



FLORIDA CLIMATE INSTITUTE

University of Florida and The Florida State University

The Florida Climate Institute



A Work In Progress: Integrating Projects into an Interdisciplinary Program

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Outline

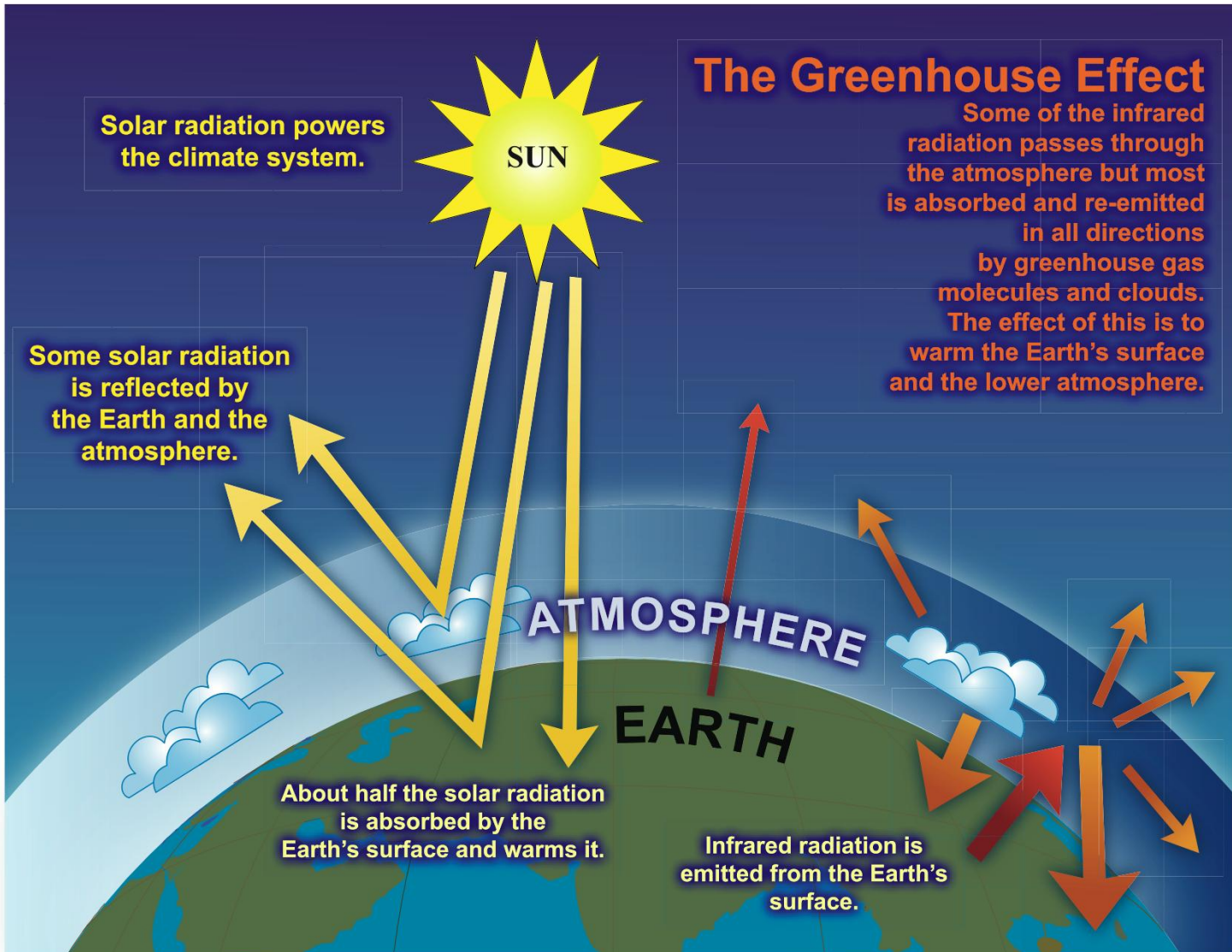


- A Few Comments on Climate Change
- Why an Institute?
- FCI Goals
- Proposed Structure of the Institute
- Examples of Active Programs at UF, FSU
 - SouthEast Climate Consortium(SECC)
 - Other Colleges and Institutes
- Current Status & Plans





