

# Factors Affecting Florida Ag Water Use, Allocations and Protection

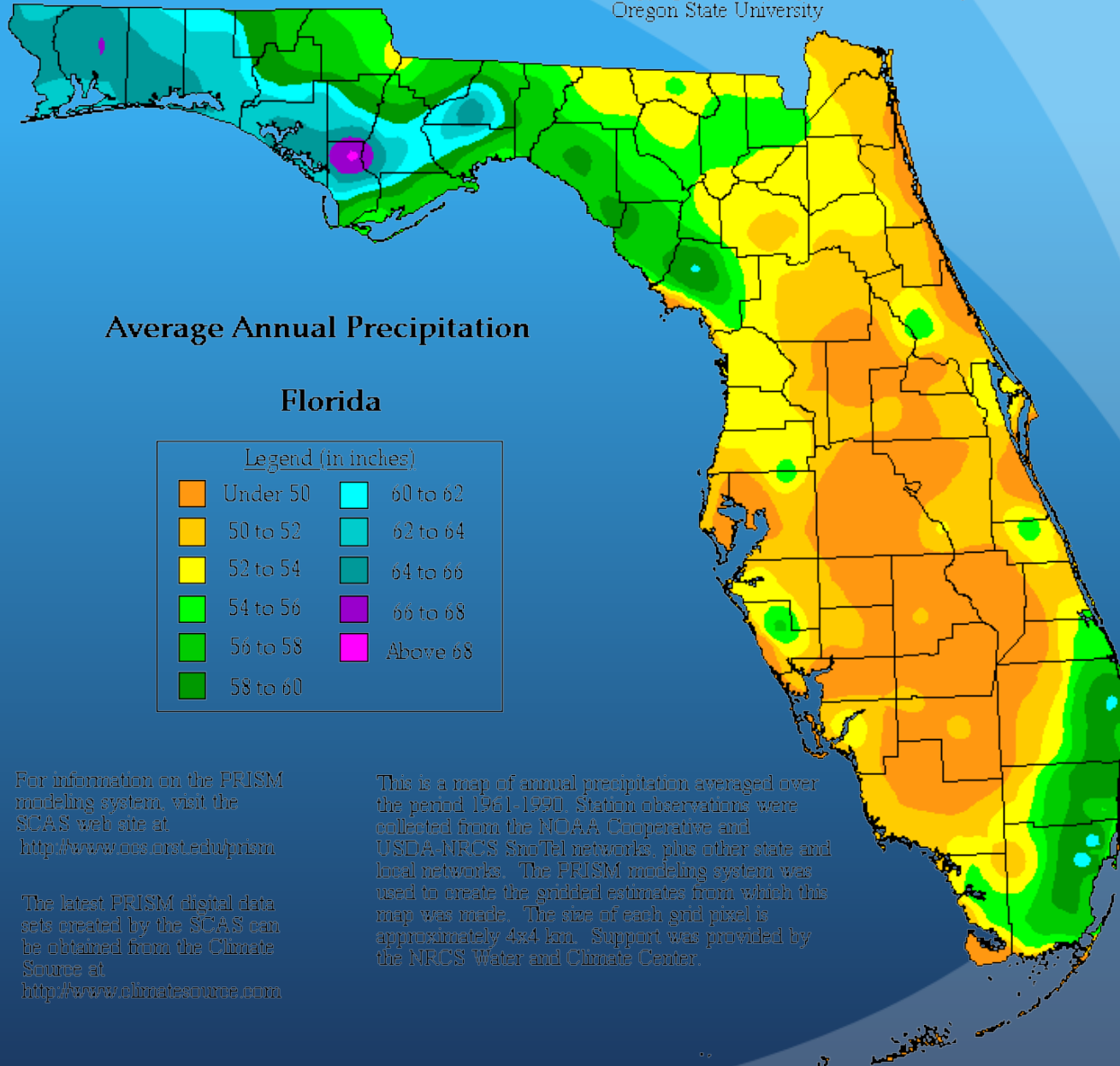
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University of Florida

Gulf Coast Research and Education Center

# Overview

- Florida's unique climate and hydrologic situation
- Stress on water resource allocation and use
- Florida water resource management and regulation
- Impact of regulation on agricultural water use
- Water conservation and water quality protection

