

# Possible Causes of Recent Lower Dry Season Water Levels at Corkscrew Swamp Sanctuary

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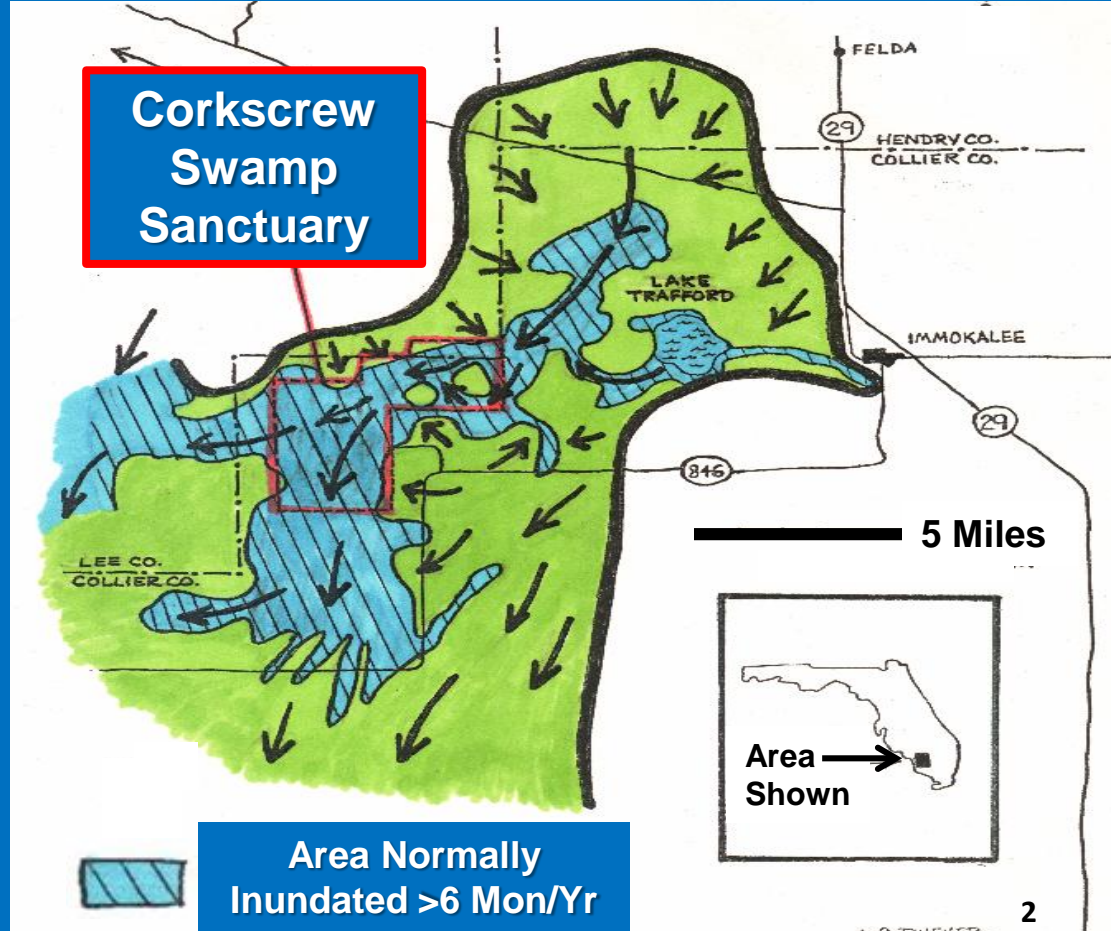
<sup>1</sup> National Audubon Society, Naples, Florida

<sup>2</sup> Natural Ecosystems, Naples, Florida

# Dry Season Water Levels

Upstream  
Agricultural  
Development has  
Lowered Water  
Storage in  
Landscape at the  
Beginning of the  
Dry Season

## Corkscrew Swamp Watershed



# Agricultural Lands within a Wetland Landscape



NO STEP



# Agriculture in Southwest Florida

64% of Total Water Use in SW Florida in 2014  
(LWCWSP 2017)

