



OSTDS and Decentralized Systems Wastewater Treatment Program

PHASE I REPORT

Planning Area Characteristics

Dr. Julie Harrington, Director
Ms. Jinjin Guo, Research Assistant
Center for Economic Forecasting and Analysis
The Florida State University
Innovation Park
2035 E. Paul Dirac Dr.
Suite 129 Morgan Bldg
Tallahassee Fl 32310

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Contents

I.	Introduction	1
II.	Impetus for Study	4
III.	Objectives of Phase I	4
IV.	Information about Wakulla County	5
V.	Future Land Use	11
VI.	OSTDS Data & Information	13
VII.	Water & Soil Characteristics.....	20
VIII.	Wakulla County’s Plan for OSTDS.....	27
IX.	Conclusions & Recommendations	28
X.	References.....	29
	Appendix A: City of Tallahassee Septic System Mapping Methodology	30

Tables

Table 1.	Demographic and Housing Market Data for Crawfordville, FL.....	5
Table 2.	Wakulla County Employment.....	6
Table 3.	Business Patterns of Wakulla County	8
Table 4.	Per Capita Personal Income	10
Table 5.	Existing vacant, not vacant, and public lands for unincorporated Wakulla County, 2005	11
Table 6.	Sewer and Water Utility Customer Base for Wakulla County as of October 18, 2006.....	14

Figures

Figure 1.	Population Growth Rate Comparisons	7
Figure 2.	Wakulla County Median Family Income levels	9
Figure 3.	Wakulla County Future Land Use,2006.....	12
Figure 4.	Wakulla County Sewer Locations.....	14
Figure 5:	Location of Wastewater Treatment Facility Locations	15
Figure 6.	Wakulla County OSTDS Map	16
Figure 7:	Location of OSTDS in Leon and Wakulla Counties	16
Figure 8:	Property Appraiser Map of Wakulla	18
Figure 9:	Number of OSTDS Repairs in Wakulla and Leon Counties	18
Figure 10:	New OSTDS Installations.....	19
Figure 11:	Wakulla Springshed and Recharge Area.....	20
Figure 12.	Wakulla County Soils Map	22
Figure 13.	Wakulla County Sinkholes Locations	23
Figure 14.	Wakulla County Hydrogeological Map.....	24
Figure 16.	Wakulla County Soil/Hydrogeology/Hydrographic/ Sinkholes/Sewers Map.....	26

I. Introduction

Based on the 1990 United States Census, approximately 26% of Florida's population was served by onsite sewage treatment and disposal systems (OSTDS). There are approximately 2.5 million OSTDS in Florida and 9,330 OSTDS in Wakulla County¹. OSTDS include standard septic tank-subsurface disposal systems, aerobic treatment units, and other site-specific engineered or performance-based wastewater treatment systems. Decentralized wastewater systems are groupings of two or more homes or businesses, but not entire communities, served by a single treatment and/or disposal means.

Due to the prevalence of disease, regulation of septic tank systems began in the 1920's. Regulations have been revised extensively since then based on scientific research and technological advances. Many septic tank systems have been grandfathered in along the state regulatory revision processes, permitting many systems to remain that do not or cannot meet current day standards. Many of Florida's county governments have ordinances related to specific regulation of OSTDS. Some of these local ordinances are primarily references to the minimum state standards promulgated by the Florida Department of Health (DOH), while many now go beyond the minimum standards.

Although some individuals might claim that central sewers connected to central treatment are the most effective treatment systems, this is not always the case. These types of systems are not affordable in some communities from a capital investment standpoint and from a long-term operation and maintenance standpoint. Centralized sewer projects are often cost prohibitive in rural areas, such as portions of Wakulla County, due to the distance between individual properties and the size of the properties. It is important for communities to evaluate all of the OSTDS, decentralized, and central sewerage options available to them in order to end up with alternatives that best provide the most effective means of achieving environmental and public health goals at reasonable costs to the citizens.

Communities, too, should evaluate long-term maintenance management strategies for all wastewater systems within their jurisdictions. No system should be considered as "out of sight, out of mind" in the 21st century.

¹ Onsite Sewage Treatment and Disposal Systems Statistical Data, Florida Department of Health, 2003-2004.
<http://www.doh.state.fl.us/environment/ostds/statistics/NewInstallations.htm>



In 1999, Governor Bush issued a letter to the Secretaries of the Departments of Environmental Protection, Health, and Community Affairs. The letter directed the agencies to undertake a study related to onsite sewage treatment as described here:

“Therefore, I am directing all three of you, or your designees, to undertake a study of the effects of onsite sewage disposal systems on the public health and water resources of Florida. The study will consider whether the current planning and permitting processes applied to the use, design and placement of onsite sewage disposal systems, adequately address the impacts, including the cumulative impacts, of onsite sewage disposal systems, and whether these processes can be modified to reduce costs and increase predictability, efficiency and effectiveness.”

In addition, the Governor instructed the Secretaries to consult with local government officials and planners, developers, and environmentalists concerning the study.

Wakulla Spring is the third largest spring in Florida and one of the best known. The spring is the centerpiece of Wakulla Springs State Park, considered to be a crown jewel of the Florida state parks. Wakulla Spring is also a national cultural treasure being the site of Indian artifacts, and the setting for classic movies such as the original Tarzan series and the Creature from the Black Lagoon. There was a Wakulla Springs Initiative sponsored by 1000 Friends of Florida in May 2005 that publicly addressed water pollution problems in the Wakulla Springs watershed. The following is a link to the general and specific findings of the septic tank committee that was formed at the workshop.

http://www.1000fof.org/FL_Panhandle_Initiative/SPRINGS/May2005Wakulla%20Results.asp

The Initiative workshop septic tank committee also developed the following action plan items in May 2005. The Wakulla Springs Protection Work Group continues today to address the septic systems, stormwater, and sprayfield issues associated with ensuring good water quality for the Wakulla Springs watershed.

Purpose: To reduce nutrients in the groundwater flowing to Wakulla Spring.

1. The Department of Health will continue research and monitoring to verify the effectiveness of Best Management Practices.
2. Pursue funding for a Florida Aquifer Vulnerability Assessment (FAVA) project for the portion of the Wakulla Springs Basin south of the Cody Scarp. AGI Inc. has submitted a project proposal.

3. Draft an ordinance to establish setback criteria for sinkholes and karst windows.
4. Plan a workshop to introduce local officials, local health department staffs, and interested citizens to the various OSTDS management entity possibilities. Speakers will have experience with different levels of management.
5. Develop a regional sewage treatment plan to include southern Leon and northern Wakulla counties. The plan will indicate the areas to be served with central sewer systems and areas where septic tanks will be permanent.
6. Meet with DEP/Division of State Lands to determine the status of the Wakulla Springs Protection Zone land acquisition project and encourage additional acquisition.

The Wakulla County assistance project addresses the intentions of the Governor's 1999 request as well as the needs of Wakulla County citizens and officials. The project involves a multi-disciplinary team of government and university personnel and citizens (represented by the citizen's advisory group). The goal of the project is to ensure that Wakulla County is provided with the best available information for decision making regarding the use of onsite sewage treatment and disposal systems and decentralized wastewater systems. The ultimate choices for wastewater treatment and disposal will remain in the hands of Wakulla County citizens and officials. FSU's Center for Economic Forecasting and Analysis (CEFA) staff is providing guidance through expert facilitation in helping the Wakulla County community develop their OSTDS and decentralized systems use program.

The Wakulla County assistance project has a two-pronged approach. The first is oriented toward collection of existing data on planning area characteristics and assisting with the acquisition of new data. The second approach focuses on development of options for a 10-year management program for use of OSTDS and decentralized wastewater systems in Wakulla County. The majority of this project's efforts comprised synthesizing the planning area characteristics into a scientifically sound and economically feasible site-specific management plan for unsewered areas of Wakulla County. In addition, CEFA will act as a link for Wakulla County officials and citizens by providing a springboard to other universities and government agencies and to private businesses and other pertinent sources of information and assistance useful for Wakulla County in accomplishing the goals of the project.



II. Impetus for Study

The growth rate of population of the state of Florida is about 8.4% from 2000 to 2004; while Wakulla county's growth rate is about 18.2% in the same period, which is more than 2 times as the whole state's level and it is ranked No. 6 among 68 counties. Development in Wakulla County has increased significantly in the last ten years and is projected to increase dramatically in the ensuing years. Increased numbers of OSTDS have contributed to increased nutrient loads. Risks associated with the growing number of standard onsite systems used in the karst environment of Wakulla County include increasing nitrate and phosphorus loadings, as well as of bacteria and virus loadings, to ground and surface waters. These loadings can result in deterioration of water quality. Health risks can increase as well as unwanted algal blooms and nuisance aquatic vegetation in area surface waters. Coastal and riverine fisheries may be negatively impacted and, hence, the quality of life for homeowners in Wakulla County. However, great potential economic benefits flow from eco-tourist wildlife viewing, hunting and fishing. In Florida, Wildlife viewing annually generates \$2.861 billion in economic impact and creates 28,427 jobs; taken together, hunting, freshwater fishing, wildlife viewing, and saltwater fishing generate approximately \$1.575 billion in retail sales. Sales tax benefits to the state that are directly associated with Florida's fish and wildlife-related recreation are estimated at \$79.6 million. The Economic impact of visitors to Wakulla Springs is about \$22.2 million on area's economy.

It is critical to define the current and future OSTDS and decentralized systems use requirements for Wakulla County in order to address these concerns. It is important to address these matters before the county's growth exacerbates the potential problems. Determining sound wastewater practices for Wakulla County for the next several years can help guide-planning decisions made by county government and developers.

III. Objectives of Phase I

The availability of this data determined, in large part, the success of this assistance project The following list describes many of the objectives upon which this project was centered. Thanks to the assistance of numerous key people from Wakulla County and from various other governmental agencies and private entities, the most appropriate existing data was located for use in this project.



- Soils, geology and hydrogeology (both countywide and site specific for each planning unit), distance to springs, sinks and cavern flow systems
- Sensitive areas - lands, including public lands, planned for no or low density development
- Population demographics and forecasts for planning units
- Current and planned water service areas
- Current and planned sewer service areas
- GIS Property Appraiser maps, including property values
- Economic factors - employment, industries (tourism, agriculture, real estate, government, etc.), income levels, vision for county of income stream for its citizens and for the county government tax revenues, etc.
- Land use plan/vision for 10-year or 20-year period (2006-2016)
- County's adopted comprehensive plan for relevance to OSTDS and decentralized systems use.

IV. Information about Wakulla County

In this section, we will take a step back to discuss the area of Wakulla County itself. In order to better understand the significance of the septic systems within Wakulla County, it is critical to establish the background information, such as demographics and socio-economic characteristics of the county. Table 1 provides insight into the composition of Wakulla County.

