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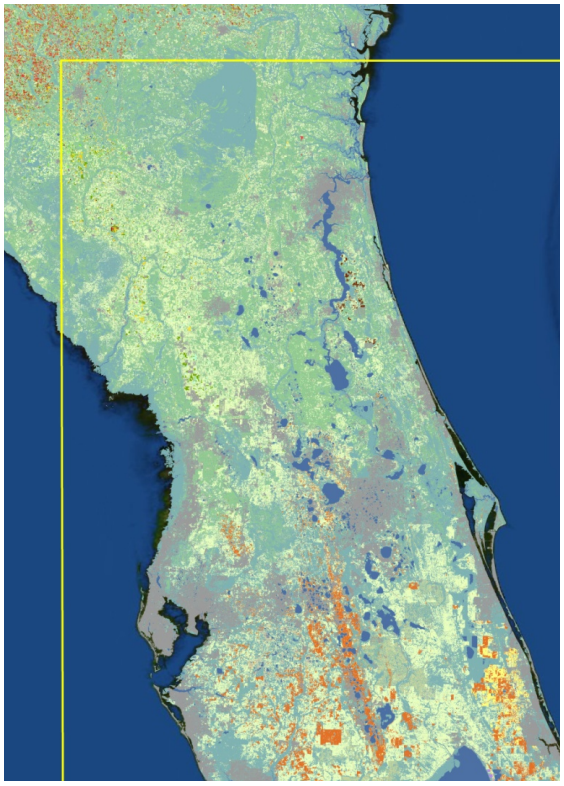
# DEVELOPMENT OF 1995 AND 2010 AGRICULTURAL GEODATABASES AND IRRIGATION ESTIMATES: AUGUST 2013

# St. Johns River Water Management District

## Development of 1995 and 2010 Agricultural Geodatabases and Irrigation Estimates

**August 2013**

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## Table of Contents

**List of Figures** ..... **iii**

**List of Tables** ..... **iv**

**Executive Summary** ..... **v**

**Section 1 Introduction** ..... **1**

1.1 Background ..... 1

1.2 Description of the Study Area ..... 3

1.3 Objectives ..... 3

1.3.1 Task Breakdown ..... 5

**Section 2 Data Collection** ..... **6**

2.1 Literature Review ..... 6

2.2 Mobile Irrigation Lab data ..... 6

2.3 Ag Statistics Data ..... 6

2.4 GIS Data ..... 7

2.5 Historical Water Use Data ..... 7

**Section 3 Geodatabase Development** ..... **8**

3.1 Preliminary GIS Processing ..... 11

3.1.1 Description of GIS Data within the SJRWMD study area ..... 12

3.1.2 Description of GIS Data within the SWFWMD study area ..... 12

3.1.3 Description of GIS Data within the SFWMD study area ..... 12

3.1.4 Description of GIS Data within the SRWMD study area ..... 12

3.1.5 Description of GIS Data within the Georgia study area ..... 13

3.2 GIS Overlay Procedures ..... 13

3.3 Data Processing and Categorization ..... 15

3.3.1 Ag Lands Geodatabase Preparation ..... 15

3.3.2 Irrigated Lands Geodatabase Preparation ..... 15

3.4 Final Overlays and Formatting ..... 20

3.4.1 Predominant Soil Type ..... 20

3.4.2 Zip Code ..... 20

3.4.3 Nearest Source of Rainfall/ET data ..... 20

3.4.4 Depth to Water Table ..... 22

**Section 4 Irrigation Estimates ..... 24**
4.1 Crop Irrigation Demand Model Selection ..... 24
4.2 AFSIRS Model Setup ..... 25
4.3 Unadjusted AFSIRS Results – Net Irrigation Requirements ..... 27
4.4 Adjusted AFSIRS Results – Gross Irrigation Requirements ..... 27
4.4.1 Farm Irrigation Rating Method Theory ..... 28
4.4.2 MIL Data Analysis and O&M Classes ..... 29
4.4.3 Gross Irrigation Requirements ..... 32
4.5 Other Non-Irrigation Water Uses ..... 33
4.6 Irrigation Water Use Estimates Summary ..... 34
**Section 5 CFACT Development ..... 35**
5.1 CFACT Overview ..... 35
5.2 Crop & Irrigation System Compatibility ..... 36
5.3 Irrigation Application Efficiency Assumptions ..... 36
5.4 Cost Assumptions ..... 37
5.5 CFACT Test Case ..... 37
5.6 Full-Dataset CFACT Runs – Preliminary Results ..... 39
**Section 6 Summary and Conclusions ..... 41**
6.1 GIS Processing Summary ..... 41
6.2 Irrigation Estimates Summary ..... 41
6.3 CFACT Summary ..... 42
6.4 Conclusions ..... 43
**Section 7 References ..... 45**
**Appendix A GIS Processing Summaries ..... 56**
**Appendix B Irrigation Demand Summaries ..... 57**
**Appendix C CFACT Input Assumptions ..... 58**
**Appendix D Expansion of Methodologies to the NFSEG Model ..... 59**

## List of Figures

Figure 1 Study Area ..... 2

Figure 2 Study Area (Subdivided) ..... 4

Figure 3 GIS Workflow Schematic ..... 9

Figure 4 Comparison of GIS Data Sources for a Typical Farm ..... 10

Figure 5 Hierarchy-Based Data Aggregation Example ..... 14

Figure 6 Comparison of GIS-Derived and Ag Census Irrigated Land ..... 18

Figure 7 1995 and 2010 Ag and Irrigation Land Geodatabase ..... 19

Figure 8 Daily Rainfall and ET Data Locations ..... 21

Figure 9 Extent of Depth to Water Coverage ..... 23

Figure 10 Number of MIL Records by Crop Type and Irrigation System ..... 30

Figure 11 Grouping of MIL Reports by ZIP Code ..... 31

Figure 12 Cost-Water Savings for CFACT County-Scale Demonstration Simulation ..... 38

Figure 13 Cost-Water Savings for CFACT Full-Scale Demonstration Simulation ..... 39

## List of Tables

Table 1 Project Task Breakdown .....5

Table 2 Data Availability and Source Attribute Matrix .....11

Table 3 GIS Overlay Source Code System .....14

Table 4 Final List of Irrigation Systems from GIS Overlay Procedure .....15

Table 5 Final List of Crop Types from GIS Overlay Procedure .....16

Table 6 AFSIRS Irrigation Types and Parameters .....26

Table 7 Irrigation Application Efficiency for various O&M Classes .....29

Table 8 Gross Annual Irrigation Requirements for the 2010 Irrigated Lands Geodatabase .....32

Table 9 FIRM Variables .....36

Table 10 Water Savings Options Cost Assumptions .....37

## Executive Summary

There are two principal objectives for the current study: (1) Develop the base assumptions of irrigation efficiencies and cost factors associated with the various types of irrigation systems and crops grown within the study area, and (2) develop an Irrigated Land Geodatabase and associated farm-level irrigation estimates for 1995 and 2010 conditions.

The first objective was developed with the intention of identifying the most cost effective dependable BMPs in the District for saving water. The GIS component of the input data will be used to identify opportunities for cost-share funding and potential project partnerships. This work can also be used to help quantify the amount of funds that should be appropriated for these projects, and an overall Ag water conservation cost-share program. Once funded, the successes and/or failures of the BMPs should be tracked and evaluated. This will support refinements of the input assumptions and help guide future District efforts to promote water conservation with Agriculture (Ag).

The second objective was developed with the intention of providing estimates of irrigation for use in the District's groundwater modeling efforts. Applied irrigation can significantly increase groundwater recharge, especially if the producer does not carefully try to avoid losing water to deep percolation below the crop root zone. Recharge is a critical component to any long-term regional groundwater model.

To the extent possible, this project was designed to maintain the integrity of the input data sets with as few assumptions as possible. Random spot checking of the GIS coverages have revealed instances where the line work could be improved or the database corrected based on aerial imagery alone. However, to keep these results true to their original source, no efforts were made to manually modify the data. Readers should bear this in mind when comparing the results from this project to other efforts.

At the field-level, Ag irrigation is difficult to characterize with any degree of certainty because of many factors that change year-to-year and season-to-season. However, from a wider perspective, this uncertainty can be managed by tensioning the data to published values. Developing the GIS coverages and irrigation estimates for such a large study area is an important step forward in better understanding Ag water use, which in turn will help our ability to predict future Ag water requirements and develop water conservation strategies.

# Section 1 Introduction

Agricultural (Ag) water use represents a major portion of Florida's conservation potential. The St. Johns River Water Management District (SJRWMD) hired Royal Consulting Services, Inc. (RCS) to evaluate the amount of potential Ag water conservation in the areas of Peninsular Florida and Southeast Georgia (**Figure 1**). This area is analogous to the USGS 'Mega Model' extent (Sepulveda, 2012). This study uses a Linear Programming (LP) model to optimize water conservation relative to cost. The LP tool is modeled after the District's similar work estimating conservation potential for public supply utilities at the account-level. This work will be an ongoing collaborative approach, using input from producers, FDACS, universities, industry experts, and District staff.

This initial phase of the work is focused on developing the base assumptions to be used in the LP tool, and to develop parcel-level Geographic Information Systems (GIS) coverage of irrigated areas representing conditions in 1995 and 2010. Additionally, the amount of irrigation used for each parcel will be estimated. This information is essential to the development of groundwater model because it is a key input to the calculation of groundwater recharge, and represents the bulk of Ag water use (pumpage, surface water withdrawals).

## 1.1 Background

SJRWMD developed several water conservation planning tools based on LP methods for evaluating the water conservation potential of an optimized selection of Best Management Practices (BMPs) for public supply utilities. Two versions of these tools have been featured in the Florida water Resources Journal in the August Water Conservation Issues for years 2011 and 2012. (Castaneda Blush 2011, Castaneda Blush 2012)The tools generally rely on current regional end-use and efficiency studies, paired with account level historical consumption data (where available), and generally-accepted water use estimates to project the potential for water savings and associated costs. The LP planning tools analyze historical water use for each permit holder or utility account individually for both indoor and outdoor use to optimize the selection of water conservation BMPs. The LP tool executes optimization routines to identify and estimate the costs and benefits of water conservation at the parcel level. This parcel level resolution provides the ability for a utility conservation coordinator to customize and optimize water conservation programs on a customer-by-customer basis.

Recognizing the vast potential for additional water savings within the Ag sector, SJRWMD hired RCS to study to apply these principles to Ag irrigation. The LP tool used for public supply utilities was thus modified to fit the various factors involving Ag irrigation water use. The name of this tool is the Comparative Farm Agricultural (Water) Conservation Tool (CFACT). The CFACT is currently set up to optimize the cost-benefit ratio of improving irrigation water management practices or installing compatible new irrigation systems altogether.

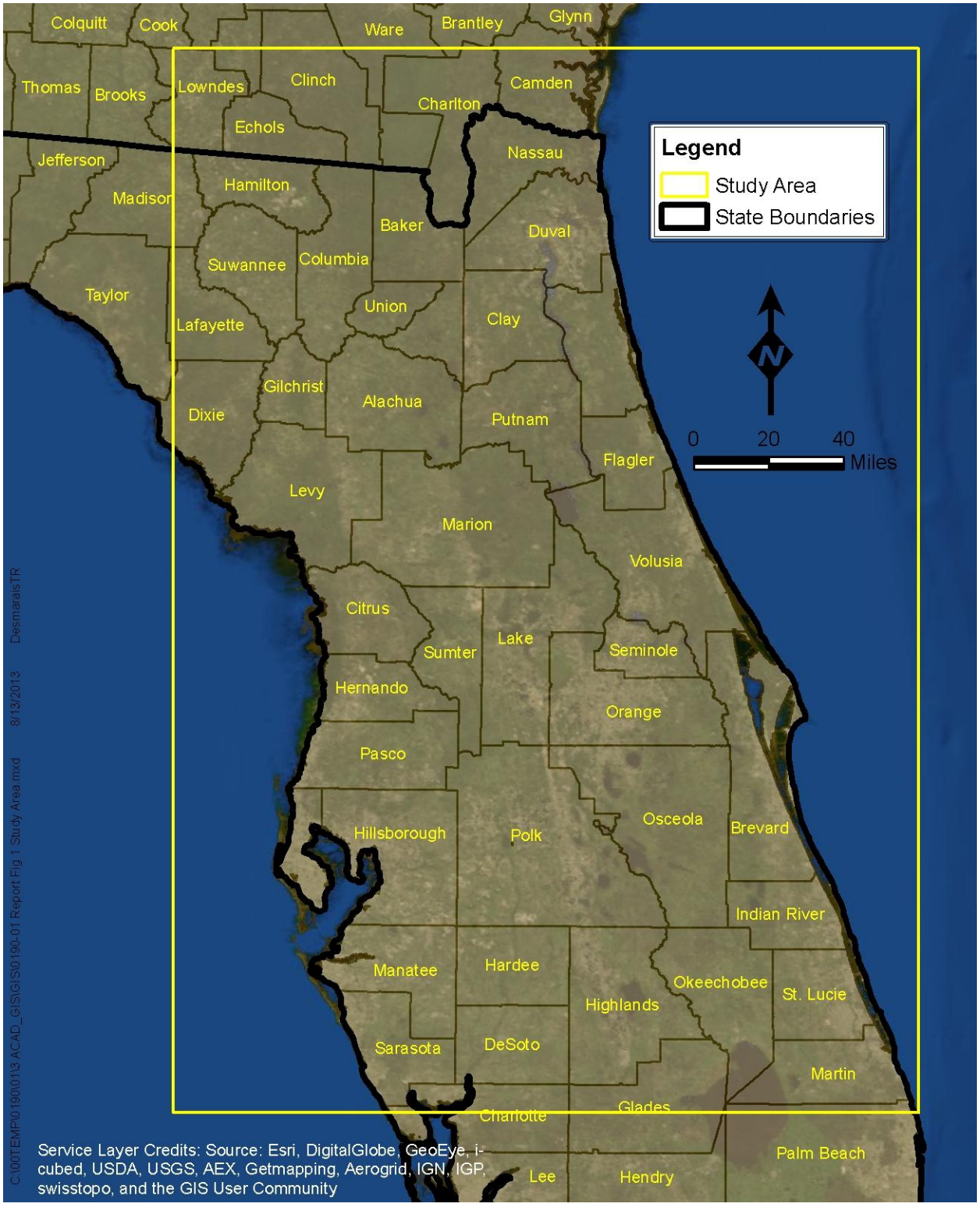


**Figure 1 Study Area**

## 1.2 Description of the Study Area

The 'MegaModel', formally known as the United States Geological Survey (USGS) Peninsular Florida Model, was used as the overall study area (for development of 1995 and 2010 agricultural irrigation estimates). However, the CFACT was developed with specific focus on the SJRWMD boundary for this project.

The MegaModel was initially developed in 2002 to simulate groundwater flow in the intermediate and Floridan aquifer systems (Sepúlveda, 2002). Encompassing roughly 56,495 square miles (64% land, 36% water), the model extends from Lake Okeechobee in the south to as far north as the southern portion of Georgia. The model encompasses all or portions of 46 counties in Florida and 12 counties in Georgia (see **Figure 2**). The overall study area was divided into five sections: SJRWMD, the Southwest Florida Water Management District (SWFWMD), the Suwannee River Water Management District (SRWMD), the South Florida Water Management District (SFWMD), and Georgia

## 1.3 Objectives

There are two principal objectives for the current study: (1) Develop the base assumptions of irrigation efficiencies and cost factors associated with the various types of irrigation systems and crops grown within the study area, and (2) develop an Irrigated Land Geodatabase (ILG) and associated farm-level irrigation estimates for 1995 and 2010 conditions.

The assumptions developed in the first objective will form the basis for the first fully-functional version of the CFACT. Due to the many variables related to Ag irrigation (system type, crops, region, cultivation practices, etc.) and the immense size of the study area (approx. 56,500 square miles), it will be necessary to categorize and simplify To the extent possible, detailed assumptions will be developed for predominant crops and irrigation systems. However, the purpose of the current phase of the CFACT is to develop planning-level estimates that will be used to identify key areas (regions, crops, and/or irrigation systems on the whole) for focusing future water conservation efforts. Furthermore, the structure of the CFACT will be designed to accommodate adding more detail at a later date.

The second objective will utilize available GIS information (e.g., coverages of irrigated areas, land use, crop satellite imagery, and consumptive/water use permitting data) to develop a comprehensive compilation of irrigated land in the study area. While emphasis will be placed on developing the ILG, non-irrigated areas will be picked up in the process and included as a secondary data set (the Ag Land geodatabase, or ALG). For the irrigated areas, monthly estimates of irrigation water use will be prepared to represent average, dry, and wet years.

This project was developed in collaboration with data, input, and overall guidance from several entities in addition to SJRWMD:

- Florida Department of Agricultural and Consumer Services (FDACS)
- University of Florida Institute of Food and Agricultural Sciences (UF-IFAS)
- Other Water Management Districts
- Other industry experts and producers

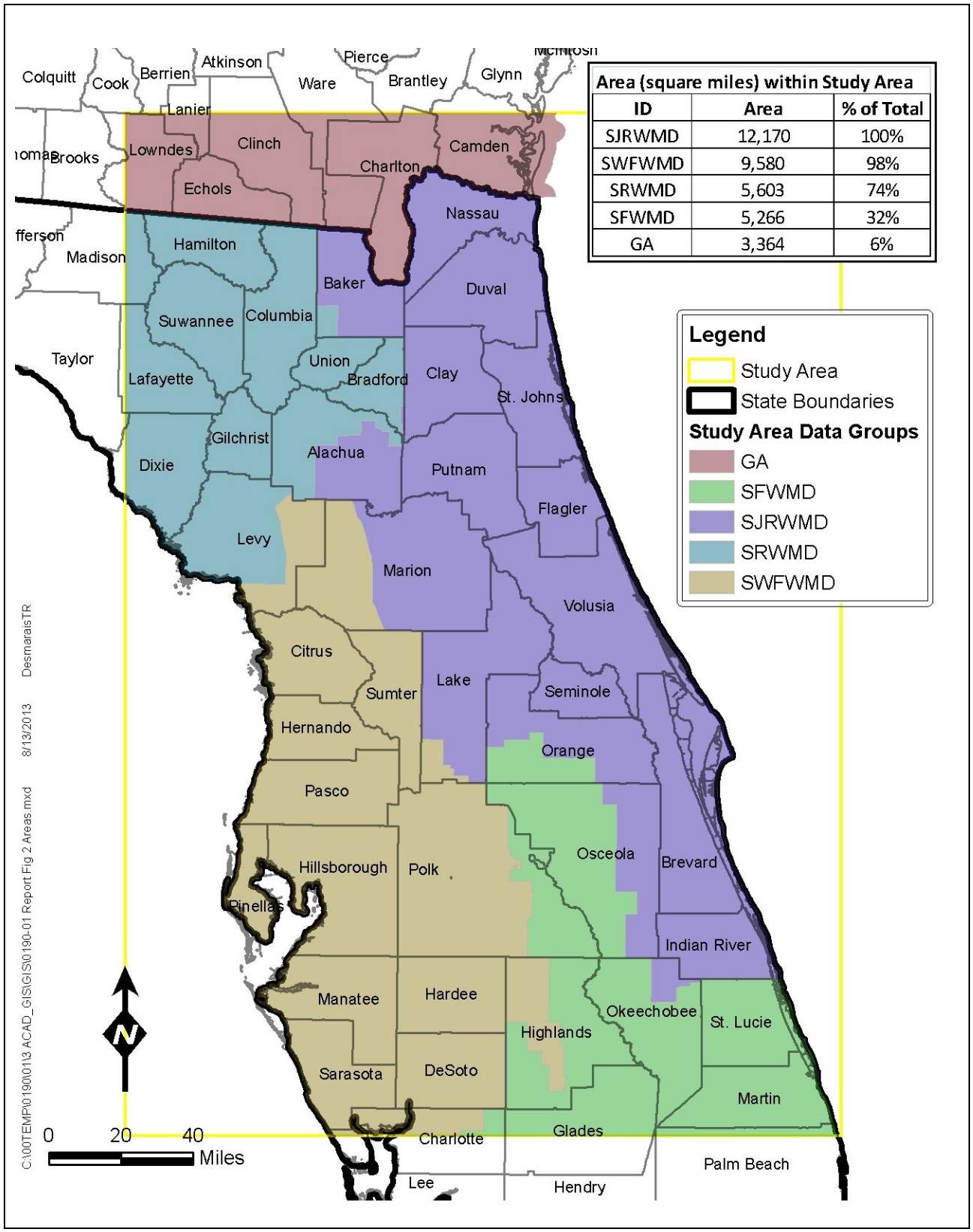


**Figure 2 Study Area (Subdivided)**

### 1.3.1 Task Breakdown

This project was divided into six tasks as indicated in **Table 1**. Initially, the work proceeded in this order. After the initial data gathering for Task 2-4 was complete, a 'test case' was run that utilized data from an early version of the ALG. The lessons learned from this exercise highlighted the importance of compiling and synthesizing the GIS data to facilitate the irrigation estimating portion of the project (an essential input to the CFACT).

**Table 1 Project Task Breakdown**

| Task No. | Task Description |
|---|---|
| 1 | Project coordination and meetings |
| 2 | Review of CFAC Tool |
| 3 | Literature Review |
| 4 | MIL Data Analysis and Assumptions of Costs, Savings, and Benefits |
| 5 | Development of Agricultural Lands Geo-DataBase and Water Use Estimates |
| 6 | Project Reporting |

# Section 2 Data Collection

The data collection effort consisted of a literature review, data provided directly from other source (e.g., SJRWMD, FDACS), and data downloaded from websites (e.g., GIS coverages, Ag census).

## 2.1 Literature Review

A listing of the references collected in the literature review is included in the references section. Throughout this report, these references are cited in italics using the numbering in the References section.

The literature review effort initially started with an effort to compile the necessary information to support the CFACT. Such information included both broad-based reviews of irrigation BMPs as well as crop-specific growing practices. For all of the crops and irrigation systems within the study area, it was desired to have information on irrigation efficiency, new system costs, operation and maintenance (O&M) costs, fertilizer and other chemical costs, feasibility of growing a particular crop with a given irrigation system, and more. Since it was not feasible to collect this information for every specific crop and variety, crop groups were established to lump similar crops together.

The literature review was also used for estimating irrigation requirements. For annual crops, the literature collected was used to define typical planting and harvesting dates for a given season. To this end, the study area was divided into Central Florida and North Florida (*112*).

## 2.2 Mobile Irrigation Lab data

FDACS provided the results from 3,380 Mobile Irrigation Lab (MIL) audits throughout Florida. The data includes both preliminary and follow-up site visits. This information includes a zip code, acreage, irrigation system, crop, source info (e.g., well and pump info), and list of problems (e.g., leaks, ponding, etc.). As will be discussed in Section 5, the MIL data were used to help characterize the initial O&M class (pro-active, reactive, or deferred management styles), which is linked to the overall irrigation efficiency for a given system.

## 2.3 Ag Statistics Data

The National Agricultural Statistics Service (NASS) makes estimates of agricultural production typically at the county level (some recent surveys report information by zip code level). Annual estimates are typically less comprehensive than the more formal 5-yr. Census of Agriculture For this project, the most recent Ag Census available was for 2007. One of the items included in the Ag Census is the total acreage of irrigated land for a given county. However, less detail in terms of crop type are recorded in the Ag Census. Therefore, the 2010 county-level statistics ("Quick Stats") were used to obtain a more refined list of crops grown in a particular county.

The Census of Agriculture data are limited in applicability to this project because the areas used for Agricultural production can vary substantially from year to year. Therefore, as will be discussed in Section 3, the AgCensus data were used only as a guide to help define crops and acreages in areas with too little or too vague information.

## 2.4 GIS Data

SJRWMD provided a set of preliminary GIS coverages that would be used for this project. The most valuable sets of data were polygons of irrigated areas for SJRWMD (1995 and 2010) and Georgia. The irrigated areas polygons were digitized from aerials and later field-verified. Other coverages provided by SJRWMD include the MegaModel domain (a.ka. 'the study area'), 1995 Land Use (FL only), 2010 Land Use (SJRWMD only), Water Use Permitting point and polygon data, and the 2010 Cropland Data Layer from NASS.

## 2.5 Historical Water Use Data

SJRWMD provided a spreadsheet with self-reported monthly water use (January 2007 to June 2012) for all permitted Agricultural water users in their District. This data, commonly referred to as the "EN-50 data", was compiled on a source-by-source basis (e.g., by well or surface water pump) and then summed together by permit ID. The resulting monthly total permit water use was then joined to the District's consumptive (water) use permitting (CUP) polygon GIS coverage. However, the crop or irrigation system type is not specified in the District's CUP polygon coverage. Therefore, to use the EN-50 data for the development of the CFACT it was necessary to cross-reference this information during the GIS overlay procedure (discussed in Section 3).

Similar to the NASS Ag statistics data, the EN-50 was problematic for a number of reasons. Using either the 'project acreage' from the EN-50 data or the GIS-derived irrigated acreage (see Section 3), the calculated per-acre monthly water use estimates varied drastically among similar crops (up to two orders of magnitude). Potential causes for this apparent discrepancy include errors in recording the meter readings themselves, poorly calibrated meters, and changes in irrigated areas from year-to-year or season to season. Also, it should be noted that the 'project acreage' specified in an SJRWMD Consumptive Water Use Permit (CUP) or a SWFMWD Water Use Permit (WUP) is typically the build-out farm acreage and does not necessarily reflect what is being irrigated.

## Section 3 Geodatabase Development

Currently there is no sole source for GIS data that can be used to define the crop types, acreages and irrigation system throughout the study area. The development of the 1995 and 2010 ILGs was based on a series of GIS overlays of best-available information. A generalized workflow schematic of this process is shown in **Figure 3**.

Once the data were compiled and overlain, it was necessary to develop a series of assumptions and lookup tables to define a uniform crop and irrigation system type for each polygon (i.e., unique parcel of land derived from overlay procedure). Once the merged data was formatted consistently, the resulting ALGs and ILGs were compared to the 2007 Ag Census (*89, 90, and 91*) and adjustments were made for areas lacking in GIS information. Lastly, the final 1995 and 2010 ILGs were joined with other GIS coverages (e.g., soil types, locations of rain and evapotranspiration data sets, etc.) to facilitate the integration with the CFACT and pre-processing for the irrigation water use estimating.

Four main categories of data were identified to be potentially useful for establishing the geodatabase of Ag land within the study area. These layers are listed below, in order of utility to this project and overall reliability.

(1) Irrigated Areas. This type of GIS coverage would generally be assembled by the water management district. This level of data is more detailed than the typical CUP polygons commonly available, and represents the actual irrigated areas.
(2) Land Use / Land Cover. For the state of Florida, this data utilizes the Florida Land Use and Cover Classification System (FLUCCS) and is available at various yearly intervals (depending on the water management district). However, this classification system is not used in Georgia. Similar data for Georgia uses a different classification system, but Ag Land categories are too vague to define the crop type.
(3) USDA NASS satellite imagery. Prepared by the USDA National Agricultural Statistics Service (NASS), this data source was developed using infra-red satellite imagery and is available for the entire study area for 2008 and 2010.
(4) CUP polygons. This type of GIS coverage is developed and maintained by the water management district. Generally, the polygon area for this type of coverage represents the permittee's total site area, whether it is irrigated or not.

**Figure 4** shows an example of how these data appear when overlaid together. In most situations, the irrigated areas polygons is the most reliable source of information. As expected, the CUP polygons pick up the entire project site. The FLUCCS data is useful at identifying all agricultural areas (irrigated or not) and does a good job of excluding wetland areas. The NASS data is generally less reliable spatially, however, it has more detailed definitions of crop type than the FLUCCS data.

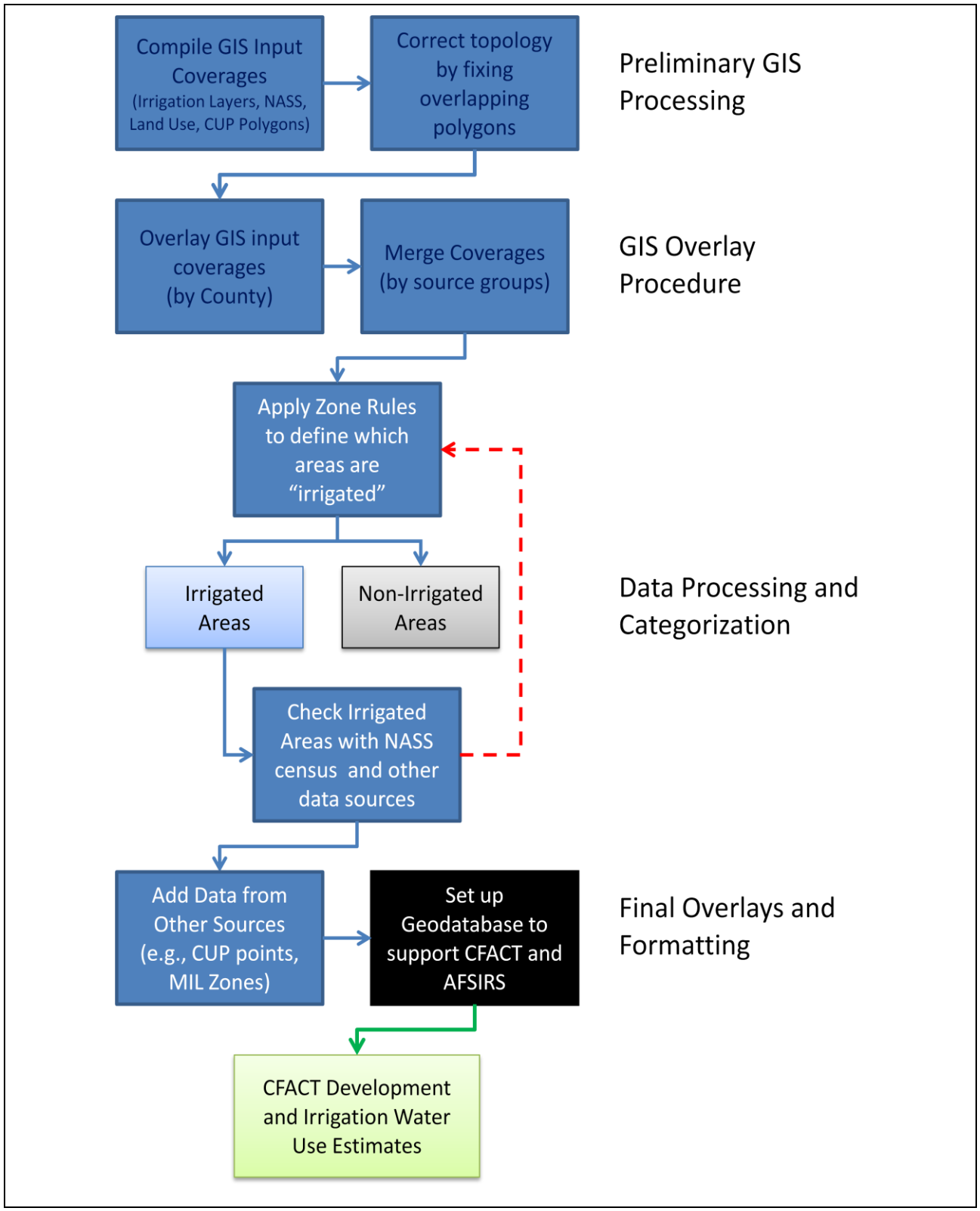


**Figure 3 GIS Workflow Schematic**

**LEGEND**

Green: Irrigated Areas (SJRWMD)

Yellow: Land Use / Land Cover

Lt Green: NASS satellite imagery

Red Hatch: CUP polygons


**Figure 4 Comparison of GIS Data Sources for a Typical Farm**

## 3.1 Preliminary GIS Processing

The first step for developing the geodatabases was to collect and compile the four categories of input coverages from all available sources. Since the study area encompasses such a large area, it is not surprising that the availability of information varies widely among these regions. Because most of this information is available from water management district websites, the data were categorized into five groups: SJRWMD, SWFWMD, SFWMD, SRWMD, and Georgia.

**Table 2** summarizes the sources of data available for each of the five data groups, and the type of information that it can provide. Irrigated areas layers are the most useful information because it provides information on both crop type and irrigation system, and this information has been digitized from aerial imagery and, to some degree, field-verified.

**Table 2 Data Availability and Source Attribute Matrix[1]**

| Data Group | Crop Type | Irrigation System | Water Use Records | SW/GW Source | Well and/or Pump Details[2] |
|---|---|---|---|---|---|
| SJRWMD | 1,2,3 | 1 | 4 | 5 | 5 |
| SWFWMD[3] | 2,3,5*,6 | 5*,6 | 6 | 5 | 6 |
| SFWMD | 2,3,6 | 6 | 6 | 5 | 5 |
| SRWMD | 2,3,6 | 6 | 6 | 5 | 6 |
| Georgia | 1,2,3 | 1 | - | - | - |

[1]The numbers in this table refer to the following GIS data sources: (1) Irrigated Areas, (2) Land Use / Land Cover, (3) NASS satellite imagery, (4) CUP polygons, (5) CUP point data, (6) in the absence of any other source of data, crop and irrigation system is available in permitting records but must be extracted on a case-by-case basis or with water management district assistance.

[2]Well and/or Pump details vary by data group. Not all information may be readily available.

[3]For source 5, a point coverage was provided by SJRWMD for a region in south-central Florida portion of the SWFWMD jurisdiction that includes crop and irrigation system information.

Details of the availability of input GIS coverage for each data group are discussed below. A table is provided in **Tables A-1 and A-2 of Appendix A** that lists the specific source of data and how it was obtained (for the 1995 and 2010 data sets, respectively). After the data was collected from each of the five data groups, it was projected to a consistent geographic projection (NAD83 HARN UTM Zone 17, meters) and checked for topologic errors and overlapping/duplicate polygons. If necessary, overlapping/duplicate polygons and errors in topology were corrected using the "Clean" routine available in the ET Geo Wizards™ GIS toolset (http://www.ian-ko.com/).

### 3.1.1 Description of GIS Data within the SJRWMD study area

Of the five data source groups, the data for the SJRWMD portion of the study area is the most complete. Irrigated areas coverage for both 1995 and 2010 were provided by SJRWMD for this project. While it was known in advance that these coverages would singularly be used to define the geographic extent of the irrigated areas, the overlay process was still carried out for the purpose of filling missing or vague crop descriptions (e.g., polygons coded as "unknown", "plowed", etc.). In addition, the overlay process was used to assign the irrigated areas to a permit ID, which allowed the assignment of crop and irrigation system type to the EN-50 data.

### 3.1.2 Description of GIS Data within the SWFWMD study area

SWFWMD maintains very detailed water use permitting records, including a shapefile of irrigated areas. However, the version of the file publicly available does not include a crop or irrigation system type. Using the permit number, this information can be determined on a permit-by-permit basis through the SWFWMD Water Management Information System (WMIS) database.

SJRWMD provided a GIS point coverage of Ag wells within the SWFWMD with more information than what is available to download from the website, including a crop and irrigation system type. However, this GIS coverage only includes Polk, Highlands, Hardee and portions of Lake and Sumter counties. After discussing the project with SWFMWD's GIS department it was learned that this information could be extracted more efficiently by SWFWMD staff. A public records request for this information was submitted, but the data was not received in time to incorporate into this study. However, the point data that was provided by SJRWMD was used to define the crop and irrigation system based on a permit ID lookup routine.

### 3.1.3 Description of GIS Data within the SFWMD study area

There was no irrigated areas coverage available for SFWMD. Therefore, the only means to automatically assign a crop or irrigation system type to a given polygon is based on the Land Use and NASS coverages. However, a CUP polygon file is available that could be used to look up the crop and irrigation system information from permitting records. Unlike SWFWMD, a review of online SFWMD permit records do not suggest that crop and irrigation system is coded into their records. Scanned copies of the actual permits, however, do include this information (typically). Populating this information by downloading and reading each permit within the model domain would be a very tedious effort and is outside the scope of the current work.

### 3.1.4 Description of GIS Data within the SRWMD study area

Of the four Florida water management districts within the study area, the least amount of information is available for SRWMD. A GIS point coverage was provided by SRWMD that, for newer permits, shows the location of wells and the permit ID. Older permits, however, have a point placed in the center of a particular project's Section-Township-Range. Crop and irrigation system information may be available from paper copies of the permits, but this information is not online and obtaining it constitutes a very long and tedious effort that is outside the scope of the current work. Thus, the definition of crop and irrigation system type within the SRWMD will be based solely on the Land Use and NASS coverages.

### 3.1.5 Description of GIS Data within the Georgia study area

A coverage of irrigated areas for the entire state of Georgia was provided by SJRWMD for this project. This coverage includes the crop and irrigation system. The land use/land cover data available for Georgia uses a different classification system than the FLUCCS used for Florida. The categories for Ag land use in the Georgia classification system are too vague to provide any meaningful information, and as such this coverage was not used for this project. Similar to the way the data for the SJRWMD was handled, the overlay process was carried out to help define vague or missing crop types using the NASS data.

## 3.2 GIS Overlay Procedures

Initially, it was envisioned that the overlay process would be carried out individually for each of the five data groups. However, the overlay of up to four dense GIS coverage for such large extents yields extremely large file sizes and processing times. To keep file sizes more manageable, intermittent steps were taken to reduce the number of fields in the resulting shapefile and the overlay operations were carried out on a county-by-county basis for each source group.

The overlay procedure used was a series of nested GIS unions. The first coverage (typically irrigated areas) was unioned with Land Use. The output from this procedure was then unioned with the NASS data, and so on. To facilitate the processing of the data after the overlays were complete, a coding system was developed that would allow for the identification of which layers were present for each polygon. This coding system would later be used to filter out certain results (i.e., areas that were present in only the CUP polygons were not included in the irrigated areas database).

**Table 3** shows how the source coding system was used. In the final overlay coverage, if a particular polygon is located within the Irrigated Areas layer, (Source 1000), a value of 1000 is added to the source code. If that same polygon is also present in the Land Use layer (Source 100), a value of 100 is added again. This same procedure is repeated for the other two sources, except that values of 10 and/or 1 are added to the source code. To illustrate, if a particular polygon was common to all four data sources, the source code would be 1111. If a particular polygon was found only in Source 1000, the source code would be 1000. These codes were very helpful in filtering out irrigated areas in instances where an Irrigated Areas layer was not available.

The resulting final GIS overlays consisted of millions of small polygons. In areas with an Irrigation Layer, the large contiguous parcels were subdivided based on changes in any of the other three sources, making the data unnecessarily cumbersome (see **Figure 5**). Further, the CFACT model is set up to process one parcel at a time, not many bits and pieces. To retain the original geometry of the most valuable sources of information, a hierarchy-based series of GIS dissolve functions were run on the final overlay dataset. The first dissolve aggregated the Irrigation Layers (Source codes of 1000 or more) back to its original geometry. The remaining pieces were then dissolved by Land Use (source codes between 100 and 111) to retain what was left of its original geometry. A final dissolve was then made to aggregate the NASS data (source codes 10 & 11), leaving only the bits and pieces left from the CUP polygon (source code 1). The resulting hierarchy-dissolved polygons were assigned a unique identification value, and this 'Unique ID' coverage was set aside and used in later processing steps.

**Table 3 GIS Overlay Source Code System**

| Source 1000 Irrigated Areas Layer | Source 100 Land Use (FLUCCS 2000) | Source 10 NASS | Source 1 WUP | Source Code |
|---|---|---|---|---|
| 1000 | 100 | 10 | 1 | 1111 |
| | | | 0 | 1110 |
| | | 0 | 1 | 1101 |
| | | | 0 | 1100 |
| | 0 | 10 | 1 | 111 |
| | | | 0 | 1010 |
| | | 0 | 1 | 1001 |
| | | | 0 | 1000 |
| 0 | 100 | 10 | 1 | 0111 |
| | | | 0 | 0110 |
| | | 0 | 1 | 0101 |
| | | | 0 | 0100 |
| | 0 | 10 | 1 | 0011 |
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| | | 0 | 1 | 0001 |
| | | | 0 | 0000 |

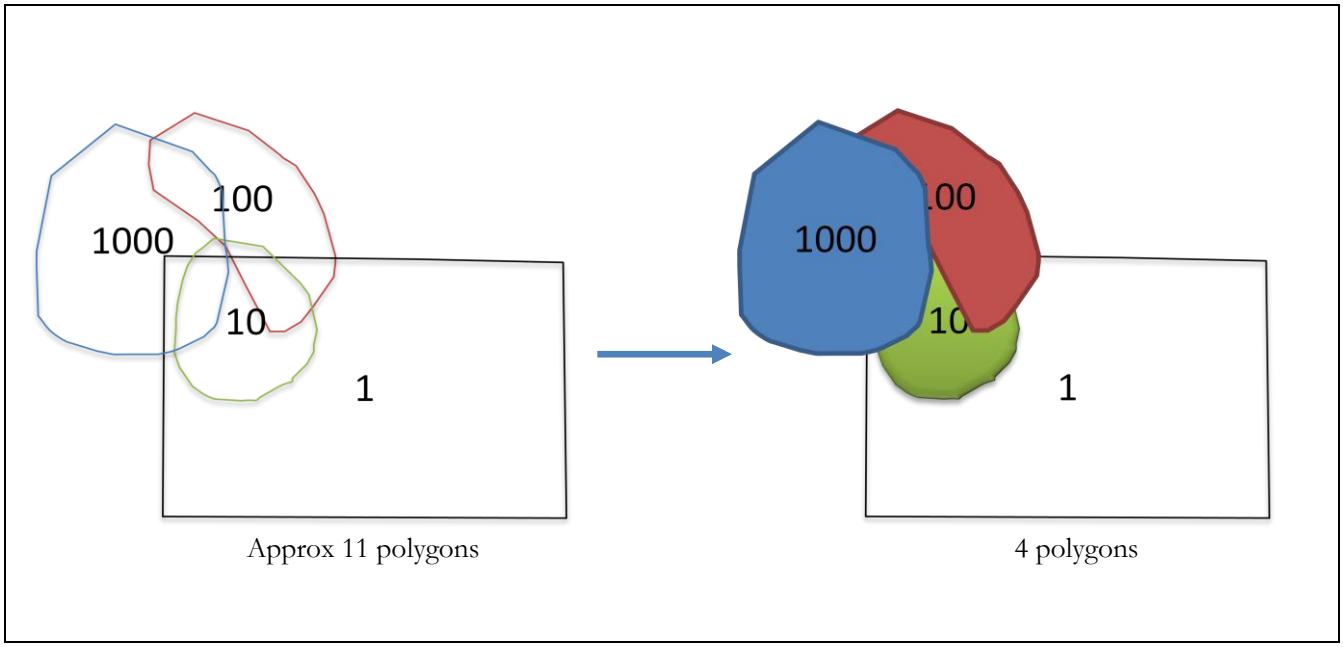



**Figure 5 Hierarchy-Based Data Aggregation Example**

## 3.3 Data Processing and Categorization

### 3.3.1 Ag Lands Geodatabase Preparation

The source codes were used to define rules for how the crop and irrigation system fields were populated. For example, Source Codes 1000 or more (Irrigation Layer) were set to use the attribute column from the Irrigation Layer, unless a missing value or "na" is encountered and then the crop type from the next-best source of data was used (Land Use or NASS data). To accommodate for farms where two or more annual crops are typically grown in a year, the database was set up to have up to three crop type and three irrigation system entries for each polygon.

Following this step, the polygons were joined with the Unique ID polygons discussed in the previous section. Next, the resulting coverage was dissolved by the Unique ID, permit ID, crop types 1-3 and irrigation system types 1-3. To elaborate, all polygons that have the same values for those attributes were combined into one record. This operation reduced the number of polygons considerably without losing any of the potentially valuable information. In addition, a lookup table of Unique ID and Permit ID was created. This lookup table was used to assign a Permit ID to all polygons with the same Unique ID. It is in this way that many of the polygons defined in the SJRWMD Irrigated Areas Layer were able to be linked to the EN-50 data.

After these final steps, the 1995 and 2010 ALGs were complete. The ALGs are an inventory of all land within the model domain that is considered to be Ag from one of the four sources. No manual refinement or re-digitizing was attempted to improve the accuracy of this information.

### 3.3.2 Irrigated Lands Geodatabase Preparation

The first step to developing a refined subset of the ALGs representing the land that is irrigated was to export the data to a spreadsheet. Next, the three crop and irrigation systems fields were concatenated into one text value ('crop string'). All unique crop strings were extracted and then assigned a consistently formatted crop and irrigation system entry. By doing this, polygons with unspecified, vague, or missing crop and/or irrigation system information could use the next best source of information from the overlay procedure. **Table 4 and Table 5** list the final list of irrigation systems and crops that were generated from the data.

**Table 4 Final List of Irrigation Systems from GIS Overlay Procedure**

| | | |
|---|---|---|
| Center Pivot | Pipeline Seepage | Wheel Roll |
| Flood | Reclaimed - Impact Sprinkler | Over-Plant Sprinkler |
| Hand | Reclaimed - Micro Spray | LT Drip/Over-Plant Sprinkler |
| Impact Sprinkler | Sprayhead Sprinkler | LT Drip w/Plastic |
| Linear | Short-Term (ST) Drip | Pipeline Seepage w/Plastic |
| Long-Term (LT) Drip | Stationary Guns | Container Nursery Sprinkler |
| Micro Spray | Traveling Gun | |
| none | Unspecified | |

**Table 5 Final List of Crop Types from GIS Overlay Procedure**

| | | |
|---|---|---|
| Abandoned Tree Crops | Liriope | Sweet Potatoes |
| Alfalfa | Mangos | Tomatoes |
| Animal Feeding Operations | Melons | Tree Fern |
| Aquaculture | Millet | Turf Grass |
| Asparagus Fern | Misc. Vegetables | Turnips |
| Aspidistra | Mushrooms | Unknown |
| Beans | Mustard Greens | Unspecified Crop |
| Beets | Nurseries and Vineyards | Unspecified Field Crop |
| Blueberries | Oats | Unspecified Nurseries and Vineyards |
| Broccoli | Oats/Corn | Unspecified Row Crop |
| Cabbage | Okra | Unspecified Row Crop/Pasture |
| Caladiums | Onions | Unspecified Tree Crop |
| Cantaloupe | Ornamentals | Water Mgmt Area |
| Chestnuts | Parsley | Watercress |
| Chinese Cabbage | Pasture | Watermelons |
| Citrus | Peaches | Weeping Willow |
| Clover | Peanuts | Winter Wheat |
| Collard Greens | Peas | Winter Wheat/Sorghum |
| Container Nursery | Pecans | Winter Wheat/Soybeans |
| Coontie Fern | Peppers | |
| Corn | Persimmons | |
| Cotton | Pine | |
| Cucurbits | Pittosporum | |
| Cut Foliage | Plowed | |
| Dairies | Potatoes | |
| Developed | Potatoes/Cabbage | |
| Developed - Cabbage | Produce | |
| Dry Beans | Radish | |
| Fallow | Rice | |
| Fennels | Rotation | |
| Field Corn | Rotation - Sorghum | |
| Field Nursery | Rotation - Soybeans | |
| Floriculture | Rye | |
| Grapes | Shade Ferns | |
| Greenhouse | Small Grains | |
| Greens | Sod | |
| Hammock Ferns | Sorghum | |
| Hay | Soybeans | |
| Herbs | Soybeans/Oats | |
| Horse Farms | Specialty Farms | |
| IFAS Research Fields | Spinach | |
| Inactive | Squash | |
| Kale | Strawberries | |
| Leatherleaf | Sugar Cane | |
| Lettuce | Sunflowers | |
| Ligustrum | Sweet Corn | |

The resulting attribute table for this GIS coverage was then analyzed in a spreadsheet. The crop string lookup table was used to assign each individual polygon a consistent crop and irrigation system type. Once this was complete, the data was summarized on a county-by-county basis and compared with the Ag Census data. A separate spreadsheet was set up for each County with filters to allow a user to help 'calibrate' the GIS data to match the Census. **Table A-3** in Appendix A present a detailed breakdown of this analysis, which was performed only for the 2010 geodatabase and only for counties located entirely within one source group.

While it is was demonstrated that aggressive source code filters and crop-specific adjustments could be applied to obtain a better match with the data on a county-by-county basis, the only filters that were used were applied for the entire source group. For instance, small wetlands can theoretically be removed from the Irrigated Areas dataset by requiring that that Source Code 100 (Land Use) be present for the area to be defined as 'irrigated'. While such an operation works very well in open areas, this operation causes problems for Ag operations in areas obscured by trees that aren't classified as FLUCCS Ag land uses. Since aggressive filters and exclusions like this must be applied with such attention to detail, only basic source code requirements and obvious crop type or irrigation system exclusions were applied for defining the Irrigated Lands subset geodatabase. The rules used for each data source group are discussed below:

SJRWMD: 'Irrigated Lands' are restricted to only the shapes defined by the Source 1000 (Irrigated Areas) layer. In addition, a definite irrigation system must be included in the data. Crop values indicating inactive land (e.g., inactive, developed, fallow, etc.) were excluded.

SWFWMD: 'Irrigated Lands' are restricted to only the shapes defined by the Source 1000 (Irrigated Areas) layer. Since irrigation system is not provided in this data, the 'Irrigation Y or N' filter was not applied. Crop values "fallow" and "unknown" were excluded.

SFWMD: No Source 1000 (Irrigated Areas) layer available. 'Irrigated Lands' were restricted to the intersection of the Source 1 (CUP polygons) with the Source 100 (Land Use) and Source 10 (NASS). In other words, source codes 0111, 0101, and 0011. Crop values "fallow" and "abandoned tree crops" were excluded.

SRWMD: No Source 1000 (Irrigated Areas) layer available. 'Irrigated Lands' were restricted to the intersection of Source 100 (Land Use) and Source 10 (NASS). In other words, source codes 0111 and 0110. No crop values were excluded.

Georgia: 'Irrigated Lands' are restricted to only the shapes defined by the Source 1000 (Irrigated Areas) layer. In addition, a definite irrigation system must be included in the data. No crop values were excluded.

In addition to the above, crop and irrigation systems adjustments were set up to be applied outside of GIS so they could be modified later without the need for GIS processing (Table C-3). These adjustments were made specifically for certain source groups, and in some cases, specific counties. No crop adjustments were made to the SJRWMD or Georgia datasets.

These crop adjustments differ from the Source Code filtering discussed above because the adjustments do not alter the GIS data. For example, take the case of the 10% of pasture land that

was assumed to be irrigated within the SFWMD. The data provide no means to distinguish between which parcels are irrigated and which are not. To apply the adjustment, the calculated acreage (and thus the irrigation demand) is multiplied by 10% for each parcel. This spreads the irrigation demand out equally, as opposed to the other option which would be select entire parcels at random.

**Figure 6** shows a history of the irrigated land for all counties located entirely within the study area, as reported by the Ag Census data (*98, 99, 100, 101, 102, and 105*). The unadjusted GIS-derived coverages are 1.5 to 2 times greater than the Ag census data. The adjusted 1995 ILG is in very good agreement with the extrapolated line between the 1992 and 1997 census. The 2010 ILG is 11.4% greater than the 2007 census, which is well within a reasonable range considering the many reasons why there could be discrepancies. The coverages used to develop the GIS coverage are essentially slices of one moment in time, whereas the census covers the whole year. Some fields are left fallow in some years and started back up later.

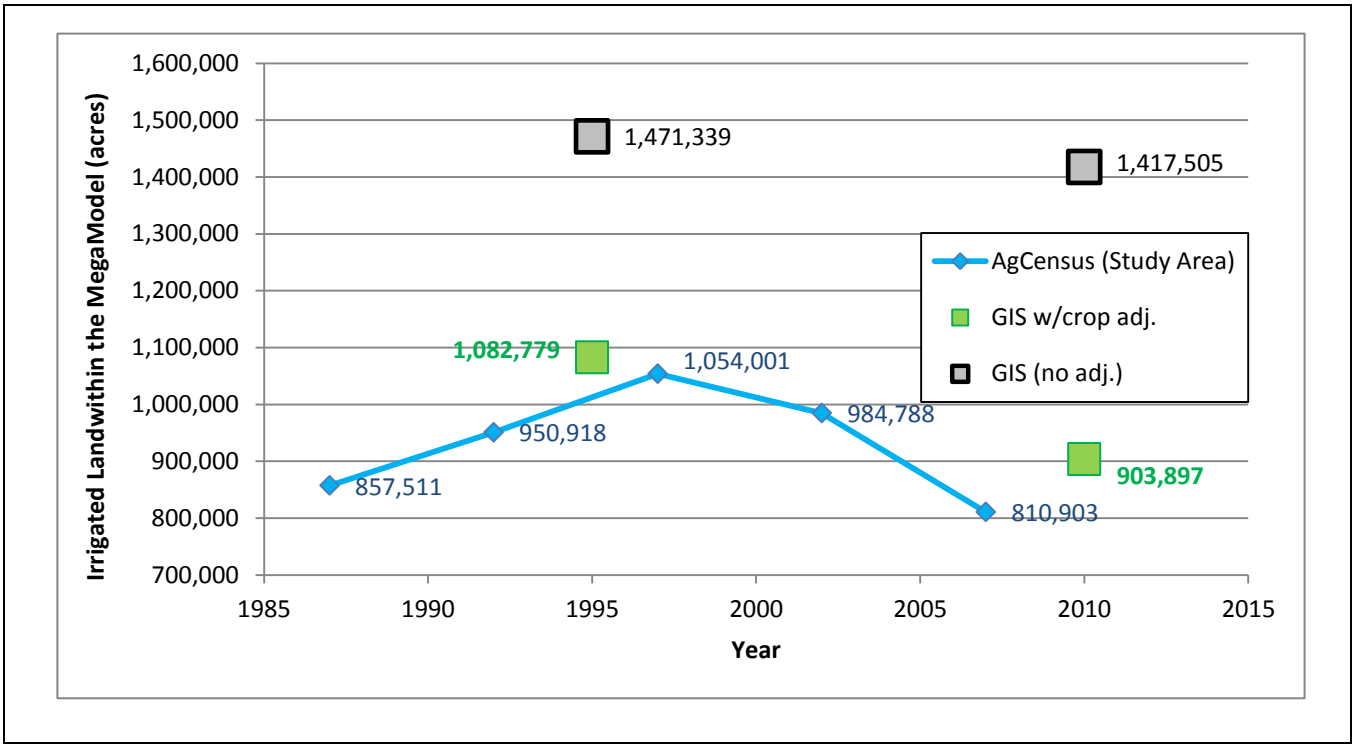
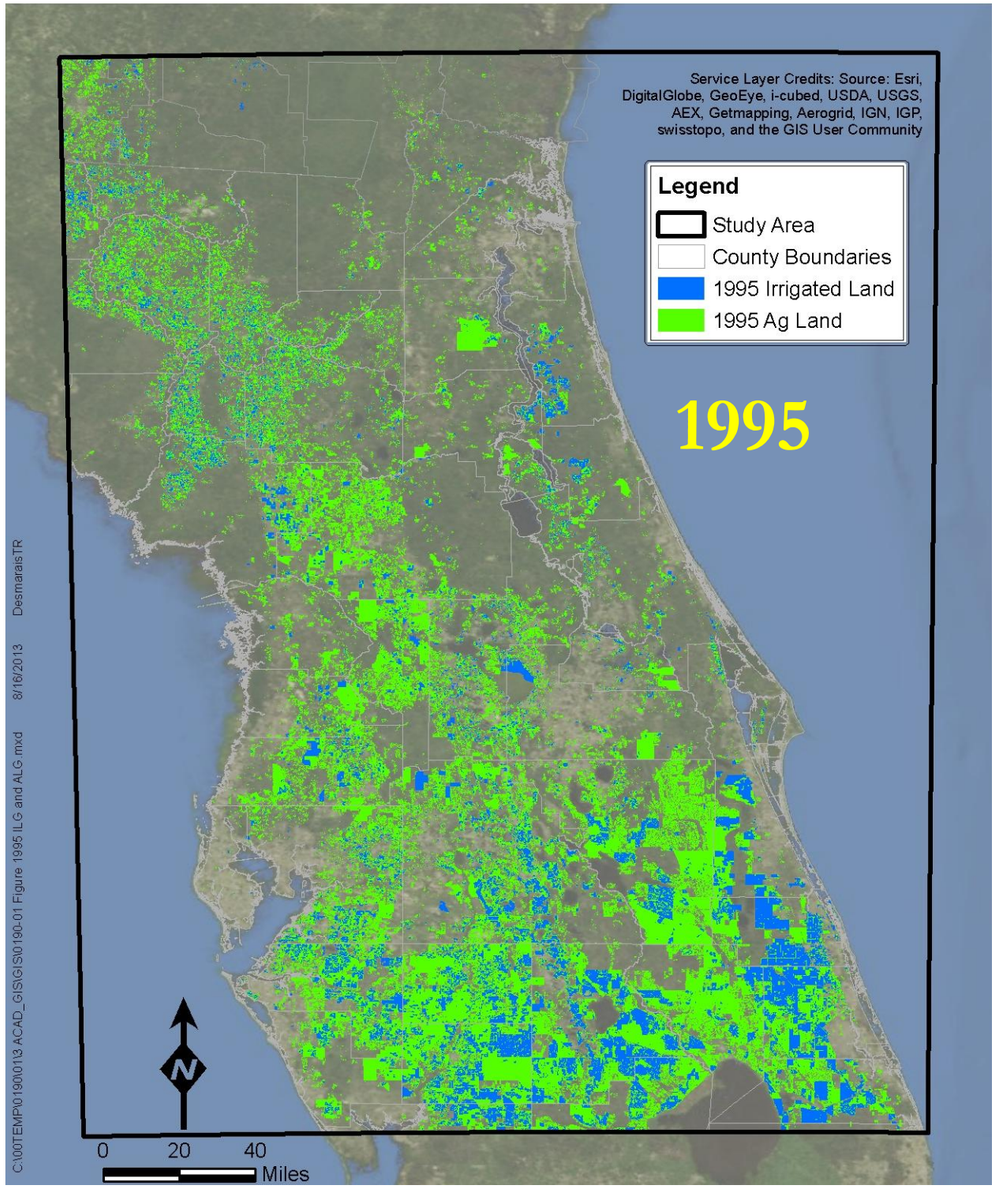



**Figure 6 Comparison of GIS-Derived and Ag Census Irrigated Land**

A full county-by-county comparison of the adjusted GIS-derived and Ag Census irrigated areas is provided in **Tables A-4 and A-5** of Appendix A, for both 1995 and 2010 datasets and for all of the counties within the model domain, regardless of whether a county is present in more than one of the five data groups.

**Figure 7** shows a comparison of the 1995 and 2010 ILGs and ALGs.



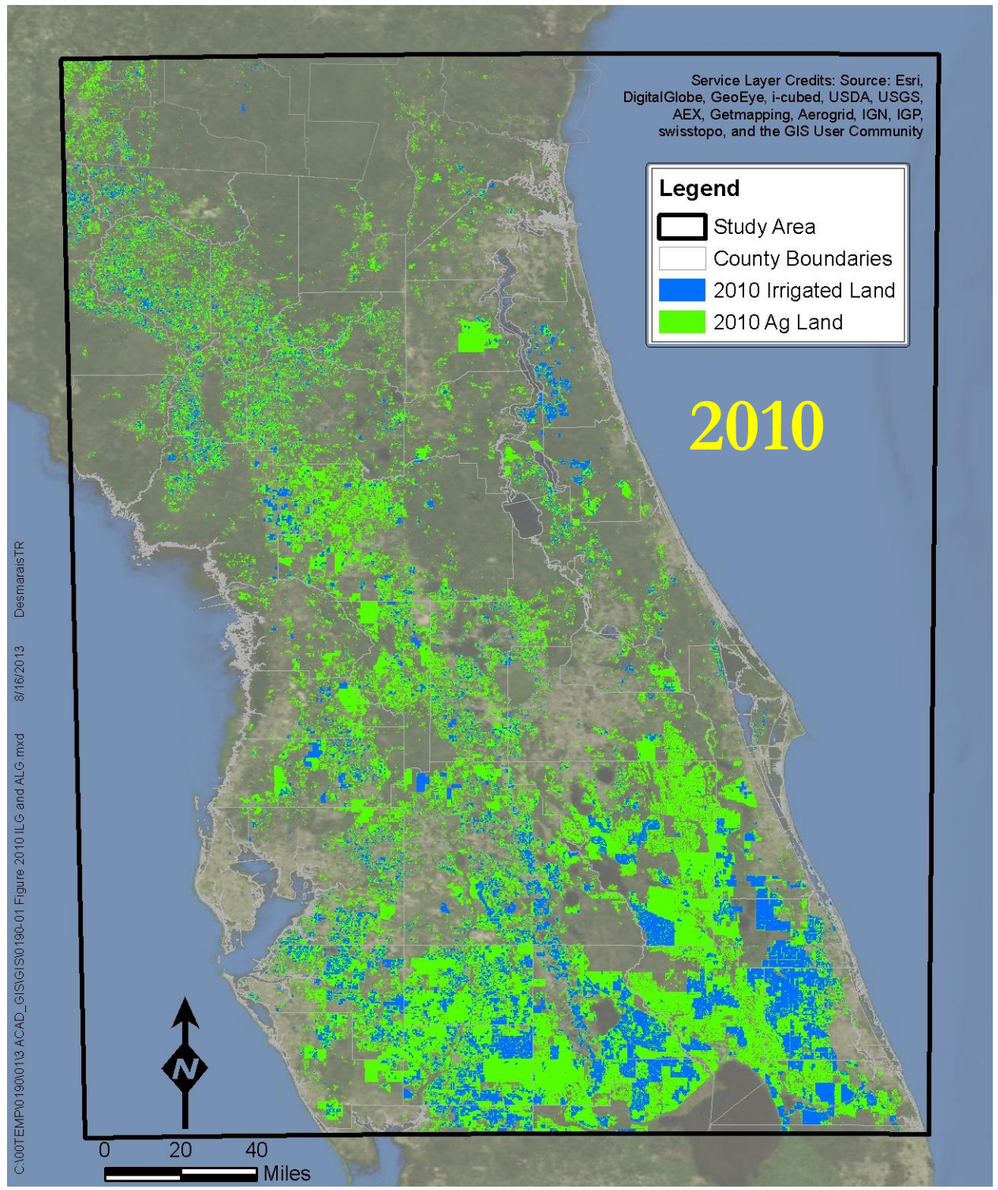




**Figure 7 1995 and 2010 Ag and Irrigation Land Geodatabase**

## 3.4 Final Overlays and Formatting

The final step in this process was to overlay and join additional information to the 1995 and 2010 ILGs. The following data were attached to each polygon:

- Predominant Soil Type
- Zip Code
- Nearest Source of Daily Rain and ET data
- Depth to Water (average)

### 3.4.1 Predominant Soil Type

A model-wide soil coverage was developed by merging multiple data sets from the 5 data groups and formatted to a consistent data structure. Soil data for Georgia was obtained from the USDA NRCS GeoSpatial Data Gateway website (datagateway.nrcs.usda.gov).

The more detailed Soil Survey Geographic (SSURGO) coverage was used for all counties except for where the data was unavailable electronically (11 counties in Georgia). In these cases, the less-detailed State Soil Geographic (STATSGO) coverage was used.

The predominant soil type was defined for each of the ILG polygons by intersecting the two coverages and then analyzing the attribute table in a spreadsheet. The resulting predominant soil table was then incorporated into the original ILG.

### 3.4.2 Zip Code

A model-wide coverage of US Postal ZIP codes was also intersected with the ILGs. To account for polygons residing in one or more zip code regions, the predominant zip code for each polygon was computed in the same way as the soils data.

### 3.4.3 Nearest Source of Rainfall/ET data

SJRWMD provided two time-variable GIS coverage of daily rainfall and ET values. The District obtained this data from the NASA Land Data Assimilation Systems (NLDAS) website (ldas.gsfc.nasa.gov/nldas/NLDASnews.php). The rainfall and ET coverages are composed of daily values from July 1989 to January 2013 on a 12 by 12 kilometer grid for the entire study area and beyond (**Figure 8**). The data for each point was converted into a daily time series spanning 21 years (1992 to 2012).

According to SJRWMD, the rainfall data was not adjusted but the ET data was adjusted to better match the higher-quality ET estimates available for the District from the USGS (fl.water.usgs.gov/et/). The USGS ET data was not available for the entire study area, which is why it was not used in the place of the NLDAS data. In addition, the ET data near the coast was very erratic and suspect. Therefore, based on guidance from SJRWMD, the ET points within 25 km of the coast were excluded from the dataset.