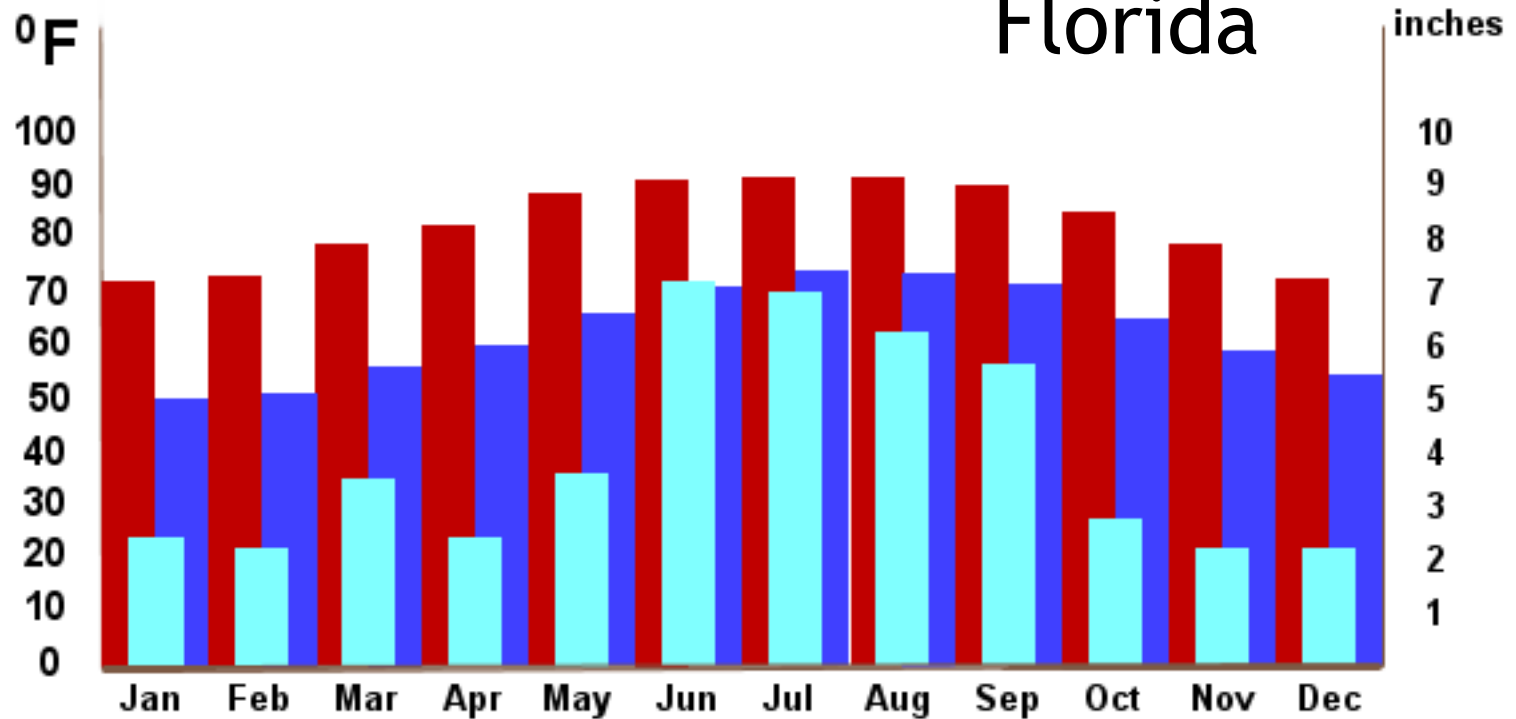


For information on the PRISM modeling system, visit the SCAS web site at <http://www.oes.orst.edu/prism>

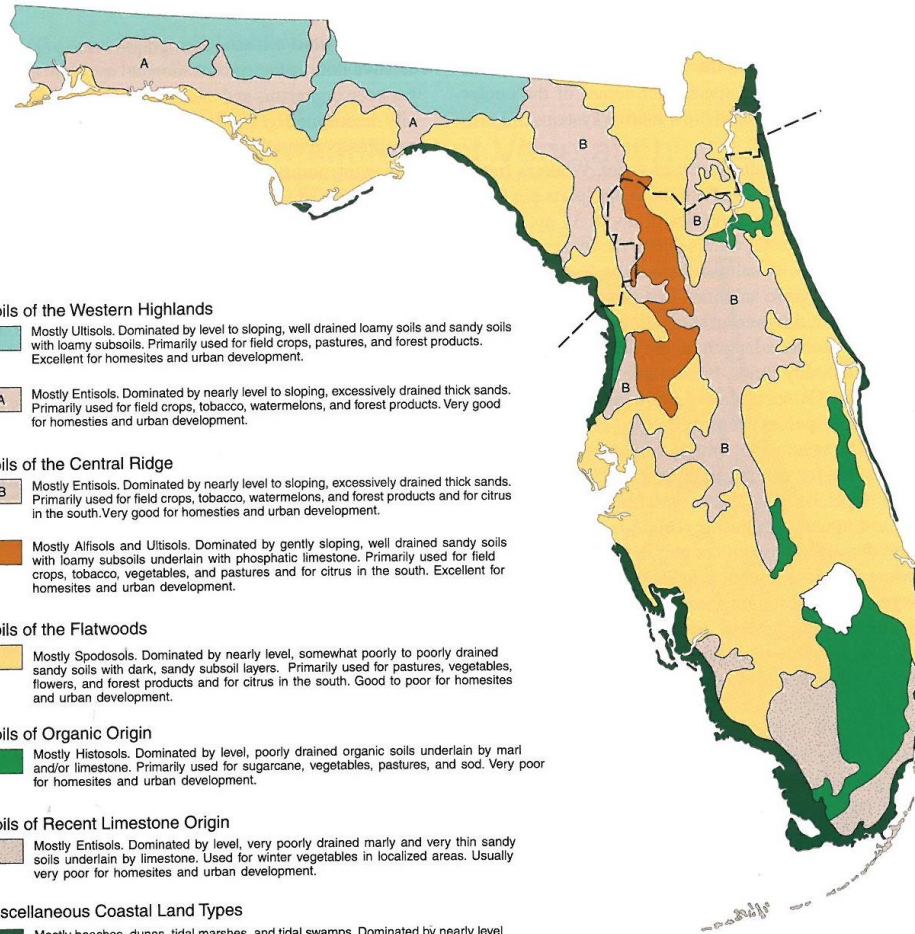
The latest PRISM digital data sets created by the SCAS can be obtained from the Climate Source at <http://www.climate-source.com>

■ Average High Temp  
■ Average Low Temp  
■ Average Rain Fall


# Florida




# Soil Types





## Soils of the Western Highlands

 Mostly Ultisols. Dominated by level to sloping, well drained loamy soils and sandy soils with loamy subsoils. Primarily used for field crops, pastures, and forest products. Excellent for homesites and urban development.


 **A** Mostly Entisols. Dominated by nearly level to sloping, excessively drained thick sands. Primarily used for field crops, tobacco, watermelons, and forest products. Very good for homesites and urban development.

