

# Climate Change

## Preparedness in New Jersey:

### Leading Practices and Policy Priorities



*Doug Mills, New York Times/AP*

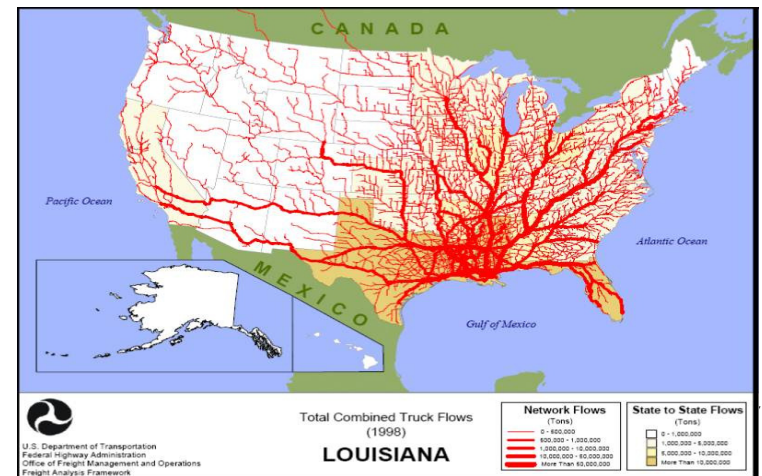
**Margaret A. Davidson**

National Oceanic and Atmospheric Administration

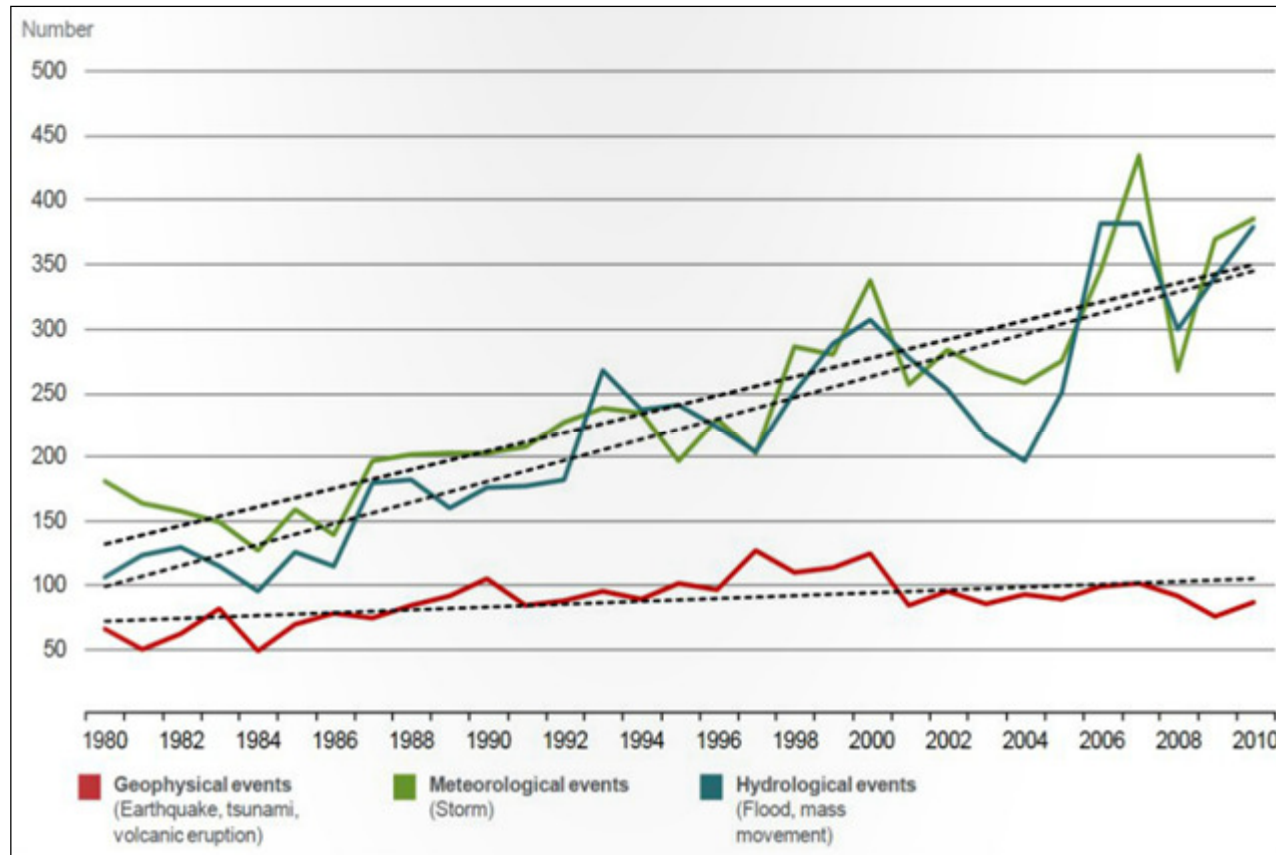


# Coastal Communities: Vital to U.S. and International Economies

- 45 percent of the U.S. national gross domestic product is contributed by coastal communities  
51 million jobs
- Coastal habitats help reduce impacts of floods, storms, and climate change on coastal communities by absorbing water, wave energy, and other stressors.