The nearest rainfall and ET station was assigned to each polygon of the ILGs.

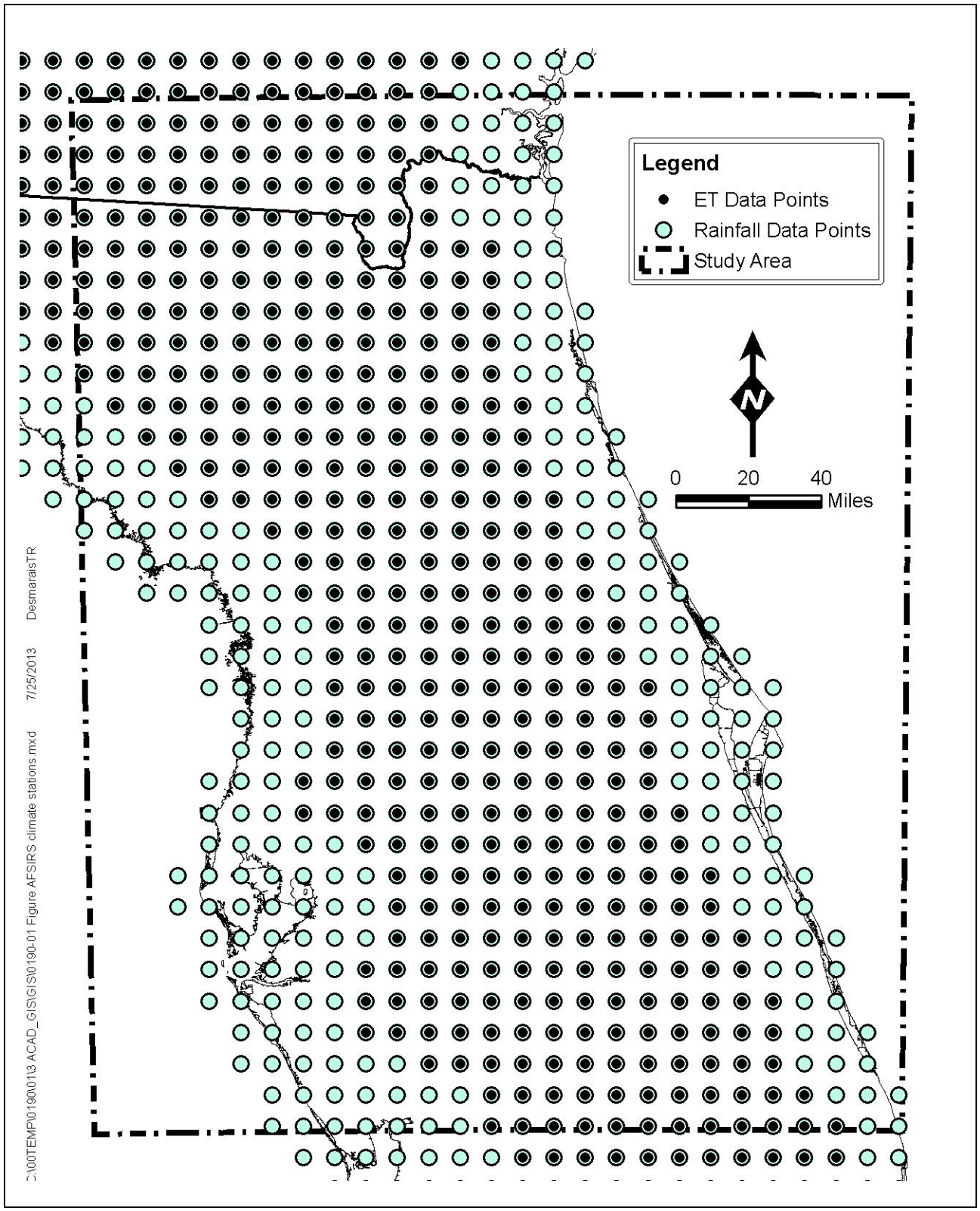



**Figure 8 Daily Rainfall and ET Data Locations**

### 3.4.4 Depth to Water Table

SJRWMD also provided a coverage of depth to the water table that was used for the District's GWRAPPS program (version 1.4). This data consists of 115 by 115-meter gridded data encompassing the entire District and parts of adjoining WMDs (**Figure 9**). This coverage was joined for the development of the irrigation water demand modeling (see next Section). For the portion of the study area outside of the depth-to-water coverage of 3 feet was used. In the model, if a particular crop's root zone extends into this user-specified depth-to-water, a portion of the crop's water requirements is assumed to be satisfied from the water table. In the AFSIRS database, the only crops that have root zones deeper than 3 feet are alfalfa, citrus, and other tree crops.

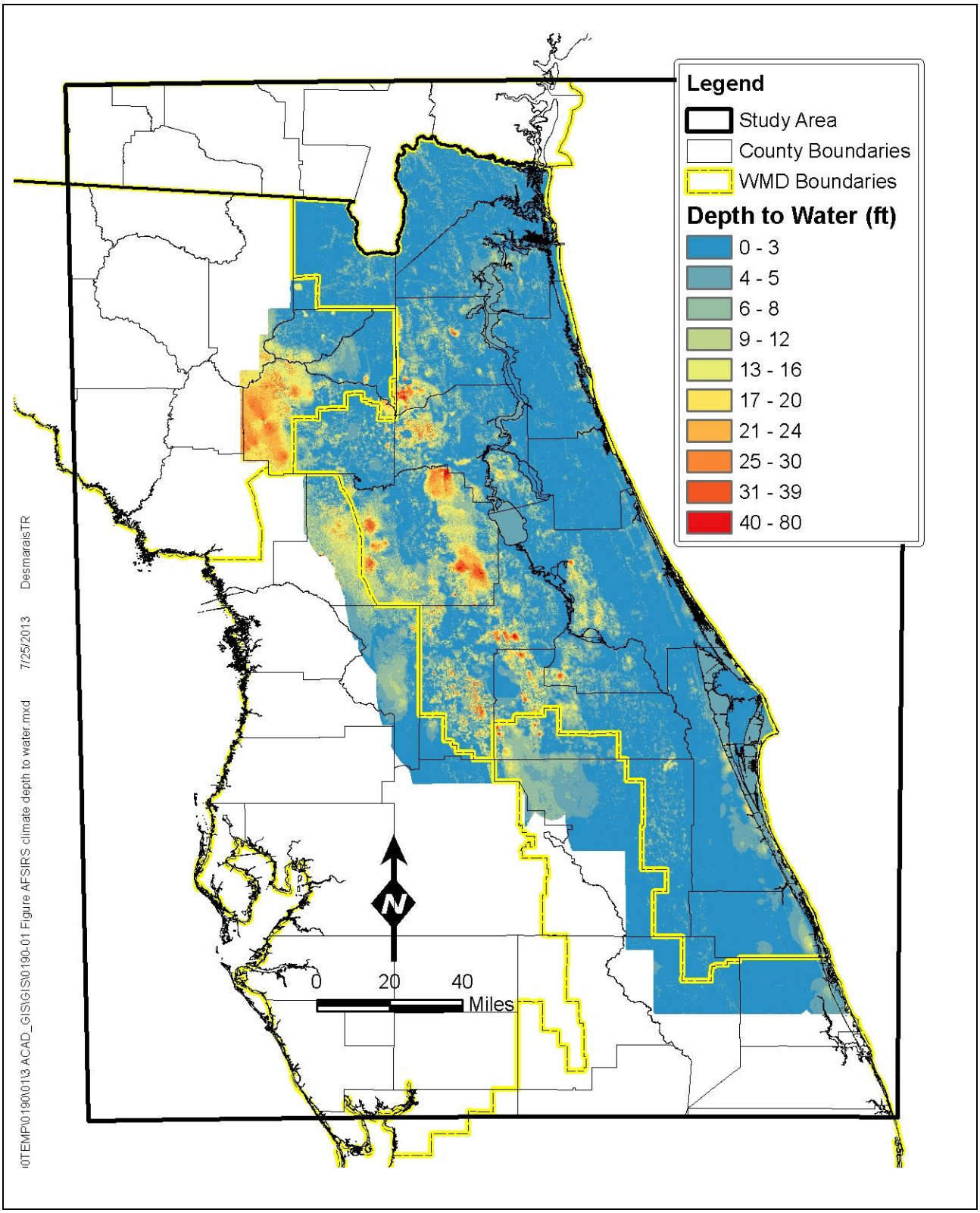



**Figure 9 Extent of Depth to Water Coverage**

# Section 4 Irrigation Estimates

The ILGs were developed thinking ahead to the requirements that would be necessary for estimating the irrigation water use. At the onset of this project, it was envisioned that the SJRWMD EN-50 data would be used whenever available and that a crop water demand model would be used to estimate water use for parcels without this information.

However, a closer inspection of the EN-50 data identified numerous potential ways this could introduce errors that would adversely impact the CFACT model. As mentioned in the previous section regarding the comparison of the GIS-derived irrigated lands and the Ag census data, the GIS coverage is one fixed moment in time. The areas associated with the EN-50 may vary with time. Unless the cropped area is recorded and verified for each month or season, it will be problematic to compare the per-acre water use to results from a crop irrigation model. If the actual water use data were used with the CFACT optimization tool, the model would automatically select the farms with an apparent high per-acre water use because the savings would be inflated relative to the area-based costs for the improvements. Thus to 'level the playing field', it was decided that regardless of the existence of the EN-50 data, a crop irrigation demand model would be used to estimate water use for the entire study area.

The EN-50 data may still be used in the groundwater modeling effort by attaching the data to the Irrigated Areas polygons, or by replacing the coverage entirely. Since the EN-50 data are already in a format that can be used by a groundwater model (in terms of well pumpage), no manipulation of this data using the GIS analysis in this project would be required. However, using the EN-50 data still leaves the question of how to estimate the corresponding recharge.

For the remainder of this report, all water use estimates refer to the results from the crop irrigation demand modeling.

## 4.1 Crop Irrigation Demand Model Selection

There are two main methods for computing crop irrigation requirements that are commonly used for Florida, the Blaney-Criddle (B-C) method and Agricultural Field-Scale Irrigation Requirements Simulation (AFSIRS) model. While there are variations between districts, the B-C model is used for permitting purposes by SWFWMD, SFWMD, and SJRWMD. The SJRWMD CUP Handbook states that the Blaney-Criddle (B-C) method should be used, but SJRWMD encourages the use of their online GIS-Based Water Resources and Agricultural Permitting and Planning System (GWRAPPS) program, which is essentially a user interface for AFSIRS.

The B-C method is a monthly analysis that was developed by the Soil Conservation Service (USDA, 1970). The details of this procedure are provided in Appendix A of the Part 623 of the National Engineering Handbook (*80*). The application of the B-C method is also discussed briefly in the SJRWMD CUP Handbook. The main advantages of the B-C method are the relatively simple approach, extensive documentation, and low input data requirements.

AFSIRS was originally developed in 1990 by the University of Florida and was later updated in 2008 (*14, 25, and 26*). The AFSIRS model simulates a daily soil water balance and attempts to predict the timing and magnitude of irrigation events based on soil moisture conditions and an irrigation water management (IWM) strategy. While the AFSIRS model is traditionally more cumbersome and data-

intensive than the B-C method, the integration of the GWRAPPS user interface makes this model fairly intuitive and easy to use.

AFSIRS was selected as the model used to estimate crop irrigation demands. One clear advantage of AFSIRS over the B-C model is the time step. Because AFSIRS uses daily time steps, it has the potential to mimic the relationship between weather conditions and irrigation application. The B-C model only considers monthly rainfall totals and thus makes no distinction for day-to-day weather patterns (i.e., a month with 30 days with 0.5 inches of rain per day would be treated the same as a month with only one 15-inch rain event).

For both the CFACT model and groundwater modeling, the goal of the irrigation estimating is to mimic actual water use as accurately as possible. AFSIRS represents a very ideal IWM scenario whereby the conditions of a uniform soil are known at the start of each day, and, in advance, exactly how much it will rain that day. In reality, soil moisture monitoring is not widespread and many other factors go into the decision to irrigate. A farmer endeavors to develop an IWM that is most economically viable and this varies widely by crop type and a number of other factors. In this sense it is logical to assume that a higher-value crop and/or crops at water-sensitive stages would have a completely different IWM strategy than a low value crop. However, the more precise, daily time step nature of the AFSIRS model offers a greater potential for refinement to better mimic actual water use for a given crop, location, and soil type.

A recompiled version of AFSIRS was provided by SJRWMD for this project. The model code was revised to enable batch processing (up to about 25,000 runs at a time), to run one year at a time, and to produce a customized monthly output. The model was set to run in 'Net' irrigation mode with the intention that irrigation application efficiency would be factored during processing of the model results.

## 4.2 AFSIRS Model Setup

The application of the AFSIRS model to the ILGs required converting and/or assembling the following data elements:

- Soil Type: The AFSIRS model was originally set up with 766 of the major soil types in Florida. The predominant SSURGO soil types in the ILG, which greatly exceeds this number, had to thus be categorized. For most soils, this was accomplished easily because the soil descriptions matched identically. However, for rarer soils and the soils in Georgia, a representative soil was selected based on the soil texture in the descriptions (e.g., 'sand', 'loamy sand', etc.). A more precise way to handle this data would be to develop county-specific AFSIRS soil databases because the parameters used by AFSIRS (soil profile depth and available water content) vary for the same soil between the counties. An alternative approach would be to reconfigure the batch model to accept custom soil parameters. Either approach would be a fairly extensive effort and was outside the scope of this project.

- Crop Type: Similar to the conversion of the soil types to conform to the AFSIRS database, the crop types were assigned an AFSIRS crop type (see **Exhibit B-1 in Appendix B**). For crops not in the AFSIRS database, a similar crop was assumed based on the literature. **Tables B-2 and B-3** in Appendix D provides details on how the crop types were categorized into the AFSIRS format.
- Growing Season: AFSIRS simulates crops as either perennials (year-round irrigation season) or annuals (seasonal). For the annuals, AFSIRS requires user-defined planting and harvesting dates. Tables B-2 and B-3 also show the assumed planting and harvesting dates, along with the reference that was used to define this period. Since crop planting dates and duration of the growing season data are presented as ranges, median values were selected.

  Multiple simulations were executed for double-and triple cropped systems, one model run per crop. Each county in the study area was designated as either in the North and Central zone (*112*) because growing seasons vary by location (see **Table B-4** in Appendix D). In reality, there are a multitude of crop/planting data combinations that change from year to year based on market prices, weather, and other factors.

  The pre-processing program used to set up the batch AFSIRS input files allows for up to three growing periods per crop. The model results are later merged to obtain a monthly time series for each polygon.
- Irrigation System**:** Similar to the conversion of the soil types to conform to the AFSIRS database, the irrigation systems were assigned an AFSIRS irrigation system type. **Table 6** below is a summary of the AFSIRS irrigation types and their corresponding parameters.

**Table 6 AFSIRS Irrigation Types and Parameters**

| AFSIRS Code | Irrigation Application Efficiency (EFF) | Fraction of Soil Surface Irrigated (ARZI) | Fraction of ET extracted from irrigated root zone (EXIR) | Description |
|---|---|---|---|---|
| 1 | 1 | 1 | 1 | User-specified system |
| 2 | 0.85 | 0.5 | 0.4 | Micro, Drip |
| 3 | 0.8 | 0.5 | 0.4 | Micro, Spray |
| 4 | 0.7 | 1 | 1 | Multiple Sprinkler |
| 5 | 0.2 | 0.3 | 0.7 | Sprinkler, Container Nursery |
| 6 | 0.7 | 1 | 0.7 | Sprinkler, Large Guns |
| 7 | 0.6 | 1 | 1 | Seepage, Subirrigation |
| 8 | 0.5 | 1 | 0.7 | Crown Flood (Citrus) |
| 9 | 0.5 | 1 | 1 | Flood (Rice) |

- Irrigation Management Option**:** AFSIRS determines the timing and magnitude of irrigation events based on a daily soil water balance and an assumed management option. The model has three options:
  - Normal Irrigation – An irrigation event occurs if soil storage reaches the maximum allowable depletion (MAD) for the crop. The soil is irrigated to field capacity for each event. This was the option selected for this project.

- Fixed Depth - An irrigation event occurs if soil storage reaches the maximum allowable depletion (MAD) for the crop. A fixed amount of water is applied for each irrigation event.
- Deficit Irrigation - An irrigation event occurs if soil storage reaches the maximum allowable depletion (MAD) for the crop. The soil is irrigated to only a fraction of field capacity.

## 4.3 Unadjusted AFSIRS Results – Net Irrigation Requirements

The output from the batch model includes month-by-month results of the irrigation applied for each simulation. **Tables B-5 and B-6** of Appendix D are a summary of the net irrigation requirements by crop for the 1995 and 2010 data sets, respectively. **Tables B-7 and B-8** of Appendix D provide a more detailed view of this same information, where the net irrigation requirements for each crop are broken down by irrigation system.

## 4.4 Adjusted AFSIRS Results – Gross Irrigation Requirements

The AFSIRS modeling was performed in 'net' irrigation mode, which means the results are the amount of water needed to prevent undesirable crop water stress assuming a 100% efficient system. The 'gross' irrigation requirement incorporates a system's irrigation efficiency. The term 'irrigation efficiency' is often used to mean two different things. From a water management perspective, it means the amount of water used by the crop divided by the total amount of water withdrawn. This is how the term is applied in consumptive use permitting when the net irrigation requirement is converted to a reasonable gross water demand.

From a farmer's perspective, however, the more meaningful definition of irrigation efficiency is the effectiveness of an irrigation practice at improving crop yield or market value. In this light, the entire practice of irrigation functions as a sort of safeguard that protects the farmer's investment from reduced yields associated with dry weather. Drainage systems, fertilization, pest control, and other Ag practices essentially serve the same function. The costs, benefits, and potential downside of all these practices are only part of the complex balancing act that an Ag producer must manage to be successful (other factors include highly variable market prices, cultivation logistics, and more). While this study is focused on the water management definition, it is helpful to remember that a farmer's decision to irrigate or not on any given day is more complicated than the simple soil moisture content trigger used by AFSIRS.

The conversion of AFSIRS-computed crop irrigation requirement to an estimate of the amount of water actually applied by the producer must incorporate the effectiveness of the irrigation system to deliver water to the crop as well as irrigation water management practices. For this reason, the NRCS Farm Irrigation Rating Method (FIRM) was used.

### 4.4.1 Farm Irrigation Rating Method Theory

The Farm Irrigation Rating Method (FIRM) is typically used in irrigation audits to assess the actual efficiency of existing systems and evaluate the potential benefits from improved maintenance practices or design. To understand how FIRM works, it is necessary to understand the basic theory regarding irrigation efficiency. Irrigation efficiency is commonly broken into three parts:

- Storage efficiency (Es),
- Conveyance efficiency (Ec), and
- Application efficiency (Ea).

The overall efficiency of a system is the product of these three parts. Most studies focus on Ea exclusively as the other two variables are very site-specific. Nonetheless, Es and Ec can be significant in many situations (e.g., irrigation ponds, open irrigation supply ditches).

FIRM operates solely within the Ea term. The Ea term is considered to be the product of the 'potential' irrigation application efficiency (Ep) for a given irrigation system and a management factor (Fm). FIRM is essentially a rational methodology for computing Fm based on a number of factors, such as:

- Flow measurement practices and irrigation scheduling
- Maintenance of the system (e.g., replacing sprinkler heads regularly)
- Experience and skill of the operator
- Site and System conditions (e.g. application uniformity, pressure variations, etc.)

FIRM was run for the major classes of irrigation systems to determine appropriate Fm factors for three classes of O&M: deferred, reactive, and proactive. The deferred class corresponds to poorly managed and maintained systems where poor uniformity or management leads to over-watering the entire crop in favor of meeting the water requirements of trouble areas (e.g., edges of the field, sandy spots, etc.). The proactive, on the other hand, corresponds to a very well managed and maintained system, with one or more BMPs such as irrigation scheduling, soil moisture or crop stress monitoring, full-time irrigation system operators, and a well-designed system located in a suitable field. The reactive class falls somewhere between the deferred and proactive classes. **Table 7** lists the values for the irrigation application efficiency for new systems ('potential' irrigation application efficiency) and the three classes of O&M. A more detailed description of how these numbers were derived is provided in Section 5.

**Table 7 Irrigation Application Efficiency for various O&M Classes**

| Existing System | Efficiency at Maintenance Levels | | | |
|---|---|---|---|---|
| | New | Proactive | Reactive | Deferred |
| Subsurface Drip | 90% | 88% | 72% | 63% |
| Surface Drip | 90% | 88% | 72% | 63% |
| Micro Spray | 85% | 83% | 68% | 56% |
| Center Pivot | 85% | 79% | 65% | 56% |
| Impact sprinkler | 75% | 70% | 57% | 50% |
| Sprayhead sprinkler | 75% | 70% | 57% | 50% |
| Linear Move | 85% | 79% | 65% | 56% |
| Traveling gun | 70% | 65% | 53% | 46% |
| Wheel roll | 70% | 65% | 53% | 46% |
| Stationary gun | 75% | 70% | 57% | 50% |
| Pipeline seepage | 70% | 69% | 60% | 43% |
| Flood | 60% | 57% | 49% | 38% |
| Container nursery impact sprinkler | 50% | 46% | 38% | 33% |

*Values compiled from Sources 3, 7, 18, 19, 25, 35, 37

### 4.4.2 MIL Data Analysis and O&M Classes

Data from the Mobile Irrigation Lab (MIL) reports provided by FDACS were used to define an O&M class to each Irrigated Areas polygons, to the extent afforded by the data. A total of 3,380 MIL records were analyzed to categorize and profile the number and type of problem codes by crop type and irrigation system type. **Table B-9** in Appendix D lists the problem code and problem description included in the MIL reports.

**Figure 10** shows the number of MIL audits categorized by crop and irrigation system. The majority of the crop types audited are for citrus and nursery operations (58%) and the remaining 42% is composed of about 22 other crops. Almost all of the MIL audits (98%) were conducted for Micro Spray, Fixed Sprinklers, Center Pivots, and Micro Drip systems.

The MIL reports do not include a farm name or any means to identify a location except for a County and ZIP code. **Figure 11** shows the distribution of MIL reports by zip code. Since data is lacking in many areas of the model domain, a two-tiered approach was used to assign an O&M class to the polygons. In both cases, a minimum number of 20 reports were required to establish a rule. The first tier separates farms by irrigation system type, crop type, and zip code.

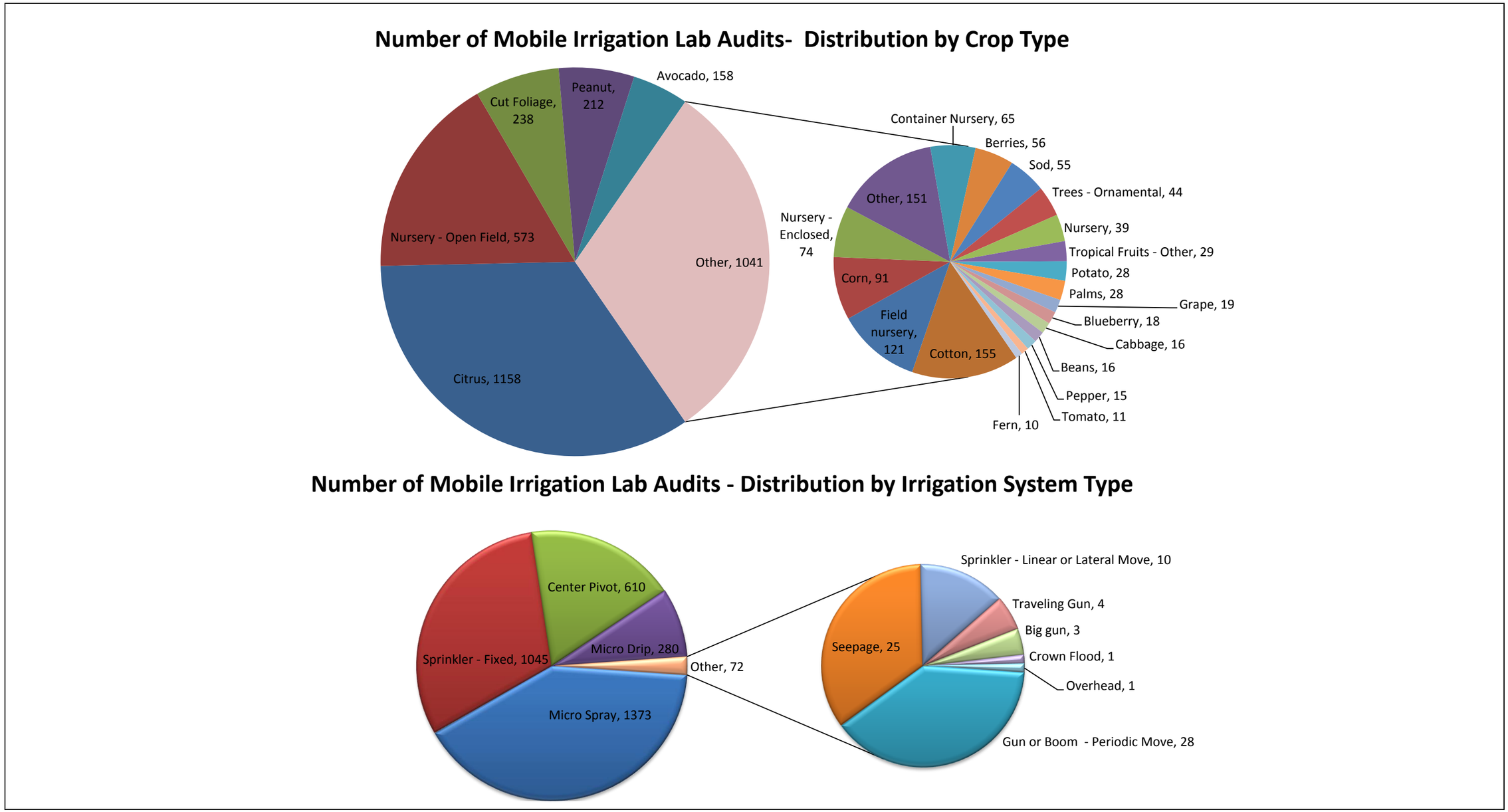



**Figure 10 Number of MIL Records by Crop Type and Irrigation System**

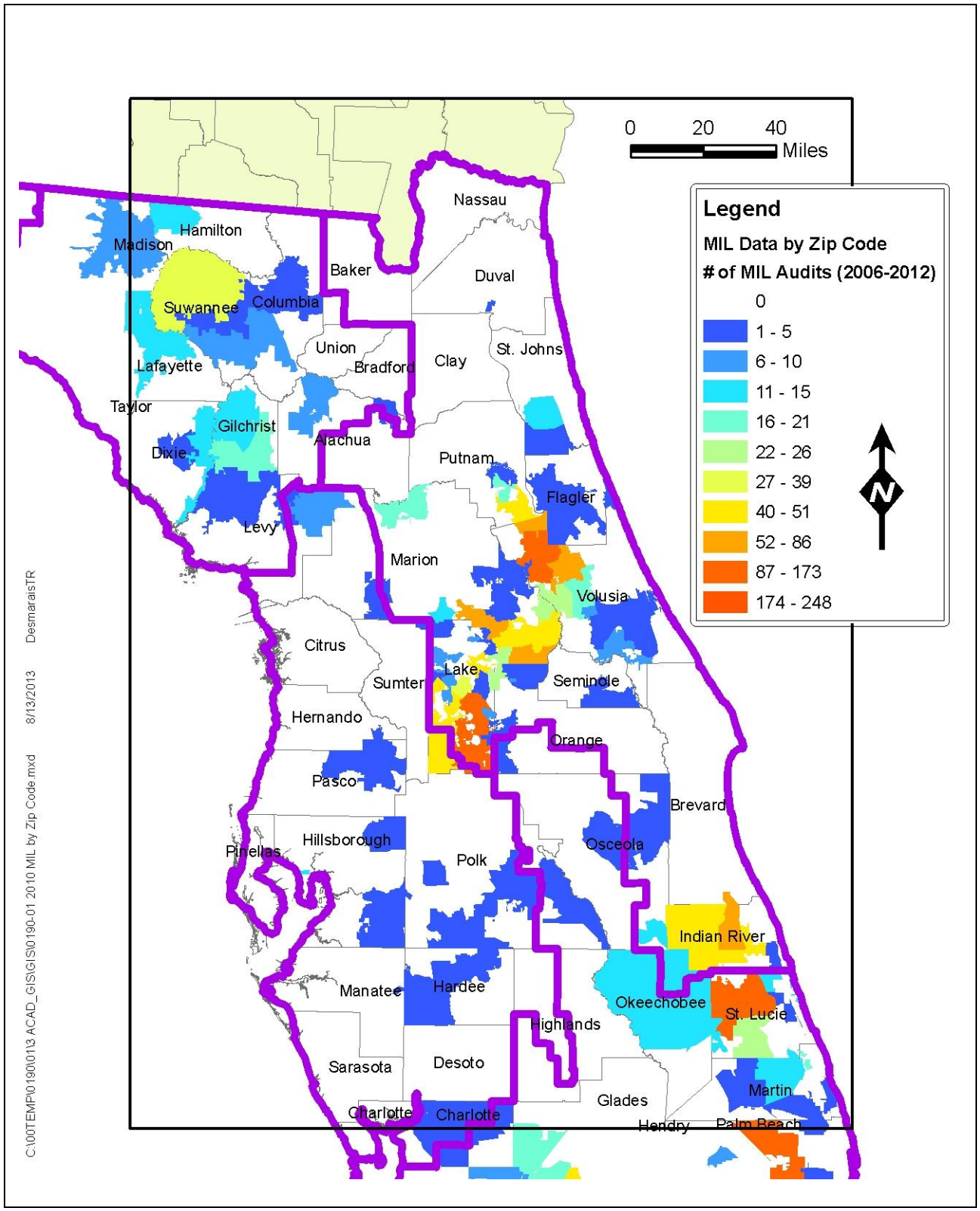



**Figure 11 Grouping of MIL Reports by ZIP Code**

**Table B-10** in Appendix D provides a listing of the first and second tier categories, the occurrence frequency of each problem code, the average distribution and/or emitter uniformity, and the assumed O&M class for each. Distribution and emitter uniformity is a measure of how even the water is distributed over the crop. Poor uniformity does not directly relate to a lower application efficiency and greater water use in the traditional sense (water used equals the net irrigation requirement divided by application efficiency) because water use is ultimately up to the farmer. However, it is reasonable to assume a farmer would generally over-water certain areas to some extent in favor of meeting the water requirements of their 'trouble spots'.

Polygons that did not fit into either first- or second-tier categories were assumed to have a default O&M class of "reactive".

### 4.4.3 Gross Irrigation Requirements

**Table 8** is an abridged summary of the gross irrigation requirements for the more prevalent crop types within the study area, using the 2010 ILG. The highest per-acre water use among the crops was from nurseries, which is potentially misleading because the area for this type of operation is difficult to define because of varying plant varieties, container spacing, and sizes.

**Table 8 Gross Annual Irrigation Requirements for the 2010 Irrigated Lands Geodatabase**

| Crop | Total Area (acres) | Average Irrigation Application Efficiency (%) | Gross Annual Irrigation Requirement (inches) | | |
|---|---|---|---|---|---|
| | | | Wet Year[1] | Average | Dry Year[1] |
| Citrus | 510,522 | 68% | 7.1 | 12.6 | 18.3 |
| Sod | 85,378 | 53% | 21.4 | 29.0 | 36.3 |
| Sugar Cane | 85,260 | 60% | 21.8 | 28.0 | 37.1 |
| Pasture | 76,223 | 60% | 22.6 | 29.1 | 37.2 |
| Strawberries | 27,170 | 72% | 5.7 | 8.2 | 11.6 |
| Unspecified Row Crop | 23,521 | 65% | 8.6 | 11.3 | 13.7 |
| Unspecified Row Crop/Pasture | 20,976 | 65% | 17.3 | 22.9 | 28.3 |
| Potatoes | 19,036 | 60% | 3.8 | 6.2 | 8.3 |
| Hay | 17,510 | 53% | 6.4 | 12.3 | 17.4 |
| Winter Wheat | 14,363 | 53% | 0.0 | 0.3 | 0.4 |
| Sorghum | 11,657 | 53% | 7.0 | 10.6 | 14.5 |
| Rye | 10,788 | 53% | 0.2 | 0.6 | 1.0 |
| Sweet Corn | 7,452 | 53% | 6.6 | 9.4 | 12.0 |
| Tomatoes | 7,009 | 71% | 7.2 | 9.1 | 10.7 |
| Watermelons | 6,881 | 63% | 6.4 | 9.3 | 11.9 |
| Container Nursery | 6,460 | 64% | 32.4 | 38.1 | 44.3 |
| Field Nursery | 5,869 | 68% | 22.2 | 27.6 | 33.2 |

[1]Wct year calculated as the average of the 20th percentile irrigation requirements of each polygon based on the 21-year simulation period. Dry year was calculated similarly for the 80th percentile irrigation requirement.

## 4.5 Other Non-Irrigation Water Uses

The estimates provided in this report pertain to irrigation requirements only. Other water uses on a farm include, but are not limited to:

- Frost Protection
- Crop Establishment (annuals)
- Relief from Other Stress (e.g., heat, salinity)
- Fertigation, Chemigation, and Pesticide Mixing

Incorporating these additional factors is outside the scope of the current work. However, the framework of the ILGs could facilitate such a task, with the addition of more datasets.

Frost protection is used on a variety of crops in areas such as Central Florida where freezes occur fairly regularly but not every year. Citrus, strawberries, and ferns are examples of crops commonly protected from freezes. While strategies vary by crop and the capabilities of a particular irrigation system, the most common method is to apply a constant high supply of water to the plant. As ice is continually formed around the plant, the heat gained from the transition of a liquid to a solid (heat of fusion) helps to protect the plant. It is recommended that 0.25 to 0.40 inches per hour of water be applied so that the heat of fusion and heat of vaporization (liquid to water vapor) balance (*106*). If too little water is applied, the effect can be more damaging than if no water were applied at all. For some farms, the capacity of the irrigation system limits frost protection to a portion of the field. The high water requirements from frost protection have led to very high short-term groundwater drawdown, and more and more farms are adding reuse ponds for this very purpose. Another strategy used, which offers less of a guarantee but at least some measure of protection, is to flood or moisten the ground before the freeze occurs to act as a heat buffer. So in addition to the obvious input requirement of temperature, the many factors related to freeze protection make it inappropriate to estimate this water use given the scope of this project and data collected thus far.

Crop establishment, while seemingly a simple exercise to incorporate into the current irrigation estimates, depends on antecedent weather conditions and the timing of the planting date. While antecedent moisture conditions could potentially be inferred by analyzing the AFSIRS results for a perennial crop in a given area, the planting dates for a particular crop are assumed from the literature and could vary considerably.

Water used to relieve heat or salinity stress can be significant for some farms. Some farms base a portion their irrigation management strategy (or sometimes entirely) on these factors. Crops on sandy soils with low water-holding capacity may require daily applications of water to relieve heat stress. For farms irrigated with saline water, the accumulation of salt within the root zone makes it more difficult for the roots to extract water. If sufficient rains do not occur to periodically flush the root zone and clear out the salinity, the grower must increase the supply of water to the root zone by irrigating more frequently and/or in greater amounts. Site-specific data would be required to incorporate this type of water use, and is outside the scope of the current work.

Water used for fertigation, chemigation, and pesticide mixing is typically small and is ideally scheduled along with regular irrigation events. While certain irrigation systems enable a farm to do these activities using water, it does not necessarily mean it is the method of choice. Granular fertilizers, aerial applications, spray trucks, and other alternatives offer their own unique advantages. Site-specific data would be required to incorporate this type of water use, and is outside the scope of the current work.

## 4.6 Irrigation Water Use Estimates Summary

The gross irrigation water demands discussed in the previous section were multiplied by the adjusted polygon areas to determine the annual and monthly estimates of irrigation-related water use. The average annual water use from the current work ranges is 886, 1286, and 1688 million gallons per day (mgd) for a wet year, average year, and dry year, respectively.

A comparison of the 2010 irrigation water use estimates and the USGS 2005 Agricultural water use estimates (*86*) is provided on **Table B-11** of Appendix B. Isolating only those counties that reside entirely within the MegaModel and within Florida, the average annual irrigation water use is 814, 1,183, and 1,551 mgd for a wet year, average year, and dry year, respectively. While there are some discrepancies at the county level, overall the numbers are in reasonable agreement. The USGS 2005 Ag Water Use estimate for these same counties was 1,215 which fits between an average and dry year. While there are numerous difference in how these values were calculated and what is included, this comparison does provide some level of assurance that the current values are 'in the ballpark' with previous estimates.

**Tables B-12 and B-13** of Appendix B provide a more detailed county-by-county breakdown of the irrigation water use estimates by crop and county, for 1995 and 2010, respectively. As discussed previously, no effort was made to calibrate or change the crop types for each County using the census data. The only adjustments that were made in this analysis were discussed in the previous section, and were applied only to the assumed percentage of irrigated acreages of certain crops. A more detailed county-by-county crop type refinement is beyond the scope of the current work.

Lastly, **Figures B-1 to B-12** of Appendix B shows the average adjusted irrigation amounts for the study area for each month of the year. The adjusted irrigation amount was calculated based on the adjusted polygon area (which include the crop adjustment factors discussed in Section 3) and gross irrigation requirements.

# Section 5 CFACT Development

Early in the project, a trial run of the GIS processing and integration with the CFACT model was executed to verify the overall approach and identify the additional data requirements. The county selected for this analysis was Putnam County because it was within the SJRWMD and the version of the CFACT model at the time appeared ready to handle the input. It was during the development of this trial run that the preliminary assumptions for the CFACT model were defined. Following completion of the Irrigated Areas database, these assumptions were expanded to support the wider variety of crop types that were generated during the GIS processing. The pre-processing was also refined to facilitate adding new crops.

For the development of the CFACT discussed in this section, a subset of only SJRWMD parcels from the 2010 ILG was used.

## 5.1 CFACT Overview

In general, the goal of the CFACT optimization routine is to maximize water savings while minimizing cost. For each parcel, the model first calculates the initial gross irrigation requirement and annual maintenance cost based on the existing irrigation system type, the net irrigation requirement, and the assumed O&M class (proactive, reactive, and deferred). These input parameters are defined by the CFACT input GIS coverage (a subset of the AFSIRS-linked ILG).

Next, the model evaluates the annual water savings that could be gained by implementing a list of available BMPs, which include either improving the O&M class or installing new systems. The annual cost associated with the O&M options is simply taken to be the difference in cost between the initial and the selected O&M class. The cost for new systems is calculated as the difference between the O&M costs (new systems are assumed to have a 'proactive' O&M class), plus the new system cost of the system divided by the assumed service life.

An array of water savings and costs is thus generated by repeating the above calculations for each parcel. To help keep the list applicable to the type of crop being grown, a crop/irrigation system compatibility relationship was applied, which 'turns off' certain incompatible arrangements (e.g., a high pressure traveling gun could damage delicate row crops). The CFACT then iterates through the array of options until an optimal configuration of parcels and options is obtained. The model can currently be configured in one of two ways:

> Fixed Budget / Maximize Water Savings: The model ultimately turns options on or off (1 per parcel) within the constraints of the budget, then evaluates the water savings. The model iterates through the array, making adjustments until a maximum water savings value is obtained.
>
> Fixed Water Savings Goal/ Minimize Budget: The model ultimately turns options on or off (1 per parcel) within the constraints of the water savings goal, then evaluates the associated cost. The model iterates through the array, making adjustments until a minimum cost value is obtained.

## 5.2 Crop & Irrigation System Compatibility

A crop and irrigation system compatibility table was developed by defining categories of crops with similar characteristics as they relate to irrigation. **Table C-1 in Appendix C** provides a breakdown of the assumed compatibilities (Yes, No, or Unlikely) for the various combinations crop groups and irrigation systems.

The 'unlikely' category was assigned to combinations that, while not totally infeasible, are not commonly used due to practicality issues. For example, take the case of citrus. Most of the citrus grown in the SJRWMD uses micro spray irrigation, according to the GIS analysis, probably because it is very efficient and provides the best measure of frost protection. For the citrus crop matrix, a 'no' category for center pivots and linear move systems was applied because it is impractical for most mature citrus trees because the limbs would need to be trimmed back very frequently to allow the machine to pass through the field. Moreover, such a system would provide no means of cold protection. Stationary and traveling gun was classified as 'unlikely' because while it may not be optimal, using these systems for citrus would not pose the same O&M challenges that center pivots or linear move systems would. In the CFACT, the user chooses whether to include 'unlikely' crop & irrigation system combinations. Depending on the number of parcels being analyzed in the CFACT, it may be advantageous to reduce the number of computations by omitting the unlikely group.

A second table was developed for all of the crop types from the 2010 GIS data as well as some other crops grown throughout Florida. A more expansive list than what was needed was developed to allow for additional crops in the future. **Table C-2** of Appendix C provides the final crop and irrigation system compatibility matrix.

## 5.3 Irrigation Application Efficiency Assumptions

The assumed irrigation application efficiency assumptions previously presented in Table 6 were derived from the literature. Details of this analysis are provided in **Table C-3** of Appendix C. The final relationship for each irrigation system type was derived by first choosing a value from the literature near the upper-end of the spectrum and calling this the 'Potential' or 'New System' efficiency. Then using this number, FIRM was applied to obtain the efficiency for the proactive, reactive, and deferred O&M classes. FIRM variables that were modified to represent the differences between the O&M classes is provided in **Table 9**.

**Table 9 FIRM Variables**

| FIRM variable | Proactive | Reactive | Deferred |
|---|---|---|---|
| Md – Measuring Devices | Each Field | Farm Delivery | Farm Delivery |
| S – Irrigation Scheduling | Monitoring and Scheduling | Scheduling or Monitoring | None |
| I – Irrigation Operator | Full-time, trained | Full-time, untrained | Part-time, trained |
| M – Maintenance | Excellent | Good | Fair |

## 5.4 Cost Assumptions

As FIRM analysis was conducted to compute the factors affecting irrigation efficiency, the costs to do these things were also tallied based on assumptions derived from the literature. The corresponding breakdown for each of the irrigation systems is also given in Table C-3. **Table 10** is a summary of the final cost assumptions used in the CFACT.

**Table 10 Water Savings Options Cost Assumptions**

| Irrigation System | Service Life (years) | New Installation Costs ($/ac) | New Installation Costs Prorated Over Service Life ($/ac/year) | Proactive ($/ac/year) | Reactive ($/ac/year) | Deferred ($/ac/year) |
|---|---|---|---|---|---|---|
| Subsurface Drip | 7.5 | $1,000 | $133 | $187 | $130 | $96 |
| Surface Drip | 7.5 | $1,000 | $133 | $183 | $120 | $88 |
| Micro Spray | 7.5 | $1,000 | $133 | $181 | $131 | $88 |
| Center Pivot | 15 | $400 | $27 | $79 | $57 | $28 |
| Impact sprinkler | 7.5 | $1,600 | $213 | $194 | $146 | $100 |
| Sprayhead sprinkler | 7.5 | $1,600 | $213 | $181 | $129 | $95 |
| Linear Move | 15 | $500 | $33 | $84 | $61 | $31 |
| Traveling gun | 10 | $350 | $35 | $163 | $116 | $86 |
| Wheel roll | 15 | $350 | $23 | $163 | $116 | $86 |
| Stationary gun | 15 | $350 | $23 | $160 | $114 | $85 |
| Pipeline seepage | 15 | $65 | $4 | $104 | $63 | $43 |
| Flood | 15 | $65 | $4 | $104 | $63 | $43 |
| Container nursery impact sprinkler | 15 | $1,600 | $107 | $309 | $209 | $130 |

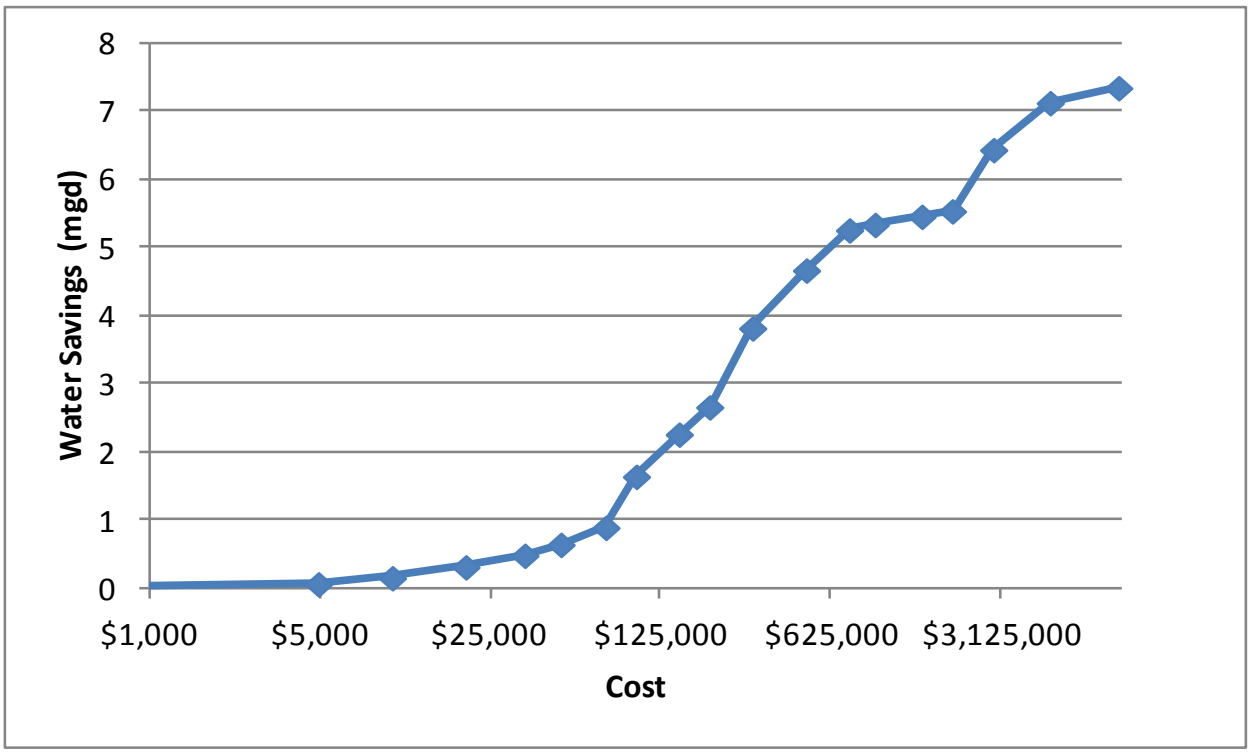
## 5.5 CFACT Test Case

Early in the development of this project, a county-scale test case of the CFACT model was prepared using Putnam County as the example. This county was selected mainly because there was sufficient MIL data available to characterize various irrigation practices and crops.

The Putnam County dataset was simulated in the CFACT model by aggregating the parcel data by irrigation type and crop. This simplification was made to reduce run times so that several approaches to the data could be tested. For example, the model can be used to maximize water savings given a fixed budget or minimize the cost to achieve a particular water savings goal.

**Figure 12** shows a graph of the results when a range of fixed budgets were assumed to determine the potential water savings. It is important to bear in mind that these results are preliminary and will be refined as the project continues. For fixed budgets of $100,000 or less, the CFACT is limited by the cost of the potential water savings practices. The water saved per dollar spent substantially improves for fixed budgets ranging between $100,000 and $0.75 million because the most effective water saving practices are selected. Beyond this, water savings flattens out until a fixed budget of about $2 million is used, indicating that the most costly water savings practices are utilized.

**Figure 12 Cost-Water Savings for CFACT County-Scale Demonstration Simulation**



### 5.6 Full-Dataset CFACT Runs – Preliminary Results

Following the completion of the study area wide GIS processing and irrigation estimates, the SJRWMD polygons were extracted from the 2010 ILG and used as input to the CFACT model. The model was run by creating 32 groups according to the predominant crop and irrigation system combinations, which accounts for roughly 95% of the irrigated acreage within SJRWMD.

**Figure 13** illustrates the relationship between water savings and cost for this scenario. In general the two trends agree, however, the full dataset version is more erratic than the Putnam County data. This is the result of the data aggregation process and the way the CFACT model is set up, which treats each parcel as an 'all or nothing' type approach The same holds true for the county-scale analysis, only to a smaller extent. For this reason, the graphs on Figures 12 and 13 are provided only to demonstrate one of the ways the CFACT can be applied. Ideally, the CFACT could be set up to consider partial BMPs as alternatives. However this would greatly increase the number of options the program must consider during the optimization routine, quite possibly increasing solver time to that of running the detailed parcel data in the first place.

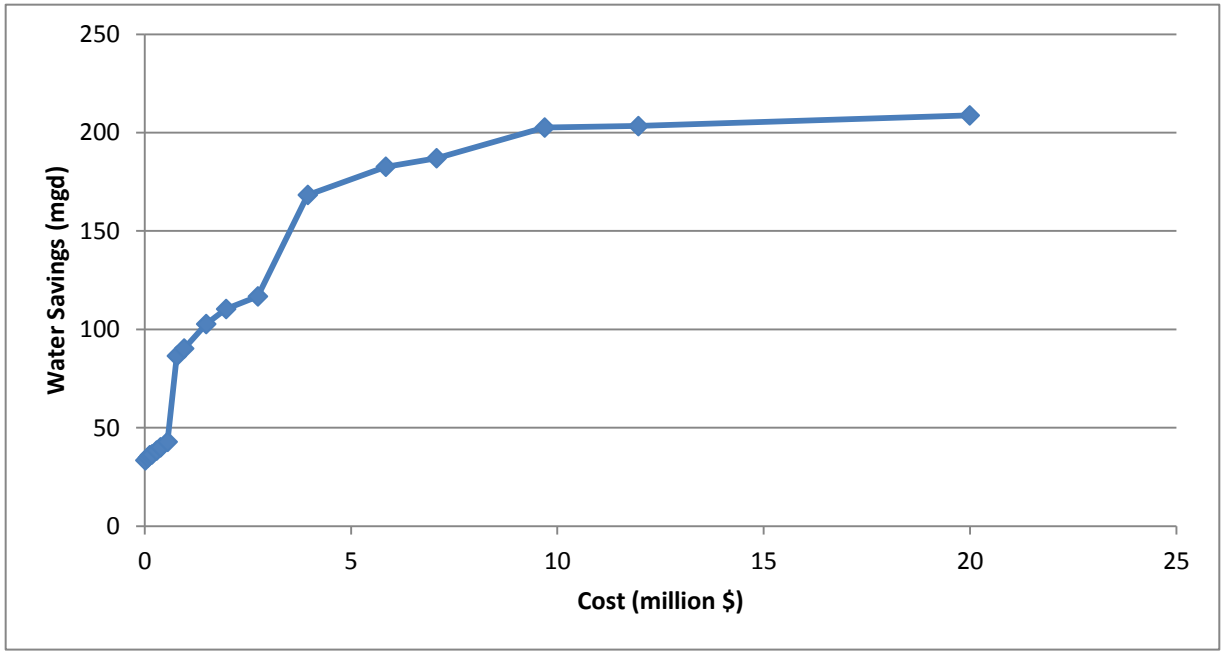



**Figure 13 Cost-Water Savings for CFACT Full-Scale Demonstration Simulation**

# Section 6 Summary and Conclusions

This project successfully completed the two stated objectives to the extent afforded by the available data. During the process of collecting and assimilating the data necessary to develop the CFACT and develop the irrigation estimates, several areas were identified that need improvement. While a very good starting point, the deliverables for this project have limitations that will be discussed in the following sections.

## 6.1 GIS Processing Summary

From a GIS perspective, the Ag Lands and Irrigated Lands Geodatabases represent a considerable improvement in accuracy compared to solely using the NASS data, which was the only model-wide input dataset available. Areas that were defined using limited data (e.g., SFWMD, SRWMD) were more aggressively tensioned to the Ag Census data, whereas areas with detailed and field-verified input coverages were left unaltered.

The GIS coverages would be best improved upon by using aerial imagery (for the 1995 or 2010 time periods) and digitizing fields. Ideally, this would be carried out with time-variable imagery (some irrigated areas are apparent only for a particular season) and with the Ag Lands and Irrigated Lands as a backdrop. These coverages will facilitate editing and often will provide a link to permitting information for a particular parcel. An example of how editing would be facilitated is the removal of wetland areas (as defined by FLUCCS) using the Source Codes.

Even with improved definition of the irrigated layers through aerial imagery, the GIS coverages still represent only one moment in time. For residential and commercial land uses, this 'snapshot' does not typically pose too great a problem. Ag land use and irrigation can vary significantly from season to season or year to year. However, in theory, the effect of this problem is diminished as the focus is placed on larger areas at a time (e.g., County-wide, District-wide).

## 6.2 Irrigation Estimates Summary

The AFSIRS modeling provides an estimate of the Irrigated Demand for each parcel in the model domain. Thus, a dataset exists by which changes to the various input assumptions or other model adjustments can be compared that is relevant to the study area. The variables that are recommended for such an analysis include, but are not limited to:

- Irrigation Management – The results could be compared to the fixed depth or deficit irrigation options, which would in a sense evaluate these as BMPs to help save water.

- Depth to Water – While a practical and reasonable simplification at the time, the constant depth to water table assumption within AFSIRS is somewhat questionable because water tables typically fluctuate with rainfall patterns. Analyses by making global changes to depth to water would help to quantify the effect on model results, at a large scale.

- Weather Input – As the Irrigated Lands coverage is refined, the effect of climate change on rainfall patterns could be identified. How the rain falls is critical to irrigation management (both real world and modeled in AFSIRS). Longer periods with no rain and bigger rain events would ultimately lead to greater irrigation demands.

With additional refinements to the GIS coverages and better selection of input parameters, there would still be limitations to using a model such as AFSIRS. AFSIRS simulates the soil water balance and schedules irrigations accordingly, translating to a real-world situation where irrigation controllers are linked to a soil moisture sensor placed in the field. This is rarely the case for typical irrigation management. While the effect of human error is emulated within FIRM efficiency calculations, this spreads the error out over the entire season. In reality, a producer will be more willing to save water and wait for rain at certain times in a season.

Even with this fundamental limitation, AFSIRS remains the most precise irrigation demand model of those commonly used in Florida, and thus the best suited for attempting to mimic actual water use patterns.

If an effort is made to tension AFSIRS to actual water use, the assumed areas corresponding to the withdrawals should be carefully inspected for the time period the data are evaluated. Supply points serving more than one type of use (e.g., irrigation and equipment washing) should be adjusted or omitted. Adjusting the crop coefficients will change the rate of water removal from the soil water column, and thus cause a change to irrigation practices. An alternative and perhaps more direct way of attempting to tension to actual use would be to interview producers or review permitting forms to better understand the factors that drive their decisions.

## 6.3 CFACT Summary

The CFACT model is also considered to be a starting point. Refinement of the irrigation efficiency and cost calculations should be an ongoing effort as more data collected and new systems emerge. The following is a list of features that are recommended for addition or improvement. The data requirements to implement these features are typically extensive and would be impractical to attempt to characterize these on a large scale, and thus were not incorporated in this phase of the model development.

1. Pumping cost calculations – In many situations, switching from a high-pressure system to a lower pressure system is a cost effective option. To incorporate this into the CFACT, each farm must have the following information:

    - Source type: Surface water or groundwater defined. This could be accomplished by joining a CUP withdrawal point coverage.

    - Operating pressures: This may be extracted from the literature review, with typical values assigned.

    - Power Type: Diesel or Electric.

    - Pump details: Pump efficiency, horsepower, total dynamic head, etc.

2. Reduced Fertilizer, Pesticide, and other Chemical Costs – The change from one irrigation system to another may provide the opportunity to apply chemicals with water, which may or may not be of value to the producer. The type of chemicals used, how they are applied

(broadcast, banding, aerial, spray trucks, etc.), and how much is used varies drastically to meet the site-specific needs of the farm. Since this level of detail is not provided in the NASS statistics, the only way to obtain this reliable information would be from interviews with farmers and/or experts for a particular crop in a particular region. Moreover, the strategy for irrigation water management would be changed if a producer/farmer switched to fertigation or chemigation because water must be used to apply the chemical even in rainy weather.

3. Benefits from a Resource Perspective – The water-savings computed by the CFACT model represents a direct benefit to the resource at large. Secondary benefits may include reduced power consumption from less pumping (and/or operating at a lower pressure) and a reduced nutrient concentration in runoff or water leaching below the root zone. Incorporating these benefits into the analysis would require completing the analysis in items 1 and 2 above.

4. Crop- and Region-Specific Water Conservation BMPs – The applicability of the CFACT could be greatly improved by developing suites of BMPs that are applicable to a particular crop in a particular region. For example, the practices involved in growing citrus on a sand ridge are drastically different than growing citrus on flatwood soils. This could be accomplished by restructuring the CFACT and developing a more rigorous preprocessing routine. For each parcel, the model would look at the existing system and develop a list of specific BMPs that could be implemented. The factors included in the O&M classes could then broken down separately and more site-specific irrigation efficiency adjustments can be made.

These limitations and suggestions for enhancement may call for the development of a more site-specific optimization tool to determine the best path toward water conservation for each farm. The structure of the existing regional CFACT model is fairly robust and would be able to manage the incorporation of crop-specific BMPs as they become available, allowing the model to become a smarter and a more useful tool.

## 6.4 Conclusions

To the extent possible, this project was designed to maintain the integrity of the input data sets with as few assumptions as possible. Random spot-checking of the GIS coverages have revealed instances where the farm boundaries could be improved or the database corrected based on aerial imagery alone. However, to keep these results true to their original source, no efforts were made to manually modify the data. Readers should bear this in mind when comparing the results from this project to other efforts. Even though additional refinements could be made, this project established three milestones.

First, the compilation of Ag and Irrigated land for the entire study area (which encompasses most of Florida) represents the synthesis and standardization of many types of different data (land use, NASS crop data layer, soils, depth to water, etc.). A GIS coverage of this magnitude and detail could be leveraged in many ways beyond the objectives of this study. For example, this coverage would be useful in sub-regional surface or groundwater modeling because changes to a site's drainage system could potentially be inferred by the growing season of that particular crop. The

coverage could also be used to help develop public-private partnerships and innovative ways to meet growing water demands.

The second milestone is the development of the AFSIRS runs for all of the parcels within the study area. The summaries of net and gross irrigation requirements generated could be used as a convenient reference guide. Furthermore, the model pre-processing spreadsheets were set up to allow for easy manipulation of some of the key model assumptions and parameters (depth to water, irrigation management strategy, etc.). This allows for a unique opportunity to perform sensitivity analyses and model-to-model comparisons (e.g., AFSIRS vs. Blaney-Criddle) on actual farm sites. With careful processing of the EN-50 data, AFSIRS could be refined to develop an irrigation water management strategy that produces a better match with actual water use. Such refinements could then be plugged in globally to make sure a refinement to one type of crop in a particular location does not adversely affect the irrigation estimates elsewhere in the study area.

The third and final milestone is the completion of the assumptions used by the preliminary version of the CFACT. While the cost and efficiency assumptions will likely be refined in the future, having these base assumptions, along with the complete input data set, allows for fine-tuning of the model's optimization routine. Meanwhile, efforts can continue to refine the existing cost assumptions and develop new cost-benefit relationships.

At the field-level, Ag irrigation is difficult to characterize with any degree of certainty because of many factors that change year-to-year and season-to-season. However, from a wider perspective, this uncertainty can be managed by tensioning the data to published values. Developing the GIS coverages and irrigation estimates for such a large study area is an important step forward in better understanding Ag water use, which in turn will help our ability to predict future Ag water requirements and develop water conservation strategies.

