Climate Adaptation:
Making Decisions for the Future

AAPA Harbors, Navigation and Environment Seminar
and GreenPort Americas 2010

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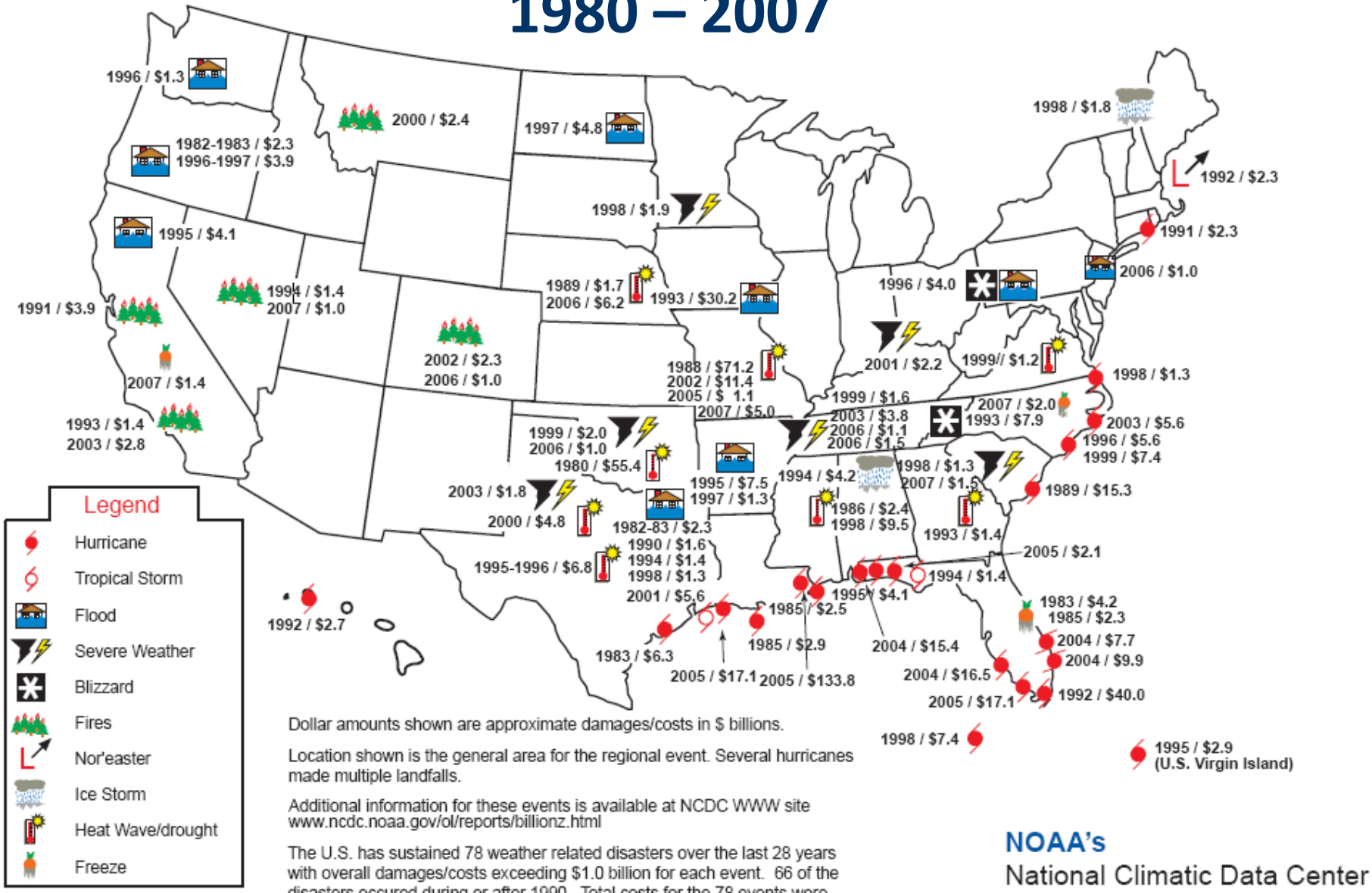
>$1 Billion Weather Disasters
1980 – 2007