# Weather-Related Versus Geophysical Events

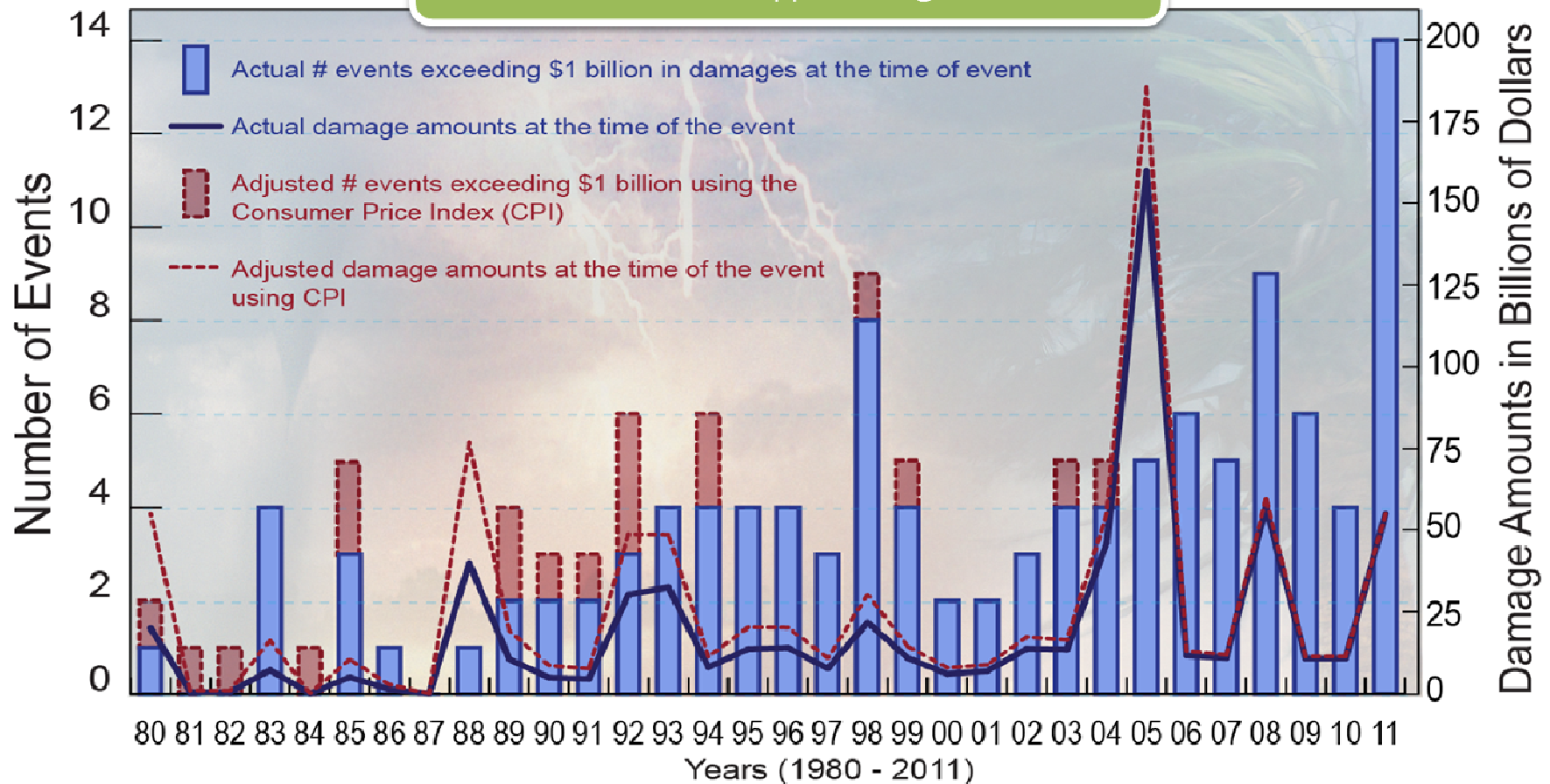


Source: Munich Reinsurance (Re) Company



# Billion Dollar Disasters: Fact of Life

A Record 14 Disasters in the U.S. in 2011  
