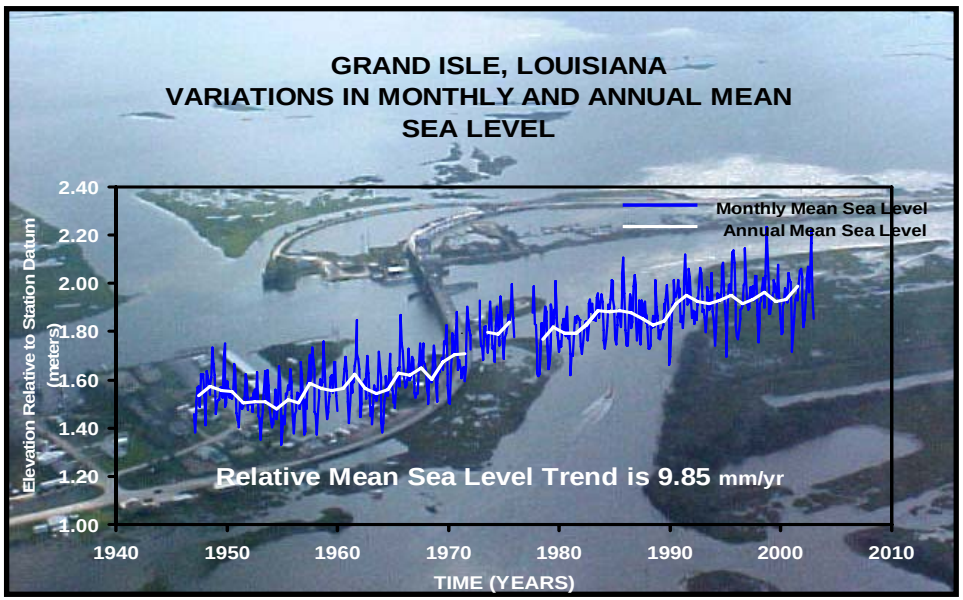
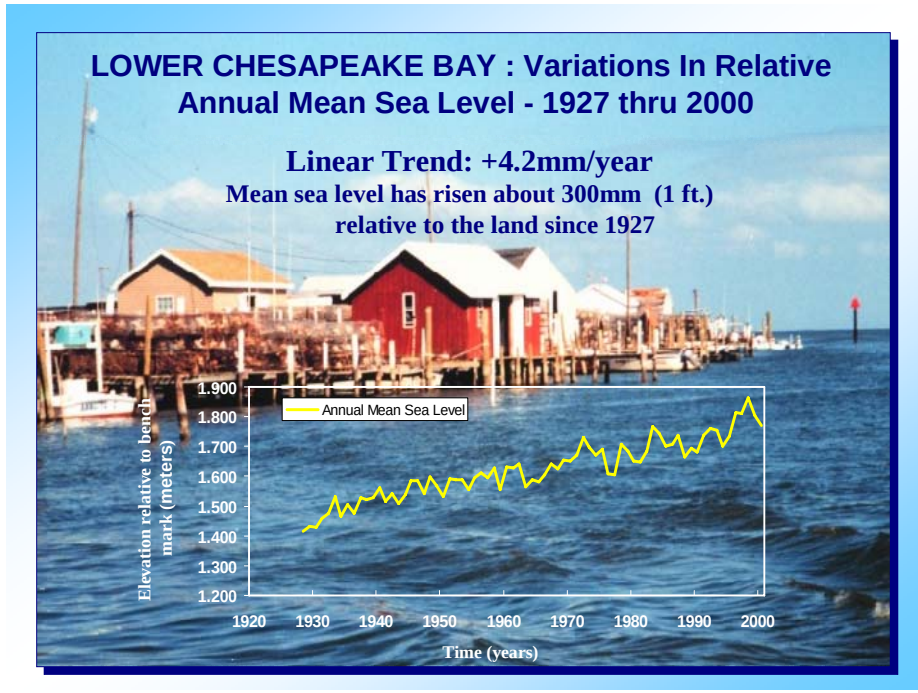
Coastal Elevation and Sensitivity to Sea Level Rise – A Climate Change Science Program Assessment Product





