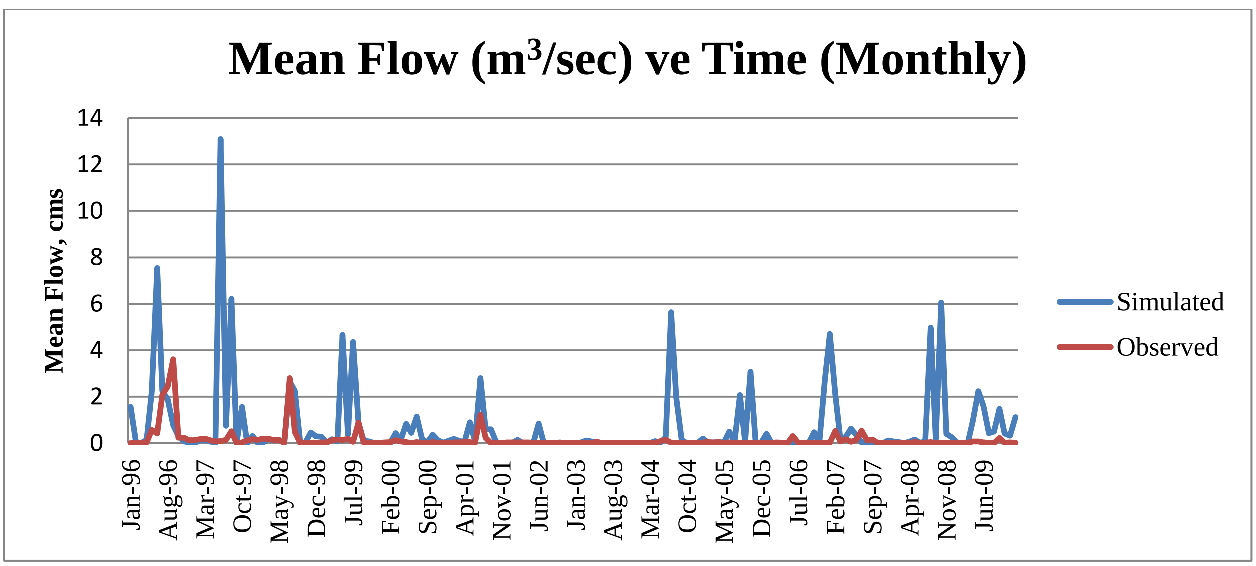
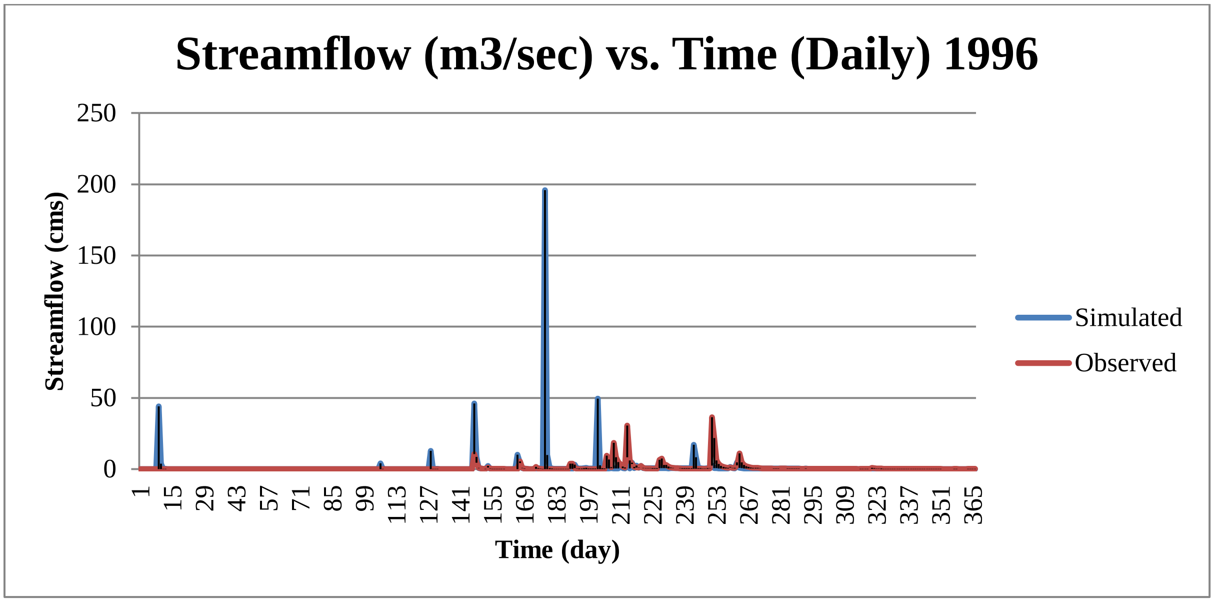


Figure 11 Mean Daily Flow vs. Time for 1996 for Smoky Hill River at Elkader, KS Stream Gage



Please see Appendix G, H, and I for the rest of the graphs for Subbasin 69 and for the graphs for Subbasin 89 and 148.

The graphs are helpful in identifying the manner in which the simulated and observed values are dissimilar. There are three main scenarios that can be more easily observed using graphs. The first scenario is the areas where there are overlapping peaks that are not similar in magnitude indicate that the timing of the simulated and actual storm event are the same, but the amount of flow observed is incorrect-possibly due to land cover being incorrectly modeled or stream channel conditions being incorrect (Sheshukov and Douglas-Mankin, 2012). An example of this can be seen in the monthly graph around May 1997. Another scenario is when peaks are offset but similar in magnitude. This would indicate correct amount stream flow, but the model incorrectly placed the storm event (Sheshukov and Douglas-Mankin, 2012). An example of this can be seen in the monthly graph around September of 1996. The third, and most common, scenario is a combination of the other two. The peaks are dissimilar in magnitude and offset in time (Sheshukov and Douglas-Mankin, 2012). An example of this can be seen in the monthly graph around May of 1997. These discrepancies would slowly be corrected with calibration.

6.2 Discussion of Results

There are many things that needed to be simplified and assumed in order to attempt the preliminary analysis of this uncalibrated computer simulation. While these assumptions and simplifications are fairly common, they nonetheless introduce errors. One of the first things that may have introduced errors into the statistics is the user. A large amount of the data processing required repeated copying and pasting of material from one file into another. If an error was introduced at some point during this process, then the error would have continued throughout the preliminary analysis and skewed the results of the statistics. Another possible user error could have been in the statistical computations performed on the simulated and observed results.

An example of an error caused by an assumption is using only three different storm gages to calibrate for stream flow. The gage itself is only at one point in only one of the subbasins. Only three points in the entire watershed were chosen to provide data for the statistical analysis. This would suggest that the subtle nuances of the individual subbasins without the stream gage are not being taken into account. The cumulative effect of this over the large area of the watershed can cause noticeable errors. We must assume that the entire subbasin (and sometimes the entire watershed upstream of this gage) received the same storm with the same storm intensity. This is probably not the case. Suppose that the gage was involved with the top portion of a storm that was mainly concentrated further downstream. It would record that there had been flow at that gage due to the storm, but it would not affect the rest of the subbasin. When the model attempts to simulate this, it will not have flow in the proper location. In Kansas, storms from convective air currents appear rapidly over localized areas. The storm gage may be far from the storm location so little data is recorded or the storm may be centralized over the storm gage location and cause the data to over emphasize the effect of that storm. It is important to note that many states have less than the desired number of weather monitoring sites which could potentially results in whole storm systems being absent from recorded data.

The interactions between plant growth and runoff yields could also play a role in the poor statistics. The simulation is currently producing unsatisfactory results for crop yield. This suggests that plant growth is not being simulated properly in the computer model. Accuracy in the amount of water that could be intercepted by or used by the plants will be uncertain until plant growth is properly modeled. The water balance that governs the land portion of the hydrologic cycle in SWAT must determine the amount of evapotranspiration (See Equation 3.12). Plant growth can play a significant role in determining these two factors. To determine the amount of evapotranspiration, SWAT calculates actual evapotranspiration by first evaporating water that is being held in the plant canopy (See equation 3.26). If the plants are not at the growth stage that is appropriate, then the amount of water that is stored in the canopy will be incorrect which would lead to the amount of water evaporated from the canopy to be incorrect as well. This could change the water balance used for the hydrologic processes. Along with other factors, this could explain why the simulated runoff values are consistently higher than the observed yields.

A possible concern related to the amount of precipitation is the antecedent soil moisture content. In SWAT, the initial soil moisture content is found as a fraction of field capacity ranging from 0.0 to 1.0. All soil in the watershed will be set to this initial value and then will be calculated after that as a function of precipitation (Arnold et al.,2011). It is common for modelers to have an “adjustment/warm up period” where the model is allowed to run for at least a year prior to the time period under study to try to allow the model to better calculate soil moisture. If the soil is not initially at the fraction of field capacity used in the initial calculation, then errors could be introduced. Since it is difficult to measure watershed scale soil moisture, it is can be very difficult to calibrate the initial soil moisture content to better represent the actual conditions.

Another interesting thing about soil moisture is how SWAT allows crops to access the soil moisture. Unless the user specifies otherwise, the computer model will set the depth of moisture extraction so that 50% of plant uptake of soil water occurs in the upper 6% of the soil profile (Neitsch et al., 2011). There are two factors that adjust the amount of water that can be drawn from lower soil layers. The plant uptake compensation factor (epco) allows the potential water demand of the plant to be met by lower layers of the soil when the upper layer is insufficient. It ranges from 0.01 to 1.00 with the default set to 1.0. As epco approaches 1.0, more water demand is met by lower soil layers if necessary. The other factor that adjusts soil moisture content is the soil evaporation compensation factor (esco) (See equation 3.38). This factor ranges from 0.01 to 1.0 with the default set to 0.95. As esco approaches 1, less soil evaporative demand is allowed to be met by lower soil layers (Arnold et al., 2011). This could have interesting effects on plant growth depending on the soil moisture content. For example, if the upper soil layer has low moisture content, the plant would be allowed to extract the water it needed for growth from the lower layers, while the soil evaporative demand cannot be met this way. This could potentially cause higher than expected yields from rather dry soils.

Another possible error could be in the strain of crop used in the study. There could be a hardier, more drought tolerant crop strain that is in use, but the model crop growth parameters are set to a different strain. This could result in fewer yields being simulated than what actually occurred. The water and temperature stresses on the plants were not calibrated either (See equations 3.72-3.7.75). If the simulation did not have accurate runoff data due to issues with stream gages, then it would incorrectly calculate the amount of stress the plant was actually under. Plants with higher stresses produce lower yields (See equation 3.76). This area may also have experienced a local blight of individual crops that was not recorded in state wide data sets. There may also have been high wind or hail damage that destroyed the crop yield. If the simulation did not know of an isolated hail storm, it would not know to compensate for the damage.

A possible source of error is the amount of fertilizer used. Many of the simulated crop yields were much higher than the observed yields. The fertilizer management scheme used in the simulation was devised with the aid of Dr. Nathan Nelson from the Kansas State University Agronomy Department. It is reasonable to assume that his information regarding best fertilizer management is more current than the average producer in the western portion of the state. If the producer incorrectly applied the amount of fertilizer or mistimed the application so that it was washed into a stream channel due to a storm event, then the observed yields would be lower than the simulated yields.

Another assumption that was made was that the moisture content of the observed yield and the simulated yield was the same.. This would change the weight of the yield by not accounting for the differences in water content. This would change the amount of yield that the model was being calibrated with (See equations 6.1 & 6.2).

The difficulty with computer modeling of any natural system is that the programmer is attempting to fit biological data or processes that are by nature inhomogeneous and inconsistent to a mathematical relationship that is consistent and uniform. If more detailed information regarding crop yields, crop strains, leaf areas, storm patterns, etc. were available, then the model would improve. There is always room for improvement of these models that attempt to distill highly complex interactions into simpler equations.

Chapter 7 - Future Study

7.1 Proposed Calibration Process

This paper details the preliminary work accomplished with this model. If time had permitted, this model would have been further calibrated with the following proposed process. First, a sensitivity analysis would have been performed to help in variable selection. This would not have been the restricting guideline, merely a tool to help prioritize variables. In general, the proposed calibration process would have been iterative. For each variable, a local maximum would have been determined. Then, a second variable would have been maximized. The first variable would have been examined to see if there was change caused by the second. If there was no change created, then the process would move on to the third variable. If there was a change to the first variable, then the first variable would have been recalibrated to find a new maximum using the second variable in the model. This would generate the new maximums for variable 1 and 2. This process would have been completed until all proposed variables had been maximized.

The unique thing regarding this research would be that crop growth and crop yield parameters would have been calibrated first and then hydrology related parameters. This would be helpful in determining whether this approach is valid in research where the crop growth is more important than the water quality or sediment. While models are traditionally calibrated in reverse, there is little to no research to state whether a different order is valid.

There are several possible crop growth parameters that could be used to calibrate this model. One possible variable would be the harvest index for optimal growing conditions (HVSTI). This would allow the user to define the fraction of aboveground biomass that is removed which would be important for biofuel simulations. Another plant related variable is the maximum potential leaf area index (BLAI) which would determine the amount of leaf and therefore plant development. This could be important in influencing the total yields produced. Maximum canopy height (CHTMX) could be important for influencing plant development and the amount of biomass available for harvesting during biofuel simulations. The lower limit of the harvest index (WSYF) could also be a valuable parameter. This parameter represents the lowest harvest index during water stress. Another possible variable is the plant uptake compensation factor (EPCO). This describes the amount of water demand of the plant that can be met with lower soil layers (Arnold et al., 2011).

When examining hydrology, there are also several possible parameters that can be used to calibrate the model. One possible variable that affects plant and water interaction is the maximum canopy storage (CANMX) variable. This describes the amount of water that is intercepted by the plant canopy. It can affect runoff, evapotranspiration, infiltration, etc. Another possible variable is the soil evaporation compensation factor (ESCO). This allows the user to modify the water distribution in the soil profile. Another possible variable is the surface runoff lag coefficient (SURLAG). This allows the user to describe the delay in water reaching the output of the watershed due to large area watersheds. The initial SCS runoff curve number for moisture condition II (CN2) could be modified as well, but this should be avoided when possible. This is a very powerful parameter that could dramatically change the relevancy of the model to the actual area. It is easy for the model to match the actual data for crop or runoff, but not accurately reflect the study area because the fundamental parameters have been altered. Another possible calibration variable is the base flow alpha factor (ALPHA_BF). This describes the response of the groundwater flow to changes in the recharge of the soil profile. This could affect channel processes (Arnold et al., 2011).

These are only suggested variables that could be used to calibrate the model. There are many other available parameters that can be adjusted to better simulate the study area. The sensitivity analysis would also be helpful in determining the importance of these suggested variables.

Once calibration and validation is completed, then several different biofuel scenarios would be arranged and run in SWAT to determine the effect this would have on water quality in the Kanopolis Lake Watershed and eventually the Kansas River Basin. Some possible biofuel crop candidates are sweet sorghum, switchgrass, miscanthus, but there are others that could be examined to determine the suitability of the crop to the Kansas climate. The effects of climate change on the current cropping systems and on biofuel scenarios could also be conducted.

7.2 Conclusion

This paper describes the preliminary work to create a model of the Kanopolis Lake Watershed that is part of the Kansas River Basin using SWAT 2009. Data pertaining to weather, topography, land use, management, stream flow, and reservoirs was gathered and incorporated into the SWAT model. This was then simulated to obtain the uncalibrated data. SWAT produced unacceptable statistics for both crop yields and for stream flow using the Nash-Sutcliffe Efficiency equation and using percent bias. This suggests that the model must be calibrated to be of use in understanding both the current and future land use scenarios.

While the uncalibrated results of the study are unacceptable for use in decision making or accurately describing the watershed, this project did accomplish the main goal. The main goal was to learn about SWAT and demonstrate its use on a large agricultural watershed by achieving the three main objectives. The first objective was to understand and present the crop growth and hydrologic process of SWAT. The more I worked with SWAT, the more I learned about it. I also presented the processes that the SWAT 2009 program uses to model crop growth and hydrology in Chapter 3. The second main objective was to explain crop growth processes and explain how they interact with the hydrologic processes. While I did present the two topics in more detail in Chapter 3, it is important to briefly highlight the main interactions between them.

The hydrologic cycle has many components that interact with plants at different stages. When precipitation falls to the ground it can be intercepted to the plant in the canopy or impede the movement of water on the surface which prevents a portion of the precipitation from becoming runoff. SWAT simulates this with canopy storage of precipitation. The impediment of water movement by the plant is represented by the Curve Number Method and Manning's Roughness coeffiecent. The portion of the precipitation that infiltrates into the ground has several options. It can evaporate back into the air where it will eventually condense and fall again as precipitation. SWAT uses the equations regarding soil evaporation to model this. It can seep into the deeper layers of the soil and recharge the aquifer or seep into the channel bed depending on its location. This process is described in SWAT as percolation processes. It can also be absorbed into the plant roots to be used for plant metabolic processes, which SWAT models as plant uptake. Once it moves through the plant, it transpires back into the atmosphere where it can again precipitate onto the ground. SWAT uses evapotranspiration equations to simulate the movement of water through the plant and transpiring into the air.

The soil moisture content is a significant factor in the amount of runoff as well. If the soil moisture content is very high, then there is little room for increased saturation and the water will runoff into the stream channel. If the precipitation runs off the ground and moves into the channel it again has several opportunities to interact with plants. It can be used to water the plant either through irrigation pumping or through direct use by long plant roots. It can evaporate again and return as more precipitation. A stream can also cool the surrounding areas through evaporation which decreases the amount of water needed by plants, which changes the amount of water in the soil available to seep into the channel from the soil. As can be seen from this brief description, the interactions between plants and hydrology are many.

The last main objective was to explore the importance of considering both crop growth and hydrological processes in SWAT modeling studies. The importance of addressing crop growth as well as hydrology in modeling studies is partially explained in objective two. Since the crop/plant growth interacts at various stages with hydrological processes it is strange to assume that any model that does not take this into account will be accurate. While this study was not able to show the improvement of runoff statistics due to improvement of crop calibration, this idea can be drawn from reasoning. If the water needs of the plants in the watershed are met and simulated properly, then there is only one system that could be affecting the runoff yields: the soil. If the runoff values that the program simulates are not correct, then soil physical processes are the only cause (assuming that precipitation has been modeled correctly). This knowledge could save valuable time and effort of future studies.

Since all the objectives have been in some way met, then the main goal has also been met. The goal could be more fully achieved with continued study and proper calibration of the watershed if time had permitted. If calibration of the crop values had produced more acceptable statistics for runoff values, as I believe it would, then the last objective would have been fully realized and the main goal more completely achieved. As it stands, this study did achieve the goals stated in the beginning of the paper.

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Appendix A – Table of Irrigated Corn Identification

Table 8 Irrigated Corn Identification

Irrigated Corn Identification		
Subbasin	**HRU Number**	**GIS Number**
3	133	30009
3	134	30010
3	135	30011
3	136	30012
3	137	30013
3	138	30014
3	139	30015
5	262	50005
5	263	50006
5	264	50007
5	265	50008
5	266	50009
5	267	50010
5	268	50011
5	269	50012
5	270	50013
5	271	50014
5	272	50015
5	273	50016
6	362	60005
6	363	60006
6	364	60007
6	365	60008
6	366	60009
6	367	60010
6	368	60011
6	369	60012
6	370	60013
6	371	60014
6	372	60015
6	373	60016
6	374	60017
6	375	60018

6	376	60019
6	377	60020
11	767	110005
11	765	110003
11	766	110004
11	768	110006
11	769	110007
11	770	110008
12	850	120008
12	851	120009
12	852	120012
12	853	120011
12	854	120012
13	905	130019
13	906	130020
13	907	130021
13	908	130022
13	909	130023
13	910	130024
13	911	130025
13	912	130026
14	982	140011
14	983	140012
15	1014	150008
15	1015	150009
15	1016	150010
15	1017	150011
15	1018	150012
16	1085	160021
16	1086	160022
16	1087	160023
16	1088	160024
17	1148	170012
17	1149	170013
17	1150	170014
17	1151	170015
17	1152	170016
17	1153	170017
17	1154	170018
18	1227	180009
18	1228	180010

19	1263	190009
19	1264	190010
19	1265	190011
20	1310	200007
20	1311	200008
20	1312	200009
20	1313	200010
20	1314	200011
20	1315	200012
20	1316	200013
20	1317	200014
20	1318	200015
20	1319	200016
20	1320	200017
20	1321	200018
20	1322	200019
20	1323	200020
20	1324	200021
20	1325	200022
20	1326	200023
21	1464	210017
21	1465	210018
21	1466	210019
21	1467	210020
21	1468	210021
21	1469	210022
22	1527	220006
22	1528	220007
22	1529	220008
22	1530	220009
22	1531	220010
22	1532	220011
22	1533	220012
22	1534	220013
22	1535	220014
24	1655	240007
24	1656	240008
24	1657	240009
24	1658	240010
24	1659	240011
24	1660	240012

24	1661	240013
24	1662	240014
24	1663	240015
24	1664	240016
24	1665	240017
26	1803	260025
26	1804	260026
26	1805	260027
26	1806	260028
26	1807	260029
26	1808	260030
27	1887	270011
27	1888	270012
27	1889	270013
28	1938	280009
28	1939	280010
28	1940	280011
28	1941	280012
28	1942	280013
28	1943	280014
28	1944	280015
28	1945	280016
28	1946	280017
28	1947	280018
28	1948	280019
28	1949	280020
28	1950	280021
28	1951	280022
28	1952	280023
31	2176	310014
31	2177	310015
31	2178	310016
31	2179	310017
31	2180	310018
31	2181	310019
31	2182	310020
31	2183	310021
31	2184	310022
32	2235	320009
32	2236	320010
32	2237	320011

32	2238	320012
32	2239	320013
32	2240	320014
33	2302	330021
33	2303	330022
33	2304	330023
33	2305	330024
33	2306	330025
33	2307	330026
33	2308	330027
34	2411	340025
34	2412	340026
34	2413	340027
34	2414	340028
34	2415	340029
34	2416	340030
36	2599	360013
36	2600	360014
36	2601	360015
37	2702	370044
37	2703	370045
37	2704	370046
37	2705	370047
37	2706	370048
37	2707	370049
37	2708	370050
37	2709	370051
38	2820	380018
38	2821	380019
38	2822	380020
40	2970	400010
40	2971	400011
40	2972	400012
40	2973	400013
40	2974	400014
40	2975	400015
40	2976	400016
40	2977	400017
40	2978	400018
40	2979	400019
40	2980	400020

40	2981	400021
41	3076	410023
41	3077	410024
41	3078	410025
41	3079	410026
41	3080	410027
41	3081	410028
43	3225	430014
43	3226	430015
43	3227	430016
43	3228	430017
43	3229	430018
43	3230	430019
43	3231	430020
43	3232	430021
43	3233	430022
43	3234	430023
43	3235	430024
43	3236	430025
44	3323	440031
44	3324	440032
44	3325	440033
44	3326	440034
44	3327	440035
44	3328	440036
46	3573	460015
46	3574	460016
46	3575	460017
46	3576	460018
46	3577	460019
46	3578	460020
46	3579	460021
47	3672	470036
47	3673	470037
47	3674	470038
47	3675	470039
47	3676	470040
47	3677	470041
47	3678	470042
47	3679	470043
49	3875	490013

49	3876	490014
49	3877	490015
49	3878	490016
49	3879	490017
50	3949	500018
50	3950	500019
51	4019	510025
51	4020	510026
51	4021	510027
51	4022	510028
51	4023	510029
51	4024	510030
51	4025	510031
51	4026	510032
51	4027	510033
51	4028	510034
51	4029	510035
51	4030	510036
51	4031	510037
51	4032	510038
52	4131	520019
54	4299	540022
54	4300	540023
56	4453	560012
56	4454	560013
56	4455	560014
57	4540	570030
57	4541	570031
57	4542	570032
59	4764	590005
59	4765	590006
59	4766	590007
59	4767	590008
59	4768	590009
59	4769	590010
59	4770	590011
59	4771	590012
59	4772	590013
59	4773	590014
59	4774	590015
59	4775	590016

59	4776	590017
60	4887	600011
60	4888	600012
60	4889	600013
61	4970	610033
61	4971	610034
61	4972	610035
61	4973	610036
61	4974	610037
61	4975	610038
61	4976	610039
61	4977	610040
61	4978	610041
64	5342	640019
64	5343	640020
64	5344	640021
64	5345	640022
64	5346	640023
64	5347	640024
64	5348	640025
66	5526	660018
66	5527	660019
66	5528	660020
75	6191	750023
75	6192	750024
75	6193	750025
75	6194	750026
75	6195	750027
75	6196	750028
77	6323	770002
77	6324	770003
77	6325	770004
77	6326	770005
77	6327	770006
77	6328	770007
77	6329	770008
77	6330	770009
77	6331	770010
77	6332	770011
79	6495	790008
79	6496	790009

79	6497	790010
79	6498	790011
79	6499	790012
80	6551	800012
80	6552	800013
80	6553	800014
80	6554	800015
80	6555	800016
80	6556	800017
80	6557	800018
80	6558	800019
80	6559	800020
80	6560	800021
80	6561	800022
80	6562	800023
80	6563	800024
80	6564	800025
82	6755	820009
82	6756	820010
82	6757	820011
82	6758	820012
82	6759	820013
82	6760	820014
82	6761	820015
85	6985	850021
85	6986	850022
85	6987	850023
85	6988	850024
85	6989	850025
85	6990	850026
85	6991	850027
85	6992	850028
85	6993	850029
86	7093	860029
86	7094	860030
86	7095	860031
86	7096	860032
86	7097	860033
86	7098	860034
86	7099	860035
86	7100	860036

86	7101	860037
87	7245	870031
87	7246	870032
87	7247	870033
87	7248	870034
87	7249	870035
87	7250	870036
87	7251	870037
88	7344	880006
88	7345	880007
88	7346	880008
88	7347	880009
88	7348	880010
88	7349	880011
89	7411	890020
89	7412	890021
89	7413	890022
89	7414	890023
89	7415	890024
89	7416	890025
90	7505	900021
90	7506	900022
90	7507	900023
90	7508	900024
90	7509	900025
90	7510	900026
91	7584	910012
91	7585	910013
91	7586	910014
91	7587	910015
91	7588	910016
91	7589	910017
91	7590	910018
91	7591	910019
91	7592	910020
92	7700	920023
92	7701	920024
92	7702	920025
92	7703	920026
92	7704	920027
93	7818	930030

93	7819	930031
93	7820	930032
93	7821	930033
93	7822	930034
93	7823	930035
93	7824	930036
93	7825	930037
93	7826	930038
96	8154	960046
96	8155	960047
96	8156	960048
96	8157	960049
97	8327	970019
97	8328	970020
97	8329	970021
98	8393	980012
98	8394	980013
98	8395	980014
100	8587	1000032
100	8588	1000033
100	8589	1000034
100	8590	1000035
100	8591	1000036
101	8698	1010017
101	8699	1010018
101	8700	1010019
101	8701	1010020
101	8702	1010021
101	8703	1010022
104	9055	1040009
104	9056	1040010
116	10645	1160024
116	10646	1160025
116	10647	1160026
118	10861	1180019
118	10862	1180020
118	10863	1180021
118	10864	1180022
118	10865	1180023
118	10866	1180024
118	10867	1180025

118	10868	1180026
118	10869	1180027
119	10976	1190043
119	10977	1190044
123	11353	1230012
123	11354	1230013
123	11355	1230014
123	11356	1230015
123	11357	1230016
123	11358	1230017
123	11359	1230018
123	11360	1230019
123	11361	1230020
123	11362	1230021
123	11363	1230022
123	11364	1230023
124	11451	1240004
124	11452	1240005
124	11453	1240006
124	11454	1240007
124	11455	1240008
124	11456	1240009
124	11457	1240010
124	11458	1240011
124	11459	1240012
124	11460	1240013
129	12048	1290022
129	12049	1290023
130	12146	1300032
130	12147	1300033
130	12148	1300034
148	14221	1480069
148	14222	1480070

Appendix B – Table of County Simulated Crop Data

Table 9 County Simulated Crop Data

Ellis County																							
SUB	Area (m)	Area (ha)	Year	CORN (t)	CORN*A (t/ha)	IRCN (t)	IRCN*A (t/ha)	GRSG (t)	GRSG*A (t/ha)	IRGS (t)	IRGS*A (t/ha)	WWHT (t)	WWHT*A (t/ha)	IRWW (t)	IRWW *A (t/ha)	SOYB (t)	SOYB*A (t/ha)	IRSB (t)	IRSB*A (t/ha)	ALFA (t)	ALFA*A (t/ha)	IRAL (t)	IRAL*A (t/ha)
58	12196.75	1.22	1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.82	54.67	0.00	0.00	10.28	12.53	0.00	0.00	25.55	31.17	0.00	0.00
58	12196.75	1.22	1997	43.99	53.65	0.00	0.00	60.19	73.41	0.00	0.00	37.98	46.32	0.00	0.00	17.66	21.54	0.00	0.00	24.83	30.28	0.00	0.00
58	12196.75	1.22	1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.03	28.09	0.00	0.00	25.61	31.24	0.00	0.00
58	12196.75	1.22	1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	114.21	139.29	0.00	0.00	27.63	33.69	0.00	0.00	37.41	45.63	0.00	0.00
58	12196.75	1.22	2000	68.11	83.07	0.00	0.00	50.31	61.36	0.00	0.00	0.00	0.00	0.00	0.00	2.37	2.89	0.00	0.00	22.14	27.00	0.00	0.00
58	12196.75	1.22	2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	48.24	58.84	0.00	0.00	12.93	15.77	0.00	0.00	18.39	22.43	0.00	0.00
58	12196.75	1.22	2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.67	49.61	0.00	0.00	0.41	0.50	0.00	0.00	18.41	22.46	0.00	0.00
58	12196.75	1.22	2003	27.64	33.71	0.00	0.00	12.96	15.80	0.00	0.00	44.31	54.04	0.00	0.00	0.35	0.43	0.00	0.00	19.71	24.04	0.00	0.00
58	12196.75	1.22	2004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.64	23.96	0.00	0.00	29.51	36.00	0.00	0.00
58	12196.75	1.22	2005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	119.20	145.38	0.00	0.00	15.49	18.89	0.00	0.00	25.96	31.66	0.00	0.00
58	12196.75	1.22	2006	39.13	47.73	0.00	0.00	33.90	41.34	0.00	0.00	0.00	0.00	0.00	0.00	7.10	8.65	0.00	0.00	22.09	26.94	0.00	0.00
58	12196.75	1.22	2007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	52.77	64.36	0.00	0.00	27.71	33.80	0.00	0.00	42.45	51.77	0.00	0.00
58	12196.75	1.22	2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.24	83.23	0.00	0.00	11.62	14.18	0.00	0.00	20.11	24.52	0.00	0.00
58	12196.75	1.22	2009	72.05	87.88	0.00	0.00	71.48	87.18	0.00	0.00	49.27	60.10	0.00	0.00	29.35	35.80	0.00	0.00	37.64	45.91	0.00	0.00
62	8758.89	0.88	1996	0.00	0.00	0.00	0.00	34.25	30.00	0.00	0.00	27.51	24.10	0.00	0.00	13.19	11.55	0.00	0.00	0.00	0.00	0.00	0.00
62	8758.89	0.88	1997	47.32	41.45	0.00	0.00	43.95	38.49	0.00	0.00	34.88	30.55	0.00	0.00	1.93	1.69	0.00	0.00	0.00	0.00	0.00	0.00
62	8758.89	0.88	1998	0.00	0.00	0.00	0.00	54.01	47.31	0.00	0.00	64.46	56.46	0.00	0.00	0.59	0.51	0.00	0.00	0.00	0.00	0.00	0.00
62	8758.89	0.88	1999	0.00	0.00	0.00	0.00	62.28	54.55	0.00	0.00	0.00	0.00	0.00	0.00	21.49	18.82	0.00	0.00	0.00	0.00	0.00	0.00
62	8758.89	0.88	2000	61.24	53.64	0.00	0.00	27.40	24.00	0.00	0.00	0.00	0.00	0.00	0.00	12.70	11.13	0.00	0.00	0.00	0.00	0.00	0.00
62	8758.89	0.88	2001	0.00	0.00	0.00	0.00	33.54	29.38	0.00	0.00	51.63	45.23	0.00	0.00	0.37	0.33	0.00	0.00	0.00	0.00	0.00	0.00
62	8758.89	0.88	2002	0.00	0.00	0.00	0.00	15.58	13.65	0.00	0.00	0.00	0.00	0.00	0.00	1.75	1.53	0.00	0.00	0.00	0.00	0.00	0.00
62	8758.89	0.88	2003	32.16	28.17	0.00	0.00	10.76	9.43	0.00	0.00	27.71	24.27	0.00	0.00	0.36	0.32	0.00	0.00	0.00	0.00	0.00	0.00

62	8758.89	0.88	2004	0.00	0.00	0.00	0.00	50.16	43.94	0.00	0.00	46.07	40.35	0.00	0.00	17.95	15.72	0.00	0.00	0.00	0.00	0.00	0.00
62	8758.89	0.88	2005	0.00	0.00	0.00	0.00	29.11	25.50	0.00	0.00	0.00	0.00	0.00	0.00	10.57	9.26	0.00	0.00	0.00	0.00	0.00	0.00
62	8758.89	0.88	2006	41.71	36.54	0.00	0.00	30.09	26.35	0.00	0.00	0.00	0.00	0.00	0.00	5.85	5.12	0.00	0.00	0.00	0.00	0.00	0.00
62	8758.89	0.88	2007	0.00	0.00	0.00	0.00	60.00	52.55	0.00	0.00	60.42	52.92	0.00	0.00	24.95	21.85	0.00	0.00	0.00	0.00	0.00	0.00
62	8758.89	0.88	2008	0.00	0.00	0.00	0.00	33.39	29.24	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.47	0.00	0.00	0.00	0.00	0.00	0.00
62	8758.89	0.88	2009	67.83	59.41	0.00	0.00	68.26	59.79	0.00	0.00	43.66	38.24	0.00	0.00	15.58	13.65	0.00	0.00	0.00	0.00	0.00	0.00
63	11461.68	1.15	1996	0.00	0.00	0.00	0.00	69.43	79.58	0.00	0.00	28.34	32.48	0.00	0.00	19.44	22.28	0.00	0.00	15.68	17.97	19.77	22.66
63	11461.68	1.15	1997	42.51	48.72	0.00	0.00	27.83	31.90	0.00	0.00	40.57	46.50	0.00	0.00	0.45	0.52	0.00	0.00	10.12	11.60	12.26	14.05
63	11461.68	1.15	1998	0.00	0.00	0.00	0.00	49.58	56.82	0.00	0.00	0.00	0.00	0.00	0.00	13.52	15.50	0.00	0.00	12.29	14.09	13.55	15.53
63	11461.68	1.15	1999	0.00	0.00	0.00	0.00	39.06	44.77	0.00	0.00	55.98	64.16	0.00	0.00	12.16	13.94	0.00	0.00	13.93	15.97	17.58	20.15
63	11461.68	1.15	2000	44.33	50.81	0.00	0.00	30.02	34.40	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.79	0.00	0.00	10.37	11.89	10.63	12.18
63	11461.68	1.15	2001	0.00	0.00	0.00	0.00	56.46	64.71	0.00	0.00	42.15	48.32	0.00	0.00	15.18	17.40	0.00	0.00	17.72	20.31	18.20	20.86
63	11461.68	1.15	2002	0.00	0.00	0.00	0.00	13.90	15.94	0.00	0.00	32.47	37.21	0.00	0.00	0.24	0.27	0.00	0.00	6.43	7.37	6.84	7.84
63	11461.68	1.15	2003	42.00	48.14	0.00	0.00	18.82	21.57	0.00	0.00	33.14	37.99	0.00	0.00	0.35	0.40	0.00	0.00	11.81	13.54	11.24	12.88
63	11461.68	1.15	2004	0.00	0.00	0.00	0.00	51.02	58.47	0.00	0.00	0.00	0.00	0.00	0.00	19.06	21.84	0.00	0.00	14.37	16.47	16.46	18.87
63	11461.68	1.15	2005	0.00	0.00	0.00	0.00	50.35	57.71	0.00	0.00	58.20	66.71	0.00	0.00	12.84	14.72	0.00	0.00	16.24	18.61	18.16	20.81
63	11461.68	1.15	2006	59.86	68.61	0.00	0.00	24.75	28.37	0.00	0.00	0.00	0.00	0.00	0.00	1.56	1.79	0.00	0.00	10.25	11.75	10.56	12.10
63	11461.68	1.15	2007	0.00	0.00	0.00	0.00	25.16	28.83	0.00	0.00	32.47	37.22	0.00	0.00	3.11	3.56	0.00	0.00	14.12	16.19	12.84	14.71
63	11461.68	1.15	2008	0.00	0.00	0.00	0.00	56.73	65.03	0.00	0.00	38.17	43.75	0.00	0.00	17.45	20.01	0.00	0.00	15.81	18.12	16.71	19.15
63	11461.68	1.15	2009	51.98	59.58	0.00	0.00	55.92	64.10	0.00	0.00	33.65	38.56	0.00	0.00	9.97	11.43	0.00	0.00	13.88	15.91	15.35	17.59
73	15561.36	1.56	1996	0.00	0.00	0.00	0.00	50.31	78.29	0.00	0.00	35.61	55.41	0.00	0.00	8.71	13.56	0.00	0.00	30.85	48.00	0.00	0.00
73	15561.36	1.56	1997	59.73	92.95	0.00	0.00	60.74	94.53	0.00	0.00	44.88	69.84	0.00	0.00	1.30	2.03	0.00	0.00	34.02	52.94	0.00	0.00
73	15561.36	1.56	1998	0.00	0.00	0.00	0.00	69.80	108.62	0.00	0.00	82.71	128.71	0.00	0.00	0.41	0.63	0.00	0.00	26.05	40.54	0.00	0.00
73	15561.36	1.56	1999	0.00	0.00	0.00	0.00	79.13	123.14	0.00	0.00	0.00	0.00	0.00	0.00	14.41	22.42	0.00	0.00	50.92	79.24	0.00	0.00
73	15561.36	1.56	2000	78.03	121.42	0.00	0.00	43.75	68.08	0.00	0.00	0.00	0.00	0.00	0.00	8.78	13.67	0.00	0.00	30.69	47.76	0.00	0.00
73	15561.36	1.56	2001	0.00	0.00	0.00	0.00	46.14	71.79	0.00	0.00	65.73	102.29	0.00	0.00	0.26	0.40	0.00	0.00	25.46	39.62	0.00	0.00
73	15561.36	1.56	2002	0.00	0.00	0.00	0.00	30.50	47.46	0.00	0.00	0.00	0.00	0.00	0.00	1.58	2.46	0.00	0.00	29.54	45.97	0.00	0.00
73	15561.36	1.56	2003	40.15	62.47	0.00	0.00	25.45	39.61	0.00	0.00	34.78	54.12	0.00	0.00	0.25	0.39	0.00	0.00	32.17	50.06	0.00	0.00
73	15561.36	1.56	2004	0.00	0.00	0.00	0.00	67.99	105.79	0.00	0.00	59.19	92.11	0.00	0.00	12.09	18.82	0.00	0.00	36.56	56.90	0.00	0.00
73	15561.36	1.56	2005	0.00	0.00	0.00	0.00	45.15	70.26	0.00	0.00	0.00	0.00	0.00	0.00	7.37	11.47	0.00	0.00	38.00	59.14	0.00	0.00

73	15561.36	1.56	2006	52.47	81.64	0.00	0.00	46.10	71.74	0.00	0.00	0.00	0.00	0.00	0.00	3.95	6.15	0.00	0.00	32.93	51.25	0.00	0.00
73	15561.36	1.56	2007	0.00	0.00	0.00	0.00	77.71	120.93	0.00	0.00	78.14	121.60	0.00	0.00	16.51	25.69	0.00	0.00	61.33	95.43	0.00	0.00
73	15561.36	1.56	2008	0.00	0.00	0.00	0.00	50.41	78.44	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.58	0.00	0.00	24.21	37.68	0.00	0.00
73	15561.36	1.56	2009	84.99	132.25	0.00	0.00	86.27	134.25	0.00	0.00	55.96	87.08	0.00	0.00	9.89	15.38	0.00	0.00	42.58	66.25	0.00	0.00
95	8476.83	0.85	1996	0.00	0.00	0.00	0.00	48.31	40.95	0.00	0.00	27.57	23.37	0.00	0.00	13.90	11.78	0.00	0.00	32.48	27.53	0.00	0.00
95	8476.83	0.85	1997	72.80	61.71	0.00	0.00	44.04	37.34	0.00	0.00	44.16	37.43	0.00	0.00	13.35	11.32	0.00	0.00	33.13	28.09	0.00	0.00
95	8476.83	0.85	1998	0.00	0.00	0.00	0.00	43.92	37.23	0.00	0.00	64.02	54.27	0.00	0.00	10.70	9.07	0.00	0.00	21.57	18.29	0.00	0.00
95	8476.83	0.85	1999	0.00	0.00	0.00	0.00	49.55	42.00	0.00	0.00	0.00	0.00	0.00	0.00	17.10	14.49	0.00	0.00	39.58	33.55	0.00	0.00
95	8476.83	0.85	2000	78.52	66.56	0.00	0.00	46.20	39.17	0.00	0.00	0.00	0.00	0.00	0.00	16.73	14.18	0.00	0.00	40.40	34.25	0.00	0.00
95	8476.83	0.85	2001	0.00	0.00	0.00	0.00	32.59	27.63	0.00	0.00	59.24	50.22	0.00	0.00	1.80	1.53	0.00	0.00	28.36	24.04	0.00	0.00
95	8476.83	0.85	2002	0.00	0.00	0.00	0.00	13.72	11.63	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.22	0.00	0.00	21.17	17.94	0.00	0.00
95	8476.83	0.85	2003	25.81	21.88	0.00	0.00	12.88	10.92	0.00	0.00	38.79	32.88	0.00	0.00	0.31	0.26	0.00	0.00	26.76	22.68	0.00	0.00
95	8476.83	0.85	2004	0.00	0.00	0.00	0.00	48.64	41.23	0.00	0.00	43.11	36.54	0.00	0.00	12.84	10.89	0.00	0.00	24.24	20.54	0.00	0.00
95	8476.83	0.85	2005	0.00	0.00	0.00	0.00	27.91	23.66	0.00	0.00	0.00	0.00	0.00	0.00	9.39	7.96	0.00	0.00	27.43	23.26	0.00	0.00
95	8476.83	0.85	2006	49.09	41.61	0.00	0.00	25.33	21.47	0.00	0.00	0.00	0.00	0.00	0.00	11.71	9.93	0.00	0.00	32.09	27.21	0.00	0.00
95	8476.83	0.85	2007	0.00	0.00	0.00	0.00	50.27	42.61	0.00	0.00	62.91	53.32	0.00	0.00	21.84	18.52	0.00	0.00	51.42	43.59	0.00	0.00
95	8476.83	0.85	2008	0.00	0.00	0.00	0.00	49.11	41.63	0.00	0.00	0.00	0.00	0.00	0.00	15.71	13.32	0.00	0.00	37.25	31.58	0.00	0.00
95	8476.83	0.85	2009	83.67	70.92	0.00	0.00	51.03	43.25	0.00	0.00	43.19	36.61	0.00	0.00	18.93	16.05	0.00	0.00	42.11	35.69	0.00	0.00
102	91.38	0.01	1996	0.00	0.00	0.00	0.00	63.65	0.58	0.00	0.00	22.83	0.21	0.00	0.00	18.66	0.17	0.00	0.00	0.00	0.00	0.00	0.00
102	91.38	0.01	1997	38.15	0.35	0.00	0.00	78.30	0.72	0.00	0.00	68.56	0.63	0.00	0.00	3.74	0.03	0.00	0.00	0.00	0.00	0.00	0.00
102	91.38	0.01	1998	0.00	0.00	0.00	0.00	84.55	0.77	0.00	0.00	91.58	0.84	0.00	0.00	0.84	0.01	0.00	0.00	0.00	0.00	0.00	0.00
102	91.38	0.01	1999	0.00	0.00	0.00	0.00	94.73	0.87	0.00	0.00	0.00	0.00	0.00	0.00	29.49	0.27	0.00	0.00	0.00	0.00	0.00	0.00
102	91.38	0.01	2000	52.13	0.48	0.00	0.00	64.54	0.59	0.00	0.00	0.00	0.00	0.00	0.00	19.07	0.17	0.00	0.00	0.00	0.00	0.00	0.00
102	91.38	0.01	2001	0.00	0.00	0.00	0.00	55.54	0.51	0.00	0.00	79.98	0.73	0.00	0.00	0.62	0.01	0.00	0.00	0.00	0.00	0.00	0.00
102	91.38	0.01	2002	0.00	0.00	0.00	0.00	40.52	0.37	0.00	0.00	0.00	0.00	0.00	0.00	2.70	0.02	0.00	0.00	0.00	0.00	0.00	0.00
102	91.38	0.01	2003	26.40	0.24	0.00	0.00	33.89	0.31	0.00	0.00	53.14	0.49	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00
102	91.38	0.01	2004	0.00	0.00	0.00	0.00	91.00	0.83	0.00	0.00	65.15	0.60	0.00	0.00	24.45	0.22	0.00	0.00	0.00	0.00	0.00	0.00
102	91.38	0.01	2005	0.00	0.00	0.00	0.00	58.50	0.53	0.00	0.00	0.00	0.00	0.00	0.00	14.85	0.14	0.00	0.00	0.00	0.00	0.00	0.00
102	91.38	0.01	2006	35.02	0.32	0.00	0.00	60.63	0.55	0.00	0.00	0.00	0.00	0.00	0.00	7.11	0.06	0.00	0.00	0.00	0.00	0.00	0.00
102	91.38	0.01	2007	0.00	0.00	0.00	0.00	102.77	0.94	0.00	0.00	97.22	0.89	0.00	0.00	33.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00

102	91.38	0.01	2008	0.00	0.00	0.00	0.00	65.42	0.60	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00
102	91.38	0.01	2009	56.94	0.52	0.00	0.00	104.72	0.96	0.00	0.00	81.52	0.74	0.00	0.00	25.09	0.23	0.00	0.00	0.00	0.00	0.00	0.00
103	8778.84	0.88	1996	0.00	0.00	0.00	0.00	59.16	51.94	0.00	0.00	34.19	30.01	0.00	0.00	14.82	13.01	0.00	0.00	31.85	27.96	0.00	0.00
103	8778.84	0.88	1997	93.53	82.11	0.00	0.00	49.88	43.79	0.00	0.00	59.57	52.30	0.00	0.00	13.60	11.94	0.00	0.00	31.31	27.49	0.00	0.00
103	8778.84	0.88	1998	0.00	0.00	0.00	0.00	53.80	47.23	0.00	0.00	86.44	75.89	0.00	0.00	10.44	9.17	0.00	0.00	20.31	17.83	0.00	0.00
103	8778.84	0.88	1999	0.00	0.00	0.00	0.00	60.54	53.15	0.00	0.00	0.00	0.00	0.00	0.00	17.43	15.30	0.00	0.00	37.28	32.73	0.00	0.00
103	8778.84	0.88	2000	100.21	87.97	0.00	0.00	56.26	49.39	0.00	0.00	0.00	0.00	0.00	0.00	17.25	15.14	0.00	0.00	39.36	34.55	0.00	0.00
103	8778.84	0.88	2001	0.00	0.00	0.00	0.00	33.90	29.76	0.00	0.00	78.27	68.71	0.00	0.00	3.23	2.84	0.00	0.00	28.26	24.81	0.00	0.00
103	8778.84	0.88	2002	0.00	0.00	0.00	0.00	16.24	14.26	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.23	0.00	0.00	19.49	17.11	0.00	0.00
103	8778.84	0.88	2003	33.15	29.10	0.00	0.00	14.99	13.16	0.00	0.00	50.30	44.16	0.00	0.00	0.31	0.27	0.00	0.00	25.96	22.79	0.00	0.00
103	8778.84	0.88	2004	0.00	0.00	0.00	0.00	59.01	51.80	0.00	0.00	57.69	50.64	0.00	0.00	12.76	11.20	0.00	0.00	23.18	20.35	0.00	0.00
103	8778.84	0.88	2005	0.00	0.00	0.00	0.00	33.55	29.46	0.00	0.00	0.00	0.00	0.00	0.00	9.22	8.09	0.00	0.00	26.16	22.97	0.00	0.00
103	8778.84	0.88	2006	64.68	56.78	0.00	0.00	28.84	25.32	0.00	0.00	0.00	0.00	0.00	0.00	11.23	9.86	0.00	0.00	29.47	25.87	0.00	0.00
103	8778.84	0.88	2007	0.00	0.00	0.00	0.00	61.43	53.93	0.00	0.00	82.00	71.98	0.00	0.00	21.94	19.26	0.00	0.00	49.96	43.86	0.00	0.00
103	8778.84	0.88	2008	0.00	0.00	0.00	0.00	59.68	52.39	0.00	0.00	0.00	0.00	0.00	0.00	16.24	14.26	0.00	0.00	36.80	32.31	0.00	0.00
103	8778.84	0.88	2009	110.45	96.96	0.00	0.00	62.25	54.65	0.00	0.00	58.26	51.14	0.00	0.00	19.33	16.97	0.00	0.00	40.38	35.44	0.00	0.00
105	19049.40	1.90	1996	0.00	0.00	0.00	0.00	72.78	138.64	0.00	0.00	28.70	54.67	0.00	0.00	18.98	36.16	0.00	0.00	47.18	89.88	37.63	71.68
105	19049.40	1.90	1997	85.86	163.56	0.00	0.00	60.10	114.48	0.00	0.00	85.78	163.41	0.00	0.00	17.42	33.18	0.00	0.00	47.38	90.25	33.26	63.36
105	19049.40	1.90	1998	0.00	0.00	0.00	0.00	67.53	128.63	0.00	0.00	104.18	198.45	0.00	0.00	13.40	25.52	0.00	0.00	30.11	57.35	26.80	51.05
105	19049.40	1.90	1999	0.00	0.00	0.00	0.00	74.65	142.20	0.00	0.00	0.00	0.00	0.00	0.00	22.33	42.54	0.00	0.00	56.11	106.89	42.20	80.39
105	19049.40	1.90	2000	88.63	168.84	0.00	0.00	68.59	130.66	0.00	0.00	0.00	0.00	0.00	0.00	21.95	41.81	0.00	0.00	58.94	112.28	38.10	72.58
105	19049.40	1.90	2001	0.00	0.00	0.00	0.00	43.98	83.78	0.00	0.00	98.01	186.70	0.00	0.00	3.53	6.72	0.00	0.00	42.77	81.48	26.70	50.86
105	19049.40	1.90	2002	0.00	0.00	0.00	0.00	20.02	38.14	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.63	0.00	0.00	29.77	56.70	20.12	38.33
105	19049.40	1.90	2003	30.76	58.60	0.00	0.00	18.26	34.78	0.00	0.00	74.73	142.36	0.00	0.00	0.39	0.74	0.00	0.00	38.88	74.06	23.32	44.43
105	19049.40	1.90	2004	0.00	0.00	0.00	0.00	70.96	135.18	0.00	0.00	69.14	131.72	0.00	0.00	16.49	31.41	0.00	0.00	34.35	65.43	27.08	51.59
105	19049.40	1.90	2005	0.00	0.00	0.00	0.00	39.29	74.85	0.00	0.00	0.00	0.00	0.00	0.00	11.93	22.73	0.00	0.00	39.08	74.44	27.42	52.23
105	19049.40	1.90	2006	62.17	118.42	0.00	0.00	32.81	62.51	0.00	0.00	0.00	0.00	0.00	0.00	14.55	27.72	0.00	0.00	43.98	83.77	31.40	59.81
105	19049.40	1.90	2007	0.00	0.00	0.00	0.00	71.15	135.54	0.00	0.00	102.38	195.02	0.00	0.00	27.88	53.11	0.00	0.00	75.54	143.89	57.31	109.18
105	19049.40	1.90	2008	0.00	0.00	0.00	0.00	71.35	135.91	0.00	0.00	0.00	0.00	0.00	0.00	20.43	38.92	0.00	0.00	54.95	104.67	32.71	62.30
105	19049.40	1.90	2009	97.98	186.64	0.00	0.00	75.02	142.92	0.00	0.00	84.09	160.19	0.00	0.00	24.70	47.06	0.00	0.00	60.65	115.54	44.22	84.23

106	3385.73	0.34	1996	0.00	0.00	0.00	0.00	65.63	22.22	0.00	0.00	32.92	11.15	0.00	0.00	14.62	4.95	0.00	0.00	31.24	10.58	0.00	0.00
106	3385.73	0.34	1997	88.48	29.96	0.00	0.00	55.61	18.83	0.00	0.00	49.21	16.66	0.00	0.00	13.86	4.69	0.00	0.00	31.70	10.73	0.00	0.00
106	3385.73	0.34	1998	0.00	0.00	0.00	0.00	58.59	19.84	0.00	0.00	73.77	24.97	0.00	0.00	10.34	3.50	0.00	0.00	19.93	6.75	0.00	0.00
106	3385.73	0.34	1999	0.00	0.00	0.00	0.00	66.03	22.35	0.00	0.00	0.00	0.00	0.00	0.00	17.75	6.01	0.00	0.00	37.44	12.68	0.00	0.00
106	3385.73	0.34	2000	95.96	32.49	0.00	0.00	61.53	20.83	0.00	0.00	0.00	0.00	0.00	0.00	17.29	5.85	0.00	0.00	39.22	13.28	0.00	0.00
106	3385.73	0.34	2001	0.00	0.00	0.00	0.00	47.04	15.93	0.00	0.00	67.83	22.96	0.00	0.00	3.83	1.30	0.00	0.00	28.62	9.69	0.00	0.00
106	3385.73	0.34	2002	0.00	0.00	0.00	0.00	18.44	6.24	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.09	0.00	0.00	20.00	6.77	0.00	0.00
106	3385.73	0.34	2003	30.64	10.38	0.00	0.00	16.84	5.70	0.00	0.00	41.41	14.02	0.00	0.00	0.31	0.10	0.00	0.00	25.87	8.76	0.00	0.00
106	3385.73	0.34	2004	0.00	0.00	0.00	0.00	63.84	21.62	0.00	0.00	49.59	16.79	0.00	0.00	12.50	4.23	0.00	0.00	22.75	7.70	0.00	0.00
106	3385.73	0.34	2005	0.00	0.00	0.00	0.00	35.68	12.08	0.00	0.00	0.00	0.00	0.00	0.00	9.05	3.06	0.00	0.00	25.98	8.80	0.00	0.00
106	3385.73	0.34	2006	59.07	20.00	0.00	0.00	29.31	9.92	0.00	0.00	0.00	0.00	0.00	0.00	11.00	3.72	0.00	0.00	29.23	9.90	0.00	0.00
106	3385.73	0.34	2007	0.00	0.00	0.00	0.00	67.01	22.69	0.00	0.00	72.22	24.45	0.00	0.00	22.14	7.49	0.00	0.00	50.56	17.12	0.00	0.00
106	3385.73	0.34	2008	0.00	0.00	0.00	0.00	65.59	22.21	0.00	0.00	0.00	0.00	0.00	0.00	16.55	5.60	0.00	0.00	36.52	12.37	0.00	0.00
106	3385.73	0.34	2009	104.09	35.24	0.00	0.00	68.00	23.02	0.00	0.00	47.03	15.92	0.00	0.00	19.42	6.57	0.00	0.00	40.40	13.68	0.00	0.00
108	10251.60	1.03	1996	0.00	0.00	0.00	0.00	49.52	50.76	0.00	0.00	33.51	34.35	0.00	0.00	17.88	18.33	0.00	0.00	23.85	24.45	20.33	20.85
108	10251.60	1.03	1997	54.74	56.11	0.00	0.00	67.32	69.02	0.00	0.00	85.71	87.87	0.00	0.00	3.73	3.82	0.00	0.00	27.50	28.19	24.19	24.80
108	10251.60	1.03	1998	0.00	0.00	0.00	0.00	78.84	80.82	0.00	0.00	120.49	123.52	0.00	0.00	0.84	0.86	0.00	0.00	24.04	24.64	20.80	21.32
108	10251.60	1.03	1999	0.00	0.00	0.00	0.00	89.84	92.10	0.00	0.00	0.00	0.00	0.00	0.00	29.52	30.26	0.00	0.00	38.88	39.86	33.70	34.55
108	10251.60	1.03	2000	76.14	78.06	0.00	0.00	54.62	55.99	0.00	0.00	0.00	0.00	0.00	0.00	19.29	19.77	0.00	0.00	26.92	27.59	19.32	19.80
108	10251.60	1.03	2001	0.00	0.00	0.00	0.00	46.76	47.94	0.00	0.00	103.21	105.81	0.00	0.00	0.61	0.63	0.00	0.00	20.48	21.00	16.51	16.93
108	10251.60	1.03	2002	0.00	0.00	0.00	0.00	24.71	25.33	0.00	0.00	0.00	0.00	0.00	0.00	2.66	2.73	0.00	0.00	22.15	22.70	16.64	17.05
108	10251.60	1.03	2003	37.45	38.40	0.00	0.00	16.79	17.21	0.00	0.00	66.01	67.67	0.00	0.00	0.53	0.54	0.00	0.00	25.29	25.93	18.15	18.60
108	10251.60	1.03	2004	0.00	0.00	0.00	0.00	82.08	84.15	0.00	0.00	85.55	87.70	0.00	0.00	24.08	24.68	0.00	0.00	28.46	29.18	24.66	25.28
108	10251.60	1.03	2005	0.00	0.00	0.00	0.00	44.65	45.77	0.00	0.00	0.00	0.00	0.00	0.00	14.91	15.29	0.00	0.00	29.61	30.35	24.34	24.95
108	10251.60	1.03	2006	50.16	51.42	0.00	0.00	47.40	48.60	0.00	0.00	0.00	0.00	0.00	0.00	7.03	7.20	0.00	0.00	26.91	27.59	22.65	23.22
108	10251.60	1.03	2007	0.00	0.00	0.00	0.00	97.09	99.53	0.00	0.00	125.67	128.83	0.00	0.00	32.60	33.42	0.00	0.00	43.98	45.08	42.18	43.24
108	10251.60	1.03	2008	0.00	0.00	0.00	0.00	51.76	53.06	0.00	0.00	0.00	0.00	0.00	0.00	1.04	1.06	0.00	0.00	19.42	19.90	16.34	16.75
108	10251.60	1.03	2009	84.68	86.81	0.00	0.00	98.96	101.45	0.00	0.00	101.52	104.07	0.00	0.00	24.75	25.37	0.00	0.00	31.28	32.07	30.74	31.51
113	11563.92	1.16	1996	0.00	0.00	0.00	0.00	61.44	71.05	0.00	0.00	25.42	29.40	0.00	0.00	15.14	17.51	0.00	0.00	23.00	26.60	0.00	0.00
113	11563.92	1.16	1997	41.04	47.46	0.00	0.00	82.57	95.48	0.00	0.00	71.13	82.26	0.00	0.00	2.41	2.79	0.00	0.00	27.28	31.55	0.00	0.00

113	11563.92	1.16	1998	0.00	0.00	0.00	0.00	92.77	107.28	0.00	0.00	98.02	113.34	0.00	0.00	0.70	0.81	0.00	0.00	22.46	25.98	0.00	0.00
113	11563.92	1.16	1999	0.00	0.00	0.00	0.00	108.08	124.98	0.00	0.00	0.00	0.00	0.00	0.00	26.17	30.26	0.00	0.00	39.16	45.28	0.00	0.00
113	11563.92	1.16	2000	56.83	65.72	0.00	0.00	56.25	65.04	0.00	0.00	0.00	0.00	0.00	0.00	15.43	17.84	0.00	0.00	26.60	30.76	0.00	0.00
113	11563.92	1.16	2001	0.00	0.00	0.00	0.00	57.04	65.96	0.00	0.00	82.31	95.18	0.00	0.00	0.51	0.59	0.00	0.00	20.09	23.23	0.00	0.00
113	11563.92	1.16	2002	0.00	0.00	0.00	0.00	36.70	42.43	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.68	0.00	0.00	22.51	26.03	0.00	0.00
113	11563.92	1.16	2003	27.47	31.77	0.00	0.00	27.37	31.65	0.00	0.00	53.45	61.80	0.00	0.00	0.41	0.47	0.00	0.00	24.67	28.53	0.00	0.00
113	11563.92	1.16	2004	0.00	0.00	0.00	0.00	97.51	112.76	0.00	0.00	69.76	80.67	0.00	0.00	21.23	24.55	0.00	0.00	27.93	32.30	0.00	0.00
113	11563.92	1.16	2005	0.00	0.00	0.00	0.00	55.64	64.35	0.00	0.00	0.00	0.00	0.00	0.00	12.18	14.08	0.00	0.00	30.51	35.28	0.00	0.00
113	11563.92	1.16	2006	36.42	42.11	0.00	0.00	59.65	68.98	0.00	0.00	0.00	0.00	0.00	0.00	6.97	8.06	0.00	0.00	25.94	29.99	0.00	0.00
113	11563.92	1.16	2007	0.00	0.00	0.00	0.00	117.55	135.94	0.00	0.00	100.99	116.79	0.00	0.00	30.22	34.94	0.00	0.00	43.08	49.82	0.00	0.00
113	11563.92	1.16	2008	0.00	0.00	0.00	0.00	56.71	65.58	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.74	0.00	0.00	19.92	23.03	0.00	0.00
113	11563.92	1.16	2009	57.09	66.02	0.00	0.00	120.06	138.84	0.00	0.00	87.81	101.54	0.00	0.00	17.54	20.28	0.00	0.00	31.51	36.44	0.00	0.00
114	19192.68	1.92	1996	0.00	0.00	0.00	0.00	59.30	113.82	0.00	0.00	42.27	81.14	0.00	0.00	23.77	45.62	0.00	0.00	63.29	121.47	0.00	0.00
114	19192.68	1.92	1997	112.97	216.82	0.00	0.00	50.90	97.70	0.00	0.00	60.86	116.81	0.00	0.00	21.99	42.20	0.00	0.00	63.99	122.82	0.00	0.00
114	19192.68	1.92	1998	0.00	0.00	0.00	0.00	53.71	103.08	0.00	0.00	93.06	178.60	0.00	0.00	16.12	30.93	0.00	0.00	40.10	76.96	0.00	0.00
114	19192.68	1.92	1999	0.00	0.00	0.00	0.00	60.48	116.08	0.00	0.00	0.00	0.00	0.00	0.00	28.06	53.85	0.00	0.00	75.29	144.51	0.00	0.00
114	19192.68	1.92	2000	122.10	234.35	0.00	0.00	56.33	108.12	0.00	0.00	0.00	0.00	0.00	0.00	27.33	52.46	0.00	0.00	78.66	150.96	0.00	0.00
114	19192.68	1.92	2001	0.00	0.00	0.00	0.00	40.02	76.81	0.00	0.00	85.52	164.13	0.00	0.00	4.54	8.72	0.00	0.00	55.93	107.34	0.00	0.00
114	19192.68	1.92	2002	0.00	0.00	0.00	0.00	16.74	32.12	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.83	0.00	0.00	40.68	78.08	0.00	0.00
114	19192.68	1.92	2003	39.65	76.10	0.00	0.00	15.77	30.26	0.00	0.00	52.53	100.82	0.00	0.00	0.48	0.93	0.00	0.00	51.91	99.63	0.00	0.00
114	19192.68	1.92	2004	0.00	0.00	0.00	0.00	58.63	112.52	0.00	0.00	62.65	120.23	0.00	0.00	20.31	38.98	0.00	0.00	46.86	89.93	0.00	0.00
114	19192.68	1.92	2005	0.00	0.00	0.00	0.00	32.75	62.85	0.00	0.00	0.00	0.00	0.00	0.00	14.46	27.76	0.00	0.00	52.58	100.91	0.00	0.00
114	19192.68	1.92	2006	75.72	145.32	0.00	0.00	27.40	52.59	0.00	0.00	0.00	0.00	0.00	0.00	18.34	35.21	0.00	0.00	60.34	115.80	0.00	0.00
114	19192.68	1.92	2007	0.00	0.00	0.00	0.00	61.44	117.91	0.00	0.00	90.03	172.78	0.00	0.00	34.79	66.77	0.00	0.00	###	193.74	0.00	0.00
114	19192.68	1.92	2008	0.00	0.00	0.00	0.00	60.08	115.31	0.00	0.00	0.00	0.00	0.00	0.00	26.90	51.64	0.00	0.00	75.63	145.15	0.00	0.00
114	19192.68	1.92	2009	131.23	251.87	0.00	0.00	62.35	119.67	0.00	0.00	59.01	113.26	0.00	0.00	30.51	58.56	0.00	0.00	81.71	156.83	0.00	0.00
120	7913.34	0.79	1996	0.00	0.00	0.00	0.00	39.81	31.50	0.00	0.00	16.20	12.82	0.00	0.00	13.17	10.42	0.00	0.00	0.00	0.00	0.00	0.00
120	7913.34	0.79	1997	24.83	19.65	0.00	0.00	58.55	46.33	0.00	0.00	49.65	39.29	0.00	0.00	2.03	1.61	0.00	0.00	0.00	0.00	0.00	0.00
120	7913.34	0.79	1998	0.00	0.00	0.00	0.00	68.27	54.02	0.00	0.00	65.50	51.83	0.00	0.00	0.58	0.46	0.00	0.00	0.00	0.00	0.00	0.00
120	7913.34	0.79	1999	0.00	0.00	0.00	0.00	81.81	64.74	0.00	0.00	0.00	0.00	0.00	0.00	21.75	17.21	0.00	0.00	0.00	0.00	0.00	0.00

120	7913.34	0.79	2000	33.61	26.60	0.00	0.00	32.89	26.02	0.00	0.00	0.00	0.00	0.00	0.00	12.46	9.86	0.00	0.00	0.00	0.00	0.00	0.00
120	7913.34	0.79	2001	0.00	0.00	0.00	0.00	37.50	29.67	0.00	0.00	53.90	42.65	0.00	0.00	0.41	0.33	0.00	0.00	0.00	0.00	0.00	0.00
120	7913.34	0.79	2002	0.00	0.00	0.00	0.00	21.31	16.87	0.00	0.00	0.00	0.00	0.00	0.00	1.01	0.80	0.00	0.00	0.00	0.00	0.00	0.00
120	7913.34	0.79	2003	15.97	12.64	0.00	0.00	13.25	10.48	0.00	0.00	36.05	28.52	0.00	0.00	0.33	0.26	0.00	0.00	0.00	0.00	0.00	0.00
120	7913.34	0.79	2004	0.00	0.00	0.00	0.00	70.84	56.06	0.00	0.00	46.60	36.88	0.00	0.00	17.63	13.95	0.00	0.00	0.00	0.00	0.00	0.00
120	7913.34	0.79	2005	0.00	0.00	0.00	0.00	33.29	26.34	0.00	0.00	0.00	0.00	0.00	0.00	9.81	7.77	0.00	0.00	0.00	0.00	0.00	0.00
120	7913.34	0.79	2006	21.54	17.04	0.00	0.00	39.58	31.32	0.00	0.00	0.00	0.00	0.00	0.00	5.89	4.66	0.00	0.00	0.00	0.00	0.00	0.00
120	7913.34	0.79	2007	0.00	0.00	0.00	0.00	88.59	70.11	0.00	0.00	68.86	54.49	0.00	0.00	25.67	20.31	0.00	0.00	0.00	0.00	0.00	0.00
120	7913.34	0.79	2008	0.00	0.00	0.00	0.00	38.26	30.28	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.41	0.00	0.00	0.00	0.00	0.00	0.00
120	7913.34	0.79	2009	34.41	27.23	0.00	0.00	90.19	71.37	0.00	0.00	61.43	48.61	0.00	0.00	16.99	13.44	0.00	0.00	0.00	0.00	0.00	0.00
126	13743.29	1.37	1996	0.00	0.00	0.00	0.00	47.08	64.70	0.00	0.00	31.68	43.54	0.00	0.00	19.57	26.90	0.00	0.00	27.04	37.17	0.00	0.00
126	13743.29	1.37	1997	49.49	68.01	0.00	0.00	68.30	93.87	0.00	0.00	59.07	81.18	0.00	0.00	3.09	4.24	0.00	0.00	29.66	40.76	0.00	0.00
126	13743.29	1.37	1998	0.00	0.00	0.00	0.00	81.57	112.10	0.00	0.00	92.66	127.34	0.00	0.00	0.89	1.22	0.00	0.00	22.82	31.36	0.00	0.00
126	13743.29	1.37	1999	0.00	0.00	0.00	0.00	98.20	134.96	0.00	0.00	0.00	0.00	0.00	0.00	33.52	46.06	0.00	0.00	43.66	60.00	0.00	0.00
126	13743.29	1.37	2000	68.30	93.86	0.00	0.00	39.82	54.73	0.00	0.00	0.00	0.00	0.00	0.00	19.46	26.75	0.00	0.00	26.42	36.31	0.00	0.00
126	13743.29	1.37	2001	0.00	0.00	0.00	0.00	44.88	61.68	0.00	0.00	74.54	102.45	0.00	0.00	0.65	0.89	0.00	0.00	20.32	27.92	0.00	0.00
126	13743.29	1.37	2002	0.00	0.00	0.00	0.00	25.53	35.09	0.00	0.00	0.00	0.00	0.00	0.00	1.22	1.68	0.00	0.00	25.50	35.04	0.00	0.00
126	13743.29	1.37	2003	31.94	43.89	0.00	0.00	15.74	21.63	0.00	0.00	43.50	59.78	0.00	0.00	0.52	0.71	0.00	0.00	26.93	37.01	0.00	0.00
126	13743.29	1.37	2004	0.00	0.00	0.00	0.00	84.68	116.37	0.00	0.00	66.00	90.71	0.00	0.00	27.08	37.21	0.00	0.00	31.08	42.72	0.00	0.00
126	13743.29	1.37	2005	0.00	0.00	0.00	0.00	40.31	55.40	0.00	0.00	0.00	0.00	0.00	0.00	15.41	21.18	0.00	0.00	31.99	43.96	0.00	0.00
126	13743.29	1.37	2006	42.68	58.65	0.00	0.00	46.46	63.84	0.00	0.00	0.00	0.00	0.00	0.00	8.95	12.30	0.00	0.00	27.71	38.08	0.00	0.00
126	13743.29	1.37	2007	0.00	0.00	0.00	0.00	106.31	146.11	0.00	0.00	91.42	125.65	0.00	0.00	38.83	53.37	0.00	0.00	53.86	74.02	0.00	0.00
126	13743.29	1.37	2008	0.00	0.00	0.00	0.00	44.99	61.83	0.00	0.00	0.00	0.00	0.00	0.00	0.81	1.11	0.00	0.00	20.34	27.96	0.00	0.00
126	13743.29	1.37	2009	70.84	97.36	0.00	0.00	108.23	148.74	0.00	0.00	73.54	101.07	0.00	0.00	23.85	32.78	0.00	0.00	36.47	50.12	0.00	0.00
127	903.93	0.09	1996	0.00	0.00	0.00	0.00	49.12	4.44	0.00	0.00	26.83	2.43	0.00	0.00	12.53	1.13	3.91	0.35	31.25	2.82	0.00	0.00
127	903.93	0.09	1997	72.36	6.54	0.00	0.00	41.85	3.78	0.00	0.00	49.71	4.49	0.00	0.00	11.86	1.07	2.21	0.20	31.70	2.87	0.00	0.00
127	903.93	0.09	1998	0.00	0.00	0.00	0.00	43.93	3.97	0.00	0.00	67.77	6.13	0.00	0.00	8.83	0.80	6.81	0.62	19.93	1.80	0.00	0.00
127	903.93	0.09	1999	0.00	0.00	0.00	0.00	49.50	4.47	0.00	0.00	0.00	0.00	0.00	0.00	15.23	1.38	8.07	0.73	37.45	3.38	0.00	0.00
127	903.93	0.09	2000	78.48	7.09	0.00	0.00	46.15	4.17	0.00	0.00	0.00	0.00	0.00	0.00	14.77	1.34	7.60	0.69	39.23	3.55	0.00	0.00
127	903.93	0.09	2001	0.00	0.00	0.00	0.00	35.26	3.19	0.00	0.00	63.68	5.76	0.00	0.00	3.25	0.29	0.18	0.02	28.62	2.59	0.00	0.00

127	903.93	0.09	2002	0.00	0.00	0.00	0.00	13.93	1.26	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.02	0.14	0.01	20.01	1.81	0.00	0.00
127	903.93	0.09	2003	25.04	2.26	0.00	0.00	12.69	1.15	0.00	0.00	42.57	3.85	0.00	0.00	0.26	0.02	0.13	0.01	25.88	2.34	0.00	0.00
127	903.93	0.09	2004	0.00	0.00	0.00	0.00	47.83	4.32	0.00	0.00	45.92	4.15	0.00	0.00	10.69	0.97	7.17	0.65	22.75	2.06	0.00	0.00
127	903.93	0.09	2005	0.00	0.00	0.00	0.00	26.55	2.40	0.00	0.00	0.00	0.00	0.00	0.00	7.69	0.70	2.62	0.24	25.98	2.35	0.00	0.00
127	903.93	0.09	2006	48.26	4.36	0.00	0.00	21.54	1.95	0.00	0.00	0.00	0.00	0.00	0.00	9.38	0.85	2.55	0.23	29.23	2.64	0.00	0.00
127	903.93	0.09	2007	0.00	0.00	0.00	0.00	50.27	4.54	0.00	0.00	67.99	6.15	0.00	0.00	18.97	1.71	10.16	0.92	50.56	4.57	0.00	0.00
127	903.93	0.09	2008	0.00	0.00	0.00	0.00	49.19	4.45	0.00	0.00	0.00	0.00	0.00	0.00	14.16	1.28	7.52	0.68	36.53	3.30	0.00	0.00
127	903.93	0.09	2009	85.23	7.70	0.00	0.00	51.00	4.61	0.00	0.00	47.76	4.32	0.00	0.00	16.78	1.52	9.35	0.85	40.41	3.65	0.00	0.00
130	2965.83	0.30	1996	0.00	0.00	###	9.09	65.63	19.46	0.00	0.00	29.86	8.86	0.00	0.00	4.26	1.26	2.61	0.77	0.00	0.00	0.00	0.00
130	2965.83	0.30	1997	80.45	23.86	###	9.28	55.59	16.49	0.00	0.00	61.91	18.36	0.00	0.00	3.88	1.15	1.48	0.44	0.00	0.00	0.00	0.00
130	2965.83	0.30	1998	0.00	0.00	###	8.39	58.59	17.38	0.00	0.00	80.48	23.87	0.00	0.00	2.98	0.88	4.54	1.35	0.00	0.00	0.00	0.00
130	2965.83	0.30	1999	0.00	0.00	###	9.52	66.03	19.58	0.00	0.00	0.00	0.00	0.00	0.00	4.99	1.48	5.38	1.59	0.00	0.00	0.00	0.00
130	2965.83	0.30	2000	87.24	25.87	###	9.26	61.53	18.25	0.00	0.00	0.00	0.00	0.00	0.00	4.96	1.47	5.06	1.50	0.00	0.00	0.00	0.00
130	2965.83	0.30	2001	0.00	0.00	###	9.26	46.99	13.94	0.00	0.00	76.37	22.65	0.00	0.00	1.04	0.31	0.12	0.03	0.00	0.00	0.00	0.00
130	2965.83	0.30	2002	0.00	0.00	###	9.01	18.44	5.47	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.02	0.09	0.03	0.00	0.00	0.00	0.00
130	2965.83	0.30	2003	27.85	8.26	###	9.86	16.84	4.99	0.00	0.00	52.94	15.70	0.00	0.00	0.09	0.03	0.08	0.02	0.00	0.00	0.00	0.00
130	2965.83	0.30	2004	0.00	0.00	###	9.27	63.84	18.93	0.00	0.00	54.42	16.14	0.00	0.00	3.64	1.08	4.78	1.42	0.00	0.00	0.00	0.00
130	2965.83	0.30	2005	0.00	0.00	###	8.96	35.66	10.58	0.00	0.00	0.00	0.00	0.00	0.00	2.61	0.77	1.75	0.52	0.00	0.00	0.00	0.00
130	2965.83	0.30	2006	53.69	15.92	###	8.27	29.30	8.69	0.00	0.00	0.00	0.00	0.00	0.00	3.17	0.94	1.70	0.50	0.00	0.00	0.00	0.00
130	2965.83	0.30	2007	0.00	0.00	###	10.47	67.02	19.88	0.00	0.00	82.12	24.36	0.00	0.00	6.32	1.87	6.78	2.01	0.00	0.00	0.00	0.00
130	2965.83	0.30	2008	0.00	0.00	30.11	8.93	65.59	19.45	0.00	0.00	0.00	0.00	0.00	0.00	4.71	1.40	5.01	1.49	0.00	0.00	0.00	0.00
130	2965.83	0.30	2009	94.67	28.08	###	9.26	68.00	20.17	0.00	0.00	59.48	17.64	0.00	0.00	5.59	1.66	6.23	1.85	0.00	0.00	0.00	0.00
134	3307.74	0.33	1996	0.00	0.00	0.00	0.00	49.12	16.25	0.00	0.00	26.83	8.88	0.00	0.00	12.53	4.14	0.00	0.00	15.33	5.07	0.00	0.00
134	3307.74	0.33	1997	72.39	23.94	0.00	0.00	41.85	13.84	0.00	0.00	49.71	16.44	0.00	0.00	11.86	3.92	0.00	0.00	16.06	5.31	0.00	0.00
134	3307.74	0.33	1998	0.00	0.00	0.00	0.00	43.93	14.53	0.00	0.00	67.77	22.41	0.00	0.00	8.83	2.92	0.00	0.00	9.78	3.24	0.00	0.00
134	3307.74	0.33	1999	0.00	0.00	0.00	0.00	49.50	16.37	0.00	0.00	0.00	0.00	0.00	0.00	15.23	5.04	0.00	0.00	18.82	6.23	0.00	0.00
134	3307.74	0.33	2000	78.49	25.96	0.00	0.00	46.15	15.26	0.00	0.00	0.00	0.00	0.00	0.00	14.77	4.89	0.00	0.00	19.57	6.47	0.00	0.00
134	3307.74	0.33	2001	0.00	0.00	0.00	0.00	35.26	11.66	0.00	0.00	63.69	21.07	0.00	0.00	3.25	1.07	0.00	0.00	14.50	4.80	0.00	0.00
134	3307.74	0.33	2002	0.00	0.00	0.00	0.00	13.93	4.61	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.08	0.00	0.00	10.27	3.40	0.00	0.00
134	3307.74	0.33	2003	25.04	8.28	0.00	0.00	12.69	4.20	0.00	0.00	42.56	14.08	0.00	0.00	0.26	0.09	0.00	0.00	12.90	4.27	0.00	0.00