Three more approaching \$1B

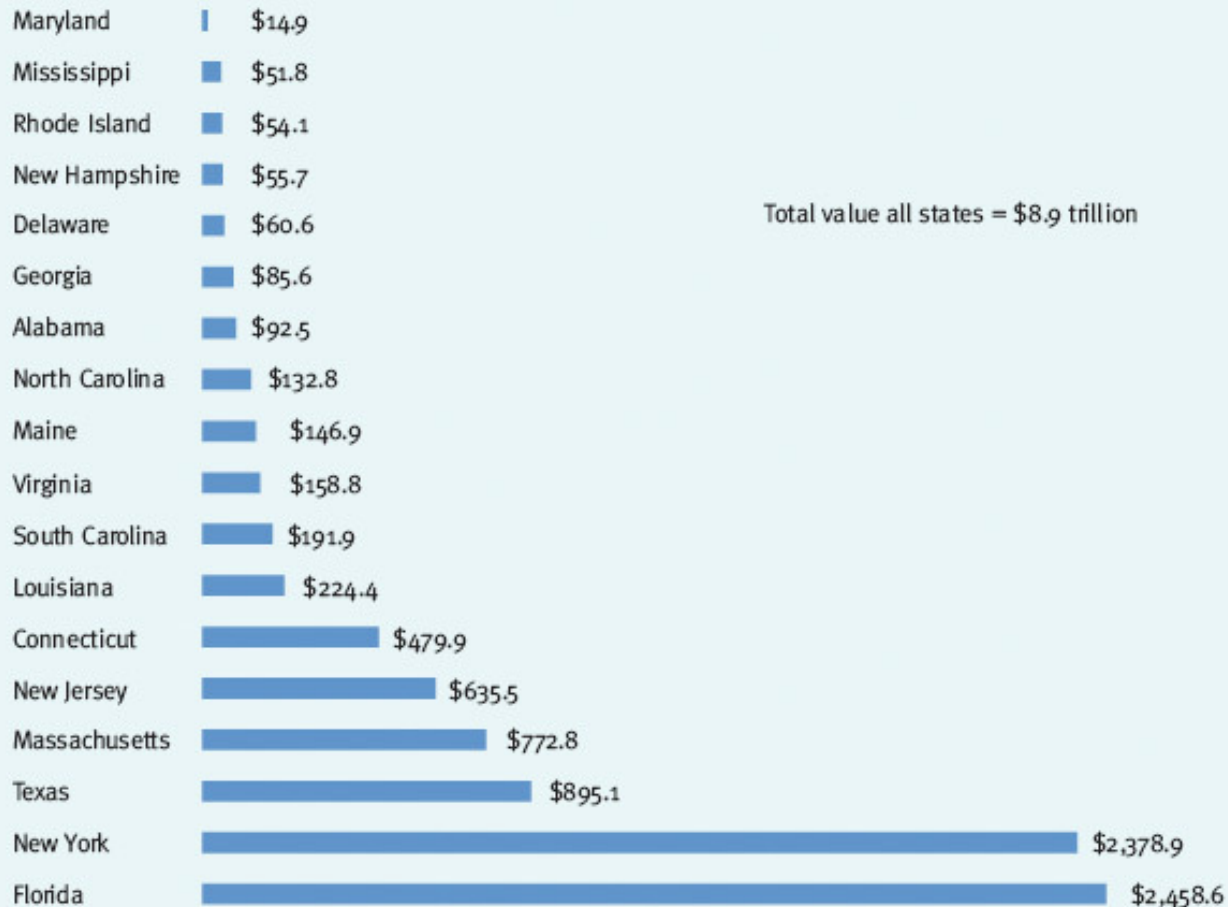




# Adaptation Costs of Climate Change Risks

## INSURED VALUE OF COASTAL PROPERTIES BY STATE, 2007

(Billions of Dollars)



Source: AIR Worldwide.

