



**Wildfire, Prescribed
Fire, and Climate
Change in Florida**

June 12, 2007

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Overview:

- 1) Effects of fire on CO₂ emissions
- 2) Effects of climate change on fire



Sweat Farm Road Fire, May 2007



$\text{CO}_2 + \text{H}_2\text{O} + \text{heat}$



$\text{CH}_4 + 2\text{O}_2$

Florida forests



CO₂

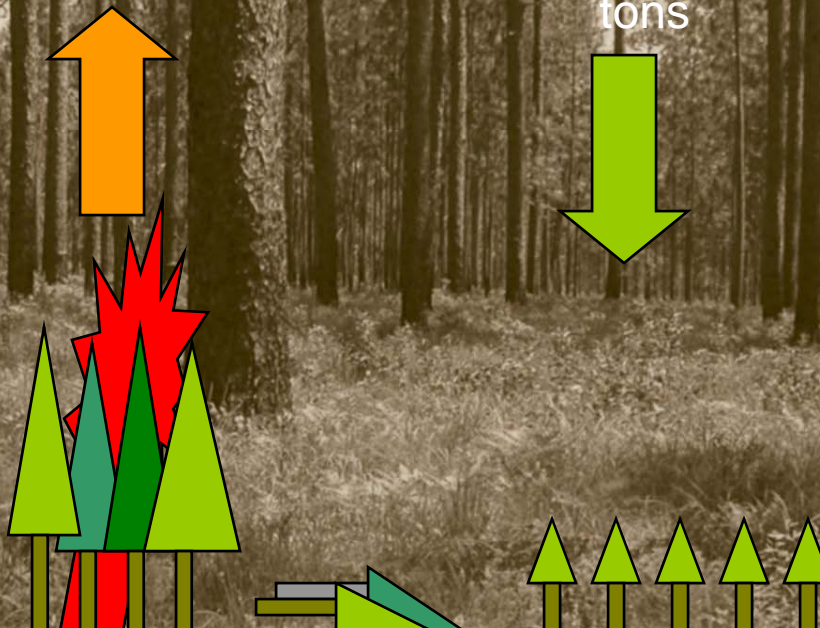
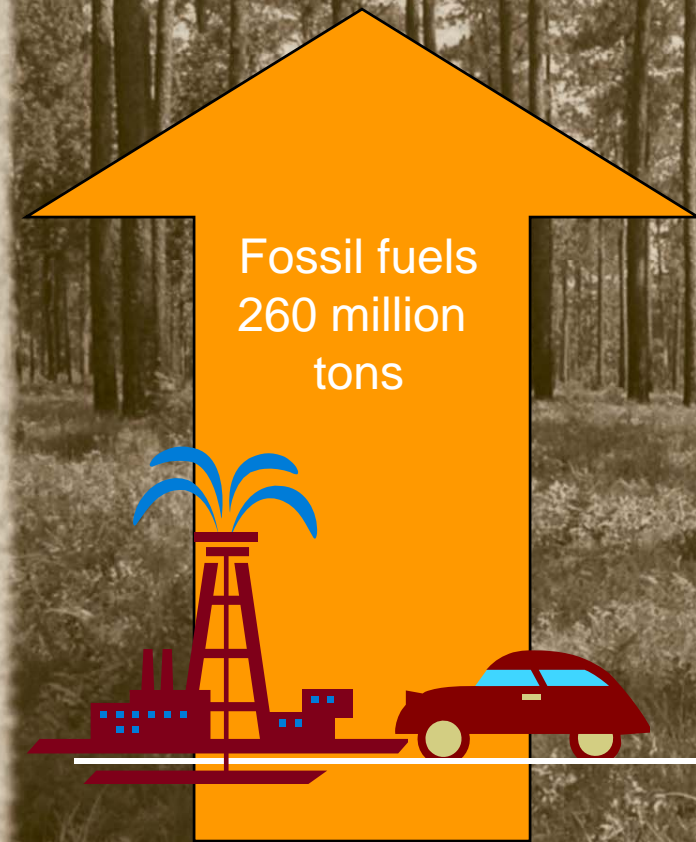


