Building the Foundation for Hazard- and Climate-Resilient Coastal Communities

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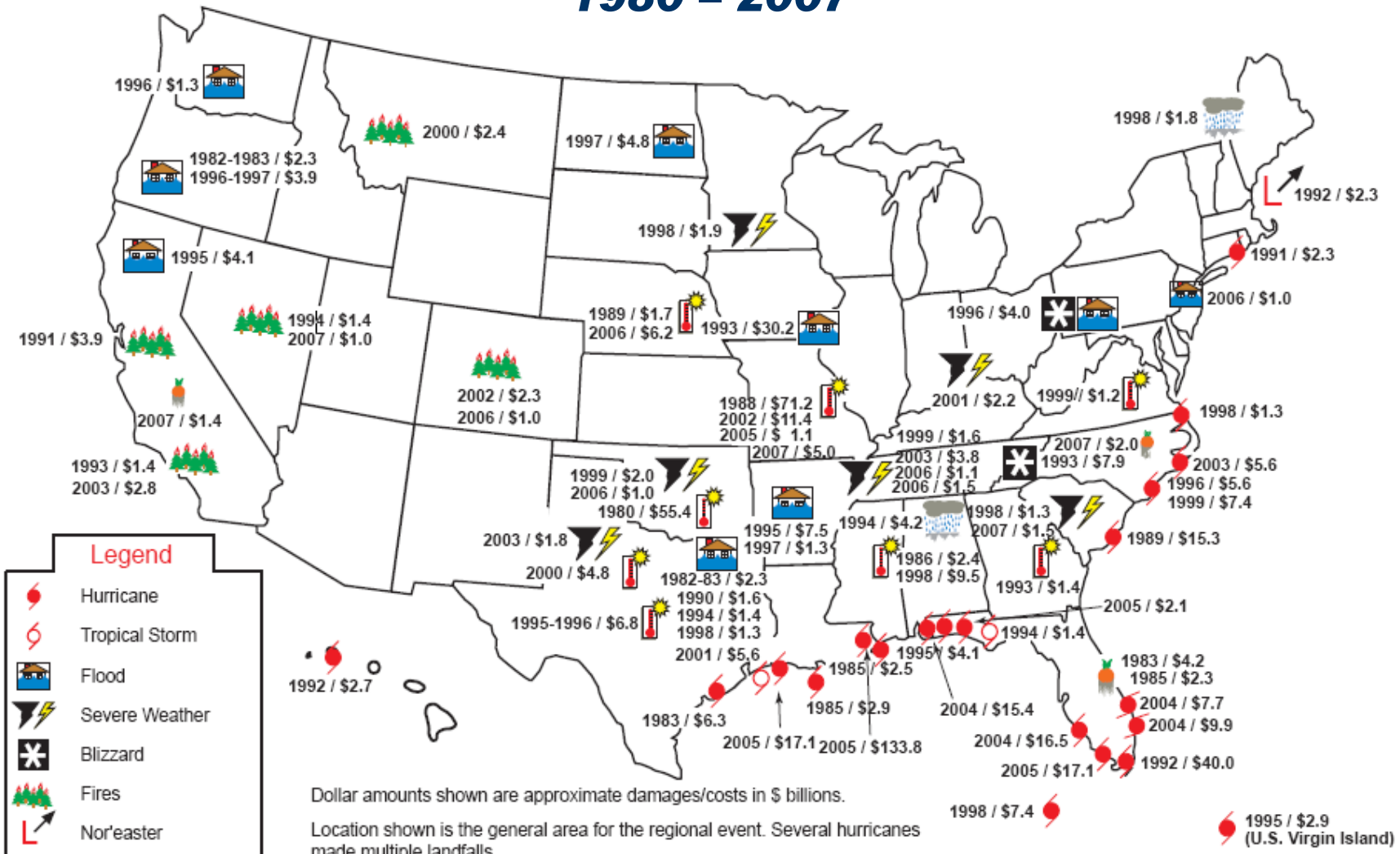
Coastal Communities: Vital to U.S. and International Economies

- 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.

>$1 Billion Weather Disasters

1980 – 2007



Legend

- Hurricane
- Tropical Storm
- Flood
- Severe Weather
- Blizzard
- Fires
- Nor'easter
- Ice Storm
- Heat Wave/drought
- Freeze

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 occured during or after 1990. Total costs for the 78 events were 600 billion using a GNP inflation index.