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

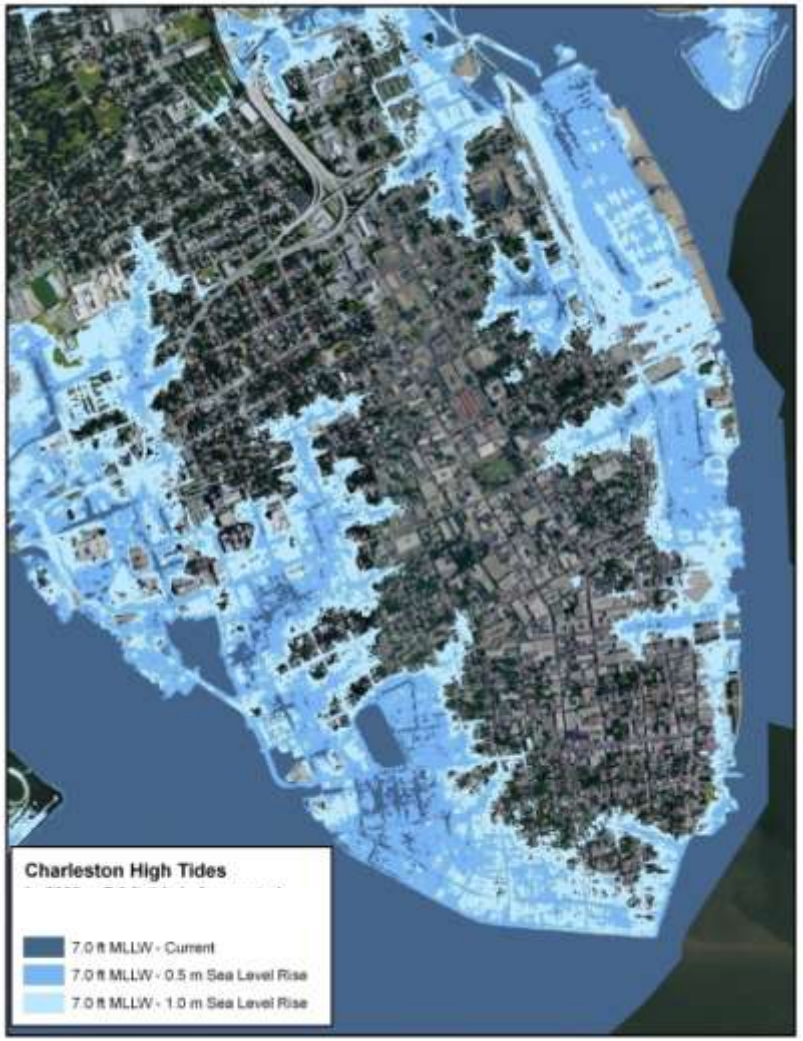
Location shown is the general area for the regional event. Several hurricanes made multiple landfalls.

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 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

Inundation and Accelerated Sea Level Rise



"Models used to date do not… include the full effects of changes in ice sheet flow, because a basis in published literature is lacking."