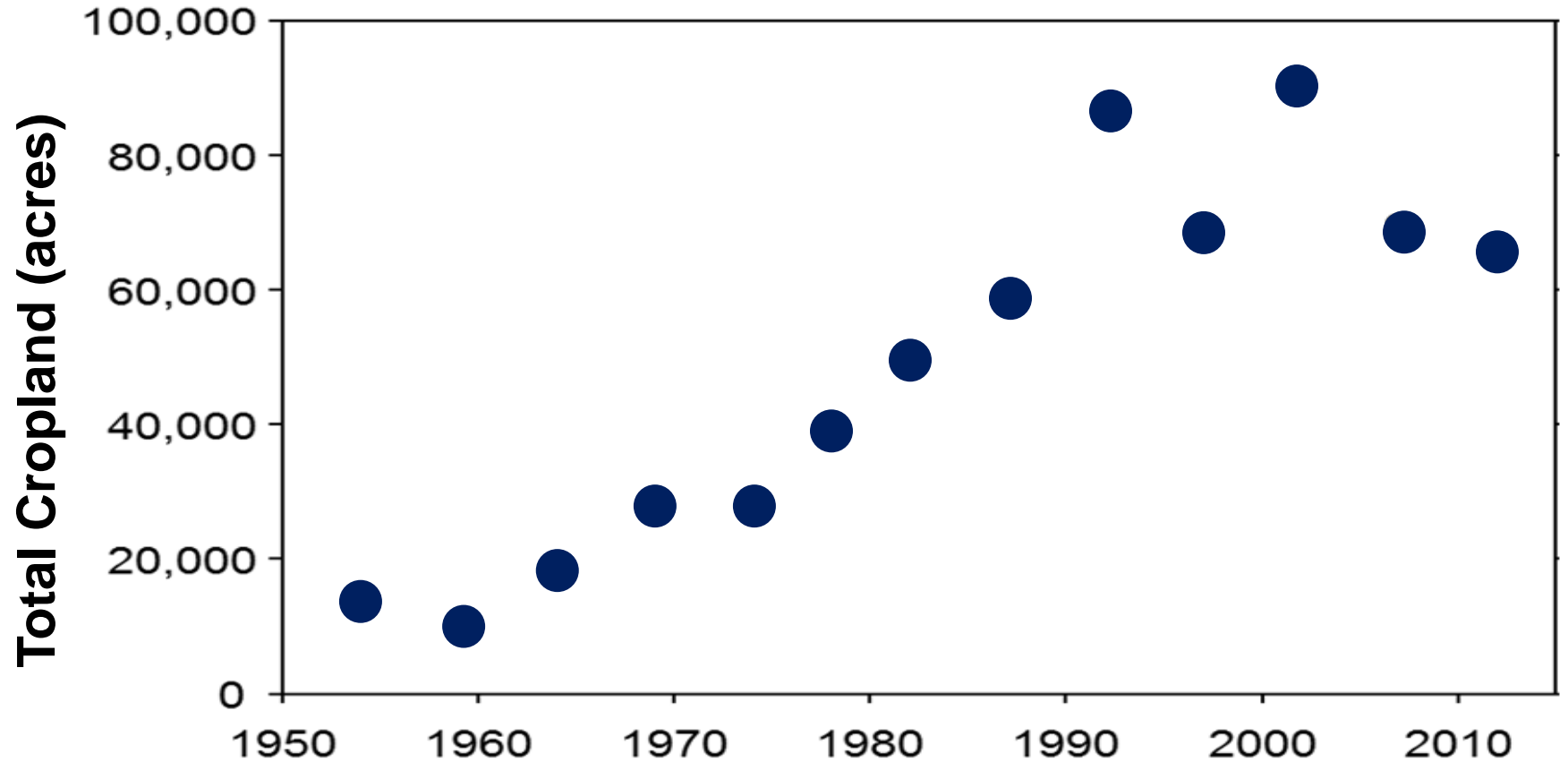


**Winter Vegetables**



**Citrus**

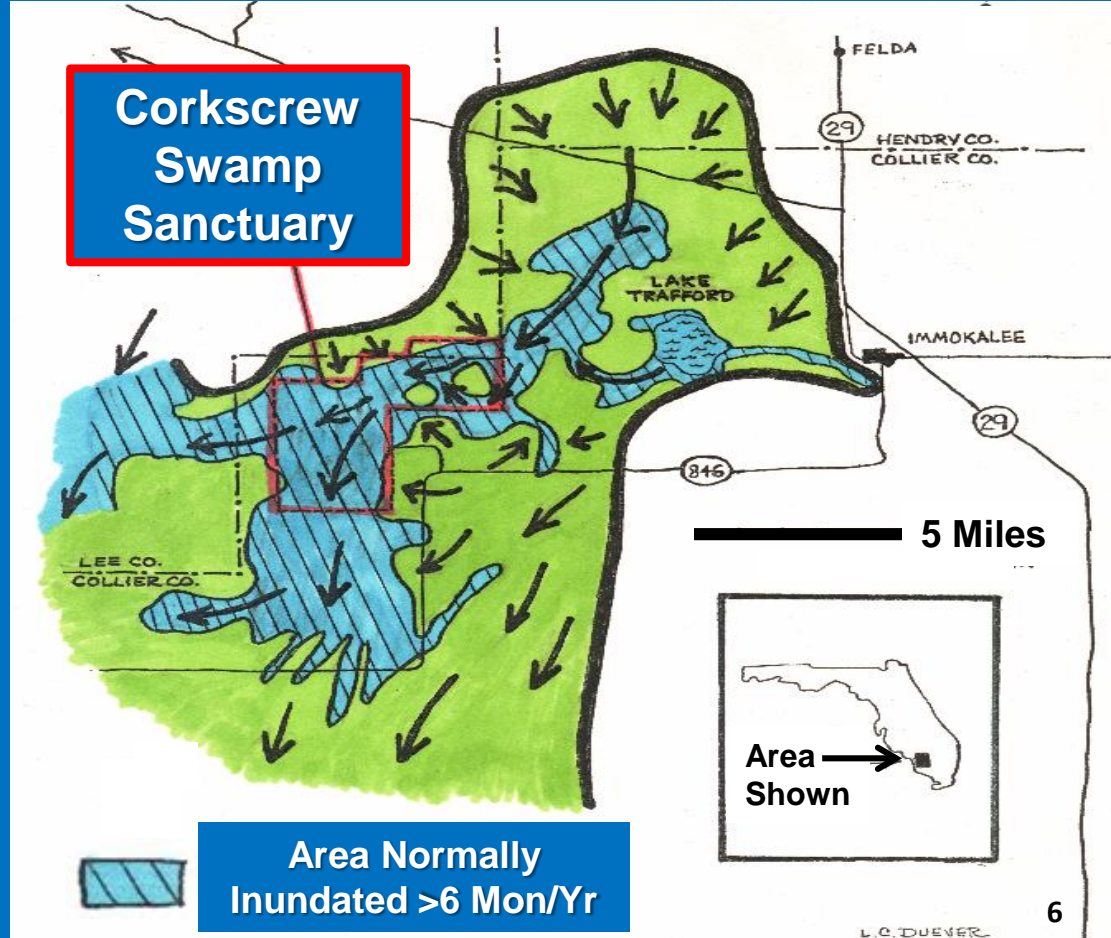
# Total Acreage of Cropland in Collier County