NOAA's
National Climatic Data Center

Hazard- and climate-resilient communities…

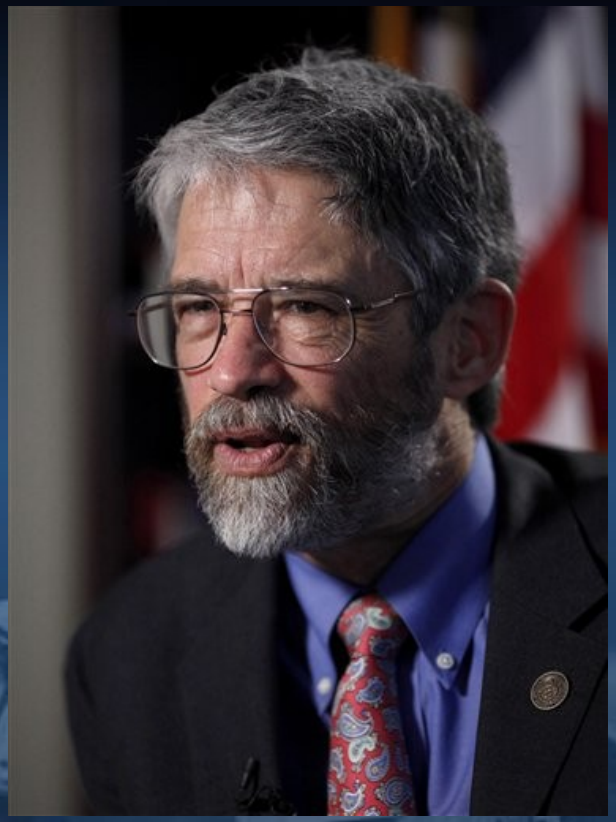
- Recognize and understand the risks posed by both present-day hazards and those associated with a changing climate
- Recognize and understand their vulnerabilities
- Take actions to minimize loss of life, property damage, and adverse environmental impacts resulting from hazard events and climate change
- Experience minimum disruption to life and economy when hazard events and climate changes occur

Barriers to Success

- Risk should be driving decision-making regarding development and redevelopment, but it is not. Why?
  - Development revenues infused to local communities; losses are spread nationally
  - Impediments associated with takings law: *". . . nor shall private property be taken for public use, without just compensation."*
  - Federal policies that subsidize development in risky areas
  - Need for improved risk communication
- Lack of incentives and mechanisms for the array of state/local managers (i.e., emergency, floodplain, resource managers, land use, transportation planners) to work together on effective solutions

Disaster risk reduction efforts need to inform climate adaptation strategies

Given the relationships between climate change and extreme events, the community of researchers, engineers and other experts who work on reducing risks from natural and human-caused disasters will have an important role to play in framing climate change adaptation strategies and in providing information to support decision-making during implementation.



-- Presidential science advisor
John Holdren

U.S. National Science & Technology Council Subcommittee on Disaster Reduction

- SDR is an element of the President's National Science & Technology Council charged with establishing clear national goals for Federal science and technology investments in disaster reduction.
- Promotes interagency cooperation for natural and technological hazards and disaster planning.
- Facilitates interagency approaches to identification and assessment of risk, and to disaster reduction.
- Advises the Administration about relevant resources and the work of SDR member agencies.
- Serves as the US national platform for UN International Strategy for Disaster Reduction

sdr
subcommittee on disaster reduction

U.S. National Science & Technology Council Subcommittee on Disaster Reduction

- Centers for Disease Control and Prevention
- Department of Defense
- Department of Energy
- Department of Homeland Security
- Department of Housing & Urban Development
- Department of the Interior
- Department of State
- Department of Transportation
- Environmental Protection Agency
- FEMA
- NASA
- National Geospatial-Information Agency
- National Guard Bureau
- National Institute of Standards and Technology
- National Oceanic & Atmospheric Administration
- National Science Foundation
- U.S. Agency for International Development
- U.S. Army Corps of Engineers
- U.S. Coast Guard
- U.S. Department of Agriculture
- U.S. Forest Service
- U.S. Geological Survey
- U.S. Public Health Commissioned Corps

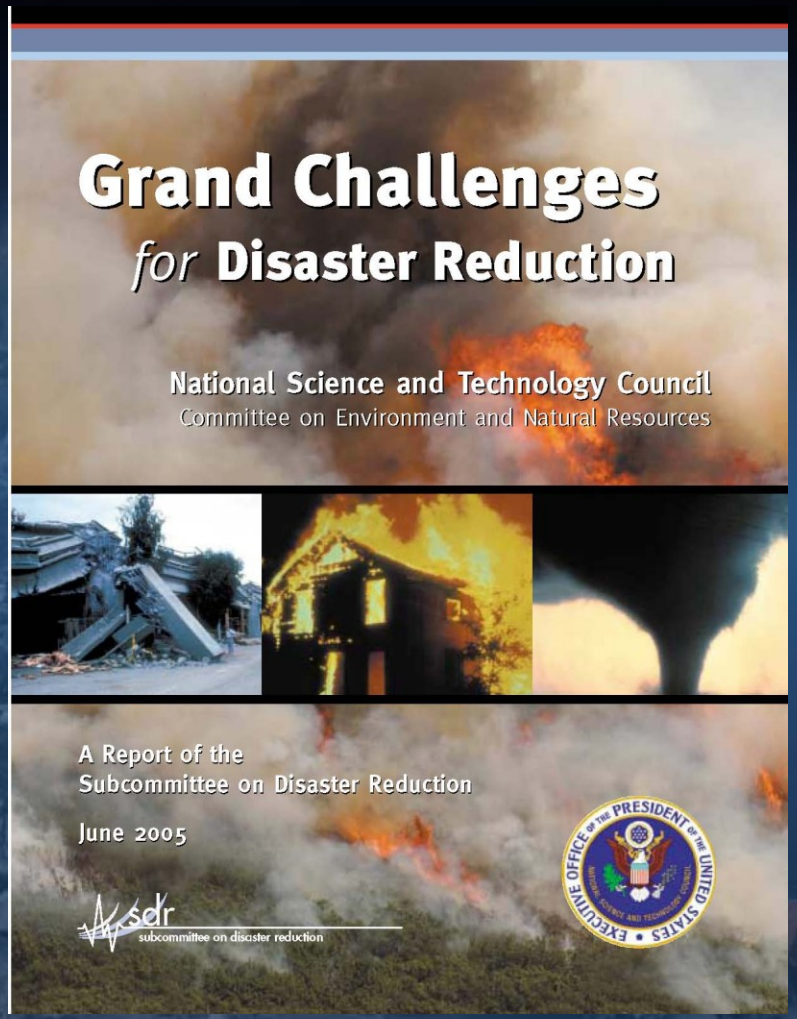
Framing the Grand Challenges for Disaster Reduction