Intergovernmental Panel on Climate Change (IPCC), Fourth Assessment Report

- More frequent and severe flooding from accelerated sea level rise (SLR)
- Increasing population and development at risk
- Information and tools needed now to aid decision making, even with the uncertainty in SLR projections

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Impacts of Climate Change: More intense storms

Key impacts:

- Ship and ground traffic delays
- Economic cost of shipping service disruptions
- Evacuations, debris, and infrastructure damage
- Port closure

Hurricane Katrina

Hurricane Ike damage to an Coastal Area
(Source: NOAA)

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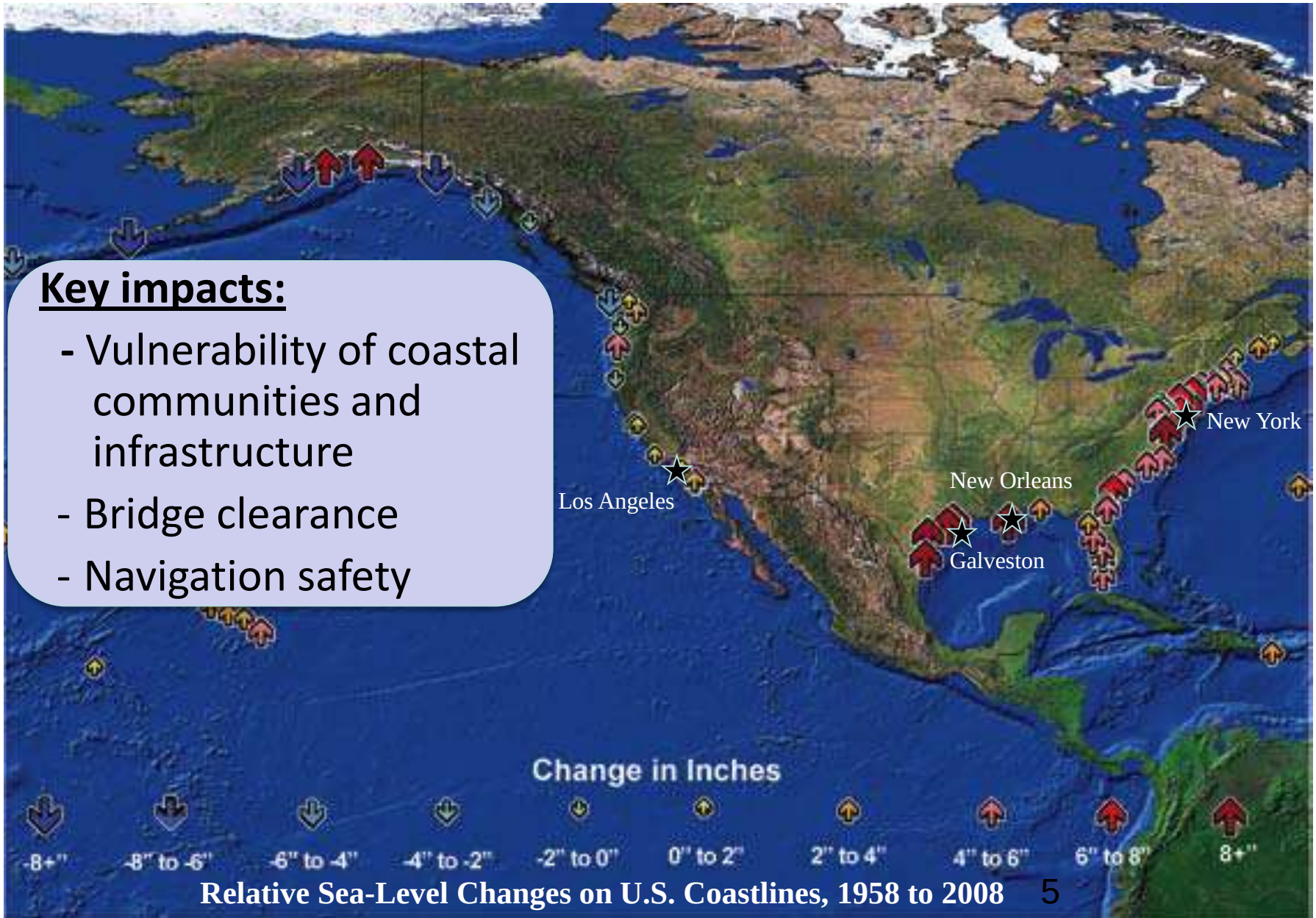
Impacts of Climate Change: Observed Sea Level Rise



Relative Sea-Level Changes on U.S. Coastlines, 1958 to 2008

SEA LEVEL RISE IMPACTS FOR WILMINGTON, DELAWARE

Sea Level Rise: 4 ft

This map shows potential flooding due to sea level rise. Use the slider bar to view the extent of inundation.