## Soils of the Central Ridge


 **B** Mostly Entisols. Dominated by nearly level to sloping, excessively drained thick sands. Primarily used for field crops, tobacco, watermelons, and forest products and for citrus in the south. Very good for homesites and urban development.

 Mostly Alfisols and Ultisols. Dominated by gently sloping, well drained sandy soils with loamy subsoils underlain with phosphatic limestone. Primarily used for field crops, tobacco, vegetables, and pastures and for citrus in the south. Excellent for homesites and urban development.


## Soils of the Flatwoods

 Mostly Spodosols. Dominated by nearly level, somewhat poorly to poorly drained sandy soils with dark, sandy subsoil layers. Primarily used for pastures, vegetables, flowers, and forest products and for citrus in the south. Good to poor for homesites and urban development.


## Soils of Organic Origin

 Mostly Histisols. Dominated by level, poorly drained organic soils underlain by marl and/or limestone. Primarily used for sugarcane, vegetables, pastures, and sod. Very poor for homesites and urban development.

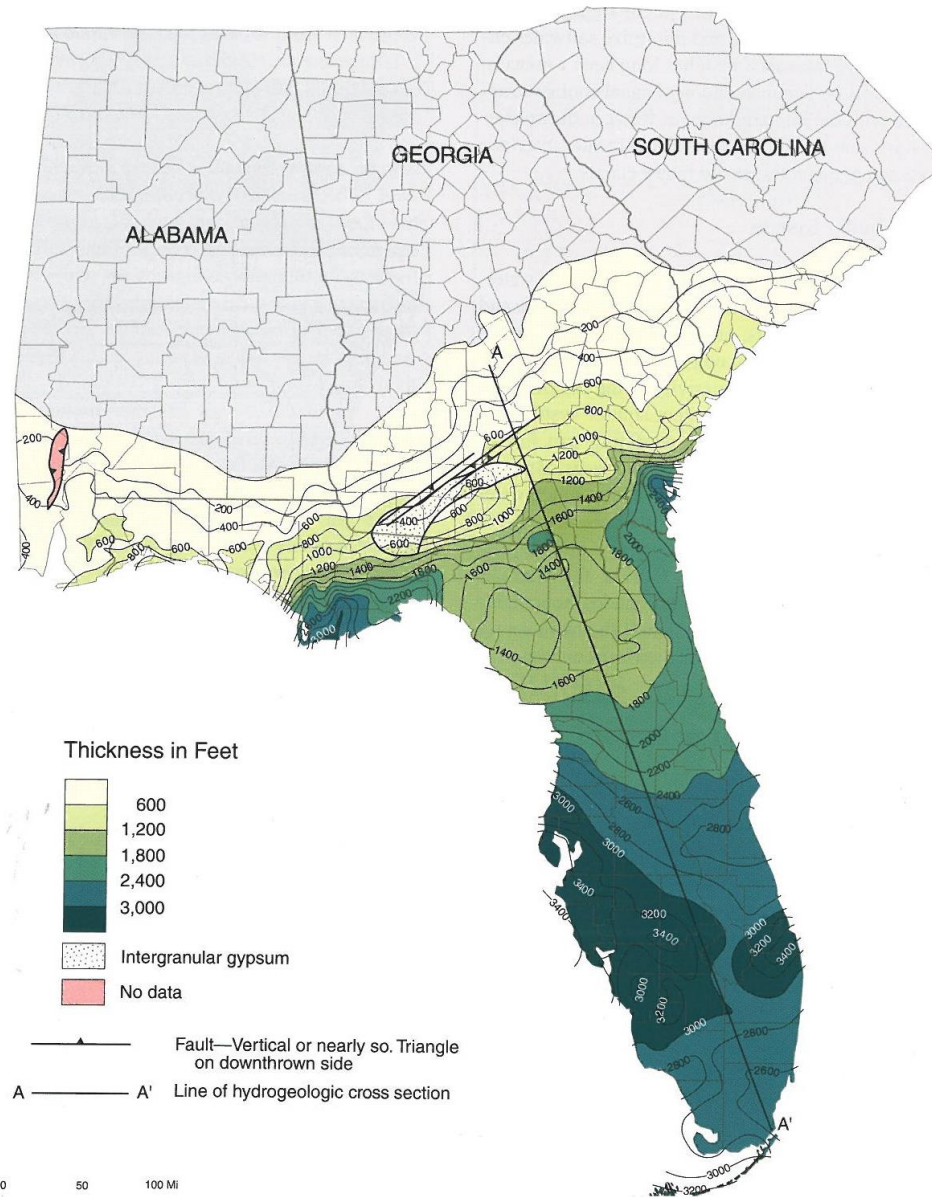
## Soils of Recent Limestone Origin

 Mostly Entisols. Dominated by level, very poorly drained marly and very thin sandy soils underlain by limestone. Used for winter vegetables in localized areas. Usually very poor for homesites and urban development.