Presented by Stephen Gill, NOAA
Coastal Programs Session
OCRM Program Managers Meeting
March 7, 2006

http://www.climatescience.gov/default.htm

Climate Change Science Program

Integrates:

- Existing U.S. Global Change Research Program (USGCRP) established in 1990
- Administration's U.S. Climate Change Research Initiative (CCRI)

Combines and Focuses:

- Near-term focus of the CCRI with the long-term goals of the USGCRP
- On accelerating progress of USGCRP over a 5-year period

Climate Change Science Program

- Family of 12 federal agencies
  - DOC/NOAA - DOE - DOI/USGS - DOD
  - EPA - HHS/NIH - NASA - DOT
  - NSF - SI - USDA - DOS/AID

- CCSP Strategic Plan sets forth goals covered in 21 Synthesis and Assessment Products:
  1. Past and present climate
  2. Forces that change the climate
  3. Projections of future climate change
  4. Sensitivity and adaptation of ecosystems and human activities

<u>ALL 21 Products Must be Completed by December 2007</u>

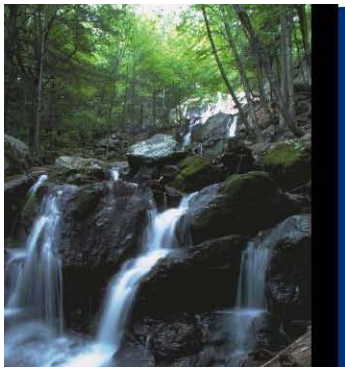
Climate Change Science Program Synthesis and Assessment Products

- Supports research goals for the periodic synthesis and assessment of cumulative knowledge and the evaluation of the implications of that knowledge for scientific research and policy formulation
- Supports informed discussion and decisions by policymakers, resource managers, stakeholders, the media, and the general public
- Helps define and set future direction of CCSP program
- Meets the requirements of Global Change Research Act of 1990 to "produce information readily usable by policymakers attempting to formulate effective strategies for preventing, mitigating, and adapting to the effects of global change

NOAA's Role in Climate Change Science Program Goal 4 Synthesis and Assessment Product 4.1

- **Goal 4 Objective: "Understand the sensitivity and adaptability of natural and managed ecosystems and human systems to climate and related global changes"**

