

Rising Seas: How NOAA Can Lead the Partnership to Anticipate and Adapt



**Brownbag Presentation
August 14, 2008**

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NOS Climate Services Development Team Representative**



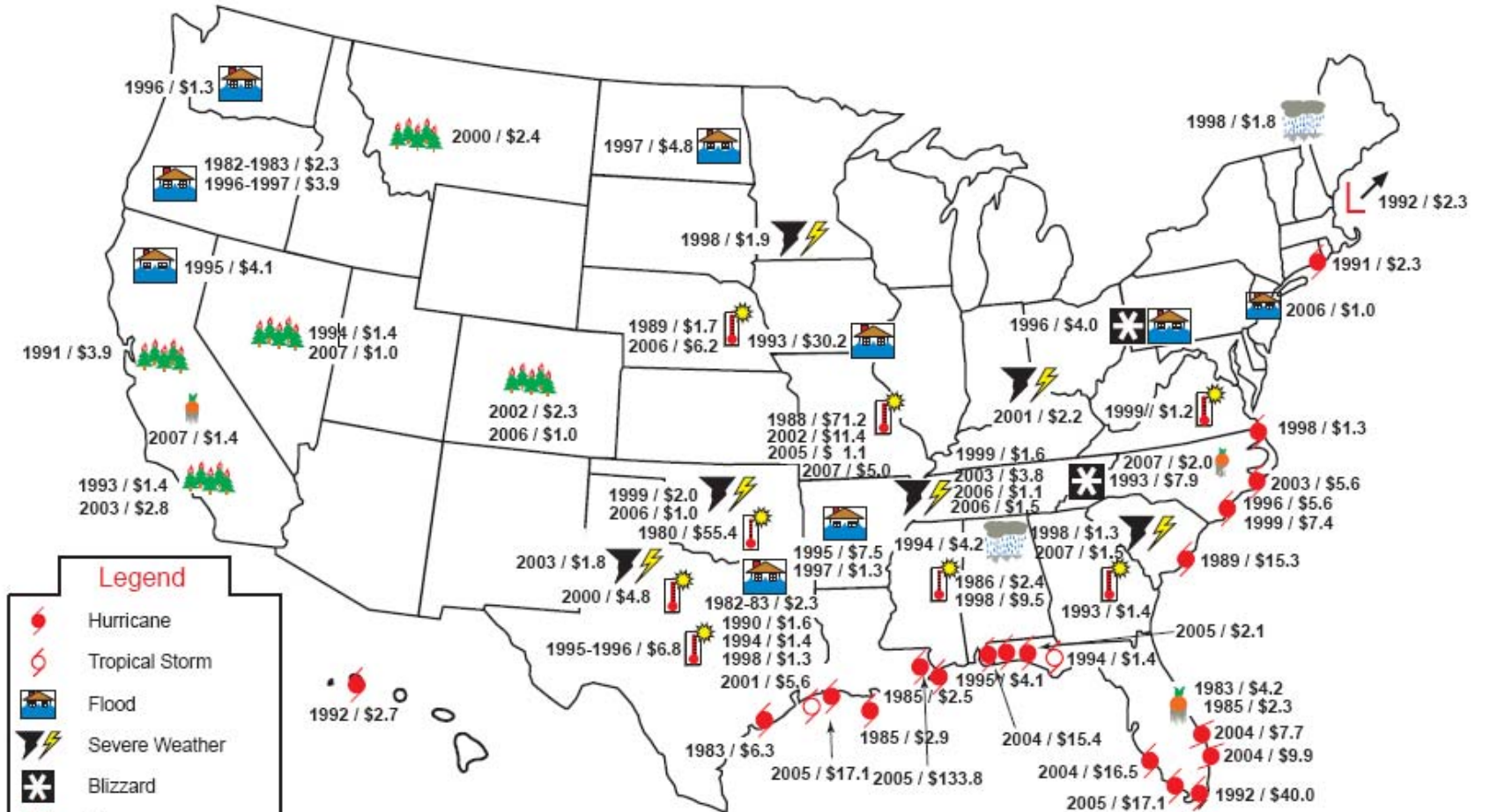
Coastal Communities: Vital to U.S. and International Economies

- 57% of U.S. national GDP is contributed by coastal watershed counties.
- Coastal counties contain 53% of the nation's population – but account for only 17% of U.S. land area (excludes Alaska).
- Coastal habitats help reduce impacts of floods, storms, and climate change on coastal communities by absorbing water, wave energy, and other stressors.



