

Florida Climate Institute

Economic, Policy and Other Issues Related to Climate and SLR Research in Florida

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FloridaClimateInstitute.org



Florida State University

Center for Economic Forecasting and Analysis (CEFA)



Specializes in applying advanced, computer-based economic models and techniques to perform economic analyses and to examine public policy issues across a spectrum of research areas. FSU CEFA also serves as a foundation for training students on the uses and applications of advanced economics and statistical tools.

Key Areas of Expertise:

- Economics
- Sustainable Energy
- High Tech Economic Research
- Environmental/Natural Resources
- Economic Development
- Econometrics
- Economic Impact Analysis

<http://www.cefa.fsu.edu>

Recent Activities Concerning Climate Change

Federal

1) The **Interagency Climate Change Adaptation Task Force**¹ submitted their progress report “**Federal Actions for a Climate Resilient Nation**” on Oct. 28, 2011, including the following goals and actions:

- **Integrating Adaptation into Federal Government Planning and Activities**
- **Building Resilience to Climate Change in Communities**
- **Improving Accessibility and Coordination of Science for Decision Making**
- **Developing Strategies to Safeguard Natural Resources in a Changing Climate**
- **Enhancing Efforts to Lead and Support International Adaptation**

¹**Executive Order 13514-** in 2009, charged the **Interagency Climate Change Adaptation Task Force** with providing recommendations on how Federal policies, programs, and planning efforts can better prepare the United States for climate change.

http://www.whitehouse.gov/sites/default/files/microsites/ceq/2011_adaptation_progress_report.pdf

Recent Activities Concerning Climate Change (Cont.)

Federal

2) The current federal priorities for research and development were released by the Office of Science and Technology and OMB. One of their goals (for the next several years) included:

- Understanding, adapting to, and mitigating the impacts of global climate change

- Support an integrated and continuing National Climate Assessment of climate change science, impacts, vulnerabilities, and response strategies, including mitigation and adaptation;
- Prioritize research for measuring, reporting and verifying greenhouse gas emissions.

<http://www.whitehouse.gov/sites/default/files/microsites/ostp/fy12-budget-guidance-memo.pdf>

Recent Activities Concerning Climate Change (Cont.)

Federal – Some Examples

Many federal agencies have started addressing climate change and sea level rise adaptation planning, typically, through a task force or committee. Recent examples include:

- **Army Corps of Engineers** – include SLR in managing, planning, designing, constructing, operating and maintaining their infrastructure projects. They've also expanded to quantifying in addition to cost benefit analysis, health & safety, environmental impacts and social effects.
- **Department of Transportation**
- **Environmental Protection Agency**
- **U.S. Fish and Wildlife**

<http://www.owrc.org/useruploads/files/federal/GAO%20-%20Climate%20Adaption%20Report.pdf>