Table 1. Demographic and Housing Market Data for Crawfordville, FL

Population Statistics	Wakulla	Florida
Population, 2005 estimate	28,212	17,789,864
Population, 2000	22,863	15,982,378
Persons under 5 years old, 2004	1,496	1,091,292
Persons under 18 years old, 2004	6,175	4,003,290
Persons 65 years old and over, 2004	3,196	2,927,583
Female persons, 2004	12,951	8,872,763
Living in same house in 1995 and 2000, pct 5 yrs old & over	55.80%	48.90%
Education Statistics	Wakulla	Florida
High school graduates, percent of persons age 25+, 2000	78.40%	79.90%
Bachelor's degree or higher, pct of persons age 25+, 2000	15.70%	22.30%
Persons with a disability, age 5+, 2000	4,047	3,274,566
Household Statistics	Wakulla	Florida
Housing units, 2004	11,484	8,009,427
Housing units, net change, April 1 2000 to July 1 2004	1,664	706,319
Housing units, percent change, April 1 2000 to July 1 2004	16.90%	9.70%
Homeownership rate, 2000	84.20%	70.10%
Median value of owner-occupied housing units, 2000	\$96,200	\$105,500
Households, 2000	8,450	6,337,929



Persons per household, 2000	2.57	2.46
Median household income, 2003	\$37,995	\$38,985
Persons below poverty, percent, 2003	11.00%	13.00%
Business Statistics	Wakulla	Florida
Personal income, 2004 (\$1000)	618,414	547,107,143
Personal income per capita, 2004	\$22,842	\$31,469
Civilian Labor force, 2005	13,547	8,735,500
Average earnings per job, 2004	\$39,735	\$32,625
Total number of firms, 1997	1,536	1,301,921
Geography Statistics	Wakulla	Florida
Land area, 2000 (square miles)	607	53,927
Persons per square mile, 2000	37.7	296.4

Source: Bureau of Economic Analysis, Bureau of Labor Statistics, National Agricultural Statistics Service, National Center for Health Statistics, U.S. Census Bureau (<http://www.fedstats.gov/qf/states/12/12129.html>)

Wakulla County has a relatively high median family income when compared with other rural counties in Florida and a lower population density than both Florida. However, as mentioned previously, the growth rate of population is increasing dramatically.

To further illustrate this point, Wakulla County's employment will be presented in Table 2. In the past decade, Wakulla has experienced strong and steady employment growth. This signifies numerous things. First of all, Wakulla County is growing steadily. This point is reinforced further by observing population data in Figure 1. As seen in Figure 1, the growth rates of Wakulla and Leon counties maintain a similar trend as in Florida, but Wakulla County is experiencing a greater rate of growth than Leon County and Florida in general. Secondly, the demand for land is increasing which implies that the need for an improved septic system is necessary to sustain such economic development. To not improve the system would be detrimental to not only Wakulla Springs, but also to the quality of life.



Table 2. Wakulla County Employment

Year	Employment		Unemployment	
	Total	% Change* Year Ago	Rate	Unit Change* Year Ago
1990	7,522	-	3.8	-
1991	7,796	3.7	4.6	0.9
1992	7,984	2.4	5	0.4
1993	8,301	4	4.4	-0.6
1994	8,347	0.6	4.6	0.2
1995	9,084	8.8	4.1	-0.4
1996	9,483	4.4	4.3	0.2
1997	10,048	6	3.8	-0.6
1998	10,889	8.4	3.5	-0.3
1999	11,094	1.9	3.2	-0.3
2000	11,322	2.1	3.2	0
2001	11,798	4.2	3.6	0.3
2002	12,016	1.8	4.3	0.7
2003	12,487	3.9	4.1	-0.2
2004	12,560	0.6	3.5	-0.6
2005	13,177	4.9	2.7	-0.8

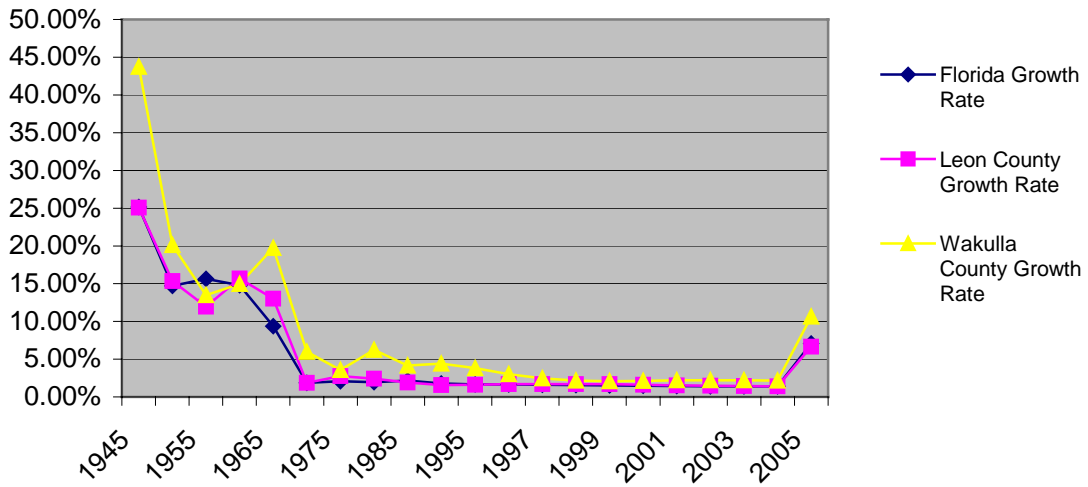
* Change between 2 continuous years.

Source: CEFA & BEBR (2002)

Nitrate concentrations in waters discharging from Wakulla Springs have increased threefold in the past 25 years, from roughly 80,000 kilograms of nitrogen per year in the mid- to late 1970s to 270,000 kilogram of nitrogen per year currently. Isotopic analyses indicate that both inorganic and organic sources contribute to the nitrogen load discharged by the spring. Assuming that nutrient removal efficiencies remain at present levels for the OSTDS, the nitrogen load discharged through the springs will likely increase as the populations of Leon and Wakulla counties increase.



Figure 1. Population Growth Rate Comparisons



Source: CEFA & MyFlorida

Table 3 indicates the main employment industries in Wakulla County. The total labor force in Wakulla County is 13,547 representing approximately 48% of the total population.



Table 3. Business Patterns of Wakulla County

* 2002 County Business Patterns

Number of Establishments by Employment-size class

<i>Industry</i>	Total	'1-4'	'5-9'	'10-19'	'20-49'	'50-99'	'100-249'	'250-499'	'500-999'	'1000 +'
Total	247	160	44	23	14	3	2	1	0	0
Forestry, fishing, hunting, and agriculture	4	3	0	1	0	0	0	0	0	0
Utilities	2	1	0	0	1	0	0	0	0	0
Construction	52	41	10	0	1	0	0	0	0	0
Manufacturing	6	4	0	0	1	0	0	1	0	0
Wholesale trade	6	5	1	0	0	0	0	0	0	0
Retail trade	40	20	14	3	2	0	1	0	0	0
Transportation & warehousing	4	1	1	1	1	0	0	0	0	0
Information	3	0	1	1	0	0	1	0	0	0
Finance & insurance	13	8	3	0	1	1	0	0	0	0
Real estate & rental & leasing	12	10	1	1	0	0	0	0	0	0
Professional, scientific & technical services	32	23	4	4	1	0	0	0	0	0
Admin, support, waste mgt, remediation ser	13	10	1	2	0	0	0	0	0	0
Educational services	1	1	0	0	0	0	0	0	0	0
Health care and social assistance	19	10	1	6	1	1	0	0	0	0
Arts, entertainment & recreation	3	1	1	0	1	0	0	0	0	0
Accommodation & food services	14	5	1	3	4	1	0	0	0	0
Other services (except public administration)	21	16	4	1	0	0	0	0	0	0
Unclassified establishments	2	1	1	0	0	0	0	0	0	0

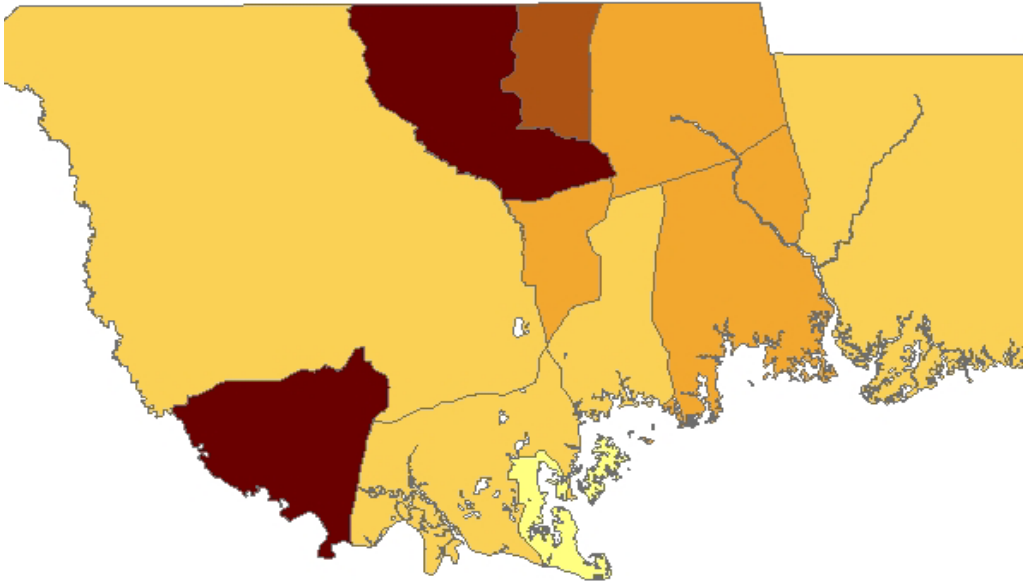
* 2002 County Business Patterns

Number of Establishments by Employment-size class

Source: U.S. Census Bureau



Figure 2. Wakulla County Median Family Income levels



Legend



Source: US Census Data, 2000 and CEFA

Table 4 indicates that the per capita personal income of Wakulla County is below the average level of Florida. As shown in the figure above, the families with lowest median family income level concentrate in the southeastern part of the county. The highest median family income levels are based in the southwestern and north central areas of the county.

Table 4. Per Capita Personal Income

	Wakulla	Florida
2002	\$ 21,373	\$ 29,709
2003	\$ 21,716	\$ 30,128
2004	\$ 22,842	\$ 31,469

Source: <http://www.eflorida.com>



V. Future Land Use

In addition to Wakulla County's rising population, the issue of Wakulla County's future land use is also of significance to the increased nutrient loads



for increased OSTDS. Future land use generally revolves around the protection of Wakulla Springs and other local water bodies based on current local trends towards significantly stricter environmental local ordinances.

The need to protect the springs is not only because of this; Wakulla Springs is one of the most visited tourist sites in the area. It defines the area and contributes to the county's overall character. Therefore, the need to protect the quality of Wakulla Springs affects not only the local population but those who visit the springs.

The following table and figure depict the current land uses in Wakulla County.