Water levels shown are relative to mean high water. Rising sea levels will increase the frequency of daily tidal floods.

The map illustrates the scale of potential flooding, not the exact location, and does not account for erosion, subsidence, or future construction.

Places of interest vulnerable to sea level rise.

Note: Flood layers may take a moment to load.

Flood Frequency Predictions

Coastal Infrastructure

Getting the Goods Out

Aerial view of the Missouri River flooding on July 30, 1993, at U.S. Highway 54 just north of Jefferson City, Missouri, looking south (photography from the Missouri Highway and Transportation Department).

Thinking Ahead

- Designing now to mitigate future problems
- Must plan now for events in the distant future
- What does the port look like in 2050?

The Partnership Dimension

- Creating partnerships to integrate climate information and planning tools
- Understanding perceptions and the socio-economic costs to promote risk-wise behavior and development
- Raising the level of community understanding and interaction

NOAA Decision Support for Resilience

Partnerships

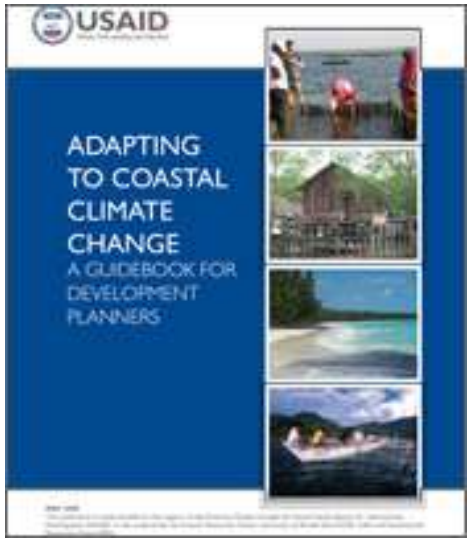
- Chambers of Commerce (Mobile Bay)
- The Nature Conservancy, Trust for Public Land, Land Trust Alliance
- Federal agencies
- Academia

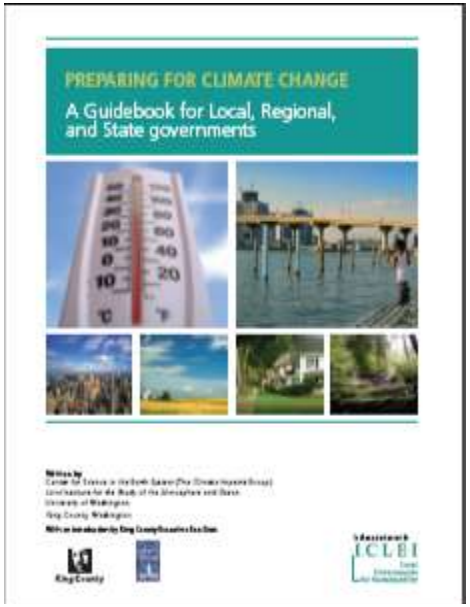
Assessments and Planning Guidance

- *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





Preparing Your Port

Multihazard Mitigation Council: a public/private partnership designed to reduce the societal and economic costs of natural hazards

Study Goal:
"to fund an independent study to assess the future savings resulting from the various types of mitigation activities."

Study Finding:

Grants are cost effective:

$1 spent on mitigation saves society an average of $4

If this is 2010, what is 2039?

- Coastal infrastructure programs generally have 30 year lead times
- How many times should you pay to upgrade the port infrastructure?
- What are the solutions?
- Who are you talking to?

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