Wildland fire
13 million
tons

CO₂

Carbon fixation
approx.
13 million
tons

Fossil fuels
260 million
tons



Florida

Fire in Florida



Wade Tract, Georgia



Big Turnaround Fire, May 2007



Tall Timbers Fire Plots, Tallahassee, Florida 1 yr interval plot



1 Year Interval



2 Year Interval

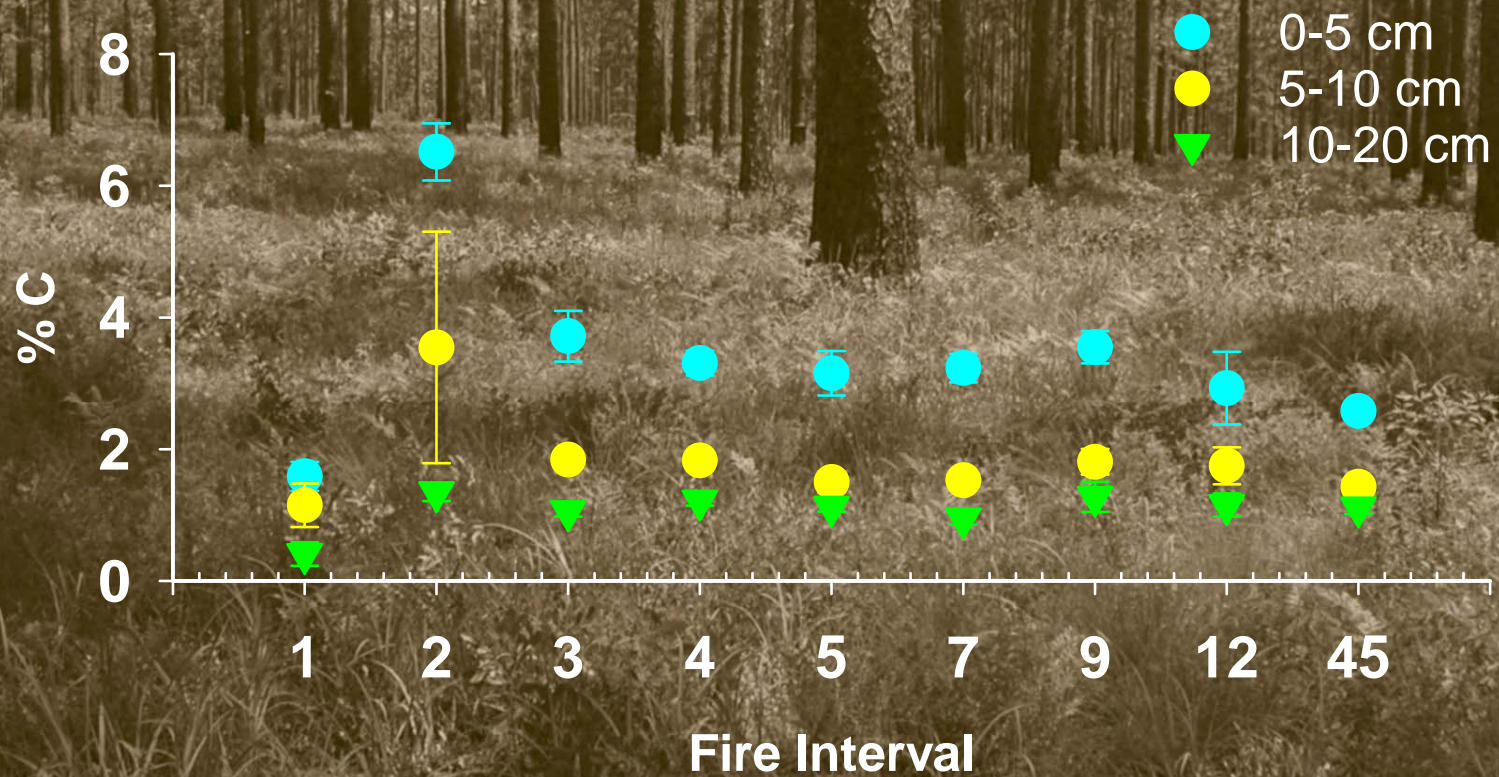


3 Year Interval

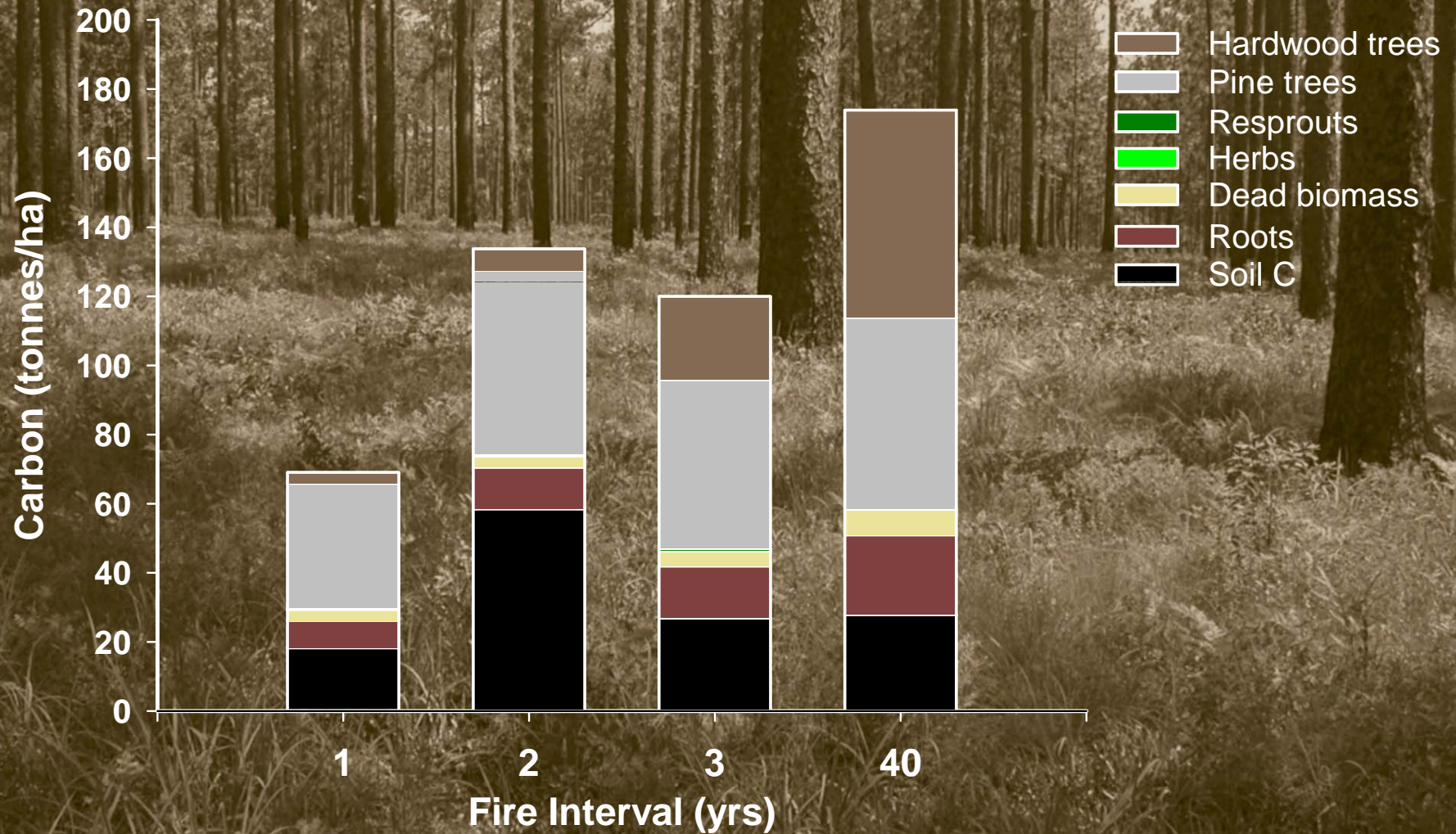


40 Years No Fire

Stoddard Plot Soil Carbon

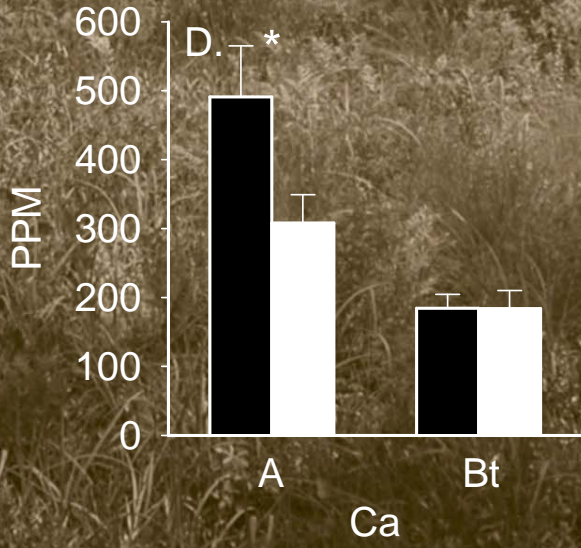
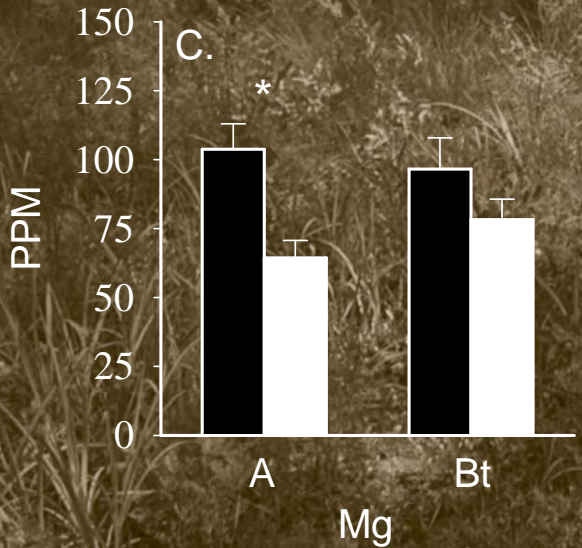
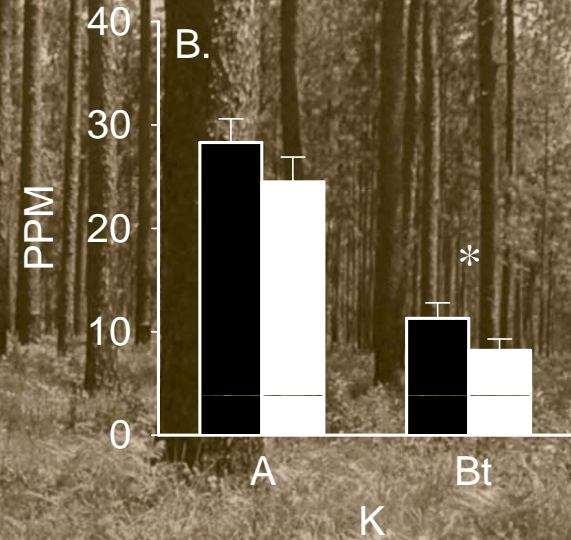
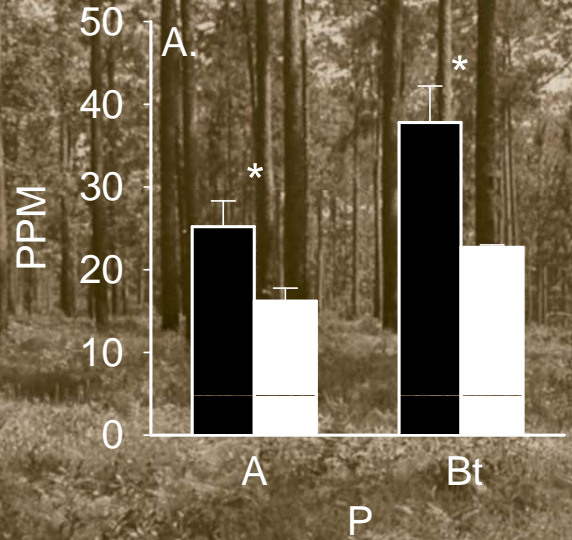