- **Goal 4 has seven (7) Synthesis and Assessment Products**

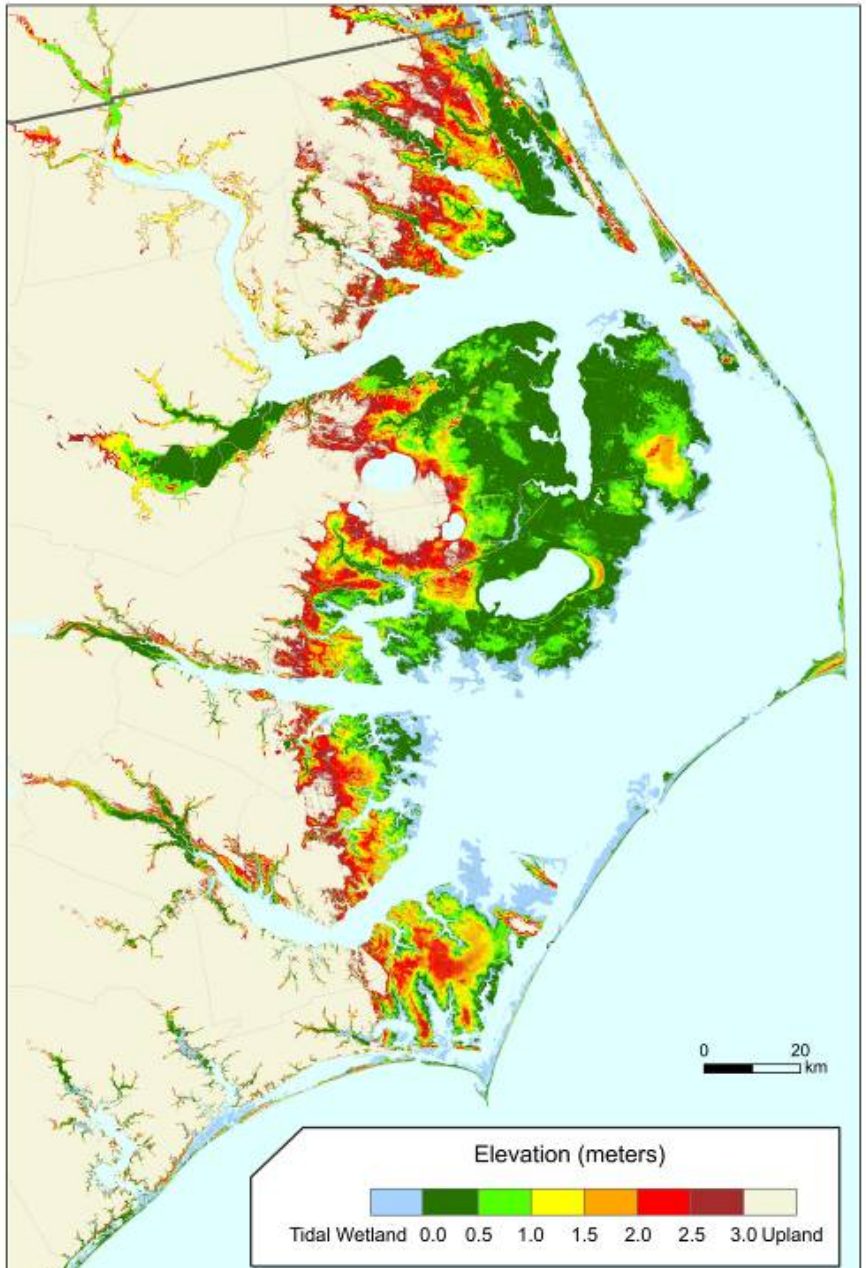


GOAL 4

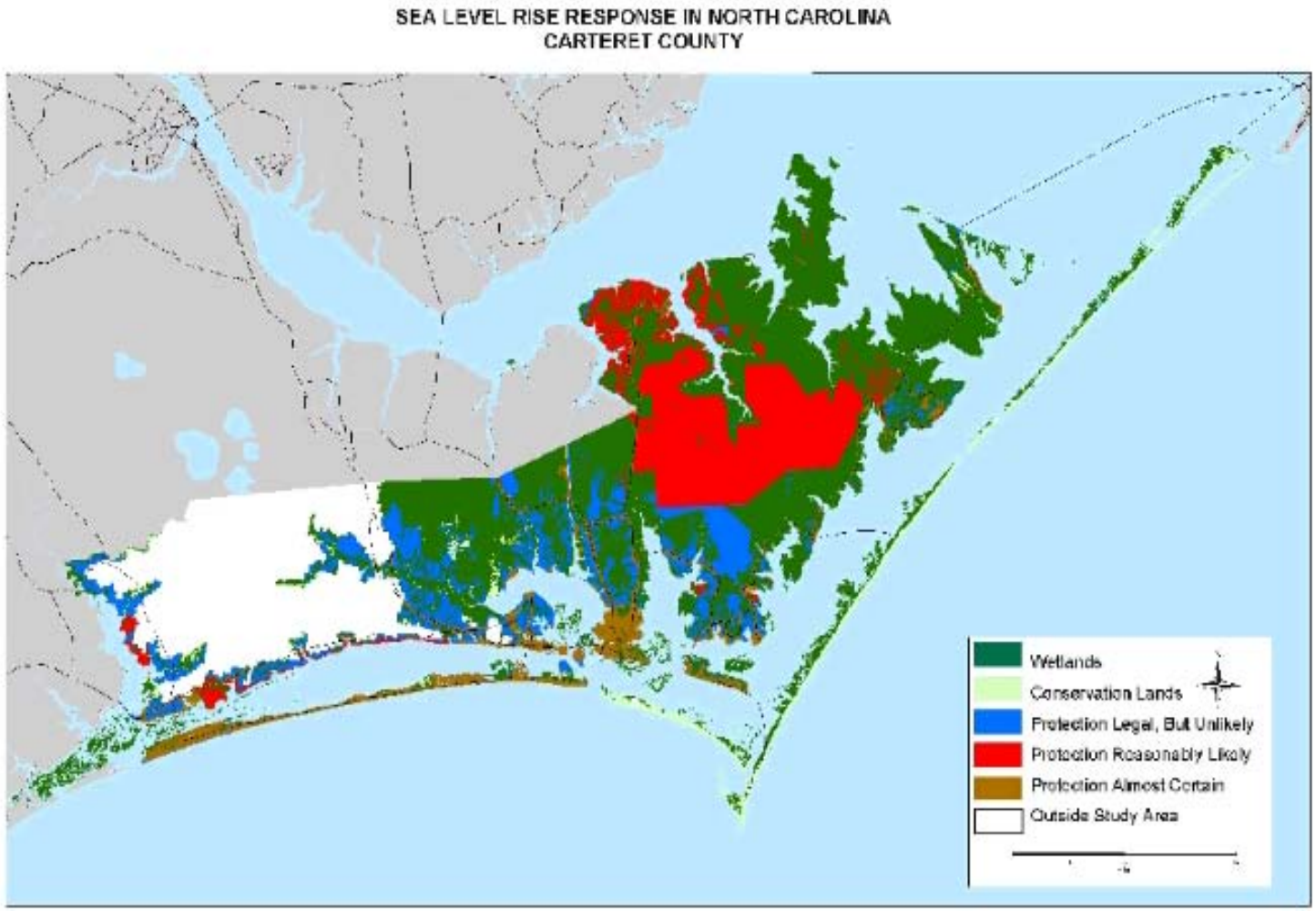
Understand the sensitivity and adaptability of different natural and managed ecosystems and human systems to climate and related global changes.

TOPICS FOR PRIORITY CCSP SYNTHESIS PRODUCTS	SIGNIFICANCE	COMPLETION
Coastal elevation and sensitivity to sea level rise.	Evaluation of how well equipped society is to cope with potential sea level rise can help reduce vulnerability.	within 2 years
State-of-knowledge of thresholds of change that could lead to discontinuities (sudden changes) in some ecosystems and climate-sensitive resources.	This approach seeks to determine how much climate change natural environments and resources can withstand before being adversely affected.	2-4 years
Relationship between observed ecosystem changes and climate change.	Earlier blossoming times, longer growing seasons, and other changes are being observed, and this report will explore what is known about why these events are happening.	2-4 years
Preliminary review of adaptation options for climate-sensitive ecosystems and resources.	Understanding of adaptation options can support improved resource management—whether change results from natural or human causes—and thus helps realize opportunities or reduce negative impacts.	2-4 years
Scenario-based analysis of the climatological, environmental, resource, technological, and economic implications of different atmospheric concentrations of greenhouse gases.	Knowing how well we can differentiate the impacts of different greenhouse gas concentrations is important in determining the range of appropriate response policies.	2-4 years
State-of-the-science of socioeconomic and environmental impacts of climate variability.	This product will help improve application of evolving ENSO forecasts by synthesizing information on impacts, both positive and negative, of variability.	2-4 years
Within the transportation sector, a summary of climate change and variability sensitivities, potential impacts, and response options.	Safety and efficiency of transportation infrastructure—much of which has a long lifetime—may be increased through planning that takes account of sensitivities to climate variability and change.	2-4 years

