RULES AND DIRECTIVES
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GOT WATER?

Our economy is in crisis – Just not enough money for everyone to sustain their previous lifestyle and now several thing are occurring

1. Everyone is cutting back on their usage of money and making wise decisions on their purchases
2. Globally governments are bailing out financial institutions and big business who did not manage or use their money wisely in the past/
3. Everyone is learning that we can not continue with business as usually, all over the world people are having to make difficult choices about their finances that will effect the future of many generations to come
4. This country is in an important period where change needs to occur quickly and smartly, the world IS watching

Just like with the economy the world is beginning to realize that we are now experiencing the starting point of global water crises!!

1. People are slowly cutting back on unnecessary water usage and are starting to making wise choices on when and where to consume water
2. Globally people are suffering from the lack of clean, fresh water and there is no government that can bail us all out of this crisis
3. Everyone is learning that we can not continue with business as usually, all over the world people are having to make difficult choices concerning how much water they can obtain for food, cleanliness, health and industry uses, the choices made today will affect the future of not only many generations of humans to come but the health of all ecological systems on this planet!
4. This county is in an important period where change needs to occur quickly and smartly, the world IS watching

The above represents a quick snapshot of how the economy and water are expercing a similar crisis, the only way our environment is ever going to be able to recover from the water deficit is to allow the earths ecological banking system to work!!!

Where can this banking system be found and what types of resources are needed to make this accounting system function properly?? The recharge areas, which allow water from rainfall to percolate into the Floridan Aquifer quickly and the wetlands, which hold (save) water after the rainfall event, must be protected NOW!!

The location of the proposed Levy 1 and 2 nuclear power plants would be in the area of the single most important recharge zone for southern Levy County and thus for the Waccaassa Bay, the Big Bend Seagrass Beds, the Withlacoochee River and its associated watershed area, the Goethe State Forrest, the Gulf Hammock Wildlife Preserve the Rainbow Springs Watershed area and aquaculture farms in Cedar Key and of utmost importance for the area would be that it provides fresh drinking water to the inhabitants of most of the southern part of Levy and Marion County and to the northern part of Citrus County. This small red zone shown on the Levy County, Floridan Aquifer Vulnerability Assessment map (ex.1) shows an area where our groundwater's quantity and quality are extremely vulnerable. It is a very karst area, meaning that the thin limestone covering of the Floridan Aquifer has lots of hole in it (sinkholes in fact) (ex 2), and water can and will flow in many different directions, it just depends on the amount of water in the system!

Surrounding the vulnerability recharge area (money spent quickly) is the most important assets Florida has, the wetlands (savings account). From Cedar Key through an area north of Bronson and over to Daytona Beach it is now known that the aquifer only receives water from rainfall. The monitoring well set up north of the proposed power plant area (Tidewater station) * by USGS shows that the system is at a critical stage for water quantity a lot of the year. The less rainfall, the less water there is to go into the system. The less water in a system along with extremely high increases in consumption can and will be catastrophic to this area.

. We tend to think of countries that have lots of oil under their feet as being rich. We should understand that an area with fresh, clean water has a treasure under their feet and it must not be wasted anymore. Placing the proposed plants in this area would contribute to the degradation of the ecological banking system that has worked for this earth in the past and would work better in the future if the area was restored. We can use the wetlands and the trees that will grow there as part of the carbon sequestration banking system in a truly safe, clean and secure world using many combinations of RENEWABLE resources

It has been estimated that to provide water needs for all uses through 2030, the world will need to invest as much as $1 trillion a year on technologies toward that end. By not placing even more demands on the Floridan Aquifer, but to restore habitat and allowing nature to work as it was intended to, there does exist a low cost system to provide the most precious commodity we all need; clean and fresh water.

Thank You,
Emily Casey
Southern Director
Environmental Alliance of North Florida (EANoF)
Also on behalf of the Nature Coast Serria Club
(

TIDEWATER MONITERING WELL

Progress Energy's environmental report documents all wells in the area that have been used in the past for monitoring quantity and quality , except for ONE – *Tidewate*r.

USGS website: wdr.water.usgs.gov
Tidewater #1 – Floridan Aquifer System

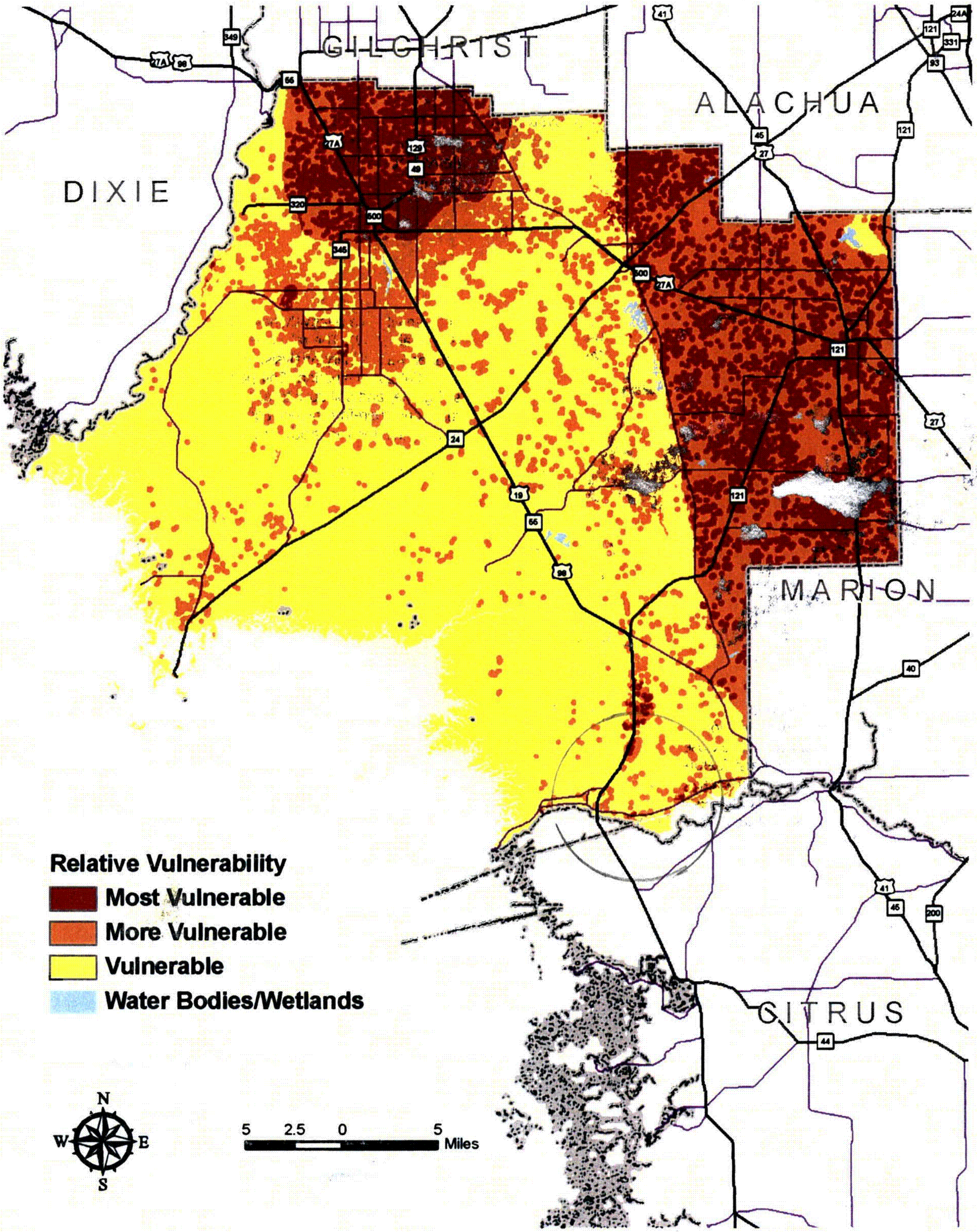
The very one that is active, monitored and recording everyday. It is north and a little east of the proposed plant location and thus gives a good picture of the water flowing within the Floridan Aquifer at any moment. This well for the past several years has been reading in the critical stages. This shows there is already stress on the system – what will 1 **million gallons per day** or more a day, pumped out do to this system?? It is stated by PE that the water movement is west – southwest in the proposed area, which is just in line with the water the well is monitoring.

From an important recharge zone in this area the water flows downward in all directions. Some available water flows toward the Rainbow Springs Watershed, some flows toward the Waccassassa River Basin and still some flows toward the Withlacoochee River Basin. It is hard to predict in the extremly karst area, just where the water will flow. It all depends on the amount of water in the system at any time; an inch difference in the topography will make a difference as to the type of plant life that will live there.

Thus another problem – It is stated in the text for Table 2.3.18 that almost no surface water is usage within a 50 mile radius of the LNP site. The logic used to rationalize why the surface water contamination would be small is appalling. Even if air contamination were small it does not mean that water contamination would be small!! The problem here is the fact that there is very little difference in surface water and groundwater. The surface water becomes part of the Floridan aquifer rapidly in this area –hence the reason it is vulnerable!

The biggest problem with this statement is when PE has explained what the MACCS2 Computer air pollution model analysis and then states this program does not model groundwater pathways (for example, aquifers). Then, how can an assumption be made that any effects would be small?? Both water quantity and water quality for all living things in the environment are in peril if these plants are allowed to be built.

Levy Vulnerability
FAVA



○ - circle = LNP siting area of critical concern (the land area for this study)