Extreme Living:

> \$1 Billion Weather Disasters, 1980 to 2007



Dollar amounts shown are approximate damages/costs in \$ billions.

Location shown is the general area for the regional event. Several hurricanes made multiple landfalls.

Additional information for these events is available at NCDC WWW site www.ncdc.noaa.gov/ol/reports/billionz.html

The U.S. has sustained 78 weather related disasters over the last 28 years with overall damages/costs exceeding \$1.0 billion for each event. 66 of the disasters occurred during or after 1990. Total costs for the 78 events were 600 billion using a GNP inflation index.

NOAA's National Climatic Data Center

Coastal Issues

- Coastal Ecosystem Services
- Living Marine Resources
- Coastal Infrastructure
- Human Dimensions

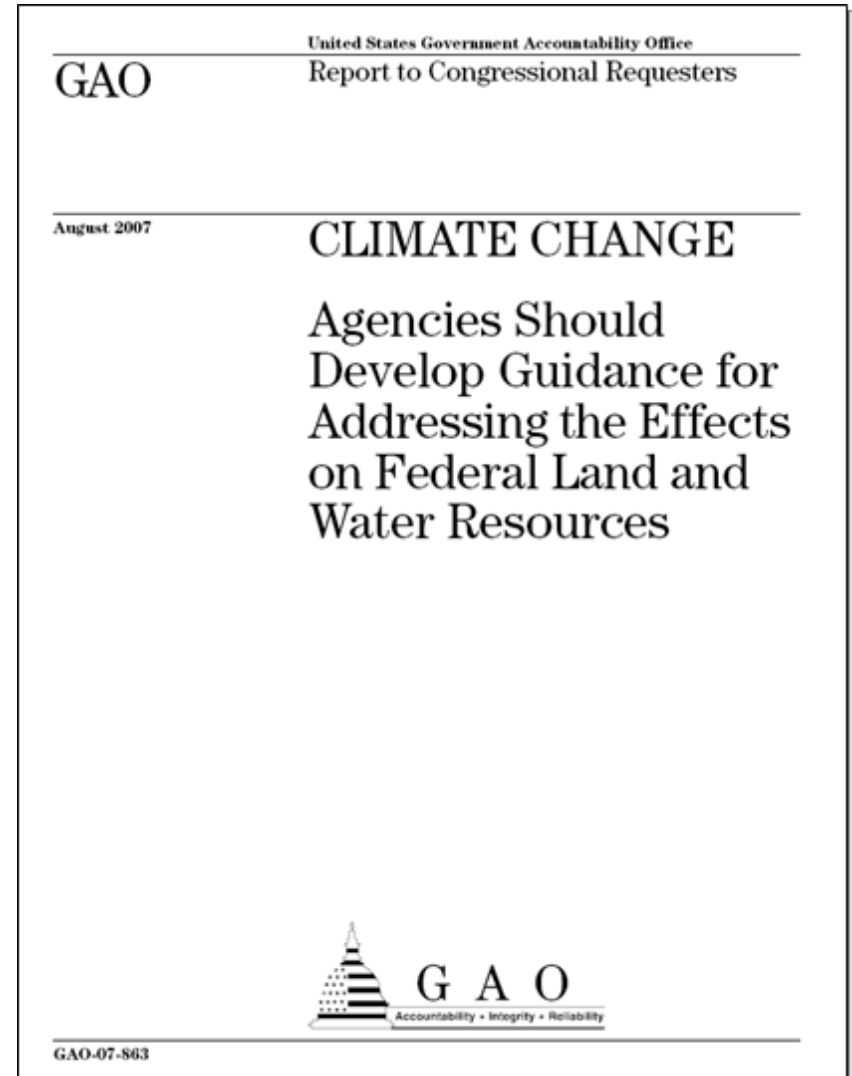


The Federal Wake-Up Call: August 2007 GAO Report



“In general, resource managers lack specific guidance for incorporating climate change into their management actions and planning efforts.