Table 5 Existing vacant, not vacant, and public lands for unincorporated Wakulla County, June 2006

Land Use Category	Vacant Acres	Not Vacant Acres	Public Acres	Total Acres
Agriculture	68,222.08	3,999.07	2,646.26	74,867.41
Commercial	58.86	4.55		63.41
Conservation	186.40	3,359.98	235,993.48	239,539.86
Industrial	141.39	1,688.43	64.51	1,894.33
Rural 1	12,969.32	17,137.38	397.79	30,504.49
Rural 2	8,241.09	15,898.66	552.25	24,692.00
Rural 3	433.00	42.23		475.23
Urban 1	1,634.59	6,041.67	110.05	7,786.31
Urban 2	457.00	960.86	121.71	1,539.57
Total	92,343.73	49,132.83	239,886.05	381,362.61

Source: WilsonMiller, June 2006

Wakulla County Commissioners established the Wakulla County Citizens Advisory Committee for Infrastructure Development to:

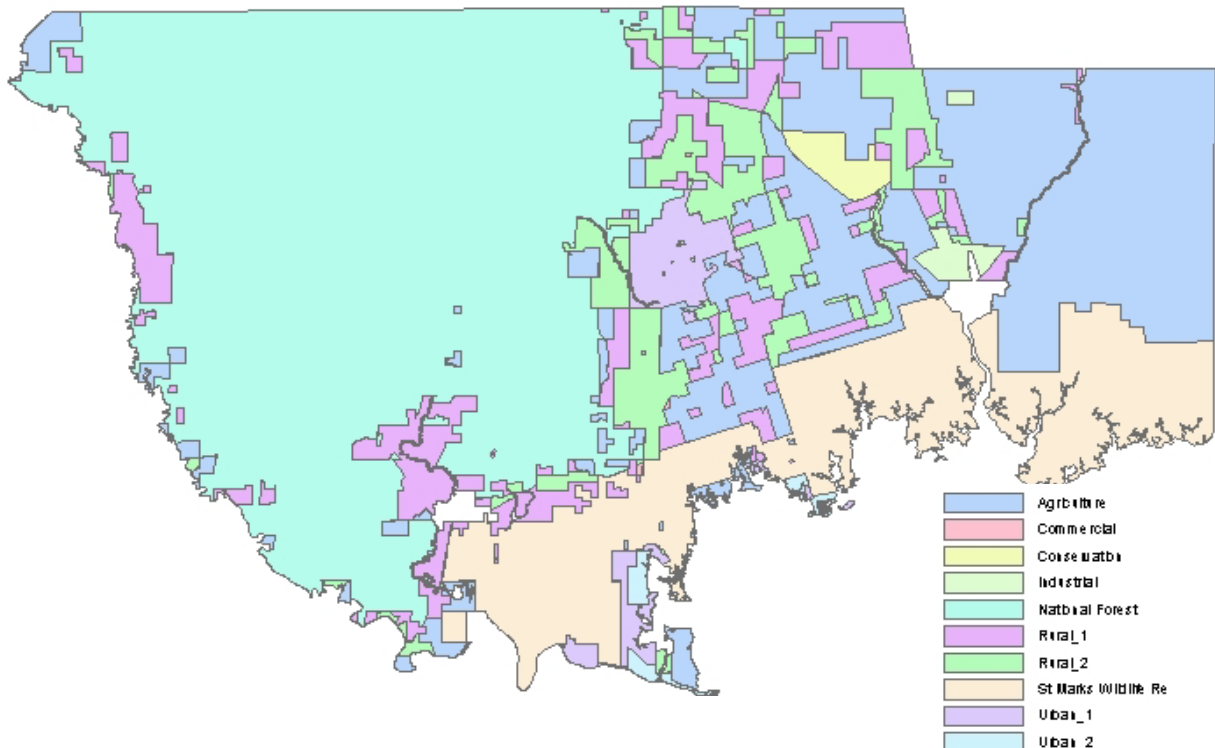
- a) Determine the condition of the county's infrastructure including roads,



- stormwater, water, and sewer systems
- b) Identify infrastructure needing repair or replacement
 - c) Estimate how much improvements will cost; and
 - d) Identify possible sources of funding.

Figure 3 displays the Future Land Use element from Wilson Miller.

Figure 3. Wakulla County Future Land Use, 2006.



Source: Wilson Miller Data in FLUM report for Wakulla County, 2006

Now having discussed the preliminary issues, the next relevant issue concerns the OSTDS data.



VI. OSTDS Data & Information

Based on the aforementioned objectives, listed below are some pertinent available data. The data was compiled from a multitude of sources, ranging from local public officials and agencies, to online sources. The data presented was selected as the best data available for OSTDS analysis.

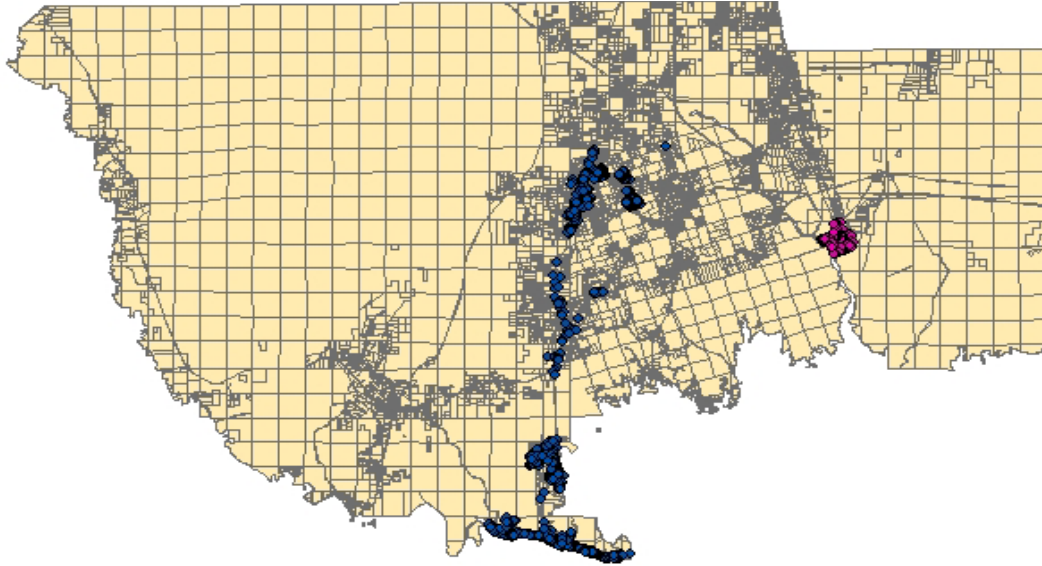
Figure 6 describes the location of sewer systems throughout Wakulla County. There are currently three main sewer utilities serving Wakulla County as depicted in Table 4. Wakulla County utility has Panacea Area Water System (PAWS) handling their sewer billing. Talquin Electric handles a section of Spring Creek and the majority of Shell Point. The City of Tallahassee handles the sewer utility portion of St. Marks utility.

Figure 7 serves to highlight the extensive network of septic systems distributed through Wakulla County. FSU CEFA manually entered the new septic permit records obtained as hard copies from the Wakulla County Department of Health (from 1979 to 1997), for a total of 9,476 septic permit records. The City of Tallahassee also tallied the existing septic systems in Wakulla County, based on a series of assumptions (see Appendix A), with a grand total of 11,436 septic systems.

In addition, there is also general information supplied regarding Wakulla County itself. This proves to be particularly important, especially to establish the emergence and vast development of Wakulla.



Figure 4. Wakulla County Sewer Locations



Legend

- ◆ PAWS
- ◆ PAWS No Spatial Data
- ◆ St Marks

* PAWS No Spatial has only 111 records, cannot be shown up detailed on the map.

Source: City of Tallahassee, Water Utility Unit, 2006

Created by CEFA

Table 6. Sewer and Water Utility Customer Base for Wakulla County as of October 18, 2006

Water and Sewer Customers	Utilities							
	Wakulla County Utility	Talquin Electric	Panacea Area Water System (PAWS)	City of Tallahassee	Sopchoppy Water	St. Marks	Winco/Southern Water Services***	River Plantation
Water Customers	110	2,387	1,000	608	3,168	229/38**	1,500	NA^
Sewer Customers	1,760	320	NA*	NA	0	229	1,500	47^

Utilities include both residential and commercial customers

* Sewage billing for Wakulla County Utility and some 10 mile radius of Panacea is handled by PAWS

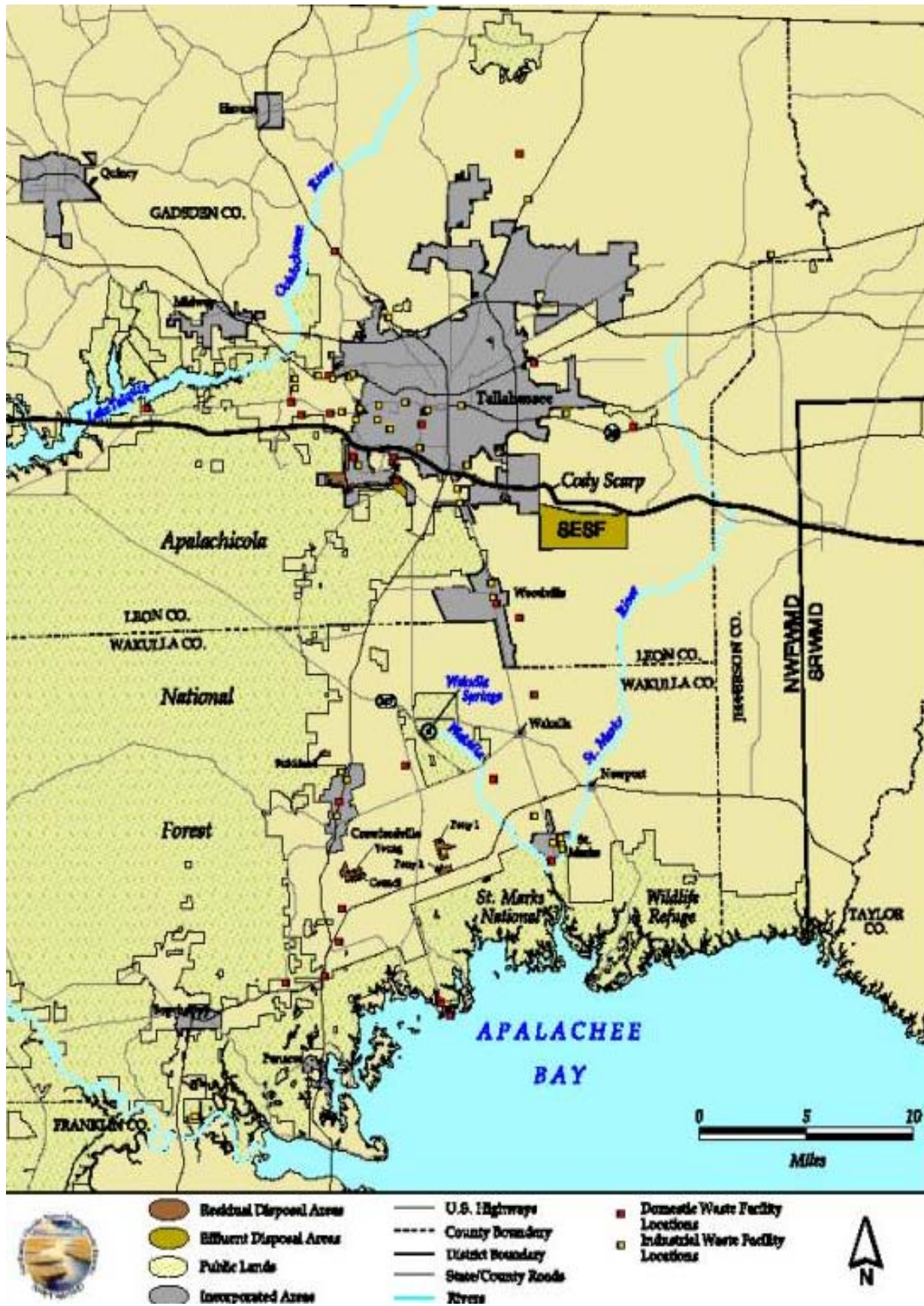
** 229 inside city limits; 38 outside city limits, City of Tall. Water for St. Marks. City of St. Marks handles sewage at Purdom Plant upgraded to 0.150mgd

*** Southern Water Services in Quincy is the utility that services Wakulla Correctional Institution sewer and water, owned by Winco there is expansion capable for 3,000 customers including the commercial printing operation, CSG. Current capacity = 0.450mgd, treating 0.200mgd

^ 67 capacity for sewer, 47 hooked up. There are 109 lots in River Plantation, NA^ 47 are hooked up to City of Tallahassee water.