Impacts - will be much broader

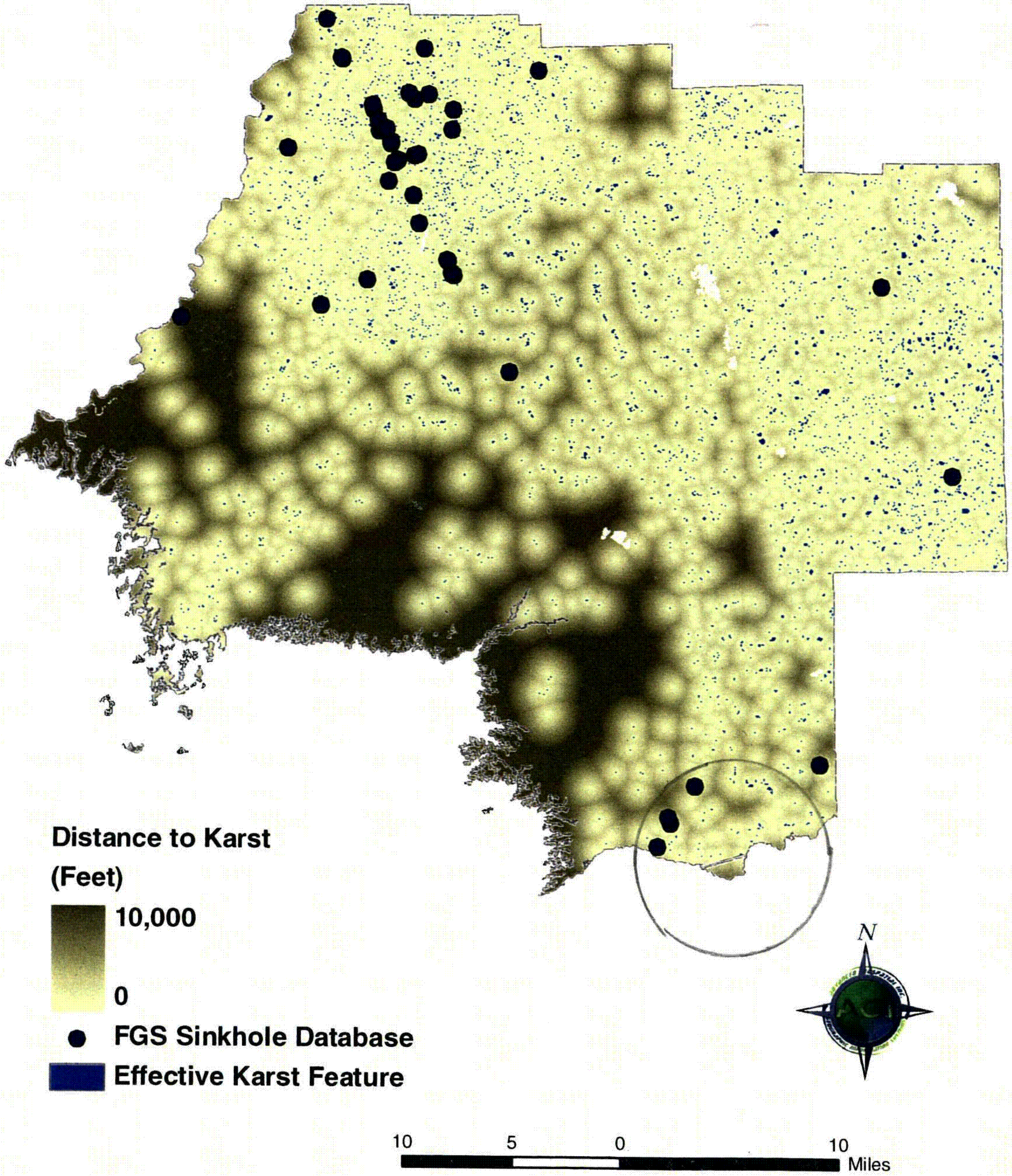


Figure 12. Effective karst features evidential theme buffered into 100-ft zones for proximity analysis in the weights of evidence analysis.

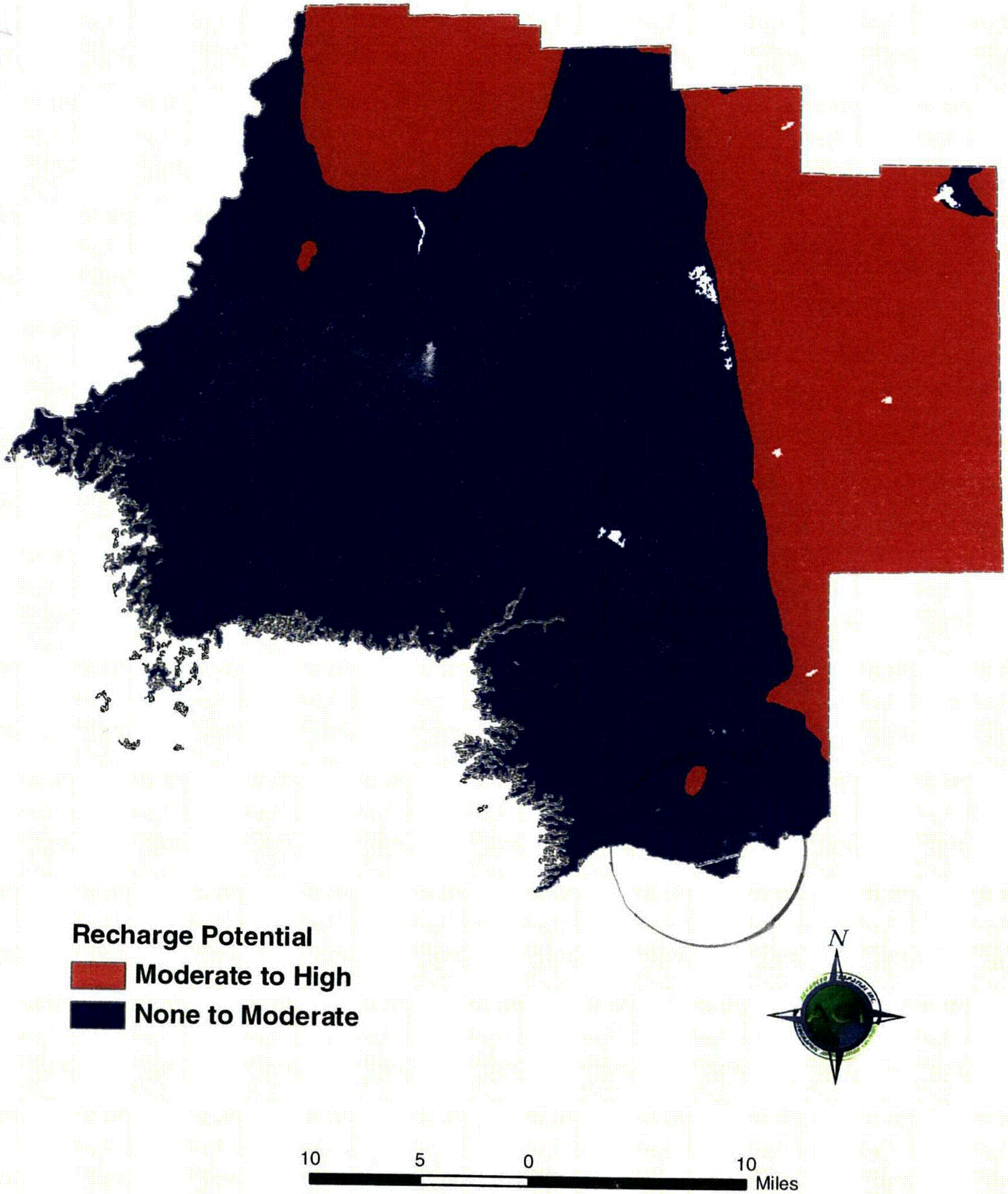


Figure 11. Generalized recharge potential evidential theme; based on calculated weights analysis blue areas share a weaker association with training points and thereby aquifer vulnerability, whereas red areas share a stronger association with training points.

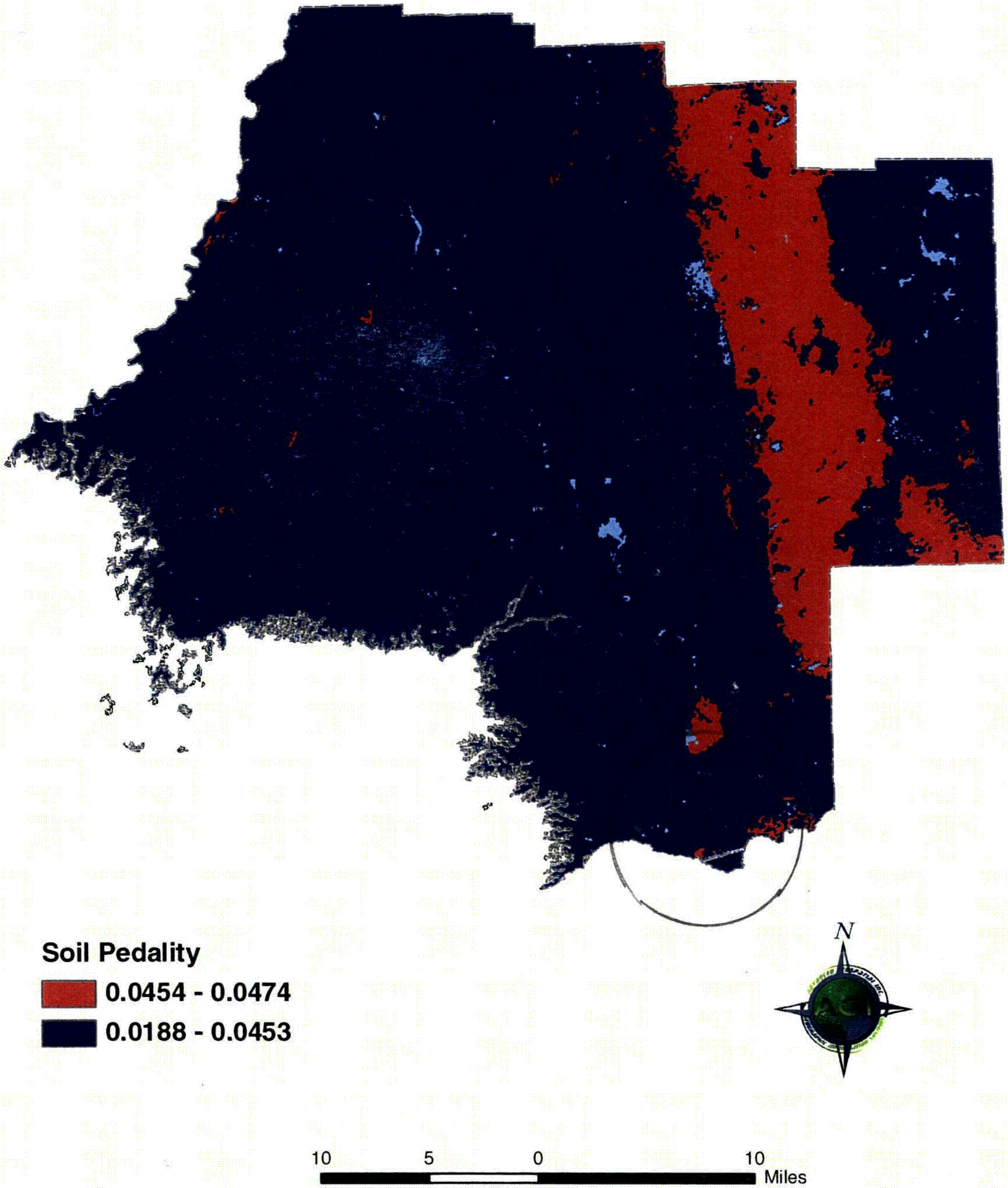


Figure 10. Generalized soil pedality evidential theme; based on calculated weights analysis blue areas share a weaker association with training points and thereby aquifer vulnerability, whereas red areas share a stronger association with training points.