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| 99 | NASS. *1992 Florida Census of Agriculture – County Data.* Prepared by the United States Department of Agriculture (USDA) National Agricultural Statistics Service (NASS) Table 8. |
| 100 | NASS. *2002 Florida Census of Agriculture – County Data.* Prepared by the United States Department of Agriculture (USDA) National Agricultural Statistics Service (NASS) Table 10. |
| 101 | NASS. *2002 Georgia Census of Agriculture – County Data.* Prepared by the United States Department of Agriculture (USDA) National Agricultural Statistics Service (NASS) Table 10. |
| 102 | NASS. *1992 Georgia Census of Agriculture – County Data.* Prepared by the United States Department of Agriculture (USDA) National Agricultural Statistics Service (NASS) Table 8. |
| 103 | NASS. *2007 Alabama Census of Agriculture – County Data.* Prepared by the United States Department of Agriculture (USDA) National Agricultural Statistics Service (NASS) Table 10. |
| 104 | NASS. *2007 South Carolina Census of Agriculture – County Data.* Prepared by the United States Department of Agriculture (USDA) National Agricultural Statistics Service (NASS) Table 10. |
| 105 | NASS. *2007 Georgia Census of Agriculture – County Data.* Prepared by the United States Department of Agriculture (USDA) National Agricultural Statistics Service (NASS) Table 10. |
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| 109 | Juanita Popenoe, PhD, 2008. *Lily-turf Liriope muscari.* University of Florida Institute of Food and Agricultural Sciences (UF-IFAS) Extension. Original publish date January 2008. |
| 110 | E.P. Miller and T.E. Crocker, 1994. *Oriental Persimmons in Florida.* Florida Cooperative Extension Service, Institute of Food and Agricultural Sciences, University of Florida. Publication date: April 1994. |
| 111 | Mark A. Mossler, 2001. *Florida Crop/Pest Management Profile: Muckmelon.* University of Florida Institute of Food and Agricultural Sciences (UF-IFAS) Publication CIR 1272. Original publication date September 2001. Revised April 2010 and September 2012. |
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# Appendix A GIS Processing Summaries

# Appendix A

Table A-1 Summary of GIS Overlay Sources by Data Group for 1995 geodatabase

| Data Component | Original Filename | Source | Updated/Merged Filename | Comments |
|---|---|---|---|---|
| **SJRWMD** | | | | |
| Irrigated Areas | 1995_SJRWMD_Ag_Layer.shp | Provided by SJRWMD | 1995_SJRWMD_Ag_Layer_CLEAN.shp | 3 minor errors/overlaps/duplicates corrected |
| Land Use / Land Cover | SJRWMD_1995_LULC.shp | Provided by SJRWMD | 1995_LULC_Merged_LVL2000_clean.shp | Merged data with other data groups. Only FLUCCS level 2000 (Agricultural) records were included. |
| NASS | CDL_2008_clip_20130624214449_614295765.tif | NASS CropScape website | MM_2008_CDL_poly_CLEAN.shp | Statewide (FL and GA) datasets were reclassified extracting only Ag land uses and then converted to polygons and merged together. |
| CUP Polygons | Ag_CUP_Boundaries_Joined_to_EN50s_2007_to_2012.shp | Provided by SJRWMD | SJRWMD_CUPs_FINAL.shp | Overlaps and duplicates removed (e.g., water control districts with multiple permitted users within the boundary) |
| **SWFWMD** | | | | |
| Irrigated Areas | WUP_IRR_AREA_PERMITTED_EXT.shp | SWFWMD GIS Data Website | SWF_IRR_areas_CLEAN_proj.shp | 396 minor errors/overlaps/duplicates corrected |
| Land Use / Land Cover | multiple zipped input files (e.g. lu95-kissi_sw.exe) | SWFWMD GIS Data Website (intially provided by SJRWMD) | 1995_LULC_Merged_LVL2000_clean.shp | The coverage provided by SJRWMD was incomplete. 34 Zip files of tiled land use data were extracted and merged together for the SWFWMD boundary. Merged data with other data groups. Only FLUCCS level 2000 (Agricultural) records were included. |
| NASS | CDL_2008_clip_20130624214449_614295765.tif | NASS CropScape website | MM_2008_CDL_poly_CLEAN.shp | Statewide (FL and GA) datasets were reclassified extracting only Ag land uses and then converted to polygons and merged together. |
| CUP Polygons | WUP_BOUNDARY_PERMITTED_EXT.shp | SWFWMD GIS Data Website | SWF_WUPs_FINAL.shp | Only agricultural permits were extracted. Overlaps and duplicates removed |

Table A-1 Summary of GIS Overlay Sources by Data Group for 1995 geodatabase

| Data Component | Original Filename | Source | Updated/Merged Filename | Comments |
|---|---|---|---|---|
| **SFWMD** | | | | |
| Irrigated Areas | na | na | na | na |
| Land Use / Land Cover | SFWMD_1995_LULC.shp | Provided by SJRWMD | 1995_LULC_Merged_LVL2000_clean.shp | Merged data with other data groups. Only FLUCCS level 2000 (Agricultural) records were included. |
| NASS | CDL_2008_clip_20130624214449_614295765.tif | NASS CropScape website | MM_2008_CDL_poly_CLEAN.shp | Statewide (FL and GA) datasets were reclassified extracting only Ag land uses and then converted to polygons and merged together. |
| CUP Polygons | SFWMD_ALL_Permit_Boundaries.shp | Provided by SJRWMD | SFWMD_WUP_clean.shp | Only agricultural permits were extracted. Overlaps and duplicates removed |
| **SRWMD** | | | | |
| Irrigated Areas | na | na | na | na |
| Land Use / Land Cover | SRWMD_1995_LULC.shp | Provided by SJRWMD | 1995_LULC_Merged_LVL2000_clean.shp | Merged data with other data groups. Only FLUCCS level 2000 (Agricultural) records were included. |
| NASS | CDL_2008_clip_20130624214449_614295765.tif | NASS CropScape website | MM_2008_CDL_poly_CLEAN.shp | Statewide (FL and GA) datasets were reclassified extracting only Ag land uses and then converted to polygons and merged together. |
| CUP Polygons | na | na | na | na |
| **Georgia** | | | | |
| Irrigated Areas | GA_statewide_IrrAreas.shp | Provided by SJRWMD | GA_statewide_IrrAreas_clipped_CLEAN.shp | 17 minor errors/overlaps/duplicates corrected |
| Land Use / Land Cover | na | na | na | na |
| NASS | CDL_2008_clip_20130624214449_614295765.tif | NASS CropScape website | MM_2008_CDL_poly_CLEAN.shp | Statewide (FL and GA) datasets were reclassified extracting only Ag land uses and then converted to polygons and merged together. |
| CUP Polygons | na | na | na | na |

NASS CropScape website: http://nassgeodata.gmu.edu/CropScape/
SWFWMD GIS Data website: http://www.swfwmd.state.fl.us/data/gis/layer_library/
SFWMD GIS Data website: http://my.sfwmd.gov/gisapps/sfwmdxwebdc/dataview.asp?
SRWMD GIS Data website: http://www.srwmd.state.fl.us/index.aspx?NID=319

# Appendix A

Table A-2 Summary of GIS Overlay Sources by Data Group for 2010 geodatabase

| Data Component | Original Filename | Source | Updated/Merged Filename | Comments |
|---|---|---|---|---|
| **SJRWMD** | | | | |
| Irrigated Areas | AgLayer2010.shp | Provided by SJRWMD | SJRWMD_AgLayer2010_FINAL.shp | 70 minor errors/overlaps/duplicates corrected |
| Land Use / Land Cover | SJRWMD_2009_LULC.shp | Provided by SJRWMD | 2010_LULC_Merge_LVL2000__CLEAN.shp | Merged data with other data groups. Only FLUCCS level 2000 (Agricultural) records were included. |
| NASS | cdl_30m_r_fl_2010_utm17 (Grid) | Provided by SJRWMD (data is from NASS) | MM_2010_CDL_poly_CLEAN.shp | Statewide (FL and GA) datasets were reclassified extracting only Ag land uses and then converted to polygons and merged together. |
| CUP Polygons | Ag_CUP_Boundaries_Joined_to_EN50s_2007_to_2012.shp | Provided by SJRWMD | SJRWMD_CUPs_FINAL.shp | Overlaps and duplicates removed (e.g., water control districts with multiple permitted users within the boundary) |
| **SWFWMD** | | | | |
| Irrigated Areas | WUP_IRR_AREA_PERMITTED_EXT.shp | SWFWMD GIS Data Website | SWF_IRR_areas_CLEAN_proj.shp | 396 minor errors/overlaps/duplicates corrected |
| Land Use / Land Cover | multiple zipped input files (e.g. lu10-kissi_sw.exe) | SWFWMD GIS Data Website | 2010_LULC_Merge_LVL2000__CLEAN.shp | 34 Zip files of tiled land use data were extracted and merged together for the SWFWMD boundary. Merged data with other data groups. Only FLUCCS level 2000 (Agricultural) records were included. |
| NASS | cdl_30m_r_fl_2010_utm17 (Grid) | Provided by SJRWMD (data is from NASS) | MM_2010_CDL_poly_CLEAN.shp | Statewide (FL and GA) datasets were reclassified extracting only Ag land uses and then converted to polygons and merged together. |
| CUP Polygons | WUP_BOUNDARY_PERMITTED_EXT.shp | SWFWMD GIS Data Website | SWF_WUPs_FINAL.shp | Only agricultural permits were extracted. Overlaps and duplicates removed |
| **SWFWMD** | | | | |
| Irrigated Areas | na | na | na | na |
| Land Use / Land Cover | lscndclu08_v1dot1.gdb | SFWMD GIS data website | 2010_LULC_Merge_LVL2000__CLEAN.shp | Merged data with other data groups. Only FLUCCS level 2000 (Agricultural) records were included. |
| NASS | cdl_30m_r_fl_2010_utm17 (Grid) | Provided by SJRWMD (data is from NASS) | MM_2010_CDL_poly_CLEAN.shp | Statewide (FL and GA) datasets were reclassified extracting only Ag land uses and then converted to polygons and merged together. |
| CUP Polygons | SFWMD_ALL_Permit_Boundaries.shp | Provided by SJRWMD | SFWMD_WUP_clean.shp | Only agricultural permits were extracted. Overlaps and duplicates removed |

Table A-2 Summary of GIS Overlay Sources by Data Group for 2010 geodatabase

| Data Component | Original Filename | Source | Updated/Merged Filename | Comments |
|---|---|---|---|---|
| **SRWMD** | | | | |
| Irrigated Areas | na | na | na | na |
| Land Use / Land Cover | landcov04.shp | SRWMD GIS Data website | 2010_LULC_Merge_LVL2000__CLEAN.shp | Merged data with other data groups. Only FLUCCS level 2000 (Agricultural) records were included. |
| NASS | cdl_30m_r_fl_2010_utm17 (Grid) | Provided by SJRWMD (data is from NASS) | MM_2010_CDL_poly_CLEAN.shp | Statewide (FL and GA) datasets were reclassified extracting only Ag land uses and then converted to polygons and merged together. |
| CUP Polygons | na | na | na | na |
| **Georgia** | | | | |
| Irrigated Areas | GA_statewide_IrrAreas.shp | Provided by SJRWMD | GA_statewide_IrrAreas_clipped_CLEAN.shp | 17 minor errors/overlaps/duplicates corrected |
| Land Use / Land Cover | na | na | na | na |
| NASS | CDL_2008_clip_20130624214449_614295765.tif | NASS CropScape website | MM_2008_CDL_poly_CLEAN.shp | Statewide (FL and GA) datasets were reclassified extracting only Ag land uses and then converted to polygons and merged together. |
| CUP Polygons | na | na | na | na |

NASS CropScape website: http://nassgeodata.gmu.edu/CropScape/
SWFWMD GIS Data website: http://www.swfwmd.state.fl.us/data/gis/layer_library/
SFWMD GIS Data website: http://my.sfwmd.gov/gisapps/sfwmdxwebdc/dataview.asp?
SRWMD GIS Data website: http://www.srwmd.state.fl.us/index.aspx?NID=319

# Appendix A

Table A-3 Adjustment Factors and Partial Comparison of GIS-derived 2010 Irrigated Area and 2007 Ag Census Irrigated Area

| County | Data Group(s) | GIS Source Code Filter(s) (by data group) | Irrigation System Filter (by data group) | Crop-Specific adjustment(s) (by data group) | Crop-Specific adjustment(s) (County-Specific) | 2010 GIS Irrigated Area (acres) | 2007 Ag Census Irrigated Land (acres) | Diff. (acres) |
|---|---|---|---|---|---|---|---|---|
| **GEORGIA** | | | | | | | | |
| Echols | GA | All 1000 values (Irrigation Layer) | Remove unspecified or none | none | none | 2,234 | 3,962 | -1,728 |
| Charlton* | GA | | | | none | 0 | 111 | -111 |
| | | | | | Georgia Subtotals[1] | 2,234 | 4,073 | -1,839 |
| **Suwanne River Water Management District** | | | | | | | | |
| Bradford | SR | 110, 111 (Area in common between Land Use and NASS) | NA - no data available to determine Irrigation System | Hay, Sod, Soybeans, & Peanuts @ 20% | none | 1,294 | 156 | 1,138 |
| Hamilton | SR | | | | none | 5,815 | 5,518 | 297 |
| Suwannee | SR | | | | none | 18,288 | 20,096 | -1,808 |
| Columbia | SR | | | | none | 5,823 | 2,693 | 3,130 |
| Union | SR | | | | none | 1,619 | 1,036 | 583 |
| Gilchrist | SR | | | | none | 7,195 | 7,808 | -613 |
| | | | | | SRWMD Subtotals[1] | 40,034 | 37,307 | 2,727 |
| **St. Johns River Water Management District** | | | | | | | | |
| Nassau | SJR | All 1000 values (Irrigation Layer) | Remove unspecified or none | none | none | 826 | 270 | 556 |
| Duval | SJR | | | | none | 1,302 | 2,024 | -722 |
| Clay | SJR | | | | none | 435 | 913 | -478 |
| St. Johns | SJR | | | | none | 21,372 | 14,359 | 7,013 |
| Putnam | SJR | | | | none | 10,320 | 4,620 | 5,700 |
| Flagler | SJR | | | | none | 7,550 | 6,812 | 738 |
| Volusia | SJR | | | | none | 9,529 | 9,068 | 461 |
| Seminole | SJR | | | | none | 3,160 | 1,829 | 1,331 |
| Brevard | SJR | | | | none | 21,546 | 20,486 | 1,060 |
| Indian_River | SJR | | | | none | 64,821 | 66,866 | -2,045 |
| | | | | | SJRWMD Subtotals[1] | 140,862 | 127,247 | 13,615 |
| **Southwest Florida Water Management District** | | | | | | | | |
| Citrus | SWF | All 1000 values (Irrigation Layer) | NA - data to determine Irrigation System is only available for some counties | Peanuts, Rye, Sorghum, and Hay @ 10% | none | 1,515 | 1,375 | 140 |
| Sumter | SWF | | | | none | 4,896 | 2,013 | 2,883 |
| Hernando | SWF | | | | none | 3,110 | 1,488 | 1,622 |
| Pasco | SWF | | | | none | 10,884 | 10,599 | 285 |
| Pinellas | SWF | | | | none | 21 | 189 | -168 |
| Hillsborough | SWF | | | | none | 29,017 | 29,923 | -906 |
| Manatee | SWF | | | | none | 59,036 | 50,791 | 8,245 |
| Hardee | SWF | | | | citrus @ 50% | 42,263 | 44,141 | -1,878 |
| Sarasota | SWF | | | | none | 9,677 | 2,348 | 7,329 |
| DeSoto | SWF | | | | citrus @ 50% | 61,485 | 56,162 | 5,323 |
| | | | | | SWFWMD Subtotals[1] | 221,903 | 199,029 | 22,874 |
| **South Florida Water Management District** | | | | | | | | |
| St. Lucie | SF | 111, 101, 11 (Area shared by CUP poly and Land Use or CUP poly and NASS) | NA - no data available to determine Irrigation System | Pasture @ 10% | Sod, Sugar Cane @ 10% | 75,512 | 69,302 | 6,210 |
| Martin | SF | | | | none | 62,776 | 48,521 | 14,255 |
| | | | | | SFWMD Subtotals[1] | 138,288 | 117,823 | 20,465 |

[1]This analyis includes only the counties that reside entirely in one of the 5 source data groups (* indicated 'most')

**Grand Total** 543,322 485,479

# Appendix A

Table A-4 Model-Wide Comparison of GIS-derived 2010 Irrigated Area and 2007 Ag Census Irrigated Area

| County | Data Group(s) | 2010 GIS Irrigated Area (acres) | 2007 Ag Census Irrigated Land (acres) | Diff. (acres) |
|---|---|---|---|---|
| Alachua | SJR & SR | 8,919 | 13,387 | -4,468 |
| Baker | SJR & SR | 200 | 699 | -499 |
| Berrien | GA | 280 | 14,482 | -14,202 |
| Bradford | SR | 1,294 | 156 | 1,138 |
| Brevard | SJR | 21,546 | 20,486 | 1,060 |
| Citrus | SWF | 1,515 | 1,375 | 140 |
| Clay | SJR | 435 | 913 | -478 |
| Clinch | GA | 2,146 | 1,819 | 327 |
| Columbia | SR | 5,823 | 2,693 | 3,130 |
| Desoto | SWF | 61,485 | 56,162 | 5,323 |
| Duval | SJR | 1,302 | 2,024 | -722 |
| Echols | GA | 2,234 | 3,962 | -1,728 |
| Flagler | SJR | 7,550 | 6,812 | 738 |
| Gilchrist | SR | 7,195 | 7,808 | -613 |
| Hamilton | SR | 5,815 | 5,518 | 297 |
| Hardee | SWF | 42,263 | 44,141 | -1,878 |
| Hernando | SWF | 3,110 | 1,488 | 1,622 |
| Highlands | SF & SWF | 93,475 | 73,713 | 19,762 |
| Hillsborough | SWF | 29,017 | 29,923 | -906 |
| Indian_River | SJR | 64,821 | 66,866 | -2,045 |
| Lafayette | SR | 3,875 | 7,426 | -3,551 |
| Lake | SJR & SWF | 17,128 | 15,013 | 2,115 |
| Lanier | GA | 1,652 | 8,434 | -6,782 |
| Levy | SR & SWF | 26,980 | 14,488 | 12,492 |
| Lowndes | GA | 4,953 | 4,169 | 784 |
| Manatee | SR | 59,036 | 50,791 | 8,245 |
| Marion | SJR & SWF | 11,706 | 9,666 | 2,040 |
| Martin | SF | 62,776 | 48,521 | 14,255 |
| Nassau | SJR | 826 | 270 | 556 |
| Okeechobee | SJR & SF | 40,703 | 20,545 | 20,158 |
| Orange | SJR & SF | 8,654 | 11,870 | -3,216 |
| Osceola | SJR & SF | 22,741 | 31,420 | -8,679 |
| Pasco | SWF | 10,884 | 10,599 | 285 |
| Pinellas | SWF | 21 | 189 | -168 |
| Polk | SF & SWF | 117,165 | 98,404 | 18,761 |
| Putnam | SJR | 10,320 | 4,620 | 5,700 |
| Sarasota | SWF | 9,677 | 2,348 | 7,329 |
| Seminole | SJR | 3,160 | 1,829 | 1,331 |
| St_Johns | SJR | 21,372 | 14,359 | 7,013 |
| St_Lucie | SF | 75,512 | 69,302 | 6,210 |
| Sumter | SWF | 4,896 | 2,013 | 2,883 |
| Suwannee | SR | 18,288 | 20,096 | -1,808 |
| Union | SR | 1,619 | 1,036 | 583 |
| Volusia | SJR | 9,529 | 9,068 | 461 |
| | **Total:** | **903,897** | **810,903** | |
| Counties Partially Located in MegaModel Extent | | | | |
| Charlotte | SWF | 25,103 | na | na |
| Glades | SF | 24,088 | na | na |
| Palm_Beach | SF | 1,480 | na | na |
| Dixie | SR | 1,771 | na | na |
| Madison | SR | 5,908 | na | na |

# Appendix A

Table A-5 Model-Wide Comparison of GIS-derived 1995 Irrigated Area and 1992 Ag Census Irrigated Area

| County | Data Group(s) | 1995 GIS Irrigated Area (acres) | 1992 Ag Census Irrigated Land (acres) | Diff. (acres) |
|---|---|---|---|---|
| Alachua | SJR & SR | 10,314 | 7,371 | 2,943 |
| Baker | SJR & SR | 456 | 456 | 0 |
| Berrien | GA | 548 | 10,502 | -9,954 |
| Bradford | SR | 987 | 553 | 434 |
| Brevard | SJR | 55,473 | 24,958 | 30,515 |
| Citrus | SWF | 1,287 | 658 | 629 |
| Clay | SJR | 460 | 1,293 | -833 |
| Clinch | GA | 2,446 | 149 | 2,297 |
| Columbia | SR | 4,686 | 2,597 | 2,089 |
| Desoto | SWF | 58,577 | 58,806 | -229 |
| Duval | SJR | 1,236 | 1,203 | 33 |
| Echols | GA | 2,947 | 1,353 | 1,594 |
| Flagler | SJR | 8,538 | 4,744 | 3,794 |
| Gilchrist | SR | 5,450 | 6,440 | -990 |
| Hamilton | SR | 6,068 | 3,591 | 2,477 |
| Hardee | SWF | 43,923 | 53,777 | -9,854 |
| Hernando | SWF | 7,231 | 521 | 6,710 |
| Highlands | SF & SWF | 123,071 | 83,301 | 39,770 |
| Hillsborough | SWF | 40,621 | 45,709 | -5,088 |
| Indian_River | SJR | 85,837 | 77,493 | 8,344 |
| Lafayette | SR | 3,586 | 3,198 | 388 |
| Lake | SJR & SWF | 31,821 | 24,373 | 7,448 |
| Lanier | GA | 2,275 | 5,888 | -3,613 |
| Levy | SR & SWF | 24,632 | 9,895 | 14,737 |
| Lowndes | GA | 6,094 | 2,062 | 4,032 |
| Manatee | SR | 70,594 | 54,568 | 16,026 |
| Marion | SJR & SWF | 14,752 | 5,217 | 9,535 |
| Martin | SF | 62,890 | 58,742 | 4,148 |
| Nassau | SJR | 1,960 | 33 | 1,927 |
| Okeechobee | SJR & SF | 23,105 | 27,662 | -4,557 |
| Orange | SJR & SF | 20,493 | 25,249 | -4,756 |
| Osceola | SJR & SF | 40,996 | 14,474 | 26,522 |
| Pasco | SWF | 23,683 | 11,024 | 12,659 |
| Pinellas | SWF | 31 | 288 | -257 |
| Polk | SF & SWF | 123,014 | 116,734 | 6,280 |
| Putnam | SJR | 10,010 | 9,560 | 450 |
| Sarasota | SWF | 10,072 | 5,207 | 4,865 |
| Seminole | SJR | 4,426 | 3,155 | 1,271 |
| St_Johns | SJR | 25,409 | 24,208 | 1,201 |
| St_Lucie | SF | 90,670 | 138,133 | -47,463 |
| Sumter | SWF | 6,097 | 3,974 | 2,123 |
| Suwannee | SR | 11,770 | 12,869 | -1,099 |
| Union | SR | 849 | 470 | 379 |
| Volusia | SJR | 13,393 | 8,460 | 4,933 |
| | **Total:** | **1,082,779** | **950,918** | |
| Counties Partially Located in MegaModel Extent | | | | |
| Charlotte | SWF | 32,355 | na | na |
| Glades | SF | 14,677 | na | na |
| Palm_Beach | SF | 1,661 | na | na |
| Dixie | SR | 885 | na | na |
| Madison | SR | 4,159 | na | na |

# Appendix B Irrigation Demand Summaries

# Appendix B

## Exhibit B-1 AFSIRS Crop Codes

CROP LIST : TOTAL NUMBER = 60

NUMBER OF PERENNIAL CROPS = 16

| | | |
|---|---|---|
| 1 ALFALFA | 2 AVOCADO | 3 BLUEBERRY |
| 4 CITRUS | 5 FERNS | 6 GENERIC CROP |
| 7 GRAPES | 8 NURSERY,CNTR | 9 NURSERY,FLD. |
| 10 PASTURE | 11 PEACHES | 12 PECANS |
| 13 SOD | 14 SUGARCANE | 15 TURF,GOLF |
| 16 TURF,LNDSCP. | | |

NUMBER OF ANNUAL CROPS = 44

| | | |
|---|---|---|
| 17 BARLEY | 18 BEANS,GRN. | 19 BEANS,DRY |
| 20 BEETS | 21 BROCCOLI | 22 BRUSSEL SPTS |
| 23 CABBAGE | 24 CARROTS | 25 CAULIFLOWER |
| 26 CELERY | 27 CLOVER | 28 CORN,FIELD |
| 29 CORN,SWEET | 30 COTTON | 31 CUCUMBER |
| 32 EGGPLANT | 33 FIELD CROPS | 34 GENERIC CROP |
| 35 GREENS,HERBS | 36 LETTUCE | 37 MELONS |
| 38 MILLET,FORGE | 39 MILLET,GRAIN | 40 OATS |
| 41 ONION,DRY | 42 ONION,GRN. | 43 PEANUTS |
| 44 PEAS | 45 PEPPERS,GRN. | 46 POTATOES |
| 47 RADISH | 48 RICE | 49 SMALL GRAINS |
| 50 SMALL VEGETS | 51 SORGHUM | 52 SOYBEAN |
| 53 SPINACH | 54 SQUASH | 55 STRAWBERRY |
| 56 SUNFLOWERS | 57 SWEET POTATO | 58 TOBACCO |
| 59 TOMATO | 60 WHEAT | |

**Table B-2 Crop Growing Season Definition - NORTH REGION**

| | Crop1 | | | | | | | Crop2 | | | | | | | Crop3 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| "AF_CROP" | | | | Planting | | Harvesting | | | | | Planting | | Harvesting | | | | | Planting | | Harvesting | | |
| Crop | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | Source |
| Abandoned Tree Crops | 0 | na | na | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Animal Feeding Operations | 0 | na | na | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Aquaculture | 0 | na | na | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Asparagus Fern | 5 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Aspidistra | 8 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Blueberries | 3 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Broccoli | 21 | 1-Aug | 82 | 8 | 1 | 10 | 22 | 21 | 1-Dec | 82 | 12 | 1 | 2 | 21 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Cabbage | 23 | 1-Aug | 97 | 8 | 1 | 11 | 6 | 23 | 1-Dec | 97 | 12 | 1 | 3 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Cantaloupe | 27 | 15-Mar | 80 | 3 | 15 | 6 | 3 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 92 |
| Chestnuts | 12 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Citrus | 4 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Clover | 27 | 22-Oct | 110 | 10 | 22 | 2 | 9 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 93 |
| Collard Greens | 23 | 1-Aug | 80 | 8 | 1 | 10 | 20 | 23 | 1-Dec | 80 | 12 | 1 | 2 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Container Nursery | 8 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Coontie Fern | 5 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Corn | 29 | 1-Mar | 77 | 3 | 1 | 5 | 17 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 68 |
| Cotton | 30 | 1-May | 167 | 5 | 1 | 10 | 15 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 81 |
| Cucurbits | 31 | 1-Mar | 52 | 3 | 1 | 4 | 22 | 31 | 1-Aug | 52 | 8 | 1 | 9 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 |
| Dairies | 0 | na | na | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Developed | 0 | na | na | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| DevelopedCabbage | 23 | 1-Aug | 97 | 8 | 1 | 11 | 6 | 23 | 1-Dec | 97 | 12 | 1 | 3 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Dry Beans | 19 | 1-Apr | 70 | 4 | 1 | 6 | 10 | 19 | 15-Aug | 70 | 8 | 15 | 10 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 |
| Fallow | 0 | na | na | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Field Corn | 28 | 1-Apr | 135 | 4 | 1 | 8 | 14 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 72,81 |
| Field Nursery | 9 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Grapes | 7 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Greenhouse | 0 | na | na | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Greens | 35 | 1-Aug | 80 | 8 | 1 | 10 | 20 | 35 | 1-Dec | 80 | 12 | 1 | 2 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Hammock Ferns | 5 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Hay | 10 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Horse Farms | 0 | na | na | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| IFAS Research Fields | 0 | na | na | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Inactive | 0 | na | na | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Leatherleaf | 5 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ligustrum | 8 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Liriope | 8 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Mangos | 11 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Millet | 39 | 1-Mar | 180 | 3 | 1 | 8 | 28 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83 |
| Misc. Vegetables | 33 | 1-Aug | 97 | 8 | 1 | 11 | 6 | 23 | 1-Dec | 97 | 12 | 1 | 3 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Nurseries and Vineyards | 9 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Oats | 40 | 15-Nov | 90 | 11 | 15 | 2 | 13 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80,83 |
| OatsCorn | 40 | 15-Nov | 90 | 11 | 15 | 2 | 13 | 28 | 1-Apr | 135 | 4 | 1 | 8 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80,83,72,81 |
| Onions | 41 | 15-Oct | 115 | 10 | 15 | 2 | 7 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 61 |
| Ornamentals | 9 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Pasture | 10 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Peaches | 11 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Peanuts | 43 | 22-Apr | 155 | 4 | 22 | 9 | 24 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 81 |
| Peas | 44 | 1-Jan | 70 | 1 | 1 | 3 | 12 | 44 | 15-Apr | 85 | 4 | 15 | 7 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 |
| Pecans | 12 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Persimmons | 11 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Pine | 0 | na | na | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Pittosporum | 8 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Plowed | 0 | na | na | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Potatoes | 46 | 15-Jan | 97 | 1 | 15 | 4 | 22 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 65 |
| PotatoesCabbage | 46 | 15-Jan | 97 | 1 | 15 | 4 | 22 | 23 | 1-Aug | 97 | 8 | 1 | 11 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 65,51 |

**Table B-2 Crop Growing Season Definition - NORTH REGION**

| | Crop1 | | | | | | | Crop2 | | | | | | | Crop3 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| "AF_CROP" | | | | Planting | | Harvesting | | | | | Planting | | Harvesting | | | | | Planting | | Harvesting | | |
| Crop | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | Source |
| produce | 33 | 1-Apr | 70 | 4 | 1 | 6 | 10 | 19 | 15-Aug | 70 | 8 | 15 | 10 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 |
| Radish | 47 | 1-Sep | 30 | 9 | 1 | 10 | 1 | 47 | 15-Nov | 30 | 11 | 15 | 12 | 15 | 47 | 1-Feb | 30 | 2 | 1 | 3 | 3 | 64 |
| Rice | 48 | 15-Apr | 125 | 4 | 15 | 8 | 18 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 81 |
| rotation | 49 | 15-Nov | 90 | 11 | 15 | 2 | 13 | 28 | 1-Apr | 135 | 4 | 1 | 8 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80,83,72,81 |
| rotationSorghum | 49 | 15-Nov | 90 | 11 | 15 | 2 | 13 | 51 | 1-Apr | 180 | 4 | 1 | 9 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83,80 |
| rotationSoybeans | 49 | 15-Nov | 90 | 11 | 15 | 2 | 13 | 52 | 15-May | 140 | 5 | 15 | 10 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83,80,94 |
| Rye | 60 | 15-Nov | 120 | 11 | 15 | 3 | 15 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83 |
| Shade Ferns | 5 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sod | 13 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sorghum | 51 | 1-Apr | 180 | 4 | 1 | 9 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83,80 |
| Soybeans | 52 | 15-May | 140 | 5 | 15 | 10 | 2 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 94,80 |
| SoybeansOats | 52 | 15-May | 140 | 5 | 15 | 10 | 2 | 40 | 15-Nov | 90 | 11 | 15 | 2 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 94,80,83 |
| Specialty Farms | 50 | 1-Aug | 97 | 8 | 1 | 11 | 6 | 50 | 1-Dec | 97 | 12 | 1 | 3 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Spinach | 53 | 15-Sep | 55 | 9 | 15 | 11 | 9 | 53 | 1-Dec | 55 | 12 | 1 | 1 | 25 | 53 | 15-Feb | 55 | 2 | 15 | 4 | 11 | 66 |
| Squash | 54 | 1-Mar | 45 | 3 | 1 | 4 | 15 | 54 | 1-Aug | 45 | 8 | 1 | 9 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 |
| Strawberries | 55 | 15-Oct | 240 | 10 | 15 | 6 | 12 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 95 |
| Sugar Cane | 14 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sweet Corn | 29 | 1-Mar | 77 | 3 | 1 | 5 | 17 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 68 |
| Sweet Potatoes | 46 | 1-Apr | 120 | 4 | 1 | 7 | 30 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 69 |
| Tomatoes | 59 | 15-Jul | 80 | 7 | 15 | 10 | 3 | 59 | 1-Mar | 80 | 3 | 1 | 5 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 71 |
| Tree Fern | 5 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| unknown | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Unspecified Crop | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Unspecified Field Crop | 33 | 15-Nov | 90 | 11 | 15 | 2 | 13 | 28 | 1-Apr | 135 | 4 | 1 | 8 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80,83,72,81 |
| Unspecified Nurseries and Vineyards | 9 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Unspecified Row Crop | 33 | 1-Aug | 97 | 8 | 1 | 11 | 6 | 23 | 1-Dec | 97 | 12 | 1 | 3 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Unspecified Row Crop/Pasture | 33 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Unspecified Tree Crop | 11 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Water Mgmt Area | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Watermelons | 37 | 15-Mar | 90 | 3 | 15 | 6 | 13 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Weeiping Willow | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 96 |
| Winter Wheat | 60 | 15-Nov | 90 | 11 | 15 | 2 | 13 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80,83 |
| Winter WheatSorghum | 60 | 15-Nov | 90 | 11 | 15 | 2 | 13 | 51 | 1-Apr | 180 | 4 | 1 | 9 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83,80 |
| Winter WheatSoybeans | 60 | 15-Nov | 90 | 11 | 15 | 2 | 13 | 52 | 15-May | 140 | 5 | 15 | 10 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83,80,94 |
| Caladiums | 9 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Peppers | 45 | 1-Sep | 70 | 9 | 1 | 11 | 10 | 45 | 15-Feb | 70 | 2 | 15 | 4 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 62 |
| Alfalfa | 1 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sunflowers | 56 | 15-Feb | 240 | 2 | 15 | 10 | 13 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 78 |
| Unspecified Field C* | 33 | 15-Nov | 90 | 11 | 15 | 2 | 13 | 28 | 1-Apr | 135 | 4 | 1 | 8 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80,83,72,81 |
| Cut Foliage | 5 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Tomato | 59 | 15-Jul | 80 | 7 | 15 | 10 | 3 | 59 | 1-Mar | 80 | 3 | 1 | 5 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 71 |
| Unspecified Row Cro* | 33 | 1-Aug | 97 | 8 | 1 | 11 | 6 | 23 | 1-Dec | 97 | 12 | 1 | 3 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Unspecified Tree Cr* | 11 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nurseries and Viney* | 9 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Small Grains | 49 | 15-Nov | 90 | 11 | 15 | 2 | 13 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83,80 |
| Beets | 20 | 15-Sep | 60 | 9 | 15 | 11 | 14 | 20 | 15-Feb | 60 | 2 | 15 | 4 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 82 |
| Animal Feeding Oper* | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Herbs | 35 | 1-Aug | 80 | 8 | 1 | 10 | 20 | 35 | 1-Dec | 80 | 12 | 1 | 2 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Chinese Cabbage | 23 | 1-Aug | 97 | 8 | 1 | 11 | 6 | 23 | 1-Dec | 97 | 12 | 1 | 3 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Watercress | 0 | na | na | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Beans | 19 | 1-Apr | 70 | 4 | 1 | 6 | 10 | 19 | 15-Aug | 70 | 8 | 15 | 10 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 |
| Turf grass | 13 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Kennels | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Melons | 37 | 15-Mar | 90 | 3 | 15 | 6 | 13 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Parsley | 35 | 1-Aug | 80 | 8 | 1 | 10 | 20 | 35 | 1-Dec | 80 | 12 | 1 | 2 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |

**Table B-2 Crop Growing Season Definition - NORTH REGION**

| | Crop1 | | | | | | | Crop2 | | | | | | | Crop3 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| "AF_CROP" | | | | Planting | | Harvesting | | | | | Planting | | Harvesting | | | | | Planting | | Harvesting | | |
| Crop | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | Source |
| Lettuce | 23 | 1-Aug | 97 | 8 | 1 | 11 | 6 | 23 | 1-Dec | 97 | 12 | 1 | 3 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Floriculture | 56 | 15-Feb | 240 | 2 | 15 | 10 | 13 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 78 |
| Mushroom | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Kale | 23 | 1-Aug | 97 | 8 | 1 | 11 | 6 | 23 | 1-Dec | 97 | 12 | 1 | 3 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Mustard Greens | 35 | 1-Aug | 80 | 8 | 1 | 10 | 20 | 35 | 1-Dec | 80 | 12 | 1 | 2 | 19 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Okra | 50 | 15-Mar | 65 | 3 | 15 | 5 | 19 | 50 | 15-Jun | 97 | 6 | 15 | 9 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 82 |
| Turnips | 50 | 1-Feb | 50 | 2 | 1 | 3 | 23 | 50 | 1-Aug | 50 | 8 | 1 | 9 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 82 |

**Table B-3 Crop Growing Season Definition - CENTRAL REGION**

| | Crop1 | | | | | | | Crop2 | | | | | | | Crop3 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| "AF_CROP" | | | | Planting | | Harvesting | | | | | Planting | | Harvesting | | | | | Planting | | Harvesting | | |
| Crop | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | source |
| Abandoned Tree Crops | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Animal Feeding Operations | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Aquaculture | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Asparagus Fern | 5 | | | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Aspidistra | 8 | | | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Blueberries | 3 | | | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Broccoli | 21 | 1-Sep | 82 | 9 | 1 | 11 | 22 | 21 | 1-Jan | 82 | 1 | 1 | 3 | 24 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Cabbage | 23 | 1-Sep | 97 | 9 | 1 | 12 | 7 | 23 | 1-Jan | 97 | 1 | 1 | 4 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Cantaloupe | 27 | 1-Feb | 80 | 2 | 1 | 4 | 22 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 92 |
| Chestnuts | 12 | | | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Citrus | 4 | | | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Clover | 27 | 22-Oct | 110 | 10 | 22 | 2 | 9 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 93 |
| Collard Greens | 23 | 1-Sep | 80 | 9 | 1 | 11 | 20 | 23 | 1-Jan | 80 | 1 | 1 | 3 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Container Nursery | 8 | | | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Coontie Fern | 5 | | | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Corn | 29 | 1-Mar | 77 | 3 | 1 | 5 | 17 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 68 |
| Cotton | 30 | 1-May | 167 | 5 | 1 | 10 | 15 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 81 |
| Cucurbits | 31 | 1-Feb | 52 | 2 | 1 | 3 | 25 | 31 | 15-Sep | 52 | 9 | 15 | 11 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 |
| Dairies | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Developed | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| DevelopedCabbage | 23 | 1-Aug | 97 | 8 | 1 | 11 | 6 | 23 | 1-Dec | 97 | 12 | 1 | 3 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Dry Beans | 19 | 1-Mar | 70 | 3 | 1 | 5 | 10 | 19 | 1-Sep | 70 | 9 | 1 | 11 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 |
| Fallow | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Field Corn | 28 | 1-Apr | 135 | 4 | 1 | 8 | 14 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 72&81 |
| Field Nursery | 9 | | | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Grapes | 7 | | | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Greenhouse | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Greens | 35 | 1-Sep | 80 | 9 | 1 | 11 | 20 | 35 | 1-Jan | 80 | 1 | 1 | 3 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Hammock Ferns | 5 | | | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Hay | 10 | | | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Horse Farms | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| IFAS Research Fields | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Inactive | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Leatherleaf | 5 | | | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Ligustrum | 8 | | | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Liriope | 8 | | | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Mangos | 8 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Millet | 39 | 15-Feb | 180 | 2 | 15 | 8 | 14 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83 |
| Misc. Vegetables | 33 | 1-Sep | 97 | 9 | 1 | 12 | 7 | 23 | 1-Jan | 97 | 1 | 1 | 4 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Nurseries and Vineyards | 9 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Oats | 40 | 1-Dec | 90 | 12 | 1 | 3 | 1 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80,83 |
| OatsCorn | 40 | 1-Dec | 90 | 12 | 1 | 3 | 1 | 28 | 1-Apr | 135 | 4 | 1 | 8 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80,83,72,81 |
| Onions | 41 | 15-Oct | 115 | 10 | 15 | 2 | 7 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 61 |
| Ornamentals | 9 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Pasture | 10 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Peaches | 11 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Peanuts | 43 | 22-Apr | 155 | 4 | 22 | 9 | 24 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 81 |
| Peas | 44 | 15-Nov | 70 | 11 | 15 | 1 | 24 | 44 | 1-Mar | 85 | 3 | 1 | 5 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 |
| Pecans | 12 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Persimmons | 11 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Pine | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Pittosporum | 8 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Plowed | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Potatoes | 46 | 1-Jan | 97 | 1 | 1 | 4 | 8 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 65 |
| PotatoesCabbage | 46 | 1-Jan | 97 | 1 | 1 | 4 | 8 | 23 | 1-Aug | 97 | 8 | 1 | 11 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 65,51 |
| produce | 33 | 1-Mar | 70 | 3 | 1 | 5 | 10 | 19 | 1-Sep | 70 | 9 | 1 | 11 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 |

**Table B-3 Crop Growing Season Definition - CENTRAL REGION**

| | Crop1 | | | | | | | Crop2 | | | | | | | Crop3 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| "AF_CROP" | | | | Planting | | Harvesting | | | | | Planting | | Harvesting | | | | | Planting | | Harvesting | | |
| Crop | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | source |
| Radish | 47 | 1-Sep | 30 | 9 | 1 | 10 | 1 | 47 | 15-Nov | 30 | 11 | 15 | 12 | 15 | 47 | 1-Feb | 30 | 2 | 1 | 3 | 3 | 64 |
| Rice | 48 | 15-Apr | 125 | 4 | 15 | 8 | 18 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 81 |
| rotation | 49 | 1-Dec | 90 | 12 | 1 | 3 | 1 | 28 | 1-Apr | 135 | 4 | 1 | 8 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80,83,72,81 |
| rotationSorghum | 49 | 1-Dec | 90 | 12 | 1 | 3 | 1 | 51 | 15-Mar | 180 | 3 | 15 | 9 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83,80 |
| rotationSoybeans | 49 | 1-Dec | 90 | 12 | 1 | 3 | 1 | 52 | 15-May | 140 | 5 | 15 | 10 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83,80,94 |
| Rye | 60 | 1-Dec | 120 | 12 | 1 | 3 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83 |
| Shade Ferns | 5 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sod | 13 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sorghum | 51 | 15-Mar | 180 | 3 | 15 | 9 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83,80 |
| Soybeans | 52 | 15-May | 140 | 5 | 15 | 10 | 2 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 94,80 |
| SoybeansOats | 52 | 15-May | 140 | 5 | 15 | 10 | 2 | 40 | 1-Dec | 90 | 12 | 1 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 94,80,83 |
| Specialty Farms | 50 | 1-Sep | 97 | 9 | 1 | 12 | 7 | 50 | 1-Jan | 97 | 1 | 1 | 4 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Spinach | 53 | 15-Sep | 55 | 9 | 15 | 11 | 9 | 53 | 1-Dec | 55 | 12 | 1 | 1 | 25 | 53 | 15-Feb | 55 | 2 | 15 | 4 | 11 | 66 |
| Squash | 54 | 1-Feb | 45 | 2 | 1 | 3 | 18 | 54 | 22-Aug | 45 | 8 | 22 | 10 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 |
| Strawberries | 55 | 30-Sep | 200 | 9 | 30 | 4 | 18 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 67 |
| Sugar Cane | 14 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sweet Corn | 29 | 1-Mar | 77 | 3 | 1 | 5 | 17 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 68 |
| Sweet Potatoes | 46 | 1-Mar | 120 | 3 | 1 | 6 | 29 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 69 |
| Tomatoes | 59 | 15-Aug | 80 | 8 | 15 | 11 | 3 | 59 | 15-Jan | 80 | 1 | 15 | 4 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Tree Fern | 5 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| unknown | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Unspecified Crop | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Unspecified Field Crop | 33 | 1-Dec | 90 | 12 | 1 | 3 | 1 | 28 | 1-Apr | 135 | 4 | 1 | 8 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80,83,72,81 |
| Unspecified Nurseries and Vineyards | 9 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Unspecified Row Crop | 33 | 1-Sep | 97 | 9 | 1 | 12 | 7 | 23 | 1-Jan | 97 | 1 | 1 | 4 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Unspecified Row Crop/Pasture | 33 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Unspecified Tree Crop | 11 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Water Mgmt Area | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Watermelons | 37 | 15-Feb | 90 | 2 | 15 | 5 | 16 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Weeiping Willow | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 96 |
| Winter Wheat | 60 | 1-Dec | 90 | 12 | 1 | 3 | 1 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80,83 |
| Winter WheatSorghum | 60 | 1-Dec | 90 | 12 | 1 | 3 | | 51 | 15-Mar | 180 | 3 | 15 | 9 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80,83 |
| Winter WheatSoybeans | 60 | 1-Dec | 90 | 12 | 1 | 3 | 1 | 52 | 15-May | 140 | 5 | 15 | 10 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83,80,94 |
| Caladiums | 9 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Peppers | 45 | 15-Aug | 70 | 8 | 15 | 10 | 24 | 45 | 15-Feb | 70 | 2 | 15 | 4 | 26 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 62 |
| Alfalfa | 1 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Sunflowers | 56 | 15-Feb | 240 | 2 | 15 | 10 | 13 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 78 |
| Unspecified Field C* | 33 | 1-Dec | 90 | 12 | 1 | 3 | 1 | 28 | 1-Apr | 135 | 4 | 1 | 8 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 80,83,72,81 |
| Cut Foliage | 5 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Tomato | 59 | 15-Aug | 80 | 8 | 15 | 11 | 3 | 59 | 15-Jan | 80 | 1 | 15 | 4 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Unspecified Row Cro* | 33 | 1-Sep | 97 | 9 | 1 | 12 | 7 | 23 | 1-Jan | 97 | 1 | 1 | 4 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Unspecified Tree Cr* | 11 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Nurseries and Viney* | 9 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Small Grains | 49 | 15-Nov | 90 | 11 | 15 | 2 | 13 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 83,80 |
| Beets | 20 | 15-Oct | 60 | 10 | 15 | 12 | 14 | 20 | 15-Jan | 60 | 1 | 15 | 3 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 82 |
| Animal Feeding Oper* | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Herbs | 35 | 1-Sep | 80 | 9 | 1 | 11 | 20 | 35 | 1-Jan | 80 | 1 | 1 | 3 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Chinese Cabbage | 23 | 1-Sep | 97 | 9 | 1 | 12 | 7 | 23 | 1-Jan | 97 | 1 | 1 | 4 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Watercress | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Beans | 19 | 1-Mar | 70 | 3 | 1 | 5 | 10 | 19 | 1-Sep | 70 | 9 | 1 | 11 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 58 |
| Turf grass | 13 | p | p | 1 | 1 | 12 | 31 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Kennels | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Melons | 37 | 15-Feb | 90 | 2 | 15 | 5 | 16 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Parsley | 35 | 1-Sep | 80 | 9 | 1 | 11 | 20 | 35 | 1-Jan | 80 | 1 | 1 | 3 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Lettuce | 23 | 1-Sep | 97 | 9 | 1 | 12 | 7 | 23 | 1-Jan | 97 | 1 | 1 | 4 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Floriculture | 56 | 15-Feb | 240 | 2 | 15 | 10 | 13 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 78 |

**Table B-3 Crop Growing Season Definition - CENTRAL REGION**

| | Crop1 | | | | | | | Crop2 | | | | | | | Crop3 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| "AF_CROP" | | | | Planting | | Harvesting | | | | | Planting | | Harvesting | | | | | Planting | | Harvesting | | |
| Crop | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | AFCrop | Begin Date | Season Length | Begin Mo | Begin Day | End mo | End Day | source |
| Mushroom | 0 | | | 0 | 0 | 0 | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Kale | 23 | 1-Sep | 97 | 9 | 1 | 12 | 7 | 23 | 1-Jan | 97 | 1 | 1 | 4 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Mustard Greens | 35 | 1-Sep | 80 | 9 | 1 | 11 | 20 | 35 | 1-Jan | 80 | 1 | 1 | 3 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 51 |
| Okra | 50 | 15-Mar | 65 | 3 | 15 | 5 | 19 | 50 | 15-Jun | 97 | 6 | 15 | 9 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 82 |
| Turnips | 50 | 1-Feb | 50 | 2 | 1 | 3 | 23 | 50 | 1-Oct | 50 | 10 | 1 | 11 | 20 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 82 |

**Table B-4 Designation of North/South Growing Regions by County**

| Zone | COUNTY | Zone | COUNTY |
|---|---|---|---|
| Central | Brevard | North | Alachua |
| Central | Charlotte | North | Baker |
| Central | Citrus | North | Berrien |
| Central | Clay | North | Bradford |
| Central | Desoto | North | Brantley |
| Central | Duval | North | Brooks |
| Central | Flagler | North | Camden |
| Central | Glades | North | Charlton |
| Central | Hardee | North | Clinch |
| Central | Hendry | North | Columbia |
| Central | Hernando | North | Cook |
| Central | Highlands | North | Dixie |
| Central | Hillsborough | North | Echols |
| Central | Indian River | North | Gilchrist |
| Central | Lake | North | Glynn |
| Central | Manatee | North | Hamilton |
| Central | Marion | North | Lafayette |
| Central | Martin | North | Lanier |
| Central | Okeechobee | North | Levy |
| Central | Orange | North | Lowndes |
| Central | Osceola | North | Madison |
| Central | Palm Beach | North | Nassau |
| Central | Pasco | North | Suwannee |
| Central | Pinellas | North | Taylor |
| Central | Polk | North | Union |
| Central | Putnam | North | Ware |
| Central | Sarasota | | |
| Central | Seminole | | |
| Central | St Johns | | |
| Central | St Lucie | | |
| Central | Sumter | | |
| Central | Volusia | | |

# Appendix B

## Table B-5 1995 Irrigated Lands Net Irrigation Summary Statistics by Crop Type

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| Alfalfa | 3.3 | 5.6 | 6.8 |
| Asparagus Fern | 14.8 | 18.5 | 23.2 |
| Aspidistra | 26.7 | 30.2 | 34.9 |
| Beans | 5.9 | 7.9 | 9.7 |
| Beets | 3.1 | 3.8 | 4.8 |
| Blueberries | 13.1 | 17.2 | 21.2 |
| Broccoli | 3.7 | 5.1 | 6.4 |
| Cabbage | 5.3 | 6.8 | 8.3 |
| Cantaloupe | 3.1 | 4.6 | 6.3 |
| Chestnuts | 3.3 | 6.3 | 8.3 |
| Chinese Cabbage | 5.5 | 6.8 | 8.2 |
| Citrus | 4.1 | 7.3 | 10.4 |
| Collard Greens | 4.5 | 5.9 | 7.2 |
| Container Nursery | 20.0 | 23.2 | 26.5 |
| Corn | 3.8 | 5.0 | 6.0 |
| Cotton | 2.8 | 4.3 | 5.7 |
| Cucurbits | 3.6 | 5.1 | 6.1 |
| Cut Foliage | 14.1 | 17.8 | 21.5 |
| Dry Beans | 9.2 | 10.8 | 12.5 |
| Field Corn | 6.7 | 8.5 | 10.4 |
| Field Nursery | 15.8 | 19.6 | 23.5 |
| Floriculture | 12.4 | 15.6 | 18.5 |
| Grapes | 2.5 | 4.3 | 5.8 |
| Greens | 3.3 | 4.6 | 6.2 |
| Hammock Ferns | 8.6 | 12.6 | 16.9 |
| Hay | 4.2 | 7.1 | 9.2 |
| Herbs | 5.4 | 6.7 | 7.8 |
| Kale | 5.5 | 6.8 | 8.2 |
| Leatherleaf | 14.5 | 18.3 | 23.0 |
| Lettuce | 2.6 | 3.7 | 4.5 |
| Melons | 6.2 | 7.8 | 9.0 |
| Millet | 5.1 | 7.6 | 10.1 |
| Misc. Vegetables | 4.3 | 5.8 | 7.3 |
| Mustard Greens | 4.2 | 5.4 | 6.8 |
| Nurseries and Viney* | 21.0 | 23.7 | 26.4 |
| Oats | 0.0 | 0.1 | 0.1 |
| Okra | 6.9 | 8.8 | 10.8 |
| Ornamentals | 20.4 | 23.3 | 26.7 |
| Parsley | 2.8 | 3.9 | 5.0 |
| Pasture | 15.4 | 19.2 | 23.7 |
| Peaches | 4.2 | 7.2 | 9.6 |
| Peanuts | 3.4 | 5.0 | 6.5 |

**Table B-5 1995 Irrigated Lands Net Irrigation Summary Statistics by Crop Type**

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| Peas | 7.1 | 9.3 | 11.7 |
| Pecans | 3.9 | 6.6 | 8.8 |
| Peppers | 5.7 | 7.5 | 9.2 |
| Persimmons | 3.3 | 6.4 | 8.6 |
| Potatoes | 2.2 | 3.6 | 4.8 |
| produce | 5.5 | 6.9 | 8.1 |
| rotation | 4.8 | 7.3 | 9.9 |
| Rye | 0.1 | 0.3 | 0.5 |
| Small Grains | 0.1 | 0.6 | 0.8 |
| Sod | 11.3 | 15.4 | 19.3 |
| Sorghum | 3.3 | 5.0 | 6.7 |
| Soybeans | 2.9 | 4.6 | 5.9 |
| Specialty Farms | 6.1 | 7.3 | 8.5 |
| Squash | 2.3 | 3.4 | 4.3 |
| Strawberries | 5.0 | 6.6 | 8.8 |
| Sugar Cane | 14.6 | 18.2 | 23.5 |
| Sunflowers | 5.0 | 6.6 | 8.2 |
| Sweet Corn | 3.3 | 4.8 | 6.4 |
| Tomato | 8.3 | 9.6 | 10.9 |
| Tomatoes | 4.1 | 5.8 | 7.0 |
| Turf grass | 13.4 | 17.8 | 23.5 |
| Turnips | 3.2 | 4.0 | 5.4 |
| Unspecified Field C* | 2.1 | 4.5 | 6.4 |
| Unspecified Row Cro* | 6.1 | 7.7 | 9.4 |
| Unspecified Row Crop | 5.6 | 7.3 | 8.8 |
| Unspecified Tree Cr* | 3.1 | 5.5 | 7.4 |
| Watermelons | 3.9 | 5.7 | 7.3 |
| Winter Wheat | 0.0 | 0.1 | 0.2 |

[1]Wct year calculated as the average of the 20$^{th}$ percentile irrigation requirements of each polygon based on the 21-year simulation period. Dry year was calculated similarly for the 80$^{th}$ percentile irrigation requirement.

**Table B-6 2010 Irrigated Lands Net Irrigation Summary Statistics by Crop Type**

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| Alfalfa | 5.2 | 9.0 | 12.1 |
| Asparagus Fern | 14.5 | 18.4 | 23.1 |
| Aspidistra | 26.4 | 29.9 | 34.5 |
| Blueberries | 13.0 | 17.0 | 20.9 |
| Broccoli | 4.4 | 5.7 | 7.1 |
| Cabbage | 5.4 | 6.9 | 8.4 |
| Cantaloupe | 2.6 | 4.3 | 6.2 |
| Chestnuts | 3.3 | 6.3 | 8.3 |
| Citrus | 4.8 | 8.5 | 12.4 |
| Clover | 1.6 | 2.3 | 2.8 |
| Collard Greens | 1.8 | 2.7 | 3.5 |
| Container Nursery | 20.0 | 23.5 | 27.5 |
| Coontie Fern | 15.7 | 18.9 | 23.2 |
| Corn | 3.7 | 4.9 | 6.0 |
| Cotton | 3.3 | 4.8 | 6.1 |
| Cucurbits | 3.6 | 5.1 | 6.1 |
| DevelopedCabbage | 5.4 | 6.5 | 8.2 |
| Dry Beans | 6.2 | 8.1 | 9.6 |
| Field Corn | 7.0 | 10.1 | 12.9 |
| Field Nursery | 14.8 | 18.4 | 22.1 |
| Grapes | 2.9 | 4.9 | 6.6 |
| Greens | 3.9 | 5.2 | 6.7 |
| Hammock Ferns | 14.3 | 18.2 | 23.3 |
| Hay | 3.4 | 6.5 | 9.2 |
| Leatherleaf | 14.7 | 18.5 | 23.2 |
| Ligustrum | 25.8 | 29.7 | 34.0 |
| Liriope | 25.9 | 29.1 | 33.5 |
| Mangos | 18.9 | 22.9 | 26.8 |
| Millet | 5.0 | 7.5 | 10.0 |
| Misc. Vegetables | 3.9 | 5.3 | 6.5 |
| Nurseries and Vineyards | 21.2 | 23.9 | 26.5 |
| Oats | 0.0 | 0.1 | 0.2 |
| OatsCorn | 4.2 | 6.4 | 8.6 |
| Onions | 1.6 | 2.0 | 2.3 |
| Ornamentals | 20.0 | 22.9 | 26.6 |
| Pasture | 13.4 | 17.4 | 22.2 |
| Peaches | 4.4 | 7.9 | 11.1 |
| Peanuts | 3.4 | 4.9 | 6.4 |
| Peas | 7.0 | 9.4 | 11.8 |
| Pecans | 5.8 | 9.3 | 12.3 |
| Peppers | 6.4 | 8.3 | 9.8 |
| Persimmons | 3.3 | 6.3 | 8.3 |

**Table B-6 2010 Irrigated Lands Net Irrigation Summary Statistics by Crop Type**

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| Pittosporum | 26.0 | 29.5 | 34.1 |
| Potatoes | 2.3 | 3.7 | 5.0 |
| PotatoesCabbage | 6.1 | 7.8 | 9.3 |
| produce | 5.5 | 6.9 | 8.1 |
| Radish | 2.4 | 3.2 | 3.9 |
| Rice | 9.8 | 12.7 | 16.0 |
| rotation | 4.7 | 7.2 | 9.8 |
| rotationSorghum | 2.7 | 5.2 | 7.9 |
| rotationSoybeans | 2.6 | 4.9 | 6.1 |
| Rye | 0.1 | 0.3 | 0.5 |
| Shade Ferns | 13.1 | 17.4 | 22.1 |
| Sod | 11.4 | 15.4 | 19.3 |
| Sorghum | 3.7 | 5.7 | 7.8 |
| Soybeans | 2.9 | 4.6 | 5.9 |
| SoybeansOats | 3.3 | 5.1 | 6.5 |
| Specialty Farms | 6.1 | 7.4 | 8.5 |
| Spinach | 4.2 | 5.4 | 6.5 |
| Squash | 2.8 | 3.8 | 4.6 |
| Strawberries | 4.1 | 5.9 | 8.3 |
| Sugar Cane | 13.1 | 16.8 | 22.3 |
| Sweet Corn | 3.5 | 5.0 | 6.4 |
| Sweet Potatoes | 8.0 | 10.3 | 13.0 |
| Tomatoes | 5.1 | 6.4 | 7.6 |
| Tree Fern | 13.9 | 18.2 | 23.1 |
| Unspecified Field Crop | 4.2 | 6.1 | 8.1 |
| Unspecified Nurseries and Vineyards | 13.7 | 17.6 | 21.8 |
| Unspecified Row Crop | 5.6 | 7.3 | 8.9 |
| Unspecified Row Crop/Pasture | 11.2 | 14.9 | 18.4 |
| Unspecified Tree Crop | 4.7 | 7.9 | 10.9 |
| Watermelons | 3.9 | 5.7 | 7.3 |
| Winter Wheat | 0.0 | 0.1 | 0.2 |
| Winter WheatSorghum | 2.7 | 4.5 | 6.1 |
| Winter WheatSoybeans | 2.7 | 4.2 | 5.4 |

[1]Wct year calculated as the average of the 20$^{th}$ percentile irrigation requirements of each polygon based on the 21-year simulation period. Dry year was calculated similarly for the 80$^{th}$ percentile irrigation requirement.

# Appendix B

## Table B-7 1995 Irrigated Lands Net Irrigation by Crop and Irrigation System

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| **Alfalfa** | | | |
| Micro Spray | 3.25 | 5.56 | 6.82 |
| **Asparagus Fern** | | | |
| Impact Sprinkler | 14.76 | 18.49 | 23.11 |
| LT Drip | 10.48 | 14.04 | 17.48 |
| Sprayhead Sprinkler | 20.65 | 24.69 | 29.97 |
| **Aspidistra** | | | |
| Impact Sprinkler | 26.65 | 30.17 | 34.85 |
| **Beans** | | | |
| Impact Sprinkler | 5.89 | 7.90 | 9.70 |
| **Beets** | | | |
| Pipeline Seepage | 3.14 | 3.85 | 4.81 |
| **Blueberries** | | | |
| Impact Sprinkler | 10.92 | 14.89 | 18.74 |
| LT Drip | 11.13 | 15.22 | 18.72 |
| LT Drip/OP Sprinkler | 12.34 | 16.44 | 20.43 |
| Micro Spray | 10.85 | 14.98 | 19.05 |
| OP Sprinkler | 17.26 | 21.34 | 25.83 |
| Sprayhead Sprinkler | 17.47 | 22.20 | 26.23 |
| Subsurface Drip | 11.45 | 15.41 | 19.43 |
| **Broccoli** | | | |
| Impact Sprinkler | 1.82 | 2.84 | 3.57 |
| Pipeline Seepage | 4.37 | 5.81 | 7.38 |
| **Cabbage** | | | |
| Flood | 3.33 | 4.70 | 5.68 |
| Pipeline Seepage | 5.38 | 6.82 | 8.36 |
| **Cantaloupe** | | | |
| Sprayhead Sprinkler | 3.24 | 4.60 | 5.98 |
| Subsurface Drip | 2.53 | 4.31 | 6.26 |
| Traveling Gun | 4.08 | 5.43 | 6.95 |
| **Chestnuts** | | | |
| Micro Spray | 3.27 | 6.28 | 8.29 |
| **Chinese Cabbage** | | | |
| Pipeline Seepage | 5.54 | 6.80 | 8.23 |

**Table B-7 1995 Irrigated Lands Net Irrigation by Crop and Irrigation System**

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| **Citrus** | | | |
| Center Pivot | 11.30 | 15.55 | 19.07 |
| Flood | 15.97 | 19.22 | 22.98 |
| Impact Sprinkler | 6.95 | 10.52 | 13.80 |
| LT Drip | 4.20 | 7.28 | 10.07 |
| LT Drip/OP Sprinkler | 3.76 | 6.84 | 8.73 |
| Micro Spray | 3.79 | 6.98 | 10.07 |
| OP Sprinkler | 12.24 | 16.62 | 20.89 |
| Pipeline Seepage | 15.89 | 20.09 | 24.28 |
| Sprayhead Sprinkler | 12.15 | 16.62 | 21.75 |
| Stationary Guns | 6.01 | 9.01 | 11.85 |
| Traveling Gun | 5.40 | 8.43 | 10.91 |
| **Collard Greens** | | | |
| Pipeline Seepage | 4.49 | 5.88 | 7.22 |
| **Container Nursery** | | | |
| Containter Nursery | 20.41 | 23.62 | 26.90 |
| LT Drip | 17.24 | 20.61 | 24.20 |
| LT Drip/OP Sprinkler | 15.51 | 19.53 | 22.73 |
| Micro Spray | 16.30 | 20.18 | 23.73 |
| OP Sprinkler | 20.96 | 23.76 | 26.77 |
| Sprayhead Sprinkler | 20.36 | 23.18 | 25.37 |
| Surface Drip | 16.27 | 20.05 | 23.79 |
| **Corn** | | | |
| Traveling Gun | 3.77 | 4.96 | 6.03 |
| **Cotton** | | | |
| Traveling Gun | 2.84 | 4.26 | 5.70 |
| **Cucurbits** | | | |
| Micro Spray | 1.44 | 2.66 | 3.45 |
| Pipeline Seepage | 3.98 | 5.53 | 6.59 |
| **Cut Foliage** | | | |
| Impact Sprinkler | 13.87 | 18.24 | 22.85 |
| Traveling Gun | 14.26 | 17.47 | 20.40 |
| **Dry Beans** | | | |
| Center Pivot | 9.42 | 10.97 | 12.70 |
| Micro Spray | 3.72 | 5.71 | 6.53 |

# Appendix B

## Table B-7 1995 Irrigated Lands Net Irrigation by Crop and Irrigation System

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| **Field Corn** | | | |
| Center Pivot | 4.84 | 6.84 | 8.75 |
| Impact Sprinkler | 4.10 | 5.40 | 6.62 |
| Linear | 4.13 | 6.79 | 9.52 |
| OP Sprinkler | 6.49 | 8.93 | 10.46 |
| Pipeline Seepage | 8.81 | 10.77 | 12.85 |
| Traveling Gun | 3.44 | 5.04 | 6.61 |
| **Field Nursery** | | | |
| Flood | 16.10 | 20.02 | 24.68 |
| Impact Sprinkler | 16.00 | 19.66 | 23.81 |
| LT Drip | 12.81 | 16.43 | 19.92 |
| Micro Spray | 13.29 | 17.27 | 20.82 |
| OP Sprinkler | 22.05 | 25.90 | 29.65 |
| Pipeline Seepage | 17.53 | 21.42 | 25.76 |
| Sprayhead Sprinkler | 22.70 | 26.57 | 31.72 |
| ST Drip | 10.24 | 14.26 | 17.71 |
| Stationary Guns | 16.83 | 20.88 | 24.82 |
| Traveling Gun | 15.67 | 19.29 | 22.09 |
| **Floriculture** | | | |
| Sprinkler - CTR Nursery | 12.40 | 15.61 | 18.46 |
| **Grapes** | | | |
| Impact Sprinkler | 2.57 | 5.11 | 6.85 |
| LT Drip | 2.44 | 4.27 | 5.67 |
| Micro Spray | 2.47 | 4.02 | 5.28 |
| **Greens** | | | |
| Traveling Gun | 3.26 | 4.59 | 6.17 |
| **Hammock Ferns** | | | |
| Micro Spray | 8.63 | 12.59 | 16.88 |
| **Hay** | | | |
| Center Pivot | 7.90 | 10.91 | 14.87 |
| Linear | 8.43 | 12.53 | 15.39 |
| Micro Spray | 2.03 | 4.52 | 5.77 |
| Pipeline Seepage | 13.55 | 17.02 | 21.70 |
| Stationary Guns | 4.73 | 8.10 | 10.06 |
| Traveling Gun | 2.83 | 5.56 | 7.51 |
| **Herbs** | | | |
| Pipeline Seepage | 5.43 | 6.68 | 7.80 |
| **Kale** | | | |
| Pipeline Seepage | 5.54 | 6.80 | 8.23 |

# Appendix B

## Table B-7 1995 Irrigated Lands Net Irrigation by Crop and Irrigation System

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| **Leatherleaf** | | | |
| Impact Sprinkler | 14.41 | 18.27 | 22.97 |
| Micro Spray | 13.76 | 17.21 | 21.37 |
| Sprayhead Sprinkler | 20.24 | 24.40 | 29.56 |
| **Lettuce** | | | |
| Traveling Gun | 2.59 | 3.67 | 4.49 |
| **Melons** | | | |
| Pipeline Seepage | 6.18 | 7.81 | 9.02 |
| **Millet** | | | |
| Traveling Gun | 5.12 | 7.61 | 10.09 |
| **Misc. Vegetables** | | | |
| Flood | 1.49 | 2.77 | 3.97 |
| Impact Sprinkler | 2.00 | 3.36 | 4.78 |
| Pipeline Seepage | 6.03 | 7.62 | 9.30 |
| **Mustard Greens** | | | |
| Pipeline Seepage | 4.15 | 5.37 | 6.80 |
| **Nurseries and Viney*** | | | |
| Container nursery impact sprinkler | 20.99 | 23.74 | 26.37 |
| **Oats** | | | |
| Traveling Gun | 0.00 | 0.10 | 0.12 |
| **Okra** | | | |
| Impact Sprinkler | 6.90 | 8.81 | 10.84 |
| **Ornamentals** | | | |
| Container nursery impact sprinkler | 20.39 | 23.33 | 26.71 |
| **Parsley** | | | |
| Impact Sprinkler | 2.81 | 3.90 | 4.98 |
| **Pasture** | | | |
| Center Pivot | 6.95 | 10.18 | 13.49 |
| Flood | 12.70 | 15.60 | 18.73 |
| Impact Sprinkler | 2.59 | 5.66 | 7.95 |
| Linear | 7.34 | 10.29 | 14.82 |
| Micro Spray | 1.93 | 4.25 | 5.52 |
| Pipeline Seepage | 15.82 | 19.66 | 24.22 |
| ST Drip | 1.18 | 3.37 | 4.54 |
| Traveling Gun | 2.96 | 5.66 | 7.62 |
| **Peaches** | | | |
| LT Drip | 4.18 | 7.04 | 9.42 |
| Micro Spray | 4.25 | 7.32 | 9.76 |

# Appendix B

## Table B-7 1995 Irrigated Lands Net Irrigation by Crop and Irrigation System

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| **Peanuts** | | | |
| Impact Sprinkler | 2.49 | 3.99 | 5.68 |
| Linear | 5.33 | 7.41 | 9.50 |
| Pipeline Seepage | 7.90 | 9.84 | 11.88 |
| Sprayhead Sprinkler | 5.65 | 7.79 | 9.48 |
| Traveling Gun | 3.44 | 5.02 | 6.52 |
| **Peas** | | | |
| Center Pivot | 7.07 | 9.35 | 11.75 |
| Impact Sprinkler | 5.22 | 6.82 | 8.62 |
| Micro Spray | 5.58 | 7.52 | 8.99 |
| Traveling Gun | 3.74 | 5.40 | 6.82 |
| **Pecans** | | | |
| Impact Sprinkler | 5.65 | 8.90 | 11.60 |
| LT Drip | 2.86 | 5.46 | 7.71 |
| Micro Spray | 3.31 | 6.10 | 8.63 |
| Pipeline Seepage | 9.16 | 13.74 | 16.44 |
| Sprayhead Sprinkler | 9.91 | 13.46 | 16.64 |
| Subsurface Drip | 3.28 | 5.81 | 7.95 |
| **Peppers** | | | |
| Pipeline Seepage | 6.41 | 8.32 | 9.80 |
| Sprayhead Sprinkler | 5.05 | 6.74 | 8.67 |
| **Persimmons** | | | |
| Micro Spray | 3.27 | 6.40 | 8.59 |
| **Potatoes** | | | |
| Flood | 1.03 | 2.04 | 3.19 |
| Pipeline Seepage | 2.24 | 3.65 | 4.84 |
| Traveling Gun | 1.35 | 2.26 | 2.90 |
| Wheel Roll | 2.19 | 3.32 | 4.25 |
| **produce** | | | |
| LT Drip | 4.96 | 6.36 | 7.52 |
| Sprayhead Sprinkler | 9.61 | 11.11 | 12.52 |
| ST Drip | 4.96 | 6.41 | 7.57 |
| Traveling Gun | 5.71 | 7.30 | 8.58 |
| **rotation** | | | |
| Center Pivot | 6.72 | 9.30 | 12.19 |
| LT Drip | 3.15 | 5.52 | 7.54 |
| ST Drip | 2.78 | 5.16 | 6.96 |
| Traveling Gun | 3.42 | 5.86 | 8.37 |
| **Rye** | | | |
| Traveling Gun | 0.08 | 0.31 | 0.51 |

# Appendix B

## Table B-7 1995 Irrigated Lands Net Irrigation by Crop and Irrigation System

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| **Small Grains** | | | |
| Center Pivot | 0.16 | 0.66 | 0.87 |
| Linear | 0.00 | 0.66 | 1.17 |
| Traveling Gun | 0.00 | 0.24 | 0.34 |
| **Sod** | | | |
| Center Pivot | 15.86 | 20.46 | 24.69 |
| Flood | 15.13 | 18.48 | 21.81 |
| Impact Sprinkler | 11.57 | 14.61 | 17.95 |
| Linear | 16.03 | 20.36 | 25.21 |
| Micro Spray | 10.91 | 15.23 | 19.12 |
| OP Sprinkler | 15.96 | 20.19 | 24.05 |
| Pipeline Seepage | 15.31 | 19.41 | 23.56 |
| Sprayhead Sprinkler | 15.91 | 20.24 | 24.16 |
| Stationary Guns | 12.46 | 16.56 | 20.64 |
| Traveling Gun | 11.30 | 15.40 | 19.32 |
| Wheel Roll | 15.16 | 19.81 | 23.66 |
| **Sorghum** | | | |
| Pipeline Seepage | 8.65 | 11.48 | 14.60 |
| Traveling Gun | 3.20 | 4.94 | 6.59 |
| **Soybeans** | | | |
| Traveling Gun | 2.89 | 4.58 | 5.88 |
| **Specialty Farms** | | | |
| Container nursery impact sprinkler | 6.91 | 7.86 | 8.77 |
| LT Drip | 2.94 | 4.43 | 5.90 |
| Micro Spray | 2.73 | 4.05 | 5.56 |
| OP Sprinkler | 6.49 | 8.32 | 10.41 |
| Pipeline Seepage | 7.48 | 9.28 | 11.48 |
| **Squash** | | | |
| Center Pivot | 2.21 | 3.40 | 4.31 |
| Pipeline Seepage | 2.57 | 3.60 | 4.58 |
| Stationary Guns | 1.94 | 2.68 | 3.11 |
| Traveling Gun | 1.53 | 2.37 | 3.08 |
| **Strawberries** | | | |
| LT Drip | 4.37 | 6.04 | 8.36 |
| LT Drip/OP Sprinkler | 4.14 | 5.73 | 8.06 |
| Micro Spray | 3.27 | 4.90 | 7.23 |
| OP Sprinkler | 7.93 | 9.54 | 11.69 |
| Pipeline Seepage | 10.79 | 13.62 | 16.51 |
| Surface Drip | 4.21 | 5.78 | 7.88 |

**Table B-7 1995 Irrigated Lands Net Irrigation by Crop and Irrigation System**

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| **Sugar Cane** | | | |
| Pipeline Seepage | 14.61 | 18.16 | 23.52 |
| **Sunflowers** | | | |
| LT Drip | 4.98 | 6.60 | 8.21 |
| **Sweet Corn** | | | |
| Impact Sprinkler | 3.69 | 4.76 | 6.01 |
| LT Drip | 2.48 | 3.77 | 4.88 |
| Sprayhead Sprinkler | 6.81 | 7.38 | 8.24 |
| Traveling Gun | 3.15 | 4.74 | 6.32 |
| Wheel Roll | 5.01 | 6.24 | 7.62 |
| **Tomato** | | | |
| Pipeline Seepage | 8.26 | 9.63 | 10.91 |
| **Tomatoes** | | | |
| Micro Spray | 2.04 | 4.02 | 5.17 |
| OP Sprinkler | 5.26 | 6.83 | 8.17 |
| Pipeline Seepage | 6.09 | 7.95 | 9.31 |
| Surface Drip | 2.23 | 3.79 | 4.90 |
| **Turf grass** | | | |
| Impact Sprinkler | 13.38 | 17.78 | 23.52 |
| **Turnips** | | | |
| Pipeline Seepage | 3.17 | 4.00 | 5.38 |
| **Unspecified Field C*** | | | |
| Impact Sprinkler | 3.16 | 4.69 | 6.30 |
| LT Drip | 3.56 | 5.18 | 6.39 |
| Micro Spray | 3.79 | 5.24 | 6.82 |
| Traveling Gun | 2.08 | 4.47 | 6.36 |
| **Unspecified Row Cro*** | | | |
| Center Pivot | 6.11 | 7.75 | 9.41 |
| **Unspecified Row Crop** | | | |
| Center Pivot | 5.69 | 7.34 | 8.93 |
| LT Drip | 2.11 | 3.21 | 4.55 |
| Micro Spray | 2.76 | 4.59 | 6.06 |
| OP Sprinkler | 6.84 | 8.65 | 10.19 |
| **Unspecified Tree Cr*** | | | |
| Micro Spray | 3.60 | 6.27 | 8.40 |
| Subsurface Drip | 3.12 | 5.50 | 7.34 |

**Table B-7 1995 Irrigated Lands Net Irrigation by Crop and Irrigation System**

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| **Watermelons** | | | |
| LT Drip/OP Sprinkler | 2.42 | 4.18 | 5.59 |
| Micro Spray | 2.51 | 4.55 | 6.18 |
| Pipeline Seepage | 6.52 | 8.23 | 9.81 |
| ST Drip | 2.79 | 4.62 | 6.23 |
| Traveling Gun | 3.41 | 5.22 | 6.72 |
| **Winter Wheat** | | | |
| Traveling Gun | 0.01 | 0.12 | 0.17 |

[1]Wct year calculated as the average of the 20th percentile irrigation requirements of each polygon based on the 21-year simulation period. Dry year was calculated similarly for the 80th percentile irrigation requirement.

