

# Climate Variability & Change: The Role of Florida Sea Grant

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# Outline

- Florida Sea Grant
- Climate Change & Sea-Level Rise
  - Mitigation vs. Adaptation
- Rationale and Approach
- What We Are Doing
- How YOU Fit in the Picture

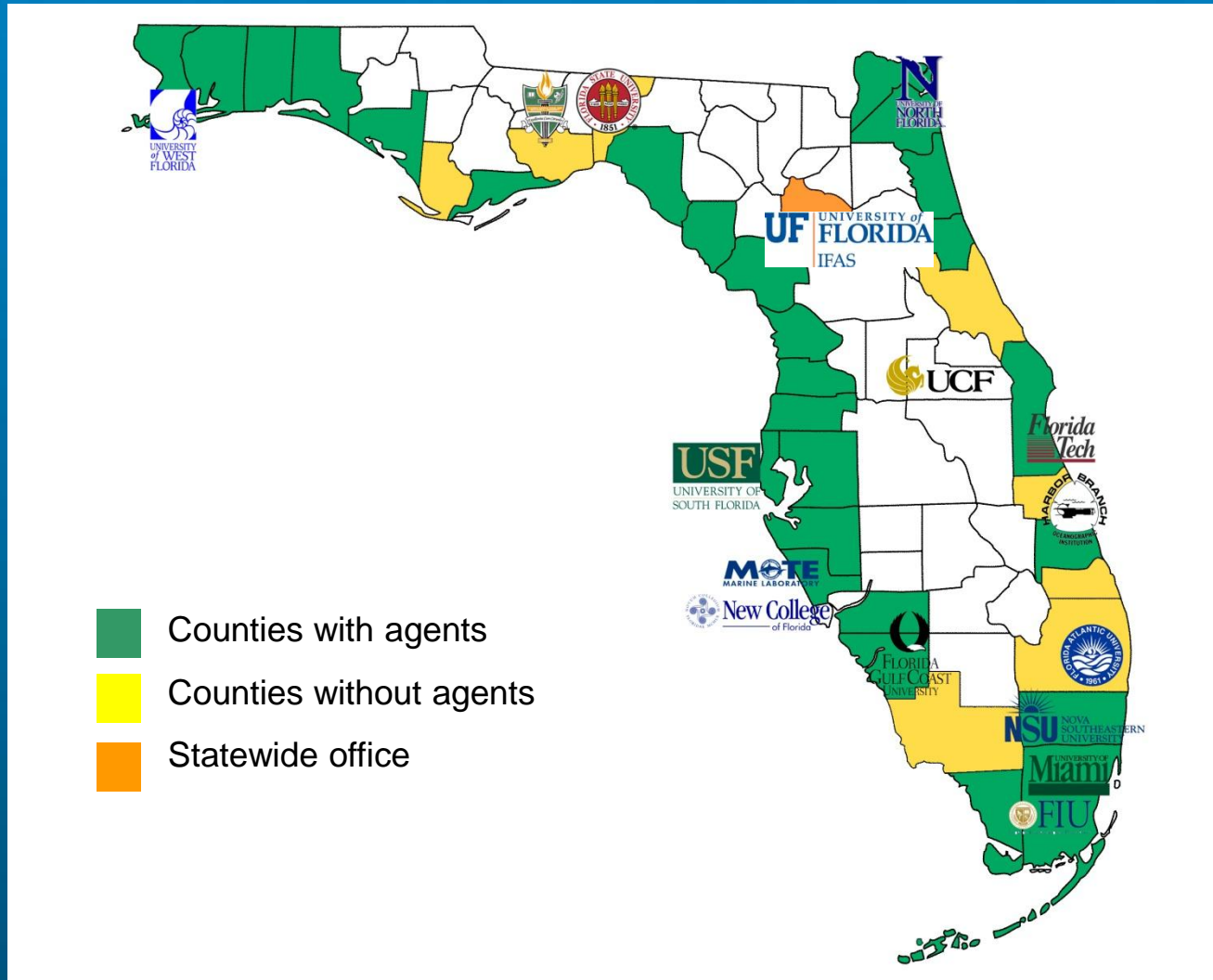


## Program Mission:

The mission of Florida Sea Grant is to support research, outreach and education to enhance the responsible use of coastal and marine resources to create a sustainable economy and environment.