# Dry Season Water Levels II

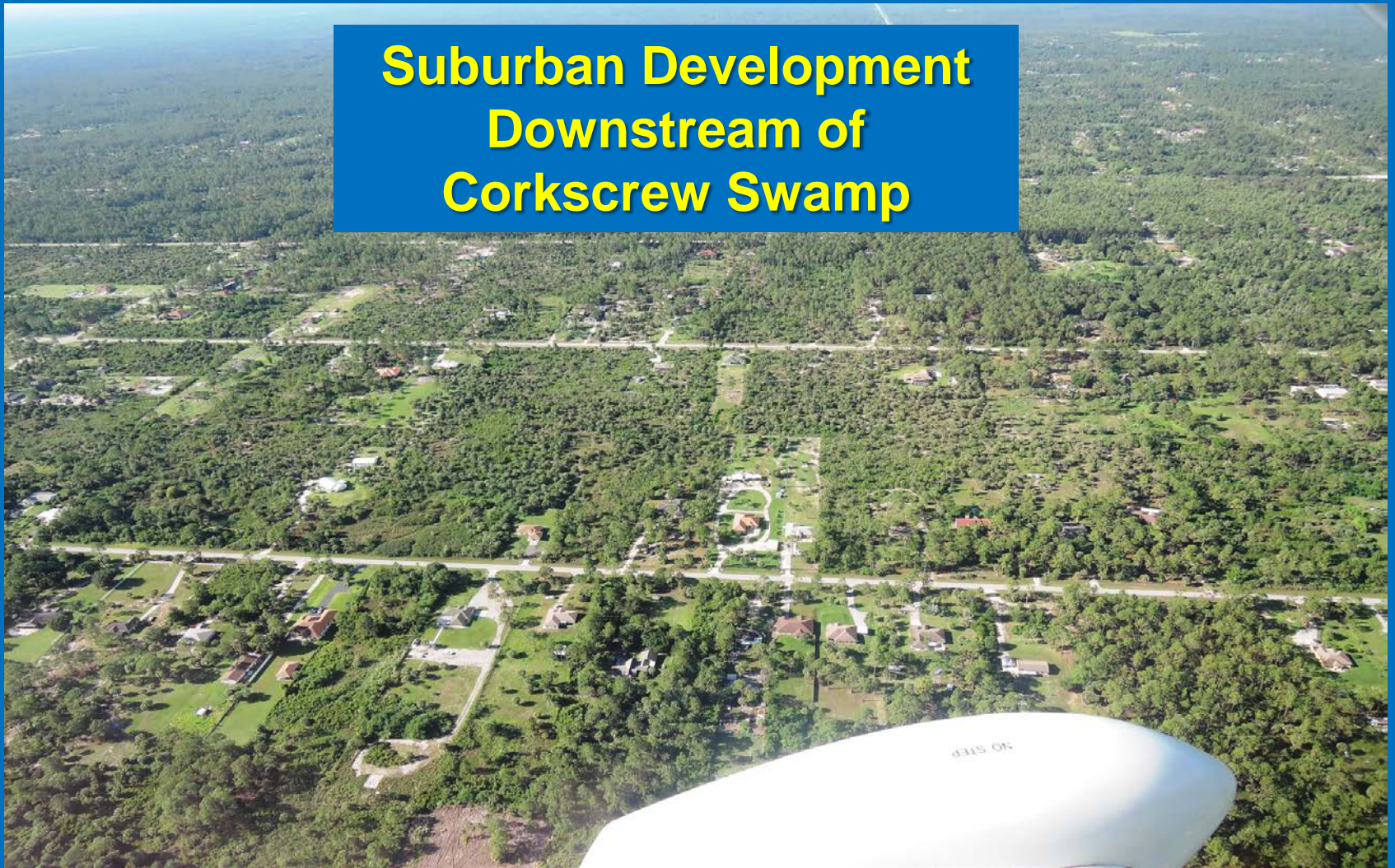
Residential  
Development  
Downstream