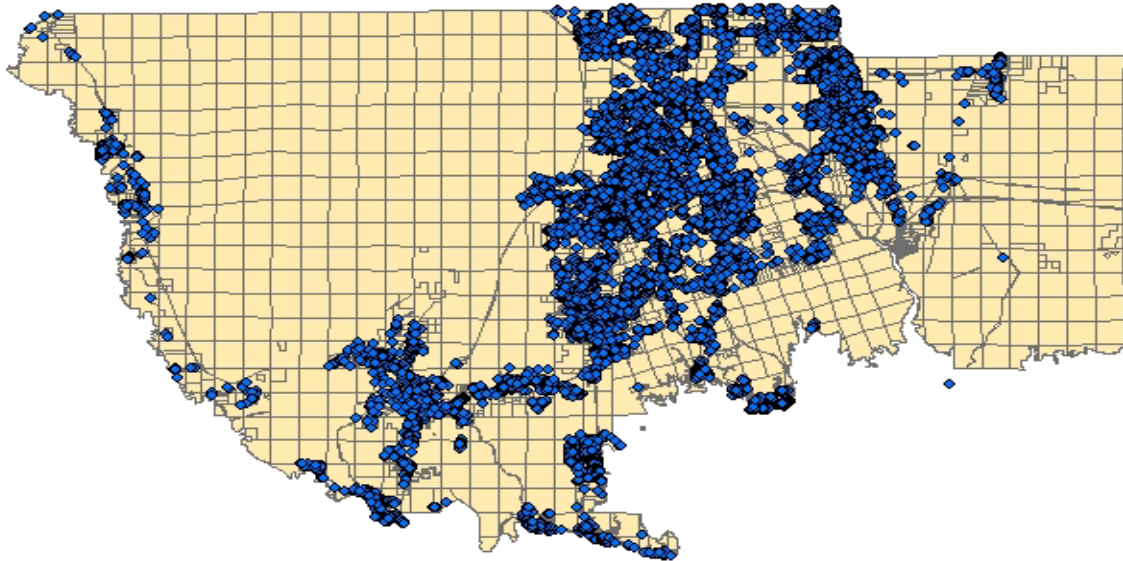
Figure 5: Location of Wastewater Treatment Facility Locations



Source: NFWFMD Nitrate Study, 2002



Figure 6. Wakulla County OSTDS Map

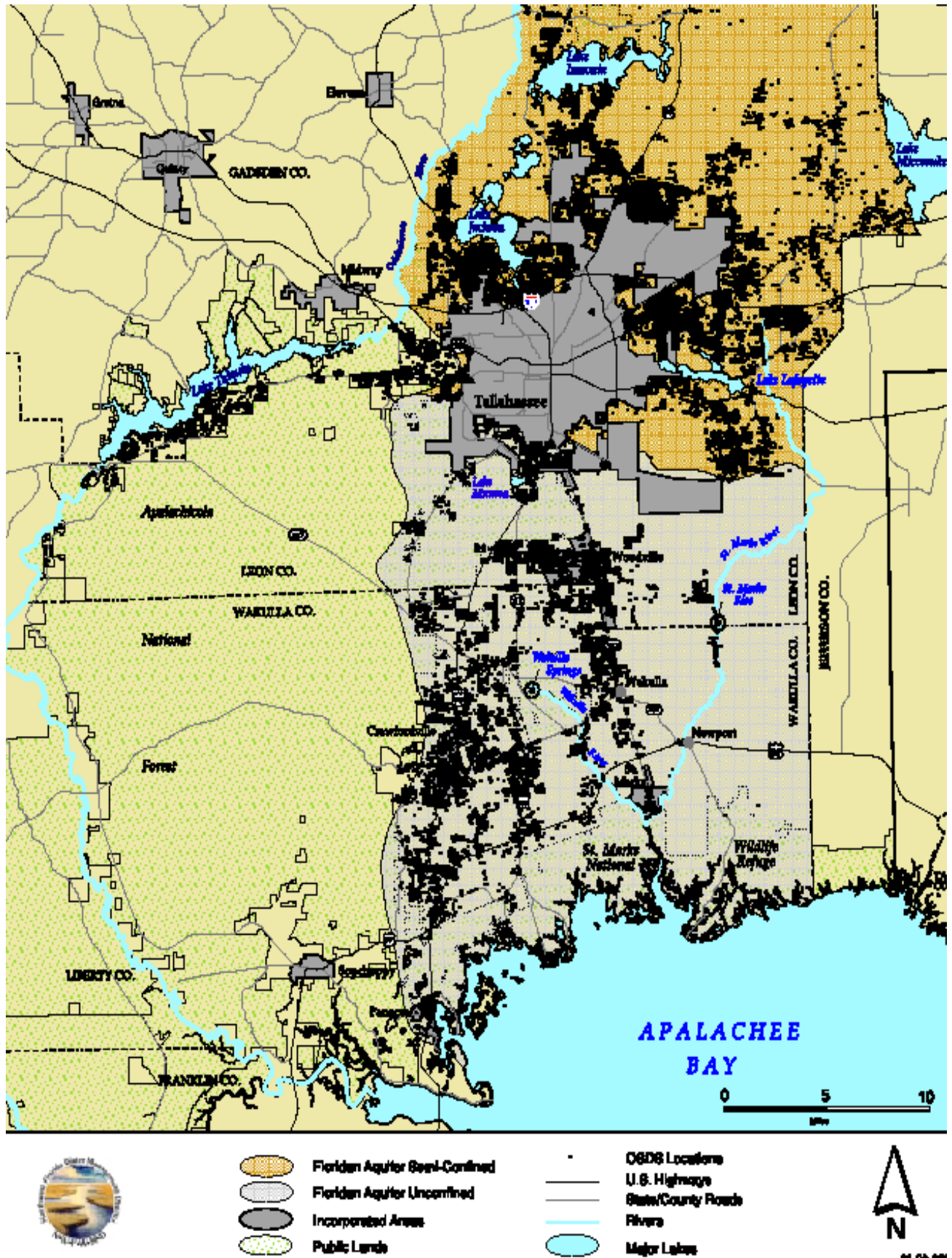


Legend
● OSTDS

Source: City of Tallahassee, Water Utility Unit, 2006
Created by CEFA



Figure 7: Location of OSTDS in Leon and Wakulla Counties

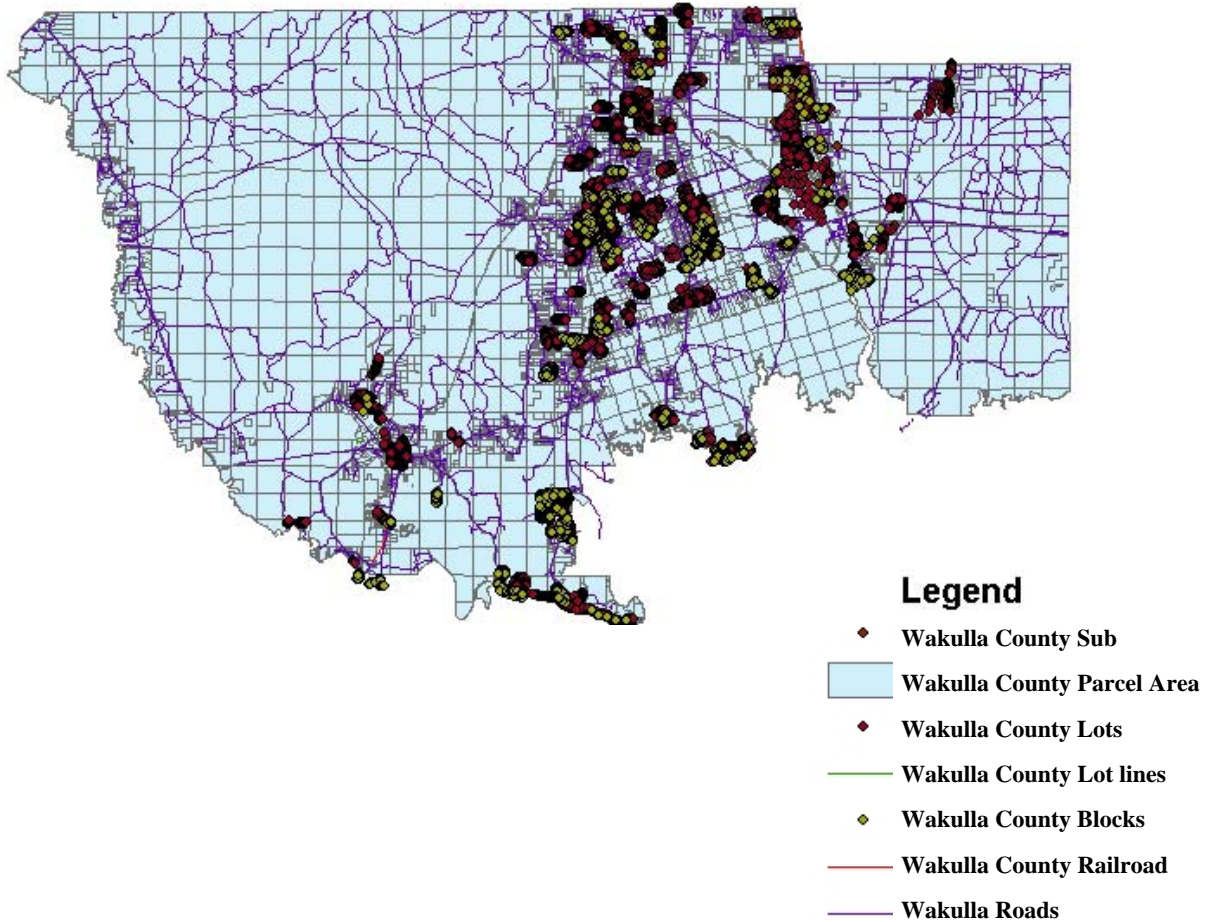


Source: NFWMD Nitrate Study, 2002



The following map (Figure 10) provides insight into the area of Wakulla County itself. The map includes roads, railroads.