“Without such guidance, their ability to address climate change and effectively manage resources is constrained.”

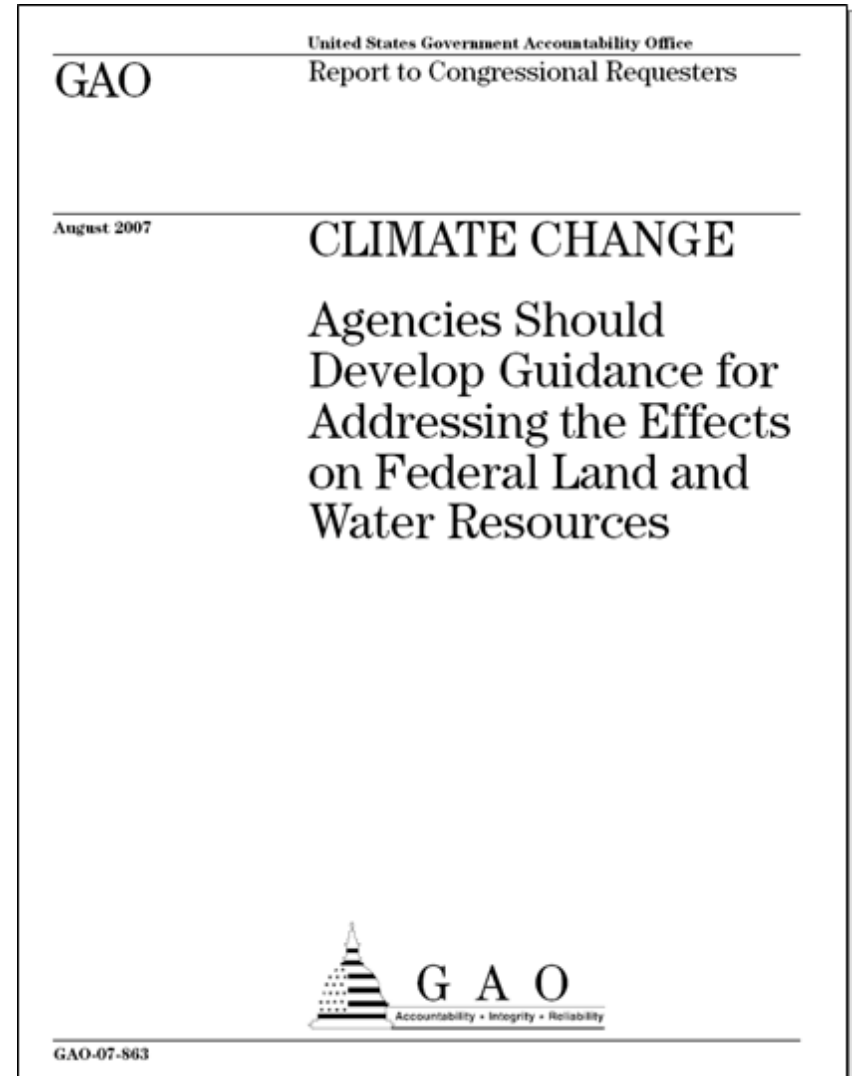


NOAA GAO Response



By December 2008, NOAA will . . .

- Engage in consultations within agency to identify climate information needs and capacities
- Provide written guidance to help resource managers address climate change effects
- Enhance interagency dialogue on climate and ecosystem management, contributing to identification of best practices



NOAA Climate and Living Marine Resources (LMR) Workshop:

Seattle, Washington, May 14 to 15, 2008

Preliminary Recommendations:

- Climate guidelines for LMR management
- Standard operating procedures for Endangered Species Act actions
- Multidisciplinary regional LMR research and management programs
- Engage social scientists, managers, regulators, and stakeholders
- Downscale environmental forecasts
- Standardize observation and prediction products



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Strengthening Capacity to Address Impacts of Climate Change on Communities and Ecosystems Workshop:

Washington, DC, June 19 to 20, 2008

Preliminary Recommendations:

- Focus service on user needs
- Establish NOAA-wide working group(s)
- Develop a coastal management guidebook including integration of climate change
- Develop interdisciplinary and integrated analytical tools and resources
- Use regional approaches to working with our partners
- Establish indicators of climate risk and resilience for communities and ecosystems



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Thinking Strategically about Climate

NOAA Action:

- September 19, 2007: NOAA Executive Council directs NOAA to take action to establish a National Climate Service

Congressional Interest:

S. 2307 – Global Change Research Improvement Act of 2007

- Establishes a National Climate Service within NOAA that “shall produce and deliver authoritative, timely and usable information about climate change, climate variability, trends, and impacts on local, State, regional, national, and global scales.”



Developing NOAA's Climate Service

NOAA's Vision for a National Climate Service:

An informed society anticipating and responding to climate and its impacts.

Tasks of the Cross-NOAA Climate Services Working Group:

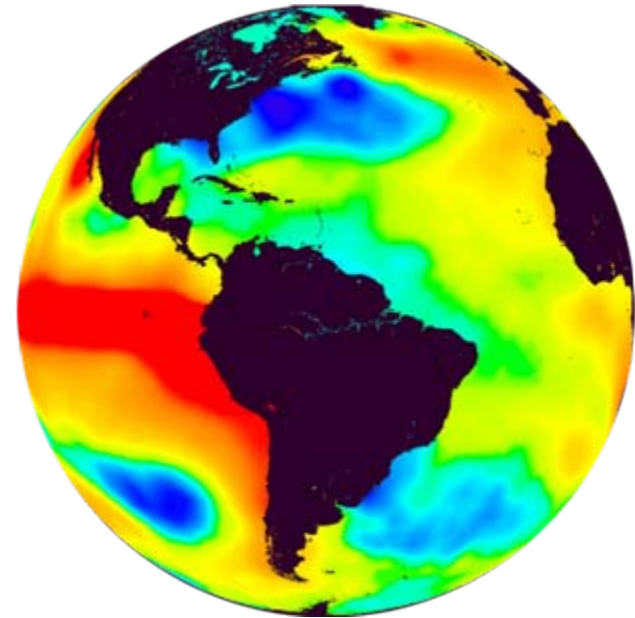
1. Define climate services and a National Climate Service
2. Define NOAA's role for the provision of climate services
3. Assess evolving user needs for climate information
4. Assess other private- and public-sector involvement in climate services
5. Begin to develop a draft climate services strategy for NOAA
6. Engage external community



Climate Services

NOAA's Climate Service Strategy is a comprehensive system that . . .

- Monitors, collects, and integrates information on the key indicators of climate and develops credible, usable, accessible, and timely assessments and predictions of climate
- Assesses climate trends, conditions, projections, and impacts
- Works with user communities to develop and transfer information into planning and decision-making



Understanding the Past and Current State of the Climate

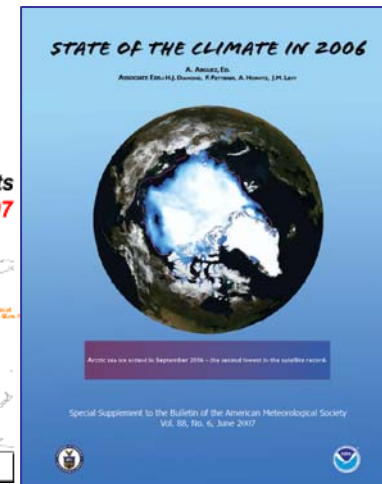
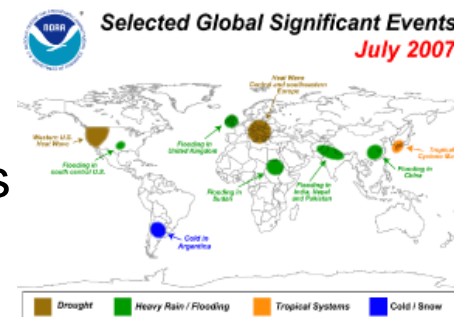
• Climate System Observations