**Table B-8 2010 Irrigated Lands Net Irrigation Summary Statistics by Crop and Irrigation System**

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| **Alfalfa** | | | |
| Micro Spray | | | |
| **Asparagus Fern** | 5.21 | 8.98 | 12.05 |
| Impact Sprinkler | | | |
| Micro Spray | 14.50 | 18.40 | 23.08 |
| **Aspidistra** | 9.05 | 12.64 | 16.11 |
| Impact Sprinkler | | | |
| Micro Spray | 26.64 | 30.15 | 34.76 |
| Sprayhead Sprinkler* | 15.68 | 19.34 | 23.53 |
| **Blueberries** | 20.14 | 23.16 | 26.63 |
| Impact Sprinkler | | | |
| LT Drip | 10.88 | 14.77 | 18.49 |
| LT Drip/OP Sprinkler | 11.17 | 15.23 | 18.70 |
| Micro Spray | 12.34 | 16.44 | 20.43 |
| OP Sprinkler | 17.26 | 21.34 | 25.83 |
| Sprayhead Sprinkler* | 17.62 | 22.29 | 26.16 |
| Subsurface Drip | 11.39 | 15.29 | 18.95 |
| **Broccoli** | | | |
| Pipeline seepage | 4.90 | 6.26 | 7.77 |
| Traveling gun | 1.40 | 2.39 | 3.36 |
| **Cabbage** | | | |
| Pipeline seepage | 5.46 | 6.93 | 8.51 |
| Traveling gun | 2.38 | 3.37 | 4.44 |
| **Cantaloupe** | | | |
| Subsurface Drip | 2.60 | 4.27 | 6.18 |
| **Chestnuts** | | | |
| Micro Spray | 3.27 | 6.28 | 8.29 |
| **Citrus** | | | |
| Center Pivot | 11.30 | 15.55 | 19.07 |
| Flood | 15.30 | 18.66 | 22.55 |
| Impact Sprinkler | 6.92 | 10.39 | 13.81 |
| LT Drip | 6.04 | 10.19 | 13.72 |
| LT Drip/OP Sprinkler | 5.99 | 10.43 | 13.75 |
| Micro Spray | 4.68 | 8.41 | 12.29 |
| OP Sprinkler | 12.24 | 16.62 | 20.89 |
| Pipeline seepage | 13.03 | 17.44 | 21.69 |
| Reclaimed - Micro S* | 6.31 | 11.22 | 14.04 |
| Sprayhead Sprinkler* | 11.94 | 16.42 | 20.76 |
| Stationary Guns | 7.08 | 11.13 | 14.97 |
| Traveling gun | 7.22 | 11.27 | 15.18 |

# Appendix B

**Table B-8 2010 Irrigated Lands Net Irrigation Summary Statistics by Crop and Irrigation System**

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| **Clover** | | | |
| Traveling gun | 1.56 | 2.25 | 2.77 |
| **Collard Greens** | | | |
| Traveling gun | 1.82 | 2.73 | 3.53 |
| **Container Nursery** | | | |
| Impact Sprinkler | 27.15 | 30.76 | 35.05 |
| LT Drip | 17.24 | 20.61 | 24.20 |
| LT Drip/OP Sprinkler | 15.51 | 19.53 | 22.73 |
| Micro Spray | 16.57 | 20.36 | 24.21 |
| OP Sprinkler | 20.96 | 23.76 | 26.77 |
| Sprayhead Sprinkler* | 20.45 | 23.85 | 27.30 |
| ST Drip | 16.22 | 20.09 | 23.96 |
| Surface Drip | 15.77 | 19.26 | 23.67 |
| **Coontie Fern** | | | |
| Impact Sprinkler | 15.66 | 18.88 | 23.23 |
| **Corn** | | | |
| Traveling gun | 3.72 | 4.94 | 6.03 |
| **Cotton** | | | |
| Pipeline seepage | 8.42 | 10.33 | 12.23 |
| Traveling gun | 1.62 | 2.98 | 4.01 |
| **Cucurbits** | | | |
| Micro Spray | 1.44 | 2.66 | 3.45 |
| Pipeline seepage | 3.91 | 5.39 | 6.49 |
| **DevelopedCabbage** | | | |
| Pipeline seepage | 5.37 | 6.51 | 8.18 |
| **Dry Beans** | | | |
| Center Pivot | 6.22 | 8.15 | 9.70 |
| Micro Spray | 3.72 | 5.71 | 6.53 |
| **Field Corn** | | | |
| Impact Sprinkler | 3.13 | 5.89 | 8.76 |
| OP Sprinkler | 6.49 | 8.93 | 10.46 |
| Pipeline seepage | 7.70 | 10.97 | 14.25 |

# Appendix B

**Table B-8 2010 Irrigated Lands Net Irrigation Summary Statistics by Crop and Irrigation System**

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| **Field Nursery** | | | |
| Flood | 17.55 | 21.37 | 25.76 |
| Impact Sprinkler | 15.75 | 19.39 | 23.47 |
| LT Drip | 12.70 | 16.22 | 19.59 |
| Micro Spray | 12.74 | 16.32 | 19.93 |
| OP Sprinkler | 22.05 | 25.90 | 29.65 |
| Pipeline seepage | 14.89 | 18.98 | 23.30 |
| Sprayhead Sprinkler* | 22.55 | 26.62 | 31.48 |
| ST Drip | 10.24 | 14.26 | 17.71 |
| Stationary Guns | 16.83 | 20.88 | 24.82 |
| Traveling gun | 15.34 | 18.90 | 21.80 |
| **Grapes** | | | |
| Impact Sprinkler | 2.32 | 4.90 | 6.51 |
| LT Drip | 2.93 | 4.78 | 6.47 |
| Micro Spray | 3.29 | 5.85 | 7.82 |
| Subsurface Drip | 2.27 | 3.59 | 4.93 |
| **Greens** | | | |
| Pipeline seepage | 3.94 | 5.23 | 6.77 |
| Traveling gun | 1.93 | 2.93 | 4.16 |
| **Hammock Ferns** | | | |
| Impact Sprinkler | 14.26 | 18.24 | 23.27 |
| **Hay** | | | |
| Center Pivot | 9.22 | 12.57 | 15.40 |
| Impact Sprinkler | 5.06 | 8.24 | 11.67 |
| Linear | 8.70 | 11.88 | 15.22 |
| Micro Spray | 2.89 | 6.41 | 8.82 |
| Pipeline seepage | 16.84 | 21.36 | 25.60 |
| Reclaimed - Impact * | 10.28 | 15.40 | 19.53 |
| Stationary Guns | 4.73 | 8.39 | 10.70 |
| Traveling gun | 3.39 | 6.53 | 9.22 |
| **Leatherleaf** | | | |
| Impact Sprinkler | 14.67 | 18.44 | 23.15 |
| LT Drip | 14.12 | 17.07 | 20.80 |
| Sprayhead Sprinkler* | 18.43 | 22.67 | 28.04 |
| Stationary Guns | 16.36 | 19.51 | 24.01 |
| **Ligustrum** | | | |
| Impact Sprinkler | 25.80 | 29.67 | 34.04 |
| **Liriope** | | | |
| Impact Sprinkler | 26.76 | 30.07 | 34.57 |
| Sprayhead Sprinkler* | 20.41 | 23.08 | 26.27 |

# Appendix B

**Table B-8 2010 Irrigated Lands Net Irrigation Summary Statistics by Crop and Irrigation System**

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| **Mangos** | | | |
| Flood | 18.86 | 22.90 | 26.82 |
| **Millet** | | | |
| Traveling gun | 4.99 | 7.47 | 9.99 |
| **Misc. Vegetables** | | | |
| Impact Sprinkler | 3.04 | 4.37 | 5.44 |
| LT Drip | 2.53 | 3.98 | 4.91 |
| Pipeline seepage | 5.99 | 7.52 | 9.15 |
| **Nurseries and Vineyards** | | | |
| Container nursery impact sprinkler | 21.20 | 23.90 | 26.52 |
| **Oats** | | | |
| Traveling gun | 0.02 | 0.14 | 0.18 |
| **OatsCorn** | | | |
| Traveling gun | 4.18 | 6.41 | 8.64 |
| **Onions** | | | |
| Impact Sprinkler | 0.79 | 1.11 | 1.31 |
| Pipeline seepage | 2.38 | 2.80 | 3.25 |
| **Ornamentals** | | | |
| Container nursery impact sprinkler | 20.54 | 23.23 | 26.71 |
| Flood | 17.98 | 22.10 | 26.58 |
| Impact Sprinkler | 16.06 | 19.52 | 23.47 |
| LT Drip | 12.22 | 15.70 | 18.71 |
| Micro Spray | 12.35 | 16.67 | 20.78 |
| Pipeline seepage | 18.00 | 22.36 | 26.88 |
| Sprayhead Sprinkler* | 23.05 | 27.22 | 32.05 |
| **Pasture** | | | |
| Center Pivot | 6.44 | 10.07 | 12.83 |
| Flood | 14.84 | 17.67 | 20.74 |
| Impact Sprinkler | 3.93 | 6.74 | 9.33 |
| Linear | 7.15 | 10.46 | 13.91 |
| Micro Spray | 3.22 | 6.81 | 9.43 |
| Pipeline seepage | 13.80 | 17.80 | 22.73 |
| Sprayhead Sprinkler* | 8.74 | 12.58 | 15.92 |
| ST Drip | 2.36 | 6.30 | 9.33 |
| Traveling gun | 2.92 | 6.15 | 8.70 |
| **Peaches** | | | |
| LT Drip | 3.62 | 7.28 | 10.73 |
| Micro Spray | 5.66 | 8.88 | 11.55 |
| **Peanuts** | | | |
| Traveling gun | 3.35 | 4.90 | 6.38 |

## Appendix B

**Table B-8 2010 Irrigated Lands Net Irrigation Summary Statistics by Crop and Irrigation System**

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| **Peas** | | | |
| Center Pivot | 7.02 | 9.40 | 11.82 |
| Impact Sprinkler | 6.09 | 8.38 | 10.56 |
| Micro Spray | 5.58 | 7.52 | 8.99 |
| **Pecans** | | | |
| LT Drip | 3.73 | 6.85 | 9.55 |
| Micro Spray | 3.45 | 6.17 | 9.02 |
| Sprayhead Sprinkler* | 9.85 | 13.42 | 16.53 |
| Subsurface Drip | 4.52 | 8.22 | 11.19 |
| Traveling gun | 4.84 | 7.10 | 9.14 |
| **Peppers** | | | |
| Pipeline seepage | 6.41 | 8.32 | 9.80 |
| **Persimmons** | | | |
| Micro Spray | 3.27 | 6.28 | 8.29 |
| **Pittosporum** | | | |
| Container nursery impact sprinkler | 20.32 | 23.02 | 26.25 |
| Impact Sprinkler | 26.68 | 30.20 | 34.79 |
| LT Drip | 15.70 | 19.94 | 24.00 |
| Micro Spray | 15.96 | 19.91 | 24.43 |
| Sprayhead Sprinkler* | 20.18 | 22.93 | 26.26 |
| **Potatoes** | | | |
| Pipeline seepage | 2.26 | 3.72 | 4.97 |
| **PotatoesCabbage** | | | |
| Pipeline seepage | 6.14 | 7.80 | 9.31 |
| **produce** | | | |
| Center Pivot | 9.23 | 10.81 | 12.11 |
| LT Drip | 5.03 | 6.44 | 7.59 |
| Sprayhead Sprinkler* | 9.50 | 11.03 | 12.41 |
| ST Drip | 4.74 | 6.38 | 7.55 |
| Traveling gun | 5.54 | 7.15 | 8.46 |
| **Radish** | | | |
| Pipeline seepage | 2.42 | 3.21 | 3.89 |
| **Rice** | | | |
| Flood | 9.81 | 12.71 | 16.03 |
| **rotation** | | | |
| Center Pivot | 6.68 | 9.31 | 12.19 |
| LT Drip | 3.18 | 5.55 | 7.61 |
| Traveling gun | 3.45 | 5.87 | 8.37 |
| **rotationSorghum** | | | |
| Traveling gun | 2.69 | 5.23 | 7.89 |

# Appendix B

**Table B-8 2010 Irrigated Lands Net Irrigation Summary Statistics by Crop and Irrigation System**

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| **rotationSoybeans** | | | |
| Traveling gun | 2.61 | 4.85 | 6.11 |
| **Rye** | | | |
| Traveling gun | 0.09 | 0.33 | 0.53 |
| **Shade Ferns** | | | |
| Impact Sprinkler | 13.09 | 17.41 | 22.10 |
| LT Drip | 13.29 | 17.99 | 21.64 |
| **Sod** | | | |
| Center Pivot | 15.63 | 20.01 | 23.90 |
| Flood | 13.34 | 17.17 | 20.83 |
| Impact Sprinkler | 5.13 | 9.13 | 11.45 |
| Linear | 14.60 | 19.10 | 23.61 |
| Micro Spray | 10.91 | 15.23 | 19.12 |
| OP Sprinkler | 15.96 | 20.19 | 24.05 |
| Pipeline seepage | 14.62 | 18.93 | 23.10 |
| Sprayhead Sprinkler* | 15.72 | 20.12 | 24.05 |
| Stationary Guns | 12.46 | 16.56 | 20.64 |
| Traveling gun | 11.29 | 15.33 | 19.23 |
| Wheel Roll | 16.46 | 21.10 | 25.15 |
| **Sorghum** | | | |
| Pipeline seepage | 9.04 | 12.30 | 15.89 |
| Traveling gun | 3.46 | 5.35 | 7.35 |
| **Soybeans** | | | |
| Traveling gun | 2.91 | 4.59 | 5.87 |
| **SoybeansOats** | | | |
| Traveling gun | 3.29 | 5.14 | 6.49 |
| **Specialty Farms** | | | |
| Container nursery impact sprinkler | 6.50 | 7.76 | 8.71 |
| LT Drip | 2.94 | 4.43 | 5.90 |
| Micro Spray | 2.73 | 4.05 | 5.56 |
| OP Sprinkler | 6.49 | 8.32 | 10.41 |
| Pipeline seepage | 7.48 | 9.28 | 11.48 |
| **Spinach** | | | |
| Pipeline seepage | 4.19 | 5.39 | 6.53 |
| **Squash** | | | |
| Center Pivot | 2.91 | 3.80 | 4.61 |
| Pipeline seepage | 2.56 | 3.97 | 4.83 |
| Stationary Guns | 1.94 | 2.68 | 3.11 |

## Appendix B

**Table B-8 2010 Irrigated Lands Net Irrigation Summary Statistics by Crop and Irrigation System**

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| **Strawberries** | | | |
| Impact Sprinkler | 3.97 | 5.50 | 7.11 |
| LT Drip | 4.37 | 6.04 | 8.36 |
| LT Drip/OP Sprinkler | 4.14 | 5.73 | 8.06 |
| Micro Spray | 3.27 | 4.90 | 7.23 |
| OP Sprinkler | 7.93 | 9.54 | 11.69 |
| ST Drip | 4.30 | 6.12 | 7.73 |
| Surface Drip | 3.99 | 5.83 | 8.21 |
| **Sugar Cane** | | | |
| Pipeline seepage | 13.06 | 16.78 | 22.25 |
| **Sweet Corn** | | | |
| Traveling gun | 3.47 | 4.96 | 6.38 |
| **Sweet Potatoes** | | | |
| Pipeline seepage | 8.05 | 10.31 | 12.98 |
| **Tomatoes** | | | |
| Micro Spray | 2.04 | 4.02 | 5.17 |
| OP Sprinkler | 5.26 | 6.83 | 8.17 |
| Pipeline seepage | 6.09 | 7.95 | 9.31 |
| Surface Drip | 5.17 | 6.43 | 7.55 |
| **Tree Fern** | | | |
| Impact Sprinkler | 13.94 | 18.16 | 23.11 |
| **Unspecified Field Crop** | | | |
| Center Pivot | 7.45 | 9.68 | 12.13 |
| Flood | 9.28 | 11.41 | 13.74 |
| Impact Sprinkler | 3.25 | 5.00 | 6.37 |
| Micro Spray | 3.44 | 5.87 | 7.57 |
| Pipeline seepage | 8.90 | 12.43 | 15.62 |
| Traveling gun | 4.14 | 6.03 | 8.01 |
| **Unspecified Nurseries and Vineyards** | | | |
| Impact Sprinkler | 15.96 | 19.76 | 24.25 |
| LT Drip | 12.09 | 15.98 | 20.06 |
| Micro Spray | 13.55 | 17.25 | 21.27 |
| **Unspecified Row Crop** | | | |
| Center Pivot | 5.65 | 7.39 | 8.97 |
| Impact Sprinkler | 2.24 | 3.37 | 4.41 |
| Micro Spray | 2.71 | 4.52 | 5.98 |
| OP Sprinkler | 6.84 | 8.65 | 10.19 |
| Pipeline seepage | 5.91 | 7.68 | 8.98 |
| Traveling gun | 2.02 | 2.79 | 3.43 |
| **Unspecified Row Crop/Pasture** | | | |
| Center Pivot | 11.22 | 14.90 | 18.38 |

**Table B-8 2010 Irrigated Lands Net Irrigation Summary Statistics by Crop and Irrigation System**

| Crop | Annual Net Irrigation Requiment, Inches | | |
|---|---|---|---|
| | Wet Year[1] | Average Year | Dry Year[1] |
| **Unspecified Tree Crop** | | | |
| Flood | 13.33 | 16.58 | 18.97 |
| LT Drip | 4.33 | 7.65 | 10.88 |
| Micro Spray | 5.42 | 9.15 | 12.05 |
| Pipeline seepage | 15.79 | 20.03 | 24.07 |
| Subsurface Drip | 4.57 | 7.75 | 10.83 |
| Traveling gun | 4.37 | 6.02 | 7.97 |
| **Watermelons** | | | |
| Impact Sprinkler | 4.31 | 6.00 | 7.49 |
| LT Drip/OP Sprinkler | 2.42 | 4.18 | 5.59 |
| Micro Spray | 2.51 | 4.55 | 6.18 |
| Pipeline seepage | 6.52 | 8.45 | 10.29 |
| ST Drip | 2.67 | 4.51 | 6.19 |
| Traveling gun | 3.36 | 5.05 | 6.41 |
| **Winter Wheat** | | | |
| Traveling gun | 0.00 | 0.14 | 0.24 |
| **Winter WheatSorghum** | | | |
| Traveling gun | 2.65 | 4.47 | 6.14 |
| **Winter WheatSoybeans** | | | |
| Traveling gun | 2.75 | 4.17 | 5.42 |

[1]Wct year calculated as the average of the 20$^{th}$ percentile irrigation requirements of each polygon based on the 21-year simulation period. Dry year was calculated similarly for the 80$^{th}$ percentile irrigation requirement.

## Appendix B

Table B- 9 MIL Problem Code Description and Count

| Code | Count | Problem Definition |
|---|---|---|
| **PRESSURE AND IRRIGATION RATE** | | |
| 1 | 28 | Under-sized pump for number and type of sprinkler heads or emitters |
| 2 | 305 | Pressure loss between pump and sprinklers/emitters due to inadequate pipe size |
| 3 | 92 | Higher pressure than manufacturer's specifications |
| 4 | 547 | Lower pressure than manufacturer's specifications |
| 5 | 41 | Low pressure due to water supply |
| 6 | 386 | Different pressure between manifolds |
| 7 | 141 | Wetted area not adequate for crop requirement |
| 8 | 31 | Application rate > soil infiltration rate (ponding) |
| 9 | 16 | Air in pipelines |
| 11 | 303 | Pressure variation due to elevation differences |
| 12 | 717 | Missing/malfunctioning pressure gauge/regulator/filter |
| 13 | 55 | Mixed Crops or container with different water requirements in the same zone |
| **Generic List -PRESSURE AND IRRIGATION RATE** | | |
| 101 | 4 | Too High or Low Pressure at Pump Station |
| 102 | 0 | Too High or Low Flow at Pump Station |
| 103 | 28 | Uneven pressure distribution across manifold(s) and/or lateral(s) |
| 104 | 22 | Uneven irrigation distribution across lateral(s) |
| **EMITTERS AND/OR SPRINKLERS** | | |
| 20 | 765 | Mixed sprinkler/emitter sizes & unmatched precipitation in the same zone |
| 21 | 528 | Mixed sprinkler/emitter brands or types in the same zone |
| 22 | 329 | Poor emitter/sprinkler uniformity due to worn orifice |
| 23 | 221 | Poor overlap due to improper sprinkler/emitter alignment or spacing |
| 24 | 101 | Various riser heights in same zone |
| 25 | 100 | Emitter/sprinkler spacing varies in same zone |
| 26 | 406 | Missing/malfunctioning emitters or sprinklers |
| 27 | 518 | End Gun is out of adjustment or not operating |
| **Generic List -EMITTERS AND/OR SPRINKLERS** | | |
| 201 | 95 | Mixed sprinkler/emitter sizes |
| 202 | 93 | Mixed sprinkler/emitter brands |
| 203 | 120 | Missing and/or broken emitters or sprinklers |
| 204 | 7 | Wrong emitter or sprinkler size and/or spacing for type and/or layout of crop |

**Appendix B**

Table B- 9 MIL Problem Code Description and Count

| Code | Count | Problem Definition |
|---|---|---|
| **MAINTENANCE** | | |
| 30 | 881 | Leaks and broken valves, pipe, laterals lines (Poly-tubing), emitters, sprinklers |
| 31 | 108 | Clogged filter or filter screen |
| 32 | 42 | Sprinkler heads not properly adjusted, causing overflow on paved areas |
| 33 | 1148 | Clogged emitters/nozzles (due to biological, chemical or physical factors) |
| 34 | 141 | Leaning sprinklers/emitters causing non-uniform distribution |
| 35 | 59 | Malfunctioning valves |
| 36 | 36 | Control box in need of repair |
| 37 | 155 | Boot Leak |
| 38 | 27 | System has no booster pump |
| 40 | 328 | Stream of water blocked by vegetation |
| 41 | 149 | Variable crop spacing and stage of growth |
| 42 | 5 | Poor drainage, requiring water control |
| 44 | 1 | Uncatagorized |
| 45 | 0 | Uncatagorized |
| **Generic List -MAINTENANCE** | | |
| 301 | 18 | Pump Station Engine and/or Pump leaks or malfunctions |
| 302 | 15 | Filter leaks, clogged, or malfunctions |
| 303 | 123 | Pipe Leaks in Irrigation System |
| 304 | 10 | Valve(s) Malfunction(s) or Leak(s) in Irrigation System |
| 305 | 91 | Emitters and/or Sprinklers leaks, clogged, or malfunctioning |
| **OPERATION AND/OR MANAGEMENT** | | |
| 50 | 154 | Operating time too long |
| 51 | 10 | Operating time too short |
| 52 | 57 | Operating time too frequent |
| 53 | 623 | No rain shut-off device |
| 54 | 698 | No soil moisture measuring device or rain gage |
| 55 | 1191 | No irrigation water management plan |
| 56 | 240 | No tachometer |
| 57 | 3 | Contamination of water with oil and fuel |
| 63 | 0 | Uncatagorized |
| **Generic List -OPERATION AND/OR MANAGEMENT** | | |
| 501 | 12 | Irrigation System Running too Long |
| 502 | 0 | Irrigation System not Running Long Enough |
| 503 | 9 | Inappropriate Irrigation Frequency |
| 504 | 0 | Inappropriate Irrigation System for type of crop |
| 505 | 0 | Abandoned and/or Inoperable Irrigation System |

## Appendix B

**Table B-10 Frequency of MIL Problem Codes for Frequently Audited Crops, Irrigation Systems, and ZIP Codes**

| | Problem Code / Description | Crop | Avocado | | | | | | Berries | Citrus | Citrus | Citrus | Citrus | Citrus | Citrus | Citrus |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Irrigation System | Micro-Spray | Fixed Sprinkler | | | | | Fixed Sprinkler | Drip | Micro Spray | | | | | |
| | | ZIP Code | na | na | 33030 | 33031 | 33034 | 33170 | na | na | na | 32778 | 32784 | 32948 | 32966 | 33913 |
| | **Total Number of Reports** | | **22** | **24** | **26** | **34** | **25** | **24** | **29** | **5** | **183** | **23** | **22** | **66** | **46** | **39** |
| 1 | emitters | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 2% | 0% | 0% | 0% | 0% | 0% |
| 2 | inadequate pipe size | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 9% | 0% | 0% | 0% | 0% | 33% |
| 3 | Higher pressure than manufacturer's specifications | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 9% | 0% | 0% | 9% | 0% |
| 4 | Lower pressure than manufacturer's specifications | | 0% | 8% | 0% | 0% | 0% | 8% | 14% | 40% | 21% | 4% | 0% | 12% | 20% | 3% |
| 5 | Low pressure due to water supply | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 20% | 2% | 0% | 0% | 0% | 0% | 38% |
| 6 | Different pressure between manifolds | | 0% | 0% | 0% | 0% | 0% | 0% | 3% | 20% | 38% | 48% | 9% | 20% | 17% | 23% |
| 7 | Wetted area not adequate for crop requirement | | 5% | 17% | 0% | 3% | 0% | 21% | 0% | 0% | 4% | 0% | 0% | 0% | 0% | 0% |
| 8 | Application rate > soil infiltration rate (ponding) | | 0% | 8% | 0% | 0% | 0% | 13% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 3% |
| 9 | Air in pipelines | | 0% | 0% | 0% | 0% | 12% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 11 | Pressure variation due to elevation differences | | 0% | 0% | 0% | 0% | 0% | 0% | 34% | 0% | 40% | 74% | 45% | 0% | 0% | 0% |
| 12 | Missing/malfunctioning pressure gauge/regulator/filter | | 41% | 21% | 42% | 15% | 0% | 13% | 3% | 0% | 18% | 39% | 9% | 20% | 11% | 64% |
| 13 | the same zone | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 20 | same zone | | 0% | 0% | 8% | 32% | 0% | 25% | 0% | 40% | 39% | 39% | 27% | 64% | 39% | 0% |
| 21 | Mixed sprinkler/emitter brands or types in the same zone | | 0% | 8% | 27% | 56% | 24% | 4% | 0% | 40% | 11% | 0% | 0% | 52% | 33% | 5% |
| 22 | Poor emitter/sprinkler uniformity due to worn orifice | | 0% | 0% | 4% | 3% | 0% | 0% | 0% | 0% | 8% | 4% | 0% | 5% | 7% | 0% |
| 23 | spacing | | 0% | 8% | 19% | 6% | 16% | 0% | 14% | 0% | 1% | 0% | 0% | 5% | 0% | 0% |
| 24 | Various riser heights in same zone | | 0% | 0% | 0% | 21% | 0% | 0% | 14% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 25 | Emitter/sprinkler spacing varies in same zone | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 2% | 0% | 0% | 5% | 2% | 0% |
| 26 | Missing/malfunctioning emitters or sprinklers | | 0% | 0% | 4% | 0% | 0% | 0% | 0% | 20% | 23% | 43% | 32% | 26% | 37% | 0% |
| 27 | End Gun is out of adjustment or not operating | | 0% | 0% | 0% | 0% | 0% | 13% | 3% | 40% | 1% | 0% | 0% | 6% | 0% | 0% |
| 30 | emitters, sprinklers | | 68% | 25% | 38% | 18% | 8% | 21% | 0% | 20% | 46% | 65% | 18% | 33% | 17% | 33% |
| 31 | Clogged filter or filter screen | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 5% | 4% | 0% | 24% | 11% | 0% |
| 32 | paved areas | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 2% | 0% |
| 33 | physical factors) | | 50% | 13% | 4% | 47% | 0% | 29% | 17% | 60% | 62% | 57% | 45% | 41% | 41% | 21% |
| 34 | Leaning sprinklers/emitters causing non-uniform distribution | | 91% | 8% | 12% | 0% | 0% | 4% | 7% | 0% | 1% | 0% | 0% | 2% | 0% | 0% |
| 36 | Control box in need of repair | | 0% | 0% | 0% | 0% | 0% | 13% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 35 | Malfunctioning valves | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 2% | 0% | 0% | 0% | 0% | 15% |
| 37 | Boot Leak | | 9% | 13% | 27% | 68% | 12% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 38 | System has no booster pump | | 0% | 0% | 0% | 0% | 0% | 4% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 40 | Stream of water blocked by vegetation | | 0% | 63% | 62% | 79% | 76% | 38% | 0% | 0% | 5% | 35% | 0% | 8% | 0% | 54% |
| 41 | Variable crop spacing and stage of growth | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 40% | 5% | 0% | 0% | 5% | 4% | 3% |
| 42 | Poor drainage, requiring water control | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 44 | Uncatagorized | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 50 | Operating time too long | | 23% | 33% | 23% | 47% | 16% | 21% | 0% | 0% | 1% | 0% | 0% | 3% | 13% | 0% |
| 51 | Operating time too short | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% | 0% |
| 52 | Operating time too frequent | | 5% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% | 0% |
| 53 | No rain shut-off device | | 50% | 75% | 100% | 85% | 88% | 71% | 7% | 0% | 8% | 17% | 0% | 0% | 0% | 0% |
| 54 | No soil moisture measuring device or rain gage | | 68% | 92% | 96% | 88% | 96% | 96% | 3% | 40% | 13% | 0% | 0% | 2% | 0% | 0% |
| 55 | No irrigation water management plan | | 77% | 96% | 96% | 68% | 100% | 96% | 72% | 20% | 42% | 30% | 14% | 0% | 9% | 0% |

## Appendix B

**Table B-10 Frequency of MIL Problem Codes for Frequently Audited Crops, Irrigation Systems, and ZIP Codes**

| | Problem Code / Description | Crop | Avocado | | | | | | Berries | Citrus | Citrus | Citrus | Citrus | Citrus | Citrus | Citrus |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Irrigation System | Micro-Spray | Fixed Sprinkler | | | | | Fixed Sprinkler | Drip | Micro Spray | | | | | |
| | | ZIP Code | na | na | 33030 | 33031 | 33034 | 33170 | na | na | na | 32778 | 32784 | 32948 | 32966 | 33913 |
| 56 | No tachometer | | 50% | 88% | 100% | 53% | 88% | 63% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 21% |
| 57 | Contamination of water with oil and fuel | | 0% | 0% | 0% | 3% | 0% | 4% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 101 | Too High or Low Pressure at Pump Station | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 20% | 0% | 0% | 0% | 2% | 0% | 0% |
| 103 | lateral(s) | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 5% | 17% | 0% |
| 104 | Uneven irrigation distribution across lateral(s) | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 5% | 15% | 0% |
| 201 | Mixed sprinkler/emitter sizes | | 0% | 83% | 50% | 24% | 24% | 63% | 0% | 0% | 1% | 0% | 0% | 2% | 7% | 0% |
| 202 | Mixed sprinkler/emitter brands | | 0% | 92% | 54% | 29% | 24% | 63% | 0% | 0% | 1% | 0% | 0% | 0% | 0% | 0% |
| 203 | Missing and/or broken emitters or sprinklers | | 55% | 58% | 15% | 24% | 48% | 67% | 0% | 0% | 0% | 0% | 0% | 21% | 11% | 0% |
| 204 | layout of crop | | 0% | 0% | 0% | 0% | 8% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 301 | Pump Station Engine and/or Pump leaks or malfunctions | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 14% | 11% | 0% |
| 302 | Filter leaks, clogged, or malfunctions | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 40% | 1% | 0% | 0% | 3% | 2% | 0% |
| 303 | Pipe Leaks in Irrigation System | | 0% | 13% | 15% | 6% | 24% | 25% | 0% | 0% | 5% | 4% | 9% | 12% | 7% | 0% |
| 304 | Valve(s) Malfunction(s) or Leak(s) in Irrigation System | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 5% | 7% | 0% |
| 305 | Emitters and/or Sprinklers leaks, clogged, or malfunctioning | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 20% | 3% | 39% | 23% | 36% | 7% | 0% |
| 501 | Irrigation System Running too Long | | 0% | 8% | 0% | 0% | 0% | 8% | 0% | 0% | 1% | 0% | 0% | 0% | 9% | 0% |
| 503 | Inappropriate Irrigation Frequency | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 40% | 0% | 0% | 0% | 0% | 0% | 0% |
| | Average Distribution Uniformity | | | 54.9 | 57.8 | 54.6 | 63.8 | 53.3 | 81.7 | | | | | | | |
| | Average Emitter Uniformity | | 77.3 | | | | | | | 67.0 | 79.8 | 73.1 | 88.1 | 74.1 | 76.5 | 76.7 |
| | Uniformity Rating | | fair | poor | poor | poor | poor | poor | good | poor | fair | fair | good | fair | fair | fair |
| | O&M Class | | Reactive | Deferred | Deferred | Deferred | Deferred | Deferred | Reactive | Reactive | Reactive | Reactive | Proactive | Reactive | Reactive | Reactive |

**Table B-10 Frequency of MIL Problem Codes for Frequently Audit**

| | Problem Code / Description | Crop | Citrus | Citrus | Citrus | Citrus | Citrus | Citrus | Citrus | Citrus | Citrus | Cut Foliage | | | | Nursery - Enclosed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Irrigation System | | Micro Spray | | | | | | | | Fixed Sprinkler | | | | Fixed Sprinkler |
| | | ZIP Code | 33930 | 33975 | 34142 | 34143 | 34711 | 34714 | 34945 | 34987 | 34994 | na | 32130 | 32180 | 32190 | na |
| | **Total Number of Reports** | | **119** | **49** | **243** | **40** | **29** | **20** | **100** | **26** | **20** | **61** | **33** | **82** | **55** | **44** |
| 1 | emitters | | 0% | 0% | 7% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 2 | inadequate pipe size | | 8% | 78% | 52% | 98% | 0% | 0% | 1% | 19% | 0% | 0% | 0% | 0% | 0% | 0% |
| 3 | Higher pressure than manufacturer's specifications | | 0% | 0% | 1% | 0% | 0% | 0% | 1% | 0% | 0% | 2% | 15% | 10% | 15% | 2% |
| 4 | Lower pressure than manufacturer's specifications | | 35% | 57% | 44% | 60% | 7% | 5% | 15% | 23% | 95% | 15% | 18% | 13% | 5% | 5% |
| 5 | Low pressure due to water supply | | 8% | 0% | 2% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 6 | Different pressure between manifolds | | 26% | 45% | 22% | 5% | 41% | 20% | 6% | 27% | 95% | 0% | 0% | 0% | 0% | 0% |
| 7 | Wetted area not adequate for crop requirement | | 0% | 0% | 0% | 0% | 0% | 0% | 9% | 0% | 0% | 0% | 0% | 0% | 0% | 2% |
| 8 | Application rate > soil infiltration rate (ponding) | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 9 | Air in pipelines | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 11 | Pressure variation due to elevation differences | | 0% | 0% | 0% | 0% | 66% | 70% | 0% | 0% | 0% | 25% | 12% | 5% | 11% | 0% |
| 12 | Missing/malfunctioning pressure gauge/regulator/filter | | 98% | 31% | 35% | 90% | 45% | 35% | 24% | 0% | 0% | 8% | 3% | 4% | 4% | 2% |
| 13 | the same zone | | 1% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 2% | 0% | 0% | 0% | 0% |
| 20 | same zone | | 1% | 53% | 4% | 10% | 28% | 20% | 39% | 19% | 100% | 48% | 55% | 57% | 49% | 9% |
| 21 | Mixed sprinkler/emitter brands or types in the same zone | | 61% | 0% | 22% | 0% | 0% | 0% | 46% | 8% | 95% | 28% | 33% | 39% | 35% | 9% |
| 22 | Poor emitter/sprinkler uniformity due to worn orifice | | 0% | 16% | 2% | 0% | 0% | 0% | 20% | 54% | 85% | 54% | 58% | 79% | 62% | 5% |
| 23 | spacing | | 0% | 0% | 0% | 0% | 0% | 0% | 3% | 4% | 0% | 33% | 24% | 48% | 36% | 18% |
| 24 | Various riser heights in same zone | | 0% | 0% | 0% | 0% | 0% | 0% | 3% | 0% | 0% | 13% | 24% | 27% | 24% | 0% |
| 25 | Emitter/sprinkler spacing varies in same zone | | 1% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 25% | 15% | 13% | 15% | 7% |
| 26 | Missing/malfunctioning emitters or sprinklers | | 3% | 6% | 4% | 5% | 31% | 20% | 34% | 35% | 5% | 13% | 15% | 12% | 5% | 9% |
| 27 | End Gun is out of adjustment or not operating | | 3% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 5% |
| 30 | emitters, sprinklers | | 61% | 84% | 32% | 58% | 72% | 95% | 25% | 50% | 95% | 15% | 15% | 4% | 11% | 16% |
| 31 | Clogged filter or filter screen | | 0% | 0% | 13% | 0% | 3% | 35% | 7% | 0% | 20% | 0% | 0% | 0% | 0% | 0% |
| 32 | paved areas | | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 2% | 3% | 0% | 11% | 11% |
| 33 | physical factors) | | 11% | 16% | 23% | 18% | 76% | 60% | 43% | 65% | 95% | 15% | 3% | 11% | 11% | 57% |
| 34 | Leaning sprinklers/emitters causing non-uniform distribution | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 11% | 12% | 4% | 2% | 11% |
| 36 | Control box in need of repair | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 2% |
| 35 | Malfunctioning valves | | 15% | 12% | 7% | 8% | 0% | 0% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 37 | Boot Leak | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 2% |
| 38 | System has no booster pump | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 40 | Stream of water blocked by vegetation | | 7% | 24% | 19% | 10% | 0% | 0% | 1% | 8% | 95% | 34% | 21% | 22% | 18% | 2% |
| 41 | Variable crop spacing and stage of growth | | 13% | 33% | 17% | 10% | 0% | 0% | 20% | 0% | 0% | 2% | 9% | 6% | 0% | 0% |
| 42 | Poor drainage, requiring water control | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 44 | Uncatagorized | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 50 | Operating time too long | | 0% | 8% | 0% | 0% | 0% | 0% | 2% | 0% | 0% | 7% | 0% | 0% | 0% | 0% |
| 51 | Operating time too short | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 52 | Operating time too frequent | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 53 | No rain shut-off device | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 72% | 61% | 68% | 65% | 5% |
| 54 | No soil moisture measuring device or rain gage | | 0% | 0% | 0% | 0% | 0% | 0% | 4% | 46% | 95% | 70% | 76% | 83% | 75% | 2% |
| 55 | No irrigation water management plan | | 0% | 0% | 0% | 0% | 21% | 35% | 0% | 19% | 95% | 80% | 73% | 93% | 98% | 80% |

**Table B-10 Frequency of MIL Problem Codes for Frequently Audit**

| | | Crop | Citrus | Citrus | Citrus | Citrus | Citrus | Citrus | Citrus | Citrus | Citrus | Cut Foliage | | | | Nursery - Enclosed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Irrigation System | | Micro Spray | | | | | | | | Fixed Sprinkler | | | | Fixed Sprinkler |
| Problem Code | Description | ZIP Code | 33930 | 33975 | 34142 | 34143 | 34711 | 34714 | 34945 | 34987 | 34994 | na | 32130 | 32180 | 32190 | na |
| 56 | No tachometer | | 32% | 0% | 4% | 20% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 57 | Contamination of water with oil and fuel | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 101 | Too High or Low Pressure at Pump Station | | 0% | 0% | 0% | 0% | 0% | 0% | 2% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 103 | lateral(s) | | 0% | 0% | 0% | 0% | 0% | 0% | 4% | 8% | 0% | 0% | 0% | 0% | 0% | 5% |
| 104 | Uneven irrigation distribution across lateral(s) | | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 8% | 0% | 0% | 0% | 0% | 0% | 0% |
| 201 | Mixed sprinkler/emitter sizes | | 0% | 0% | 0% | 0% | 3% | 0% | 6% | 4% | 0% | 0% | 0% | 0% | 0% | 0% |
| 202 | Mixed sprinkler/emitter brands | | 0% | 0% | 0% | 0% | 0% | 0% | 5% | 15% | 0% | 0% | 0% | 0% | 0% | 0% |
| 203 | Missing and/or broken emitters or sprinklers | | 0% | 0% | 0% | 0% | 0% | 0% | 8% | 4% | 0% | 0% | 0% | 0% | 0% | 0% |
| 204 | layout of crop | | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 301 | Pump Station Engine and/or Pump leaks or malfunctions | | 0% | 0% | 0% | 0% | 0% | 0% | 2% | 0% | 0% | 0% | 0% | 1% | 0% | 0% |
| 302 | Filter leaks, clogged, or malfunctions | | 0% | 0% | 0% | 0% | 0% | 0% | 8% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 303 | Pipe Leaks in Irrigation System | | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 304 | Valve(s) Malfunction(s) or Leak(s) in Irrigation System | | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 305 | Emitters and/or Sprinklers leaks, clogged, or malfunctioning | | 0% | 0% | 0% | 0% | 0% | 20% | 12% | 19% | 5% | 0% | 0% | 0% | 0% | 0% |
| 501 | Irrigation System Running too Long | | 0% | 0% | 0% | 0% | 0% | 0% | 1% | 4% | 0% | 0% | 0% | 0% | 0% | 0% |
| 503 | Inappropriate Irrigation Frequency | | 0% | 0% | 0% | 0% | 0% | 0% | 7% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| Average Distribution Uniformity | | | | | | | | | | | | 67.0 | 70.1 | 64.7 | 66.7 | 70.0 |
| Average Emitter Uniformity | | | 83.1 | 76.7 | 83.7 | 83.6 | 84.8 | 78.9 | 81.1 | 78.8 | 71.2 | | | | | |
| Uniformity Rating | | | good | fair | good | good | good | fair | good | fair | fair | poor | good | poor | poor | poor |
| O&M Class | | | Proactive | Reactive | Proactive | Proactive | Proactive | Reactive | Proactive | Reactive | Reactive | Deferred | Reactive | Deferred | Deferred | Reactive |

**Table B-10 Frequency of MIL Problem Codes for Frequently Audit**

| | Problem Code / Description | Crop | Nursery - Open | | | | | | | | Trees - Ornamental | Fruits - Other | All other MIL Data |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Irrigation System | Micro Spray | | Fixed Sprinkler | | | | | | Micro Spray | Micro Spray | |
| | | ZIP Code | na | 33470 | na | 33170 | 33187 | 33332 | 33446 | 33470 | na | na | |
| | **Total Number of Reports** | | **139** | **46** | **159** | **29** | **38** | **67** | **24** | **59** | **25** | **22** | **1283** |
| 1 | emitters | | 0% | 0% | 1% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% |
| 2 | inadequate pipe size | | 7% | 4% | 7% | 0% | 0% | 12% | 17% | 20% | 0% | 0% | 1% |
| 3 | Higher pressure than manufacturer's specifications | | 2% | 0% | 2% | 0% | 0% | 0% | 0% | 0% | 0% | 5% | 4% |
| 4 | Lower pressure than manufacturer's specifications | | 11% | 13% | 17% | 0% | 0% | 9% | 21% | 5% | 0% | 0% | 11% |
| 5 | Low pressure due to water supply | | 0% | 0% | 0% | 0% | 0% | 3% | 0% | 5% | 0% | 0% | 0% |
| 6 | Different pressure between manifolds | | 1% | 0% | 0% | 3% | 0% | 0% | 0% | 0% | 0% | 0% | 9% |
| 7 | Wetted area not adequate for crop requirement | | 2% | 0% | 11% | 86% | 66% | 0% | 0% | 0% | 0% | 0% | 3% |
| 8 | Application rate > soil infiltration rate (ponding) | | 0% | 0% | 0% | 3% | 5% | 0% | 0% | 0% | 0% | 5% | 2% |
| 9 | Air in pipelines | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% |
| 11 | Pressure variation due to elevation differences | | 14% | 0% | 3% | 0% | 0% | 0% | 0% | 0% | 16% | 0% | 8% |
| 12 | Missing/malfunctioning pressure gauge/regulator/filter | | 8% | 0% | 6% | 0% | 3% | 0% | 0% | 0% | 20% | 14% | 20% |
| 13 | the same zone | | 5% | 0% | 8% | 0% | 16% | 6% | 25% | 7% | 4% | 14% | 1% |
| 20 | same zone | | 40% | 28% | 22% | 14% | 8% | 40% | 42% | 41% | 28% | 14% | 14% |
| 21 | Mixed sprinkler/emitter brands or types in the same zone | | 3% | 0% | 6% | 28% | 0% | 0% | 0% | 0% | 0% | 14% | 9% |
| 22 | Poor emitter/sprinkler uniformity due to worn orifice | | 3% | 0% | 6% | 0% | 11% | 4% | 0% | 0% | 0% | 9% | 5% |
| 23 | spacing | | 1% | 4% | 9% | 3% | 0% | 9% | 4% | 2% | 0% | 5% | 6% |
| 24 | Various riser heights in same zone | | 0% | 0% | 1% | 21% | 16% | 0% | 0% | 2% | 0% | 0% | 2% |
| 25 | Emitter/sprinkler spacing varies in same zone | | 1% | 0% | 0% | 7% | 0% | 0% | 4% | 0% | 0% | 9% | 3% |
| 26 | Missing/malfunctioning emitters or sprinklers | | 16% | 4% | 3% | 10% | 0% | 3% | 13% | 2% | 16% | 23% | 12% |
| 27 | End Gun is out of adjustment or not operating | | 8% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 38% |
| 30 | emitters, sprinklers | | 30% | 2% | 1% | 7% | 11% | 0% | 0% | 0% | 44% | 36% | 22% |
| 31 | Clogged filter or filter screen | | 4% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 9% | 1% |
| 32 | paved areas | | 1% | 0% | 9% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% |
| 33 | physical factors) | | 62% | 28% | 35% | 93% | 89% | 12% | 33% | 12% | 68% | 32% | 31% |
| 34 | Leaning sprinklers/emitters causing non-uniform distribution | | 1% | 0% | 2% | 48% | 21% | 0% | 8% | 7% | 8% | 50% | 4% |
| 36 | Control box in need of repair | | 0% | 0% | 4% | 34% | 0% | 0% | 0% | 0% | 0% | 0% | 1% |
| 35 | Malfunctioning valves | | 3% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 37 | Boot Leak | | 0% | 0% | 7% | 38% | 26% | 0% | 0% | 0% | 0% | 0% | 7% |
| 38 | System has no booster pump | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 2% |
| 40 | Stream of water blocked by vegetation | | 0% | 0% | 1% | 0% | 0% | 0% | 0% | 3% | 0% | 9% | 3% |
| 41 | Variable crop spacing and stage of growth | | 4% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 9% | 1% |
| 42 | Poor drainage, requiring water control | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 44 | Uncatagorized | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 50 | Operating time too long | | 1% | 0% | 5% | 3% | 42% | 0% | 0% | 0% | 0% | 5% | 5% |
| 51 | Operating time too short | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 1% |
| 52 | Operating time too frequent | | 5% | 0% | 1% | 3% | 11% | 0% | 0% | 0% | 0% | 0% | 3% |
| 53 | No rain shut-off device | | 22% | 0% | 14% | 97% | 84% | 0% | 0% | 0% | 12% | 27% | 16% |
| 54 | No soil moisture measuring device or rain gage | | 13% | 0% | 18% | 100% | 84% | 0% | 0% | 0% | 12% | 32% | 16% |
| 55 | No irrigation water management plan | | 26% | 0% | 42% | 100% | 100% | 0% | 0% | 0% | 44% | 27% | 37% |

## Appendix B

**Table B-10 Frequency of MIL Problem Codes for Frequently Audit**

| | | Crop | Nursery - Open | | | | | | | | Trees - Ornamental | Fruits - Other | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Irrigation System | Micro Spray | | Fixed Sprinkler | | | | | | Micro Spray | Micro Spray | All other MIL Data |
| | Problem Code / Description | ZIP Code | na | 33470 | na | 33170 | 33187 | 33332 | 33446 | 33470 | na | na | |
| 56 | No tachometer | | 1% | 0% | 3% | 0% | 16% | 0% | 0% | 0% | 0% | 5% | 4% |
| 57 | Contamination of water with oil and fuel | | 0% | 0% | 0% | 0% | 3% | 0% | 0% | 0% | 0% | 0% | 0% |
| 101 | Too High or Low Pressure at Pump Station | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 103 | lateral(s) | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 5% | 1% |
| 104 | Uneven irrigation distribution across lateral(s) | | 0% | 0% | 0% | 0% | 0% | 1% | 0% | 0% | 0% | 14% | 0% |
| 201 | Mixed sprinkler/emitter sizes | | 1% | 0% | 1% | 0% | 5% | 0% | 0% | 0% | 20% | 14% | 1% |
| 202 | Mixed sprinkler/emitter brands | | 0% | 0% | 1% | 0% | 5% | 0% | 0% | 0% | 0% | 0% | 1% |
| 203 | Missing and/or broken emitters or sprinklers | | 2% | 0% | 1% | 0% | 18% | 0% | 0% | 0% | 4% | 23% | 1% |
| 204 | layout of crop | | 0% | 0% | 1% | 0% | 0% | 0% | 0% | 2% | 0% | 0% | 0% |
| 301 | Pump Station Engine and/or Pump leaks or malfunctions | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 302 | Filter leaks, clogged, or malfunctions | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 303 | Pipe Leaks in Irrigation System | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 2% | 8% | 0% | 6% |
| 304 | Valve(s) Malfunction(s) or Leak(s) in Irrigation System | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 305 | Emitters and/or Sprinklers leaks, clogged, or malfunctioning | | 1% | 0% | 1% | 0% | 5% | 0% | 0% | 0% | 12% | 18% | 1% |
| 501 | Irrigation System Running too Long | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| 503 | Inappropriate Irrigation Frequency | | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| | Average Distribution Uniformity | | | | 70.2 | 70.1 | 64.1 | 68.3 | 65.8 | 68.8 | | | |
| | Average Emitter Uniformity | | 79.6 | 74.0 | | | | | | | 83.0 | 77.9 | |
| | Uniformity Rating | | fair | fair | good | good | poor | poor | poor | poor | good | fair | |
| | O&M Class | | Reactive | Reactive | Proactive | Reactive | Defered | Reactuve | Reactuve | Reactuve | Proactive | Reactive | Reactive |

# Appendix B

## Table B-11 Comparison of 2010 Irrigated Water Usewith 2005 USGS Ag Water Use Estimates

| County | 2010 Irrigated Areas | | | USGS 2005 (Source 86) |
|---|---|---|---|---|
| | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) | |
| Alachua | 5.7 | 8.3 | 10.8 | 23.5 |
| Baker | 0.2 | 0.3 | 0.3 | 2.5 |
| Bradford | 0.7 | 1.0 | 1.3 | 1.0 |
| Brevard | 36.4 | 44.3 | 53.1 | 48.5 |
| Citrus | 2.4 | 3.2 | 3.8 | 1.5 |
| Clay | 0.8 | 0.9 | 1.1 | 2.3 |
| Columbia | 2.9 | 4.1 | 5.3 | 4.5 |
| Desoto | 35.0 | 67.1 | 97.4 | 40.0 |
| Dixie | 0.4 | 0.7 | 0.9 | 1.9 |
| Duval | 2.3 | 2.9 | 3.6 | 2.1 |
| Flagler | 7.9 | 10.5 | 12.9 | 9.3 |
| Gilchrist | 3.9 | 5.7 | 7.7 | 12.9 |
| Hamilton | 3.9 | 5.6 | 7.0 | 19.3 |
| Hardee | 24.9 | 42.5 | 56.9 | 26.2 |
| Hernando | 3.9 | 5.2 | 6.4 | 2.0 |
| Highlands | 87.7 | 129.2 | 168.1 | 105.5 |
| Hillsborough | 20.9 | 29.6 | 38.5 | 48.4 |
| Indian_River | 38.9 | 59.5 | 81.1 | 157.6 |
| Lafayette | 1.6 | 2.4 | 3.1 | 7.0 |
| Lake | 16.7 | 24.9 | 31.5 | 19.9 |
| Levy | 32.8 | 44.6 | 55.3 | 21.2 |
| Manatee | 41.7 | 59.9 | 77.3 | 73.6 |
| Marion | 16.3 | 22.0 | 26.5 | 6.4 |
| Martin | 93.0 | 123.1 | 163.7 | 90.1 |
| Nassau | 0.2 | 0.4 | 0.5 | 0.0 |
| Okeechobee | 77.4 | 103.2 | 135.5 | 50.0 |
| Orange | 6.5 | 10.2 | 12.8 | 29.8 |
| Osceola | 22.3 | 30.7 | 38.0 | 100.3 |
| Pasco | 8.4 | 12.6 | 16.5 | 9.5 |
| Pinellas | 0.1 | 0.1 | 0.1 | 0.3 |
| Polk | 88.7 | 143.6 | 188.8 | 67.9 |
| Putnam | 10.4 | 13.8 | 17.5 | 8.9 |
| Sarasota | 7.2 | 10.1 | 13.3 | 3.5 |
| Seminole | 6.3 | 7.9 | 9.3 | 8.4 |
| St_Johns | 16.7 | 23.2 | 29.0 | 15.0 |
| St_Lucie | 56.1 | 87.7 | 123.1 | 147.2 |
| Sumter | 3.7 | 5.0 | 6.2 | 6.3 |
| Suwannee | 7.7 | 11.2 | 14.2 | 20.7 |
| Union | 1.1 | 1.6 | 2.2 | 1.7 |
| Volusia | 20.1 | 24.9 | 30.6 | 17.7 |
| **Total** | **813.8** | **1183.3** | **1551.1** | **1214.5** |

**Table B-11 Comparison of 2010 Irrigated Water Usewith 2005 USGS Ag Water Use Estimates**

| County | 2010 Irrigated Areas | | | USGS 2005 (Source 86) |
|---|---|---|---|---|
| | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) | |
| **Florida Counties not Completely within the MegaModel** | | | | |
| Charlotte | 16.1 | 28.6 | 40.3 | 26.2 |
| Madison | 3.2 | 4.6 | 5.8 | 11.3 |
| Glades | 41.5 | 53.8 | 70.4 | 93.3 |
| Palm_Beach | 1.6 | 2.3 | 3.2 | 792.5 |
| **Georgia** | | | | |
| Berrien | 0.2 | 0.3 | 0.4 | na |
| Clinch | 2.5 | 3.4 | 4.2 | na |
| Echols | 1.4 | 2.0 | 2.5 | na |
| Lanier | 1.5 | 2.2 | 2.8 | na |
| Lowndes | 3.9 | 5.7 | 7.3 | na |

[1]Wct year calculated as the average of the 20$^{th}$ percentile irrigation requirements of each polygon based on the 21-year simulation period. Dry year was calculated similarly for the 80$^{th}$ percentile irrigation requirement.