Figure 8: Property Appraiser Map of Wakulla

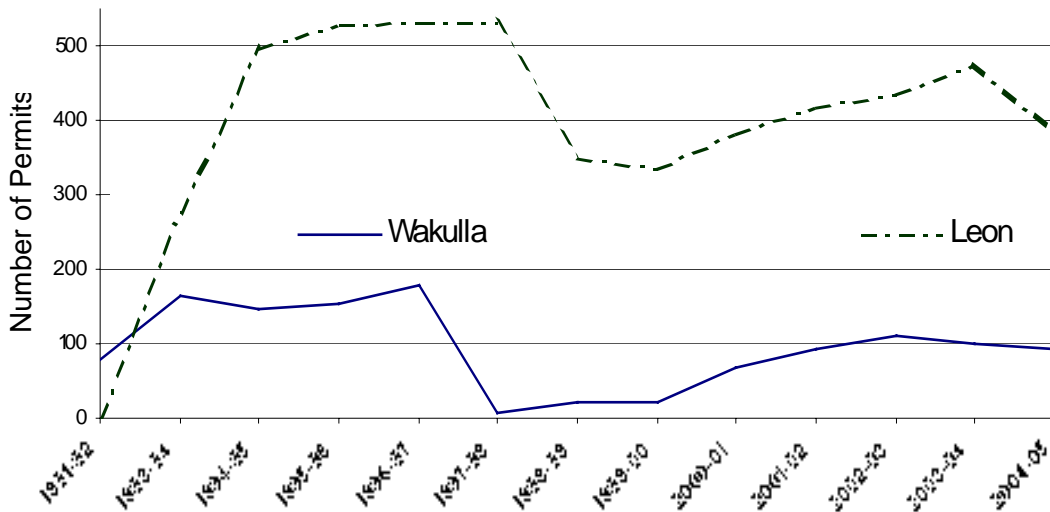


Source: Wakulla Property Appraiser Data, 2006

Having analyzed various maps and charts, no quantitative steps have been taken to demonstrate the importance of the OSTDS. The two graphs (Figure 10 and Figure 11) on the following page provide reference for the current status of Wakulla and Leon counties. The observations are straightforward – Wakulla shares the same trend as Leon County.



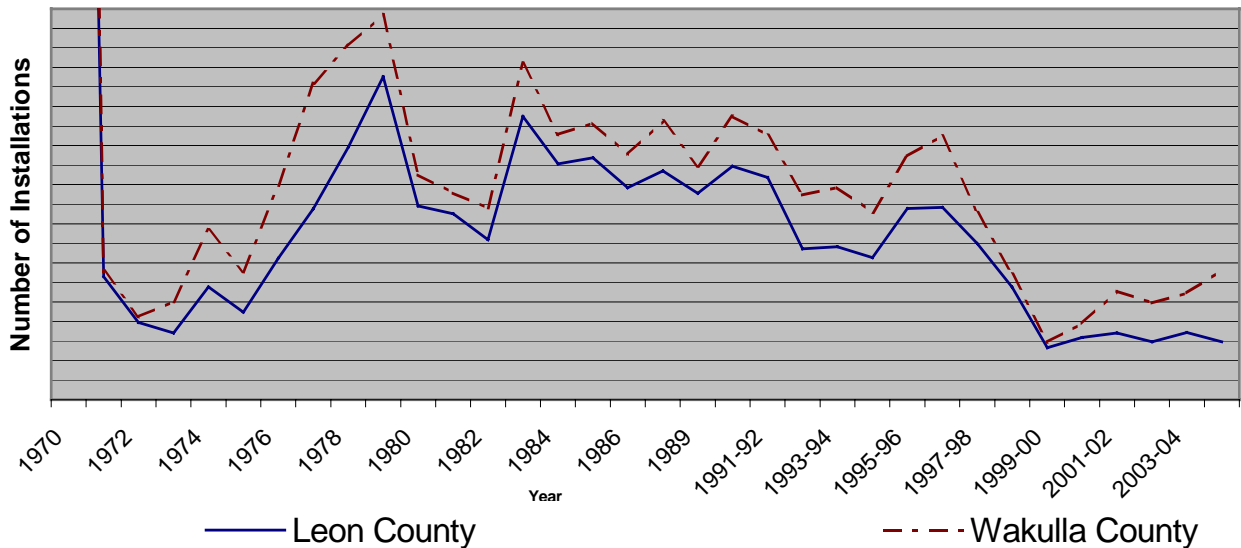
Figure 9: Number of OSTDS Repairs in Wakulla and Leon Counties



Source: Department of Health, 2006

For instance, Wakulla County has *substantially* fewer OSTDS repair permits, not a trend difference, which is usually at least 200% lower than Leon County. This is proportional to the total number of new installations from 1970 – 2005 (according to DOH²) of 9,698 and 37,867 septic systems in Wakulla County and Leon County, respectively. The Wakulla County septic system total is approximately 1/4 that of Leon County.

Figure 10: New OSTDS Installations



Source: Department of Health, 2006

² <http://www.doh.state.fl.us/environment/ostds/statistics/NewInstallations.htm>



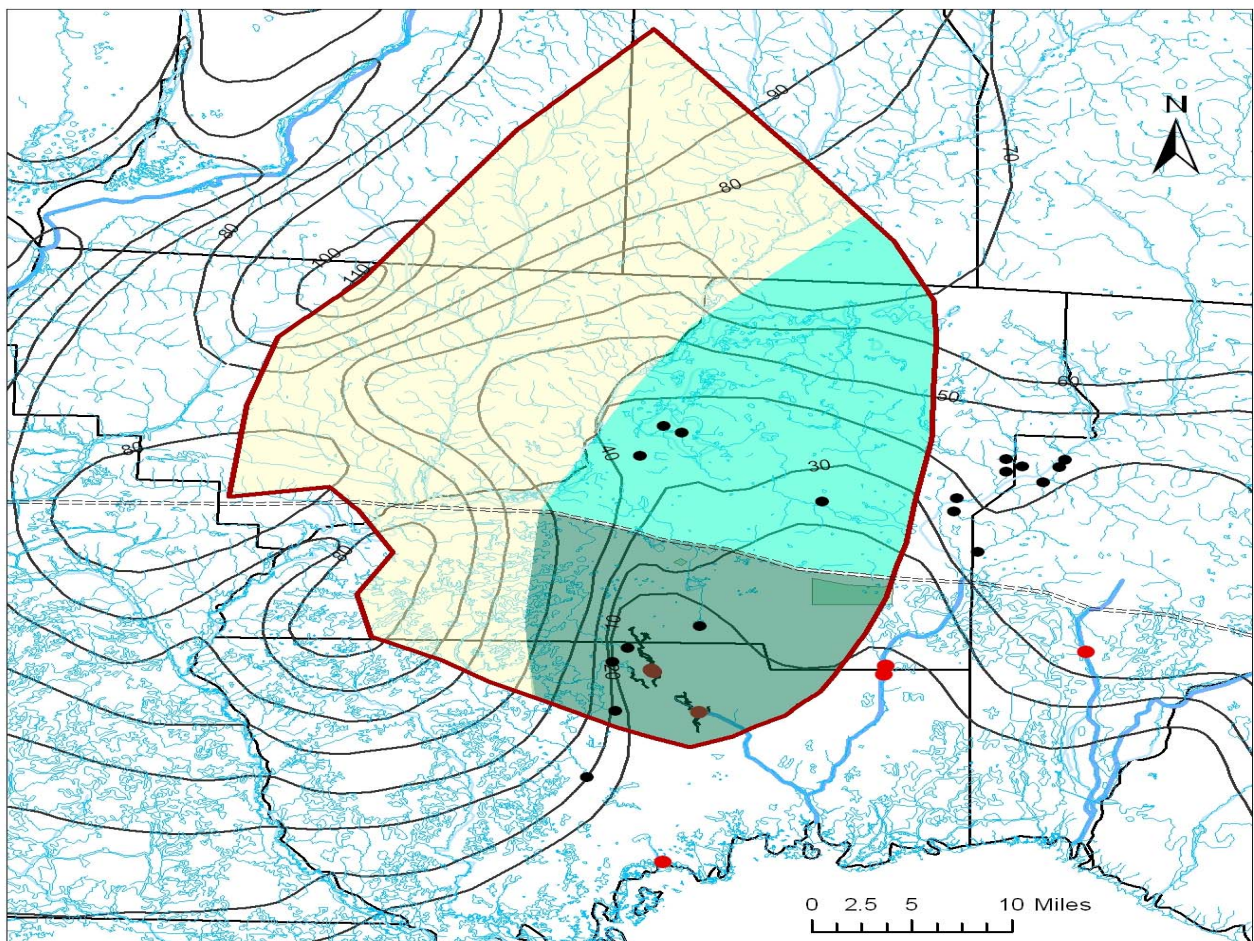
However, Wakulla County has an increasing number of new installations. Taking into consideration the size and development of Wakulla as compared to Leon, and as mentioned previously, the need for better systems is evident.

VII. Water & Soil Characteristics










Evaluating a proposed area in terms of its environmental conditions (climate, geology, slopes, soils, landscape, ground water and surface water aspects), physical features (property lines, wells, hydrologic boundaries structures), and wastewater characteristics provides important information needed to size, select and site the appropriate wastewater treatment system. In section 6, water and soil characteristics of Wakulla County will be discussed.

Figure 12 shows recharge basin for Wakulla Springs. This is a key feature of the information obtained on Wakulla County. The figure shows the vulnerability of the land to human activity.

Figure 11: Wakulla Springshed and Recharge Area



Legend:

	First Magnitude Springs
	Major Sinkhole
	Wakulla Spring springshed and total recharge area. Approximately 1,100 square miles.
	Cody Scarp
	Mapped Caves
	Potentiometric Contour Line, Contour interval 10 feet
	A high recharge rate occurs in this area because the Floridan aquifer is covered by permeable sands and there is a near absence of clays. Numerous sinkholes occur. Approximately 200 square miles.
	A moderate rate of recharge occurs in this area because the clays overlying the Floridan aquifer are relatively thin (20 to 50 feet). At some points the clays are breached by sinkholes. Approximately 300 square miles.
	A very low recharge rate occurs in this area due to a clay layer overlying the Floridan aquifer that is up to several hundred feet thick. Few if any sinkholes. Approximately 600 square miles.