# State-Wide Outreach Program





# Climate Change & Sea-Level Rise



# Climate Change & Sea-Level Rise

- SLR, not climate change,
- is focus

The New York Times

## Climate Change Doubt Is Tea Party Article of Faith

By JOHN M. BRODER

Published: October 20, 2010

JASPER, Ind. — At a candidate forum here last week, [Representative Baron P. Hill](#), a threatened Democratic incumbent in a largely conservative southern Indiana district, was endeavoring to explain his unpopular vote for the House [cap-and-trade](#) energy bill.

 [Enlarge This Image](#)





Peter Stevenson for The New York Times


Representative Baron P. Hill after a forum in Jasper, Ind., where he tried to defend his vote for a cap-and-trade energy measure.


It will create jobs in Indiana, reduce foreign oil imports and address [global warming](#), Mr. Hill said at a debate with [Todd Young](#), a novice Republican candidate who is supported by an array of Indiana [Tea Party](#) groups and is a climate change skeptic.

“Climate change is real, and man is causing it,” Mr. Hill said, echoing most climate scientists. “That is indisputable. And we have to do something about

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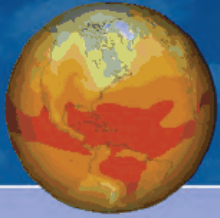
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**CONVICTION**  
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# Climate Change & Sea-Level Rise



YALE PROJECT ON  
CLIMATE CHANGE  
COMMUNICATION

BRIDGING SCIENCE + SOCIETY

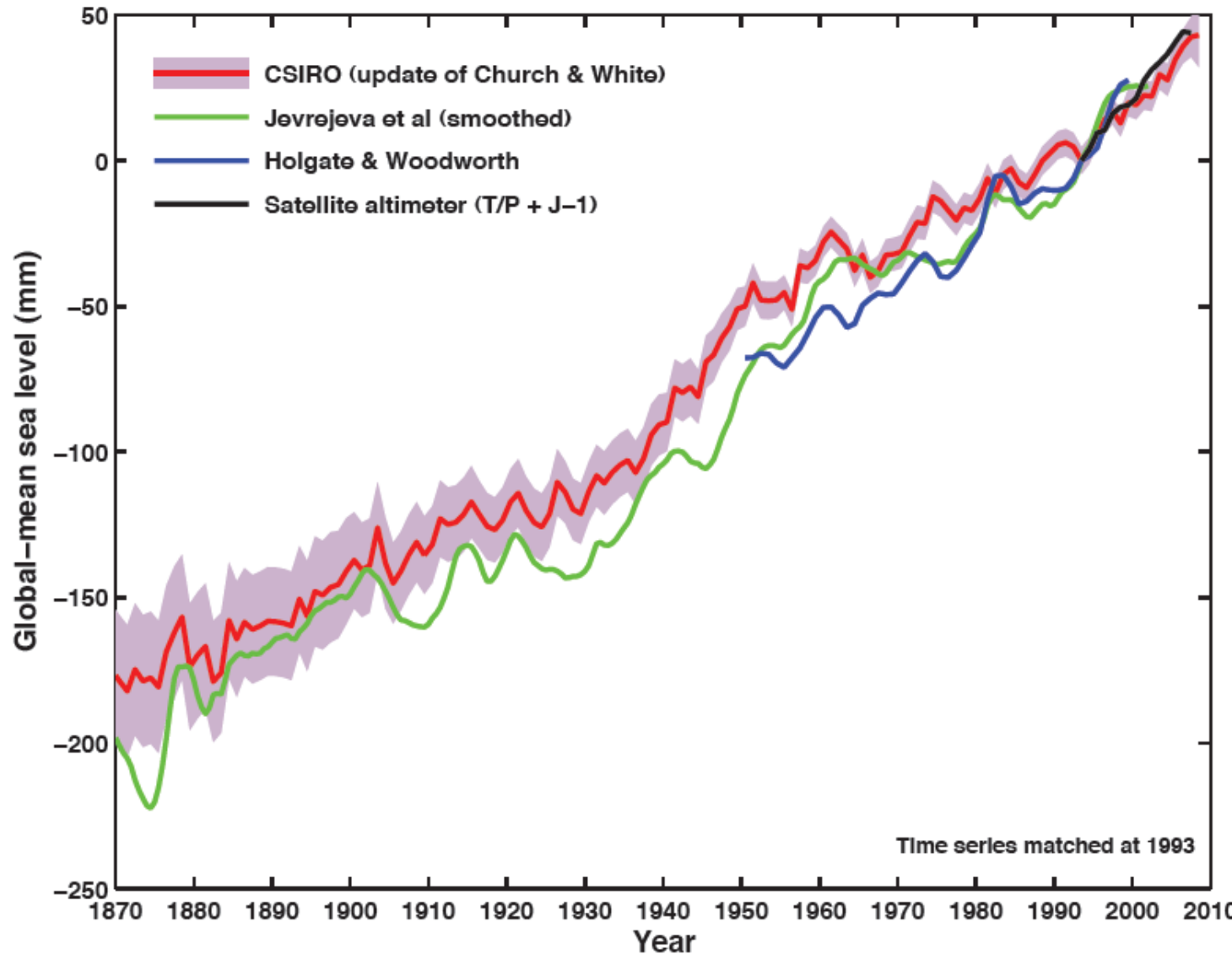
## Americans' Knowledge of Climate Change