The “Greenhouse” Effect

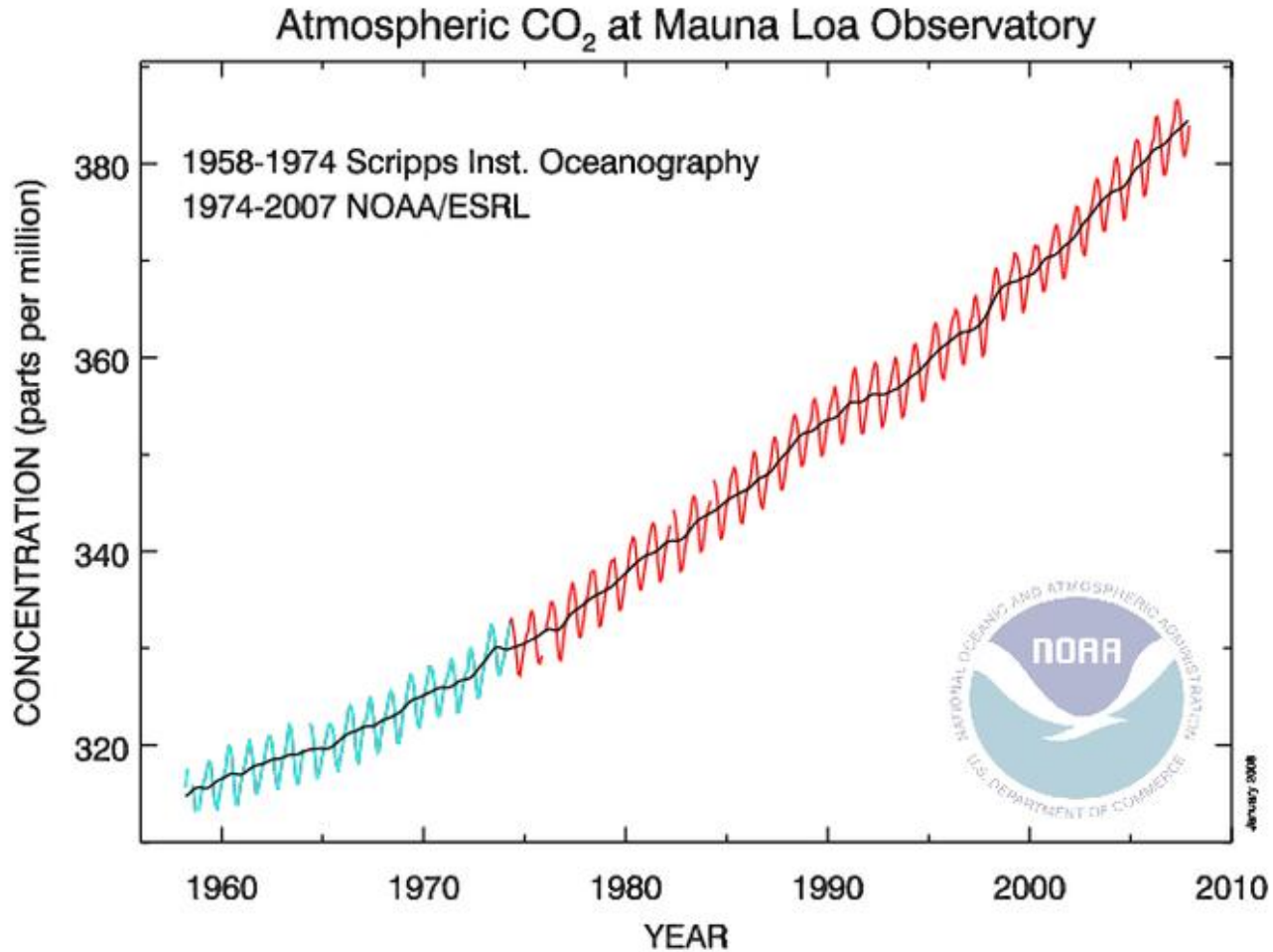




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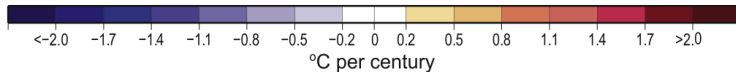
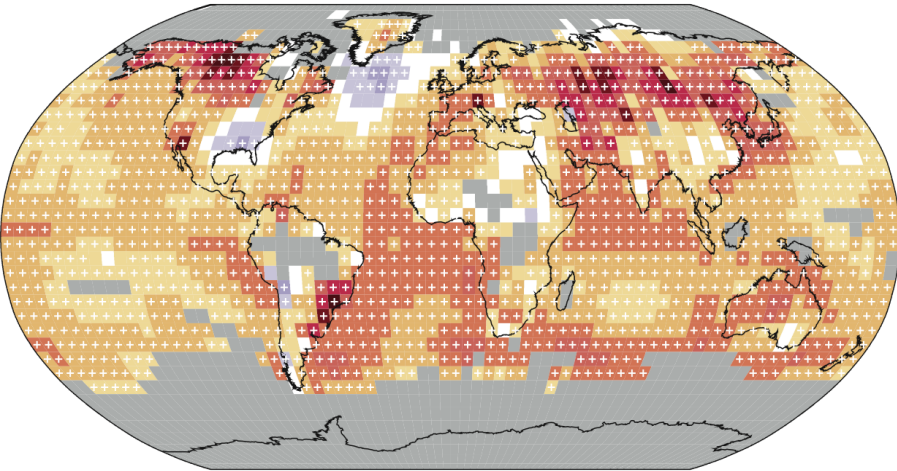
Recent CO₂ Trends