- Objective: To enhance disaster resilience by composing a 10-year agenda for science and technology activities that will produce a dramatic reduction in the loss of life and property from natural and technological disasters.






Grand Challenges for Disaster Reduction



1. Provide hazard and disaster information where and when it is needed.
2. Understand the natural processes that produce hazards.
3. Develop hazard mitigation strategies and technologies.
4. Recognize and reduce vulnerability of interdependent critical infrastructure.
5. Assess disaster resilience using standard methods.
6. Promote risk-wise behavior.

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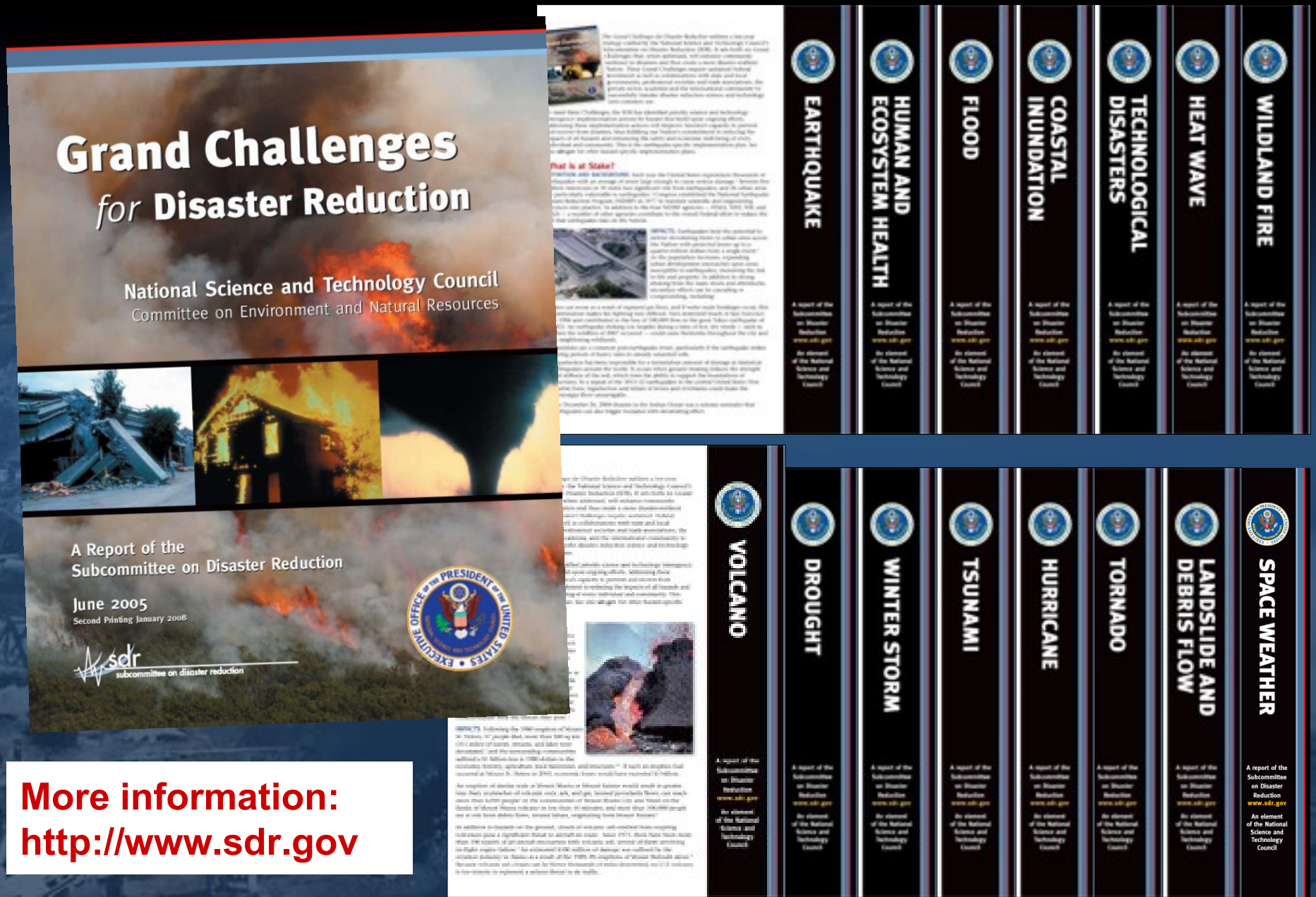
Hazard-Specific Implementation Plans