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Alachua** | **10318.5** | **10.81** | **15.05** | **18.99** |
| Sod | 4804.9 | 7.50 | 10.32 | 12.87 |
| Sorghum | 2017.5 | 1.03 | 1.56 | 2.05 |
| Peanuts | 567.5 | 0.19 | 0.30 | 0.44 |
| Pecans | 542.4 | 0.19 | 0.36 | 0.52 |
| Potatoes | 440.5 | 0.15 | 0.22 | 0.30 |
| Corn | 336.1 | 0.17 | 0.23 | 0.30 |
| Rye | 306.1 | 0.00 | 0.01 | 0.01 |
| Blueberries | 254.8 | 0.38 | 0.52 | 0.64 |
| Pasture | 217.3 | 0.28 | 0.38 | 0.49 |
| Container Nursery | 144.2 | 0.56 | 0.65 | 0.73 |
| Millet | 118.4 | 0.08 | 0.12 | 0.16 |
| Sweet Corn | 110.8 | 0.08 | 0.10 | 0.12 |
| Watermelons | 82.5 | 0.03 | 0.04 | 0.05 |
| Cantaloupe | 82.1 | 0.05 | 0.06 | 0.08 |
| Soybeans | 81.3 | 0.03 | 0.04 | 0.06 |
| Unspecified Row Crop | 48.4 | 0.02 | 0.03 | 0.04 |
| Citrus | 38.1 | 0.02 | 0.03 | 0.04 |
| Misc. Vegetables | 31.6 | 0.01 | 0.01 | 0.02 |
| Oats | 25.5 | 0.00 | 0.00 | 0.00 |
| Peas | 17.8 | 0.01 | 0.01 | 0.02 |
| Strawberries | 15.3 | 0.02 | 0.03 | 0.03 |
| Winter Wheat | 14.2 | 0.00 | 0.00 | 0.00 |
| Cabbage | 7.1 | 0.00 | 0.01 | 0.01 |
| Chestnuts | 5.6 | 0.00 | 0.00 | 0.01 |
| Field Nursery | 5.0 | 0.01 | 0.01 | 0.01 |
| Grapes | 1.8 | 0.00 | 0.00 | 0.00 |
| Persimmons | 1.7 | 0.00 | 0.00 | 0.00 |
| **Baker** | **501.6** | **1.53** | **1.73** | **1.92** |
| Container Nursery | 303.4 | 1.23 | 1.37 | 1.50 |
| Field Nursery | 74.6 | 0.15 | 0.17 | 0.20 |
| Field Corn | 65.7 | 0.05 | 0.07 | 0.08 |
| Cut Foliage | 42.6 | 0.09 | 0.11 | 0.13 |
| Peanuts | 10.1 | 0.01 | 0.01 | 0.01 |
| Peaches | 2.1 | 0.00 | 0.00 | 0.00 |
| Sunflowers | 2.0 | 0.00 | 0.00 | 0.00 |
| Tomato | 1.1 | 0.00 | 0.00 | 0.00 |
| Unspecified Field C* | 0.0 | 0.00 | 0.00 | 0.00 |
| **Berrien** | **548.0** | **0.28** | **0.40** | **0.51** |
| Pecans | 357.3 | 0.17 | 0.27 | 0.36 |
| produce | 190.7 | 0.10 | 0.13 | 0.15 |

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Bradford** | **1007.5** | **0.90** | **1.21** | **1.53** |
| Sod | 345.7 | 0.57 | 0.76 | 0.95 |
| Sorghum | 243.9 | 0.14 | 0.21 | 0.28 |
| Corn | 177.0 | 0.10 | 0.12 | 0.15 |
| Rye | 88.1 | 0.00 | 0.01 | 0.01 |
| Peanuts | 47.1 | 0.02 | 0.03 | 0.04 |
| Unspecified Row Crop | 27.9 | 0.01 | 0.02 | 0.02 |
| Unspecified Field C* | 20.6 | 0.01 | 0.01 | 0.02 |
| Pecans | 20.1 | 0.01 | 0.01 | 0.02 |
| Millet | 15.4 | 0.01 | 0.02 | 0.02 |
| Pasture | 8.2 | 0.02 | 0.02 | 0.02 |
| Soybeans | 8.0 | 0.00 | 0.00 | 0.01 |
| Oats | 4.6 | 0.00 | 0.00 | 0.00 |
| Winter Wheat | 0.8 | 0.00 | 0.00 | 0.00 |
| **Brevard** | **55472.6** | **85.99** | **107.45** | **131.06** |
| Pasture | 30164.6 | 60.06 | 72.04 | 86.33 |
| Citrus | 9722.5 | 9.17 | 12.21 | 15.20 |
| Sod | 7745.0 | 11.20 | 14.67 | 18.03 |
| Sorghum | 3839.4 | 4.51 | 5.59 | 7.06 |
| Field Corn | 3561.9 | 0.00 | 1.73 | 3.04 |
| Field Nursery | 292.0 | 0.51 | 0.61 | 0.72 |
| Container Nursery | 136.1 | 0.52 | 0.59 | 0.66 |
| Cantaloupe | 6.1 | 0.00 | 0.00 | 0.00 |
| Leatherleaf | 5.0 | 0.01 | 0.01 | 0.01 |
| **Charlotte** | **34497.8** | **16.33** | **31.49** | **47.38** |
| Citrus | 29895.0 | 10.90 | 24.14 | 38.00 |
| Unspecified Row Cro* | 2055.5 | 1.34 | 1.75 | 2.13 |
| Sod | 783.1 | 1.39 | 1.94 | 2.57 |
| Pasture | 671.9 | 1.16 | 1.61 | 2.10 |
| Sugar Cane | 590.9 | 0.97 | 1.33 | 1.72 |
| Unspecified Row Crop | 300.1 | 0.21 | 0.26 | 0.32 |
| Unspecified Tree Cr* | 87.6 | 0.02 | 0.05 | 0.07 |
| Ornamentals | 82.1 | 0.33 | 0.38 | 0.43 |
| Watermelons | 31.6 | 0.02 | 0.03 | 0.03 |

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Citrus** | **1605.2** | **2.20** | **2.89** | **3.45** |
| Sod | 922.1 | 1.76 | 2.28 | 2.70 |
| Unspecified Row Cro* | 165.5 | 0.12 | 0.15 | 0.18 |
| Unspecified Tree Cr* | 153.0 | 0.06 | 0.10 | 0.12 |
| Strawberries | 147.0 | 0.06 | 0.09 | 0.11 |
| Blueberries | 135.4 | 0.18 | 0.24 | 0.29 |
| Rye | 45.4 | 0.00 | 0.01 | 0.01 |
| Peanuts | 23.4 | 0.01 | 0.02 | 0.02 |
| Unspecified Row Crop | 9.0 | 0.01 | 0.01 | 0.01 |
| Citrus | 4.5 | 0.00 | 0.00 | 0.00 |
| **Clay** | **460.2** | **0.85** | **1.09** | **1.28** |
| Pasture | 348.2 | 0.63 | 0.82 | 0.98 |
| Field Nursery | 94.9 | 0.16 | 0.19 | 0.22 |
| Container Nursery | 17.0 | 0.07 | 0.08 | 0.08 |
| **Clinch** | **2445.8** | **2.89** | **3.95** | **4.83** |
| Blueberries | 2387.0 | 2.86 | 3.89 | 4.76 |
| rotation | 58.9 | 0.03 | 0.05 | 0.07 |
| **Columbia** | **4686.2** | **5.59** | **7.71** | **9.89** |
| Sod | 3159.8 | 4.99 | 6.82 | 8.67 |
| Sorghum | 779.6 | 0.31 | 0.49 | 0.70 |
| Rye | 218.3 | 0.00 | 0.01 | 0.02 |
| Corn | 202.2 | 0.11 | 0.14 | 0.17 |
| Peanuts | 176.6 | 0.08 | 0.11 | 0.15 |
| Millet | 44.6 | 0.03 | 0.05 | 0.06 |
| Pecans | 42.4 | 0.01 | 0.02 | 0.03 |
| Soybeans | 34.8 | 0.01 | 0.02 | 0.02 |
| Pasture | 20.9 | 0.04 | 0.05 | 0.06 |
| Oats | 5.4 | 0.00 | 0.00 | 0.00 |
| Winter Wheat | 1.5 | 0.00 | 0.00 | 0.00 |
| **Desoto** | **64329.5** | **27.87** | **56.16** | **82.51** |
| Citrus | 54816.0 | 18.53 | 43.13 | 66.26 |
| Unspecified Row Cro* | 5701.6 | 3.72 | 4.94 | 5.98 |
| Sod | 3062.7 | 4.90 | 7.12 | 9.06 |
| Unspecified Row Crop | 253.9 | 0.16 | 0.21 | 0.27 |
| Watermelons | 215.5 | 0.09 | 0.14 | 0.18 |
| Sugar Cane | 198.3 | 0.37 | 0.48 | 0.59 |
| Unspecified Tree Cr* | 60.0 | 0.01 | 0.04 | 0.05 |
| Nurseries and Viney* | 21.3 | 0.08 | 0.10 | 0.11 |
| Pasture | 0.2 | 0.00 | 0.00 | 0.00 |

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Dixie** | **885.3** | **0.83** | **1.20** | **1.60** |
| Sod | 427.2 | 0.67 | 0.92 | 1.21 |
| Sorghum | 333.6 | 0.11 | 0.20 | 0.28 |
| Peanuts | 53.0 | 0.02 | 0.04 | 0.05 |
| Corn | 28.5 | 0.01 | 0.02 | 0.02 |
| Soybeans | 15.1 | 0.00 | 0.01 | 0.01 |
| Rye | 12.7 | 0.00 | 0.00 | 0.00 |
| Millet | 9.7 | 0.01 | 0.01 | 0.01 |
| Oats | 1.8 | 0.00 | 0.00 | 0.00 |
| Dry Beans | 1.5 | 0.00 | 0.00 | 0.00 |
| Pasture | 1.5 | 0.00 | 0.00 | 0.00 |
| Winter Wheat | 0.8 | 0.00 | 0.00 | 0.00 |
| **Duval** | **1230.9** | **2.18** | **2.83** | **3.47** |
| Sod | 981.8 | 1.81 | 2.36 | 2.90 |
| Field Nursery | 229.2 | 0.32 | 0.41 | 0.49 |
| Container Nursery | 12.2 | 0.05 | 0.06 | 0.06 |
| Grapes | 5.6 | 0.00 | 0.00 | 0.00 |
| Pecans | 2.1 | 0.00 | 0.00 | 0.00 |
| **Echols** | **2943.6** | **1.86** | **2.59** | **3.22** |
| rotation | 1760.3 | 1.13 | 1.67 | 2.15 |
| produce | 1119.0 | 0.71 | 0.89 | 1.03 |
| Pasture | 64.3 | 0.02 | 0.04 | 0.04 |
| **Flagler** | **8663.8** | **5.02** | **7.00** | **8.76** |
| Potatoes | 5522.7 | 1.60 | 2.57 | 3.31 |
| Cabbage | 1234.3 | 0.84 | 1.09 | 1.33 |
| Sod | 771.0 | 1.38 | 1.80 | 2.24 |
| Misc. Vegetables | 384.7 | 0.28 | 0.35 | 0.43 |
| Pasture | 172.7 | 0.35 | 0.47 | 0.58 |
| Citrus | 165.1 | 0.05 | 0.10 | 0.14 |
| Broccoli | 87.7 | 0.05 | 0.06 | 0.08 |
| Container Nursery | 82.9 | 0.32 | 0.37 | 0.42 |
| Watermelons | 80.1 | 0.06 | 0.07 | 0.09 |
| Small Grains | 62.7 | 0.00 | 0.00 | 0.00 |
| Beets | 62.6 | 0.02 | 0.03 | 0.04 |
| Field Nursery | 17.6 | 0.02 | 0.03 | 0.04 |
| Blueberries | 12.5 | 0.03 | 0.04 | 0.04 |
| Pecans | 7.2 | 0.00 | 0.00 | 0.01 |

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Gilchrist** | **5450.1** | **6.81** | **9.41** | **12.32** |
| Sod | 4173.4 | 6.44 | 8.81 | 11.49 |
| Sorghum | 486.6 | 0.17 | 0.29 | 0.40 |
| Rye | 334.1 | 0.00 | 0.01 | 0.03 |
| Peanuts | 194.6 | 0.07 | 0.12 | 0.16 |
| Corn | 133.7 | 0.06 | 0.09 | 0.11 |
| Millet | 57.5 | 0.04 | 0.06 | 0.08 |
| Soybeans | 41.9 | 0.01 | 0.02 | 0.03 |
| Oats | 12.9 | 0.00 | 0.00 | 0.00 |
| Dry Beans | 6.8 | 0.01 | 0.01 | 0.01 |
| Winter Wheat | 2.8 | 0.00 | 0.00 | 0.00 |
| Cotton | 2.3 | 0.00 | 0.00 | 0.00 |
| Pasture | 1.9 | 0.00 | 0.00 | 0.01 |
| Unspecified Row Crop | 0.7 | 0.00 | 0.00 | 0.00 |
| Peas | 0.5 | 0.00 | 0.00 | 0.00 |
| Pecans | 0.3 | 0.00 | 0.00 | 0.00 |
| **Glades** | **14690.3** | **16.47** | **22.79** | **29.47** |
| Citrus | 8492.3 | 3.57 | 7.03 | 10.20 |
| Pasture | 4906.7 | 10.38 | 12.67 | 15.49 |
| Sugar Cane | 1040.3 | 2.21 | 2.70 | 3.29 |
| Unspecified Row Crop | 132.2 | 0.10 | 0.12 | 0.15 |
| Sod | 105.8 | 0.20 | 0.25 | 0.33 |
| Unspecified Field C* | 13.0 | 0.01 | 0.01 | 0.02 |
| **Hamilton** | **6067.6** | **4.08** | **5.66** | **7.08** |
| Peas | 2343.8 | 1.89 | 2.50 | 3.17 |
| Sorghum | 996.5 | 0.42 | 0.67 | 0.92 |
| Rye | 834.0 | 0.01 | 0.04 | 0.06 |
| Sod | 653.2 | 1.12 | 1.49 | 1.75 |
| Soybeans | 503.3 | 0.22 | 0.36 | 0.44 |
| Peanuts | 266.7 | 0.14 | 0.21 | 0.27 |
| Corn | 226.8 | 0.12 | 0.16 | 0.18 |
| Pecans | 113.6 | 0.03 | 0.06 | 0.09 |
| Millet | 47.6 | 0.04 | 0.05 | 0.07 |
| Pasture | 46.0 | 0.09 | 0.11 | 0.13 |
| Oats | 23.7 | 0.00 | 0.00 | 0.00 |
| Unspecified Row Crop | 6.0 | 0.00 | 0.00 | 0.00 |
| Winter Wheat | 3.3 | 0.00 | 0.00 | 0.00 |
| Dry Beans | 2.1 | 0.00 | 0.00 | 0.00 |
| Cotton | 1.0 | 0.00 | 0.00 | 0.00 |

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Hardee** | **43720.5** | **22.49** | **37.24** | **49.77** |
| Citrus | 33540.9 | 14.07 | 25.90 | 36.09 |
| Watermelons | 2412.6 | 0.96 | 1.48 | 1.89 |
| Pasture | 1768.9 | 1.80 | 2.52 | 3.10 |
| Tomatoes | 1311.9 | 0.90 | 1.18 | 1.38 |
| Unspecified Row Cro* | 1278.4 | 0.84 | 1.10 | 1.32 |
| Sod | 948.1 | 1.73 | 2.23 | 2.63 |
| Unspecified Row Crop | 759.9 | 0.19 | 0.33 | 0.43 |
| Cucurbits | 570.0 | 0.28 | 0.39 | 0.46 |
| Container Nursery | 449.4 | 0.98 | 1.16 | 1.33 |
| Strawberries | 160.1 | 0.07 | 0.10 | 0.14 |
| Blueberries | 140.5 | 0.24 | 0.31 | 0.36 |
| Peppers | 108.3 | 0.09 | 0.11 | 0.13 |
| Field Nursery | 84.4 | 0.21 | 0.25 | 0.28 |
| Squash | 64.0 | 0.02 | 0.03 | 0.04 |
| Unspecified Tree Cr* | 55.8 | 0.02 | 0.03 | 0.04 |
| Hay | 40.9 | 0.01 | 0.02 | 0.03 |
| Nurseries and Viney* | 21.8 | 0.09 | 0.10 | 0.11 |
| Peas | 4.6 | 0.00 | 0.00 | 0.00 |
| **Hernando** | **8293.3** | **8.98** | **12.11** | **15.15** |
| Sod | 3171.1 | 5.91 | 7.78 | 9.48 |
| Strawberries | 2606.6 | 1.21 | 1.69 | 2.32 |
| Unspecified Row Cro* | 743.7 | 0.46 | 0.60 | 0.76 |
| Blueberries | 724.5 | 0.90 | 1.20 | 1.52 |
| Citrus | 572.7 | 0.25 | 0.46 | 0.62 |
| Unspecified Tree Cr* | 299.7 | 0.11 | 0.19 | 0.24 |
| Peanuts | 132.2 | 0.04 | 0.07 | 0.09 |
| Nurseries and Viney* | 19.2 | 0.08 | 0.09 | 0.10 |
| Unspecified Row Crop | 11.3 | 0.01 | 0.01 | 0.01 |
| Millet | 9.2 | 0.01 | 0.01 | 0.02 |
| Specialty Farms | 3.2 | 0.00 | 0.01 | 0.01 |

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Highlands** | **128750.2** | **85.56** | **131.51** | **173.24** |
| Citrus | 79598.9 | 36.46 | 64.67 | 89.79 |
| Watermelons | 15056.5 | 7.71 | 10.96 | 14.04 |
| Sod | 11794.7 | 18.40 | 25.46 | 32.20 |
| Unspecified Row Crop | 7823.8 | 4.84 | 6.74 | 7.99 |
| Pasture | 6254.3 | 11.49 | 14.48 | 17.64 |
| Unspecified Tree Cr* | 5246.4 | 1.53 | 2.82 | 3.98 |
| Sugar Cane | 1808.0 | 3.76 | 4.55 | 5.36 |
| Unspecified Field C* | 426.3 | 0.16 | 0.30 | 0.43 |
| Container Nursery | 281.9 | 0.51 | 0.62 | 0.74 |
| Blueberries | 205.6 | 0.23 | 0.32 | 0.40 |
| Field Nursery | 177.2 | 0.31 | 0.41 | 0.47 |
| Nurseries and Viney* | 36.3 | 0.14 | 0.16 | 0.19 |
| Squash | 35.5 | 0.01 | 0.01 | 0.01 |
| Peanuts | 4.6 | 0.00 | 0.00 | 0.00 |
| **Hillsborough** | **43406.8** | **25.99** | **39.64** | **51.39** |
| Citrus | 34660.1 | 13.75 | 24.65 | 33.51 |
| Unspecified Row Crop | 1685.2 | 1.22 | 1.50 | 1.85 |
| Sod | 1616.7 | 2.89 | 3.68 | 4.54 |
| Unspecified Row Cro* | 1370.8 | 1.04 | 1.26 | 1.54 |
| Nurseries and Viney* | 1100.2 | 4.43 | 5.04 | 5.62 |
| Unspecified Tree Cr* | 1047.4 | 0.34 | 0.57 | 0.78 |
| Sugar Cane | 751.9 | 1.46 | 1.82 | 2.16 |
| Strawberries | 479.0 | 0.20 | 0.28 | 0.40 |
| Squash | 209.0 | 0.04 | 0.07 | 0.10 |
| Millet | 206.1 | 0.16 | 0.23 | 0.30 |
| Container Nursery | 112.0 | 0.29 | 0.33 | 0.36 |
| Field Nursery | 58.1 | 0.10 | 0.11 | 0.14 |
| Herbs | 39.6 | 0.03 | 0.03 | 0.04 |
| Peanuts | 25.0 | 0.01 | 0.01 | 0.02 |
| Cantaloupe | 18.8 | 0.00 | 0.01 | 0.01 |
| Potatoes | 12.4 | 0.01 | 0.01 | 0.01 |
| Specialty Farms | 8.1 | 0.01 | 0.01 | 0.02 |
| Blueberries | 6.5 | 0.01 | 0.01 | 0.01 |

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Indian_River** | **85836.5** | **73.80** | **101.13** | **133.39** |
| Citrus | 74579.5 | 53.11 | 74.89 | 101.72 |
| Pasture | 8305.3 | 18.16 | 21.78 | 25.77 |
| Sod | 2658.6 | 2.07 | 3.89 | 5.18 |
| Field Nursery | 146.2 | 0.21 | 0.26 | 0.33 |
| Hay | 55.1 | 0.09 | 0.12 | 0.15 |
| Container Nursery | 34.6 | 0.13 | 0.15 | 0.18 |
| Sweet Corn | 32.6 | 0.01 | 0.01 | 0.02 |
| Asparagus Fern | 16.1 | 0.02 | 0.02 | 0.03 |
| Peppers | 8.3 | 0.01 | 0.01 | 0.01 |
| Unspecified Row Crop | 0.3 | 0.00 | 0.00 | 0.00 |
| **Lafayette** | **3586.0** | **2.41** | **3.36** | **4.27** |
| Peas | 949.9 | 0.74 | 0.99 | 1.24 |
| Sorghum | 821.6 | 0.33 | 0.51 | 0.66 |
| Sod | 594.6 | 0.94 | 1.27 | 1.59 |
| Rye | 361.3 | 0.00 | 0.01 | 0.01 |
| Peanuts | 242.1 | 0.11 | 0.16 | 0.21 |
| Soybeans | 211.0 | 0.08 | 0.12 | 0.17 |
| Corn | 156.4 | 0.08 | 0.11 | 0.13 |
| Pecans | 132.2 | 0.04 | 0.07 | 0.11 |
| Millet | 49.3 | 0.03 | 0.05 | 0.07 |
| Oats | 27.9 | 0.00 | 0.00 | 0.00 |
| Pasture | 25.4 | 0.05 | 0.06 | 0.07 |
| Dry Beans | 5.4 | 0.01 | 0.01 | 0.01 |
| Unspecified Row Crop | 3.8 | 0.00 | 0.00 | 0.00 |
| Container Nursery | 2.3 | 0.00 | 0.00 | 0.01 |
| Winter Wheat | 2.3 | 0.00 | 0.00 | 0.00 |
| Cotton | 0.5 | 0.00 | 0.00 | 0.00 |

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Lake** | **31988.7** | **28.67** | **43.89** | **56.15** |
| Citrus | 22938.9 | 15.18 | 25.81 | 34.00 |
| Sod | 2047.0 | 3.03 | 4.49 | 5.70 |
| Container Nursery | 1472.9 | 5.96 | 6.99 | 7.97 |
| Pasture | 1471.7 | 1.88 | 2.62 | 3.38 |
| Misc. Vegetables | 1163.6 | 0.00 | 0.28 | 0.47 |
| Field Nursery | 791.9 | 1.24 | 1.56 | 1.84 |
| Peaches | 576.3 | 0.16 | 0.37 | 0.54 |
| Squash | 538.9 | 0.12 | 0.18 | 0.22 |
| Leatherleaf | 352.4 | 0.52 | 0.75 | 0.96 |
| Unspecified Tree Cr* | 87.8 | 0.05 | 0.09 | 0.11 |
| Asparagus Fern | 86.9 | 0.17 | 0.21 | 0.27 |
| Hay | 85.3 | 0.11 | 0.14 | 0.17 |
| Watermelons | 85.3 | 0.03 | 0.05 | 0.07 |
| Grapes | 79.9 | 0.03 | 0.06 | 0.08 |
| Blueberries | 59.8 | 0.06 | 0.09 | 0.12 |
| Unspecified Row Cro* | 58.7 | 0.03 | 0.05 | 0.05 |
| Sweet Corn | 24.1 | 0.01 | 0.02 | 0.03 |
| Turf grass | 19.2 | 0.03 | 0.04 | 0.06 |
| Beans | 17.3 | 0.01 | 0.02 | 0.02 |
| Hammock Ferns | 10.1 | 0.01 | 0.01 | 0.02 |
| Cut Foliage | 9.9 | 0.02 | 0.02 | 0.03 |
| Pecans | 5.3 | 0.00 | 0.01 | 0.01 |
| Aspidistra | 3.7 | 0.02 | 0.02 | 0.02 |
| Field Corn | 2.1 | 0.00 | 0.00 | 0.00 |
| Unspecified Field C* | 0.0 | 0.00 | 0.00 | 0.00 |
| **Lanier** | **2274.8** | **2.07** | **2.90** | **3.68** |
| rotation | 910.3 | 0.61 | 0.88 | 1.21 |
| Sod | 662.0 | 1.17 | 1.52 | 1.83 |
| Pecans | 594.1 | 0.26 | 0.43 | 0.56 |
| Peaches | 86.5 | 0.02 | 0.05 | 0.07 |
| produce | 16.5 | 0.01 | 0.01 | 0.01 |
| Pasture | 5.4 | 0.00 | 0.00 | 0.00 |

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Levy** | **25120.4** | **40.48** | **54.84** | **67.52** |
| Sod | 23947.9 | 39.97 | 54.12 | 66.57 |
| Unspecified Row Cro* | 488.0 | 0.21 | 0.29 | 0.38 |
| Peanuts | 277.8 | 0.12 | 0.19 | 0.25 |
| Rye | 94.0 | 0.00 | 0.01 | 0.01 |
| Millet | 85.4 | 0.06 | 0.09 | 0.12 |
| Sorghum | 62.5 | 0.03 | 0.04 | 0.06 |
| Corn | 52.7 | 0.03 | 0.04 | 0.05 |
| Oats | 37.8 | 0.00 | 0.00 | 0.00 |
| Peas | 33.1 | 0.03 | 0.04 | 0.04 |
| Unspecified Row Crop | 15.7 | 0.00 | 0.01 | 0.01 |
| Dry Beans | 12.4 | 0.01 | 0.02 | 0.02 |
| Container Nursery | 5.4 | 0.01 | 0.01 | 0.01 |
| Soybeans | 2.5 | 0.00 | 0.00 | 0.00 |
| Cotton | 1.5 | 0.00 | 0.00 | 0.00 |
| Citrus | 1.3 | 0.00 | 0.00 | 0.00 |
| Pasture | 0.8 | 0.00 | 0.00 | 0.00 |
| Winter Wheat | 0.8 | 0.00 | 0.00 | 0.00 |
| Pecans | 0.8 | 0.00 | 0.00 | 0.00 |
| **Lowndes** | **6093.6** | **4.76** | **6.84** | **8.84** |
| rotation | 3419.6 | 1.92 | 3.03 | 4.26 |
| Pecans | 1625.9 | 1.87 | 2.61 | 3.19 |
| produce | 811.0 | 0.49 | 0.63 | 0.73 |
| Field Nursery | 95.3 | 0.23 | 0.28 | 0.31 |
| Sod | 67.3 | 0.12 | 0.15 | 0.18 |
| Container Nursery | 40.8 | 0.11 | 0.12 | 0.14 |
| Pasture | 33.8 | 0.01 | 0.03 | 0.04 |
| **Madison** | **4159.5** | **3.14** | **4.33** | **5.46** |
| Peas | 1464.7 | 1.27 | 1.63 | 2.07 |
| Soybeans | 984.2 | 0.49 | 0.82 | 1.06 |
| Sod | 460.0 | 0.86 | 1.13 | 1.33 |
| Rye | 446.9 | 0.01 | 0.02 | 0.03 |
| Sorghum | 377.7 | 0.24 | 0.36 | 0.47 |
| Peanuts | 160.3 | 0.09 | 0.14 | 0.19 |
| Corn | 113.3 | 0.06 | 0.08 | 0.09 |
| Pecans | 81.6 | 0.03 | 0.05 | 0.07 |
| Pasture | 35.6 | 0.07 | 0.09 | 0.11 |
| Unspecified Row Crop | 13.0 | 0.01 | 0.01 | 0.01 |
| Oats | 11.2 | 0.00 | 0.00 | 0.00 |
| Millet | 8.9 | 0.01 | 0.01 | 0.01 |
| Cotton | 1.9 | 0.00 | 0.00 | 0.00 |

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Manatee** | **77955.8** | **41.43** | **63.40** | **82.46** |
| Citrus | 59982.7 | 26.63 | 44.79 | 59.73 |
| Unspecified Row Crop | 8172.8 | 6.41 | 7.85 | 9.51 |
| Unspecified Row Cro* | 5875.7 | 4.50 | 5.61 | 6.82 |
| Unspecified Tree Cr* | 1408.3 | 0.37 | 0.70 | 1.02 |
| Sod | 741.7 | 1.37 | 1.80 | 2.18 |
| Herbs | 374.6 | 0.31 | 0.35 | 0.42 |
| Sugar Cane | 349.8 | 0.67 | 0.84 | 0.99 |
| Millet | 288.0 | 0.28 | 0.35 | 0.46 |
| Strawberries | 284.3 | 0.14 | 0.19 | 0.26 |
| Watermelons | 211.0 | 0.12 | 0.19 | 0.24 |
| Nurseries and Viney* | 134.0 | 0.53 | 0.61 | 0.68 |
| Peanuts | 110.6 | 0.06 | 0.08 | 0.10 |
| Specialty Farms | 22.4 | 0.03 | 0.04 | 0.04 |
| **Marion** | **17333.7** | **20.20** | **27.25** | **32.95** |
| Sod | 8702.7 | 14.65 | 19.69 | 23.68 |
| Small Grains | 2194.4 | 0.07 | 0.18 | 0.25 |
| Citrus | 1621.4 | 1.37 | 2.05 | 2.65 |
| Peanuts | 1220.5 | 0.60 | 0.90 | 1.14 |
| Strawberries | 785.6 | 0.37 | 0.45 | 0.56 |
| Specialty Farms | 735.7 | 1.00 | 1.12 | 1.25 |
| Pasture | 478.5 | 0.80 | 1.07 | 1.27 |
| Hay | 377.0 | 0.32 | 0.49 | 0.61 |
| Unspecified Row Cro* | 279.9 | 0.17 | 0.22 | 0.25 |
| Watermelons | 276.4 | 0.22 | 0.27 | 0.31 |
| Potatoes | 204.7 | 0.03 | 0.06 | 0.09 |
| Greens | 67.7 | 0.03 | 0.04 | 0.06 |
| Misc. Vegetables | 62.4 | 0.03 | 0.05 | 0.06 |
| Field Nursery | 57.6 | 0.08 | 0.10 | 0.12 |
| Blueberries | 57.0 | 0.07 | 0.10 | 0.12 |
| Container Nursery | 36.8 | 0.15 | 0.17 | 0.19 |
| Melons | 30.5 | 0.02 | 0.03 | 0.03 |
| Nurseries and Viney* | 30.2 | 0.13 | 0.14 | 0.16 |
| Leatherleaf | 28.3 | 0.05 | 0.07 | 0.08 |
| Parsley | 25.3 | 0.01 | 0.01 | 0.02 |
| Rye | 20.9 | 0.00 | 0.00 | 0.01 |
| Lettuce | 19.1 | 0.01 | 0.01 | 0.01 |
| Peaches | 8.9 | 0.01 | 0.01 | 0.01 |
| Pecans | 6.3 | 0.00 | 0.00 | 0.01 |
| Grapes | 3.7 | 0.00 | 0.00 | 0.00 |
| Unspecified Tree Cr* | 2.3 | 0.00 | 0.00 | 0.00 |
| Unspecified Field C* | 0.0 | 0.00 | 0.00 | 0.00 |

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Martin** | **62880.9** | **42.29** | **59.38** | **83.88** |
| Citrus | 41057.1 | 16.11 | 26.66 | 41.92 |
| Sugar Cane | 8192.8 | 15.76 | 19.28 | 24.95 |
| Sweet Corn | 6579.3 | 3.24 | 4.52 | 6.07 |
| Unspecified Row Crop | 4627.3 | 2.45 | 3.39 | 4.13 |
| Pasture | 1614.6 | 3.30 | 3.82 | 4.68 |
| Container Nursery | 732.1 | 1.18 | 1.42 | 1.79 |
| Ornamentals | 48.6 | 0.19 | 0.21 | 0.25 |
| Floriculture | 17.9 | 0.04 | 0.05 | 0.06 |
| Sod | 10.5 | 0.02 | 0.02 | 0.03 |
| Dry Beans | 0.5 | 0.00 | 0.00 | 0.00 |
| **Nassau** | **1959.7** | **1.63** | **2.11** | **2.63** |
| Field Corn | 1679.9 | 1.24 | 1.62 | 2.05 |
| Field Nursery | 258.9 | 0.35 | 0.44 | 0.52 |
| Container Nursery | 8.7 | 0.04 | 0.04 | 0.05 |
| Grapes | 4.7 | 0.00 | 0.00 | 0.00 |
| Peas | 4.1 | 0.00 | 0.00 | 0.00 |
| Sweet Corn | 3.4 | 0.00 | 0.00 | 0.00 |
| Unspecified Field C* | 0.0 | 0.00 | 0.00 | 0.00 |
| **Okeechobee** | **23830.2** | **18.21** | **26.61** | **36.19** |
| Citrus | 18111.4 | 7.31 | 13.34 | 20.20 |
| Pasture | 3997.7 | 8.68 | 10.54 | 12.62 |
| Sod | 778.0 | 1.36 | 1.64 | 2.04 |
| Unspecified Field C* | 725.2 | 0.51 | 0.67 | 0.83 |
| Sugar Cane | 102.2 | 0.24 | 0.29 | 0.33 |
| Unspecified Row Crop | 82.0 | 0.06 | 0.07 | 0.09 |
| Container Nursery | 31.3 | 0.05 | 0.06 | 0.08 |
| Sweet Corn | 2.3 | 0.00 | 0.00 | 0.00 |
| **Orange** | **20328.1** | **8.40** | **15.24** | **20.60** |
| Misc. Vegetables | 10541.2 | 0.08 | 2.27 | 4.31 |
| Citrus | 8318.0 | 4.89 | 8.72 | 11.28 |
| Container Nursery | 531.2 | 2.11 | 2.49 | 2.86 |
| Sod | 231.3 | 0.30 | 0.46 | 0.58 |
| Field Corn | 181.1 | 0.20 | 0.24 | 0.30 |
| Watermelons | 155.7 | 0.09 | 0.13 | 0.17 |
| Hay | 110.2 | 0.02 | 0.07 | 0.11 |
| Ornamentals | 103.8 | 0.41 | 0.48 | 0.54 |
| Field Nursery | 68.9 | 0.13 | 0.16 | 0.20 |
| Pasture | 61.3 | 0.11 | 0.15 | 0.18 |
| Leatherleaf | 20.5 | 0.04 | 0.05 | 0.07 |
| Aspidistra | 4.9 | 0.02 | 0.02 | 0.02 |
| Unspecified Field C* | 0.0 | 0.00 | 0.00 | 0.00 |

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Osceola** | **41327.6** | **29.46** | **40.93** | **50.87** |
| Unspecified Row Crop | 20990.0 | 13.16 | 17.80 | 22.21 |
| Citrus | 15267.7 | 6.98 | 11.46 | 14.64 |
| Pasture | 4450.5 | 8.77 | 10.90 | 13.09 |
| Unspecified Tree Cr* | 326.0 | 0.11 | 0.18 | 0.21 |
| Sod | 280.3 | 0.41 | 0.56 | 0.71 |
| Unspecified Field C* | 8.4 | 0.00 | 0.01 | 0.01 |
| Ornamentals | 4.7 | 0.02 | 0.02 | 0.02 |
| **Palm_Beach** | **1660.9** | **0.54** | **0.98** | **1.41** |
| Sweet Corn | 1253.6 | 0.24 | 0.59 | 0.93 |
| Unspecified Row Crop | 305.4 | 0.20 | 0.25 | 0.28 |
| Sugar Cane | 67.4 | 0.10 | 0.13 | 0.17 |
| Citrus | 34.4 | 0.01 | 0.02 | 0.03 |
| **Pasco** | **27721.4** | **27.12** | **38.11** | **46.84** |
| Sod | 11972.1 | 19.16 | 25.83 | 31.18 |
| Citrus | 8222.2 | 3.79 | 6.37 | 8.17 |
| Unspecified Tree Cr* | 3046.8 | 1.08 | 1.84 | 2.29 |
| Strawberries | 2116.9 | 1.07 | 1.41 | 1.90 |
| Unspecified Row Cro* | 978.2 | 0.67 | 0.86 | 1.05 |
| Blueberries | 891.9 | 1.07 | 1.40 | 1.75 |
| Peanuts | 191.0 | 0.07 | 0.09 | 0.11 |
| Millet | 116.2 | 0.09 | 0.13 | 0.17 |
| Unspecified Row Crop | 74.4 | 0.05 | 0.07 | 0.08 |
| Squash | 66.4 | 0.02 | 0.03 | 0.03 |
| Sorghum | 32.1 | 0.01 | 0.02 | 0.03 |
| Nurseries and Viney* | 13.2 | 0.06 | 0.06 | 0.07 |
| **Pinellas** | **71.8** | **0.18** | **0.20** | **0.22** |
| Nurseries and Viney* | 37.8 | 0.16 | 0.18 | 0.19 |
| Strawberries | 30.6 | 0.01 | 0.02 | 0.03 |
| Unspecified Tree Cr* | 3.3 | 0.00 | 0.00 | 0.00 |

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Polk** | **122949.2** | **75.92** | **120.00** | **153.28** |
| Citrus | 99619.7 | 49.31 | 83.40 | 106.80 |
| Pasture | 9726.7 | 7.35 | 11.00 | 14.28 |
| Sod | 7416.4 | 12.67 | 16.99 | 21.69 |
| Unspecified Row Crop | 1393.5 | 0.64 | 0.91 | 1.11 |
| Blueberries | 1378.0 | 2.45 | 3.15 | 3.87 |
| Watermelons | 879.0 | 0.47 | 0.67 | 0.88 |
| Field Nursery | 818.6 | 1.20 | 1.57 | 1.88 |
| Container Nursery | 560.9 | 1.07 | 1.30 | 1.52 |
| Unspecified Row Cro* | 213.6 | 0.15 | 0.19 | 0.22 |
| Specialty Farms | 204.4 | 0.16 | 0.20 | 0.25 |
| Unspecified Tree Cr* | 199.6 | 0.07 | 0.12 | 0.16 |
| Strawberries | 183.1 | 0.16 | 0.19 | 0.25 |
| Tomatoes | 114.4 | 0.08 | 0.10 | 0.12 |
| Hay | 78.1 | 0.01 | 0.03 | 0.04 |
| Alfalfa | 62.1 | 0.02 | 0.04 | 0.05 |
| Field Corn | 55.8 | 0.05 | 0.06 | 0.08 |
| Potatoes | 18.2 | 0.01 | 0.01 | 0.02 |
| Nurseries and Viney* | 10.5 | 0.04 | 0.05 | 0.06 |
| Dry Beans | 8.3 | 0.00 | 0.01 | 0.01 |
| Grapes | 8.3 | 0.00 | 0.00 | 0.00 |

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Putnam** | **10113.3** | **8.01** | **10.88** | **14.01** |
| Potatoes | 5934.6 | 1.34 | 2.36 | 3.28 |
| Asparagus Fern | 1123.1 | 2.29 | 2.98 | 3.78 |
| Leatherleaf | 754.0 | 1.52 | 2.01 | 2.55 |
| Hay | 500.1 | 0.32 | 0.41 | 0.65 |
| Container Nursery | 313.7 | 1.22 | 1.38 | 1.54 |
| Cabbage | 270.9 | 0.18 | 0.22 | 0.27 |
| Squash | 232.3 | 0.07 | 0.09 | 0.13 |
| Field Nursery | 160.9 | 0.28 | 0.34 | 0.42 |
| Citrus | 160.8 | 0.12 | 0.19 | 0.27 |
| Peanuts | 137.8 | 0.07 | 0.13 | 0.17 |
| Pecans | 134.9 | 0.11 | 0.17 | 0.21 |
| Misc. Vegetables | 70.6 | 0.05 | 0.06 | 0.07 |
| Kale | 69.4 | 0.05 | 0.06 | 0.07 |
| Blueberries | 59.2 | 0.06 | 0.09 | 0.11 |
| Aspidistra | 57.2 | 0.23 | 0.25 | 0.30 |
| Collard Greens | 55.8 | 0.03 | 0.03 | 0.05 |
| Sod | 36.3 | 0.06 | 0.08 | 0.10 |
| Mustard Greens | 15.1 | 0.01 | 0.01 | 0.01 |
| Beets | 10.8 | 0.00 | 0.00 | 0.01 |
| Grapes | 7.7 | 0.00 | 0.00 | 0.00 |
| Chinese Cabbage | 5.3 | 0.00 | 0.00 | 0.01 |
| Cut Foliage | 2.8 | 0.01 | 0.01 | 0.01 |
| **Sarasota** | **13435.9** | **6.20** | **10.39** | **14.35** |
| Citrus | 9424.8 | 3.37 | 6.64 | 9.73 |
| Unspecified Row Cro* | 2423.8 | 1.79 | 2.32 | 2.81 |
| Unspecified Tree Cr* | 923.7 | 0.24 | 0.45 | 0.65 |
| Unspecified Row Crop | 333.3 | 0.25 | 0.32 | 0.39 |
| Sugar Cane | 135.5 | 0.28 | 0.34 | 0.39 |
| Specialty Farms | 105.9 | 0.16 | 0.18 | 0.20 |
| Millet | 72.9 | 0.05 | 0.08 | 0.10 |
| Nurseries and Viney* | 16.1 | 0.07 | 0.07 | 0.08 |

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Seminole** | **4448.8** | **5.15** | **7.05** | **8.97** |
| Citrus | 2643.5 | 1.34 | 2.34 | 3.29 |
| Field Nursery | 899.0 | 1.81 | 2.26 | 2.79 |
| Sod | 370.7 | 0.62 | 0.84 | 1.03 |
| Container Nursery | 290.0 | 1.17 | 1.34 | 1.52 |
| Watermelons | 80.0 | 0.07 | 0.08 | 0.09 |
| Pasture | 62.3 | 0.10 | 0.13 | 0.15 |
| Sweet Corn | 51.4 | 0.03 | 0.03 | 0.04 |
| Unspecified Field C* | 19.9 | 0.01 | 0.01 | 0.01 |
| Unspecified Row Crop | 19.7 | 0.00 | 0.01 | 0.01 |
| Grapes | 9.9 | 0.00 | 0.01 | 0.01 |
| Okra | 2.5 | 0.00 | 0.00 | 0.00 |
| Unspecified Tree Cr* | 0.0 | 0.00 | 0.00 | 0.00 |
| **St_Johns** | **25490.7** | **9.43** | **14.44** | **18.77** |
| Potatoes | 21823.7 | 6.06 | 9.94 | 13.09 |
| Cabbage | 1257.3 | 0.83 | 1.05 | 1.29 |
| Pasture | 642.4 | 0.70 | 1.10 | 1.50 |
| Collard Greens | 498.1 | 0.27 | 0.36 | 0.44 |
| Sod | 381.1 | 0.79 | 0.98 | 1.19 |
| Misc. Vegetables | 349.8 | 0.26 | 0.33 | 0.39 |
| Field Corn | 325.4 | 0.24 | 0.35 | 0.45 |
| Turnips | 81.7 | 0.03 | 0.04 | 0.05 |
| Field Nursery | 62.3 | 0.09 | 0.11 | 0.14 |
| Container Nursery | 37.7 | 0.14 | 0.17 | 0.19 |
| Broccoli | 20.8 | 0.01 | 0.01 | 0.02 |
| Beets | 6.6 | 0.00 | 0.00 | 0.00 |
| Blueberries | 3.8 | 0.01 | 0.01 | 0.01 |
| **St_Lucie** | **90902.6** | **44.58** | **72.36** | **106.95** |
| Citrus | 86329.4 | 37.61 | 63.73 | 96.28 |
| Pasture | 2243.1 | 4.89 | 5.90 | 7.31 |
| Unspecified Row Crop | 1418.9 | 0.84 | 1.17 | 1.39 |
| Sugar Cane | 435.0 | 0.85 | 1.06 | 1.35 |
| Sweet Corn | 317.1 | 0.14 | 0.20 | 0.25 |
| Container Nursery | 64.9 | 0.10 | 0.13 | 0.16 |
| Unspecified Tree Cr* | 64.4 | 0.02 | 0.04 | 0.06 |
| Ornamentals | 29.8 | 0.12 | 0.14 | 0.16 |

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Sumter** | **8716.9** | **8.57** | **11.44** | **13.79** |
| Unspecified Row Cro* | 2528.6 | 1.63 | 2.10 | 2.47 |
| Sod | 1960.6 | 3.59 | 4.77 | 5.60 |
| Strawberries | 1292.3 | 0.62 | 0.83 | 1.13 |
| Millet | 1143.4 | 0.97 | 1.45 | 1.83 |
| Unspecified Row Crop | 417.4 | 0.23 | 0.30 | 0.38 |
| Watermelons | 295.0 | 0.14 | 0.22 | 0.28 |
| Peanuts | 279.8 | 0.12 | 0.17 | 0.23 |
| Sorghum | 267.1 | 0.18 | 0.25 | 0.33 |
| Nurseries and Viney* | 161.6 | 0.68 | 0.78 | 0.86 |
| Specialty Farms | 152.1 | 0.22 | 0.25 | 0.28 |
| Citrus | 144.9 | 0.08 | 0.15 | 0.21 |
| Blueberries | 53.9 | 0.11 | 0.14 | 0.17 |
| Unspecified Tree Cr* | 14.5 | 0.00 | 0.01 | 0.01 |
| Hay | 5.2 | 0.00 | 0.01 | 0.01 |
| Rye | 0.4 | 0.00 | 0.00 | 0.00 |
| Pasture | 0.3 | 0.00 | 0.00 | 0.00 |
| **Suwannee** | **11769.0** | **10.03** | **13.67** | **16.90** |
| Sod | 3105.3 | 5.34 | 7.13 | 8.69 |
| Peas | 2493.1 | 2.00 | 2.68 | 3.34 |
| Sorghum | 1783.5 | 0.97 | 1.42 | 1.82 |
| Soybeans | 1209.5 | 0.45 | 0.69 | 0.87 |
| Rye | 1124.7 | 0.02 | 0.05 | 0.08 |
| Peanuts | 876.1 | 0.50 | 0.69 | 0.85 |
| Corn | 528.5 | 0.30 | 0.38 | 0.46 |
| Pecans | 255.9 | 0.09 | 0.15 | 0.21 |
| Millet | 165.4 | 0.12 | 0.18 | 0.24 |
| Pasture | 102.9 | 0.20 | 0.26 | 0.30 |
| Oats | 58.0 | 0.00 | 0.00 | 0.00 |
| Potatoes | 49.1 | 0.02 | 0.03 | 0.04 |
| Unspecified Row Crop | 9.1 | 0.00 | 0.01 | 0.01 |
| Cantaloupe | 3.1 | 0.00 | 0.00 | 0.00 |
| Winter Wheat | 2.0 | 0.00 | 0.00 | 0.00 |
| Cotton | 1.6 | 0.00 | 0.00 | 0.00 |
| Ornamentals | 1.5 | 0.01 | 0.01 | 0.01 |

**Table B-12 Breakdown of 1995 Irrigated Water Use by County and Crop**

| **County** / Crop | 1995 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Union** | **848.7** | **0.90** | **1.24** | **1.59** |
| Sod | 475.1 | 0.75 | 1.01 | 1.29 |
| Rye | 86.0 | 0.00 | 0.01 | 0.01 |
| Sorghum | 74.4 | 0.03 | 0.05 | 0.08 |
| Corn | 71.1 | 0.04 | 0.05 | 0.06 |
| Peanuts | 65.3 | 0.03 | 0.04 | 0.05 |
| Unspecified Row Crop | 25.5 | 0.01 | 0.02 | 0.02 |
| Pasture | 23.3 | 0.03 | 0.05 | 0.06 |
| Millet | 11.8 | 0.01 | 0.01 | 0.02 |
| Pecans | 8.7 | 0.00 | 0.01 | 0.01 |
| Oats | 4.1 | 0.00 | 0.00 | 0.00 |
| Winter Wheat | 3.1 | 0.00 | 0.00 | 0.00 |
| Soybeans | 0.3 | 0.00 | 0.00 | 0.00 |
| **Volusia** | **13397.6** | **24.60** | **30.92** | **38.45** |
| Leatherleaf | 3886.4 | 8.39 | 10.45 | 13.06 |
| Citrus | 3008.2 | 1.83 | 2.84 | 3.89 |
| Asparagus Fern | 2359.1 | 5.26 | 6.49 | 8.08 |
| Sod | 1539.4 | 2.61 | 3.41 | 4.32 |
| Field Nursery | 796.3 | 1.50 | 1.84 | 2.24 |
| Container Nursery | 795.0 | 3.21 | 3.63 | 4.10 |
| Pasture | 640.8 | 0.91 | 1.21 | 1.55 |
| Aspidistra | 203.0 | 0.79 | 0.90 | 1.04 |
| Collard Greens | 57.8 | 0.04 | 0.05 | 0.05 |
| Misc. Vegetables | 31.0 | 0.02 | 0.03 | 0.04 |
| Squash | 27.4 | 0.01 | 0.01 | 0.02 |
| Hay | 25.3 | 0.02 | 0.03 | 0.04 |
| Tomato | 8.4 | 0.01 | 0.01 | 0.01 |
| Grapes | 5.7 | 0.00 | 0.00 | 0.00 |
| Unspecified Field C* | 5.0 | 0.00 | 0.00 | 0.00 |
| Broccoli | 3.0 | 0.00 | 0.00 | 0.00 |
| Blueberries | 2.5 | 0.00 | 0.01 | 0.01 |
| Sweet Corn | 2.1 | 0.00 | 0.00 | 0.00 |
| Peas | 1.0 | 0.00 | 0.00 | 0.00 |

[1]Wct year calculated as the average of the 20$^{th}$ percentile irrigation requirements of each polygon based on the 21-year simulation period. Dry year was calculated similarly for the 80$^{th}$ percentile irrigation requirement.

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Alachua** | | | | |
| Sorghum | 2267.6 | 1.19 | 1.77 | 2.35 |
| Sod | 1569.2 | 2.42 | 3.36 | 4.21 |
| Winter Wheat | 779.2 | 0.00 | 0.01 | 0.03 |
| Tomatoes | 774.5 | 0.47 | 0.56 | 0.66 |
| Rye | 659.7 | 0.00 | 0.02 | 0.02 |
| Hay | 595.2 | 0.19 | 0.48 | 0.66 |
| Pecans | 489.2 | 0.16 | 0.30 | 0.44 |
| Blueberries | 453.7 | 0.59 | 0.82 | 1.03 |
| Pasture | 253.9 | 0.13 | 0.23 | 0.34 |
| Peanuts | 211.9 | 0.08 | 0.13 | 0.18 |
| Peas | 172.3 | 0.13 | 0.18 | 0.22 |
| Unspecified Field Crop | 153.2 | 0.06 | 0.10 | 0.14 |
| Soybeans | 127.9 | 0.04 | 0.06 | 0.09 |
| Millet | 114.3 | 0.08 | 0.11 | 0.15 |
| Corn | 81.9 | 0.04 | 0.06 | 0.07 |
| Container Nursery | 28.5 | 0.10 | 0.11 | 0.12 |
| Citrus | 19.6 | 0.01 | 0.01 | 0.02 |
| Unspecified Row Crop | 11.9 | 0.00 | 0.00 | 0.00 |
| Unspecified Tree Crop | 8.1 | 0.00 | 0.01 | 0.01 |
| Misc. Vegetables | 7.2 | 0.00 | 0.00 | 0.00 |
| Greens | 6.9 | 0.00 | 0.00 | 0.00 |
| Strawberries | 6.4 | 0.00 | 0.01 | 0.01 |
| Chestnuts | 5.6 | 0.00 | 0.00 | 0.01 |
| Field Nursery | 4.3 | 0.01 | 0.01 | 0.01 |
| Grapes | 4.0 | 0.00 | 0.00 | 0.00 |
| Persimmons | 1.3 | 0.00 | 0.00 | 0.00 |
| Oats | 1.1 | 0.00 | 0.00 | 0.00 |
| Winter WheatSoybeans | 0.7 | 0.00 | 0.00 | 0.00 |
| **Baker** | | | | |
| Field Nursery | 97.6 | 0.13 | 0.16 | 0.19 |
| Pasture | 35.8 | 0.01 | 0.03 | 0.04 |
| Hay | 29.2 | 0.01 | 0.02 | 0.03 |
| Collard Greens | 14.6 | 0.00 | 0.01 | 0.01 |
| Container Nursery | 14.4 | 0.05 | 0.06 | 0.06 |
| Broccoli | 4.3 | 0.00 | 0.00 | 0.00 |
| Unspecified Row Crop | 1.8 | 0.00 | 0.00 | 0.00 |
| Cabbage | 1.5 | 0.00 | 0.00 | 0.00 |
| Corn | 0.4 | 0.00 | 0.00 | 0.00 |
| Grapes | 0.0 | 0.00 | 0.00 | 0.00 |
| **Berrien** | | | | |
| Pecans | 274.8 | 0.18 | 0.27 | 0.35 |
| produce | 5.5 | 0.00 | 0.00 | 0.00 |

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Bradford** | | | | |
| Sorghum | 306.7 | 0.15 | 0.24 | 0.32 |
| Rye | 263.9 | 0.00 | 0.02 | 0.03 |
| Hay | 185.2 | 0.11 | 0.17 | 0.23 |
| Sod | 166.8 | 0.28 | 0.37 | 0.46 |
| Winter Wheat | 139.3 | 0.00 | 0.00 | 0.01 |
| Corn | 62.6 | 0.03 | 0.04 | 0.05 |
| Peas | 62.2 | 0.05 | 0.07 | 0.08 |
| Soybeans | 39.5 | 0.01 | 0.02 | 0.03 |
| Peanuts | 32.3 | 0.01 | 0.02 | 0.03 |
| Millet | 22.9 | 0.02 | 0.02 | 0.03 |
| Cotton | 5.8 | 0.00 | 0.00 | 0.00 |
| Tomatoes | 5.5 | 0.00 | 0.00 | 0.00 |
| Oats | 1.7 | 0.00 | 0.00 | 0.00 |
| **Brevard** | | | | |
| Pasture | 12100.7 | 24.44 | 29.39 | 34.95 |
| Citrus | 3981.5 | 5.91 | 7.41 | 9.06 |
| Watermelons | 2937.8 | 1.27 | 1.67 | 2.09 |
| Sod | 2090.0 | 4.04 | 4.96 | 5.97 |
| Unspecified Field Crop | 195.7 | 0.28 | 0.34 | 0.41 |
| Field Nursery | 132.4 | 0.20 | 0.24 | 0.29 |
| Container Nursery | 83.4 | 0.20 | 0.23 | 0.26 |
| Ornamentals | 8.1 | 0.01 | 0.01 | 0.02 |
| Unspecified Tree Crop | 2.6 | 0.01 | 0.01 | 0.01 |
| Blueberries | 2.5 | 0.00 | 0.00 | 0.01 |
| Mangos | 1.7 | 0.00 | 0.01 | 0.01 |
| **Charlotte** | | | | |
| Citrus | 19226.1 | 9.16 | 19.07 | 28.07 |
| Unspecified Row Crop/Pastur | 4057.3 | 4.71 | 6.49 | 8.39 |
| Unspecified Row Crop | 762.6 | 0.62 | 0.79 | 0.95 |
| Pasture | 602.7 | 0.91 | 1.32 | 1.78 |
| Unspecified Field Crop | 290.9 | 0.18 | 0.27 | 0.36 |
| Nurseries and Vineyards | 123.0 | 0.45 | 0.53 | 0.61 |
| Ornamentals | 24.1 | 0.10 | 0.11 | 0.13 |
| Hay | 16.1 | 0.01 | 0.02 | 0.02 |

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Citrus** | | | | |
| Sod | 1208.9 | 2.09 | 2.78 | 3.32 |
| Strawberries | 143.9 | 0.06 | 0.08 | 0.11 |
| Unspecified Row Crop/Pastur | 67.1 | 0.11 | 0.14 | 0.16 |
| Hay | 42.8 | 0.04 | 0.06 | 0.07 |
| Unspecified Tree Crop | 20.7 | 0.02 | 0.02 | 0.03 |
| Peanuts | 15.5 | 0.01 | 0.01 | 0.02 |
| Nurseries and Vineyards | 11.5 | 0.05 | 0.05 | 0.06 |
| Rye | 5.0 | 0.00 | 0.00 | 0.00 |
| **Clay** | | | | |
| Field Nursery | 263.8 | 0.35 | 0.44 | 0.53 |
| Container Nursery | 136.8 | 0.36 | 0.42 | 0.47 |
| Pasture | 25.8 | 0.05 | 0.06 | 0.08 |
| Ornamentals | 2.0 | 0.00 | 0.00 | 0.00 |
| Grapes | 0.3 | 0.00 | 0.00 | 0.00 |
| **Clinch** | | | | |
| Blueberries | 2096.8 | 2.49 | 3.39 | 4.15 |
| rotation | 54.5 | 0.03 | 0.05 | 0.07 |
| **Columbia** | | | | |
| Winter Wheat | 1125.6 | 0.00 | 0.04 | 0.07 |
| Rye | 912.9 | 0.00 | 0.04 | 0.08 |
| Sorghum | 888.5 | 0.35 | 0.57 | 0.79 |
| Sod | 870.1 | 1.41 | 1.90 | 2.39 |
| Tomatoes | 800.0 | 0.53 | 0.61 | 0.67 |
| Hay | 515.6 | 0.21 | 0.43 | 0.64 |
| Soybeans | 279.4 | 0.09 | 0.14 | 0.19 |
| Peas | 207.2 | 0.16 | 0.22 | 0.27 |
| Peanuts | 123.6 | 0.05 | 0.08 | 0.11 |
| Corn | 63.3 | 0.03 | 0.04 | 0.05 |
| Millet | 29.7 | 0.02 | 0.03 | 0.04 |
| Winter WheatSoybeans | 5.0 | 0.00 | 0.00 | 0.00 |
| Winter WheatSorghum | 1.3 | 0.00 | 0.00 | 0.00 |
| **Desoto** | | | | |
| Citrus | 51556.2 | 23.80 | 51.52 | 77.56 |
| Unspecified Row Crop/Pastur | 8228.5 | 9.67 | 13.43 | 17.03 |
| Unspecified Row Crop | 758.0 | 0.43 | 0.59 | 0.74 |
| Hay | 492.5 | 0.12 | 0.42 | 0.71 |
| Nurseries and Vineyards | 231.2 | 0.92 | 1.05 | 1.20 |
| Tomatoes | 172.4 | 0.04 | 0.08 | 0.10 |
| Unspecified Tree Crop | 15.0 | 0.00 | 0.01 | 0.02 |
| Pasture | 0.5 | 0.00 | 0.00 | 0.00 |

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Dixie** | | | | |
| Winter Wheat | 659.2 | 0.00 | 0.01 | 0.01 |
| Rye | 526.4 | 0.00 | 0.01 | 0.02 |
| Sorghum | 257.0 | 0.12 | 0.19 | 0.26 |
| Sod | 138.2 | 0.21 | 0.29 | 0.39 |
| Hay | 95.2 | 0.05 | 0.09 | 0.13 |
| Peas | 38.5 | 0.03 | 0.04 | 0.05 |
| Peanuts | 23.6 | 0.01 | 0.02 | 0.02 |
| Pecans | 12.5 | 0.00 | 0.01 | 0.01 |
| Corn | 7.4 | 0.00 | 0.00 | 0.01 |
| Soybeans | 7.3 | 0.00 | 0.00 | 0.00 |
| Millet | 3.5 | 0.00 | 0.00 | 0.01 |
| Oats | 1.1 | 0.00 | 0.00 | 0.00 |
| Cantaloupe | 0.9 | 0.00 | 0.00 | 0.00 |
| **Duval** | | | | |
| Sod | 981.8 | 1.79 | 2.32 | 2.85 |
| Field Nursery | 250.9 | 0.35 | 0.45 | 0.54 |
| Container Nursery | 52.4 | 0.14 | 0.16 | 0.18 |
| Grapes | 7.5 | 0.00 | 0.00 | 0.00 |
| Pasture | 0.0 | 0.00 | 0.00 | 0.00 |
| **Echols** | | | | |
| rotation | 1198.2 | 0.73 | 1.10 | 1.42 |
| produce | 968.2 | 0.67 | 0.82 | 0.95 |
| Pasture | 64.1 | 0.02 | 0.06 | 0.08 |
| **Flagler** | | | | |
| Sod | 2856.1 | 5.51 | 7.08 | 8.58 |
| Potatoes | 2835.1 | 0.79 | 1.28 | 1.65 |
| Cabbage | 664.1 | 0.45 | 0.58 | 0.71 |
| Pasture | 509.1 | 0.38 | 0.54 | 0.67 |
| Greens | 190.3 | 0.10 | 0.13 | 0.17 |
| Field Nursery | 151.3 | 0.21 | 0.27 | 0.33 |
| Sorghum | 140.2 | 0.18 | 0.23 | 0.28 |
| Hay | 132.1 | 0.28 | 0.35 | 0.42 |
| Strawberries | 50.5 | 0.02 | 0.02 | 0.03 |
| Unspecified Row Crop | 8.2 | 0.00 | 0.01 | 0.01 |
| Pecans | 7.2 | 0.00 | 0.00 | 0.00 |
| Container Nursery | 5.9 | 0.01 | 0.01 | 0.01 |
| PotatoesCabbage | 0.0 | 0.00 | 0.00 | 0.00 |

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Gilchrist** | | | | |
| Sod | 1800.3 | 2.77 | 3.78 | 4.92 |
| Winter Wheat | 1564.4 | 0.00 | 0.02 | 0.03 |
| Rye | 1397.4 | 0.00 | 0.04 | 0.09 |
| Sorghum | 907.8 | 0.38 | 0.65 | 0.93 |
| Hay | 723.3 | 0.30 | 0.61 | 0.87 |
| Peanuts | 300.2 | 0.12 | 0.19 | 0.26 |
| Peas | 228.2 | 0.18 | 0.24 | 0.31 |
| Tomatoes | 122.4 | 0.07 | 0.08 | 0.10 |
| Corn | 51.2 | 0.02 | 0.03 | 0.04 |
| Millet | 37.6 | 0.03 | 0.04 | 0.06 |
| Soybeans | 31.6 | 0.01 | 0.02 | 0.02 |
| Potatoes | 29.7 | 0.01 | 0.02 | 0.02 |
| Oats | 0.8 | 0.00 | 0.00 | 0.00 |
| **Glades** | | | | |
| Sugar Cane | 16096.0 | 28.39 | 37.07 | 48.76 |
| Pasture | 4904.5 | 8.78 | 10.93 | 13.94 |
| Sod | 1947.9 | 3.66 | 4.58 | 5.92 |
| Citrus | 1115.4 | 0.67 | 1.22 | 1.78 |
| Container Nursery | 11.8 | 0.02 | 0.02 | 0.03 |
| Sweet Corn | 7.6 | 0.00 | 0.01 | 0.01 |
| Hay | 0.4 | 0.00 | 0.00 | 0.00 |
| **Hamilton** | | | | |
| Sweet Potatoes | 1491.1 | 1.50 | 1.90 | 2.41 |
| Peas | 1055.6 | 0.85 | 1.13 | 1.42 |
| Soybeans | 966.8 | 0.42 | 0.70 | 0.87 |
| Rye | 394.4 | 0.01 | 0.02 | 0.03 |
| Hay | 297.4 | 0.13 | 0.29 | 0.39 |
| Winter Wheat | 274.8 | 0.00 | 0.00 | 0.00 |
| Sod | 267.8 | 0.47 | 0.63 | 0.73 |
| Sorghum | 264.3 | 0.11 | 0.21 | 0.29 |
| Pecans | 256.2 | 0.13 | 0.23 | 0.31 |
| Peanuts | 238.4 | 0.12 | 0.18 | 0.23 |
| Millet | 162.4 | 0.10 | 0.17 | 0.23 |
| Corn | 84.0 | 0.04 | 0.06 | 0.07 |
| Potatoes | 50.9 | 0.02 | 0.03 | 0.04 |
| OatsCorn | 7.2 | 0.00 | 0.01 | 0.01 |
| Oats | 3.0 | 0.00 | 0.00 | 0.00 |
| SoybeansOats | 2.2 | 0.00 | 0.00 | 0.00 |
| Unspecified Row Crop | 2.0 | 0.00 | 0.00 | 0.00 |
| Cantaloupe | 1.9 | 0.00 | 0.00 | 0.00 |
| Winter WheatSorghum | 0.6 | 0.00 | 0.00 | 0.00 |
| Pasture | 0.3 | 0.00 | 0.00 | 0.00 |

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Hardee** | | | | |
| Citrus | 30702.3 | 17.07 | 31.15 | 42.75 |
| Watermelons | 2254.3 | 0.87 | 1.36 | 1.72 |
| Pasture | 1768.9 | 1.51 | 2.37 | 3.08 |
| Tomatoes | 1311.9 | 0.90 | 1.18 | 1.38 |
| Sod | 868.4 | 1.23 | 1.69 | 2.05 |
| Unspecified Row Crop/Pastur | 762.3 | 0.96 | 1.29 | 1.62 |
| Unspecified Row Crop | 760.0 | 0.19 | 0.33 | 0.43 |
| Hay | 669.4 | 0.21 | 0.63 | 0.98 |
| Cucurbits | 570.0 | 0.28 | 0.39 | 0.46 |
| Container Nursery | 449.4 | 0.98 | 1.16 | 1.33 |
| Strawberries | 160.1 | 0.07 | 0.10 | 0.14 |
| Blueberries | 140.5 | 0.24 | 0.31 | 0.36 |
| Peppers | 108.3 | 0.09 | 0.11 | 0.13 |
| Field Nursery | 84.4 | 0.21 | 0.25 | 0.28 |
| Squash | 64.0 | 0.02 | 0.03 | 0.04 |
| Unspecified Tree Crop | 24.7 | 0.01 | 0.02 | 0.02 |
| Nurseries and Vineyards | 21.8 | 0.09 | 0.10 | 0.11 |
| Peas | 4.6 | 0.00 | 0.00 | 0.00 |
| **Hernando** | | | | |
| Sod | 1015.7 | 1.81 | 2.42 | 3.04 |
| Peas | 489.5 | 0.40 | 0.51 | 0.62 |
| Citrus | 373.4 | 0.26 | 0.41 | 0.56 |
| Unspecified Row Crop/Pastur | 344.9 | 0.44 | 0.56 | 0.70 |
| Hay | 299.5 | 0.17 | 0.31 | 0.43 |
| Sorghum | 214.0 | 0.17 | 0.23 | 0.27 |
| Nurseries and Vineyards | 123.4 | 0.52 | 0.58 | 0.64 |
| Rye | 111.6 | 0.00 | 0.02 | 0.03 |
| Peanuts | 77.5 | 0.04 | 0.06 | 0.07 |
| Unspecified Tree Crop | 28.5 | 0.01 | 0.02 | 0.03 |
| Blueberries | 22.0 | 0.03 | 0.04 | 0.05 |
| Unspecified Row Crop | 9.6 | 0.01 | 0.01 | 0.01 |