Tall Timbers Fire Plots Carbon Budget Est. Winter 2005



2 yr vs. 40 year unburned Mineral nutrients

■ Burned
□ Not Burned



Frequent prescribed burning in pinelands:

- does not reduce soil health and sustainability and may improve it
- ensures future forest productivity (carbon sequestration)
- results in increased soil carbon storage





Big Turnaround Fire, May 2007

Wildfires:

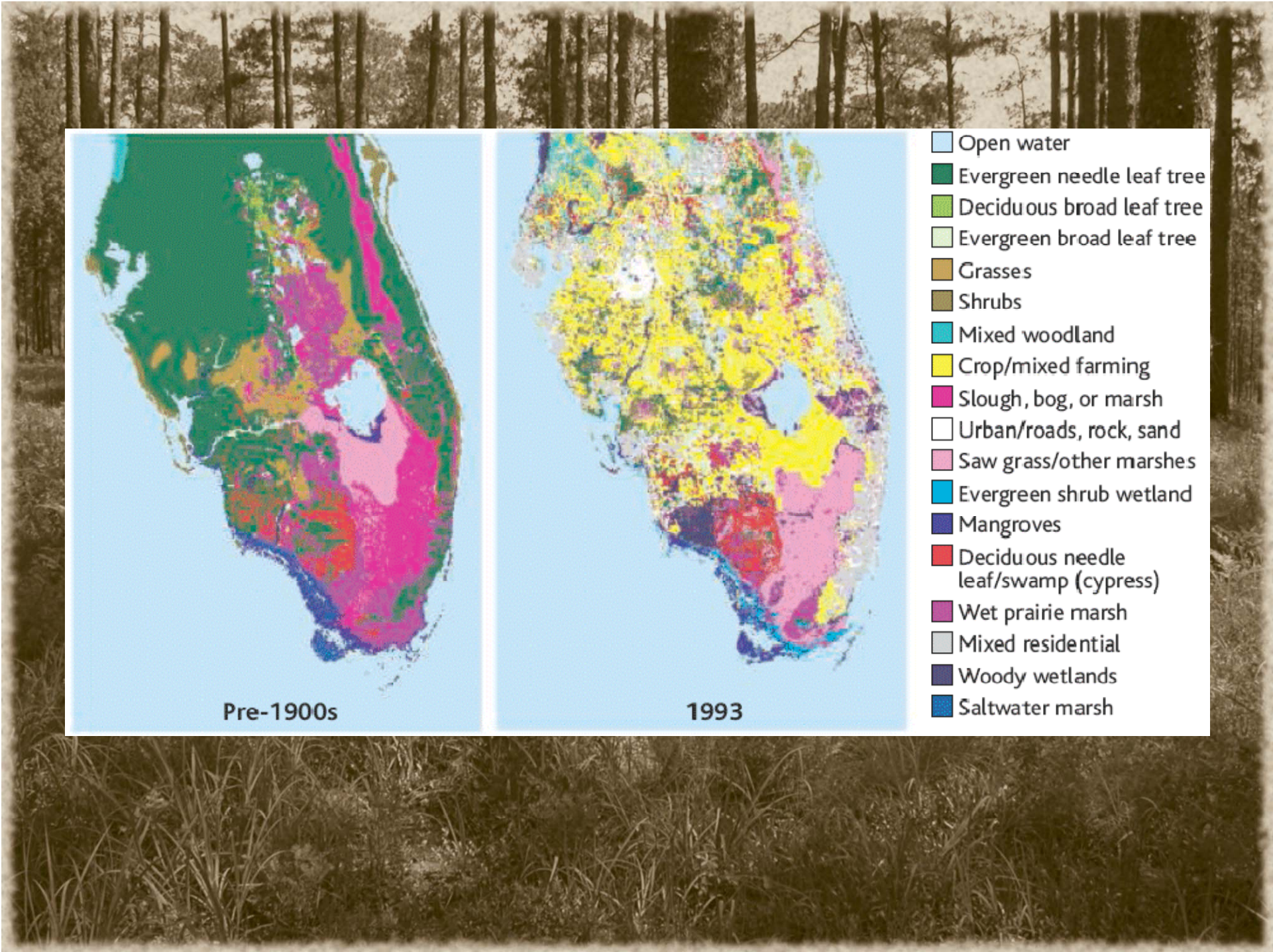
- may cause soil sterilization and loss of plant seeds and root stocks
- have higher rates of N mineralization and subsequent leaching
- more efficiently volatilize nutrients
- produce less charcoal over time