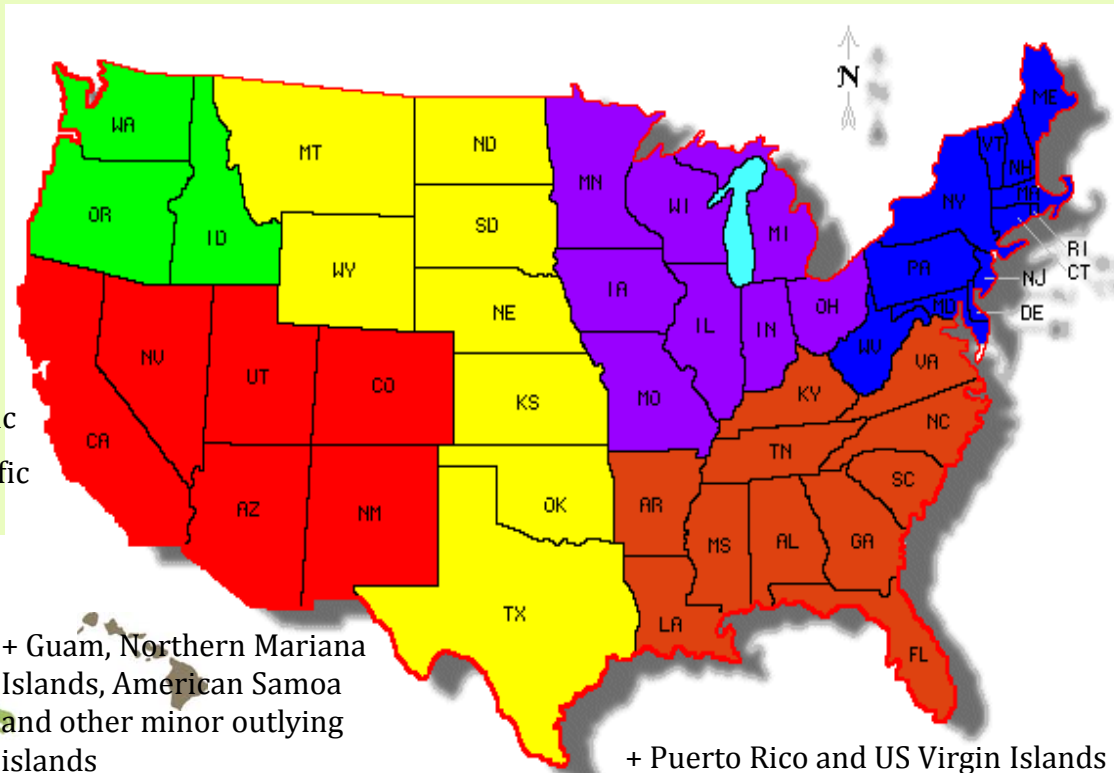
It should be noted that there is currently no national policy or strategy for adapting to climate change.

Recent Activities Concerning Climate Change

Southeast Region – an Example

National Climate Assessment U.S. Global Change Research Program

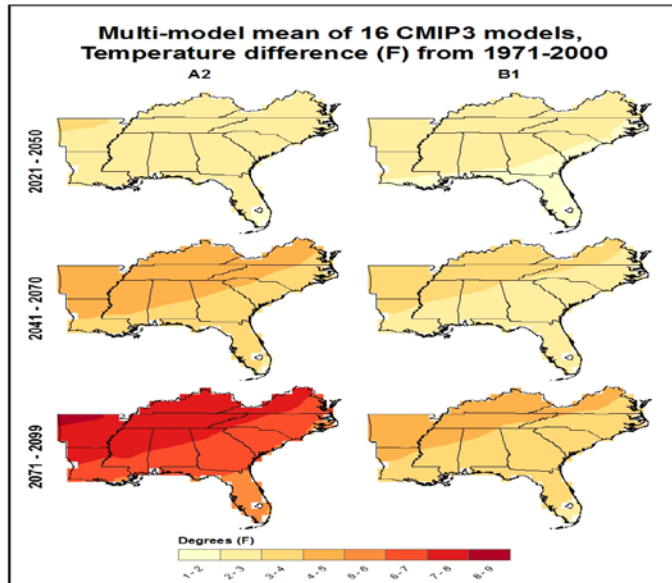
- Northeast
- Southeast and Caribbean
- Midwest
- Great Plains
- Northwest
- Southwest
- Alaska and Arctic
- Hawaii and Pacific Islands



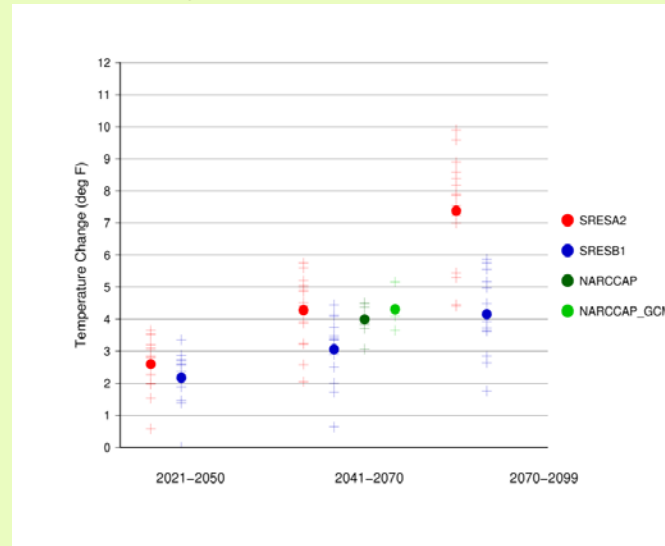
<http://assessment.globalchange.gov>

Southeast Region Research Findings Regarding Climate Change

• Southeast Regional Outlook*



Summary of model simulations



For the Southeast, the results of the A2 and B1 scenarios showed that mean temperatures increased from **2.5-2.8 degrees** (for years 2021-2050), **3.4-4.9 degrees** (for years 2041-2070) and **4.3-7.9 degrees** (for years 2070-2099), respectively.