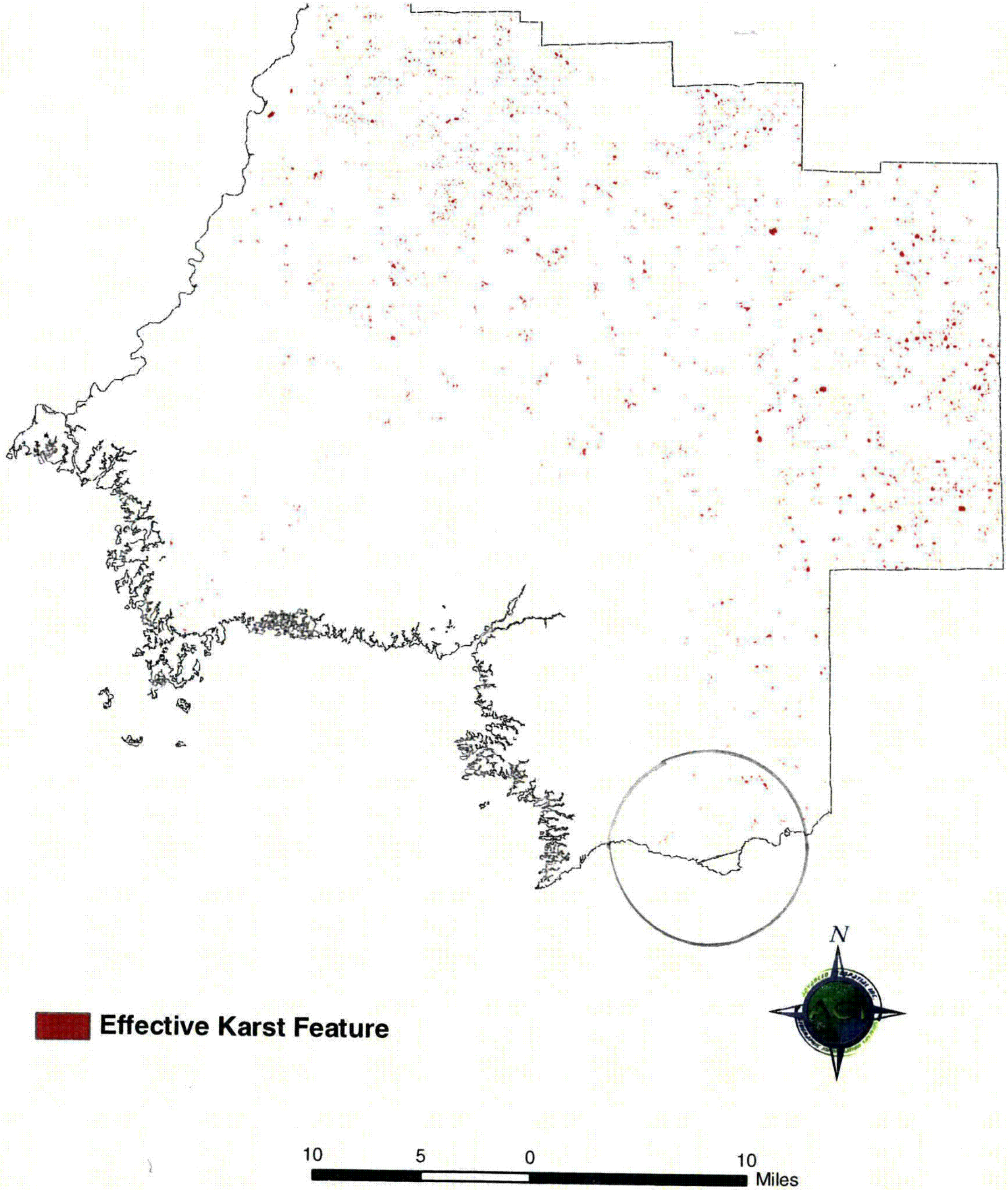


Figure 9. Effective karst features resulting from circular index method applied to U.S. Geological Survey 7.5-minute topographical contour lines combined with sinkholes from the Florida Geological Survey sinkhole database.

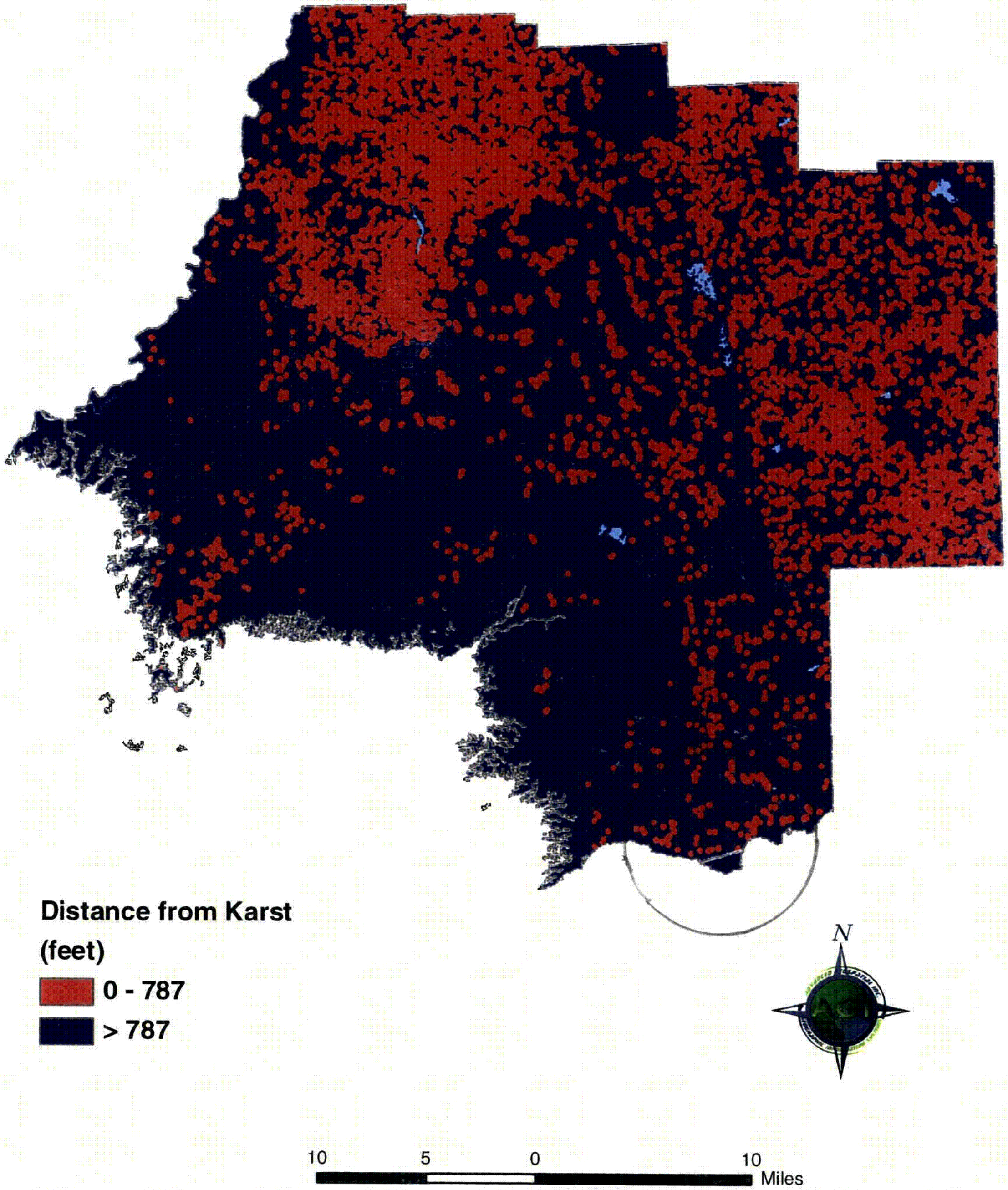


Figure 13. Generalized effective karst feature evidential theme; based on calculated weights analysis blue areas share a weaker association with training points and thereby aquifer vulnerability, whereas red areas share a stronger association with training points.

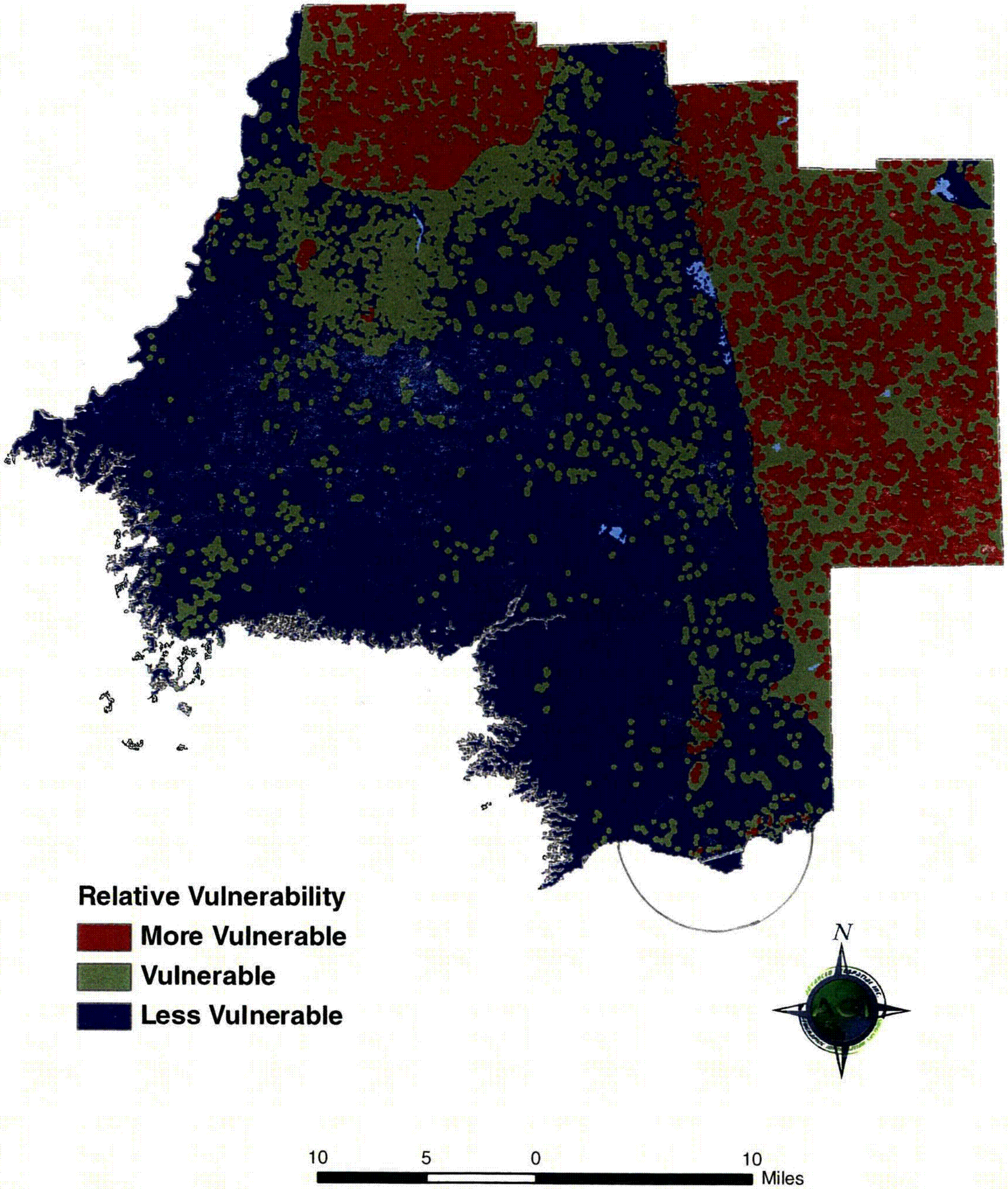


Figure 14. Relative vulnerability map for the Levy County Aquifer Vulnerability Assessment project. Classes of vulnerability are based on calculated favorability of a unit area containing a training point, or a monitor well with water quality sample results indicative of vulnerability.

Florida Aquifer Vulnerability Assessment Phase II
Levy County, Floridan Aquifer System

Michael Sole, Secretary

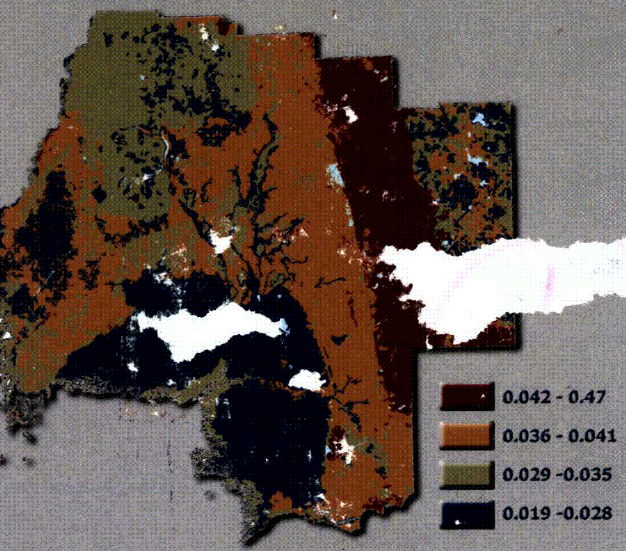
Walter Schmidt
State Geologist and Director

INTRODUCTION

The Floridan aquifer system is the most important and prolific source of fresh water in Levy County. Groundwater use from the Floridan aquifer system in Levy County is an estimated 57 million gallons of water per day for public supply, agriculture and other uses. In addition to this amount, there are over 6,257 self-supply wells in the county tapping the Floridan aquifer system providing fresh water to homeowners (SWFWMD; 2006, 2003 (Revised), and 2004). Levy County's 34,450 residents (U.S. Census Bureau, 2000) rely almost exclusively on the Floridan aquifer system for their fresh water needs.