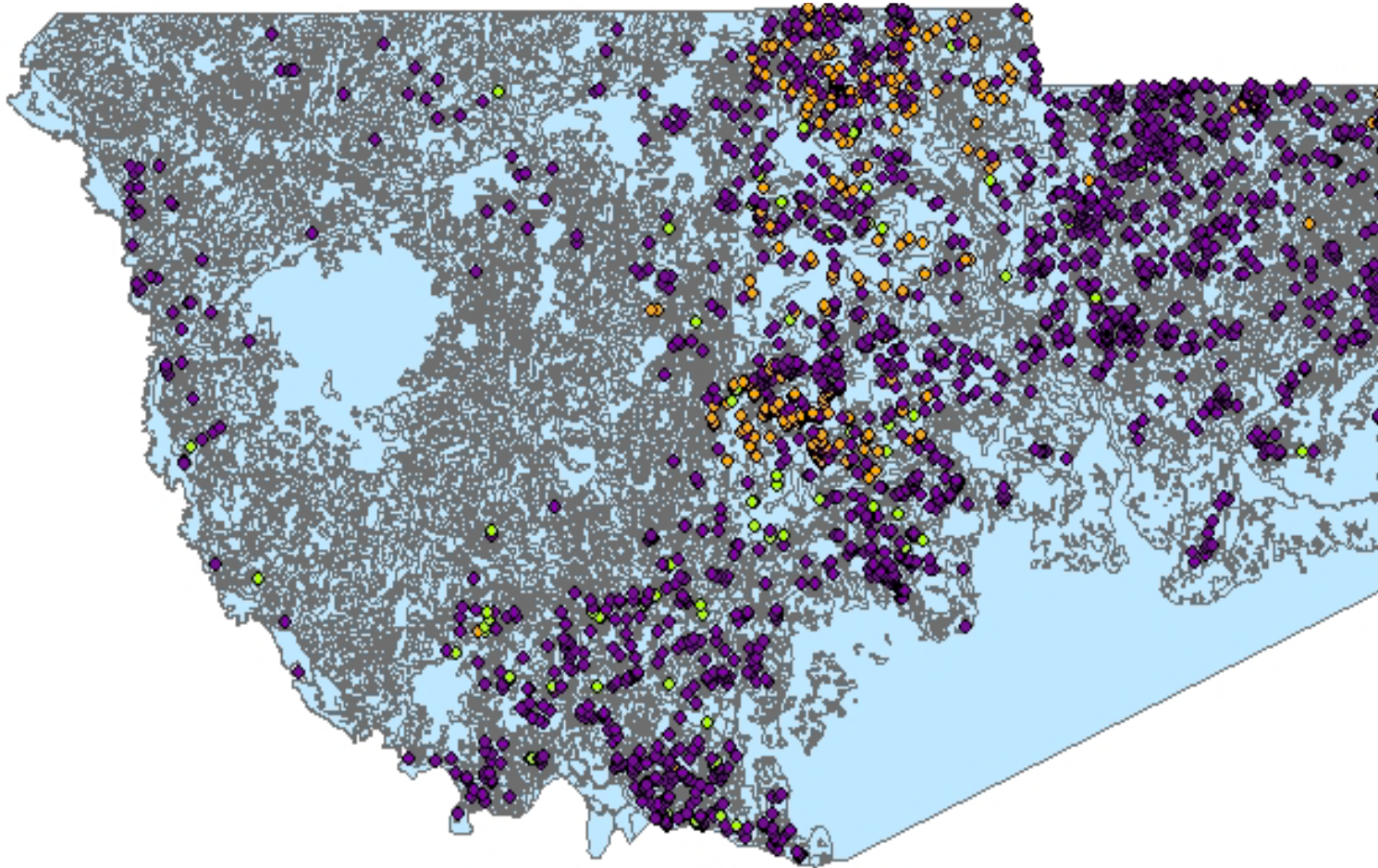
Source: U.S. Geological Survey, Hal Davis, 2006

The following maps show the soil, sinkholes hydrogeology and hydrographic condition of Wakulla County. This geologic data in Figure 14 was developed by the Florida Department of Environmental Protection (FDEP) - Florida Geological Survey (FGS) to carry out agency responsibilities related to management, protection, and development of Florida's natural resources. Although efforts have been made to make the information accurate and useful, the FDEP/FGS assumes no responsibility for errors in the information and does not guarantee that the data are free from errors or inaccuracies.



Figure 12. Wakulla County Soils Map

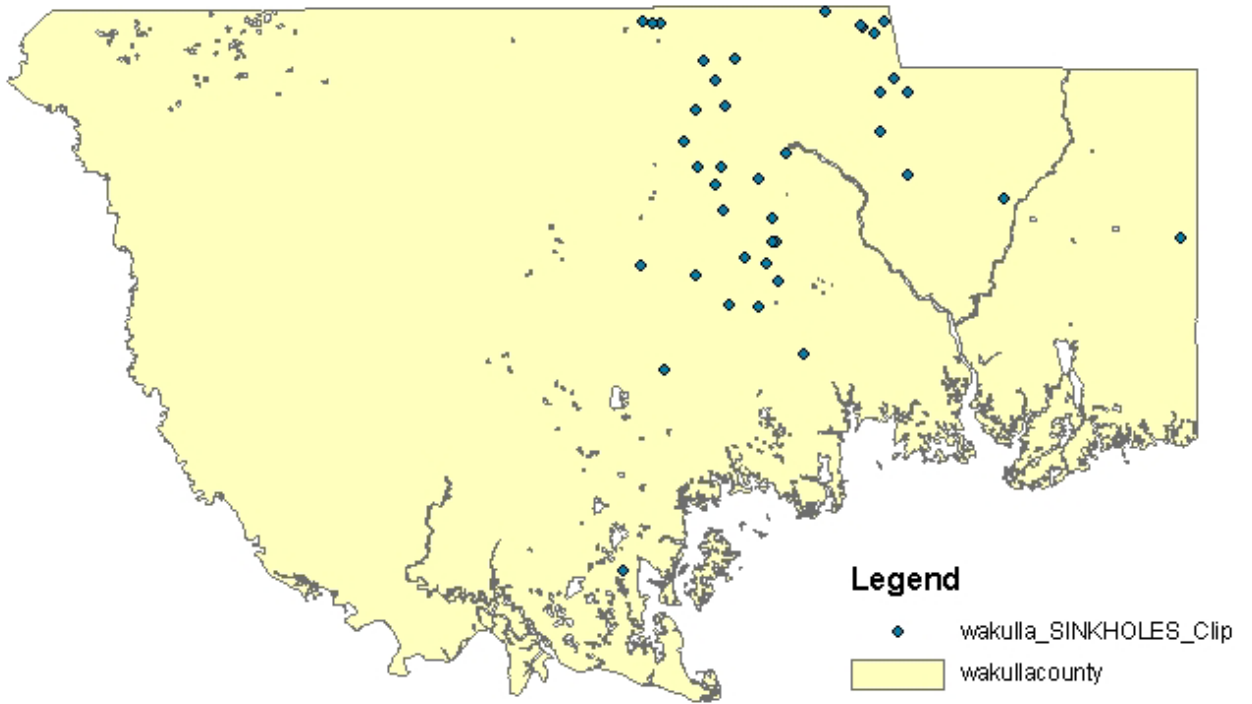
This geologic data was developed by the Florida Department of Environmental Protection (FDEP) – Florida Geological Survey (FGS) to carry out agency responsibility related to management, protection, and development of Florida’s natural resources. Although efforts have been made to make the information accurate and useful, the FEDP/FGS assumes no responsibility for errors in the information and does not guarantee that the data are free from errors or inaccuracies.



Source: Florida Geological Survey (FGS), 1998



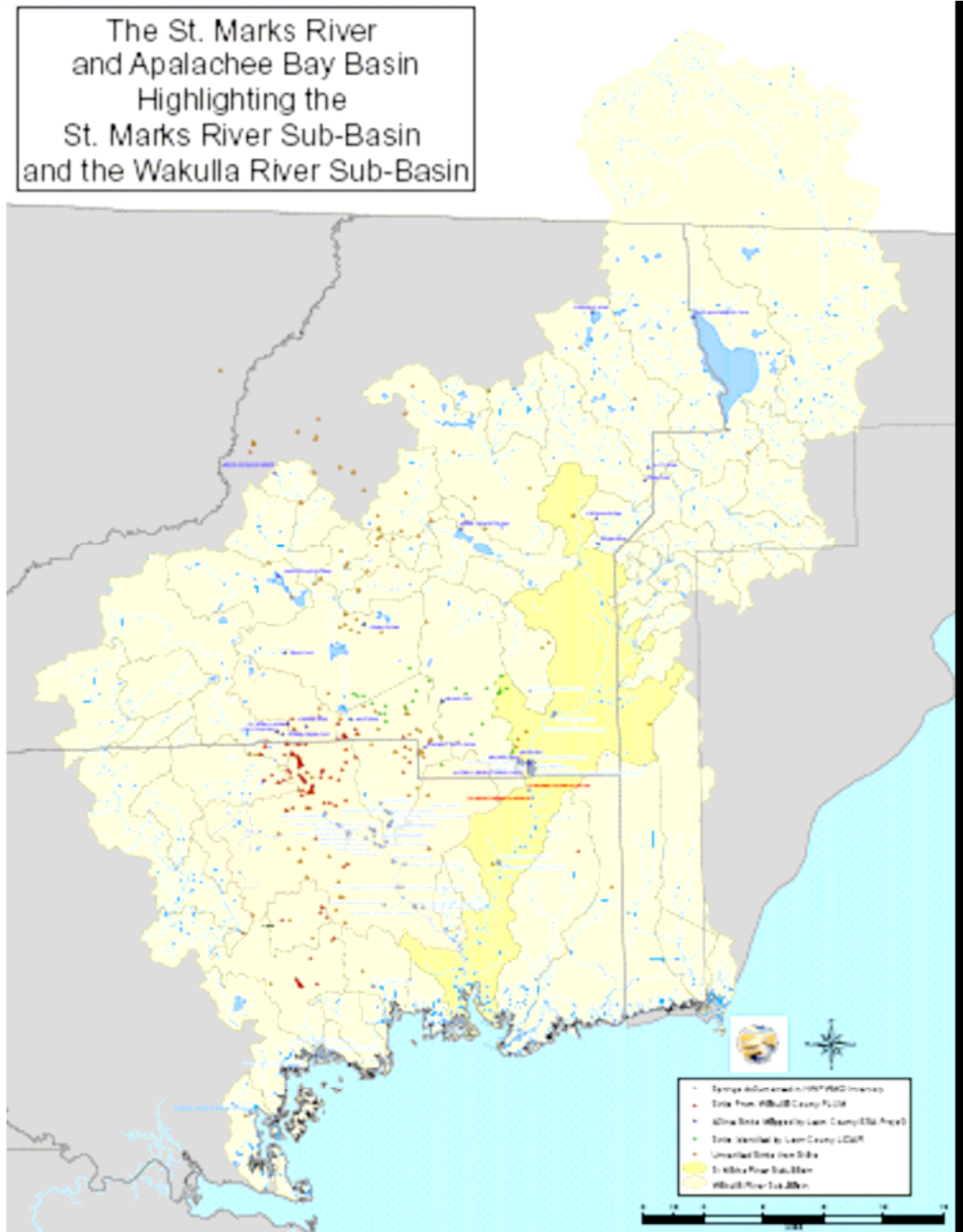
Figure 13. Wakulla County Sinkholes Locations