Northern North Carolina
Elevation above Tidal Wetlands (meters)



EPA Low Resolution Maps



Participating Agencies

Lead Agencies: EPA, NOAA, USGS

Supporting Agencies: NASA, DOE

FEMA: Proposed Lead for coastal elevations and flood damages

Department of Defense

- Corps of Engineers– Proposed Lead for Shore protection
- 2nd largest landowner

Department of Interior: Parks and Refuges

Federal Advisory Committee

- CCSP guidelines for product preparation require Federal Advisory Committee (FAC) process.
- EPA is lead agency for SAP 4.1 FAC administrative purposes.
- Establishing a package for the Coastal Elevations and Sea Level Rise Advisory Committee

Prospectus: Key Questions

1) Which lands could be inundated by the tides without shore protection?
2) How would the floodplain boundaries change?
3) Which land could potentially erode?
4) Ability of wetlands to vertically accrete: Will sea level rise cause the area of wetlands to increase or decrease?
5) Which lands have been set aside so that wetlands will migrate inland; which land [will] require shore protection? Which lands could be available for either?

That is: What happens to the land?

Other Questions

For alternate scenarios of sea level rise and shore protection

- Population, economic activity, land use in vulnerable area?
- Cost of shore protection?
- Ecological implications?
- Flood damages?
- Public's access to (and use of) the shore?

Decisions:

- Which near-term actions (if any) justify different decisions?
- What options are being considered by specific organizations?
- What lessons can the Mid-Atlantic States learn from the unfolding consequences in Louisiana?

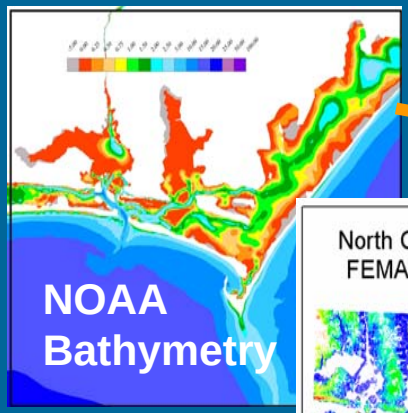
Answers on three scales

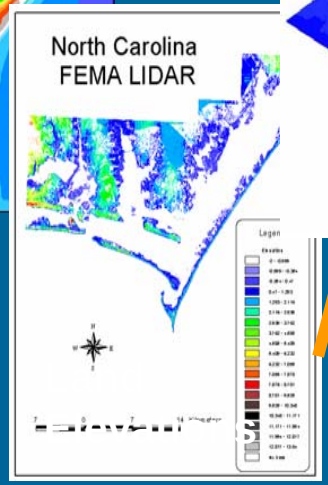
- National—literature review
- Middle Atlantic—quantitative estimates of key questions
- Estuary or county scale: Case Studies

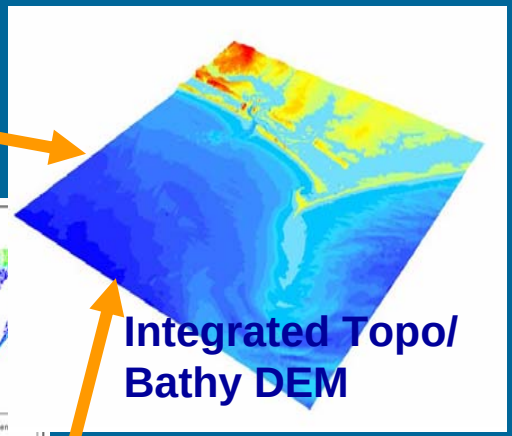
NOAA is concentrating of North Carolina Case Study in particular