134	3307.74	0.33	2004	0.00	0.00	0.00	0.00	47.83	15.82	0.00	0.00	45.92	15.19	0.00	0.00	10.69	3.54	0.00	0.00	11.17	3.69	0.00	0.00
134	3307.74	0.33	2005	0.00	0.00	0.00	0.00	26.55	8.78	0.00	0.00	0.00	0.00	0.00	0.00	7.69	2.54	0.00	0.00	12.90	4.27	0.00	0.00
134	3307.74	0.33	2006	48.27	15.97	0.00	0.00	21.55	7.13	0.00	0.00	0.00	0.00	0.00	0.00	9.38	3.10	0.00	0.00	14.50	4.80	0.00	0.00
134	3307.74	0.33	2007	0.00	0.00	0.00	0.00	50.27	16.63	0.00	0.00	68.00	22.49	0.00	0.00	18.97	6.27	0.00	0.00	25.58	8.46	0.00	0.00
134	3307.74	0.33	2008	0.00	0.00	0.00	0.00	49.19	16.27	0.00	0.00	0.00	0.00	0.00	0.00	14.16	4.68	0.00	0.00	18.14	6.00	0.00	0.00
134	3307.74	0.33	2009	85.23	28.19	0.00	0.00	51.01	16.87	0.00	0.00	47.76	15.80	0.00	0.00	16.78	5.55	0.00	0.00	20.26	6.70	0.00	0.00
135	6843.87	0.68	1996	0.00	0.00	0.00	0.00	76.87	52.61	0.00	0.00	35.94	24.59	0.00	0.00	23.17	15.86	0.00	0.00	10.22	7.00	18.57	12.71
135	6843.87	0.68	1997	96.57	66.09	0.00	0.00	66.95	45.82	0.00	0.00	49.21	33.68	0.00	0.00	21.57	14.76	0.00	0.00	10.71	7.33	16.78	11.48
135	6843.87	0.68	1998	0.00	0.00	0.00	0.00	68.49	46.87	0.00	0.00	77.01	52.70	0.00	0.00	16.30	11.15	0.00	0.00	6.52	4.46	13.22	9.05
135	6843.87	0.68	1999	0.00	0.00	0.00	0.00	77.51	53.05	0.00	0.00	0.00	0.00	0.00	0.00	27.69	18.95	0.00	0.00	12.55	8.59	21.53	14.73
135	6843.87	0.68	2000	104.70	71.65	0.00	0.00	72.25	49.45	0.00	0.00	0.00	0.00	0.00	0.00	27.16	18.58	0.00	0.00	13.05	8.93	18.81	12.87
135	6843.87	0.68	2001	0.00	0.00	0.00	0.00	56.60	38.73	0.00	0.00	70.14	48.01	0.00	0.00	5.85	4.00	0.00	0.00	9.67	6.62	13.44	9.20
135	6843.87	0.68	2002	0.00	0.00	0.00	0.00	29.30	20.05	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.28	0.00	0.00	6.85	4.69	10.31	7.06
135	6843.87	0.68	2003	33.45	22.89	0.00	0.00	27.99	19.15	0.00	0.00	41.39	28.32	0.00	0.00	0.48	0.33	0.00	0.00	8.61	5.89	11.62	7.95
135	6843.87	0.68	2004	0.00	0.00	0.00	0.00	75.30	51.53	0.00	0.00	51.78	35.44	0.00	0.00	19.78	13.54	0.00	0.00	7.45	5.10	13.35	9.14
135	6843.87	0.68	2005	0.00	0.00	0.00	0.00	46.80	32.03	0.00	0.00	0.00	0.00	0.00	0.00	14.21	9.73	0.00	0.00	8.61	5.89	13.60	9.31
135	6843.87	0.68	2006	64.51	44.15	0.00	0.00	40.01	27.38	0.00	0.00	0.00	0.00	0.00	0.00	17.32	11.85	0.00	0.00	9.67	6.62	15.64	10.70
135	6843.87	0.68	2007	0.00	0.00	0.00	0.00	78.19	53.51	0.00	0.00	74.46	50.96	0.00	0.00	34.77	23.80	0.00	0.00	17.05	11.67	29.12	19.93
135	6843.87	0.68	2008	0.00	0.00	0.00	0.00	76.53	52.37	0.00	0.00	0.00	0.00	0.00	0.00	25.93	17.75	0.00	0.00	12.09	8.28	16.27	11.13
135	6843.87	0.68	2009	113.48	77.67	0.00	0.00	79.34	54.30	0.00	0.00	47.04	32.19	0.00	0.00	30.77	21.06	0.00	0.00	13.51	9.25	22.11	15.13
143	433.95	0.04	1996	0.00	0.00	0.00	0.00	49.12	2.13	0.00	0.00	26.84	1.16	0.00	0.00	14.82	0.64	0.00	0.00	31.26	1.36	24.93	1.08
143	433.95	0.04	1997	72.43	3.14	0.00	0.00	41.86	1.82	0.00	0.00	49.71	2.16	0.00	0.00	13.66	0.59	0.00	0.00	31.72	1.38	22.27	0.97
143	433.95	0.04	1998	0.00	0.00	0.00	0.00	43.93	1.91	0.00	0.00	67.76	2.94	0.00	0.00	10.41	0.45	0.00	0.00	19.94	0.87	17.74	0.77
143	433.95	0.04	1999	0.00	0.00	0.00	0.00	49.50	2.15	0.00	0.00	0.00	0.00	0.00	0.00	17.54	0.76	0.00	0.00	37.47	1.63	28.42	1.23
143	433.95	0.04	2000	78.51	3.41	0.00	0.00	46.15	2.00	0.00	0.00	0.00	0.00	0.00	0.00	17.31	0.75	0.00	0.00	39.26	1.70	25.25	1.10
143	433.95	0.04	2001	0.00	0.00	0.00	0.00	35.28	1.53	0.00	0.00	63.70	2.76	0.00	0.00	3.67	0.16	0.00	0.00	28.63	1.24	17.86	0.78
143	433.95	0.04	2002	0.00	0.00	0.00	0.00	13.93	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.01	0.00	0.00	20.02	0.87	13.59	0.59
143	433.95	0.04	2003	25.05	1.09	0.00	0.00	12.70	0.55	0.00	0.00	42.56	1.85	0.00	0.00	0.31	0.01	0.00	0.00	25.89	1.12	15.52	0.67
143	433.95	0.04	2004	0.00	0.00	0.00	0.00	47.83	2.08	0.00	0.00	45.93	1.99	0.00	0.00	12.65	0.55	0.00	0.00	22.75	0.99	17.93	0.78
143	433.95	0.04	2005	0.00	0.00	0.00	0.00	26.56	1.15	0.00	0.00	0.00	0.00	0.00	0.00	9.08	0.39	0.00	0.00	25.98	1.13	18.20	0.79

143	433.95	0.04	2006	48.30	2.10	0.00	0.00	21.58	0.94	0.00	0.00	0.00	0.00	0.00	0.00	11.06	0.48	0.00	0.00	29.24	1.27	20.90	0.91
143	433.95	0.04	2007	0.00	0.00	0.00	0.00	50.27	2.18	0.00	0.00	68.02	2.95	0.00	0.00	22.13	0.96	0.00	0.00	50.56	2.19	38.52	1.67
143	433.95	0.04	2008	0.00	0.00	0.00	0.00	49.20	2.13	0.00	0.00	0.00	0.00	0.00	0.00	16.49	0.72	0.00	0.00	36.55	1.59	21.75	0.94
143	433.95	0.04	2009	85.23	3.70	0.00	0.00	51.01	2.21	0.00	0.00	47.76	2.07	0.00	0.00	19.58	0.85	0.00	0.00	40.46	1.76	29.49	1.28
147	502.43	0.05	1996	0.00	0.00	0.00	0.00	57.90	2.91	0.00	0.00	32.53	1.63	0.00	0.00	12.78	0.64	0.00	0.00	27.71	1.39	0.00	0.00
147	502.43	0.05	1997	58.29	2.93	0.00	0.00	74.43	3.74	0.00	0.00	59.94	3.01	0.00	0.00	2.00	0.10	0.00	0.00	29.94	1.50	0.00	0.00
147	502.43	0.05	1998	0.00	0.00	0.00	0.00	80.65	4.05	0.00	0.00	96.19	4.83	0.00	0.00	0.41	0.02	0.00	0.00	24.77	1.24	0.00	0.00
147	502.43	0.05	1999	0.00	0.00	0.00	0.00	95.03	4.77	0.00	0.00	0.00	0.00	0.00	0.00	18.96	0.95	0.00	0.00	43.18	2.17	0.00	0.00
147	502.43	0.05	2000	74.12	3.72	0.00	0.00	57.65	2.90	0.00	0.00	0.00	0.00	0.00	0.00	11.05	0.56	0.00	0.00	26.60	1.34	0.00	0.00
147	502.43	0.05	2001	0.00	0.00	0.00	0.00	50.24	2.52	0.00	0.00	79.55	4.00	0.00	0.00	0.30	0.02	0.00	0.00	20.25	1.02	0.00	0.00
147	502.43	0.05	2002	0.00	0.00	0.00	0.00	35.87	1.80	0.00	0.00	0.00	0.00	0.00	0.00	1.58	0.08	0.00	0.00	25.02	1.26	0.00	0.00
147	502.43	0.05	2003	38.55	1.94	0.00	0.00	28.23	1.42	0.00	0.00	47.64	2.39	0.00	0.00	0.39	0.02	0.00	0.00	27.12	1.36	0.00	0.00
147	502.43	0.05	2004	0.00	0.00	0.00	0.00	84.73	4.26	0.00	0.00	69.61	3.50	0.00	0.00	15.33	0.77	0.00	0.00	31.13	1.56	0.00	0.00
147	502.43	0.05	2005	0.00	0.00	0.00	0.00	51.33	2.58	0.00	0.00	0.00	0.00	0.00	0.00	4.36	0.22	0.00	0.00	30.64	1.54	0.00	0.00
147	502.43	0.05	2006	52.50	2.64	0.00	0.00	55.48	2.79	0.00	0.00	0.00	0.00	0.00	0.00	4.12	0.21	0.00	0.00	28.66	1.44	0.00	0.00
147	502.43	0.05	2007	0.00	0.00	0.00	0.00	95.60	4.80	0.00	0.00	95.69	4.81	0.00	0.00	22.88	1.15	0.00	0.00	55.27	2.78	0.00	0.00
147	502.43	0.05	2008	0.00	0.00	0.00	0.00	63.04	3.17	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.02	0.00	0.00	19.14	0.96	0.00	0.00
147	502.43	0.05	2009	83.17	4.18	0.00	0.00	103.78	5.21	0.00	0.00	73.04	3.67	0.00	0.00	16.93	0.85	0.00	0.00	35.95	1.81	0.00	0.00

Ellsworth County

SUB	Area (m)	Area (ha)	Year	CORN (t)	CORN*A (t/ha)	IRCN (t)	IRCN*A (t/ha)	GRSG (t)	GRSG*A (t/ha)	IRGS (t)	IRGS*A (t/ha)	WWHT (t)	WWHT*A (t/ha)	IRWW (t)	IRWW *A (t/ha)	SOYB (t)	SOYB*A (t/ha)	IRSB (t)	IRSB*A (t/ha)	ALFA (t)	ALFA*A (t/ha)	IRAL (t)	IRAL*A (t/ha)
115	2.43	0.00	1996	0.00	0.00	0.00	0.00	74.94	0.02	0.00	0.00	32.27	0.01	0.00	0.00	13.75	0.00	0.00	0.00	28.26	0.01	0.00	0.00
115	2.43	0.00	1997	49.06	0.01	0.00	0.00	44.30	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	18.84	0.00	0.00	0.00
115	2.43	0.00	1998	0.00	0.00	0.00	0.00	75.91	0.02	0.00	0.00	40.70	0.01	0.00	0.00	26.02	0.01	0.00	0.00	21.67	0.01	0.00	0.00
115	2.43	0.00	1999	0.00	0.00	0.00	0.00	77.43	0.02	0.00	0.00	0.00	0.00	0.00	0.00	21.46	0.01	0.00	0.00	29.10	0.01	0.00	0.00
115	2.43	0.00	2000	70.93	0.02	0.00	0.00	62.99	0.02	0.00	0.00	22.82	0.01	0.00	0.00	7.70	0.00	0.00	0.00	22.01	0.01	0.00	0.00
115	2.43	0.00	2001	0.00	0.00	0.00	0.00	71.55	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.14	0.00	0.00	0.00	25.12	0.01	0.00	0.00
115	2.43	0.00	2002	0.00	0.00	0.00	0.00	28.58	0.01	0.00	0.00	30.04	0.01	0.00	0.00	0.41	0.00	0.00	0.00	12.99	0.00	0.00	0.00
115	2.43	0.00	2003	67.46	0.02	0.00	0.00	62.34	0.02	0.00	0.00	41.11	0.01	0.00	0.00	17.81	0.00	0.00	0.00	29.08	0.01	0.00	0.00
115	2.43	0.00	2004	0.00	0.00	0.00	0.00	70.02	0.02	0.00	0.00	47.76	0.01	0.00	0.00	30.50	0.01	0.00	0.00	30.33	0.01	0.00	0.00

115	2.43	0.00	2005	0.00	0.00	0.00	0.00	73.68	0.02	0.00	0.00	0.00	0.00	0.00	0.00	26.92	0.01	0.00	0.00	38.87	0.01	0.00	0.00
115	2.43	0.00	2006	34.43	0.01	0.00	0.00	69.62	0.02	0.00	0.00	0.00	0.00	0.00	0.00	10.22	0.00	0.00	0.00	14.64	0.00	0.00	0.00
115	2.43	0.00	2007	0.00	0.00	0.00	0.00	59.48	0.01	0.00	0.00	40.90	0.01	0.00	0.00	15.49	0.00	0.00	0.00	15.56	0.00	0.00	0.00
115	2.43	0.00	2008	0.00	0.00	0.00	0.00	88.34	0.02	0.00	0.00	29.33	0.01	0.00	0.00	30.18	0.01	0.00	0.00	33.58	0.01	0.00	0.00
115	2.43	0.00	2009	79.11	0.02	0.00	0.00	78.15	0.02	0.00	0.00	41.91	0.01	0.00	0.00	23.36	0.01	0.00	0.00	26.18	0.01	0.00	0.00
119	6452.34	0.65	1996	0.00	0.00	23.69	15.28	97.75	63.07	0.00	0.00	37.29	24.06	0.00	0.00	10.11	6.52	0.00	0.00	44.01	28.40	0.00	0.00
119	6452.34	0.65	1997	32.04	20.67	22.29	14.38	61.51	39.69	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.26	0.00	0.00	28.71	18.53	0.00	0.00
119	6452.34	0.65	1998	0.00	0.00	21.68	13.99	103.30	66.65	0.00	0.00	38.50	24.84	0.00	0.00	18.70	12.06	0.00	0.00	34.30	22.13	0.00	0.00
119	6452.34	0.65	1999	0.00	0.00	22.09	14.26	103.70	66.91	0.00	0.00	0.00	0.00	0.00	0.00	10.34	6.67	0.00	0.00	44.89	28.97	0.00	0.00
119	6452.34	0.65	2000	47.61	30.72	23.86	15.40	85.71	55.30	0.00	0.00	27.13	17.50	0.00	0.00	5.71	3.69	0.00	0.00	35.40	22.84	0.00	0.00
119	6452.34	0.65	2001	0.00	0.00	21.89	14.12	95.36	61.53	0.00	0.00	0.00	0.00	0.00	0.00	2.80	1.81	0.00	0.00	38.85	25.07	0.00	0.00
119	6452.34	0.65	2002	0.00	0.00	21.02	13.57	46.25	29.84	0.00	0.00	19.97	12.88	0.00	0.00	0.30	0.19	0.00	0.00	21.05	13.58	0.00	0.00
119	6452.34	0.65	2003	46.32	29.89	24.61	15.88	85.32	55.05	0.00	0.00	51.48	33.22	0.00	0.00	12.37	7.98	0.00	0.00	44.79	28.90	0.00	0.00
119	6452.34	0.65	2004	0.00	0.00	19.27	12.43	93.60	60.39	0.00	0.00	43.91	28.33	0.00	0.00	21.84	14.09	0.00	0.00	46.79	30.19	0.00	0.00
119	6452.34	0.65	2005	0.00	0.00	22.41	14.46	96.33	62.15	0.00	0.00	0.00	0.00	0.00	0.00	9.87	6.37	0.00	0.00	56.62	36.53	0.00	0.00
119	6452.34	0.65	2006	22.03	14.22	19.24	12.42	90.14	58.16	0.00	0.00	0.00	0.00	0.00	0.00	7.51	4.85	0.00	0.00	23.50	15.16	0.00	0.00
119	6452.34	0.65	2007	0.00	0.00	18.93	12.21	77.73	50.15	0.00	0.00	48.06	31.01	0.00	0.00	8.48	5.47	0.00	0.00	24.18	15.60	0.00	0.00
119	6452.34	0.65	2008	0.00	0.00	24.47	15.79	118.18	76.25	0.00	0.00	19.22	12.40	0.00	0.00	18.25	11.78	0.00	0.00	52.59	33.93	0.00	0.00
119	6452.34	0.65	2009	52.71	34.01	21.99	14.19	102.85	66.36	0.00	0.00	49.99	32.25	0.00	0.00	14.48	9.34	0.00	0.00	41.24	26.61	0.00	0.00
125	5553.95	0.56	1996	0.00	0.00	0.00	0.00	75.69	42.04	0.00	0.00	23.97	13.31	0.00	0.00	12.72	7.07	0.00	0.00	27.56	15.30	0.00	0.00
125	5553.95	0.56	1997	67.34	37.40	0.00	0.00	62.78	34.87	0.00	0.00	45.90	25.49	0.00	0.00	9.03	5.01	0.00	0.00	25.60	14.22	0.00	0.00
125	5553.95	0.56	1998	0.00	0.00	0.00	0.00	73.04	40.56	0.00	0.00	66.88	37.15	0.00	0.00	25.94	14.40	0.00	0.00	16.82	9.34	0.00	0.00
125	5553.95	0.56	1999	0.00	0.00	0.00	0.00	75.83	42.11	0.00	0.00	0.00	0.00	0.00	0.00	27.00	14.99	0.00	0.00	32.30	17.94	0.00	0.00
125	5553.95	0.56	2000	71.07	39.47	0.00	0.00	72.38	40.20	0.00	0.00	0.00	0.00	0.00	0.00	29.22	16.23	0.00	0.00	29.53	16.40	0.00	0.00
125	5553.95	0.56	2001	0.00	0.00	0.00	0.00	43.61	24.22	0.00	0.00	61.24	34.01	0.00	0.00	0.85	0.47	0.00	0.00	21.75	12.08	0.00	0.00
125	5553.95	0.56	2002	0.00	0.00	0.00	0.00	20.91	11.62	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.30	0.00	0.00	15.91	8.83	0.00	0.00
125	5553.95	0.56	2003	22.98	12.76	0.00	0.00	18.63	10.35	0.00	0.00	43.87	24.36	0.00	0.00	0.55	0.31	0.00	0.00	20.91	11.61	0.00	0.00
125	5553.95	0.56	2004	0.00	0.00	0.00	0.00	75.78	42.09	0.00	0.00	44.74	24.85	0.00	0.00	30.59	16.99	0.00	0.00	20.87	11.59	0.00	0.00
125	5553.95	0.56	2005	0.00	0.00	0.00	0.00	37.59	20.88	0.00	0.00	0.00	0.00	0.00	0.00	15.52	8.62	0.00	0.00	23.85	13.24	0.00	0.00
125	5553.95	0.56	2006	44.48	24.71	0.00	0.00	34.68	19.26	0.00	0.00	22.88	12.71	0.00	0.00	20.65	11.47	0.00	0.00	29.66	16.47	0.00	0.00

125	5553.95	0.56	2007	0.00	0.00	0.00	0.00	68.14	37.85	0.00	0.00	19.52	10.84	0.00	0.00	39.65	22.02	0.00	0.00	40.68	22.59	0.00	0.00
125	5553.95	0.56	2008	0.00	0.00	0.00	0.00	72.44	40.23	0.00	0.00	0.00	0.00	0.00	0.00	25.38	14.10	0.00	0.00	29.74	16.52	0.00	0.00
125	5553.95	0.56	2009	79.00	43.88	0.00	0.00	76.97	42.75	0.00	0.00	43.62	24.23	0.00	0.00	31.89	17.71	0.00	0.00	31.11	17.28	0.00	0.00
132	14876.85	1.49	1996	0.00	0.00	0.00	0.00	66.95	99.60	0.00	0.00	43.91	65.32	0.00	0.00	13.74	20.45	4.14	6.16	47.47	70.62	0.00	0.00
132	14876.85	1.49	1997	52.14	77.56	0.00	0.00	37.99	56.52	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.82	0.11	0.16	27.36	40.71	0.00	0.00
132	14876.85	1.49	1998	0.00	0.00	0.00	0.00	71.39	106.20	0.00	0.00	50.22	74.71	0.00	0.00	25.79	38.36	5.20	7.73	34.66	51.56	0.00	0.00
132	14876.85	1.49	1999	0.00	0.00	0.00	0.00	72.32	107.58	0.00	0.00	0.00	0.00	0.00	0.00	17.00	25.28	1.30	1.94	45.35	67.46	0.00	0.00
132	14876.85	1.49	2000	79.19	117.80	0.00	0.00	56.03	83.35	0.00	0.00	31.82	47.33	0.00	0.00	7.80	11.60	2.65	3.94	35.71	53.12	0.00	0.00
132	14876.85	1.49	2001	0.00	0.00	0.00	0.00	65.09	96.83	0.00	0.00	0.00	0.00	0.00	0.00	3.95	5.87	1.44	2.13	41.41	61.61	0.00	0.00
132	14876.85	1.49	2002	0.00	0.00	0.00	0.00	24.86	36.99	0.00	0.00	32.86	48.89	0.00	0.00	0.41	0.61	0.08	0.12	22.98	34.19	0.00	0.00
132	14876.85	1.49	2003	69.57	103.50	0.00	0.00	56.39	83.88	0.00	0.00	59.05	87.85	0.00	0.00	17.24	25.65	3.94	5.86	47.58	70.78	0.00	0.00
132	14876.85	1.49	2004	0.00	0.00	0.00	0.00	61.96	92.17	0.00	0.00	58.39	86.86	0.00	0.00	30.05	44.70	5.98	8.89	49.14	73.10	0.00	0.00
132	14876.85	1.49	2005	0.00	0.00	0.00	0.00	66.60	99.08	0.00	0.00	0.00	0.00	0.00	0.00	18.70	27.81	5.84	8.69	55.24	82.18	0.00	0.00
132	14876.85	1.49	2006	37.98	56.51	0.00	0.00	60.97	90.70	0.00	0.00	0.00	0.00	0.00	0.00	10.25	15.25	2.27	3.37	24.26	36.10	0.00	0.00
132	14876.85	1.49	2007	0.00	0.00	0.00	0.00	53.53	79.64	0.00	0.00	56.46	84.00	0.00	0.00	13.31	19.81	0.99	1.48	25.66	38.18	0.00	0.00
132	14876.85	1.49	2008	0.00	0.00	0.00	0.00	79.29	117.95	0.00	0.00	32.52	48.38	0.00	0.00	27.67	41.17	6.90	10.26	53.32	79.32	0.00	0.00
132	14876.85	1.49	2009	82.93	123.37	0.00	0.00	70.20	104.44	0.00	0.00	58.87	87.57	0.00	0.00	21.62	32.16	4.87	7.24	42.87	63.78	0.00	0.00
136	5231.79	0.52	1996	0.00	0.00	0.00	0.00	27.64	14.46	0.00	0.00	8.98	4.70	0.00	0.00	4.50	2.36	0.00	0.00	0.00	0.00	0.00	0.00
136	5231.79	0.52	1997	25.25	13.21	0.00	0.00	22.46	11.75	0.00	0.00	42.03	21.99	0.00	0.00	4.25	2.22	0.00	0.00	0.00	0.00	0.00	0.00
136	5231.79	0.52	1998	0.00	0.00	0.00	0.00	27.79	14.54	0.00	0.00	47.80	25.01	0.00	0.00	5.79	3.03	0.00	0.00	0.00	0.00	0.00	0.00
136	5231.79	0.52	1999	0.00	0.00	0.00	0.00	27.30	14.28	0.00	0.00	0.00	0.00	0.00	0.00	8.34	4.36	0.00	0.00	0.00	0.00	0.00	0.00
136	5231.79	0.52	2000	26.69	13.96	0.00	0.00	25.77	13.48	0.00	0.00	0.00	0.00	0.00	0.00	8.20	4.29	0.00	0.00	0.00	0.00	0.00	0.00
136	5231.79	0.52	2001	0.00	0.00	0.00	0.00	12.96	6.78	0.00	0.00	46.00	24.06	0.00	0.00	0.19	0.10	0.00	0.00	0.00	0.00	0.00	0.00
136	5231.79	0.52	2002	0.00	0.00	0.00	0.00	7.28	3.81	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.07	0.00	0.00	0.00	0.00	0.00	0.00
136	5231.79	0.52	2003	8.72	4.56	0.00	0.00	6.28	3.29	0.00	0.00	40.63	21.26	0.00	0.00	0.13	0.07	0.00	0.00	0.00	0.00	0.00	0.00
136	5231.79	0.52	2004	0.00	0.00	0.00	0.00	25.09	13.13	0.00	0.00	31.67	16.57	0.00	0.00	6.92	3.62	0.00	0.00	0.00	0.00	0.00	0.00
136	5231.79	0.52	2005	0.00	0.00	0.00	0.00	13.00	6.80	0.00	0.00	0.00	0.00	0.00	0.00	3.79	1.98	0.00	0.00	0.00	0.00	0.00	0.00
136	5231.79	0.52	2006	16.88	8.83	0.00	0.00	11.85	6.20	0.00	0.00	20.94	10.95	0.00	0.00	4.78	2.50	0.00	0.00	0.00	0.00	0.00	0.00
136	5231.79	0.52	2007	0.00	0.00	0.00	0.00	22.99	12.03	0.00	0.00	6.94	3.63	0.00	0.00	10.38	5.43	0.00	0.00	0.00	0.00	0.00	0.00
136	5231.79	0.52	2008	0.00	0.00	0.00	0.00	25.65	13.42	0.00	0.00	0.00	0.00	0.00	0.00	8.31	4.35	0.00	0.00	0.00	0.00	0.00	0.00

136	5231.79	0.52	2009	29.21	15.28	0.00	0.00	27.90	14.60	0.00	0.00	40.19	21.03	0.00	0.00	9.30	4.87	0.00	0.00	0.00	0.00	0.00	0.00
138	16199.67	1.62	1996	0.00	0.00	0.00	0.00	50.41	81.67	0.00	0.00	57.29	92.81	0.00	0.00	17.38	28.15	0.00	0.00	72.97	118.21	0.00	0.00
138	16199.67	1.62	1997	52.14	84.46	0.00	0.00	25.37	41.09	0.00	0.00	0.00	0.00	0.00	0.00	0.70	1.13	0.00	0.00	45.24	73.28	0.00	0.00
138	16199.67	1.62	1998	0.00	0.00	0.00	0.00	58.99	95.56	0.00	0.00	58.88	95.39	0.00	0.00	32.89	53.28	0.00	0.00	55.90	90.56	0.00	0.00
138	16199.67	1.62	1999	0.00	0.00	0.00	0.00	56.36	91.30	0.00	0.00	0.00	0.00	0.00	0.00	23.66	38.32	0.00	0.00	73.41	118.93	0.00	0.00
138	16199.67	1.62	2000	79.19	128.28	0.00	0.00	43.91	71.14	0.00	0.00	40.72	65.96	0.00	0.00	9.89	16.02	0.00	0.00	57.72	93.50	0.00	0.00
138	16199.67	1.62	2001	0.00	0.00	0.00	0.00	51.01	82.64	0.00	0.00	0.00	0.00	0.00	0.00	5.10	8.27	0.00	0.00	64.93	105.18	0.00	0.00
138	16199.67	1.62	2002	0.00	0.00	0.00	0.00	13.29	21.52	0.00	0.00	32.87	53.24	0.00	0.00	0.51	0.83	0.00	0.00	34.94	56.60	0.00	0.00
138	16199.67	1.62	2003	69.58	112.71	0.00	0.00	41.87	67.83	0.00	0.00	74.30	120.36	0.00	0.00	22.11	35.81	0.00	0.00	74.35	120.45	0.00	0.00
138	16199.67	1.62	2004	0.00	0.00	0.00	0.00	55.69	90.21	0.00	0.00	69.54	112.65	0.00	0.00	38.29	62.02	0.00	0.00	77.94	126.26	0.00	0.00
138	16199.67	1.62	2005	0.00	0.00	0.00	0.00	52.31	84.74	0.00	0.00	0.00	0.00	0.00	0.00	27.53	44.60	0.00	0.00	88.78	143.82	0.00	0.00
138	16199.67	1.62	2006	37.99	61.54	0.00	0.00	44.11	71.46	0.00	0.00	0.00	0.00	0.00	0.00	13.01	21.07	0.00	0.00	39.18	63.47	0.00	0.00
138	16199.67	1.62	2007	0.00	0.00	0.00	0.00	40.19	65.10	0.00	0.00	73.41	118.92	0.00	0.00	18.16	29.42	0.00	0.00	40.50	65.61	0.00	0.00
138	16199.67	1.62	2008	0.00	0.00	0.00	0.00	67.69	109.65	0.00	0.00	32.52	52.69	0.00	0.00	37.13	60.15	0.00	0.00	86.36	139.90	0.00	0.00
138	16199.67	1.62	2009	82.92	134.33	0.00	0.00	55.17	89.37	0.00	0.00	76.91	124.59	0.00	0.00	28.77	46.60	0.00	0.00	68.17	110.43	0.00	0.00
141	12921.48	1.29	1996	0.00	0.00	0.00	0.00	48.23	62.32	0.00	0.00	34.94	45.15	0.00	0.00	3.98	5.14	0.00	0.00	66.49	85.91	0.00	0.00
141	12921.48	1.29	1997	61.97	80.08	0.00	0.00	25.86	33.42	0.00	0.00	0.00	0.00	0.00	0.00	2.63	3.40	0.00	0.00	39.02	50.41	0.00	0.00
141	12921.48	1.29	1998	0.00	0.00	0.00	0.00	57.18	73.89	0.00	0.00	0.00	0.00	0.00	0.00	18.57	23.99	0.00	0.00	52.67	68.06	0.00	0.00
141	12921.48	1.29	1999	0.00	0.00	0.00	0.00	55.05	71.14	0.00	0.00	81.61	105.45	0.00	0.00	19.80	25.58	0.00	0.00	64.87	83.83	0.00	0.00
141	12921.48	1.29	2000	88.79	114.73	0.00	0.00	51.59	66.66	0.00	0.00	0.00	0.00	0.00	0.00	10.32	13.34	0.00	0.00	51.53	66.58	0.00	0.00
141	12921.48	1.29	2001	0.00	0.00	0.00	0.00	50.32	65.02	0.00	0.00	44.60	57.63	0.00	0.00	12.63	16.32	0.00	0.00	55.79	72.08	0.00	0.00
141	12921.48	1.29	2002	0.00	0.00	0.00	0.00	13.87	17.92	0.00	0.00	33.64	43.47	0.00	0.00	0.28	0.36	0.00	0.00	31.77	41.05	0.00	0.00
141	12921.48	1.29	2003	68.61	88.65	0.00	0.00	37.28	48.17	0.00	0.00	52.53	67.87	0.00	0.00	11.98	15.48	0.00	0.00	63.33	81.84	0.00	0.00
141	12921.48	1.29	2004	0.00	0.00	0.00	0.00	51.43	66.46	0.00	0.00	43.60	56.34	0.00	0.00	19.78	25.56	0.00	0.00	63.07	81.50	0.00	0.00
141	12921.48	1.29	2005	0.00	0.00	0.00	0.00	50.94	65.83	0.00	0.00	0.00	0.00	0.00	0.00	17.44	22.54	0.00	0.00	70.78	91.45	0.00	0.00
141	12921.48	1.29	2006	50.40	65.12	0.00	0.00	47.88	61.87	0.00	0.00	0.00	0.00	0.00	0.00	5.62	7.27	0.00	0.00	32.16	41.56	0.00	0.00
141	12921.48	1.29	2007	0.00	0.00	0.00	0.00	41.03	53.01	0.00	0.00	47.52	61.40	0.00	0.00	12.60	16.28	0.00	0.00	34.19	44.18	0.00	0.00
141	12921.48	1.29	2008	0.00	0.00	0.00	0.00	65.41	84.51	0.00	0.00	35.93	46.42	0.00	0.00	20.78	26.85	0.00	0.00	77.03	99.54	0.00	0.00
141	12921.48	1.29	2009	85.01	109.85	0.00	0.00	53.47	69.09	0.00	0.00	47.73	61.68	0.00	0.00	16.27	21.02	0.00	0.00	62.80	81.14	0.00	0.00
142	6357.69	0.64	1996	0.00	0.00	0.00	0.00	48.43	30.79	0.00	0.00	44.08	28.02	0.00	0.00	5.49	3.49	0.00	0.00	50.51	32.11	0.00	0.00

142	6357.69	0.64	1997	25.14	15.99	0.00	0.00	27.44	17.44	0.00	0.00	0.00	0.00	0.00	0.00	2.77	1.76	0.00	0.00	29.75	18.91	0.00	0.00
142	6357.69	0.64	1998	0.00	0.00	0.00	0.00	57.14	36.33	0.00	0.00	0.00	0.00	0.00	0.00	24.92	15.84	0.00	0.00	39.41	25.06	0.00	0.00
142	6357.69	0.64	1999	0.00	0.00	0.00	0.00	55.05	35.00	0.00	0.00	72.43	46.05	0.00	0.00	24.96	15.87	0.00	0.00	49.76	31.63	0.00	0.00
142	6357.69	0.64	2000	38.27	24.33	0.00	0.00	51.28	32.60	0.00	0.00	0.00	0.00	0.00	0.00	13.56	8.62	0.00	0.00	37.06	23.56	0.00	0.00
142	6357.69	0.64	2001	0.00	0.00	0.00	0.00	50.48	32.09	0.00	0.00	56.29	35.79	0.00	0.00	13.49	8.57	0.00	0.00	43.07	27.38	0.00	0.00
142	6357.69	0.64	2002	0.00	0.00	0.00	0.00	14.20	9.02	0.00	0.00	14.84	9.43	0.00	0.00	0.37	0.24	0.00	0.00	22.85	14.53	0.00	0.00
142	6357.69	0.64	2003	26.49	16.84	0.00	0.00	37.22	23.66	0.00	0.00	64.40	40.95	0.00	0.00	14.13	8.99	0.00	0.00	48.15	30.61	0.00	0.00
142	6357.69	0.64	2004	0.00	0.00	0.00	0.00	51.76	32.91	0.00	0.00	39.15	24.89	0.00	0.00	26.53	16.87	0.00	0.00	46.40	29.50	0.00	0.00
142	6357.69	0.64	2005	0.00	0.00	0.00	0.00	51.02	32.44	0.00	0.00	0.00	0.00	0.00	0.00	17.86	11.35	0.00	0.00	55.84	35.50	0.00	0.00
142	6357.69	0.64	2006	19.04	12.11	0.00	0.00	49.09	31.21	0.00	0.00	0.00	0.00	0.00	0.00	7.55	4.80	0.00	0.00	26.76	17.02	0.00	0.00
142	6357.69	0.64	2007	0.00	0.00	0.00	0.00	41.12	26.14	0.00	0.00	59.85	38.05	0.00	0.00	15.95	10.14	0.00	0.00	26.96	17.14	0.00	0.00
142	6357.69	0.64	2008	0.00	0.00	0.00	0.00	65.81	41.84	0.00	0.00	15.93	10.13	0.00	0.00	28.19	17.92	0.00	0.00	57.80	36.75	0.00	0.00
142	6357.69	0.64	2009	36.87	23.44	0.00	0.00	53.97	34.31	0.00	0.00	60.94	38.74	0.00	0.00	21.73	13.81	0.00	0.00	48.22	30.66	0.00	0.00
144	13258.44	1.33	1996	0.00	0.00	0.00	0.00	42.06	55.76	0.00	0.00	23.32	30.92	0.00	0.00	23.02	30.52	0.00	0.00	58.78	77.93	0.00	0.00
144	13258.44	1.33	1997	96.16	127.49	0.00	0.00	36.31	48.15	0.00	0.00	0.00	0.00	0.00	0.00	20.72	27.47	0.00	0.00	48.28	64.01	0.00	0.00
144	13258.44	1.33	1998	0.00	0.00	0.00	0.00	37.34	49.51	0.00	0.00	0.00	0.00	0.00	0.00	23.08	30.60	0.00	0.00	45.80	60.72	0.00	0.00
144	13258.44	1.33	1999	0.00	0.00	0.00	0.00	43.71	57.96	0.00	0.00	72.66	96.34	0.00	0.00	25.15	33.34	0.00	0.00	58.40	77.43	0.00	0.00
144	13258.44	1.33	2000	98.27	130.29	0.00	0.00	39.70	52.63	0.00	0.00	0.00	0.00	0.00	0.00	19.63	26.03	0.00	0.00	53.64	71.12	0.00	0.00
144	13258.44	1.33	2001	0.00	0.00	0.00	0.00	25.71	34.09	0.00	0.00	31.83	42.20	0.00	0.00	16.57	21.97	0.00	0.00	45.42	60.22	0.00	0.00
144	13258.44	1.33	2002	0.00	0.00	0.00	0.00	20.55	27.25	0.00	0.00	31.51	41.77	0.00	0.00	9.33	12.37	0.00	0.00	36.75	48.73	0.00	0.00
144	13258.44	1.33	2003	58.18	77.13	0.00	0.00	24.28	32.19	0.00	0.00	39.35	52.17	0.00	0.00	15.49	20.54	0.00	0.00	40.39	53.55	0.00	0.00
144	13258.44	1.33	2004	0.00	0.00	0.00	0.00	32.49	43.07	0.00	0.00	41.03	54.40	0.00	0.00	15.79	20.94	0.00	0.00	42.53	56.38	0.00	0.00
144	13258.44	1.33	2005	0.00	0.00	0.00	0.00	28.44	37.70	0.00	0.00	0.00	0.00	0.00	0.00	22.53	29.87	0.00	0.00	57.49	76.23	0.00	0.00
144	13258.44	1.33	2006	76.24	101.08	0.00	0.00	37.50	49.72	0.00	0.00	0.00	0.00	0.00	0.00	18.02	23.90	0.00	0.00	37.13	49.22	0.00	0.00
144	13258.44	1.33	2007	0.00	0.00	0.00	0.00	29.39	38.97	0.00	0.00	36.46	48.34	0.00	0.00	11.99	15.90	0.00	0.00	26.07	34.57	0.00	0.00
144	13258.44	1.33	2008	0.00	0.00	0.00	0.00	43.46	57.63	0.00	0.00	34.29	45.46	0.00	0.00	12.84	17.02	0.00	0.00	52.73	69.91	0.00	0.00
144	13258.44	1.33	2009	84.64	112.21	0.00	0.00	35.34	46.86	0.00	0.00	36.31	48.13	0.00	0.00	13.01	17.25	0.00	0.00	47.10	62.45	0.00	0.00
145	10501.11	1.05	1996	0.00	0.00	0.00	0.00	42.95	45.10	0.00	0.00	15.83	16.62	0.00	0.00	8.62	9.05	0.00	0.00	11.47	12.05	0.00	0.00
145	10501.11	1.05	1997	56.63	59.46	0.00	0.00	34.32	36.04	0.00	0.00	34.27	35.99	0.00	0.00	6.61	6.94	0.00	0.00	9.50	9.98	0.00	0.00
145	10501.11	1.05	1998	0.00	0.00	0.00	0.00	43.02	45.17	0.00	0.00	54.53	57.26	0.00	0.00	15.51	16.29	0.00	0.00	6.73	7.07	0.00	0.00

145	10501.11	1.05	1999	0.00	0.00	0.00	0.00	43.12	45.28	0.00	0.00	0.00	0.00	0.00	0.00	16.88	17.72	0.00	0.00	13.49	14.17	0.00	0.00
145	10501.11	1.05	2000	54.74	57.48	0.00	0.00	41.13	43.19	0.00	0.00	0.00	0.00	0.00	0.00	18.63	19.56	0.00	0.00	11.09	11.65	0.00	0.00
145	10501.11	1.05	2001	0.00	0.00	0.00	0.00	20.63	21.67	0.00	0.00	46.13	48.44	0.00	0.00	0.50	0.53	0.00	0.00	8.89	9.33	0.00	0.00
145	10501.11	1.05	2002	0.00	0.00	0.00	0.00	11.54	12.12	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.35	0.00	0.00	5.28	5.54	0.00	0.00
145	10501.11	1.05	2003	21.78	22.87	0.00	0.00	10.16	10.67	0.00	0.00	34.08	35.79	0.00	0.00	0.33	0.35	0.00	0.00	8.24	8.65	0.00	0.00
145	10501.11	1.05	2004	0.00	0.00	0.00	0.00	41.81	43.91	0.00	0.00	36.27	38.09	0.00	0.00	18.51	19.44	0.00	0.00	8.74	9.17	0.00	0.00
145	10501.11	1.05	2005	0.00	0.00	0.00	0.00	20.81	21.86	0.00	0.00	0.00	0.00	0.00	0.00	9.08	9.54	0.00	0.00	9.93	10.43	0.00	0.00
145	10501.11	1.05	2006	45.43	47.70	0.00	0.00	19.00	19.95	0.00	0.00	17.04	17.90	0.00	0.00	12.86	13.50	0.00	0.00	13.67	14.35	0.00	0.00
145	10501.11	1.05	2007	0.00	0.00	0.00	0.00	35.67	37.46	0.00	0.00	11.20	11.76	0.00	0.00	24.14	25.34	0.00	0.00	15.01	15.76	0.00	0.00
145	10501.11	1.05	2008	0.00	0.00	0.00	0.00	39.81	41.81	0.00	0.00	0.00	0.00	0.00	0.00	16.50	17.33	0.00	0.00	9.78	10.27	0.00	0.00
145	10501.11	1.05	2009	63.60	66.79	0.00	0.00	43.16	45.33	0.00	0.00	33.18	34.84	0.00	0.00	20.03	21.03	0.00	0.00	11.18	11.74	0.00	0.00
148	31894.32	3.19	1996	0.00	0.00	19.38	61.82	54.68	174.41	0.00	0.00	29.00	92.48	0.00	0.00	8.02	25.57	0.00	0.00	60.36	192.53	0.00	0.00
148	31894.32	3.19	1997	92.94	296.43	19.70	62.84	55.87	178.19	0.00	0.00	52.74	168.21	0.00	0.00	19.70	62.83	0.00	0.00	70.27	224.11	0.00	0.00
148	31894.32	3.19	1998	0.00	0.00	16.86	53.78	55.06	175.62	0.00	0.00	73.55	234.57	0.00	0.00	15.16	48.35	0.00	0.00	50.01	159.50	0.00	0.00
148	31894.32	3.19	1999	0.00	0.00	20.16	64.29	60.34	192.45	0.00	0.00	0.00	0.00	0.00	0.00	23.60	75.26	0.00	0.00	82.05	261.68	0.00	0.00
148	31894.32	3.19	2000	95.94	306.00	19.60	62.51	52.70	168.08	0.00	0.00	0.00	0.00	0.00	0.00	22.07	70.40	0.00	0.00	74.10	236.35	0.00	0.00
148	31894.32	3.19	2001	0.00	0.00	18.88	60.22	36.69	117.03	0.00	0.00	66.83	213.14	0.00	0.00	9.02	28.76	0.00	0.00	59.61	190.11	0.00	0.00
148	31894.32	3.19	2002	0.00	0.00	18.36	58.57	34.60	110.35	0.00	0.00	0.00	0.00	0.00	0.00	5.27	16.81	0.00	0.00	49.70	158.50	0.00	0.00
148	31894.32	3.19	2003	58.86	187.74	19.91	63.50	36.09	115.10	0.00	0.00	52.54	167.58	0.00	0.00	7.56	24.10	0.00	0.00	59.43	189.55	0.00	0.00
148	31894.32	3.19	2004	0.00	0.00	19.03	60.70	58.85	187.69	0.00	0.00	50.20	160.12	0.00	0.00	20.71	66.04	0.00	0.00	62.96	200.81	0.00	0.00
148	31894.32	3.19	2005	0.00	0.00	16.21	51.70	45.87	146.29	0.00	0.00	0.00	0.00	0.00	0.00	15.45	49.28	0.00	0.00	73.82	235.44	0.00	0.00
148	31894.32	3.19	2006	80.80	257.69	17.26	55.03	47.62	151.88	0.00	0.00	24.94	79.55	0.00	0.00	13.99	44.62	0.00	0.00	68.03	216.98	0.00	0.00
148	31894.32	3.19	2007	0.00	0.00	20.30	64.74	50.27	160.32	0.00	0.00	22.03	70.26	0.00	0.00	15.36	48.99	0.00	0.00	73.48	234.37	0.00	0.00
148	31894.32	3.19	2008	0.00	0.00	19.33	61.65	53.09	169.32	0.00	0.00	0.00	0.00	0.00	0.00	11.30	36.05	0.00	0.00	65.16	207.82	0.00	0.00
148	31894.32	3.19	2009	93.59	298.51	18.80	59.96	50.82	162.08	0.00	0.00	47.29	150.83	0.00	0.00	12.55	40.03	0.00	0.00	64.62	206.09	0.00	0.00

Gove County

SUB	Area (m)	Area (ha)	Year	CORN (t)	CORN*A (t/ha)	IRCN (t)	IRCN*A (t/ha)	GRSG (t)	GRSG*A (t/ha)	IRGS (t)	IRSG*A (t/ha)	WWHT (t)	WWHT*A (t/ha)	IRWW (t)	IRWW *A (t/ha)	SOYB (t)	SOYB*A (t/ha)	IRSB (t)	IRSB*A (t/ha)	ALFA (t)	ALFA*A (t/ha)	IRAL (t)	IRAL*A (t/ha)
19	339.00	0.03	1996	0.00	0.00	32.59	1.10	12.43	0.42	0.00	0.00	12.73	0.43	0.00	0.00	8.86	0.30	10.37	0.35	0.00	0.00	0.00	0.00
19	339.00	0.03	1997	16.31	0.55	30.30	1.03	27.57	0.93	0.00	0.00	21.98	0.75	0.00	0.00	0.44	0.01	3.95	0.13	0.00	0.00	0.00	0.00

19	339.00	0.03	1998	0.00	0.00	30.80	1.04	11.22	0.38	0.00	0.00	0.00	0.00	0.00	0.00	5.51	0.19	6.27	0.21	0.00	0.00	0.00	0.00
19	339.00	0.03	1999	0.00	0.00	34.49	1.17	11.91	0.40	0.00	0.00	45.14	1.53	0.00	0.00	5.48	0.19	8.05	0.27	0.00	0.00	0.00	0.00
19	339.00	0.03	2000	19.46	0.66	31.27	1.06	26.47	0.90	0.00	0.00	0.00	0.00	0.00	0.00	5.85	0.20	6.69	0.23	0.00	0.00	0.00	0.00
19	339.00	0.03	2001	0.00	0.00	29.63	1.00	10.06	0.34	0.00	0.00	28.31	0.96	0.00	0.00	5.36	0.18	7.90	0.27	0.00	0.00	0.00	0.00
19	339.00	0.03	2002	0.00	0.00	27.83	0.94	10.39	0.35	0.00	0.00	11.38	0.39	0.00	0.00	0.07	0.00	0.11	0.00	0.00	0.00	0.00	0.00
19	339.00	0.03	2003	6.57	0.22	30.66	1.04	14.66	0.50	0.00	0.00	26.58	0.90	0.00	0.00	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.00
19	339.00	0.03	2004	0.00	0.00	31.99	1.08	12.09	0.41	0.00	0.00	0.00	0.00	0.00	0.00	5.32	0.18	0.72	0.02	0.00	0.00	0.00	0.00
19	339.00	0.03	2005	0.00	0.00	28.77	0.98	10.33	0.35	0.00	0.00	46.92	1.59	0.00	0.00	1.40	0.05	4.79	0.16	0.00	0.00	0.00	0.00
19	339.00	0.03	2006	11.10	0.38	29.32	0.99	19.64	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.01	0.14	0.00	0.00	0.00	0.00	0.00
19	339.00	0.03	2007	0.00	0.00	34.57	1.17	11.46	0.39	0.00	0.00	33.37	1.13	0.00	0.00	0.21	0.01	0.17	0.01	0.00	0.00	0.00	0.00
19	339.00	0.03	2008	0.00	0.00	31.74	1.08	12.00	0.41	0.00	0.00	14.97	0.51	0.00	0.00	2.18	0.07	3.73	0.13	0.00	0.00	0.00	0.00
19	339.00	0.03	2009	25.40	0.86	32.72	1.11	30.64	1.04	0.00	0.00	21.76	0.74	0.00	0.00	8.65	0.29	8.60	0.29	0.00	0.00	0.00	0.00
21	13518.95	1.35	1996	0.00	0.00	66.13	89.40	6.23	8.42	0.00	0.00	20.58	27.82	0.00	0.00	17.96	24.28	0.00	0.00	14.72	19.89	0.00	0.00
21	13518.95	1.35	1997	35.43	47.90	60.25	81.46	33.83	45.73	0.00	0.00	24.89	33.65	0.00	0.00	1.01	1.37	0.00	0.00	9.99	13.51	0.00	0.00
21	13518.95	1.35	1998	0.00	0.00	60.93	82.37	5.52	7.47	0.00	0.00	37.14	50.21	0.00	0.00	10.79	14.59	0.00	0.00	8.55	11.56	0.00	0.00
21	13518.95	1.35	1999	0.00	0.00	64.98	87.84	5.65	7.63	0.00	0.00	0.00	0.00	0.00	0.00	10.22	13.82	0.00	0.00	11.33	15.31	0.00	0.00
21	13518.95	1.35	2000	43.12	58.29	64.41	87.07	32.36	43.74	0.00	0.00	0.00	0.00	0.00	0.00	9.41	12.72	0.00	0.00	10.74	14.52	0.00	0.00
21	13518.95	1.35	2001	0.00	0.00	60.42	81.68	5.04	6.82	0.00	0.00	32.68	44.18	0.00	0.00	5.40	7.30	0.00	0.00	7.85	10.61	0.00	0.00
21	13518.95	1.35	2002	0.00	0.00	57.54	77.79	5.11	6.91	0.00	0.00	24.13	32.63	0.00	0.00	0.14	0.19	0.00	0.00	4.98	6.73	0.00	0.00
21	13518.95	1.35	2003	11.71	15.83	63.49	85.83	9.89	13.36	0.00	0.00	30.13	40.73	0.00	0.00	0.18	0.24	0.00	0.00	6.57	8.88	0.00	0.00
21	13518.95	1.35	2004	0.00	0.00	65.80	88.95	5.90	7.98	0.00	0.00	0.00	0.00	0.00	0.00	10.73	14.51	0.00	0.00	7.91	10.69	0.00	0.00
21	13518.95	1.35	2005	0.00	0.00	58.72	79.38	5.02	6.79	0.00	0.00	59.79	80.84	0.00	0.00	1.82	2.45	0.00	0.00	8.08	10.92	0.00	0.00
21	13518.95	1.35	2006	17.59	23.78	56.88	76.90	15.95	21.57	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.90	0.00	0.00	7.33	9.90	0.00	0.00
21	13518.95	1.35	2007	0.00	0.00	70.01	94.65	5.72	7.74	0.00	0.00	36.07	48.77	0.00	0.00	0.38	0.51	0.00	0.00	8.72	11.79	0.00	0.00
21	13518.95	1.35	2008	0.00	0.00	63.93	86.42	5.91	7.99	0.00	0.00	22.91	30.97	0.00	0.00	4.16	5.62	0.00	0.00	5.41	7.31	0.00	0.00
21	13518.95	1.35	2009	46.17	62.42	67.06	90.66	36.96	49.96	0.00	0.00	24.83	33.57	0.00	0.00	16.11	21.77	0.00	0.00	13.63	18.42	0.00	0.00
26	12444.00	1.24	1996	0.00	0.00	69.80	86.86	19.65	24.45	0.00	0.00	31.58	39.29	0.00	0.00	30.30	37.71	18.20	22.64	0.00	0.00	0.00	0.00
26	12444.00	1.24	1997	57.80	71.93	65.45	81.44	52.69	65.56	0.00	0.00	22.10	27.50	0.00	0.00	11.55	14.37	7.61	9.47	0.00	0.00	0.00	0.00
26	12444.00	1.24	1998	0.00	0.00	64.28	79.99	17.40	21.65	0.00	0.00	30.23	37.62	0.00	0.00	19.07	23.73	9.65	12.00	0.00	0.00	0.00	0.00
26	12444.00	1.24	1999	0.00	0.00	67.45	83.93	17.45	21.72	0.00	0.00	0.00	0.00	0.00	0.00	20.64	25.69	13.48	16.77	0.00	0.00	0.00	0.00

26	12444.00	1.24	2000	67.23	83.66	68.88	85.71	51.72	64.36	0.00	0.00	0.00	0.00	0.00	0.00	16.69	20.77	12.00	14.93	0.00	0.00	0.00	0.00
26	12444.00	1.24	2001	0.00	0.00	65.34	81.31	15.96	19.86	0.00	0.00	26.80	33.35	0.00	0.00	1.49	1.86	12.35	15.36	0.00	0.00	0.00	0.00
26	12444.00	1.24	2002	0.00	0.00	61.13	76.07	17.00	21.16	0.00	0.00	33.02	41.09	0.00	0.00	0.25	0.31	0.24	0.29	0.00	0.00	0.00	0.00
26	12444.00	1.24	2003	17.18	21.38	67.77	84.33	24.03	29.90	0.00	0.00	18.65	23.21	0.00	0.00	0.33	0.41	0.16	0.20	0.00	0.00	0.00	0.00
26	12444.00	1.24	2004	0.00	0.00	69.89	86.97	19.25	23.95	0.00	0.00	0.00	0.00	0.00	0.00	19.42	24.17	1.54	1.92	0.00	0.00	0.00	0.00
26	12444.00	1.24	2005	0.00	0.00	63.45	78.96	16.27	20.24	0.00	0.00	64.01	79.66	0.00	0.00	8.27	10.29	8.03	9.99	0.00	0.00	0.00	0.00
26	12444.00	1.24	2006	27.68	34.44	60.72	75.56	34.47	42.89	0.00	0.00	0.00	0.00	0.00	0.00	6.63	8.25	1.25	1.55	0.00	0.00	0.00	0.00
26	12444.00	1.24	2007	0.00	0.00	75.72	94.22	18.57	23.11	0.00	0.00	25.50	31.73	0.00	0.00	0.75	0.94	0.29	0.36	0.00	0.00	0.00	0.00
26	12444.00	1.24	2008	0.00	0.00	67.93	84.53	19.18	23.86	0.00	0.00	34.29	42.67	0.00	0.00	7.67	9.54	5.74	7.14	0.00	0.00	0.00	0.00
26	12444.00	1.24	2009	69.91	87.00	71.23	88.64	58.02	72.20	0.00	0.00	18.60	23.14	0.00	0.00	28.24	35.14	15.96	19.87	0.00	0.00	0.00	0.00
27	1267.70	0.13	1996	0.00	0.00	33.07	4.19	12.45	1.58	0.00	0.00	10.59	1.34	0.00	0.00	8.98	1.14	0.00	0.00	0.00	0.00	26.25	3.33
27	1267.70	0.13	1997	16.44	2.08	29.42	3.73	28.11	3.56	0.00	0.00	19.13	2.43	0.00	0.00	0.64	0.08	0.00	0.00	0.00	0.00	17.37	2.20
27	1267.70	0.13	1998	0.00	0.00	30.26	3.84	11.04	1.40	0.00	0.00	24.93	3.16	0.00	0.00	5.88	0.75	0.00	0.00	0.00	0.00	15.60	1.98
27	1267.70	0.13	1999	0.00	0.00	32.41	4.11	11.29	1.43	0.00	0.00	0.00	0.00	0.00	0.00	5.38	0.68	0.00	0.00	0.00	0.00	18.90	2.40
27	1267.70	0.13	2000	23.73	3.01	32.50	4.12	27.30	3.46	0.00	0.00	0.00	0.00	0.00	0.00	5.93	0.75	0.00	0.00	0.00	0.00	19.56	2.48
27	1267.70	0.13	2001	0.00	0.00	29.46	3.74	10.09	1.28	0.00	0.00	25.93	3.29	0.00	0.00	3.63	0.46	0.00	0.00	0.00	0.00	13.48	1.71
27	1267.70	0.13	2002	0.00	0.00	28.46	3.61	10.23	1.30	0.00	0.00	13.56	1.72	0.00	0.00	0.08	0.01	0.00	0.00	0.00	0.00	6.03	0.76
27	1267.70	0.13	2003	6.53	0.83	31.16	3.95	14.68	1.86	0.00	0.00	23.59	2.99	0.00	0.00	0.11	0.01	0.00	0.00	0.00	0.00	8.19	1.04
27	1267.70	0.13	2004	0.00	0.00	32.87	4.17	11.81	1.50	0.00	0.00	0.00	0.00	0.00	0.00	5.42	0.69	0.00	0.00	0.00	0.00	13.00	1.65
27	1267.70	0.13	2005	0.00	0.00	28.83	3.66	10.05	1.27	0.00	0.00	41.02	5.20	0.00	0.00	1.01	0.13	0.00	0.00	0.00	0.00	13.34	1.69
27	1267.70	0.13	2006	9.93	1.26	27.91	3.54	20.46	2.59	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.04	0.00	0.00	0.00	0.00	9.24	1.17
27	1267.70	0.13	2007	0.00	0.00	34.48	4.37	11.45	1.45	0.00	0.00	28.27	3.58	0.00	0.00	0.20	0.03	0.00	0.00	0.00	0.00	14.11	1.79
27	1267.70	0.13	2008	0.00	0.00	31.32	3.97	11.82	1.50	0.00	0.00	13.49	1.71	0.00	0.00	2.19	0.28	0.00	0.00	0.00	0.00	10.09	1.28
27	1267.70	0.13	2009	26.31	3.34	33.76	4.28	30.81	3.91	0.00	0.00	19.54	2.48	0.00	0.00	8.67	1.10	0.00	0.00	0.00	0.00	23.69	3.00
34	13894.55	1.39	1996	0.00	0.00	66.13	91.88	37.38	51.94	0.00	0.00	22.25	30.92	0.00	0.00	17.96	24.96	20.94	29.09	22.06	30.65	26.29	36.53
34	13894.55	1.39	1997	35.45	49.25	60.27	83.74	67.69	94.05	0.00	0.00	25.49	35.41	0.00	0.00	1.01	1.41	7.64	10.62	12.15	16.88	16.11	22.38
34	13894.55	1.39	1998	0.00	0.00	60.94	84.67	33.02	45.89	0.00	0.00	38.18	53.05	0.00	0.00	10.79	15.00	11.40	15.83	10.12	14.06	12.47	17.33
34	13894.55	1.39	1999	0.00	0.00	64.99	90.30	33.81	46.98	0.00	0.00	0.00	0.00	0.00	0.00	10.23	14.21	15.06	20.92	14.38	19.99	17.21	23.92
34	13894.55	1.39	2000	43.13	59.92	64.41	89.50	64.81	90.05	0.00	0.00	0.00	0.00	0.00	0.00	9.41	13.08	12.72	17.67	12.69	17.63	15.85	22.02
34	13894.55	1.39	2001	0.00	0.00	60.43	83.96	29.65	41.20	0.00	0.00	32.77	45.54	0.00	0.00	5.40	7.50	13.64	18.96	8.57	11.90	10.72	14.89

34	13894.55	1.39	2002	0.00	0.00	57.55	79.96	31.40	43.63	0.00	0.00	26.36	36.62	0.00	0.00	0.14	0.19	0.33	0.46	4.97	6.91	5.02	6.97
34	13894.55	1.39	2003	11.72	16.28	63.50	88.23	38.83	53.95	0.00	0.00	29.91	41.56	0.00	0.00	0.18	0.25	0.17	0.24	7.36	10.22	6.27	8.71
34	13894.55	1.39	2004	0.00	0.00	65.81	91.44	36.13	50.21	0.00	0.00	0.00	0.00	0.00	0.00	10.73	14.91	1.44	2.00	12.24	17.01	13.44	18.68
34	13894.55	1.39	2005	0.00	0.00	58.68	81.54	30.39	42.23	0.00	0.00	62.08	86.25	0.00	0.00	1.82	2.52	8.67	12.04	10.73	14.90	12.89	17.91
34	13894.55	1.39	2006	17.59	24.45	56.89	79.04	46.84	65.08	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.92	0.92	1.28	9.06	12.59	8.54	11.86
34	13894.55	1.39	2007	0.00	0.00	70.02	97.29	34.35	47.72	0.00	0.00	36.21	50.32	0.00	0.00	0.38	0.52	0.33	0.45	10.64	14.79	11.37	15.80
34	13894.55	1.39	2008	0.00	0.00	63.94	88.84	35.62	49.49	0.00	0.00	25.14	34.93	0.00	0.00	4.16	5.78	7.00	9.73	7.23	10.04	9.19	12.76
34	13894.55	1.39	2009	46.19	64.18	67.07	93.19	73.92	102.71	0.00	0.00	24.79	34.44	0.00	0.00	16.11	22.38	17.71	24.60	18.11	25.16	20.58	28.59
36	10619.37	1.06	1996	0.00	0.00	33.05	35.10	0.00	0.00	0.00	0.00	22.25	23.63	0.00	0.00	17.96	19.07	20.94	22.23	22.06	23.43	0.00	0.00
36	10619.37	1.06	1997	35.42	37.61	30.86	32.77	33.68	35.76	0.00	0.00	30.04	31.90	0.00	0.00	1.01	1.07	7.64	8.11	12.14	12.90	0.00	0.00
36	10619.37	1.06	1998	0.00	0.00	30.68	32.58	0.00	0.00	0.00	0.00	42.62	45.26	0.00	0.00	10.79	11.46	11.39	12.10	10.12	10.74	0.00	0.00
36	10619.37	1.06	1999	0.00	0.00	32.58	34.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.22	10.85	15.06	15.99	14.38	15.27	0.00	0.00
36	10619.37	1.06	2000	43.11	45.78	31.92	33.89	32.32	34.33	0.00	0.00	0.00	0.00	0.00	0.00	9.41	9.99	12.72	13.51	12.68	13.47	0.00	0.00
36	10619.37	1.06	2001	0.00	0.00	30.97	32.89	0.00	0.00	0.00	0.00	39.34	41.78	0.00	0.00	5.40	5.73	13.64	14.49	8.56	9.09	0.00	0.00
36	10619.37	1.06	2002	0.00	0.00	29.12	30.92	0.00	0.00	0.00	0.00	26.35	27.99	0.00	0.00	0.14	0.15	0.33	0.35	4.97	5.28	0.00	0.00
36	10619.37	1.06	2003	11.71	12.44	32.35	34.36	5.65	6.00	0.00	0.00	36.85	39.13	0.00	0.00	0.18	0.19	0.17	0.18	7.36	7.81	0.00	0.00
36	10619.37	1.06	2004	0.00	0.00	32.71	34.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.73	11.40	1.44	1.53	12.24	13.00	0.00	0.00
36	10619.37	1.06	2005	0.00	0.00	29.77	31.61	0.00	0.00	0.00	0.00	68.89	73.15	0.00	0.00	1.81	1.93	8.66	9.20	10.72	11.39	0.00	0.00
36	10619.37	1.06	2006	17.59	18.68	28.98	30.77	13.76	14.61	0.00	0.00	0.00	0.00	0.00	0.00	0.66	0.71	0.92	0.97	9.06	9.62	0.00	0.00
36	10619.37	1.06	2007	0.00	0.00	35.55	37.75	0.00	0.00	0.00	0.00	43.71	46.42	0.00	0.00	0.38	0.40	0.33	0.35	10.64	11.29	0.00	0.00
36	10619.37	1.06	2008	0.00	0.00	32.64	34.66	0.00	0.00	0.00	0.00	25.16	26.72	0.00	0.00	4.16	4.42	7.00	7.43	7.23	7.67	0.00	0.00
36	10619.37	1.06	2009	46.17	49.03	33.32	35.38	36.95	39.24	0.00	0.00	30.16	32.03	0.00	0.00	16.10	17.10	17.71	18.80	18.10	19.22	0.00	0.00
37	14005.26	1.40	1996	0.00	0.00	93.11	130.40	39.38	55.15	0.00	0.00	40.83	57.18	0.00	0.00	27.27	38.20	21.83	30.58	31.98	44.78	28.11	39.37
37	14005.26	1.40	1997	65.54	91.79	87.18	122.10	88.42	123.84	0.00	0.00	54.78	76.71	0.00	0.00	9.59	13.43	9.10	12.75	20.01	28.02	19.27	26.98
37	14005.26	1.40	1998	0.00	0.00	85.57	119.84	34.69	48.58	0.00	0.00	51.60	72.27	0.00	0.00	17.61	24.66	11.80	16.52	16.06	22.50	13.97	19.56
37	14005.26	1.40	1999	0.00	0.00	89.72	125.66	34.80	48.74	0.00	0.00	0.00	0.00	0.00	0.00	19.09	26.73	16.33	22.87	22.62	31.68	18.35	25.69
37	14005.26	1.40	2000	75.06	105.12	91.89	128.69	85.94	120.37	0.00	0.00	0.00	0.00	0.00	0.00	16.23	22.72	14.55	20.37	21.07	29.50	18.88	26.44
37	14005.26	1.40	2001	0.00	0.00	87.04	121.90	31.35	43.90	0.00	0.00	61.52	86.16	0.00	0.00	1.44	2.01	14.99	20.99	13.56	18.99	12.16	17.03
37	14005.26	1.40	2002	0.00	0.00	82.07	114.95	34.07	47.71	0.00	0.00	42.80	59.94	0.00	0.00	0.23	0.32	0.26	0.37	7.52	10.52	5.84	8.18
37	14005.26	1.40	2003	19.16	26.83	90.20	126.32	44.13	61.81	0.00	0.00	48.58	68.03	0.00	0.00	0.31	0.43	0.20	0.27	11.42	15.99	7.53	10.55

37	14005.26	1.40	2004	0.00	0.00	93.58	131.05	38.39	53.77	0.00	0.00	0.00	0.00	0.00	0.00	17.38	24.34	1.82	2.55	18.42	25.80	14.87	20.82
37	14005.26	1.40	2005	0.00	0.00	84.27	118.02	32.31	45.26	0.00	0.00	104.34	146.14	0.00	0.00	7.54	10.56	9.84	13.78	16.64	23.30	14.59	20.44
37	14005.26	1.40	2006	30.47	42.68	81.60	114.28	57.15	80.04	0.00	0.00	0.00	0.00	0.00	0.00	6.27	8.78	1.50	2.11	13.81	19.34	9.92	13.89
37	14005.26	1.40	2007	0.00	0.00	101.20	141.73	36.92	51.71	0.00	0.00	62.66	87.75	0.00	0.00	0.69	0.96	0.35	0.49	17.32	24.25	14.04	19.66
37	14005.26	1.40	2008	0.00	0.00	91.15	127.66	38.14	53.42	0.00	0.00	43.70	61.21	0.00	0.00	7.02	9.83	6.96	9.75	11.48	16.07	10.42	14.59
37	14005.26	1.40	2009	78.37	109.75	95.07	133.15	97.02	135.87	0.00	0.00	44.65	62.53	0.00	0.00	25.48	35.68	19.36	27.11	27.65	38.73	23.53	32.95
44	2331.54	0.23	1996	0.00	0.00	66.15	15.42	0.00	0.00	0.00	0.00	60.72	14.16	0.00	0.00	36.03	8.40	0.00	0.00	68.11	15.88	0.00	0.00
44	2331.54	0.23	1997	87.92	20.50	60.90	14.20	67.14	15.65	0.00	0.00	53.83	12.55	0.00	0.00	17.86	4.16	0.00	0.00	48.48	11.30	0.00	0.00
44	2331.54	0.23	1998	0.00	0.00	58.65	13.68	0.00	0.00	0.00	0.00	68.50	15.97	0.00	0.00	22.83	5.32	0.00	0.00	38.38	8.95	0.00	0.00
44	2331.54	0.23	1999	0.00	0.00	63.03	14.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.78	5.08	0.00	0.00	50.17	11.70	0.00	0.00
44	2331.54	0.23	2000	94.62	22.06	64.01	14.92	65.64	15.30	0.00	0.00	0.00	0.00	0.00	0.00	18.65	4.35	0.00	0.00	45.24	10.55	0.00	0.00
44	2331.54	0.23	2001	0.00	0.00	60.22	14.04	0.00	0.00	0.00	0.00	68.79	16.04	0.00	0.00	13.31	3.10	0.00	0.00	31.54	7.35	0.00	0.00
44	2331.54	0.23	2002	0.00	0.00	55.55	12.95	0.00	0.00	0.00	0.00	65.69	15.32	0.00	0.00	0.28	0.06	0.00	0.00	16.98	3.96	0.00	0.00
44	2331.54	0.23	2003	24.26	5.66	61.12	14.25	9.39	2.19	0.00	0.00	52.92	12.34	0.00	0.00	0.35	0.08	0.00	0.00	25.75	6.00	0.00	0.00
44	2331.54	0.23	2004	0.00	0.00	64.84	15.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.25	5.65	0.00	0.00	42.81	9.98	0.00	0.00
44	2331.54	0.23	2005	0.00	0.00	57.44	13.39	0.00	0.00	0.00	0.00	125.45	29.25	0.00	0.00	2.80	0.65	0.00	0.00	36.99	8.62	0.00	0.00
44	2331.54	0.23	2006	34.99	8.16	55.19	12.87	20.73	4.83	0.00	0.00	0.00	0.00	0.00	0.00	1.91	0.45	0.00	0.00	30.95	7.22	0.00	0.00
44	2331.54	0.23	2007	0.00	0.00	69.06	16.10	0.00	0.00	0.00	0.00	65.31	15.23	0.00	0.00	0.90	0.21	0.00	0.00	38.92	9.08	0.00	0.00
44	2331.54	0.23	2008	0.00	0.00	61.81	14.41	0.00	0.00	0.00	0.00	57.22	13.34	0.00	0.00	10.84	2.53	0.00	0.00	26.87	6.26	0.00	0.00
44	2331.54	0.23	2009	110.31	25.72	66.18	15.43	74.11	17.28	0.00	0.00	45.80	10.68	0.00	0.00	35.01	8.16	0.00	0.00	62.77	14.64	0.00	0.00
46	11056.42	1.11	1996	10.55	11.66	63.56	70.27	11.75	12.99	0.00	0.00	28.09	31.06	0.00	0.00	16.76	18.53	3.55	3.92	43.86	48.49	0.00	0.00
46	11056.42	1.11	1997	49.14	54.33	60.57	66.97	49.88	55.15	0.00	0.00	22.79	25.19	0.00	0.00	3.81	4.22	0.97	1.07	26.80	29.64	0.00	0.00
46	11056.42	1.11	1998	9.61	10.63	57.61	63.70	10.80	11.94	0.00	0.00	43.71	48.33	0.00	0.00	8.25	9.12	0.53	0.59	22.39	24.76	0.00	0.00
46	11056.42	1.11	1999	10.58	11.70	62.56	69.17	11.34	12.54	0.00	0.00	0.00	0.00	0.00	0.00	5.81	6.42	2.17	2.40	29.84	32.99	0.00	0.00
46	11056.42	1.11	2000	50.58	55.93	60.19	66.55	47.15	52.13	0.00	0.00	0.00	0.00	0.00	0.00	11.03	12.19	1.89	2.09	27.08	29.94	0.00	0.00
46	11056.42	1.11	2001	10.03	11.09	59.16	65.41	9.69	10.71	0.00	0.00	52.67	58.23	0.00	0.00	0.28	0.31	2.06	2.28	22.63	25.03	0.00	0.00
46	11056.42	1.11	2002	10.07	11.14	59.02	65.26	10.39	11.48	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.18	0.02	0.03	13.88	15.34	0.00	0.00
46	11056.42	1.11	2003	25.05	27.70	62.32	68.90	16.64	18.39	0.00	0.00	25.33	28.00	0.00	0.00	0.26	0.29	0.03	0.03	18.74	20.72	0.00	0.00
46	11056.42	1.11	2004	10.71	11.84	63.14	69.81	11.96	13.22	0.00	0.00	0.00	0.00	0.00	0.00	9.47	10.47	1.55	1.71	23.58	26.07	0.00	0.00
46	11056.42	1.11	2005	10.12	11.19	59.94	66.28	10.63	11.75	0.00	0.00	64.47	71.28	0.00	0.00	2.55	2.82	0.63	0.70	24.56	27.16	0.00	0.00

46	11056.42	1.11	2006	32.74	36.20	57.77	63.88	26.06	28.81	0.00	0.00	0.00	0.00	0.00	0.00	4.96	5.48	0.19	0.21	17.86	19.74	0.00	0.00
46	11056.42	1.11	2007	11.46	12.67	68.55	75.79	11.14	12.32	0.00	0.00	30.26	33.45	0.00	0.00	0.36	0.40	0.05	0.05	24.00	26.54	0.00	0.00
46	11056.42	1.11	2008	10.70	11.83	63.16	69.83	11.00	12.16	0.00	0.00	23.55	26.03	0.00	0.00	4.36	4.83	0.38	0.42	15.79	17.46	0.00	0.00
46	11056.42	1.11	2009	54.74	60.52	61.15	67.61	50.44	55.77	0.00	0.00	27.53	30.44	0.00	0.00	11.33	12.52	2.85	3.15	33.29	36.81	0.00	0.00
49	14075.19	1.41	1996	0.00	0.00	55.11	77.56	12.46	17.54	0.00	0.00	26.95	37.93	0.00	0.00	12.01	16.91	3.48	4.90	22.69	31.93	17.65	24.84
49	14075.19	1.41	1997	42.81	60.26	51.68	72.74	44.53	62.68	0.00	0.00	33.90	47.72	0.00	0.00	3.47	4.89	1.62	2.28	15.56	21.89	12.78	17.99
49	14075.19	1.41	1998	0.00	0.00	50.95	71.71	10.95	15.41	0.00	0.00	40.30	56.72	0.00	0.00	7.86	11.06	2.23	3.13	12.90	18.16	9.79	13.78
49	14075.19	1.41	1999	0.00	0.00	53.54	75.36	11.06	15.56	0.00	0.00	0.00	0.00	0.00	0.00	7.97	11.22	2.81	3.96	16.77	23.60	12.28	17.29
49	14075.19	1.41	2000	50.28	70.77	54.96	77.36	43.65	61.44	0.00	0.00	0.00	0.00	0.00	0.00	7.16	10.07	2.50	3.51	15.11	21.27	12.15	17.11
49	14075.19	1.41	2001	0.00	0.00	52.01	73.21	9.91	13.95	0.00	0.00	48.36	68.07	0.00	0.00	4.91	6.91	2.80	3.94	10.70	15.06	8.55	12.04
49	14075.19	1.41	2002	0.00	0.00	48.24	67.89	10.77	15.16	0.00	0.00	29.91	42.10	0.00	0.00	0.09	0.13	0.03	0.05	5.76	8.11	3.84	5.41
49	14075.19	1.41	2003	13.24	18.64	54.27	76.38	17.56	24.71	0.00	0.00	35.97	50.63	0.00	0.00	0.13	0.18	0.04	0.05	8.41	11.84	4.99	7.02
49	14075.19	1.41	2004	0.00	0.00	56.09	78.95	12.10	17.04	0.00	0.00	0.00	0.00	0.00	0.00	7.90	11.11	0.32	0.44	13.84	19.48	9.80	13.80
49	14075.19	1.41	2005	0.00	0.00	49.30	69.40	10.09	14.19	0.00	0.00	75.15	105.77	0.00	0.00	1.27	1.79	1.80	2.53	12.23	17.21	9.38	13.20
49	14075.19	1.41	2006	24.04	33.84	48.62	68.43	28.35	39.90	0.00	0.00	0.00	0.00	0.00	0.00	1.11	1.57	0.24	0.34	10.20	14.35	6.54	9.21
49	14075.19	1.41	2007	0.00	0.00	59.39	83.59	11.73	16.51	0.00	0.00	44.90	63.19	0.00	0.00	0.36	0.51	0.07	0.09	12.59	17.72	9.02	12.70
49	14075.19	1.41	2008	0.00	0.00	53.66	75.52	12.22	17.20	0.00	0.00	28.40	39.97	0.00	0.00	3.60	5.07	1.45	2.04	8.61	12.12	6.93	9.76
49	14075.19	1.41	2009	53.17	74.83	56.59	79.65	49.13	69.15	0.00	0.00	33.36	46.95	0.00	0.00	11.55	16.26	3.36	4.73	20.76	29.22	15.25	21.47
50	13452.30	1.35	1996	0.00	0.00	22.04	29.64	0.00	0.00	0.00	0.00	15.01	20.19	0.00	0.00	8.98	12.08	10.46	14.08	22.06	29.68	26.29	35.36
50	13452.30	1.35	1997	18.95	25.49	20.56	27.65	28.12	37.83	0.00	0.00	25.48	34.28	0.00	0.00	0.38	0.50	4.02	5.41	12.13	16.31	16.08	21.63
50	13452.30	1.35	1998	0.00	0.00	20.44	27.49	0.00	0.00	0.00	0.00	31.46	42.32	0.00	0.00	4.91	6.61	5.29	7.12	10.11	13.60	12.46	16.77
50	13452.30	1.35	1999	0.00	0.00	21.70	29.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.84	6.51	7.23	9.72	14.37	19.33	17.21	23.15
50	13452.30	1.35	2000	19.40	26.10	21.27	28.61	26.87	36.14	0.00	0.00	0.00	0.00	0.00	0.00	3.48	4.68	5.93	7.98	12.68	17.05	15.84	21.31
50	13452.30	1.35	2001	0.00	0.00	20.63	27.75	0.00	0.00	0.00	0.00	32.75	44.06	0.00	0.00	1.77	2.38	6.27	8.43	8.56	11.51	10.71	14.41
50	13452.30	1.35	2002	0.00	0.00	19.39	26.08	0.00	0.00	0.00	0.00	17.30	23.27	0.00	0.00	0.06	0.08	0.23	0.31	4.96	6.68	5.02	6.75
50	13452.30	1.35	2003	5.18	6.97	21.50	28.92	4.41	5.93	0.00	0.00	29.92	40.25	0.00	0.00	0.07	0.10	0.08	0.10	7.36	9.89	6.27	8.43
50	13452.30	1.35	2004	0.00	0.00	21.83	29.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.32	7.15	0.71	0.95	12.24	16.46	13.44	18.08
50	13452.30	1.35	2005	0.00	0.00	19.83	26.68	0.00	0.00	0.00	0.00	50.21	67.54	0.00	0.00	0.81	1.09	3.87	5.20	10.72	14.41	12.88	17.32
50	13452.30	1.35	2006	7.67	10.32	19.30	25.96	10.54	14.18	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.43	0.44	0.59	9.06	12.18	8.54	11.48
50	13452.30	1.35	2007	0.00	0.00	23.68	31.85	0.00	0.00	0.00	0.00	36.20	48.70	0.00	0.00	0.17	0.23	0.16	0.21	10.63	14.29	11.37	15.29