“The study found that 63 percent of Americans believe that global warming is happening, but many do not understand why.”





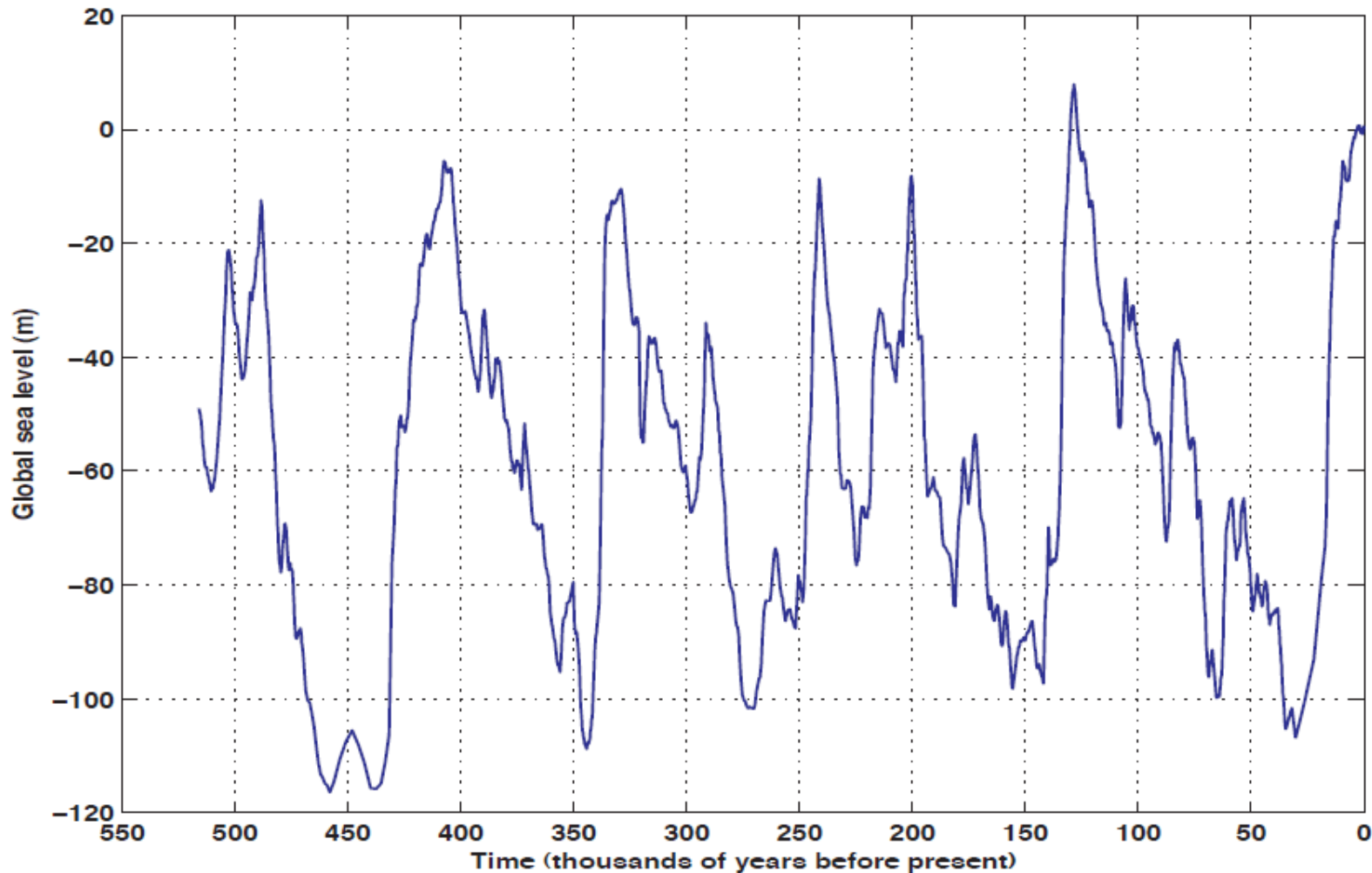
**Fig. 2.** Global mean sea level from 1870 to 2008 with 1 standard deviation error estimates updated from Church and White (2006; red), from Jevrejeva et al. (2006; green) and from 1950 to 2000 from Holgate and Woodworth (2004; blue). The TOPEX/Poseidon/Jason-1 and -2 global mean sea level (based on standard processing as in Church and White 2006) from 1993 to 2008 is in black. All series have been set to a common value at the start of the altimeter record in 1993.