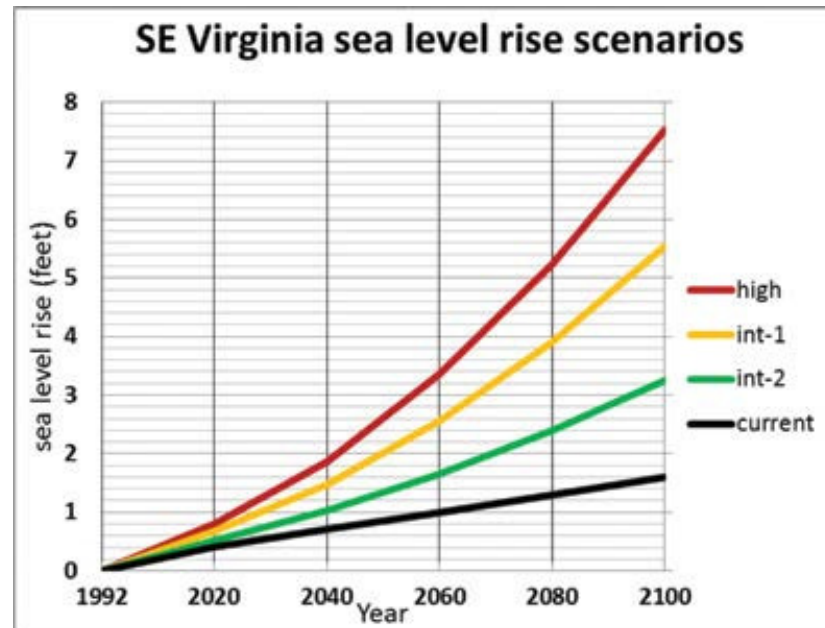
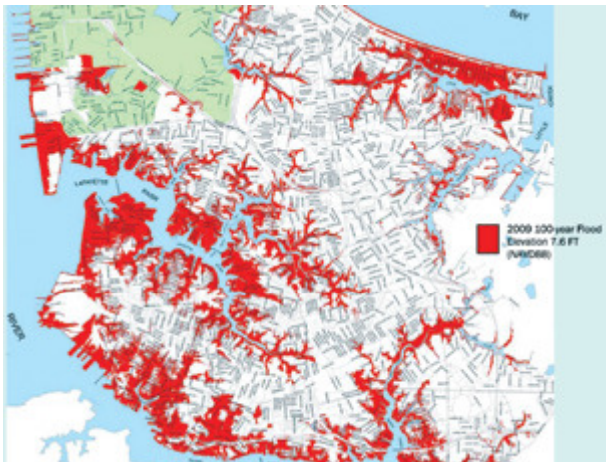
Note: Figures are the estimated cost to replace insured and insurable residential and commercial structures, including their contents and business interruption coverage, in coastal counties along the U.S. East and Gulf coasts.