50	13452.30	1.35	2008	0.00	0.00	21.74	29.25	0.00	0.00	0.00	0.00	16.21	21.81	0.00	0.00	1.97	2.65	3.29	4.42	7.23	9.72	9.19	12.36
50	13452.30	1.35	2009	19.80	26.63	22.24	29.92	30.79	41.42	0.00	0.00	24.77	33.32	0.00	0.00	7.43	10.00	8.31	11.18	18.09	24.33	20.55	27.64
55	4871.79	0.49	1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37.06	18.05	0.00	0.00	11.19	5.45	0.00	0.00	0.00	0.00	0.00	0.00
55	4871.79	0.49	1997	50.76	24.73	0.00	0.00	49.81	24.27	0.00	0.00	27.43	13.36	0.00	0.00	2.65	1.29	0.00	0.00	0.00	0.00	0.00	0.00
55	4871.79	0.49	1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	54.14	26.37	0.00	0.00	5.46	2.66	0.00	0.00	0.00	0.00	0.00	0.00
55	4871.79	0.49	1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.85	1.88	0.00	0.00	0.00	0.00	0.00	0.00
55	4871.79	0.49	2000	50.52	24.61	0.00	0.00	47.14	22.97	0.00	0.00	0.00	0.00	0.00	0.00	7.32	3.57	0.00	0.00	0.00	0.00	0.00	0.00
55	4871.79	0.49	2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	66.04	32.17	0.00	0.00	0.19	0.09	0.00	0.00	0.00	0.00	0.00	0.00
55	4871.79	0.49	2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.05	0.00	0.00	0.00	0.00	0.00	0.00
55	4871.79	0.49	2003	18.48	9.00	0.00	0.00	7.11	3.46	0.00	0.00	30.29	14.76	0.00	0.00	0.17	0.08	0.00	0.00	0.00	0.00	0.00	0.00
55	4871.79	0.49	2004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.55	3.19	0.00	0.00	0.00	0.00	0.00	0.00
55	4871.79	0.49	2005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	79.35	38.66	0.00	0.00	1.72	0.84	0.00	0.00	0.00	0.00	0.00	0.00
55	4871.79	0.49	2006	28.93	14.09	0.00	0.00	18.10	8.82	0.00	0.00	0.00	0.00	0.00	0.00	3.26	1.59	0.00	0.00	0.00	0.00	0.00	0.00
55	4871.79	0.49	2007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.69	17.39	0.00	0.00	0.25	0.12	0.00	0.00	0.00	0.00	0.00	0.00
55	4871.79	0.49	2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.04	14.63	0.00	0.00	3.08	1.50	0.00	0.00	0.00	0.00	0.00	0.00
55	4871.79	0.49	2009	56.30	27.43	0.00	0.00	50.42	24.56	0.00	0.00	32.59	15.88	0.00	0.00	9.14	4.45	0.00	0.00	0.00	0.00	0.00	0.00
56	11611.62	1.16	1996	0.00	0.00	33.07	38.40	0.00	0.00	0.00	0.00	28.05	32.58	0.00	0.00	18.02	20.92	0.00	0.00	22.69	26.34	0.00	0.00
56	11611.62	1.16	1997	38.36	44.55	31.02	36.02	38.68	44.91	0.00	0.00	23.65	27.46	0.00	0.00	7.80	9.06	0.00	0.00	15.53	18.04	0.00	0.00
56	11611.62	1.16	1998	0.00	0.00	30.46	35.37	0.00	0.00	0.00	0.00	30.92	35.91	0.00	0.00	12.25	14.23	0.00	0.00	12.90	14.98	0.00	0.00
56	11611.62	1.16	1999	0.00	0.00	32.27	37.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.91	14.99	0.00	0.00	16.76	19.46	0.00	0.00
56	11611.62	1.16	2000	38.56	44.78	32.87	38.16	38.21	44.36	0.00	0.00	0.00	0.00	0.00	0.00	12.14	14.10	0.00	0.00	15.10	17.54	0.00	0.00
56	11611.62	1.16	2001	0.00	0.00	31.55	36.64	0.00	0.00	0.00	0.00	31.08	36.08	0.00	0.00	8.31	9.65	0.00	0.00	10.70	12.42	0.00	0.00
56	11611.62	1.16	2002	0.00	0.00	29.13	33.82	0.00	0.00	0.00	0.00	30.99	35.98	0.00	0.00	0.15	0.17	0.00	0.00	5.76	6.69	0.00	0.00
56	11611.62	1.16	2003	9.91	11.51	32.75	38.03	7.20	8.36	0.00	0.00	21.26	24.69	0.00	0.00	0.20	0.24	0.00	0.00	8.41	9.77	0.00	0.00
56	11611.62	1.16	2004	0.00	0.00	33.81	39.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.91	13.83	0.00	0.00	13.84	16.06	0.00	0.00
56	11611.62	1.16	2005	0.00	0.00	29.55	34.31	0.00	0.00	0.00	0.00	60.61	70.38	0.00	0.00	2.41	2.80	0.00	0.00	12.22	14.19	0.00	0.00
56	11611.62	1.16	2006	14.59	16.94	29.51	34.26	18.64	21.65	0.00	0.00	0.00	0.00	0.00	0.00	2.25	2.61	0.00	0.00	10.20	11.84	0.00	0.00
56	11611.62	1.16	2007	0.00	0.00	36.40	42.27	0.00	0.00	0.00	0.00	28.57	33.18	0.00	0.00	0.68	0.78	0.00	0.00	12.58	14.61	0.00	0.00
56	11611.62	1.16	2008	0.00	0.00	32.95	38.26	0.00	0.00	0.00	0.00	28.19	32.74	0.00	0.00	5.56	6.46	0.00	0.00	8.61	10.00	0.00	0.00
56	11611.62	1.16	2009	44.72	51.92	33.66	39.08	42.94	49.86	0.00	0.00	20.53	23.84	0.00	0.00	17.69	20.54	0.00	0.00	20.75	24.10	0.00	0.00

60	12556.98	1.26	1996	0.00	0.00	33.07	41.52	0.00	0.00	19.56	24.57	21.63	27.16	0.00	0.00	12.01	15.08	6.97	8.75	22.69	28.49	0.00	0.00
60	12556.98	1.26	1997	30.59	38.41	31.01	38.94	27.97	35.13	16.05	20.16	39.97	50.19	0.00	0.00	2.60	3.27	3.35	4.21	15.53	19.50	0.00	0.00
60	12556.98	1.26	1998	0.00	0.00	30.45	38.23	0.00	0.00	16.55	20.78	36.22	45.48	0.00	0.00	7.54	9.46	3.95	4.96	12.90	16.19	0.00	0.00
60	12556.98	1.26	1999	0.00	0.00	32.27	40.52	0.00	0.00	20.29	25.48	0.00	0.00	0.00	0.00	7.31	9.17	5.16	6.48	16.76	21.04	0.00	0.00
60	12556.98	1.26	2000	30.97	38.89	32.86	41.26	27.34	34.33	16.96	21.29	0.00	0.00	0.00	0.00	6.20	7.78	4.49	5.64	15.10	18.96	0.00	0.00
60	12556.98	1.26	2001	0.00	0.00	31.55	39.61	0.00	0.00	23.07	28.97	47.41	59.53	0.00	0.00	4.23	5.31	4.95	6.22	10.69	13.43	0.00	0.00
60	12556.98	1.26	2002	0.00	0.00	29.27	36.75	0.00	0.00	3.12	3.91	24.27	30.48	0.00	0.00	0.09	0.11	0.12	0.16	5.76	7.23	0.00	0.00
60	12556.98	1.26	2003	7.91	9.94	32.70	41.06	3.80	4.77	4.65	5.83	38.24	48.02	0.00	0.00	0.12	0.14	0.06	0.08	8.41	10.56	0.00	0.00
60	12556.98	1.26	2004	0.00	0.00	33.80	42.44	0.00	0.00	12.97	16.29	0.00	0.00	0.00	0.00	7.85	9.86	0.68	0.85	13.84	17.37	0.00	0.00
60	12556.98	1.26	2005	0.00	0.00	29.55	37.10	0.00	0.00	14.56	18.28	64.07	80.45	0.00	0.00	0.93	1.16	2.97	3.73	12.22	15.35	0.00	0.00
60	12556.98	1.26	2006	11.77	14.77	29.50	37.04	8.36	10.50	6.29	7.89	0.00	0.00	0.00	0.00	0.73	0.92	0.45	0.56	10.19	12.80	0.00	0.00
60	12556.98	1.26	2007	0.00	0.00	36.39	45.70	0.00	0.00	11.86	14.89	47.20	59.27	0.00	0.00	0.27	0.34	0.12	0.15	12.58	15.79	0.00	0.00
60	12556.98	1.26	2008	0.00	0.00	32.94	41.36	0.00	0.00	11.05	13.88	21.08	26.47	0.00	0.00	3.48	4.37	2.59	3.25	8.61	10.81	0.00	0.00
60	12556.98	1.26	2009	35.90	45.08	33.65	42.26	30.88	38.78	19.47	24.44	33.16	41.64	0.00	0.00	11.27	14.15	6.08	7.63	20.75	26.05	0.00	0.00
65	13891.14	1.39	1996	0.00	0.00	0.00	0.00	49.26	68.43	0.00	0.00	22.72	31.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	13891.14	1.39	1997	62.01	86.14	0.00	0.00	44.34	61.59	0.00	0.00	31.73	44.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	13891.14	1.39	1998	0.00	0.00	0.00	0.00	36.56	50.79	0.00	0.00	45.51	63.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	13891.14	1.39	1999	0.00	0.00	0.00	0.00	43.43	60.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	13891.14	1.39	2000	59.87	83.17	0.00	0.00	42.41	58.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	13891.14	1.39	2001	0.00	0.00	0.00	0.00	34.23	47.55	0.00	0.00	60.03	83.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	13891.14	1.39	2002	0.00	0.00	0.00	0.00	9.80	13.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	13891.14	1.39	2003	22.26	30.92	0.00	0.00	7.22	10.03	0.00	0.00	32.96	45.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	13891.14	1.39	2004	0.00	0.00	0.00	0.00	35.71	49.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	13891.14	1.39	2005	0.00	0.00	0.00	0.00	24.02	33.37	0.00	0.00	61.47	85.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	13891.14	1.39	2006	34.72	48.23	0.00	0.00	12.16	16.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	13891.14	1.39	2007	0.00	0.00	0.00	0.00	15.93	22.13	0.00	0.00	39.46	54.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	13891.14	1.39	2008	0.00	0.00	0.00	0.00	21.03	29.21	0.00	0.00	17.85	24.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
65	13891.14	1.39	2009	66.37	92.19	0.00	0.00	50.41	70.02	0.00	0.00	36.86	51.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3909.70	0.39	1996	0.00	0.00	0.00	0.00	16.82	6.57	0.00	0.00	14.73	5.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3909.70	0.39	1997	39.24	15.34	0.00	0.00	15.85	6.20	0.00	0.00	31.72	12.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

69	3909.70	0.39	1998	0.00	0.00	0.00	0.00	10.88	4.25	0.00	0.00	37.95	14.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3909.70	0.39	1999	0.00	0.00	0.00	0.00	14.16	5.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3909.70	0.39	2000	41.01	16.03	0.00	0.00	13.82	5.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3909.70	0.39	2001	0.00	0.00	0.00	0.00	10.29	4.02	0.00	0.00	53.81	21.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3909.70	0.39	2002	0.00	0.00	0.00	0.00	3.07	1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3909.70	0.39	2003	14.69	5.74	0.00	0.00	1.85	0.72	0.00	0.00	32.95	12.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3909.70	0.39	2004	0.00	0.00	0.00	0.00	11.87	4.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3909.70	0.39	2005	0.00	0.00	0.00	0.00	6.83	2.67	0.00	0.00	51.03	19.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3909.70	0.39	2006	23.05	9.01	0.00	0.00	3.83	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3909.70	0.39	2007	0.00	0.00	0.00	0.00	4.96	1.94	0.00	0.00	39.46	15.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3909.70	0.39	2008	0.00	0.00	0.00	0.00	7.13	2.79	0.00	0.00	11.86	4.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	3909.70	0.39	2009	45.93	17.96	0.00	0.00	16.80	6.57	0.00	0.00	36.85	14.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
74	17212.05	1.72	1996	0.00	0.00	0.00	0.00	71.16	122.48	0.00	0.00	11.55	19.88	0.00	0.00	11.98	20.61	0.00	0.00	0.00	0.00	0.00	0.00
74	17212.05	1.72	1997	35.27	60.71	0.00	0.00	63.95	110.07	0.00	0.00	38.35	66.00	0.00	0.00	0.54	0.93	0.00	0.00	0.00	0.00	0.00	0.00
74	17212.05	1.72	1998	0.00	0.00	0.00	0.00	60.79	104.64	0.00	0.00	39.56	68.10	0.00	0.00	6.86	11.80	0.00	0.00	0.00	0.00	0.00	0.00
74	17212.05	1.72	1999	0.00	0.00	0.00	0.00	64.43	110.90	0.00	0.00	0.00	0.00	0.00	0.00	6.63	11.41	0.00	0.00	0.00	0.00	0.00	0.00
74	17212.05	1.72	2000	43.01	74.02	0.00	0.00	61.13	105.22	0.00	0.00	0.00	0.00	0.00	0.00	5.47	9.41	0.00	0.00	0.00	0.00	0.00	0.00
74	17212.05	1.72	2001	0.00	0.00	0.00	0.00	55.62	95.74	0.00	0.00	49.23	84.73	0.00	0.00	2.97	5.12	0.00	0.00	0.00	0.00	0.00	0.00
74	17212.05	1.72	2002	0.00	0.00	0.00	0.00	37.73	64.94	0.00	0.00	13.75	23.67	0.00	0.00	0.09	0.15	0.00	0.00	0.00	0.00	0.00	0.00
74	17212.05	1.72	2003	11.71	20.15	0.00	0.00	39.13	67.36	0.00	0.00	44.83	77.17	0.00	0.00	0.11	0.18	0.00	0.00	0.00	0.00	0.00	0.00
74	17212.05	1.72	2004	0.00	0.00	0.00	0.00	58.12	100.03	0.00	0.00	0.00	0.00	0.00	0.00	7.12	12.26	0.00	0.00	0.00	0.00	0.00	0.00
74	17212.05	1.72	2005	0.00	0.00	0.00	0.00	47.16	81.17	0.00	0.00	59.69	102.73	0.00	0.00	1.14	1.96	0.00	0.00	0.00	0.00	0.00	0.00
74	17212.05	1.72	2006	17.56	30.23	0.00	0.00	41.53	71.48	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.38	0.00	0.00	0.00	0.00	0.00	0.00
74	17212.05	1.72	2007	0.00	0.00	0.00	0.00	46.81	80.56	0.00	0.00	54.89	94.48	0.00	0.00	0.24	0.41	0.00	0.00	0.00	0.00	0.00	0.00
74	17212.05	1.72	2008	0.00	0.00	0.00	0.00	49.50	85.20	0.00	0.00	12.63	21.73	0.00	0.00	2.69	4.63	0.00	0.00	0.00	0.00	0.00	0.00
74	17212.05	1.72	2009	46.02	79.21	0.00	0.00	73.93	127.25	0.00	0.00	38.15	65.66	0.00	0.00	10.32	17.76	0.00	0.00	0.00	0.00	0.00	0.00
75	2032.62	0.20	1996	0.00	0.00	66.11	13.44	34.66	7.05	0.00	0.00	25.69	5.22	0.00	0.00	2.50	0.51	0.00	0.00	13.16	2.68	0.00	0.00
75	2032.62	0.20	1997	47.73	9.70	61.83	12.57	44.39	9.02	0.00	0.00	32.09	6.52	0.00	0.00	7.38	1.50	0.00	0.00	12.73	2.59	0.00	0.00
75	2032.62	0.20	1998	0.00	0.00	60.48	12.29	47.01	9.56	0.00	0.00	50.32	10.23	0.00	0.00	11.32	2.30	0.00	0.00	13.55	2.75	0.00	0.00
75	2032.62	0.20	1999	0.00	0.00	61.58	12.52	46.27	9.40	0.00	0.00	0.00	0.00	0.00	0.00	14.35	2.92	0.00	0.00	18.76	3.81	0.00	0.00

75	2032.62	0.20	2000	70.96	14.42	65.22	13.26	32.02	6.51	0.00	0.00	0.00	0.00	0.00	0.00	2.58	0.53	0.00	0.00	11.56	2.35	0.00	0.00
75	2032.62	0.20	2001	0.00	0.00	58.37	11.86	26.96	5.48	0.00	0.00	39.89	8.11	0.00	0.00	3.75	0.76	0.00	0.00	8.55	1.74	0.00	0.00
75	2032.62	0.20	2002	0.00	0.00	55.24	11.23	13.07	2.66	0.00	0.00	25.94	5.27	0.00	0.00	0.29	0.06	0.00	0.00	8.63	1.75	0.00	0.00
75	2032.62	0.20	2003	25.85	5.26	63.95	13.00	8.61	1.75	0.00	0.00	35.18	7.15	0.00	0.00	0.16	0.03	0.00	0.00	9.41	1.91	0.00	0.00
75	2032.62	0.20	2004	0.00	0.00	67.43	13.71	42.46	8.63	0.00	0.00	0.00	0.00	0.00	0.00	13.47	2.74	0.00	0.00	15.99	3.25	0.00	0.00
75	2032.62	0.20	2005	0.00	0.00	59.57	12.11	24.34	4.95	0.00	0.00	94.63	19.23	0.00	0.00	2.49	0.51	0.00	0.00	12.40	2.52	0.00	0.00
75	2032.62	0.20	2006	42.58	8.65	59.84	12.16	19.29	3.92	0.00	0.00	0.00	0.00	0.00	0.00	3.55	0.72	0.00	0.00	12.44	2.53	0.00	0.00
75	2032.62	0.20	2007	0.00	0.00	70.98	14.43	51.81	10.53	0.00	0.00	45.93	9.34	0.00	0.00	16.24	3.30	0.00	0.00	23.11	4.70	0.00	0.00
75	2032.62	0.20	2008	0.00	0.00	59.53	12.10	29.18	5.93	0.00	0.00	40.17	8.17	0.00	0.00	6.32	1.29	0.00	0.00	9.06	1.84	0.00	0.00
75	2032.62	0.20	2009	87.45	17.77	68.29	13.88	57.29	11.65	0.00	0.00	39.26	7.98	0.00	0.00	16.86	3.43	0.00	0.00	19.29	3.92	0.00	0.00
78	8486.45	0.85	1996	0.00	0.00	0.00	0.00	39.21	33.27	0.00	0.00	24.87	21.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	8486.45	0.85	1997	64.23	54.51	0.00	0.00	33.70	28.60	0.00	0.00	30.59	25.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	8486.45	0.85	1998	0.00	0.00	0.00	0.00	25.33	21.50	0.00	0.00	47.83	40.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	8486.45	0.85	1999	0.00	0.00	0.00	0.00	32.87	27.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	8486.45	0.85	2000	57.97	49.19	0.00	0.00	32.50	27.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	8486.45	0.85	2001	0.00	0.00	0.00	0.00	24.05	20.41	0.00	0.00	59.60	50.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	8486.45	0.85	2002	0.00	0.00	0.00	0.00	6.80	5.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	8486.45	0.85	2003	24.67	20.93	0.00	0.00	4.27	3.62	0.00	0.00	32.14	27.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	8486.45	0.85	2004	0.00	0.00	0.00	0.00	26.73	22.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	8486.45	0.85	2005	0.00	0.00	0.00	0.00	15.68	13.31	0.00	0.00	64.15	54.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	8486.45	0.85	2006	36.70	31.14	0.00	0.00	8.76	7.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	8486.45	0.85	2007	0.00	0.00	0.00	0.00	11.00	9.33	0.00	0.00	40.23	34.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	8486.45	0.85	2008	0.00	0.00	0.00	0.00	16.15	13.71	0.00	0.00	18.81	15.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	8486.45	0.85	2009	63.01	53.47	0.00	0.00	39.17	33.24	0.00	0.00	37.37	31.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
83	7438.41	0.74	1996	0.00	0.00	0.00	0.00	87.80	65.31	0.00	0.00	21.15	15.73	0.00	0.00	21.02	15.64	0.00	0.00	0.00	0.00	0.00	0.00
83	7438.41	0.74	1997	65.61	48.81	0.00	0.00	80.99	60.24	0.00	0.00	31.00	23.06	0.00	0.00	4.75	3.53	0.00	0.00	0.00	0.00	0.00	0.00
83	7438.41	0.74	1998	0.00	0.00	0.00	0.00	78.35	58.28	0.00	0.00	33.83	25.16	0.00	0.00	13.52	10.06	0.00	0.00	0.00	0.00	0.00	0.00
83	7438.41	0.74	1999	0.00	0.00	0.00	0.00	79.07	58.82	0.00	0.00	0.00	0.00	0.00	0.00	13.46	10.01	0.00	0.00	0.00	0.00	0.00	0.00
83	7438.41	0.74	2000	73.65	54.78	0.00	0.00	77.62	57.74	0.00	0.00	0.00	0.00	0.00	0.00	11.81	8.78	0.00	0.00	0.00	0.00	0.00	0.00
83	7438.41	0.74	2001	0.00	0.00	0.00	0.00	70.68	52.57	0.00	0.00	43.79	32.57	0.00	0.00	8.09	6.02	0.00	0.00	0.00	0.00	0.00	0.00

83	7438.41	0.74	2002	0.00	0.00	0.00	0.00	44.76	33.30	0.00	0.00	22.61	16.82	0.00	0.00	0.16	0.12	0.00	0.00	0.00	0.00	0.00	0.00
83	7438.41	0.74	2003	19.15	14.25	0.00	0.00	42.51	31.62	0.00	0.00	29.79	22.16	0.00	0.00	0.21	0.16	0.00	0.00	0.00	0.00	0.00	0.00
83	7438.41	0.74	2004	0.00	0.00	0.00	0.00	76.22	56.70	0.00	0.00	0.00	0.00	0.00	0.00	13.79	10.26	0.00	0.00	0.00	0.00	0.00	0.00
83	7438.41	0.74	2005	0.00	0.00	0.00	0.00	57.08	42.46	0.00	0.00	60.77	45.20	0.00	0.00	1.96	1.46	0.00	0.00	0.00	0.00	0.00	0.00
83	7438.41	0.74	2006	32.93	24.50	0.00	0.00	48.66	36.20	0.00	0.00	0.00	0.00	0.00	0.00	1.66	1.23	0.00	0.00	0.00	0.00	0.00	0.00
83	7438.41	0.74	2007	0.00	0.00	0.00	0.00	57.22	42.56	0.00	0.00	40.08	29.81	0.00	0.00	0.56	0.42	0.00	0.00	0.00	0.00	0.00	0.00
83	7438.41	0.74	2008	0.00	0.00	0.00	0.00	60.35	44.89	0.00	0.00	21.15	15.73	0.00	0.00	6.21	4.62	0.00	0.00	0.00	0.00	0.00	0.00
83	7438.41	0.74	2009	80.28	59.71	0.00	0.00	92.35	68.69	0.00	0.00	29.02	21.59	0.00	0.00	20.03	14.90	0.00	0.00	0.00	0.00	0.00	0.00
84	14248.16	1.42	1996	0.00	0.00	0.00	0.00	16.79	23.92	0.00	0.00	10.19	14.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	14248.16	1.42	1997	25.43	36.23	0.00	0.00	13.37	19.05	0.00	0.00	16.05	22.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	14248.16	1.42	1998	0.00	0.00	0.00	0.00	10.84	15.44	0.00	0.00	24.67	35.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	14248.16	1.42	1999	0.00	0.00	0.00	0.00	14.03	19.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	14248.16	1.42	2000	24.07	34.29	0.00	0.00	14.01	19.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	14248.16	1.42	2001	0.00	0.00	0.00	0.00	10.32	14.71	0.00	0.00	30.53	43.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	14248.16	1.42	2002	0.00	0.00	0.00	0.00	2.80	3.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	14248.16	1.42	2003	10.77	15.34	0.00	0.00	1.82	2.59	0.00	0.00	17.75	25.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	14248.16	1.42	2004	0.00	0.00	0.00	0.00	11.14	15.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	14248.16	1.42	2005	0.00	0.00	0.00	0.00	6.64	9.46	0.00	0.00	33.00	47.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	14248.16	1.42	2006	15.76	22.45	0.00	0.00	3.70	5.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	14248.16	1.42	2007	0.00	0.00	0.00	0.00	4.53	6.45	0.00	0.00	23.91	34.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	14248.16	1.42	2008	0.00	0.00	0.00	0.00	6.77	9.64	0.00	0.00	7.81	11.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	14248.16	1.42	2009	25.25	35.97	0.00	0.00	16.77	23.90	0.00	0.00	21.65	30.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	5850.50	0.59	1996	0.00	0.00	76.06	44.50	82.21	48.10	0.00	0.00	40.42	23.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	5850.50	0.59	1997	79.27	46.38	72.02	42.13	89.26	52.22	0.00	0.00	37.08	21.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	5850.50	0.59	1998	0.00	0.00	69.96	40.93	89.30	52.25	0.00	0.00	69.65	40.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	5850.50	0.59	1999	0.00	0.00	72.38	42.34	88.82	51.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	5850.50	0.59	2000	115.76	67.72	76.08	44.51	73.60	43.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	5850.50	0.59	2001	0.00	0.00	68.10	39.84	63.40	37.09	0.00	0.00	47.57	27.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	5850.50	0.59	2002	0.00	0.00	64.01	37.45	48.69	28.49	0.00	0.00	42.15	24.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	5850.50	0.59	2003	46.25	27.06	74.12	43.37	44.89	26.26	0.00	0.00	43.45	25.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

87	5850.50	0.59	2004	0.00	0.00	78.49	45.92	88.78	51.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	5850.50	0.59	2005	0.00	0.00	70.17	41.05	63.73	37.29	0.00	0.00	132.21	77.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	5850.50	0.59	2006	73.33	42.90	69.65	40.75	61.37	35.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	5850.50	0.59	2007	0.00	0.00	82.08	48.02	97.75	57.19	0.00	0.00	54.39	31.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	5850.50	0.59	2008	0.00	0.00	69.05	40.40	69.15	40.45	0.00	0.00	61.02	35.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	5850.50	0.59	2009	137.02	80.16	79.70	46.63	107.84	63.09	0.00	0.00	45.86	26.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
92	11946.92	1.19	1996	0.00	0.00	54.49	65.10	51.01	60.94	0.00	0.00	24.22	28.94	0.00	0.00	3.75	4.48	0.00	0.00	0.00	0.00	0.00	0.00
92	11946.92	1.19	1997	53.34	63.72	51.19	61.15	60.83	72.67	0.00	0.00	39.44	47.11	0.00	0.00	12.91	15.42	0.00	0.00	0.00	0.00	0.00	0.00
92	11946.92	1.19	1998	0.00	0.00	49.85	59.55	61.33	73.27	0.00	0.00	53.02	63.35	0.00	0.00	18.65	22.28	0.00	0.00	0.00	0.00	0.00	0.00
92	11946.92	1.19	1999	0.00	0.00	51.62	61.67	60.86	72.71	0.00	0.00	0.00	0.00	0.00	0.00	22.24	26.57	0.00	0.00	0.00	0.00	0.00	0.00
92	11946.92	1.19	2000	74.44	88.93	54.11	64.65	49.63	59.30	0.00	0.00	0.00	0.00	0.00	0.00	4.36	5.21	0.00	0.00	0.00	0.00	0.00	0.00
92	11946.92	1.19	2001	0.00	0.00	48.36	57.78	41.56	49.65	0.00	0.00	48.51	57.96	0.00	0.00	7.49	8.95	0.00	0.00	0.00	0.00	0.00	0.00
92	11946.92	1.19	2002	0.00	0.00	44.79	53.51	23.36	27.91	0.00	0.00	25.66	30.66	0.00	0.00	0.46	0.54	0.00	0.00	0.00	0.00	0.00	0.00
92	11946.92	1.19	2003	28.80	34.40	52.09	62.23	16.06	19.19	0.00	0.00	43.34	51.77	0.00	0.00	0.28	0.34	0.00	0.00	0.00	0.00	0.00	0.00
92	11946.92	1.19	2004	0.00	0.00	55.88	66.76	59.40	70.97	0.00	0.00	0.00	0.00	0.00	0.00	20.92	24.99	0.00	0.00	0.00	0.00	0.00	0.00
92	11946.92	1.19	2005	0.00	0.00	49.93	59.65	38.21	45.65	0.00	0.00	102.66	122.64	0.00	0.00	3.75	4.48	0.00	0.00	0.00	0.00	0.00	0.00
92	11946.92	1.19	2006	49.01	58.55	49.48	59.11	37.58	44.90	0.00	0.00	0.00	0.00	0.00	0.00	7.67	9.17	0.00	0.00	0.00	0.00	0.00	0.00
92	11946.92	1.19	2007	0.00	0.00	57.76	69.01	67.84	81.05	0.00	0.00	53.33	63.71	0.00	0.00	23.40	27.95	0.00	0.00	0.00	0.00	0.00	0.00
92	11946.92	1.19	2008	0.00	0.00	48.90	58.42	43.21	51.63	0.00	0.00	35.38	42.27	0.00	0.00	10.76	12.85	0.00	0.00	0.00	0.00	0.00	0.00
92	11946.92	1.19	2009	82.28	98.30	56.62	67.64	73.21	87.46	0.00	0.00	45.27	54.09	0.00	0.00	26.11	31.19	0.00	0.00	0.00	0.00	0.00	0.00
94	17375.40	1.74	1996	0.00	0.00	0.00	0.00	32.44	56.37	0.00	0.00	16.11	27.99	0.00	0.00	16.77	29.14	0.00	0.00	0.00	0.00	0.00	0.00
94	17375.40	1.74	1997	44.30	76.96	0.00	0.00	28.47	49.47	0.00	0.00	49.45	85.92	0.00	0.00	3.65	6.35	0.00	0.00	0.00	0.00	0.00	0.00
94	17375.40	1.74	1998	0.00	0.00	0.00	0.00	25.67	44.61	0.00	0.00	53.89	93.64	0.00	0.00	8.20	14.24	0.00	0.00	0.00	0.00	0.00	0.00
94	17375.40	1.74	1999	0.00	0.00	0.00	0.00	29.26	50.85	0.00	0.00	0.00	0.00	0.00	0.00	5.67	9.86	0.00	0.00	0.00	0.00	0.00	0.00
94	17375.40	1.74	2000	44.98	78.15	0.00	0.00	28.58	49.65	0.00	0.00	0.00	0.00	0.00	0.00	11.00	19.11	0.00	0.00	0.00	0.00	0.00	0.00
94	17375.40	1.74	2001	0.00	0.00	0.00	0.00	23.93	41.58	0.00	0.00	76.08	132.19	0.00	0.00	0.28	0.48	0.00	0.00	0.00	0.00	0.00	0.00
94	17375.40	1.74	2002	0.00	0.00	0.00	0.00	6.73	11.70	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.28	0.00	0.00	0.00	0.00	0.00	0.00
94	17375.40	1.74	2003	16.52	28.71	0.00	0.00	5.38	9.34	0.00	0.00	51.98	90.31	0.00	0.00	0.26	0.45	0.00	0.00	0.00	0.00	0.00	0.00
94	17375.40	1.74	2004	0.00	0.00	0.00	0.00	23.83	41.41	0.00	0.00	0.00	0.00	0.00	0.00	9.51	16.53	0.00	0.00	0.00	0.00	0.00	0.00
94	17375.40	1.74	2005	0.00	0.00	0.00	0.00	17.18	29.84	0.00	0.00	70.85	123.11	0.00	0.00	2.54	4.40	0.00	0.00	0.00	0.00	0.00	0.00

94	17375.40	1.74	2006	25.93	45.06	0.00	0.00	8.33	14.47	0.00	0.00	0.00	0.00	0.00	0.00	4.92	8.55	0.00	0.00	0.00	0.00	0.00	0.00
94	17375.40	1.74	2007	0.00	0.00	0.00	0.00	10.95	19.03	0.00	0.00	61.28	106.47	0.00	0.00	0.36	0.63	0.00	0.00	0.00	0.00	0.00	0.00
94	17375.40	1.74	2008	0.00	0.00	0.00	0.00	13.89	24.13	0.00	0.00	13.00	22.58	0.00	0.00	4.93	8.56	0.00	0.00	0.00	0.00	0.00	0.00
94	17375.40	1.74	2009	48.73	84.67	0.00	0.00	33.60	58.38	0.00	0.00	56.59	98.33	0.00	0.00	11.37	19.75	0.00	0.00	0.00	0.00	0.00	0.00
97	6760.12	0.68	1996	0.00	0.00	30.57	20.67	24.63	16.65	0.00	0.00	17.85	12.06	0.00	0.00	0.00	0.00	1.44	0.98	0.00	0.00	0.00	0.00
97	6760.12	0.68	1997	34.58	23.37	31.54	21.32	37.24	25.17	0.00	0.00	23.32	15.77	0.00	0.00	0.00	0.00	3.92	2.65	0.00	0.00	0.00	0.00
97	6760.12	0.68	1998	0.00	0.00	28.41	19.21	37.90	25.62	0.00	0.00	41.52	28.07	0.00	0.00	0.00	0.00	3.40	2.30	0.00	0.00	0.00	0.00
97	6760.12	0.68	1999	0.00	0.00	30.63	20.71	41.43	28.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.43	3.00	0.00	0.00	0.00	0.00
97	6760.12	0.68	2000	46.59	31.50	30.86	20.86	20.90	14.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.13	0.00	0.00	0.00	0.00
97	6760.12	0.68	2001	0.00	0.00	28.57	19.31	22.92	15.50	0.00	0.00	37.17	25.13	0.00	0.00	0.00	0.00	2.50	1.69	0.00	0.00	0.00	0.00
97	6760.12	0.68	2002	0.00	0.00	27.94	18.88	11.13	7.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.05	0.00	0.00	0.00	0.00
97	6760.12	0.68	2003	22.01	14.88	31.85	21.53	7.88	5.33	0.00	0.00	23.32	15.76	0.00	0.00	0.00	0.00	0.08	0.05	0.00	0.00	0.00	0.00
97	6760.12	0.68	2004	0.00	0.00	32.19	21.76	35.92	24.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.87	1.94	0.00	0.00	0.00	0.00
97	6760.12	0.68	2005	0.00	0.00	30.44	20.58	21.65	14.64	0.00	0.00	61.81	41.79	0.00	0.00	0.00	0.00	1.65	1.12	0.00	0.00	0.00	0.00
97	6760.12	0.68	2006	29.99	20.27	29.46	19.92	20.26	13.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.83	1.24	0.00	0.00	0.00	0.00
97	6760.12	0.68	2007	0.00	0.00	34.06	23.02	42.86	28.97	0.00	0.00	30.85	20.85	0.00	0.00	0.00	0.00	3.46	2.34	0.00	0.00	0.00	0.00
97	6760.12	0.68	2008	0.00	0.00	29.54	19.97	17.62	11.91	0.00	0.00	20.55	13.89	0.00	0.00	0.00	0.00	1.16	0.79	0.00	0.00	0.00	0.00
97	6760.12	0.68	2009	43.60	29.47	31.25	21.13	46.44	31.39	0.00	0.00	30.75	20.79	0.00	0.00	0.00	0.00	5.18	3.50	0.00	0.00	0.00	0.00
98	2850.31	0.29	1996	0.00	0.00	31.67	9.03	56.01	15.96	0.00	0.00	11.98	3.41	0.00	0.00	13.97	3.98	0.00	0.00	0.00	0.00	0.00	0.00
98	2850.31	0.29	1997	34.19	9.74	30.10	8.58	47.98	13.68	0.00	0.00	39.29	11.20	0.00	0.00	0.72	0.20	0.00	0.00	0.00	0.00	0.00	0.00
98	2850.31	0.29	1998	0.00	0.00	28.68	8.17	40.56	11.56	0.00	0.00	41.26	11.76	0.00	0.00	5.94	1.69	0.00	0.00	0.00	0.00	0.00	0.00
98	2850.31	0.29	1999	0.00	0.00	31.22	8.90	48.31	13.77	0.00	0.00	0.00	0.00	0.00	0.00	1.34	0.38	0.00	0.00	0.00	0.00	0.00	0.00
98	2850.31	0.29	2000	28.30	8.07	29.80	8.49	47.96	13.67	0.00	0.00	0.00	0.00	0.00	0.00	8.69	2.48	0.00	0.00	0.00	0.00	0.00	0.00
98	2850.31	0.29	2001	0.00	0.00	30.24	8.62	36.17	10.31	0.00	0.00	61.70	17.59	0.00	0.00	0.21	0.06	0.00	0.00	0.00	0.00	0.00	0.00
98	2850.31	0.29	2002	0.00	0.00	30.36	8.65	13.79	3.93	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.03	0.00	0.00	0.00	0.00	0.00	0.00
98	2850.31	0.29	2003	11.34	3.23	31.13	8.87	11.25	3.21	0.00	0.00	43.01	12.26	0.00	0.00	0.19	0.05	0.00	0.00	0.00	0.00	0.00	0.00
98	2850.31	0.29	2004	0.00	0.00	31.74	9.05	40.43	11.52	0.00	0.00	0.00	0.00	0.00	0.00	7.94	2.26	0.00	0.00	0.00	0.00	0.00	0.00
98	2850.31	0.29	2005	0.00	0.00	30.17	8.60	25.96	7.40	0.00	0.00	54.64	15.57	0.00	0.00	2.25	0.64	0.00	0.00	0.00	0.00	0.00	0.00
98	2850.31	0.29	2006	17.52	4.99	29.28	8.35	16.58	4.73	0.00	0.00	0.00	0.00	0.00	0.00	3.81	1.09	0.00	0.00	0.00	0.00	0.00	0.00
98	2850.31	0.29	2007	0.00	0.00	34.24	9.76	19.28	5.50	0.00	0.00	50.31	14.34	0.00	0.00	0.28	0.08	0.00	0.00	0.00	0.00	0.00	0.00

98	2850.31	0.29	2008	0.00	0.00	31.98	9.12	25.97	7.40	0.00	0.00	8.98	2.56	0.00	0.00	4.08	1.16	0.00	0.00	0.00	0.00	0.00	0.00
98	2850.31	0.29	2009	30.69	8.75	30.74	8.76	55.98	15.96	0.00	0.00	48.13	13.72	0.00	0.00	8.19	2.33	0.00	0.00	0.00	0.00	0.00	0.00
99	7791.66	0.78	1996	0.00	0.00	0.00	0.00	56.11	43.72	0.00	0.00	17.11	13.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	7791.66	0.78	1997	38.99	30.38	0.00	0.00	67.10	52.28	0.00	0.00	45.65	35.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	7791.66	0.78	1998	0.00	0.00	0.00	0.00	66.05	51.47	0.00	0.00	52.28	40.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	7791.66	0.78	1999	0.00	0.00	0.00	0.00	70.17	54.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	7791.66	0.78	2000	51.63	40.23	0.00	0.00	54.19	42.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	7791.66	0.78	2001	0.00	0.00	0.00	0.00	46.53	36.26	0.00	0.00	64.22	50.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	7791.66	0.78	2002	0.00	0.00	0.00	0.00	39.35	30.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	7791.66	0.78	2003	23.87	18.59	0.00	0.00	33.24	25.90	0.00	0.00	42.07	32.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	7791.66	0.78	2004	0.00	0.00	0.00	0.00	69.99	54.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	7791.66	0.78	2005	0.00	0.00	0.00	0.00	51.54	40.16	0.00	0.00	85.19	66.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	7791.66	0.78	2006	37.38	29.12	0.00	0.00	50.00	38.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	7791.66	0.78	2007	0.00	0.00	0.00	0.00	71.50	55.71	0.00	0.00	54.19	42.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	7791.66	0.78	2008	0.00	0.00	0.00	0.00	53.10	41.38	0.00	0.00	21.19	16.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
99	7791.66	0.78	2009	54.00	42.07	0.00	0.00	75.08	58.50	0.00	0.00	52.97	41.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
101	6909.74	0.69	1996	0.00	0.00	60.46	41.77	19.45	13.44	0.00	0.00	12.48	8.63	0.00	0.00	0.00	0.00	2.06	1.42	0.00	0.00	0.00	0.00
101	6909.74	0.69	1997	24.89	17.20	62.63	43.28	33.23	22.96	0.00	0.00	34.33	23.72	0.00	0.00	0.00	0.00	5.57	3.85	0.00	0.00	0.00	0.00
101	6909.74	0.69	1998	0.00	0.00	55.96	38.66	32.85	22.70	0.00	0.00	43.83	30.29	0.00	0.00	0.00	0.00	4.87	3.37	0.00	0.00	0.00	0.00
101	6909.74	0.69	1999	0.00	0.00	61.15	42.25	35.95	24.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.62	4.57	0.00	0.00	0.00	0.00
101	6909.74	0.69	2000	35.75	24.70	61.36	42.39	20.82	14.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.19	0.00	0.00	0.00	0.00
101	6909.74	0.69	2001	0.00	0.00	57.01	39.39	19.50	13.47	0.00	0.00	46.47	32.11	0.00	0.00	0.00	0.00	3.43	2.37	0.00	0.00	0.00	0.00
101	6909.74	0.69	2002	0.00	0.00	56.22	38.85	10.38	7.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.07	0.00	0.00	0.00	0.00
101	6909.74	0.69	2003	15.06	10.41	62.69	43.32	6.66	4.60	0.00	0.00	35.63	24.62	0.00	0.00	0.00	0.00	0.10	0.07	0.00	0.00	0.00	0.00
101	6909.74	0.69	2004	0.00	0.00	63.77	44.06	32.47	22.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.15	2.87	0.00	0.00	0.00	0.00
101	6909.74	0.69	2005	0.00	0.00	60.52	41.81	19.24	13.30	0.00	0.00	66.38	45.87	0.00	0.00	0.00	0.00	2.30	1.59	0.00	0.00	0.00	0.00
101	6909.74	0.69	2006	21.82	15.08	58.91	40.71	18.41	12.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.65	1.83	0.00	0.00	0.00	0.00
101	6909.74	0.69	2007	0.00	0.00	67.99	46.98	37.81	26.13	0.00	0.00	44.15	30.50	0.00	0.00	0.00	0.00	0.51	0.35	0.00	0.00	0.00	0.00
101	6909.74	0.69	2008	0.00	0.00	58.31	40.29	16.89	11.67	0.00	0.00	14.32	9.90	0.00	0.00	0.00	0.00	1.64	1.13	0.00	0.00	0.00	0.00
101	6909.74	0.69	2009	37.43	25.86	62.21	42.98	40.13	27.73	0.00	0.00	43.39	29.98	0.00	0.00	0.00	0.00	7.66	5.29	0.00	0.00	0.00	0.00

118	2068.60	0.21	1996	0.00	0.00	95.07	19.67	50.97	10.54	0.00	0.00	19.43	4.02	0.00	0.00	0.00	0.00	31.91	6.60	0.00	0.00	0.00	0.00
118	2068.60	0.21	1997	43.95	9.09	90.74	18.77	45.73	9.46	0.00	0.00	29.97	6.20	0.00	0.00	0.00	0.00	6.00	1.24	0.00	0.00	0.00	0.00
118	2068.60	0.21	1998	0.00	0.00	85.96	17.78	40.20	8.32	0.00	0.00	41.36	8.55	0.00	0.00	0.00	0.00	8.79	1.82	0.00	0.00	0.00	0.00
118	2068.60	0.21	1999	0.00	0.00	94.36	19.52	45.55	9.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.37	3.39	0.00	0.00	0.00	0.00
118	2068.60	0.21	2000	43.93	9.09	89.71	18.56	44.43	9.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.41	3.19	0.00	0.00	0.00	0.00
118	2068.60	0.21	2001	0.00	0.00	90.77	18.78	35.15	7.27	0.00	0.00	55.05	11.39	0.00	0.00	0.00	0.00	15.03	3.11	0.00	0.00	0.00	0.00
118	2068.60	0.21	2002	0.00	0.00	90.55	18.73	21.93	4.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.04	0.00	0.00	0.00	0.00
118	2068.60	0.21	2003	19.52	4.04	94.07	19.46	19.91	4.12	0.00	0.00	34.61	7.16	0.00	0.00	0.00	0.00	0.22	0.05	0.00	0.00	0.00	0.00
118	2068.60	0.21	2004	0.00	0.00	95.56	19.77	41.21	8.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.94	3.09	0.00	0.00	0.00	0.00
118	2068.60	0.21	2005	0.00	0.00	90.34	18.69	30.17	6.24	0.00	0.00	56.01	11.59	0.00	0.00	0.00	0.00	3.72	0.77	0.00	0.00	0.00	0.00
118	2068.60	0.21	2006	27.91	5.77	88.12	18.23	23.96	4.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.53	0.32	0.00	0.00	0.00	0.00
118	2068.60	0.21	2007	0.00	0.00	103.06	21.32	25.92	5.36	0.00	0.00	40.13	8.30	0.00	0.00	0.00	0.00	0.38	0.08	0.00	0.00	0.00	0.00
118	2068.60	0.21	2008	0.00	0.00	96.38	19.94	30.29	6.26	0.00	0.00	13.29	2.75	0.00	0.00	0.00	0.00	3.37	0.70	0.00	0.00	0.00	0.00
118	2068.60	0.21	2009	46.48	9.62	91.82	18.99	50.41	10.43	0.00	0.00	38.60	7.99	0.00	0.00	0.00	0.00	22.43	4.64	0.00	0.00	0.00	0.00

Logan County

SUB	Area (m)	Area (ha)	Year	CORN (t)	CORN*A (t/ha)	IRCN (t)	IRCN* A (t/ha)	GRSG (t)	GRSG*A (t/ha)	IRGS (t)	IRGS*A (t/ha)	WWHT (t)	WWHT* A (t/ha)	IRWW (t)	IRWW *A (t/ha)	SOYB (t)	SOYB*A (t/ha)	IRSB (t)	IRSB*A (t/ha)	ALFA (t)	ALFA*A (t/ha)	IRAL (t)	IRAL*A (t/ha)
14	11824.73	1.18	1996	0.00	0.00	22.46	26.56	0.00	0.00	0.00	0.00	10.79	12.76	0.00	0.00	2.88	3.40	0.00	0.00	0.00	0.00	0.00	0.00
14	11824.73	1.18	1997	18.96	22.42	20.54	24.29	10.88	12.86	0.00	0.00	18.00	21.29	0.00	0.00	2.06	2.44	0.00	0.00	0.00	0.00	0.00	0.00
14	11824.73	1.18	1998	0.00	0.00	20.96	24.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.05	2.42	0.00	0.00	0.00	0.00	0.00	0.00
14	11824.73	1.18	1999	0.00	0.00	22.49	26.60	0.00	0.00	0.00	0.00	39.92	47.20	0.00	0.00	2.43	2.87	0.00	0.00	0.00	0.00	0.00	0.00
14	11824.73	1.18	2000	20.32	24.03	20.73	24.52	10.25	12.11	0.00	0.00	0.00	0.00	0.00	0.00	1.65	1.95	0.00	0.00	0.00	0.00	0.00	0.00
14	11824.73	1.18	2001	0.00	0.00	19.87	23.50	0.00	0.00	0.00	0.00	26.27	31.07	0.00	0.00	0.36	0.42	0.00	0.00	0.00	0.00	0.00	0.00
14	11824.73	1.18	2002	0.00	0.00	19.15	22.65	0.00	0.00	0.00	0.00	10.08	11.92	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00
14	11824.73	1.18	2003	6.62	7.83	20.54	24.29	2.55	3.02	0.00	0.00	21.46	25.37	0.00	0.00	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00
14	11824.73	1.18	2004	0.00	0.00	22.77	26.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95	2.30	0.00	0.00	0.00	0.00	0.00	0.00
14	11824.73	1.18	2005	0.00	0.00	19.33	22.85	0.00	0.00	0.00	0.00	37.26	44.05	0.00	0.00	0.69	0.82	0.00	0.00	0.00	0.00	0.00	0.00
14	11824.73	1.18	2006	12.06	14.27	19.53	23.09	6.79	8.03	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.08	0.00	0.00	0.00	0.00	0.00	0.00
14	11824.73	1.18	2007	0.00	0.00	22.16	26.21	0.00	0.00	0.00	0.00	30.48	36.04	0.00	0.00	0.18	0.21	0.00	0.00	0.00	0.00	0.00	0.00
14	11824.73	1.18	2008	0.00	0.00	21.85	25.84	0.00	0.00	0.00	0.00	13.82	16.35	0.00	0.00	0.75	0.89	0.00	0.00	0.00	0.00	0.00	0.00

14	11824.73	1.18	2009	25.20	29.80	22.37	26.45	12.16	14.38	0.00	0.00	18.33	21.68	0.00	0.00	2.89	3.42	0.00	0.00	0.00	0.00	0.00	0.00
16	5734.40	0.57	1996	0.00	0.00	45.88	26.31	0.00	0.00	0.00	0.00	19.68	11.28	0.00	0.00	8.82	5.06	9.74	5.59	0.00	0.00	0.00	0.00
16	5734.40	0.57	1997	50.91	29.19	44.60	25.58	12.24	7.02	0.00	0.00	20.48	11.74	0.00	0.00	6.43	3.68	4.52	2.59	0.00	0.00	0.00	0.00
16	5734.40	0.57	1998	0.00	0.00	45.20	25.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95	1.12	5.73	3.28	0.00	0.00	0.00	0.00
16	5734.40	0.57	1999	0.00	0.00	46.74	26.80	0.00	0.00	0.00	0.00	64.37	36.91	0.00	0.00	6.41	3.68	6.38	3.66	0.00	0.00	0.00	0.00
16	5734.40	0.57	2000	56.55	32.43	43.41	24.89	11.06	6.34	0.00	0.00	0.00	0.00	0.00	0.00	6.05	3.47	6.22	3.57	0.00	0.00	0.00	0.00
16	5734.40	0.57	2001	0.00	0.00	41.78	23.96	0.00	0.00	0.00	0.00	31.36	17.98	0.00	0.00	5.12	2.94	7.76	4.45	0.00	0.00	0.00	0.00
16	5734.40	0.57	2002	0.00	0.00	41.78	23.96	0.00	0.00	0.00	0.00	20.05	11.49	0.00	0.00	0.08	0.04	0.16	0.09	0.00	0.00	0.00	0.00
16	5734.40	0.57	2003	17.52	10.05	43.34	24.86	1.55	0.89	0.00	0.00	32.26	18.50	0.00	0.00	0.08	0.04	0.09	0.05	0.00	0.00	0.00	0.00
16	5734.40	0.57	2004	0.00	0.00	48.01	27.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.73	3.28	4.70	2.69	0.00	0.00	0.00	0.00
16	5734.40	0.57	2005	0.00	0.00	42.07	24.12	0.00	0.00	0.00	0.00	59.72	34.24	0.00	0.00	0.16	0.09	5.06	2.90	0.00	0.00	0.00	0.00
16	5734.40	0.57	2006	26.74	15.33	42.40	24.32	3.34	1.92	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.47	0.13	0.07	0.00	0.00	0.00	0.00
16	5734.40	0.57	2007	0.00	0.00	46.11	26.44	0.00	0.00	0.00	0.00	42.16	24.17	0.00	0.00	0.12	0.07	3.64	2.09	0.00	0.00	0.00	0.00
16	5734.40	0.57	2008	0.00	0.00	43.00	24.66	0.00	0.00	0.00	0.00	25.73	14.75	0.00	0.00	2.52	1.44	3.82	2.19	0.00	0.00	0.00	0.00
16	5734.40	0.57	2009	71.05	40.74	45.87	26.30	12.48	7.16	0.00	0.00	26.91	15.43	0.00	0.00	8.56	4.91	7.21	4.13	0.00	0.00	0.00	0.00
17	4326.26	0.43	1996	0.00	0.00	73.79	31.92	0.00	0.00	0.00	0.00	29.41	12.72	0.00	0.00	18.64	8.07	15.54	6.72	0.00	0.00	0.00	0.00
17	4326.26	0.43	1997	47.39	20.50	71.59	30.97	32.67	14.13	0.00	0.00	27.61	11.94	0.00	0.00	9.03	3.91	7.69	3.33	0.00	0.00	0.00	0.00
17	4326.26	0.43	1998	0.00	0.00	71.88	31.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.61	5.46	10.45	4.52	0.00	0.00	0.00	0.00
17	4326.26	0.43	1999	0.00	0.00	76.54	33.11	0.00	0.00	0.00	0.00	72.94	31.55	0.00	0.00	15.59	6.75	12.86	5.57	0.00	0.00	0.00	0.00
17	4326.26	0.43	2000	51.36	22.22	71.55	30.95	30.67	13.27	0.00	0.00	0.00	0.00	0.00	0.00	13.11	5.67	10.79	4.67	0.00	0.00	0.00	0.00
17	4326.26	0.43	2001	0.00	0.00	67.57	29.23	0.00	0.00	0.00	0.00	38.16	16.51	0.00	0.00	14.45	6.25	11.78	5.10	0.00	0.00	0.00	0.00
17	4326.26	0.43	2002	0.00	0.00	65.15	28.19	0.00	0.00	0.00	0.00	27.33	11.82	0.00	0.00	0.44	0.19	0.40	0.17	0.00	0.00	0.00	0.00
17	4326.26	0.43	2003	14.95	6.47	71.50	30.93	5.87	2.54	0.00	0.00	34.16	14.78	0.00	0.00	0.18	0.08	0.15	0.06	0.00	0.00	0.00	0.00
17	4326.26	0.43	2004	0.00	0.00	77.61	33.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.65	1.14	2.17	0.94	0.00	0.00	0.00	0.00
17	4326.26	0.43	2005	0.00	0.00	66.36	28.71	0.00	0.00	0.00	0.00	71.36	30.87	0.00	0.00	9.82	4.25	8.22	3.56	0.00	0.00	0.00	0.00
17	4326.26	0.43	2006	26.01	11.25	69.52	30.07	14.63	6.33	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.12	0.22	0.10	0.00	0.00	0.00	0.00
17	4326.26	0.43	2007	0.00	0.00	76.62	33.15	0.00	0.00	0.00	0.00	48.06	20.79	0.00	0.00	1.60	0.69	1.28	0.55	0.00	0.00	0.00	0.00
17	4326.26	0.43	2008	0.00	0.00	74.59	32.27	0.00	0.00	0.00	0.00	35.82	15.50	0.00	0.00	7.72	3.34	6.37	2.76	0.00	0.00	0.00	0.00
17	4326.26	0.43	2009	62.97	27.24	75.87	32.82	35.90	15.53	0.00	0.00	28.86	12.48	0.00	0.00	16.74	7.24	13.86	6.00	0.00	0.00	0.00	0.00
18	13705.77	1.37	1996	0.00	0.00	22.77	31.20	0.00	0.00	0.00	0.00	11.41	15.64	0.00	0.00	9.31	12.76	6.46	8.85	0.00	0.00	27.54	37.75

18	13705.77	1.37	1997	17.64	24.18	21.04	28.84	16.83	23.07	0.00	0.00	5.94	8.15	0.00	0.00	0.46	0.62	2.62	3.59	0.00	0.00	19.73	27.03
18	13705.77	1.37	1998	0.00	0.00	21.08	28.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.42	1.95	4.21	5.76	0.00	0.00	17.10	23.43
18	13705.77	1.37	1999	0.00	0.00	22.66	31.06	0.00	0.00	0.00	0.00	24.58	33.69	0.00	0.00	5.97	8.18	5.36	7.34	0.00	0.00	21.43	29.38
18	13705.77	1.37	2000	19.80	27.14	20.99	28.77	15.75	21.59	0.00	0.00	0.00	0.00	0.00	0.00	6.03	8.26	4.43	6.07	0.00	0.00	18.28	25.05
18	13705.77	1.37	2001	0.00	0.00	19.88	27.25	0.00	0.00	0.00	0.00	8.92	12.22	0.00	0.00	5.39	7.39	5.33	7.30	0.00	0.00	13.82	18.93
18	13705.77	1.37	2002	0.00	0.00	18.89	25.89	0.00	0.00	0.00	0.00	11.54	15.82	0.00	0.00	0.07	0.10	0.10	0.13	0.00	0.00	4.97	6.81
18	13705.77	1.37	2003	6.32	8.67	20.50	28.09	3.72	5.09	0.00	0.00	7.57	10.38	0.00	0.00	0.09	0.12	0.06	0.09	0.00	0.00	7.81	10.70
18	13705.77	1.37	2004	0.00	0.00	23.51	32.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.10	5.61	0.64	0.88	0.00	0.00	15.30	20.97
18	13705.77	1.37	2005	0.00	0.00	19.18	26.29	0.00	0.00	0.00	0.00	26.48	36.30	0.00	0.00	0.47	0.64	3.13	4.29	0.00	0.00	13.14	18.00
18	13705.77	1.37	2006	10.85	14.86	19.89	27.26	9.21	12.62	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.60	0.09	0.12	0.00	0.00	9.38	12.85
18	13705.77	1.37	2007	0.00	0.00	22.21	30.44	0.00	0.00	0.00	0.00	9.40	12.89	0.00	0.00	0.18	0.24	0.99	1.36	0.00	0.00	13.09	17.94
18	13705.77	1.37	2008	0.00	0.00	21.60	29.60	0.00	0.00	0.00	0.00	16.18	22.17	0.00	0.00	1.93	2.65	2.81	3.85	0.00	0.00	10.02	13.74
18	13705.77	1.37	2009	25.40	34.82	22.24	30.48	18.71	25.64	0.00	0.00	6.12	8.38	0.00	0.00	8.84	12.12	5.73	7.86	0.00	0.00	24.01	32.90
19	9958.94	1.00	1996	0.00	0.00	32.59	32.46	12.43	12.38	0.00	0.00	12.73	12.68	0.00	0.00	8.86	8.82	10.37	10.33	0.00	0.00	0.00	0.00
19	9958.94	1.00	1997	16.31	16.24	30.30	30.17	27.57	27.46	0.00	0.00	21.98	21.89	0.00	0.00	0.44	0.43	3.95	3.93	0.00	0.00	0.00	0.00
19	9958.94	1.00	1998	0.00	0.00	30.80	30.67	11.22	11.18	0.00	0.00	0.00	0.00	0.00	0.00	5.51	5.48	6.27	6.24	0.00	0.00	0.00	0.00
19	9958.94	1.00	1999	0.00	0.00	34.49	34.35	11.91	11.86	0.00	0.00	45.14	44.95	0.00	0.00	5.48	5.45	8.05	8.02	0.00	0.00	0.00	0.00
19	9958.94	1.00	2000	19.46	19.38	31.27	31.14	26.47	26.36	0.00	0.00	0.00	0.00	0.00	0.00	5.85	5.83	6.69	6.66	0.00	0.00	0.00	0.00
19	9958.94	1.00	2001	0.00	0.00	29.63	29.51	10.06	10.01	0.00	0.00	28.31	28.20	0.00	0.00	5.36	5.34	7.90	7.86	0.00	0.00	0.00	0.00
19	9958.94	1.00	2002	0.00	0.00	27.83	27.71	10.39	10.34	0.00	0.00	11.38	11.33	0.00	0.00	0.07	0.07	0.11	0.11	0.00	0.00	0.00	0.00
19	9958.94	1.00	2003	6.57	6.54	30.66	30.53	14.66	14.60	0.00	0.00	26.58	26.47	0.00	0.00	0.10	0.10	0.10	0.10	0.00	0.00	0.00	0.00
19	9958.94	1.00	2004	0.00	0.00	31.99	31.86	12.09	12.04	0.00	0.00	0.00	0.00	0.00	0.00	5.32	5.30	0.72	0.71	0.00	0.00	0.00	0.00
19	9958.94	1.00	2005	0.00	0.00	28.77	28.65	10.33	10.29	0.00	0.00	46.92	46.72	0.00	0.00	1.40	1.39	4.79	4.77	0.00	0.00	0.00	0.00
19	9958.94	1.00	2006	11.10	11.05	29.32	29.20	19.64	19.56	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.25	0.14	0.13	0.00	0.00	0.00	0.00
19	9958.94	1.00	2007	0.00	0.00	34.57	34.43	11.46	11.41	0.00	0.00	33.37	33.23	0.00	0.00	0.21	0.21	0.17	0.17	0.00	0.00	0.00	0.00
19	9958.94	1.00	2008	0.00	0.00	31.74	31.61	12.00	11.95	0.00	0.00	14.97	14.91	0.00	0.00	2.18	2.17	3.73	3.72	0.00	0.00	0.00	0.00
19	9958.94	1.00	2009	25.40	25.30	32.72	32.59	30.64	30.52	0.00	0.00	21.76	21.67	0.00	0.00	8.65	8.61	8.60	8.56	0.00	0.00	0.00	0.00
27	12683.02	1.27	1996	0.00	0.00	33.07	41.95	12.45	15.79	0.00	0.00	10.59	13.44	0.00	0.00	8.98	11.39	0.00	0.00	0.00	0.00	26.25	33.29
27	12683.02	1.27	1997	16.44	20.85	29.42	37.32	28.11	35.65	0.00	0.00	19.13	24.27	0.00	0.00	0.64	0.81	0.00	0.00	0.00	0.00	17.37	22.03
27	12683.02	1.27	1998	0.00	0.00	30.26	38.38	11.04	14.01	0.00	0.00	24.93	31.62	0.00	0.00	5.88	7.46	0.00	0.00	0.00	0.00	15.60	19.78

27	12683.02	1.27	1999	0.00	0.00	32.41	41.11	11.29	14.32	0.00	0.00	0.00	0.00	0.00	0.00	5.38	6.82	0.00	0.00	0.00	0.00	18.90	23.97
27	12683.02	1.27	2000	23.73	30.09	32.50	41.22	27.30	34.62	0.00	0.00	0.00	0.00	0.00	0.00	5.93	7.52	0.00	0.00	0.00	0.00	19.56	24.81
27	12683.02	1.27	2001	0.00	0.00	29.46	37.37	10.09	12.79	0.00	0.00	25.93	32.88	0.00	0.00	3.63	4.60	0.00	0.00	0.00	0.00	13.48	17.10
27	12683.02	1.27	2002	0.00	0.00	28.46	36.09	10.23	12.98	0.00	0.00	13.56	17.20	0.00	0.00	0.08	0.10	0.00	0.00	0.00	0.00	6.03	7.65
27	12683.02	1.27	2003	6.53	8.28	31.16	39.52	14.68	18.61	0.00	0.00	23.59	29.92	0.00	0.00	0.11	0.13	0.00	0.00	0.00	0.00	8.19	10.39
27	12683.02	1.27	2004	0.00	0.00	32.87	41.69	11.81	14.97	0.00	0.00	0.00	0.00	0.00	0.00	5.42	6.87	0.00	0.00	0.00	0.00	13.00	16.49
27	12683.02	1.27	2005	0.00	0.00	28.83	36.57	10.05	12.75	0.00	0.00	41.02	52.02	0.00	0.00	1.01	1.27	0.00	0.00	0.00	0.00	13.34	16.92
27	12683.02	1.27	2006	9.93	12.59	27.91	35.40	20.46	25.95	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.44	0.00	0.00	0.00	0.00	9.24	11.72
27	12683.02	1.27	2007	0.00	0.00	34.48	43.74	11.45	14.52	0.00	0.00	28.27	35.86	0.00	0.00	0.20	0.25	0.00	0.00	0.00	0.00	14.11	17.90
27	12683.02	1.27	2008	0.00	0.00	31.32	39.72	11.82	14.99	0.00	0.00	13.49	17.11	0.00	0.00	2.19	2.78	0.00	0.00	0.00	0.00	10.09	12.80
27	12683.02	1.27	2009	26.31	33.37	33.76	42.82	30.81	39.07	0.00	0.00	19.54	24.79	0.00	0.00	8.67	10.99	0.00	0.00	0.00	0.00	23.69	30.05
31	4719.50	0.47	1996	0.00	0.00	93.42	44.09	0.00	0.00	0.00	0.00	15.47	7.30	0.00	0.00	13.70	6.47	0.00	0.00	0.00	0.00	0.00	0.00
31	4719.50	0.47	1997	29.55	13.95	95.56	45.10	17.68	8.34	0.00	0.00	8.89	4.19	0.00	0.00	7.71	3.64	0.00	0.00	0.00	0.00	0.00	0.00
31	4719.50	0.47	1998	0.00	0.00	98.99	46.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.69	3.63	0.00	0.00	0.00	0.00	0.00	0.00
31	4719.50	0.47	1999	0.00	0.00	100.62	47.49	0.00	0.00	0.00	0.00	39.30	18.55	0.00	0.00	11.84	5.59	0.00	0.00	0.00	0.00	0.00	0.00
31	4719.50	0.47	2000	34.63	16.34	86.46	40.80	15.95	7.53	0.00	0.00	0.00	0.00	0.00	0.00	10.09	4.76	0.00	0.00	0.00	0.00	0.00	0.00
31	4719.50	0.47	2001	0.00	0.00	89.46	42.22	0.00	0.00	0.00	0.00	16.03	7.56	0.00	0.00	9.14	4.31	0.00	0.00	0.00	0.00	0.00	0.00
31	4719.50	0.47	2002	0.00	0.00	88.52	41.77	0.00	0.00	0.00	0.00	13.94	6.58	0.00	0.00	0.12	0.06	0.00	0.00	0.00	0.00	0.00	0.00
31	4719.50	0.47	2003	12.30	5.80	92.29	43.55	3.94	1.86	0.00	0.00	16.49	7.78	0.00	0.00	0.15	0.07	0.00	0.00	0.00	0.00	0.00	0.00
31	4719.50	0.47	2004	0.00	0.00	94.47	44.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89	2.78	0.00	0.00	0.00	0.00	0.00	0.00
31	4719.50	0.47	2005	0.00	0.00	90.00	42.47	0.00	0.00	0.00	0.00	37.97	17.92	0.00	0.00	0.33	0.15	0.00	0.00	0.00	0.00	0.00	0.00
31	4719.50	0.47	2006	18.78	8.86	92.50	43.65	10.45	4.93	0.00	0.00	0.00	0.00	0.00	0.00	1.41	0.66	0.00	0.00	0.00	0.00	0.00	0.00
31	4719.50	0.47	2007	0.00	0.00	97.34	45.94	0.00	0.00	0.00	0.00	22.26	10.50	0.00	0.00	0.20	0.09	0.00	0.00	0.00	0.00	0.00	0.00
31	4719.50	0.47	2008	0.00	0.00	93.51	44.13	0.00	0.00	0.00	0.00	20.72	9.78	0.00	0.00	4.31	2.04	0.00	0.00	0.00	0.00	0.00	0.00
31	4719.50	0.47	2009	42.64	20.13	97.25	45.89	18.67	8.81	0.00	0.00	14.20	6.70	0.00	0.00	12.36	5.83	0.00	0.00	0.00	0.00	0.00	0.00
34	2319.82	0.23	1996	0.00	0.00	66.13	15.34	37.38	8.67	0.00	0.00	22.25	5.16	0.00	0.00	17.96	4.17	20.94	4.86	22.06	5.12	26.29	6.10
34	2319.82	0.23	1997	35.45	8.22	60.27	13.98	67.69	15.70	0.00	0.00	25.49	5.91	0.00	0.00	1.01	0.23	7.64	1.77	12.15	2.82	16.11	3.74
34	2319.82	0.23	1998	0.00	0.00	60.94	14.14	33.02	7.66	0.00	0.00	38.18	8.86	0.00	0.00	10.79	2.50	11.40	2.64	10.12	2.35	12.47	2.89
34	2319.82	0.23	1999	0.00	0.00	64.99	15.08	33.81	7.84	0.00	0.00	0.00	0.00	0.00	0.00	10.23	2.37	15.06	3.49	14.38	3.34	17.21	3.99
34	2319.82	0.23	2000	43.13	10.00	64.41	14.94	64.81	15.03	0.00	0.00	0.00	0.00	0.00	0.00	9.41	2.18	12.72	2.95	12.69	2.94	15.85	3.68

34	2319.82	0.23	2001	0.00	0.00	60.43	14.02	29.65	6.88	0.00	0.00	32.77	7.60	0.00	0.00	5.40	1.25	13.64	3.17	8.57	1.99	10.72	2.49
34	2319.82	0.23	2002	0.00	0.00	57.55	13.35	31.40	7.28	0.00	0.00	26.36	6.11	0.00	0.00	0.14	0.03	0.33	0.08	4.97	1.15	5.02	1.16
34	2319.82	0.23	2003	11.72	2.72	63.50	14.73	38.83	9.01	0.00	0.00	29.91	6.94	0.00	0.00	0.18	0.04	0.17	0.04	7.36	1.71	6.27	1.45
34	2319.82	0.23	2004	0.00	0.00	65.81	15.27	36.13	8.38	0.00	0.00	0.00	0.00	0.00	0.00	10.73	2.49	1.44	0.33	12.24	2.84	13.44	3.12
34	2319.82	0.23	2005	0.00	0.00	58.68	13.61	30.39	7.05	0.00	0.00	62.08	14.40	0.00	0.00	1.82	0.42	8.67	2.01	10.73	2.49	12.89	2.99
34	2319.82	0.23	2006	17.59	4.08	56.89	13.20	46.84	10.87	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.15	0.92	0.21	9.06	2.10	8.54	1.98
34	2319.82	0.23	2007	0.00	0.00	70.02	16.24	34.35	7.97	0.00	0.00	36.21	8.40	0.00	0.00	0.38	0.09	0.33	0.08	10.64	2.47	11.37	2.64
34	2319.82	0.23	2008	0.00	0.00	63.94	14.83	35.62	8.26	0.00	0.00	25.14	5.83	0.00	0.00	4.16	0.97	7.00	1.62	7.23	1.68	9.19	2.13
34	2319.82	0.23	2009	46.19	10.72	67.07	15.56	73.92	17.15	0.00	0.00	24.79	5.75	0.00	0.00	16.11	3.74	17.71	4.11	18.11	4.20	20.58	4.77
35	16813.89	1.68	1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	51.31	86.28	0.00	0.00	5.09	8.56	0.00	0.00	0.00	0.00	0.00	0.00
35	16813.89	1.68	1997	72.05	121.14	0.00	0.00	54.09	90.95	0.00	0.00	26.56	44.66	0.00	0.00	0.32	0.54	0.00	0.00	0.00	0.00	0.00	0.00
35	16813.89	1.68	1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	67.40	113.32	0.00	0.00	0.67	1.13	0.00	0.00	0.00	0.00	0.00	0.00
35	16813.89	1.68	1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.04	3.44	0.00	0.00	0.00	0.00	0.00	0.00
35	16813.89	1.68	2000	78.85	132.58	0.00	0.00	56.43	94.88	0.00	0.00	0.00	0.00	0.00	0.00	2.01	3.38	0.00	0.00	0.00	0.00	0.00	0.00
35	16813.89	1.68	2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	81.08	136.32	0.00	0.00	0.09	0.16	0.00	0.00	0.00	0.00	0.00	0.00
35	16813.89	1.68	2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.08	0.00	0.00	0.00	0.00	0.00	0.00
35	16813.89	1.68	2003	32.09	53.95	0.00	0.00	10.79	18.15	0.00	0.00	35.06	58.95	0.00	0.00	0.11	0.18	0.00	0.00	0.00	0.00	0.00	0.00
35	16813.89	1.68	2004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.49	7.54	0.00	0.00	0.00	0.00	0.00	0.00
35	16813.89	1.68	2005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	104.84	176.27	0.00	0.00	0.37	0.62	0.00	0.00	0.00	0.00	0.00	0.00
35	16813.89	1.68	2006	51.69	86.91	0.00	0.00	28.77	48.37	0.00	0.00	0.00	0.00	0.00	0.00	3.12	5.24	0.00	0.00	0.00	0.00	0.00	0.00
35	16813.89	1.68	2007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.62	75.02	0.00	0.00	0.10	0.16	0.00	0.00	0.00	0.00	0.00	0.00
35	16813.89	1.68	2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.00	73.98	0.00	0.00	0.31	0.52	0.00	0.00	0.00	0.00	0.00	0.00
35	16813.89	1.68	2009	88.94	149.55	0.00	0.00	61.11	102.75	0.00	0.00	40.04	67.32	0.00	0.00	1.25	2.10	0.00	0.00	0.00	0.00	0.00	0.00
38	6269.51	0.63	1996	0.00	0.00	31.53	19.77	0.00	0.00	0.00	0.00	33.09	20.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	6269.51	0.63	1997	49.57	31.08	29.90	18.75	35.35	22.16	0.00	0.00	23.04	14.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	6269.51	0.63	1998	0.00	0.00	28.30	17.74	0.00	0.00	0.00	0.00	50.35	31.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	6269.51	0.63	1999	0.00	0.00	31.31	19.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	6269.51	0.63	2000	49.72	31.17	29.60	18.56	39.97	25.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	6269.51	0.63	2001	0.00	0.00	28.94	18.15	0.00	0.00	0.00	0.00	59.43	37.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	6269.51	0.63	2002	0.00	0.00	28.92	18.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

38	6269.51	0.63	2003	20.76	13.02	30.69	19.24	7.55	4.73	0.00	0.00	28.34	17.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	6269.51	0.63	2004	0.00	0.00	31.50	19.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	6269.51	0.63	2005	0.00	0.00	30.16	18.91	0.00	0.00	0.00	0.00	74.85	46.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	6269.51	0.63	2006	33.34	20.90	28.64	17.95	17.80	11.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	6269.51	0.63	2007	0.00	0.00	33.59	21.06	0.00	0.00	0.00	0.00	38.23	23.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	6269.51	0.63	2008	0.00	0.00	30.91	19.38	0.00	0.00	0.00	0.00	28.35	17.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	6269.51	0.63	2009	56.44	35.38	30.51	19.13	43.31	27.15	0.00	0.00	34.44	21.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	14352.84	1.44	1996	0.00	0.00	58.74	84.30	0.00	0.00	0.00	0.00	25.30	36.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	14352.84	1.44	1997	47.03	67.50	57.69	82.81	17.86	25.64	0.00	0.00	37.97	54.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	14352.84	1.44	1998	0.00	0.00	54.81	78.67	0.00	0.00	0.00	0.00	52.04	74.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	14352.84	1.44	1999	0.00	0.00	60.51	86.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	14352.84	1.44	2000	46.83	67.22	56.60	81.23	18.80	26.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	14352.84	1.44	2001	0.00	0.00	55.78	80.05	0.00	0.00	0.00	0.00	73.98	106.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	14352.84	1.44	2002	0.00	0.00	55.54	79.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	14352.84	1.44	2003	19.19	27.54	59.18	84.94	4.16	5.97	0.00	0.00	41.68	59.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	14352.84	1.44	2004	0.00	0.00	60.11	86.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	14352.84	1.44	2005	0.00	0.00	58.05	83.31	0.00	0.00	0.00	0.00	76.32	109.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	14352.84	1.44	2006	30.73	44.10	55.07	79.04	11.60	16.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	14352.84	1.44	2007	0.00	0.00	64.39	92.42	0.00	0.00	0.00	0.00	55.31	79.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	14352.84	1.44	2008	0.00	0.00	60.21	86.42	0.00	0.00	0.00	0.00	21.11	30.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	14352.84	1.44	2009	52.80	75.78	58.20	83.54	20.38	29.25	0.00	0.00	51.30	73.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	3609.27	0.36	1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	3609.27	0.36	1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.58	7.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	3609.27	0.36	1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.86	5.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	3609.27	0.36	1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	3609.27	0.36	2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	3609.27	0.36	2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.62	10.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	3609.27	0.36	2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	3609.27	0.36	2003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.08	7.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	3609.27	0.36	2004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

42	3609.27	0.36	2005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.35	7.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	3609.27	0.36	2006	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	3609.27	0.36	2007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	28.43	10.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	3609.27	0.36	2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	3609.27	0.36	2009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	26.48	9.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45	168676.20	16.87	1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	58.77	991.24	0.00	0.00	7.80	131.52	0.00	0.00	0.00	0.00	0.00	0.00
45	168676.20	16.87	1997	84.18	1419.87	0.00	0.00	64.58	1089.24	0.00	0.00	43.06	726.35	0.00	0.00	6.10	102.96	0.00	0.00	0.00	0.00	0.00	0.00
45	168676.20	16.87	1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	79.75	1345.26	0.00	0.00	1.08	18.27	0.00	0.00	0.00	0.00	0.00	0.00
45	168676.20	16.87	1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.77	114.14	0.00	0.00	0.00	0.00	0.00	0.00
45	168676.20	16.87	2000	75.28	1269.71	0.00	0.00	61.78	1042.01	0.00	0.00	0.00	0.00	0.00	0.00	5.78	97.43	0.00	0.00	0.00	0.00	0.00	0.00
45	168676.20	16.87	2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	107.39	1811.36	0.00	0.00	0.16	2.73	0.00	0.00	0.00	0.00	0.00	0.00
45	168676.20	16.87	2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	1.77	0.00	0.00	0.00	0.00	0.00	0.00
45	168676.20	16.87	2003	27.70	467.28	0.00	0.00	11.05	186.39	0.00	0.00	48.50	818.08	0.00	0.00	0.15	2.48	0.00	0.00	0.00	0.00	0.00	0.00
45	168676.20	16.87	2004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.58	77.29	0.00	0.00	0.00	0.00	0.00	0.00
45	168676.20	16.87	2005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	123.77	2087.76	0.00	0.00	3.59	60.49	0.00	0.00	0.00	0.00	0.00	0.00
45	168676.20	16.87	2006	47.12	794.75	0.00	0.00	30.23	509.98	0.00	0.00	0.00	0.00	0.00	0.00	3.72	62.76	0.00	0.00	0.00	0.00	0.00	0.00
45	168676.20	16.87	2007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	61.43	1036.19	0.00	0.00	0.15	2.51	0.00	0.00	0.00	0.00	0.00	0.00
45	168676.20	16.87	2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.29	780.84	0.00	0.00	0.32	5.36	0.00	0.00	0.00	0.00	0.00	0.00
45	168676.20	16.87	2009	91.04	1535.58	0.00	0.00	66.21	1116.81	0.00	0.00	56.84	958.81	0.00	0.00	7.12	120.08	0.00	0.00	0.00	0.00	0.00	0.00
46	11309.21	1.13	1996	10.55	11.93	63.56	71.88	11.75	13.29	0.00	0.00	28.09	31.77	0.00	0.00	16.76	18.96	3.55	4.01	43.86	49.60	0.00	0.00
46	11309.21	1.13	1997	49.14	55.58	60.57	68.50	49.88	56.41	0.00	0.00	22.79	25.77	0.00	0.00	3.81	4.31	0.97	1.10	26.80	30.31	0.00	0.00
46	11309.21	1.13	1998	9.61	10.87	57.61	65.15	10.80	12.21	0.00	0.00	43.71	49.43	0.00	0.00	8.25	9.33	0.53	0.60	22.39	25.33	0.00	0.00
46	11309.21	1.13	1999	10.58	11.97	62.56	70.75	11.34	12.82	0.00	0.00	0.00	0.00	0.00	0.00	5.81	6.57	2.17	2.46	29.84	33.75	0.00	0.00
46	11309.21	1.13	2000	50.58	57.21	60.19	68.07	47.15	53.32	0.00	0.00	0.00	0.00	0.00	0.00	11.03	12.47	1.89	2.13	27.08	30.63	0.00	0.00
46	11309.21	1.13	2001	10.03	11.34	59.16	66.91	9.69	10.96	0.00	0.00	52.67	59.56	0.00	0.00	0.28	0.32	2.06	2.33	22.63	25.60	0.00	0.00
46	11309.21	1.13	2002	10.07	11.39	59.02	66.75	10.39	11.75	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.18	0.02	0.03	13.88	15.69	0.00	0.00
46	11309.21	1.13	2003	25.05	28.33	62.32	70.47	16.64	18.81	0.00	0.00	25.33	28.64	0.00	0.00	0.26	0.30	0.03	0.03	18.74	21.20	0.00	0.00
46	11309.21	1.13	2004	10.71	12.11	63.14	71.40	11.96	13.52	0.00	0.00	0.00	0.00	0.00	0.00	9.47	10.71	1.55	1.75	23.58	26.67	0.00	0.00
46	11309.21	1.13	2005	10.12	11.44	59.94	67.79	10.63	12.02	0.00	0.00	64.47	72.91	0.00	0.00	2.55	2.88	0.63	0.71	24.56	27.78	0.00	0.00
46	11309.21	1.13	2006	32.74	37.03	57.77	65.34	26.06	29.47	0.00	0.00	0.00	0.00	0.00	0.00	4.96	5.60	0.19	0.22	17.86	20.19	0.00	0.00