# Sea Level for Past Half Million Years

**Fig. 1.** Sea level over the last 500 000 years compared to present day sea level. This sea-level estimate is from Rohling et al. (2009) and is based on carbonate  $\delta^{18}\text{O}$  measurements in the central Red Sea as these give a more continuous time series compared with the direct paleo inferences of sea level.





# Rationale and Approach



# Climate Change & Sea-Level Rise

- Focus more on adaptation than mitigation

**I.C.L.E.I** Local Governments for Sustainable Living



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### Mitigation

Since its inception in 1993, the [Cities for Climate Protection Campaign](#) has become the centerpiece globally.

The [five milestone process](#) is considered a key feature of CCP. Within this framework, the following statement of the representative of their 1 participating cities are expected to:

- *Measure* their emissions of greenhouse gases through the actions of their local (government emissions) and through the community they serve (community emissions)
- *Commit* for an emissions reduction target with respect to a specific sector
- *Plan* their actions (e.g. energy efficiency in buildings and transport, introduction of renewable energy, sustainable waste management) at the government and community level to reach their committed reduction target

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### Sustainable Living

- Climate Change
- Energy Conservation
- Green Building
- Green Home
- Green Office
- Green Purchasing
- Fact Sheets & Resources
- Frequently Asked Questions

### Green Business Partnership

### Climate Change

Climate Change, also called Global Warming, is a subject of tremendous interest and debate. Pinellas County is particularly vulnerable, as a coastal community, to the potential impacts of climate change. Many communities are taking action to create plans to prepare for potential impacts, such as sea level rise, changes in weather conditions (floods or drought), higher maximum temperatures, more severe weather, and changes in distribution of plants and insects. Sea level rise, combined with an increase in the severity of storms, is a serious concern for the local community, as well as all of Florida. Early signs of climate change in the state include drought, increased forest fires, eroding shorelines and dying coral reefs.



### Impacts of Sea Level Rise

- St. Petersburg, FL
- Treasure Island, FL

### Just the Facts

- Climate Change Frequently Asked Questions
- Ten Climate Change Resources
- Economic Impacts of Climate Change on Florida
- National Academies: Understanding and Responding to Climate Change