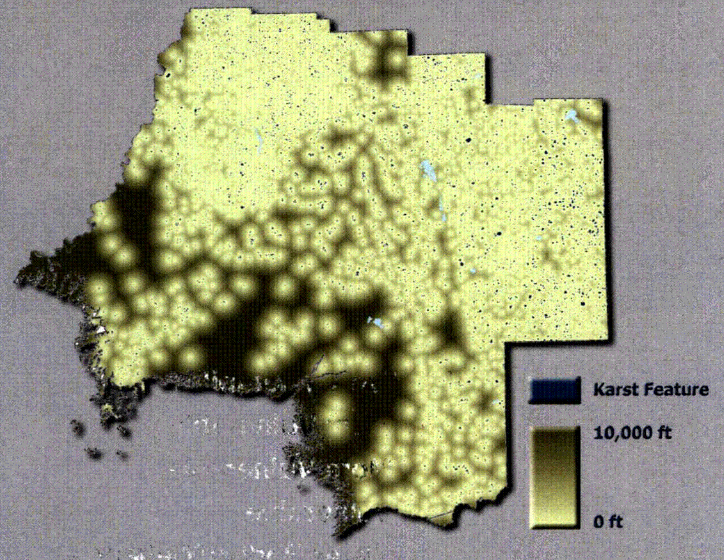
Identifying areas of Levy County where the Floridan aquifer system is more vulnerable to contamination from activities at land surface is a critical component of a comprehensive groundwater management program. Protection of the Floridan aquifer system is an important measure to take in helping ensure viable, fresh water is available from the Floridan aquifer system for continued future use in the Levy County study area. Aquifer vulnerability modeling allows for a pro-active approach to protection of aquifer systems, which can save significant time and increase the value of protection efforts. Maps of three types of data were used to determine aquifer vulnerability in Levy County; soil pedality, karst features and recharge potential. Maps explaining these data are displayed below.

Soil Pedality Theme



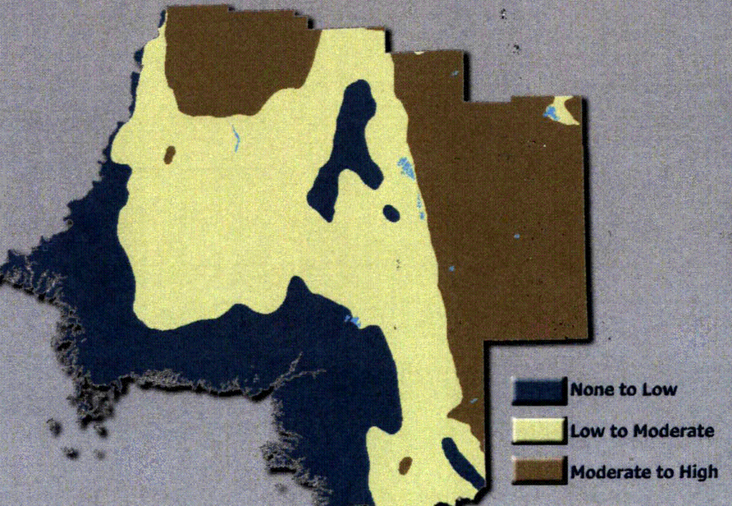
Soil pedality is a relatively new concept used to estimate how water moves through soil (Lin et al. 1999). The rate that water moves through soil is a critical component of any aquifer vulnerability analysis, as soil is an aquifer system's first line of defense against potential contamination. Soil pedality values, which are calculated based on soil type, soil grade, ... higher values correspond to higher flow ... In 2006, Levy County soils data were ... area by the Natural Resources Conservation Service. As a result, more detailed information is available for soils analysis for the LCAVA project than during previous projects.

Potential Karst Feature Theme



Karst features, or sinkholes and depressions, can provide preferential pathways for movement of surface water into the underlying Floridan aquifer system and increase an area's aquifer vulnerability where present. The closer an area is to a karst feature, the more vulnerable it may be considered. Karst features tend to be generally circular in nature (in contrast to non-karstic depressional features which may not be circular) and can be identified and extracted from a digital elevation model based on this characteristic. These resulting potential karst features can be buffered into zones as shown here to allow for a relative distance analysis.

Recharge Potential Theme



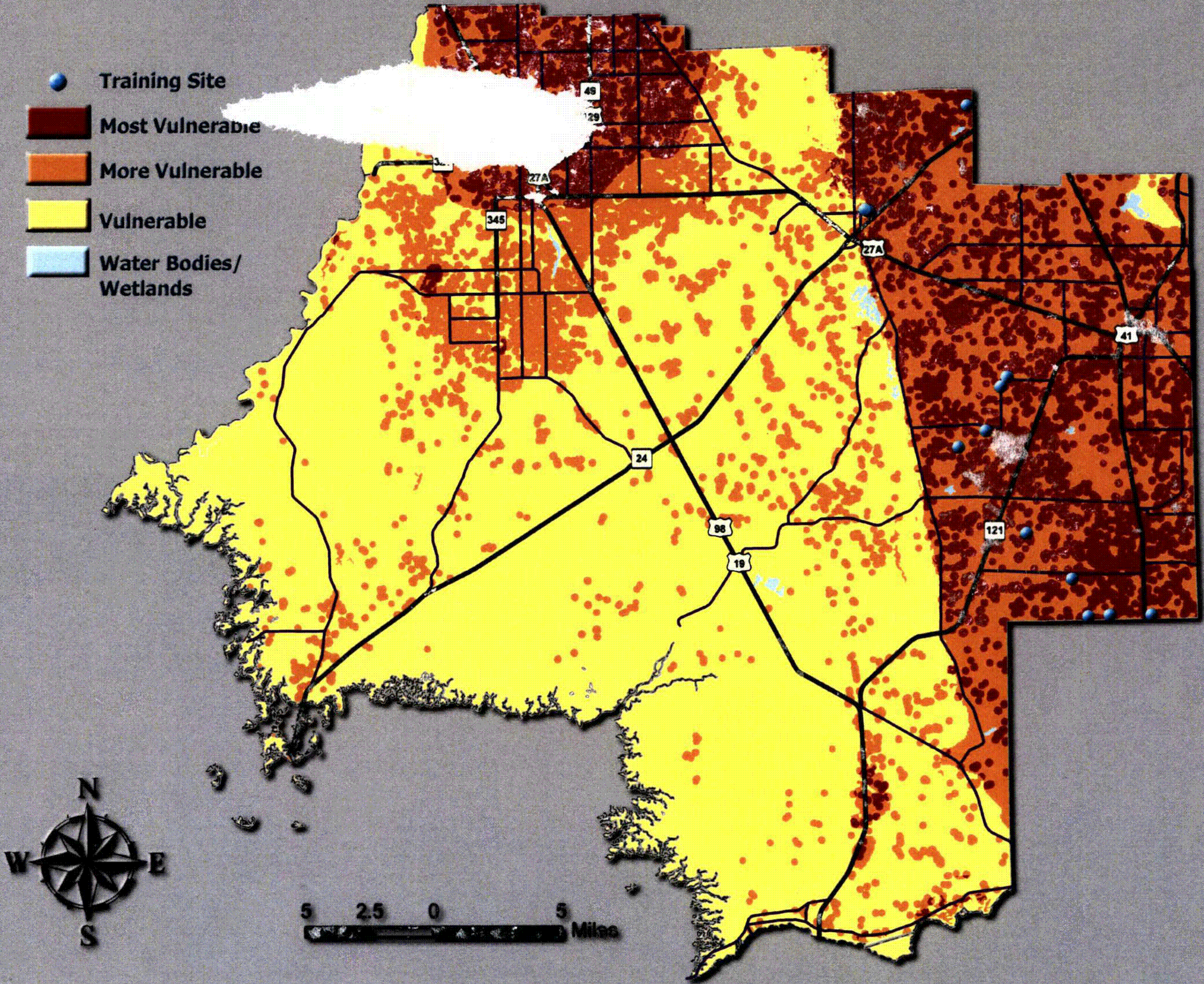
In Copeland et al. (1991), the area of the Brooksville Ridge in central Florida is defined as having higher recharge potential than adjacent areas. The Brooksville Ridge is chiefly composed of undifferentiated Hawthorn Group sediments which are poorly to moderately consolidated clayey sands and silty clays (Scott et al., 2001). In the study area, these sediments are estimated to exceed 100 feet in thickness. In other areas of Florida, Hawthorn Group sediments forming the Intermediate Confining Unit normally provide an effective confining or semi-confining unit for the underlying FAS. In Levy County, however, these sediments are generally highly weathered, leaky, thin and intensely breached by karst features. These factors combine to increase the recharge potential to the FAS in the study area where these sediments are present. Where recharge potential is high, aquifer vulnerability is increased.

APPROACH TO MODEL DEVELOPMENT

The primary purpose of the Levy County Aquifer Vulnerability Assessment, or LCAVA, is to provide a science-based, water-resource management tool that can be used to help minimize adverse impacts on ground-water quality, including focused protection of sensitive areas such as springsheds and ground-water recharge areas. The modeling process used for the LCAVA project is "weights of evidence," and is based in a geographic information system (GIS). The approach used in the project is a modification of the technique used in Phase I of the Florida Aquifer Vulnerability Assessment project (Arthur et al., 2007). One of the main benefits of applying this technique to the LCAVA project is that it is data-driven, rather than expert-driven, and model output is dependent upon a training site dataset, which produces a self-validated model output. For LCAVA, training sites are groundwater wells with water quality indicative of a good connection between the aquifer and land surface, or simply, aquifer vulnerability.

Model generation is accomplished by associating training site locations with data layers representing natural conditions which control aquifer vulnerability. Data layers used for the LCAVA project are described on the lower left side of this poster and include karst features, soil pedality, and recharge potential. The model helps determine which areas of each data layer share a greater association with aquifer vulnerability based on the location of the training sites, and then combine them in a map as shown here. The model results are an estimate of the natural vulnerability of the aquifer system; land use types and human activities are not used as input. The LCAVA model output map indicates that the areas of highest vulnerability are associated with dense karst-feature distribution, higher soil pedality values and areas having a higher recharge potential.