More information:
http://www.sdr.gov

Coastal Inundation Working Group

An ad hoc interagency body of the SDR – includes NOAA, USACE, USGS, FEMA, DOT/FHWA, U.S. Navy

Policy Focus

- Prioritized and coordinated federal science and technology investment will improve the Nation's capacity to make coastal communities more resilient and thereby reduce disaster losses.
- Citizens and decision makers want clear, unambiguous answers and guidance from the federal sector about the frequency, timing, geospatial extent, and impacts of inundation.
- These simple questions require multidisciplinary, interagency science and policy to develop clear answers.

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Modeling Focus

- Develop and share improved inundation models, decision-support tools and training to better inform citizens and decision makers and enable actions to:
  - Protect vulnerable coastal regions
  - Reduce the number of vulnerable structures being rebuilt in flood-susceptible areas
  - Increase infrastructure resilience to the effects of coastal inundation damage
- Group compiled an inventory of agency models currently in use to forecast inundation hazards and determine related risks

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Interagency Climate Change Adaptation Task Force

- *Executive Order on Federal Leadership in Environmental, Energy, and Economic Performance* (October 2009):

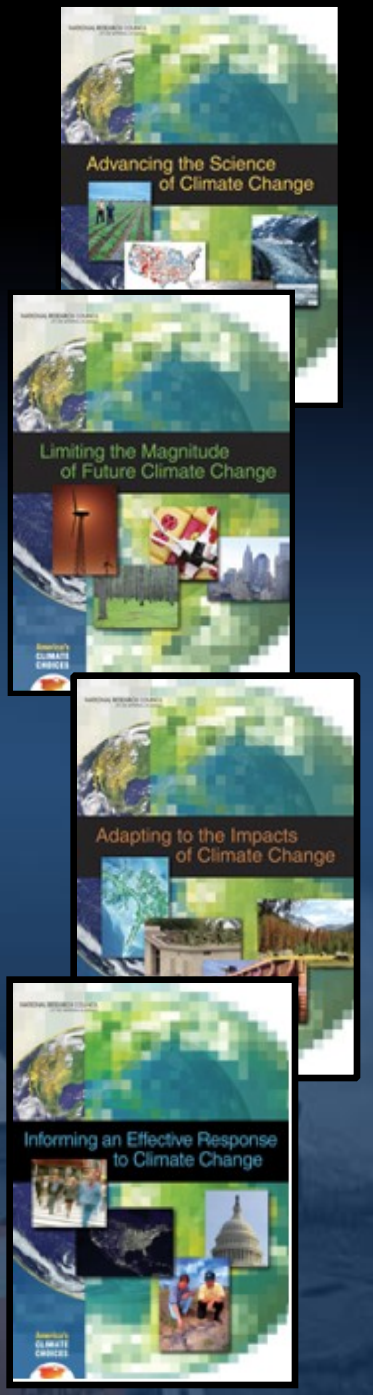
Within 1 year, Task Force to develop Federal recommendations for adapting to climate change impacts

- Co-chairs:
  - White House Council on Environmental Quality
  - White House Office of Science and Technology Policy
  - NOAA
- Interim Progress Report (March 2010): Recommends key components for a national adaptation strategy, including:
  - Integration of Science into Adaptation Decisions and Policy
  - Communications and Capacity-building
  - Coordination and Collaboration
  - Prioritization
  - A Flexible Framework for Agencies
  - Evaluation

NATIONAL RESEARCH COUNCIL
OF THE NATIONAL ACADEMIES

America's CLIMATE CHOICES

- Main Committee and Four Panels:
  - Advancing the Science of Climate Change
  - Limiting the Magnitude of Future Climate Change
  - Adapting to the Impacts of Climate Change
  - Informing an Effective Response to Climate Change



Among the Recommendations:

- Decision makers at all levels should identify their vulnerabilities and the short- and long-term options that could increase their resilience to impacts.
- The private sector, NGOs, and society should assess their own vulnerabilities and risks and actively engage with government to build the nation's adaptation capacity
- Adopt an iterative risk management approach

http://americasclimatechoices.org

NOAA's Climate Service

NCS Vision*

An informed society anticipating and responding to climate and its impacts

NCS Mission

To improve understanding and anticipation of changes in climate in service of a resilient society and environment

NCS Objectives*

- *Improved scientific understanding of the changing climate system and its impacts*
- *Integrated assessments of current and future states of the climate system that identify potential impacts and inform science, services, and decisions*
- *Mitigation and adaptation efforts supported by sustained, reliable, and timely climate services*
- *A climate-literate public that understands its vulnerabilities to a changing climate and makes informed decisions*

** Note: These are subject to input from NOAA's Science Advisory Board and public comment*

Enhancing Hazard- and Climate-Resilience in Coastal Communities

With its partners, NOAA develops and delivers products and services that help users to:

- Understand and identify climate and weather hazards
- Assess risks and vulnerabilities, and develop strategies/action plans
- Communicate risk
- Understand and overcome barriers to action
- Foster partnerships and support the community of practice

DIGITAL COAST
NOAA Coastal Services Center

Home | Data | Tools | Training | Approaches | In Action

http://csc.noaa.gov/digitalcoast

More than just data...