## Miscellaneous Coastal Land Types

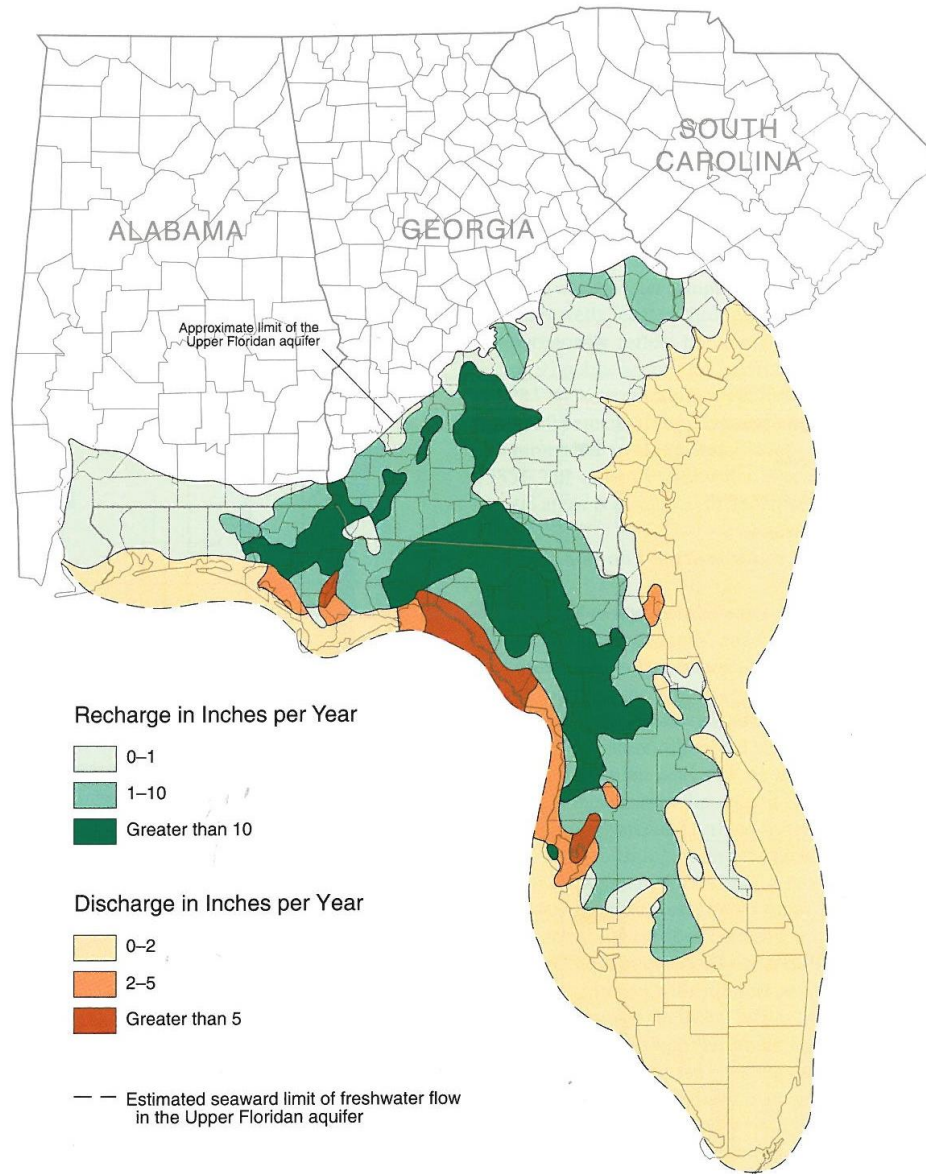
 Mostly beaches, dunes, tidal marshes, and tidal swamps. Dominated by nearly level to sloping sandy beaches and adjacent sand dunes; also level, very poorly drained coastal marshes and swamps of variable-textured mineral and organic soils subject to frequent tidal flooding. Primarily used for recreation and wildlife. Highly variable for homesites and urban development.