Historical Global Temperature Trends

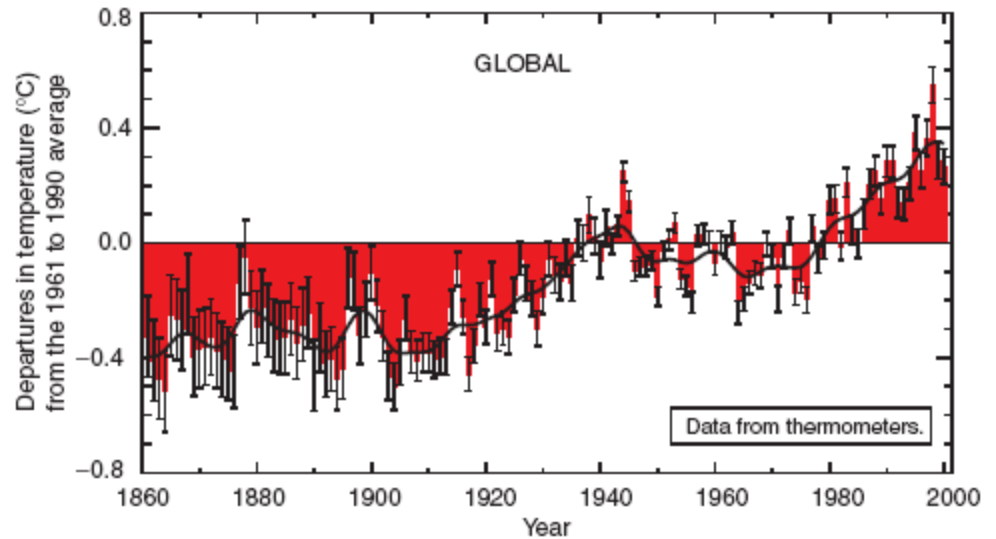
Annual

Trend 1901 to 2005



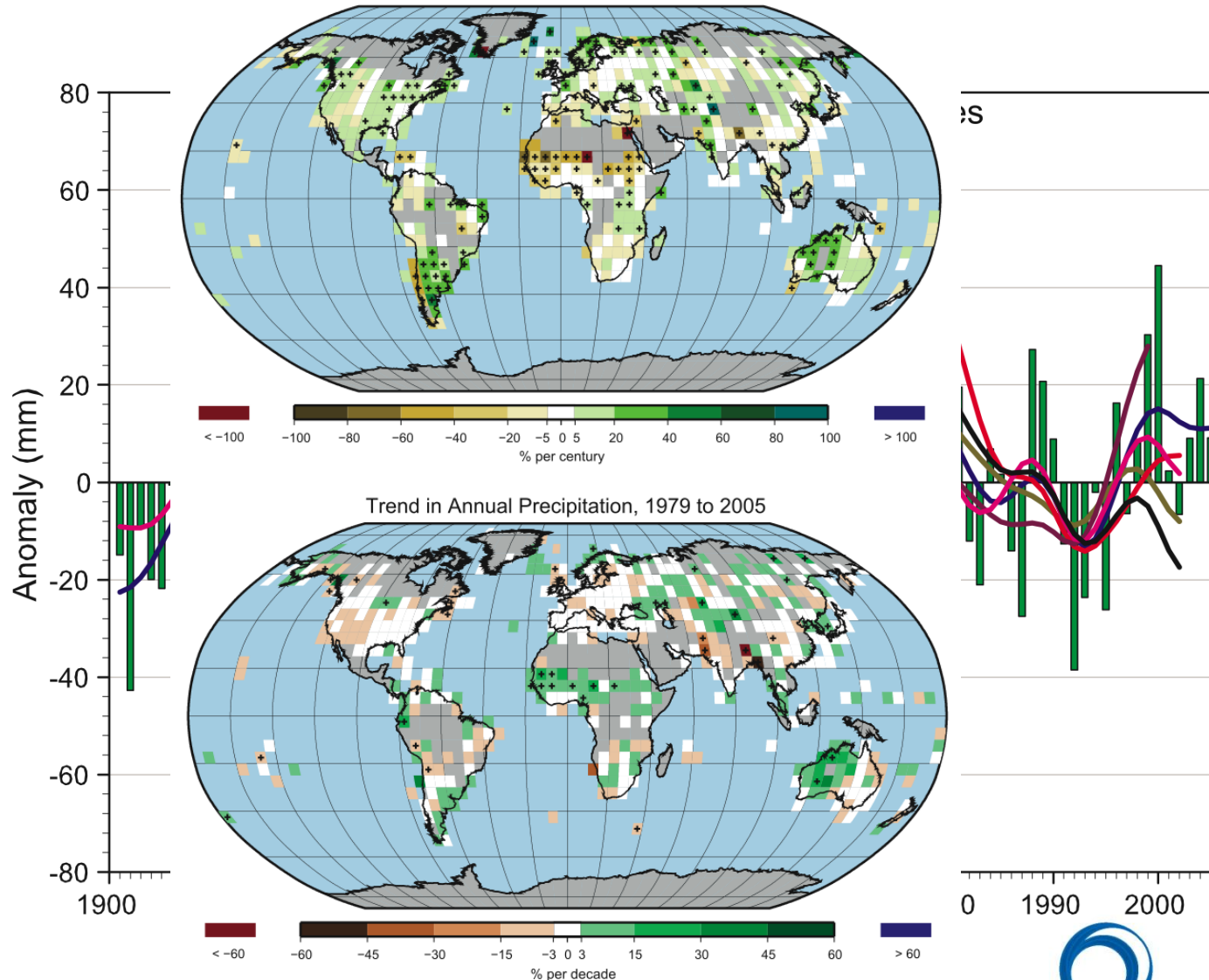
Variations of the Earth's surface temperature for:

(a) the past 140 years



Global Precipitation Trends

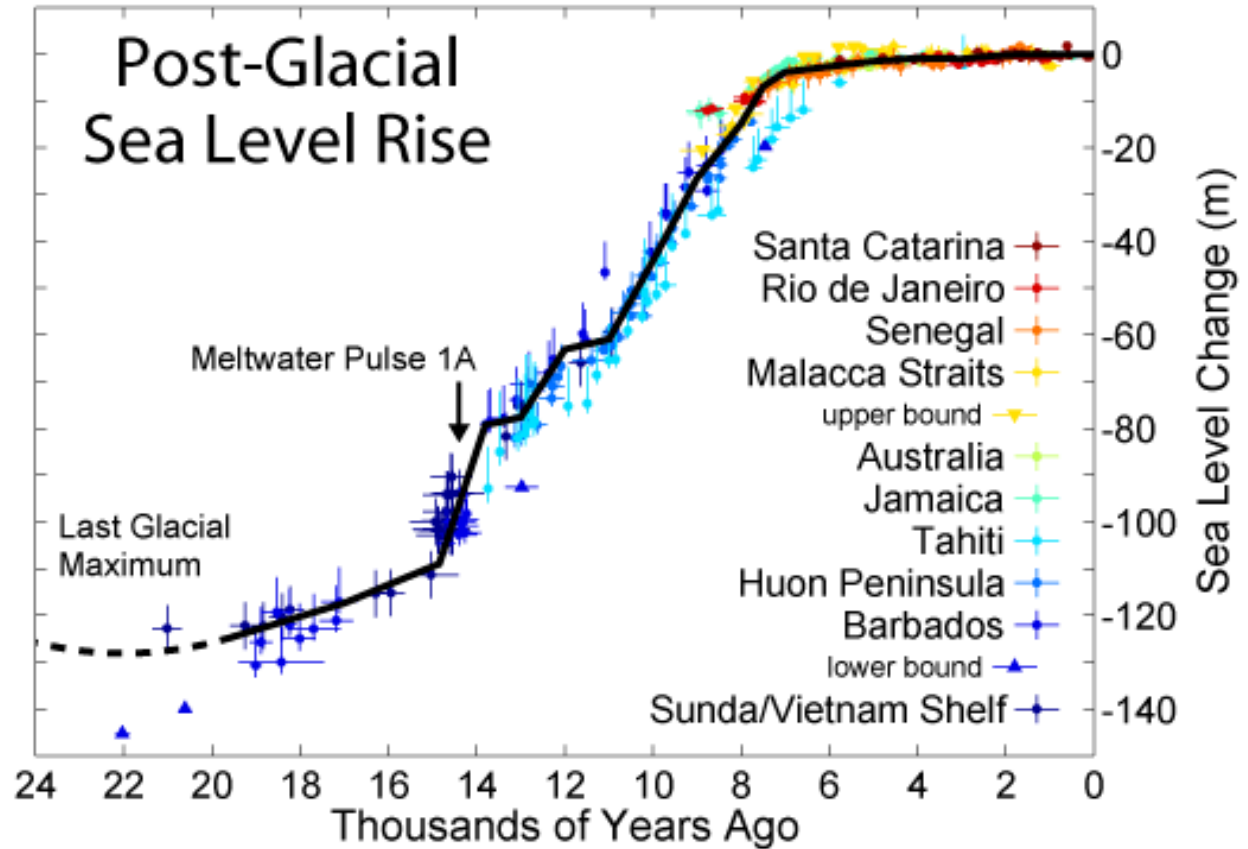
Trend in Annual Precipitation, 1901 to 2005