- Climate change will not affect only temperatures, but it is expected to come with more extreme weather events and with greater temperature variability over the short and longer term. Currently, research is not definitive regarding climate change and the increased or decreased frequency of droughts, floods, heat waves, freezes, or storm events.

*Source: Kenneth Kunkel, "Southeast Regional Outlook", Workshop Climate Outlook, National Climate Assessment, NOAA Cooperative Institute for Climate and Satellites, 2011.

<http://assessment.globalchange.gov> and ** http://agroclimate.org/climate_change/

Recent Activities Concerning Climate Change (Cont.)

State of Florida – Some Examples

Many state agencies have started addressing climate change and sea level rise adaptation planning, similar to the federal framework; through a task force, committee or advisory group.

Recent examples include:

- **Florida Department of Transportation (FDOT) –**
 - addressing climate issues in their Florida transportation plan
 - modifying efficient transportation decision making to include climate change considerations
 - working with federal DOT and EPA to measure GHG emissions
 - working cooperatively with state & local governments to identify infrastructure at risk and coordinate adaptation efforts.

[http://www.2060ftp.org/images/uploads/learn_more/Background_Resources/FDOT%20Climate%20Change%20and%20Adaptation%20Resource%20Memorandum%20\(April%202010\).pdf](http://www.2060ftp.org/images/uploads/learn_more/Background_Resources/FDOT%20Climate%20Change%20and%20Adaptation%20Resource%20Memorandum%20(April%202010).pdf)

- **Florida Dpt of Agriculture and Consumer Services**

<http://www.freshfromflorida.com/offices/energy/>

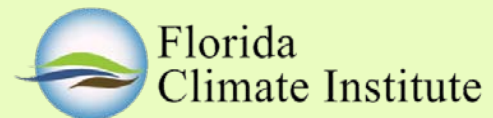
- **Florida Fish and Wildlife Conservation Commission**

<http://myfwc.com/conservation/special-initiatives/climate-change/>

- **Florida Department of Environmental Protection**

http://www.dep.state.fl.us/oceanscouncil/reports/Climate_Change_and_Sea_Level_Rise.pdf

Source: NOAA RISA, FCI & SECC Climate Assessment Project - Identified through task involving climate data user/stakeholder interviews.



Recent Activities Concerning Climate Change (Cont.)

Local Government in Florida- Some Examples

A general approach is to hold public workshops and based on stakeholder feedback, identify the climate vulnerabilities and prioritization.

Recent Examples Include:

- **Charlotte County/City of Punta Gorda Adaptation Plan**

<http://www.chnep.org/projects/climate/PuntaGordaAdaptationPlan.pdf>

- **Broward County**

<http://www.broward.org/NaturalResources/ClimateChange/Documents/Broward%20County%20FL%20Climate%20Protection%20Agreement%20Resolution.pdf>

- **City of Tallahassee**

http://www.broward.org/NaturalResources/ClimateChange/Documents/green_inits_annual_2008.pdf

- **Space Coast**

<http://spacecoastclimatechange.com/mission.html>

Other examples:

<http://www.epa.gov/statelocalclimate/local/local-examples/action-plans.html>

<http://www.broward.org/NATURALRESOURCES/CLIMATECHANGE/Pages/StateActionPlans.aspx>

Economic Analysis Methodologies

Standard Approaches

- **Cost Benefit – provides financial feasibility/**
 - **Cost Effectiveness – often used in environmental policy - cost**
- **Economic Valuation – non-monetary/non-market goods & services**
 - **Contingent valuation (wtp), travel cost, (and random utility), hedonic, among others**
- **Risk and Uncertainty or Stochastic Analysis – probabilities or likelihood measurements regarding input or output variables**
- **Economic Impact – monetary (revenues, jobs, income)**