# Case Study

## Virginia: Tidewater Area



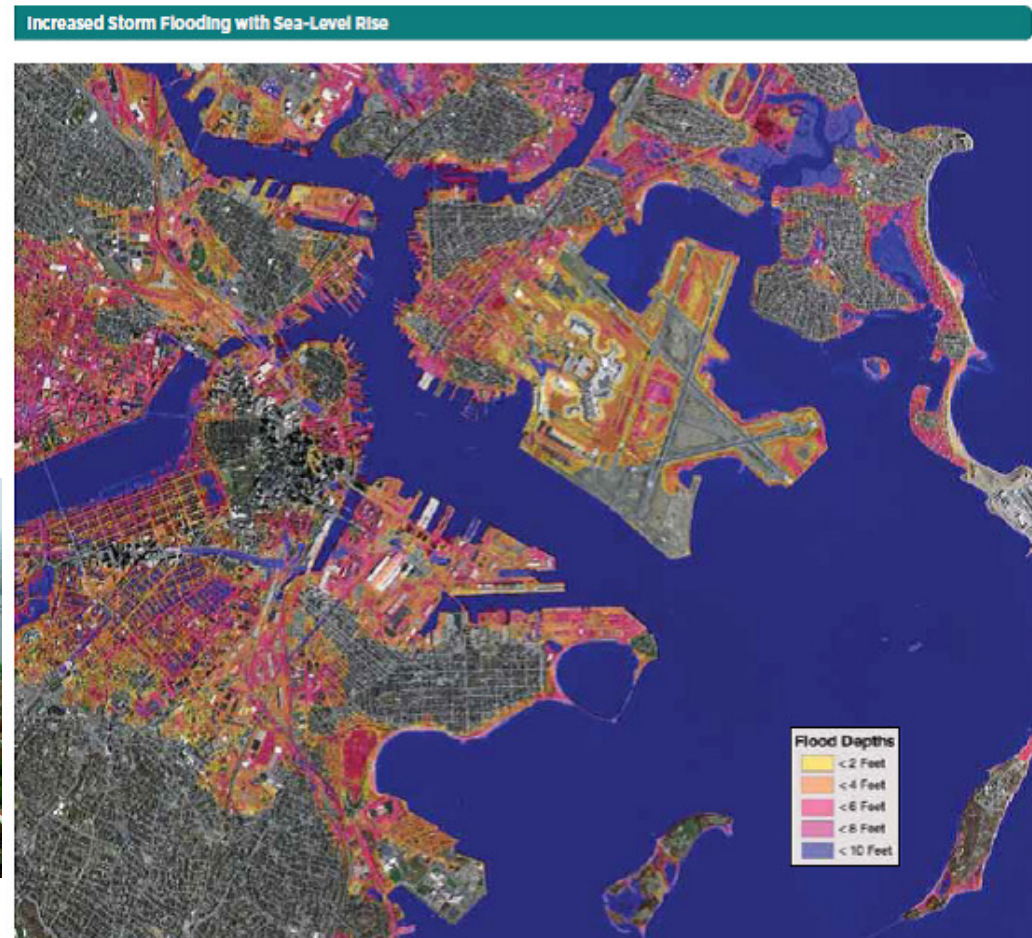
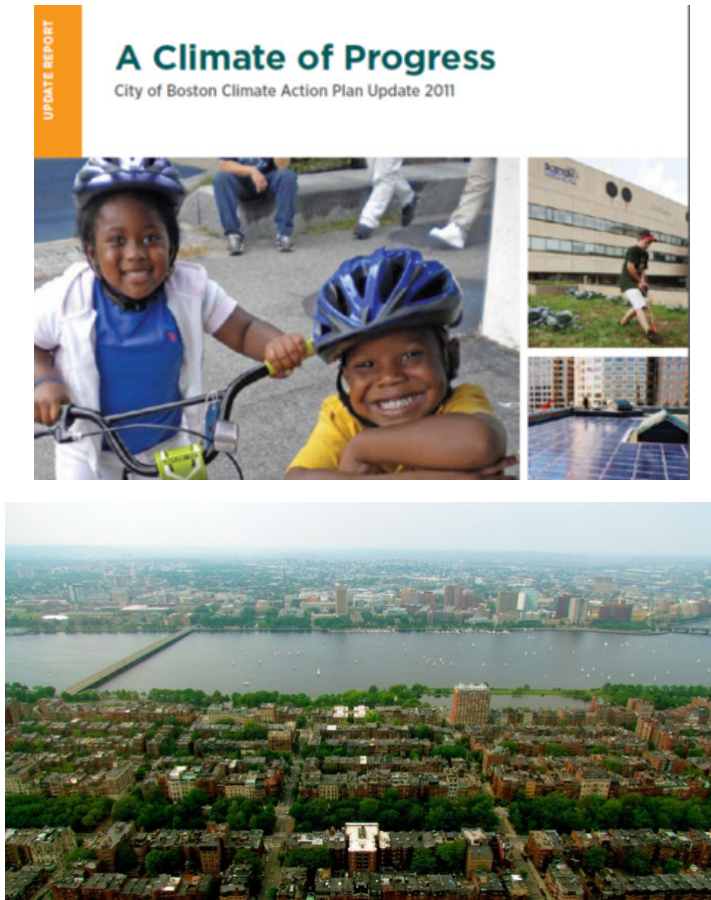
Water Resource Strategies and Information Needs in Response to Extreme Weather/Climate Events