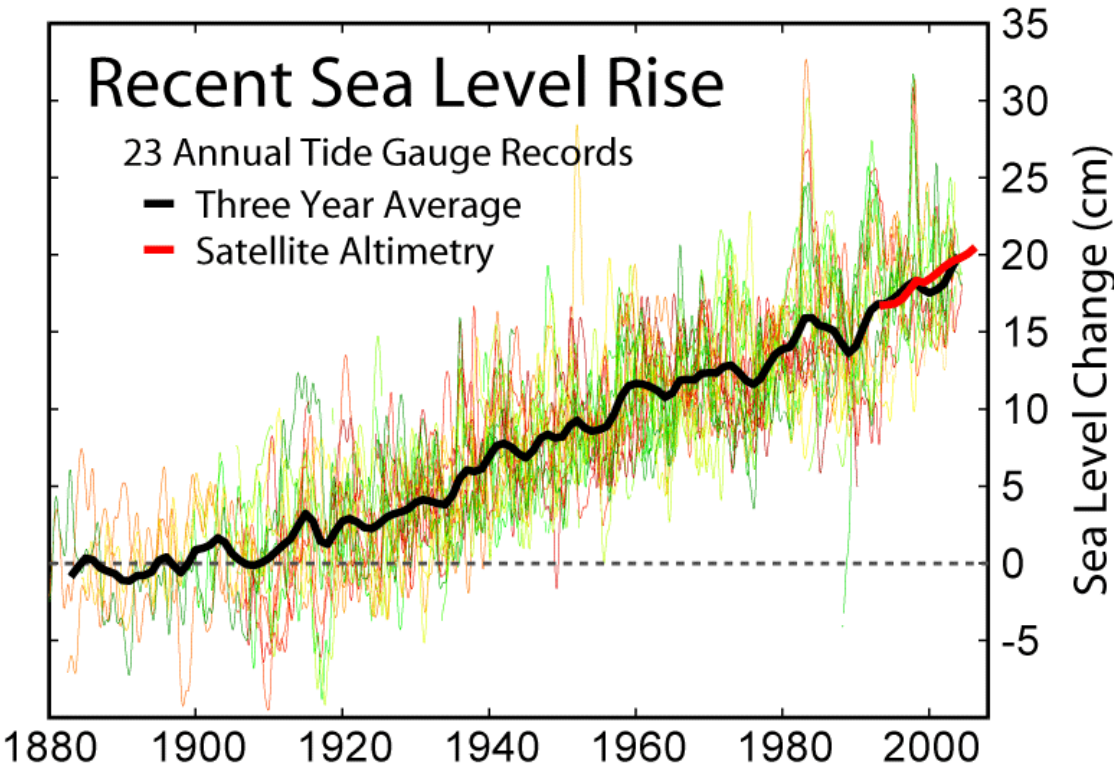
Sea Level Rise

Global sea level can rise from two primary causes:

- 1) Warming of the oceans (thermal expansion)
- 2) Melting of ice caps and glaciers



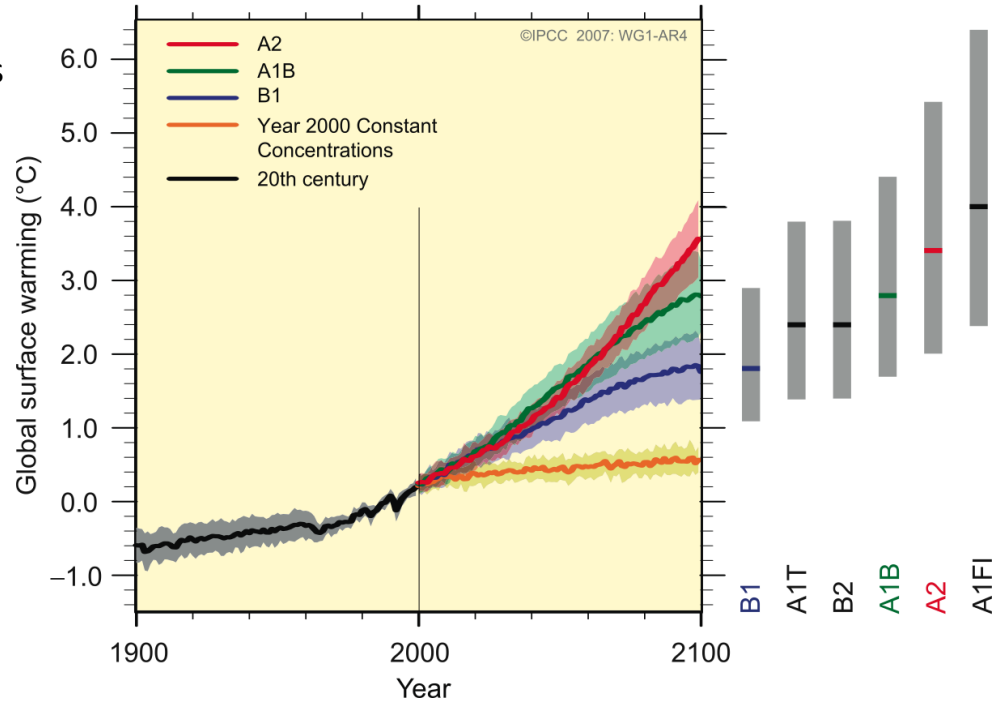
Historic sea level rise



- Sea level measurements from 23 highest quality tidal stations around the world.
- Estimates of sea level rise from 1 mm/yr to 2 mm/yr.
- Satellite measurements (altimeters) since 1992 indicate a rise of around 3mm/yr.
- IPCC third assessment report stated "No significant acceleration in the rate of sea level rise during the 20th century has been detected."

IPCC 4 Conclusions & Projections

- “Warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.”
- “Global atmospheric concentrations of CO₂, methane (CH₄) and nitrous oxide (N₂O) have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of years.”
- “Most of the observed increase in globally-averaged temperatures since the mid-20th century is *very likely* due to the observed increase in anthropogenic GHG concentrations.”
- - IPCC 4 Summary for Policy Makers



Criticisms:

- uncertainties are high, inadequate communication of uncertainties
- understates the importance of other natural and man-made influences



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Why an Institute?

- Importance of climate to everything on Earth
- Tremendous progress on understanding of the global climate and its changes, but less on changes at local to regional scales
- Lack of knowledge on responses of natural & managed systems
- Lack of understanding of how society should respond to climate change information at local to regional scales
- Many questions in Florida on climate change, sea level rise, and associated policies
- We do not have answers for Floridians, and similar situations exist in most regions of the world



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Why an Institute?

- Strong projects on climate that are relatively isolated
- Lack of visibility & collective reputation at UF, FSU regarding climate change and integrated Earth Systems Science research
- Emerging State, Federal and International opportunities
- The SECC experience during the last 10 years
- Strong interest from administration (UF and FSU)
- More can be accomplished, with greater impact, by creating a more active climate science community – the Florida Climate Institute

Proposed Center of Excellence-2007/8: Climate Technologies & Preparedness

- Developed proposal in response to Florida Universities Board of Governors
- Endorsement and support from private & public groups
 - Florida Farm Bureau Federation
 - Private engineering and financial/insurance/risk management companies
 - City and county governments
 - Florida Department of Agriculture & Consumer Services
 - Commodity groups
 - Law firms
 - Land and housing developers
 - Urban and regional planners
 - Florida Forestry Association
 - Water management districts
 - Non-governmental organizations
 - Water supply authorities
 - More ...