- Ocean
- Atmosphere
- Arctic
- Carbon



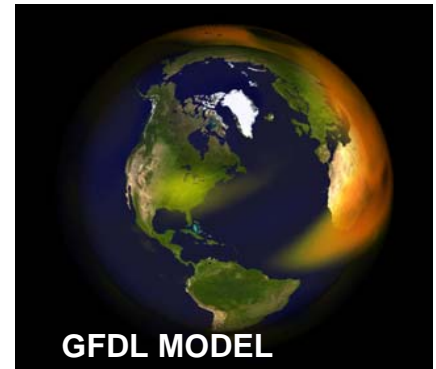
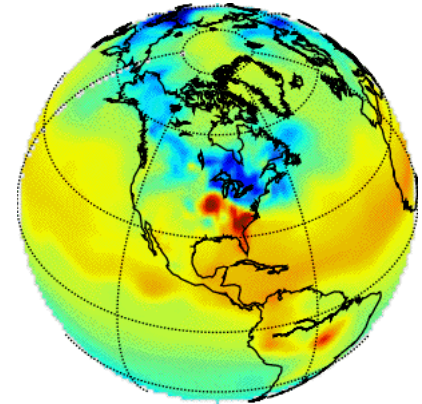
• Data Management and Information

- NOAA's Comprehensive Large Array-data Stewardship System
- State of the Climate Report
- Climatology Statistics and Summaries



Advance Predictive Understanding and Skill about the Future State of Climate

- **Understanding Climate Processes**
 - NOAA's Research Laboratories, Centers, and Cooperative Institutes
 - Competitive Grants
- **Earth System Modeling, Predictions, and Projections**
 - GFDL- and NCEP-coupled climate models
 - Earth system model development
- **Analysis and Attribution**
 - Reanalysis
 - Emerging focus on Integrated Earth System Analysis and attribution

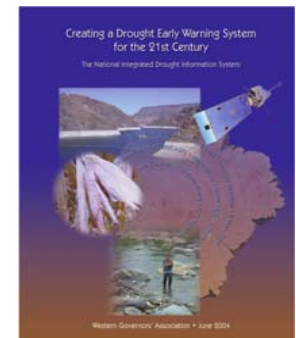
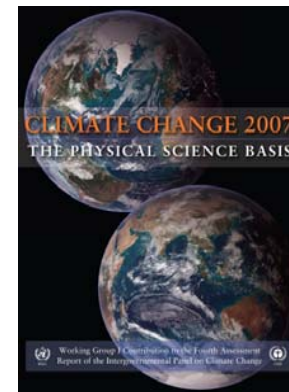
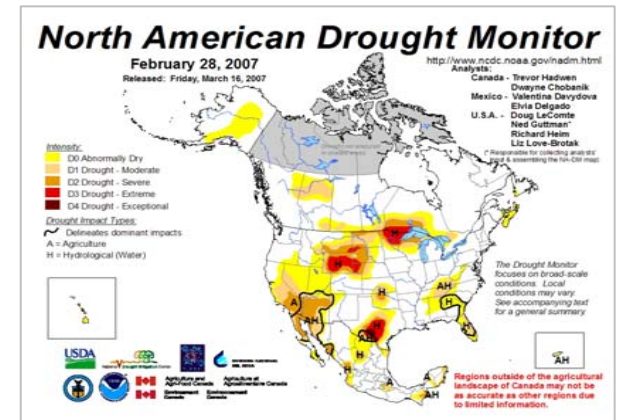


Capturing the global distribution of the short-lived Aerosols spreading out from the source regions