## Corkscrew Swamp Watershed





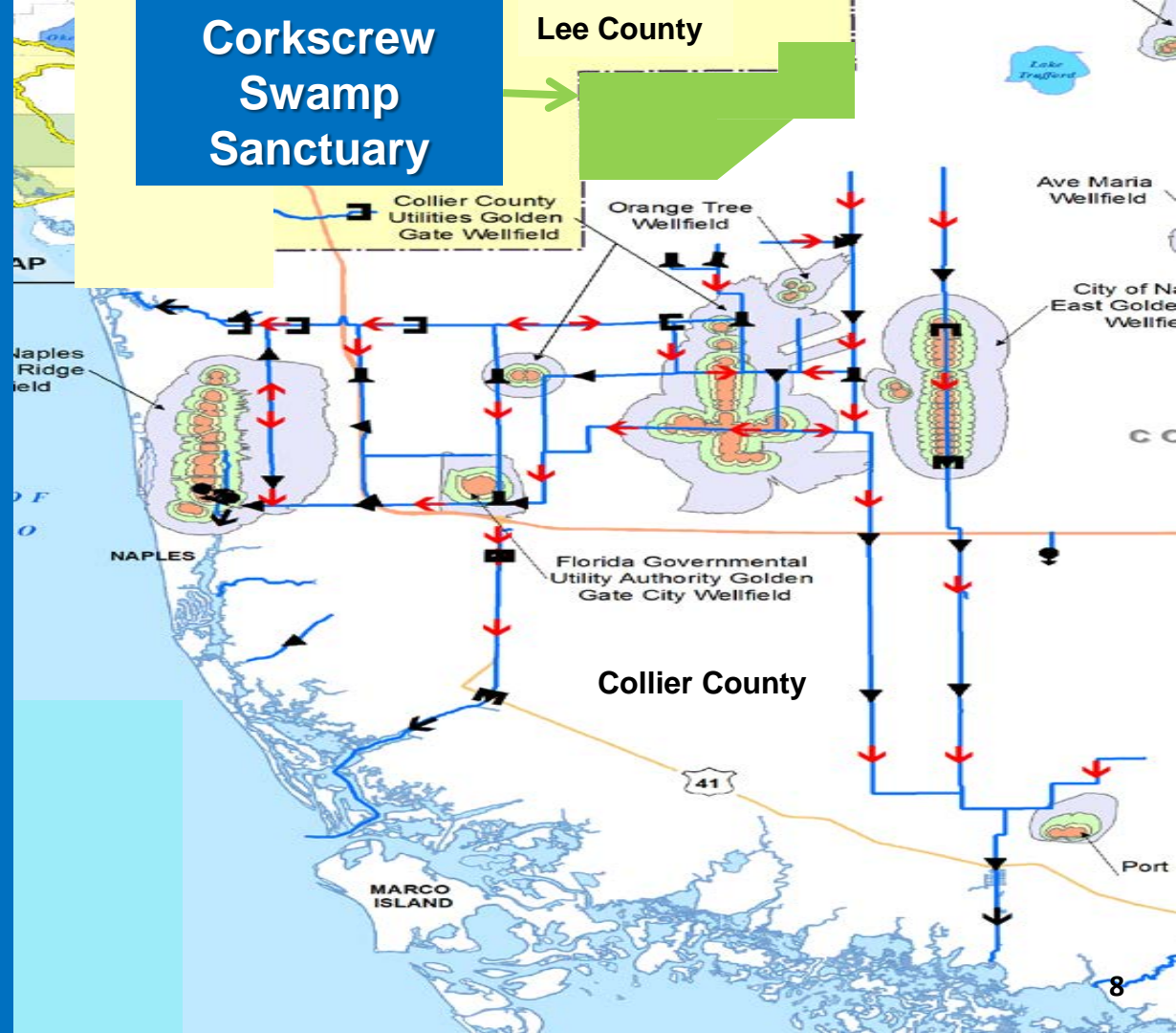
# Suburban Development Downstream of Corkscrew Swamp