# Floridan Aquifer System



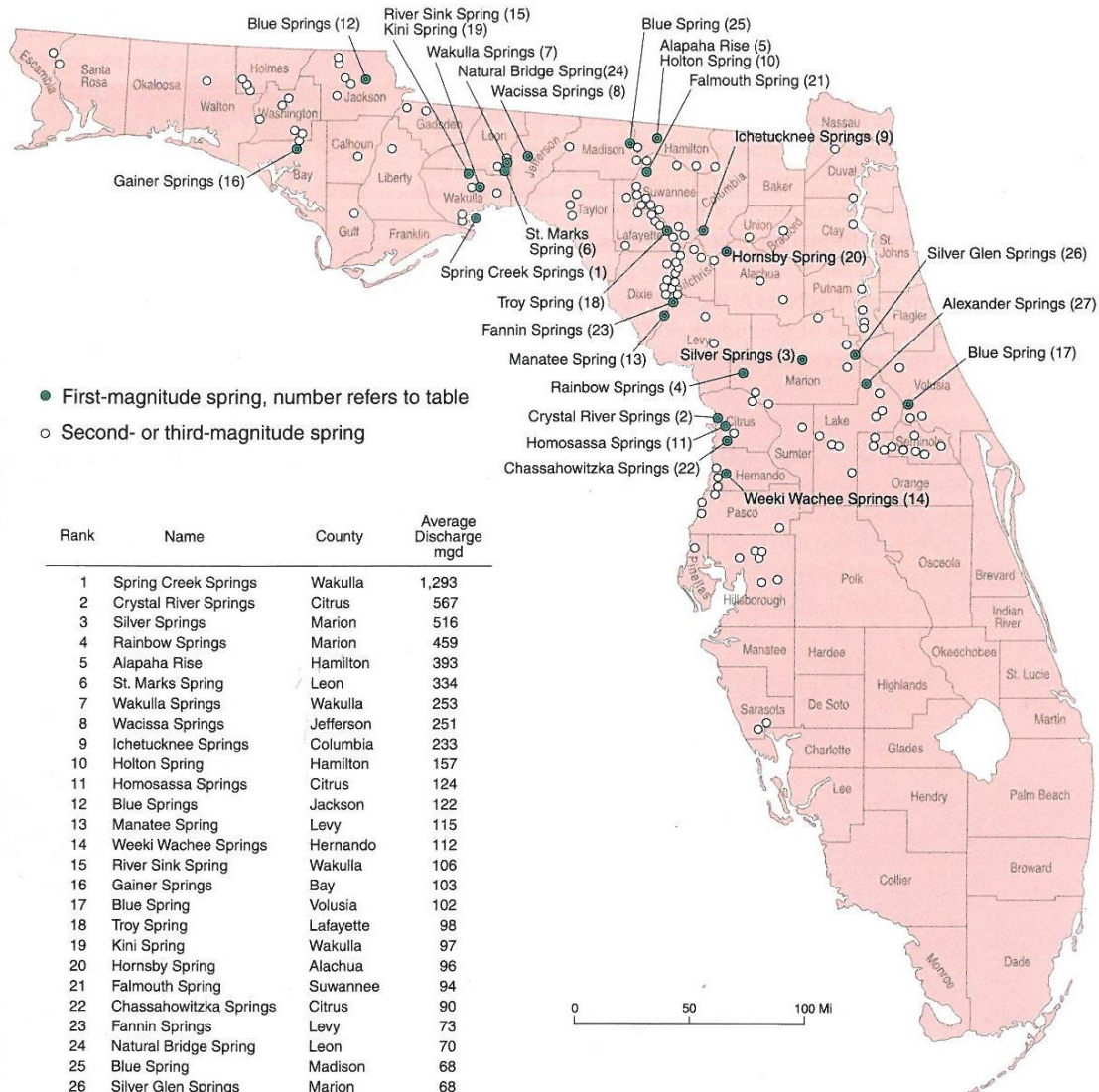
# Recharge and Discharge

## Upper Floridan Aquifer





# Springs





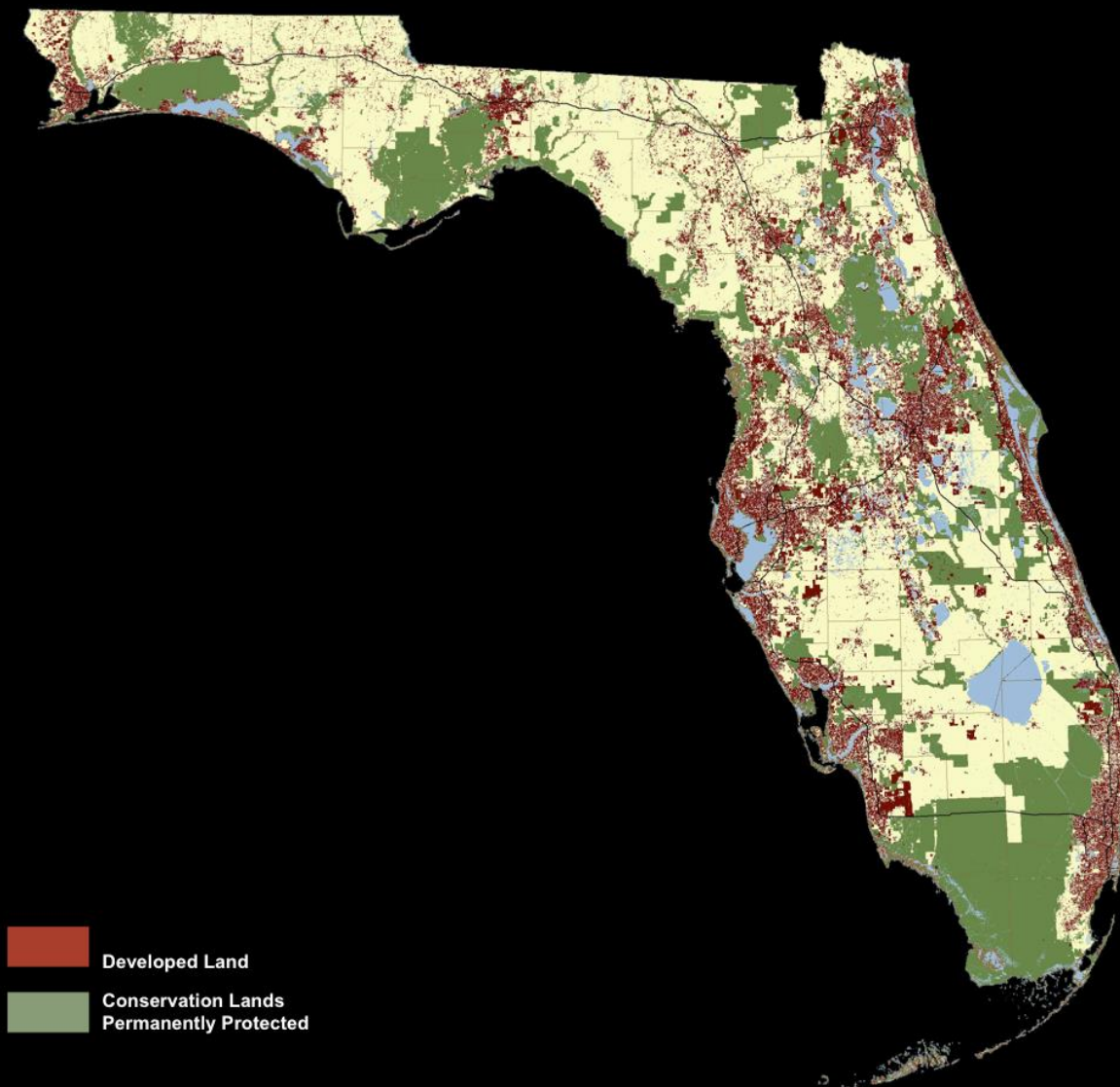
# Florida Water Facts

- Florida's total surface water area covers 4,308 square miles and ranks third in the nation.
- Florida's coastline stretches 1,197 miles with 663 miles of beaches.
- The state has more than 11,000 miles of rivers, streams, and waterways.
- Florida has about 7,700 lakes that are larger than 10 acres.
- Florida has more than 700 springs with water that comes primarily from the aquifer.
- Florida receives 50-54 inches of rain annually.
- Depending on the region, between 65 and 85 percent of the water used is groundwater pumped from Florida's underground aquifer system