The Digital Coast also provides the tools, training, and information needed to turn these data into the information most needed by coastal resource management professionals. Read more...

Welcome to the new Digital Coast. If you have questions or comments, please contact us.

Data
Learn more about the kinds of data available and download data.

Tools
Use these tools to turn data into the useful information your organization needs.

Training
Update your skills by participating in one of these training programs.

In Action
See how data and tools are used to address coastal management issues.

Approaches
In this section, Digital Coast resources are packaged in a way that best assists coastal communities working to address a specific issue.

Coastal Inundation Toolkit
Understand the basics and get the tools that will help make your community more resilient.

Offshore Renewable Energy Planning
Get the data and tools needed to make siting decisions.

Featured Resources
Building Resilient Coastal Communities
See how coastal counties can use Digital Coast to build resilient communities.

Mississippi Geospatial Clearinghouse
A comprehensive spatial information warehouse of geographic information system (GIS) resources for Mississippi for use by government, academia, and the private sector.

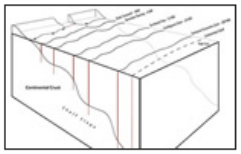
Recent Updates
Sign up for updates

Tools

Topographic and Bathymetric Data Inventory

Enables users to locate

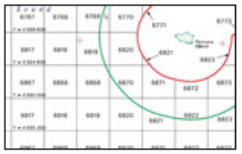
Data



Marine Jurisdictions

Authoritative U.S. marine boundaries depicting the extent of

Data



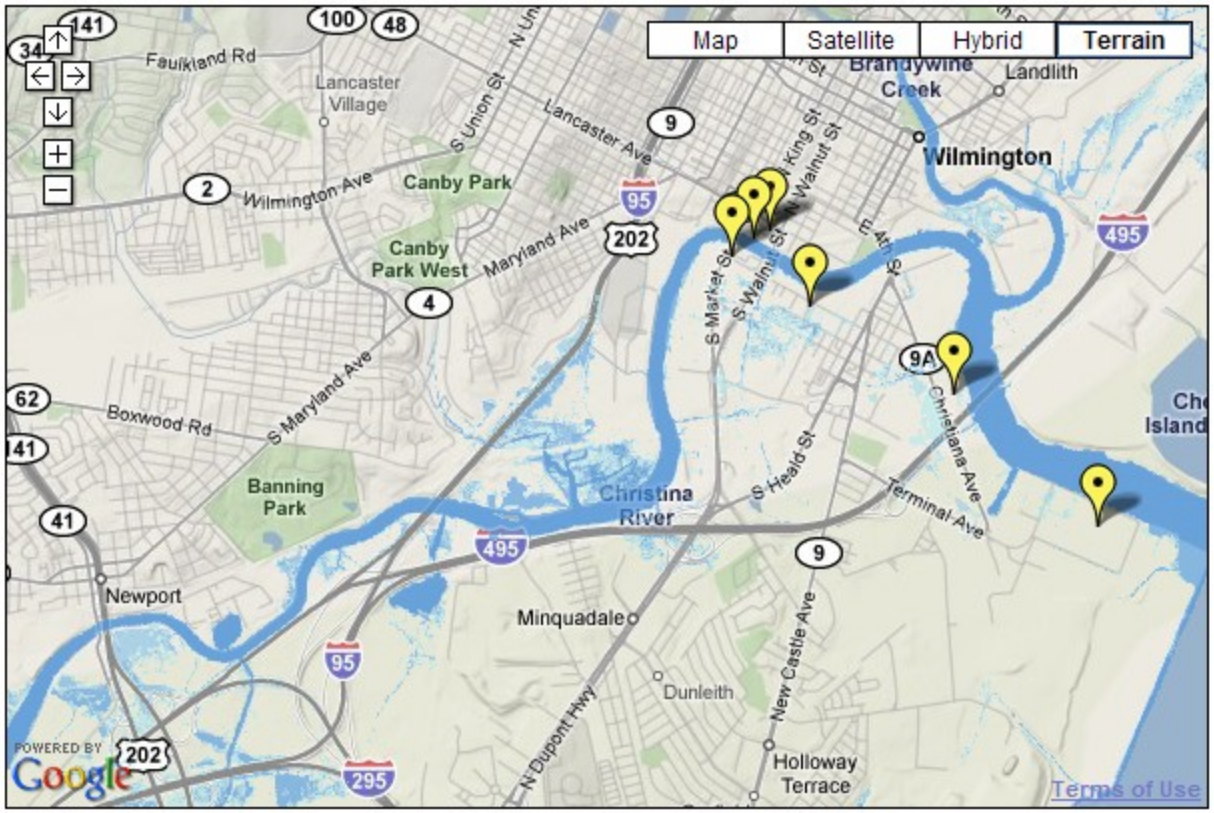
Outer Continental Shelf Lease Blocks

Authoritative U.S. marine boundaries

Testimonials
> **Digital Coast has a real role in standards, guidelines, specifications for elevation data, datums, and inundation mapping.**