Source: NOAA Climate Program Office



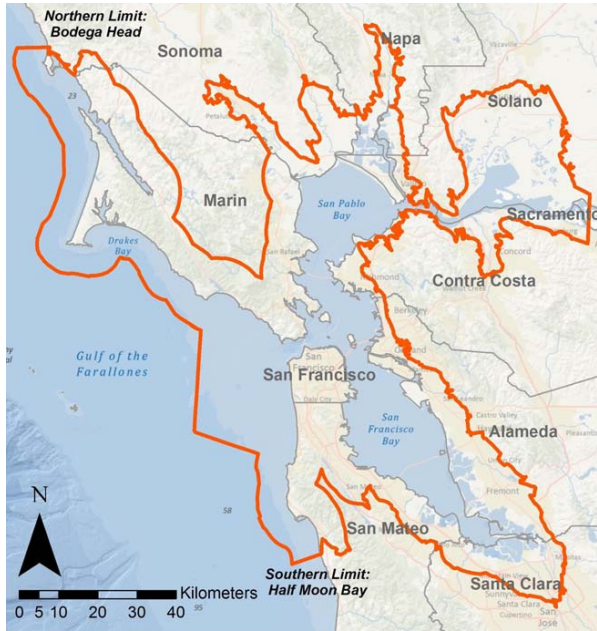
# City of Boston



Source: City of Boston Climate Action Plan Update, 2011



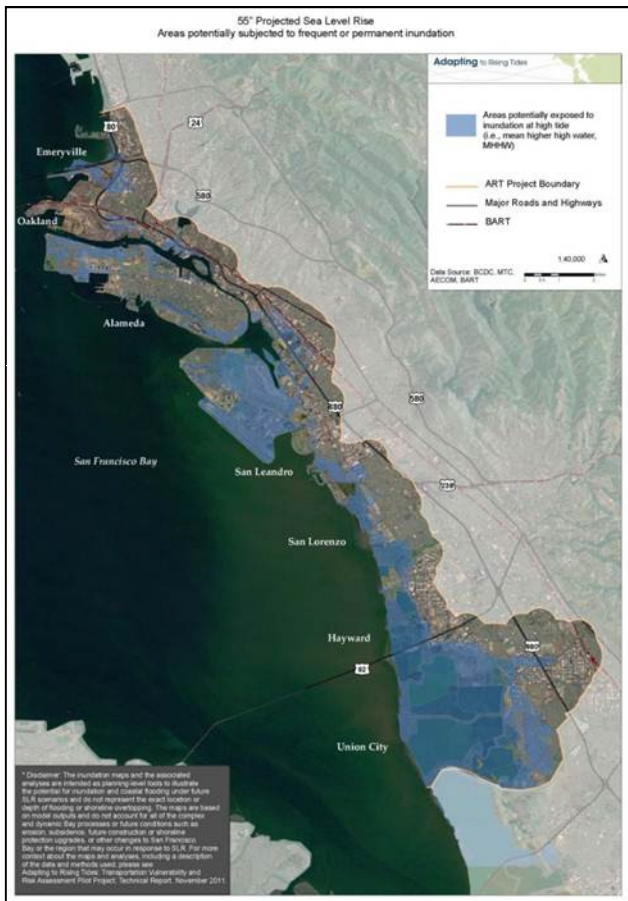




Source: <http://data.prbo.org/apps/ocof/>



# Adapting to Rising Tides



Source: <http://www.adaptingtorisingtides.org/>

## Addresses two main questions:

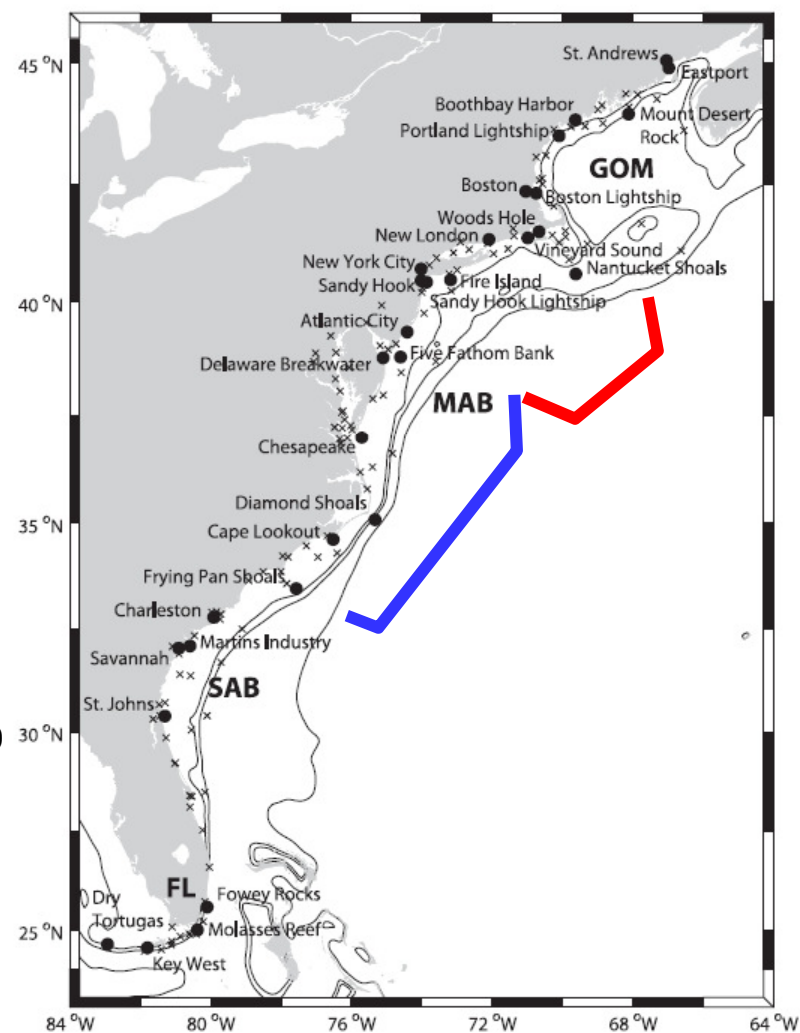
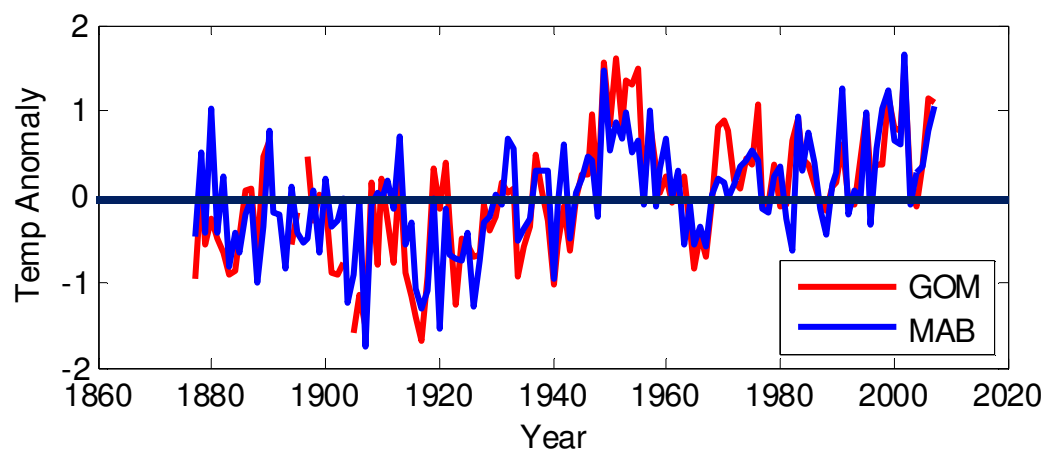
- How will climate change impacts of sea level rise and storm events affect the future of Bay Area communities, infrastructure, ecosystems and economy?
- What strategies can we pursue, both locally and regionally, to reduce and manage these risks?