46	11309.21	1.13	2007	11.46	12.96	68.55	77.52	11.14	12.60	0.00	0.00	30.26	34.22	0.00	0.00	0.36	0.41	0.05	0.05	24.00	27.14	0.00	0.00
46	11309.21	1.13	2008	10.70	12.10	63.16	71.43	11.00	12.44	0.00	0.00	23.55	26.63	0.00	0.00	4.36	4.94	0.38	0.43	15.79	17.86	0.00	0.00
46	11309.21	1.13	2009	54.74	61.90	61.15	69.16	50.44	57.04	0.00	0.00	27.53	31.14	0.00	0.00	11.33	12.81	2.85	3.22	33.29	37.65	0.00	0.00
48	11640.60	1.16	1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	42.48	49.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	11640.60	1.16	1997	51.90	60.41	0.00	0.00	61.94	72.10	0.00	0.00	29.56	34.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	11640.60	1.16	1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	58.80	68.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	11640.60	1.16	1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	11640.60	1.16	2000	43.19	50.28	0.00	0.00	63.17	73.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	11640.60	1.16	2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.60	79.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	11640.60	1.16	2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	11640.60	1.16	2003	17.07	19.87	0.00	0.00	9.82	11.43	0.00	0.00	30.35	35.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	11640.60	1.16	2004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	11640.60	1.16	2005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	85.08	99.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	11640.60	1.16	2006	26.30	30.62	0.00	0.00	22.68	26.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	11640.60	1.16	2007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	36.40	42.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	11640.60	1.16	2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	33.50	39.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
48	11640.60	1.16	2009	48.38	56.31	0.00	0.00	67.85	78.98	0.00	0.00	34.22	39.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	15698.07	1.57	1996	0.00	0.00	10.63	16.69	0.00	0.00	16.56	26.00	29.66	46.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	15698.07	1.57	1997	55.46	87.07	9.98	15.67	22.19	34.83	11.00	17.27	48.84	76.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	15698.07	1.57	1998	0.00	0.00	9.55	14.98	0.00	0.00	10.52	16.52	65.86	103.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	15698.07	1.57	1999	0.00	0.00	10.24	16.07	0.00	0.00	13.55	21.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	15698.07	1.57	2000	62.65	98.34	10.08	15.82	20.97	32.91	11.26	17.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	15698.07	1.57	2001	0.00	0.00	9.63	15.11	0.00	0.00	12.29	19.30	89.53	140.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	15698.07	1.57	2002	0.00	0.00	9.65	15.15	0.00	0.00	2.82	4.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	15698.07	1.57	2003	21.80	34.22	10.28	16.14	2.99	4.70	2.84	4.45	53.75	84.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	15698.07	1.57	2004	0.00	0.00	10.39	16.31	0.00	0.00	7.32	11.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	15698.07	1.57	2005	0.00	0.00	9.88	15.52	0.00	0.00	9.52	14.95	91.41	143.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	15698.07	1.57	2006	34.52	54.18	9.57	15.02	7.45	11.70	4.02	6.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	15698.07	1.57	2007	0.00	0.00	11.30	17.74	0.00	0.00	6.41	10.06	63.18	99.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	15698.07	1.57	2008	0.00	0.00	10.28	16.14	0.00	0.00	6.14	9.64	24.27	38.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

52	15698.07	1.57	2009	69.47	109.06	10.16	15.95	22.41	35.18	15.65	24.56	58.00	91.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
55	7734.06	0.77	1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37.06	28.66	0.00	0.00	11.19	8.65	0.00	0.00	0.00	0.00	0.00	0.00
55	7734.06	0.77	1997	50.76	39.26	0.00	0.00	49.81	38.52	0.00	0.00	27.43	21.22	0.00	0.00	2.65	2.05	0.00	0.00	0.00	0.00	0.00	0.00
55	7734.06	0.77	1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	54.14	41.87	0.00	0.00	5.46	4.23	0.00	0.00	0.00	0.00	0.00	0.00
55	7734.06	0.77	1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.85	2.98	0.00	0.00	0.00	0.00	0.00	0.00
55	7734.06	0.77	2000	50.52	39.07	0.00	0.00	47.14	36.46	0.00	0.00	0.00	0.00	0.00	0.00	7.32	5.66	0.00	0.00	0.00	0.00	0.00	0.00
55	7734.06	0.77	2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	66.04	51.08	0.00	0.00	0.19	0.14	0.00	0.00	0.00	0.00	0.00	0.00
55	7734.06	0.77	2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.09	0.00	0.00	0.00	0.00	0.00	0.00
55	7734.06	0.77	2003	18.48	14.29	0.00	0.00	7.11	5.50	0.00	0.00	30.29	23.42	0.00	0.00	0.17	0.13	0.00	0.00	0.00	0.00	0.00	0.00
55	7734.06	0.77	2004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.55	5.07	0.00	0.00	0.00	0.00	0.00	0.00
55	7734.06	0.77	2005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	79.35	61.37	0.00	0.00	1.72	1.33	0.00	0.00	0.00	0.00	0.00	0.00
55	7734.06	0.77	2006	28.93	22.37	0.00	0.00	18.10	14.00	0.00	0.00	0.00	0.00	0.00	0.00	3.26	2.52	0.00	0.00	0.00	0.00	0.00	0.00
55	7734.06	0.77	2007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.69	27.60	0.00	0.00	0.25	0.19	0.00	0.00	0.00	0.00	0.00	0.00
55	7734.06	0.77	2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.04	23.23	0.00	0.00	3.08	2.38	0.00	0.00	0.00	0.00	0.00	0.00
55	7734.06	0.77	2009	56.30	43.54	0.00	0.00	50.42	39.00	0.00	0.00	32.59	25.20	0.00	0.00	9.14	7.07	0.00	0.00	0.00	0.00	0.00	0.00
64	19439.88	1.94	1996	0.00	0.00	73.35	142.59	49.68	96.58	0.00	0.00	20.91	40.64	0.00	0.00	12.51	24.32	0.00	0.00	0.00	0.00	12.98	25.24
64	19439.88	1.94	1997	61.74	120.01	69.90	135.89	44.37	86.25	0.00	0.00	56.24	109.33	0.00	0.00	3.13	6.08	0.00	0.00	0.00	0.00	6.98	13.57
64	19439.88	1.94	1998	0.00	0.00	66.31	128.91	37.61	73.11	0.00	0.00	60.86	118.32	0.00	0.00	1.72	3.35	0.00	0.00	0.00	0.00	7.87	15.30
64	19439.88	1.94	1999	0.00	0.00	73.50	142.88	43.42	84.40	0.00	0.00	0.00	0.00	0.00	0.00	5.59	10.87	0.00	0.00	0.00	0.00	9.47	18.41
64	19439.88	1.94	2000	44.86	87.20	69.27	134.65	42.39	82.40	0.00	0.00	0.00	0.00	0.00	0.00	4.29	8.34	0.00	0.00	0.00	0.00	7.20	14.00
64	19439.88	1.94	2001	0.00	0.00	70.26	136.58	31.24	60.73	0.00	0.00	91.81	178.48	0.00	0.00	0.23	0.45	0.00	0.00	0.00	0.00	5.44	10.58
64	19439.88	1.94	2002	0.00	0.00	68.59	133.34	8.89	17.29	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.27	0.00	0.00	0.00	0.00	2.91	5.66
64	19439.88	1.94	2003	17.72	34.45	72.33	140.61	5.81	11.29	0.00	0.00	62.28	121.08	0.00	0.00	0.22	0.44	0.00	0.00	0.00	0.00	5.61	10.90
64	19439.88	1.94	2004	0.00	0.00	73.56	143.00	36.04	70.05	0.00	0.00	0.00	0.00	0.00	0.00	9.43	18.34	0.00	0.00	0.00	0.00	8.45	16.42
64	19439.88	1.94	2005	0.00	0.00	69.54	135.19	20.86	40.55	0.00	0.00	82.63	160.62	0.00	0.00	0.83	1.61	0.00	0.00	0.00	0.00	9.51	18.48
64	19439.88	1.94	2006	29.14	56.66	68.23	132.64	11.58	22.50	0.00	0.00	0.00	0.00	0.00	0.00	6.40	12.44	0.00	0.00	0.00	0.00	5.99	11.64
64	19439.88	1.94	2007	0.00	0.00	79.56	154.66	14.03	27.28	0.00	0.00	75.53	146.84	0.00	0.00	0.22	0.42	0.00	0.00	0.00	0.00	5.78	11.23
64	19439.88	1.94	2008	0.00	0.00	74.90	145.61	21.38	41.56	0.00	0.00	14.93	29.02	0.00	0.00	0.48	0.93	0.00	0.00	0.00	0.00	6.32	12.29
64	19439.88	1.94	2009	56.80	110.41	70.85	137.74	49.64	96.50	0.00	0.00	71.65	139.29	0.00	0.00	9.28	18.03	0.00	0.00	0.00	0.00	8.75	17.02
66	22058.55	2.21	1996	0.00	0.00	31.82	70.19	60.46	133.36	0.00	0.00	24.71	54.51	0.00	0.00	8.39	18.50	0.00	0.00	0.00	0.00	0.00	0.00

66	22058.55	2.21	1997	67.79	149.53	30.75	67.82	53.29	117.56	0.00	0.00	38.26	84.38	0.00	0.00	0.38	0.83	0.00	0.00	0.00	0.00	0.00	0.00
66	22058.55	2.21	1998	0.00	0.00	29.05	64.08	43.82	96.65	0.00	0.00	53.73	118.52	0.00	0.00	3.24	7.15	0.00	0.00	0.00	0.00	0.00	0.00
66	22058.55	2.21	1999	0.00	0.00	31.58	69.65	52.80	116.47	0.00	0.00	0.00	0.00	0.00	0.00	0.66	1.46	0.00	0.00	0.00	0.00	0.00	0.00
66	22058.55	2.21	2000	64.63	142.57	30.17	66.55	51.75	114.16	0.00	0.00	0.00	0.00	0.00	0.00	5.04	11.12	0.00	0.00	0.00	0.00	0.00	0.00
66	22058.55	2.21	2001	0.00	0.00	30.11	66.41	41.12	90.71	0.00	0.00	71.93	158.67	0.00	0.00	0.12	0.26	0.00	0.00	0.00	0.00	0.00	0.00
66	22058.55	2.21	2002	0.00	0.00	30.01	66.20	11.67	25.74	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.17	0.00	0.00	0.00	0.00	0.00	0.00
66	22058.55	2.21	2003	24.15	53.27	31.49	69.45	8.43	18.60	0.00	0.00	40.83	90.07	0.00	0.00	0.11	0.24	0.00	0.00	0.00	0.00	0.00	0.00
66	22058.55	2.21	2004	0.00	0.00	31.53	69.55	43.15	95.19	0.00	0.00	0.00	0.00	0.00	0.00	5.08	11.20	0.00	0.00	0.00	0.00	0.00	0.00
66	22058.55	2.21	2005	0.00	0.00	30.33	66.90	28.46	62.77	0.00	0.00	72.29	159.46	0.00	0.00	1.45	3.19	0.00	0.00	0.00	0.00	0.00	0.00
66	22058.55	2.21	2006	37.66	83.08	29.01	63.99	14.63	32.27	0.00	0.00	0.00	0.00	0.00	0.00	2.31	5.09	0.00	0.00	0.00	0.00	0.00	0.00
66	22058.55	2.21	2007	0.00	0.00	34.52	76.15	18.96	41.82	0.00	0.00	48.75	107.54	0.00	0.00	0.18	0.40	0.00	0.00	0.00	0.00	0.00	0.00
66	22058.55	2.21	2008	0.00	0.00	31.97	70.53	25.55	56.37	0.00	0.00	19.36	42.71	0.00	0.00	2.31	5.09	0.00	0.00	0.00	0.00	0.00	0.00
66	22058.55	2.21	2009	71.56	157.86	30.77	67.88	61.59	135.86	0.00	0.00	44.86	98.96	0.00	0.00	6.40	14.11	0.00	0.00	0.00	0.00	0.00	0.00
68	14881.86	1.49	1996	0.00	0.00	0.00	0.00	44.17	65.74	0.00	0.00	6.94	10.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	14881.86	1.49	1997	20.48	30.48	0.00	0.00	39.37	58.58	0.00	0.00	30.41	45.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	14881.86	1.49	1998	0.00	0.00	0.00	0.00	33.30	49.55	0.00	0.00	29.93	44.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	14881.86	1.49	1999	0.00	0.00	0.00	0.00	38.58	57.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	14881.86	1.49	2000	14.94	22.23	0.00	0.00	37.63	56.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	14881.86	1.49	2001	0.00	0.00	0.00	0.00	27.70	41.23	0.00	0.00	48.75	72.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	14881.86	1.49	2002	0.00	0.00	0.00	0.00	7.90	11.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	14881.86	1.49	2003	5.90	8.78	0.00	0.00	5.15	7.67	0.00	0.00	32.33	48.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	14881.86	1.49	2004	0.00	0.00	0.00	0.00	32.01	47.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	14881.86	1.49	2005	0.00	0.00	0.00	0.00	18.52	27.56	0.00	0.00	40.48	60.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	14881.86	1.49	2006	9.66	14.37	0.00	0.00	10.29	15.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	14881.86	1.49	2007	0.00	0.00	0.00	0.00	12.47	18.56	0.00	0.00	44.18	65.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	14881.86	1.49	2008	0.00	0.00	0.00	0.00	19.00	28.27	0.00	0.00	4.98	7.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	14881.86	1.49	2009	18.92	28.16	0.00	0.00	44.12	65.66	0.00	0.00	40.95	60.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	9492.56	0.95	1996	0.00	0.00	0.00	0.00	16.82	15.96	0.00	0.00	14.73	13.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	9492.56	0.95	1997	39.24	37.25	0.00	0.00	15.85	15.04	0.00	0.00	31.72	30.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	9492.56	0.95	1998	0.00	0.00	0.00	0.00	10.88	10.33	0.00	0.00	37.95	36.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

69	9492.56	0.95	1999	0.00	0.00	0.00	0.00	14.16	13.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	9492.56	0.95	2000	41.01	38.93	0.00	0.00	13.82	13.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	9492.56	0.95	2001	0.00	0.00	0.00	0.00	10.29	9.77	0.00	0.00	53.81	51.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	9492.56	0.95	2002	0.00	0.00	0.00	0.00	3.07	2.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	9492.56	0.95	2003	14.69	13.95	0.00	0.00	1.85	1.75	0.00	0.00	32.95	31.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	9492.56	0.95	2004	0.00	0.00	0.00	0.00	11.87	11.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	9492.56	0.95	2005	0.00	0.00	0.00	0.00	6.83	6.48	0.00	0.00	51.03	48.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	9492.56	0.95	2006	23.05	21.88	0.00	0.00	3.83	3.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	9492.56	0.95	2007	0.00	0.00	0.00	0.00	4.96	4.71	0.00	0.00	39.46	37.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	9492.56	0.95	2008	0.00	0.00	0.00	0.00	7.13	6.77	0.00	0.00	11.86	11.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
69	9492.56	0.95	2009	45.93	43.60	0.00	0.00	16.80	15.95	0.00	0.00	36.85	34.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	17.28	0.00	1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	17.28	0.00	1997	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	17.28	0.00	1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	17.28	0.00	1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	17.28	0.00	2000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	17.28	0.00	2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	17.28	0.00	2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	17.28	0.00	2003	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	17.28	0.00	2004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	17.28	0.00	2005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	17.28	0.00	2006	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	17.28	0.00	2007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	17.28	0.00	2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
70	17.28	0.00	2009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	12034.80	1.20	1996	0.00	0.00	0.00	0.00	16.79	20.21	0.00	0.00	11.98	14.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	12034.80	1.20	1997	34.22	41.19	0.00	0.00	13.41	16.14	0.00	0.00	17.30	20.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	12034.80	1.20	1998	0.00	0.00	0.00	0.00	10.86	13.07	0.00	0.00	23.30	28.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	12034.80	1.20	1999	0.00	0.00	0.00	0.00	14.04	16.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	12034.80	1.20	2000	28.32	34.08	0.00	0.00	14.01	16.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

71	12034.80	1.20	2001	0.00	0.00	0.00	0.00	10.33	12.43	0.00	0.00	30.50	36.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	12034.80	1.20	2002	0.00	0.00	0.00	0.00	2.80	3.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	12034.80	1.20	2003	11.34	13.65	0.00	0.00	1.82	2.18	0.00	0.00	15.85	19.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	12034.80	1.20	2004	0.00	0.00	0.00	0.00	11.15	13.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	12034.80	1.20	2005	0.00	0.00	0.00	0.00	6.64	8.00	0.00	0.00	30.91	37.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	12034.80	1.20	2006	17.52	21.09	0.00	0.00	3.70	4.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	12034.80	1.20	2007	0.00	0.00	0.00	0.00	4.54	5.46	0.00	0.00	19.98	24.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	12034.80	1.20	2008	0.00	0.00	0.00	0.00	6.78	8.15	0.00	0.00	8.99	10.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
71	12034.80	1.20	2009	30.72	36.97	0.00	0.00	16.78	20.19	0.00	0.00	19.26	23.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	3799.98	0.38	1996	0.00	0.00	0.00	0.00	16.72	6.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	3799.98	0.38	1997	0.00	0.00	0.00	0.00	14.12	5.37	0.00	0.00	12.91	4.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	3799.98	0.38	1998	0.00	0.00	0.00	0.00	11.82	4.49	0.00	0.00	11.09	4.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	3799.98	0.38	1999	0.00	0.00	0.00	0.00	14.22	5.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	3799.98	0.38	2000	0.00	0.00	0.00	0.00	14.25	5.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	3799.98	0.38	2001	0.00	0.00	0.00	0.00	10.53	4.00	0.00	0.00	19.36	7.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	3799.98	0.38	2002	0.00	0.00	0.00	0.00	2.78	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	3799.98	0.38	2003	0.00	0.00	0.00	0.00	2.02	0.77	0.00	0.00	15.55	5.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	3799.98	0.38	2004	0.00	0.00	0.00	0.00	11.53	4.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	3799.98	0.38	2005	0.00	0.00	0.00	0.00	6.86	2.61	0.00	0.00	14.32	5.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	3799.98	0.38	2006	0.00	0.00	0.00	0.00	3.67	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	3799.98	0.38	2007	0.00	0.00	0.00	0.00	4.57	1.74	0.00	0.00	20.93	7.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	3799.98	0.38	2008	0.00	0.00	0.00	0.00	6.80	2.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	3799.98	0.38	2009	0.00	0.00	0.00	0.00	16.79	6.38	0.00	0.00	18.89	7.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.01	0.00	1996	0.00	0.00	0.00	0.00	39.21	0.00	0.00	0.00	24.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.01	0.00	1997	64.23	0.00	0.00	0.00	33.70	0.00	0.00	0.00	30.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.01	0.00	1998	0.00	0.00	0.00	0.00	25.33	0.00	0.00	0.00	47.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.01	0.00	1999	0.00	0.00	0.00	0.00	32.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.01	0.00	2000	57.97	0.00	0.00	0.00	32.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.01	0.00	2001	0.00	0.00	0.00	0.00	24.05	0.00	0.00	0.00	59.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.01	0.00	2002	0.00	0.00	0.00	0.00	6.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

78	0.01	0.00	2003	24.67	0.00	0.00	0.00	4.27	0.00	0.00	0.00	32.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.01	0.00	2004	0.00	0.00	0.00	0.00	26.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.01	0.00	2005	0.00	0.00	0.00	0.00	15.68	0.00	0.00	0.00	64.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.01	0.00	2006	36.70	0.00	0.00	0.00	8.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.01	0.00	2007	0.00	0.00	0.00	0.00	11.00	0.00	0.00	0.00	40.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.01	0.00	2008	0.00	0.00	0.00	0.00	16.15	0.00	0.00	0.00	18.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.01	0.00	2009	63.01	0.00	0.00	0.00	39.17	0.00	0.00	0.00	37.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
79	3965.47	0.40	1996	0.00	0.00	46.17	18.31	25.86	10.26	0.00	0.00	5.64	2.23	0.00	0.00	7.37	2.92	0.00	0.00	0.00	0.00	0.00	0.00
79	3965.47	0.40	1997	16.41	6.51	51.69	20.50	10.78	4.27	0.00	0.00	33.55	13.30	0.00	0.00	0.21	0.08	0.00	0.00	0.00	0.00	0.00	0.00
79	3965.47	0.40	1998	0.00	0.00	48.98	19.42	24.18	9.59	0.00	0.00	42.87	17.00	0.00	0.00	6.18	2.45	0.00	0.00	0.00	0.00	0.00	0.00
79	3965.47	0.40	1999	0.00	0.00	50.07	19.85	12.11	4.80	0.00	0.00	0.00	0.00	0.00	0.00	2.60	1.03	0.00	0.00	0.00	0.00	0.00	0.00
79	3965.47	0.40	2000	8.33	3.30	49.54	19.65	6.43	2.55	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.11	0.00	0.00	0.00	0.00	0.00	0.00
79	3965.47	0.40	2001	0.00	0.00	48.79	19.35	19.14	7.59	0.00	0.00	28.79	11.42	0.00	0.00	4.73	1.87	0.00	0.00	0.00	0.00	0.00	0.00
79	3965.47	0.40	2002	0.00	0.00	45.88	18.20	2.99	1.19	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00
79	3965.47	0.40	2003	15.56	6.17	50.47	20.02	7.82	3.10	0.00	0.00	34.47	13.67	0.00	0.00	3.23	1.28	0.00	0.00	0.00	0.00	0.00	0.00
79	3965.47	0.40	2004	0.00	0.00	49.42	19.60	28.16	11.17	0.00	0.00	0.00	0.00	0.00	0.00	5.24	2.08	0.00	0.00	0.00	0.00	0.00	0.00
79	3965.47	0.40	2005	0.00	0.00	50.06	19.85	18.12	7.19	0.00	0.00	66.43	26.34	0.00	0.00	7.24	2.87	0.00	0.00	0.00	0.00	0.00	0.00
79	3965.47	0.40	2006	15.61	6.19	47.46	18.82	9.98	3.96	0.00	0.00	0.00	0.00	0.00	0.00	1.85	0.73	0.00	0.00	0.00	0.00	0.00	0.00
79	3965.47	0.40	2007	0.00	0.00	54.75	21.71	7.97	3.16	0.00	0.00	48.02	19.04	0.00	0.00	0.22	0.09	0.00	0.00	0.00	0.00	0.00	0.00
79	3965.47	0.40	2008	0.00	0.00	48.65	19.29	4.22	1.67	0.00	0.00	4.88	1.93	0.00	0.00	0.09	0.03	0.00	0.00	0.00	0.00	0.00	0.00
79	3965.47	0.40	2009	14.44	5.73	51.19	20.30	14.67	5.82	0.00	0.00	36.46	14.46	0.00	0.00	3.39	1.34	0.00	0.00	0.00	0.00	0.00	0.00
82	10551.37	1.06	1996	0.00	0.00	73.40	77.45	90.59	95.58	0.00	0.00	11.62	12.26	0.00	0.00	7.80	8.23	0.00	0.00	0.00	0.00	0.00	0.00
82	10551.37	1.06	1997	34.30	36.19	70.15	74.01	77.21	81.47	0.00	0.00	50.53	53.32	0.00	0.00	1.93	2.04	0.00	0.00	0.00	0.00	0.00	0.00
82	10551.37	1.06	1998	0.00	0.00	66.10	69.74	71.59	75.54	0.00	0.00	49.20	51.91	0.00	0.00	0.84	0.88	0.00	0.00	0.00	0.00	0.00	0.00
82	10551.37	1.06	1999	0.00	0.00	73.37	77.41	81.63	86.13	0.00	0.00	0.00	0.00	0.00	0.00	2.70	2.84	0.00	0.00	0.00	0.00	0.00	0.00
82	10551.37	1.06	2000	24.90	26.27	69.04	72.85	77.46	81.73	0.00	0.00	0.00	0.00	0.00	0.00	2.01	2.12	0.00	0.00	0.00	0.00	0.00	0.00
82	10551.37	1.06	2001	0.00	0.00	70.05	73.91	60.05	63.36	0.00	0.00	78.43	82.76	0.00	0.00	0.12	0.13	0.00	0.00	0.00	0.00	0.00	0.00
82	10551.37	1.06	2002	0.00	0.00	69.17	72.98	37.09	39.14	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.08	0.00	0.00	0.00	0.00	0.00	0.00
82	10551.37	1.06	2003	9.84	10.39	72.76	76.77	33.74	35.60	0.00	0.00	56.24	59.34	0.00	0.00	0.11	0.11	0.00	0.00	0.00	0.00	0.00	0.00
82	10551.37	1.06	2004	0.00	0.00	73.36	77.40	71.35	75.29	0.00	0.00	0.00	0.00	0.00	0.00	4.64	4.89	0.00	0.00	0.00	0.00	0.00	0.00

82	10551.37	1.06	2005	0.00	0.00	70.10	73.97	53.50	56.45	0.00	0.00	66.55	70.22	0.00	0.00	0.44	0.46	0.00	0.00	0.00	0.00	0.00	0.00
82	10551.37	1.06	2006	16.19	17.08	67.14	70.84	41.94	44.25	0.00	0.00	0.00	0.00	0.00	0.00	3.21	3.39	0.00	0.00	0.00	0.00	0.00	0.00
82	10551.37	1.06	2007	0.00	0.00	79.95	84.36	44.16	46.59	0.00	0.00	67.21	70.92	0.00	0.00	0.12	0.13	0.00	0.00	0.00	0.00	0.00	0.00
82	10551.37	1.06	2008	0.00	0.00	74.31	78.41	55.21	58.26	0.00	0.00	8.27	8.73	0.00	0.00	0.21	0.22	0.00	0.00	0.00	0.00	0.00	0.00
82	10551.37	1.06	2009	31.47	33.20	70.90	74.80	87.93	92.78	0.00	0.00	64.59	68.15	0.00	0.00	6.39	6.75	0.00	0.00	0.00	0.00	0.00	0.00
90	7340.77	0.73	1996	0.00	0.00	58.88	43.22	30.26	22.21	0.00	0.00	19.31	14.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	7340.77	0.73	1997	47.23	34.67	58.62	43.03	23.08	16.94	0.00	0.00	25.38	18.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	7340.77	0.73	1998	0.00	0.00	53.61	39.35	20.81	15.28	0.00	0.00	43.56	31.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	7340.77	0.73	1999	0.00	0.00	60.69	44.55	25.99	19.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	7340.77	0.73	2000	46.84	34.38	55.52	40.76	25.25	18.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	7340.77	0.73	2001	0.00	0.00	56.58	41.53	17.98	13.20	0.00	0.00	55.14	40.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	7340.77	0.73	2002	0.00	0.00	56.85	41.73	4.54	3.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	7340.77	0.73	2003	22.72	16.68	59.71	43.83	3.81	2.80	0.00	0.00	36.67	26.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	7340.77	0.73	2004	0.00	0.00	59.06	43.35	19.40	14.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	7340.77	0.73	2005	0.00	0.00	57.70	42.36	13.02	9.56	0.00	0.00	57.38	42.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	7340.77	0.73	2006	30.93	22.71	55.93	41.06	6.67	4.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	7340.77	0.73	2007	0.00	0.00	64.74	47.52	7.62	5.60	0.00	0.00	47.46	34.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	7340.77	0.73	2008	0.00	0.00	61.36	45.05	13.01	9.55	0.00	0.00	13.63	10.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
90	7340.77	0.73	2009	50.35	36.96	58.41	42.88	29.47	21.63	0.00	0.00	43.54	31.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
91	3155.72	0.32	1996	0.00	0.00	89.94	28.38	56.62	17.87	0.00	0.00	4.62	1.46	0.00	0.00	0.00	0.00	3.49	1.10	0.00	0.00	29.95	9.45
91	3155.72	0.32	1997	13.67	4.31	88.16	27.82	46.53	14.68	0.00	0.00	55.55	17.53	0.00	0.00	0.00	0.00	0.55	0.17	0.00	0.00	16.72	5.28
91	3155.72	0.32	1998	0.00	0.00	82.94	26.17	43.76	13.81	0.00	0.00	55.27	17.44	0.00	0.00	0.00	0.00	1.18	0.37	0.00	0.00	16.10	5.08
91	3155.72	0.32	1999	0.00	0.00	92.49	29.19	50.86	16.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.11	0.67	0.00	0.00	20.01	6.31
91	3155.72	0.32	2000	9.96	3.14	86.10	27.17	47.96	15.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82	0.57	0.00	0.00	15.91	5.02
91	3155.72	0.32	2001	0.00	0.00	86.50	27.30	36.13	11.40	0.00	0.00	94.81	29.92	0.00	0.00	0.00	0.00	1.77	0.56	0.00	0.00	12.36	3.90
91	3155.72	0.32	2002	0.00	0.00	85.50	26.98	17.85	5.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	6.97	2.20
91	3155.72	0.32	2003	3.93	1.24	90.90	28.68	16.24	5.13	0.00	0.00	74.83	23.61	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.00	10.92	3.45
91	3155.72	0.32	2004	0.00	0.00	91.51	28.88	41.92	13.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82	0.57	0.00	0.00	17.34	5.47
91	3155.72	0.32	2005	0.00	0.00	88.36	27.88	30.72	9.69	0.00	0.00	74.23	23.43	0.00	0.00	0.00	0.00	0.19	0.06	0.00	0.00	18.92	5.97
91	3155.72	0.32	2006	6.44	2.03	83.82	26.45	21.44	6.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.05	0.00	0.00	11.86	3.74

91	3155.72	0.32	2007	0.00	0.00	99.38	31.36	22.92	7.23	0.00	0.00	92.99	29.35	0.00	0.00	0.00	0.00	0.04	0.01	0.00	0.00	13.99	4.42
91	3155.72	0.32	2008	0.00	0.00	92.88	29.31	31.45	9.92	0.00	0.00	3.32	1.05	0.00	0.00	0.00	0.00	0.54	0.17	0.00	0.00	12.29	3.88
91	3155.72	0.32	2009	12.63	3.99	88.06	27.79	54.85	17.31	0.00	0.00	86.99	27.45	0.00	0.00	0.00	0.00	2.73	0.86	0.00	0.00	21.16	6.68
98	1253.14	0.13	1996	0.00	0.00	31.67	3.97	56.01	7.02	0.00	0.00	11.98	1.50	0.00	0.00	13.97	1.75	0.00	0.00	0.00	0.00	0.00	0.00
98	1253.14	0.13	1997	34.19	4.28	30.10	3.77	47.98	6.01	0.00	0.00	39.29	4.92	0.00	0.00	0.72	0.09	0.00	0.00	0.00	0.00	0.00	0.00
98	1253.14	0.13	1998	0.00	0.00	28.68	3.59	40.56	5.08	0.00	0.00	41.26	5.17	0.00	0.00	5.94	0.74	0.00	0.00	0.00	0.00	0.00	0.00
98	1253.14	0.13	1999	0.00	0.00	31.22	3.91	48.31	6.05	0.00	0.00	0.00	0.00	0.00	0.00	1.34	0.17	0.00	0.00	0.00	0.00	0.00	0.00
98	1253.14	0.13	2000	28.30	3.55	29.80	3.73	47.96	6.01	0.00	0.00	0.00	0.00	0.00	0.00	8.69	1.09	0.00	0.00	0.00	0.00	0.00	0.00
98	1253.14	0.13	2001	0.00	0.00	30.24	3.79	36.17	4.53	0.00	0.00	61.70	7.73	0.00	0.00	0.21	0.03	0.00	0.00	0.00	0.00	0.00	0.00
98	1253.14	0.13	2002	0.00	0.00	30.36	3.80	13.79	1.73	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00
98	1253.14	0.13	2003	11.34	1.42	31.13	3.90	11.25	1.41	0.00	0.00	43.01	5.39	0.00	0.00	0.19	0.02	0.00	0.00	0.00	0.00	0.00	0.00
98	1253.14	0.13	2004	0.00	0.00	31.74	3.98	40.43	5.07	0.00	0.00	0.00	0.00	0.00	0.00	7.94	1.00	0.00	0.00	0.00	0.00	0.00	0.00
98	1253.14	0.13	2005	0.00	0.00	30.17	3.78	25.96	3.25	0.00	0.00	54.64	6.85	0.00	0.00	2.25	0.28	0.00	0.00	0.00	0.00	0.00	0.00
98	1253.14	0.13	2006	17.52	2.20	29.28	3.67	16.58	2.08	0.00	0.00	0.00	0.00	0.00	0.00	3.81	0.48	0.00	0.00	0.00	0.00	0.00	0.00
98	1253.14	0.13	2007	0.00	0.00	34.24	4.29	19.28	2.42	0.00	0.00	50.31	6.30	0.00	0.00	0.28	0.03	0.00	0.00	0.00	0.00	0.00	0.00
98	1253.14	0.13	2008	0.00	0.00	31.98	4.01	25.97	3.25	0.00	0.00	8.98	1.13	0.00	0.00	4.08	0.51	0.00	0.00	0.00	0.00	0.00	0.00
98	1253.14	0.13	2009	30.69	3.85	30.74	3.85	55.98	7.02	0.00	0.00	48.13	6.03	0.00	0.00	8.19	1.03	0.00	0.00	0.00	0.00	0.00	0.00
104	2581.49	0.26	1996	0.00	0.00	19.68	5.08	27.92	7.21	0.00	0.00	0.00	0.00	0.00	0.00	2.80	0.72	0.00	0.00	0.00	0.00	0.00	0.00
104	2581.49	0.26	1997	0.00	0.00	19.63	5.07	21.29	5.49	0.00	0.00	25.41	6.56	0.00	0.00	0.26	0.07	0.00	0.00	0.00	0.00	0.00	0.00
104	2581.49	0.26	1998	0.00	0.00	17.85	4.61	20.85	5.38	0.00	0.00	23.72	6.12	0.00	0.00	1.33	0.34	0.00	0.00	0.00	0.00	0.00	0.00
104	2581.49	0.26	1999	0.00	0.00	20.33	5.25	25.28	6.53	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.08	0.00	0.00	0.00	0.00	0.00	0.00
104	2581.49	0.26	2000	0.00	0.00	18.54	4.79	23.81	6.15	0.00	0.00	0.00	0.00	0.00	0.00	1.80	0.46	0.00	0.00	0.00	0.00	0.00	0.00
104	2581.49	0.26	2001	0.00	0.00	18.93	4.89	17.14	4.42	0.00	0.00	41.30	10.66	0.00	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00
104	2581.49	0.26	2002	0.00	0.00	19.00	4.91	7.96	2.06	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
104	2581.49	0.26	2003	0.00	0.00	19.87	5.13	8.23	2.12	0.00	0.00	35.02	9.04	0.00	0.00	0.04	0.01	0.00	0.00	0.00	0.00	0.00	0.00
104	2581.49	0.26	2004	0.00	0.00	19.73	5.09	19.32	4.99	0.00	0.00	0.00	0.00	0.00	0.00	1.61	0.41	0.00	0.00	0.00	0.00	0.00	0.00
104	2581.49	0.26	2005	0.00	0.00	19.25	4.97	15.64	4.04	0.00	0.00	30.77	7.94	0.00	0.00	0.42	0.11	0.00	0.00	0.00	0.00	0.00	0.00
104	2581.49	0.26	2006	0.00	0.00	18.65	4.81	10.23	2.64	0.00	0.00	0.00	0.00	0.00	0.00	0.73	0.19	0.00	0.00	0.00	0.00	0.00	0.00
104	2581.49	0.26	2007	0.00	0.00	21.59	5.57	10.72	2.77	0.00	0.00	43.24	11.16	0.00	0.00	0.06	0.01	0.00	0.00	0.00	0.00	0.00	0.00
104	2581.49	0.26	2008	0.00	0.00	20.46	5.28	15.72	4.06	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.23	0.00	0.00	0.00	0.00	0.00	0.00

104	2581.49	0.26	2009	0.00	0.00	19.50	5.03	27.12	7.00	0.00	0.00	40.61	10.48	0.00	0.00	2.07	0.54	0.00	0.00	0.00	0.00	0.00	0.00
124	84.15	0.01	1996	0.00	0.00	91.75	0.77	59.19	0.50	0.00	0.00	1.41	0.01	0.00	0.00	5.60	0.05	7.79	0.07	0.00	0.00	0.00	0.00
124	84.15	0.01	1997	4.12	0.03	101.62	0.86	41.13	0.35	0.00	0.00	55.08	0.46	0.00	0.00	0.16	0.00	0.52	0.00	0.00	0.00	0.00	0.00
124	84.15	0.01	1998	0.00	0.00	94.70	0.80	56.91	0.48	0.00	0.00	54.58	0.46	0.00	0.00	4.83	0.04	2.79	0.02	0.00	0.00	0.00	0.00
124	84.15	0.01	1999	0.00	0.00	98.92	0.83	39.44	0.33	0.00	0.00	0.00	0.00	0.00	0.00	2.09	0.02	0.23	0.00	0.00	0.00	0.00	0.00
124	84.15	0.01	2000	2.06	0.02	94.52	0.80	31.97	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.11	0.00	0.00	0.00	0.00	0.00
124	84.15	0.01	2001	0.00	0.00	96.41	0.81	47.15	0.40	0.00	0.00	44.42	0.37	0.00	0.00	4.02	0.03	5.14	0.04	0.00	0.00	0.00	0.00
124	84.15	0.01	2002	0.00	0.00	88.17	0.74	27.89	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.10	0.00	0.00	0.00	0.00	0.00
124	84.15	0.01	2003	3.92	0.03	99.74	0.84	36.10	0.30	0.00	0.00	57.44	0.48	0.00	0.00	2.94	0.02	0.14	0.00	0.00	0.00	0.00	0.00
124	84.15	0.01	2004	0.00	0.00	97.51	0.82	62.00	0.52	0.00	0.00	0.00	0.00	0.00	0.00	4.12	0.03	7.96	0.07	0.00	0.00	0.00	0.00
124	84.15	0.01	2005	0.00	0.00	98.21	0.83	52.87	0.44	0.00	0.00	85.66	0.72	0.00	0.00	5.58	0.05	0.22	0.00	0.00	0.00	0.00	0.00
124	84.15	0.01	2006	3.87	0.03	91.03	0.77	39.14	0.33	0.00	0.00	0.00	0.00	0.00	0.00	1.76	0.01	3.03	0.03	0.00	0.00	0.00	0.00
124	84.15	0.01	2007	0.00	0.00	105.87	0.89	34.69	0.29	0.00	0.00	73.23	0.62	0.00	0.00	0.17	0.00	0.13	0.00	0.00	0.00	0.00	0.00
124	84.15	0.01	2008	0.00	0.00	92.35	0.78	30.58	0.26	0.00	0.00	1.23	0.01	0.00	0.00	0.06	0.00	0.65	0.01	0.00	0.00	0.00	0.00
124	84.15	0.01	2009	3.60	0.03	99.19	0.83	45.18	0.38	0.00	0.00	57.93	0.49	0.00	0.00	3.00	0.03	0.48	0.00	0.00	0.00	0.00	0.00

Russell County

SUB	Area (m)	Area (ha)	Year	CORN (t)	CORN*A (t/ha)	IRCN (t)	IRCN* A (t/ha)	GRSG (t)	GRSG*A (t/ha)	IRGS (t)	IRGS*A (t/ha)	WWHT (t)	WWHT* A (t/ha)	IRWW (t)	IRWW *A (t/ha)	SOYB (t)	SOYB*A (t/ha)	IRSB (t)	IRSB*A (t/ha)	ALFA (t)	ALFA*A (t/ha)	IRAL (t)	IRAL*A (t/ha)
103	2835.03	0.28	1996	0.00	0.00	0.00	0.00	59.16	16.77	0.00	0.00	34.19	9.69	0.00	0.00	14.82	4.20	0.00	0.00	31.85	9.03	0.00	0.00
103	2835.03	0.28	1997	93.53	26.52	0.00	0.00	49.88	14.14	0.00	0.00	59.57	16.89	0.00	0.00	13.60	3.86	0.00	0.00	31.31	8.88	0.00	0.00
103	2835.03	0.28	1998	0.00	0.00	0.00	0.00	53.80	15.25	0.00	0.00	86.44	24.51	0.00	0.00	10.44	2.96	0.00	0.00	20.31	5.76	0.00	0.00
103	2835.03	0.28	1999	0.00	0.00	0.00	0.00	60.54	17.16	0.00	0.00	0.00	0.00	0.00	0.00	17.43	4.94	0.00	0.00	37.28	10.57	0.00	0.00
103	2835.03	0.28	2000	100.21	28.41	0.00	0.00	56.26	15.95	0.00	0.00	0.00	0.00	0.00	0.00	17.25	4.89	0.00	0.00	39.36	11.16	0.00	0.00
103	2835.03	0.28	2001	0.00	0.00	0.00	0.00	33.90	9.61	0.00	0.00	78.27	22.19	0.00	0.00	3.23	0.92	0.00	0.00	28.26	8.01	0.00	0.00
103	2835.03	0.28	2002	0.00	0.00	0.00	0.00	16.24	4.60	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.07	0.00	0.00	19.49	5.53	0.00	0.00
103	2835.03	0.28	2003	33.15	9.40	0.00	0.00	14.99	4.25	0.00	0.00	50.30	14.26	0.00	0.00	0.31	0.09	0.00	0.00	25.96	7.36	0.00	0.00
103	2835.03	0.28	2004	0.00	0.00	0.00	0.00	59.01	16.73	0.00	0.00	57.69	16.35	0.00	0.00	12.76	3.62	0.00	0.00	23.18	6.57	0.00	0.00
103	2835.03	0.28	2005	0.00	0.00	0.00	0.00	33.55	9.51	0.00	0.00	0.00	0.00	0.00	0.00	9.22	2.61	0.00	0.00	26.16	7.42	0.00	0.00
103	2835.03	0.28	2006	64.68	18.34	0.00	0.00	28.84	8.18	0.00	0.00	0.00	0.00	0.00	0.00	11.23	3.18	0.00	0.00	29.47	8.36	0.00	0.00
103	2835.03	0.28	2007	0.00	0.00	0.00	0.00	61.43	17.42	0.00	0.00	82.00	23.25	0.00	0.00	21.94	6.22	0.00	0.00	49.96	14.16	0.00	0.00

103	2835.03	0.28	2008	0.00	0.00	0.00	0.00	59.68	16.92	0.00	0.00	0.00	0.00	0.00	0.00	16.24	4.61	0.00	0.00	36.80	10.43	0.00	0.00
103	2835.03	0.28	2009	110.45	31.31	0.00	0.00	62.25	17.65	0.00	0.00	58.26	16.52	0.00	0.00	19.33	5.48	0.00	0.00	40.38	11.45	0.00	0.00
106	8138.23	0.81	1996	0.00	0.00	0.00	0.00	65.63	53.41	0.00	0.00	32.92	26.79	0.00	0.00	14.62	11.89	0.00	0.00	31.24	25.42	0.00	0.00
106	8138.23	0.81	1997	88.48	72.00	0.00	0.00	55.61	45.25	0.00	0.00	49.21	40.05	0.00	0.00	13.86	11.28	0.00	0.00	31.70	25.80	0.00	0.00
106	8138.23	0.81	1998	0.00	0.00	0.00	0.00	58.59	47.68	0.00	0.00	73.77	60.03	0.00	0.00	10.34	8.41	0.00	0.00	19.93	16.22	0.00	0.00
106	8138.23	0.81	1999	0.00	0.00	0.00	0.00	66.03	53.73	0.00	0.00	0.00	0.00	0.00	0.00	17.75	14.44	0.00	0.00	37.44	30.47	0.00	0.00
106	8138.23	0.81	2000	95.96	78.09	0.00	0.00	61.53	50.08	0.00	0.00	0.00	0.00	0.00	0.00	17.29	14.07	0.00	0.00	39.22	31.92	0.00	0.00
106	8138.23	0.81	2001	0.00	0.00	0.00	0.00	47.04	38.28	0.00	0.00	67.83	55.20	0.00	0.00	3.83	3.12	0.00	0.00	28.62	23.29	0.00	0.00
106	8138.23	0.81	2002	0.00	0.00	0.00	0.00	18.44	15.01	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.22	0.00	0.00	20.00	16.28	0.00	0.00
106	8138.23	0.81	2003	30.64	24.94	0.00	0.00	16.84	13.71	0.00	0.00	41.41	33.70	0.00	0.00	0.31	0.25	0.00	0.00	25.87	21.06	0.00	0.00
106	8138.23	0.81	2004	0.00	0.00	0.00	0.00	63.84	51.96	0.00	0.00	49.59	40.36	0.00	0.00	12.50	10.18	0.00	0.00	22.75	18.51	0.00	0.00
106	8138.23	0.81	2005	0.00	0.00	0.00	0.00	35.68	29.03	0.00	0.00	0.00	0.00	0.00	0.00	9.05	7.36	0.00	0.00	25.98	21.14	0.00	0.00
106	8138.23	0.81	2006	59.07	48.07	0.00	0.00	29.31	23.85	0.00	0.00	0.00	0.00	0.00	0.00	11.00	8.95	0.00	0.00	29.23	23.79	0.00	0.00
106	8138.23	0.81	2007	0.00	0.00	0.00	0.00	67.01	54.54	0.00	0.00	72.22	58.78	0.00	0.00	22.14	18.02	0.00	0.00	50.56	41.15	0.00	0.00
106	8138.23	0.81	2008	0.00	0.00	0.00	0.00	65.59	53.38	0.00	0.00	0.00	0.00	0.00	0.00	16.55	13.46	0.00	0.00	36.52	29.72	0.00	0.00
106	8138.23	0.81	2009	104.09	84.71	0.00	0.00	68.00	55.34	0.00	0.00	47.03	38.28	0.00	0.00	19.42	15.80	0.00	0.00	40.40	32.88	0.00	0.00
109	10762.47	1.08	1996	0.00	0.00	0.00	0.00	82.05	88.30	0.00	0.00	35.99	38.74	0.00	0.00	16.98	18.27	0.00	0.00	26.02	28.00	0.00	0.00
109	10762.47	1.08	1997	96.47	103.83	0.00	0.00	69.93	75.26	0.00	0.00	70.54	75.92	0.00	0.00	15.58	16.77	0.00	0.00	26.48	28.49	0.00	0.00
109	10762.47	1.08	1998	0.00	0.00	0.00	0.00	73.24	78.83	0.00	0.00	93.57	100.70	0.00	0.00	11.93	12.84	0.00	0.00	16.20	17.43	0.00	0.00
109	10762.47	1.08	1999	0.00	0.00	0.00	0.00	82.62	88.92	0.00	0.00	0.00	0.00	0.00	0.00	19.96	21.48	0.00	0.00	31.09	33.46	0.00	0.00
109	10762.47	1.08	2000	104.52	112.49	0.00	0.00	77.04	82.91	0.00	0.00	0.00	0.00	0.00	0.00	19.85	21.36	0.00	0.00	32.26	34.72	0.00	0.00
109	10762.47	1.08	2001	0.00	0.00	0.00	0.00	55.97	60.24	0.00	0.00	88.94	95.72	0.00	0.00	4.07	4.38	0.00	0.00	22.78	24.52	0.00	0.00
109	10762.47	1.08	2002	0.00	0.00	0.00	0.00	23.17	24.94	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.32	0.00	0.00	16.62	17.88	0.00	0.00
109	10762.47	1.08	2003	33.13	35.66	0.00	0.00	20.93	22.52	0.00	0.00	60.44	65.05	0.00	0.00	0.35	0.38	0.00	0.00	21.31	22.94	0.00	0.00
109	10762.47	1.08	2004	0.00	0.00	0.00	0.00	79.77	85.85	0.00	0.00	62.53	67.30	0.00	0.00	14.53	15.64	0.00	0.00	19.22	20.68	0.00	0.00
109	10762.47	1.08	2005	0.00	0.00	0.00	0.00	43.92	47.27	0.00	0.00	0.00	0.00	0.00	0.00	10.48	11.27	0.00	0.00	21.53	23.17	0.00	0.00
109	10762.47	1.08	2006	63.89	68.76	0.00	0.00	36.13	38.89	0.00	0.00	0.00	0.00	0.00	0.00	12.74	13.71	0.00	0.00	25.16	27.08	0.00	0.00
109	10762.47	1.08	2007	0.00	0.00	0.00	0.00	83.77	90.16	0.00	0.00	95.64	102.94	0.00	0.00	25.30	27.22	0.00	0.00	42.20	45.42	0.00	0.00
109	10762.47	1.08	2008	0.00	0.00	0.00	0.00	81.99	88.24	0.00	0.00	0.00	0.00	0.00	0.00	18.86	20.30	0.00	0.00	32.29	34.76	0.00	0.00
109	10762.47	1.08	2009	114.35	123.07	0.00	0.00	85.02	91.50	0.00	0.00	67.62	72.78	0.00	0.00	22.19	23.88	0.00	0.00	33.69	36.26	0.00	0.00

110	5556.15	0.56	1996	0.00	0.00	0.00	0.00	54.62	30.35	0.00	0.00	17.74	9.85	0.00	0.00	10.37	5.76	0.00	0.00	25.94	14.41	0.00	0.00
110	5556.15	0.56	1997	48.19	26.77	0.00	0.00	46.43	25.80	0.00	0.00	49.91	27.73	0.00	0.00	9.96	5.53	0.00	0.00	26.48	14.71	0.00	0.00
110	5556.15	0.56	1998	0.00	0.00	0.00	0.00	48.82	27.12	0.00	0.00	57.90	32.17	0.00	0.00	7.35	4.08	0.00	0.00	16.55	9.19	0.00	0.00
110	5556.15	0.56	1999	0.00	0.00	0.00	0.00	55.01	30.57	0.00	0.00	0.00	0.00	0.00	0.00	12.75	7.09	0.00	0.00	31.23	17.35	0.00	0.00
110	5556.15	0.56	2000	52.28	29.05	0.00	0.00	51.28	28.49	0.00	0.00	0.00	0.00	0.00	0.00	12.32	6.85	0.00	0.00	32.67	18.15	0.00	0.00
110	5556.15	0.56	2001	0.00	0.00	0.00	0.00	39.19	21.77	0.00	0.00	57.10	31.73	0.00	0.00	2.79	1.55	0.00	0.00	23.91	13.29	0.00	0.00
110	5556.15	0.56	2002	0.00	0.00	0.00	0.00	15.43	8.57	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.11	0.00	0.00	16.76	9.31	0.00	0.00
110	5556.15	0.56	2003	16.64	9.25	0.00	0.00	14.08	7.82	0.00	0.00	42.34	23.53	0.00	0.00	0.22	0.12	0.00	0.00	21.55	11.97	0.00	0.00
110	5556.15	0.56	2004	0.00	0.00	0.00	0.00	53.17	29.54	0.00	0.00	38.59	21.44	0.00	0.00	8.87	4.93	0.00	0.00	18.89	10.50	0.00	0.00
110	5556.15	0.56	2005	0.00	0.00	0.00	0.00	29.58	16.44	0.00	0.00	0.00	0.00	0.00	0.00	6.42	3.57	0.00	0.00	21.62	12.01	0.00	0.00
110	5556.15	0.56	2006	32.02	17.79	0.00	0.00	24.11	13.40	0.00	0.00	0.00	0.00	0.00	0.00	7.81	4.34	0.00	0.00	24.32	13.51	0.00	0.00
110	5556.15	0.56	2007	0.00	0.00	0.00	0.00	55.85	31.03	0.00	0.00	61.22	34.01	0.00	0.00	15.81	8.79	0.00	0.00	42.23	23.46	0.00	0.00
110	5556.15	0.56	2008	0.00	0.00	0.00	0.00	54.65	30.37	0.00	0.00	0.00	0.00	0.00	0.00	11.83	6.57	0.00	0.00	30.39	16.89	0.00	0.00
110	5556.15	0.56	2009	56.95	31.64	0.00	0.00	56.67	31.49	0.00	0.00	47.63	26.46	0.00	0.00	13.87	7.71	0.00	0.00	33.68	18.71	0.00	0.00
111	5654.79	0.57	1996	0.00	0.00	0.00	0.00	43.96	24.86	0.00	0.00	24.29	13.74	0.00	0.00	10.61	6.00	0.00	0.00	31.31	17.71	0.00	0.00
111	5654.79	0.57	1997	64.33	36.37	0.00	0.00	37.05	20.95	0.00	0.00	37.26	21.07	0.00	0.00	9.74	5.51	0.00	0.00	31.67	17.91	0.00	0.00
111	5654.79	0.57	1998	0.00	0.00	0.00	0.00	39.09	22.11	0.00	0.00	54.87	31.03	0.00	0.00	7.46	4.22	0.00	0.00	19.57	11.07	0.00	0.00
111	5654.79	0.57	1999	0.00	0.00	0.00	0.00	44.11	24.94	0.00	0.00	0.00	0.00	0.00	0.00	12.47	7.05	0.00	0.00	37.28	21.08	0.00	0.00
111	5654.79	0.57	2000	69.64	39.38	0.00	0.00	41.11	23.25	0.00	0.00	0.00	0.00	0.00	0.00	12.41	7.01	0.00	0.00	38.79	21.93	0.00	0.00
111	5654.79	0.57	2001	0.00	0.00	0.00	0.00	29.43	16.64	0.00	0.00	50.86	28.76	0.00	0.00	2.53	1.43	0.00	0.00	27.48	15.54	0.00	0.00
111	5654.79	0.57	2002	0.00	0.00	0.00	0.00	12.19	6.89	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.10	0.00	0.00	19.85	11.23	0.00	0.00
111	5654.79	0.57	2003	22.08	12.48	0.00	0.00	11.01	6.23	0.00	0.00	32.04	18.12	0.00	0.00	0.22	0.12	0.00	0.00	25.63	14.49	0.00	0.00
111	5654.79	0.57	2004	0.00	0.00	0.00	0.00	42.64	24.11	0.00	0.00	36.27	20.51	0.00	0.00	9.08	5.14	0.00	0.00	23.07	13.05	0.00	0.00
111	5654.79	0.57	2005	0.00	0.00	0.00	0.00	23.72	13.41	0.00	0.00	0.00	0.00	0.00	0.00	6.54	3.70	0.00	0.00	25.88	14.63	0.00	0.00
111	5654.79	0.57	2006	42.65	24.12	0.00	0.00	20.05	11.34	0.00	0.00	0.00	0.00	0.00	0.00	7.96	4.50	0.00	0.00	30.07	17.00	0.00	0.00
111	5654.79	0.57	2007	0.00	0.00	0.00	0.00	44.68	25.26	0.00	0.00	54.72	30.94	0.00	0.00	15.81	8.94	0.00	0.00	50.53	28.57	0.00	0.00
111	5654.79	0.57	2008	0.00	0.00	0.00	0.00	43.72	24.72	0.00	0.00	0.00	0.00	0.00	0.00	11.79	6.66	0.00	0.00	38.40	21.71	0.00	0.00
111	5654.79	0.57	2009	76.19	43.08	0.00	0.00	45.33	25.63	0.00	0.00	35.69	20.18	0.00	0.00	13.87	7.84	0.00	0.00	40.38	22.83	0.00	0.00
112	18852.08	1.89	1996	0.00	0.00	0.00	0.00	73.37	138.31	0.00	0.00	23.99	45.22	0.00	0.00	12.24	23.07	5.99	11.28	49.31	92.96	0.00	0.00
112	18852.08	1.89	1997	67.35	126.96	0.00	0.00	69.35	130.73	0.00	0.00	47.79	90.09	0.00	0.00	8.74	16.48	3.02	5.68	47.50	89.55	0.00	0.00

112	18852.08	1.89	1998	0.00	0.00	0.00	0.00	65.41	123.31	0.00	0.00	64.04	120.73	0.00	0.00	17.61	33.19	7.13	13.44	31.01	58.46	0.00	0.00
112	18852.08	1.89	1999	0.00	0.00	0.00	0.00	73.64	138.83	0.00	0.00	0.00	0.00	0.00	0.00	24.48	46.15	8.43	15.88	56.90	107.26	0.00	0.00
112	18852.08	1.89	2000	71.08	133.99	0.00	0.00	69.79	131.56	0.00	0.00	0.00	0.00	0.00	0.00	24.81	46.76	8.03	15.13	58.37	110.03	0.00	0.00
112	18852.08	1.89	2001	0.00	0.00	0.00	0.00	55.42	104.47	0.00	0.00	60.36	113.80	0.00	0.00	0.60	1.12	0.18	0.34	40.60	76.55	0.00	0.00
112	18852.08	1.89	2002	0.00	0.00	0.00	0.00	35.95	67.78	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.72	0.15	0.28	30.64	57.77	0.00	0.00
112	18852.08	1.89	2003	22.98	43.33	0.00	0.00	34.40	64.84	0.00	0.00	41.13	77.54	0.00	0.00	0.39	0.74	0.13	0.24	38.51	72.59	0.00	0.00
112	18852.08	1.89	2004	0.00	0.00	0.00	0.00	75.50	142.34	0.00	0.00	44.28	83.48	0.00	0.00	20.80	39.22	7.75	14.62	35.31	66.56	0.00	0.00
112	18852.08	1.89	2005	0.00	0.00	0.00	0.00	48.08	90.64	0.00	0.00	0.00	0.00	0.00	0.00	11.05	20.84	2.20	4.15	40.29	75.95	0.00	0.00
112	18852.08	1.89	2006	44.50	83.89	0.00	0.00	44.88	84.60	0.00	0.00	23.82	44.90	0.00	0.00	13.72	25.86	2.46	4.63	45.29	85.38	0.00	0.00
112	18852.08	1.89	2007	0.00	0.00	0.00	0.00	75.65	142.62	0.00	0.00	19.53	36.81	0.00	0.00	31.12	58.67	10.52	19.83	75.98	143.24	0.00	0.00
112	18852.08	1.89	2008	0.00	0.00	0.00	0.00	73.90	139.32	0.00	0.00	0.00	0.00	0.00	0.00	23.39	44.09	7.82	14.74	57.74	108.85	0.00	0.00
112	18852.08	1.89	2009	79.00	148.94	0.00	0.00	76.15	143.57	0.00	0.00	43.30	81.62	0.00	0.00	27.84	52.48	9.83	18.53	60.81	114.64	0.00	0.00
115	9547.83	0.95	1996	0.00	0.00	0.00	0.00	74.94	71.55	0.00	0.00	32.27	30.81	0.00	0.00	13.75	13.13	0.00	0.00	28.26	26.99	0.00	0.00
115	9547.83	0.95	1997	49.06	46.84	0.00	0.00	44.30	42.30	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.53	0.00	0.00	18.84	17.98	0.00	0.00
115	9547.83	0.95	1998	0.00	0.00	0.00	0.00	75.91	72.48	0.00	0.00	40.70	38.86	0.00	0.00	26.02	24.84	0.00	0.00	21.67	20.69	0.00	0.00
115	9547.83	0.95	1999	0.00	0.00	0.00	0.00	77.43	73.93	0.00	0.00	0.00	0.00	0.00	0.00	21.46	20.49	0.00	0.00	29.10	27.79	0.00	0.00
115	9547.83	0.95	2000	70.93	67.72	0.00	0.00	62.99	60.14	0.00	0.00	22.82	21.79	0.00	0.00	7.70	7.35	0.00	0.00	22.01	21.01	0.00	0.00
115	9547.83	0.95	2001	0.00	0.00	0.00	0.00	71.55	68.31	0.00	0.00	0.00	0.00	0.00	0.00	4.14	3.95	0.00	0.00	25.12	23.98	0.00	0.00
115	9547.83	0.95	2002	0.00	0.00	0.00	0.00	28.58	27.29	0.00	0.00	30.04	28.68	0.00	0.00	0.41	0.39	0.00	0.00	12.99	12.40	0.00	0.00
115	9547.83	0.95	2003	67.46	64.41	0.00	0.00	62.34	59.52	0.00	0.00	41.11	39.25	0.00	0.00	17.81	17.01	0.00	0.00	29.08	27.77	0.00	0.00
115	9547.83	0.95	2004	0.00	0.00	0.00	0.00	70.02	66.85	0.00	0.00	47.76	45.60	0.00	0.00	30.50	29.12	0.00	0.00	30.33	28.96	0.00	0.00
115	9547.83	0.95	2005	0.00	0.00	0.00	0.00	73.68	70.35	0.00	0.00	0.00	0.00	0.00	0.00	26.92	25.70	0.00	0.00	38.87	37.11	0.00	0.00
115	9547.83	0.95	2006	34.43	32.87	0.00	0.00	69.62	66.48	0.00	0.00	0.00	0.00	0.00	0.00	10.22	9.75	0.00	0.00	14.64	13.98	0.00	0.00
115	9547.83	0.95	2007	0.00	0.00	0.00	0.00	59.48	56.79	0.00	0.00	40.90	39.05	0.00	0.00	15.49	14.79	0.00	0.00	15.56	14.85	0.00	0.00
115	9547.83	0.95	2008	0.00	0.00	0.00	0.00	88.34	84.34	0.00	0.00	29.33	28.00	0.00	0.00	30.18	28.82	0.00	0.00	33.58	32.06	0.00	0.00
115	9547.83	0.95	2009	79.11	75.54	0.00	0.00	78.15	74.62	0.00	0.00	41.91	40.01	0.00	0.00	23.36	22.30	0.00	0.00	26.18	25.00	0.00	0.00
116	6555.34	0.66	1996	0.00	0.00	31.59	20.71	27.92	18.30	0.00	0.00	17.98	11.79	0.00	0.00	3.87	2.53	4.00	2.62	32.45	21.27	0.00	0.00
116	6555.34	0.66	1997	50.55	33.14	31.90	20.91	25.11	16.46	0.00	0.00	39.73	26.05	0.00	0.00	2.23	1.46	2.01	1.32	31.78	20.83	0.00	0.00
116	6555.34	0.66	1998	0.00	0.00	28.90	18.94	24.90	16.32	0.00	0.00	52.72	34.56	0.00	0.00	5.91	3.87	4.75	3.12	21.16	13.87	0.00	0.00
116	6555.34	0.66	1999	0.00	0.00	33.15	21.73	27.59	18.09	0.00	0.00	0.00	0.00	0.00	0.00	8.06	5.29	5.62	3.68	37.36	24.49	0.00	0.00

116	6555.34	0.66	2000	53.38	34.99	32.29	21.17	26.29	17.24	0.00	0.00	0.00	0.00	0.00	0.00	8.30	5.44	5.36	3.51	37.69	24.71	0.00	0.00
116	6555.34	0.66	2001	0.00	0.00	32.36	21.21	21.24	13.93	0.00	0.00	48.95	32.09	0.00	0.00	0.20	0.13	0.12	0.08	26.65	17.47	0.00	0.00
116	6555.34	0.66	2002	0.00	0.00	31.78	20.83	8.10	5.31	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.08	0.10	0.06	20.67	13.55	0.00	0.00
116	6555.34	0.66	2003	17.45	11.44	34.07	22.33	7.26	4.76	0.00	0.00	36.20	23.73	0.00	0.00	0.13	0.09	0.09	0.06	25.57	16.76	0.00	0.00
116	6555.34	0.66	2004	0.00	0.00	31.97	20.96	28.58	18.73	0.00	0.00	36.21	23.73	0.00	0.00	6.94	4.55	5.17	3.39	24.08	15.79	0.00	0.00
116	6555.34	0.66	2005	0.00	0.00	31.60	20.71	14.52	9.52	0.00	0.00	0.00	0.00	0.00	0.00	3.63	2.38	1.47	0.96	27.98	18.34	0.00	0.00
116	6555.34	0.66	2006	33.78	22.15	29.69	19.47	13.64	8.94	0.00	0.00	19.71	12.92	0.00	0.00	4.47	2.93	1.64	1.08	31.14	20.41	0.00	0.00
116	6555.34	0.66	2007	0.00	0.00	36.23	23.75	29.10	19.07	0.00	0.00	13.89	9.11	0.00	0.00	10.37	6.80	7.01	4.60	50.76	33.27	0.00	0.00
116	6555.34	0.66	2008	0.00	0.00	31.52	20.66	28.42	18.63	0.00	0.00	0.00	0.00	0.00	0.00	7.54	4.94	5.22	3.42	38.09	24.97	0.00	0.00
116	6555.34	0.66	2009	58.47	38.33	31.81	20.85	29.12	19.09	0.00	0.00	36.47	23.91	0.00	0.00	9.27	6.07	6.56	4.30	40.01	26.23	0.00	0.00
119	1170.93	0.12	1996	0.00	0.00	23.69	2.77	97.75	11.45	0.00	0.00	37.29	4.37	0.00	0.00	10.11	1.18	0.00	0.00	44.01	5.15	0.00	0.00
119	1170.93	0.12	1997	32.04	3.75	22.29	2.61	61.51	7.20	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.05	0.00	0.00	28.71	3.36	0.00	0.00
119	1170.93	0.12	1998	0.00	0.00	21.68	2.54	103.30	12.10	0.00	0.00	38.50	4.51	0.00	0.00	18.70	2.19	0.00	0.00	34.30	4.02	0.00	0.00
119	1170.93	0.12	1999	0.00	0.00	22.09	2.59	103.70	12.14	0.00	0.00	0.00	0.00	0.00	0.00	10.34	1.21	0.00	0.00	44.89	5.26	0.00	0.00
119	1170.93	0.12	2000	47.61	5.57	23.86	2.79	85.71	10.04	0.00	0.00	27.13	3.18	0.00	0.00	5.71	0.67	0.00	0.00	35.40	4.14	0.00	0.00
119	1170.93	0.12	2001	0.00	0.00	21.89	2.56	95.36	11.17	0.00	0.00	0.00	0.00	0.00	0.00	2.80	0.33	0.00	0.00	38.85	4.55	0.00	0.00
119	1170.93	0.12	2002	0.00	0.00	21.02	2.46	46.25	5.42	0.00	0.00	19.97	2.34	0.00	0.00	0.30	0.04	0.00	0.00	21.05	2.46	0.00	0.00
119	1170.93	0.12	2003	46.32	5.42	24.61	2.88	85.32	9.99	0.00	0.00	51.48	6.03	0.00	0.00	12.37	1.45	0.00	0.00	44.79	5.24	0.00	0.00
119	1170.93	0.12	2004	0.00	0.00	19.27	2.26	93.60	10.96	0.00	0.00	43.91	5.14	0.00	0.00	21.84	2.56	0.00	0.00	46.79	5.48	0.00	0.00
119	1170.93	0.12	2005	0.00	0.00	22.41	2.62	96.33	11.28	0.00	0.00	0.00	0.00	0.00	0.00	9.87	1.16	0.00	0.00	56.62	6.63	0.00	0.00
119	1170.93	0.12	2006	22.03	2.58	19.24	2.25	90.14	10.55	0.00	0.00	0.00	0.00	0.00	0.00	7.51	0.88	0.00	0.00	23.50	2.75	0.00	0.00
119	1170.93	0.12	2007	0.00	0.00	18.93	2.22	77.73	9.10	0.00	0.00	48.06	5.63	0.00	0.00	8.48	0.99	0.00	0.00	24.18	2.83	0.00	0.00
119	1170.93	0.12	2008	0.00	0.00	24.47	2.87	118.18	13.84	0.00	0.00	19.22	2.25	0.00	0.00	18.25	2.14	0.00	0.00	52.59	6.16	0.00	0.00
119	1170.93	0.12	2009	52.71	6.17	21.99	2.57	102.85	12.04	0.00	0.00	49.99	5.85	0.00	0.00	14.48	1.70	0.00	0.00	41.24	4.83	0.00	0.00
125	1318.55	0.13	1996	0.00	0.00	0.00	0.00	75.69	9.98	0.00	0.00	23.97	3.16	0.00	0.00	12.72	1.68	0.00	0.00	27.56	3.63	0.00	0.00
125	1318.55	0.13	1997	67.34	8.88	0.00	0.00	62.78	8.28	0.00	0.00	45.90	6.05	0.00	0.00	9.03	1.19	0.00	0.00	25.60	3.37	0.00	0.00
125	1318.55	0.13	1998	0.00	0.00	0.00	0.00	73.04	9.63	0.00	0.00	66.88	8.82	0.00	0.00	25.94	3.42	0.00	0.00	16.82	2.22	0.00	0.00
125	1318.55	0.13	1999	0.00	0.00	0.00	0.00	75.83	10.00	0.00	0.00	0.00	0.00	0.00	0.00	27.00	3.56	0.00	0.00	32.30	4.26	0.00	0.00
125	1318.55	0.13	2000	71.07	9.37	0.00	0.00	72.38	9.54	0.00	0.00	0.00	0.00	0.00	0.00	29.22	3.85	0.00	0.00	29.53	3.89	0.00	0.00
125	1318.55	0.13	2001	0.00	0.00	0.00	0.00	43.61	5.75	0.00	0.00	61.24	8.07	0.00	0.00	0.85	0.11	0.00	0.00	21.75	2.87	0.00	0.00

125	1318.55	0.13	2002	0.00	0.00	0.00	0.00	20.91	2.76	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.07	0.00	0.00	15.91	2.10	0.00	0.00
125	1318.55	0.13	2003	22.98	3.03	0.00	0.00	18.63	2.46	0.00	0.00	43.87	5.78	0.00	0.00	0.55	0.07	0.00	0.00	20.91	2.76	0.00	0.00
125	1318.55	0.13	2004	0.00	0.00	0.00	0.00	75.78	9.99	0.00	0.00	44.74	5.90	0.00	0.00	30.59	4.03	0.00	0.00	20.87	2.75	0.00	0.00
125	1318.55	0.13	2005	0.00	0.00	0.00	0.00	37.59	4.96	0.00	0.00	0.00	0.00	0.00	0.00	15.52	2.05	0.00	0.00	23.85	3.14	0.00	0.00
125	1318.55	0.13	2006	44.48	5.87	0.00	0.00	34.68	4.57	0.00	0.00	22.88	3.02	0.00	0.00	20.65	2.72	0.00	0.00	29.66	3.91	0.00	0.00
125	1318.55	0.13	2007	0.00	0.00	0.00	0.00	68.14	8.99	0.00	0.00	19.52	2.57	0.00	0.00	39.65	5.23	0.00	0.00	40.68	5.36	0.00	0.00
125	1318.55	0.13	2008	0.00	0.00	0.00	0.00	72.44	9.55	0.00	0.00	0.00	0.00	0.00	0.00	25.38	3.35	0.00	0.00	29.74	3.92	0.00	0.00
125	1318.55	0.13	2009	79.00	10.42	0.00	0.00	76.97	10.15	0.00	0.00	43.62	5.75	0.00	0.00	31.89	4.20	0.00	0.00	31.11	4.10	0.00	0.00
127	10058.38	1.01	1996	0.00	0.00	0.00	0.00	49.12	49.41	0.00	0.00	26.83	26.99	0.00	0.00	12.53	12.60	3.91	3.94	31.25	31.43	0.00	0.00
127	10058.38	1.01	1997	72.36	72.78	0.00	0.00	41.85	42.09	0.00	0.00	49.71	50.00	0.00	0.00	11.86	11.93	2.21	2.23	31.70	31.89	0.00	0.00
127	10058.38	1.01	1998	0.00	0.00	0.00	0.00	43.93	44.18	0.00	0.00	67.77	68.16	0.00	0.00	8.83	8.88	6.81	6.85	19.93	20.05	0.00	0.00
127	10058.38	1.01	1999	0.00	0.00	0.00	0.00	49.50	49.79	0.00	0.00	0.00	0.00	0.00	0.00	15.23	15.32	8.07	8.12	37.45	37.66	0.00	0.00
127	10058.38	1.01	2000	78.48	78.93	0.00	0.00	46.15	46.42	0.00	0.00	0.00	0.00	0.00	0.00	14.77	14.86	7.60	7.64	39.23	39.46	0.00	0.00
127	10058.38	1.01	2001	0.00	0.00	0.00	0.00	35.26	35.47	0.00	0.00	63.68	64.05	0.00	0.00	3.25	3.26	0.18	0.18	28.62	28.78	0.00	0.00
127	10058.38	1.01	2002	0.00	0.00	0.00	0.00	13.93	14.01	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.23	0.14	0.14	20.01	20.12	0.00	0.00
127	10058.38	1.01	2003	25.04	25.19	0.00	0.00	12.69	12.77	0.00	0.00	42.57	42.82	0.00	0.00	0.26	0.27	0.13	0.13	25.88	26.03	0.00	0.00
127	10058.38	1.01	2004	0.00	0.00	0.00	0.00	47.83	48.11	0.00	0.00	45.92	46.19	0.00	0.00	10.69	10.76	7.17	7.21	22.75	22.88	0.00	0.00
127	10058.38	1.01	2005	0.00	0.00	0.00	0.00	26.55	26.70	0.00	0.00	0.00	0.00	0.00	0.00	7.69	7.74	2.62	2.64	25.98	26.13	0.00	0.00
127	10058.38	1.01	2006	48.26	48.54	0.00	0.00	21.54	21.67	0.00	0.00	0.00	0.00	0.00	0.00	9.38	9.44	2.55	2.57	29.23	29.40	0.00	0.00
127	10058.38	1.01	2007	0.00	0.00	0.00	0.00	50.27	50.56	0.00	0.00	67.99	68.39	0.00	0.00	18.97	19.08	10.16	10.22	50.56	50.86	0.00	0.00
127	10058.38	1.01	2008	0.00	0.00	0.00	0.00	49.19	49.48	0.00	0.00	0.00	0.00	0.00	0.00	14.16	14.25	7.52	7.56	36.53	36.74	0.00	0.00
127	10058.38	1.01	2009	85.23	85.72	0.00	0.00	51.00	51.30	0.00	0.00	47.76	48.03	0.00	0.00	16.78	16.88	9.35	9.41	40.41	40.65	0.00	0.00
128	7030.80	0.70	1996	0.00	0.00	0.00	0.00	45.10	31.71	0.00	0.00	26.59	18.69	0.00	0.00	7.74	5.44	5.98	4.20	43.13	30.32	19.75	13.89
128	7030.80	0.70	1997	75.76	53.26	0.00	0.00	41.86	29.43	0.00	0.00	43.46	30.56	0.00	0.00	4.48	3.15	3.02	2.12	42.27	29.72	###	11.74
128	7030.80	0.70	1998	0.00	0.00	0.00	0.00	40.16	28.24	0.00	0.00	63.56	44.69	0.00	0.00	11.81	8.31	7.13	5.01	29.34	20.63	###	9.87
128	7030.80	0.70	1999	0.00	0.00	0.00	0.00	45.03	31.66	0.00	0.00	0.00	0.00	0.00	0.00	16.13	11.34	8.43	5.92	49.97	35.13	21.12	14.85
128	7030.80	0.70	2000	80.08	56.30	0.00	0.00	42.72	30.03	0.00	0.00	0.00	0.00	0.00	0.00	16.61	11.68	8.03	5.64	51.13	35.95	###	14.25
128	7030.80	0.70	2001	0.00	0.00	0.00	0.00	35.57	25.01	0.00	0.00	58.82	41.35	0.00	0.00	0.40	0.28	0.18	0.13	36.97	25.99	###	9.04
128	7030.80	0.70	2002	0.00	0.00	0.00	0.00	20.90	14.70	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.18	0.15	0.10	27.48	19.32	9.64	6.77
128	7030.80	0.70	2003	26.04	18.31	0.00	0.00	20.01	14.07	0.00	0.00	36.64	25.76	0.00	0.00	0.26	0.19	0.13	0.09	34.34	24.15	11.63	8.17

128	7030.80	0.70	2004	0.00	0.00	0.00	0.00	46.44	32.65	0.00	0.00	44.53	31.31	0.00	0.00	13.88	9.76	7.75	5.45	31.71	22.30	###	9.80
128	7030.80	0.70	2005	0.00	0.00	0.00	0.00	28.83	20.27	0.00	0.00	0.00	0.00	0.00	0.00	7.27	5.11	2.20	1.55	37.44	26.32	13.51	9.50
128	7030.80	0.70	2006	50.33	35.39	0.00	0.00	27.50	19.33	0.00	0.00	21.72	15.27	0.00	0.00	8.93	6.28	2.46	1.73	40.44	28.43	###	11.01
128	7030.80	0.70	2007	0.00	0.00	0.00	0.00	46.55	32.73	0.00	0.00	20.91	14.70	0.00	0.00	20.74	14.58	10.52	7.39	67.56	47.50	###	19.98
128	7030.80	0.70	2008	0.00	0.00	0.00	0.00	45.48	31.97	0.00	0.00	0.00	0.00	0.00	0.00	15.08	10.60	7.82	5.50	48.26	33.93	###	11.94
128	7030.80	0.70	2009	88.26	62.05	0.00	0.00	46.71	32.84	0.00	0.00	39.46	27.74	0.00	0.00	18.53	13.03	9.83	6.91	53.62	37.70	###	15.61
129	5632.80	0.56	1996	0.00	0.00	21.09	11.88	33.49	18.87	0.00	0.00	17.98	10.13	0.00	0.00	6.46	3.64	5.98	3.37	38.01	21.41	0.00	0.00
129	5632.80	0.56	1997	50.56	28.48	21.28	11.99	30.11	16.96	0.00	0.00	43.74	24.64	0.00	0.00	3.74	2.11	3.02	1.70	36.89	20.78	0.00	0.00
129	5632.80	0.56	1998	0.00	0.00	19.28	10.86	29.88	16.83	0.00	0.00	54.31	30.59	0.00	0.00	9.85	5.55	7.13	4.02	25.18	14.18	0.00	0.00
129	5632.80	0.56	1999	0.00	0.00	22.09	12.44	33.11	18.65	0.00	0.00	0.00	0.00	0.00	0.00	13.44	7.57	8.43	4.75	43.48	24.49	0.00	0.00
129	5632.80	0.56	2000	53.38	30.07	21.43	12.07	31.55	17.77	0.00	0.00	0.00	0.00	0.00	0.00	13.84	7.80	8.02	4.52	44.39	25.00	0.00	0.00
129	5632.80	0.56	2001	0.00	0.00	21.59	12.16	25.48	14.35	0.00	0.00	51.90	29.24	0.00	0.00	0.34	0.19	0.18	0.10	31.56	17.78	0.00	0.00
129	5632.80	0.56	2002	0.00	0.00	21.20	11.94	9.72	5.47	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.12	0.15	0.08	23.82	13.42	0.00	0.00
129	5632.80	0.56	2003	17.45	9.83	22.73	12.81	8.71	4.91	0.00	0.00	37.53	21.14	0.00	0.00	0.22	0.12	0.13	0.07	29.94	16.87	0.00	0.00
129	5632.80	0.56	2004	0.00	0.00	21.32	12.01	34.29	19.31	0.00	0.00	37.73	21.25	0.00	0.00	11.56	6.51	7.75	4.37	28.01	15.78	0.00	0.00
129	5632.80	0.56	2005	0.00	0.00	21.08	11.88	17.42	9.81	0.00	0.00	0.00	0.00	0.00	0.00	6.06	3.41	2.20	1.24	32.73	18.43	0.00	0.00
129	5632.80	0.56	2006	33.79	19.03	19.81	11.16	16.36	9.22	0.00	0.00	21.80	12.28	0.00	0.00	7.45	4.19	2.46	1.39	35.92	20.23	0.00	0.00
129	5632.80	0.56	2007	0.00	0.00	24.16	13.61	34.91	19.67	0.00	0.00	13.89	7.82	0.00	0.00	17.29	9.74	10.52	5.92	58.94	33.20	0.00	0.00
129	5632.80	0.56	2008	0.00	0.00	21.02	11.84	34.10	19.21	0.00	0.00	0.00	0.00	0.00	0.00	12.57	7.08	7.82	4.40	43.53	24.52	0.00	0.00
129	5632.80	0.56	2009	58.47	32.94	21.23	11.96	34.93	19.68	0.00	0.00	39.62	22.32	0.00	0.00	15.45	8.70	9.81	5.53	46.78	26.35	0.00	0.00
131	6343.85	0.63	1996	0.00	0.00	0.00	0.00	61.13	38.78	0.00	0.00	17.97	11.40	0.00	0.00	3.86	2.45	5.98	3.79	32.73	20.76	0.00	0.00
131	6343.85	0.63	1997	50.54	32.06	0.00	0.00	52.57	33.35	0.00	0.00	35.64	22.61	0.00	0.00	2.23	1.42	3.02	1.91	31.38	19.91	0.00	0.00
131	6343.85	0.63	1998	0.00	0.00	0.00	0.00	57.66	36.58	0.00	0.00	47.70	30.26	0.00	0.00	5.90	3.74	7.13	4.52	22.12	14.03	0.00	0.00
131	6343.85	0.63	1999	0.00	0.00	0.00	0.00	60.40	38.32	0.00	0.00	0.00	0.00	0.00	0.00	8.06	5.11	8.42	5.34	37.09	23.53	0.00	0.00
131	6343.85	0.63	2000	53.38	33.86	0.00	0.00	57.31	36.36	0.00	0.00	0.00	0.00	0.00	0.00	8.30	5.27	8.02	5.09	38.49	24.42	0.00	0.00
131	6343.85	0.63	2001	0.00	0.00	0.00	0.00	38.45	24.39	0.00	0.00	44.86	28.46	0.00	0.00	0.20	0.13	0.18	0.11	27.58	17.49	0.00	0.00
131	6343.85	0.63	2002	0.00	0.00	0.00	0.00	16.99	10.78	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.08	0.15	0.09	20.07	12.73	0.00	0.00
131	6343.85	0.63	2003	17.44	11.06	0.00	0.00	15.00	9.51	0.00	0.00	30.33	19.24	0.00	0.00	0.13	0.08	0.13	0.08	25.78	16.36	0.00	0.00
131	6343.85	0.63	2004	0.00	0.00	0.00	0.00	59.37	37.66	0.00	0.00	32.96	20.91	0.00	0.00	6.94	4.40	7.75	4.92	23.90	15.16	0.00	0.00
131	6343.85	0.63	2005	0.00	0.00	0.00	0.00	30.42	19.30	0.00	0.00	0.00	0.00	0.00	0.00	3.63	2.30	2.20	1.40	28.13	17.85	0.00	0.00