Assessing Evolving User Needs and Context

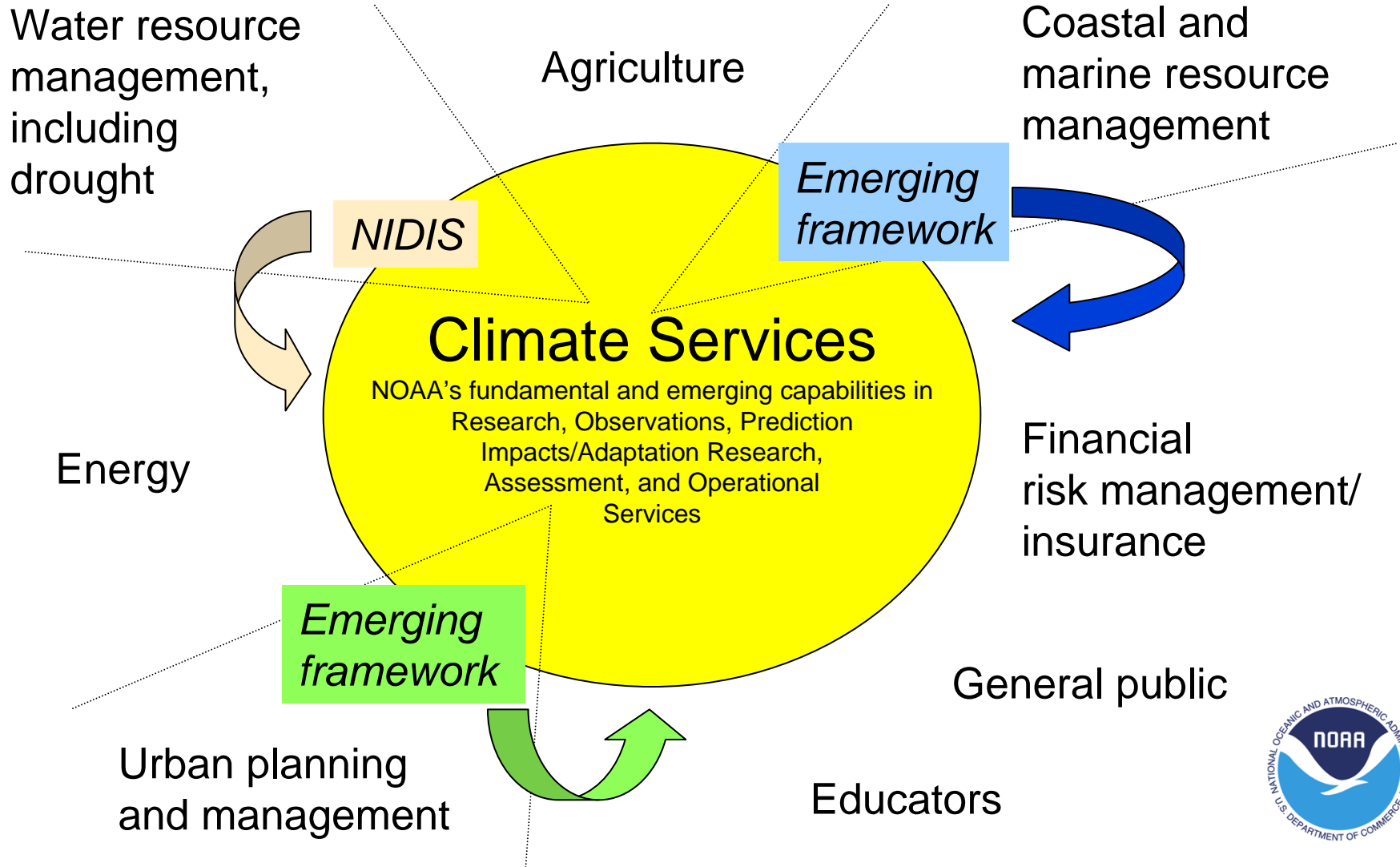


- **Assessing Climate, Impacts, and Adaptation**
 - Global, national, regional, sectoral assessments of vulnerability, impacts, and adaptation
- **Climate Services Development and Delivery**
 - National Integrated Drought Information System (NIDIS)
 - Emerging foci on coasts, Arctic, and living marine resources
 - Regional
 - International



Concept for Moving Forward:

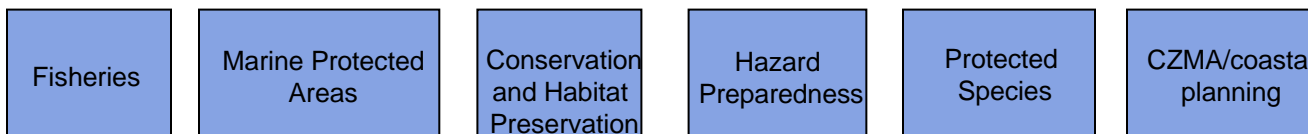
An Issue-Focused Perspective on Developing Climate Services