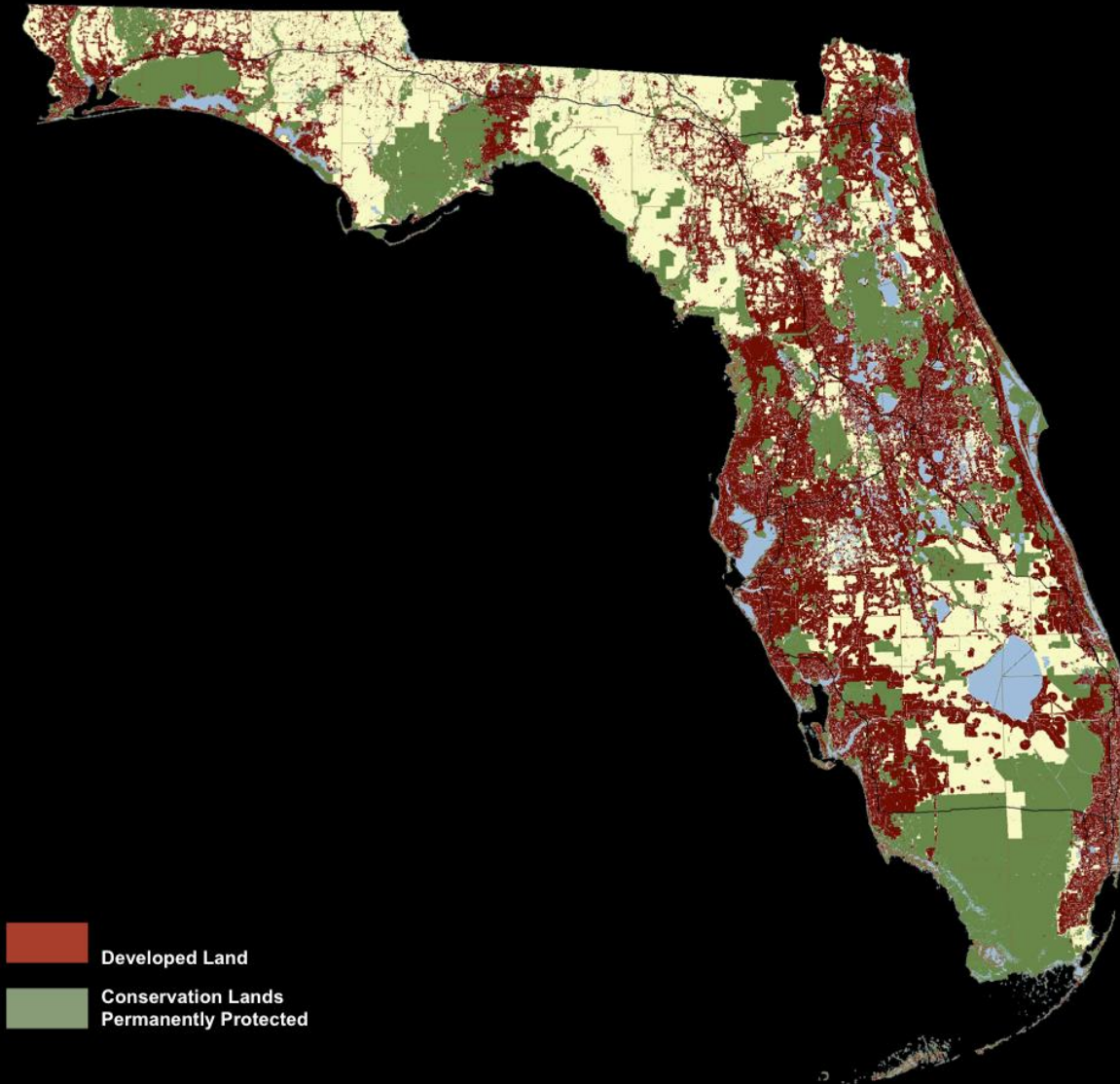
# Florida Water Users

- General population (Public supply)
  - Municipal use
  - Disposal of treated wastewater (reclaimed water)
- Agriculture
- Industry (phosphate mining, power generation, etc.)
- Natural ecosystems