Source: Florida Geological Survey (FGS), 2006



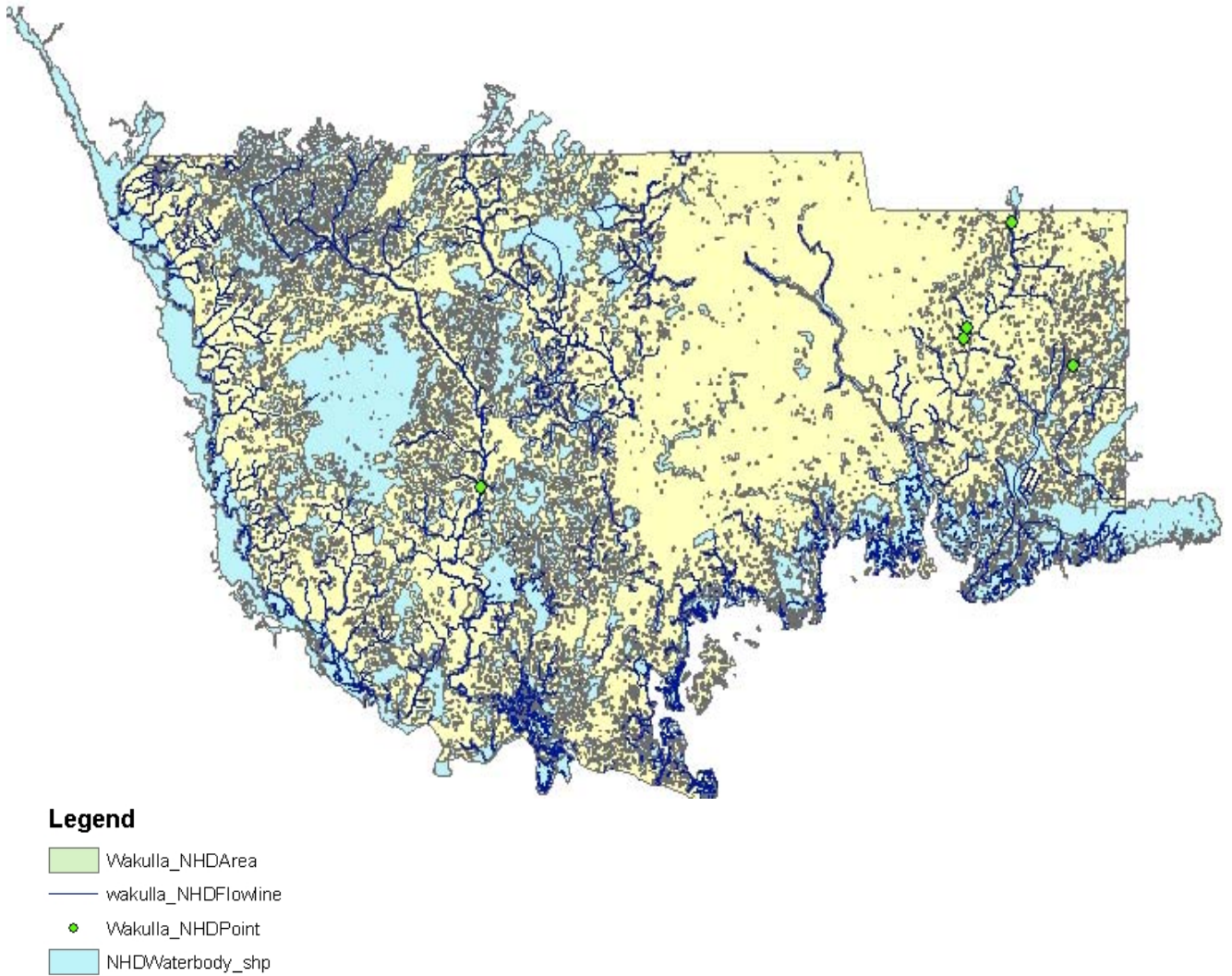
Figure 14. Wakulla County Hydrogeological Map



Source: NWFWMDd, 2006



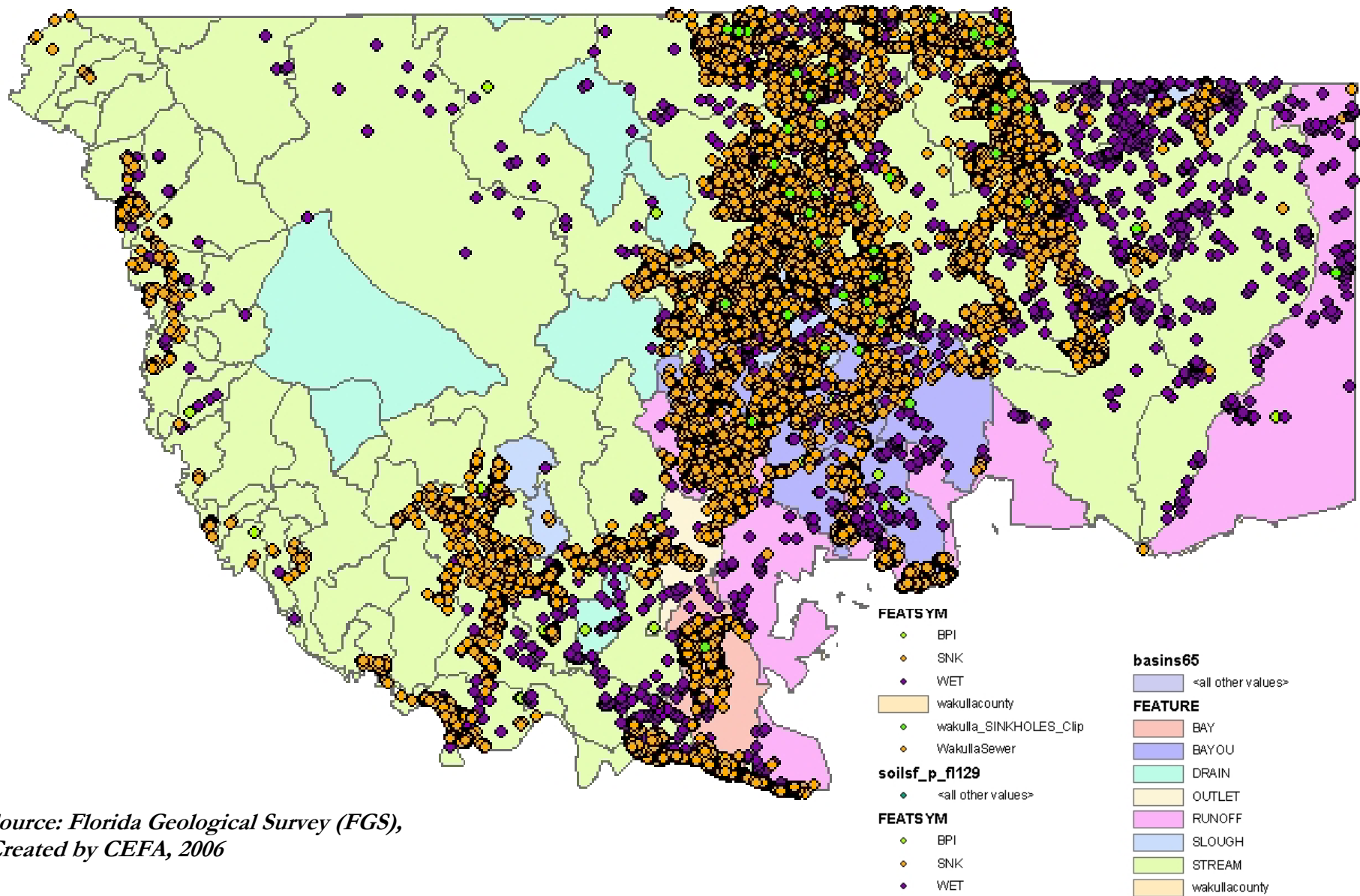
Figure 15. Wakulla County Hydrographic Map



Source: Florida Geological Survey (FGS), 2004



Figure 16. Wakulla County Soil/Hydrogeology/Hydrographic/ Sinkholes/Sewers Map



Source: Florida Geological Survey (FGS),
Created by CEFA, 2006



VIII. Wakulla County's Plan for OSTDS

In early October 2006, Wakulla County adopted a “water quality” ordinance that requires performance based systems in all new development and for existing repairs (Appendix B). An excerpt of that ordinance follows:

Infrastructure Element

OBJECTIVE 1.3: Within one year of the effective date of this plan amendment, The County will implement mandatory requirements for inspections, operations and maintenance of on-site wastewater treatment systems.

Policy 1.3.1: Use of on-site wastewater treatment systems shall be limited to the following conditions:

- a. Existing septic tank and package treatment plants may remain in service until such time as centralized service is made available, or the systems fail to properly perform;
- b. The County shall amend its land development regulations within one year of the effective date of this plan amendment to provide that existing septic systems shall be replaced with performance-based septic systems when the existing system fails or otherwise requires replacement, as determined by the Department of Health. As part of such land development regulations, the County will provide an exception from the requirement of replacing a system with a performance-based septic system if the system's owner has demonstrated to the satisfaction of the County that the user cannot afford to upgrade the system without public funding. If such a demonstration is made, the system's owner must replace the system but a performance-based septic system shall not be required until sources of funding are available to assist those owners who cannot afford to pay for the upgrade;

The County shall diligently seek sources of funding to assist those who cannot afford to upgrade failed systems as required.

- c. Septic systems for new development shall be limited to



performance-based septic systems as certified by the Department of Health;

- d. All existing and new septic systems shall be inspected every three years by a licensed septic system contractor for maintenance or upgrade, and
- e. Use of package treatment plants shall be limited to those with business and management plans approved by the County.

IX. Conclusions & Recommendations

In short, thousands of pages of GIS maps and statistics could be printed out regarding Wakulla County. However, in a world where time is of the essence, brevity is invaluable. Only the most relevant and most current figures could be displayed in this report in order to provide the most suitable framework for analyzing OSTDS.

Concerning Task 1, CEFA would like to make the following recommendations to Wakulla County regarding future steps with respect to the OSTDS planning process:

- In order to properly plan for performance based systems, Wakulla County needs to know what the current OSTDS profile is. There must be an inventory of all existing OSTDS, with location characteristics (parcel id, latitude longitude, etc.) in a database for Wakulla County. CEFA has established an initial database of 9,476 septic permit records that could be used as a baseline for the inventory process.
- Using GIS, create an OSTDS suitability model as the next step. A small group of Wakulla County representatives (e.g., County Commissioner, Planner, Property Appraiser, Public Works Director, County Administrator, Citizen’s Advisory Board) and scientific “experts” (e.g., FGS Geologist, Hydrogeologist, Hydrologist, Water Quality Biologist, Soils, etc.) would comprise this group. The goal would be to establish a set of working criteria/plans for directing OSTDS establishment in Wakulla County. For example, if a certain area (based on current conditions) has been designated “vulnerable” then only performance



based systems could be acceptable for that area. The GIS suitability model would run the certain criteria (for example; all OSTDS on one acre or greater, ½ mile from the cave system, 1 mile from the sinkhole with buffer, etc.) and a map would be drawn that represents the areas where only performance based systems could be acceptable. The rest of the area would allow existing OSTDS to continue.