VULNERABILITY OF THE FLORIDAN AQUIFER SYSTEM, LEVY COUNTY



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This poster is developed as part of Florida Aquifer Vulnerability Assessment (FAVA) Phase II for the Florida Department of Environmental Protection/Florida Geological Survey per FDEP/FGS Contract No. RM059. Version 1.5: July 10, 2008. The vulnerability map accompanies "The Levy County Aquifer Vulnerability Assessment Report" prepared by Alan E. Baker, P.G. 2324, Alex R. Wood, and James R. Cichon of Advanced GeoSpatial Inc.;

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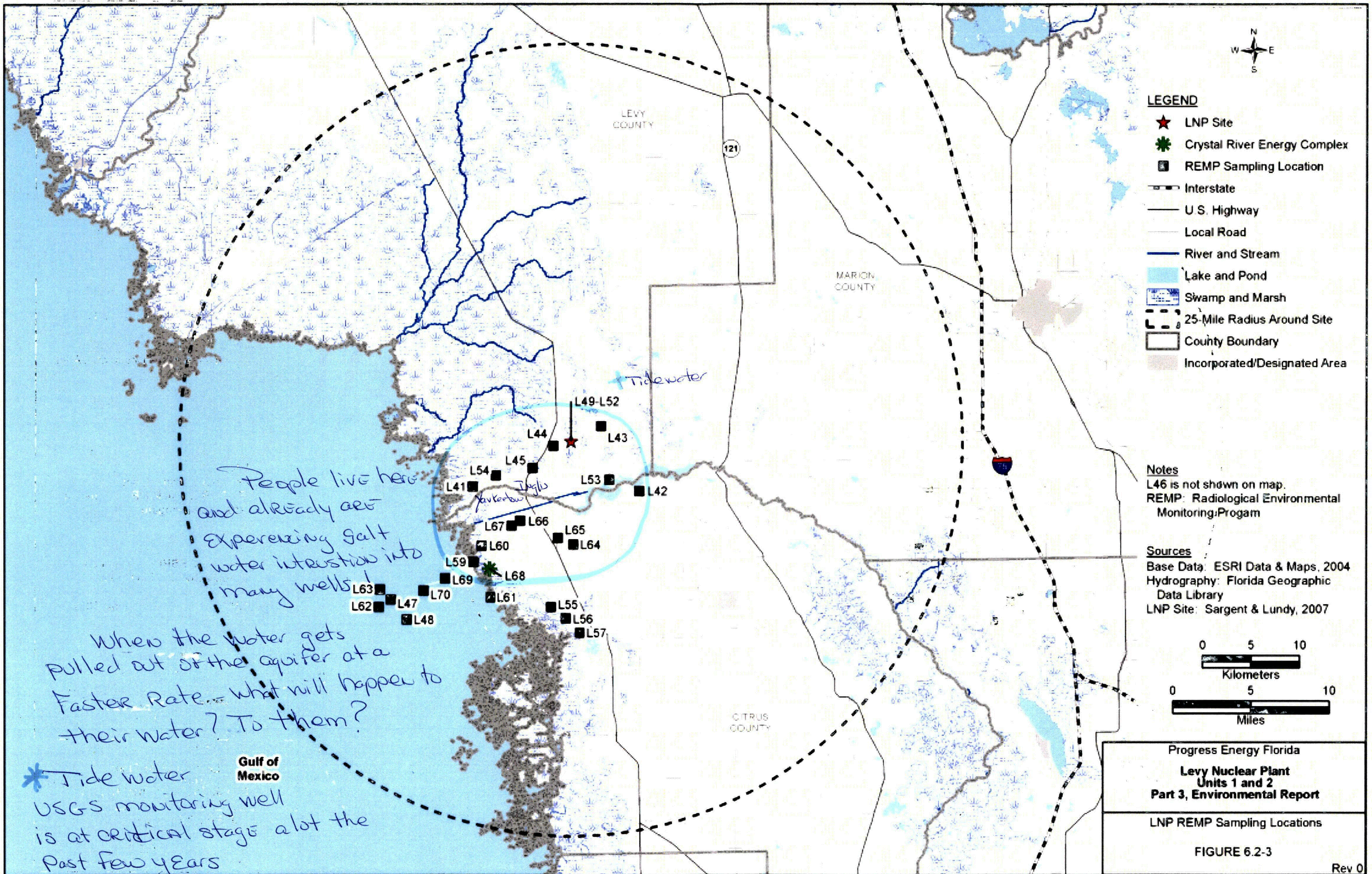
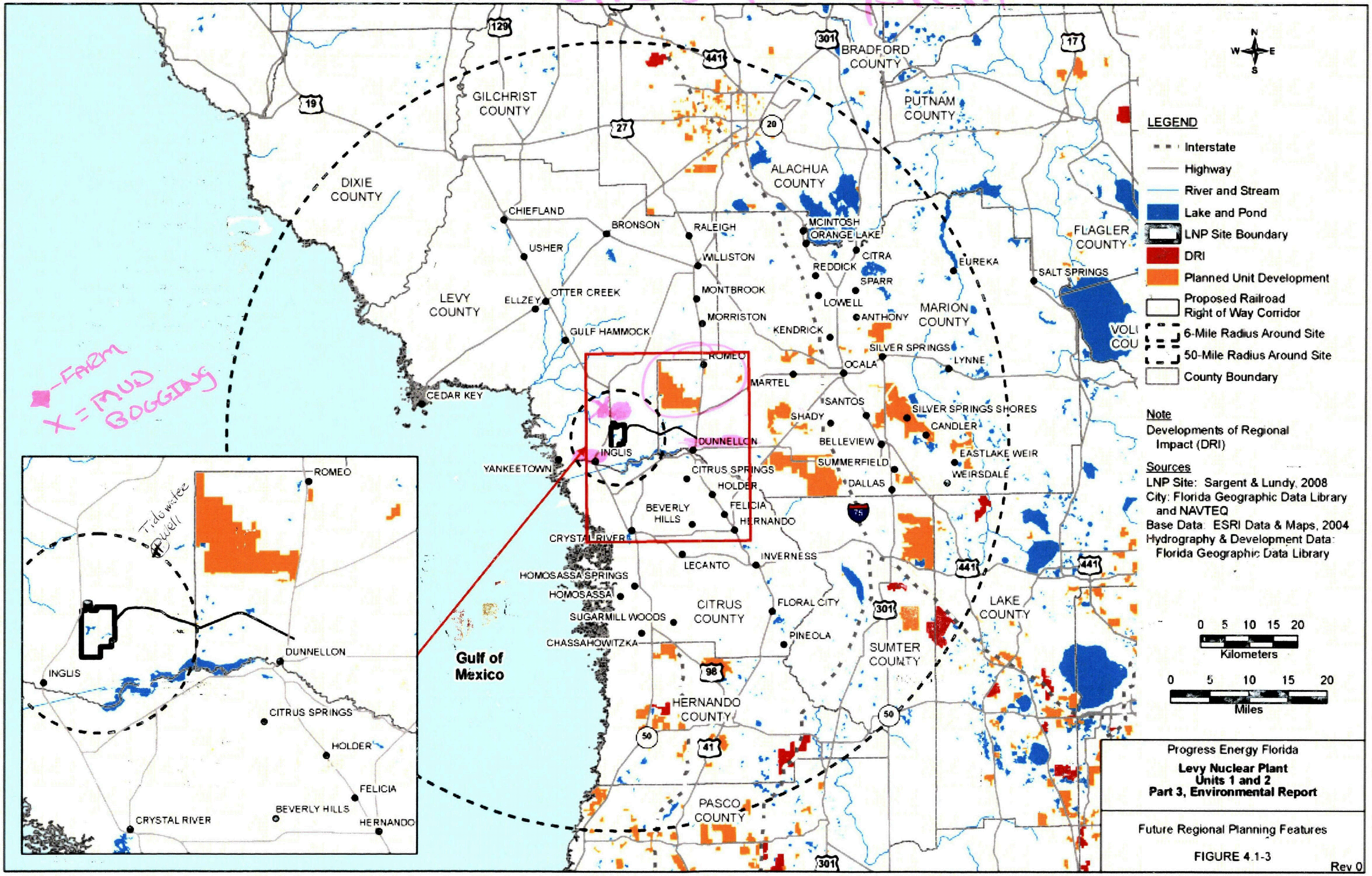

LEVY COUNTY
MARION COUNTY
CITRUS COUNTY
121
Gulf of Mexico
L49-L52
L43
L44
L45
L54
L41
L53
L42
L67
L66
L65
L64
L60
L59
L68
L69
L63
L70
L62
L47
L48
L61
L55
L56
L57
Tidewater
Yankeetown
Inglis
People live here and already are experiencing salt water intrusion into many wells!
When the water gets pulled out of the aquifer at a faster rate - what will happen to their water? To them?
* Tide water USGS monitoring well is at critical stage a lot the past few years
N
W
E
S
LEGEND
LNP Site
Crystal River Energy Complex
REMP Sampling Location
Interstate
U.S. Highway
Local Road
River and Stream
Lake and Pond
Swamp and Marsh
25-Mile Radius Around Site
County Boundary
Incorporated/Designated Area
Notes
L46 is not shown on map.
REMP: Radiological Environmental Monitoring Progam
Sources
Base Data: ESRI Data & Maps, 2004
Hydrography: Florida Geographic Data Library
LNP Site: Sargent & Lundy, 2007
0 5 10
Kilometers
0 5 10
Miles
Progress Energy Florida
Levy Nuclear Plant Units 1 and 2
Part 3, Environmental Report
LNP REMP Sampling Locations
FIGURE 6.2-3
Rev 0

Stress To System



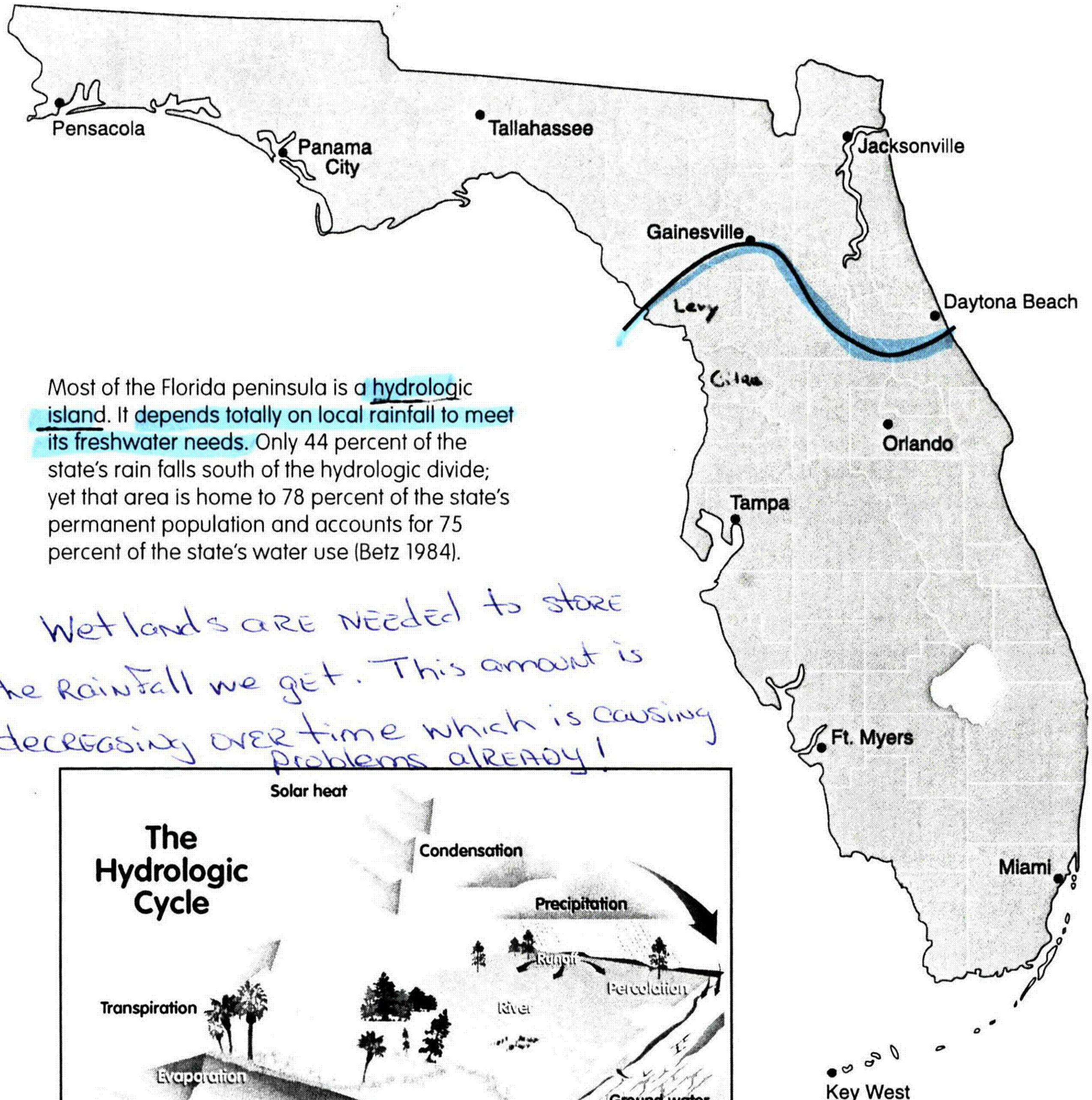
Progress Energy Florida
Levy Nuclear Plant Units 1 and 2 Part 3, Environmental Report