## Existing Developed Lands and Permanent Conservation Lands



## 2060 Developed Lands and Permanent Conservation Lands





# Horticultural Fruit and Vegetable Industry





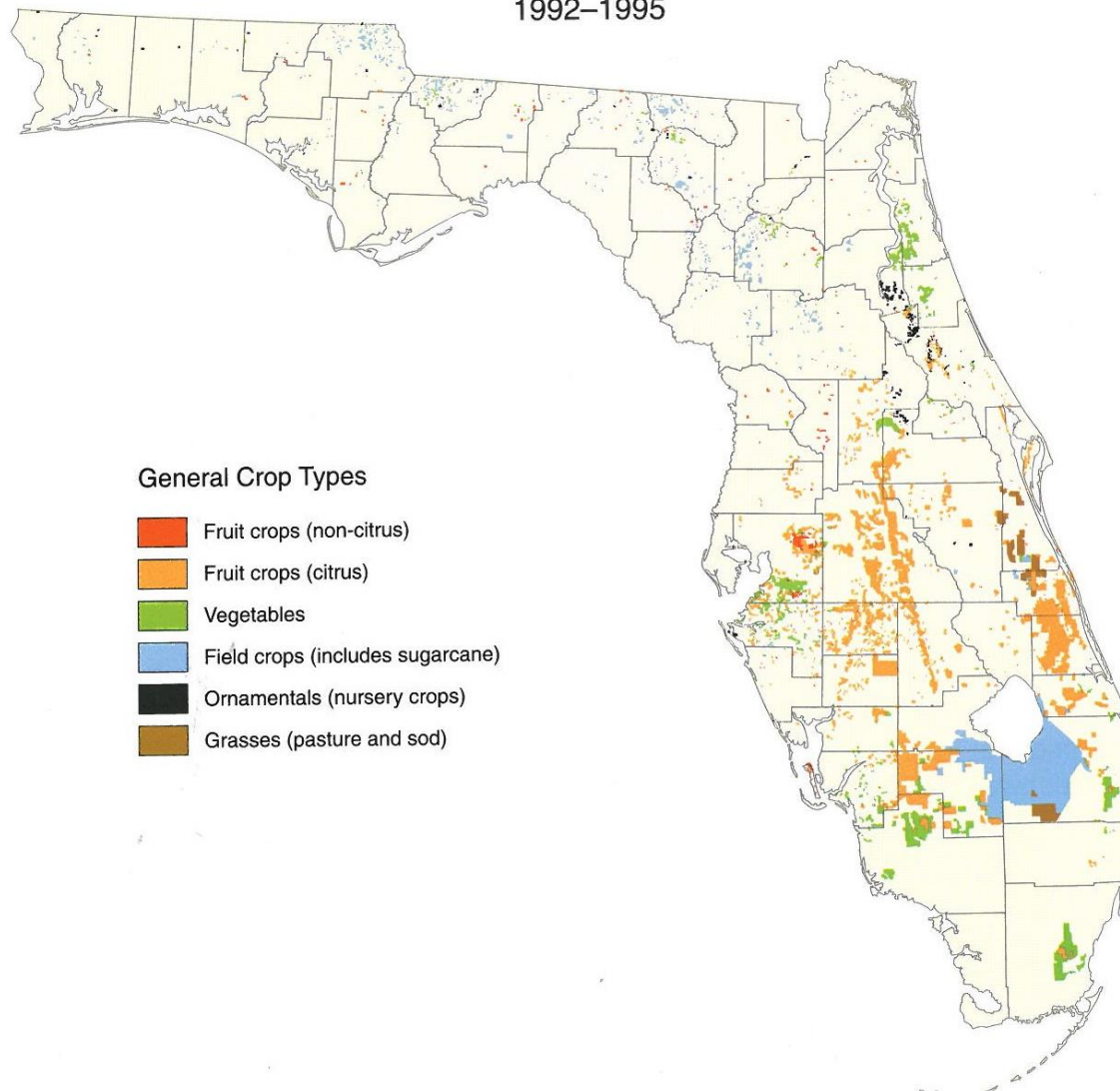
# Ornamental Horticulture Industry





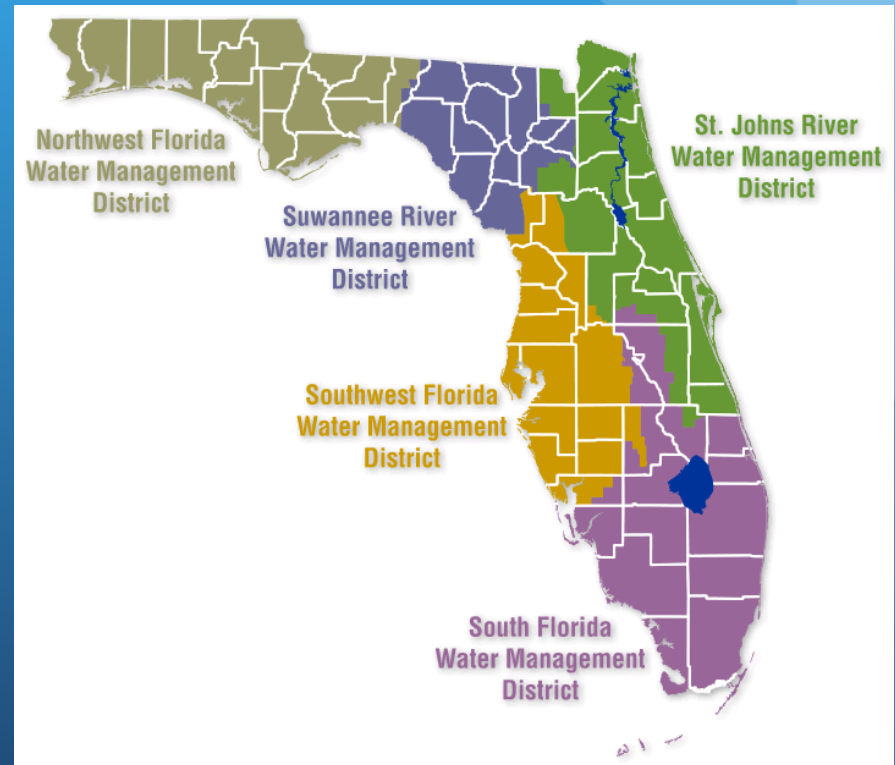
# Irrigated Acreage

1992-1995



# Florida Water Resource Allocation and Management

- All surface water and groundwater is regulated through Water Management Districts
- Five districts created by major watershed regions in state
- Districts have total authority for issuing water use permits
- Permits are specific to use and are for a defined period of time



# Water Use Permits

- There are three types of WUPs based primarily on the amount of water needed for a year.
  - Individual: 500,000 gpd or more
  - General: 100,000 gpd or more, but less than 500,000 gpd (also includes some uses less than 100,000 gpd)
  - Small general: most uses less than 100,000 gpd

# Permit Use

- Public supply
- Industrial or commercial
- Mining or dewatering
- Recreation or aesthetic
- Agriculture

# Ag Permit Quantities

- Annual daily average\*
- Peak month
- Crop protection (maximum daily)