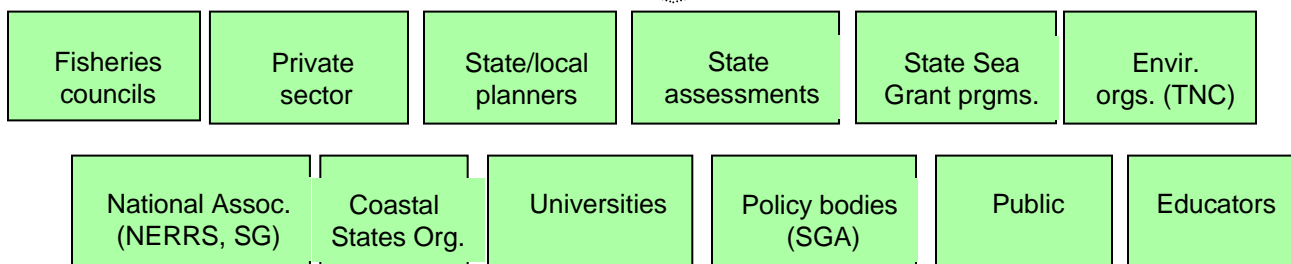
Concept For Moving Forward: Linking Climate with Coastal and Marine Resource Management



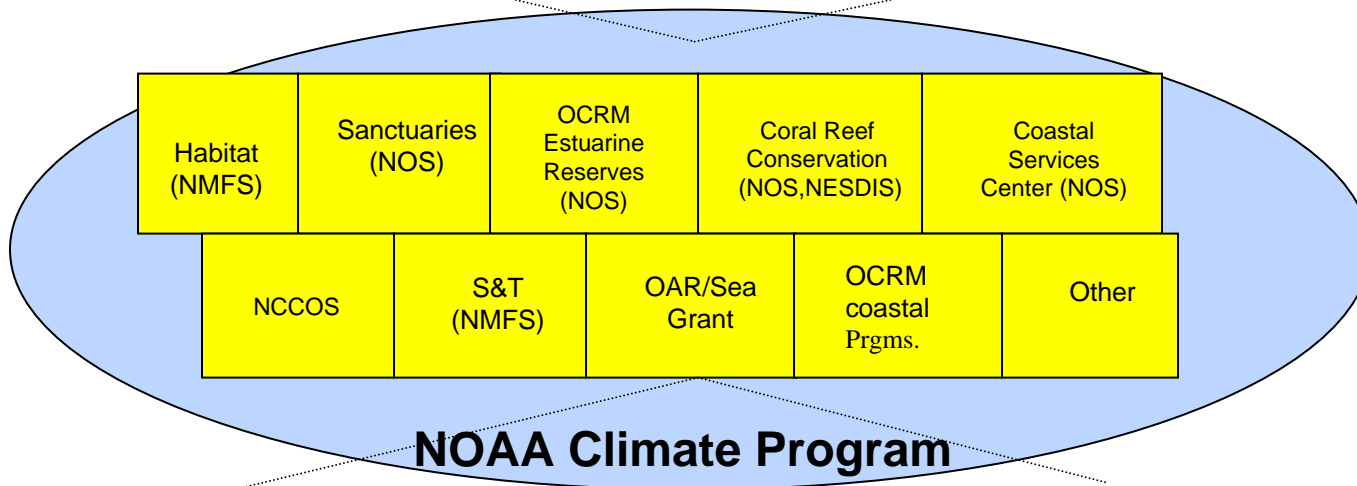
Climate-sensitive management decisions



Stakeholders and partners



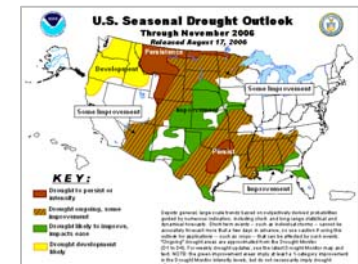
NOAA Technical research, stewardship, and resource management capabilities