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Highlands** | | | | |
| Citrus | 65363.7 | 46.69 | 76.10 | 102.25 |
| Sugar Cane | 13889.6 | 23.25 | 29.81 | 37.11 |
| Pasture | 6760.8 | 11.02 | 14.04 | 17.47 |
| Unspecified Row Crop | 2212.1 | 1.21 | 1.75 | 2.11 |
| Tomatoes | 2069.7 | 0.00 | 0.38 | 0.60 |
| Sod | 1576.0 | 2.83 | 3.66 | 4.48 |
| Nurseries and Vineyards | 334.3 | 1.26 | 1.46 | 1.67 |
| Container Nursery | 316.5 | 0.57 | 0.70 | 0.82 |
| Hay | 278.9 | 0.00 | 0.16 | 0.26 |
| Blueberries | 205.6 | 0.23 | 0.32 | 0.40 |
| Field Nursery | 177.2 | 0.31 | 0.40 | 0.47 |
| Specialty Farms | 96.0 | 0.12 | 0.15 | 0.17 |
| Unspecified Row Crop/Pastur | 74.2 | 0.08 | 0.12 | 0.15 |
| Squash | 35.5 | 0.01 | 0.01 | 0.01 |
| Ornamentals | 22.4 | 0.09 | 0.10 | 0.12 |
| Unspecified Tree Crop | 16.2 | 0.00 | 0.01 | 0.02 |
| Unspecified Field Crop | 11.8 | 0.00 | 0.01 | 0.01 |
| Sweet Corn | 2.4 | 0.00 | 0.00 | 0.00 |
| **Hillsborough** | | | | |
| Citrus | 11078.5 | 7.29 | 11.78 | 15.99 |
| Strawberries | 9611.2 | 4.14 | 5.98 | 8.36 |
| Unspecified Row Crop | 2186.5 | 1.61 | 1.99 | 2.46 |
| Nurseries and Vineyards | 1058.5 | 4.39 | 4.93 | 5.47 |
| Squash | 984.3 | 0.32 | 0.44 | 0.51 |
| Unspecified Row Crop/Pastur | 935.1 | 1.27 | 1.66 | 2.00 |
| Hay | 914.4 | 0.50 | 0.89 | 1.26 |
| Unspecified Tree Crop | 754.5 | 0.39 | 0.65 | 0.88 |
| Peanuts | 364.6 | 0.15 | 0.21 | 0.27 |
| Sod | 210.6 | 0.32 | 0.41 | 0.50 |
| Cantaloupe | 162.9 | 0.03 | 0.06 | 0.09 |
| Container Nursery | 112.0 | 0.29 | 0.33 | 0.36 |
| Sorghum | 90.6 | 0.05 | 0.07 | 0.10 |
| Rye | 69.4 | 0.01 | 0.02 | 0.03 |
| Specialty Farms | 62.0 | 0.09 | 0.10 | 0.11 |
| Field Nursery | 58.1 | 0.10 | 0.11 | 0.14 |
| Blueberries | 11.3 | 0.01 | 0.02 | 0.02 |

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Indian_River** | | | | |
| Citrus | 46625.4 | 18.89 | 31.29 | 45.42 |
| Pasture | 15199.0 | 18.05 | 24.68 | 30.93 |
| Sod | 1815.7 | 0.29 | 1.52 | 2.25 |
| Field Nursery | 1107.0 | 1.55 | 1.92 | 2.38 |
| Container Nursery | 47.5 | 0.09 | 0.10 | 0.12 |
| Unspecified Field Crop | 13.2 | 0.01 | 0.01 | 0.01 |
| Misc. Vegetables | 11.9 | 0.00 | 0.01 | 0.01 |
| Sugar Cane | 0.9 | 0.00 | 0.00 | 0.00 |
| **Lafayette** | | | | |
| Rye | 1378.3 | 0.00 | 0.02 | 0.02 |
| Peas | 633.1 | 0.49 | 0.66 | 0.83 |
| Hay | 353.1 | 0.17 | 0.33 | 0.46 |
| Soybeans | 347.7 | 0.13 | 0.19 | 0.26 |
| Pecans | 307.6 | 0.12 | 0.23 | 0.31 |
| Peanuts | 202.2 | 0.09 | 0.13 | 0.17 |
| Sweet Potatoes | 194.7 | 0.19 | 0.24 | 0.30 |
| Sod | 181.1 | 0.30 | 0.39 | 0.48 |
| Sorghum | 87.7 | 0.04 | 0.06 | 0.09 |
| Potatoes | 86.3 | 0.03 | 0.05 | 0.06 |
| Corn | 59.8 | 0.03 | 0.04 | 0.05 |
| Millet | 18.2 | 0.01 | 0.02 | 0.03 |
| OatsCorn | 9.2 | 0.00 | 0.01 | 0.01 |
| Winter Wheat | 7.4 | 0.00 | 0.00 | 0.00 |
| Oats | 7.4 | 0.00 | 0.00 | 0.00 |
| SoybeansOats | 0.8 | 0.00 | 0.00 | 0.00 |

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Lake** | | | | |
| Citrus | 9886.6 | 6.64 | 11.34 | 14.88 |
| Container Nursery | 2004.8 | 4.26 | 5.20 | 6.02 |
| Hay | 1303.7 | 0.81 | 1.41 | 1.82 |
| Pasture | 1044.7 | 1.59 | 2.21 | 2.83 |
| Sod | 856.1 | 1.08 | 1.71 | 2.21 |
| Field Nursery | 660.8 | 1.05 | 1.33 | 1.61 |
| Blueberries | 176.4 | 0.26 | 0.36 | 0.44 |
| Leatherleaf | 149.1 | 0.30 | 0.40 | 0.51 |
| Grapes | 93.7 | 0.04 | 0.07 | 0.09 |
| Watermelons | 91.4 | 0.04 | 0.06 | 0.07 |
| Unspecified Row Crop/Pastur | 62.0 | 0.09 | 0.12 | 0.14 |
| Shade Ferns | 55.4 | 0.09 | 0.13 | 0.16 |
| Unspecified Field Crop | 54.7 | 0.03 | 0.04 | 0.06 |
| Peaches | 47.2 | 0.02 | 0.04 | 0.05 |
| Peanuts | 45.2 | 0.00 | 0.01 | 0.02 |
| Hammock Ferns | 36.3 | 0.07 | 0.09 | 0.11 |
| Ornamentals | 33.0 | 0.07 | 0.09 | 0.10 |
| Misc. Vegetables | 32.6 | 0.02 | 0.02 | 0.03 |
| Tree Fern | 28.6 | 0.05 | 0.07 | 0.08 |
| Pecans | 23.5 | 0.01 | 0.02 | 0.03 |
| Asparagus Fern | 20.1 | 0.04 | 0.05 | 0.07 |
| Peas | 14.0 | 0.01 | 0.02 | 0.02 |
| Pittosporum | 9.7 | 0.03 | 0.04 | 0.05 |
| Aspidistra | 8.5 | 0.03 | 0.04 | 0.04 |
| Unspecified Nurseries and Vin | 7.9 | 0.01 | 0.01 | 0.02 |
| Strawberries | 3.5 | 0.00 | 0.00 | 0.00 |
| Field Corn | 3.1 | 0.00 | 0.00 | 0.00 |
| Unspecified Tree Crop | 2.2 | 0.00 | 0.00 | 0.00 |
| Unspecified Row Crop | 0.4 | 0.00 | 0.00 | 0.00 |
| **Lanier** | | | | |
| rotation | 690.8 | 0.47 | 0.68 | 0.91 |
| Sod | 465.3 | 0.82 | 1.07 | 1.27 |
| Pecans | 412.0 | 0.21 | 0.36 | 0.47 |
| Peaches | 71.2 | 0.03 | 0.06 | 0.09 |
| produce | 8.0 | 0.00 | 0.00 | 0.01 |
| Pasture | 4.0 | 0.00 | 0.00 | 0.00 |
| rotationSorghum | 0.7 | 0.00 | 0.00 | 0.00 |

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Levy** | | | | |
| Sod | 17689.2 | 30.29 | 40.82 | 50.25 |
| Winter Wheat | 4027.7 | 0.00 | 0.04 | 0.03 |
| Sorghum | 2154.4 | 1.03 | 1.55 | 2.20 |
| Tomatoes | 1503.0 | 0.88 | 1.15 | 1.38 |
| Hay | 832.2 | 0.39 | 0.75 | 1.04 |
| Rye | 407.7 | 0.01 | 0.04 | 0.05 |
| Peanuts | 223.2 | 0.09 | 0.14 | 0.19 |
| Sweet Potatoes | 91.2 | 0.09 | 0.12 | 0.13 |
| Corn | 19.4 | 0.01 | 0.01 | 0.02 |
| Peas | 18.2 | 0.02 | 0.02 | 0.02 |
| Soybeans | 8.7 | 0.00 | 0.00 | 0.01 |
| Millet | 8.6 | 0.01 | 0.01 | 0.01 |
| Potatoes | 1.8 | 0.00 | 0.00 | 0.00 |
| Oats | 1.1 | 0.00 | 0.00 | 0.00 |
| Pasture | 0.8 | 0.00 | 0.00 | 0.00 |
| **Lowndes** | | | | |
| rotation | 2945.0 | 1.70 | 2.65 | 3.69 |
| Pecans | 1200.1 | 1.41 | 1.96 | 2.39 |
| produce | 783.5 | 0.46 | 0.59 | 0.69 |
| Field Nursery | 75.0 | 0.17 | 0.21 | 0.24 |
| Sod | 52.8 | 0.09 | 0.12 | 0.14 |
| Container Nursery | 36.0 | 0.10 | 0.11 | 0.12 |
| Pasture | 28.0 | 0.02 | 0.03 | 0.04 |
| rotationSoybeans | 1.3 | 0.00 | 0.00 | 0.00 |
| **Madison** | | | | |
| Sweet Potatoes | 1311.1 | 1.33 | 1.73 | 2.18 |
| Winter Wheat | 1258.6 | 0.00 | 0.04 | 0.06 |
| Soybeans | 1052.1 | 0.54 | 0.88 | 1.14 |
| Peas | 831.1 | 0.73 | 0.93 | 1.18 |
| Rye | 772.4 | 0.01 | 0.03 | 0.05 |
| Hay | 268.5 | 0.14 | 0.28 | 0.38 |
| Sod | 199.5 | 0.37 | 0.49 | 0.58 |
| Peanuts | 145.0 | 0.07 | 0.12 | 0.16 |
| Millet | 24.6 | 0.02 | 0.03 | 0.03 |
| Corn | 23.9 | 0.01 | 0.02 | 0.02 |
| Sorghum | 17.8 | 0.01 | 0.01 | 0.02 |
| Pecans | 0.9 | 0.00 | 0.00 | 0.00 |
| Container Nursery | 0.9 | 0.00 | 0.00 | 0.00 |
| OatsCorn | 0.9 | 0.00 | 0.00 | 0.00 |
| Ornamentals | 0.7 | 0.00 | 0.00 | 0.00 |

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Manatee** | | | | |
| Citrus | 29619.0 | 18.55 | 30.33 | 40.73 |
| Unspecified Row Crop | 10378.4 | 8.21 | 10.14 | 12.29 |
| Strawberries | 7876.7 | 4.46 | 5.85 | 7.87 |
| Unspecified Row Crop/Pastur | 4091.4 | 5.52 | 7.20 | 8.68 |
| Squash | 3674.6 | 1.33 | 1.67 | 1.98 |
| Hay | 1284.4 | 0.68 | 1.26 | 1.82 |
| Peanuts | 791.5 | 0.33 | 0.46 | 0.58 |
| Nurseries and Vineyards | 594.3 | 2.45 | 2.76 | 3.09 |
| Unspecified Tree Crop | 191.3 | 0.08 | 0.15 | 0.21 |
| Sorghum | 31.9 | 0.02 | 0.03 | 0.04 |
| Clover | 27.8 | 0.01 | 0.01 | 0.01 |
| Peas | 20.2 | 0.02 | 0.03 | 0.03 |
| Oats | 12.2 | 0.00 | 0.00 | 0.00 |
| Rye | 2.4 | 0.00 | 0.00 | 0.00 |
| **Marion** | | | | |
| Sod | 7288.7 | 12.05 | 16.14 | 19.37 |
| Hay | 1940.2 | 1.80 | 2.48 | 3.00 |
| Citrus | 1023.7 | 0.89 | 1.32 | 1.70 |
| Peanuts | 248.4 | 0.13 | 0.19 | 0.24 |
| Field Nursery | 222.4 | 0.33 | 0.42 | 0.50 |
| Container Nursery | 153.4 | 0.34 | 0.40 | 0.46 |
| Pasture | 150.8 | 0.10 | 0.16 | 0.21 |
| Blueberries | 140.0 | 0.20 | 0.27 | 0.34 |
| Peas | 118.4 | 0.11 | 0.14 | 0.15 |
| Specialty Farms | 84.1 | 0.11 | 0.12 | 0.14 |
| Rye | 64.8 | 0.00 | 0.01 | 0.02 |
| Unspecified Field Crop | 63.3 | 0.05 | 0.07 | 0.08 |
| Sorghum | 46.5 | 0.02 | 0.04 | 0.04 |
| Nurseries and Vineyards | 31.5 | 0.13 | 0.15 | 0.17 |
| Pecans | 27.6 | 0.02 | 0.02 | 0.03 |
| Misc. Vegetables | 15.8 | 0.01 | 0.01 | 0.01 |
| Strawberries | 7.7 | 0.00 | 0.01 | 0.01 |
| Oats | 7.7 | 0.00 | 0.00 | 0.00 |
| Unspecified Tree Crop | 5.3 | 0.00 | 0.00 | 0.00 |
| Grapes | 2.1 | 0.00 | 0.00 | 0.00 |
| Unspecified Row Crop/Pastur | 1.8 | 0.00 | 0.00 | 0.00 |
| Peaches | 0.5 | 0.00 | 0.00 | 0.00 |
| Field Corn | 0.0 | 0.00 | 0.00 | 0.00 |

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Martin** | | | | |
| Sugar Cane | 50103.8 | 77.06 | 100.61 | 132.87 |
| Citrus | 9515.7 | 4.93 | 8.33 | 13.24 |
| Sweet Corn | 4554.4 | 2.53 | 3.52 | 4.45 |
| Unspecified Row Crop | 2149.0 | 1.24 | 1.70 | 2.02 |
| Pasture | 1203.1 | 1.91 | 2.40 | 3.15 |
| Sweet Potatoes | 803.9 | 0.84 | 1.10 | 1.31 |
| Unspecified Field Crop | 779.7 | 0.54 | 0.72 | 0.90 |
| Sod | 756.1 | 1.35 | 1.62 | 2.07 |
| Container Nursery | 658.6 | 1.02 | 1.26 | 1.61 |
| Ornamentals | 400.3 | 1.57 | 1.78 | 2.06 |
| Dry Beans | 22.9 | 0.02 | 0.02 | 0.03 |
| Unspecified Tree Crop | 16.0 | 0.01 | 0.01 | 0.02 |
| Rice | 0.4 | 0.00 | 0.00 | 0.00 |
| **Nassau** | | | | |
| Cotton | 730.6 | 0.02 | 0.13 | 0.20 |
| Container Nursery | 92.9 | 0.18 | 0.22 | 0.26 |
| Field Nursery | 2.6 | 0.00 | 0.00 | 0.01 |
| Hay | 0.0 | 0.00 | 0.00 | 0.00 |
| Pecans | 0.0 | 0.00 | 0.00 | 0.00 |
| Misc. Vegetables | 0.0 | 0.00 | 0.00 | 0.00 |
| **Okeechobee** | | | | |
| Sod | 25916.8 | 44.72 | 58.32 | 73.98 |
| Citrus | 22596.7 | 15.43 | 24.14 | 36.28 |
| Pasture | 7377.2 | 16.93 | 20.27 | 24.70 |
| Sugar Cane | 149.1 | 0.28 | 0.35 | 0.43 |
| Unspecified Row Crop | 35.8 | 0.03 | 0.03 | 0.04 |
| Unspecified Field Crop | 25.3 | 0.01 | 0.02 | 0.03 |
| Unspecified Tree Crop | 19.6 | 0.00 | 0.01 | 0.02 |
| Container Nursery | 12.4 | 0.02 | 0.03 | 0.03 |
| Sweet Corn | 1.3 | 0.00 | 0.00 | 0.00 |
| Ornamentals | 0.7 | 0.00 | 0.00 | 0.00 |

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Orange** | | | | |
| Citrus | 4646.3 | 2.89 | 5.11 | 6.57 |
| Pasture | 1496.9 | 0.52 | 1.13 | 1.56 |
| Container Nursery | 567.8 | 1.41 | 1.67 | 1.95 |
| Watermelons | 484.4 | 0.33 | 0.45 | 0.55 |
| Ornamentals | 251.3 | 0.67 | 0.81 | 0.96 |
| Sod | 248.1 | 0.30 | 0.40 | 0.49 |
| Hay | 210.0 | 0.10 | 0.20 | 0.28 |
| Field Nursery | 118.3 | 0.19 | 0.24 | 0.29 |
| Unspecified Tree Crop | 65.6 | 0.04 | 0.07 | 0.09 |
| Blueberries | 36.2 | 0.04 | 0.07 | 0.09 |
| Unspecified Nurseries and Vin | 2.9 | 0.00 | 0.00 | 0.01 |
| Misc. Vegetables | 1.4 | 0.00 | 0.00 | 0.00 |
| **Osceola** | | | | |
| Citrus | 12661.4 | 4.98 | 8.66 | 11.22 |
| Pasture | 8025.8 | 15.36 | 19.49 | 23.58 |
| Unspecified Field Crop | 769.3 | 0.50 | 0.68 | 0.88 |
| Sod | 611.3 | 0.96 | 1.27 | 1.56 |
| Unspecified Row Crop | 527.3 | 0.36 | 0.46 | 0.58 |
| Ornamentals | 18.5 | 0.08 | 0.09 | 0.10 |
| Hay | 13.2 | 0.01 | 0.01 | 0.02 |
| Container Nursery | 11.3 | 0.02 | 0.02 | 0.03 |
| Sugar Cane | 1.3 | 0.00 | 0.00 | 0.00 |
| Unspecified Tree Crop | 1.0 | 0.00 | 0.00 | 0.00 |
| **Palm_Beach** | | | | |
| Sugar Cane | 1417.5 | 1.50 | 2.13 | 3.03 |
| Container Nursery | 30.9 | 0.05 | 0.06 | 0.07 |
| Ornamentals | 14.8 | 0.06 | 0.06 | 0.07 |
| Specialty Farms | 12.7 | 0.01 | 0.02 | 0.02 |
| Sod | 4.2 | 0.01 | 0.01 | 0.01 |
| Pasture | 0.0 | 0.00 | 0.00 | 0.00 |

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Pasco** | | | | |
| Citrus | 4865.4 | 3.36 | 5.33 | 7.06 |
| Strawberries | 1925.6 | 1.00 | 1.30 | 1.74 |
| Hay | 1866.9 | 0.94 | 1.90 | 2.69 |
| Sod | 1115.4 | 1.83 | 2.40 | 2.97 |
| Unspecified Row Crop/Pastur | 402.2 | 0.53 | 0.71 | 0.88 |
| Unspecified Tree Crop | 296.7 | 0.18 | 0.26 | 0.33 |
| Peanuts | 131.9 | 0.05 | 0.07 | 0.09 |
| Nurseries and Vineyards | 105.0 | 0.44 | 0.48 | 0.52 |
| Peas | 75.0 | 0.07 | 0.09 | 0.11 |
| Rye | 62.6 | 0.00 | 0.01 | 0.02 |
| Sorghum | 18.1 | 0.01 | 0.01 | 0.02 |
| Blueberries | 13.4 | 0.02 | 0.02 | 0.03 |
| Unspecified Row Crop | 5.6 | 0.00 | 0.00 | 0.01 |
| **Pinellas** | | | | |
| Nurseries and Vineyards | 19.2 | 0.08 | 0.09 | 0.09 |
| Hay | 1.7 | 0.00 | 0.00 | 0.00 |
| **Polk** | | | | |
| Citrus | 98067.1 | 70.81 | 118.39 | 156.84 |
| Pasture | 9795.3 | 7.30 | 11.10 | 14.50 |
| Sod | 1725.9 | 2.51 | 3.50 | 4.48 |
| Blueberries | 1378.0 | 2.45 | 3.15 | 3.87 |
| Unspecified Row Crop | 1246.6 | 0.55 | 0.79 | 0.98 |
| Field Nursery | 818.6 | 1.20 | 1.57 | 1.88 |
| Watermelons | 818.4 | 0.45 | 0.63 | 0.82 |
| Unspecified Row Crop/Pastur | 603.0 | 0.69 | 0.97 | 1.20 |
| Container Nursery | 560.9 | 1.07 | 1.30 | 1.52 |
| Hay | 420.9 | 0.23 | 0.40 | 0.52 |
| Unspecified Tree Crop | 280.3 | 0.13 | 0.23 | 0.31 |
| Specialty Farms | 204.4 | 0.16 | 0.20 | 0.25 |
| Strawberries | 193.0 | 0.16 | 0.20 | 0.25 |
| Nurseries and Vineyards | 182.2 | 0.74 | 0.85 | 0.94 |
| Tomatoes | 114.5 | 0.08 | 0.10 | 0.12 |
| Alfalfa | 62.1 | 0.04 | 0.06 | 0.08 |
| Field Corn | 55.8 | 0.05 | 0.06 | 0.08 |
| Ornamentals | 23.7 | 0.10 | 0.11 | 0.12 |
| Dry Beans | 8.3 | 0.00 | 0.01 | 0.01 |
| Grapes | 8.3 | 0.00 | 0.01 | 0.01 |

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Putnam** | | | | |
| Potatoes | 4394.7 | 0.97 | 1.73 | 2.41 |
| Asparagus Fern | 1049.3 | 2.18 | 2.84 | 3.61 |
| Sod | 1032.4 | 1.94 | 2.46 | 2.95 |
| Hay | 568.1 | 0.35 | 0.44 | 0.72 |
| Sorghum | 410.0 | 0.48 | 0.65 | 0.85 |
| Container Nursery | 373.2 | 0.70 | 0.85 | 1.02 |
| Leatherleaf | 360.6 | 0.74 | 0.96 | 1.22 |
| Greens | 339.2 | 0.16 | 0.21 | 0.28 |
| Citrus | 298.5 | 0.19 | 0.31 | 0.46 |
| Aspidistra | 273.2 | 1.09 | 1.23 | 1.42 |
| Pecans | 162.7 | 0.06 | 0.11 | 0.16 |
| Pittosporum | 157.0 | 0.63 | 0.70 | 0.81 |
| Blueberries | 154.9 | 0.22 | 0.30 | 0.38 |
| Field Nursery | 118.9 | 0.19 | 0.24 | 0.29 |
| Broccoli | 111.6 | 0.06 | 0.07 | 0.09 |
| Cabbage | 105.4 | 0.06 | 0.08 | 0.10 |
| Spinach | 91.0 | 0.05 | 0.06 | 0.07 |
| Shade Ferns | 86.7 | 0.17 | 0.23 | 0.29 |
| Pasture | 75.8 | 0.07 | 0.10 | 0.14 |
| Grapes | 59.6 | 0.02 | 0.03 | 0.04 |
| Field Corn | 33.7 | 0.03 | 0.05 | 0.06 |
| Hammock Ferns | 25.2 | 0.05 | 0.06 | 0.08 |
| Misc. Vegetables | 22.0 | 0.01 | 0.02 | 0.02 |
| Liriope | 5.6 | 0.02 | 0.02 | 0.03 |
| Onions | 3.5 | 0.00 | 0.00 | 0.00 |
| Unspecified Field Crop | 2.8 | 0.00 | 0.00 | 0.01 |
| Unspecified Row Crop | 2.0 | 0.00 | 0.00 | 0.00 |
| PotatoesCabbage | 0.0 | 0.00 | 0.00 | 0.00 |
| **Sarasota** | | | | |
| Strawberries | 4288.7 | 2.26 | 2.98 | 4.01 |
| Citrus | 3068.3 | 1.70 | 3.09 | 4.32 |
| Unspecified Row Crop/Pastur | 1191.9 | 1.62 | 2.07 | 2.55 |
| Nurseries and Vineyards | 299.5 | 1.24 | 1.40 | 1.55 |
| Hay | 198.4 | 0.07 | 0.17 | 0.26 |
| Unspecified Row Crop | 189.0 | 0.14 | 0.18 | 0.22 |
| Peanuts | 153.8 | 0.06 | 0.08 | 0.11 |
| Squash | 143.9 | 0.05 | 0.06 | 0.08 |
| Unspecified Tree Crop | 120.2 | 0.05 | 0.10 | 0.14 |
| Sorghum | 22.5 | 0.01 | 0.02 | 0.02 |
| Specialty Farms | 1.2 | 0.00 | 0.00 | 0.00 |

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Seminole** | | | | |
| Pasture | 1545.2 | 3.87 | 4.71 | 5.41 |
| Field Nursery | 691.1 | 1.18 | 1.50 | 1.83 |
| Citrus | 372.2 | 0.21 | 0.35 | 0.47 |
| Container Nursery | 260.7 | 0.68 | 0.79 | 0.92 |
| Sod | 255.7 | 0.34 | 0.50 | 0.61 |
| Unspecified Nurseries and Vin | 21.0 | 0.03 | 0.04 | 0.04 |
| Ornamentals | 1.2 | 0.00 | 0.00 | 0.00 |
| **St_Johns** | | | | |
| Potatoes | 11163.7 | 2.85 | 5.08 | 6.72 |
| Sod | 3509.8 | 6.53 | 8.46 | 10.32 |
| Sorghum | 1656.5 | 1.78 | 2.47 | 3.21 |
| Pasture | 1462.5 | 2.67 | 3.46 | 4.20 |
| Cabbage | 1360.5 | 0.94 | 1.19 | 1.46 |
| Greens | 745.2 | 0.37 | 0.50 | 0.64 |
| PotatoesCabbage | 359.9 | 0.28 | 0.35 | 0.42 |
| Misc. Vegetables | 243.5 | 0.21 | 0.25 | 0.30 |
| Field Nursery | 171.7 | 0.22 | 0.31 | 0.38 |
| Broccoli | 165.1 | 0.10 | 0.13 | 0.16 |
| Field Corn | 151.4 | 0.14 | 0.21 | 0.27 |
| Hay | 115.6 | 0.16 | 0.22 | 0.28 |
| Container Nursery | 84.7 | 0.23 | 0.26 | 0.30 |
| Asparagus Fern | 79.7 | 0.15 | 0.21 | 0.25 |
| Radish | 46.5 | 0.01 | 0.02 | 0.02 |
| Unspecified Tree Crop | 32.6 | 0.06 | 0.08 | 0.10 |
| Ligustrum | 4.5 | 0.02 | 0.02 | 0.02 |
| Onions | 3.4 | 0.00 | 0.00 | 0.00 |
| DevelopedCabbage | 0.0 | 0.00 | 0.00 | 0.00 |
| **St_Lucie** | | | | |
| Citrus | 83020.0 | 40.71 | 67.82 | 98.13 |
| Sugar Cane | 3601.7 | 7.08 | 8.77 | 11.19 |
| Sweet Corn | 2886.0 | 1.46 | 2.06 | 2.62 |
| Unspecified Row Crop | 2272.4 | 1.24 | 1.75 | 2.11 |
| Pasture | 1343.1 | 2.78 | 3.42 | 4.29 |
| Sweet Potatoes | 1049.1 | 0.95 | 1.39 | 1.71 |
| Sod | 754.9 | 0.99 | 1.32 | 1.69 |
| Unspecified Tree Crop | 348.9 | 0.11 | 0.21 | 0.31 |
| Ornamentals | 142.4 | 0.58 | 0.66 | 0.75 |
| Container Nursery | 117.9 | 0.19 | 0.23 | 0.29 |
| Dry Beans | 15.8 | 0.01 | 0.01 | 0.02 |
| Specialty Farms | 9.0 | 0.01 | 0.01 | 0.01 |
| Unspecified Field Crop | 1.4 | 0.00 | 0.00 | 0.00 |

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Sumter** | | | | |
| Strawberries | 2902.5 | 1.37 | 1.87 | 2.49 |
| Hay | 537.6 | 0.27 | 0.53 | 0.68 |
| Watermelons | 295.0 | 0.14 | 0.22 | 0.28 |
| Sorghum | 255.3 | 0.14 | 0.21 | 0.27 |
| Nurseries and Vineyards | 245.7 | 1.03 | 1.19 | 1.30 |
| Peanuts | 245.7 | 0.12 | 0.18 | 0.23 |
| Unspecified Row Crop/Pastur | 154.1 | 0.21 | 0.28 | 0.33 |
| Sod | 116.6 | 0.23 | 0.29 | 0.35 |
| Cantaloupe | 56.5 | 0.01 | 0.02 | 0.03 |
| Blueberries | 43.0 | 0.10 | 0.12 | 0.14 |
| Citrus | 42.1 | 0.04 | 0.05 | 0.07 |
| Unspecified Row Crop | 1.8 | 0.00 | 0.00 | 0.00 |
| **Suwannee** | | | | |
| Winter Wheat | 4493.9 | 0.00 | 0.06 | 0.08 |
| Rye | 3530.2 | 0.07 | 0.18 | 0.27 |
| Peas | 1826.5 | 1.48 | 1.98 | 2.47 |
| Hay | 1760.2 | 0.88 | 1.68 | 2.39 |
| Soybeans | 1594.3 | 0.68 | 1.04 | 1.30 |
| Sorghum | 1355.6 | 0.88 | 1.27 | 1.62 |
| Sod | 1123.7 | 1.95 | 2.59 | 3.14 |
| Sweet Potatoes | 836.6 | 0.85 | 1.05 | 1.32 |
| Peanuts | 720.2 | 0.39 | 0.54 | 0.68 |
| Potatoes | 473.8 | 0.20 | 0.27 | 0.36 |
| Corn | 178.1 | 0.10 | 0.13 | 0.15 |
| Millet | 144.3 | 0.11 | 0.16 | 0.20 |
| Tomatoes | 110.7 | 0.07 | 0.08 | 0.09 |
| Pecans | 109.7 | 0.06 | 0.11 | 0.14 |
| Oats | 20.7 | 0.00 | 0.00 | 0.00 |
| OatsCorn | 3.4 | 0.00 | 0.00 | 0.00 |
| Cantaloupe | 3.1 | 0.00 | 0.00 | 0.00 |
| SoybeansOats | 1.7 | 0.00 | 0.00 | 0.00 |
| Pasture | 0.7 | 0.00 | 0.00 | 0.00 |

**Table B-13 Breakdown of 2010 Irrigated Water Use by County and Crop**

| **County** / Crop | 2010 Irrigated Areas | | | |
|---|---|---|---|---|
| | Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| **Union** | | | | |
| Hay | 548.4 | 0.28 | 0.49 | 0.69 |
| Sod | 363.7 | 0.58 | 0.79 | 1.00 |
| Sorghum | 264.2 | 0.11 | 0.18 | 0.26 |
| Rye | 229.2 | 0.00 | 0.01 | 0.02 |
| Peas | 62.4 | 0.05 | 0.07 | 0.08 |
| Peanuts | 45.4 | 0.02 | 0.03 | 0.04 |
| Winter Wheat | 32.7 | 0.00 | 0.00 | 0.00 |
| Tomatoes | 24.9 | 0.01 | 0.02 | 0.02 |
| Corn | 23.8 | 0.01 | 0.02 | 0.02 |
| Millet | 14.3 | 0.01 | 0.01 | 0.02 |
| Soybeans | 9.8 | 0.00 | 0.00 | 0.01 |
| **Volusia** | | | | |
| Leatherleaf | 3036.0 | 6.60 | 8.24 | 10.30 |
| Sod | 1727.3 | 2.77 | 3.67 | 4.68 |
| Asparagus Fern | 1268.9 | 2.74 | 3.43 | 4.28 |
| Pittosporum | 869.8 | 3.40 | 3.84 | 4.41 |
| Citrus | 796.8 | 0.56 | 0.81 | 1.12 |
| Field Nursery | 662.9 | 1.07 | 1.33 | 1.63 |
| Pasture | 443.4 | 0.72 | 0.96 | 1.21 |
| Aspidistra | 361.1 | 1.39 | 1.58 | 1.81 |
| Container Nursery | 235.2 | 0.60 | 0.70 | 0.81 |
| Liriope | 31.2 | 0.12 | 0.13 | 0.15 |
| Shade Ferns | 28.6 | 0.06 | 0.07 | 0.09 |
| Hammock Ferns | 17.9 | 0.04 | 0.05 | 0.06 |
| Unspecified Nurseries and Vin | 8.3 | 0.01 | 0.02 | 0.02 |
| Ligustrum | 4.3 | 0.02 | 0.02 | 0.02 |
| Cucurbits | 3.3 | 0.00 | 0.00 | 0.00 |
| Coontie Fern | 2.4 | 0.01 | 0.01 | 0.01 |
| Grapes | 2.2 | 0.00 | 0.00 | 0.00 |
| Blueberries | 1.7 | 0.00 | 0.00 | 0.00 |
| Hay | 0.0 | 0.00 | 0.00 | 0.00 |

[1]Wct year calculated as the average of the 20$^{th}$ percentile irrigation requirements of each polygon based on the 21-year simulation period. Dry year was calculated similarly for the 80$^{th}$ percentile irrigation requirement.