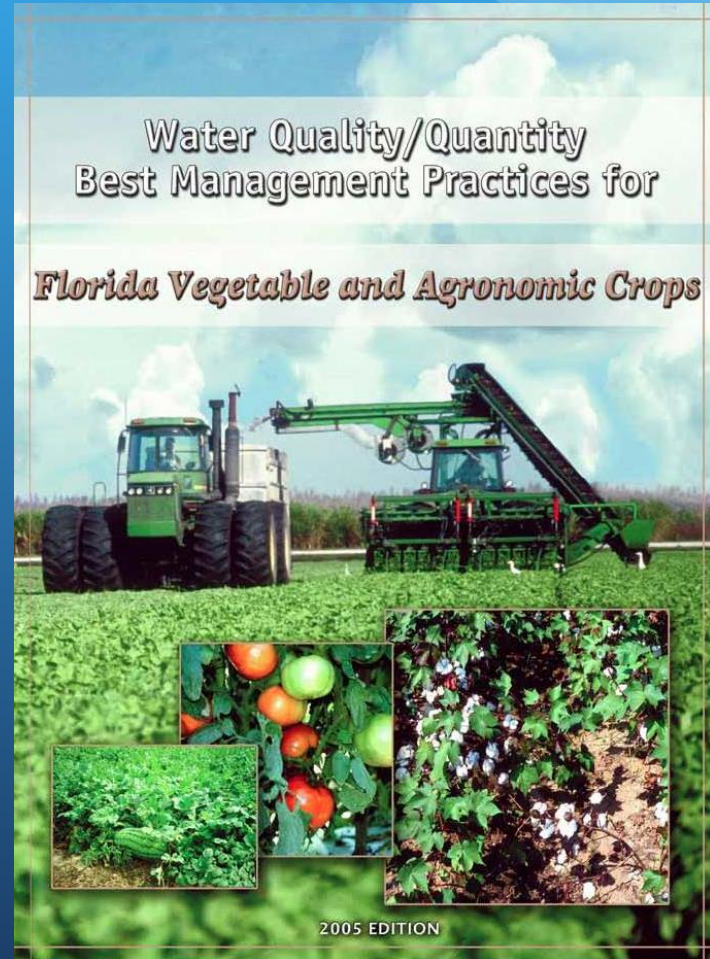
## Water Use Caution Areas (special rules apply):

- Dover/Plant City area
- Southern Water Use Caution Area, inside the Most Impacted Area
- Southern Water Use Caution Area, outside of the Most Impacted Area
- Northern Tampa Bay Water Use Caution Area



# Effect of Imposed TMDL's

- Development of Best Management Practices (BMP)
- Use of manuals for voluntary implementation
- Benefit to grower (presumed compliance)
- Benefit to state
  - Water resource protection
  - Reduction of nutrient loads to water bodies



# Agriculture Water Conservation

- Research for:
  - Determination of water needs for specific crops
  - Development of Best Management Practices
    - Efficient irrigation systems management
    - Direct link with nutrient management
    - Automated controls
  - Innovative approaches to reduce water needs (ex. strawberry transplant establishment)



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Google earth



1995

Imagery Date: 3/14/2013 27°45'25.39" N 82°13'26.87" W elev 125 ft eye alt 5340 ft



# GCREC Water Management

- Water sources
  - Two ag use primary wells
  - Potable use and fire protection well
- Systems
  - Sub-irrigation (water table management)
  - Overhead sprinkler
  - Microirrigation
- Drainage System
  - Canals
  - Ditches

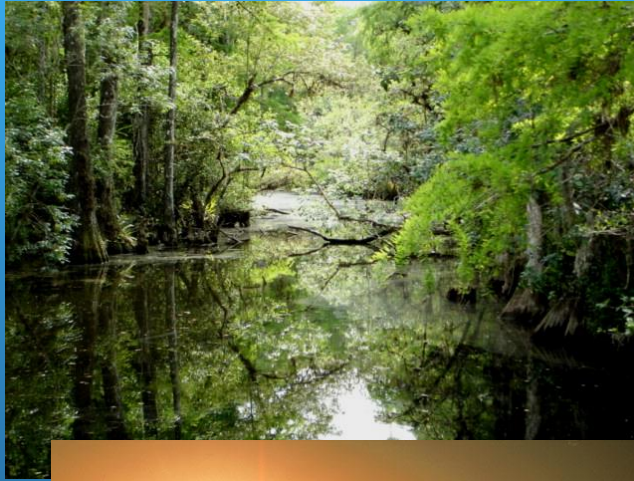
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# Critical Issue: Protection of Fragile Ecosystems



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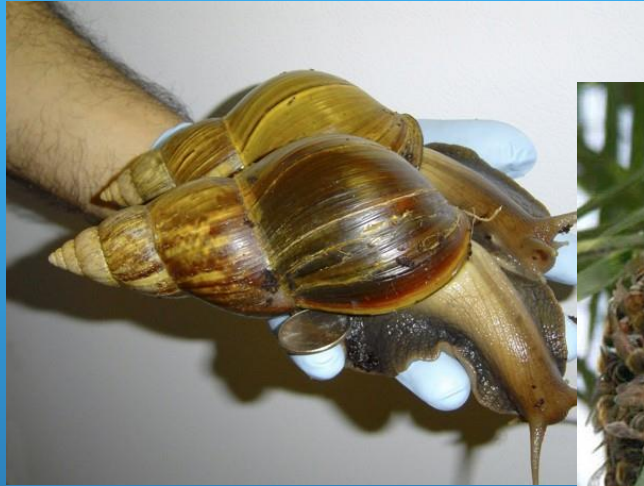


# Critical Issue: Protection of Native Wildlife Species





# Other Threats to Ecosystems - Invasive Species



## UF/IFAS Statewide Research and Education Network

- Main Campus
- ▲ Research and Education Centers (REC)
- Research Sites/Demonstration Units  
Administered by RECs/Departments
- ◆ Alachua County Units
- 4-H Camps