North Carolina Sea Level Rise Project

NOAA Higher Resolution Product

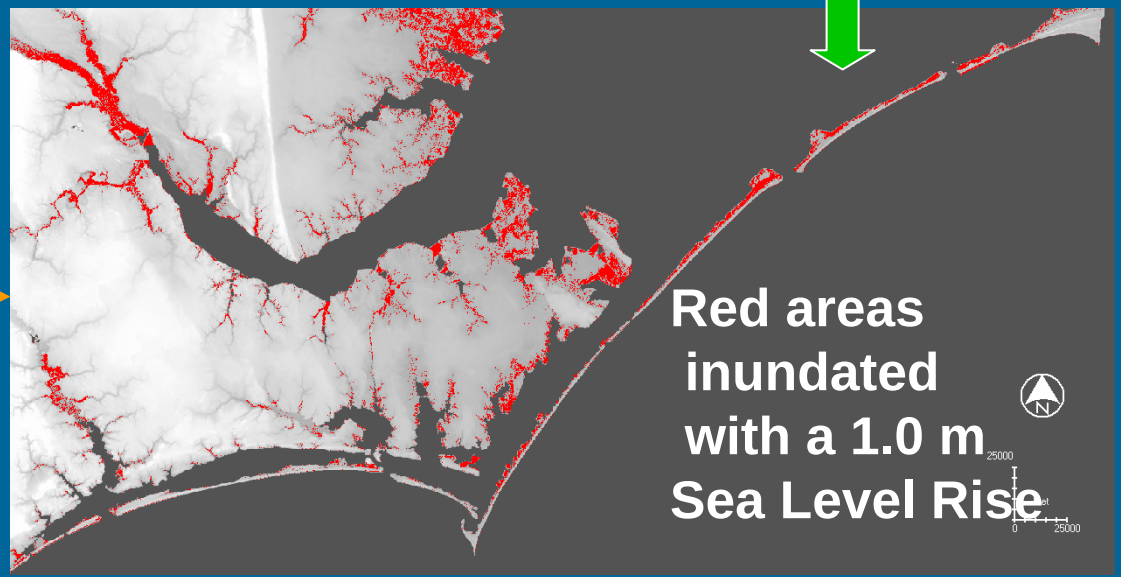




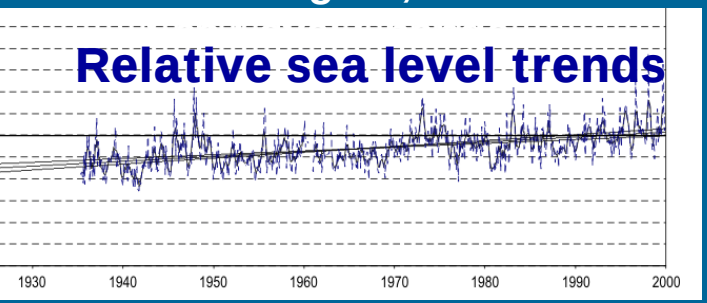


Create Digital Elevation Model (with approx. 20cm vertical resolution)

To Assess Sea Level Rise



Wilmington, NC



The Report

- **General introduction and overview of the background science and concepts of sea level change and potential impacts.**
- **Dedicated chapter to each of the key questions**
- **Specific case studies illustrating one or several of the key questions**
- **Heavy dependence on GIS technology, presentation, and data files**
- **Public data and information**

Schedule

Final prospectus posted	March 06
First FACA/Lead Authors Meeting	April-May 06
Rough draft for Key Questions 1-5	July 06
Rough draft for Case Studies	August 06
Stakeholder Review complete	November 06
Expert Review (first) draft	December 06
Public Comment (second) draft	May 07
Public Comment Period	August 07
Third draft submitted to CCSP	*September 07*
Final product released	*November 07*

ALL 21 *Synthesis and Assessment Products must be completed by December 2007*

Coastal Elevation and Sensitivity to Sea Level Rise – A Climate Change Science Program Assessment Product – How to Help

- Review the prospectus and provide feedback and comments
- Provide us information on your activities related to climate and sea level change
- Help locate relevant data and information such LiDAR data, land use maps, floodmaps, etc..
- Participate in stakeholder reviews, expert reviewer nominations, public comment periods

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