131	6343.85	0.63	2006	33.78	21.43	0.00	0.00	28.21	17.90	0.00	0.00	17.73	11.25	0.00	0.00	4.47	2.83	2.46	1.56	30.30	19.22	0.00	0.00
131	6343.85	0.63	2007	0.00	0.00	0.00	0.00	57.90	36.73	0.00	0.00	13.89	8.81	0.00	0.00	10.37	6.58	10.52	6.67	50.20	31.84	0.00	0.00
131	6343.85	0.63	2008	0.00	0.00	0.00	0.00	59.74	37.90	0.00	0.00	0.00	0.00	0.00	0.00	7.54	4.78	7.82	4.96	36.23	22.98	0.00	0.00
131	6343.85	0.63	2009	58.46	37.09	0.00	0.00	62.83	39.86	0.00	0.00	32.20	20.43	0.00	0.00	9.27	5.88	9.83	6.23	40.15	25.47	0.00	0.00

Trego County

SUB	Area (m)	Area (ha)	Year	CORN (t)	CORN*A (t/ha)	IRCN (t)	IRCN* A (t/ha)	GRSG (t)	GRSG*A (t/ha)	IRGS (t)	IRGS*A (t/ha)	WWHT (t)	WWHT* A (t/ha)	IRWW (t)	IRWW *A (t/ha)	SOYB (t)	SOYB*A (t/ha)	IRSB (t)	IRSB*A (t/ha)	ALFA (t)	ALFA*A (t/ha)	IRAL (t)	IRAL*A (t/ha)
44	12065.49	1.21	1996	0.00	0.00	66.15	79.82	0.00	0.00	0.00	0.00	60.72	73.27	0.00	0.00	36.03	43.47	0.00	0.00	68.11	82.17	0.00	0.00
44	12065.49	1.21	1997	87.92	106.08	60.90	73.48	67.14	81.00	0.00	0.00	53.83	64.95	0.00	0.00	17.86	21.55	0.00	0.00	48.48	58.50	0.00	0.00
44	12065.49	1.21	1998	0.00	0.00	58.65	70.77	0.00	0.00	0.00	0.00	68.50	82.65	0.00	0.00	22.83	27.55	0.00	0.00	38.38	46.30	0.00	0.00
44	12065.49	1.21	1999	0.00	0.00	63.03	76.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.78	26.28	0.00	0.00	50.17	60.54	0.00	0.00
44	12065.49	1.21	2000	94.62	114.16	64.01	77.23	65.64	79.20	0.00	0.00	0.00	0.00	0.00	0.00	18.65	22.50	0.00	0.00	45.24	54.58	0.00	0.00
44	12065.49	1.21	2001	0.00	0.00	60.22	72.66	0.00	0.00	0.00	0.00	68.79	83.00	0.00	0.00	13.31	16.06	0.00	0.00	31.54	38.06	0.00	0.00
44	12065.49	1.21	2002	0.00	0.00	55.55	67.02	0.00	0.00	0.00	0.00	65.69	79.26	0.00	0.00	0.28	0.33	0.00	0.00	16.98	20.48	0.00	0.00
44	12065.49	1.21	2003	24.26	29.27	61.12	73.75	9.39	11.33	0.00	0.00	52.92	63.85	0.00	0.00	0.35	0.42	0.00	0.00	25.75	31.06	0.00	0.00
44	12065.49	1.21	2004	0.00	0.00	64.84	78.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.25	29.26	0.00	0.00	42.81	51.65	0.00	0.00
44	12065.49	1.21	2005	0.00	0.00	57.44	69.31	0.00	0.00	0.00	0.00	125.45	151.36	0.00	0.00	2.80	3.38	0.00	0.00	36.99	44.63	0.00	0.00
44	12065.49	1.21	2006	34.99	42.22	55.19	66.59	20.73	25.01	0.00	0.00	0.00	0.00	0.00	0.00	1.91	2.31	0.00	0.00	30.95	37.35	0.00	0.00
44	12065.49	1.21	2007	0.00	0.00	69.06	83.32	0.00	0.00	0.00	0.00	65.31	78.80	0.00	0.00	0.90	1.08	0.00	0.00	38.92	46.96	0.00	0.00
44	12065.49	1.21	2008	0.00	0.00	61.81	74.57	0.00	0.00	0.00	0.00	57.22	69.04	0.00	0.00	10.84	13.08	0.00	0.00	26.87	32.42	0.00	0.00
44	12065.49	1.21	2009	110.31	133.09	66.18	79.85	74.11	89.41	0.00	0.00	45.80	55.26	0.00	0.00	35.01	42.25	0.00	0.00	62.77	75.74	0.00	0.00
47	11717.37	1.17	1996	0.00	0.00	85.04	99.65	36.85	43.18	0.00	0.00	40.75	47.75	0.00	0.00	3.72	4.36	19.23	22.54	27.03	31.68	26.70	31.29
47	11717.37	1.17	1997	39.93	46.79	81.18	95.12	82.45	96.61	0.00	0.00	24.76	29.01	0.00	0.00	11.63	13.63	18.00	21.09	25.52	29.91	25.18	29.50
47	11717.37	1.17	1998	0.00	0.00	78.44	91.91	32.21	37.75	0.00	0.00	55.59	65.14	0.00	0.00	17.16	20.11	18.77	21.99	26.63	31.20	25.11	29.42
47	11717.37	1.17	1999	0.00	0.00	81.62	95.64	32.50	38.08	0.00	0.00	0.00	0.00	0.00	0.00	21.89	25.65	24.91	29.18	37.53	43.97	32.74	38.36
47	11717.37	1.17	2000	59.59	69.82	83.31	97.62	72.80	85.31	0.00	0.00	0.00	0.00	0.00	0.00	3.51	4.11	14.00	16.40	22.95	26.89	20.95	24.55
47	11717.37	1.17	2001	0.00	0.00	75.39	88.33	27.68	32.44	0.00	0.00	30.09	35.26	0.00	0.00	6.40	7.50	12.42	14.55	17.78	20.84	17.79	20.85
47	11717.37	1.17	2002	0.00	0.00	71.10	83.31	30.14	35.32	0.00	0.00	41.62	48.77	0.00	0.00	0.45	0.52	0.92	1.08	17.46	20.46	14.74	17.27
47	11717.37	1.17	2003	21.35	25.02	81.66	95.68	42.08	49.31	0.00	0.00	27.12	31.78	0.00	0.00	0.26	0.30	0.53	0.62	19.65	23.03	14.84	17.39
47	11717.37	1.17	2004	0.00	0.00	89.12	104.42	36.69	43.00	0.00	0.00	0.00	0.00	0.00	0.00	20.80	24.37	19.23	22.53	32.59	38.19	31.19	36.54

47	11717.37	1.17	2005	0.00	0.00	77.21	90.47	31.02	36.35	0.00	0.00	112.99	132.40	0.00	0.00	3.36	3.94	9.51	11.15	25.16	29.48	19.21	22.51
47	11717.37	1.17	2006	35.02	41.04	77.04	90.27	59.79	70.05	0.00	0.00	0.00	0.00	0.00	0.00	5.44	6.37	9.13	10.70	24.99	29.28	18.73	21.95
47	11717.37	1.17	2007	0.00	0.00	93.40	109.44	34.54	40.47	0.00	0.00	34.63	40.58	0.00	0.00	25.34	29.70	28.72	33.65	47.16	55.26	41.63	48.78
47	11717.37	1.17	2008	0.00	0.00	76.76	89.94	33.35	39.07	0.00	0.00	70.16	82.21	0.00	0.00	10.07	11.80	4.20	4.92	18.11	21.22	17.39	20.38
47	11717.37	1.17	2009	79.18	92.78	89.77	105.19	95.48	111.88	0.00	0.00	30.14	35.31	0.00	0.00	26.41	30.94	27.57	32.30	39.55	46.35	40.35	47.28
54	13168.62	1.32	1996	0.00	0.00	22.06	29.05	18.81	24.77	0.00	0.00	20.07	26.43	0.00	0.00	4.88	6.43	0.00	0.00	41.97	55.27	0.00	0.00
54	13168.62	1.32	1997	23.25	30.61	20.81	27.41	45.66	60.13	0.00	0.00	21.93	28.88	0.00	0.00	12.04	15.85	0.00	0.00	36.05	47.48	0.00	0.00
54	13168.62	1.32	1998	0.00	0.00	20.16	26.55	16.06	21.15	0.00	0.00	35.24	46.41	0.00	0.00	17.90	23.58	0.00	0.00	37.96	49.99	0.00	0.00
54	13168.62	1.32	1999	0.00	0.00	20.52	27.02	16.19	21.31	0.00	0.00	0.00	0.00	0.00	0.00	20.24	26.65	0.00	0.00	52.07	68.56	0.00	0.00
54	13168.62	1.32	2000	31.94	42.06	21.76	28.65	37.23	49.03	0.00	0.00	0.00	0.00	0.00	0.00	3.68	4.84	0.00	0.00	31.88	41.98	0.00	0.00
54	13168.62	1.32	2001	0.00	0.00	19.54	25.74	14.40	18.96	0.00	0.00	26.45	34.82	0.00	0.00	7.35	9.67	0.00	0.00	27.24	35.87	0.00	0.00
54	13168.62	1.32	2002	0.00	0.00	18.43	24.26	15.80	20.81	0.00	0.00	18.97	24.98	0.00	0.00	0.41	0.53	0.00	0.00	24.39	32.12	0.00	0.00
54	13168.62	1.32	2003	12.88	16.96	21.29	28.03	22.32	29.39	0.00	0.00	24.56	32.34	0.00	0.00	0.26	0.35	0.00	0.00	30.08	39.61	0.00	0.00
54	13168.62	1.32	2004	0.00	0.00	22.54	29.68	18.50	24.36	0.00	0.00	0.00	0.00	0.00	0.00	15.74	20.72	0.00	0.00	45.58	60.02	0.00	0.00
54	13168.62	1.32	2005	0.00	0.00	19.84	26.12	16.07	21.17	0.00	0.00	71.36	93.97	0.00	0.00	2.64	3.48	0.00	0.00	37.46	49.32	0.00	0.00
54	13168.62	1.32	2006	21.13	27.82	20.01	26.35	30.71	40.44	0.00	0.00	0.00	0.00	0.00	0.00	5.42	7.13	0.00	0.00	37.16	48.94	0.00	0.00
54	13168.62	1.32	2007	0.00	0.00	23.52	30.97	17.27	22.74	0.00	0.00	31.00	40.82	0.00	0.00	22.14	29.15	0.00	0.00	60.22	79.31	0.00	0.00
54	13168.62	1.32	2008	0.00	0.00	19.76	26.02	16.81	22.14	0.00	0.00	31.22	41.12	0.00	0.00	10.95	14.42	0.00	0.00	27.45	36.15	0.00	0.00
54	13168.62	1.32	2009	39.07	51.45	22.80	30.03	54.12	71.27	0.00	0.00	26.48	34.87	0.00	0.00	23.33	30.73	0.00	0.00	55.15	72.62	0.00	0.00
57	9654.21	0.97	1996	0.00	0.00	33.09	31.95	0.00	0.00	0.00	0.00	40.75	39.34	0.00	0.00	3.72	3.59	6.18	5.96	22.87	22.08	0.00	0.00
57	9654.21	0.97	1997	39.92	38.54	31.22	30.14	48.93	47.24	0.00	0.00	43.07	41.58	0.00	0.00	11.63	11.22	5.85	5.65	21.07	20.34	0.00	0.00
57	9654.21	0.97	1998	0.00	0.00	30.24	29.20	0.00	0.00	0.00	0.00	69.84	67.42	0.00	0.00	17.16	16.57	6.26	6.04	21.56	20.81	0.00	0.00
57	9654.21	0.97	1999	0.00	0.00	30.78	29.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	21.89	21.13	8.10	7.82	31.42	30.33	0.00	0.00
57	9654.21	0.97	2000	59.56	57.50	32.64	31.51	40.76	39.35	0.00	0.00	0.00	0.00	0.00	0.00	3.50	3.38	4.55	4.40	19.16	18.50	0.00	0.00
57	9654.21	0.97	2001	0.00	0.00	29.32	28.30	0.00	0.00	0.00	0.00	51.41	49.63	0.00	0.00	6.40	6.18	3.95	3.81	15.19	14.67	0.00	0.00
57	9654.21	0.97	2002	0.00	0.00	27.64	26.69	0.00	0.00	0.00	0.00	41.61	40.17	0.00	0.00	0.45	0.43	0.29	0.28	14.92	14.40	0.00	0.00
57	9654.21	0.97	2003	21.35	20.61	31.93	30.83	10.31	9.95	0.00	0.00	47.96	46.30	0.00	0.00	0.26	0.25	0.16	0.16	16.70	16.12	0.00	0.00
57	9654.21	0.97	2004	0.00	0.00	33.81	32.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.80	20.08	6.07	5.86	27.36	26.41	0.00	0.00
57	9654.21	0.97	2005	0.00	0.00	29.76	28.73	0.00	0.00	0.00	0.00	139.62	134.79	0.00	0.00	3.36	3.24	3.07	2.96	21.07	20.34	0.00	0.00
57	9654.21	0.97	2006	35.00	33.79	30.01	28.98	27.63	26.67	0.00	0.00	0.00	0.00	0.00	0.00	5.43	5.25	3.03	2.92	20.76	20.04	0.00	0.00

57	9654.21	0.97	2007	0.00	0.00	35.28	34.06	0.00	0.00	0.00	0.00	60.13	58.05	0.00	0.00	25.34	24.46	9.39	9.07	39.59	38.22	0.00	0.00
57	9654.21	0.97	2008	0.00	0.00	29.64	28.61	0.00	0.00	0.00	0.00	70.12	67.70	0.00	0.00	10.07	9.72	1.35	1.31	15.05	14.53	0.00	0.00
57	9654.21	0.97	2009	79.11	76.38	34.20	33.02	57.29	55.30	0.00	0.00	52.83	51.00	0.00	0.00	26.41	25.49	8.84	8.54	34.03	32.86	0.00	0.00
58	3408.71	0.34	1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.82	15.28	0.00	0.00	10.28	3.50	0.00	0.00	25.55	8.71	0.00	0.00
58	3408.71	0.34	1997	43.99	14.99	0.00	0.00	60.19	20.52	0.00	0.00	37.98	12.95	0.00	0.00	17.66	6.02	0.00	0.00	24.83	8.46	0.00	0.00
58	3408.71	0.34	1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.03	7.85	0.00	0.00	25.61	8.73	0.00	0.00
58	3408.71	0.34	1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	114.21	38.93	0.00	0.00	27.63	9.42	0.00	0.00	37.41	12.75	0.00	0.00
58	3408.71	0.34	2000	68.11	23.22	0.00	0.00	50.31	17.15	0.00	0.00	0.00	0.00	0.00	0.00	2.37	0.81	0.00	0.00	22.14	7.55	0.00	0.00
58	3408.71	0.34	2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	48.24	16.44	0.00	0.00	12.93	4.41	0.00	0.00	18.39	6.27	0.00	0.00
58	3408.71	0.34	2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.67	13.86	0.00	0.00	0.41	0.14	0.00	0.00	18.41	6.28	0.00	0.00
58	3408.71	0.34	2003	27.64	9.42	0.00	0.00	12.96	4.42	0.00	0.00	44.31	15.10	0.00	0.00	0.35	0.12	0.00	0.00	19.71	6.72	0.00	0.00
58	3408.71	0.34	2004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.64	6.70	0.00	0.00	29.51	10.06	0.00	0.00
58	3408.71	0.34	2005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	119.20	40.63	0.00	0.00	15.49	5.28	0.00	0.00	25.96	8.85	0.00	0.00
58	3408.71	0.34	2006	39.13	13.34	0.00	0.00	33.90	11.55	0.00	0.00	0.00	0.00	0.00	0.00	7.10	2.42	0.00	0.00	22.09	7.53	0.00	0.00
58	3408.71	0.34	2007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	52.77	17.99	0.00	0.00	27.71	9.45	0.00	0.00	42.45	14.47	0.00	0.00
58	3408.71	0.34	2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	68.24	23.26	0.00	0.00	11.62	3.96	0.00	0.00	20.11	6.85	0.00	0.00
58	3408.71	0.34	2009	72.05	24.56	0.00	0.00	71.48	24.37	0.00	0.00	49.27	16.80	0.00	0.00	29.35	10.01	0.00	0.00	37.64	12.83	0.00	0.00
60	316.53	0.03	1996	0.00	0.00	33.07	1.05	0.00	0.00	19.56	0.62	21.63	0.68	0.00	0.00	12.01	0.38	6.97	0.22	22.69	0.72	0.00	0.00
60	316.53	0.03	1997	30.59	0.97	31.01	0.98	27.97	0.89	16.05	0.51	39.97	1.27	0.00	0.00	2.60	0.08	3.35	0.11	15.53	0.49	0.00	0.00
60	316.53	0.03	1998	0.00	0.00	30.45	0.96	0.00	0.00	16.55	0.52	36.22	1.15	0.00	0.00	7.54	0.24	3.95	0.13	12.90	0.41	0.00	0.00
60	316.53	0.03	1999	0.00	0.00	32.27	1.02	0.00	0.00	20.29	0.64	0.00	0.00	0.00	0.00	7.31	0.23	5.16	0.16	16.76	0.53	0.00	0.00
60	316.53	0.03	2000	30.97	0.98	32.86	1.04	27.34	0.87	16.96	0.54	0.00	0.00	0.00	0.00	6.20	0.20	4.49	0.14	15.10	0.48	0.00	0.00
60	316.53	0.03	2001	0.00	0.00	31.55	1.00	0.00	0.00	23.07	0.73	47.41	1.50	0.00	0.00	4.23	0.13	4.95	0.16	10.69	0.34	0.00	0.00
60	316.53	0.03	2002	0.00	0.00	29.27	0.93	0.00	0.00	3.12	0.10	24.27	0.77	0.00	0.00	0.09	0.00	0.12	0.00	5.76	0.18	0.00	0.00
60	316.53	0.03	2003	7.91	0.25	32.70	1.04	3.80	0.12	4.65	0.15	38.24	1.21	0.00	0.00	0.12	0.00	0.06	0.00	8.41	0.27	0.00	0.00
60	316.53	0.03	2004	0.00	0.00	33.80	1.07	0.00	0.00	12.97	0.41	0.00	0.00	0.00	0.00	7.85	0.25	0.68	0.02	13.84	0.44	0.00	0.00
60	316.53	0.03	2005	0.00	0.00	29.55	0.94	0.00	0.00	14.56	0.46	64.07	2.03	0.00	0.00	0.93	0.03	2.97	0.09	12.22	0.39	0.00	0.00
60	316.53	0.03	2006	11.77	0.37	29.50	0.93	8.36	0.26	6.29	0.20	0.00	0.00	0.00	0.00	0.73	0.02	0.45	0.01	10.19	0.32	0.00	0.00
60	316.53	0.03	2007	0.00	0.00	36.39	1.15	0.00	0.00	11.86	0.38	47.20	1.49	0.00	0.00	0.27	0.01	0.12	0.00	12.58	0.40	0.00	0.00
60	316.53	0.03	2008	0.00	0.00	32.94	1.04	0.00	0.00	11.05	0.35	21.08	0.67	0.00	0.00	3.48	0.11	2.59	0.08	8.61	0.27	0.00	0.00

60	316.53	0.03	2009	35.90	1.14	33.65	1.07	30.88	0.98	19.47	0.62	33.16	1.05	0.00	0.00	11.27	0.36	6.08	0.19	20.75	0.66	0.00	0.00
61	13409.28	1.34	1996	0.00	0.00	94.57	126.81	63.05	84.55	0.00	0.00	22.06	29.58	0.00	0.00	5.30	7.11	0.00	0.00	42.12	56.47	43.61	58.48
61	13409.28	1.34	1997	39.83	53.40	90.45	121.28	74.44	99.81	0.00	0.00	43.43	58.23	0.00	0.00	12.01	16.10	0.00	0.00	38.54	51.68	41.00	54.97
61	13409.28	1.34	1998	0.00	0.00	86.33	115.76	78.24	104.91	0.00	0.00	53.60	71.88	0.00	0.00	18.07	24.23	0.00	0.00	40.24	53.96	41.85	56.12
61	13409.28	1.34	1999	0.00	0.00	92.11	123.52	77.69	104.17	0.00	0.00	0.00	0.00	0.00	0.00	21.70	29.10	0.00	0.00	56.40	75.63	51.87	69.56
61	13409.28	1.34	2000	60.46	81.08	93.05	124.78	57.13	76.60	0.00	0.00	0.00	0.00	0.00	0.00	3.34	4.47	0.00	0.00	34.91	46.81	33.93	45.50
61	13409.28	1.34	2001	0.00	0.00	82.86	111.11	48.80	65.44	0.00	0.00	51.88	69.57	0.00	0.00	6.95	9.32	0.00	0.00	28.00	37.55	29.18	39.13
61	13409.28	1.34	2002	0.00	0.00	78.56	105.34	22.48	30.14	0.00	0.00	22.34	29.95	0.00	0.00	0.45	0.60	0.00	0.00	26.67	35.76	23.37	31.34
61	13409.28	1.34	2003	22.73	30.47	90.70	121.62	17.04	22.85	0.00	0.00	47.07	63.12	0.00	0.00	0.27	0.36	0.00	0.00	31.44	42.15	24.78	33.22
61	13409.28	1.34	2004	0.00	0.00	98.69	132.33	72.81	97.63	0.00	0.00	0.00	0.00	0.00	0.00	21.10	28.29	0.00	0.00	50.05	67.12	51.01	68.40
61	13409.28	1.34	2005	0.00	0.00	86.72	116.28	42.96	57.60	0.00	0.00	100.94	135.36	0.00	0.00	3.22	4.31	0.00	0.00	38.71	51.91	31.49	42.23
61	13409.28	1.34	2006	35.52	47.63	85.16	114.20	37.70	50.55	0.00	0.00	0.00	0.00	0.00	0.00	5.51	7.38	0.00	0.00	37.68	50.53	30.61	41.05
61	13409.28	1.34	2007	0.00	0.00	104.44	140.05	86.35	115.79	0.00	0.00	58.60	78.58	0.00	0.00	25.68	34.43	0.00	0.00	71.54	95.92	67.14	90.03
61	13409.28	1.34	2008	0.00	0.00	83.55	112.04	59.24	79.44	0.00	0.00	34.55	46.33	0.00	0.00	10.83	14.53	0.00	0.00	28.21	37.83	28.70	38.48
61	13409.28	1.34	2009	79.36	106.42	100.30	134.49	95.48	128.03	0.00	0.00	50.95	68.32	0.00	0.00	26.23	35.18	0.00	0.00	60.35	80.93	63.14	84.66
75	14599.92	1.46	1996	0.00	0.00	66.11	96.51	34.66	50.60	0.00	0.00	25.69	37.50	0.00	0.00	2.50	3.66	0.00	0.00	13.16	19.22	0.00	0.00
75	14599.92	1.46	1997	47.73	69.69	61.83	90.27	44.39	64.81	0.00	0.00	32.09	46.84	0.00	0.00	7.38	10.78	0.00	0.00	12.73	18.58	0.00	0.00
75	14599.92	1.46	1998	0.00	0.00	60.48	88.29	47.01	68.64	0.00	0.00	50.32	73.47	0.00	0.00	11.32	16.53	0.00	0.00	13.55	19.78	0.00	0.00
75	14599.92	1.46	1999	0.00	0.00	61.58	89.90	46.27	67.55	0.00	0.00	0.00	0.00	0.00	0.00	14.35	20.95	0.00	0.00	18.76	27.39	0.00	0.00
75	14599.92	1.46	2000	70.96	103.60	65.22	95.23	32.02	46.75	0.00	0.00	0.00	0.00	0.00	0.00	2.58	3.77	0.00	0.00	11.56	16.87	0.00	0.00
75	14599.92	1.46	2001	0.00	0.00	58.37	85.22	26.96	39.36	0.00	0.00	39.89	58.24	0.00	0.00	3.75	5.48	0.00	0.00	8.55	12.49	0.00	0.00
75	14599.92	1.46	2002	0.00	0.00	55.24	80.65	13.07	19.08	0.00	0.00	25.94	37.86	0.00	0.00	0.29	0.42	0.00	0.00	8.63	12.60	0.00	0.00
75	14599.92	1.46	2003	25.85	37.75	63.95	93.37	8.61	12.56	0.00	0.00	35.18	51.37	0.00	0.00	0.16	0.24	0.00	0.00	9.41	13.74	0.00	0.00
75	14599.92	1.46	2004	0.00	0.00	67.43	98.45	42.46	61.99	0.00	0.00	0.00	0.00	0.00	0.00	13.47	19.67	0.00	0.00	15.99	23.35	0.00	0.00
75	14599.92	1.46	2005	0.00	0.00	59.57	86.98	24.34	35.54	0.00	0.00	94.63	138.16	0.00	0.00	2.49	3.63	0.00	0.00	12.40	18.10	0.00	0.00
75	14599.92	1.46	2006	42.58	62.16	59.84	87.37	19.29	28.17	0.00	0.00	0.00	0.00	0.00	0.00	3.55	5.19	0.00	0.00	12.44	18.16	0.00	0.00
75	14599.92	1.46	2007	0.00	0.00	70.98	103.63	51.81	75.65	0.00	0.00	45.93	67.06	0.00	0.00	16.24	23.71	0.00	0.00	23.11	33.74	0.00	0.00
75	14599.92	1.46	2008	0.00	0.00	59.53	86.92	29.18	42.60	0.00	0.00	40.17	58.65	0.00	0.00	6.32	9.23	0.00	0.00	9.06	13.23	0.00	0.00
75	14599.92	1.46	2009	87.45	127.67	68.29	99.70	57.29	83.65	0.00	0.00	39.26	57.33	0.00	0.00	16.86	24.61	0.00	0.00	19.29	28.16	0.00	0.00
81	4468.32	0.45	1996	0.00	0.00	0.00	0.00	35.63	15.92	0.00	0.00	27.93	12.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

81	4468.32	0.45	1997	52.18	23.32	0.00	0.00	44.67	19.96	0.00	0.00	46.61	20.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
81	4468.32	0.45	1998	0.00	0.00	0.00	0.00	46.96	20.98	0.00	0.00	64.66	28.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
81	4468.32	0.45	1999	0.00	0.00	0.00	0.00	46.23	20.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
81	4468.32	0.45	2000	77.05	34.43	0.00	0.00	32.33	14.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
81	4468.32	0.45	2001	0.00	0.00	0.00	0.00	27.26	12.18	0.00	0.00	58.42	26.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
81	4468.32	0.45	2002	0.00	0.00	0.00	0.00	12.91	5.77	0.00	0.00	28.54	12.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
81	4468.32	0.45	2003	30.15	13.47	0.00	0.00	8.94	4.00	0.00	0.00	52.44	23.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
81	4468.32	0.45	2004	0.00	0.00	0.00	0.00	42.48	18.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
81	4468.32	0.45	2005	0.00	0.00	0.00	0.00	24.65	11.01	0.00	0.00	121.76	54.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
81	4468.32	0.45	2006	47.77	21.34	0.00	0.00	21.07	9.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
81	4468.32	0.45	2007	0.00	0.00	0.00	0.00	51.81	23.15	0.00	0.00	67.29	30.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
81	4468.32	0.45	2008	0.00	0.00	0.00	0.00	31.76	14.19	0.00	0.00	43.09	19.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
81	4468.32	0.45	2009	93.97	41.99	0.00	0.00	57.29	25.60	0.00	0.00	56.94	25.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
85	14154.75	1.42	1996	0.00	0.00	94.84	134.25	23.22	32.87	0.00	0.00	18.78	26.58	0.00	0.00	2.90	4.10	0.00	0.00	40.18	56.87	15.55	22.01
85	14154.75	1.42	1997	34.57	48.93	91.21	129.10	29.43	41.65	0.00	0.00	27.74	39.27	0.00	0.00	8.95	12.67	0.00	0.00	37.47	53.03	15.02	21.26
85	14154.75	1.42	1998	0.00	0.00	88.71	125.57	31.32	44.33	0.00	0.00	39.82	56.36	0.00	0.00	13.49	19.10	0.00	0.00	38.98	55.17	14.49	20.51
85	14154.75	1.42	1999	0.00	0.00	92.20	130.50	30.84	43.65	0.00	0.00	0.00	0.00	0.00	0.00	16.80	23.77	0.00	0.00	55.29	78.26	19.34	27.38
85	14154.75	1.42	2000	51.46	72.84	95.58	135.29	21.09	29.85	0.00	0.00	0.00	0.00	0.00	0.00	2.66	3.76	0.00	0.00	34.11	48.27	12.43	17.59
85	14154.75	1.42	2001	0.00	0.00	86.67	122.67	18.11	25.64	0.00	0.00	33.38	47.24	0.00	0.00	4.81	6.81	0.00	0.00	26.47	37.47	10.03	14.20
85	14154.75	1.42	2002	0.00	0.00	80.58	114.06	8.65	12.24	0.00	0.00	18.96	26.83	0.00	0.00	0.34	0.47	0.00	0.00	24.99	35.38	8.47	11.99
85	14154.75	1.42	2003	18.70	26.47	92.36	130.73	5.76	8.16	0.00	0.00	29.86	42.27	0.00	0.00	0.20	0.28	0.00	0.00	28.98	41.02	8.04	11.38
85	14154.75	1.42	2004	0.00	0.00	99.63	141.02	28.40	40.19	0.00	0.00	0.00	0.00	0.00	0.00	15.99	22.63	0.00	0.00	48.42	68.53	18.23	25.80
85	14154.75	1.42	2005	0.00	0.00	88.60	125.40	16.18	22.90	0.00	0.00	74.80	105.88	0.00	0.00	2.65	3.76	0.00	0.00	37.43	52.98	11.09	15.70
85	14154.75	1.42	2006	30.66	43.40	87.12	123.32	12.53	17.73	0.00	0.00	0.00	0.00	0.00	0.00	4.14	5.86	0.00	0.00	37.09	52.50	10.55	14.93
85	14154.75	1.42	2007	0.00	0.00	103.91	147.08	34.54	48.89	0.00	0.00	39.21	55.49	0.00	0.00	19.29	27.31	0.00	0.00	70.45	99.72	24.44	34.60
85	14154.75	1.42	2008	0.00	0.00	86.60	122.58	19.98	28.28	0.00	0.00	29.74	42.10	0.00	0.00	7.81	11.06	0.00	0.00	26.94	38.13	9.88	13.99
85	14154.75	1.42	2009	65.39	92.55	102.24	144.72	38.20	54.07	0.00	0.00	34.38	48.66	0.00	0.00	20.16	28.54	0.00	0.00	58.54	82.86	22.48	31.82
86	5908.32	0.59	1996	0.00	0.00	94.96	56.11	31.97	18.89	0.00	0.00	20.27	11.98	0.00	0.00	2.46	1.45	0.00	0.00	22.29	13.17	0.00	0.00
86	5908.32	0.59	1997	39.47	23.32	91.28	53.93	39.35	23.25	0.00	0.00	41.61	24.58	0.00	0.00	9.59	5.67	0.00	0.00	21.09	12.46	0.00	0.00
86	5908.32	0.59	1998	0.00	0.00	88.74	52.43	41.70	24.64	0.00	0.00	52.54	31.04	0.00	0.00	13.44	7.94	0.00	0.00	22.22	13.13	0.00	0.00

86	5908.32	0.59	1999	0.00	0.00	91.96	54.33	41.09	24.28	0.00	0.00	0.00	0.00	0.00	0.00	14.98	8.85	0.00	0.00	30.68	18.13	0.00	0.00
86	5908.32	0.59	2000	57.72	34.11	95.43	56.39	28.43	16.79	0.00	0.00	0.00	0.00	0.00	0.00	2.66	1.57	0.00	0.00	18.99	11.22	0.00	0.00
86	5908.32	0.59	2001	0.00	0.00	86.60	51.17	24.65	14.56	0.00	0.00	50.68	29.94	0.00	0.00	6.04	3.57	0.00	0.00	14.72	8.69	0.00	0.00
86	5908.32	0.59	2002	0.00	0.00	80.55	47.59	11.48	6.78	0.00	0.00	21.12	12.48	0.00	0.00	0.30	0.18	0.00	0.00	13.74	8.12	0.00	0.00
86	5908.32	0.59	2003	23.00	13.59	92.25	54.50	8.03	4.75	0.00	0.00	44.25	26.14	0.00	0.00	0.21	0.12	0.00	0.00	16.22	9.58	0.00	0.00
86	5908.32	0.59	2004	0.00	0.00	99.57	58.83	38.31	22.63	0.00	0.00	0.00	0.00	0.00	0.00	14.31	8.46	0.00	0.00	26.99	15.95	0.00	0.00
86	5908.32	0.59	2005	0.00	0.00	88.71	52.42	21.70	12.82	0.00	0.00	100.02	59.10	0.00	0.00	2.21	1.30	0.00	0.00	20.94	12.37	0.00	0.00
86	5908.32	0.59	2006	36.22	21.40	87.42	51.65	17.98	10.62	0.00	0.00	0.00	0.00	0.00	0.00	5.91	3.49	0.00	0.00	20.72	12.24	0.00	0.00
86	5908.32	0.59	2007	0.00	0.00	103.91	61.39	46.05	27.21	0.00	0.00	58.04	34.29	0.00	0.00	15.55	9.19	0.00	0.00	39.32	23.23	0.00	0.00
86	5908.32	0.59	2008	0.00	0.00	86.62	51.17	30.69	18.13	0.00	0.00	30.36	17.94	0.00	0.00	7.95	4.70	0.00	0.00	15.06	8.90	0.00	0.00
86	5908.32	0.59	2009	68.92	40.72	102.24	60.41	50.93	30.09	0.00	0.00	50.05	29.57	0.00	0.00	17.57	10.38	0.00	0.00	32.04	18.93	0.00	0.00
87	3955.17	0.40	1996	0.00	0.00	76.06	30.08	82.21	32.52	0.00	0.00	40.42	15.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	3955.17	0.40	1997	79.27	31.35	72.02	28.48	89.26	35.30	0.00	0.00	37.08	14.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	3955.17	0.40	1998	0.00	0.00	69.96	27.67	89.30	35.32	0.00	0.00	69.65	27.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	3955.17	0.40	1999	0.00	0.00	72.38	28.63	88.82	35.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	3955.17	0.40	2000	115.76	45.78	76.08	30.09	73.60	29.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	3955.17	0.40	2001	0.00	0.00	68.10	26.93	63.40	25.08	0.00	0.00	47.57	18.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	3955.17	0.40	2002	0.00	0.00	64.01	25.32	48.69	19.26	0.00	0.00	42.15	16.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	3955.17	0.40	2003	46.25	18.29	74.12	29.32	44.89	17.75	0.00	0.00	43.45	17.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	3955.17	0.40	2004	0.00	0.00	78.49	31.04	88.78	35.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	3955.17	0.40	2005	0.00	0.00	70.17	27.75	63.73	25.21	0.00	0.00	132.21	52.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	3955.17	0.40	2006	73.33	29.00	69.65	27.55	61.37	24.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	3955.17	0.40	2007	0.00	0.00	82.08	32.46	97.75	38.66	0.00	0.00	54.39	21.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	3955.17	0.40	2008	0.00	0.00	69.05	27.31	69.15	27.35	0.00	0.00	61.02	24.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	3955.17	0.40	2009	137.02	54.19	79.70	31.52	107.84	42.65	0.00	0.00	45.86	18.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
89	6642.90	0.66	1996	0.00	0.00	62.71	41.66	37.15	24.68	0.00	0.00	23.20	15.41	0.00	0.00	2.47	1.64	0.00	0.00	0.00	0.00	0.00	0.00
89	6642.90	0.66	1997	43.49	28.89	59.96	39.83	44.77	29.74	0.00	0.00	29.04	19.29	0.00	0.00	7.90	5.25	0.00	0.00	0.00	0.00	0.00	0.00
89	6642.90	0.66	1998	0.00	0.00	58.69	38.98	46.93	31.17	0.00	0.00	45.09	29.95	0.00	0.00	11.87	7.89	0.00	0.00	0.00	0.00	0.00	0.00
89	6642.90	0.66	1999	0.00	0.00	60.94	40.48	46.28	30.74	0.00	0.00	0.00	0.00	0.00	0.00	14.38	9.55	0.00	0.00	0.00	0.00	0.00	0.00
89	6642.90	0.66	2000	64.12	42.59	62.59	41.58	32.45	21.56	0.00	0.00	0.00	0.00	0.00	0.00	2.20	1.46	0.00	0.00	0.00	0.00	0.00	0.00

89	6642.90	0.66	2001	0.00	0.00	57.22	38.01	28.14	18.69	0.00	0.00	35.68	23.70	0.00	0.00	4.27	2.84	0.00	0.00	0.00	0.00	0.00	0.00
89	6642.90	0.66	2002	0.00	0.00	52.58	34.93	12.73	8.46	0.00	0.00	23.78	15.80	0.00	0.00	0.28	0.19	0.00	0.00	0.00	0.00	0.00	0.00
89	6642.90	0.66	2003	25.39	16.87	59.78	39.71	9.47	6.29	0.00	0.00	31.81	21.13	0.00	0.00	0.17	0.12	0.00	0.00	0.00	0.00	0.00	0.00
89	6642.90	0.66	2004	0.00	0.00	65.40	43.44	42.79	28.42	0.00	0.00	0.00	0.00	0.00	0.00	13.72	9.11	0.00	0.00	0.00	0.00	0.00	0.00
89	6642.90	0.66	2005	0.00	0.00	58.27	38.70	25.03	16.63	0.00	0.00	85.10	56.53	0.00	0.00	2.19	1.46	0.00	0.00	0.00	0.00	0.00	0.00
89	6642.90	0.66	2006	39.92	26.52	57.06	37.90	22.26	14.79	0.00	0.00	0.00	0.00	0.00	0.00	3.67	2.43	0.00	0.00	0.00	0.00	0.00	0.00
89	6642.90	0.66	2007	0.00	0.00	68.32	45.38	51.81	34.41	0.00	0.00	41.13	27.32	0.00	0.00	16.46	10.93	0.00	0.00	0.00	0.00	0.00	0.00
89	6642.90	0.66	2008	0.00	0.00	56.81	37.74	33.95	22.55	0.00	0.00	35.39	23.51	0.00	0.00	6.81	4.53	0.00	0.00	0.00	0.00	0.00	0.00
89	6642.90	0.66	2009	77.28	51.34	67.73	45.00	57.29	38.06	0.00	0.00	35.06	23.29	0.00	0.00	16.98	11.28	0.00	0.00	0.00	0.00	0.00	0.00
93	5431.05	0.54	1996	0.00	0.00	95.29	51.75	68.86	37.40	0.00	0.00	25.67	13.94	0.00	0.00	3.70	2.01	0.00	0.00	0.00	0.00	0.00	0.00
93	5431.05	0.54	1997	48.32	26.24	91.34	49.61	72.69	39.48	0.00	0.00	25.05	13.60	0.00	0.00	13.50	7.33	0.00	0.00	0.00	0.00	0.00	0.00
93	5431.05	0.54	1998	0.00	0.00	89.10	48.39	73.85	40.11	0.00	0.00	43.72	23.74	0.00	0.00	19.25	10.45	0.00	0.00	0.00	0.00	0.00	0.00
93	5431.05	0.54	1999	0.00	0.00	91.74	49.82	73.54	39.94	0.00	0.00	0.00	0.00	0.00	0.00	22.22	12.07	0.00	0.00	0.00	0.00	0.00	0.00
93	5431.05	0.54	2000	71.61	38.89	95.50	51.87	59.23	32.17	0.00	0.00	0.00	0.00	0.00	0.00	4.28	2.32	0.00	0.00	0.00	0.00	0.00	0.00
93	5431.05	0.54	2001	0.00	0.00	86.41	46.93	52.16	28.33	0.00	0.00	30.69	16.67	0.00	0.00	8.19	4.45	0.00	0.00	0.00	0.00	0.00	0.00
93	5431.05	0.54	2002	0.00	0.00	80.48	43.71	38.71	21.02	0.00	0.00	26.30	14.28	0.00	0.00	0.45	0.24	0.00	0.00	0.00	0.00	0.00	0.00
93	5431.05	0.54	2003	28.59	15.53	92.13	50.04	36.21	19.66	0.00	0.00	26.65	14.47	0.00	0.00	0.30	0.16	0.00	0.00	0.00	0.00	0.00	0.00
93	5431.05	0.54	2004	0.00	0.00	99.58	54.08	74.14	40.27	0.00	0.00	0.00	0.00	0.00	0.00	21.37	11.61	0.00	0.00	0.00	0.00	0.00	0.00
93	5431.05	0.54	2005	0.00	0.00	88.85	48.26	51.20	27.81	0.00	0.00	83.18	45.17	0.00	0.00	3.41	1.85	0.00	0.00	0.00	0.00	0.00	0.00
93	5431.05	0.54	2006	44.27	24.04	87.30	47.41	48.69	26.44	0.00	0.00	0.00	0.00	0.00	0.00	7.86	4.27	0.00	0.00	0.00	0.00	0.00	0.00
93	5431.05	0.54	2007	0.00	0.00	103.86	56.41	80.59	43.77	0.00	0.00	34.60	18.79	0.00	0.00	24.16	13.12	0.00	0.00	0.00	0.00	0.00	0.00
93	5431.05	0.54	2008	0.00	0.00	86.60	47.03	62.09	33.72	0.00	0.00	37.93	20.60	0.00	0.00	11.36	6.17	0.00	0.00	0.00	0.00	0.00	0.00
93	5431.05	0.54	2009	87.63	47.59	102.23	55.52	89.11	48.39	0.00	0.00	29.86	16.22	0.00	0.00	26.25	14.26	0.00	0.00	0.00	0.00	0.00	0.00
96	32419.95	3.24	1996	0.00	0.00	39.66	128.58	37.29	120.90	0.00	0.00	31.02	100.56	0.00	0.00	20.22	65.56	2.81	9.11	23.90	77.48	0.00	0.00
96	32419.95	3.24	1997	50.58	163.98	40.10	130.00	49.51	160.49	0.00	0.00	58.60	189.96	0.00	0.00	3.93	12.74	5.47	17.72	26.87	87.13	0.00	0.00
96	32419.95	3.24	1998	0.00	0.00	36.39	117.97	55.13	178.74	0.00	0.00	90.81	294.41	0.00	0.00	0.91	2.94	7.13	23.12	23.31	75.58	0.00	0.00
96	32419.95	3.24	1999	0.00	0.00	40.54	131.42	62.90	203.93	0.00	0.00	0.00	0.00	0.00	0.00	31.85	103.26	8.58	27.81	39.20	127.10	0.00	0.00
96	32419.95	3.24	2000	68.63	222.49	41.39	134.19	36.46	118.20	0.00	0.00	0.00	0.00	0.00	0.00	20.47	66.36	1.22	3.96	26.25	85.11	0.00	0.00
96	32419.95	3.24	2001	0.00	0.00	38.91	126.16	34.51	111.88	0.00	0.00	75.35	244.28	0.00	0.00	0.66	2.15	0.26	0.83	20.37	66.05	0.00	0.00
96	32419.95	3.24	2002	0.00	0.00	37.25	120.77	17.92	58.10	0.00	0.00	0.00	0.00	0.00	0.00	2.82	9.13	0.13	0.41	22.38	72.57	0.00	0.00

96	32419.95	3.24	2003	34.49	111.82	40.96	132.78	12.54	40.66	0.00	0.00	45.16	146.40	0.00	0.00	0.57	1.85	0.13	0.42	25.23	81.78	0.00	0.00
96	32419.95	3.24	2004	0.00	0.00	39.89	129.31	58.73	190.41	0.00	0.00	64.65	209.59	0.00	0.00	26.46	85.78	7.10	23.01	28.49	92.37	0.00	0.00
96	32419.95	3.24	2005	0.00	0.00	38.49	124.77	32.89	106.62	0.00	0.00	0.00	0.00	0.00	0.00	15.97	51.77	2.20	7.15	29.31	95.02	0.00	0.00
96	32419.95	3.24	2006	46.08	149.40	37.79	122.50	34.47	111.74	0.00	0.00	0.00	0.00	0.00	0.00	7.53	24.41	1.93	6.27	26.25	85.09	0.00	0.00
96	32419.95	3.24	2007	0.00	0.00	47.33	153.45	68.55	222.25	0.00	0.00	93.10	301.82	0.00	0.00	35.96	116.59	7.98	25.86	43.17	139.97	0.00	0.00
96	32419.95	3.24	2008	0.00	0.00	38.93	126.20	37.27	120.82	0.00	0.00	0.00	0.00	0.00	0.00	1.08	3.49	3.21	10.40	18.94	61.41	0.00	0.00
96	32419.95	3.24	2009	75.89	246.03	41.91	135.86	69.90	226.62	0.00	0.00	69.93	226.72	0.00	0.00	27.11	87.87	8.09	26.24	31.36	101.68	0.00	0.00
100	4520.47	0.45	1996	0.00	0.00	54.29	24.54	35.61	16.10	0.00	0.00	34.33	15.52	0.00	0.00	6.77	3.06	0.00	0.00	0.00	0.00	0.00	0.00
100	4520.47	0.45	1997	65.73	29.71	51.75	23.39	44.96	20.32	0.00	0.00	47.62	21.53	0.00	0.00	5.28	2.38	0.00	0.00	0.00	0.00	0.00	0.00
100	4520.47	0.45	1998	0.00	0.00	50.23	22.71	47.03	21.26	0.00	0.00	70.51	31.87	0.00	0.00	18.22	8.24	0.00	0.00	0.00	0.00	0.00	0.00
100	4520.47	0.45	1999	0.00	0.00	51.58	23.31	46.40	20.97	0.00	0.00	0.00	0.00	0.00	0.00	22.10	9.99	0.00	0.00	0.00	0.00	0.00	0.00
100	4520.47	0.45	2000	96.70	43.71	54.57	24.67	32.62	14.74	0.00	0.00	0.00	0.00	0.00	0.00	12.13	5.48	0.00	0.00	0.00	0.00	0.00	0.00
100	4520.47	0.45	2001	0.00	0.00	48.74	22.03	27.15	12.27	0.00	0.00	57.25	25.88	0.00	0.00	3.52	1.59	0.00	0.00	0.00	0.00	0.00	0.00
100	4520.47	0.45	2002	0.00	0.00	46.13	20.85	13.05	5.90	0.00	0.00	35.36	15.98	0.00	0.00	0.54	0.24	0.00	0.00	0.00	0.00	0.00	0.00
100	4520.47	0.45	2003	37.34	16.88	53.03	23.97	8.93	4.04	0.00	0.00	51.66	23.35	0.00	0.00	0.28	0.13	0.00	0.00	0.00	0.00	0.00	0.00
100	4520.47	0.45	2004	0.00	0.00	56.35	25.47	42.65	19.28	0.00	0.00	0.00	0.00	0.00	0.00	21.36	9.65	0.00	0.00	0.00	0.00	0.00	0.00
100	4520.47	0.45	2005	0.00	0.00	50.37	22.77	24.74	11.18	0.00	0.00	133.33	60.27	0.00	0.00	7.92	3.58	0.00	0.00	0.00	0.00	0.00	0.00
100	4520.47	0.45	2006	60.17	27.20	50.09	22.64	21.54	9.73	0.00	0.00	0.00	0.00	0.00	0.00	7.79	3.52	0.00	0.00	0.00	0.00	0.00	0.00
100	4520.47	0.45	2007	0.00	0.00	59.38	26.84	51.81	23.42	0.00	0.00	67.38	30.46	0.00	0.00	23.27	10.52	0.00	0.00	0.00	0.00	0.00	0.00
100	4520.47	0.45	2008	0.00	0.00	49.78	22.50	31.37	14.18	0.00	0.00	53.62	24.24	0.00	0.00	10.59	4.79	0.00	0.00	0.00	0.00	0.00	0.00
100	4520.47	0.45	2009	118.55	53.59	57.25	25.88	57.29	25.90	0.00	0.00	58.20	26.31	0.00	0.00	25.87	11.70	0.00	0.00	0.00	0.00	0.00	0.00
102	9792.24	0.98	1996	0.00	0.00	0.00	0.00	63.65	62.32	0.00	0.00	22.83	22.36	0.00	0.00	18.66	18.28	0.00	0.00	0.00	0.00	0.00	0.00
102	9792.24	0.98	1997	38.15	37.36	0.00	0.00	78.30	76.67	0.00	0.00	68.56	67.13	0.00	0.00	3.74	3.66	0.00	0.00	0.00	0.00	0.00	0.00
102	9792.24	0.98	1998	0.00	0.00	0.00	0.00	84.55	82.79	0.00	0.00	91.58	89.68	0.00	0.00	0.84	0.83	0.00	0.00	0.00	0.00	0.00	0.00
102	9792.24	0.98	1999	0.00	0.00	0.00	0.00	94.73	92.76	0.00	0.00	0.00	0.00	0.00	0.00	29.49	28.87	0.00	0.00	0.00	0.00	0.00	0.00
102	9792.24	0.98	2000	52.13	51.05	0.00	0.00	64.54	63.20	0.00	0.00	0.00	0.00	0.00	0.00	19.07	18.68	0.00	0.00	0.00	0.00	0.00	0.00
102	9792.24	0.98	2001	0.00	0.00	0.00	0.00	55.54	54.38	0.00	0.00	79.98	78.32	0.00	0.00	0.62	0.60	0.00	0.00	0.00	0.00	0.00	0.00
102	9792.24	0.98	2002	0.00	0.00	0.00	0.00	40.52	39.68	0.00	0.00	0.00	0.00	0.00	0.00	2.70	2.65	0.00	0.00	0.00	0.00	0.00	0.00
102	9792.24	0.98	2003	26.40	25.85	0.00	0.00	33.89	33.18	0.00	0.00	53.14	52.04	0.00	0.00	0.53	0.52	0.00	0.00	0.00	0.00	0.00	0.00
102	9792.24	0.98	2004	0.00	0.00	0.00	0.00	91.00	89.11	0.00	0.00	65.15	63.80	0.00	0.00	24.45	23.95	0.00	0.00	0.00	0.00	0.00	0.00

102	9792.24	0.98	2005	0.00	0.00	0.00	0.00	58.50	57.28	0.00	0.00	0.00	0.00	0.00	0.00	14.85	14.54	0.00	0.00	0.00	0.00	0.00	0.00
102	9792.24	0.98	2006	35.02	34.29	0.00	0.00	60.63	59.37	0.00	0.00	0.00	0.00	0.00	0.00	7.11	6.96	0.00	0.00	0.00	0.00	0.00	0.00
102	9792.24	0.98	2007	0.00	0.00	0.00	0.00	102.77	100.63	0.00	0.00	97.22	95.20	0.00	0.00	33.00	32.31	0.00	0.00	0.00	0.00	0.00	0.00
102	9792.24	0.98	2008	0.00	0.00	0.00	0.00	65.42	64.06	0.00	0.00	0.00	0.00	0.00	0.00	1.04	1.01	0.00	0.00	0.00	0.00	0.00	0.00
102	9792.24	0.98	2009	56.94	55.75	0.00	0.00	104.72	102.55	0.00	0.00	81.52	79.83	0.00	0.00	25.09	24.57	0.00	0.00	0.00	0.00	0.00	0.00
107	8444.19	0.84	1996	0.00	0.00	0.00	0.00	37.78	31.90	0.00	0.00	38.83	32.79	0.00	0.00	6.08	5.14	0.00	0.00	0.00	0.00	0.00	0.00
107	8444.19	0.84	1997	63.15	53.32	0.00	0.00	48.67	41.10	0.00	0.00	53.31	45.02	0.00	0.00	0.81	0.68	0.00	0.00	0.00	0.00	0.00	0.00
107	8444.19	0.84	1998	0.00	0.00	0.00	0.00	55.12	46.55	0.00	0.00	94.08	79.44	0.00	0.00	0.25	0.21	0.00	0.00	0.00	0.00	0.00	0.00
107	8444.19	0.84	1999	0.00	0.00	0.00	0.00	63.63	53.73	0.00	0.00	0.00	0.00	0.00	0.00	9.49	8.02	0.00	0.00	0.00	0.00	0.00	0.00
107	8444.19	0.84	2000	85.24	71.98	0.00	0.00	36.47	30.79	0.00	0.00	0.00	0.00	0.00	0.00	5.54	4.68	0.00	0.00	0.00	0.00	0.00	0.00
107	8444.19	0.84	2001	0.00	0.00	0.00	0.00	32.96	27.83	0.00	0.00	75.08	63.40	0.00	0.00	0.18	0.15	0.00	0.00	0.00	0.00	0.00	0.00
107	8444.19	0.84	2002	0.00	0.00	0.00	0.00	24.37	20.58	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.32	0.00	0.00	0.00	0.00	0.00	0.00
107	8444.19	0.84	2003	42.46	35.85	0.00	0.00	19.04	16.08	0.00	0.00	39.49	33.35	0.00	0.00	0.15	0.13	0.00	0.00	0.00	0.00	0.00	0.00
107	8444.19	0.84	2004	0.00	0.00	0.00	0.00	59.14	49.94	0.00	0.00	67.25	56.79	0.00	0.00	7.69	6.49	0.00	0.00	0.00	0.00	0.00	0.00
107	8444.19	0.84	2005	0.00	0.00	0.00	0.00	34.15	28.83	0.00	0.00	0.00	0.00	0.00	0.00	4.29	3.62	0.00	0.00	0.00	0.00	0.00	0.00
107	8444.19	0.84	2006	57.90	48.89	0.00	0.00	36.52	30.83	0.00	0.00	0.00	0.00	0.00	0.00	1.75	1.48	0.00	0.00	0.00	0.00	0.00	0.00
107	8444.19	0.84	2007	0.00	0.00	0.00	0.00	68.59	57.92	0.00	0.00	92.12	77.78	0.00	0.00	11.39	9.61	0.00	0.00	0.00	0.00	0.00	0.00
107	8444.19	0.84	2008	0.00	0.00	0.00	0.00	43.55	36.78	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.17	0.00	0.00	0.00	0.00	0.00	0.00
107	8444.19	0.84	2009	92.32	77.96	0.00	0.00	69.95	59.07	0.00	0.00	63.86	53.92	0.00	0.00	6.11	5.16	0.00	0.00	0.00	0.00	0.00	0.00
108	1925.94	0.19	1996	0.00	0.00	0.00	0.00	49.52	9.54	0.00	0.00	33.51	6.45	0.00	0.00	17.88	3.44	0.00	0.00	23.85	4.59	20.33	3.92
108	1925.94	0.19	1997	54.74	10.54	0.00	0.00	67.32	12.97	0.00	0.00	85.71	16.51	0.00	0.00	3.73	0.72	0.00	0.00	27.50	5.30	24.19	4.66
108	1925.94	0.19	1998	0.00	0.00	0.00	0.00	78.84	15.18	0.00	0.00	120.49	23.21	0.00	0.00	0.84	0.16	0.00	0.00	24.04	4.63	20.80	4.01
108	1925.94	0.19	1999	0.00	0.00	0.00	0.00	89.84	17.30	0.00	0.00	0.00	0.00	0.00	0.00	29.52	5.68	0.00	0.00	38.88	7.49	33.70	6.49
108	1925.94	0.19	2000	76.14	14.66	0.00	0.00	54.62	10.52	0.00	0.00	0.00	0.00	0.00	0.00	19.29	3.71	0.00	0.00	26.92	5.18	19.32	3.72
108	1925.94	0.19	2001	0.00	0.00	0.00	0.00	46.76	9.01	0.00	0.00	103.21	19.88	0.00	0.00	0.61	0.12	0.00	0.00	20.48	3.94	16.51	3.18
108	1925.94	0.19	2002	0.00	0.00	0.00	0.00	24.71	4.76	0.00	0.00	0.00	0.00	0.00	0.00	2.66	0.51	0.00	0.00	22.15	4.27	16.64	3.20
108	1925.94	0.19	2003	37.45	7.21	0.00	0.00	16.79	3.23	0.00	0.00	66.01	12.71	0.00	0.00	0.53	0.10	0.00	0.00	25.29	4.87	18.15	3.49
108	1925.94	0.19	2004	0.00	0.00	0.00	0.00	82.08	15.81	0.00	0.00	85.55	16.48	0.00	0.00	24.08	4.64	0.00	0.00	28.46	5.48	24.66	4.75
108	1925.94	0.19	2005	0.00	0.00	0.00	0.00	44.65	8.60	0.00	0.00	0.00	0.00	0.00	0.00	14.91	2.87	0.00	0.00	29.61	5.70	24.34	4.69
108	1925.94	0.19	2006	50.16	9.66	0.00	0.00	47.40	9.13	0.00	0.00	0.00	0.00	0.00	0.00	7.03	1.35	0.00	0.00	26.91	5.18	22.65	4.36

108	1925.94	0.19	2007	0.00	0.00	0.00	0.00	97.09	18.70	0.00	0.00	125.67	24.20	0.00	0.00	32.60	6.28	0.00	0.00	43.98	8.47	42.18	8.12
108	1925.94	0.19	2008	0.00	0.00	0.00	0.00	51.76	9.97	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.20	0.00	0.00	19.42	3.74	16.34	3.15
108	1925.94	0.19	2009	84.68	16.31	0.00	0.00	98.96	19.06	0.00	0.00	101.52	19.55	0.00	0.00	24.75	4.77	0.00	0.00	31.28	6.02	30.74	5.92
117	6223.63	0.62	1996	0.00	0.00	0.00	0.00	40.89	25.45	0.00	0.00	28.09	17.48	0.00	0.00	9.34	5.82	3.11	1.93	0.00	0.00	0.00	0.00
117	6223.63	0.62	1997	45.45	28.29	0.00	0.00	50.18	31.23	0.00	0.00	39.85	24.80	0.00	0.00	1.24	0.77	4.12	2.57	0.00	0.00	0.00	0.00
117	6223.63	0.62	1998	0.00	0.00	0.00	0.00	55.61	34.61	0.00	0.00	68.93	42.90	0.00	0.00	0.39	0.24	5.59	3.48	0.00	0.00	0.00	0.00
117	6223.63	0.62	1999	0.00	0.00	0.00	0.00	63.72	39.66	0.00	0.00	0.00	0.00	0.00	0.00	14.46	9.00	8.06	5.01	0.00	0.00	0.00	0.00
117	6223.63	0.62	2000	61.06	38.00	0.00	0.00	39.27	24.44	0.00	0.00	0.00	0.00	0.00	0.00	8.69	5.41	2.30	1.43	0.00	0.00	0.00	0.00
117	6223.63	0.62	2001	0.00	0.00	0.00	0.00	34.98	21.77	0.00	0.00	55.81	34.73	0.00	0.00	0.28	0.18	0.21	0.13	0.00	0.00	0.00	0.00
117	6223.63	0.62	2002	0.00	0.00	0.00	0.00	27.85	17.33	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.56	0.12	0.07	0.00	0.00	0.00	0.00
117	6223.63	0.62	2003	29.40	18.30	0.00	0.00	23.30	14.50	0.00	0.00	29.62	18.43	0.00	0.00	0.24	0.15	0.10	0.06	0.00	0.00	0.00	0.00
117	6223.63	0.62	2004	0.00	0.00	0.00	0.00	60.23	37.49	0.00	0.00	49.20	30.62	0.00	0.00	12.07	7.51	6.75	4.20	0.00	0.00	0.00	0.00
117	6223.63	0.62	2005	0.00	0.00	0.00	0.00	37.30	23.21	0.00	0.00	0.00	0.00	0.00	0.00	6.81	4.24	2.51	1.56	0.00	0.00	0.00	0.00
117	6223.63	0.62	2006	40.73	25.35	0.00	0.00	39.49	24.58	0.00	0.00	0.00	0.00	0.00	0.00	2.72	1.69	1.59	0.99	0.00	0.00	0.00	0.00
117	6223.63	0.62	2007	0.00	0.00	0.00	0.00	68.59	42.69	0.00	0.00	68.41	42.58	0.00	0.00	17.71	11.02	9.62	5.99	0.00	0.00	0.00	0.00
117	6223.63	0.62	2008	0.00	0.00	0.00	0.00	46.55	28.97	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.20	2.39	1.49	0.00	0.00	0.00	0.00
117	6223.63	0.62	2009	65.23	40.60	0.00	0.00	69.96	43.54	0.00	0.00	47.84	29.78	0.00	0.00	12.53	7.80	7.75	4.82	0.00	0.00	0.00	0.00
146	147.59	0.01	1996	0.00	0.00	0.00	0.00	27.44	0.40	0.00	0.00	13.11	0.19	0.00	0.00	8.41	0.12	0.00	0.00	19.13	0.28	0.00	0.00
146	147.59	0.01	1997	24.27	0.36	0.00	0.00	38.30	0.57	0.00	0.00	29.86	0.44	0.00	0.00	1.18	0.02	0.00	0.00	21.80	0.32	0.00	0.00
146	147.59	0.01	1998	0.00	0.00	0.00	0.00	43.23	0.64	0.00	0.00	44.27	0.65	0.00	0.00	0.24	0.00	0.00	0.00	17.47	0.26	0.00	0.00
146	147.59	0.01	1999	0.00	0.00	0.00	0.00	51.59	0.76	0.00	0.00	0.00	0.00	0.00	0.00	11.73	0.17	0.00	0.00	29.64	0.44	0.00	0.00
146	147.59	0.01	2000	31.33	0.46	0.00	0.00	24.79	0.37	0.00	0.00	0.00	0.00	0.00	0.00	5.90	0.09	0.00	0.00	19.11	0.28	0.00	0.00
146	147.59	0.01	2001	0.00	0.00	0.00	0.00	25.68	0.38	0.00	0.00	38.55	0.57	0.00	0.00	0.20	0.00	0.00	0.00	15.31	0.23	0.00	0.00
146	147.59	0.01	2002	0.00	0.00	0.00	0.00	12.56	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.01	0.00	0.00	17.05	0.25	0.00	0.00
146	147.59	0.01	2003	15.89	0.23	0.00	0.00	8.58	0.13	0.00	0.00	25.55	0.38	0.00	0.00	0.26	0.00	0.00	0.00	19.72	0.29	0.00	0.00
146	147.59	0.01	2004	0.00	0.00	0.00	0.00	42.32	0.62	0.00	0.00	32.93	0.49	0.00	0.00	8.78	0.13	0.00	0.00	22.34	0.33	0.00	0.00
146	147.59	0.01	2005	0.00	0.00	0.00	0.00	22.38	0.33	0.00	0.00	0.00	0.00	0.00	0.00	3.27	0.05	0.00	0.00	22.62	0.33	0.00	0.00
146	147.59	0.01	2006	21.77	0.32	0.00	0.00	26.26	0.39	0.00	0.00	0.00	0.00	0.00	0.00	2.61	0.04	0.00	0.00	20.99	0.31	0.00	0.00
146	147.59	0.01	2007	0.00	0.00	0.00	0.00	42.81	0.63	0.00	0.00	48.59	0.72	0.00	0.00	8.79	0.13	0.00	0.00	35.33	0.52	0.00	0.00
146	147.59	0.01	2008	0.00	0.00	0.00	0.00	27.84	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.00	14.21	0.21	0.00	0.00

146	147.59	0.01	2009	31.86	0.47	0.00	0.00	55.94	0.83	0.00	0.00	39.35	0.58	0.00	0.00	6.70	0.10	0.00	0.00	23.88	0.35	0.00	0.00
147	1391.47	0.14	1996	0.00	0.00	0.00	0.00	57.90	8.06	0.00	0.00	32.53	4.53	0.00	0.00	12.78	1.78	0.00	0.00	27.71	3.86	0.00	0.00
147	1391.47	0.14	1997	58.29	8.11	0.00	0.00	74.43	10.36	0.00	0.00	59.94	8.34	0.00	0.00	2.00	0.28	0.00	0.00	29.94	4.17	0.00	0.00
147	1391.47	0.14	1998	0.00	0.00	0.00	0.00	80.65	11.22	0.00	0.00	96.19	13.38	0.00	0.00	0.41	0.06	0.00	0.00	24.77	3.45	0.00	0.00
147	1391.47	0.14	1999	0.00	0.00	0.00	0.00	95.03	13.22	0.00	0.00	0.00	0.00	0.00	0.00	18.96	2.64	0.00	0.00	43.18	6.01	0.00	0.00
147	1391.47	0.14	2000	74.12	10.31	0.00	0.00	57.65	8.02	0.00	0.00	0.00	0.00	0.00	0.00	11.05	1.54	0.00	0.00	26.60	3.70	0.00	0.00
147	1391.47	0.14	2001	0.00	0.00	0.00	0.00	50.24	6.99	0.00	0.00	79.55	11.07	0.00	0.00	0.30	0.04	0.00	0.00	20.25	2.82	0.00	0.00
147	1391.47	0.14	2002	0.00	0.00	0.00	0.00	35.87	4.99	0.00	0.00	0.00	0.00	0.00	0.00	1.58	0.22	0.00	0.00	25.02	3.48	0.00	0.00
147	1391.47	0.14	2003	38.55	5.36	0.00	0.00	28.23	3.93	0.00	0.00	47.64	6.63	0.00	0.00	0.39	0.05	0.00	0.00	27.12	3.77	0.00	0.00
147	1391.47	0.14	2004	0.00	0.00	0.00	0.00	84.73	11.79	0.00	0.00	69.61	9.69	0.00	0.00	15.33	2.13	0.00	0.00	31.13	4.33	0.00	0.00
147	1391.47	0.14	2005	0.00	0.00	0.00	0.00	51.33	7.14	0.00	0.00	0.00	0.00	0.00	0.00	4.36	0.61	0.00	0.00	30.64	4.26	0.00	0.00
147	1391.47	0.14	2006	52.50	7.31	0.00	0.00	55.48	7.72	0.00	0.00	0.00	0.00	0.00	0.00	4.12	0.57	0.00	0.00	28.66	3.99	0.00	0.00
147	1391.47	0.14	2007	0.00	0.00	0.00	0.00	95.60	13.30	0.00	0.00	95.69	13.32	0.00	0.00	22.88	3.18	0.00	0.00	55.27	7.69	0.00	0.00
147	1391.47	0.14	2008	0.00	0.00	0.00	0.00	63.04	8.77	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.04	0.00	0.00	19.14	2.66	0.00	0.00
147	1391.47	0.14	2009	83.17	11.57	0.00	0.00	103.78	14.44	0.00	0.00	73.04	10.16	0.00	0.00	16.93	2.36	0.00	0.00	35.95	5.00	0.00	0.00

Wallace County

SUB	Area (m)	Area (ha)	Year	CORN (t)	CORN*A (t/ha)	IRCN (t)	IRCN*A (t/ha)	GRSG (t)	GRSG*A (t/ha)	IRGS (t)	IRGS*A (t/ha)	WWHT (t)	WWHT*A (t/ha)	IRWW (t)	IRWW*A (t/ha)	SOYB (t)	SOYB*A (t/ha)	IRSB (t)	IRSB*A (t/ha)	ALFA (t)	ALFA*A (t/ha)	IRAL (t)	IRAL*A (t/ha)
3	32.38	0.00	1996	0.00	0.00	73.08	0.24	5.88	0.02	0.00	0.00	21.88	0.07	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	32.38	0.00	1997	25.05	0.08	73.14	0.24	48.96	0.16	0.00	0.00	25.41	0.08	0.00	0.00	7.42	0.02	0.00	0.00	0.00	0.00	0.00	0.00
3	32.38	0.00	1998	0.00	0.00	73.52	0.24	5.58	0.02	0.00	0.00	0.00	0.00	0.00	0.00	4.69	0.02	0.00	0.00	0.00	0.00	0.00	0.00
3	32.38	0.00	1999	0.00	0.00	77.67	0.25	5.82	0.02	0.00	0.00	54.59	0.18	0.00	0.00	4.99	0.02	0.00	0.00	0.00	0.00	0.00	0.00
3	32.38	0.00	2000	8.34	0.03	71.22	0.23	15.16	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	32.38	0.00	2001	0.00	0.00	69.17	0.22	5.35	0.02	0.00	0.00	18.32	0.06	0.00	0.00	4.52	0.01	0.00	0.00	0.00	0.00	0.00	0.00
3	32.38	0.00	2002	0.00	0.00	68.22	0.22	5.52	0.02	0.00	0.00	16.85	0.05	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	32.38	0.00	2003	12.44	0.04	69.11	0.22	16.56	0.05	0.00	0.00	14.46	0.05	0.00	0.00	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	32.38	0.00	2004	0.00	0.00	71.90	0.23	5.41	0.02	0.00	0.00	0.00	0.00	0.00	0.00	8.37	0.03	0.00	0.00	0.00	0.00	0.00	0.00
3	32.38	0.00	2005	0.00	0.00	70.32	0.23	5.34	0.02	0.00	0.00	73.59	0.24	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	32.38	0.00	2006	16.06	0.05	69.24	0.22	17.97	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	32.38	0.00	2007	0.00	0.00	70.48	0.23	5.22	0.02	0.00	0.00	35.10	0.11	0.00	0.00	3.96	0.01	0.00	0.00	0.00	0.00	0.00	0.00

3	32.38	0.00	2008	0.00	0.00	66.13	0.21	5.14	0.02	0.00	0.00	17.66	0.06	0.00	0.00	5.90	0.02	0.00	0.00	0.00	0.00	0.00	0.00
3	32.38	0.00	2009	33.03	0.11	75.08	0.24	47.00	0.15	0.00	0.00	40.93	0.13	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	198.07	0.02	1996	0.00	0.00	122.94	2.44	0.00	0.00	0.00	0.00	17.81	0.35	0.00	0.00	2.28	0.05	0.00	0.00	0.00	0.00	0.00	0.00
5	198.07	0.02	1997	16.87	0.33	123.59	2.45	51.51	1.02	0.00	0.00	42.42	0.84	0.00	0.00	17.07	0.34	0.00	0.00	0.00	0.00	0.00	0.00
5	198.07	0.02	1998	0.00	0.00	125.24	2.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.61	0.21	0.00	0.00	0.00	0.00	0.00	0.00
5	198.07	0.02	1999	0.00	0.00	131.85	2.61	0.00	0.00	0.00	0.00	76.95	1.52	0.00	0.00	11.86	0.23	0.00	0.00	0.00	0.00	0.00	0.00
5	198.07	0.02	2000	6.64	0.13	120.45	2.39	12.97	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	198.07	0.02	2001	0.00	0.00	116.20	2.30	0.00	0.00	0.00	0.00	35.24	0.70	0.00	0.00	10.66	0.21	0.00	0.00	0.00	0.00	0.00	0.00
5	198.07	0.02	2002	0.00	0.00	114.10	2.26	0.00	0.00	0.00	0.00	16.41	0.33	0.00	0.00	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	198.07	0.02	2003	8.50	0.17	116.11	2.30	15.40	0.30	0.00	0.00	31.01	0.61	0.00	0.00	1.60	0.03	0.00	0.00	0.00	0.00	0.00	0.00
5	198.07	0.02	2004	0.00	0.00	124.63	2.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.41	0.38	0.00	0.00	0.00	0.00	0.00	0.00
5	198.07	0.02	2005	0.00	0.00	117.83	2.33	0.00	0.00	0.00	0.00	95.66	1.89	0.00	0.00	0.33	0.01	0.00	0.00	0.00	0.00	0.00	0.00
5	198.07	0.02	2006	13.12	0.26	116.32	2.30	22.83	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.42	0.01	0.00	0.00	0.00	0.00	0.00	0.00
5	198.07	0.02	2007	0.00	0.00	120.03	2.38	0.00	0.00	0.00	0.00	62.92	1.25	0.00	0.00	9.60	0.19	0.00	0.00	0.00	0.00	0.00	0.00
5	198.07	0.02	2008	0.00	0.00	111.71	2.21	0.00	0.00	0.00	0.00	20.12	0.40	0.00	0.00	12.96	0.26	0.00	0.00	0.00	0.00	0.00	0.00
5	198.07	0.02	2009	225.14	4.46	128.06	2.54	47.85	0.95	0.00	0.00	69.78	1.38	0.00	0.00	1.56	0.03	0.00	0.00	0.00	0.00	0.00	0.00
6	2053.56	0.21	1996	0.00	0.00	162.07	33.28	0.00	0.00	0.00	0.00	22.66	4.65	0.00	0.00	1.79	0.37	0.00	0.00	8.62	1.77	6.99	1.44
6	2053.56	0.21	1997	0.00	0.00	163.92	33.66	96.65	19.85	0.00	0.00	58.05	11.92	0.00	0.00	13.37	2.74	0.00	0.00	18.33	3.76	18.12	3.72
6	2053.56	0.21	1998	0.00	0.00	166.78	34.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.26	1.70	0.00	0.00	14.96	3.07	9.92	2.04
6	2053.56	0.21	1999	0.00	0.00	174.99	35.94	0.00	0.00	0.00	0.00	102.70	21.09	0.00	0.00	9.36	1.92	0.00	0.00	16.53	3.39	13.65	2.80
6	2053.56	0.21	2000	0.00	0.00	158.80	32.61	24.25	4.98	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.02	0.00	0.00	2.98	0.61	2.38	0.49
6	2053.56	0.21	2001	0.00	0.00	153.56	31.53	0.00	0.00	0.00	0.00	47.88	9.83	0.00	0.00	8.40	1.72	0.00	0.00	10.30	2.11	7.83	1.61
6	2053.56	0.21	2002	0.00	0.00	151.46	31.10	0.00	0.00	0.00	0.00	21.96	4.51	0.00	0.00	0.15	0.03	0.00	0.00	8.06	1.66	5.71	1.17
6	2053.56	0.21	2003	0.00	0.00	152.78	31.37	28.81	5.92	0.00	0.00	42.00	8.62	0.00	0.00	1.25	0.26	0.00	0.00	10.05	2.06	7.55	1.55
6	2053.56	0.21	2004	0.00	0.00	165.89	34.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.23	3.13	0.00	0.00	14.59	3.00	15.30	3.14
6	2053.56	0.21	2005	0.00	0.00	155.52	31.94	0.00	0.00	0.00	0.00	131.28	26.96	0.00	0.00	0.26	0.05	0.00	0.00	13.99	2.87	8.24	1.69
6	2053.56	0.21	2006	0.00	0.00	155.18	31.87	40.45	8.31	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.07	0.00	0.00	10.94	2.25	5.81	1.19
6	2053.56	0.21	2007	0.00	0.00	159.25	32.70	0.00	0.00	0.00	0.00	86.48	17.76	0.00	0.00	7.61	1.56	0.00	0.00	10.16	2.09	7.68	1.58
6	2053.56	0.21	2008	0.00	0.00	147.24	30.24	0.00	0.00	0.00	0.00	26.24	5.39	0.00	0.00	10.02	2.06	0.00	0.00	6.92	1.42	8.84	1.81
6	2053.56	0.21	2009	0.00	0.00	169.91	34.89	92.34	18.96	0.00	0.00	96.66	19.85	0.00	0.00	1.30	0.27	0.00	0.00	20.34	4.18	13.05	2.68

11	2908.68	0.29	1996	0.00	0.00	65.16	18.95	0.00	0.00	0.00	0.00	9.19	2.67	0.00	0.00	9.53	2.77	0.00	0.00	0.00	0.00	27.27	7.93
11	2908.68	0.29	1997	0.00	0.00	64.34	18.71	27.23	7.92	0.00	0.00	40.13	11.67	0.00	0.00	4.56	1.33	0.00	0.00	0.00	0.00	22.22	6.46
11	2908.68	0.29	1998	0.00	0.00	66.43	19.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.68	1.65	0.00	0.00	0.00	0.00	16.65	4.84
11	2908.68	0.29	1999	0.00	0.00	68.35	19.88	0.00	0.00	0.00	0.00	68.53	19.93	0.00	0.00	6.34	1.84	0.00	0.00	0.00	0.00	21.16	6.16
11	2908.68	0.29	2000	0.00	0.00	62.67	18.23	24.48	7.12	0.00	0.00	0.00	0.00	0.00	0.00	6.31	1.83	0.00	0.00	0.00	0.00	18.02	5.24
11	2908.68	0.29	2001	0.00	0.00	62.21	18.09	0.00	0.00	0.00	0.00	56.75	16.51	0.00	0.00	7.82	2.28	0.00	0.00	0.00	0.00	14.14	4.11
11	2908.68	0.29	2002	0.00	0.00	61.80	17.98	0.00	0.00	0.00	0.00	9.14	2.66	0.00	0.00	0.18	0.05	0.00	0.00	0.00	0.00	5.66	1.65
11	2908.68	0.29	2003	0.00	0.00	63.69	18.53	4.88	1.42	0.00	0.00	51.02	14.84	0.00	0.00	0.08	0.02	0.00	0.00	0.00	0.00	6.82	1.98
11	2908.68	0.29	2004	0.00	0.00	70.42	20.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.01	1.17	0.00	0.00	0.00	0.00	16.90	4.92
11	2908.68	0.29	2005	0.00	0.00	61.83	17.98	0.00	0.00	0.00	0.00	62.01	18.04	0.00	0.00	5.00	1.45	0.00	0.00	0.00	0.00	13.19	3.84
11	2908.68	0.29	2006	0.00	0.00	62.49	18.18	11.82	3.44	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.04	0.00	0.00	0.00	0.00	8.96	2.61
11	2908.68	0.29	2007	0.00	0.00	67.02	19.49	0.00	0.00	0.00	0.00	68.50	19.92	0.00	0.00	3.62	1.05	0.00	0.00	0.00	0.00	12.22	3.55
11	2908.68	0.29	2008	0.00	0.00	64.43	18.74	0.00	0.00	0.00	0.00	11.53	3.35	0.00	0.00	3.74	1.09	0.00	0.00	0.00	0.00	9.99	2.91
11	2908.68	0.29	2009	0.00	0.00	65.49	19.05	29.51	8.58	0.00	0.00	45.50	13.24	0.00	0.00	7.09	2.06	0.00	0.00	0.00	0.00	23.63	6.87
13	22527.92	2.25	1996	0.00	0.00	86.49	194.85	0.00	0.00	0.00	0.00	17.72	39.92	0.00	0.00	1.82	4.10	0.00	0.00	0.00	0.00	0.00	0.00
13	22527.92	2.25	1997	27.30	61.49	87.15	196.32	43.15	97.20	0.00	0.00	32.23	72.60	0.00	0.00	12.53	28.23	0.00	0.00	0.00	0.00	0.00	0.00
13	22527.92	2.25	1998	0.00	0.00	88.01	198.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.58	17.09	0.00	0.00	0.00	0.00	0.00	0.00
13	22527.92	2.25	1999	0.00	0.00	93.05	209.61	0.00	0.00	0.00	0.00	68.49	154.30	0.00	0.00	8.65	19.49	0.00	0.00	0.00	0.00	0.00	0.00
13	22527.92	2.25	2000	11.29	25.43	85.31	192.19	11.35	25.56	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.19	0.00	0.00	0.00	0.00	0.00	0.00
13	22527.92	2.25	2001	0.00	0.00	80.39	181.10	0.00	0.00	0.00	0.00	27.05	60.93	0.00	0.00	7.59	17.09	0.00	0.00	0.00	0.00	0.00	0.00
13	22527.92	2.25	2002	0.00	0.00	81.05	182.59	0.00	0.00	0.00	0.00	17.30	38.98	0.00	0.00	0.13	0.30	0.00	0.00	0.00	0.00	0.00	0.00
13	22527.92	2.25	2003	13.41	30.20	81.57	183.76	11.82	26.63	0.00	0.00	23.33	52.55	0.00	0.00	1.15	2.60	0.00	0.00	0.00	0.00	0.00	0.00
13	22527.92	2.25	2004	0.00	0.00	87.26	196.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	14.24	32.07	0.00	0.00	0.00	0.00	0.00	0.00
13	22527.92	2.25	2005	0.00	0.00	83.43	187.94	0.00	0.00	0.00	0.00	81.55	183.72	0.00	0.00	0.22	0.50	0.00	0.00	0.00	0.00	0.00	0.00
13	22527.92	2.25	2006	21.14	47.63	81.75	184.16	18.03	40.62	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.68	0.00	0.00	0.00	0.00	0.00	0.00
13	22527.92	2.25	2007	0.00	0.00	84.55	190.48	0.00	0.00	0.00	0.00	47.80	107.67	0.00	0.00	7.26	16.36	0.00	0.00	0.00	0.00	0.00	0.00
13	22527.92	2.25	2008	0.00	0.00	78.83	177.58	0.00	0.00	0.00	0.00	20.73	46.70	0.00	0.00	8.93	20.13	0.00	0.00	0.00	0.00	0.00	0.00
13	22527.92	2.25	2009	38.70	87.17	89.52	201.67	42.51	95.77	0.00	0.00	52.28	117.78	0.00	0.00	1.31	2.95	0.00	0.00	0.00	0.00	0.00	0.00
15	12035.23	1.20	1996	0.00	0.00	52.06	62.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	12035.23	1.20	1997	0.00	0.00	52.14	62.75	0.00	0.00	0.00	0.00	26.60	32.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