# Changing Climate, Changing Oceans

## Implications for New Jersey Coastal Communities

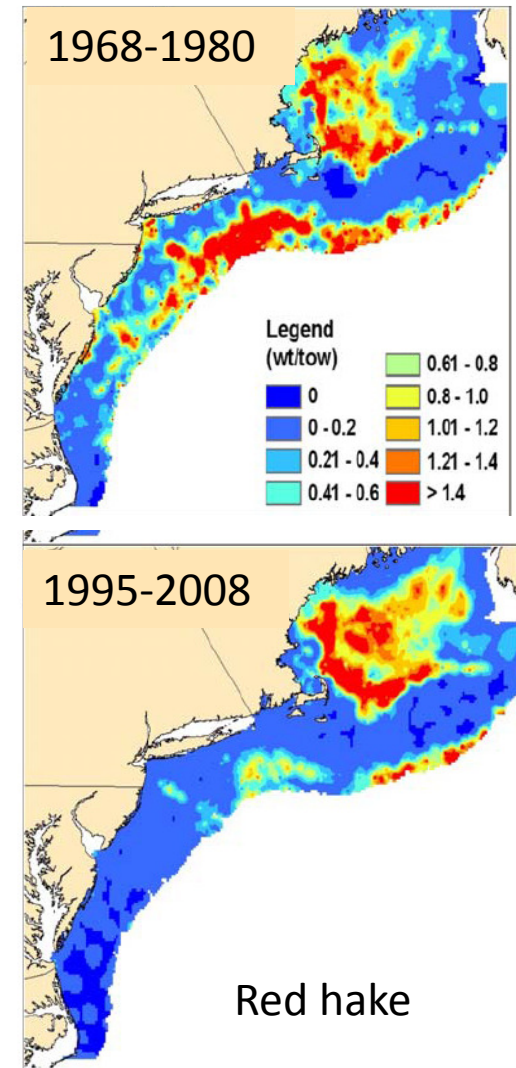
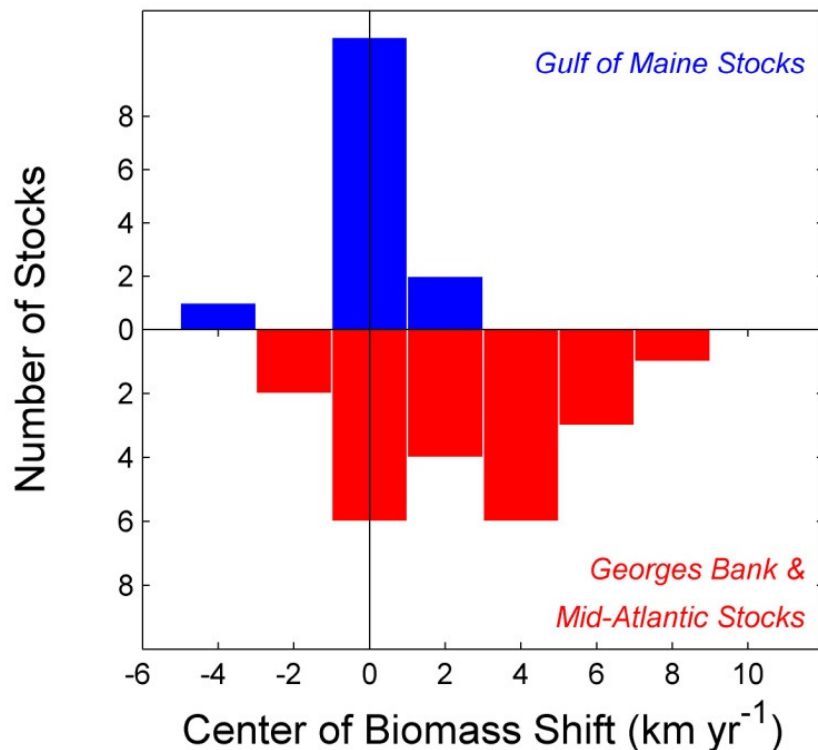
Northeast Ocean Shelf  
temperatures are increasing  
(~ 1 °C increase since 1920)