In the Task 2 report, various options for establishing an efficient OSTDS and methods of funding the transition will be discussed.

X. References

- http://www.homegain.com/local_real_estate/FL/crawfordville.html
- <http://www.EFlorida.com>
- BEBR - University of Florida, Bureau of Economic Business Research
- CEFA - Florida State University, Center for Economic Forecasting and Analysis
- MyFlorida. <http://www.myflorida.com>
- U.S. Census Bureau
- Florida Resources and Environmental Analysis Center - FSU
- Wilson Miller Environmental Consulting, Tallahassee
- City of Tallahassee
- Northwest Florida Water Management District
- Wakulla County Property Appraiser Data
- Florida Department of Health
- Onsite Sewage Treatment and Disposal Systems Statistical Data, Florida Department of Health, 2003-2004.
<http://www.doh.state.fl.us/environment/ostds/statistics/NewInstallations.htm>
- U.S. Geological Survey
- Florida Department of Environmental Protection - Florida Geological Survey
- <http://www.doh.state.fl.us/environment/ostds/researchreports.htm>
- <http://www.epa.gov/owm>

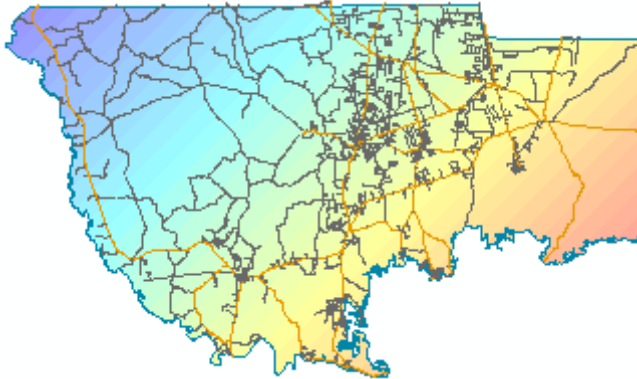


Appendix A: City of Tallahassee Septic System Mapping Methodology

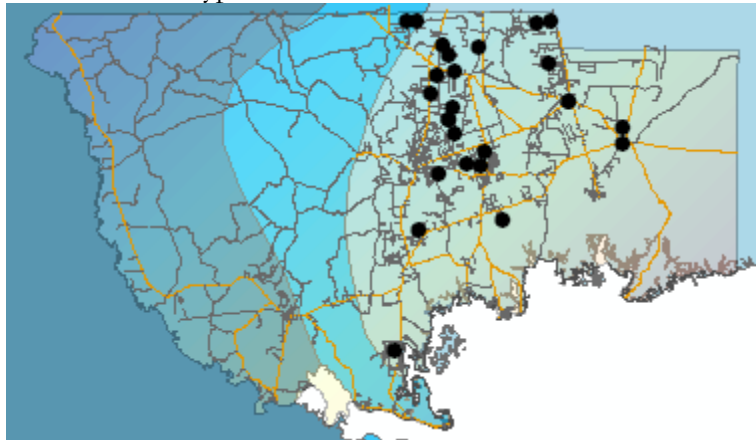
Supplemental Information Sheet to GIS mapping of Potential Onsite Sewage Treatment and Disposal Systems locations within Wakulla County

Derived from combination of:

1. County base data CAD drawings provided by Wakulla County Planning Dept. to the City of Tallahassee on 3/18/02.
 - a. Converted to GIS data by City of Tallahassee.

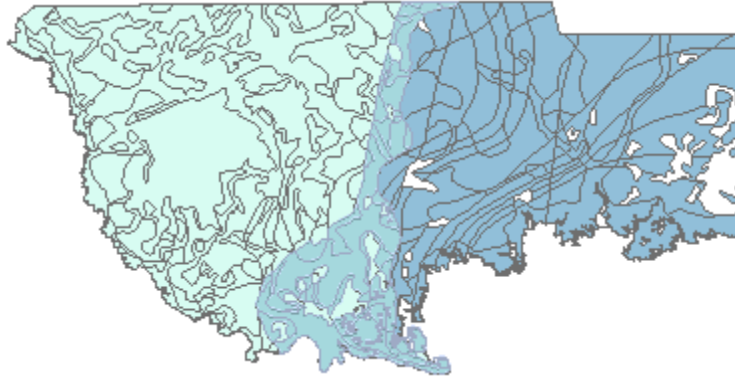


2. Geology data downloaded from <ftp://ftp1.fgdl.org/pub/>
 - a. Data
 - i. Sinks
 - ii. Sinkhole types



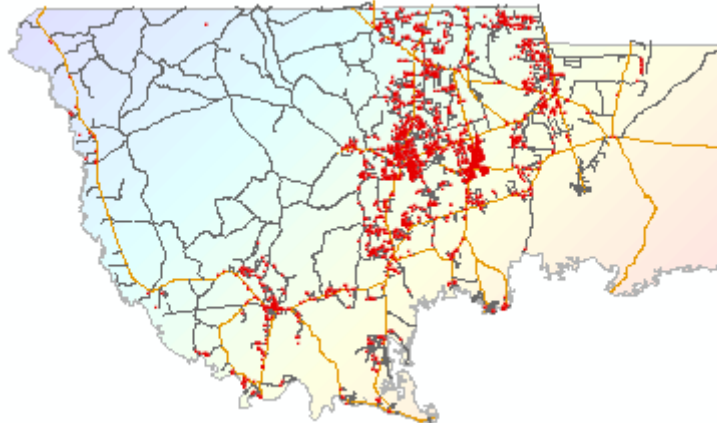
- iii. Karst Limestone Areas





3. State of Florida DOH shapefile of Onsite Sewage Treatment and Disposal Systems (OSTDS) inspected by the Department of Health data to December of 2005 downloaded from <http://www.doh.state.fl.us/environment/programs/EhGis/EhGisDownload.htm>

- a. Use
 - i. Additional systems & addresses from 2001 to 12/2005
 - ii. Age - systems last permitted as new or repaired prior to 1998



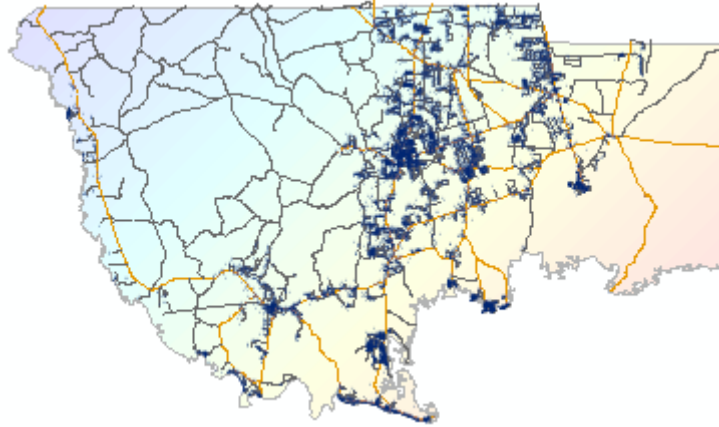
4. State of Florida DOH OSTDS data downloaded from <http://www.doh.state.fl.us/environment/ostds/statistics/OSTDStatistics.htm>

- a. Use
 - i. # of Permits By year & type

5. Wakulla County Address data converted to GIS data from CAD drawings created by Wakulla County Planning Dept. & provided to the City of Tallahassee 3/18/02

- a. Use
 - i. Number of dwellings & commercial sites
 - ii. Location & number of potential OSTDS based on subtracting PAWS & St Marks customers from overall #





6. Customer service data base from Panacea Area Water System (PAWS) Customer service data base 3/28/06

a. Use

i. Location of sanitary sewer lines & customers



7. St Marks sewer system – everyone inside city limits

a. Use

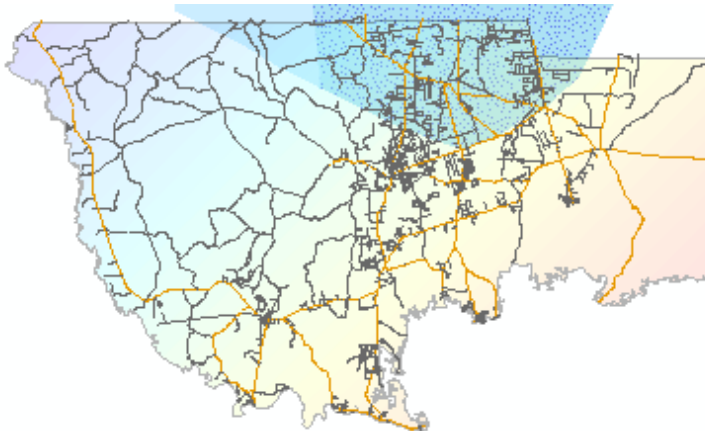
i. Location of sanitary sewer customers



8. Domestic Treatment Plants data downloaded from & <ftp://ftp.dep.state.fl.us/pub/water/gisdata/> & <ftp://ftp.dep.state.fl.us/pub/reports/wafr/wafrdw.xls> &



9. Wakulla Springs Springhead Recharge Areas
 - a. Hal Davis at USGS



Numbers:

DOH:

1. 1998 – 2005 OSTDS Permit GIS shapefile data = 2677 (excluding abandoned permits)
 - a. New systems 1998 – 2000 = 171
 - b. New systems 2001 – 2005 = 1356
 - c. Older than 1998 = 11436- 1527 = 9909
2. DOH New Septic system permits spread sheet from 1970 to 2005 = 9698
 - a. Older than 10 yrs = 5606 out of 9698
 - b. Older than 20 yrs = 3596 out of 9698

Wakulla Planning Dept:

1. 2001 address CAD Data converted to GIS = 11776

Sanitary Sewer Systems:



1. St Marks city limit spatially locatable addresses (probable City sanitary sewer customers) = 286.
2. Panacea Area Water System (PAWS) sewer customers 3/28/06 = 1686
 - a. Spatially un-locatable new addresses in their customer base = 111

Combined Data:

1. Wakulla Planning Dept address CAD. Data , DOH new on site sewer permit data , and PAWS customer base's new locatable addresses = 13297 locatable addresses
2. PAWS 111 Spatially un-locatable Wakulla addresses, brings the total number of known addresses to 13408 addresses

Potential on Site Sewer Systems:

1. Combined Data Overall
 - a. Wakulla County Potential OSTDS $13408 - (1686 + 286) = 11436$
 - i. Springhead High Recharge Area OSTDS = 3154
 - 1) 1998 – 2005 DOH data
 - a. Out of 682 permits 312 are TYPE NW therefore
 - i. Older than 1998: $3154 - 312 = 2842$