Future Regional Planning Features

FIGURE 4.1-3

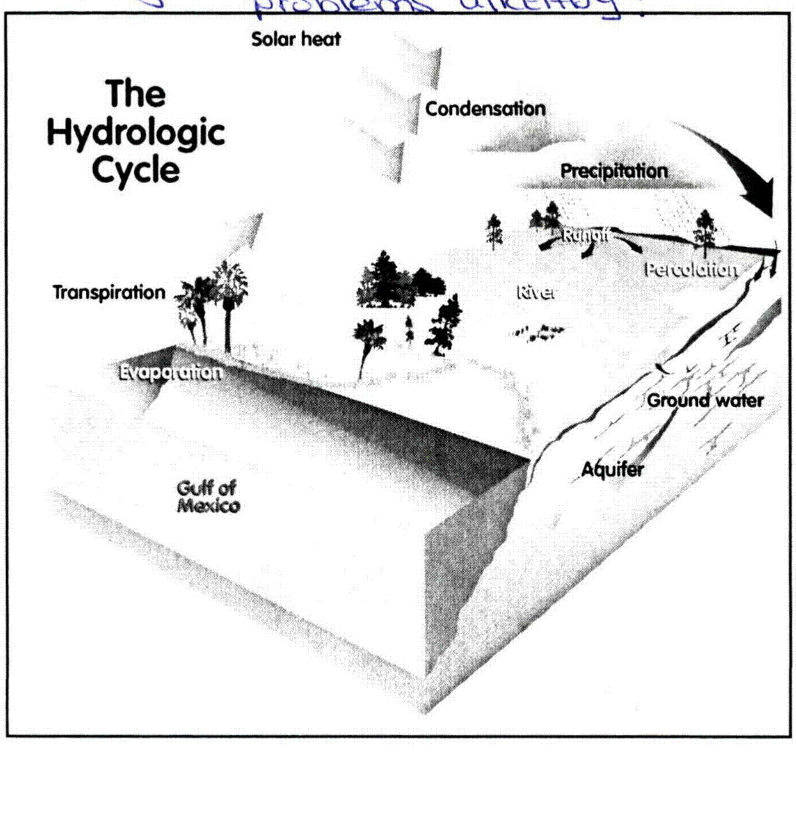
Rev 0

Hydrologic Divide



Most of the Florida peninsula is a hydrologic island. It depends totally on local rainfall to meet its freshwater needs. Only 44 percent of the state's rain falls south of the hydrologic divide; yet that area is home to 78 percent of the state's permanent population and accounts for 75 percent of the state's water use (Betz 1984).

Wetlands are needed to store the rainfall we get. This amount is decreasing over time which is causing problems already!

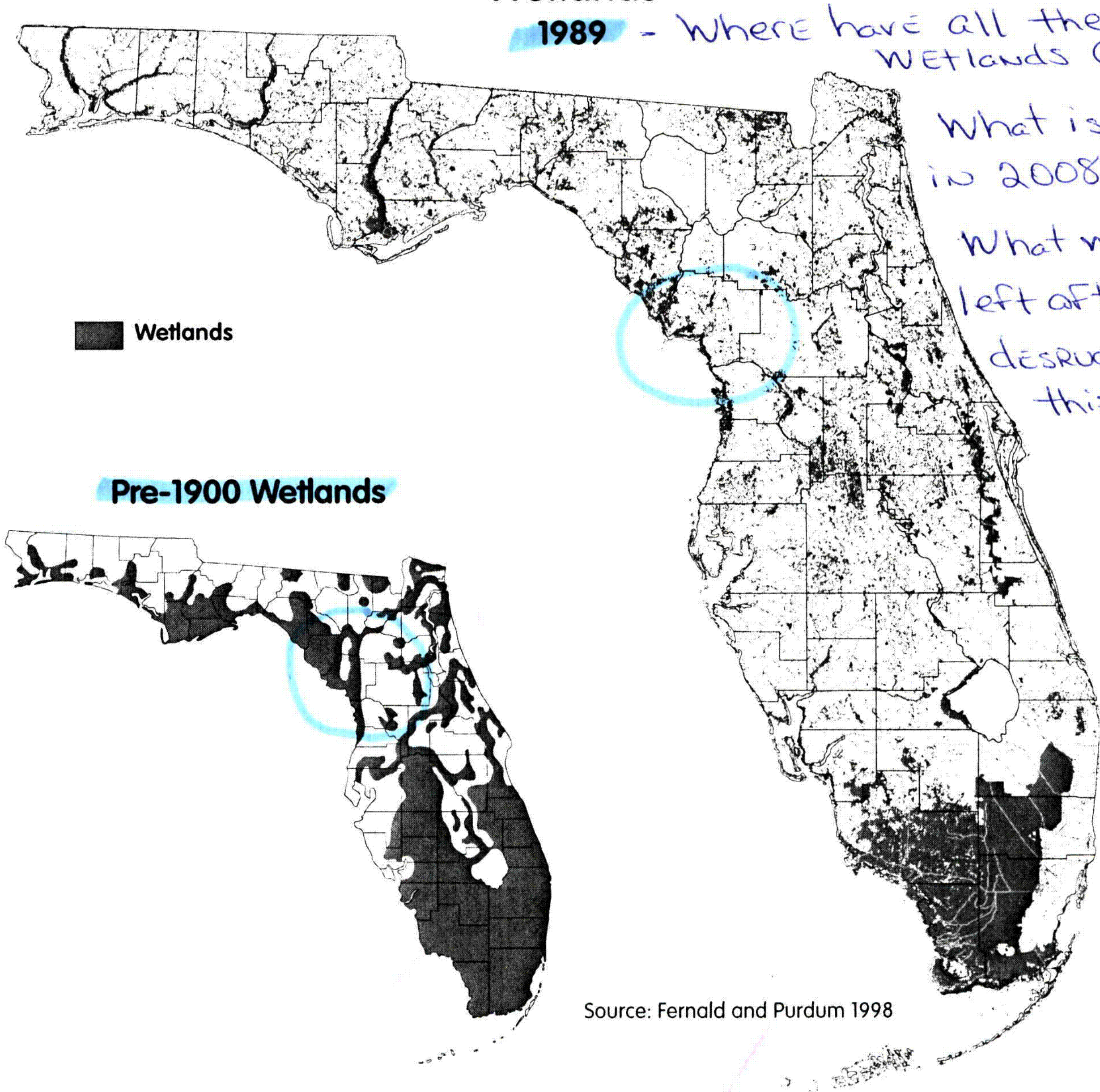


whether the vegetation is dominated by trees (swamps) or by grasses (marshes). Cypress ponds, strands, prairies, river swamps, floodplains, freshwater marshes, wet prairies, salt marshes and mangrove swamps are all wetlands.

Wetlands perform many valuable functions. They provide vital habitats for fish and wildlife. They improve water quality by trapping nutrients such as nitrogen and phosphorus, toxic substances and disease-causing microorganisms. They slow and intercept runoff, protect shorelines and banks from erosion, and protect upland areas from floods.

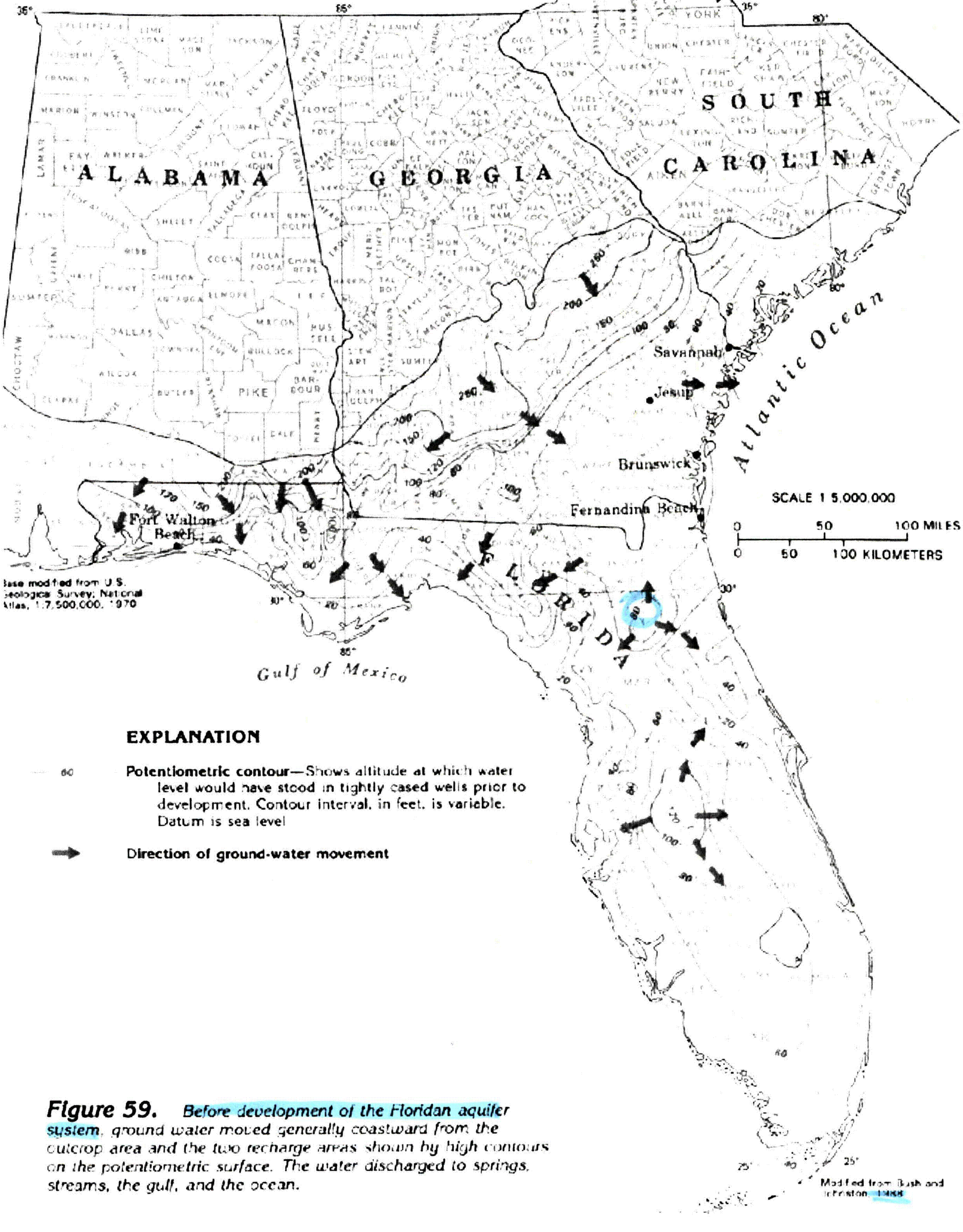
Wetlands once covered half of Florida. Over one-half of these wetlands have been drained for agriculture, flood control and residential development. Extensive areas of remaining wetlands include the Everglades and Big Cypress Swamp in southern Florida, Green Swamp in central Florida, Okefenokee Swamp near the Florida-Georgia border, and Tates Hell Swamp in northwest Florida.