# Residential Canals Downstream of Corkscrew Swamp (LWCWSP 2017)

Drain Large Amounts  
of **Surface Water**  
During Wet Season

Continue to Steadily  
Drain **Shallow  
Groundwater** Through  
Long Dry Season





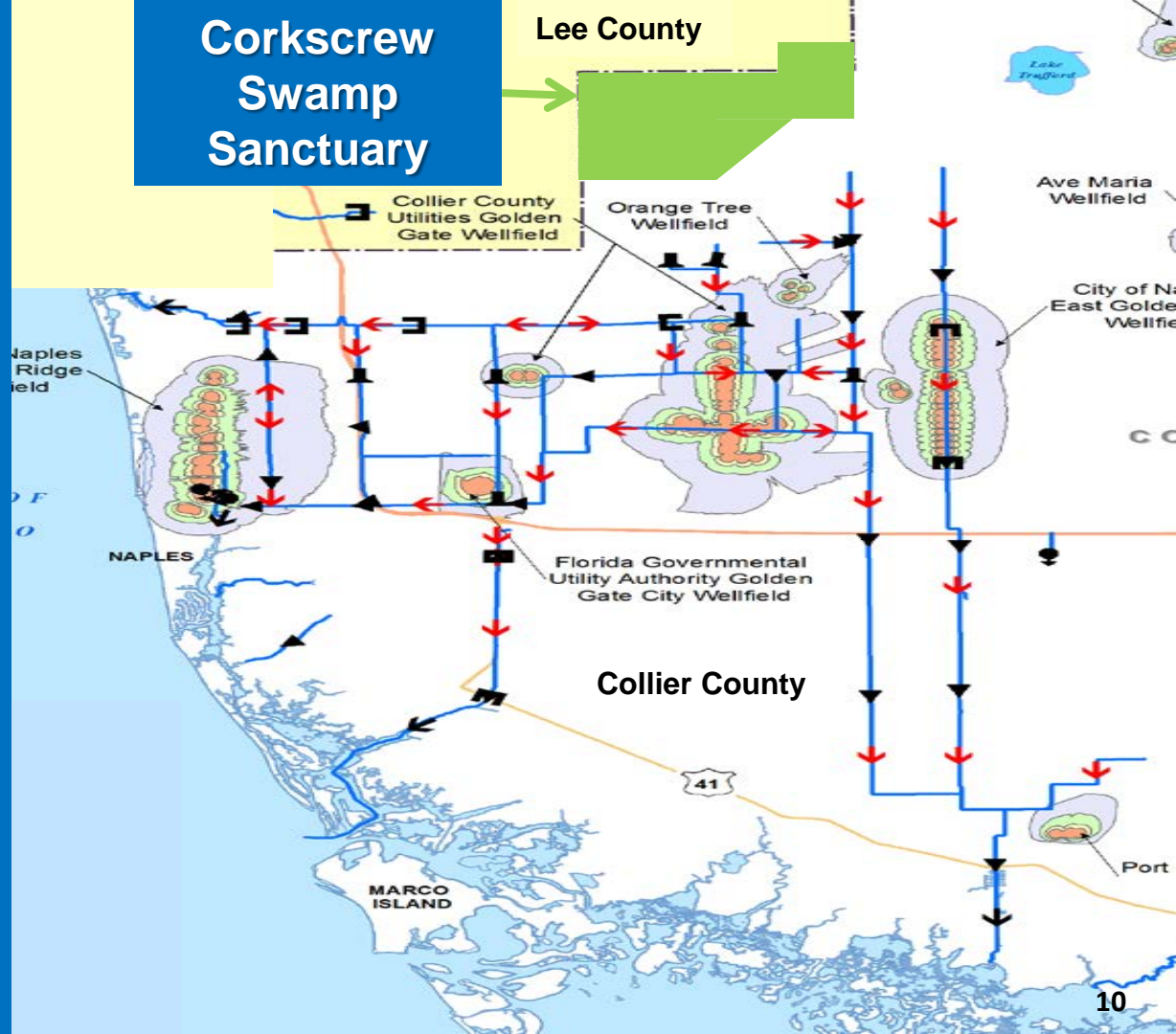
# Coastal Collier County - Urban Development