Greater concerns:

- Increased population (+10 million by 2030?)
- Loss of forest lands in Florida (2-3 million acres by 2030?)
- Increase in pine plantations relative to natural forests
- Increasing wildland-urban interface

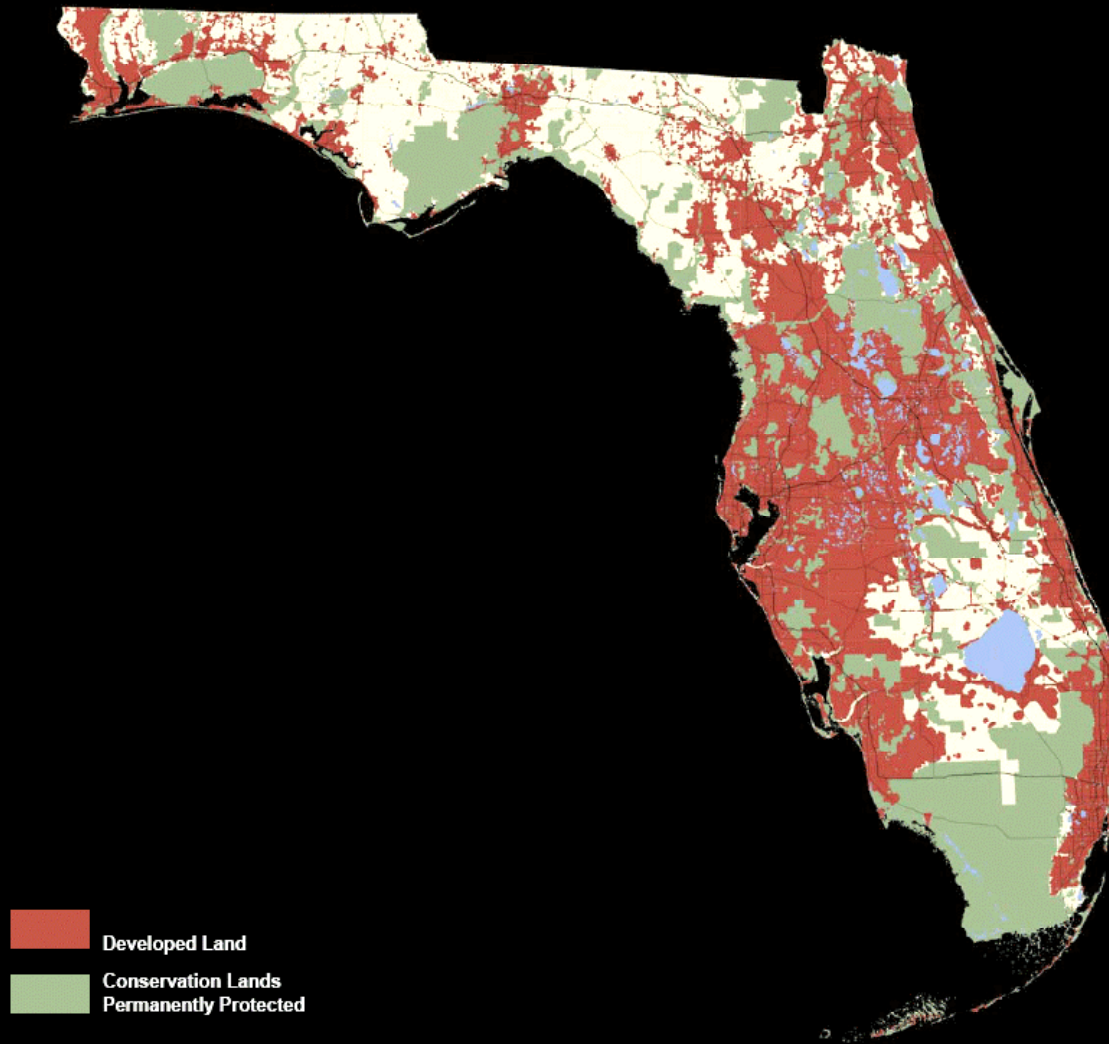


- Open water
- Evergreen needle leaf tree
- Deciduous broad leaf tree
- Evergreen broad leaf tree
- Grasses
- Shrubs
- Mixed woodland
- Crop/mixed farming
- Slough, bog, or marsh
- Urban/roads, rock, sand
- Saw grass/other marshes
- Evergreen shrub wetland
- Mangroves
- Deciduous needle leaf/swamp (cypress)
- Wet prairie marsh
- Mixed residential
- Woody wetlands
- Saltwater marsh