What We Learned: Strong Interest in:

- Developing market advantage re: carbon footprint
- Biofuel production
- Climate forecasts or projections from weeks to decades
- Technologies for reducing risks to climate variability and to climate change
- Carbon sequestration in forestry, agriculture
- Land use, management for environmental services, payments
- Sea level rise
- Recreation impacts and adaptation
- Drought, hurricane frequency
- Water policy
- Water withdrawal, allocation



Florida Climate Institute Mission??

- Create a community of science that addresses responses of agricultural and natural systems to climate change and variability in Florida.
- Facilitate interdisciplinary research for understanding climate change-related risks, impacts on agricultural and natural resources, and response options of decision makers that manage and set policy on those systems.
- Integrate climate information and response research, extension, and education efforts.

Envisioned FCI Niche

- Local to regional scale
- Globally applicable methods and tools
- Emphasis on societal “responses” to climate change
- Partnerships with public and private organizations
- Interdisciplinary – biological, physical, social scientists

FCI Goals

- Develop & make widely available climate change and climate variability scenarios & datasets
- Develop innovative approaches & tools for incorporating climate change & sea level rise into policy and decision making processes for land, water, and natural resources
- Provide information for use by different sectors to assess benefits and tradeoffs among different decision and policy response options
- Methods that use climate change information to build resiliency and adaptive capacity at local to regional scales that are globally applicable



Climate Institute Vision

- Climate Institute teams develop new scientific information, technologies, decision support systems, and education programs that:
 - help stakeholders understand local to regional climate change and variability
 - help them to make best response decisions to increase economic opportunities, reduce climate-related economic and environmental risks, and build adaptive capacity and resilience
 - that are recognized nationally and internationally for their excellence in providing scientific information and technologies for responding to climate change



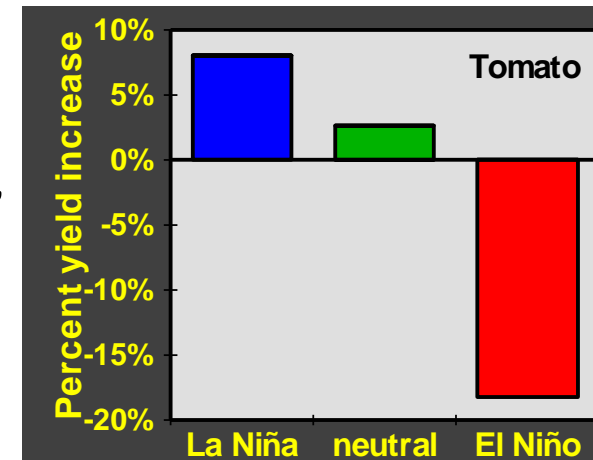
Why Focus on Responses?

- Reliable climate information, honest broker
- Impacts on biological, agricultural, ecological, hydrological, built systems
- Adaptation by farmers, water, land, and natural system managers, city/county/state agencies, businesses, etc.
- Mitigation options and opportunities
- Policy options



Southeast Climate Consortium (SECC)

- Created as a NOAA Regional Integrated Science Assessment (RISA) Center; now 1 of 9
- Started-1998, Florida Climate Consortium (FSU, UM, UF)
- Now four states and seven universities (UF, FSU, UM, UGA, AU, UA-Huntsville, NCSU)
- Additional support: USDA-RMA, USDA-CSREES, etc.
- Emphasis on climate variability, climate forecast use in agriculture and water resources, risk management
- Land Grant universities and state climatologists included in all SECC states



Assessing decision makers' knowledge, use of climate information in 2000



- Interest in seasonal climate forecasts
 - hurricanes, freezes, drought, flooding, high temperatures
- Climate change – little interest, great skepticism
- Lack of understanding of forecasts, their uncertainty
- Want local forecasts & competitors' regions forecasts
- Market variations may dominate decisions (high value crops)
- Varying flexibility to adjust management among types, sizes
- Strong interest in learning more
- Confidence in Extension Service

SECC

- Seasonal climate variability and forecast information use
- Emphasis on agriculture, water resources management
- Research – climate risk management, decision analysis framework, assessment of stakeholders and SECC products
- Extension – integral part of program via climate extension specialists



SECC Today

- Four states (FL, GA, AL, NC, and SC may join)
- About 50-60 contributors (faculty, graduate students, post docs, researchers)
- Interdisciplinary, multi-state research, extension, state climatologist partnership
- Operational climate risk management decision support system via Extension
- Semi-annual planning meeting next week at UF

http://AgroClimate.org

The screenshot shows the AgroClimate website in a browser window. The browser title is "AgroClimate - A service of the Southeast Climate Consortium - AgroClimate provides important new tools to help agricultural producers ...". The address bar shows "http://agroclimate.org/". The website header includes a navigation menu with "Join Our Mailing List" and "Contact", a "Google Custom Search" box, and "County Maps: AL FL GA". The main content area features the AgroClimate logo, a "Current Climate Phase: Neutral" announcement, a "News" section with articles like "AgClimate.org is now AgroClimate.org" and "Strong Start Increases NOAA's Confidence for Above-Normal Atlantic Hurricane Season", and an "Outlooks" section with "Summer / Fall Climate Outlook (August 6, 2008)", "2008 Hurricane Forecast (August 6, 2008)", and "Climate Phase Forecast (August 6, 2008)". A "Climate Phase Forecast for Sep-Oct-Nov" section includes a pie chart showing Neutral (70%), La Nina (10%), and El Nino (20%). A photo of an "AgroClimate Workshop - Griffin Georgia" is also visible. The footer includes "SUPPORTING ORGANIZATIONS" with logos for CSREES, USDA, and SECC Consortium Members.