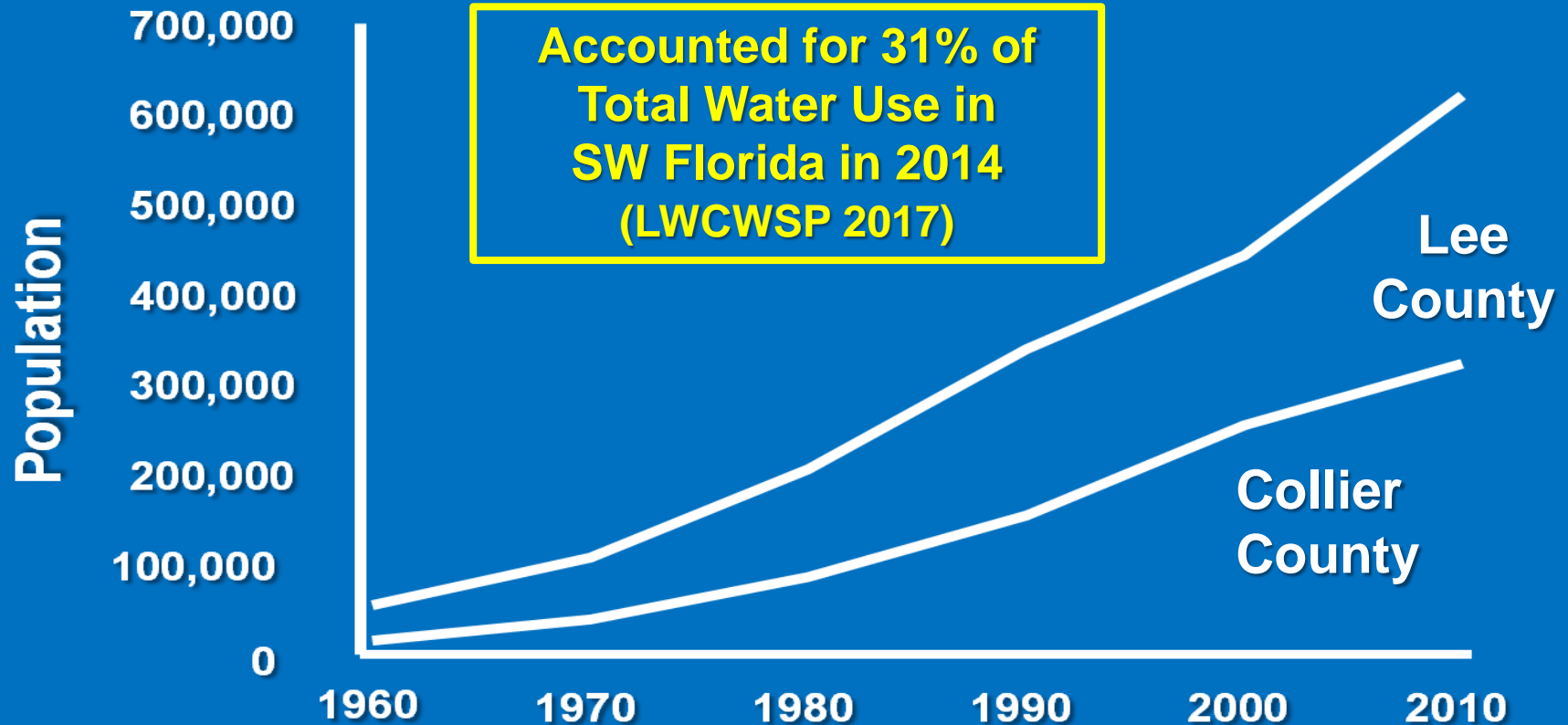
# Well Fields Downstream of Corkscrew Swamp (LWCWSP 2017)

Supply Groundwater  
Water Year Around to  
**Residents**

Increased Use of  
Groundwater During  
Long Dry Season for  
**Landscape Irrigation  
and Seasonal Visitors**