Pre-1900s

1993

2060 Developed Lands and Permanent Conservation Lands

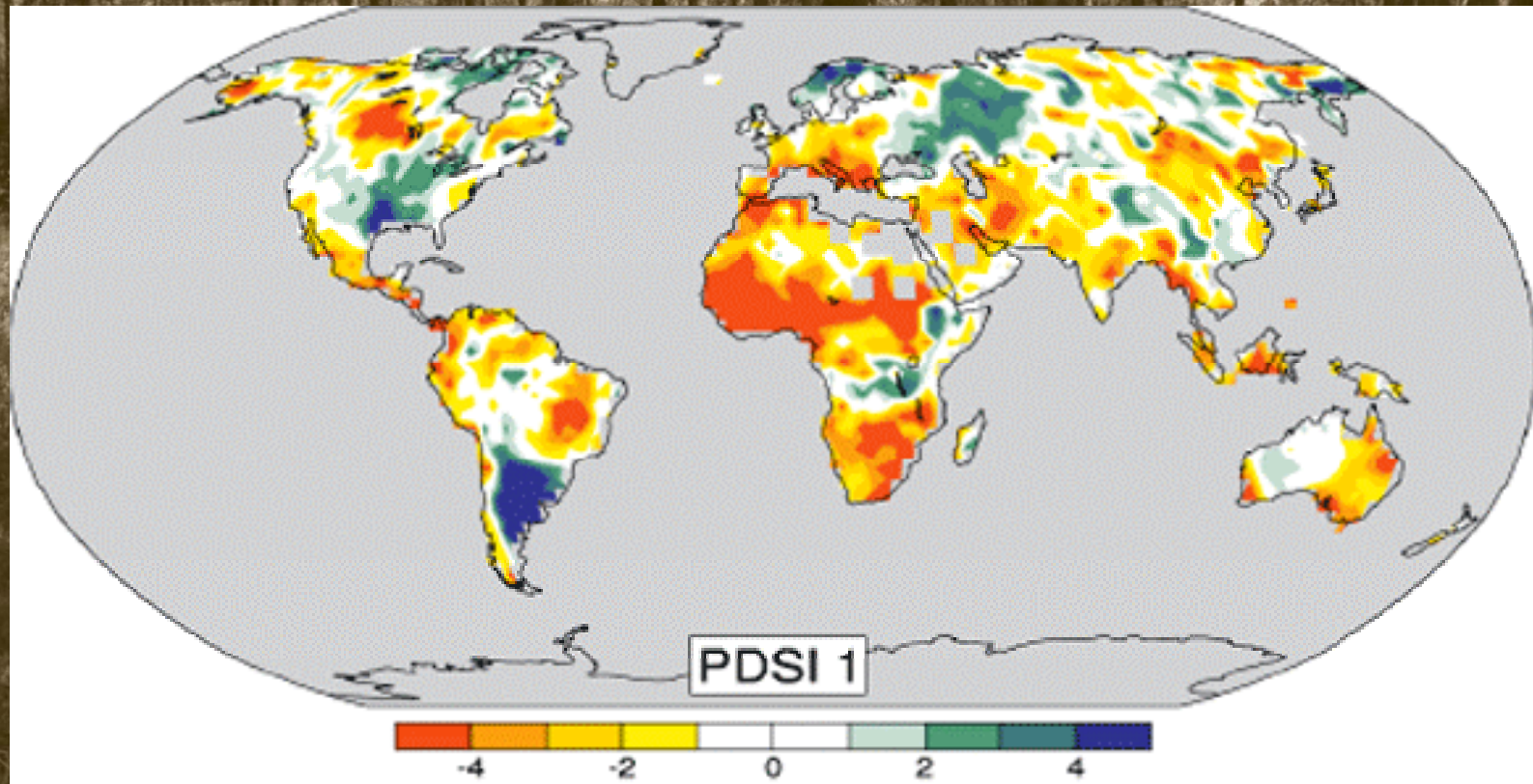


- Developed Land
- Conservation Lands
Permanently Protected



Florida 2060: A Research Project of 1000 Friends of Florida

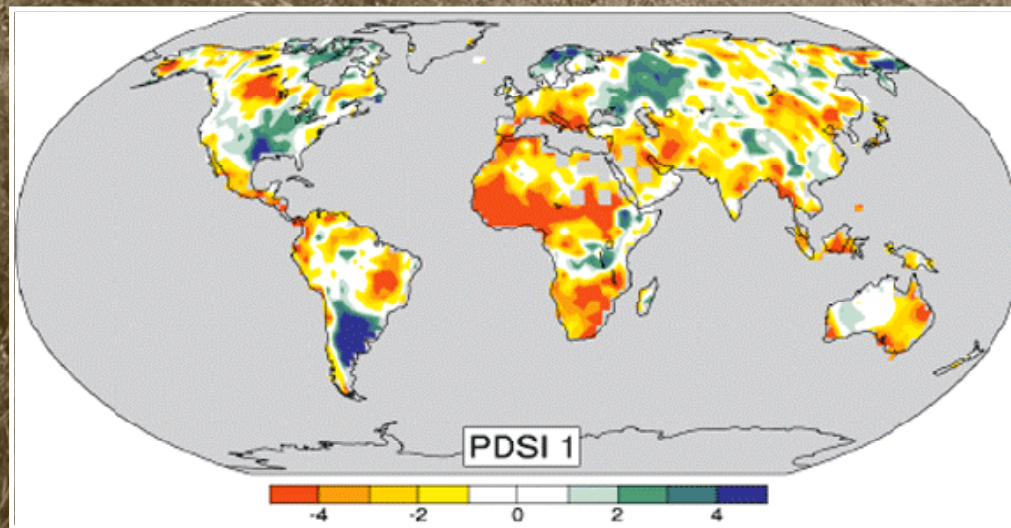