Staff member, NOAA National Marine Sanctuaries

Sea Level Rise Impacts for Wilmington, Delaware



Sea Level Rise: 0 ft

This map shows potential flooding, or inundation, caused by sea level rise. Use the slider bar to view the extent.

The map illustrates the scale of potential flooding, not the exact location, and does not account for erosion, subsidence, or future construction. Water levels are shown as they would appear during an average high tide (mean high water). Rising sea levels will cause daily high tides to reach farther inland.

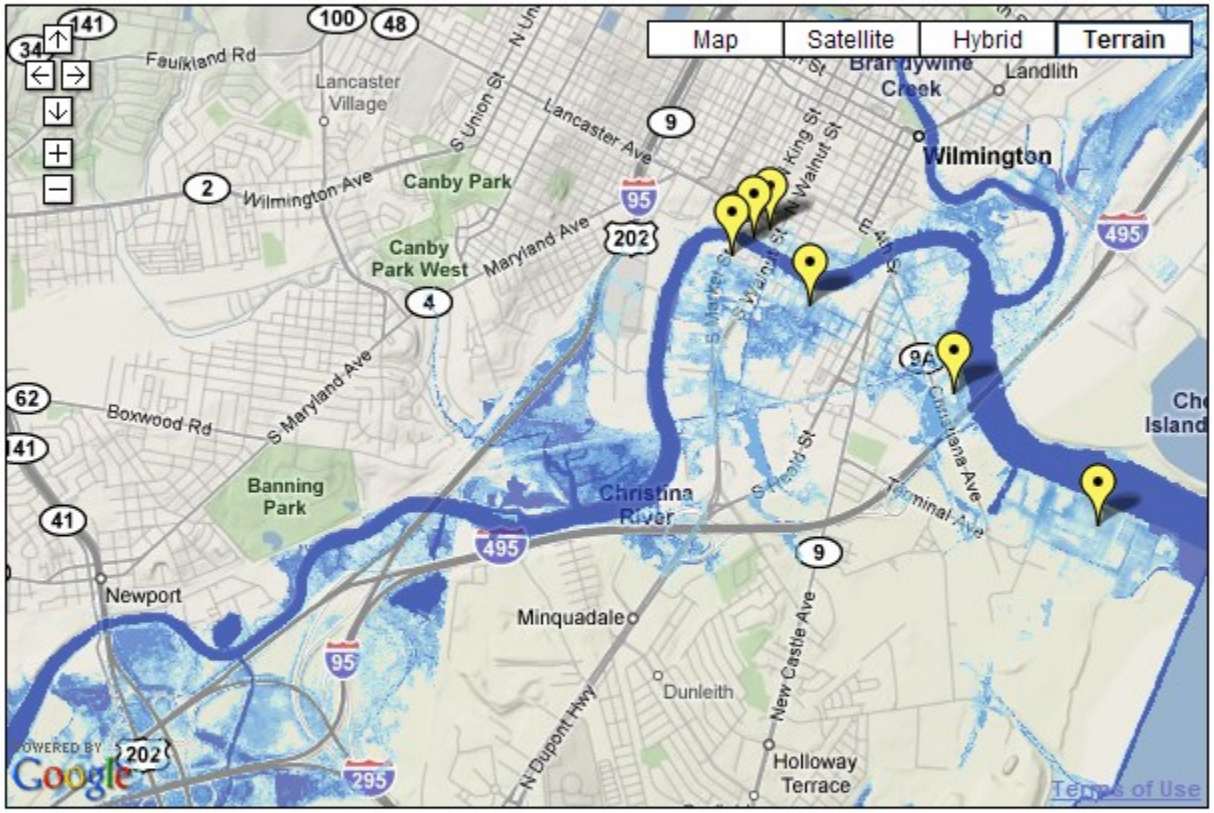
Places of interest vulnerable to sea level rise.

Note: Flood layers may take a moment to load.

View the **Flood Frequency Predictions**

This pilot project is a collaborative effort of NOAA, the U.S. Geological Survey, and the Delaware Department of Natural Resources.

Sea Level Rise Impacts for Wilmington, Delaware



Sea Level Rise: 3 ft

This map shows potential flooding, or inundation, caused by sea level rise. Use the slider bar to view the extent.

The map illustrates the scale of potential flooding, not the exact location, and does not account for erosion, subsidence, or future construction. Water levels are shown as they would appear during an average high tide (mean high water). Rising sea levels will cause daily high tides to reach farther inland.