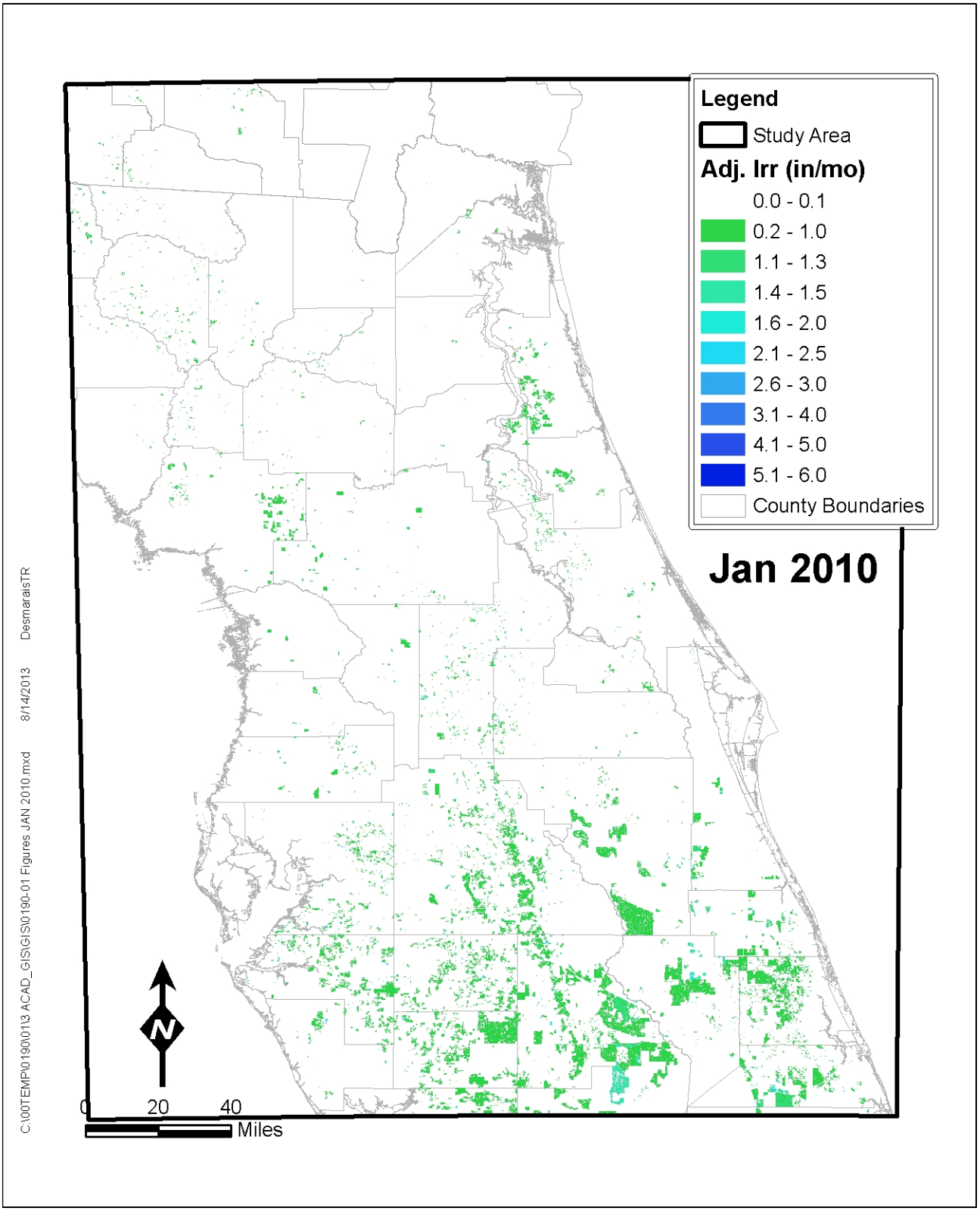


**Figure B-1 Adjusted Applied Irrigation**
**Average January – 2010 ILG**

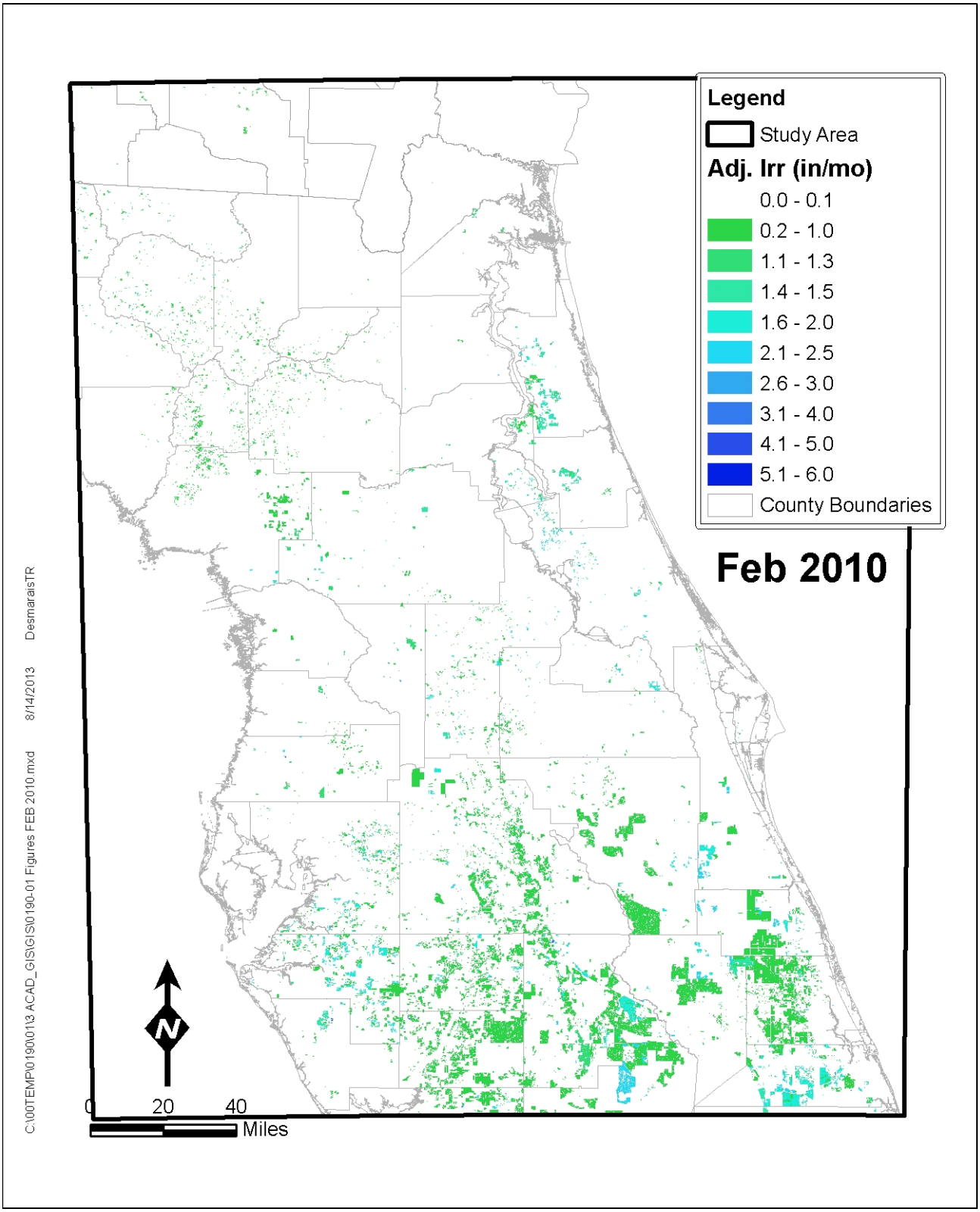


**Figure B-2 Adjusted Applied Irrigation**
**Average February – 2010 ILG**

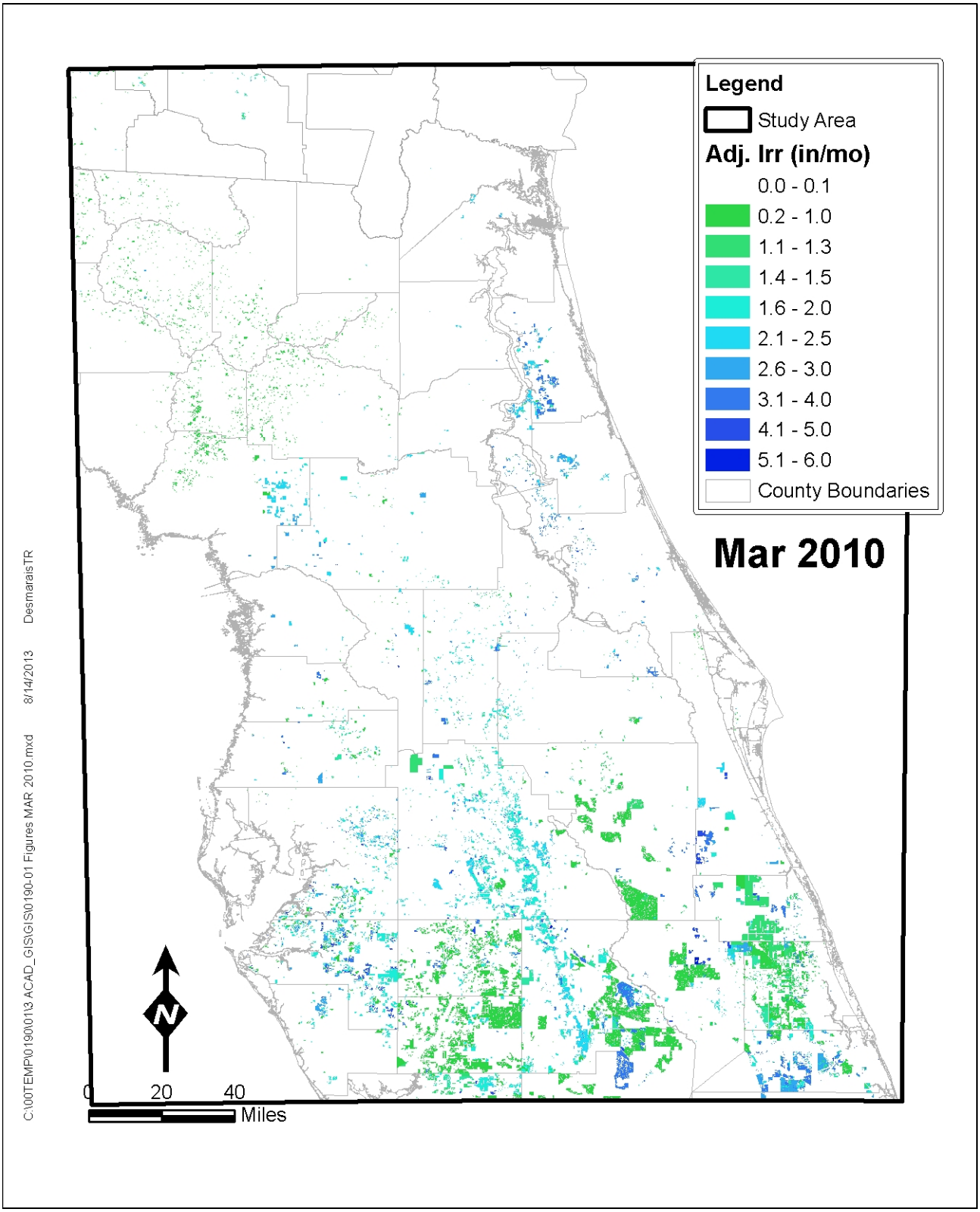


**Figure B-3 Adjusted Applied Irrigation Average March – 2010 ILG**

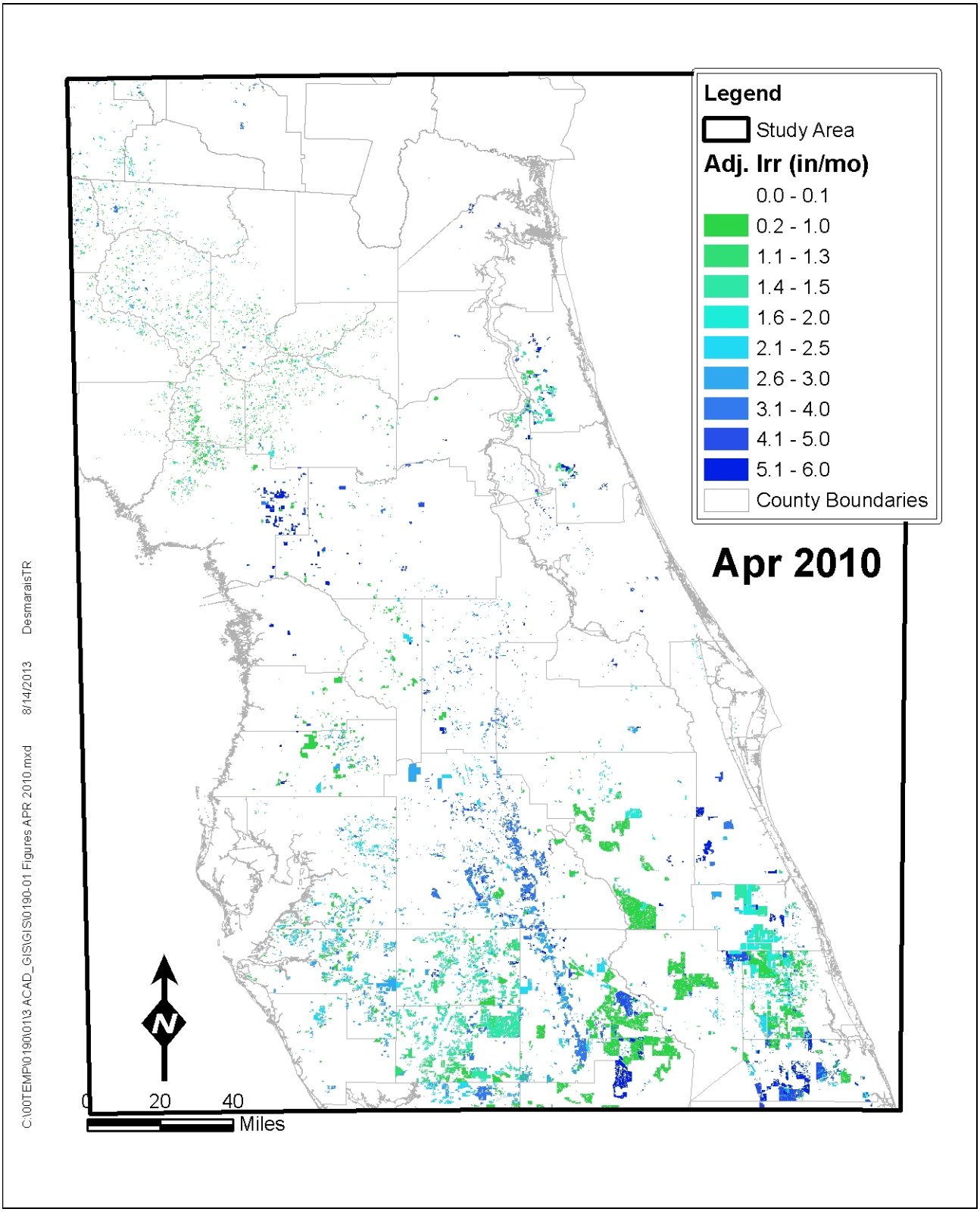


**Figure B-4 Adjusted Applied Irrigation**
**Average April – 2010 ILG**

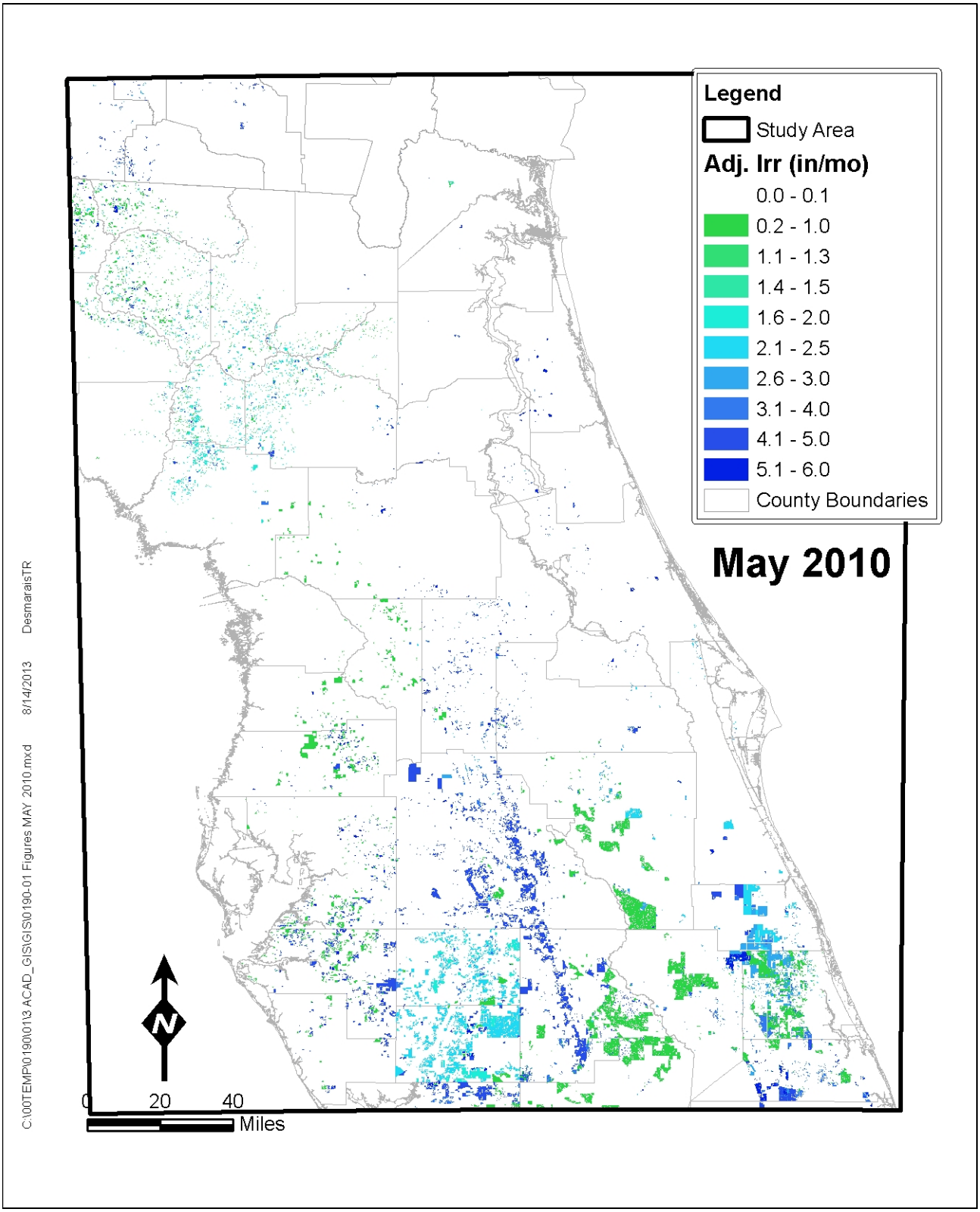


**Figure B-51 Adjusted Applied Irrigation Average May – 2010 ILG**

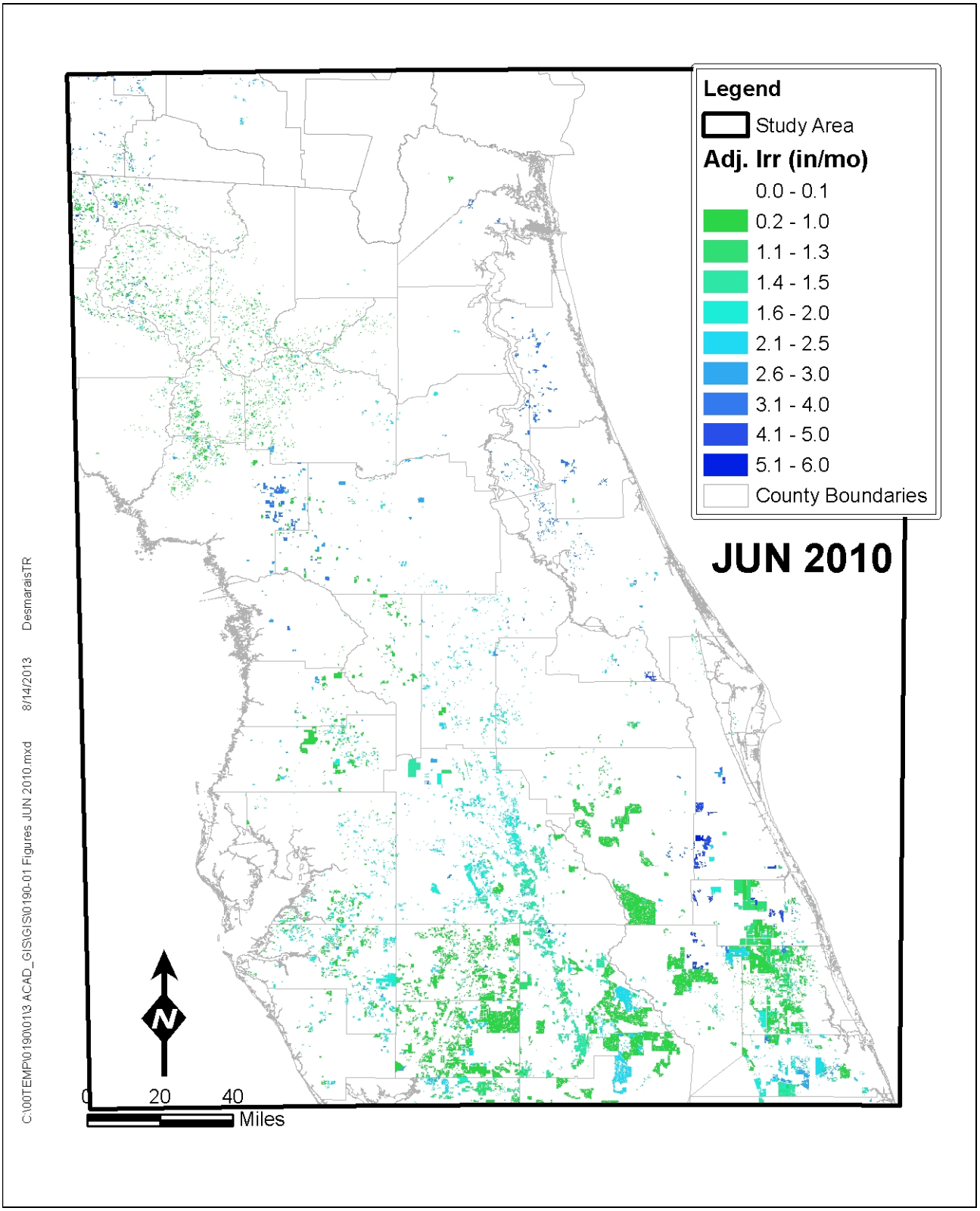


**Figure B-6 Adjusted Applied Irrigation**
**Average June – 2010 ILG**

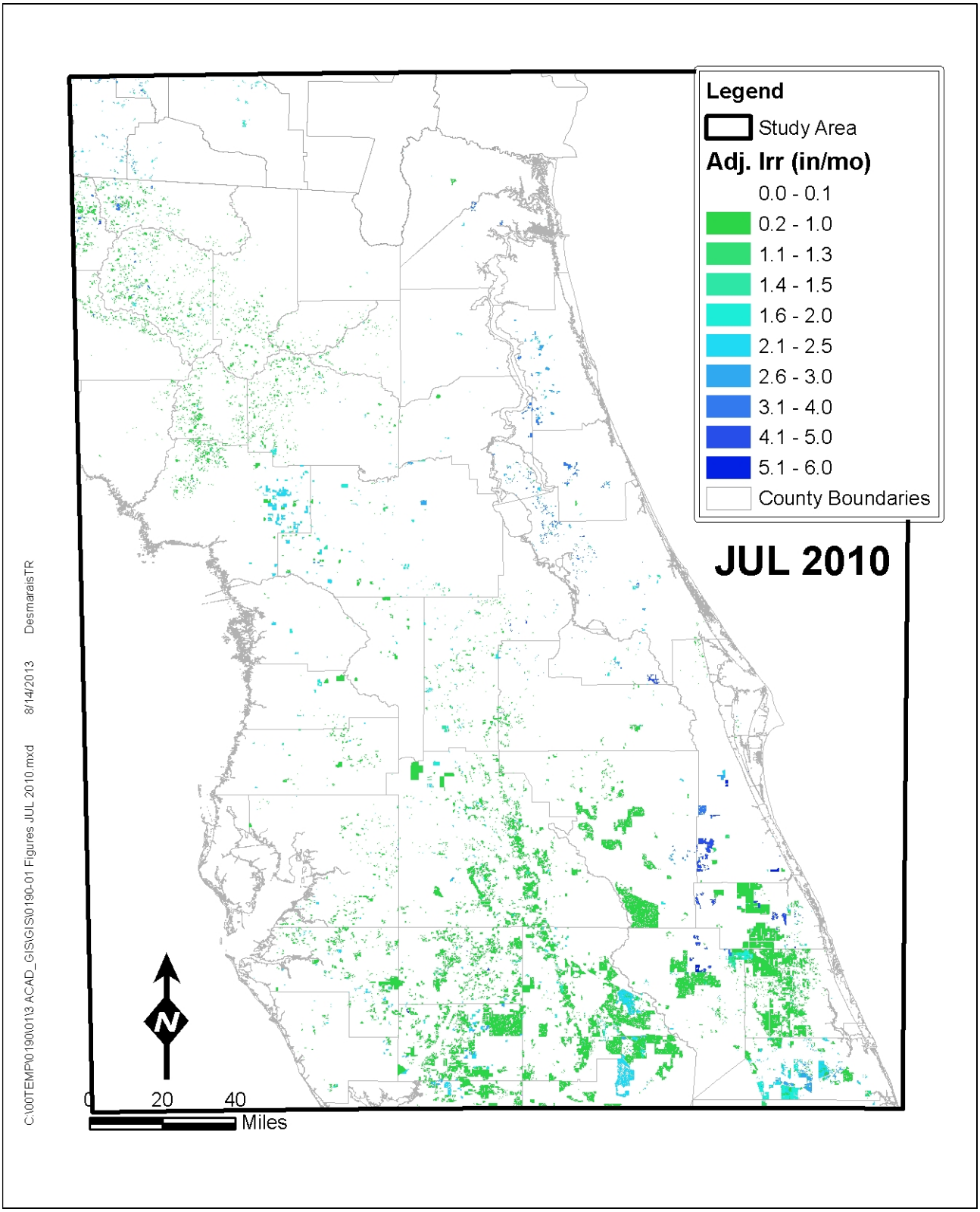


**Figure B-7 Adjusted Applied Irrigation**
**Average July – 2010 ILG**

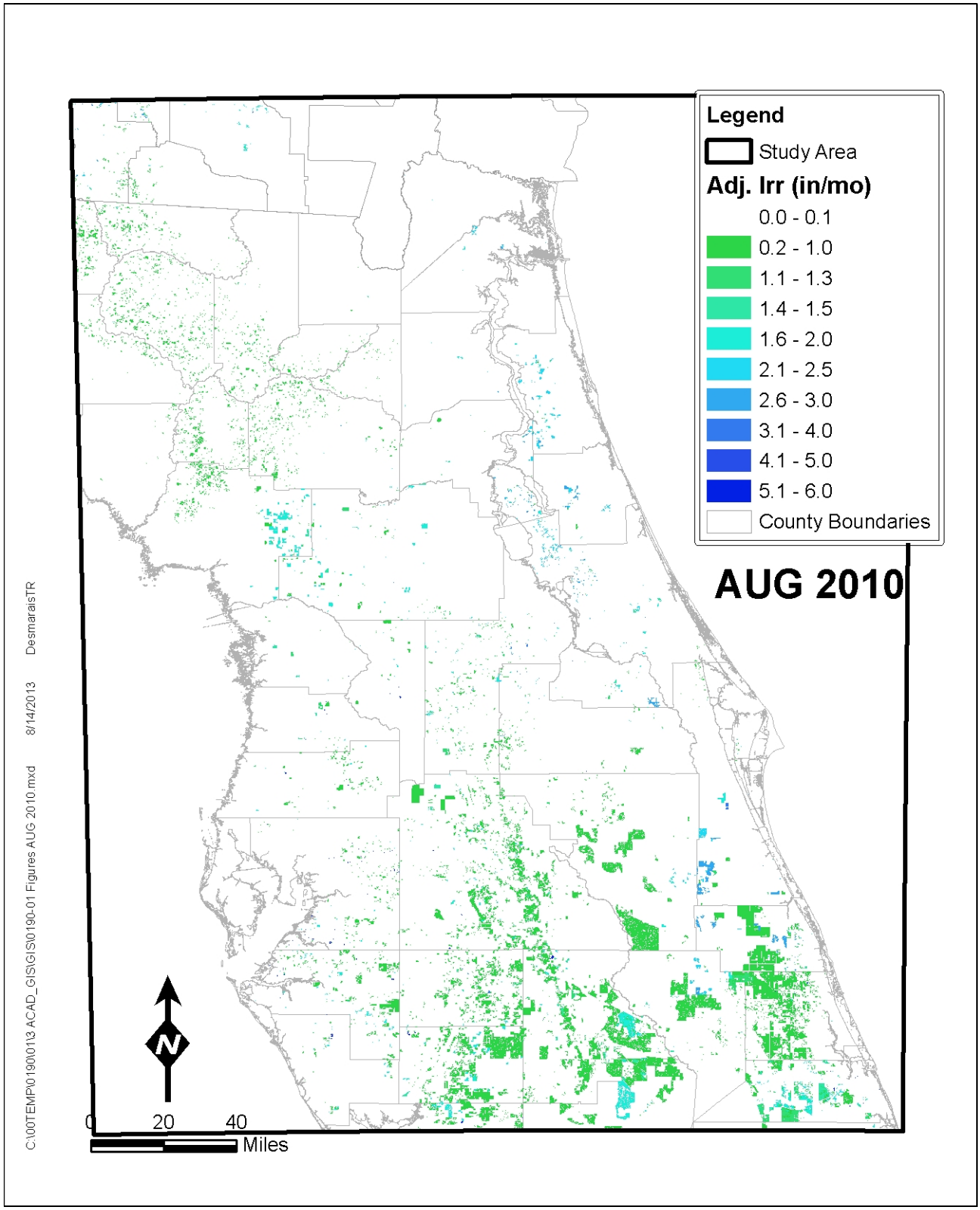


**Figure B-8 Adjusted Applied Irrigation**
**Average August – 2010 ILG**

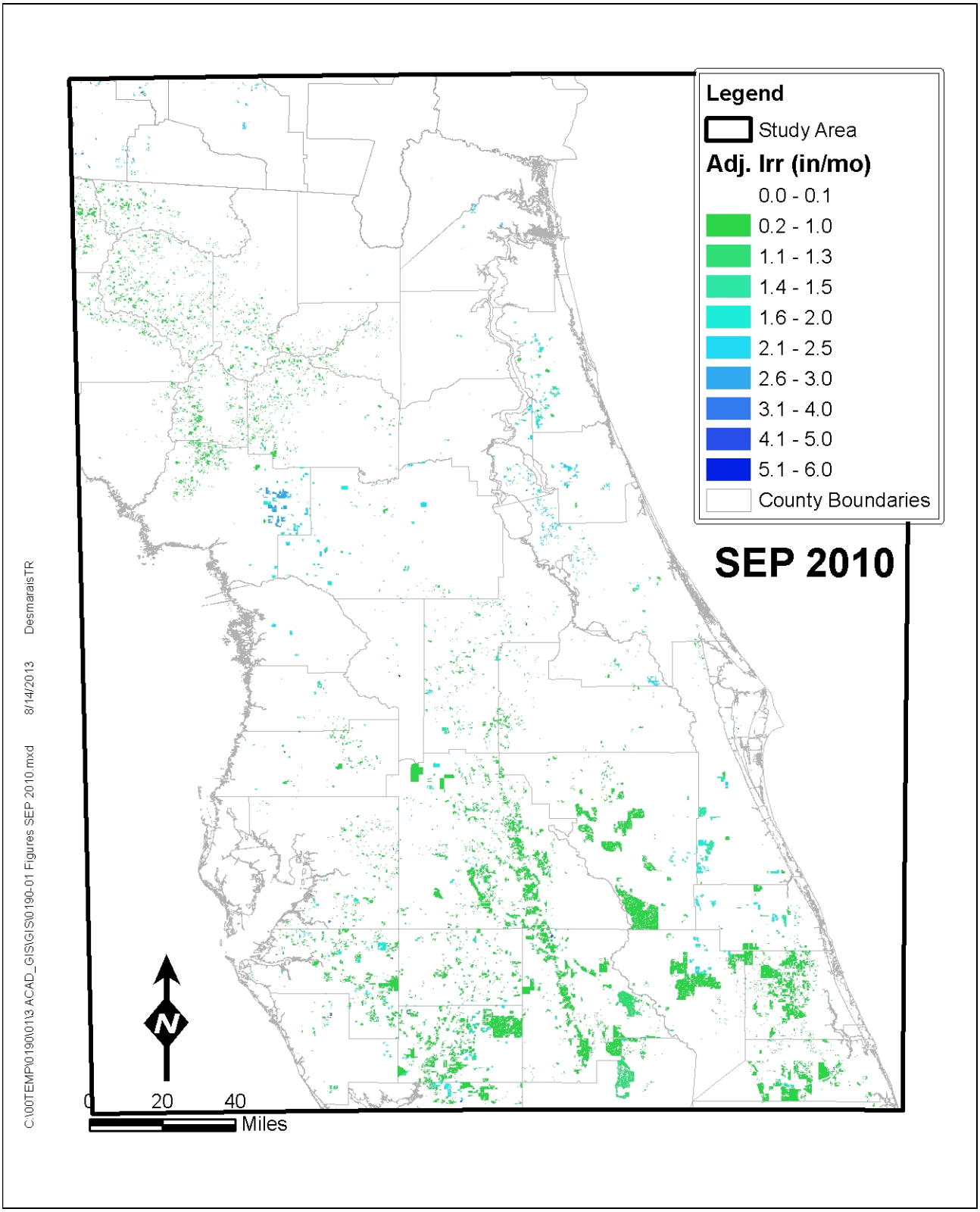


**Figure B-9 Adjusted Applied Irrigation**
**Average September – 2010 ILG**

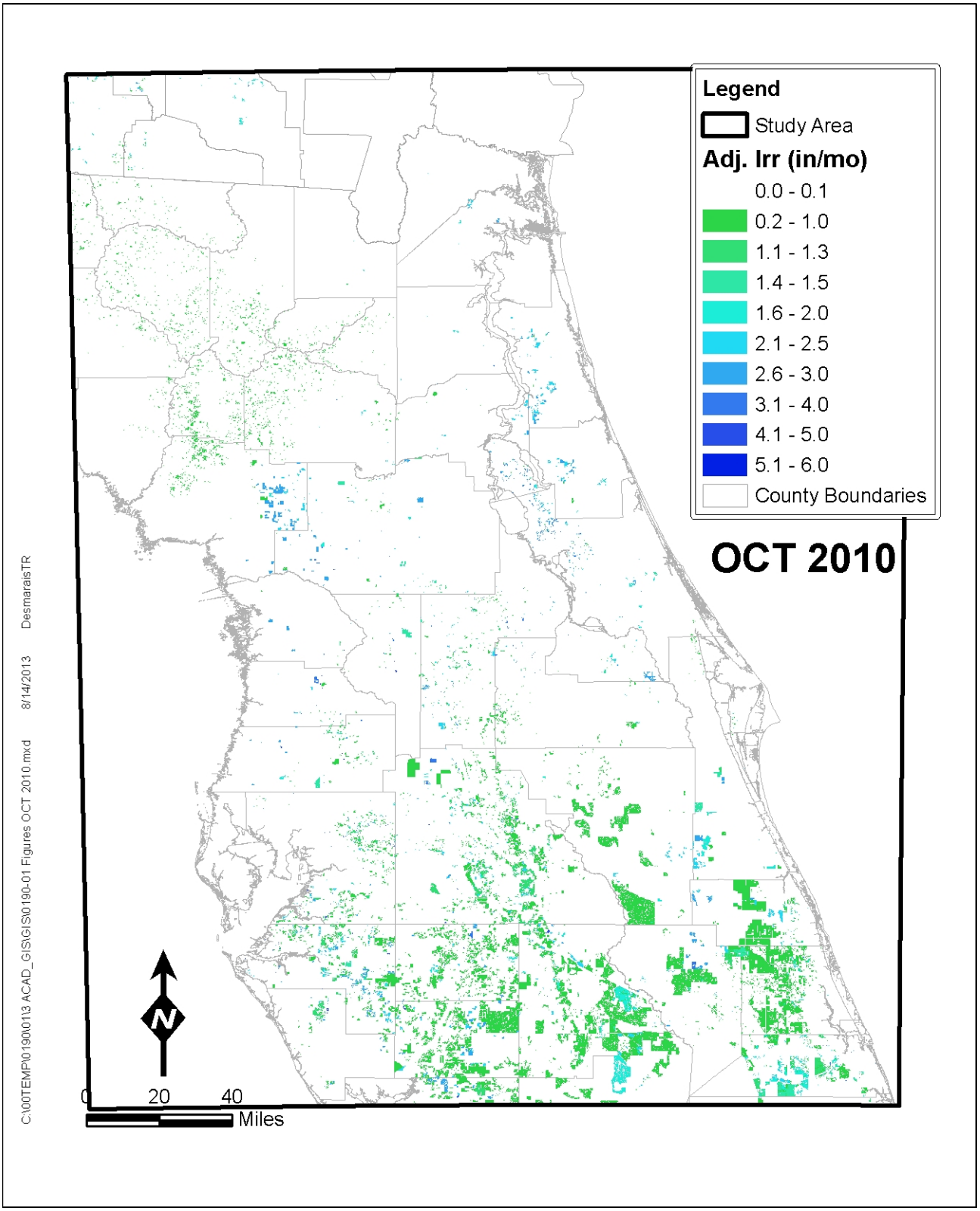


**Figure B-10 Adjusted Applied Irrigation**
**Average October– 2010 ILG**

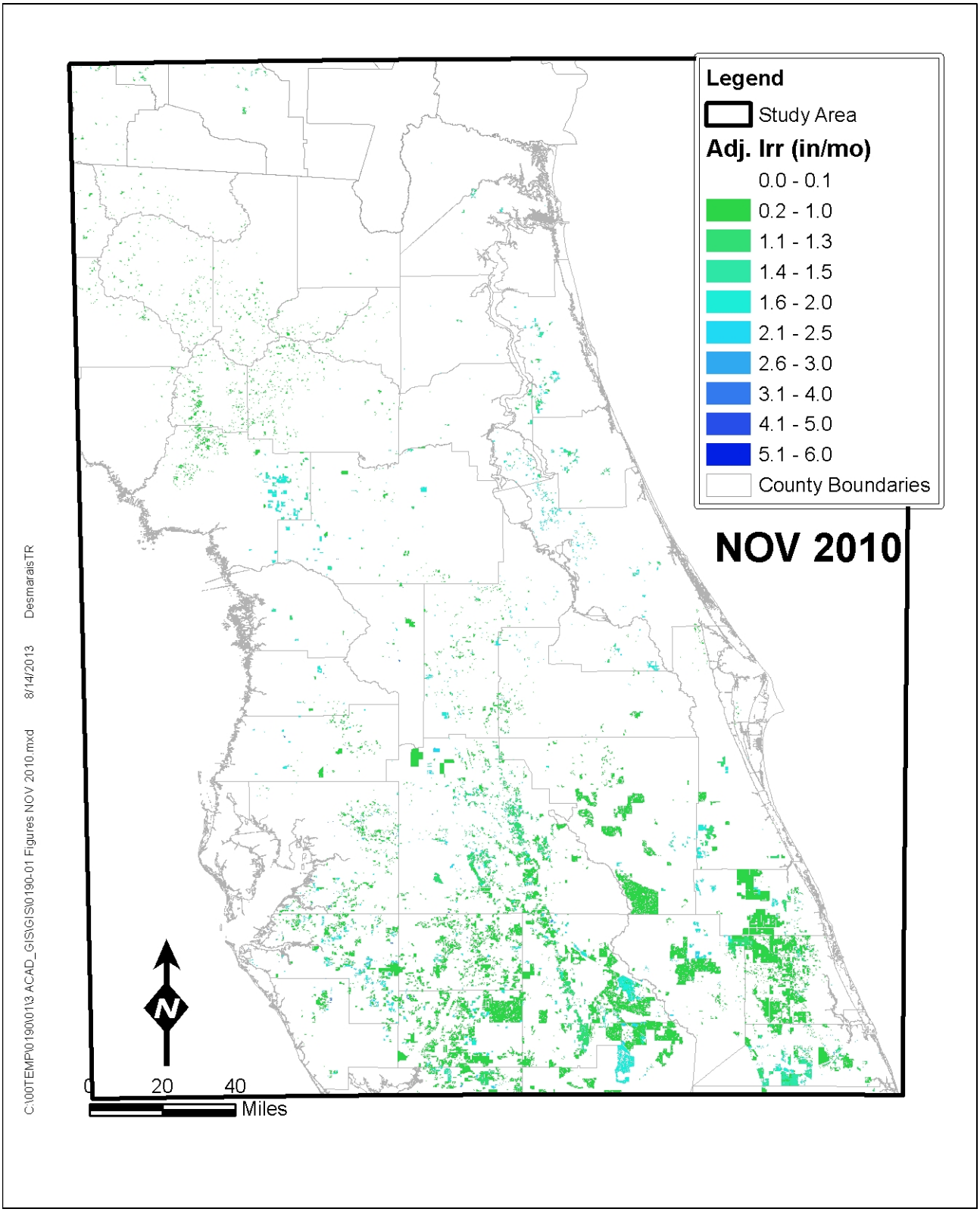


**Figure B-11 Adjusted Applied Irrigation**
**Average November – 2010 ILG**

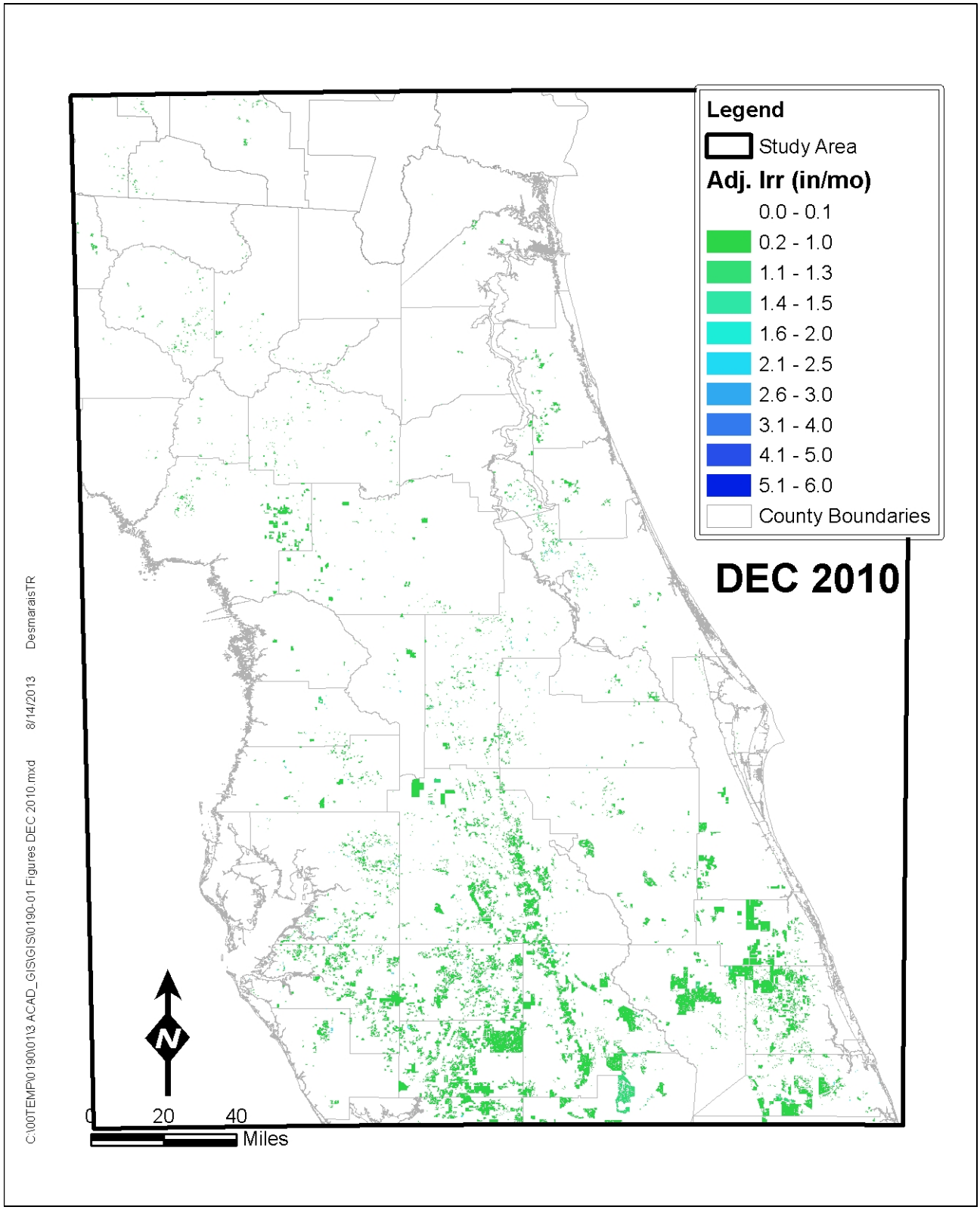


**Figure B-12 Adjusted Applied Irrigation**
**Average December – 2010 ILG**

# Appendix C CFACT Input Assumptions

**Table C-1 Irrigation System Applicability by General Category**

| Irrigation Applicability Categories | Irrigation System | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Long Term Subsurface Drip ( > 6" Deep) | Long Term Surface Drip | Short Term Surface Drip (Tape) | Micro Spray | Nursery Container Drip or Spray | Fixed Under Foliage Sprinkler | Fixed Overhead Sprinkler | Center Pivot | Linear Move & Traveling Boom | Wheel Roll | Traveling Gun | Stationary Gun | Pipeline Furrow | Seepage (Ditches) | Flooding |
| **Perennials** | | | | | | | | | | | | | | | |
| Citrus | Unlikely | Yes | No | Yes | No | Yes | Yes | No | No | No | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely |
| Large Tree Fruit and Nut | Yes | Yes | No | Yes | No | Yes | No | No | No | No | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely |
| Medium & Small Fruit & Nut Trees | Yes | Yes | No | Yes | No | Yes | Yes | No | No | No | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely |
| Fruit & Nut Bushes | Yes | Yes | No | Yes | No | Yes | Yes | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely |
| B&B Landscape Trees | No | Yes | No | Yes | No | Yes | Unlikely | No | No | No | No | No | No | Unlikely | Unlikely |
| Vineyard Crops (Trellised) | No | Yes | Unlikely | Yes | No | No | Yes | No | No | No | No | No | No | No | No |
| **Annuals** | | | | | | | | | | | | | | | |
| Annual Fruit & Nut | No | No | Yes | Yes | No | Yes | Yes | Yes | Yes | No | Yes | Unlikely | Yes | Unlikely | No |
| Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Row Crops - High Value | Yes | Yes | Yes | Yes | No | No | Yes | Yes | Yes | Yes | Unlikely | Unlikely | Yes | Unlikely | No |
| Row Crops - Leafy Greens & Spices | Unlikely | No | Yes | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Row Crops - Melons | Unlikely | No | Yes | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Row Crops - Delicate | Yes | No | Yes | No | No | No | Yes | Yes | Yes | Yes | No | No | Yes | Unlikely | No |
| Aquatic or Flooded Crops | No | No | No | No | No | No | No | No | No | No | No | No | No | Unlikely | Yes |
| Cane Crops | Yes | No | No | No | No | No | No | Yes | Yes | No | Yes | No | Unlikely | Yes | No |
| Root Crops | Unlikely | No | No | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Pasture and Forage | No | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No |
| Sod | No | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | No | Yes | No |
| Container Plants | No | No | No | No | Yes | Yes | Yes | No | No | No | No | No | No | No | No |
| Greenhouse & Shadehouse | No | No | No | Yes | Yes | No | Yes | No | No | No | No | No | No | No | No |
| Mushrooms | No | No | Yes | Yes | No | No | Yes | No | No | No | No | No | No | No | No |

**Table C-2 Irrigation System Applicability by Crop**

| Assumptions | Irrigation Applicability Category | Long Term Subsurface Drip (> 6" Deep) | Long Term Surface Drip | Short Term Surface Drip Tape | Micro Spray | Nursery Container Drip/Spray | Fixed Under Foliage Sprinkler | Fixed Overhead Sprinkler | Center Pivot | Linear Move | Wheel Roll & Traveling Boom | Traveling Gun | Stationary gun | Pipeline Furrow | Seepage (Ditches) | Flooding |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Citrus | Citrus | Unlikely | Yes | No | Yes | No | Yes | Yes | No | No | No | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely |
| Avocados | Large Tree Fruit and Nut | Yes | Yes | No | Yes | No | Yes | No | No | No | No | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely |
| Mangos | Large Tree Fruit and Nut | Yes | Yes | No | Yes | No | Yes | No | No | No | No | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely |
| Mushrooms | Mushrooms | No | No | Yes | Yes | No | No | Yes | No | No | No | No | No | No | No | No |
| Olive | Medium & Small Fruit & Nut | Yes | Yes | No | Yes | No | Yes | Yes | No | No | No | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely |
| Papayas | Annual Fruit & Nut | No | No | Yes | Yes | No | Yes | Yes | Yes | Yes | No | Yes | Unlikely | Yes | Unlikely | No |
| Peaches | Medium & Small Fruit & Nut | Yes | Yes | No | Yes | No | Yes | Yes | No | No | No | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely |
| Pecans | Large Tree Fruit and Nut | Yes | Yes | No | Yes | No | Yes | No | No | No | No | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely |
| Plums | Medium & Small Fruit & Nut | Yes | Yes | No | Yes | No | Yes | Yes | No | No | No | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely |
| Alfalfa | Pasture and Forage | No | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No |
| Beans | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Beans, Green | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Beans, Dry | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Beets | Row Crops - Leafy Greens & | Unlikely | No | Yes | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Blueberries | Fruit & Nut Bushes | Yes | Yes | No | Yes | No | Yes | Yes | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely |
| Broccoli | Row Crops - Leafy Greens & | Unlikely | No | Yes | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Brussel Sprouts | Row Crops - Leafy Greens & | Unlikely | No | Yes | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Cabbage | Row Crops - Leafy Greens & | Unlikely | No | Yes | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Cantaloupe | Row Crops - Melons | Unlikely | No | Yes | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Carrots | Root Crops | Unlikely | No | No | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Cauliflower | Row Crops - Leafy Greens & | Unlikely | No | Yes | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Celery | Row Crops - Leafy Greens & | Unlikely | No | Yes | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Chinese Vegetables | Row Crops - Leafy Greens & | Unlikely | No | Yes | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Cucumbers | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Eggplant | Row Crops - Delicate | Yes | No | Yes | No | No | No | Yes | Yes | Yes | Yes | No | No | Yes | Unlikely | No |
| Escarole | Row Crops - Delicate | Yes | No | Yes | No | No | No | Yes | Yes | Yes | Yes | No | No | Yes | Unlikely | No |
| Grapes | Vineyard Crops (Trellised) | No | Yes | Unlikely | Yes | No | No | Yes | No | No | No | No | No | No | No | No |
| Greens, Herbs | Row Crops - High Value | Yes | Yes | Yes | Yes | No | No | Yes | Yes | Yes | Yes | Unlikely | Unlikely | Yes | Unlikely | No |
| Peppers | Row Crops - Delicate | Yes | No | Yes | No | No | No | Yes | Yes | Yes | Yes | No | No | Yes | Unlikely | No |
| Peppers, Green | Row Crops - Delicate | Yes | No | Yes | No | No | No | Yes | Yes | Yes | Yes | No | No | Yes | Unlikely | No |
| Lettuce | Row Crops - Delicate | Yes | No | Yes | No | No | No | Yes | Yes | Yes | Yes | No | No | Yes | Unlikely | No |
| Melons | Row Crops - Melons | Unlikely | No | Yes | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Peas | Row Crops - Delicate | Yes | No | Yes | No | No | No | Yes | Yes | Yes | Yes | No | No | Yes | Unlikely | No |
| Potatoes | Root Crops | Unlikely | No | No | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Radish | Root Crops | Unlikely | No | No | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Small Vegetables | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Spinach | Row Crops - Delicate | Yes | No | Yes | No | No | No | Yes | Yes | Yes | Yes | No | No | Yes | Unlikely | No |
| Squash | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Sweet Corn | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Sweet Potato | Root Crops | Unlikely | No | No | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Tomatoes | Row Crops - Delicate | Yes | No | Yes | No | No | No | Yes | Yes | Yes | Yes | No | No | Yes | Unlikely | No |
| Watercress | Aquatic or Flooded Crops | No | No | No | No | No | No | No | No | No | No | No | No | No | Unlikely | Yes |
| Watermelons | Row Crops - Melons | Unlikely | No | Yes | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Barley | Pasture and Forage | No | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No |
| Clover | Pasture and Forage | No | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No |
| Corn Grain | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Cotton | Row Crops - High Value | Yes | Yes | Yes | Yes | No | No | Yes | Yes | Yes | Yes | Unlikely | Unlikely | Yes | Unlikely | No |
| Grain | Pasture and Forage | No | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No |
| Grains, Small | Pasture and Forage | No | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No |
| Hay | Pasture and Forage | No | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No |
| Millet | Pasture and Forage | No | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No |
| Millet, Forge | Pasture and Forage | No | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No |
| Millet, Grain | Pasture and Forage | No | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No |
| Oats | Pasture and Forage | No | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No |
| Onions | Row Crops - High Value | Yes | Yes | Yes | Yes | No | No | Yes | Yes | Yes | Yes | Unlikely | Unlikely | Yes | Unlikely | No |
| Onions, Dry | Row Crops - High Value | Yes | Yes | Yes | Yes | No | No | Yes | Yes | Yes | Yes | Unlikely | Unlikely | Yes | Unlikely | No |
| Onions, Green | Row Crops - High Value | Yes | Yes | Yes | Yes | No | No | Yes | Yes | Yes | Yes | Unlikely | Unlikely | Yes | Unlikely | No |
| Peanuts | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Rice - Dry Land | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Rice - Flooded | Aquatic or Flooded Crops | No | No | No | No | No | No | No | No | No | No | No | No | No | Unlikely | Yes |
| Sorghum | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Soybean | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Sugarcane | Cane Crops | Yes | No | No | No | No | No | No | Yes | Yes | No | Yes | No | Unlikely | Yes | No |
| Sunflower | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Tobacco | Row Crops - High Value | Yes | Yes | Yes | Yes | No | No | Yes | Yes | Yes | Yes | Unlikely | Unlikely | Yes | Unlikely | No |

**Table C-2 Irrigation System Applicability by Crop**

| Assumptions | Irrigation Applicability Category | Long Term Subsurface Drip (> 6" Deep) | Long Term Surface Drip | Short Term Surface Drip Tape | Micro Spray | Nursery Container Drip/Spray | Fixed Under Foliage Sprinkler | Fixed Overhead Sprinkler | Center Pivot | Linear Move | Wheel Roll & Traveling Boom | Traveling Gun | Stationary gun | Pipeline Furrow | Seepage (Ditches) | Flooding |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Wheat | Pasture and Forage | No | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No |
| Floriculture | Container Plants | No | No | No | No | Yes | Yes | Yes | No | No | No | No | No | No | No | No |
| Fern | Greenhouse & Shadehouse | No | No | No | Yes | Yes | No | Yes | No | No | No | No | No | No | No | No |
| Field ornamentals | B&B Landscape Trees | No | Yes | No | Yes | No | Yes | Unlikely | No | No | No | No | No | No | Unlikely | Unlikely |
| Container ornamentals | Container Plants | No | No | No | No | Yes | Yes | Yes | No | No | No | No | No | No | No | No |
| Grass | Sod | No | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | No | Yes | No |
| Okra | Row Crops - High Value | Yes | Yes | Yes | Yes | No | No | Yes | Yes | Yes | Yes | Unlikely | Unlikely | Yes | Unlikely | No |
| Strawberries | Row Crops - Delicate | Yes | No | Yes | No | No | No | Yes | Yes | Yes | Yes | No | No | Yes | Unlikely | No |
| Asparagus Fern | Greenhouse & Shadehouse | No | No | No | Yes | Yes | No | Yes | No | No | No | No | No | No | No | No |
| Aspidistra | Greenhouse & Shadehouse | No | No | No | Yes | Yes | No | Yes | No | No | No | No | No | No | No | No |
| Chestnuts | Medium & Small Fruit & Nut | Yes | Yes | No | Yes | No | Yes | Yes | No | No | No | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely |
| Collard Greens | Row Crops - Leafy Greens & | Unlikely | No | Yes | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Container Nursery | B&B Landscape Trees | No | Yes | No | Yes | No | Yes | Unlikely | No | No | No | No | No | No | Unlikely | Unlikely |
| Coontie Fern | Greenhouse & Shadehouse | No | No | No | Yes | Yes | No | Yes | No | No | No | No | No | No | No | No |
| Cotton | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Cucurbits | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Field Corn | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Field Nursery | Greenhouse & Shadehouse | No | No | No | Yes | Yes | No | Yes | No | No | No | No | No | No | No | No |
| Greenhouse Nursery | Greenhouse & Shadehouse | No | No | No | Yes | Yes | No | Yes | No | No | No | No | No | No | No | No |
| Greens | Row Crops - Leafy Greens & | Unlikely | No | Yes | No | No | No | Unlikely | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Hammock Ferns | Greenhouse & Shadehouse | No | No | No | Yes | Yes | No | Yes | No | No | No | No | No | No | No | No |
| Hay | Pasture and Forage | No | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No |
| Leatherleaf | Greenhouse & Shadehouse | No | No | No | Yes | Yes | No | Yes | No | No | No | No | No | No | No | No |
| Ligustrum | Greenhouse & Shadehouse | No | No | No | Yes | Yes | No | Yes | No | No | No | No | No | No | No | No |
| Liriope | Greenhouse & Shadehouse | No | No | No | Yes | Yes | No | Yes | No | No | No | No | No | No | No | No |
| Misc. Vegetables | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Ornamentals | Container Plants | No | No | No | No | Yes | Yes | Yes | No | No | No | No | No | No | No | No |
| Pasture | Pasture and Forage | No | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No |
| Persimmons | Medium & Small Fruit & Nut | Yes | Yes | No | Yes | No | Yes | Yes | No | No | No | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely |
| Pittosporum | Greenhouse & Shadehouse | No | No | No | Yes | Yes | No | Yes | No | No | No | No | No | No | No | No |
| Shade Ferns | Medium & Small Fruit & Nut | Yes | Yes | No | Yes | No | Yes | Yes | No | No | No | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely |
| Sod | Sod | No | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | No | Yes | No |
| Sorghum | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Sugar Cane | Cane Crops | Yes | No | No | No | No | No | No | Yes | Yes | No | Yes | No | Unlikely | Yes | No |
| Tree Fern | Greenhouse & Shadehouse | No | No | No | Yes | Yes | No | Yes | No | No | No | No | No | No | No | No |
| Unspecified Field Crop | Pasture and Forage | No | No | No | No | No | No | No | Yes | Yes | No | Yes | Yes | No | Yes | No |
| Unspecified Nurseries and Vineyards | Vineyard Crops (Trellised) | No | Yes | Unlikely | Yes | No | No | Yes | No | No | No | No | No | No | No | No |
| Unspecified Row Crop | Row Crops - Standard | No | No | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Unlikely | Yes | Yes | No |
| Unspecified Tree Crop | Medium & Small Fruit & Nut | Yes | Yes | No | Yes | No | Yes | Yes | No | No | No | Unlikely | Unlikely | Unlikely | Unlikely | Unlikely |

**Table C-3 Irrigation System Efficiency and Cost Assumptions**

## Subsurface Drip

| Source Index | Range | Comment |
|---|---|---|
| 19, table 1 | 70-90, average 85 | application efficiency (Ea) 70-90%, ave 85% |
| 25, table 1 | 70-90, average 85 | attainable efficiency |
| 37, Section 12.5.2 | 90 | System efficiency factor used in permitting |
| 7, Table 4-1 | 80 | potetial application efficiecy (citrus) |
| 25, | new systems 88 to 94, old 70 to 85 | new systems 88 to 94, old 0.7 to 0.85 |

**FIRM analysis assumpions**

| **New/Potential Application Efficiency:** | **90%** | Meters (Md) | Irrigation Scheduling (S) | Irrigation Operator (I) | Maintenance (M) | Water Availability (W) | Sol Condition | Farm Conveyance (F) | % Root Zone Wetted (A) | Delivery (D) |
|---|---|---|---|---|---|---|---|---|---|---|
| proactive efficiency | 88% | each field | Mon.&Sch | full-time, trained | excellent | Unrestricted (1.00) | 1 | 1 | 1 | 10% variance |
| reactive efficiency | 72% | farm delivery | Mon. only | full-time untrain | good | Unrestricted (1.00) | 1 | 1 | 1 | 15% variance |
| deferred efficiency | 63% | farm delivery | none | part-time untrain | fair | Unrestricted (1.00) | 1 | 1 | 1 | 20% variance |

**Associated Management Costs w/FIRM Assumptions (annual $/acre)**

| | **Total** | Meters (Md) | Irrigation Scheduling (S) | Irrigation Operator (I) | Maintenance (M) | Water Availability (W) | Sol Condition | Farm Conveyance (F) | % Root Zone Wetted (A) | Delivery (D) |
|---|---|---|---|---|---|---|---|---|---|---|
| proactive cost | **$ 187.00** | $ 13.00 | $ 20.00 | $ 120.00 | $ 34.00 | $ - | $ - | $ - | $ - | $ - |
| reactive cost | **$ 130.00** | $ 4.00 | $ 11.00 | $ 93.00 | $ 22.00 | $ - | $ - | $ - | $ - | $ - |
| deferred cost | **$ 96.00** | $ 4.00 | $ - | $ 74.40 | $ 17.60 | $ - | $ - | $ - | $ - | $ - |

Source(s): Base Cost (blue cells) - Source 7, Table 8C1. Exceptions are provided below:

Where data absent, deferred maintenance items were estimated at 80% of the reactive maintenance cost (relates to I & M)

## Surface Drip

| Source Index | Range | Comment |
|---|---|---|
| 19, table 1 | 70-90, average 85 | application efficiency (Ea) |
| 25, table 1 | 70-90, average 85 | attainable efficiency |
| 37, Section 12.5.2 | 90 | System efficiency factor used in permitting |
| 7, Table 4-1 | 80 | potetial application efficiecy (tomatoes) |
| 25, | new systems 88 to 94, old 70 to 85 | new systems 88 to 94, old 0.7 to 0.85 |
| 31 | 80-90% | |

**FIRM analysis assumpions**

| New/Potential Application Efficiency: | **90%** | Md | S | I | M | W | Sc | F | A | D |
|---|---|---|---|---|---|---|---|---|---|---|
| proactive efficiency | 88% | each field | Mon.&Sch | full-time, trained | excellent | Unrestricted (1.00) | 1 | 1 | 1 | 10% variance |
| reactive efficiency | 72% | farm delivery | scheduling | full-time untrain | good | Unrestricted (1.00) | 1 | 1 | 1 | 15% variance |
| deferred efficiency | 63% | farm delivery | none | part-time untrain | fair | Unrestricted (1.00) | 1 | 1 | 1 | 20% variance |

**Associated Management Costs w/FIRM Assumptions (annual $/acre)**

| | **Total** | Meters (Md) | Irrigation Scheduling (S) | Irrigation Operator (I) | Maintenance (M) | Water Availability (W) | Sol Condition | Farm Conveyance (F) | % Root Zone Wetted (A) | Delivery (D) |
|---|---|---|---|---|---|---|---|---|---|---|
| proactive cost | **$ 183.00** | $ 13.00 | $ 20.00 | $ 120.00 | $ 30.00 | $ - | $ - | $ - | $ - | $ - |
| reactive cost | **$ 120.00** | $ 4.00 | $ 11.00 | $ 93.00 | $ 12.00 | $ - | $ - | $ - | $ - | $ - |
| deferred cost | **$ 88.00** | $ 4.00 | $ - | $ 74.40 | $ 9.60 | $ - | $ - | $ - | $ - | $ - |

Source(s): Base Cost (blue cells) - Source 7, Table 8C2. Exceptions are provided below:

Where data absent, deferred maintenance items were estimated at 80% of the reactive maintenance cost (relates to I & M)

# Micro Spray

| Source Index | Range | Comment |
|---|---|---|
| 19, table 1 | 70-85, average 80 | application efficiency (Ea) |
| 25, table 1 | 70-85, average 80 | attainable efficiency |
| 37, Section 12.5.2 | 90 | System efficiency factor used in permitting |
| 7, Table 4-1 | 80 | potetial application efficiecy (citrus) |
| 25, | new systems 88 to 94, old 70 to 85 | new systems 88 to 94, old 0.7 to 0.85 |
| 35, Table FL6B-1 | 80 | spray for orchard crops |

**FIRM analysis assumpions**

| New/Potential Application Efficiency: | **85%** | Md | S | I | M | W | Sc | F | A | D |
|---|---|---|---|---|---|---|---|---|---|---|
| proactive efficiency | 83% | each field | Mon.&Sch | full-time, trained | excellent | Unrestricted (1.00) | 1 | 1 | 1 | 10% variance |
| reactive efficiency | 68% | farm delivery | scheduling | full-time untrain | good | Unrestricted (1.00) | 1 | 1 | 1 | 15% variance |
| deferred efficiency | 56% | farm delivery | none | part-time untrain | fair | Unrestricted (1.00) | 1 | 1 | 1 | 20% variance |

| **Associated Management Costs w/FIRM Assumptions (annual $/acre)** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | Meters (Md) | Irrigation Scheduling (S) | Irrigation Operator (I) | Maintenance (M) | Water Availability (W) | Sol Condition | Farm Conveyance (F) | % Root Zone Wetted (A) | Delivery (D) |
| proactive cost | **$ 181.00** | $ 7.00 | $ 32.00 | $ 108.00 | $ 34.00 | $ - | $ - | $ - | $ - | $ - |
| reactive cost | **$ 131.00** | $ 3.00 | $ 22.00 | $ 84.00 | $ 22.00 | $ - | $ - | $ - | $ - | $ - |
| deferred cost | **$ 87.80** | $ 3.00 | $ - | $ 67.20 | $ 17.60 | $ - | $ - | $ - | $ - | $ - |

Source(s): Base Cost (blue cells) - Source 7, Table 7C. Exceptions are provided below:

Where data absent, deferred maintenance items were estimated at 80% of the reactive maintenance cost (relates to I & M)

# Center Pivot

| Source Index | Range | Comment |
|---|---|---|
| 19, table 1 | 70-85, average 75 | application efficiency (Ea) |
| 25, table 1 | 70-85, average 75 | attainable efficiency |
| 37, Section 12.5.2 | 80 | System efficiency factor used in permitting |
| 3, pg 47 | 50-95 | varies by sprayhead type |
| 35, Table FL6c-1 | 85 | center pivot design sheet |

**FIRM analysis assumpions**

| New/Potential Application Efficiency: | **85%** | Md | S | I | M | W | Sc | F | U / C* | D |
|---|---|---|---|---|---|---|---|---|---|---|
| proactive efficiency | 79% | each field | Mon.&Sch | full-time, trained | excellent | Unrestricted (1.00) | 1 | 1 | | press variance < 20% |
| reactive efficiency | 65% | farm delivery | scheduling | full-time untrain | good | Unrestricted (1.00) | 1 | 1 | 1 | press variance 30% |
| deferred efficiency | 56% | farm delivery | none | part-time untrain | fair | Unrestricted (1.00) | 1 | 1 | 1 | press variance 30% |

*For this analysis, uniformity was set to 85% or greater (factor =1) and climate effect was set to warm-normal ET, moderate droplet size, 7 mph wind (facotr = 0.95)

| **Associated Management Costs w/FIRM Assumptions (annual $/acre)** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | Meters (Md) | Irrigation Scheduling (S) | Irrigation Operator (I) | Maintenance (M) | Water Availability (W) | Sol Condition | Farm Conveyance (F) | U / C* | Delivery (D) |
| proactive cost | **$ 79.00** | $ 7.00 | $ 32.00 | $ 20.00 | $ 20.00 | $ - | $ - | $ - | $ - | $ - |
| reactive cost | **$ 56.50** | $ 3.00 | $ 22.00 | $ 15.50 | $ 16.00 | $ - | $ - | $ - | $ - | $ - |
| deferred cost | **$ 28.20** | $ 3.00 | $ - | $ 12.40 | $ 12.80 | $ - | $ - | $ - | $ - | $ - |

Source(s): Base Cost (blue cells) - Source 5C (assumed similar to seepage irrigation). Other Exceptions are provided below:

Source 39 Table 2 suggests that these irrigation operation costs are similar per unit of water applied, therefore, irrigation operation labor was set to 50% the estimates for seepage.

Where data absent, deferred maintenance items were estimated at 80% of the reactive maintenance cost (relates to I & M)

Pro-active maintenance costs assumed to be 5% of system initial cost ($400/acre). Reactive cost was assumed to be 80% of the proactive cost.

# Impact Sprinkler

| Source Index | Range | Comment |
|---|---|---|
| 19, table 1 | 65-75, average 70 | application efficiency (Ea), traveling gun |
| 25, table 1 | 65-75, average 70 | attainable efficiency (Ea), traveling gun |
| 37, Section 12.5.2 | 70 | System efficiency factor used in permitting, traveling gun |
| 7, table 4-1 | 70 | potetial application efficiecy (citrus, containter and field-grown ornamentals) |

**FIRM analysis assumpions**

| New/Potential Application Efficiency: | **75%** | Md | S | I | M | W | Sc | F | U / C* | D |
|---|---|---|---|---|---|---|---|---|---|---|
| proactive efficiency | 70% | each field | Mon.&Sch | full-time, trained | excellent | Unrestricted (1.00) | 1 | 1 | | press variance < 20% |
| reactive efficiency | 57% | farm delivery | scheduling | full-time untrain | good | Unrestricted (1.00) | 1 | 1 | 1 | press variance 30% |
| deferred efficiency | 50% | farm delivery | none | part-time untrain | fair | Unrestricted (1.00) | 1 | 1 | 1 | press variance 30% |

*For this analysis, uniformity was set to 85% or greater (factor =1) and climate effect was set to warm-normal ET, moderate droplet size, 7 mph wind (facotr = 0.95)

| **Associated Management Costs w/FIRM Assumptions (annual $/acre)** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | Meters (Md) | Irrigation Scheduling (S) | Irrigation Operator (I) | Maintenance (M) | Water Availability (W) | Sol Condition | Farm Conveyance (F) | U / C* | Delivery (D) |
| proactive cost | **$ 194.00** | $ 7.00 | $ 32.00 | $ 117.00 | $ 38.00 | $ - | $ - | $ - | $ - | $ - |
| reactive cost | **$ 146.00** | $ 3.00 | $ 22.00 | $ 91.00 | $ 30.00 | $ - | $ - | $ - | $ - | $ - |
| deferred cost | **$ 99.80** | $ 3.00 | $ - | $ 72.80 | $ 24.00 | $ - | $ - | $ - | $ - | $ - |

Source(s): Base Cost (blue cells) - Source 7 Table 3C. Other Exceptions are provided below:

Where data absent, deferred maintenance items were estimated at 80% of the reactive maintenance cost (relates to I & M)

# Sprayhead Sprinkler

| Source Index | Range | Comment |
|---|---|---|
| 19, table 1 | 70-80, average 75 | application efficiency (Ea), solid set systems |
| 25, table 1 | 70-80, average 75 | attainable efficiency, solid set |
| 37, Section 12.5.2 | 70 | System efficiency factor used in permitting, overhead sprinkler |
| 7, table 4-4 | 70 | potetial application efficiecy |
| 31 | 60-80% | |
| 35, Table FL6A-1 | 75 | solid set |
| 18, Table 6-4 | 60-75 | |

**FIRM analysis assumpions**

| New/Potential Application Efficiency: | **75%** | Md | S | I | M | W | Sc | F | U / C* | D |
|---|---|---|---|---|---|---|---|---|---|---|
| proactive efficiency | 70% | each field | Mon.&Sch | full-time, trained | excellent | Unrestricted (1.00) | 1 | 1 | | press variance < 20% |
| reactive efficiency | 57% | farm delivery | scheduling | full-time untrain | good | Unrestricted (1.00) | 1 | 1 | 1 | press variance 30% |
| deferred efficiency | 50% | farm delivery | none | part-time untrain | fair | Unrestricted (1.00) | 1 | 1 | 1 | press variance 30% |

*For this analysis, uniformity was set to 85% or greater (factor =1) and climate effect was set to warm-normal ET, moderate droplet size, 7 mph wind (facotr = 0.95)

| **Associated Management Costs w/FIRM Assumptions (annual $/acre)** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | Meters (Md) | Irrigation Scheduling (S) | Irrigation Operator (I) | Maintenance (M) | Water Availability (W) | Sol Condition | Farm Conveyance (F) | U / C* | Delivery (D) |
| proactive cost | **$ 181.00** | $ 7.00 | $ 20.00 | $ 120.00 | $ 34.00 | $ - | $ - | $ - | $ - | $ - |
| reactive cost | **$ 129.00** | $ 3.00 | $ 11.00 | $ 93.00 | $ 22.00 | $ - | $ - | $ - | $ - | $ - |
| deferred cost | **$ 95.00** | $ 3.00 | $ - | $ 74.40 | $ 17.60 | $ - | $ - | $ - | $ - | $ - |

Source(s): Base Cost (blue cells) - Source 7 Table 1C. Other Exceptions are provided below:

Where data absent, deferred maintenance items were estimated at 80% of the reactive maintenance cost (relates to I & M)

# Linear Move

| Source Index | Range | Comment |
|---|---|---|
| 19, table 1 | 70-85, average 85 | application efficiency (Ea) |
| 25, table 1 | 70-85, average 75 | attainable efficiency |
| 37, Section 12.5.2 | 80 | System efficiency factor used in permitting, center pivot |
| 18, Table 6-4 | 80-87 | |

**FIRM analysis assumpions**

| New/Potential Application Efficiency: | **85%** | Md | S | I | M | W | Sc | F | U / C* | D |
|---|---|---|---|---|---|---|---|---|---|---|
| proactive efficiency | 79% | each field | Mon.&Sch | full-time, trained | excellent | Unrestricted (1.00) | 1 | 1 | | press variance < 20% |
| reactive efficiency | 65% | farm delivery | scheduling | full-time untrain | good | Unrestricted (1.00) | 1 | 1 | 1 | press variance 30% |
| deferred efficiency | 56% | farm delivery | none | part-time untrain | fair | Unrestricted (1.00) | 1 | 1 | 1 | press variance 30% |

*For this analysis, uniformity was set to 85% or greater (factor =1) and climate effect was set to warm-normal ET, moderate droplet size, 7 mph wind (facotr = 0.95)

| **Associated Management Costs w/FIRM Assumptions (annual $/acre)** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | Meters (Md) | Irrigation Scheduling (S) | Irrigation Operator (I) | Maintenance (M) | Water Availability (W) | Sol Condition | Farm Conveyance (F) | U / C* | Delivery (D) |
| proactive cost | **$ 84.00** | $ 7.00 | $ 32.00 | $ 20.00 | $ 25.00 | $ - | $ - | $ - | $ - | $ - |
| reactive cost | **$ 60.50** | $ 3.00 | $ 22.00 | $ 15.50 | $ 20.00 | $ - | $ - | $ - | $ - | $ - |
| deferred cost | **$ 31.40** | $ 3.00 | $ - | $ 12.40 | $ 16.00 | $ - | $ - | $ - | $ - | $ - |

Source(s): Base Cost (blue cells) - Source 5C (assumed similar to seepage irrigation). Other Exceptions are provided below:

Source 39 Table 2 suggests that these irrigation operation costs are similar per unit of water applied, therefore, irrigation operation labor was set to 50% the estimates for seepage.

Where data absent, deferred maintenance items were estimated at 80% of the reactive maintenance cost (relates to I & M)

Pro-active maintenance costs assumed to be 5% of system initial cost ($400/acre). Reactive cost was assumed to be 80% of the proactive cost.

# Traveling Gun

| Source Index | Range | Comment |
|---|---|---|
| 19, table 1 | 65-75, average 70 | application efficiency (Ea) |
| 25, table 1 | 65-75, average 70 | attainable efficiency |
| 37, Section 12.5.2 | 70 | System efficiency factor used in permitting |
| 35, Table FL6c-1 | 65 | center pivot design sheet |
| 18, Part 652.0602 (b)1.(ii) | 60-75 | |

**FIRM analysis assumpions**

| New/Potential Application Efficiency: | **70%** | Md | S | I | M | W | Sc | F | U / C* | D |
|---|---|---|---|---|---|---|---|---|---|---|
| proactive efficiency | 65% | each field | Mon.&Sch | full-time, trained | excellent | Unrestricted (1.00) | 1 | 1 | | press variance < 20% |
| reactive efficiency | 53% | farm delivery | scheduling | full-time untrain | good | Unrestricted (1.00) | 1 | 1 | 1 | press variance 30% |
| deferred efficiency | 46% | farm delivery | none | part-time untrain | fair | Unrestricted (1.00) | 1 | 1 | 1 | press variance 30% |

*For this analysis, uniformity was set to 85% or greater (factor =1) and climate effect was set to warm-normal ET, moderate droplet size, 7 mph wind (facotr = 0.95)

| **Associated Management Costs w/FIRM Assumptions (annual $/acre)** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | Meters (Md) | Irrigation Scheduling (S) | Irrigation Operator (I) | Maintenance (M) | Water Availability (W) | Sol Condition | Farm Conveyance (F) | U / C* | Delivery (D) |
| proactive cost | **$ 163.00** | $ 13.00 | $ 17.00 | $ 120.00 | $ 13.00 | $ - | $ - | $ - | $ - | $ - |
| reactive cost | **$ 116.00** | $ 7.00 | $ 10.00 | $ 93.00 | $ 6.00 | $ - | $ - | $ - | $ - | $ - |
| deferred cost | **$ 86.20** | $ 7.00 | $ - | $ 74.40 | $ 4.80 | $ - | $ - | $ - | $ - | $ - |

Source(s): Base Cost (blue cells) - Source 7 Table 6C2. Other Exceptions are provided below:

Where data absent, deferred maintenance items were estimated at 80% of the reactive maintenance cost (relates to I & M)

## Wheel roll

(assumed similar to traveling gun)

| Source Index | Range | Comment |
|---|---|---|
| 19, table 1 | 65-75, average 70 | application efficiency (Ea), traveling gun |
| 25, table 1 | 65-75, average 70 | attainable efficiency (Ea), traveling gun |
| 37, Section 12.5.2 | 70 | System efficiency factor used in permitting, traveling gun |
| 18, Part 652.0602 (b)1.(ii) | 60-75 | |

**FIRM analysis assumpions**

| New/Potential Application Efficiency: | **70%** | Md | S | I | M | W | Sc | F | U / C* | D |
|---|---|---|---|---|---|---|---|---|---|---|
| proactive efficiency | 65% | each field | Mon.&Sch | full-time, trained | excellent | Unrestricted (1.00) | 1 | 1 | 0 | press variance < 20% |
| reactive efficiency | 53% | farm delivery | scheduling | full-time untrain | good | Unrestricted (1.00) | 1 | 1 | 1 | press variance 30% |
| deferred efficiency | 46% | farm delivery | none | part-time untrain | fair | Unrestricted (1.00) | 1 | 1 | 1 | press variance 30% |

*For this analysis, uniformity was set to 85% or greater (factor =1) and climate effect was set to warm-normal ET, moderate droplet size, 7 mph wind (facotr = 0.95)

| **Associated Management Costs w/FIRM Assumptions (annual $/acre)** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | Meters (Md) | Irrigation Scheduling (S) | Irrigation Operator (I) | Maintenance (M) | Water Availability (W) | Sol Condition | Farm Conveyance (F) | U / C* | Delivery (D) |
| proactive cost | **$ 163.00** | $ 13.00 | $ 17.00 | $ 120.00 | $ 13.00 | $ - | $ - | $ - | $ - | $ - |
| reactive cost | **$ 116.00** | $ 7.00 | $ 10.00 | $ 93.00 | $ 6.00 | $ - | $ - | $ - | $ - | $ - |
| deferred cost | **$ 86.20** | $ 7.00 | $ - | $ 74.40 | $ 4.80 | $ - | $ - | $ - | $ - | $ - |

Source(s): Base Cost (blue cells) - Source 7 Table 6C2. Other Exceptions are provided below:

Where data absent, deferred maintenance items were estimated at 80% of the reactive maintenance cost (relates to I & M)

## Stationary gun

| Source Index | Range | Comment |
|---|---|---|
| 19, table 1 | 70-80, average 75 | application efficiency (Ea), solid set systems |
| 25, table 1 | 70-80, average 75 | attainable efficiency, solid set |
| 37, Section 12.5.2 | 70 | System efficiency factor used in permitting, traveling gun |
| 7, Table 4-1 & 4-4 | 65 | potetial application efficiecy (citrus, strawberry) |

**FIRM analysis assumpions**

| New/Potential Application Efficiency: | **75%** | Md | S | I | M | W | Sc | F | U / C* | D |
|---|---|---|---|---|---|---|---|---|---|---|
| proactive efficiency | 70% | each field | Mon.&Sch | full-time, trained | excellent | Unrestricted (1.00) | 1 | 1 | | press variance < 20% |
| reactive efficiency | 57% | farm delivery | scheduling | full-time untrain | good | Unrestricted (1.00) | 1 | 1 | 1 | press variance 30% |
| deferred efficiency | 50% | farm delivery | none | part-time untrain | fair | Unrestricted (1.00) | 1 | 1 | 1 | press variance 30% |

*For this analysis, uniformity was set to 85% or greater (factor =1) and climate effect was set to warm-normal ET, moderate droplet size, 7 mph wind (facotr = 0.95)

| **Associated Management Costs w/FIRM Assumptions (annual $/acre)** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | Meters (Md) | Irrigation Scheduling (S) | Irrigation Operator (I) | Maintenance (M) | Water Availability (W) | Sol Condition | Farm Conveyance (F) | U / C* | Delivery (D) |
| proactive cost | **$ 160.00** | $ 13.00 | $ 17.00 | $ 117.00 | $ 13.00 | $ - | $ - | $ - | $ - | $ - |
| reactive cost | **$ 114.00** | $ 7.00 | $ 10.00 | $ 91.00 | $ 6.00 | $ - | $ - | $ - | $ - | $ - |
| deferred cost | **$ 84.60** | $ 7.00 | $ - | $ 72.80 | $ 4.80 | $ - | $ - | $ - | $ - | $ - |

Source(s): Base Cost (blue cells) - Source 7 Table 6C2. Other Exceptions are provided below:

Where data absent, deferred maintenance items were estimated at 80% of the reactive maintenance cost (relates to I & M)

# Pipeline seepage

| Source Index | Range | Comment |
|---|---|---|
| 19, table 1 | 30-70 | application efficiency (Ea), semi-closed flow-through |
| 25, table 1 | 30-70 | attainable efficiency (Ea), semi-closed flow-through |
| **37, Section 12.5.2** | **60** | **System efficiency factor used in permitting** |
| 7, Table 4-1 | 50 | potetial application efficiecy |
| 31 | 20-50% | |
| 35, FL652.0605e | 50 | semi-enclosed subsurface |

**FIRM analysis assumpions**

| New/Potential Application Efficiency: | **70%** | Md | S | I | M | W | Sc | F | U / L* | D |
|---|---|---|---|---|---|---|---|---|---|---|
| proactive efficiency | 69% | each field | Mon.&Sch | full-time, trained | excellent | Unrestricted (1.00) | 1 | 1 | 1 | peaks delivered daily 100% |
| reactive efficiency | 60% | farm delivery | scheduling | full-time untrain | good | Unrestricted (1.00) | 1 | 1 | 1 | peaks delivered daily 100% |
| deferred efficiency | 43% | farm delivery | none | part-time untrain | fair | Unrestricted (1.00) | 1 | 1 | 1 | peaks delivered daily 100% |

*For this analysis, uniformity was set to irrigation laterals at the Recommended Spacing and on Uniform Soil. Land surface assumed poor for deferred maintenance program.

| **Associated Management Costs w/FIRM Assumptions (annual $/acre)** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | Meters (Md) | Irrigation Scheduling (S) | Irrigation Operator (I) | Maintenance (M) | Water Availability (W) | Sol Condition | Farm Conveyance (F) | U / L* | Delivery (D) |
| proactive cost | **$ 104.00** | $ 8.00 | $ 12.00 | $ 40.00 | $ 44.00 | $ - | $ - | $ - | $ - | $ - |
| reactive cost | **$ 63.00** | $ 4.00 | $ 10.00 | $ 31.00 | $ 18.00 | $ - | $ - | $ - | $ - | $ - |
| deferred cost | **$ 43.20** | $ 4.00 | $ - | $ 24.80 | $ 14.40 | $ - | $ - | $ - | $ - | $ - |

Source(s): Base Cost (blue cells) - Source 7 Table 5C. Other Exceptions are provided below:

Where data absent, deferred maintenance items were estimated at 80% of the reactive maintenance cost (relates to I & M)

# Flood

| Source Index | Range | Comment |
|---|---|---|
| 19, table 1 | 25-75 | application efficiency (Ea), crown flood |
| 25, table 1 | 25-75 | attainable efficiency (Ea), crown flood |
| **37, Section 12.5.2** | **50** | **System efficiency factor used in permitting** |

**FIRM analysis assumpions**

| New/Potential Application Efficiency: | **60%** | Meters (Md) | Irrigation Scheduling (S) | Irrigation Operator (I) | Maintenance (M) | Water Availability (W) | Sol Condition | Farm Conveyance (F) | U / L* | Delivery (D) |
|---|---|---|---|---|---|---|---|---|---|---|
| proactive efficiency | 57% | each field | Mon.&Sch | full-time, trained | excellent | Unrestricted (1.00) | 1 | 1 | 1 | flood 36 hurs |
| reactive efficiency | 49% | farm delivery | scheduling | full-time untrain | good | Unrestricted (1.00) | 1 | 1 | 1 | flood 36 hurs |
| deferred efficiency | 38% | farm delivery | none | part-time untrain | fair | Unrestricted (1.00) | 1 | 1 | 1 | flood 36 hurs |

*For this analysis, uniformity was set to the average of range of recommended values. Fair ground surface.

| **Associated Management Costs w/FIRM Assumptions (annual $/acre)** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | Meters (Md) | Irrigation Scheduling (S) | Irrigation Operator (I) | Maintenance (M) | Water Availability (W) | Sol Condition | Farm Conveyance (F) | U / L* | Delivery (D) |
| proactive cost | **$ 104.00** | $ 8.00 | $ 12.00 | $ 40.00 | $ 44.00 | $ - | $ - | $ - | $ - | $ - |
| reactive cost | **$ 63.00** | $ 4.00 | $ 10.00 | $ 31.00 | $ 18.00 | $ - | $ - | $ - | $ - | $ - |
| deferred cost | **$ 43.20** | $ 4.00 | $ - | $ 24.80 | $ 14.40 | $ - | $ - | $ - | $ - | $ - |

Source(s): Base Cost (blue cells) - Source 7 Table 5C assuming similar costs to seepage irrigation. Other Exceptions are provided below:

Where data absent, deferred maintenance items were estimated at 80% of the reactive maintenance cost (relates to I & M)

# Container nursery impact sprinkler

| Source Index | Citation | Comment |
|---|---|---|
| 19, table 1 | 15-50, average 20 | application efficiency (Ea), solid set for container nurseries |
| 25, table 1 | 15-50, average 20 | attainable efficiency (Ea), solid set for container nurseries |

**FIRM analysis assumpions (assumed similar to traveling gun)**

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| New/Potential Application Efficiency: | **50%** | Md | S | I | M | W | Sc | F | U / C* | D |
| proactive efficiency | 46% | each zone | Mon.&Sch | full-time, trained | excellent | Unrestricted (1.00) | 1 | 1 | | press variance < 20% |
| reactive efficiency | 38% | farm delivery | scheduling | full-time untrain | good | Unrestricted (1.00) | 1 | 1 | 1 | press variance 30% |
| deferred efficiency | 33% | farm delivery | none | part-time untrain | fair | Unrestricted (1.00) | 1 | 1 | 1 | press variance 30% |

*For this analysis, uniformity was set to the average of range of recommended values. Fair ground surface.

| **Associated Management Costs w/FIRM Assumptions (annual $/acre)** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **Total** | Meters (Md) | Irrigation Scheduling (S) | Irrigation Operator (I) | Maintenance (M) | Water Availability (W) | Sol Condition | Farm Conveyance (F) | U / L* | Delivery (D) |
| proactive cost | **$ 309.00** | $ 26.00 | $ 91.00 | $ 120.00 | $ 72.00 | $ - | $ - | $ - | $ - | $ - |
| reactive cost | **$ 209.00** | $ 8.00 | $ 48.00 | $ 93.00 | $ 60.00 | $ - | $ - | $ - | $ - | $ - |
| deferred cost | **$ 130.40** | $ 8.00 | $ - | $ 74.40 | $ 48.00 | $ - | $ - | $ - | $ - | $ - |

Source(s): Base Cost (blue cells) - Source 7 Table 4C assuming similar costs to seepage irrigation. Other Exceptions are provided below:

Where data absent, deferred maintenance items were estimated at 80% of the reactive maintenance cost (relates to I & M)

# Appendix D Expansion of Methodologies to the NFSEG Model

# Royal Consulting Services, Inc.

# MEMORANDUM

To: Max Castaneda, SJRWMD

From: Tim Desmarais

Re: Task 7 Expansion of Methodologies to North Florida/Southeast Georgia

Date: 08/16/2013

C: Tom Blush, SJRWMD

The purpose of this memorandum is to present the results and discuss the assumptions that were made to develop an Irrigated Land Geodatabase (ILG) and determine the irrigation requirements for additional Agricultural (Ag) areas located to the north of the MegaModel boundary, which was the study area for Tasks 1-6 of this project. The ILG for the expanded area was developed following the same procedure used for the MegaModel, with a few exceptions that will be discussed herein.

**Figure 1** shows the expanded study area, which includes 20 counties in the Florida panhandle, 15 counties in southeast Alabama, 145 counties in Georgia, and 32 counties in South Carolina. All counties were analyzed in their entirety so that the ILG could be compared to the Ag Census data. The total land area included in this analysis is roughly 99,390 square miles, not including the counties in Figure 1 that are shaded in blue.

GIS Processing

**Table 1** shows the availability in terms of the four sources of data that were overlain previously to define the Ag Land Geodatabase (ALG). The irrigated areas coverage for Georgia used for the MegaModel processing included the entire state. No information except the NASS cropland coverage was available for Alabama and South Carolina. For these counties, the spatial extent of the irrigated areas is the same as the NASS coverage. For the Florida panhandle counties, the irrigated areas were defined as the intersection of FLUCCS land use and the NASS coverage.

Ultimately the Georgia irrigated areas were used in their original form, except that less descriptive crop types in the Georgia irrigated areas coverage (e.g., "rotation") were assigned a crop type coming from the NASS data. Crop adjustment factors were applied to the rest of the study area (Florida panhandle, Alabama, and South Carolina) to obtain a reasonable match with the Ag Census Data.

**Tables 2a to 2d** present a county-by-county comparison of the GIS-derived ILG and the Ag Census data for each state. **Tables 3a to 3c** list the crop adjustment factors that were applied for Alabama, Florida, and South Carolina (respectively).

The resulting ILGs are presented for each state in **Figures 2a** to **2d**. The difference in input data coverages is difficult to discern in these figures due to the parcel-level scale of the data and large extent of the areas processed. **Figure 3** shows an example of each of the four states at a scale of 1 inch equals 2000 feet. At this scale, the differences related to the available GIS input data become quite clear. Alabama and South Carolina, which only used the NASS grid data for input, are characterized by a dense pixilated coverage. The Florida panhandle region is very similar, except many of the corners are rounded off and better captures the landscape, which is the result of incorporating the FLUCCS land use data. The GIS coverage for Georgia is very detailed and consists of large contiguous polygons.

After processing of the ILGs, each polygon was assigned a predominant soil type, nearest ET stations, and nearest rainfall station. An irrigation system was assumed for Alabama, the Florida panhandle, and South Carolina based on the predominant irrigation system for the particular crop. For Georgia, the irrigation system information was provided in the input Irrigated areas coverage.

Irrigation Estimates – AFSIRS Modeling

Irrigation estimates were made using batch-mode version of AFSIRS described for the MegaModel analysis. Crops and irrigation systems were fit into the existing AFSIRS databases. All of the input assumptions from the MegaModel effort were carried over this work, except for the soil data. The AFSIRS soil database was set up for prevalent Florida soil types. In the MegaModel run, the soil types from the very few irrigated parcels in Georgia were manually assumed an equivalent AFSIRS soil type. However, considering the scale of the expanded study area, three new soil databases were developed – one for Alabama, Georgia, and South Carolina. These databases were prepared for only the list of predominant soils that was developed from the GIS processing. These datasets were prepared by extracting information about the soil profile for each soil type using the Soil Survey databases (NRCS Geospatial Data Gateway website). Each soil type is defined into several soil profiles. For each soil profile, the depth of the soil profile, the low estimated available water content, and high estimated water content was extracted and put into the format needed by AFSIRS.

The simulations were thus separated by state, which coincides with the GIS processing. The list of crops and growing seasons was expanded a bit, and new crops were assigned a representative AFSIRS crop code and a typical growing season was assumed.