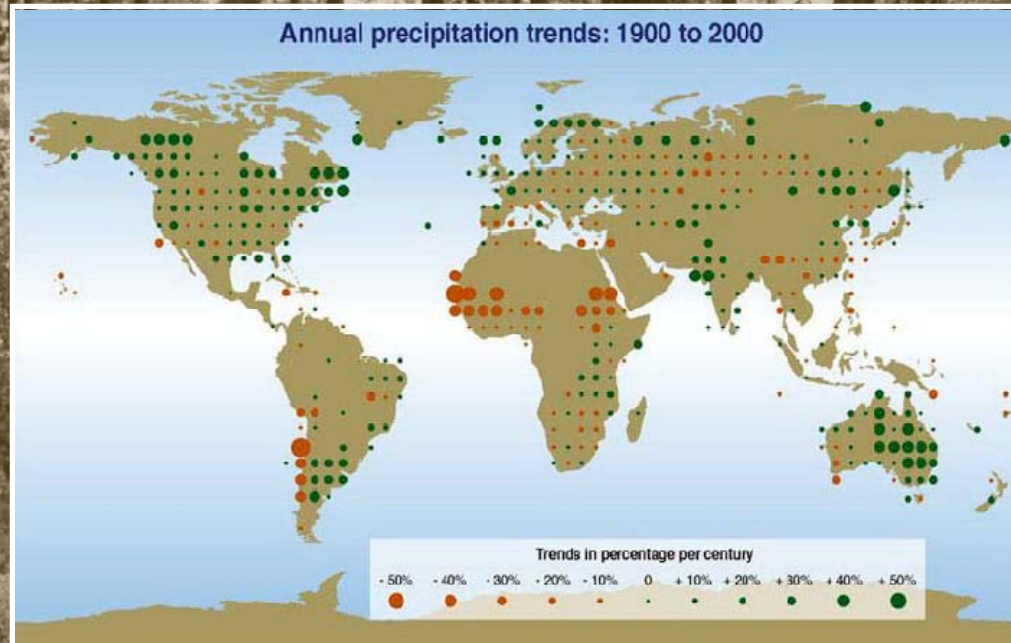
Effects of climate change on fire?





Potential effects of climate change in Florida:

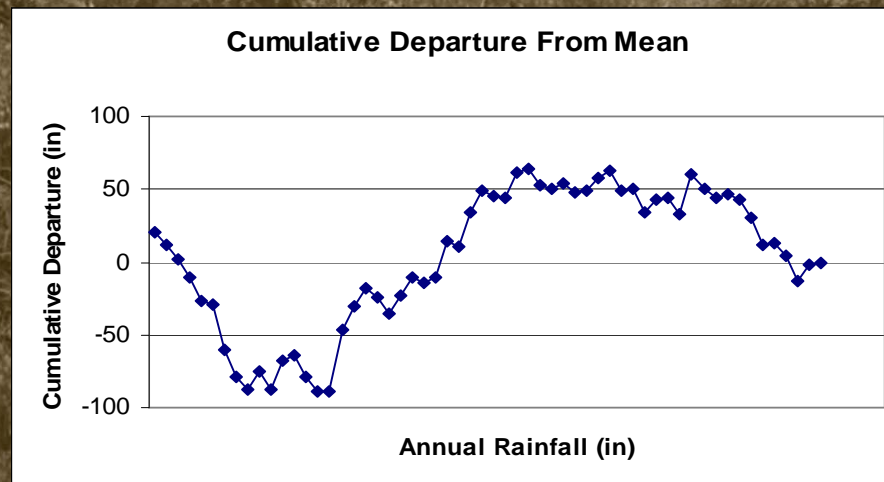
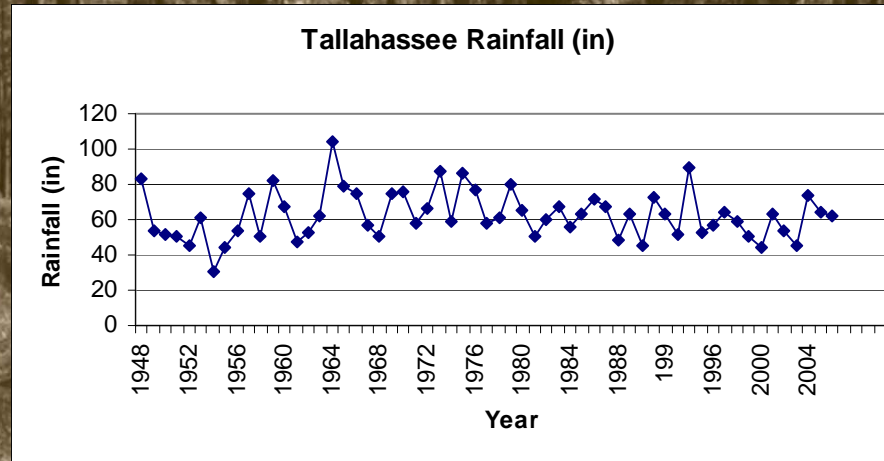
- Temperature increase, especially in summer
- Longer fire season
- Changes in total precipitation