Taxonomy of NOAA Climate Products and Services



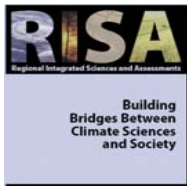
- Observations, Data, and Monitoring
- Analysis and Assessments
- Forecasts and Outlooks
- Tools and Decision Support
- Predictions and Projections
- Stakeholder driven research for decision support
- Education and Outreach
- Management



Climate Services That Help Coastal Communities



- NERRS, CO-OPS, and NGS sea-level rise and wetland/marsh restoration
- OCS and CSC seafloor mapping project for California baseline data
- Digital Coast Partnership Effort
- ICLEI guidebook
- National Integrated Drought Information System (NIDIS)
- Regional Integrated Sciences and Assessments (RISA)
- Sectoral Applications Research Program (SARP)
- Risk-Wise: NOAA and USDA Extension Disaster Education Network
- Pacific Risk Management `Ohana (PRiMO) PRICIP



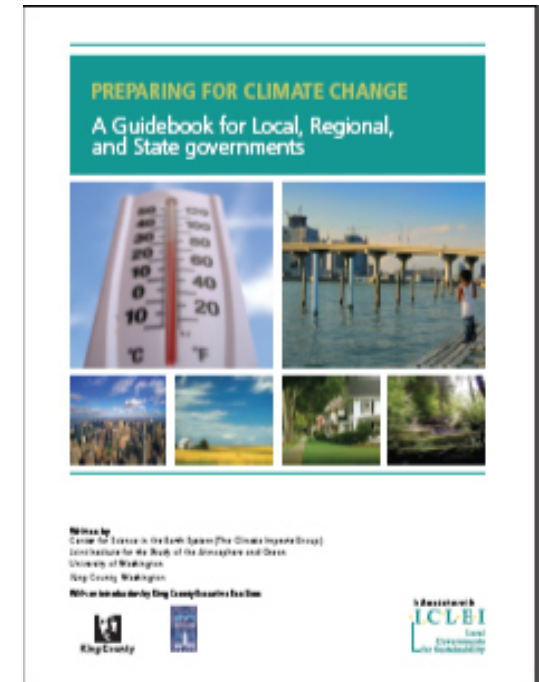
NOAA Incorporating Climate Information into Management Processes

- Restore and protect threatened islands and habitats
- Provide technical and financial assistance to communities
- Integrate climate into management
- Assess threats and extinction risks for corals
- Link oceans and human health
- Prioritize actions to mitigate species impacts
- Support regional governance bodies and state plans



NOAA Addressing Climate Change: Meeting Statutory Missions

- **Assessments and Planning Guidance**
 - Local, regional, and state government guidebooks
- **Resilience Efforts**
 - Risk-Wise partnership
 - Community resilience indicators
 - Community and regional resilience initiative
 - Mobile Bay pilot
- **Protecting and Restoring Green Infrastructure**
 - Coastal and Estuarine Land Conservation Program
 - Community restoration program
- **Protecting NOAA Trust Resources**
 - Northwestern Hawaiian Islands
 - Corals
- **Improved Observations, Forecasts, and Models**
 - Water level and elevation data
 - VDATUM
 - Coastal topo/bathy mapping



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Addressing the Crisis on the Coast: NOAA's Coastal Enterprise

Priorities:

- Reduce vulnerability of coastal communities and ecosystems to hazards and climate change
- Protect and restore coastal ecosystems and their services
- Promote sustainable use of coastal areas to meet societal needs (e.g., energy and marine transportation)

“Because global warming may result in a substantial sea level rise with serious adverse effects in the coastal zone, coastal states must anticipate and plan for such an occurrence.”

**Coastal Zone Management Act,
16 U.S.C. § 1451(I)**



Key Climate Investment Needs

- Expanded observation networks
- Expanded monitoring and forecasting of climate conditions
- Tools to understand increased inundation and accelerated sea-level rise for infrastructure
- Integrated regional approaches
- Partnerships



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