Wetlands



- Where have all the Wetlands Gone? What is here in 2008? What will be left after the desruction of this area?

Source: Fernald and Purdum 1998



EXPLANATION

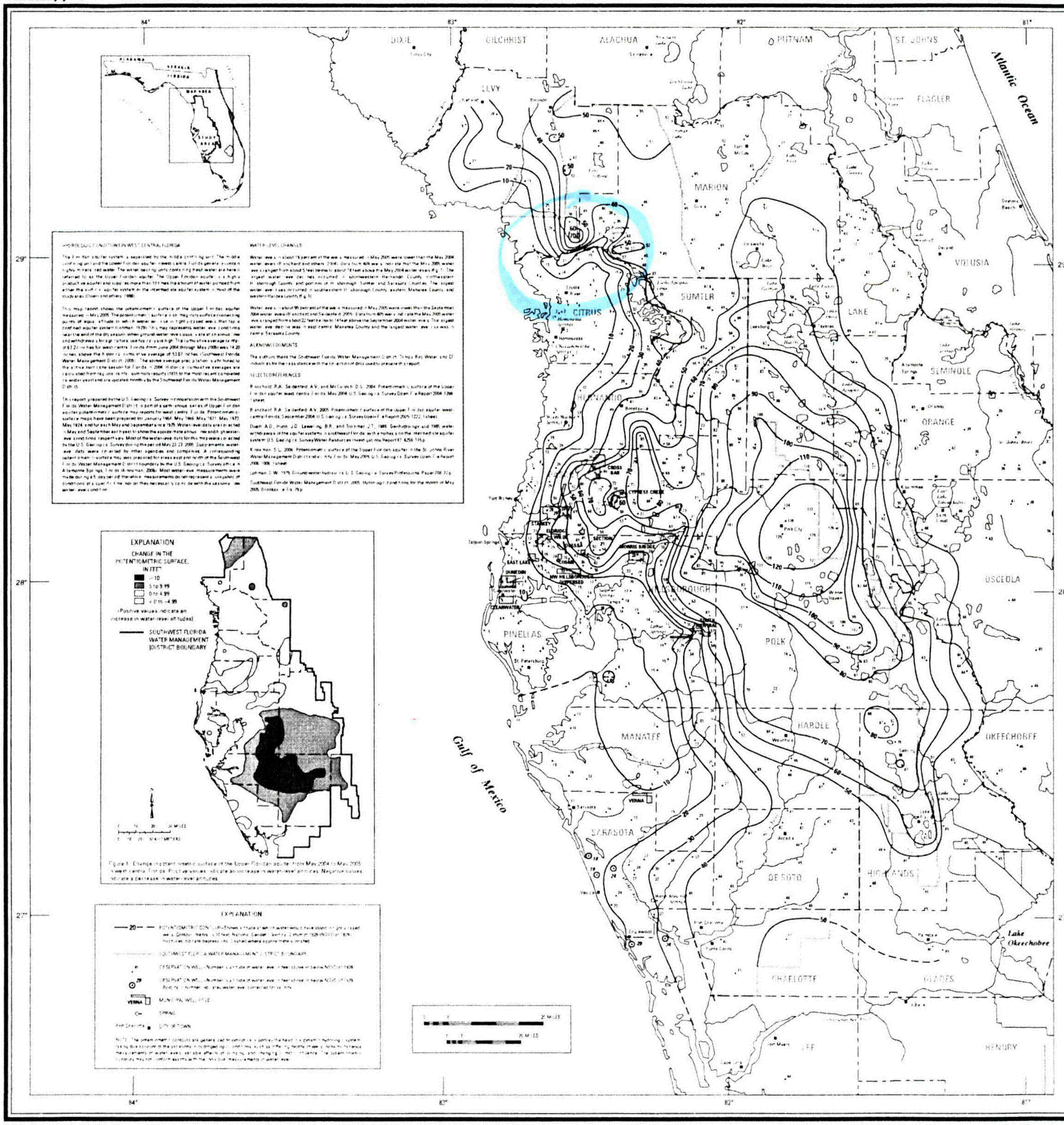
60 **Potentiometric contour**—Shows altitude at which water level would have stood in tightly cased wells prior to development. Contour interval, in feet, is variable. Datum is sea level

Direction of ground-water movement

Figure 59. *Before development of the Floridan aquifer system, ground water moved generally coastward from the outcrop area and the two recharge areas shown by high contours on the potentiometric surface. The water discharged to springs, streams, the gulf, and the ocean.*

Note: how the high has changed over time and is being drawn gulf ward. What will happen when there is a larger increase in ground water Removal?

USGS science for a changing world
U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
Prepared in cooperation with the
SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
OPEN-FILE REPORT 2006-1009
A.G. Ortiz and R.A. Blanchard, 2006, Potentiometric surface of the Upper Floridan aquifer, west-central Florida, May 2005



POTENTIOMETRIC SURFACE OF THE UPPER FLORIDAN AQUIFER, WEST-CENTRAL FLORIDA, MAY 2005

By
A.G. Ortiz and R.A. Blanchard

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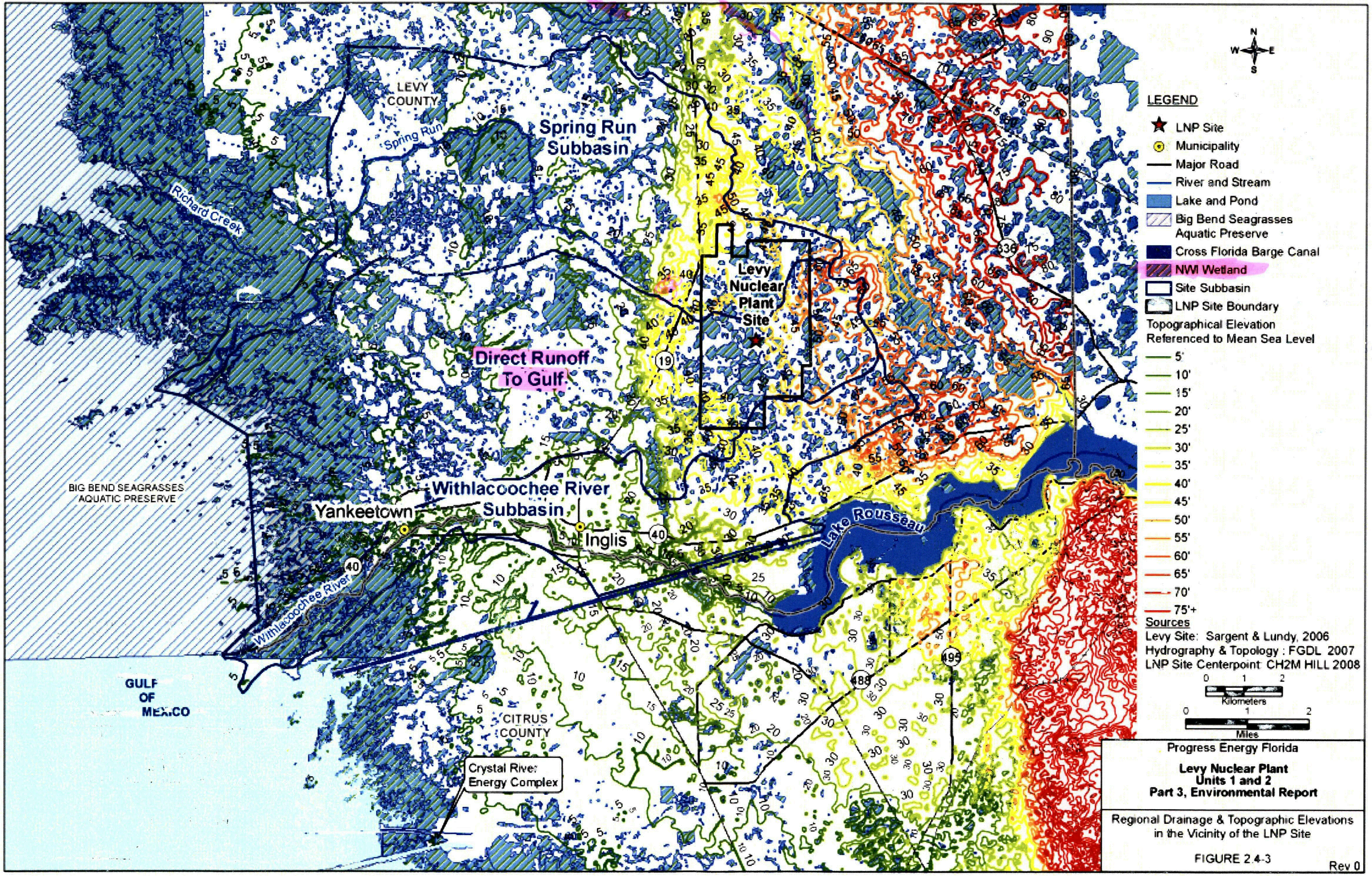