Florida: neutral to positive change in rainfall so far

Tallahassee Rainfall Analysis

James O'Brien
June 5, 2007





Potential effects of climate change in Florida:

- Temperature increase, especially in summer
- Longer fire season
- Changes in total precipitation (+/-)?
- More extreme, more frequent droughts
- Decrease in forest health and productivity
- Sea level rise



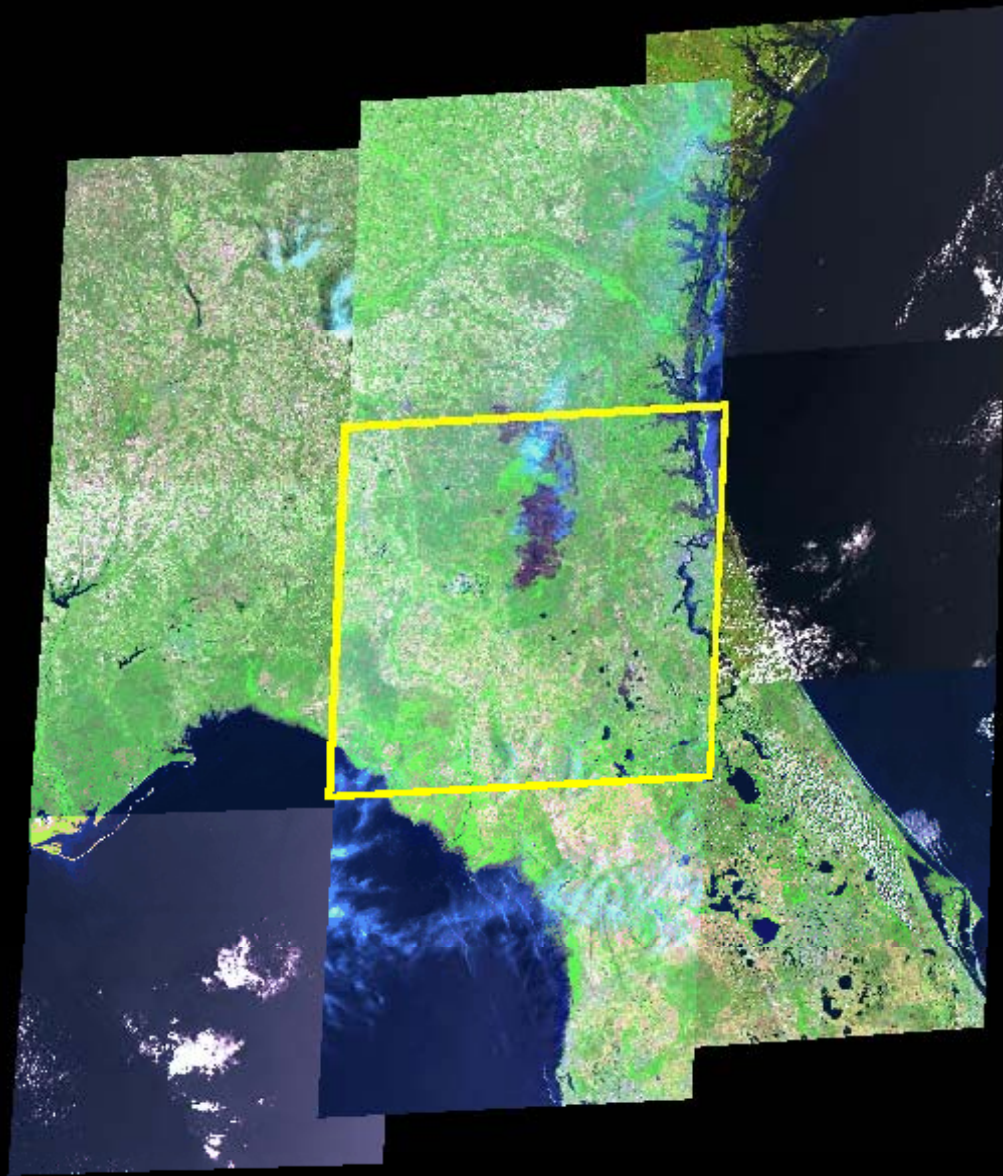
Big Turnaround Fire, May 2007





Prescribed fire:

- Conducted under conditions that we choose



Bo-Sweat Farm Road-Turnaround Fire Complex 200



Prescribed fire:

- Conducted under conditions that we choose
- Reduces fuel loading



Pebble Hill Plantation, Georgia



Prescribed fire:

- Conducted under conditions that we choose
- Reduces fuel loading
- Less particulate emissions per event



Prescribed Fire, Wade Tract, Georgia



Wildfire, Sweet Farm Road, May 2007



Prescribed fire:

- Conducted under conditions that we choose
- Reduces fuel loading
- Less particulate emissions per event
- Ecosystem sustainability

Fire in Florida



Wade Tract, Georgia



Big Turnaround Fire, May 2007



General Conclusions

- Productivity (C sequestration) in Florida forests is sustainable with regard to fire
- Frequent prescribed burning is likely more sustainable than infrequent wildfires
- Increased population and forest loss is a greater concern than fire with regard to carbon emissions
- Climate change is likely to make wildfires more common and severe
- Prescribed fire will reduce impacts of wildfire



Thanks