**Tables 4a** to **4d** provide a county-by-county breakdown of the total adjusted irrigated acreage, and average daily irrigation demand for wet (20th percentile), normal, and dry (80th percentile) rainfall years. The overall summary is as follows:

| Data Group / State | Adjusted Irrigated Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
|---|---|---|---|---|
| Alabama | 46,370 | 22 | 38 | 54 |
| Florida | 53,644 | 28 | 48 | 68 |
| Georgia | 1,363,966 | 971 | 1,397 | 1,786 |
| South Carolina | 114,766 | 46 | 81 | 115 |

The GIS output was set up to be linked to the gross irrigation requirements (in inches) summarized in a variety of ways. Each parcel has two fields for an area calculation: the geometric

area of the polygon and the adjusted irrigated area. It was set up this way to allow for manipulation of the crop adjustment factors and updating the results without the need to re-run AFSIRS. To compute volumes of water, the gross irrigation demand should be multiplied by the adjusted irrigated area. The geometric polygon area field can be used for translating the data to a model grid because it can be used to proportion the flow among multiple grid cells.

Summary and Conclusions

The resulting set of ILG for each state incorporate the best-available information. The irrigated areas for Alabama and South Carolina rely solely on the NASS data. The irrigated areas for the panhandle portion of Florida are one step better, incorporating FLUCCS. The irrigated areas for Georgia were based on manually digitized polygons and thus Georgia is considered to be the most accurate coverage from a geometry perspective.

The data for Alabama, South Carolina, and the panhandle portion of Florida were roughly tensioned to the Ag Census data. To do this, crop adjustment factors were defined that reduced the geometric area by a certain factor. No adjustments were made to the Georgia dataset.

Not surprisingly, the largest discrepancy between the ILGs and the Ag Census data is for Georgia. The total irrigated for the ILG is roughly 35% greater than the Ag Census. Tensioning Georgia's data is not recommended because at one point or another, these fields could be irrigated. The Ag Census data is for the calendar year of 2007. The input irrigated areas coverage for Georgia does not specify the time frame it represents, but considering the amount of effort that must have been spent on this, it is more than likely that it includes parcels that were not irrigated in 2007.

While the accuracy of the ILGs at present could be improved, this task achieved the important task of assembling all of the information and at least making preliminary estimates of irrigation requirements. From this point, model-wide estimates can be made and refined (in terms of the GIS geometry and AFSIRS modeling) where necessary.

**Figures**

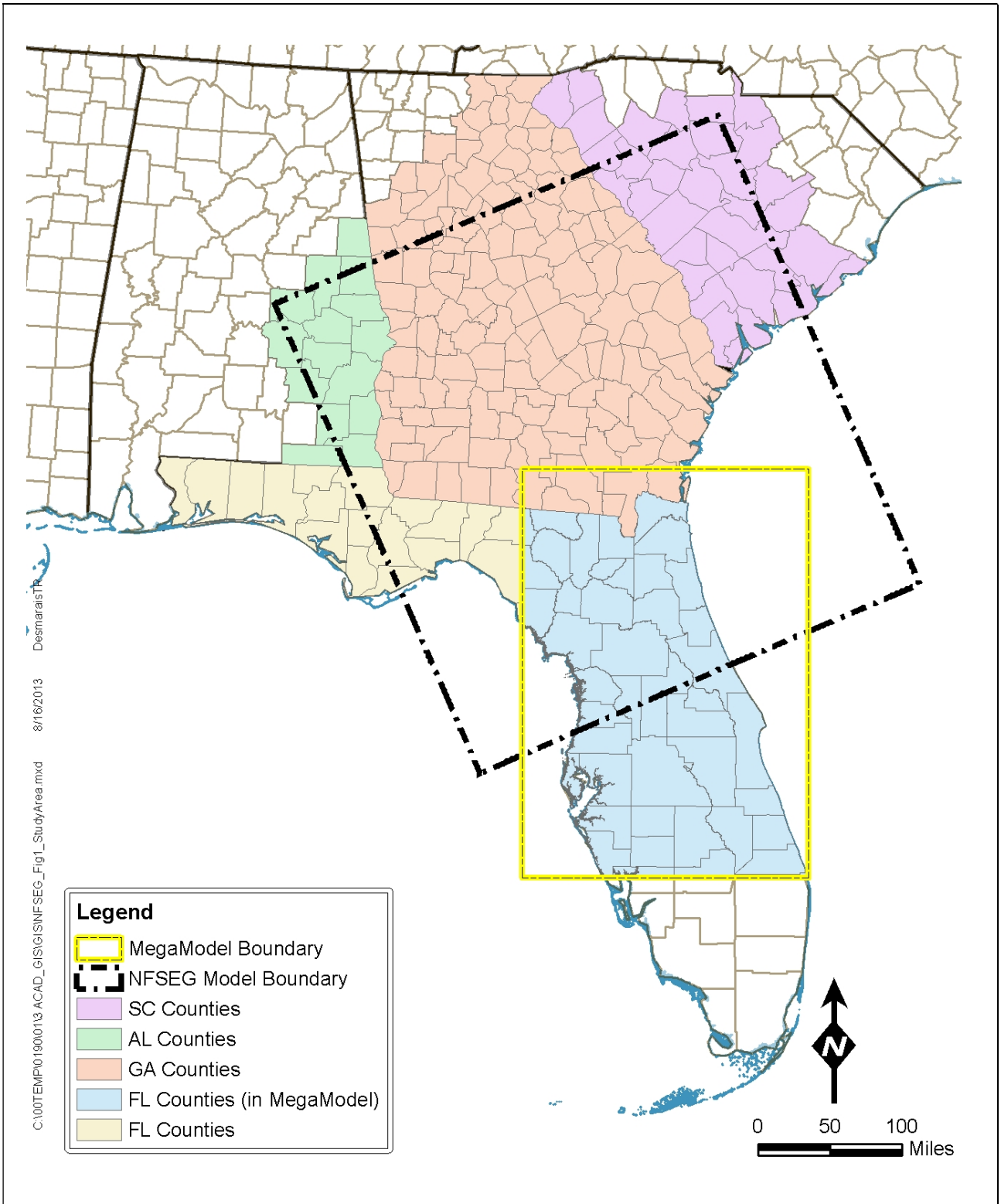


**Figure 1 Expanded Study Area**

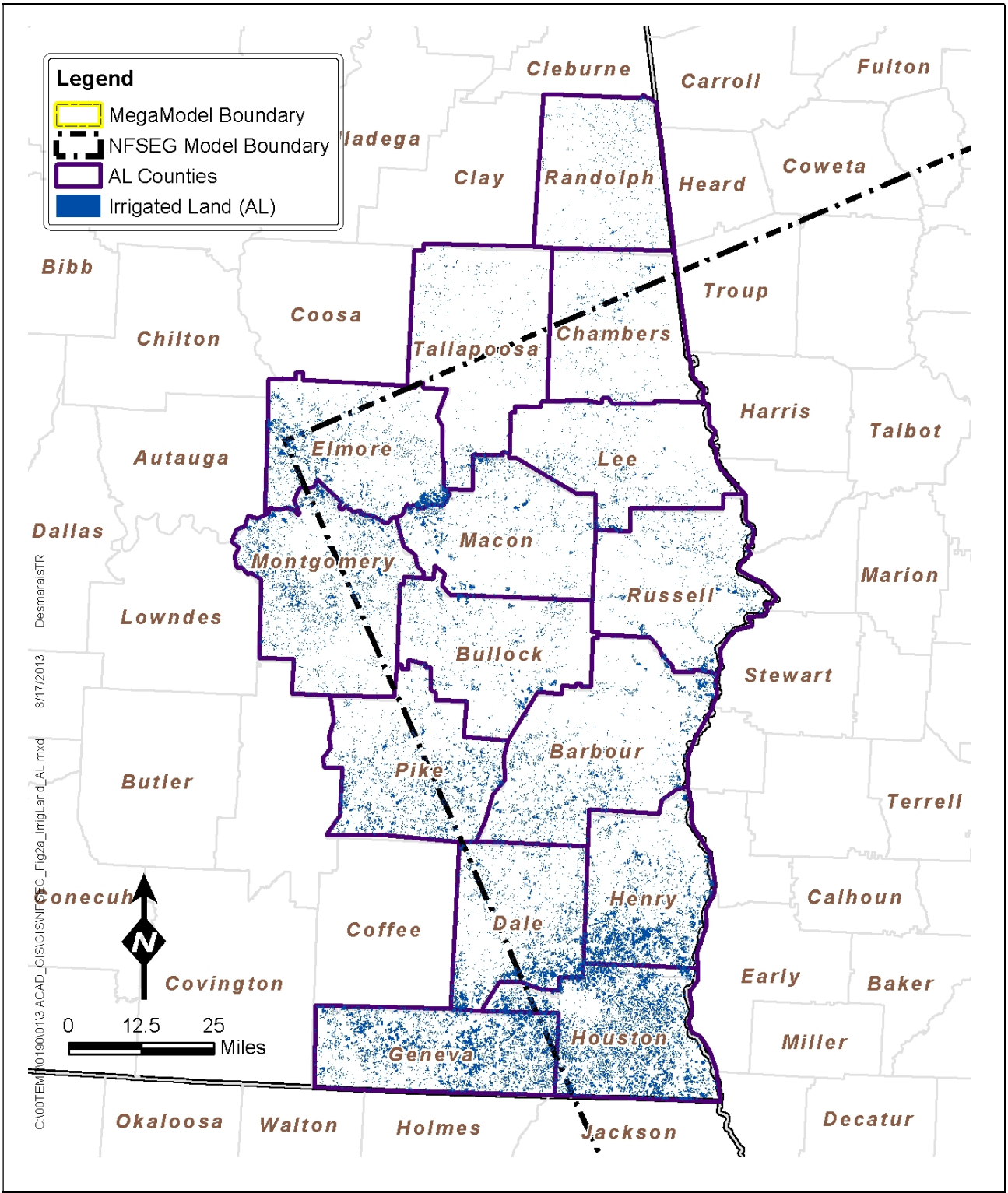


**Figure 2a Alabama Irrigated Lands Geodatabase**

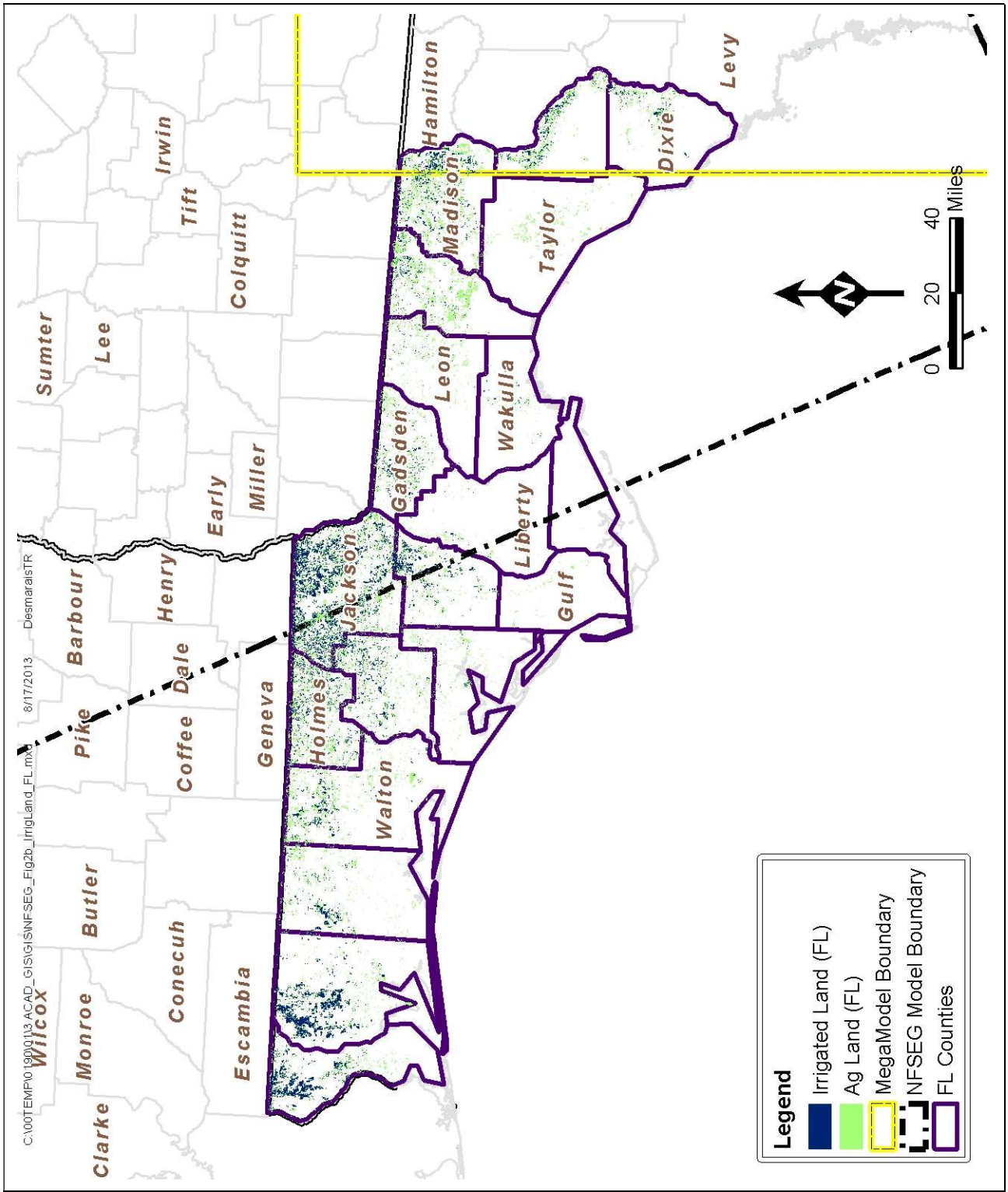


**Figure 2b Florida Irrigated Lands Geodatabase**

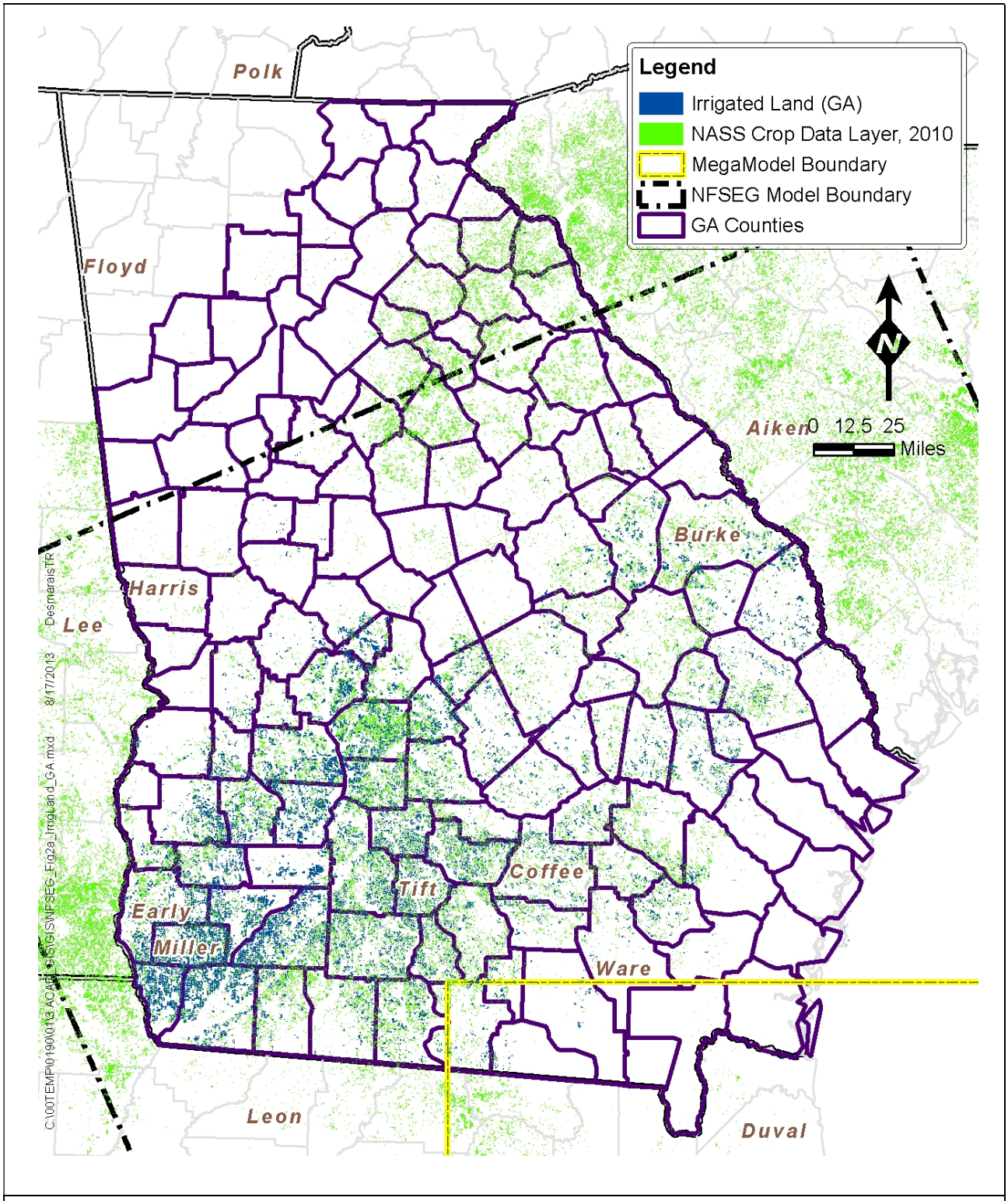


**Figure 2c Georgia Irrigated Lands Geodatabase**

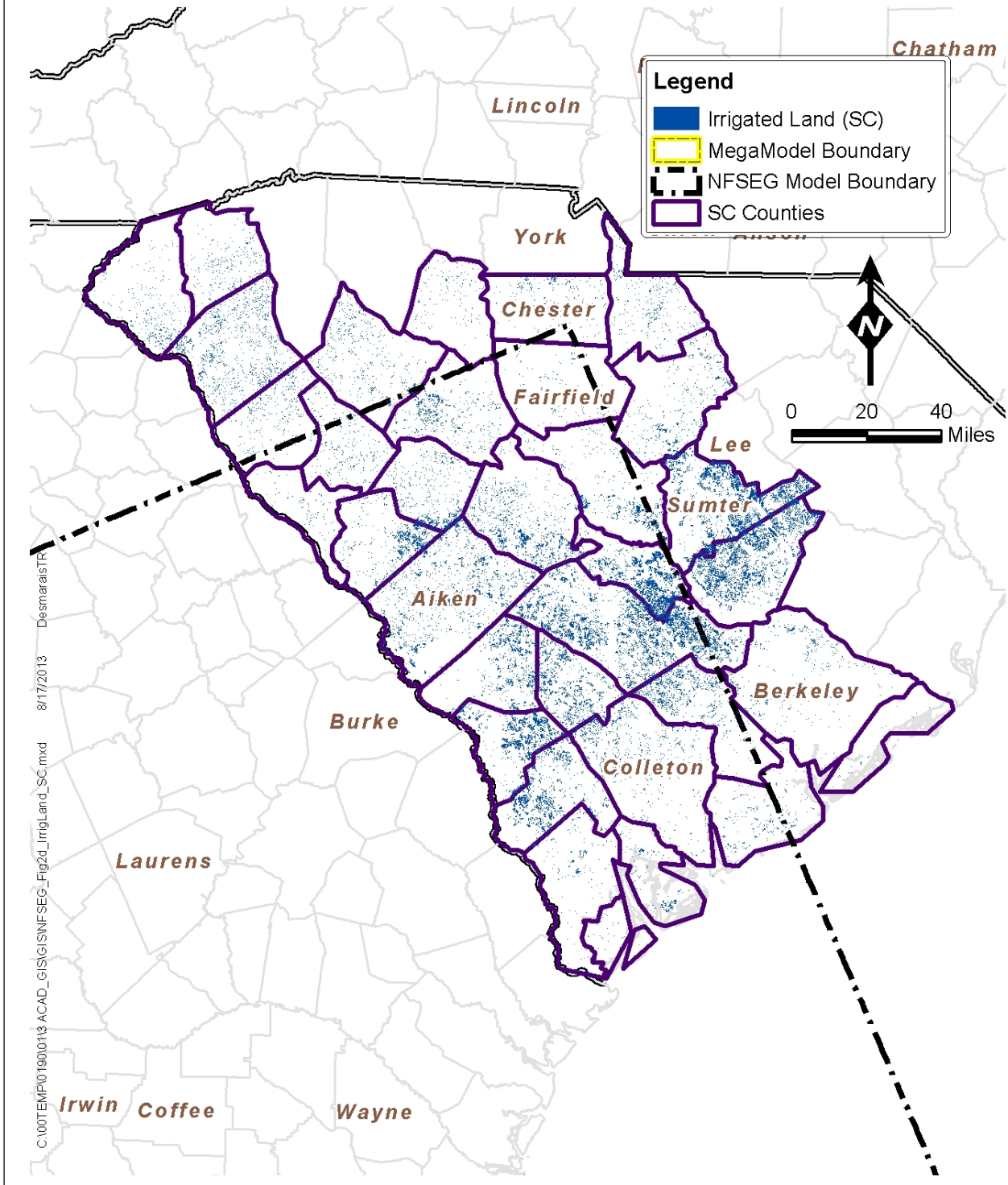


**Figure 2d South Carolina Irrigated Lands Geodatabase**

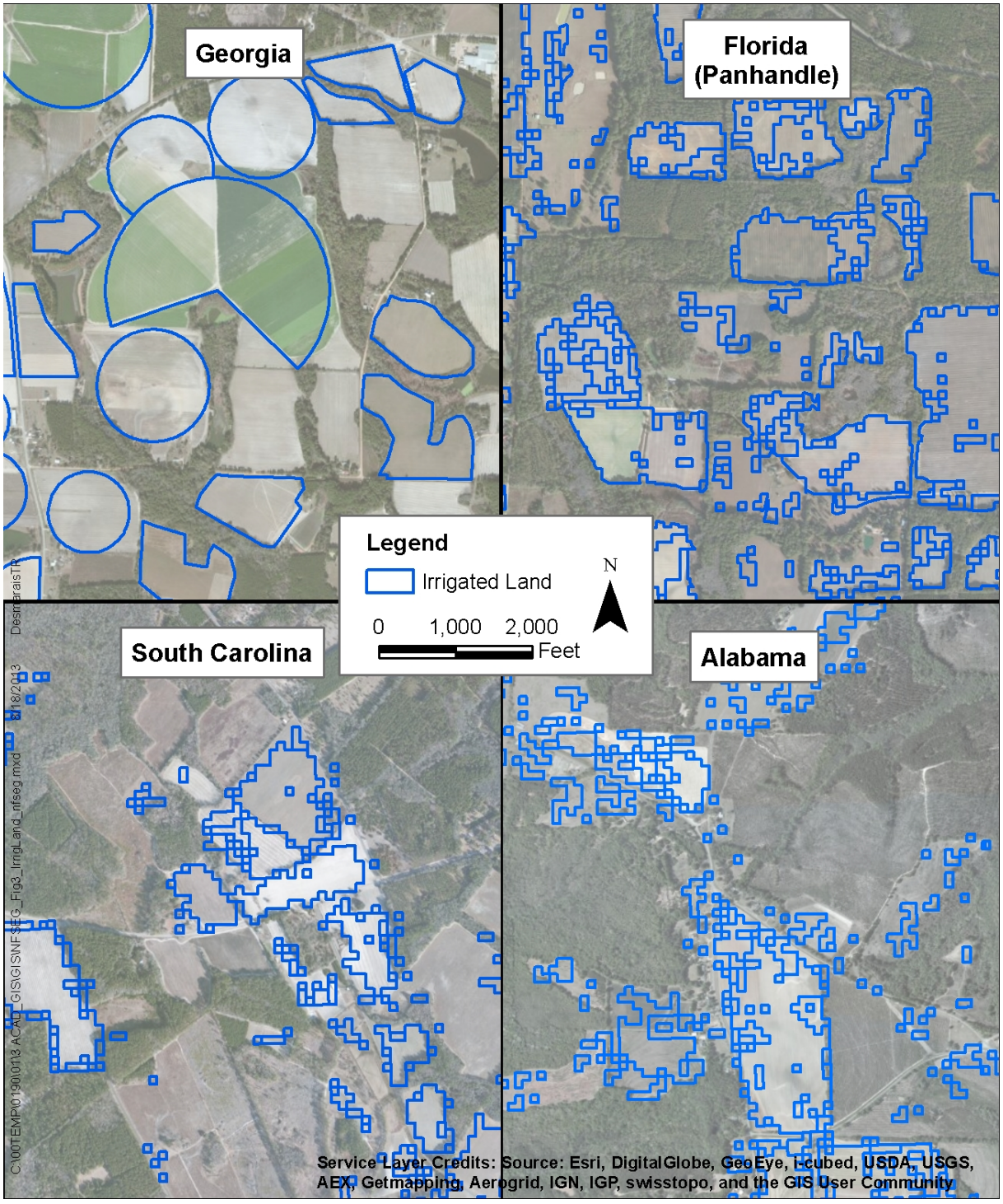


**Figure 3 Comparison of Irrigated Lands by State**

**Tables**

**Table 1 Data Availability and Source Attribute Matrix[1]**

| Data Group | Crop Type | Irrigation System |
|---|---|---|
| Alabama | 3 | - |
| South Carolina | 3 | - |
| Florida | 2,3 | - |
| Georgia | 1,2,3 | 1 |

[1]The numbers in this table refer to the following GIS data sources: (1) Irrigated Areas, (2) Land Use / Land Cover, and (3) NASS satellite imagery.

**Table 2a Alabama GIS-derived ILG and 2007 Ag Census Irrigated Area**

| County | Data Group(s) | Adjusted ILG (acres) | 2007 Ag Census Irrigated Land (acres) | Diff. (acres) |
|---|---|---|---|---|
| **ALABAMA** | | | | |
| Barbour | AL | 3,024 | 2,785 | 239 |
| Bullock | AL | 3,257 | (D) | na |
| Chambers | AL | 255 | 338 | -83 |
| Dale | AL | 3,062 | 2,602 | 460 |
| Elmore | AL | 2,504 | 2,010 | 494 |
| Geneva | AL | 3,458 | 2,953 | 505 |
| Henry | AL | 4,567 | 4,995 | -428 |
| Houston | AL | 13,701 | 13,368 | 333 |
| Lee | AL | 1,019 | 793 | 226 |
| Macon | AL | 3,148 | 2,562 | 586 |
| Montgomery | AL | 1,487 | 629 | 858 |
| Pike | AL | 3,189 | 2,414 | 775 |
| Randolph | AL | 207 | 217 | -10 |
| Russell | AL | 2,803 | 2,560 | 243 |
| Tallapoosa | AL | 688 | (D) | na |
| | **Total** | **46,370** | **38,226** | |

**Table 2b Florida Panhandle GIS-derived ILG and 2007 Ag Census Irrigated Area**

| County | Data Group(s) | Adjusted ILG (acres) | 2007 Ag Census Irrigated Land (acres) | Diff. (acres) |
|---|---|---|---|---|
| **FLORIDA** | | | | |
| Bay | FL | 1,163 | (D) | na |
| Calhoun | FL | 1,793 | 1,455 | 338 |
| Dixie | FL | 2,493 | 2,957 | -464 |
| Escambia | FL | 3,515 | 2,552 | 963 |
| Gadsden | FL | 2,135 | 2,209 | -74 |
| Holmes | FL | 3,366 | 2,033 | 1,333 |
| Jackson | FL | 21,027 | 20,275 | 752 |
| Jefferson | FL | 3,022 | 2,148 | 874 |
| Lafayette | FL | 5,514 | 7,426 | -1,912 |
| Leon | FL | 726 | 1,467 | -741 |
| Liberty | FL | 425 | (D) | na |
| Madison | FL | 4,331 | 3,119 | 1,212 |
| Okaloosa | FL | 507 | 421 | 86 |
| Santa Rosa | FL | 1,307 | 2,562 | -1,255 |
| Wakulla | FL | 566 | 282 | 284 |
| Walton | FL | 608 | 718 | -110 |
| Washington | FL | 1,145 | 888 | 257 |
| | **Total** | 53,644 | 50,512 | |

**Table 2c Georgia GIS-derived ILG and 2007 Ag Census Irrigated Area**

| County | Data Group(s) | Adjusted ILG (acres) | 2007 Ag Census Irrigated Land (acres) | Diff. (acres) |
|---|---|---|---|---|
| **GEORGIA** | | | | |
| Appling | GA | 7,911 | 9,092 | -1,181 |
| Atkinson | GA | 7,337 | 5,617 | 1,720 |
| Bacon | GA | 6,860 | 5,996 | 864 |
| Baker | GA | 40,600 | 21,999 | 18,601 |
| Banks | GA | 6 | 672 | -666 |
| BenHill | GA | 7,694 | 7,966 | -272 |
| Berrien | GA | 15,848 | 14,482 | 1,366 |
| Bibb | GA | 166 | 128 | 38 |
| Bleckley | GA | 13,282 | 17,543 | -4,261 |
| Brantley | GA | 728 | 351 | 377 |
| Brooks | GA | 21,786 | 19,064 | 2,722 |
| Bryan | GA | 122 | (D) | na |
| Bulloch | GA | 17,599 | 7,762 | 9,837 |
| Burke | GA | 25,669 | 17,693 | 7,976 |
| Butts | GA | 45 | 125 | -80 |
| Calhoun | GA | 29,062 | 30,346 | -1,284 |
| Candler | GA | 6,454 | 3,721 | 2,733 |
| Carroll | GA | 297 | 662 | -365 |
| Chatham | GA | 44 | 149 | -105 |
| Cherokee | GA | 72 | 148 | -76 |
| Clarke | GA | 107 | 117 | -10 |
| Clay | GA | 7,631 | 9,417 | -1,786 |
| Clinch | GA | 3,292 | 1,819 | 1,473 |
| Cobb | GA | 7 | 46 | -39 |
| Coffee | GA | 26,065 | 17,971 | 8,094 |
| Colquitt | GA | 47,928 | 44,075 | 3,853 |
| Columbia | GA | 45 | 79 | -34 |
| Cook | GA | 16,077 | 10,845 | 5,232 |
| Coweta | GA | 207 | 464 | -257 |
| Crawford | GA | 6,693 | 4,458 | 2,235 |
| Crisp | GA | 29,631 | 17,330 | 12,301 |
| Dawson | GA | 177 | 83 | 94 |
| Decatur | GA | 71,148 | 47,946 | 23,202 |
| Dodge | GA | 15,998 | 13,510 | 2,488 |
| Dooly | GA | 45,583 | 37,215 | 8,368 |
| Dougherty | GA | 18,731 | 15,225 | 3,506 |
| Early | GA | 53,178 | 33,053 | 20,125 |
| Echols | GA | 2,892 | 3,962 | -1,070 |
| Effingham | GA | 1,144 | 44 | 1,100 |
| Elbert | GA | 322 | 66 | 256 |
| Emanuel | GA | 5,135 | 7,626 | -2,491 |

**Table 2c (Cont) Georgia GIS-derived ILG and 2007 Ag Census Irrigated Area**

| County | Data Group(s) | Adjusted ILG (acres) | 2007 Ag Census Irrigated Land (acres) | Diff. (acres) |
|---|---|---|---|---|
| **GEORGIA** | | | | |
| Evans | GA | 7,074 | 2,802 | 4,272 |
| Fayette | GA | 164 | 97 | 67 |
| Forsyth | GA | 149 | 208 | -59 |
| Franklin | GA | 161 | 532 | -371 |
| Fulton | GA | 11 | 268 | -257 |
| Glascock | GA | 89 | 107 | -18 |
| Grady | GA | 16,199 | 8,028 | 8,171 |
| Greene | GA | 46 | 451 | -405 |
| Gwinnett | GA | 60 | 257 | -197 |
| Habersham | GA | 272 | 293 | -21 |
| Hall | GA | 108 | 170 | -62 |
| Hancock | GA | 312 | 94 | 218 |
| Harris | GA | 21 | 136 | -115 |
| Hart | GA | 934 | 1,542 | -608 |
| Henry | GA | 206 | 158 | 48 |
| Houston | GA | 10,499 | 4,479 | 6,020 |
| Irwin | GA | 33,509 | 30,577 | 2,932 |
| Jackson | GA | 114 | 617 | -503 |
| Jasper | GA | 165 | 294 | -129 |
| JeffDavis | GA | 11,060 | 9,259 | 1,801 |
| Jefferson | GA | 19,862 | 14,587 | 5,275 |
| Jenkins | GA | 8,313 | 9,978 | -1,665 |
| Johnson | GA | 2,046 | 1,614 | 432 |
| Jones | GA | 72 | 308 | -236 |
| Lamar | GA | 577 | 1,282 | -705 |
| Lanier | GA | 6,516 | 8,434 | -1,918 |
| Laurens | GA | 8,590 | 6,408 | 2,182 |
| Lee | GA | 42,099 | 15,757 | 26,342 |
| Liberty | GA | 32 | 46 | -14 |
| Long | GA | 997 | 475 | 522 |
| Lowndes | GA | 8,032 | 4,169 | 3,863 |
| Lumpkin | GA | 105 | 66 | 39 |
| Macon | GA | 28,232 | 16,905 | 11,327 |
| Marion | GA | 5,978 | 3,389 | 2,589 |
| McDuffie | GA | 798 | 506 | 292 |
| Meriwether | GA | 326 | 765 | -439 |
| Miller | GA | 59,710 | 37,704 | 22,006 |
| Mitchell | GA | 81,812 | 47,675 | 34,137 |
| Monroe | GA | 148 | 150 | -2 |
| Montgomery | GA | 2,115 | 2,581 | -466 |
| Morgan | GA | 986 | 1,817 | -831 |
| Muscogee | GA | 3 | (D) | na |

**Table 2c (Cont) Georgia GIS-derived ILG and 2007 Ag Census Irrigated Area**

| County | Data Group(s) | Adjusted ILG (acres) | 2007 Ag Census Irrigated Land (acres) | Diff. (acres) |
|---|---|---|---|---|
| **GEORGIA** | | | | |
| Newton | GA | 212 | 214 | -2 |
| Oconee | GA | 710 | 964 | -254 |
| Oglethorpe | GA | 353 | 774 | -421 |
| Paulding | GA | 2 | 10 | -8 |
| Peach | GA | 12,020 | 5,635 | 6,385 |
| Pierce | GA | 10,965 | 8,280 | 2,685 |
| Pike | GA | 1,165 | 771 | 394 |
| Pulaski | GA | 21,835 | 12,696 | 9,139 |
| Putnam | GA | 361 | 517 | -156 |
| Quitman | GA | 505 | (D) | na |
| Rabun | GA | 21 | 550 | -529 |
| Randolph | GA | 29,775 | 15,753 | 14,022 |
| Richmond | GA | 113 | 37 | 76 |
| Schley | GA | 2,176 | 1,330 | 846 |
| Screven | GA | 21,247 | 13,568 | 7,679 |
| Seminole | GA | 50,473 | 45,798 | 4,675 |
| Stewart | GA | 5,139 | 384 | 4,755 |
| Sumter | GA | 46,995 | 31,879 | 15,116 |
| Talbot | GA | 14 | 66 | -52 |
| Tattnall | GA | 18,483 | 12,510 | 5,973 |
| Taylor | GA | 3,936 | 4,364 | -428 |
| Telfair | GA | 8,101 | 7,325 | 776 |
| Terrell | GA | 29,725 | 29,111 | 614 |
| Thomas | GA | 13,448 | 12,479 | 969 |
| Tift | GA | 24,208 | 28,825 | -4,617 |
| Toombs | GA | 12,529 | 10,749 | 1,780 |
| Towns | GA | 6 | (D) | na |
| Treutlen | GA | 1,426 | 4,982 | -3,556 |
| Troup | GA | 1 | (D) | na |
| Turner | GA | 32,358 | 22,175 | 10,183 |
| Twiggs | GA | 2,430 | 2,115 | 315 |
| Union | GA | 77 | 42 | 35 |
| Upson | GA | 922 | 644 | 278 |
| Walton | GA | 916 | 843 | 73 |
| Ware | GA | 4,244 | 2,545 | 1,699 |
| Washington | GA | 7,319 | 2,267 | 5,052 |
| Wayne | GA | 4,626 | 4,614 | 12 |
| Webster | GA | 12,238 | 3,296 | 8,942 |
| Wheeler | GA | 4,552 | 4,128 | 424 |
| White | GA | 36 | 140 | -104 |
| Wilcox | GA | 17,801 | 21,429 | -3,628 |

**Table 2c (Cont) Georgia GIS-derived ILG and 2007 Ag Census Irrigated Area**

| County | Data Group(s) | Adjusted ILG (acres) | 2007 Ag Census Irrigated Land (acres) | Diff. (acres) |
|---|---|---|---|---|
| **GEORGIA** | | | | |
| Wilkes | GA | 26 | 390 | -364 |
| Wilkinson | GA | 75 | 16 | 59 |
| Worth | GA | 48,326 | 30,187 | 18,139 |
| | **Total** | 1,363,966 | 1,008,254 | |

**Table 2d South Carolina GIS-derived ILG and 2007 Ag Census Irrigated Area**

| County | Data Group(s) | Adjusted ILG (acres) | 2007 Ag Census Irrigated Land (acres) | Diff. (acres) |
|---|---|---|---|---|
| **South Carolina** | | | | |
| Abbeville | SC | 576 | 1,477 | -901 |
| Aiken | SC | 3,384 | 3,153 | 231 |
| Allendale | SC | 6,949 | 6,584 | 365 |
| Anderson | SC | 884 | 664 | 220 |
| Bamberg | SC | 4,927 | 5,486 | -559 |
| Barnwell | SC | 4,062 | 3,871 | 191 |
| Beaufort | SC | 2,104 | 2,430 | -326 |
| Berkeley | SC | 1,391 | 623 | 768 |
| Calhoun | SC | 8,292 | 10,030 | -1,738 |
| Charleston | SC | 2,424 | 1,304 | 1,120 |
| Chester | SC | 1,954 | (D) | na |
| Clarendon | SC | 4,709 | 2,761 | 1,948 |
| Colleton | SC | 2,489 | 2,630 | -141 |
| Dorchester | SC | 1,999 | 1,845 | 154 |
| Edgefield | SC | 4,272 | 4,986 | -714 |
| Fairfield | SC | 905 | 224 | 681 |
| Greenwood | SC | 466 | 115 | 351 |
| Hampton | SC | 2,848 | 2,812 | 36 |
| Jasper | SC | 1,040 | (D) | na |
| Kershaw | SC | 1,672 | 1,438 | 234 |
| Lancaster | SC | 756 | 258 | 498 |
| Laurens | SC | 1,074 | 435 | 639 |
| Lexington | SC | 10,516 | 11,078 | -562 |
| McCormick | SC | 210 | (D) | na |
| Newberry | SC | 1,718 | 1,438 | 280 |
| Oconee | SC | 1,331 | 309 | 1,022 |
| Orangeburg | SC | 22,032 | 23,570 | -1,538 |
| Pickens | SC | 359 | 779 | -420 |
| Richland | SC | 3,031 | 1,425 | 1,606 |
| Saluda | SC | 5,570 | 4,160 | 1,410 |
| Sumter | SC | 10,179 | 9,486 | 693 |
| Union | SC | 643 | 117 | 526 |
| | **Total** | **114,766** | **105,488** | |

## Table 3a Alabama Crop Adjustment Factors

| County / State | Crop | Area Adjustment Factor |
|---|---|---|
| Barbour | Peanuts | 0.25 |
| Bullock | Peanuts | 0.1 |
| Bullock | Cotton | 0.1 |
| Bullock | Soybeans | 0.1 |
| Bullock | Corn | 0.1 |
| Chambers | Peanuts | 1 |
| Dale | Peanuts | 0.25 |
| Dale | Cotton | 0.25 |
| Elmore | Peanuts | 0.1 |
| Elmore | Cotton | 0.1 |
| Geneva | Peanuts | 0.05 |
| Geneva | Cotton | 0.05 |
| Henry | Peanuts | 0.25 |
| Henry | Cotton | 0.25 |
| Houston | Peanuts | 0.25 |
| Lee | Peanuts | 0.25 |
| Lee | Cotton | 0.25 |
| Macon | Peanuts | 0.1 |
| Macon | Cotton | 0.1 |
| Macon | Soybeans | 0.1 |
| Montgomery | Peanuts | 0.1 |
| Montgomery | Cotton | 0.1 |
| Montgomery | Soybeans | 0.1 |
| Pike | Peanuts | 0.5 |
| Pike | Cotton | 0.5 |
| Randolph | Peanuts | 1 |
| Russell | Peanuts | 1 |
| Tallapoosa | Peanuts | 1 |
| Statewide | | |
| Statewide | Peanuts | 0.3 |
| Statewide | Cotton | 0.3 |
| Statewide | Corn | 0.3 |
| Statewide | Soybeans | 0.3 |
| Statewide | OtherHay_NonAlfalfa | 0 |

9

## Table 3b Florida Crop Adjustment Factors

| County / State | Crop | Area Adjustment Factor |
|---|---|---|
| Calhoun | Cotton | 0.15 |
| Calhoun | Peanuts | 0.15 |
| Calhoun | Pasture | 0.15 |
| Calhoun | OtherHay_NonAlfalfa | 0.15 |
| Calhoun | Soybeans | 0.15 |
| Calhoun | Corn | 0.15 |
| Calhoun | DblCropWinWht_Soybeans | 0.15 |
| Escambia | Cotton | 0.05 |
| Escambia | Peanuts | 0.05 |
| Escambia | Pasture | 0.05 |
| Escambia | OtherHay_NonAlfalfa | 0.05 |
| Escambia | Corn | 0.05 |
| Escambia | Soybeans | 0.05 |
| Escambia | Sod_GrassSeed | 0.05 |
| Escambia | DblCropWinWht_Soybeans | 0.05 |
| Gadsden | OtherHay_NonAlfalfa | 0.25 |
| Gadsden | Peanuts | 0.25 |
| Gadsden | Pasture | 0.25 |
| Gadsden | Cotton | 0.25 |
| Gadsden | Corn | 0.25 |
| Jackson | Peanuts | 0.4 |
| Jackson | Cotton | 0.4 |
| Jackson | Pasture | 0.4 |
| Jackson | OtherHay_NonAlfalfa | 0.4 |
| Jackson | Corn | 0.4 |
| Jackson | Fallow | 0.4 |
| Jackson | Soybeans | 0.4 |
| Jefferson | Peanuts | 0.25 |
| Jefferson | Corn | 0.25 |
| Jefferson | OtherHay_NonAlfalfa | 0.25 |
| Jefferson | Soybeans | 0.25 |
| Holmes | DblCropSoybeans_Oats | 0.05 |
| Holmes | Oats | 0.05 |
| Holmes | Peanuts | 0.05 |
| Holmes | Cotton | 0.05 |
| Holmes | OtherHay_NonAlfalfa | 0.05 |
| Holmes | Pasture | 0.05 |
| Holmes | Soybeans | 0.05 |
| Holmes | Corn | 0.05 |
| Madison | Peanuts | 0.2 |
| Madison | Corn | 0.2 |
| Madison | OtherHay_NonAlfalfa | 0.2 |
| Madison | Peas | 0.2 |
| Madison | Soybeans | 0.2 |
| Madison | Millet | 0.2 |
| Washington | Pasture | 0.2 |
| Washington | Peanuts | 0.2 |
| Washington | OtherHay_NonAlfalfa | 0.2 |
| Washington | Corn | 0.2 |
| Washington | Cotton | 0.2 |
| Washington | Soybeans | 0.2 |
| Washington | DblCropSoybeans_Oats | 0.2 |
| **Statewide** | | |
| Statewide | Fallow | 0 |
| Statewide | Peanuts | 0.5 |
| Statewide | Cotton | 0.5 |
| Statewide | Pasture | 0.5 |
| Statewide | OtherHay_NonAlfalfa | 0.5 |
| Statewide | Aquaculture | 0 |
| Statewide | Horse Farms | 0 |

## Table 3c South Carolina Crop Adjustment Factors

| County / State | Crop | Area Adjustment Factor |
|---|---|---|
| Aiken | Peaches | 0.1 |
| Aiken | Soybeans | 0.1 |
| Aiken | Corn | 0.1 |
| Aiken | DblCropWinWht_Soybeans | 0.1 |
| Aiken | Cotton | 0.1 |
| Allendale | Corn | 0.25 |
| Allendale | Soybeans | 0.25 |
| Allendale | DblCropWinWht_Soybeans | 0.25 |
| Bamberg | Corn | 0.25 |
| Bamberg | Cotton | 0.25 |
| Bamberg | Soybeans | 0.25 |
| Bamberg | DblCropWinWht_Soybeans | 0.25 |
| Clarendon | DblCropWinWht_Soybeans | 0.1 |
| Clarendon | Corn | 0.1 |
| Clarendon | Soybeans | 0.1 |
| Clarendon | Cotton | 0.1 |
| Sumter | DblCropWinWht_Soybeans | 0.25 |
| Sumter | Corn | 0.25 |
| Sumter | Soybeans | 0.25 |
| Orangeburg | Corn | 0.5 |
| Orangeburg | Cotton | 0.5 |
| Orangeburg | Soybeans | 0.5 |
| Orangeburg | DblCropWinWht_Soybeans | 0.5 |
| Orangeburg | Peanuts | 0.5 |
| Hampton | Cotton | 0.1 |
| Hampton | Corn | 0.1 |
| Hampton | Soybeans | 0.1 |
| Edgefield | Peaches | 0.25 |
| Richland | Corn | 0.25 |
| Richland | DblCropWinWht_Soybeans | 0.25 |
| Richland | Soybeans | 0.25 |
| Saluda | Peaches | 0.5 |
| Barnwell | Soybeans | 0.25 |
| Barnwell | Corn | 0.25 |
| Barnwell | Cotton | 0.25 |
| Barnwell | Peaches | 0.25 |
| Barnwell | DblCropWinWht_Soybeans | 0.25 |
| Calhoun | Cotton | 0.5 |
| Calhoun | Peanuts | 0.5 |
| Calhoun | Corn | 0.5 |
| Calhoun | Soybeans | 0.5 |
| Berkeley | Corn | 0.25 |
| Berkeley | Soybeans | 0.25 |
| Berkeley | Cotton | 0.25 |
| Colleton | Corn | 0.25 |
| Colleton | Soybeans | 0.25 |
| Colleton | Cotton | 0.25 |
| Colleton | DblCropSoybeans_Oats | 0.25 |
| Colleton | DblCropWinWht_Soybeans | 0.25 |
| Colleton | Peanuts | 0.25 |
| Dorchester | Soybeans | 0.25 |
| Dorchester | Corn | 0.25 |
| Dorchester | Cotton | 0.25 |
| Dorchester | DblCropWinWht_Soybeans | 0.25 |
| Dorchester | Peanuts | 0.25 |
| Hampton | Sod_GrassSeed | 0.25 |
| Hampton | DblCropWinWht_Soybeans | 0.25 |
| Hampton | Peanuts | 0.5 |
| Jasper | Sod_GrassSeed | 0.25 |
| Jasper | Corn | 0.25 |
| Jasper | Soybeans | 0.25 |
| Kershaw | Corn | 0.25 |
| Kershaw | Soybeans | 0.25 |
| Kershaw | DblCropWinWht_Soybeans | 0.25 |
| Kershaw | Pecans | 0.25 |
| Kershaw | Sod_GrassSeed | 0.25 |
| Newberry | DblCropWinWht_Soybeans | 0.25 |
| Newberry | Corn | 0.25 |
| Newberry | Peaches | 0.25 |
| Newberry | WinterWheat | 0.25 |
| Newberry | Soybeans | 0.25 |
| Newberry | DblCropWinWht_Sorghum | 0.25 |
| Newberry | DblCropBarley_Sorghum | 0.25 |
| Newberry | DblCropBarley_Corn | 0.25 |
| Newberry | Cotton | 0.25 |
| Newberry | DblCropSoybeans_Oats | 0.25 |
| Newberry | DblCropWinWht_Corn | 0.25 |

## Table 3c (cont.) South Carolina Crop Adjustment Factors

| County / State | Crop | Area Adjustment Factor |
|---|---|---|
| Anderson | WinterWheat | 0.25 |
| Anderson | DblCropWinWht_Soybeans | 0.25 |
| Anderson | Soybeans | 0.25 |
| Anderson | Corn | 0.25 |
| Anderson | Sorghum | 0.25 |
| Anderson | Barley | 0.25 |
| Anderson | DblCropWinWht_Sorghum | 0.25 |
| Lancaster | DblCropWinWht_Soybeans | 0.25 |
| Lancaster | Corn | 0.25 |
| Lancaster | Soybeans | 0.25 |
| Lancaster | Sod_GrassSeed | 0.25 |
| Lancaster | WinterWheat | 0.25 |

| County / State | Crop | Area Adjustment Factor |
|---|---|---|
| Statewide | | |
| Statewide | Peanuts | 0.3 |
| Statewide | Cotton | 0.3 |
| Statewide | Corn | 0.3 |
| Statewide | Soybeans | 0.3 |
| Statewide | OtherHay_NonAlfalfa | 0 |

**Table 4a Alabama Irrigation Estimates by County**

| County | Alabama Irrigated Areas | | | |
|---|---|---|---|---|
| | Adjusted Irrigaed Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| Barbour | 3,024 | 1.36 | 2.40 | 3.39 |
| Bullock | 3,257 | 2.00 | 3.11 | 4.10 |
| Chambers | 255 | 0.05 | 0.09 | 0.13 |
| Dale | 3,062 | 1.36 | 2.38 | 3.36 |
| Elmore | 2,504 | 1.30 | 2.18 | 2.99 |
| Geneva | 3,458 | 1.32 | 2.43 | 3.58 |
| Henry | 4,567 | 2.45 | 4.03 | 5.38 |
| Houston | 13,701 | 4.68 | 9.49 | 14.29 |
| Lee | 1,019 | 0.85 | 1.26 | 1.69 |
| Macon | 3,148 | 2.58 | 4.04 | 5.49 |
| Montgomery | 1,487 | 0.59 | 1.02 | 1.40 |
| Pike | 3,189 | 1.18 | 2.03 | 2.80 |
| Randolph | 207 | 0.05 | 0.11 | 0.15 |
| Russell | 2,803 | 1.71 | 3.01 | 4.29 |
| Tallapoosa | 688 | 0.34 | 0.62 | 0.87 |
| **Total** | **46,370** | **21.8** | **38.2** | **53.9** |

**Table 4b Florida Panhandle Irrigation Estimates by County**

| County | Florida Panhandle Irrigated Areas | | | |
|---|---|---|---|---|
| | Adjusted Irrigaed Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| Bay | 1,163 | 1.55 | 2.18 | 2.92 |
| Calhoun | 1,793 | 0.90 | 1.64 | 2.31 |
| Dixie | 2,493 | 0.64 | 1.30 | 1.93 |
| Escambia | 3,515 | 1.51 | 3.01 | 4.57 |
| Gadsden | 2,135 | 1.96 | 2.83 | 3.57 |
| Holmes | 3,366 | 1.50 | 2.71 | 3.97 |
| Jackson | 21,027 | 11.52 | 20.21 | 29.34 |
| Jefferson | 3,022 | 1.51 | 2.22 | 2.80 |
| Lafayette | 5,514 | 1.50 | 3.01 | 4.29 |
| Leon | 726 | 0.43 | 0.63 | 0.80 |
| Liberty | 425 | 0.22 | 0.35 | 0.47 |
| Madison | 4,331 | 1.67 | 2.80 | 3.81 |
| Okaloosa | 507 | 0.27 | 0.44 | 0.65 |
| Santa Rosa | 1,307 | 1.13 | 1.76 | 2.42 |
| Wakulla | 566 | 0.41 | 0.59 | 0.75 |
| Walton | 608 | 0.53 | 0.86 | 1.24 |
| Washington | 1,145 | 0.80 | 1.34 | 1.94 |
| **Total** | **53,644** | **28.1** | **47.9** | **67.8** |

**Table 4c Georgia Irrigation Estimates by County**

| County | Georgia Irrigated Areas | | | |
|---|---|---|---|---|
| | Adjusted Irrigaed Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| Appling | 7,911 | 5.43 | 7.52 | 9.59 |
| Atkinson | 7,337 | 6.10 | 8.05 | 9.96 |
| Bacon | 6,860 | 6.31 | 8.40 | 10.72 |
| Baker | 40,600 | 28.27 | 40.17 | 51.71 |
| Banks | 6 | 0.00 | 0.00 | 0.00 |
| BenHill | 7,694 | 5.58 | 7.83 | 9.76 |
| Berrien | 15,848 | 11.20 | 15.82 | 20.52 |
| Bibb | 166 | 0.06 | 0.14 | 0.19 |
| Bleckley | 13,282 | 9.06 | 13.63 | 17.85 |
| Brantley | 728 | 0.42 | 0.57 | 0.74 |
| Brooks | 21,786 | 13.06 | 18.78 | 24.09 |
| Bryan | 122 | 0.15 | 0.21 | 0.26 |
| Bulloch | 17,599 | 10.43 | 17.40 | 23.14 |
| Burke | 25,669 | 17.52 | 26.56 | 34.22 |
| Butts | 45 | 0.06 | 0.08 | 0.09 |
| Calhoun | 29,062 | 18.43 | 26.28 | 33.41 |
| Candler | 6,454 | 3.85 | 6.25 | 8.19 |
| Carroll | 297 | 0.41 | 0.54 | 0.66 |
| Chatham | 44 | 0.06 | 0.08 | 0.10 |
| Cherokee | 72 | 0.07 | 0.10 | 0.12 |
| Clarke | 107 | 0.22 | 0.28 | 0.31 |
| Clay | 7,631 | 5.71 | 7.88 | 9.93 |
| Clinch | 3,292 | 2.90 | 4.37 | 5.56 |
| Cobb | 7 | 0.01 | 0.01 | 0.02 |
| Coffee | 26,065 | 17.70 | 24.72 | 30.95 |
| Colquitt | 47,928 | 31.69 | 46.49 | 58.21 |
| Columbia | 45 | 0.07 | 0.09 | 0.11 |
| Cook | 16,077 | 13.01 | 17.92 | 22.35 |
| Coweta | 207 | 0.04 | 0.08 | 0.10 |
| Crawford | 6,693 | 5.16 | 8.05 | 10.66 |
| Crisp | 29,631 | 23.71 | 32.71 | 41.94 |
| Dawson | 177 | 0.08 | 0.15 | 0.22 |
| Decatur | 71,148 | 47.03 | 67.79 | 85.39 |
| Dodge | 15,998 | 13.25 | 18.77 | 23.90 |
| Dooly | 45,583 | 38.31 | 51.48 | 64.90 |
| Dougherty | 18,731 | 19.73 | 26.99 | 34.28 |

**Table 4c (cont.) Georgia Irrigation Estimates by County**

| County | Georgia Irrigated Areas | | | |
|---|---|---|---|---|
| | Adjusted Irrigaed Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| Early | 53,178 | 34.01 | 49.95 | 64.01 |
| Echols | 2,892 | 1.50 | 2.08 | 2.60 |
| Effingham | 1,144 | 1.20 | 1.72 | 2.09 |
| Elbert | 322 | 0.20 | 0.30 | 0.41 |
| Emanuel | 5,135 | 4.87 | 6.54 | 8.23 |
| Evans | 7,074 | 4.48 | 7.28 | 9.59 |
| Fayette | 164 | 0.08 | 0.15 | 0.22 |
| Forsyth | 149 | 0.11 | 0.15 | 0.21 |
| Franklin | 161 | 0.08 | 0.12 | 0.16 |
| Fulton | 11 | 0.02 | 0.02 | 0.02 |
| Glascock | 89 | 0.07 | 0.10 | 0.13 |
| Grady | 16,199 | 8.97 | 13.62 | 17.69 |
| Greene | 46 | 0.07 | 0.09 | 0.11 |
| Gwinnett | 60 | 0.07 | 0.10 | 0.12 |
| Habersham | 272 | 0.14 | 0.27 | 0.39 |
| Hall | 108 | 0.03 | 0.06 | 0.08 |
| Hancock | 312 | 0.15 | 0.29 | 0.42 |
| Harris | 21 | 0.04 | 0.04 | 0.05 |
| Hart | 934 | 0.68 | 0.91 | 1.20 |
| Henry | 206 | 0.18 | 0.24 | 0.32 |
| Houston | 10,499 | 9.93 | 13.22 | 16.59 |
| Irwin | 33,509 | 25.02 | 34.50 | 43.52 |
| Jackson | 114 | 0.11 | 0.15 | 0.19 |
| Jasper | 165 | 0.21 | 0.30 | 0.37 |
| JeffDavis | 11,060 | 9.63 | 12.92 | 15.67 |
| Jefferson | 19,862 | 15.85 | 21.93 | 27.46 |
| Jenkins | 8,313 | 6.65 | 9.52 | 12.21 |
| Johnson | 2,046 | 1.82 | 2.48 | 3.14 |
| Jones | 72 | 0.06 | 0.10 | 0.14 |
| Lamar | 577 | 0.59 | 0.83 | 1.04 |
| Lanier | 6,516 | 5.04 | 7.05 | 8.85 |
| Laurens | 8,590 | 7.34 | 10.15 | 13.02 |
| Lee | 42,099 | 31.84 | 43.84 | 55.16 |
| Liberty | 32 | 0.01 | 0.03 | 0.04 |
| Long | 997 | 0.58 | 0.96 | 1.27 |
| Lowndes | 8,032 | 4.14 | 6.44 | 8.40 |

**Table 4c (cont.) Georgia Irrigation Estimates by County**

| County | Georgia Irrigated Areas | | | |
|---|---|---|---|---|
| | Adjusted Irrigaed Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| Lumpkin | 105 | 0.06 | 0.09 | 0.13 |
| Macon | 28,232 | 26.31 | 36.03 | 46.49 |
| Marion | 5,978 | 3.61 | 5.58 | 7.72 |
| McDuffie | 798 | 1.00 | 1.29 | 1.56 |
| Meriwether | 326 | 0.07 | 0.25 | 0.33 |
| Miller | 59,710 | 36.59 | 56.59 | 73.27 |
| Mitchell | 81,812 | 52.16 | 78.77 | 102.80 |
| Monroe | 148 | 0.14 | 0.22 | 0.29 |
| Montgomery | 2,115 | 1.81 | 2.44 | 3.11 |
| Morgan | 986 | 0.88 | 1.33 | 1.71 |
| Muscogee | 3 | 0.01 | 0.01 | 0.01 |
| Newton | 212 | 0.14 | 0.24 | 0.34 |
| Oconee | 710 | 0.95 | 1.33 | 1.55 |
| Oglethorpe | 353 | 0.33 | 0.47 | 0.59 |
| Paulding | 2 | 0.00 | 0.00 | 0.01 |
| Peach | 12,020 | 6.74 | 10.93 | 15.17 |
| Pierce | 10,965 | 6.86 | 9.48 | 11.88 |
| Pike | 1,165 | 0.59 | 1.12 | 1.60 |
| Pulaski | 21,835 | 21.51 | 27.35 | 33.65 |
| Putnam | 361 | 0.23 | 0.39 | 0.52 |
| Quitman | 505 | 0.35 | 0.48 | 0.62 |
| Rabun | 21 | 0.01 | 0.02 | 0.03 |
| Randolph | 29,775 | 20.47 | 29.22 | 37.44 |
| Richmond | 113 | 0.06 | 0.13 | 0.18 |
| Schley | 2,176 | 1.49 | 2.17 | 2.93 |
| Screven | 21,247 | 11.86 | 20.83 | 27.86 |
| Seminole | 50,473 | 30.56 | 46.43 | 59.94 |
| Stewart | 5,139 | 3.33 | 5.04 | 6.71 |
| Sumter | 46,995 | 38.45 | 53.04 | 67.57 |
| Talbot | 14 | 0.01 | 0.02 | 0.02 |
| Tattnall | 18,483 | 9.82 | 16.20 | 21.71 |
| Taylor | 3,936 | 3.30 | 4.80 | 6.35 |
| Telfair | 8,101 | 6.29 | 9.14 | 11.55 |
| Terrell | 29,725 | 20.10 | 28.38 | 36.46 |
| Thomas | 13,448 | 6.53 | 10.19 | 13.28 |
| Tift | 24,208 | 17.77 | 25.43 | 32.72 |

**Table 4c (cont.) Georgia Irrigation Estimates by County**

| County | Georgia Irrigated Areas | | | |
|---|---|---|---|---|
| | Adjusted Irrigaed Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| Toombs | 12,529 | 9.37 | 12.85 | 16.04 |
| Towns | 6 | 0.00 | 0.01 | 0.01 |
| Treutlen | 1,426 | 1.67 | 2.20 | 2.74 |
| Troup | 1 | 0.00 | 0.00 | 0.00 |
| Turner | 32,358 | 22.15 | 31.91 | 40.33 |
| Twiggs | 2,430 | 2.22 | 3.05 | 3.78 |
| Union | 77 | 0.03 | 0.05 | 0.07 |
| Upson | 922 | 0.38 | 0.90 | 1.42 |
| Walton | 916 | 1.00 | 1.49 | 1.87 |
| Ware | 4,244 | 2.48 | 3.48 | 4.47 |
| Washington | 7,319 | 7.05 | 9.65 | 12.21 |
| Wayne | 4,626 | 2.75 | 3.99 | 5.06 |
| Webster | 12,238 | 8.39 | 12.34 | 16.10 |
| Wheeler | 4,552 | 4.36 | 5.85 | 7.30 |
| White | 36 | 0.03 | 0.04 | 0.05 |
| Wilcox | 17,801 | 14.52 | 20.02 | 24.91 |
| Wilkes | 26 | 0.04 | 0.05 | 0.06 |
| Wilkinson | 75 | 0.06 | 0.09 | 0.12 |
| Worth | 48,326 | 33.64 | 48.86 | 61.80 |
| **Total** | **1,363,966** | **971** | **1,397** | **1,786** |

**Table 4d South Carolina Irrigation Estimates by County**

| County | South Carolina Irrigated Areas | | | |
|---|---|---|---|---|
| | Adjusted Irrigaed Area (acres) | Wet Year[1] (mgd) | Average Year (mgd) | Dry Year[1] (mgd) |
| Abbeville | 576 | 0.23 | 0.37 | 0.54 |
| Aiken | 3,384 | 1.15 | 2.10 | 2.97 |
| Allendale | 6,949 | 3.25 | 5.55 | 7.48 |
| Anderson | 884 | 0.40 | 0.67 | 1.03 |
| Bamberg | 4,927 | 2.40 | 3.86 | 5.16 |
| Barnwell | 4,062 | 1.30 | 2.45 | 3.53 |
| Beaufort | 2,104 | 0.83 | 1.52 | 2.17 |
| Berkeley | 1,391 | 0.50 | 0.80 | 1.09 |
| Calhoun | 8,292 | 2.30 | 4.97 | 7.77 |
| Charleston | 2,424 | 0.81 | 1.41 | 2.02 |
| Chester | 1,954 | 0.75 | 1.29 | 1.89 |
| Clarendon | 4,709 | 2.02 | 3.40 | 4.81 |
| Colleton | 2,489 | 1.11 | 1.75 | 2.34 |
| Dorchester | 1,999 | 0.52 | 1.02 | 1.49 |
| Edgefield | 4,272 | 1.48 | 3.07 | 4.39 |
| Fairfield | 905 | 0.34 | 0.55 | 0.77 |
| Greenwood | 466 | 0.23 | 0.39 | 0.57 |
| Hampton | 2,848 | 1.35 | 2.32 | 3.12 |
| Jasper | 1,040 | 0.69 | 1.09 | 1.41 |
| Kershaw | 1,672 | 0.78 | 1.23 | 1.71 |
| Lancaster | 756 | 0.48 | 0.70 | 0.95 |
| Laurens | 1,074 | 0.45 | 0.75 | 1.13 |
| Lexington | 10,516 | 4.49 | 7.29 | 10.60 |
| McCormick | 210 | 0.08 | 0.16 | 0.24 |
| Newberry | 1,718 | 0.90 | 1.44 | 2.08 |
| Oconee | 1,331 | 0.55 | 1.02 | 1.54 |
| Orangeburg | 22,032 | 7.67 | 14.05 | 20.41 |
| Pickens | 359 | 0.06 | 0.13 | 0.20 |
| Richland | 3,031 | 1.51 | 2.54 | 3.68 |
| Saluda | 5,570 | 2.13 | 4.27 | 6.18 |
| Sumter | 10,179 | 4.90 | 7.97 | 11.44 |
| Union | 643 | 0.35 | 0.57 | 0.76 |
| **Total** | **114,766** | **46.02** | **80.67** | **115.47** |