Operational since August 2008

Hosted by Florida Cooperative Extension

Risk Management Products

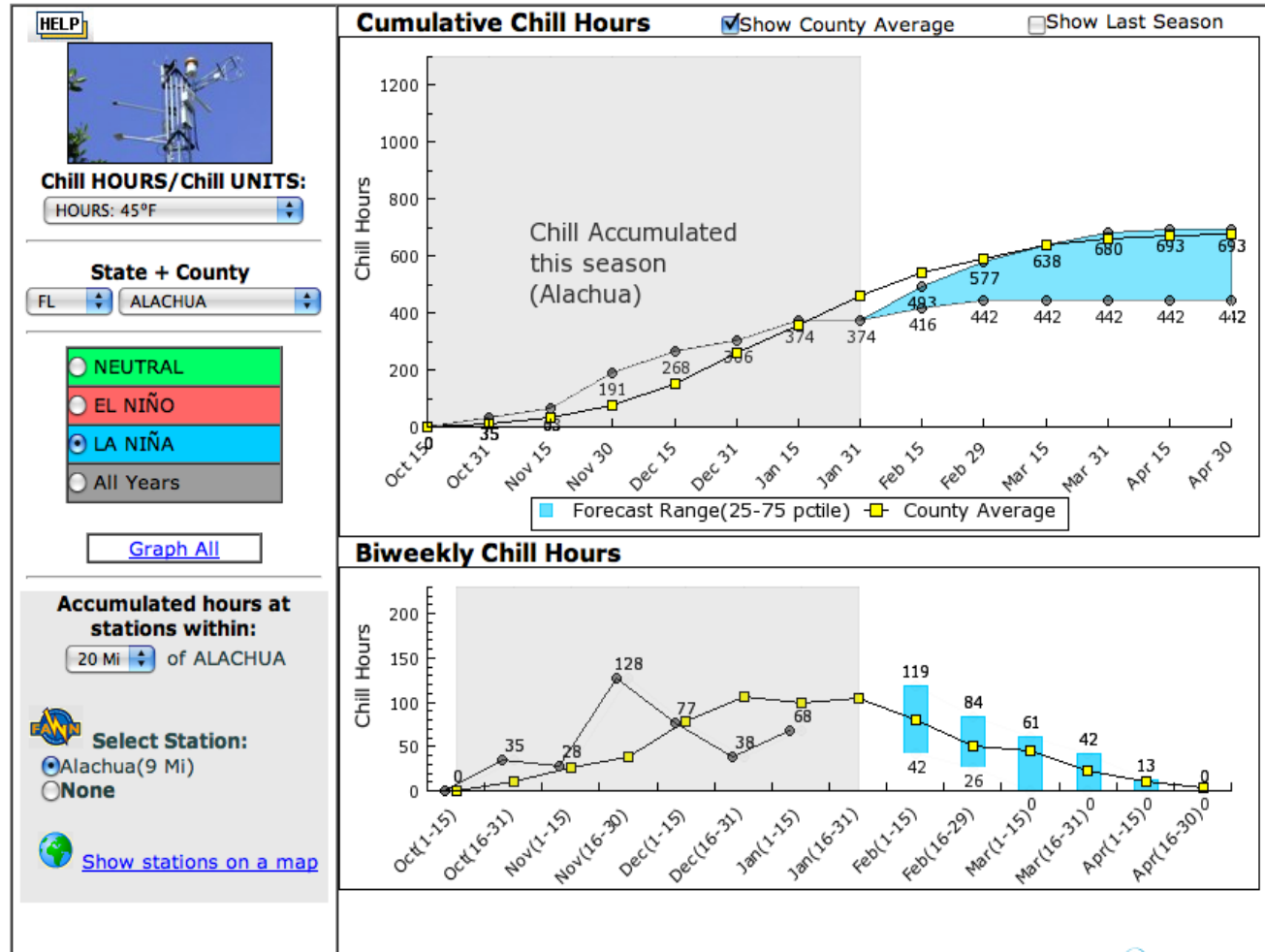
- Climate information tool
- Crop yield risk analysis (model-derived)
- Keetch-Byram drought index forecast for forest fire management
- Climate variability & ENSO effects on crop yields – historical data
- Regional Outlooks: climate, peanut, winter pasture, citrus
- Chill units and Growing degree day tools
- Lawn and garden moisture index: monitoring and forecasting (with FAWN, AEMN)



“Real-time” Monitoring and Forecasting Chill Units

Chill Accumulation

[« Back to Tools](#)

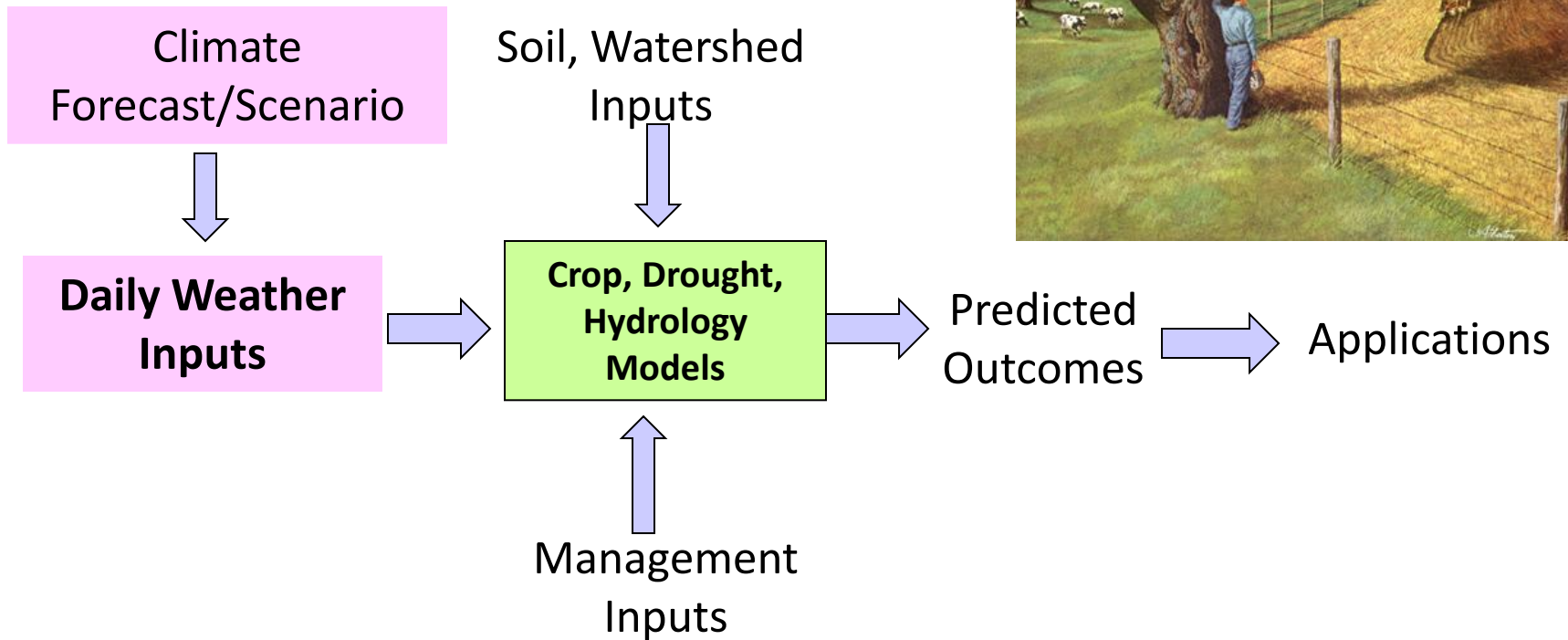


Some Current SECC Activities

- Forecasts to support decisions (drought, crop yield, degree days, chill units, disease outbreaks, advisories)
- Geospatial weather generator for downscaling climate forecasts, climate change scenarios
- Integrate regional climate models with crop models, hydrology models
- Climate change impacts and agricultural adaptation in the SE
- Manage water resources (reservoir levels, water withdrawal for public, irrigation, conservation)
- Evaluate marketing, insurance, land rental, and other decisions relative to climate variability/forecasts
- Stakeholder assessment (agricultural, coastal, terrestrial ecosystems)
- AgroClimate climate risk management decision support system