Progress Energy Florida

Levy Nuclear Plant Units 1 and 2 Part 3, Environmental Report

Regional Drainage & Topographic Elevations in the Vicinity of the LNP Site

FIGURE 2.4-3

Rev 0

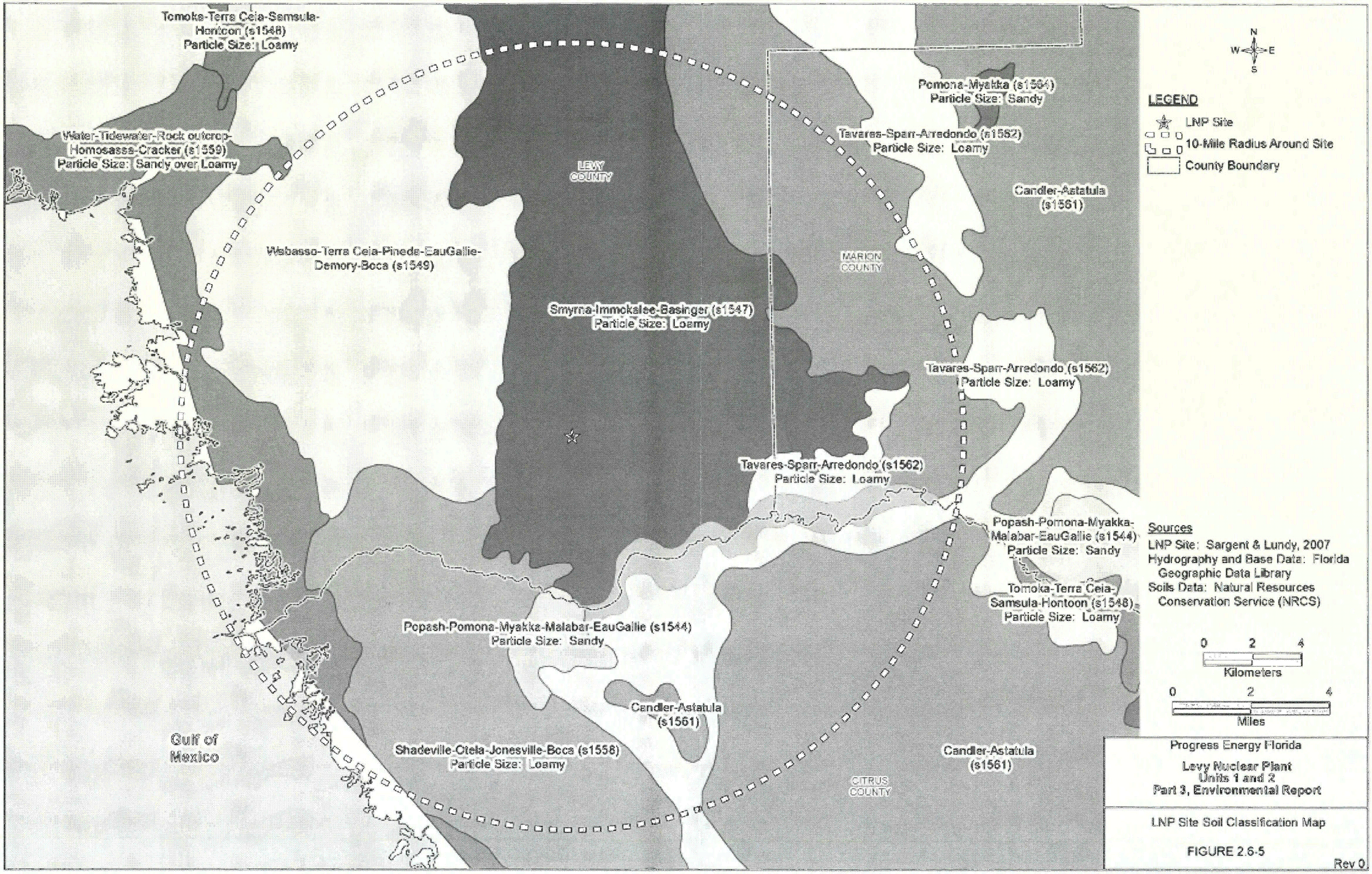
TABLE 10.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2: Tavares	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Severe: droughty.
3: Orsino	Severe: cutbanks cave.	Slight	Moderate: wetness.	Moderate: slope.	Slight	Severe: droughty.
4: Millhopper	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
5: Immokalee	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
6: Candler	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
7:						
Candler	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
Apopka	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
8: Smyrna	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
9: Pomona	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
10: Placid	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
11:						
Placid	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Samsula	Severe: cutbanks cave, excess humus, ponding.	Severe: ponding, low strength.	Severe: ponding.	Severe: ponding, low strength.	Severe: ponding.	Severe: ponding, excess humus.
12:						
Otela	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
Candler	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Severe: droughty.
13: Wekiva	Severe: depth to rock, wetness.	Severe: wetness, depth to rock.	Severe: wetness, depth to rock.	Severe: wetness, depth to rock.	Severe: depth to rock, wetness.	Severe: wetness, depth to rock.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

e and bol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
le	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
	Severe: cutbanks cave.	Slight	Moderate: wetness.	Slight	Slight	Moderate: droughty.
	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.
	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding.	Severe: wetness, flooding.	Severe: wetness, droughty, flooding.
	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
16	Severe: cutbanks cave, excess humus, wetness.	Severe: subsides, flooding, wetness.	Severe: subsides, flooding, wetness.	Severe: subsides, flooding, wetness.	Severe: subsides, wetness, flooding.	Severe: wetness, flooding, excess humus.
17 Adamsville	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty, too sandy.
18 Wauchula	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
19 Sparr	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
21 Pompano	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
22 Holopaw	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
23 Zolfo	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty, too sandy.
24 Terra Ceia	Severe: excess humus, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: subsides, ponding, low strength.	Severe: subsides, ponding.	Severe: ponding, excess humus.
25:						
Pits.						
Dumps.						



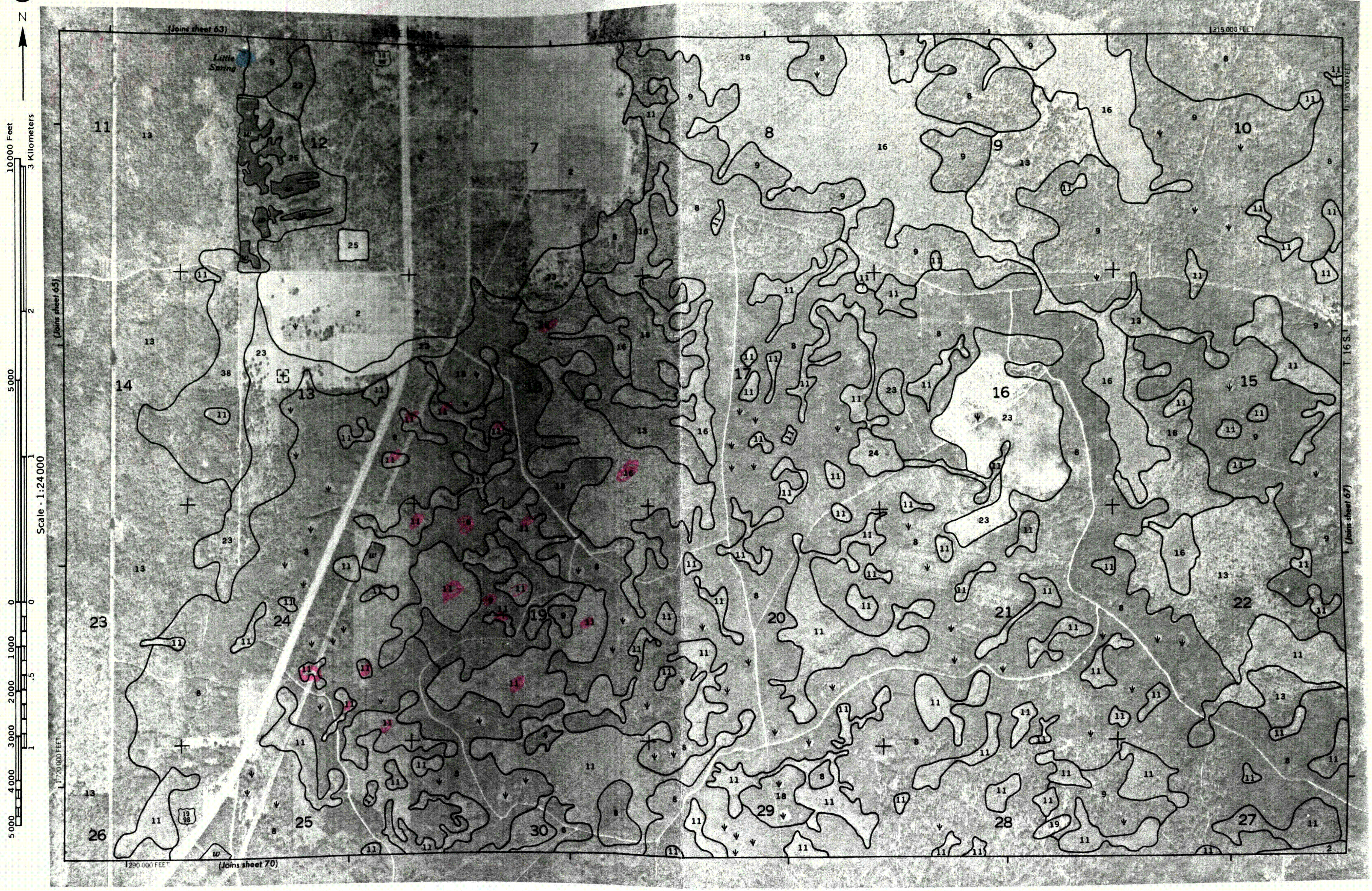
Progress Energy Florida

Levy Nuclear Plant
Units 1 and 2
Part 3, Environmental Report

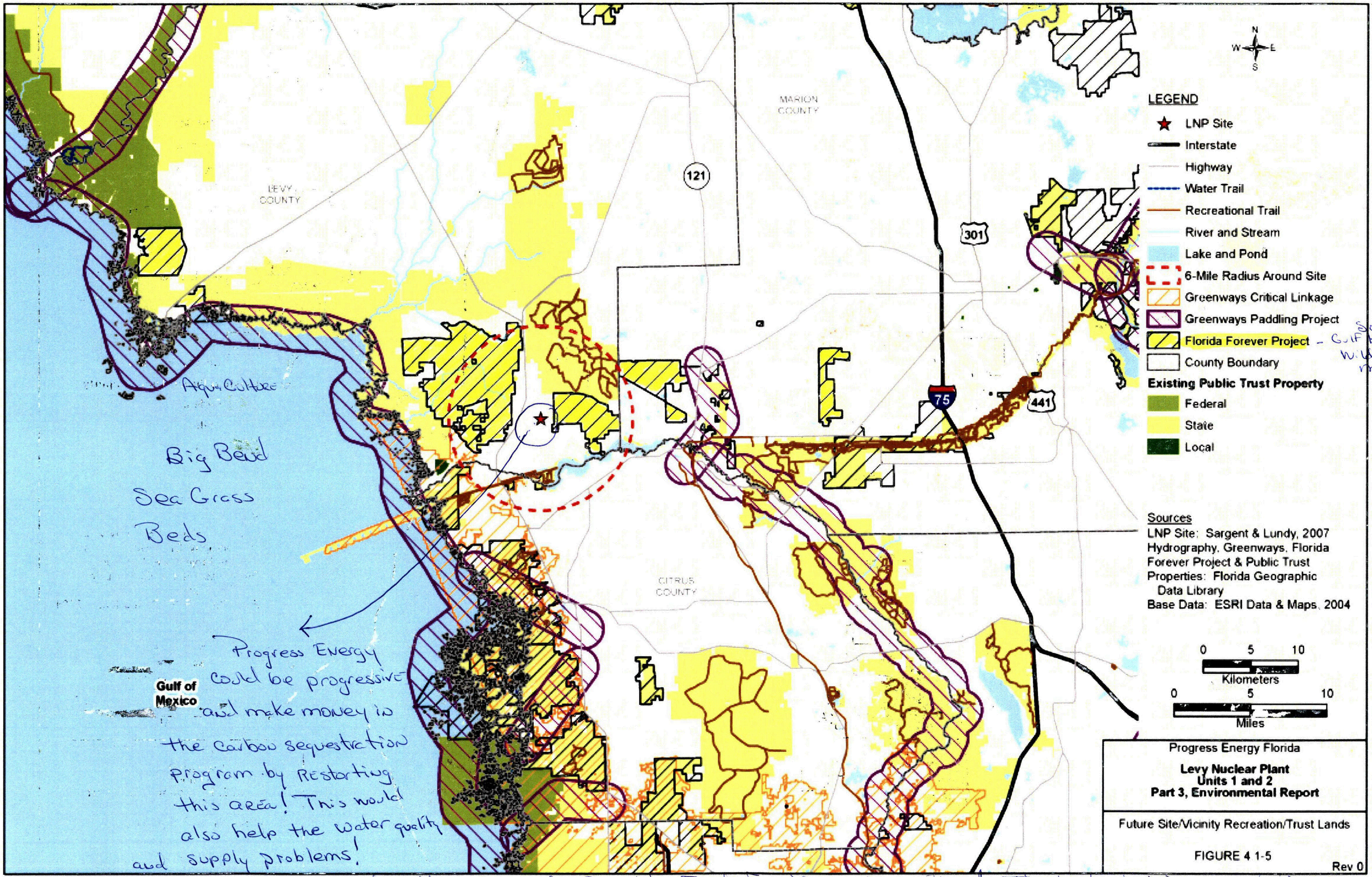
LNP Site Soil Classification Map

FIGURE 2.6-5

Rev 0



LEVY COUNTY, FLORIDA NO. 66



- Some is Gulf Hammock Wildlife Managment Area now

Aqua Culture

Big Bend Sea Grass Beds

Progress Energy could be progressive and make money in the carbon sequestration program by Restoring this area! This would also help the water quality and supply problems!

Lots of People Depend on this area to provide Food for their Families! - Think about bioaccumulation overtime!