Recent Development(s)

- **Integrated assessment modeling/systems approach**
- **Ecosystem services valuation (with mapping)**

Climate-Related Industries

Climate Sensitive Industries (Coastal)*

- Construction
- Recreation and Recreation-Related Business
- Crop Agriculture
- Military (Navy) Operations
- Oil and Gas Distribution
- Pollution Management and Prevention
- Maritime Transportation
- Storm Damage Mitigation and Repair
- Commercial Shipping
- Offshore Energy Production
- Fisheries: Commercial, Fisheries: Recreational
- Marine Search and Rescue (SAR)
- Marine Water Quality Management
- Freshwater Supply Management

Nat'l Climate Assessment Service**

- Water resources
- Energy supply and use
- Transportation
- Agriculture
- Forestry
- Ecosystems and biodiversity (with links to ecosystems services)
- Human health

*Source: Economic Impact Analysis of the COOS in the Gulf Coast Region, Report to the NOAA National Oceanographic Partnership Program (NOPP), 2005 and **Source: National Climate Assessment <http://assessment.globalchange.gov>

Example of State Policy Analysis – Economic Analysis for a Proposed Rule

Water/Wastewater Management Sectors

- Domestic Wastewater
- Industrial Wastewater
- Agriculture
- Septic Systems
- Stormwater (urban)

Estimated Cost	Range (\$) Low	Range (\$) High
EPA	\$135.5 M	\$206.1 M
Cardno Entrix	\$3.4 B	\$.4.7 B

Water Bodies

- Lakes
- Rivers
- Streams
- Spring vents
- Estuaries

*Statement of Estimated Regulatory Costs (SERC)analysis in accordance with Section 120.541, Florida Statutes, and the Governor’s Executive Order Number 11-01 for rulemaking to establish Numeric Nutrient Criteria in Sections 62-302 and 62-303, FAC. Sections 62-302 address Water Quality Standard(s) and 62-303 provides an assessment of Florida waters using the WQS in 62-302. The FDEP, in an effort to address site-specific factors in making water quality standard determinations, has proposed a rule to base new standards on establishing a systematic numeric interpretation of the existing narrative criteria. The narrative nutrient criteria would continue to apply to all water bodies, and numeric interpretations would be applied based on the scientific information available.

Recent Activities Concerning Climate Change

Florida-specific

Recent Studies: Economic Analysis of Climate Change and SLR

Florida Atlantic University Center for Environmental Studies. 2011. *Southeast Florida Resilient Water Resources, Case Study Pompano Beach*

http://www.ces.fau.edu/files/projects/climate_change/SE_Florida_Resilient_Water_FAU2011.pdf

Borisova, T., N. Breuer, and R. Carriker. 2008. *Economic Impacts of Climate Change on Florida: Estimates from Two Studies.*

<http://edis.ifas.ufl.edu/pdffiles/FE/FE78700.pdf>

Harrington, J., and T. Walton. 2008. *Climate Change in Coastal Areas in Florida: Sea Level Rise Estimation and Economic Analysis to Year 2080,* Final Report and Press Release; 2008. In: *Ocean Engineering Vol 34: 1832-1840*, Elsevier, The Netherlands, 2007.

<http://www.cefa.fsu.edu/Projects/Current-Projects>

Stanton, E.A. and F. Ackerman. 2007. *Florida and Climate Change: The Costs of Inaction.* Global Development and Environment Institute, Tufts University and Stockholm Environment. <http://ase.tufts.edu/gdae/Pubs/rp/FloridaClimate.html>

Next Steps

- **Research Areas –**
 - **Continued climate research**
 - **Include economic analyses, financing strategies, and scenarios, or options in adaptation planning**
 - **Research in areas of uncertainty: extreme weather, ocean temperature, among others**
 - **Continued investment in data collection, verification (data cleaning) database management and accessibility/clearinghouse**

In Summary –

The world must learn to work together, or finally it will not work at all

- General Eisenhower