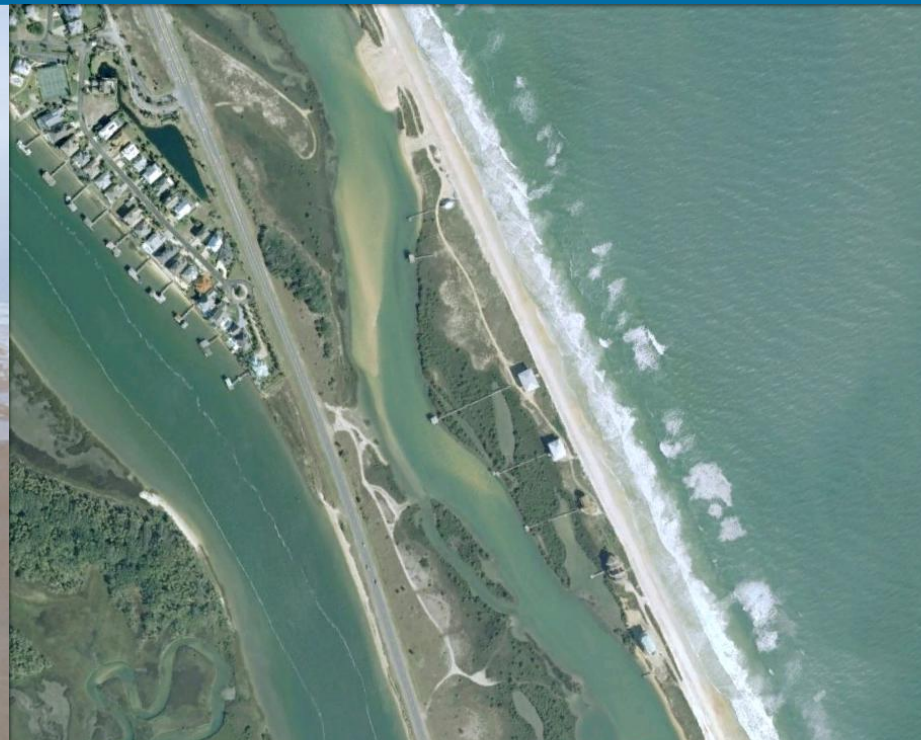
# Climate Outreach Community of Practice

- ***DO NOT*** focus on SLR!!!!
- Importance of Knowing Your Audience
  - Pre-contemplation
  - Contemplation
  - Action
- Few Communities Moving into “Action”
- Approach Communities by Learning Their Concerns
- Communities Want Examples



# Focus on Erosion

- Ubiquitous around Florida
- Costing local governments in many ways
- Already a long-term issue (segue)



# Focus on Resiliency

- Nobody wants a negative message
  - Receptivity higher if effective action is possible
- Many activities and goals for SLR adaptation and resiliency planning similar
- Hazard mitigation already a state and federal planning requirement

April  
2010:

# **Hazard and Resiliency Planning: Perceived Benefits and Barriers Among Land Use Planners**

## **Final Research Report**

**National Oceanic and Atmospheric  
Administration Coastal Services Center**



# GLOBAL WARMING'S SIX AMERICAS 2009: An Audience Segmentation Analysis




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## Climate Change and Impacts of Sea Level Rise

Sea levels are rising and are predicted to continue to rise for the foreseeable future. Because the projected rates of sea-level rise (SLR) over the next century far exceed those observed in the past several thousand years, the potential exists for historically unprecedented changes. Plausible scenarios estimate that in certain regions, sea level could increase by up to 2 meters by 2100. SLR has the potential to affect existing coastal infrastructure critical to the Department of Defense.



Potential local effects projected by global climate change models include changes in the frequency and intensity of coastal storms, precipitation, and ocean currents. Environmental effects induced by SLR are far reaching and will vary based on geography. Local evaluation of such consequences will be essential. Potential environmental effects include the following:

- ◆ increased storm damage to coastal infrastructure
- ◆ more rapid coastal erosion
- ◆ shoreline change including the possibility for total loss of protective natural barriers
- ◆ saltwater intrusion into aquifers and surface waters
- ◆ rising water tables
- ◆ changes in tidal prism

These effects will occur over time at different rates or re-occurrence intervals. Although



### Symposium & Workshop

November 30 – December 2, 2010  
Washington, D.C.

### Technical Program Highlights

#### Technical Sessions:

- ◆ Opening the Arctic: Science Challenges to Understanding the Impacts of Climate Change
- ◆ Sea Level Rise: Assessing Vulnerabilities and Impacts
- ◆ National Environmental Monitoring and Indicator Systems: Implications for DoD

For the complete agenda, visit [symposium.serdp-estcp.org/Agenda-at-a-Glance](http://symposium.serdp-estcp.org/Agenda-at-a-Glance).