Places of interest vulnerable to sea level rise.

Note: Flood layers may take a moment to load.

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Roadmap for Adapting to Coastal Risk Training

- Aimed at state and local officials, training introduces a process for incorporating hazard and climate change issues into community planning efforts

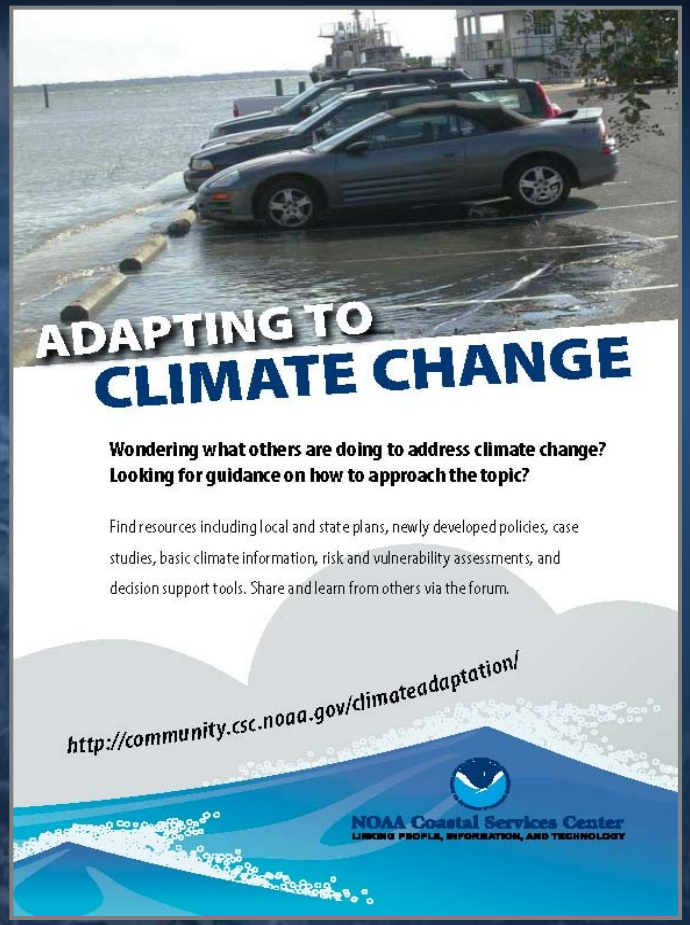
Core elements:

- Identify data and information to characterize risks and vulnerabilities
- Use hands-on exercises to assess local issues, hazard and climate concerns, and vulnerabilities
- Identify decision-processes that can incorporate risk and vulnerability issues.
- Learn multi-objective techniques and collaborative opportunities to address vulnerabilities

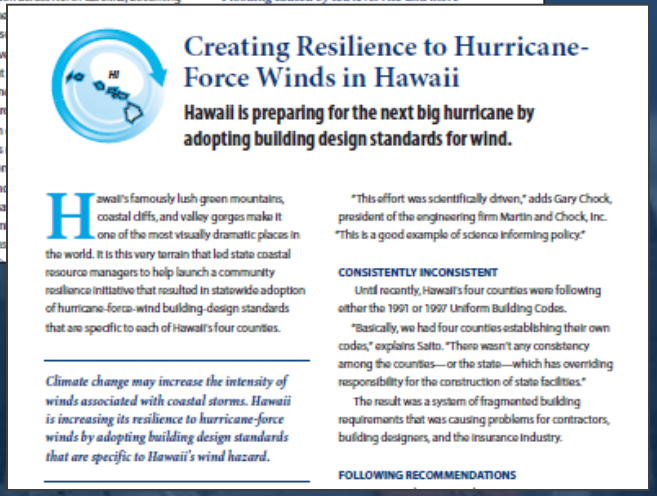
For more information:
http://www.csc.noaa.gov/digitalcoast/training/coastalrisk.html