15	12035.23	1.20	1998	0.00	0.00	53.50	64.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	12035.23	1.20	1999	0.00	0.00	54.32	65.37	0.00	0.00	0.00	0.00	42.51	51.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	12035.23	1.20	2000	0.00	0.00	47.26	56.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	12035.23	1.20	2001	0.00	0.00	48.43	58.29	0.00	0.00	0.00	0.00	38.02	45.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	12035.23	1.20	2002	0.00	0.00	48.73	58.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	12035.23	1.20	2003	0.00	0.00	50.66	60.97	0.00	0.00	0.00	0.00	37.90	45.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	12035.23	1.20	2004	0.00	0.00	50.04	60.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	12035.23	1.20	2005	0.00	0.00	49.81	59.95	0.00	0.00	0.00	0.00	33.95	40.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	12035.23	1.20	2006	0.00	0.00	49.96	60.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	12035.23	1.20	2007	0.00	0.00	53.76	64.70	0.00	0.00	0.00	0.00	49.49	59.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	12035.23	1.20	2008	0.00	0.00	51.75	62.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	12035.23	1.20	2009	0.00	0.00	53.99	64.98	0.00	0.00	0.00	0.00	32.37	38.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	2962.07	0.30	1996	0.00	0.00	45.88	13.59	0.00	0.00	0.00	0.00	19.68	5.83	0.00	0.00	8.82	2.61	9.74	2.89	0.00	0.00	0.00	0.00
16	2962.07	0.30	1997	50.91	15.08	44.60	13.21	12.24	3.63	0.00	0.00	20.48	6.07	0.00	0.00	6.43	1.90	4.52	1.34	0.00	0.00	0.00	0.00
16	2962.07	0.30	1998	0.00	0.00	45.20	13.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.95	0.58	5.73	1.70	0.00	0.00	0.00	0.00
16	2962.07	0.30	1999	0.00	0.00	46.74	13.84	0.00	0.00	0.00	0.00	64.37	19.07	0.00	0.00	6.41	1.90	6.38	1.89	0.00	0.00	0.00	0.00
16	2962.07	0.30	2000	56.55	16.75	43.41	12.86	11.06	3.28	0.00	0.00	0.00	0.00	0.00	0.00	6.05	1.79	6.22	1.84	0.00	0.00	0.00	0.00
16	2962.07	0.30	2001	0.00	0.00	41.78	12.37	0.00	0.00	0.00	0.00	31.36	9.29	0.00	0.00	5.12	1.52	7.76	2.30	0.00	0.00	0.00	0.00
16	2962.07	0.30	2002	0.00	0.00	41.78	12.37	0.00	0.00	0.00	0.00	20.05	5.94	0.00	0.00	0.08	0.02	0.16	0.05	0.00	0.00	0.00	0.00
16	2962.07	0.30	2003	17.52	5.19	43.34	12.84	1.55	0.46	0.00	0.00	32.26	9.56	0.00	0.00	0.08	0.02	0.09	0.03	0.00	0.00	0.00	0.00
16	2962.07	0.30	2004	0.00	0.00	48.01	14.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.73	1.70	4.70	1.39	0.00	0.00	0.00	0.00
16	2962.07	0.30	2005	0.00	0.00	42.07	12.46	0.00	0.00	0.00	0.00	59.72	17.69	0.00	0.00	0.16	0.05	5.06	1.50	0.00	0.00	0.00	0.00
16	2962.07	0.30	2006	26.74	7.92	42.40	12.56	3.34	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.24	0.13	0.04	0.00	0.00	0.00	0.00
16	2962.07	0.30	2007	0.00	0.00	46.11	13.66	0.00	0.00	0.00	0.00	42.16	12.49	0.00	0.00	0.12	0.04	3.64	1.08	0.00	0.00	0.00	0.00
16	2962.07	0.30	2008	0.00	0.00	43.00	12.74	0.00	0.00	0.00	0.00	25.73	7.62	0.00	0.00	2.52	0.75	3.82	1.13	0.00	0.00	0.00	0.00
16	2962.07	0.30	2009	71.05	21.04	45.87	13.59	12.48	3.70	0.00	0.00	26.91	7.97	0.00	0.00	8.56	2.54	7.21	2.13	0.00	0.00	0.00	0.00
20	14965.10	1.50	1996	0.00	0.00	170.73	255.50	0.00	0.00	0.00	0.00	21.25	31.80	0.00	0.00	0.74	1.11	0.00	0.00	6.51	9.74	0.00	0.00
20	14965.10	1.50	1997	4.18	6.25	168.88	252.72	84.00	125.71	0.00	0.00	37.26	55.75	0.00	0.00	5.68	8.50	0.00	0.00	13.80	20.65	0.00	0.00
20	14965.10	1.50	1998	0.00	0.00	174.86	261.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.47	5.19	0.00	0.00	11.74	17.57	0.00	0.00
20	14965.10	1.50	1999	0.00	0.00	174.32	260.87	0.00	0.00	0.00	0.00	82.57	123.57	0.00	0.00	3.90	5.84	0.00	0.00	12.80	19.16	0.00	0.00

20	14965.10	1.50	2000	1.42	2.13	166.40	249.01	20.07	30.03	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.08	0.00	0.00	2.14	3.20	0.00	0.00
20	14965.10	1.50	2001	0.00	0.00	161.65	241.91	0.00	0.00	0.00	0.00	34.56	51.71	0.00	0.00	3.44	5.15	0.00	0.00	7.90	11.82	0.00	0.00
20	14965.10	1.50	2002	0.00	0.00	158.29	236.88	0.00	0.00	0.00	0.00	21.79	32.60	0.00	0.00	0.06	0.09	0.00	0.00	6.19	9.27	0.00	0.00
20	14965.10	1.50	2003	2.12	3.18	161.16	241.18	26.57	39.76	0.00	0.00	31.77	47.54	0.00	0.00	0.52	0.78	0.00	0.00	7.53	11.27	0.00	0.00
20	14965.10	1.50	2004	0.00	0.00	174.32	260.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.43	9.62	0.00	0.00	11.25	16.83	0.00	0.00
20	14965.10	1.50	2005	0.00	0.00	164.44	246.09	0.00	0.00	0.00	0.00	104.27	156.04	0.00	0.00	0.11	0.16	0.00	0.00	10.69	16.00	0.00	0.00
20	14965.10	1.50	2006	2.65	3.97	161.73	242.02	36.82	55.10	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.21	0.00	0.00	8.69	13.00	0.00	0.00
20	14965.10	1.50	2007	0.00	0.00	166.76	249.56	0.00	0.00	0.00	0.00	64.17	96.03	0.00	0.00	3.08	4.62	0.00	0.00	8.13	12.17	0.00	0.00
20	14965.10	1.50	2008	0.00	0.00	154.31	230.93	0.00	0.00	0.00	0.00	27.26	40.79	0.00	0.00	4.28	6.41	0.00	0.00	5.14	7.69	0.00	0.00
20	14965.10	1.50	2009	6.61	9.90	176.12	263.56	77.15	115.45	0.00	0.00	69.67	104.26	0.00	0.00	0.52	0.78	0.00	0.00	15.80	23.64	0.00	0.00
22	11642.31	1.16	1996	0.00	0.00	91.74	106.80	0.00	0.00	0.00	0.00	2.44	2.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	11642.31	1.16	1997	0.00	0.00	89.38	104.06	12.05	14.03	0.00	0.00	21.43	24.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	11642.31	1.16	1998	0.00	0.00	93.83	109.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	11642.31	1.16	1999	0.00	0.00	86.58	100.79	0.00	0.00	0.00	0.00	31.13	36.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	11642.31	1.16	2000	0.00	0.00	90.61	105.50	3.37	3.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	11642.31	1.16	2001	0.00	0.00	86.18	100.34	0.00	0.00	0.00	0.00	20.93	24.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	11642.31	1.16	2002	0.00	0.00	86.18	100.33	0.00	0.00	0.00	0.00	2.78	3.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	11642.31	1.16	2003	0.00	0.00	87.37	101.72	3.42	3.98	0.00	0.00	18.96	22.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	11642.31	1.16	2004	0.00	0.00	95.04	110.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	11642.31	1.16	2005	0.00	0.00	88.53	103.07	0.00	0.00	0.00	0.00	33.78	39.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	11642.31	1.16	2006	0.00	0.00	86.71	100.95	6.97	8.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	11642.31	1.16	2007	0.00	0.00	88.56	103.10	0.00	0.00	0.00	0.00	38.24	44.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	11642.31	1.16	2008	0.00	0.00	84.04	97.85	0.00	0.00	0.00	0.00	4.04	4.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	11642.31	1.16	2009	0.00	0.00	95.67	111.38	11.52	13.42	0.00	0.00	35.25	41.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	8697.92	0.87	1996	0.00	0.00	115.66	100.60	0.00	0.00	0.00	0.00	5.08	4.42	0.00	0.00	0.88	0.76	0.00	0.00	0.00	0.00	0.00	0.00
24	8697.92	0.87	1997	9.18	7.98	112.73	98.05	12.56	10.92	0.00	0.00	20.82	18.11	0.00	0.00	3.48	3.03	0.00	0.00	0.00	0.00	0.00	0.00
24	8697.92	0.87	1998	0.00	0.00	117.27	102.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.80	2.43	0.00	0.00	0.00	0.00	0.00	0.00
24	8697.92	0.87	1999	0.00	0.00	111.50	96.98	0.00	0.00	0.00	0.00	39.32	34.20	0.00	0.00	2.40	2.09	0.00	0.00	0.00	0.00	0.00	0.00
24	8697.92	0.87	2000	2.89	2.51	113.20	98.46	3.04	2.64	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.03	0.00	0.00	0.00	0.00	0.00	0.00
24	8697.92	0.87	2001	0.00	0.00	107.74	93.71	0.00	0.00	0.00	0.00	18.03	15.68	0.00	0.00	2.53	2.20	0.00	0.00	0.00	0.00	0.00	0.00

24	8697.92	0.87	2002	0.00	0.00	109.02	94.83	0.00	0.00	0.00	0.00	5.74	5.00	0.00	0.00	0.06	0.05	0.00	0.00	0.00	0.00	0.00	0.00
24	8697.92	0.87	2003	4.30	3.74	107.72	93.70	4.25	3.70	0.00	0.00	16.25	14.14	0.00	0.00	0.54	0.47	0.00	0.00	0.00	0.00	0.00	0.00
24	8697.92	0.87	2004	0.00	0.00	117.41	102.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.32	3.76	0.00	0.00	0.00	0.00	0.00	0.00
24	8697.92	0.87	2005	0.00	0.00	112.46	97.82	0.00	0.00	0.00	0.00	44.18	38.43	0.00	0.00	0.06	0.05	0.00	0.00	0.00	0.00	0.00	0.00
24	8697.92	0.87	2006	6.41	5.58	109.77	95.48	5.83	5.07	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.09	0.00	0.00	0.00	0.00	0.00	0.00
24	8697.92	0.87	2007	0.00	0.00	111.65	97.11	0.00	0.00	0.00	0.00	36.50	31.75	0.00	0.00	2.50	2.18	0.00	0.00	0.00	0.00	0.00	0.00
24	8697.92	0.87	2008	0.00	0.00	105.52	91.78	0.00	0.00	0.00	0.00	7.38	6.42	0.00	0.00	1.27	1.11	0.00	0.00	0.00	0.00	0.00	0.00
24	8697.92	0.87	2009	11.57	10.06	120.67	104.95	11.24	9.77	0.00	0.00	38.78	33.73	0.00	0.00	0.11	0.09	0.00	0.00	0.00	0.00	0.00	0.00
25	6260.40	0.63	1996	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.54	4.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.90	4.95
25	6260.40	0.63	1997	0.00	0.00	0.00	0.00	38.61	24.17	0.00	0.00	20.28	12.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.18	10.76
25	6260.40	0.63	1998	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.13	6.97
25	6260.40	0.63	1999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.46	24.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.87	8.05
25	6260.40	0.63	2000	0.00	0.00	0.00	0.00	9.59	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.33	1.46
25	6260.40	0.63	2001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	19.97	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.83	5.53
25	6260.40	0.63	2002	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.63	6.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.22	3.89
25	6260.40	0.63	2003	0.00	0.00	0.00	0.00	13.16	8.24	0.00	0.00	18.16	11.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.73	4.84
25	6260.40	0.63	2004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18.50	11.58
25	6260.40	0.63	2005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	44.56	27.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.11	5.08
25	6260.40	0.63	2006	0.00	0.00	0.00	0.00	17.87	11.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.79	4.25
25	6260.40	0.63	2007	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.97	22.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.99	5.62
25	6260.40	0.63	2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.20	8.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.54	5.35
25	6260.40	0.63	2009	0.00	0.00	0.00	0.00	34.11	21.35	0.00	0.00	33.54	21.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.55	7.23
28	7327.28	0.73	1996	0.00	0.00	158.12	115.86	36.07	26.43	0.00	0.00	23.97	17.56	0.00	0.00	4.39	3.22	0.00	0.00	0.00	0.00	0.00	0.00
28	7327.28	0.73	1997	30.28	22.19	154.71	113.36	102.63	75.20	0.00	0.00	17.08	12.52	0.00	0.00	26.36	19.31	0.00	0.00	0.00	0.00	0.00	0.00
28	7327.28	0.73	1998	0.00	0.00	159.86	117.14	35.00	25.65	0.00	0.00	0.00	0.00	0.00	0.00	17.61	12.90	0.00	0.00	0.00	0.00	0.00	0.00
28	7327.28	0.73	1999	0.00	0.00	154.35	113.09	35.70	26.15	0.00	0.00	60.18	44.10	0.00	0.00	18.07	13.24	0.00	0.00	0.00	0.00	0.00	0.00
28	7327.28	0.73	2000	9.45	6.92	152.74	111.92	46.50	34.07	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.15	0.00	0.00	0.00	0.00	0.00	0.00
28	7327.28	0.73	2001	0.00	0.00	147.17	107.84	32.06	23.49	0.00	0.00	13.69	10.03	0.00	0.00	16.74	12.27	0.00	0.00	0.00	0.00	0.00	0.00
28	7327.28	0.73	2002	0.00	0.00	148.30	108.67	33.89	24.83	0.00	0.00	24.97	18.29	0.00	0.00	0.32	0.23	0.00	0.00	0.00	0.00	0.00	0.00
28	7327.28	0.73	2003	15.07	11.04	147.31	107.94	50.99	37.36	0.00	0.00	11.39	8.34	0.00	0.00	2.68	1.96	0.00	0.00	0.00	0.00	0.00	0.00

28	7327.28	0.73	2004	0.00	0.00	160.20	117.38	34.26	25.10	0.00	0.00	0.00	0.00	0.00	0.00	31.41	23.02	0.00	0.00	0.00	0.00	0.00	0.00
28	7327.28	0.73	2005	0.00	0.00	152.01	111.38	32.76	24.01	0.00	0.00	79.93	58.57	0.00	0.00	0.49	0.36	0.00	0.00	0.00	0.00	0.00	0.00
28	7327.28	0.73	2006	20.19	14.79	149.45	109.50	52.45	38.43	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.48	0.00	0.00	0.00	0.00	0.00	0.00
28	7327.28	0.73	2007	0.00	0.00	151.94	111.33	32.25	23.63	0.00	0.00	28.08	20.58	0.00	0.00	16.95	12.42	0.00	0.00	0.00	0.00	0.00	0.00
28	7327.28	0.73	2008	0.00	0.00	142.36	104.31	31.73	23.25	0.00	0.00	29.17	21.38	0.00	0.00	18.22	13.35	0.00	0.00	0.00	0.00	0.00	0.00
28	7327.28	0.73	2009	37.29	27.32	163.10	119.51	99.23	72.71	0.00	0.00	32.27	23.65	0.00	0.00	2.19	1.60	0.00	0.00	0.00	0.00	0.00	0.00
31	10900.00	1.09	1996	0.00	0.00	93.42	101.83	0.00	0.00	0.00	0.00	15.47	16.86	0.00	0.00	13.70	14.94	0.00	0.00	0.00	0.00	0.00	0.00
31	10900.00	1.09	1997	29.55	32.21	95.56	104.16	17.68	19.27	0.00	0.00	8.89	9.69	0.00	0.00	7.71	8.40	0.00	0.00	0.00	0.00	0.00	0.00
31	10900.00	1.09	1998	0.00	0.00	98.99	107.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.69	8.38	0.00	0.00	0.00	0.00	0.00	0.00
31	10900.00	1.09	1999	0.00	0.00	100.62	109.68	0.00	0.00	0.00	0.00	39.30	42.84	0.00	0.00	11.84	12.91	0.00	0.00	0.00	0.00	0.00	0.00
31	10900.00	1.09	2000	34.63	37.74	86.46	94.24	15.95	17.38	0.00	0.00	0.00	0.00	0.00	0.00	10.09	11.00	0.00	0.00	0.00	0.00	0.00	0.00
31	10900.00	1.09	2001	0.00	0.00	89.46	97.51	0.00	0.00	0.00	0.00	16.03	17.47	0.00	0.00	9.14	9.96	0.00	0.00	0.00	0.00	0.00	0.00
31	10900.00	1.09	2002	0.00	0.00	88.52	96.48	0.00	0.00	0.00	0.00	13.94	15.19	0.00	0.00	0.12	0.13	0.00	0.00	0.00	0.00	0.00	0.00
31	10900.00	1.09	2003	12.30	13.40	92.29	100.59	3.94	4.30	0.00	0.00	16.49	17.98	0.00	0.00	0.15	0.17	0.00	0.00	0.00	0.00	0.00	0.00
31	10900.00	1.09	2004	0.00	0.00	94.47	102.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.89	6.41	0.00	0.00	0.00	0.00	0.00	0.00
31	10900.00	1.09	2005	0.00	0.00	90.00	98.10	0.00	0.00	0.00	0.00	37.97	41.39	0.00	0.00	0.33	0.36	0.00	0.00	0.00	0.00	0.00	0.00
31	10900.00	1.09	2006	18.78	20.47	92.50	100.82	10.45	11.39	0.00	0.00	0.00	0.00	0.00	0.00	1.41	1.53	0.00	0.00	0.00	0.00	0.00	0.00
31	10900.00	1.09	2007	0.00	0.00	97.34	106.10	0.00	0.00	0.00	0.00	22.26	24.26	0.00	0.00	0.20	0.22	0.00	0.00	0.00	0.00	0.00	0.00
31	10900.00	1.09	2008	0.00	0.00	93.51	101.92	0.00	0.00	0.00	0.00	20.72	22.58	0.00	0.00	4.31	4.70	0.00	0.00	0.00	0.00	0.00	0.00
31	10900.00	1.09	2009	42.64	46.48	97.25	106.00	18.67	20.35	0.00	0.00	14.20	15.48	0.00	0.00	12.36	13.47	0.00	0.00	0.00	0.00	0.00	0.00
32	11464.47	1.15	1996	0.00	0.00	61.38	70.37	0.00	0.00	0.00	0.00	3.65	4.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	11464.47	1.15	1997	0.00	0.00	58.19	66.72	18.08	20.73	0.00	0.00	11.07	12.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	11464.47	1.15	1998	0.00	0.00	62.65	71.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	11464.47	1.15	1999	0.00	0.00	54.67	62.68	0.00	0.00	0.00	0.00	20.18	23.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	11464.47	1.15	2000	0.00	0.00	60.84	69.75	5.06	5.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	11464.47	1.15	2001	0.00	0.00	57.69	66.14	0.00	0.00	0.00	0.00	11.50	13.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	11464.47	1.15	2002	0.00	0.00	57.76	66.22	0.00	0.00	0.00	0.00	4.16	4.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	11464.47	1.15	2003	0.00	0.00	58.74	67.35	5.12	5.87	0.00	0.00	10.33	11.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	11464.47	1.15	2004	0.00	0.00	63.51	72.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	11464.47	1.15	2005	0.00	0.00	59.56	68.28	0.00	0.00	0.00	0.00	24.23	27.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

32	11464.47	1.15	2006	0.00	0.00	58.38	66.93	10.46	11.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	11464.47	1.15	2007	0.00	0.00	59.34	68.03	0.00	0.00	0.00	0.00	21.23	24.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	11464.47	1.15	2008	0.00	0.00	56.71	65.01	0.00	0.00	0.00	0.00	6.04	6.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	11464.47	1.15	2009	0.00	0.00	64.64	74.10	17.28	19.82	0.00	0.00	19.57	22.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	14980.68	1.50	1996	0.00	0.00	74.93	112.24	18.70	28.02	0.00	0.00	9.28	13.90	0.00	0.00	3.03	4.53	0.00	0.00	0.00	0.00	0.00	0.00
33	14980.68	1.50	1997	0.00	0.00	75.93	113.75	62.18	93.15	0.00	0.00	24.67	36.96	0.00	0.00	19.07	28.56	0.00	0.00	0.00	0.00	0.00	0.00
33	14980.68	1.50	1998	0.00	0.00	76.77	115.01	18.09	27.10	0.00	0.00	0.00	0.00	0.00	0.00	12.15	18.20	0.00	0.00	0.00	0.00	0.00	0.00
33	14980.68	1.50	1999	0.00	0.00	80.85	121.11	18.27	27.37	0.00	0.00	48.38	72.48	0.00	0.00	13.08	19.59	0.00	0.00	0.00	0.00	0.00	0.00
33	14980.68	1.50	2000	0.00	0.00	73.76	110.49	26.65	39.93	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.21	0.00	0.00	0.00	0.00	0.00	0.00
33	14980.68	1.50	2001	0.00	0.00	70.09	104.99	16.25	24.34	0.00	0.00	21.33	31.95	0.00	0.00	11.86	17.77	0.00	0.00	0.00	0.00	0.00	0.00
33	14980.68	1.50	2002	0.00	0.00	70.55	105.69	17.27	25.87	0.00	0.00	10.55	15.80	0.00	0.00	0.22	0.33	0.00	0.00	0.00	0.00	0.00	0.00
33	14980.68	1.50	2003	0.00	0.00	70.61	105.78	29.23	43.78	0.00	0.00	19.13	28.66	0.00	0.00	1.89	2.83	0.00	0.00	0.00	0.00	0.00	0.00
33	14980.68	1.50	2004	0.00	0.00	76.02	113.88	17.26	25.86	0.00	0.00	0.00	0.00	0.00	0.00	22.57	33.81	0.00	0.00	0.00	0.00	0.00	0.00
33	14980.68	1.50	2005	0.00	0.00	72.68	108.87	16.61	24.88	0.00	0.00	57.36	85.92	0.00	0.00	0.34	0.51	0.00	0.00	0.00	0.00	0.00	0.00
33	14980.68	1.50	2006	0.00	0.00	71.30	106.82	35.15	52.65	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.70	0.00	0.00	0.00	0.00	0.00	0.00
33	14980.68	1.50	2007	0.00	0.00	73.33	109.85	16.43	24.61	0.00	0.00	40.75	61.05	0.00	0.00	11.61	17.39	0.00	0.00	0.00	0.00	0.00	0.00
33	14980.68	1.50	2008	0.00	0.00	68.45	102.54	16.12	24.15	0.00	0.00	13.89	20.81	0.00	0.00	12.74	19.08	0.00	0.00	0.00	0.00	0.00	0.00
33	14980.68	1.50	2009	0.00	0.00	77.92	116.73	58.84	88.15	0.00	0.00	42.28	63.33	0.00	0.00	1.81	2.71	0.00	0.00	0.00	0.00	0.00	0.00
38	7366.48	0.74	1996	0.00	0.00	31.53	23.23	0.00	0.00	0.00	0.00	33.09	24.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	7366.48	0.74	1997	49.57	36.51	29.90	22.03	35.35	26.04	0.00	0.00	23.04	16.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	7366.48	0.74	1998	0.00	0.00	28.30	20.85	0.00	0.00	0.00	0.00	50.35	37.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	7366.48	0.74	1999	0.00	0.00	31.31	23.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	7366.48	0.74	2000	49.72	36.62	29.60	21.80	39.97	29.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	7366.48	0.74	2001	0.00	0.00	28.94	21.32	0.00	0.00	0.00	0.00	59.43	43.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	7366.48	0.74	2002	0.00	0.00	28.92	21.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	7366.48	0.74	2003	20.76	15.29	30.69	22.60	7.55	5.56	0.00	0.00	28.34	20.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	7366.48	0.74	2004	0.00	0.00	31.50	23.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	7366.48	0.74	2005	0.00	0.00	30.16	22.22	0.00	0.00	0.00	0.00	74.85	55.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	7366.48	0.74	2006	33.34	24.56	28.64	21.10	17.80	13.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	7366.48	0.74	2007	0.00	0.00	33.59	24.74	0.00	0.00	0.00	0.00	38.23	28.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

38	7366.48	0.74	2008	0.00	0.00	30.91	22.77	0.00	0.00	0.00	0.00	28.35	20.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	7366.48	0.74	2009	56.44	41.57	30.51	22.48	43.31	31.91	0.00	0.00	34.44	25.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	16676.37	1.67	1996	0.00	0.00	124.72	207.98	0.00	0.00	0.00	0.00	10.42	17.38	0.00	0.00	3.35	5.58	0.00	0.00	0.00	0.00	0.00	0.00
40	16676.37	1.67	1997	0.00	0.00	121.52	202.65	49.13	81.94	0.00	0.00	17.33	28.90	0.00	0.00	18.93	31.56	0.00	0.00	0.00	0.00	0.00	0.00
40	16676.37	1.67	1998	0.00	0.00	126.99	211.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.10	21.84	0.00	0.00	0.00	0.00	0.00	0.00
40	16676.37	1.67	1999	0.00	0.00	121.24	202.18	0.00	0.00	0.00	0.00	38.39	64.01	0.00	0.00	13.37	22.30	0.00	0.00	0.00	0.00	0.00	0.00
40	16676.37	1.67	2000	0.00	0.00	122.35	204.04	12.07	20.13	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.25	0.00	0.00	0.00	0.00	0.00	0.00
40	16676.37	1.67	2001	0.00	0.00	116.69	194.59	0.00	0.00	0.00	0.00	16.17	26.96	0.00	0.00	12.85	21.42	0.00	0.00	0.00	0.00	0.00	0.00
40	16676.37	1.67	2002	0.00	0.00	116.68	194.58	0.00	0.00	0.00	0.00	12.04	20.07	0.00	0.00	0.24	0.40	0.00	0.00	0.00	0.00	0.00	0.00
40	16676.37	1.67	2003	0.00	0.00	118.72	197.98	15.72	26.22	0.00	0.00	13.93	23.23	0.00	0.00	2.10	3.50	0.00	0.00	0.00	0.00	0.00	0.00
40	16676.37	1.67	2004	0.00	0.00	128.19	213.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	23.36	38.96	0.00	0.00	0.00	0.00	0.00	0.00
40	16676.37	1.67	2005	0.00	0.00	119.44	199.18	0.00	0.00	0.00	0.00	47.22	78.74	0.00	0.00	0.36	0.60	0.00	0.00	0.00	0.00	0.00	0.00
40	16676.37	1.67	2006	0.00	0.00	117.98	196.75	20.96	34.95	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.85	0.00	0.00	0.00	0.00	0.00	0.00
40	16676.37	1.67	2007	0.00	0.00	120.69	201.26	0.00	0.00	0.00	0.00	30.86	51.46	0.00	0.00	12.36	20.60	0.00	0.00	0.00	0.00	0.00	0.00
40	16676.37	1.67	2008	0.00	0.00	113.78	189.74	0.00	0.00	0.00	0.00	15.87	26.47	0.00	0.00	12.96	21.62	0.00	0.00	0.00	0.00	0.00	0.00
40	16676.37	1.67	2009	0.00	0.00	129.16	215.40	43.73	72.93	0.00	0.00	30.20	50.36	0.00	0.00	1.73	2.88	0.00	0.00	0.00	0.00	0.00	0.00
43	14147.01	1.41	1996	0.00	0.00	127.91	180.95	0.00	0.00	0.00	0.00	5.36	7.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	14147.01	1.41	1997	0.00	0.00	129.14	182.70	17.69	25.02	0.00	0.00	26.35	37.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	14147.01	1.41	1998	0.00	0.00	132.76	187.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	14147.01	1.41	1999	0.00	0.00	135.66	191.91	0.00	0.00	0.00	0.00	52.63	74.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	14147.01	1.41	2000	0.00	0.00	119.13	168.53	15.95	22.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	14147.01	1.41	2001	0.00	0.00	121.11	171.33	0.00	0.00	0.00	0.00	41.05	58.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	14147.01	1.41	2002	0.00	0.00	121.11	171.34	0.00	0.00	0.00	0.00	5.29	7.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	14147.01	1.41	2003	0.00	0.00	124.88	176.67	3.94	5.58	0.00	0.00	43.24	61.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	14147.01	1.41	2004	0.00	0.00	130.92	185.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	14147.01	1.41	2005	0.00	0.00	122.01	172.60	0.00	0.00	0.00	0.00	47.70	67.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	14147.01	1.41	2006	0.00	0.00	124.67	176.38	10.45	14.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	14147.01	1.41	2007	0.00	0.00	132.42	187.34	0.00	0.00	0.00	0.00	56.61	80.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	14147.01	1.41	2008	0.00	0.00	127.07	179.77	0.00	0.00	0.00	0.00	7.73	10.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	14147.01	1.41	2009	0.00	0.00	130.83	185.08	18.67	26.42	0.00	0.00	37.82	53.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

51	5591.08	0.56	1996	0.00	0.00	149.88	83.80	18.56	10.38	0.00	0.00	25.47	14.24	0.00	0.00	3.10	1.74	0.00	0.00	0.00	0.00	0.00	0.00
51	5591.08	0.56	1997	36.68	20.51	151.96	84.96	79.43	44.41	0.00	0.00	27.72	15.50	0.00	0.00	21.16	11.83	0.00	0.00	0.00	0.00	0.00	0.00
51	5591.08	0.56	1998	0.00	0.00	152.31	85.16	18.01	10.07	0.00	0.00	0.00	0.00	0.00	0.00	13.09	7.32	0.00	0.00	0.00	0.00	0.00	0.00
51	5591.08	0.56	1999	0.00	0.00	159.76	89.32	18.30	10.23	0.00	0.00	77.84	43.52	0.00	0.00	14.42	8.06	0.00	0.00	0.00	0.00	0.00	0.00
51	5591.08	0.56	2000	12.24	6.85	145.28	81.23	30.19	16.88	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.07	0.00	0.00	0.00	0.00	0.00	0.00
51	5591.08	0.56	2001	0.00	0.00	139.32	77.89	16.55	9.25	0.00	0.00	22.63	12.65	0.00	0.00	12.94	7.24	0.00	0.00	0.00	0.00	0.00	0.00
51	5591.08	0.56	2002	0.00	0.00	140.50	78.55	17.31	9.68	0.00	0.00	25.03	14.00	0.00	0.00	0.23	0.13	0.00	0.00	0.00	0.00	0.00	0.00
51	5591.08	0.56	2003	17.21	9.62	139.76	78.14	32.66	18.26	0.00	0.00	19.77	11.06	0.00	0.00	1.93	1.08	0.00	0.00	0.00	0.00	0.00	0.00
51	5591.08	0.56	2004	0.00	0.00	150.13	83.94	17.27	9.65	0.00	0.00	0.00	0.00	0.00	0.00	24.52	13.71	0.00	0.00	0.00	0.00	0.00	0.00
51	5591.08	0.56	2005	0.00	0.00	144.95	81.04	16.85	9.42	0.00	0.00	99.47	55.62	0.00	0.00	0.38	0.21	0.00	0.00	0.00	0.00	0.00	0.00
51	5591.08	0.56	2006	25.35	14.17	142.27	79.54	39.45	22.06	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.27	0.00	0.00	0.00	0.00	0.00	0.00
51	5591.08	0.56	2007	0.00	0.00	145.58	81.39	16.42	9.18	0.00	0.00	45.32	25.34	0.00	0.00	12.64	7.07	0.00	0.00	0.00	0.00	0.00	0.00
51	5591.08	0.56	2008	0.00	0.00	134.93	75.44	16.10	9.00	0.00	0.00	29.66	16.58	0.00	0.00	14.31	8.00	0.00	0.00	0.00	0.00	0.00	0.00
51	5591.08	0.56	2009	47.54	26.58	155.94	87.19	75.66	42.30	0.00	0.00	51.20	28.62	0.00	0.00	2.39	1.34	0.00	0.00	0.00	0.00	0.00	0.00
59	16079.69	1.61	1996	0.00	0.00	140.03	225.17	12.57	20.21	0.00	0.00	15.68	25.21	0.00	0.00	4.37	7.03	1.52	2.44	0.00	0.00	7.29	11.73
59	16079.69	1.61	1997	0.00	0.00	141.45	227.45	78.49	126.21	0.00	0.00	47.63	76.59	0.00	0.00	29.22	46.98	10.50	16.89	0.00	0.00	19.88	31.97
59	16079.69	1.61	1998	0.00	0.00	141.88	228.14	12.03	19.34	0.00	0.00	0.00	0.00	0.00	0.00	18.38	29.55	6.29	10.12	0.00	0.00	11.58	18.61
59	16079.69	1.61	1999	0.00	0.00	149.77	240.83	12.17	19.57	0.00	0.00	87.22	140.24	0.00	0.00	20.04	32.22	7.29	11.73	0.00	0.00	16.24	26.12
59	16079.69	1.61	2000	0.00	0.00	136.71	219.83	26.57	42.72	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.32	0.07	0.11	0.00	0.00	1.49	2.39
59	16079.69	1.61	2001	0.00	0.00	130.24	209.42	11.00	17.68	0.00	0.00	37.44	60.20	0.00	0.00	17.94	28.84	6.36	10.22	0.00	0.00	8.92	14.34
59	16079.69	1.61	2002	0.00	0.00	131.23	211.01	11.79	18.96	0.00	0.00	15.66	25.18	0.00	0.00	0.32	0.51	0.11	0.18	0.00	0.00	5.61	9.03
59	16079.69	1.61	2003	0.00	0.00	130.98	210.61	28.80	46.30	0.00	0.00	33.86	54.45	0.00	0.00	2.70	4.34	0.97	1.56	0.00	0.00	6.96	11.20
59	16079.69	1.61	2004	0.00	0.00	140.74	226.30	11.50	18.50	0.00	0.00	0.00	0.00	0.00	0.00	33.77	54.30	11.94	19.20	0.00	0.00	18.93	30.43
59	16079.69	1.61	2005	0.00	0.00	135.03	217.12	11.14	17.90	0.00	0.00	102.13	164.22	0.00	0.00	0.53	0.86	0.19	0.30	0.00	0.00	8.13	13.07
59	16079.69	1.61	2006	0.00	0.00	132.25	212.65	35.45	57.00	0.00	0.00	0.00	0.00	0.00	0.00	0.70	1.13	0.25	0.41	0.00	0.00	8.24	13.24
59	16079.69	1.61	2007	0.00	0.00	136.69	219.79	10.97	17.64	0.00	0.00	72.72	116.93	0.00	0.00	17.67	28.41	6.11	9.83	0.00	0.00	11.06	17.78
59	16079.69	1.61	2008	0.00	0.00	126.96	204.14	10.73	17.26	0.00	0.00	19.09	30.69	0.00	0.00	21.13	33.98	7.36	11.83	0.00	0.00	8.68	13.96
59	16079.69	1.61	2009	0.00	0.00	144.99	233.13	74.14	119.22	0.00	0.00	80.74	129.82	0.00	0.00	2.86	4.59	1.16	1.86	0.00	0.00	17.02	27.36
64	10036.11	1.00	1996	0.00	0.00	73.35	73.61	49.68	49.86	0.00	0.00	20.91	20.98	0.00	0.00	12.51	12.55	0.00	0.00	0.00	0.00	12.98	13.03
64	10036.11	1.00	1997	61.74	61.96	69.90	70.16	44.37	44.53	0.00	0.00	56.24	56.44	0.00	0.00	3.13	3.14	0.00	0.00	0.00	0.00	6.98	7.00

64	10036.11	1.00	1998	0.00	0.00	66.31	66.55	37.61	37.74	0.00	0.00	60.86	61.08	0.00	0.00	1.72	1.73	0.00	0.00	0.00	0.00	7.87	7.90
64	10036.11	1.00	1999	0.00	0.00	73.50	73.76	43.42	43.57	0.00	0.00	0.00	0.00	0.00	0.00	5.59	5.61	0.00	0.00	0.00	0.00	9.47	9.51
64	10036.11	1.00	2000	44.86	45.02	69.27	69.52	42.39	42.54	0.00	0.00	0.00	0.00	0.00	0.00	4.29	4.31	0.00	0.00	0.00	0.00	7.20	7.23
64	10036.11	1.00	2001	0.00	0.00	70.26	70.51	31.24	31.35	0.00	0.00	91.81	92.14	0.00	0.00	0.23	0.23	0.00	0.00	0.00	0.00	5.44	5.46
64	10036.11	1.00	2002	0.00	0.00	68.59	68.84	8.89	8.93	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.14	0.00	0.00	0.00	0.00	2.91	2.92
64	10036.11	1.00	2003	17.72	17.79	72.33	72.59	5.81	5.83	0.00	0.00	62.28	62.51	0.00	0.00	0.22	0.22	0.00	0.00	0.00	0.00	5.61	5.63
64	10036.11	1.00	2004	0.00	0.00	73.56	73.83	36.04	36.17	0.00	0.00	0.00	0.00	0.00	0.00	9.43	9.47	0.00	0.00	0.00	0.00	8.45	8.48
64	10036.11	1.00	2005	0.00	0.00	69.54	69.79	20.86	20.93	0.00	0.00	82.63	82.92	0.00	0.00	0.83	0.83	0.00	0.00	0.00	0.00	9.51	9.54
64	10036.11	1.00	2006	29.14	29.25	68.23	68.48	11.58	11.62	0.00	0.00	0.00	0.00	0.00	0.00	6.40	6.42	0.00	0.00	0.00	0.00	5.99	6.01
64	10036.11	1.00	2007	0.00	0.00	79.56	79.85	14.03	14.08	0.00	0.00	75.53	75.81	0.00	0.00	0.22	0.22	0.00	0.00	0.00	0.00	5.78	5.80
64	10036.11	1.00	2008	0.00	0.00	74.90	75.17	21.38	21.46	0.00	0.00	14.93	14.98	0.00	0.00	0.48	0.48	0.00	0.00	0.00	0.00	6.32	6.35
64	10036.11	1.00	2009	56.80	57.00	70.85	71.11	49.64	49.82	0.00	0.00	71.65	71.91	0.00	0.00	9.28	9.31	0.00	0.00	0.00	0.00	8.75	8.78
77	15044.48	1.50	1996	0.00	0.00	107.92	162.36	12.31	18.51	0.00	0.00	0.00	0.00	0.00	0.00	1.82	2.73	0.00	0.00	0.00	0.00	12.31	18.52
77	15044.48	1.50	1997	0.00	0.00	108.94	163.89	26.96	40.56	0.00	0.00	38.06	57.26	0.00	0.00	12.53	18.85	0.00	0.00	0.00	0.00	32.99	49.63
77	15044.48	1.50	1998	0.00	0.00	109.87	165.30	21.42	32.23	0.00	0.00	0.00	0.00	0.00	0.00	7.58	11.41	0.00	0.00	0.00	0.00	18.28	27.50
77	15044.48	1.50	1999	0.00	0.00	115.06	173.10	18.63	28.02	0.00	0.00	52.87	79.54	0.00	0.00	8.65	13.01	0.00	0.00	0.00	0.00	25.96	39.06
77	15044.48	1.50	2000	0.00	0.00	105.82	159.20	1.95	2.94	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.13	0.00	0.00	0.00	0.00	3.20	4.81
77	15044.48	1.50	2001	0.00	0.00	100.62	151.38	15.27	22.97	0.00	0.00	29.55	44.45	0.00	0.00	7.58	11.41	0.00	0.00	0.00	0.00	14.41	21.68
77	15044.48	1.50	2002	0.00	0.00	101.29	152.38	5.07	7.63	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.20	0.00	0.00	0.00	0.00	9.70	14.60
77	15044.48	1.50	2003	0.00	0.00	101.14	152.15	6.58	9.90	0.00	0.00	27.49	41.36	0.00	0.00	1.16	1.74	0.00	0.00	0.00	0.00	12.01	18.06
77	15044.48	1.50	2004	0.00	0.00	108.42	163.11	28.29	42.56	0.00	0.00	0.00	0.00	0.00	0.00	14.24	21.42	0.00	0.00	0.00	0.00	30.18	45.41
77	15044.48	1.50	2005	0.00	0.00	103.97	156.41	7.72	11.61	0.00	0.00	52.80	79.43	0.00	0.00	0.22	0.33	0.00	0.00	0.00	0.00	13.86	20.86
77	15044.48	1.50	2006	0.00	0.00	101.66	152.93	7.12	10.71	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.46	0.00	0.00	0.00	0.00	12.48	18.77
77	15044.48	1.50	2007	0.00	0.00	105.30	158.42	14.81	22.29	0.00	0.00	57.03	85.80	0.00	0.00	7.26	10.92	0.00	0.00	0.00	0.00	16.86	25.36
77	15044.48	1.50	2008	0.00	0.00	98.35	147.97	8.46	12.72	0.00	0.00	0.00	0.00	0.00	0.00	8.93	13.44	0.00	0.00	0.00	0.00	15.21	22.89
77	15044.48	1.50	2009	0.00	0.00	111.62	167.92	25.47	38.32	0.00	0.00	62.73	94.37	0.00	0.00	1.31	1.97	0.00	0.00	0.00	0.00	26.25	39.49
79	9272.95	0.93	1996	0.00	0.00	46.17	42.81	25.86	23.98	0.00	0.00	5.64	5.23	0.00	0.00	7.37	6.84	0.00	0.00	0.00	0.00	0.00	0.00
79	9272.95	0.93	1997	16.41	15.22	51.69	47.93	10.78	10.00	0.00	0.00	33.55	31.11	0.00	0.00	0.21	0.19	0.00	0.00	0.00	0.00	0.00	0.00
79	9272.95	0.93	1998	0.00	0.00	48.98	45.41	24.18	22.42	0.00	0.00	42.87	39.75	0.00	0.00	6.18	5.73	0.00	0.00	0.00	0.00	0.00	0.00
79	9272.95	0.93	1999	0.00	0.00	50.07	46.43	12.11	11.23	0.00	0.00	0.00	0.00	0.00	0.00	2.60	2.41	0.00	0.00	0.00	0.00	0.00	0.00

79	9272.95	0.93	2000	8.33	7.73	49.54	45.94	6.43	5.96	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.27	0.00	0.00	0.00	0.00	0.00	0.00
79	9272.95	0.93	2001	0.00	0.00	48.79	45.24	19.14	17.74	0.00	0.00	28.79	26.69	0.00	0.00	4.73	4.38	0.00	0.00	0.00	0.00	0.00	0.00
79	9272.95	0.93	2002	0.00	0.00	45.88	42.55	2.99	2.77	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00
79	9272.95	0.93	2003	15.56	14.43	50.47	46.80	7.82	7.25	0.00	0.00	34.47	31.96	0.00	0.00	3.23	2.99	0.00	0.00	0.00	0.00	0.00	0.00
79	9272.95	0.93	2004	0.00	0.00	49.42	45.83	28.16	26.11	0.00	0.00	0.00	0.00	0.00	0.00	5.24	4.86	0.00	0.00	0.00	0.00	0.00	0.00
79	9272.95	0.93	2005	0.00	0.00	50.06	46.42	18.12	16.80	0.00	0.00	66.43	61.60	0.00	0.00	7.24	6.71	0.00	0.00	0.00	0.00	0.00	0.00
79	9272.95	0.93	2006	15.61	14.48	47.46	44.01	9.98	9.25	0.00	0.00	0.00	0.00	0.00	0.00	1.85	1.71	0.00	0.00	0.00	0.00	0.00	0.00
79	9272.95	0.93	2007	0.00	0.00	54.75	50.77	7.97	7.39	0.00	0.00	48.02	44.53	0.00	0.00	0.22	0.21	0.00	0.00	0.00	0.00	0.00	0.00
79	9272.95	0.93	2008	0.00	0.00	48.65	45.12	4.22	3.91	0.00	0.00	4.88	4.52	0.00	0.00	0.09	0.08	0.00	0.00	0.00	0.00	0.00	0.00
79	9272.95	0.93	2009	14.44	13.39	51.19	47.47	14.67	13.61	0.00	0.00	36.46	33.81	0.00	0.00	3.39	3.14	0.00	0.00	0.00	0.00	0.00	0.00
80	6856.61	0.69	1996	0.00	0.00	151.37	103.79	43.86	30.08	0.00	0.00	12.50	8.57	0.00	0.00	2.45	1.68	0.92	0.63	0.00	0.00	2.47	1.69
80	6856.61	0.69	1997	41.74	28.62	152.47	104.55	71.88	49.28	0.00	0.00	34.65	23.76	0.00	0.00	16.75	11.48	6.44	4.42	0.00	0.00	6.54	4.48
80	6856.61	0.69	1998	0.00	0.00	154.21	105.74	61.71	42.31	0.00	0.00	0.00	0.00	0.00	0.00	10.29	7.06	3.71	2.54	0.00	0.00	3.62	2.48
80	6856.61	0.69	1999	0.00	0.00	160.62	110.13	54.89	37.64	0.00	0.00	71.44	48.98	0.00	0.00	11.47	7.87	4.58	3.14	0.00	0.00	5.04	3.46
80	6856.61	0.69	2000	15.17	10.40	147.42	101.08	20.13	13.80	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.08	0.03	0.02	0.00	0.00	0.62	0.43
80	6856.61	0.69	2001	0.00	0.00	141.27	96.86	47.71	32.72	0.00	0.00	28.17	19.31	0.00	0.00	10.18	6.98	3.90	2.67	0.00	0.00	2.89	1.98
80	6856.61	0.69	2002	0.00	0.00	142.46	97.68	27.69	18.99	0.00	0.00	12.27	8.41	0.00	0.00	0.18	0.12	0.07	0.05	0.00	0.00	1.93	1.32
80	6856.61	0.69	2003	19.39	13.29	141.15	96.78	29.35	20.13	0.00	0.00	26.05	17.86	0.00	0.00	1.53	1.05	0.60	0.41	0.00	0.00	2.39	1.64
80	6856.61	0.69	2004	0.00	0.00	151.48	103.87	74.20	50.88	0.00	0.00	0.00	0.00	0.00	0.00	19.14	13.13	7.35	5.04	0.00	0.00	5.84	4.01
80	6856.61	0.69	2005	0.00	0.00	146.76	100.63	32.28	22.13	0.00	0.00	79.48	54.50	0.00	0.00	0.30	0.20	0.11	0.08	0.00	0.00	2.88	1.97
80	6856.61	0.69	2006	31.78	21.79	143.34	98.28	30.70	21.05	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.27	0.16	0.11	0.00	0.00	2.35	1.61
80	6856.61	0.69	2007	0.00	0.00	147.32	101.01	45.66	31.31	0.00	0.00	55.74	38.22	0.00	0.00	9.79	6.71	3.81	2.61	0.00	0.00	3.23	2.21
80	6856.61	0.69	2008	0.00	0.00	137.35	94.17	32.82	22.50	0.00	0.00	15.16	10.40	0.00	0.00	11.84	8.12	4.21	2.88	0.00	0.00	2.87	1.96
80	6856.61	0.69	2009	54.69	37.50	156.53	107.33	67.72	46.44	0.00	0.00	62.04	42.54	0.00	0.00	1.73	1.19	0.85	0.58	0.00	0.00	4.77	3.27
88	7843.13	0.78	1996	0.00	0.00	53.65	42.08	19.86	15.57	0.00	0.00	0.00	0.00	0.00	0.00	14.56	11.42	0.00	0.00	0.00	0.00	14.90	11.68
88	7843.13	0.78	1997	0.00	0.00	59.19	46.43	14.75	11.57	0.00	0.00	32.72	25.66	0.00	0.00	0.94	0.74	0.00	0.00	0.00	0.00	12.86	10.09
88	7843.13	0.78	1998	0.00	0.00	56.31	44.16	19.05	14.94	0.00	0.00	30.40	23.84	0.00	0.00	5.96	4.67	0.00	0.00	0.00	0.00	16.92	13.27
88	7843.13	0.78	1999	0.00	0.00	57.86	45.38	15.30	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.38	0.00	0.00	0.00	0.00	14.10	11.06
88	7843.13	0.78	2000	0.00	0.00	56.71	44.48	6.58	5.16	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.19	0.00	0.00	0.00	0.00	7.59	5.95
88	7843.13	0.78	2001	0.00	0.00	56.34	44.19	17.36	13.61	0.00	0.00	31.52	24.72	0.00	0.00	10.49	8.23	0.00	0.00	0.00	0.00	17.44	13.68

88	7843.13	0.78	2002	0.00	0.00	52.78	41.40	1.96	1.53	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.15	0.00	0.00	0.00	0.00	2.63	2.07
88	7843.13	0.78	2003	0.00	0.00	58.16	45.62	11.03	8.65	0.00	0.00	35.39	27.76	0.00	0.00	0.28	0.22	0.00	0.00	0.00	0.00	14.69	11.52
88	7843.13	0.78	2004	0.00	0.00	57.27	44.92	21.71	17.03	0.00	0.00	0.00	0.00	0.00	0.00	14.84	11.64	0.00	0.00	0.00	0.00	12.51	9.81
88	7843.13	0.78	2005	0.00	0.00	57.84	45.37	17.67	13.86	0.00	0.00	48.05	37.69	0.00	0.00	3.83	3.00	0.00	0.00	0.00	0.00	19.38	15.20
88	7843.13	0.78	2006	0.00	0.00	53.82	42.21	10.39	8.15	0.00	0.00	0.00	0.00	0.00	0.00	5.40	4.24	0.00	0.00	0.00	0.00	9.17	7.19
88	7843.13	0.78	2007	0.00	0.00	62.12	48.72	8.18	6.42	0.00	0.00	45.83	35.95	0.00	0.00	0.25	0.20	0.00	0.00	0.00	0.00	13.17	10.33
88	7843.13	0.78	2008	0.00	0.00	55.36	43.42	2.99	2.34	0.00	0.00	0.00	0.00	0.00	0.00	1.26	0.99	0.00	0.00	0.00	0.00	2.24	1.75
88	7843.13	0.78	2009	0.00	0.00	59.10	46.35	19.33	15.16	0.00	0.00	33.87	26.57	0.00	0.00	1.11	0.87	0.00	0.00	0.00	0.00	15.55	12.20
123	1106.16	0.11	1996	0.00	0.00	106.11	11.74	9.84	1.09	0.00	0.00	6.12	0.68	0.00	0.00	28.54	3.16	10.26	1.13	0.00	0.00	29.98	3.32
123	1106.16	0.11	1997	19.95	2.21	117.62	13.01	8.43	0.93	0.00	0.00	57.97	6.41	0.00	0.00	1.86	0.21	0.63	0.07	0.00	0.00	24.94	2.76
123	1106.16	0.11	1998	0.00	0.00	111.19	12.30	9.55	1.06	0.00	0.00	60.03	6.64	0.00	0.00	10.55	1.17	3.54	0.39	0.00	0.00	31.43	3.48
123	1106.16	0.11	1999	0.00	0.00	114.53	12.67	8.54	0.94	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.09	0.33	0.04	0.00	0.00	25.99	2.88
123	1106.16	0.11	2000	10.39	1.15	110.86	12.26	3.54	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.05	0.19	0.02	0.00	0.00	13.19	1.46
123	1106.16	0.11	2001	0.00	0.00	111.74	12.36	9.05	1.00	0.00	0.00	55.11	6.10	0.00	0.00	18.96	2.10	7.28	0.81	0.00	0.00	33.45	3.70
123	1106.16	0.11	2002	0.00	0.00	103.14	11.41	0.92	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.04	0.12	0.01	0.00	0.00	5.79	0.64
123	1106.16	0.11	2003	15.99	1.77	114.76	12.69	6.32	0.70	0.00	0.00	61.94	6.85	0.00	0.00	0.52	0.06	0.20	0.02	0.00	0.00	28.29	3.13
123	1106.16	0.11	2004	0.00	0.00	112.87	12.49	10.86	1.20	0.00	0.00	0.00	0.00	0.00	0.00	28.39	3.14	10.46	1.16	0.00	0.00	23.96	2.65
123	1106.16	0.11	2005	0.00	0.00	114.82	12.70	9.34	1.03	0.00	0.00	97.25	10.76	0.00	0.00	5.24	0.58	3.77	0.42	0.00	0.00	36.86	4.08
123	1106.16	0.11	2006	15.85	1.75	106.76	11.81	5.61	0.62	0.00	0.00	0.00	0.00	0.00	0.00	10.63	1.18	3.69	0.41	0.00	0.00	15.43	1.71
123	1106.16	0.11	2007	0.00	0.00	122.20	13.52	4.44	0.49	0.00	0.00	78.55	8.69	0.00	0.00	0.47	0.05	0.18	0.02	0.00	0.00	23.56	2.61
123	1106.16	0.11	2008	0.00	0.00	108.43	11.99	1.44	0.16	0.00	0.00	3.92	0.43	0.00	0.00	2.39	0.26	0.79	0.09	0.00	0.00	5.18	0.57
123	1106.16	0.11	2009	17.05	1.89	115.81	12.81	10.88	1.20	0.00	0.00	60.28	6.67	0.00	0.00	1.89	0.21	0.77	0.09	0.00	0.00	28.93	3.20
124	957.51	0.10	1996	0.00	0.00	91.75	8.78	59.19	5.67	0.00	0.00	1.41	0.13	0.00	0.00	5.60	0.54	7.79	0.75	0.00	0.00	0.00	0.00
124	957.51	0.10	1997	4.12	0.39	101.62	9.73	41.13	3.94	0.00	0.00	55.08	5.27	0.00	0.00	0.16	0.01	0.52	0.05	0.00	0.00	0.00	0.00
124	957.51	0.10	1998	0.00	0.00	94.70	9.07	56.91	5.45	0.00	0.00	54.58	5.23	0.00	0.00	4.83	0.46	2.79	0.27	0.00	0.00	0.00	0.00
124	957.51	0.10	1999	0.00	0.00	98.92	9.47	39.44	3.78	0.00	0.00	0.00	0.00	0.00	0.00	2.09	0.20	0.23	0.02	0.00	0.00	0.00	0.00
124	957.51	0.10	2000	2.06	0.20	94.52	9.05	31.97	3.06	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.02	0.11	0.01	0.00	0.00	0.00	0.00
124	957.51	0.10	2001	0.00	0.00	96.41	9.23	47.15	4.51	0.00	0.00	44.42	4.25	0.00	0.00	4.02	0.38	5.14	0.49	0.00	0.00	0.00	0.00
124	957.51	0.10	2002	0.00	0.00	88.17	8.44	27.89	2.67	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.10	0.01	0.00	0.00	0.00	0.00
124	957.51	0.10	2003	3.92	0.38	99.74	9.55	36.10	3.46	0.00	0.00	57.44	5.50	0.00	0.00	2.94	0.28	0.14	0.01	0.00	0.00	0.00	0.00

124	957.51	0.10	2004	0.00	0.00	97.51	9.34	62.00	5.94	0.00	0.00	0.00	0.00	0.00	0.00	4.12	0.39	7.96	0.76	0.00	0.00	0.00	0.00
124	957.51	0.10	2005	0.00	0.00	98.21	9.40	52.87	5.06	0.00	0.00	85.66	8.20	0.00	0.00	5.58	0.53	0.22	0.02	0.00	0.00	0.00	0.00
124	957.51	0.10	2006	3.87	0.37	91.03	8.72	39.14	3.75	0.00	0.00	0.00	0.00	0.00	0.00	1.76	0.17	3.03	0.29	0.00	0.00	0.00	0.00
124	957.51	0.10	2007	0.00	0.00	105.87	10.14	34.69	3.32	0.00	0.00	73.23	7.01	0.00	0.00	0.17	0.02	0.13	0.01	0.00	0.00	0.00	0.00
124	957.51	0.10	2008	0.00	0.00	92.35	8.84	30.58	2.93	0.00	0.00	1.23	0.12	0.00	0.00	0.06	0.01	0.65	0.06	0.00	0.00	0.00	0.00
124	957.51	0.10	2009	3.60	0.34	99.19	9.50	45.18	4.33	0.00	0.00	57.93	5.55	0.00	0.00	3.00	0.29	0.48	0.05	0.00	0.00	0.00	0.00

Appendix C – Simulated County Crop Data Summary

Table 10 Simulated County Crop Data Summary

Ellis County											
Year	CORN (t/ha)	IRCN (t/ha)	GRSG (t/ha)	IRGS (t/ha)	WWHT (t/ha)	IRWW (t/ha)	SOYB (t/ha)	IRSB (t/ha)	ALFA (t/ha)	IRAL (t/ha)	Sum ALFA (t/ha)
1996	0.00	0.55	52.72	0.00	32.34	0.00	16.23	0.07	29.05	7.80	36.85
1997	67.06	0.56	56.92	0.00	57.39	0.00	9.87	0.04	29.81	6.93	36.75
1998	0.00	0.51	60.01	0.00	75.41	0.00	8.62	0.12	21.56	5.91	27.47
1999	0.00	0.58	67.50	0.00	12.30	0.00	22.60	0.14	38.60	9.13	47.73
2000	78.70	0.56	50.21	0.00	0.00	0.00	15.72	0.13	33.17	7.17	40.34
2001	0.00	0.56	40.94	0.00	72.47	0.00	3.83	0.00	25.28	5.96	31.25
2002	0.00	0.55	20.15	0.00	5.25	0.00	0.80	0.00	21.05	4.29	25.34
2003	32.66	0.60	17.78	0.00	47.72	0.00	0.38	0.00	25.52	5.11	30.63
2004	0.00	0.56	62.74	0.00	52.08	0.00	18.03	0.12	26.05	6.39	32.44
2005	0.00	0.54	36.66	0.00	12.82	0.00	11.90	0.05	28.09	6.54	34.62
2006	52.69	0.50	36.39	0.00	0.00	0.00	9.55	0.04	28.11	6.45	34.56
2007	0.00	0.63	68.28	0.00	80.54	0.00	25.89	0.18	48.63	11.41	60.04
2008	0.00	0.54	51.36	0.00	7.68	0.00	11.38	0.13	30.08	6.67	36.74
2009	85.15	0.56	78.22	0.00	62.45	0.00	20.86	0.16	37.92	9.05	46.97
Ellsworth County											
Year	CORN (t/ha)	IRCN (t/ha)	GRSG (t/ha)	IRGS (t/ha)	WWHT (t/ha)	IRWW (t/ha)	SOYB (t/ha)	IRSB (t/ha)	ALFA (t/ha)	IRAL (t/ha)	Sum ALFA (t/ha)
1996	0.00	6.26	54.30	0.00	33.54	0.00	11.22	0.50	51.36	0.00	51.36
1997	65.94	6.27	40.34	0.00	20.42	0.00	9.07	0.01	41.72	0.00	41.72
1998	0.00	5.50	57.12	0.00	44.54	0.00	20.79	0.63	40.08	0.00	40.08
1999	0.00	6.37	58.74	0.00	20.11	0.00	20.89	0.16	56.96	0.00	56.96
2000	78.14	6.32	50.84	0.00	10.61	0.00	15.40	0.32	48.29	0.00	48.29
2001	0.00	6.03	43.97	0.00	36.94	0.00	7.52	0.17	45.69	0.00	45.69
2002	0.00	5.85	22.75	0.00	17.01	0.00	2.61	0.01	30.96	0.00	30.96
2003	53.28	6.44	36.53	0.00	52.85	0.00	11.30	0.48	48.35	0.00	48.35
2004	0.00	5.93	54.53	0.00	48.93	0.00	23.55	0.72	50.18	0.00	50.18
2005	0.00	5.37	46.88	0.00	0.00	0.00	17.20	0.71	58.81	0.00	58.81
2006	52.70	5.47	45.47	0.00	9.83	0.00	12.11	0.27	38.16	0.00	38.16
2007	0.00	6.24	45.49	0.00	38.80	0.00	16.13	0.12	39.60	0.00	39.60
2008	0.00	6.28	61.07	0.00	17.48	0.00	20.02	0.83	56.30	0.00	56.30
2009	78.03	6.02	54.78	0.00	50.62	0.00	18.16	0.59	49.51	0.00	49.51
Gove County											
Year	CORN (t/ha)	IRCN (t/ha)	GRSG (t/ha)	IRGS (t/ha)	WWHT (t/ha)	IRWW (t/ha)	SOYB (t/ha)	IRSB (t/ha)	ALFA (t/ha)	IRAL (t/ha)	Sum ALFA (t/ha)
1996	0.44	34.97	28.90	0.93	22.56	0.00	11.99	5.50	11.41	5.27	16.68
1997	43.72	32.88	46.74	0.76	32.75	0.00	3.29	2.33	7.20	3.44	10.64
1998	0.40	32.14	26.70	0.78	41.81	0.00	7.98	3.02	5.98	2.62	8.60

1999	0.44	34.06	28.48	0.96	0.06	0.00	7.88	4.17	8.09	3.49	11.58
2000	49.61	34.35	43.46	0.80	0.00	0.00	6.89	3.38	7.28	3.37	10.65
2001	0.42	32.43	22.27	1.09	47.11	0.00	2.80	3.70	5.18	2.27	7.45
2002	0.42	30.75	14.92	0.15	16.94	0.00	0.12	0.08	2.99	1.06	4.05
2003	16.51	34.11	17.02	0.22	34.48	0.00	0.15	0.05	4.29	1.35	5.64
2004	0.45	35.28	26.88	0.62	0.00	0.00	8.33	0.75	6.62	2.76	9.37
2005	0.42	31.86	19.79	0.69	68.52	0.00	1.98	2.30	6.04	2.66	8.71
2006	25.53	31.07	25.27	0.30	0.00	0.00	2.03	0.42	4.99	1.80	6.79
2007	0.48	37.73	23.16	0.56	42.69	0.00	1.46	0.19	6.22	2.46	8.69
2008	0.45	33.84	20.85	0.52	23.49	0.00	3.63	1.77	4.13	1.92	6.04
2009	53.77	35.51	52.72	0.92	34.29	0.00	11.67	4.94	9.84	4.29	14.13
Logan County											
Year	CORN (t/ha)	IRCN (t/ha)	GRSG (t/ha)	IRGS (t/ha)	WWHT (t/ha)	IRWW (t/ha)	SOYB (t/ha)	IRSB (t/ha)	ALFA (t/ha)	IRAL (t/ha)	Sum ALFA (t/ha)
1996	0.28	19.27	12.71	0.60	35.82	0.00	6.58	0.96	1.27	2.59	3.85
1997	57.91	18.53	46.34	0.40	35.28	0.00	3.12	0.38	0.77	1.66	2.43
1998	0.25	17.91	9.66	0.38	54.48	0.00	1.80	0.54	0.64	1.54	2.18
1999	0.28	19.50	11.11	0.49	4.93	0.00	4.29	0.72	0.86	1.90	2.76
2000	53.77	18.33	44.91	0.41	0.00	0.00	4.21	0.62	0.78	1.68	2.46
2001	0.26	18.10	8.43	0.45	75.80	0.00	0.89	0.71	0.64	1.23	1.87
2002	0.26	17.78	3.65	0.10	2.14	0.00	0.08	0.01	0.39	0.54	0.93
2003	20.25	18.90	9.35	0.10	40.01	0.00	0.14	0.01	0.53	0.85	1.38
2004	0.28	19.42	9.61	0.27	0.00	0.00	3.90	0.18	0.68	1.45	2.13
2005	0.26	18.16	6.50	0.35	86.34	0.00	1.92	0.42	0.70	1.44	2.14
2006	33.11	17.74	20.89	0.15	0.00	0.00	2.34	0.02	0.52	0.97	1.49
2007	0.30	20.64	4.96	0.23	50.27	0.00	0.14	0.10	0.69	1.25	1.94
2008	0.28	19.31	6.44	0.22	29.40	0.00	0.84	0.34	0.45	1.04	1.49
2009	63.65	19.02	49.46	0.57	45.33	0.00	5.57	0.80	0.97	2.12	3.08
Russell County											
Year	CORN (t/ha)	IRCN (t/ha)	GRSG (t/ha)	IRGS (t/ha)	WWHT (t/ha)	IRWW (t/ha)	SOYB (t/ha)	IRSB (t/ha)	ALFA (t/ha)	IRAL (t/ha)	Sum ALFA (t/ha)
1996	0.00	3.56	60.53	0.00	26.28	0.00	11.25	2.94	35.04	1.40	36.44
1997	67.53	3.57	51.10	0.00	43.40	0.00	8.17	1.50	33.50	1.18	34.68
1998	0.00	3.25	55.37	0.00	63.30	0.00	12.72	3.72	22.91	0.99	23.90
1999	0.00	3.70	61.00	0.00	0.00	0.00	17.20	4.39	40.50	1.49	41.99
2000	74.23	3.62	56.28	0.00	2.51	0.00	15.87	4.18	40.87	1.43	42.31
2001	0.00	3.61	45.18	0.00	55.37	0.00	2.10	0.09	30.17	0.91	31.08
2002	0.00	3.54	21.47	0.00	3.12	0.00	0.27	0.08	21.53	0.68	22.21
2003	28.53	3.82	23.87	0.00	41.82	0.00	2.11	0.07	28.79	0.82	29.61
2004	0.00	3.54	59.80	0.00	45.19	0.00	15.12	4.02	26.64	0.99	27.63
2005	0.00	3.54	38.06	0.00	0.00	0.00	9.97	1.20	31.00	0.96	31.95
2006	45.13	3.31	34.08	0.00	10.02	0.00	10.01	1.30	31.52	1.11	32.62
2007	0.00	3.98	59.79	0.00	44.52	0.00	20.68	5.49	51.85	2.01	53.86

Year	CORN (t/ha)	IRCN (t/ha)	GRSG (t/ha)	IRGS (t/ha)	WWHT (t/ha)	IRWW (t/ha)	SOYB (t/ha)	IRSB (t/ha)	ALFA (t/ha)	IRAL (t/ha)	Sum ALFA (t/ha)
2008	0.00	3.56	62.13	0.00	3.04	0.00	17.26	4.08	40.99	1.20	42.19
2009	81.54	3.56	62.82	0.00	45.23	0.00	19.30	5.12	42.94	1.57	44.51
Trego County											
Year	CORN (t/ha)	IRCN (t/ha)	GRSG (t/ha)	IRGS (t/ha)	WWHT (t/ha)	IRWW (t/ha)	SOYB (t/ha)	IRSB (t/ha)	ALFA (t/ha)	IRAL (t/ha)	Sum ALFA (t/ha)
1996	0.00	50.71	34.83	0.03	30.80	0.00	10.06	2.16	23.54	6.30	29.83
1997	47.60	48.60	55.18	0.03	42.97	0.00	8.02	2.56	21.65	6.01	27.66
1998	0.00	46.64	44.62	0.03	64.28	0.00	10.60	2.98	20.86	5.99	26.85
1999	0.00	49.05	47.23	0.03	2.12	0.00	20.75	3.81	30.32	7.72	38.03
2000	66.05	50.61	43.99	0.03	0.00	0.00	8.66	1.43	19.99	4.97	24.97
2001	0.00	46.05	28.58	0.04	53.82	0.00	4.42	1.06	15.52	4.21	19.73
2002	0.00	43.28	17.98	0.01	21.25	0.00	0.96	0.10	14.49	3.47	17.97
2003	26.96	49.27	17.21	0.01	40.43	0.00	0.31	0.07	17.09	3.56	20.65
2004	0.00	52.24	45.00	0.02	21.08	0.00	18.58	3.03	25.26	7.37	32.63
2005	0.00	46.74	27.77	0.03	68.69	0.00	6.36	1.25	21.42	4.63	26.06
2006	40.08	46.13	33.17	0.01	0.00	0.00	5.01	1.14	20.21	4.48	24.69
2007	0.00	55.81	51.71	0.02	62.96	0.00	21.89	4.06	35.04	9.88	44.92
2008	0.00	46.45	33.27	0.02	30.51	0.00	6.16	0.99	15.10	4.14	19.24
2009	78.59	53.45	70.51	0.03	50.50	0.00	22.22	3.92	30.74	9.23	39.98
Wallace County											
Year	CORN (t/ha)	IRCN (t/ha)	GRSG (t/ha)	IRGS (t/ha)	WWHT (t/ha)	IRWW (t/ha)	SOYB (t/ha)	IRSB (t/ha)	ALFA (t/ha)	IRAL (t/ha)	Sum ALFA (t/ha)
1996	0.00	98.17	9.58	0.00	11.43	0.00	3.66	0.33	0.48	3.10	3.58
1997	12.96	98.18	40.73	0.00	29.16	0.00	9.48	0.95	1.02	5.29	6.31
1998	0.00	100.00	9.93	0.00	7.24	0.00	6.64	0.63	0.86	3.63	4.49
1999	0.00	101.32	9.19	0.00	46.62	0.00	7.14	0.70	0.94	4.55	5.49
2000	8.32	95.51	16.11	0.00	0.00	0.00	0.87	0.08	0.16	1.23	1.39
2001	0.00	92.55	8.28	0.00	30.81	0.00	6.73	0.69	0.58	3.00	3.59
2002	0.00	92.26	5.08	0.00	9.52	0.00	0.12	0.01	0.46	1.55	2.01
2003	5.82	93.79	14.15	0.00	27.44	0.00	1.03	0.08	0.56	2.48	3.04
2004	0.00	99.81	10.79	0.00	0.00	0.00	11.92	1.15	0.83	5.02	5.85
2005	0.00	95.00	6.99	0.00	63.40	0.00	0.72	0.10	0.79	3.14	3.93
2006	8.63	93.56	18.96	0.00	0.00	0.00	0.86	0.05	0.64	2.36	2.99
2007	0.00	97.76	6.68	0.00	47.59	0.00	5.44	0.56	0.59	3.12	3.71
2008	0.00	91.56	5.82	0.00	13.81	0.00	6.50	0.67	0.38	2.40	2.78
2009	16.04	101.65	39.63	0.00	45.57	0.00	2.18	0.20	1.16	4.63	5.79

Appendix D - Observed County Crop Yields With Conversions

Table 11 Observed County Crop Yields with Conversions

Ellis County Observed Data																			
County	**Year**	**IRCN (bu/ac)**	**IRCN (t/ha)**	**CORN (bu/ac)**	**CORN (t/ha)**	**IRGS (bu/ac)**	**IRGS (t/ha)**	**GRSG (bu/ha)**	**GRSG (t/ha)**	**IRWW (bu/ha)**	**IRWW (t/ha)**	**WWHT (bu/ha)**	**WWHT (t/ha)**	**IRSB (bu/ac)**	**IRSB (t/ha)**	**SOYB (bu/ac)**	**SOYB (t/ha)**	**SUM ALFA (bu/ac)**	**SUM ALFA (t/ha)**
Ellis	1996	140.00	8.78	98.00	6.15	106.00	6.65	68.00	4.26	41.00	2.76	28.00	1.88	0.00	0.00	0.00	0.00	3.00	0.20
Ellis	1997	136.00	8.53	66.00	4.14	84.00	5.27	69.00	4.33	59.00	3.96	39.00	2.62	0.00	0.00	33.00	2.22	2.50	0.17
Ellis	1998	140.00	8.78	65.00	4.08	88.00	5.52	92.00	5.77	52.00	3.49	47.00	3.16	42.12	2.83	42.00	2.82	4.80	0.32
Ellis	1999	125.00	7.84	95.00	5.96	114.00	7.15	91.00	5.71	60.00	4.03	48.00	3.23	60.00	4.03	30.00	2.02	4.00	0.27
Ellis	2000	213.00	13.36	57.00	3.58	91.00	5.71	68.00	4.26	0.00	0.00	34.00	2.28	49.00	3.29	23.00	1.55	3.10	0.21
Ellis	2001	154.49	9.69	67.06	4.21	74.00	4.64	61.00	3.83	0.00	0.00	32.00	2.15	35.00	2.35	18.00	1.21	4.20	0.28
Ellis	2002	157.16	9.86	30.77	1.93	82.00	5.14	35.00	2.20	35.00	2.35	28.00	1.88	40.00	2.69	13.00	0.87	3.00	0.20
Ellis	2003	0.00	0.00	0.00	0.00	82.00	5.14	23.00	1.44	64.00	4.30	47.00	3.16	46.55	3.13	13.40	0.90	2.10	0.14
Ellis	2004	183.00	11.48	70.00	4.39	115.00	7.21	78.00	4.89	30.00	2.02	37.00	2.49	51.00	3.43	13.00	0.87	2.10	0.14
Ellis	2005	165.36	10.37	51.55	3.23	96.00	6.02	69.00	4.33	49.00	3.29	36.00	2.42	51.00	3.43	26.00	1.75	2.70	0.18
Ellis	2006	148.66	9.32	28.69	1.80	93.82	5.88	66.36	4.16	42.05	2.83	16.00	1.08	52.00	3.49	15.00	1.01	2.30	0.15
Ellis	2007	184.00	11.54	90.00	5.64	119.56	7.50	83.99	5.27	56.00	3.76	32.00	2.15	53.00	3.56	28.00	1.88	3.50	0.24
Ellis	2008	175.00	10.98	98.00	6.15	0.00	0.00	0.00	0.00	47.27	3.18	40.93	2.75	0.00	0.00	0.00	0.00	4.20	0.28
Ellis	2009	206.00	12.92	91.00	5.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.70	0.25
Average			**9.53**		**4.07**		**5.13**		**3.60**		**2.57**		**2.23**		**2.30**		**1.22**		**0.22**
Sum			**133.45**		**56.95**		**71.84**		**50.45**		**35.97**		**31.24**		**32.23**		**17.10**		**3.04**
Ellsworth County Observed Data																			
County	**Year**	**IRCN (bu/ac)**	**IRCN (t/ha)**	**CORN (bu/ac)**	**CORN (t/ha)**	**IRGS (bu/ac)**	**IRGS (t/ha)**	**GRSG (bu/ha)**	**GRSG (t/ha)**	**IRWW (bu/ha)**	**IRWW (t/ha)**	**WWHT (bu/ha)**	**WWHT (t/ha)**	**IRSB (bu/ac)**	**IRSB (t/ha)**	**SOYB (bu/ac)**	**SOYB (t/ha)**	**SUM ALFA (bu/ac)**	**SUM ALFA (t/ha)**
Ellsworth	1996	135.00	8.47	80.00	5.02	104.00	6.52	75.00	4.70	32.00	2.15	30.00	2.02	39.00	2.62	28.00	1.88	4.60	0.31
Ellsworth	1997	130.00	8.15	80.00	5.02	80.00	5.02	74.00	4.64	0.00	0.00	49.00	3.29	35.00	2.35	33.00	2.22	2.70	0.18
Ellsworth	1998	155.88	9.78	77.00	4.83	0.00	0.00	0.00	0.00	0.00	0.00	53.00	3.56	40.00	2.69	24.00	1.61	3.00	0.20
Ellsworth	1999	120.00	7.53	76.00	4.77	0.00	0.00	0.00	0.00	0.00	0.00	53.00	3.56	38.00	2.55	29.00	1.95	4.50	0.30
Ellsworth	2000	123.00	7.71	71.00	4.45	0.00	0.00	0.00	0.00	0.00	0.00	42.00	2.82	42.00	2.82	14.00	0.94	3.00	0.20
Ellsworth	2001	159.84	10.03	50.61	3.17	0.00	0.00	21.00	1.32	0.00	0.00	41.00	2.76	58.04	3.90	18.49	1.24	4.30	0.29
Ellsworth	2002	169.92	10.66	36.35	2.28	96.89	6.08	53.82	3.38	0.00	0.00	33.00	2.22	40.68	2.73	26.34	1.77	2.30	0.15
Ellsworth	2003	168.31	10.56	58.85	3.69	114.10	7.16	39.06	2.45	0.00	0.00	58.00	3.90	46.85	3.15	13.36	0.90	2.30	0.15
Ellsworth	2004	0.00	0.00	123.00	7.71	122.00	7.65	101.00	6.33	0.00	0.00	50.00	3.36	61.78	4.15	33.97	2.28	3.50	0.24
Ellsworth	2005	0.00	0.00	0.00	0.00	120.80	7.58	71.07	4.46	0.00	0.00	44.00	2.96	55.89	3.76	25.08	1.69	3.00	0.20
Ellsworth	2006	0.00	0.00	42.00	2.63	86.01	5.39	55.42	3.48	57.08	3.84	29.00	1.95	57.90	3.89	20.43	1.37	2.60	0.17
Ellsworth	2007	0.00	0.00	0.00	0.00	104.85	6.58	83.77	5.25	24.87	1.67	19.00	1.28	0.00	0.00	0.00	0.00	3.50	0.24
Ellsworth	2008	171.00	10.73	106.00	6.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.12	0.28
Ellsworth	2009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	56.00	3.76	40.00	2.69	3.75	0.25
Average			**5.97**		**3.59**		**3.71**		**2.57**		**0.55**		**2.40**		**2.74**		**1.47**		**0.23**
Sum			**83.60**		**50.23**		**51.97**		**36.01**		**7.66**		**33.67**		**38.38**		**20.54**		**3.17**