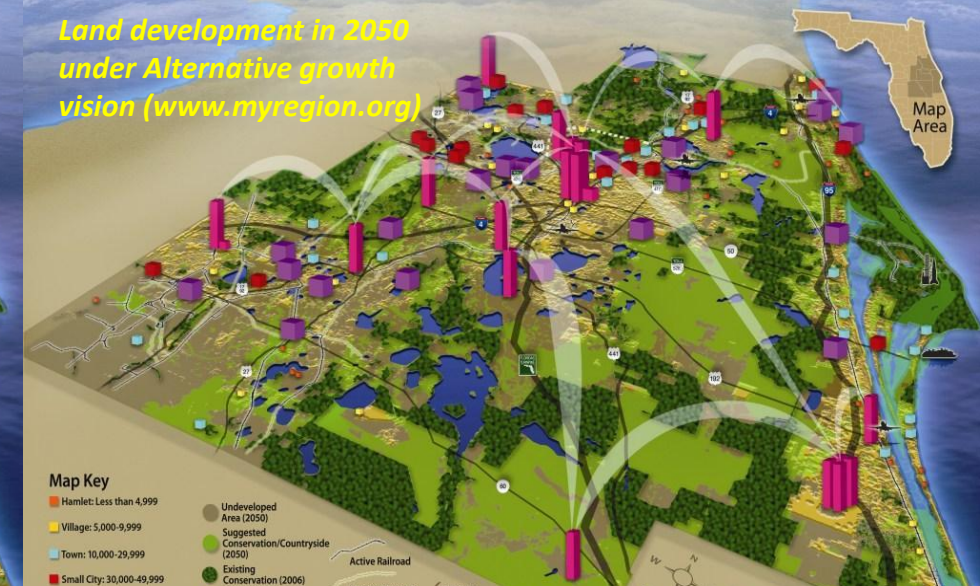
Climate Forecast Inputs to Models



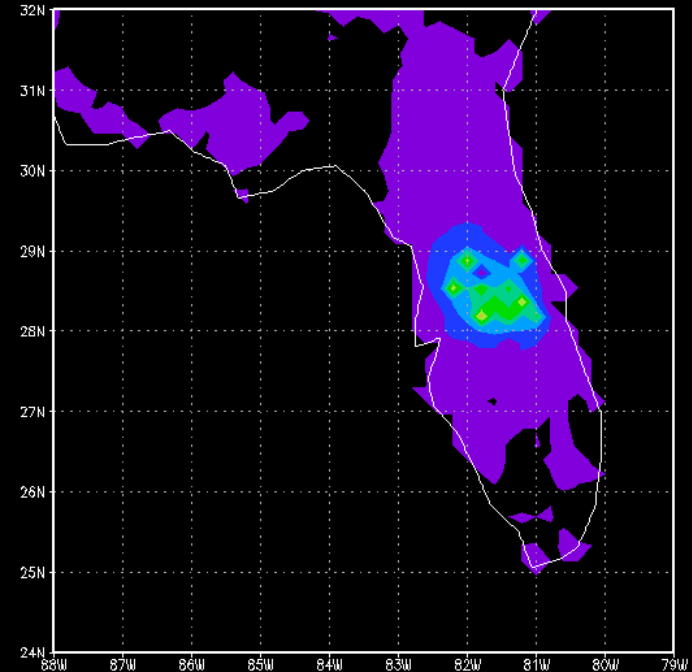
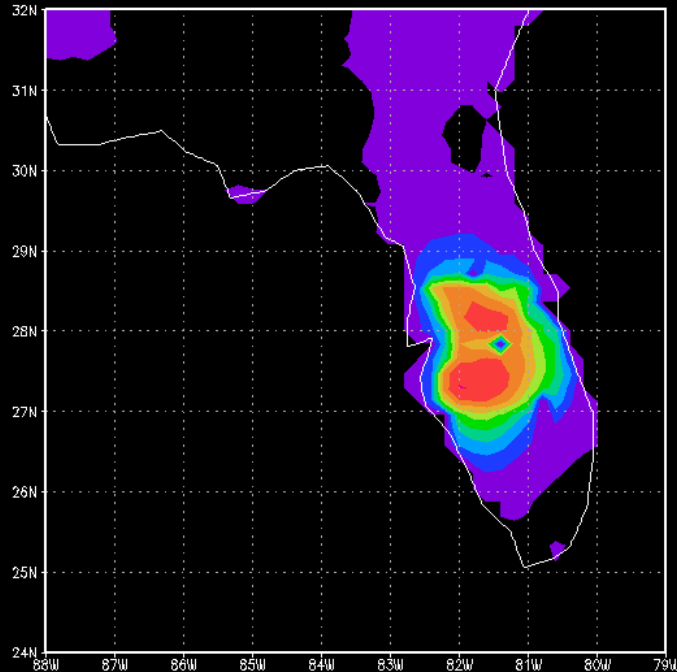
Land development in 2050 under Current growth policies (www.myregion.org)



Land development in 2050 under Alternative growth vision (www.myregion.org)



Simulated Increments in Minimum Temperature: 2050-projected land development for two urban growth scenarios in relation to current conditions