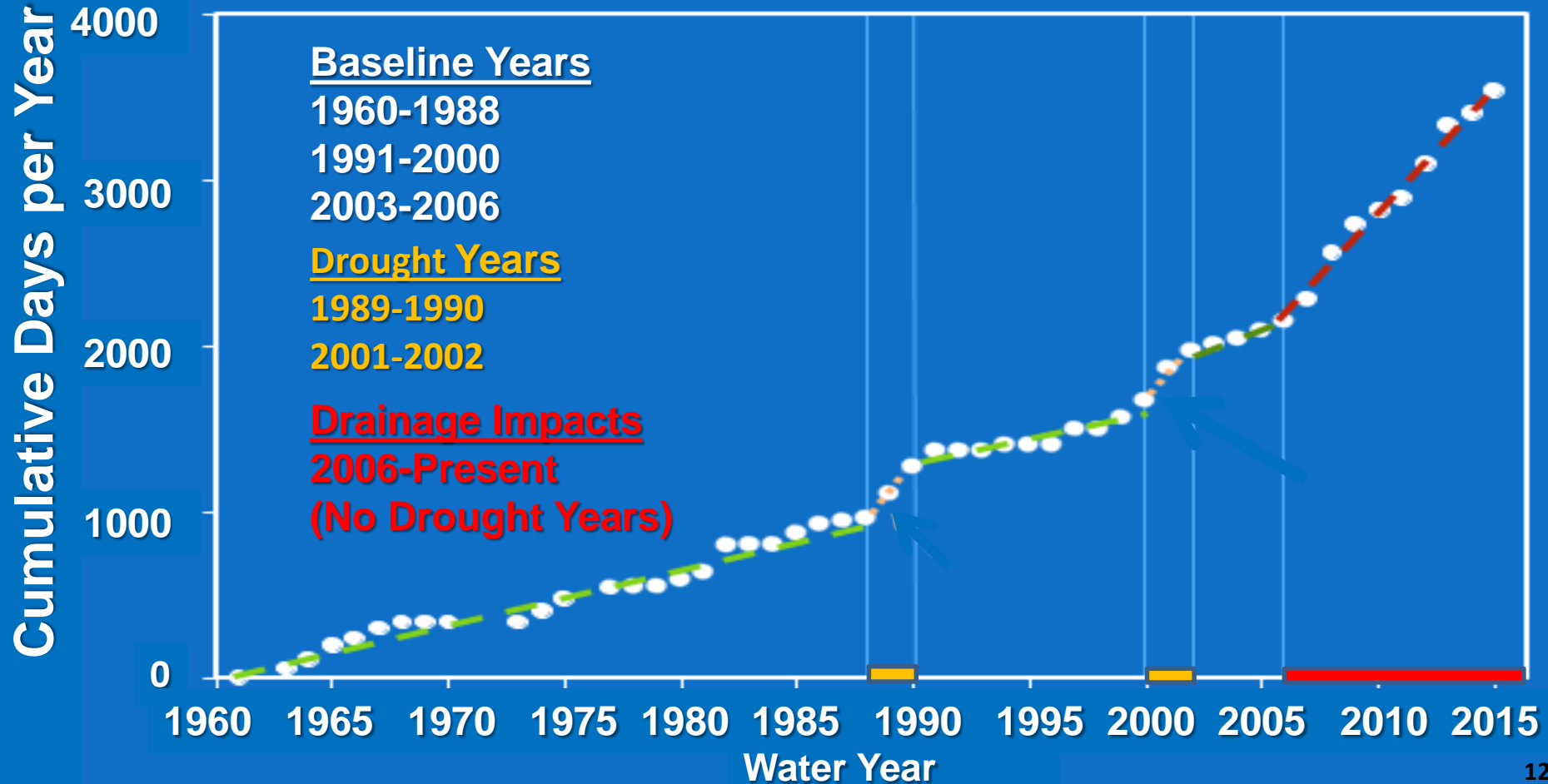


# Population in Corkscrew Swamp Watershed Counties





# Timing of Changes When Swamp Forest Was Dry



# **Increased Evapotranspiration During Spring Dry Season Associated with More Deeply Woody Vegetation**

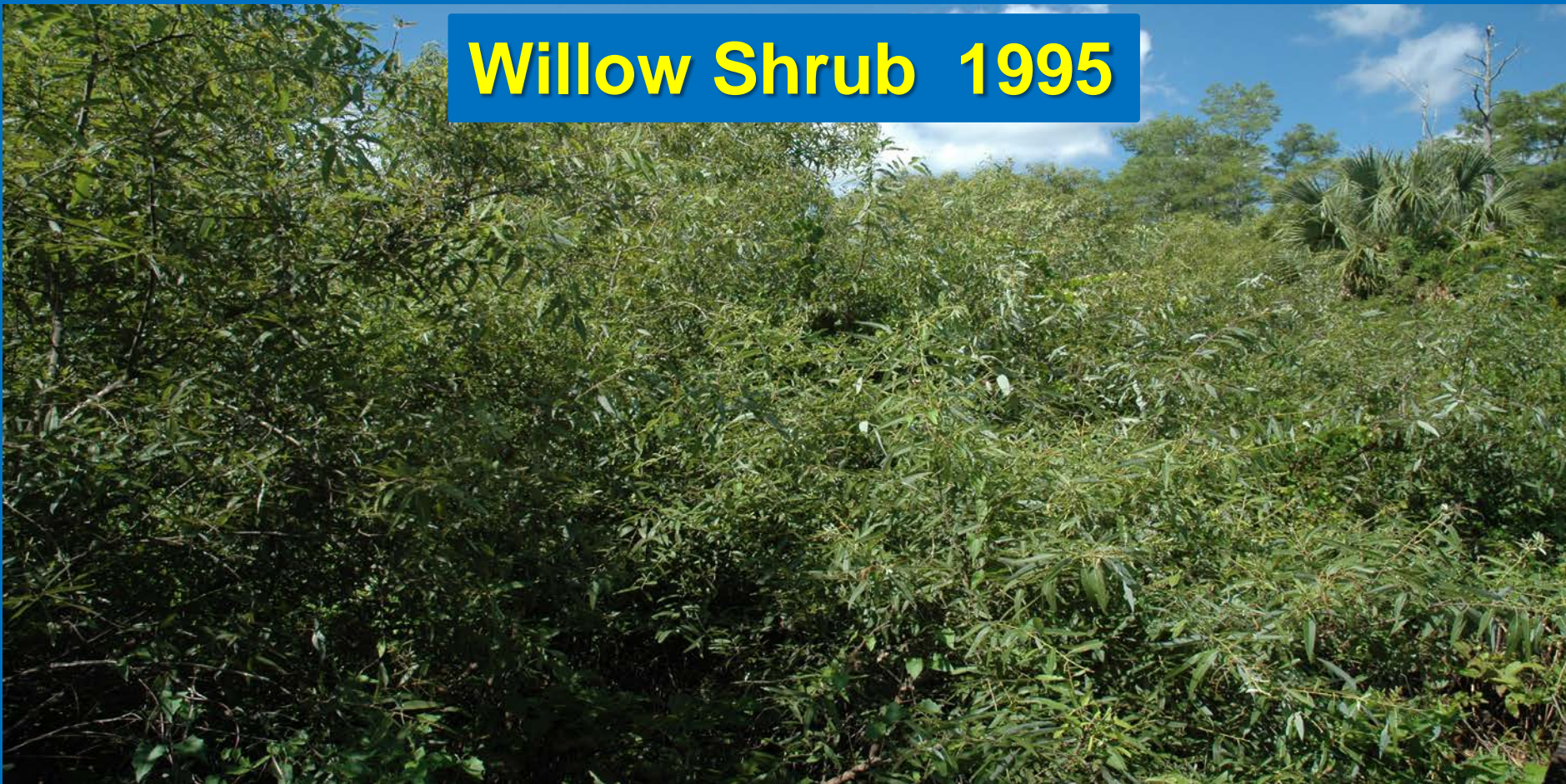
- **Willows in Wetlands**
- **Pines and Oaks and in Uplands**

# Marsh 1975





# Willow Shrub 1995





# Willow With Invading Cypress and Maple 2011





# Pine Flatwoods with Fire





# **Pine Flatwoods 40 Years - No Fire**



# Major Influences on Changing Dry Season Hydrologic Conditions at Corkscrew Swamp

- Upstream Drainage of Agricultural Land
- Downstream Drainage of Residential Lands
- 
- Pumping from Surficial Aquifers Increased
- Increased Evapotranspiration

# Addressing Problems?

- Understand Interacting Hydrologic Influences on Corkscrew's Dry Season Water Levels
- Keep Severity of Impacts from Getting Worse
  - No New Water Supply Wells Near Corkscrew
  - No New Drainage Features Downstream of Corkscrew
  - Reduce Pumping in Dry Season Close to Corkscrew
- Reduce Current Dry Season Impacts
  - Hydrology (above suggestions)
  - Fire – Reduce Fuel Loads Around Corkscrew



# Discussion