Gove County Observed Data

County	Year	IRCN (bu/ac)	IRCN (t/ha)	CORN (bu/ac)	CORN (t/ha)	IRGS (bu/ac)	IRGS (t/ha)	GRSG (bu/ha)	GRSG (t/ha)	IRWW (bu/ha)	IRWW (t/ha)	WWHT (bu/ha)	WWHT (t/ha)	IRSB (bu/ac)	IRSB (t/ha)	SOYB (bu/ac)	SOYB (t/ha)	SUM ALFA (bu/ac)	SUM ALFA (t/ha)
Gove	1996	177.00	11.10	89.00	5.58	97.00	6.08	74.00	4.64	34.00	2.28	23.00	1.55	48.00	3.23	0.00	0.00	4.60	0.31
Gove	1997	165.00	10.35	79.00	4.95	93.00	5.83	82.00	5.14	47.00	3.16	41.00	2.76	40.00	2.69	0.00	0.00	4.50	0.30
Gove	1998	165.00	10.35	100.00	6.27	99.00	6.21	91.00	5.71	62.00	4.17	51.00	3.43	39.00	2.62	0.00	0.00	5.20	0.35
Gove	1999	156.00	9.78	104.00	6.52	114.00	7.15	97.00	6.08	61.00	4.10	49.00	3.29	0.00	0.00	0.00	0.00	5.00	0.34
Gove	2000	134.00	8.40	57.00	3.58	88.00	5.52	53.00	3.32	40.00	2.69	34.00	2.28	0.00	0.00	0.00	0.00	3.00	0.20
Gove	2001	159.00	9.97	88.00	5.52	76.00	4.77	75.00	4.70	50.00	3.36	34.00	2.28	50.00	3.36	26.00	1.75	4.60	0.31
Gove	2002	137.00	8.59	38.00	2.38	91.00	5.71	23.00	1.44	42.00	2.82	32.00	2.15	0.00	0.00	0.00	0.00	3.70	0.25
Gove	2003	138.00	8.66	35.00	2.20	60.00	3.76	23.00	1.44	55.00	3.70	49.00	3.29	53.00	3.56	15.00	1.01	3.30	0.22
Gove	2004	160.00	10.04	49.00	3.07	90.00	5.64	49.00	3.07	39.00	2.62	19.00	1.28	32.00	2.15	9.00	0.60	3.40	0.23
Gove	2005	168.00	10.54	57.00	3.58	96.01	6.02	67.29	4.22	50.00	3.36	37.00	2.49	55.55	3.73	19.60	1.32	4.10	0.28
Gove	2006	139.00	8.72	24.00	1.51	74.00	4.64	26.00	1.63	44.00	2.96	16.00	1.08	41.00	2.76	19.00	1.28	3.70	0.25
Gove	2007	173.00	10.85	79.00	4.95	106.00	6.65	80.00	5.02	49.00	3.29	45.00	3.02	61.17	4.11	26.09	1.75	4.40	0.30
Gove	2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	52.20	3.51	40.16	2.70	0.00	0.00	0.00	0.00	0.00	0.00
Gove	2009	207.72	13.03	113.72	7.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.90	0.26
Average			**9.31**		**4.09**		**4.86**		**3.32**		**3.00**		**2.26**		**2.01**		**0.55**		**0.26**
Sum			**130.38**		**57.25**		**67.99**		**46.43**		**42.01**		**31.59**		**28.21**		**7.71**		**3.59**

Logan County Observed Data

County	Year	IRCN (bu/ac)	IRCN (t/ha)	CORN (bu/ac)	CORN (t/ha)	IRGS (bu/ac)	IRGS (t/ha)	GRSG (bu/ha)	GRSG (t/ha)	IRWW (bu/ha)	IRWW (t/ha)	WWHT (bu/ha)	WWHT (t/ha)	IRSB (bu/ac)	IRSB (t/ha)	SOYB (bu/ac)	SOYB (t/ha)	SUM ALFA (bu/ac)	SUM ALFA (t/ha)
Logan	1996	174.00	10.91	82.00	5.14	80.00	5.02	58.00	3.64	31.00	2.08	21.00	1.41	31.00	2.08	0.00	0.00	4.50	0.30
Logan	1997	158.00	9.91	63.00	3.95	92.00	5.77	62.00	3.89	56.00	3.76	36.00	2.42	46.00	3.09	0.00	0.00	5.70	0.38
Logan	1998	184.00	11.54	110.00	6.90	100.00	6.27	95.00	5.96	63.00	4.23	41.00	2.76	54.00	3.63	0.00	0.00	5.70	0.38
Logan	1999	167.00	10.47	82.00	5.14	105.00	6.59	78.00	4.89	63.00	4.23	45.00	3.02	0.00	0.00	0.00	0.00	5.60	0.38
Logan	2000	148.00	9.28	37.00	2.32	101.00	6.33	44.00	2.76	41.00	2.76	28.00	1.88	0.00	0.00	0.00	0.00	2.80	0.19
Logan	2001	168.00	10.54	54.00	3.39	102.00	6.40	63.00	3.95	51.00	3.43	32.00	2.15	48.67	3.27	21.73	1.46	5.60	0.38
Logan	2002	98.00	6.15	35.00	2.20	66.00	4.14	21.00	1.32	39.00	2.62	26.00	1.75	0.00	0.00	0.00	0.00	5.80	0.39
Logan	2003	140.00	8.78	29.00	1.82	61.00	3.83	26.00	1.63	66.00	4.44	37.00	2.49	47.88	3.22	9.90	0.67	3.60	0.24
Logan	2004	187.00	11.73	79.00	4.95	131.00	8.22	42.00	2.63	50.00	3.36	19.00	1.28	32.00	2.15	9.00	0.60	3.40	0.23
Logan	2005	168.00	10.54	64.00	4.01	106.00	6.65	62.00	3.89	52.00	3.49	39.00	2.62	53.00	3.56	17.00	1.14	3.10	0.21
Logan	2006	174.00	10.91	32.00	2.01	85.34	5.35	54.20	3.40	44.00	2.96	20.00	1.34	56.43	3.79	14.18	0.95	4.40	0.30
Logan	2007	168.00	10.54	66.00	4.14	93.50	5.86	78.34	4.91	71.00	4.77	47.00	3.16	59.00	3.96	23.00	1.55	5.70	0.38
Logan	2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	49.29	3.31	35.42	2.38	0.00	0.00	0.00	0.00	0.00	0.00
Logan	2009	211.00	13.23	128.00	8.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.27
Average			**9.61**		**3.86**		**5.03**		**3.06**		**3.25**		**2.05**		**2.05**		**0.46**		**0.29**
Sum			**134.53**		**54.00**		**70.42**		**42.87**		**45.45**		**28.66**		**28.76**		**6.37**		**4.03**

Russell County Observed Data

County	Year	IRCN (bu/ac)	IRCN (t/ha)	CORN (bu/ac)	CORN (t/ha)	IRGS (bu/ac)	IRGS (t/ha)	GRSG (bu/ha)	GRSG (t/ha)	IRWW (bu/ha)	IRWW (t/ha)	WWHT (bu/ha)	WWHT (t/ha)	IRSB (bu/ac)	IRSB (t/ha)	SOYB (bu/ac)	SOYB (t/ha)	SUM ALFA (bu/ac)	SUM ALFA (t/ha)
Russell	1996	140.00	8.78	70.00	4.39	0.00	0.00	71.00	4.45	41.00	2.76	27.00	1.81	37.00	2.49	29.28	1.97	3.40	0.23
Russell	1997	150.00	9.41	67.00	4.20	0.00	0.00	71.00	4.45	0.00	0.00	49.00	3.29	0.00	0.00	39.00	2.62	3.40	0.23
Russell	1998	0.00	0.00	63.00	3.95	0.00	0.00	37.00	2.32	0.00	0.00	52.00	3.49	0.00	0.00	37.00	2.49	3.60	0.24

Russell	1999	150.00	9.41	79.00	4.95	0.00	0.00	37.00	2.32	0.00	0.00	48.00	3.23	0.00	0.00	37.00	2.49	4.00	0.27
Russell	2000	0.00	0.00	75.00	4.70	0.00	0.00	13.00	0.82	0.00	0.00	40.00	2.69	0.00	0.00	13.00	0.87	3.20	0.22
Russell	2001	0.00	0.00	42.00	2.63	0.00	0.00	25.00	1.57	0.00	0.00	36.00	2.42	0.00	0.00	0.00	0.00	4.30	0.29
Russell	2002	0.00	0.00	18.00	1.13	0.00	0.00	15.00	0.94	0.00	0.00	34.00	2.28	0.00	0.00	0.00	0.00	2.80	0.19
Russell	2003	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.63	0.00	0.00	54.00	3.63	0.00	0.00	0.00	0.00	2.30	0.15
Russell	2004	0.00	0.00	112.00	7.02	132.55	8.31	90.75	5.69	0.00	0.00	36.00	2.42	0.00	0.00	0.00	0.00	3.60	0.24
Russell	2005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	42.00	2.82	0.00	0.00	0.00	0.00	2.90	0.19
Russell	2006	0.00	0.00	0.00	0.00	86.55	5.43	61.95	3.89	59.00	3.96	25.00	1.68	0.00	0.00	0.00	0.00	2.30	0.15
Russell	2007	0.00	0.00	0.00	0.00	111.64	7.00	88.73	5.57	30.00	2.02	29.00	1.95	0.00	0.00	0.00	0.00	3.10	0.21
Russell	2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.20	0.28
Russell	2009	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.10	0.21
Average			**1.97**		**2.36**		**1.48**		**2.33**		**0.62**		**2.27**		**0.18**		**0.75**		**0.22**
Sum			**27.60**		**32.99**		**20.74**		**32.64**		**8.74**		**31.72**		**2.49**		**10.44**		**3.10**

Trego County Observed Data

County	**Year**	**IRCN (bu/ac)**	**IRCN (t/ha)**	**CORN (bu/ac)**	**CORN (t/ha)**	**IRGS (bu/ac)**	**IRGS (t/ha)**	**GRSG (bu/ha)**	**GRSG (t/ha)**	**IRWW (bu/ha)**	**IRWW (t/ha)**	**WWHT (bu/ha)**	**WWHT (t/ha)**	**IRSB (bu/ac)**	**IRSB (t/ha)**	**SOYB (bu/ac)**	**SOYB (t/ha)**	**SUM ALFA (bu/ac)**	**SUM ALFA (t/ha)**
Trego	1996	124.00	7.78	95.00	5.96	99.00	6.21	65.00	4.08	35.00	2.35	27.00	1.81	39.00	2.62	0.00	0.00	4.60	0.31
Trego	1997	142.00	8.91	73.00	4.58	91.00	5.71	75.00	4.70	59.00	3.96	37.00	2.49	46.00	3.09	33.00	2.22	4.10	0.28
Trego	1998	144.00	9.03	104.00	6.52	88.00	5.52	92.00	5.77	52.00	3.49	50.00	3.36	56.00	3.76	42.00	2.82	4.80	0.32
Trego	1999	124.00	7.78	97.00	6.08	114.00	7.15	91.00	5.71	60.00	4.03	43.00	2.89	60.00	4.03	30.00	2.02	5.00	0.34
Trego	2000	122.00	7.65	71.00	4.45	91.00	5.71	68.00	4.26	38.00	2.55	38.00	2.55	49.00	3.29	23.00	1.55	2.60	0.17
Trego	2001	168.00	10.54	86.00	5.39	77.04	4.83	70.19	4.40	52.00	3.49	36.00	2.42	50.00	3.36	26.00	1.75	4.50	0.30
Trego	2002	141.00	8.84	31.00	1.94	94.57	5.93	27.29	1.71	35.00	2.35	31.00	2.08	0.00	0.00	0.00	0.00	3.50	0.24
Trego	2003	124.20	7.79	33.47	2.10	74.64	4.68	22.33	1.40	64.00	4.30	45.00	3.02	53.00	3.56	15.00	1.01	2.90	0.19
Trego	2004	152.13	9.54	39.70	2.49	85.51	5.36	48.05	3.01	30.00	2.02	20.00	1.34	32.00	2.15	9.00	0.60	2.50	0.17
Trego	2005	145.00	9.09	50.00	3.14	95.00	5.96	74.00	4.64	49.00	3.29	31.00	2.08	50.00	3.36	8.00	0.54	3.10	0.21
Trego	2006	130.00	8.15	29.00	1.82	81.29	5.10	37.93	2.38	43.00	2.89	14.00	0.94	41.00	2.76	19.00	1.28	2.10	0.14
Trego	2007	171.09	10.73	79.66	5.00	107.94	6.77	81.08	5.09	56.00	3.76	30.00	2.02	58.00	3.90	21.00	1.41	4.40	0.30
Trego	2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46.50	3.12	39.00	2.62	0.00	0.00	0.00	0.00	0.00	0.00
Trego	2009	206.00	12.92	91.00	5.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.20	0.28
Average			**8.48**		**3.94**		**4.92**		**3.37**		**2.97**		**2.12**		**2.56**		**1.08**		**0.23**
Sum			**118.76**		**55.18**		**68.93**		**47.16**		**41.63**		**29.64**		**35.88**		**15.19**		**3.25**

Wallace County Observed Data

County	**Year**	**IRCN (bu/ac)**	**IRCN (t/ha)**	**CORN (bu/ac)**	**CORN (t/ha)**	**IRGS (bu/ac)**	**IRGS (t/ha)**	**GRSG (bu/ha)**	**GRSG (t/ha)**	**IRWW (bu/ha)**	**IRWW (t/ha)**	**WWHT (bu/ha)**	**WWHT (t/ha)**	**IRSB (bu/ac)**	**IRSB (t/ha)**	**SOYB (bu/ac)**	**SOYB (t/ha)**	**SUM ALFA (bu/ac)**	**SUM ALFA (t/ha)**
Wallace	1996	162.00	10.16	67.00	4.20	86.00	5.39	66.00	4.14	37.00	2.49	19.00	1.28	38.00	2.55	0.00	0.00	4.50	0.3024
Wallace	1997	142.00	8.91	64.00	4.01	98.00	6.15	52.00	3.26	42.00	2.82	40.00	2.69	41.00	2.76	0.00	0.00	4.10	0.27552
Wallace	1998	178.00	11.16	97.00	6.08	88.00	5.52	76.00	4.77	61.00	4.10	40.00	2.69	40.00	2.69	0.00	0.00	5.90	0.39648
Wallace	1999	156.00	9.78	88.00	5.52	107.00	6.71	68.00	4.26	59.00	3.96	47.00	3.16	0.00	0.00	0.00	0.00	5.90	0.39648
Wallace	2000	161.00	10.10	36.00	2.26	90.00	5.64	24.00	1.51	43.00	2.89	25.00	1.68	0.00	0.00	0.00	0.00	3.50	0.2352
Wallace	2001	158.00	9.91	40.00	2.51	84.00	5.27	49.00	3.07	45.00	3.02	31.00	2.08	54.00	3.63	0.00	0.00	5.40	0.36288
Wallace	2002	114.00	7.15	24.00	1.51	36.00	2.26	19.00	1.19	30.00	2.02	18.00	1.21	0.00	0.00	0.00	0.00	3.40	0.22848
Wallace	2003	176.00	11.04	27.00	1.69	74.00	4.64	18.00	1.13	59.00	3.96	42.00	2.82	47.00	3.16	0.00	0.00	3.80	0.25536

Wallace	2004	178.00	11.16	77.00	4.83	93.34	5.85	43.43	2.72	51.00	3.43	13.00	0.87	0.00	0.00	0.00	0.00	4.30	0.28896
Wallace	2005	169.00	10.60	62.00	3.89	111.00	6.96	40.00	2.51	38.00	2.55	31.00	2.08	0.00	0.00	0.00	0.00	4.70	0.31584
Wallace	2006	182.00	11.42	39.00	2.45	74.00	4.64	35.00	2.20	39.00	2.62	21.00	1.41	0.00	0.00	0.00	0.00	5.20	0.34944
Wallace	2007	189.00	11.85	67.00	4.20	148.00	9.28	64.00	4.01	60.00	4.03	44.00	2.96	0.00	0.00	0.00	0.00	4.40	0.29568
Wallace	2008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45.37	3.05	30.71	2.06	0.00	0.00	0.00	0.00	0.00	0
Wallace	2009	192.00	12.04	91.00	5.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.2688
Average		**154.07**	**9.66**	**55.64**	**3.49**	**77.81**	**4.88**	**39.60**	**2.48**	**43.53**	**2.92**	**28.69**	**1.93**	**15.71**	**1.06**	**0.00**	**0.00**	**4.22**	**0.28368**
Sum			**135.29**		**48.86**		**68.32**		**34.77**		**40.95**		**26.99**		**14.78**		**0.00**		**3.97152**

Appendix E - Crop Nash-Sutcliffe Statistical Inputs

Table 12 Crop Nash-Sutcliffe Statistical Inputs

Year	CORN (o-s)^2	CORN (o-m)^2	IRCN (o-s)^2	IRCN (o-m)^2	GRSG (o-s)^2	GRSG (o-m)^2	IRSG (o-s)^2	IRSG (o-m)^2	WWHT (o-s)^2	WWHT (o-m)^2	IRWW (o-s)^2	IRWW (o-m)^2	SOYB (o-s)^2	SOYB (o-m)^2	IRSB (o-s)^2	IRSB (o-m)^2	ALFA (o-s)^2	ALFA (o-m)^2
Ellis County NSE InPuts																		
1996	37.78	4.32	67.75	0.56	2347.47	0.44	44.20	2.30	927.76	0.12	7.59	0.03	263.50	1.49	0.00	5.30	1342.85	0.00
1997	3958.61	0.01	63.50	1.00	2765.99	0.52	27.76	0.02	2999.96	0.15	15.72	1.95	58.53	0.99	0.00	5.30	1337.95	0.00
1998	16.62	0.00	68.45	0.56	2941.94	4.69	30.46	0.15	5219.87	0.86	12.21	0.86	33.58	2.56	7.36	0.28	737.11	0.01
1999	35.50	3.57	52.77	2.86	3817.88	4.43	51.12	4.08	82.38	0.99	16.26	2.14	423.50	0.63	15.14	2.99	2252.57	0.00
2000	5643.78	0.24	163.82	14.65	2111.06	0.44	32.58	0.33	5.22	0.00	0.00	6.60	200.78	0.11	9.99	0.98	1610.54	0.00
2001	17.69	0.02	83.35	0.02	1377.63	0.05	21.54	0.24	4944.17	0.01	0.00	6.60	6.85	0.00	5.52	0.00	958.77	0.00
2002	3.72	4.57	86.72	0.11	322.53	1.98	26.45	0.00	11.34	0.12	5.53	0.05	0.01	0.12	7.21	0.15	631.89	0.00
2003	1066.94	16.55	0.36	90.86	266.78	4.67	26.45	0.00	1985.34	0.86	18.50	3.00	0.27	0.10	9.77	0.68	929.50	0.01
2004	19.28	0.10	119.19	3.79	3346.71	1.66	52.02	4.33	2459.70	0.06	4.06	0.31	294.20	0.12	10.91	1.27	1043.44	0.01
2005	10.45	0.70	96.63	0.71	1045.30	0.52	36.25	0.79	108.26	0.04	10.84	0.52	103.00	0.28	11.43	1.27	1186.27	0.00
2006	2589.43	5.15	77.86	0.04	1038.43	0.31	34.63	0.57	1.16	1.34	7.99	0.07	72.89	0.05	11.90	1.42	1184.08	0.00
2007	31.86	2.49	118.97	4.03	3970.01	2.77	56.24	5.61	6145.10	0.01	14.16	1.42	576.35	0.44	11.46	1.59	3576.22	0.00
2008	37.78	4.32	108.91	2.09	2637.55	12.99	0.00	26.33	24.28	0.27	10.09	0.37	129.41	1.49	0.02	5.30	1329.51	0.00
2009	6310.76	2.69	152.78	11.48	6117.64	12.99	0.00	26.33	3900.02	4.98	0.00	6.60	435.31	1.49	0.03	5.30	2182.86	0.00
SUM	**19780.21**	**44.73**	**1261.06**	**132.77**	**34106.93**	**48.46**	**439.70**	**71.08**	**28814.56**	9.80	**122.95**	**30.52**	**2598.17**	**9.87**	**100.74**	**31.83**	**20303.54**	**0.04**
Ellsworth County NSE InPuts																		
Year	**CORN (o-s)^2**	**CORN (o-m)^2**	**IRCN (o-s)^2**	**IRCN (o-m)^2**	**GRSG (o-s)^2**	**GRSG (o-m)^2**	**IRSG (o-s)^2**	**IRSG (o-m)^2**	**WWHT (o-s)^2**	**WWHT (o-m)^2**	**IRWW (o-s)^2**	**IRWW (o-m)^2**	**SOYB (o-s)^2**	**SOYB (o-m)^2**	**IRSB (o-s)^2**	**IRSB (o-m)^2**	**ALFA (o-s)^2**	**ALFA (o-m)^2**
1996	25.18	2.04	4.89	6.23	2459.72	4.54	42.55	7.90	993.88	0.15	4.62	2.57	87.25	0.17	4.50	0.01	2606.70	0.01
1997	3711.98	2.04	3.56	4.76	1274.23	4.28	25.18	1.70	293.32	0.79	0.00	0.30	47.01	0.56	5.47	0.15	1725.15	0.00
1998	23.32	1.54	18.31	14.48	3263.07	6.62	0.00	13.78	1679.13	1.34	0.00	0.30	367.67	0.02	4.25	0.00	1590.36	0.00
1999	22.72	1.39	1.33	2.42	3450.89	6.62	0.00	13.78	273.79	1.34	0.00	0.30	358.58	0.23	5.74	0.04	3210.15	0.01
2000	5429.84	0.75	1.94	3.04	2585.15	6.62	0.00	13.78	60.69	0.17	0.00	0.30	209.00	0.28	6.26	0.01	2312.11	0.00
2001	10.08	0.17	15.95	16.43	1819.11	1.58	0.00	13.78	1168.61	0.12	0.00	0.30	39.40	0.05	13.89	1.34	2060.83	0.00
2002	5.20	1.71	23.08	21.96	375.52	0.65	36.93	5.59	218.91	0.04	0.00	0.30	0.70	0.09	7.42	0.00	948.85	0.01
2003	2459.06	0.01	16.94	21.02	1161.33	0.01	51.22	11.86	2396.62	2.23	0.00	0.30	108.21	0.32	7.14	0.17	2323.00	0.01
2004	59.51	17.03	35.21	35.66	2322.49	14.16	58.55	15.52	2076.93	0.91	0.00	0.30	452.37	0.66	11.77	1.99	2494.79	0.00
2005	0.00	12.87	28.82	35.66	1799.58	3.55	57.41	14.93	8.74	0.30	0.00	0.30	240.61	0.05	9.31	1.03	3434.98	0.00
2006	2506.43	0.91	29.95	35.66	1763.66	0.82	29.10	2.83	62.05	0.21	14.72	10.82	115.24	0.01	13.08	1.32	1442.96	0.00
2007	0.00	12.87	38.98	35.66	1619.08	7.19	43.25	8.20	1408.05	1.27	2.79	1.26	260.18	2.15	0.01	7.52	1549.22	0.00
2008	44.20	9.37	19.73	22.60	3728.94	6.62	0.00	13.78	305.67	5.78	0.00	0.30	400.73	2.15	0.69	7.52	3139.08	0.00
2009	6088.28	12.87	36.19	35.66	3001.14	6.62	0.00	13.78	2562.54	5.78	0.00	0.30	239.39	1.49	10.09	1.04	2426.14	0.00
SUM	**20385.80**	**75.58**	**274.88**	**291.23**	**30623.90**	**69.86**	**344.17**	**151.23**	**13508.93**	**20.44**	**22.13**	**17.94**	**2926.34**	**8.25**	**99.62**	**22.13**	**31264.33**	**0.04**
Gove County NSE InPuts																		

Year	CORN (o-s)^2	CORN (o-m)^2	IRCN (o-s)^2	IRCN (o-m)^2	GRSG (o-s)^2	GRSG (o-m)^2	IRSG (o-s)^2	IRSG (o-m)^2	WWHT (o-s)^2	WWHT (o-m)^2	IRWW (o-s)^2	IRWW (o-m)^2	SOYB (o-s)^2	SOYB (o-m)^2	IRSB (o-s)^2	IRSB (o-m)^2	ALFA (o-s)^2	ALFA (o-m)^2
1996	26.44	2.23	569.47	3.20	588.34	1.76	26.59	1.51	441.78	0.51	5.22	0.51	143.65	0.30	5.16	1.47	24.56	0.00
1997	1502.35	0.75	507.43	1.07	1730.27	3.34	25.72	0.95	899.44	0.25	9.98	0.02	10.81	0.30	0.13	0.45	9.87	0.00
1998	34.46	4.77	474.83	107.10	440.53	5.72	29.43	1.83	1472.93	1.37	17.36	1.36	63.60	0.30	0.16	0.37	5.16	0.01
1999	36.98	5.92	589.20	95.73	501.43	7.66	38.29	5.26	10.47	1.07	16.80	1.21	62.04	0.30	17.36	4.06	9.95	0.01
2000	2119.64	0.26	673.15	70.64	1610.59	0.00	22.23	0.44	5.22	0.00	7.23	0.10	47.49	0.30	11.41	4.06	10.07	0.00
2001	26.02	2.05	504.20	99.45	308.48	1.93	13.49	0.01	2009.49	0.00	11.29	0.13	1.11	1.43	0.12	1.81	3.84	0.00
2002	3.85	2.91	490.92	73.83	181.61	3.51	30.91	0.72	218.72	0.01	7.97	0.03	0.01	0.30	0.01	4.06	0.66	0.00
2003	204.81	3.59	648.11	0.43	242.79	3.51	12.55	1.20	972.50	1.07	13.66	0.48	0.74	0.21	12.33	2.39	1.27	0.00
2004	6.90	1.03	637.47	0.52	566.84	0.06	25.30	0.62	1.63	0.96	6.87	0.14	59.62	0.00	1.96	0.02	6.40	0.00
2005	9.94	0.26	454.80	1.50	242.31	0.82	28.43	1.36	4359.89	0.05	11.29	0.13	0.44	0.59	2.07	2.95	5.71	0.00
2006	577.00	6.68	499.54	0.35	558.74	2.84	18.86	0.05	1.16	1.40	8.74	0.00	0.57	0.53	5.47	0.55	2.40	0.00
2007	20.04	0.75	722.25	2.37	329.25	2.89	37.04	3.21	1573.08	0.59	10.84	0.09	0.08	1.45	15.40	4.39	4.70	0.00
2008	0.20	16.72	1144.83	86.73	434.87	11.00	0.27	23.58	432.20	0.20	12.31	0.26	13.16	0.30	3.14	4.06	3.67	0.07
2009	2175.01	9.26	505.47	13.81	2778.93	11.00	0.85	23.58	1175.86	5.09	0.00	9.01	136.07	0.30	24.39	4.06	16.24	0.00
SUM	**6743.62**	**57.18**	**8421.69**	**556.73**	**10514.98**	**56.02**	**309.96**	**64.33**	**13574.37**	**12.57**	**139.55**	**13.47**	**539.42**	**6.63**	**99.09**	**34.70**	**104.49**	**0.10**

Logan County NSE InPuts

Year	CORN (o-s)^2	CORN (o-m)^2	IRCN (o-s)^2	IRCN (o-m)^2	GRSG (o-s)^2	GRSG (o-m)^2	IRSG (o-s)^2	IRSG (o-m)^2	WWHT (o-s)^2	WWHT (o-m)^2	IRWW (o-s)^2	IRWW (o-m)^2	SOYB (o-s)^2	SOYB (o-m)^2	IRSB (o-s)^2	IRSB (o-m)^2	ALFA (o-s)^2	ALFA (o-m)^2
1996	23.69	1.65	69.80	1.70	82.25	0.33	19.50	0.00	1183.89	0.40	4.34	1.35	43.31	0.21	1.26	0.00	12.62	0.00
1997	2911.54	0.01	74.38	0.09	1802.53	0.68	28.84	0.55	1079.52	0.14	14.16	0.27	9.74	0.21	7.34	1.08	4.17	0.01
1998	44.19	9.25	40.58	3.73	13.71	8.39	34.69	1.54	2675.93	0.50	17.92	0.97	3.25	0.21	9.52	2.48	3.23	0.01
1999	23.68	1.65	81.44	0.75	38.62	3.35	37.13	2.42	3.62	0.95	17.92	0.97	18.40	0.21	0.52	4.22	5.67	0.01
2000	2646.65	2.36	81.84	0.11	1776.83	0.09	35.11	1.70	3.54	0.03	7.59	0.24	17.72	0.21	0.38	4.22	5.15	0.01
2001	9.76	0.22	57.15	0.86	20.10	0.79	35.41	1.87	5423.87	0.01	11.75	0.03	0.32	1.01	6.54	1.48	2.22	0.01
2002	3.73	2.76	135.38	11.99	5.45	3.05	16.30	0.79	0.15	0.09	6.87	0.39	0.01	0.21	0.00	4.22	0.30	0.01
2003	339.71	4.16	102.39	0.69	59.61	2.05	13.86	1.45	1407.87	0.19	19.67	1.41	0.28	0.04	10.29	1.35	1.30	0.00
2004	21.85	1.20	59.17	4.49	48.72	0.18	63.21	10.15	1.63	0.59	11.29	0.01	10.84	0.02	3.87	0.01	3.61	0.00
2005	14.06	0.02	58.10	0.86	6.80	0.68	39.72	2.62	7009.14	0.33	12.21	0.06	0.60	0.47	9.85	2.27	3.75	0.01
2006	967.41	3.42	46.66	1.70	305.85	0.11	27.11	0.10	1.81	0.49	8.74	0.08	1.93	0.25	14.22	3.02	1.42	0.00
2007	14.74	0.08	102.13	0.86	0.00	3.43	31.71	0.70	2219.64	1.24	22.76	2.33	1.96	1.19	14.94	3.65	2.42	0.01
2008	0.08	14.88	372.90	92.34	41.50	9.38	0.05	25.30	730.26	0.11	10.97	0.00	0.71	0.21	0.12	4.22	2.22	0.08
2009	3093.98	17.40	33.50	13.14	2446.40	9.38	0.32	25.30	2055.14	4.19	0.00	10.54	31.05	0.21	0.65	4.22	7.93	0.00
SUM	**10115.08**	**59.08**	**1315.43**	**133.30**	**6648.39**	**41.89**	**382.97**	**74.50**	**23796.01**	**9.27**	**166.20**	**18.67**	**140.12**	**4.64**	**79.49**	**36.44**	**56.00**	**0.16**

Russell County NSE InPuts

Year	CORN (o-s)^2	CORN (o-m)^2	IRCN (o-s)^2	IRCN (o-m)^2	GRSG (o-s)^2	GRSG (o-m)^2	IRSG (o-s)^2	IRSG (o-m)^2	WWHT (o-s)^2	WWHT (o-m)^2	IRWW (o-s)^2	IRWW (o-m)^2	SOYB (o-s)^2	SOYB (o-m)^2	IRSB (o-s)^2	IRSB (o-m)^2	ALFA (o-s)^2	ALFA (o-m)^2
1996	19.28	4.14	27.31	46.37	3144.85	4.50	0.00	2.20	598.54	0.20	7.59	4.54	86.10	1.49	0.20	5.33	1310.94	0.00
1997	4010.73	3.41	34.07	55.31	2175.64	4.50	0.00	2.20	1608.62	1.06	0.00	0.39	30.80	3.52	2.26	0.03	1186.92	0.00
1998	15.61	2.54	10.57	3.89	2813.79	0.00	0.00	2.20	3577.29	1.51	0.00	0.39	104.72	3.03	13.80	0.03	559.67	0.00
1999	24.55	6.75	32.63	55.31	3443.80	0.00	0.00	2.20	10.40	0.92	0.00	0.39	216.43	3.03	19.30	0.03	1740.87	0.00
2000	4833.29	5.51	13.12	3.89	3076.58	2.30	0.00	2.20	0.03	0.18	0.00	0.39	224.94	0.02	17.44	0.03	1771.58	0.00

2001	6.94	0.08	13.05	3.89	1902.39	0.58	0.00	2.20	2803.52	0.02	0.00	0.39	4.42	0.56	0.01	0.03	948.31	0.00
2002	1.27	1.51	12.55	3.89	421.41	1.93	0.00	2.20	0.70	0.00	0.00	0.39	0.08	0.56	0.01	0.03	484.86	0.00
2003	813.87	5.55	14.61	3.89	540.02	2.90	0.00	2.20	1458.56	1.86	0.00	0.39	4.45	0.56	0.00	0.03	867.74	0.00
2004	49.35	21.79	12.54	3.89	2928.07	11.29	69.12	46.67	1829.58	0.02	0.00	0.39	228.66	0.56	16.14	0.03	749.95	0.00
2005	0.00	5.55	12.53	3.89	1448.19	5.44	0.00	2.20	7.97	0.31	0.00	0.39	99.48	0.56	1.44	0.03	1008.46	0.00
2006	2036.40	5.55	10.93	3.89	911.48	2.42	29.47	15.57	69.51	0.34	15.72	11.16	100.22	0.56	1.69	0.03	1054.19	0.00
2007	0.00	5.55	15.83	3.89	2940.36	10.46	49.03	30.47	1812.55	0.10	4.06	1.94	427.52	0.56	30.18	0.03	2878.75	0.00
2008	0.00	5.55	12.64	3.89	3859.55	5.44	0.00	2.20	9.25	5.13	0.00	0.39	297.88	0.56	16.64	0.03	1755.97	0.00
2009	6649.34	5.55	12.66	3.89	3945.80	5.44	0.00	2.20	2046.13	5.13	0.00	0.39	372.55	0.56	26.20	0.03	1962.81	0.00
SUM	**18460.63**	**79.04**	**235.06**	**199.72**	**33551.93**	**57.19**	**147.61**	**116.87**	**15832.66**	16.79	**27.38**	**21.92**	**2198.24**	**16.09**	**145.33**	**5.74**	**18281.02**	**0.02**

Trego County NSE InPuts

Year	**CORN (o-s)^2**	**CORN (o-m)^2**	**IRCN (o-s)^2**	**IRCN (o-m)^2**	**GRSG (o-s)^2**	**GRSG (o-m)^2**	**IRSG (o-s)^2**	**IRSG (o-m)^2**	**WWHT (o-s)^2**	**WWHT (o-m)^2**	**IRWW (o-s)^2**	**IRWW (o-m)^2**	**SOYB (o-s)^2**	**SOYB (o-m)^2**	**IRSB (o-s)^2**	**IRSB (o-m)^2**	**ALFA (o-s)^2**	**ALFA (o-m)^2**
1996	35.50	4.07	1842.84	0.50	945.70	0.50	38.14	1.65	840.44	0.09	5.53	0.39	101.24	1.18	0.21	0.00	871.76	0.01
1997	1851.15	0.41	1575.30	0.18	2548.20	1.78	32.26	0.61	1639.08	0.14	15.72	0.98	33.69	1.28	0.28	0.28	749.73	0.00
1998	42.55	6.66	1414.67	0.30	1509.40	5.77	30.15	0.36	3710.95	1.55	12.21	0.27	60.42	3.02	0.61	1.44	703.83	0.01
1999	37.01	4.59	1703.41	0.50	1723.79	5.47	50.63	4.96	0.59	0.60	16.26	1.12	350.89	0.87	0.05	2.16	1421.03	0.01
2000	3793.95	0.26	1845.76	0.69	1578.40	0.80	32.24	0.61	6.52	0.19	6.52	0.18	50.61	0.21	3.46	0.53	614.61	0.00
2001	29.09	2.11	1261.29	4.22	584.50	1.07	22.96	0.01	2642.28	0.09	12.21	0.27	7.15	0.44	5.29	0.63	377.57	0.00
2002	3.78	3.99	1186.17	0.13	264.64	2.75	35.12	1.02	367.21	0.00	5.53	0.39	0.93	1.18	0.01	6.57	314.35	0.00
2003	618.18	3.40	1720.36	0.48	249.97	3.87	21.84	0.06	1399.34	0.82	18.50	1.76	0.49	0.01	12.20	1.00	418.48	0.00
2004	6.20	2.11	1823.31	1.12	1763.24	0.13	28.53	0.19	389.64	0.60	4.06	0.92	323.05	0.23	0.77	0.17	1054.09	0.00
2005	9.83	0.65	1417.08	0.37	534.74	1.62	35.20	1.07	4436.86	0.00	10.84	0.10	33.94	0.30	4.47	0.63	668.11	0.00
2006	1463.75	4.51	1441.94	66.48	947.83	0.98	25.88	0.03	0.89	1.38	8.35	0.01	13.97	0.04	2.62	0.04	602.74	0.01
2007	24.96	1.11	2032.37	5.05	2174.06	2.95	45.56	3.41	3713.77	0.01	14.16	0.62	419.20	0.11	0.03	1.78	1990.90	0.00
2008	0.00	15.54	2158.05	71.95	1107.03	11.35	0.00	24.24	778.02	0.25	9.76	0.02	37.96	1.18	0.98	6.57	370.15	0.05
2009	5311.29	3.12	1642.78	19.69	4971.82	11.35	0.00	24.24	2550.73	4.48	0.00	8.84	493.75	1.18	15.39	6.57	1575.82	0.00
SUM	**13227.26**	**52.51**	**23065.34**	**171.67**	**20903.33**	**50.38**	**398.51**	**62.46**	**22476.31**	**10.20**	**139.66**	**15.87**	**1927.28**	**11.21**	**46.36**	**28.38**	**11733.17**	**0.11**

Wallace County NSE InPuts

Year	**CORN (o-s)^2**	**CORN (o-m)^2**	**IRCN (o-s)^2**	**IRCN (o-m)^2**	**GRSG (o-s)^2**	**GRSG (o-m)^2**	**IRSG (o-s)^2**	**IRSG (o-m)^2**	**WWHT (o-s)^2**	**WWHT (o-m)^2**	**IRWW (o-s)^2**	**IRWW (o-m)^2**	**SOYB (o-s)^2**	**SOYB (o-m)^2**	**IRSB (o-s)^2**	**IRSB (o-m)^2**	**ALFA (o-s)^2**	**ALFA (o-m)^2**
1996	17.66	0.51	7746.04	0.25	3183.40	2.74	29.09	0.26	58.72	1.19	6.18	0.19	13.36	0.00	4.96	2.24	10.71	0.00
1997	80.09	0.27	7969.64	0.57	126.91	0.60	37.78	1.60	559.44	0.43	7.97	0.01	89.80	0.00	3.26	2.89	36.36	0.00
1998	37.01	6.73	7892.14	2.25	4364.85	5.21	30.46	0.41	0.20	3.74	16.80	1.38	44.07	0.00	4.25	2.66	16.76	0.01
1999	30.46	4.12	8378.36	0.01	3458.43	3.17	45.04	3.35	1560.27	5.15	15.72	1.08	50.93	0.00	0.49	1.12	25.91	0.01
2000	36.74	1.52	7295.99	0.19	62.21	0.96	31.86	0.58	20.88	0.08	8.35	0.00	0.77	0.00	0.01	1.12	1.33	0.00
2001	6.29	0.96	6830.11	0.06	1658.05	0.35	27.76	0.15	660.78	0.06	9.14	0.01	45.25	0.00	8.65	6.62	10.38	0.01
2002	2.27	3.94	7244.37	6.32	193.66	1.67	5.10	6.88	39.68	2.65	4.06	0.83	0.02	0.00	0.00	1.12	3.17	0.00
2003	16.99	3.23	6848.50	1.89	14.80	1.84	21.54	0.06	426.56	3.74	15.72	1.08	1.05	0.00	9.45	4.42	7.74	0.00
2004	23.32	1.79	7857.98	2.25	1065.25	0.06	34.28	0.95	18.50	0.31	11.75	0.25	142.19	0.00	1.32	1.12	30.87	0.00
2005	15.12	0.16	7123.09	0.88	1089.83	0.00	48.47	4.33	3452.55	0.05	6.52	0.14	0.52	0.00	0.01	1.12	13.03	0.00
2006	38.23	1.09	6747.64	3.07	257.38	0.08	21.54	0.06	16.26	0.67	6.87	0.09	0.75	0.00	0.00	1.12	6.99	0.00

2007	17.66	0.51	7380.34	4.80	3285.06	2.34	86.17	19.38	1648.22	4.56	16.26	1.23	29.55	0.00	0.32	1.12	11.68	0.00
2008	0.00	12.18	8383.69	93.38	33.90	6.17	0.00	23.82	75.68	0.07	9.30	0.02	42.23	0.00	0.44	1.12	7.72	0.08
2009	106.73	4.92	8029.82	5.66	1570.27	6.17	0.00	23.82	2076.34	23.55	0.00	8.56	4.75	0.00	0.04	1.12	30.48	0.00
Sum	**428.57**	**41.92**	**105727.71**	**121.58**	**20364.01**	**31.36**	**419.09**	**85.65**	**10614.08**	**46.26**	**134.64**	**14.86**	**465.22**	**0.00**	**33.21**	**28.87**	**213.14**	**0.12**

Appendix F - Crop Percent Bias Statistical Inputs

Table 13 Crop Percent Bias Statistical Inputs

Ellis County PBIAS InPuts									
Year	CORN (o-s)*100	IRCN (o-s)*100	GRSG (o-s)*100	IRSG (o-s)*100	WWHT (o-s)*100	IRWW (o-s)*100	SOYB (o-s)*100	IRSB (o-s)*100	ALFA (o-s)*100
1996	614.7	823.1	-4845.1	664.8	-3045.9	275.5	-1623.3	-6.8	-3664.5
1997	-6291.7	796.9	-5259.3	526.8	-5477.2	396.5	-765.1	-3.9	-3657.8
1998	407.7	827.4	-5424.0	551.9	-7224.9	349.4	-579.5	271.2	-2715.0
1999	595.8	726.5	-6178.9	715.0	-907.6	403.2	-2057.9	389.1	-4746.1
2000	-7512.5	1279.9	-4594.6	570.8	228.5	0.0	-1417.0	316.1	-4013.1
2001	420.6	913.0	-3711.6	464.1	-7031.5	0.0	-261.8	234.9	-3096.4
2002	193.0	931.2	-1795.9	514.3	-336.8	235.2	7.7	268.6	-2513.7
2003	-3266.4	-59.6	-1633.3	514.3	-4455.7	430.1	51.7	312.6	-3048.8
2004	439.0	1091.7	-5785.1	721.3	-4959.5	201.6	-1715.2	330.2	-3230.2
2005	323.3	983.0	-3233.1	602.1	-1040.5	329.3	-1014.9	338.2	-3444.2
2006	-5088.6	882.4	-3222.5	588.4	107.5	282.6	-853.8	345.0	-3441.0
2007	564.5	1090.7	-6300.8	749.9	-7839.1	376.3	-2400.7	338.5	-5980.1
2008	614.7	1043.6	-5135.7	0.0	-492.8	317.6	-1137.6	-13.1	-3646.2
2009	-7944.0	1236.0	-7821.5	0.0	-6245.0	0.0	-2086.4	-16.3	-4672.1
Sum	**-25930.1**	**12565.8**	**-64941.4**	**7183.9**	**-48720.5**	**3597.4**	**-15853.6**	**3104.3**	**-51869.4**
Ellsworth County PBIAS InPuts									
	CORN (o-s)*100	**IRCN (o-s)*100**	**GRSG(o-s)*100**	**IRSG(o-s)*100**	**WWHT(o-s)*100**	**IRWW(o-s)*100**	**SOYB(o-s)*100**	**IRSB(o-s)*100**	**ALF(o-s)*100**
1996	501.8	221.2	-4959.6	652.3	-3152.6	215.0	-934.1	212.1	-5105.6
1997	-6092.6	188.8	-3569.6	501.8	-1712.7	0.0	-685.6	233.9	-4153.5
1998	482.9	427.9	-5712.3	0.0	-4097.7	0.0	-1917.5	206.1	-3987.9
1999	476.7	115.4	-5874.4	0.0	-1654.6	0.0	-1893.6	239.6	-5665.8
2000	-7368.7	139.4	-5084.4	0.0	-779.0	0.0	-1445.7	250.3	-4808.4
2001	317.5	399.3	-4265.1	0.0	-3418.5	0.0	-627.7	372.7	-4539.6
2002	228.0	480.4	-1937.8	607.7	-1479.6	0.0	-83.6	272.4	-3080.3
2003	-4958.9	411.6	-3407.8	715.7	-4895.5	0.0	-1040.2	267.2	-4819.7
2004	771.5	-593.3	-4819.2	765.2	-4557.3	0.0	-2126.9	343.1	-4994.8
2005	0.0	-536.8	-4242.1	757.7	295.7	0.0	-1551.2	305.1	-5860.9
2006	-5006.4	-547.3	-4199.6	539.4	-787.7	383.6	-1073.5	361.7	-3798.6
2007	0.0	-624.3	-4023.8	657.6	-3752.4	167.1	-1613.0	-12.0	-3936.0
2008	664.8	444.2	-6106.5	0.0	-1748.4	0.0	-2001.8	-83.2	-5602.7
2009	-7802.7	-601.6	-5478.3	0.0	-5062.2	0.0	-1547.2	317.6	-4925.6
Sum	**-27786.3**	**-75.2**	**-63680.6**	**5197.3**	**-36802.5**	**765.8**	**-18541.6**	**3286.5**	**-5279.6**

Gove County PBIAS InPuts									
Year	**CORN (o-s)*100**	**IRCN (o-s)*100**	**GRSG(o-s)*100**	**IRSG(o-s)*100**	**WWHT(o-s)*100**	**IRWW(o-s)*100**	**SOYB (o-s)*100**	**IRSB (o-s)*100**	**ALFA (o-s)*100**
1996	514.2	-2386.4	-2425.6	515.6	-2101.9	228.5	-1198.5	-227.1	-1636.9
1997	-3876.0	-2252.6	-4159.7	507.2	-2999.1	315.8	-328.8	35.5	-1033.8
1998	587.1	-2179.1	-2098.9	542.5	-3837.9	416.6	-797.5	-39.8	-824.8
1999	608.1	-2427.3	-2239.3	618.8	323.5	409.9	-787.7	-416.7	-1124.3
2000	-4604.0	-2594.5	-4013.2	471.5	228.5	268.8	-689.1	-337.7	-1045.2
2001	510.1	-2245.4	-1756.4	367.3	-4482.7	336.0	-105.4	-34.5	-713.8
2002	196.3	-2215.7	-1347.6	556.0	-1478.9	282.2	-11.9	-8.2	-380.2
2003	-1431.1	-2545.8	-1558.2	354.3	-3118.5	369.6	86.2	351.1	-541.8
2004	262.6	-2524.8	-2380.8	503.0	127.7	262.1	-772.2	140.0	-914.5
2005	315.3	-2132.6	-1556.6	533.2	-6602.9	336.0	-66.7	143.7	-843.0
2006	-2402.1	-2235.0	-2363.8	434.3	107.5	295.7	-75.4	234.0	-653.8
2007	447.6	-2687.5	-1814.5	608.6	-3966.2	329.3	29.0	392.4	-839.3
2008	-44.7	-3383.5	-2085.4	-52.4	-2078.9	350.8	-362.8	-177.2	-604.5
2009	-4663.7	-2248.3	-5271.6	-92.3	-3429.1	0.0	-1166.5	-493.9	-1387.0
Sum	**-13580.3**	**-34058.6**	**-35071.4**	**5867.4**	**-33308.9**	**4201.3**	**-6247.2**	**-438.4**	**-12542.8**

Logan County PBIAS InPuts									
	CORN (o-s)*100	**IRCN (o-s)*100**	**GRSG(o-s)*100**	**IRSG(o-s)*100**	**WWHT(o-s)*100**	**IRWW(o-s)*100**	**SOYB (o-s)*100**	**IRSB (o-s)*100**	**ALFA (o-s)*100**
1996	486.7	-835.5	-906.9	441.6	-3440.8	208.3	-658.1	112.2	-355.3
1997	-5395.9	-862.5	-4245.6	537.1	-3285.6	376.3	-312.1	271.0	-204.2
1998	664.8	-637.0	-370.3	589.0	-5172.9	423.4	-180.4	308.6	-179.6
1999	486.6	-902.5	-621.4	609.3	-190.3	423.4	-428.9	-72.2	-238.2
2000	-5144.6	-904.6	-4215.3	592.6	188.2	275.5	-420.9	-61.6	-226.8
2001	312.4	-756.0	-448.3	595.1	-7364.7	342.7	56.6	255.8	-148.9
2002	193.2	-1163.5	-233.5	403.7	-38.9	262.1	-7.7	-1.4	-54.4
2003	-1843.1	-1011.9	-772.1	372.3	-3752.2	443.5	53.0	320.8	-114.2
2004	467.5	-769.3	-698.0	795.0	127.7	336.0	-329.2	196.6	-190.0
2005	374.9	-762.2	-260.8	630.2	-8372.1	349.4	-77.7	313.8	-193.6
2006	-3110.3	-683.1	-1748.9	520.7	134.4	295.7	-139.1	377.1	-119.1
2007	384.0	-1010.6	-4.3	563.2	-4711.3	477.1	140.2	386.5	-155.5
2008	-28.0	-1931.1	-644.2	-22.3	-2702.3	331.2	-84.4	-34.1	-149.0
2009	-5562.4	-578.8	-4946.1	-56.8	-4533.4	0.0	-557.2	-80.4	-281.6
Sum	**-17714.3**	**-12808.5**	**-20115.7**	**6570.5**	**-43114.2**	**4544.7**	**-2945.9**	**2292.5**	**-2610.4**

Russell County PBIAS InPuts									
	CORN (o-s)*100	**IRCN (o-s)*100**	**GRSG (o-s)*100**	**IRSG (o-s)*100**	**WWHT (o-s)*100**	**IRWW (o-s)*100**	**SOYB (o-s)*100**	**IRSB (o-s)*100**	**ALFA (o-s)*100**
1996	439.0	522.6	-5607.9	0.0	-2446.5	275.5	-927.9	-45.0	-3620.7

1997	-6333.0	583.7	-4664.4	0.0	-4010.8	0.0	-554.9	-150.4	-3445.2
1998	395.1	-325.1	-5304.5	0.0	-5981.0	0.0	-1023.3	-371.5	-2365.7
1999	495.5	571.2	-5868.4	0.0	322.6	0.0	-1471.1	-439.3	-4172.4
2000	-6952.2	-362.2	-5546.7	0.0	17.8	0.0	-1499.8	-417.6	-4209.0
2001	263.4	-361.3	-4361.6	0.0	-5294.8	0.0	-210.1	-9.4	-3079.5
2002	112.9	-354.2	-2052.8	0.0	-83.4	0.0	-27.4	-7.7	-2201.9
2003	-2852.8	-382.3	-2323.8	0.0	-3819.1	0.0	-210.9	-6.8	-2945.7
2004	702.5	-354.2	-5411.2	831.4	-4277.4	0.0	-1512.2	-401.7	-2738.5
2005	0.0	-354.0	-3805.5	0.0	282.2	0.0	-997.4	-119.9	-3175.6
2006	-4512.6	-330.6	-3019.1	542.8	-833.8	396.5	-1001.1	-130.2	-3246.8
2007	0.0	-397.9	-5422.5	700.2	-4257.4	201.6	-2067.7	-549.3	-5365.4
2008	0.0	-355.6	-6212.5	0.0	-304.2	0.0	-1725.9	-408.0	-4190.4
2009	-8154.3	-355.8	-6281.6	0.0	-4523.4	0.0	-1930.1	-511.9	-4430.4
Sum	**-26396.6**	**-2255.8**	**-65882.5**	**2074.4**	**-35209.3**	**873.6**	**-15160.0**	**-3568.8**	**-49187.3**

Trego County PBIAS InPuts

	CORN (o-s)*100	IRCN (o-s)*100	GRSG (o-s)*100	IRSG (o-s)*100	WWHT (o-s)*100	IRWW (o-s)*100	SOYB (o-s)*100	IRSB (o-s)*100	ALFA (o-s)*100
1996	595.8	-4292.8	-3075.2	617.6	-2899.0	235.2	-1006.2	45.7	-2952.6
1997	-4302.5	-3969.0	-5048.0	568.0	-4048.6	396.5	-580.4	52.6	-2738.1
1998	652.3	-3761.2	-3885.1	549.1	-6091.8	349.4	-777.3	78.4	-2653.0
1999	608.4	-4127.2	-4151.9	711.5	77.1	403.2	-1873.2	22.3	-3769.6
2000	-6159.5	-4296.2	-3972.9	567.8	255.4	255.4	-711.4	186.0	-2479.1
2001	539.4	-3551.5	-2417.6	479.2	-5140.3	349.4	-267.4	230.0	-1943.1
2002	194.4	-3444.1	-1626.8	592.6	-1916.3	235.2	-96.4	-10.1	-1773.0
2003	-2486.3	-4147.7	-1581.0	467.3	-3740.8	430.1	70.0	349.3	-2045.7
2004	249.0	-4270.0	-4199.1	534.1	-1973.9	201.6	-1797.3	-87.6	-3246.7
2005	313.6	-3764.4	-2312.5	593.3	-6661.0	329.3	-582.5	211.3	-2584.8
2006	-3825.9	-3797.3	-3078.7	508.7	94.1	289.0	-373.8	161.8	-2455.1
2007	499.6	-4508.2	-4662.7	675.0	-6094.1	376.3	-2047.4	-16.0	-4462.0
2008	0.0	-4645.5	-3327.2	-1.9	-2789.3	312.5	-616.1	-99.0	-1923.9
2009	-7287.9	-4053.1	-7051.1	-3.4	-5050.5	0.0	-2222.0	-392.3	-3969.7
Sum	**-20409.6**	**-56628.3**	**-50389.8**	**6859.0**	**-45978.9**	**4163.0**	**-12881.5**	**732.4**	**-38996.3**

Wallace County PBIAS InPuts

Year	**CORN (o-s)*100**	**IRCN (o-s)*100**	**GRSG (o-s)*100**	**IRSG (o-s)*100**	**WWHT (o-s)*100**	**IRWW (o-s)*100**	**SOYB (o-s)*100**	**IRSB (o-s)*100**	**ALFA (o-s)*100**
1996	420.2	-8801.2	-543.9	539.4	-1014.9	248.6	-365.6	222.7	-327.3
1997	-894.9	-8927.3	-3747.3	614.7	-2647.5	282.2	-947.6	180.6	-603.0
1998	608.4	-8883.8	-516.6	551.9	-454.9	409.9	-663.8	206.2	-409.4
1999	551.9	-9153.3	-492.7	671.1	-4346.5	396.5	-713.6	-70.1	-509.0
2000	-606.1	-8541.7	-1460.8	564.5	168.0	289.0	-87.5	-8.4	-115.2

2001	250.9	-8264.4	-520.8	526.8	-2873.0	302.4	-672.7	294.2	-322.2
2002	150.5	-8511.4	-389.2	225.8	-831.5	201.6	-12.4	-1.2	-178.1
2003	-412.2	-8275.6	-1302.5	464.1	-2461.8	396.5	-102.6	307.4	-278.2
2004	482.9	-8864.5	-807.1	585.5	87.4	342.7	-1192.4	-114.8	-555.6
2005	388.9	-8439.8	-447.9	696.2	-6131.2	255.4	-72.3	-9.6	-361.0
2006	-618.3	-8214.4	-1676.2	464.1	141.1	262.1	-86.5	-5.2	-264.4
2007	420.2	-8590.9	-267.0	928.3	-4463.0	403.2	-543.6	-56.5	-341.8
2008	0.0	-9156.2	-582.2	0.0	-1174.9	304.9	-649.8	-66.7	-277.8
2009	-1033.1	-8960.9	-3962.7	0.0	-4556.7	0.0	-218.0	-19.6	-552.1
Sum	**-290.6**	**-121585.4**	**-16716.7**	**6832.4**	**-30559.4**	**4095.0**	**-6328.4**	**858.9**	**-5095.1**