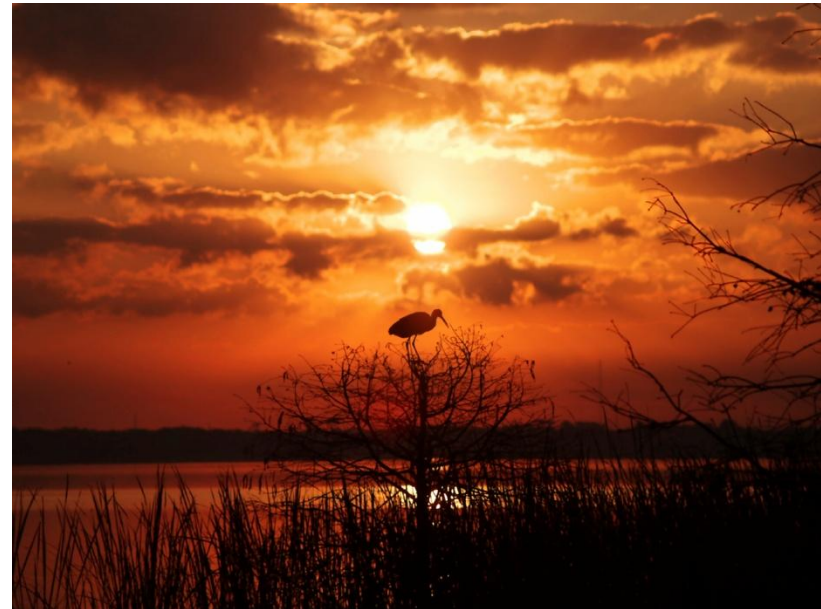
SECC is Evolving with the FCI

- Broaden to include natural resources, coastal resources management in addition to ag and water
- Bring in more expertise on:
 - Economics
 - Coastal resources
 - Terrestrial ecosystems
 - Wildlife and fisheries
 - Social & communication sciences
- Climate change
- New boundary organizations

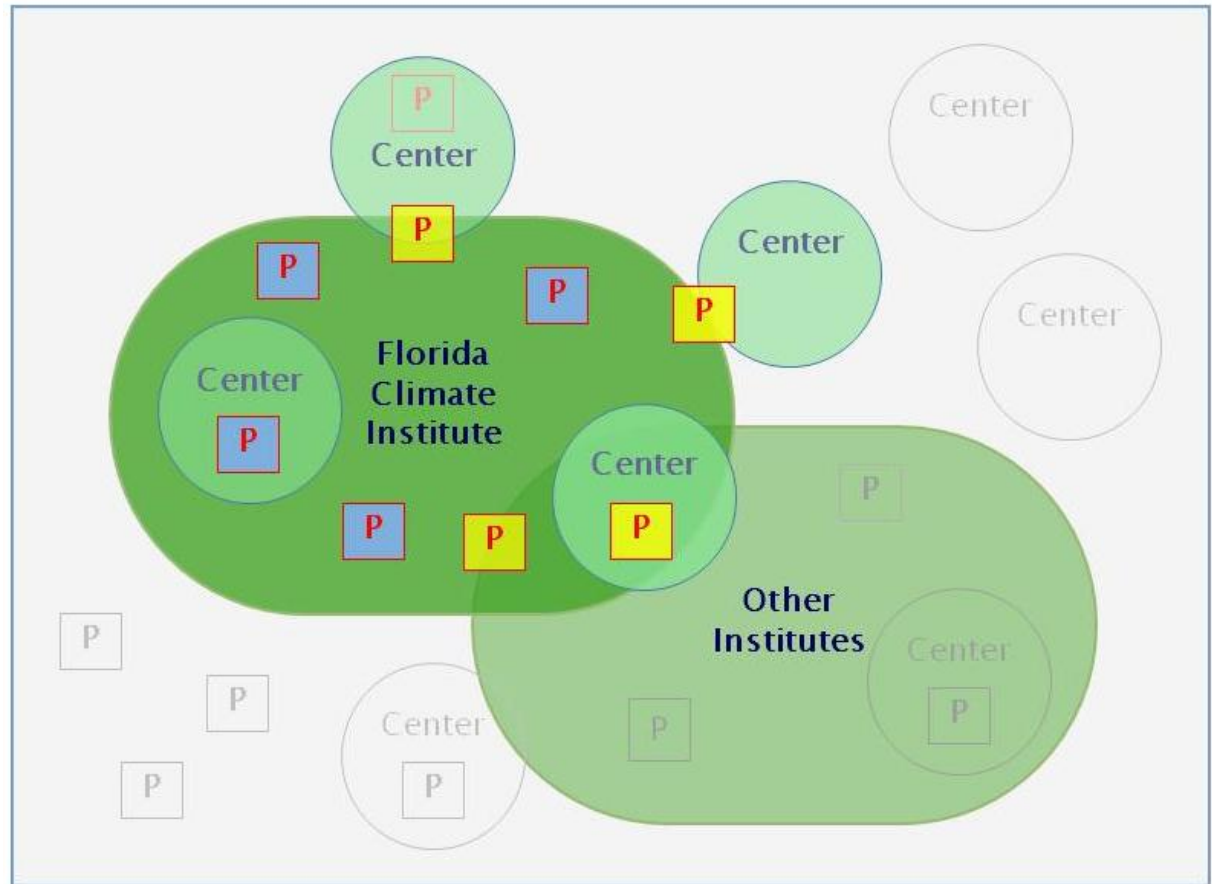


Back to the FCI

- Components of and contributors to the FCI
 - SECC
 - Carbon Resources Sciences Center
 - COAPS (FSU)
 - Water Institute
 - Emerging Pathogens Institute
 - Florida Energy Systems Consortium
 - UF Office of Sustainability
 - Departments in various colleges
 - Engineering
 - Liberal Arts and Sciences
 - Public Health and Health Professions
 - IFAS
- More ...



A Proposed Structure



Summary components of the FCI and its partners, on- and off-campus. Funded projects (P) are basic units of its activities and cooperation with other units. Some projects will be managed by the FCI (blue) others co-managed with other institutes or centers (yellow) or not part of the FCI (dimmed). Also, the FCI will manage some centers and co-manage or collaborate with other centers. Projects and centers may include UF, FSU and external partners. Overlapping areas between the FCI and other units represent both collaboration and sharing of resources.

Other Example Projects

- COAPS/FSU – Improve regional climate models, develop climate change scenarios for the SE USA, ...
- Geography/UF – NASA grant – southern Africa climate project
- Carbon Resources Sciences Center - grants for biofuel, carbon accounting
- FESC/UF – supporting grants on biofuels, carbon resources
- Water Institute/UF – Tampa Bay Water & NOAA grants - Climate forecast use for water allocation
- EPI/UF – CDC grant - climate change impacts on occurrence ciguatera (algal bloom species associated with coral reefs, an important cause off human illness in S. Florida)
- Sea Grant Program – supporting climate sea level rise research, coastal county responses
- SECC/UF & FSU – various NOAA, USDA, NASA, other grants
- More in Geology, Biology, many others ...



Current Status

- Several planning meetings, one workshop held
- Interim Steering Committee formed
- New SECC proposal submitted to NOAA with broader climate change and target sector components
- Proposal to UF VP for FCI planning grant
- Commitment from FSU VP for planning grant
- Plans to submit at least 4 large proposals during next 2 years, from various groups in FCI

Next Steps & Discussion

- December – news of VP support
- Grant development teams
- FCI seminar series
- Visiting scholar program
- Web site design, with database
- Advisory board
- Organize, go for support, official status, ...

Next Steps & Discussion