CECW-CE

Department of the Army  
U.S. Army Corps of Engineers  
Washington, DC 20314-1000

EC 1165-2-211

Circular  
No. 1165-2-211

1 July 2009

EXPIRES 1 JULY 2011  
WATER RESOURCE POLICIES AND AUTHORITIES  
INCORPORATING SEA-LEVEL CHANGE CONSIDERATIONS  
IN CIVIL WORKS PROGRAMS

1. Purpose. This circular provides United States Army Corps of Engineers (USACE) guidance for incorporating the direct and indirect physical effects of projected future sea-level change in managing, planning, engineering, designing, constructing, operating, and maintaining USACE projects and systems of projects. Recent climate research by the Intergovernmental Panel on Climate Change (IPCC) predicts continued or accelerated global warming for the 21st Century and possibly beyond, which will cause a continued or accelerated rise in global mean sea-level.



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## News

[Drought conditions expand into west, south Georgia - \(September 16, 2010 - PDF\)](#)

[Georgia sees warmest summer nights ever - \(September 8, 2010 - PDF\)](#)

[La Niña weather pattern expected this fall \(September 7, 2010\)](#)

[Shaping up your carbon footprint \(August 20, 2010\)](#)

[News Archive»](#)

## Outlooks

[SECC Fall Climate Outlook is now available \(Sept. 19, 2010\)](#)

[Monthly Climate Summary for Georgia and Florida now available \(Sept. 8, 2010\)](#)

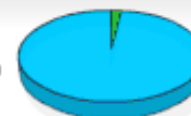
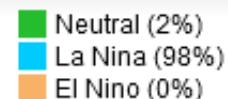
[SECC Agricultural Outlook \(August 30, 2010\):](#)

[Monthly Climate Summary \(August 4, 2010\): La Niña Conditions Return to the Pacific Ocean How can it affect your crops?](#)

[Climate Phase Update \(July 16, 2010\): La Niña develops as the Pacific Ocean continues a rapid transition.](#)

[SECC Summer Climate Outlook \(May 20, 2010\): El Niño is over in the Pacific Ocean](#)

### Climate Phase Forecast for Oct-Nov-Dec



Source: The International Research Institute for Climate and Society

 **AgroClimate** Español

**AgroClimate**  
Now available in Spanish  
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AgroClimate Training Workshop

# Overview of Approach

- Focus on small number of communities & start slow (seek to create examples)
- Identify local concerns
- Bring tools and resources to the table when possible; conduct research relevant to local concerns
- Allow SLR to enter conversation without forcing it



# What Florida Sea Grant is Doing



# Community of Practice

- Gulf of Mexico Community of Practice
  - Meeting in St. Petersburg, Florida, April 2010
- SE & Caribbean Outreach Workshop
- Network of Sea Grant programs, NOAA, Coastal Services Center, state agencies, Northern Gulf Institutes, NGOs, & others





# CoP Tools

- Science-Based Information
  - A moving target
- Local Predictions of Impacts
  - Sketchy information
- Social and Economic Impacts
  - Often not well defined
- Adaptation Strategies and Case Studies
  - Lots of ideas, less implementation



# Focus on Communities & Start Slow

- Wakulla County (erosion issues)
  - Identifying interviewees
  - Utilize Coastal Resiliency Index
- Pinellas (SLR adaptation planning)
  - Student assistance in ordinance drafting



# Research & Tools

- Share existing
  - Digital Coast; CRI; PDRP process
- Create
  - SLR and Property Tax Base
  - Takings Issues
  - Armoring Costs (proposed)





# How YOU Fit in the Picture



# Sea Grant and You

- Florida Sea Grant as liaison
  - Two Models:
    1. Community needs > FSG > Researcher > Funding > Execution > Delivery to Community
    2. Research > Awareness by FSG > Transmission to Community



# Sea Grant and You: FSG as Funding Entity

1. Develop/test innovative methods or tools to enhance understanding of potential impacts of climate change on coastal resources, infrastructure and quality of life.
2. Develop/test innovative processes and/or tools for communities to make informed, science-based decisions regarding adaptations to climate change
3. Quantify the socio-economic and environmental benefits of incorporating climate change into policy decisions

[www.flseagrant.org](http://www.flseagrant.org)

**QUESTIONS?**

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