Appendix G - Stream Flow Graphs For Subbasin 69 Smoky Hill River at Elkader, KS

Figure 12 Daily Stream Flow vs. Time 1996

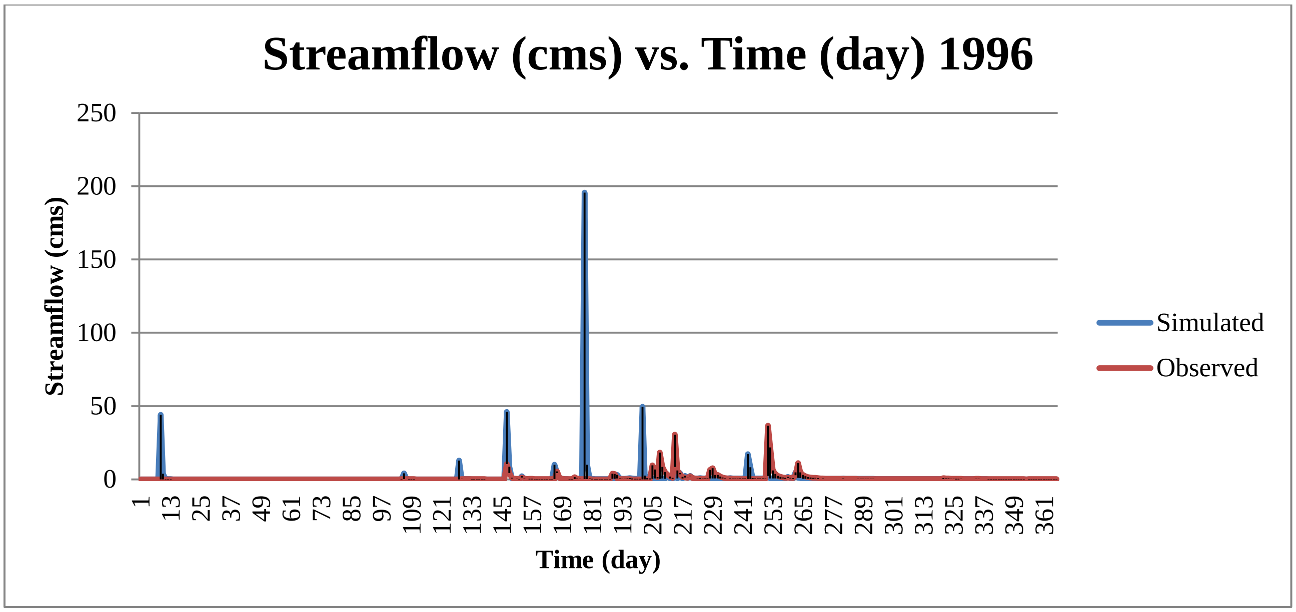


Figure 13 Daily Stream Flow vs. Time 1997

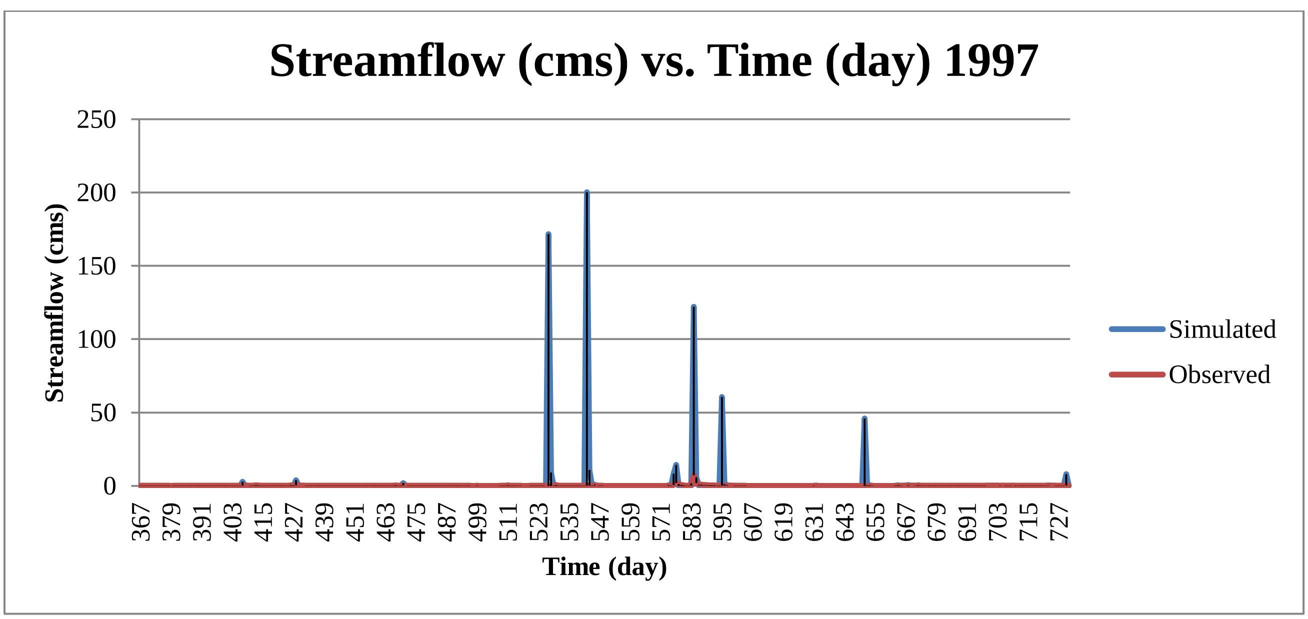


Figure 14 Daily Stream Flow vs. Time 1998

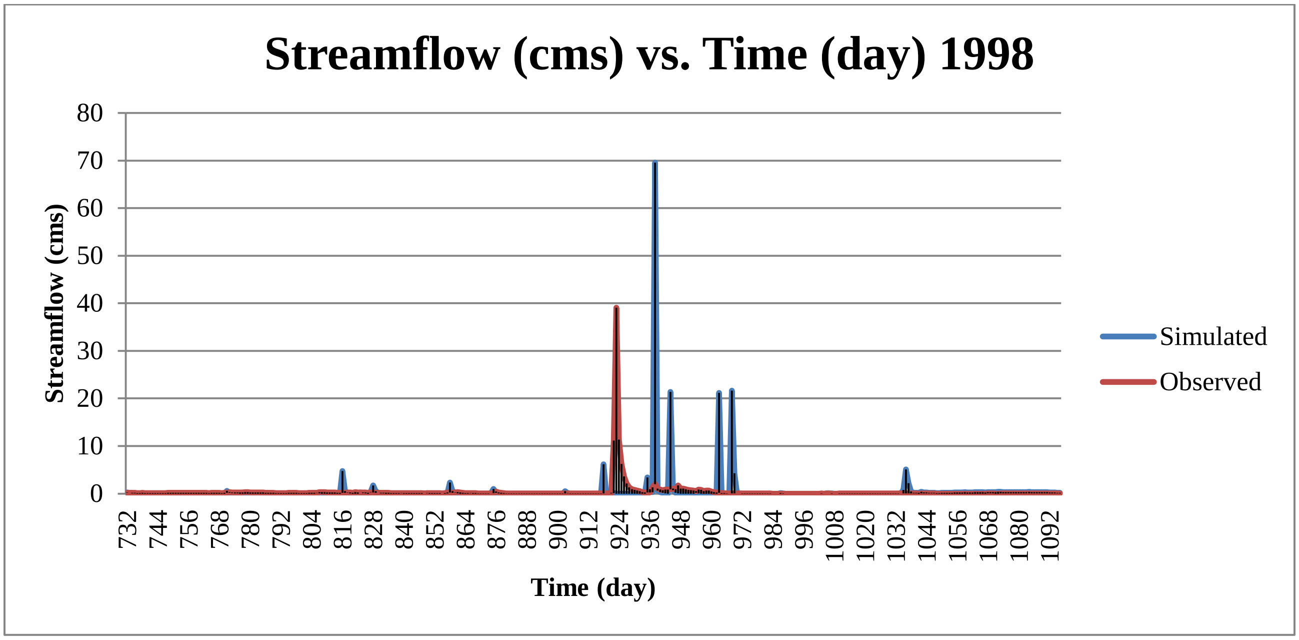


Figure 15 Daily Stream Flow vs. Time 1999

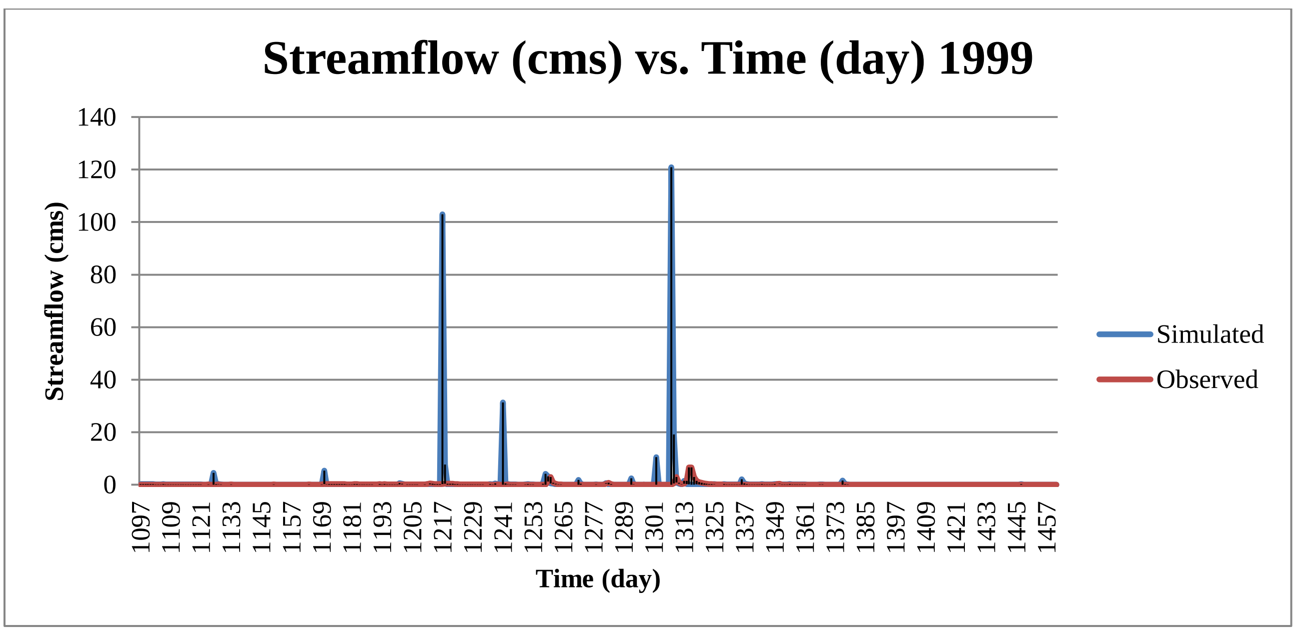


Figure 16 Daily Stream Flow vs. Time 2000

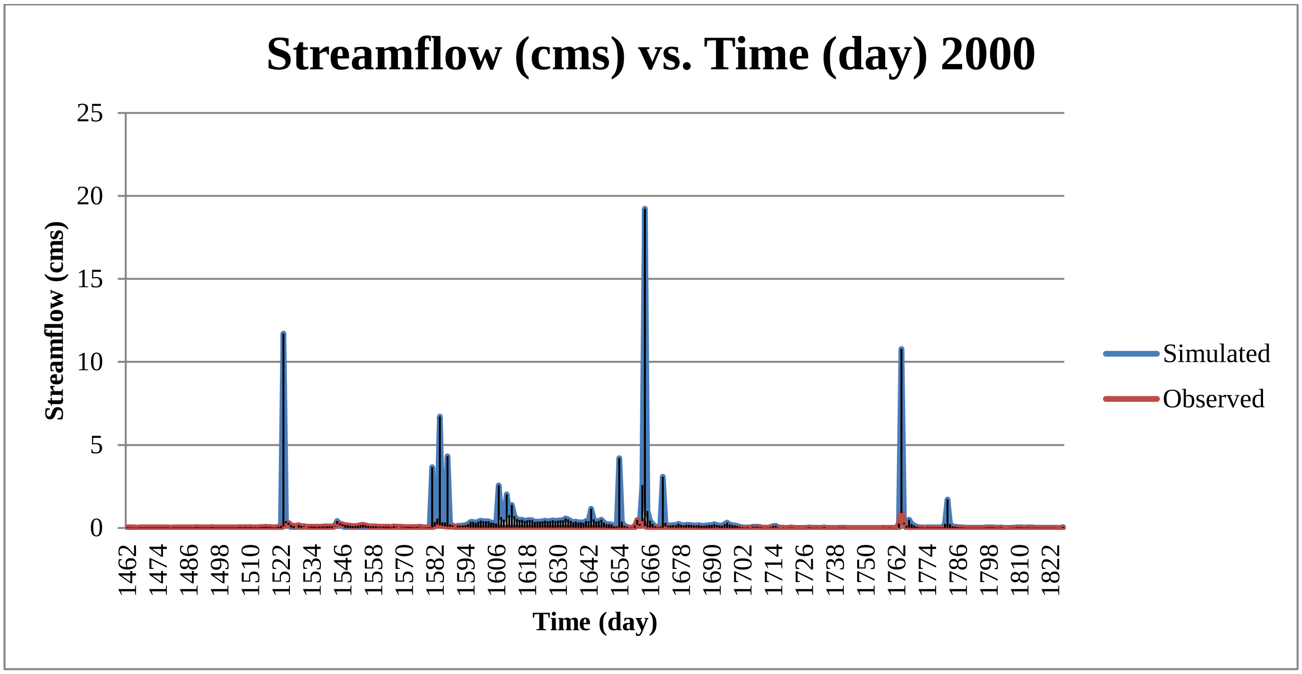


Figure 17 Daily Stream Flow vs. Time 2001

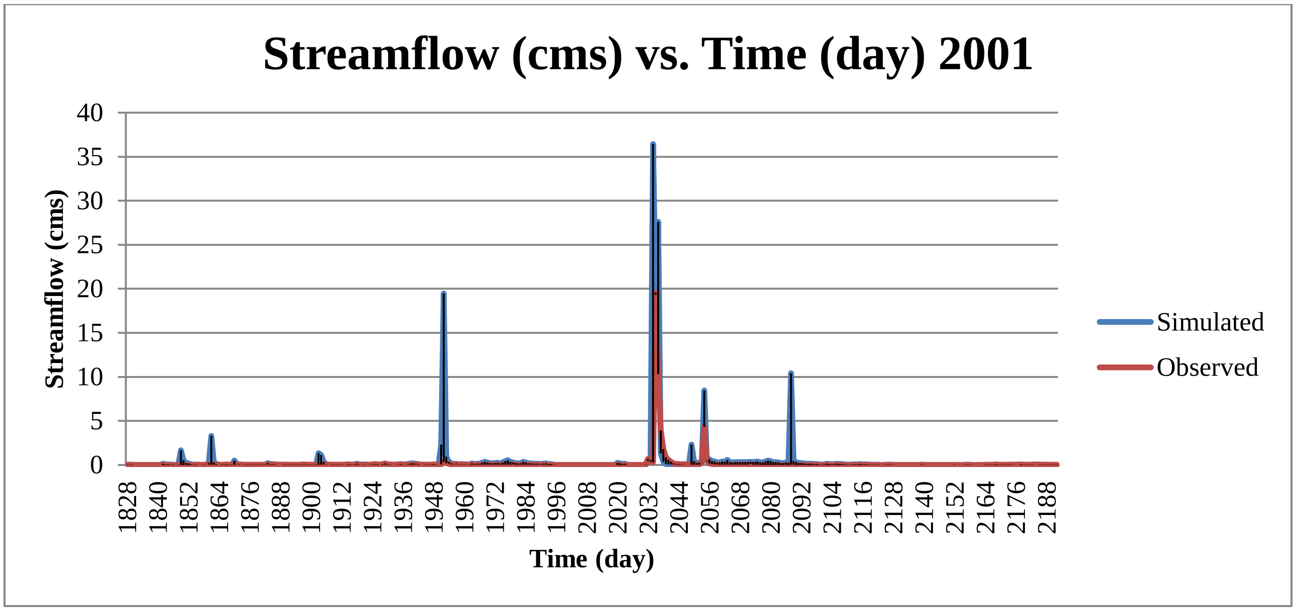


Figure 18 Daily Stream Flow vs. Time 2002

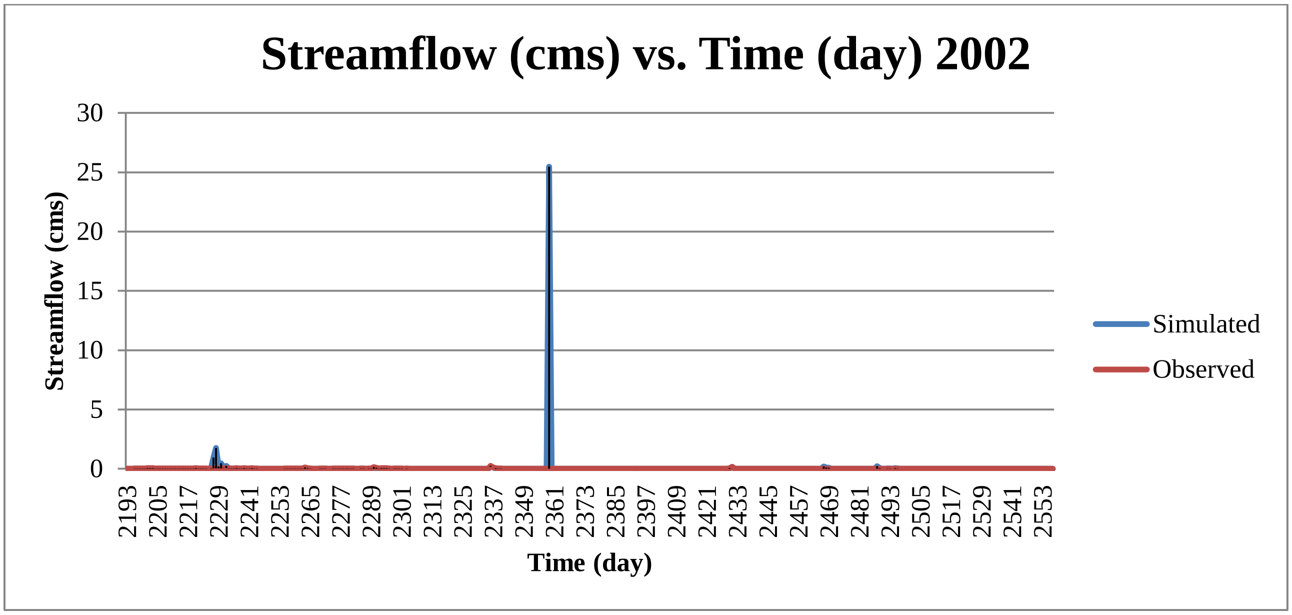


Figure 19 Daily Stream Flow vs. Time 2003

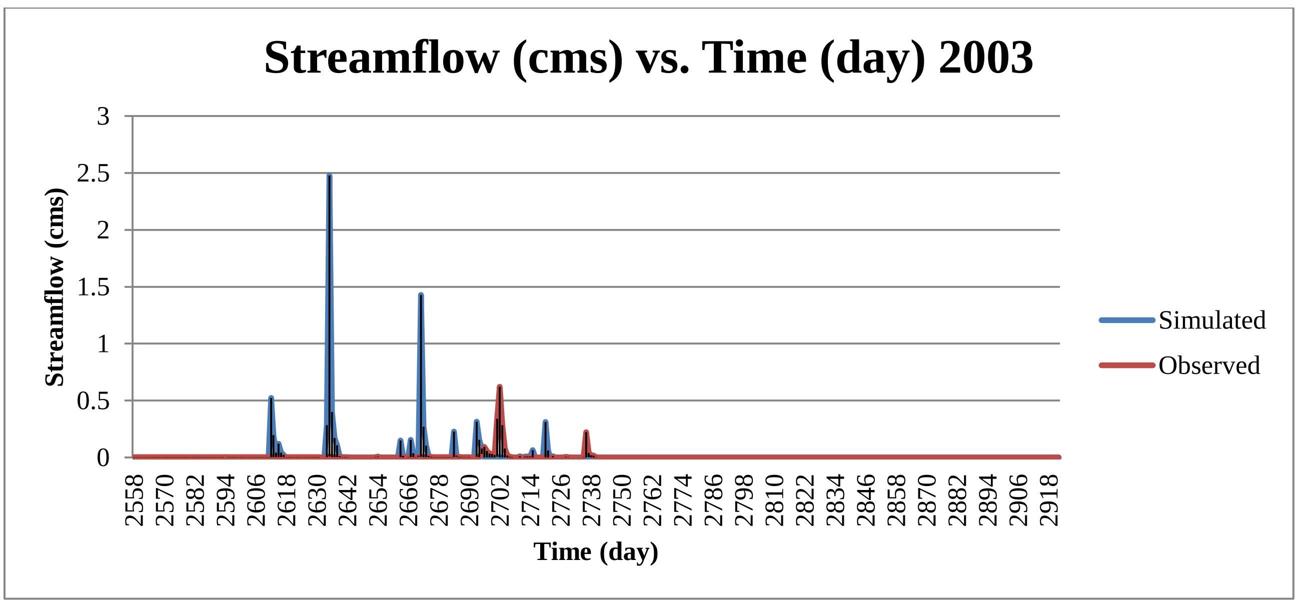


Figure 20 Daily Stream Flow vs. Time 2004

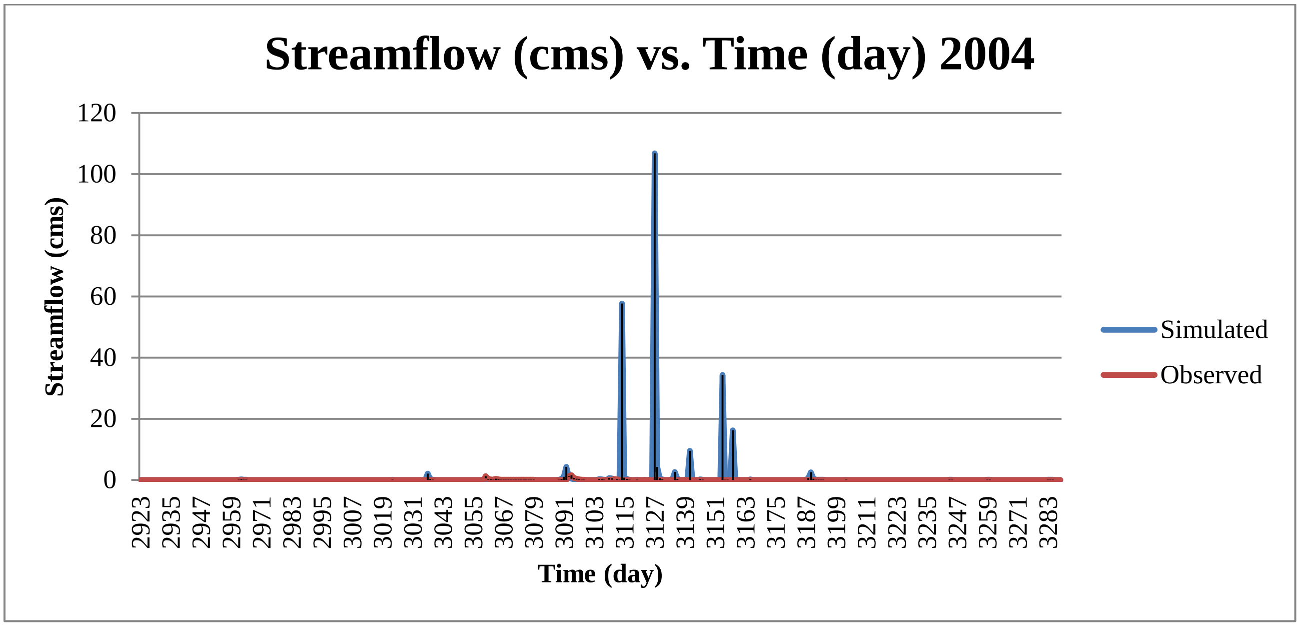


Figure 21 Daily Stream Flow vs. Time 2005

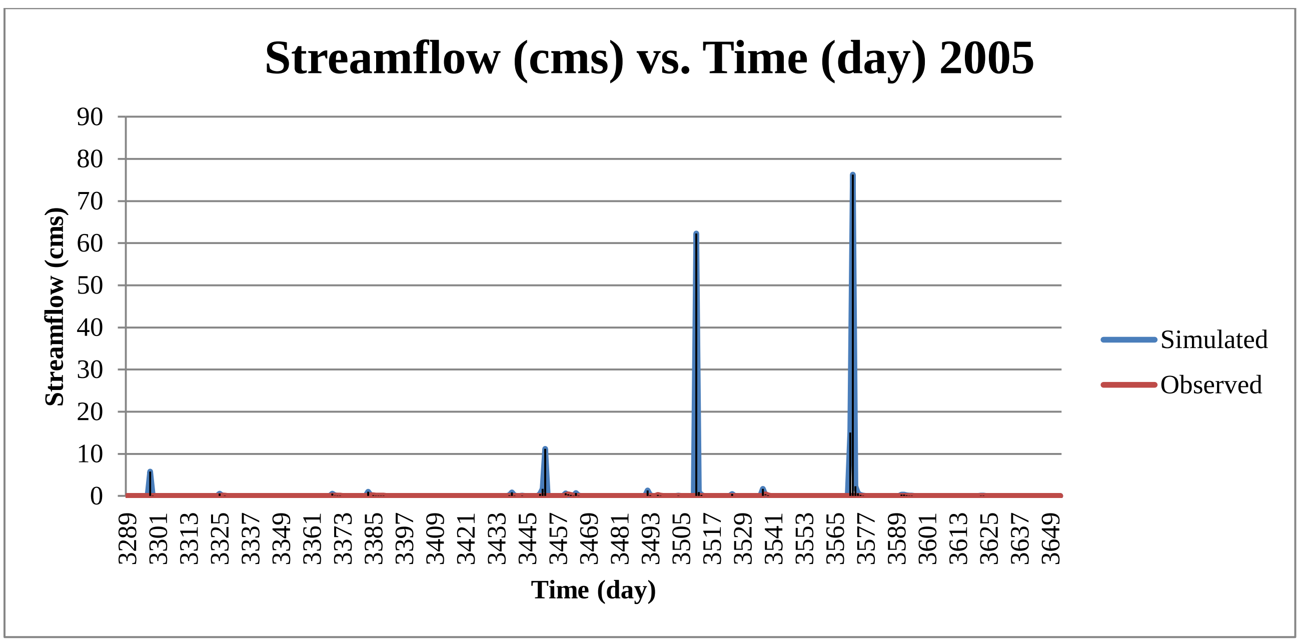


Figure 22 Daily Stream Flow vs. Time 2006

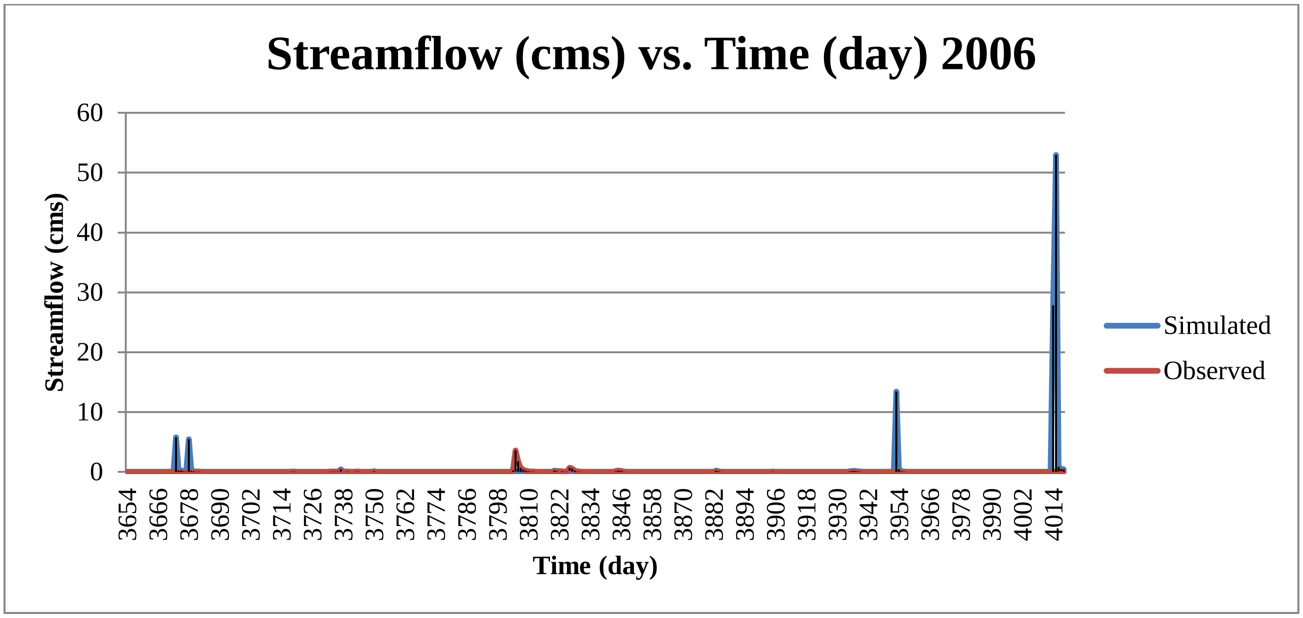


Figure 23 Daily Stream Flow vs. Time 2007

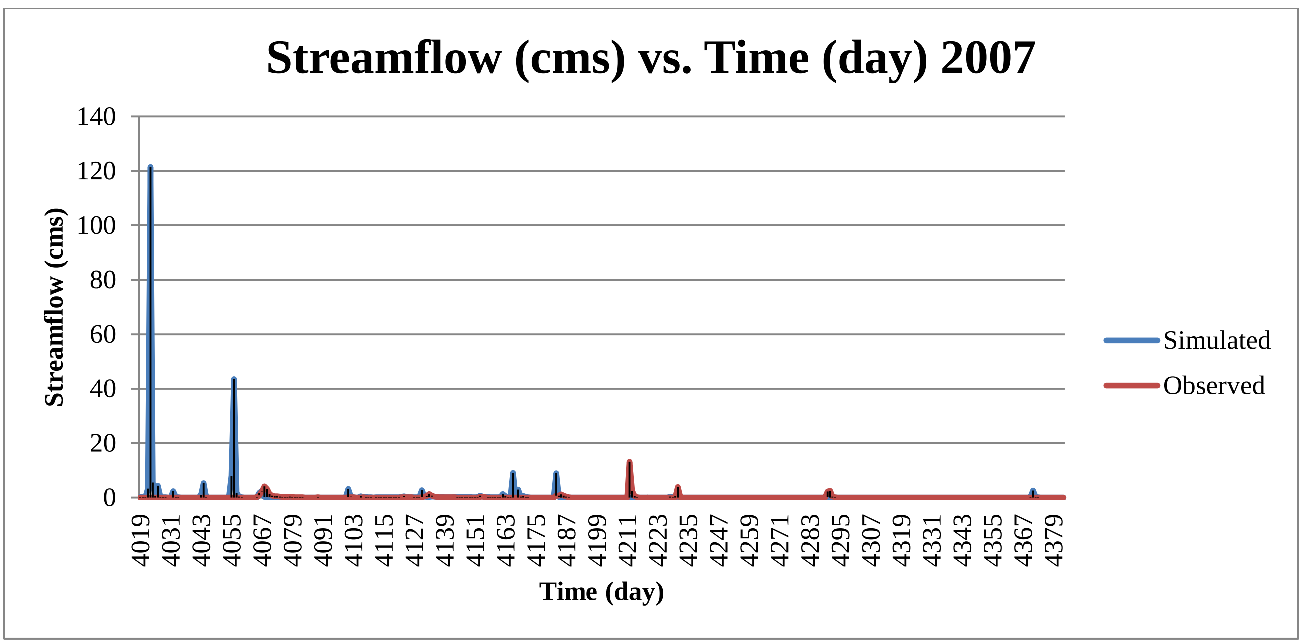


Figure 24 Daily Stream Flow vs. Time 2008

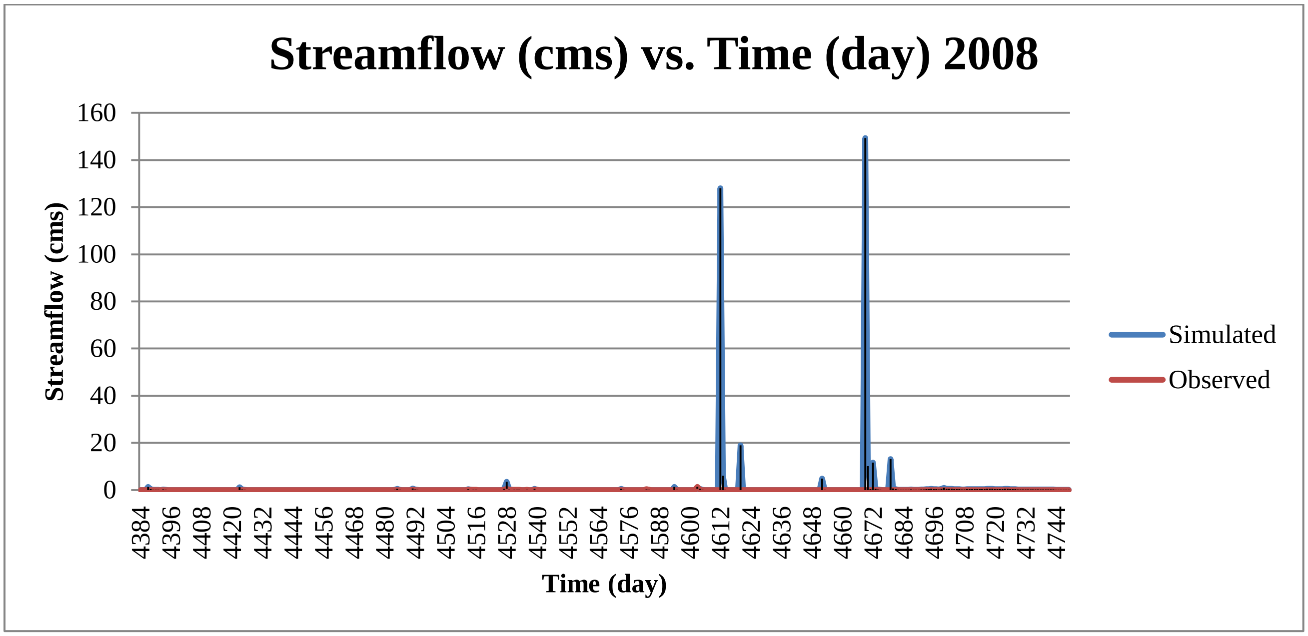
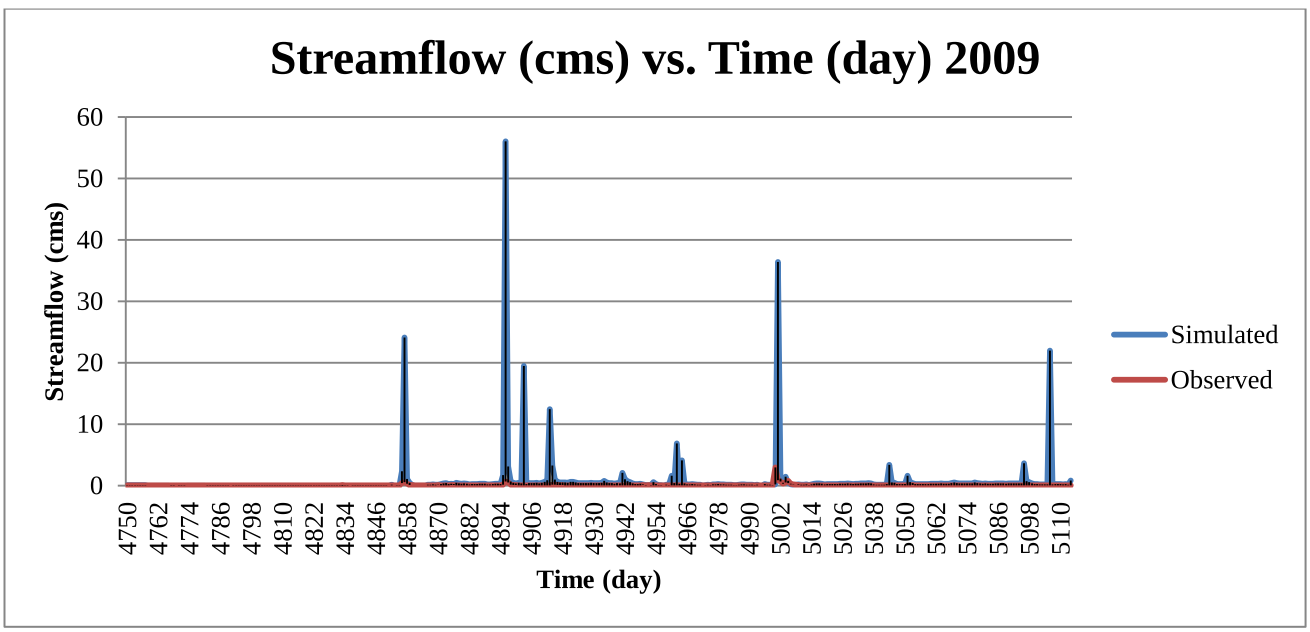


Figure 25 Daily Stream Flow vs. Time 2009



Appendix H - Stream Flow Graphs from Subbasin 89 Smoky Hill River near Arnold, KS

Figure 26 Annual Stream Flow vs. Time

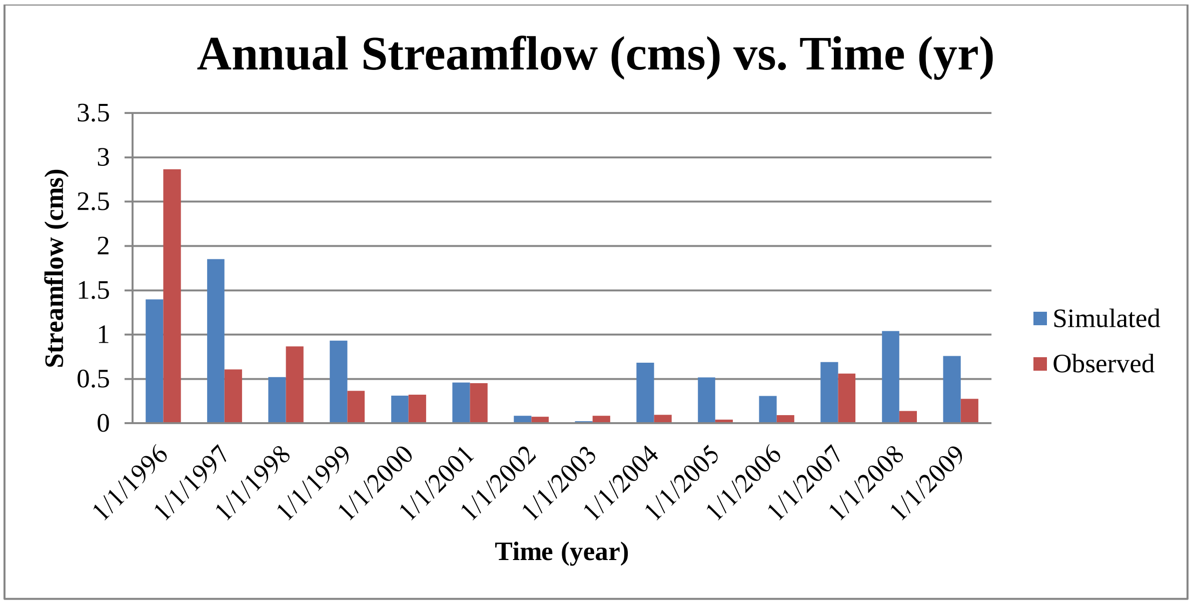


Figure 27 Monthly Stream Flow vs. Time

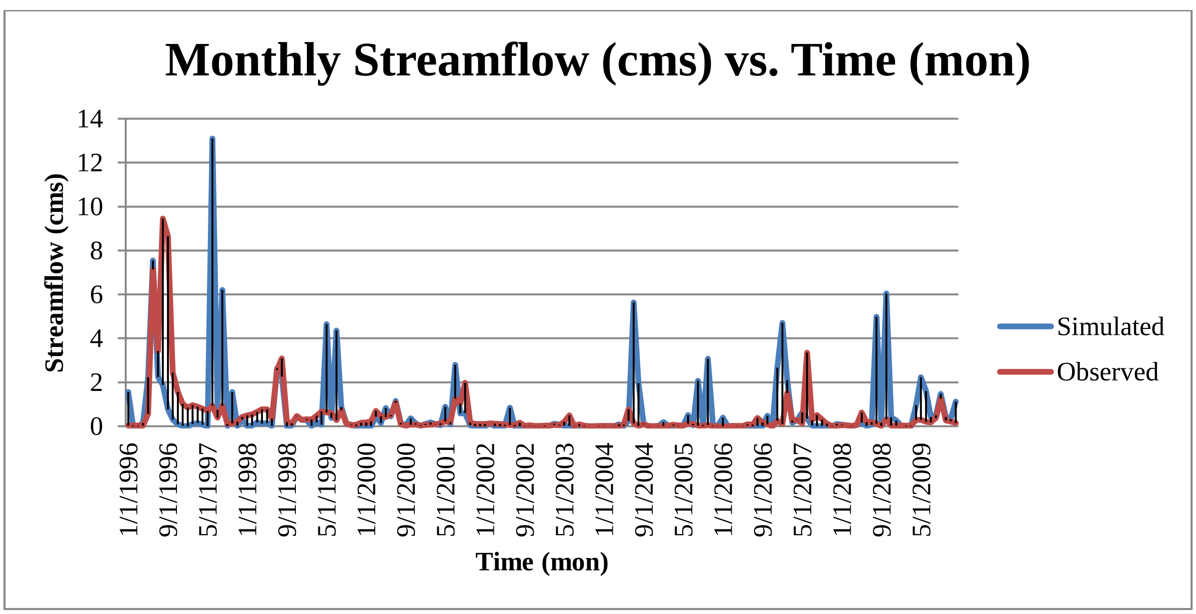


Figure 28 Daily Stream Flow vs. Time 1996

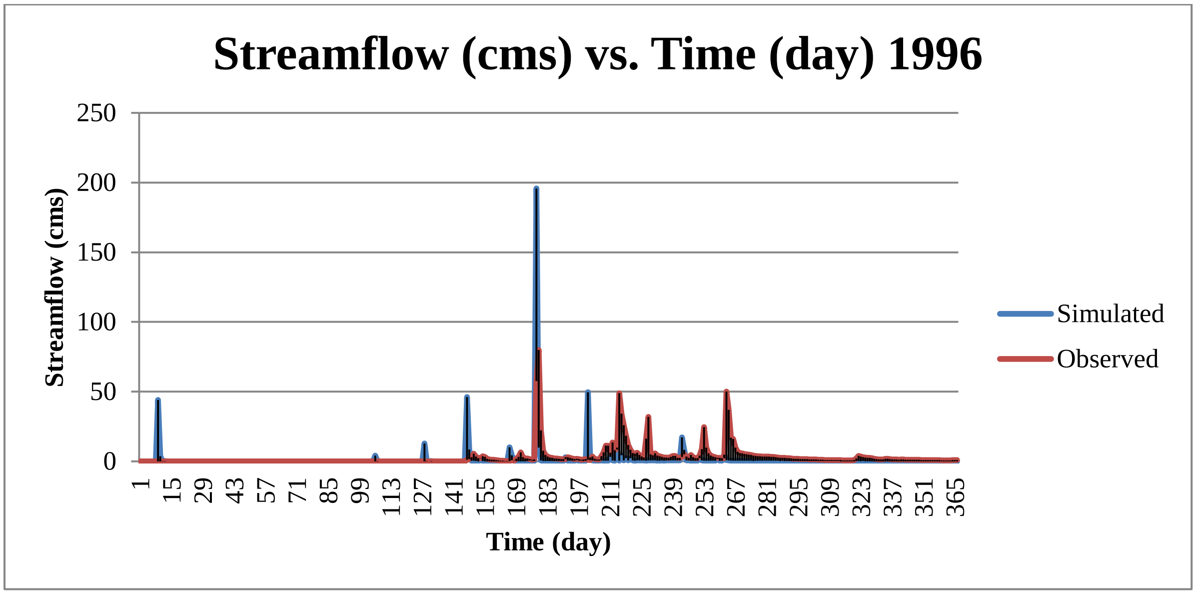


Figure 29 Daily Stream Flow vs. Time 1997

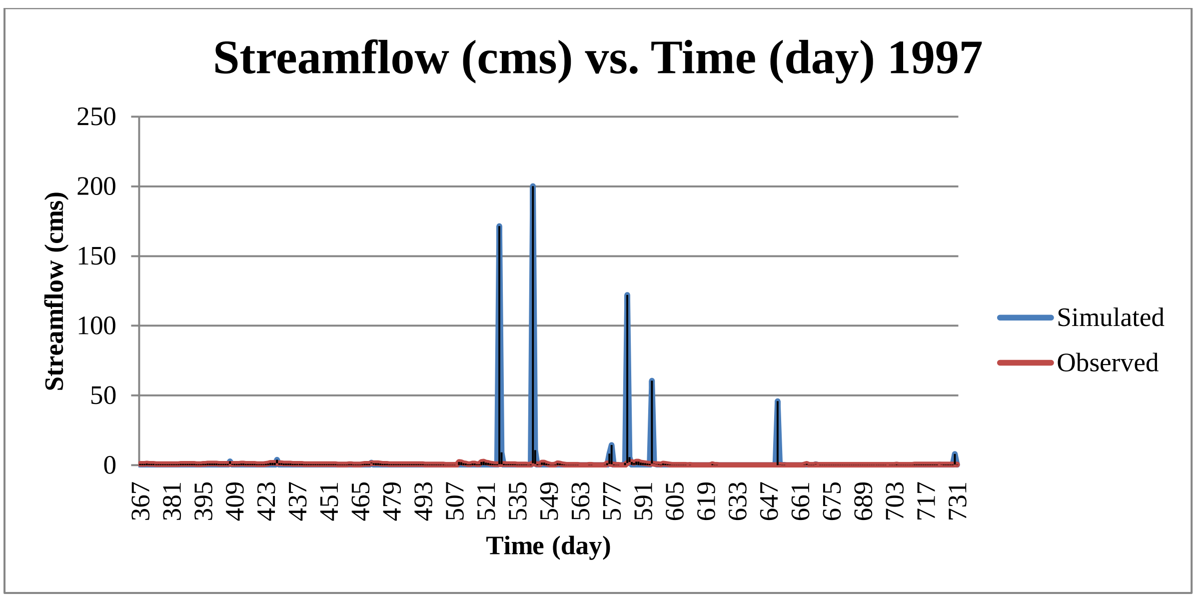


Figure 30 Daily Stream Flow vs. Time 1998

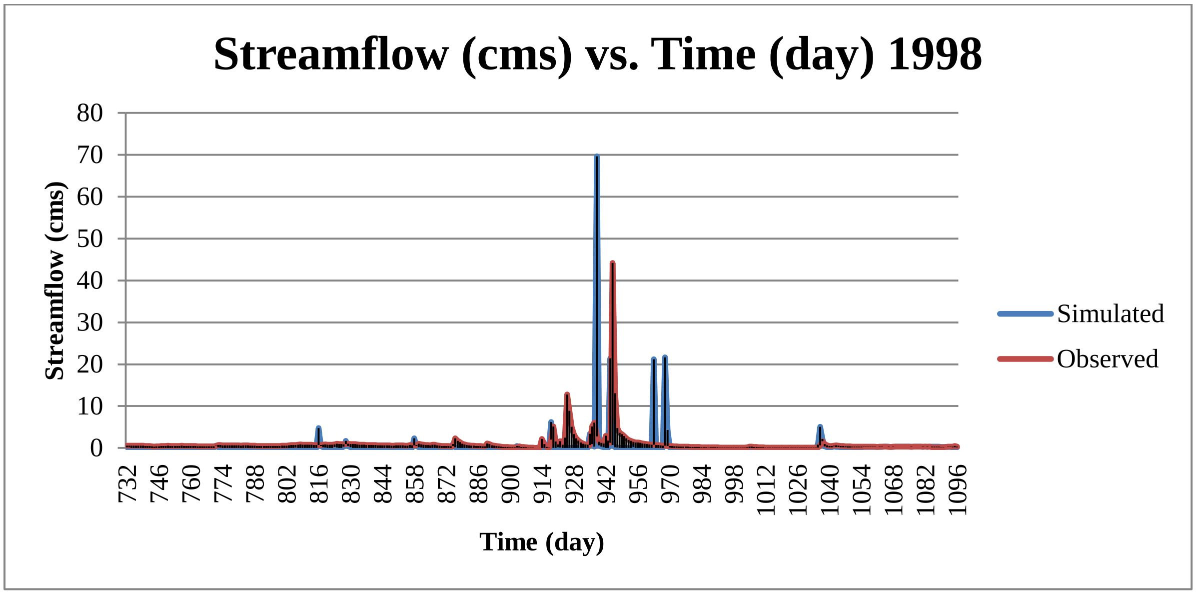


Figure 31 Daily Stream Flow vs. Time 1999

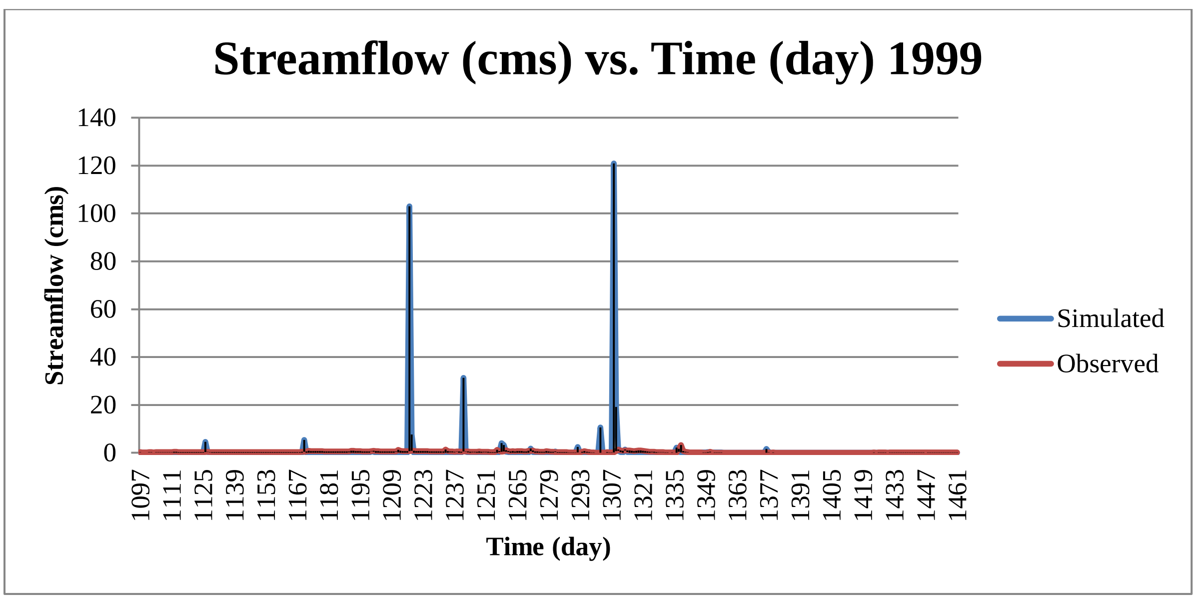


Figure 32 Daily Stream Flow vs. Time 2000

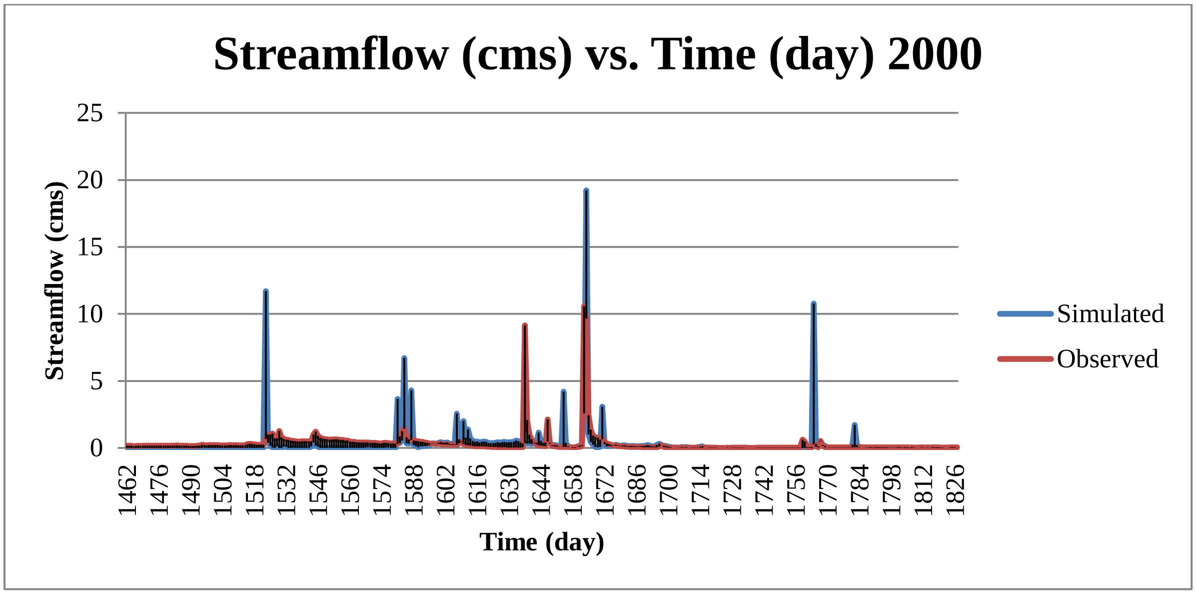


Figure 33 Daily Stream Flow vs. Time 2001

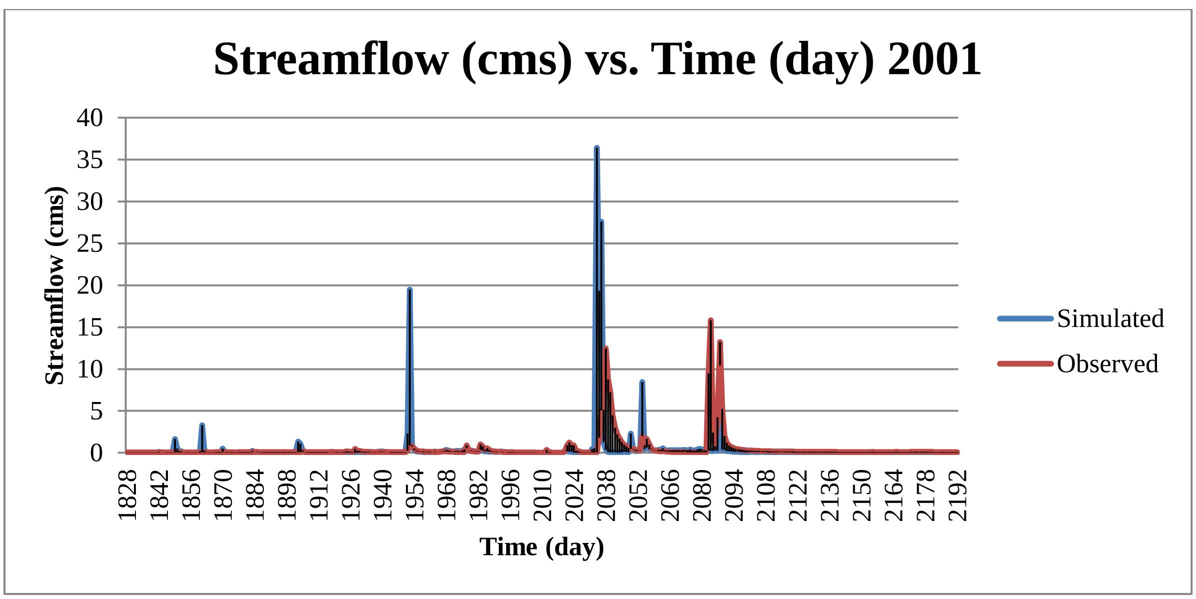


Figure 34 Daily Stream Flow vs. Time 2002

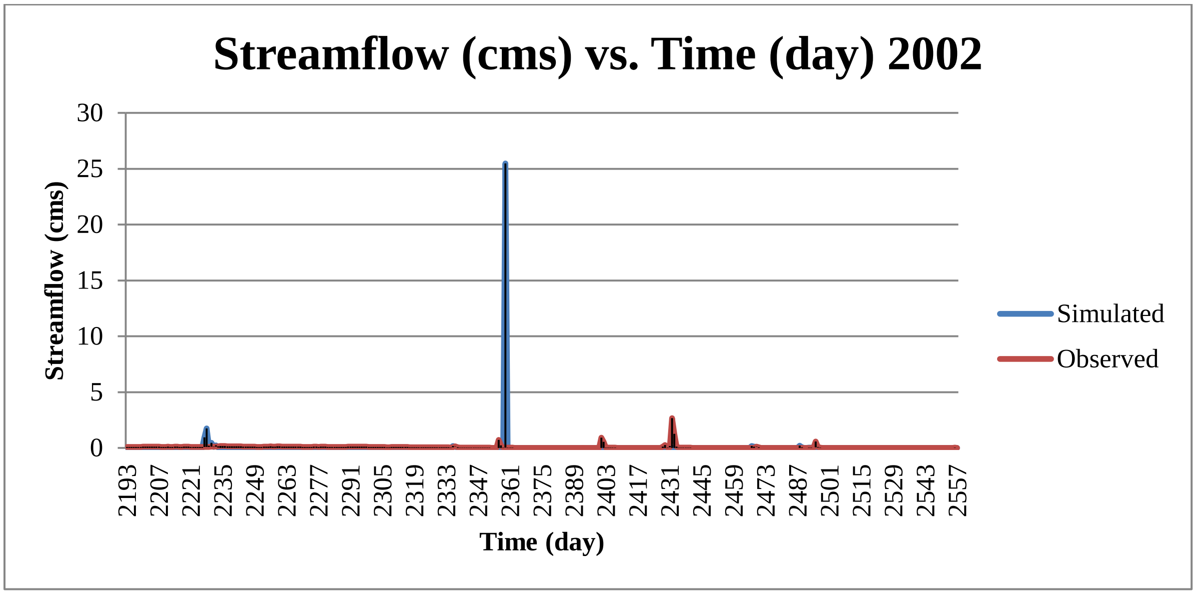


Figure 35 Daily Stream Flow vs. Time 2003

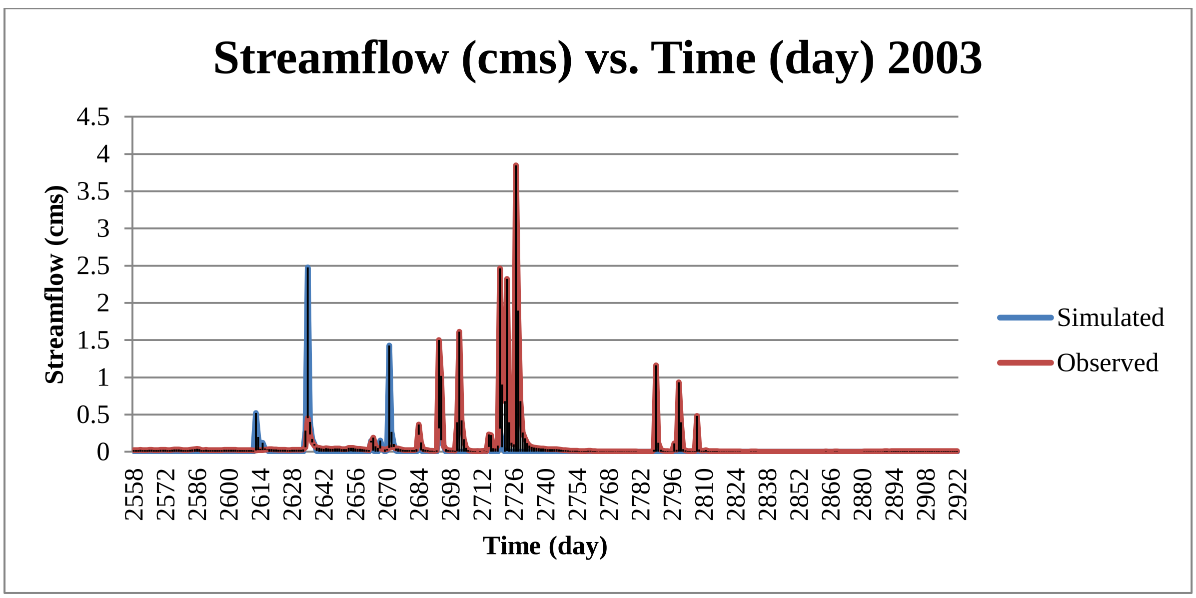


Figure 36 Daily Stream Flow vs. Time 2004

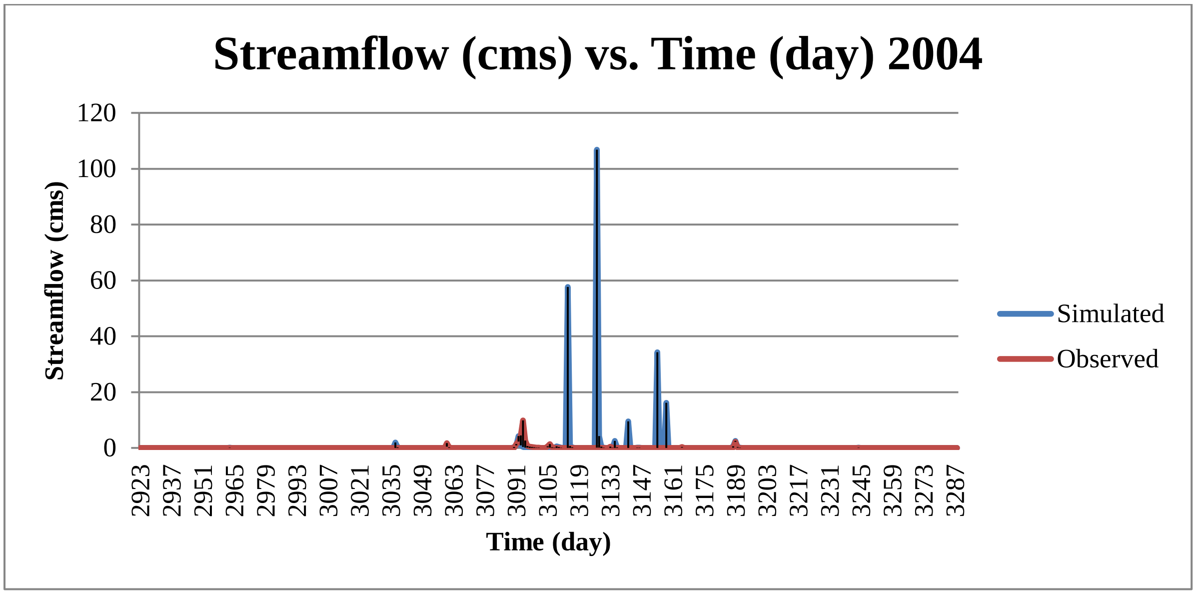


Figure 37 Daily Stream Flow vs. Time 2005

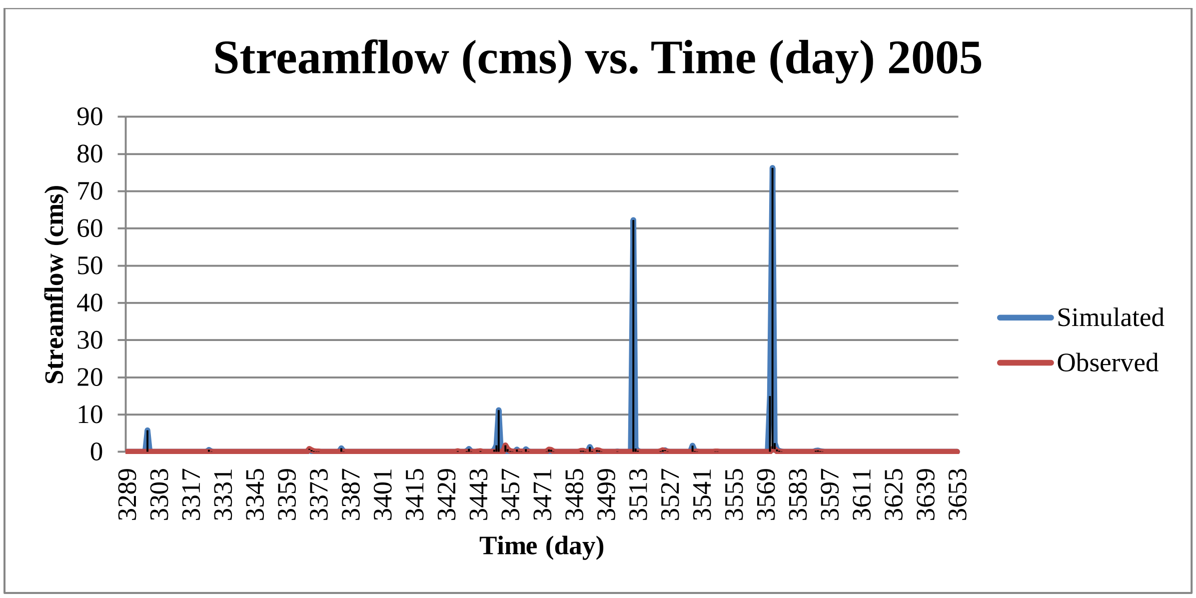


Figure 38 Daily Stream Flow vs. Time 2006

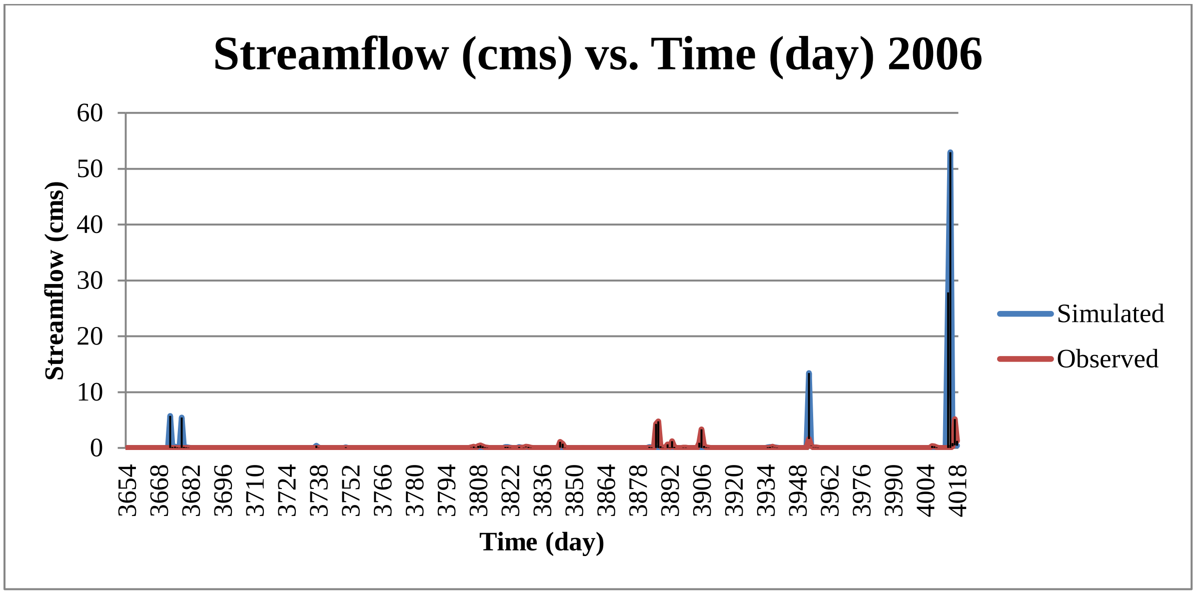


Figure 39 Daily Stream Flow vs. Time 2007

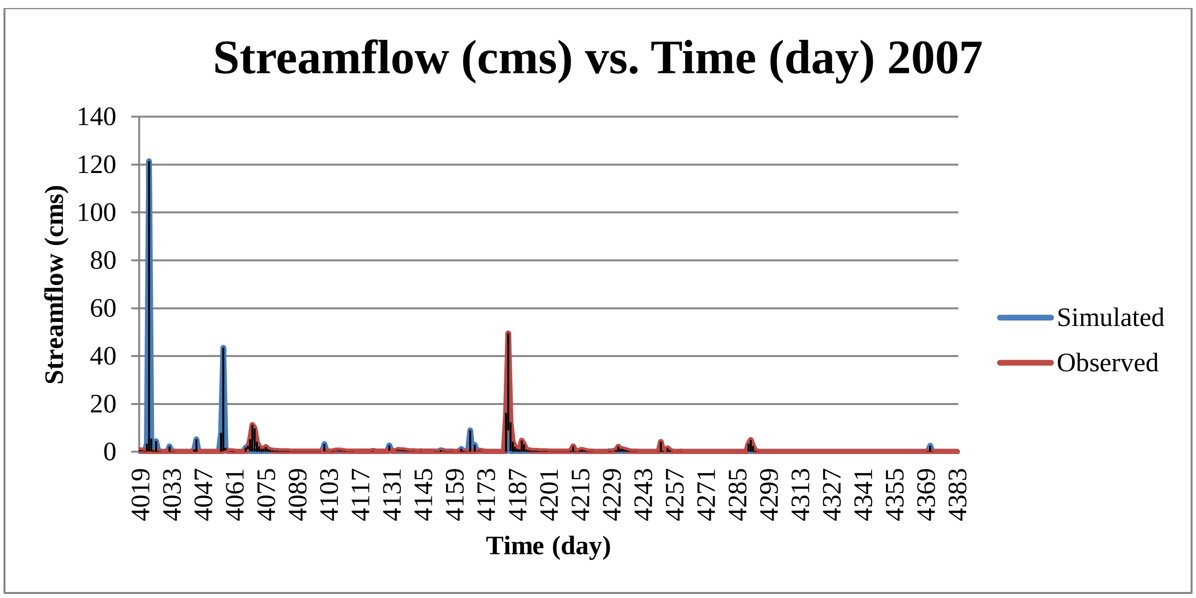


Figure 40 Daily Stream Flow vs. Time 2008

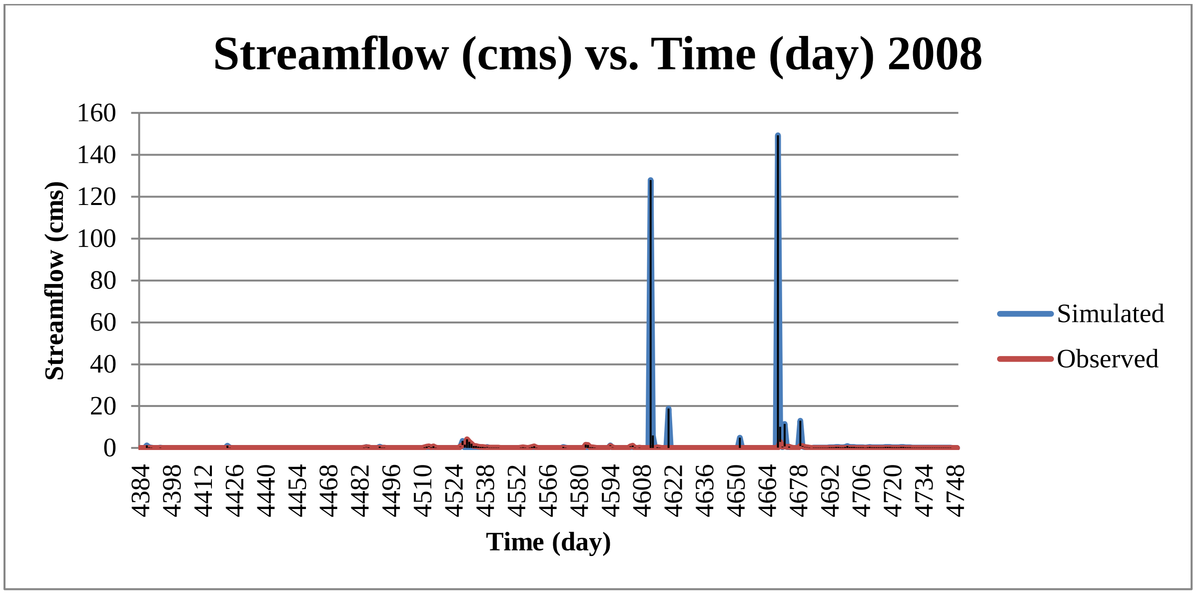
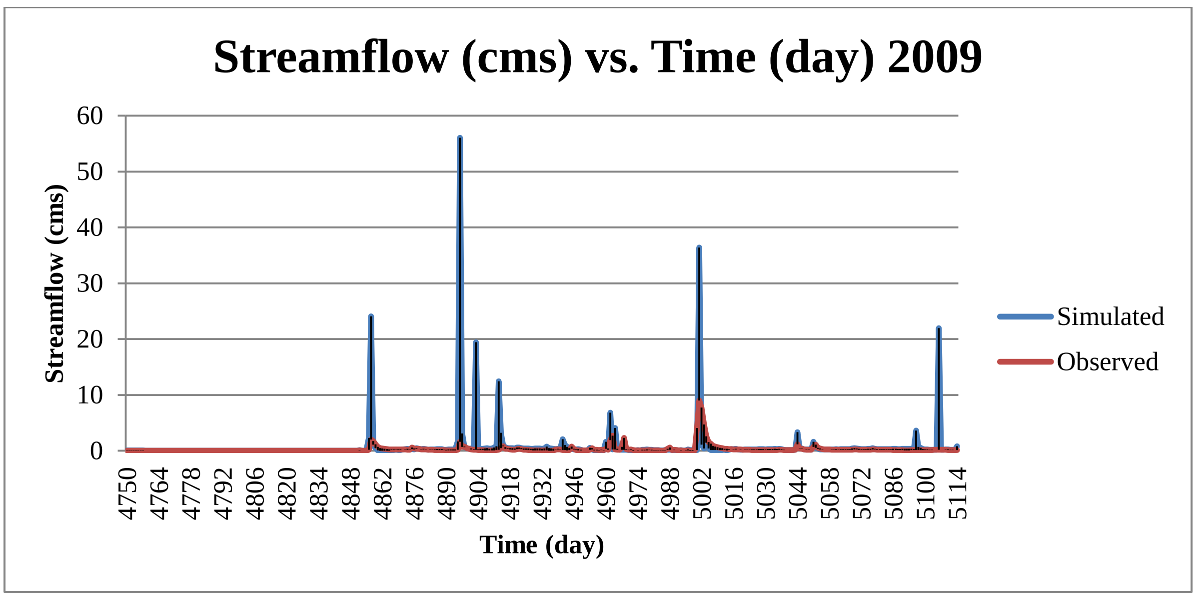


Figure 41 Daily Stream Flow vs. Time 2009



Appendix I - Stream Flow Graphs from Subbasin 148 Smoky Hill River at Ellsworth, KS

Figure 42 Mean Annual Stream Flow vs. Time

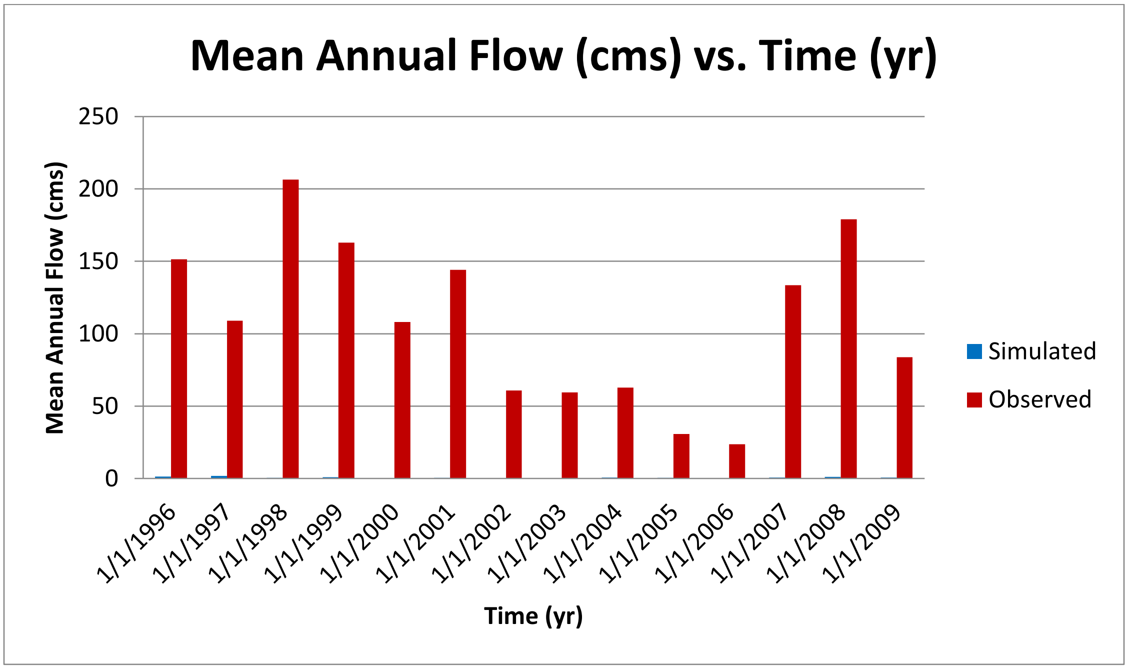


Figure 43 Monthly Flow vs. Time

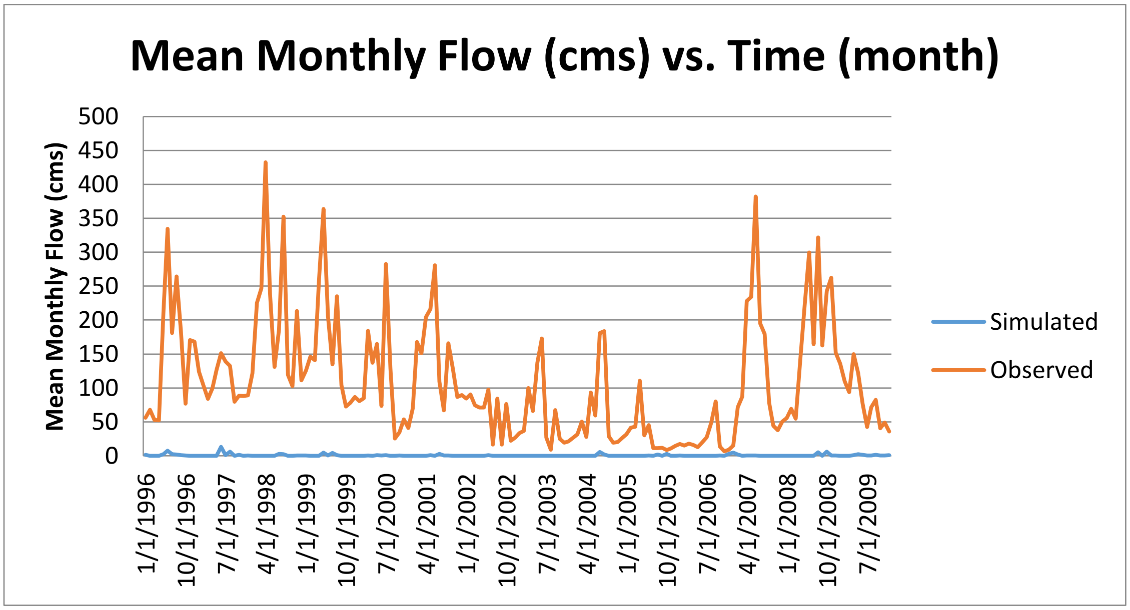


Figure 44 Daily Flow vs. Time 1996

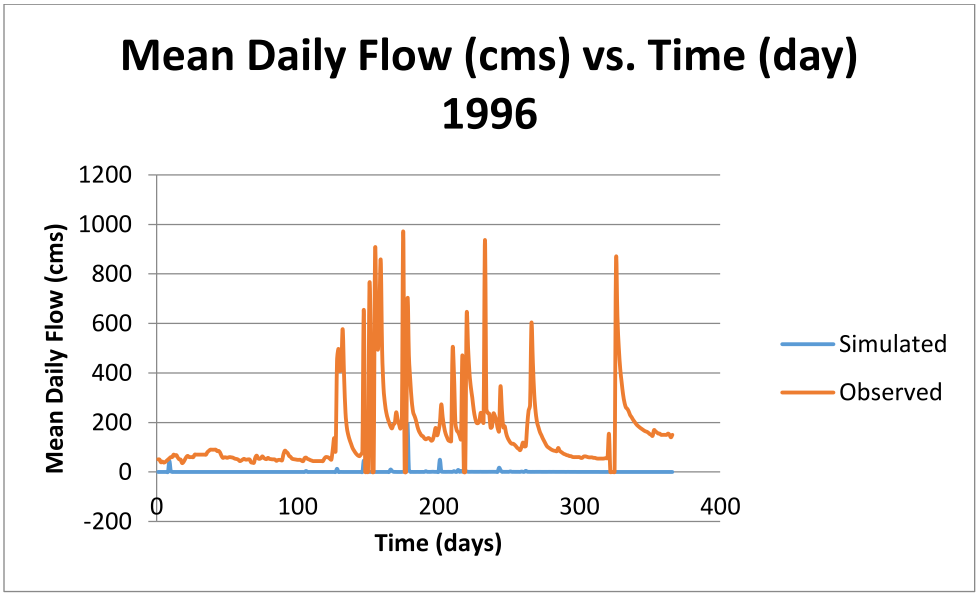


Figure 45 Daily Flow vs. Time 1997

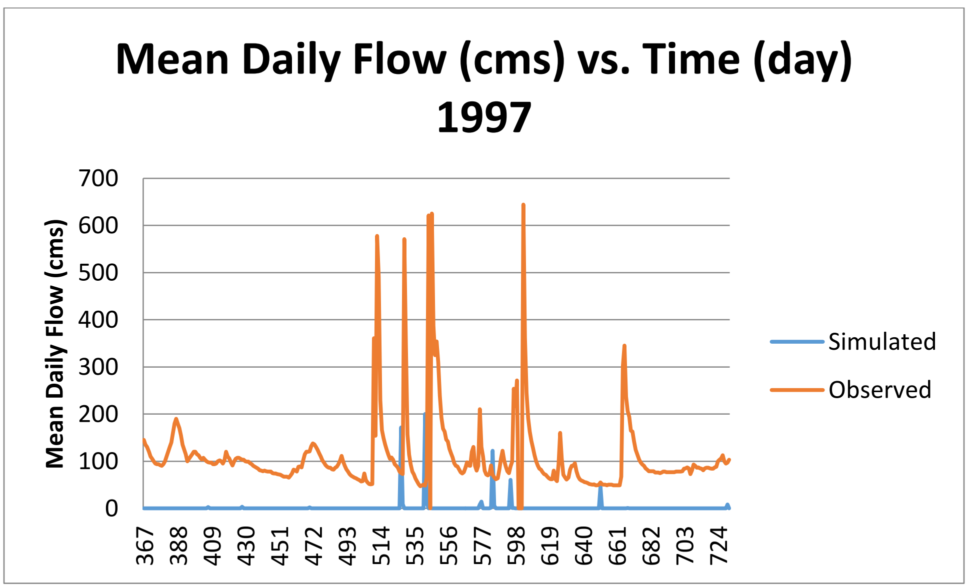


Figure 46 Daily Flow vs. Time 1998

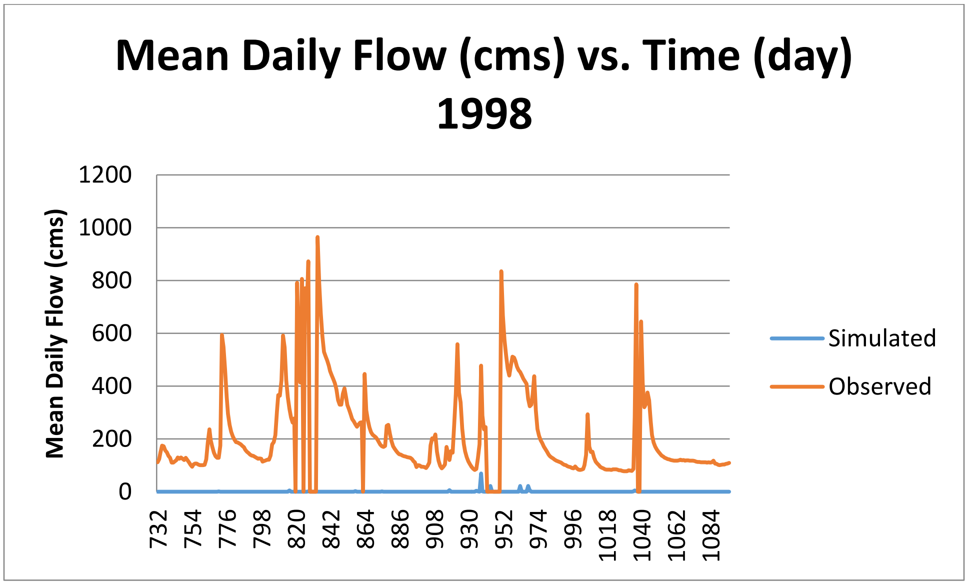


Figure 47 Daily Flow vs. Time 1999

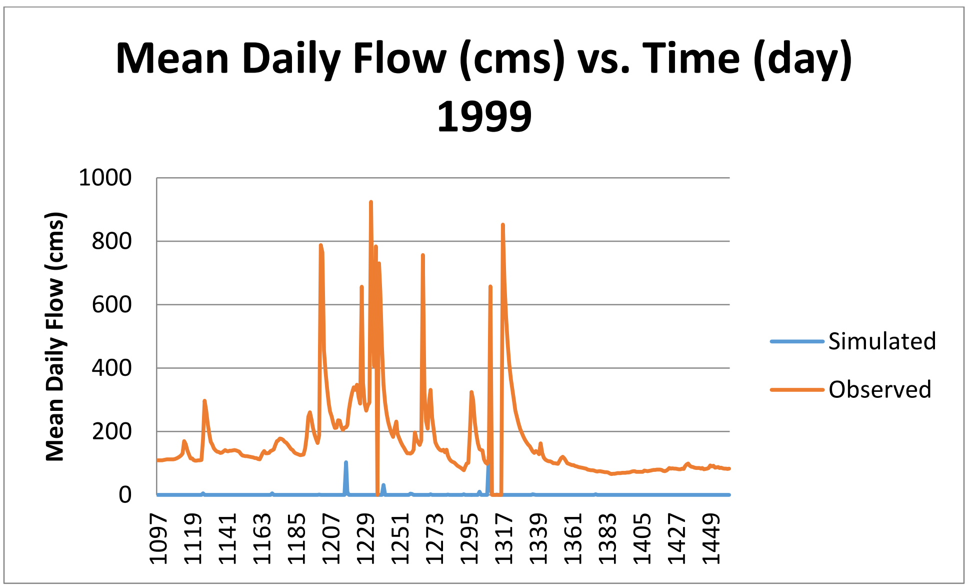


Figure 48 Daily Flow vs. Time 2000

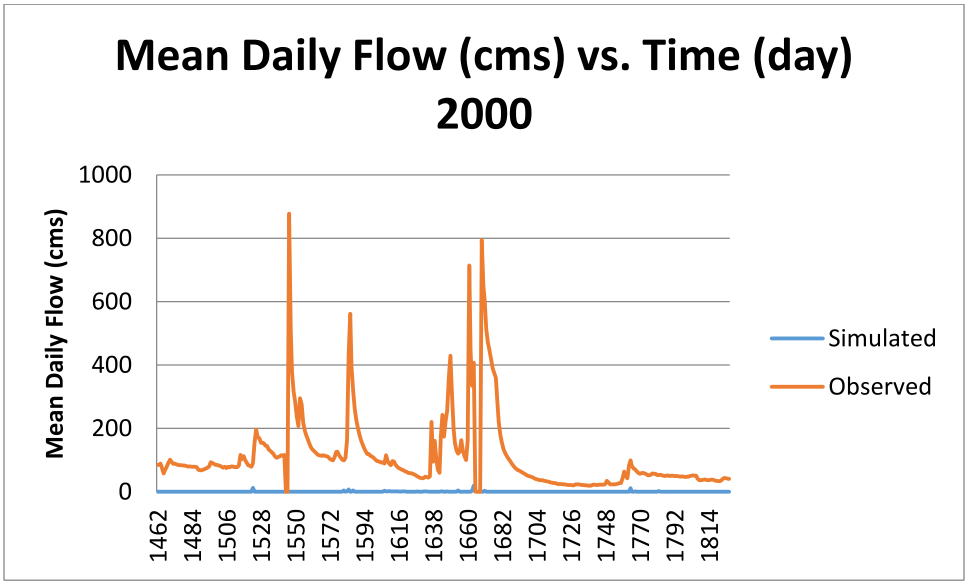


Figure 49 Daily Flow vs. Time 2001

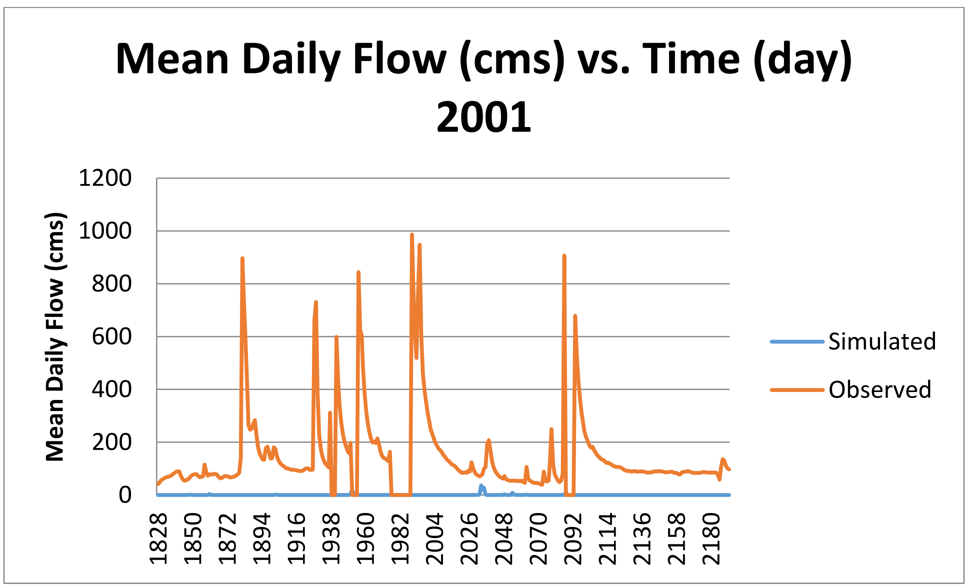


Figure 50 Daily Flow vs. Time 2002

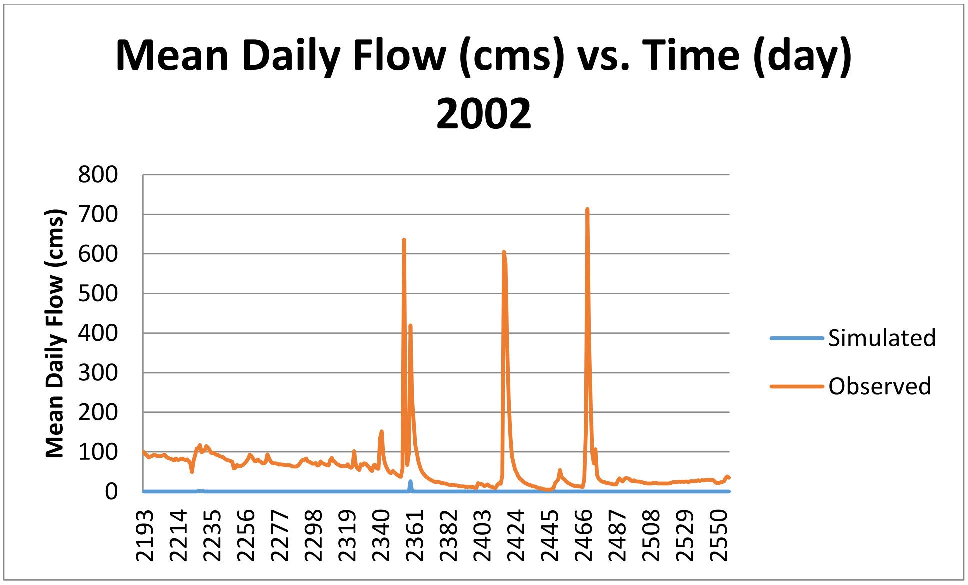


Figure 51 Daily Flow vs. Time 2003

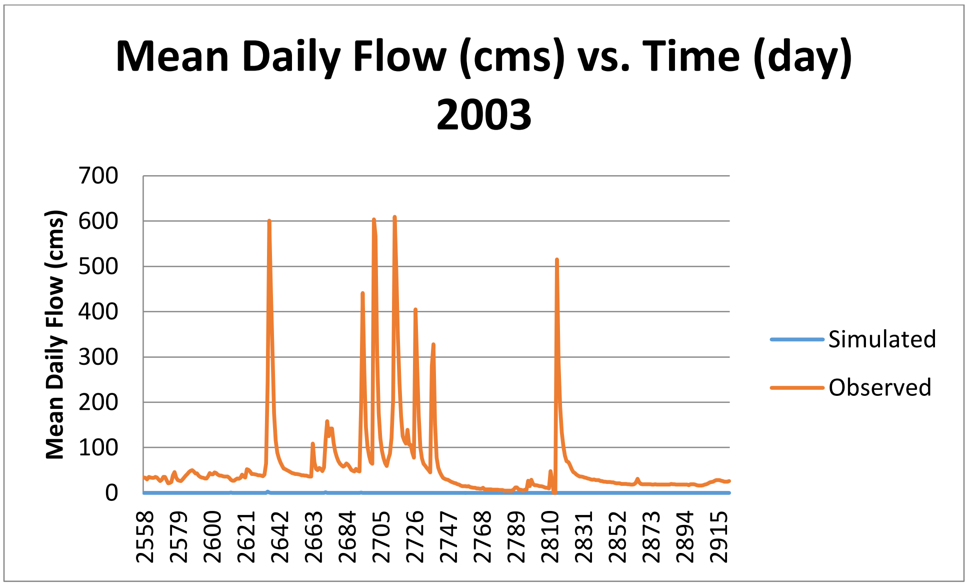


Figure 52 Daily Flow vs. Time 2004

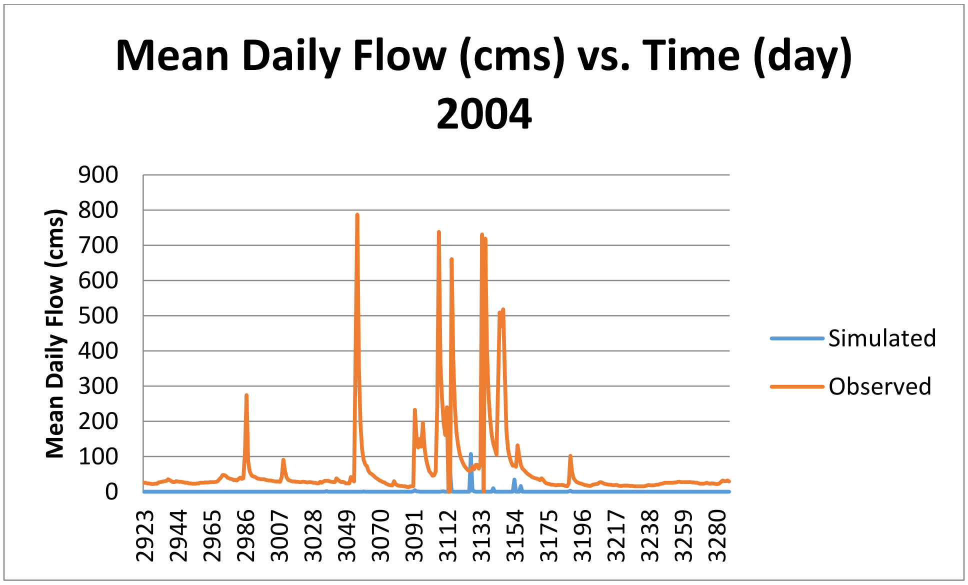


Figure 53 Daily Flow vs Time 2005

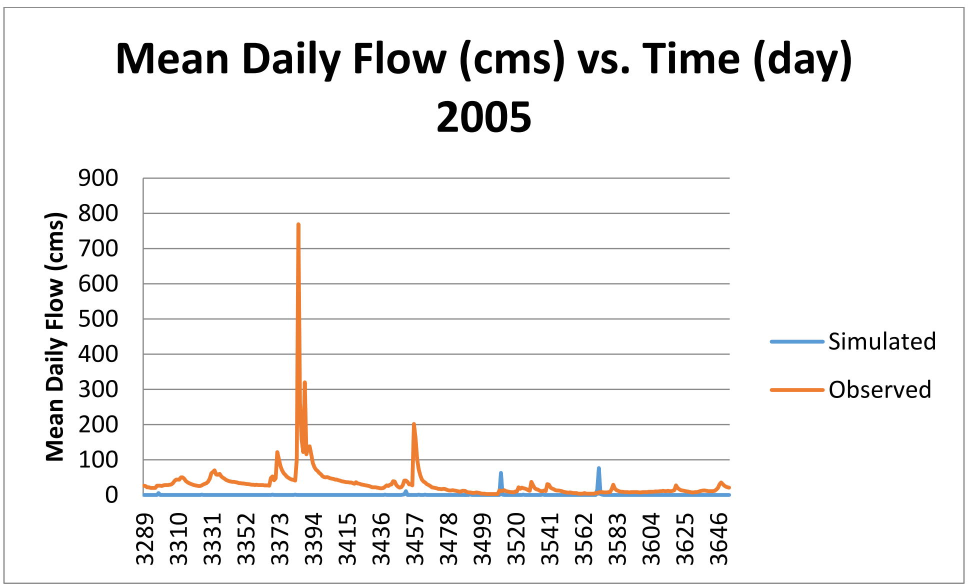


Figure 54 Daily Flow vs. Time 2006

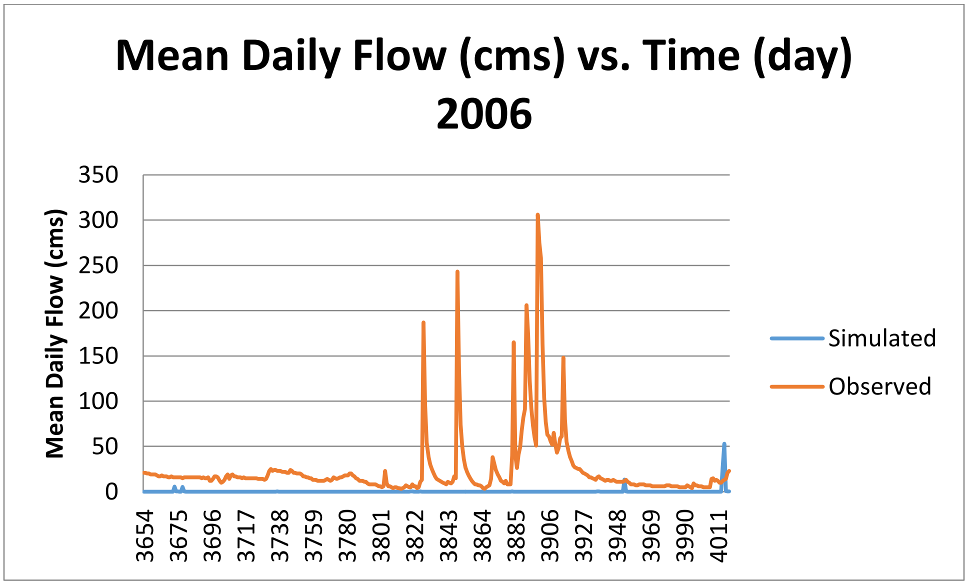


Figure 55 Daily Flow vs. Time 2007

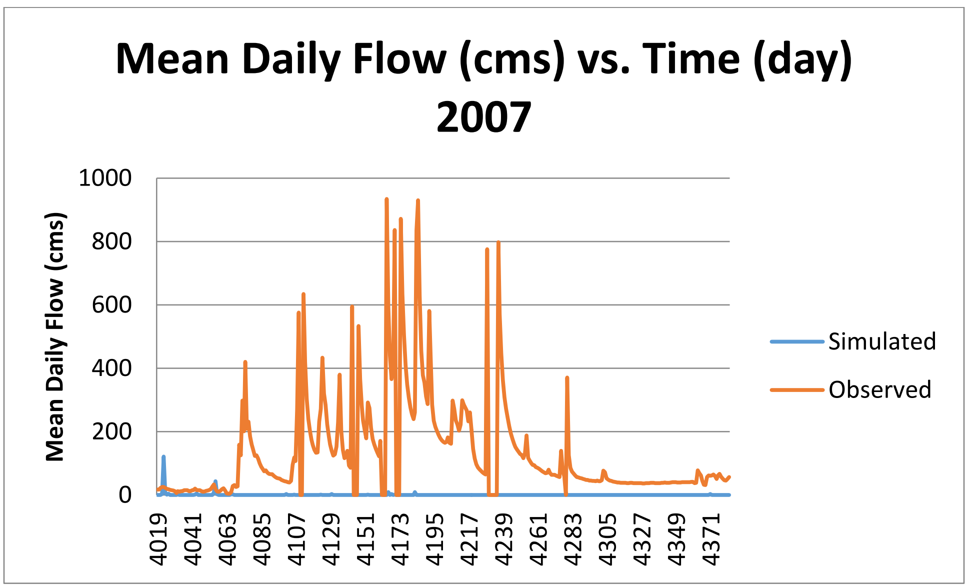


Figure 56 Daily Flow vs. Time 2008

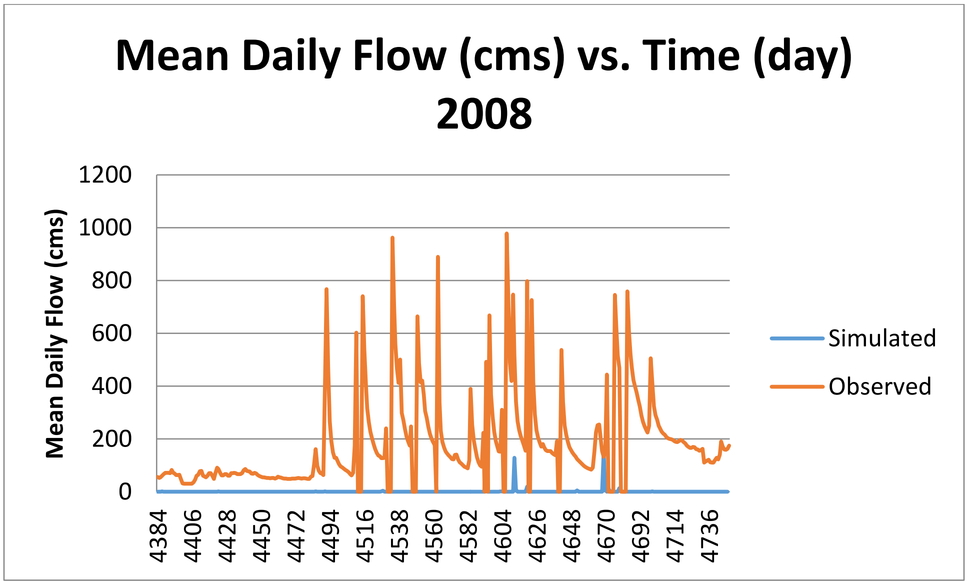


Figure 57 Daily Flow vs. Time 2009