Supporting the Coastal Resilience Community

Coastal Climate Adaptation Collaboration Website



State/Local Climate Adaptation Case Studies



More Information

NOAA Climate Portal:
climate.gov

Subcommittee on Disaster Reduction:
www.sdr.gov

NOAA Coastal Services Center
National Oceanic and Atmospheric Administration

www.csc.noaa.gov

Digital Coast:
csc.noaa.gov/digitalcoast

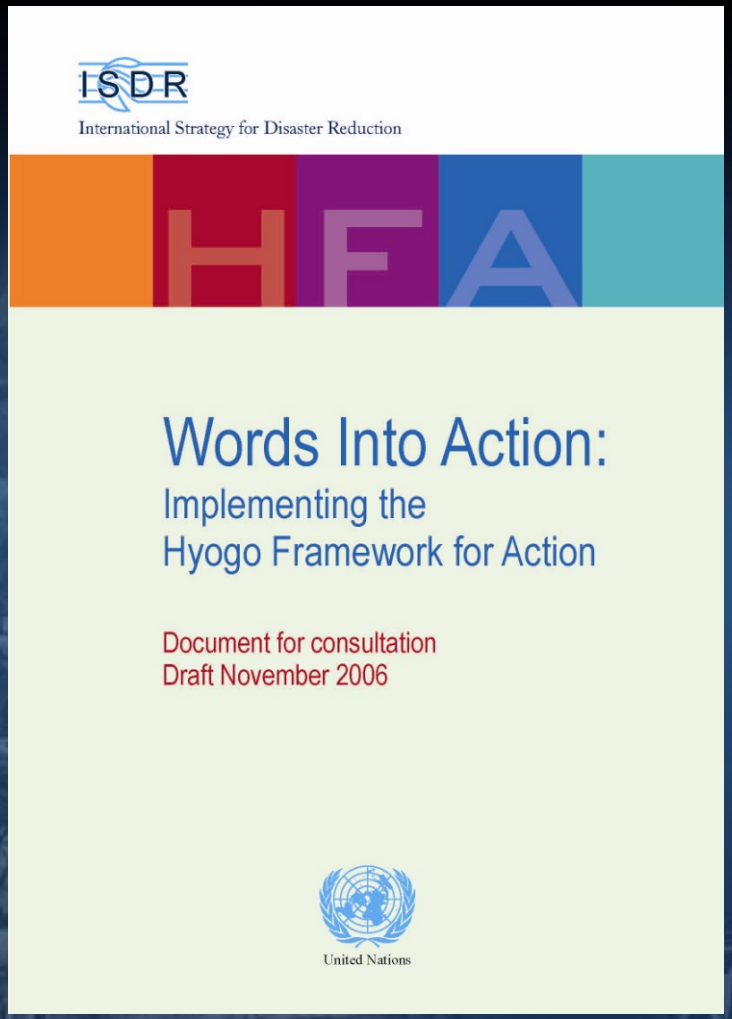
Coastal Climate Adaptation
Resources for Coastal Communities

http://collaborate.csc.noaa.gov/climateadaptation

LOCAL STRATEGIES
FOR ADDRESSING CLIMATE CHANGE

www.csc.noaa.gov/magazine/climatechangestrategies.pdf
www.csc.noaa.gov/magazine/climatechangestrategiesVol2.pdf

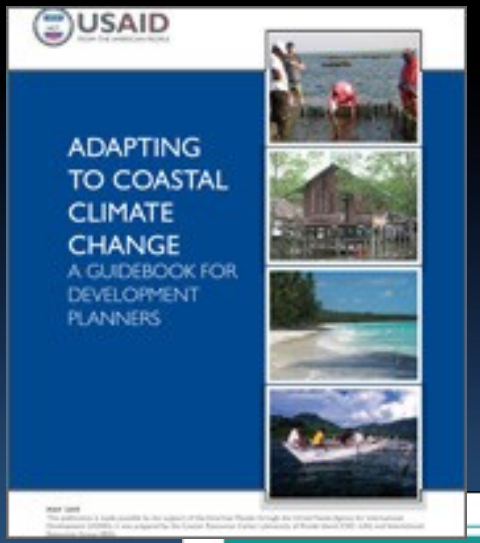
The Hyogo Framework for Action

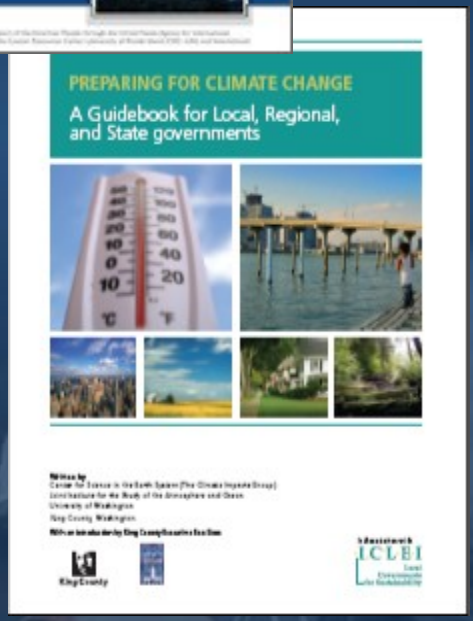


1. Ensure that disaster risk reduction is a national and local priority;
2. Identify, assess and monitor disaster risks and enhance early warning;
3. Use knowledge, innovation and education to build a culture of safety and resilience at all levels;
4. Reduce the underlying risk factors; and
5. Strengthen disaster preparedness for effective response at all levels.

NOAA Decision Support for Resilience

- Partnerships
  - Chambers of Commerce (Mobile Bay)
  - The Nature Conservancy, Trust for Public Land, Land Trust Alliance
  - Federal agencies
  - Academia
- Assessments and Planning Guidance
  - *Adapting to Coastal Climate Change: A Guidebook for Development Planners* (international)
  - Local, regional, and state government guidebooks (domestic)
- Social Science to Improve Products and Services
  - Understanding and improving how science is used in decision-making





NOAA Coastal Services Center
National Oceanic and Atmospheric Administration