Source: Shearman K, Lentz S (2009) *Journal of Physical Oceanography* 40: 1004-1017

# Shifts in Regional Fish Stock Distributions

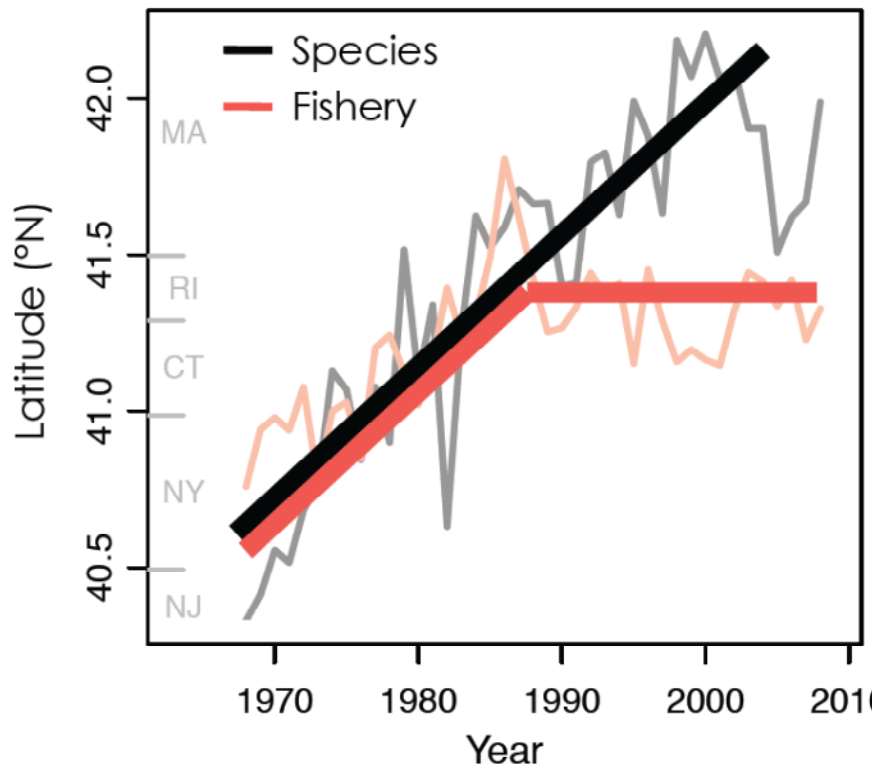
- Over past 40 years, 24 of 36 stocks have shifted poleward or deeper as ocean temperatures have increased
- Shifts pronounced in Mid-Atlantic
- Not all moving at same pace
- Winners and losers?



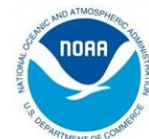
Source: Nye JA et al. (2009) *Marine Ecology Progress Series* 393:111-139



# Fishery Landings Shift More Slowly



Pinsky and Fogarty, *Climatic Change Letters* 2012

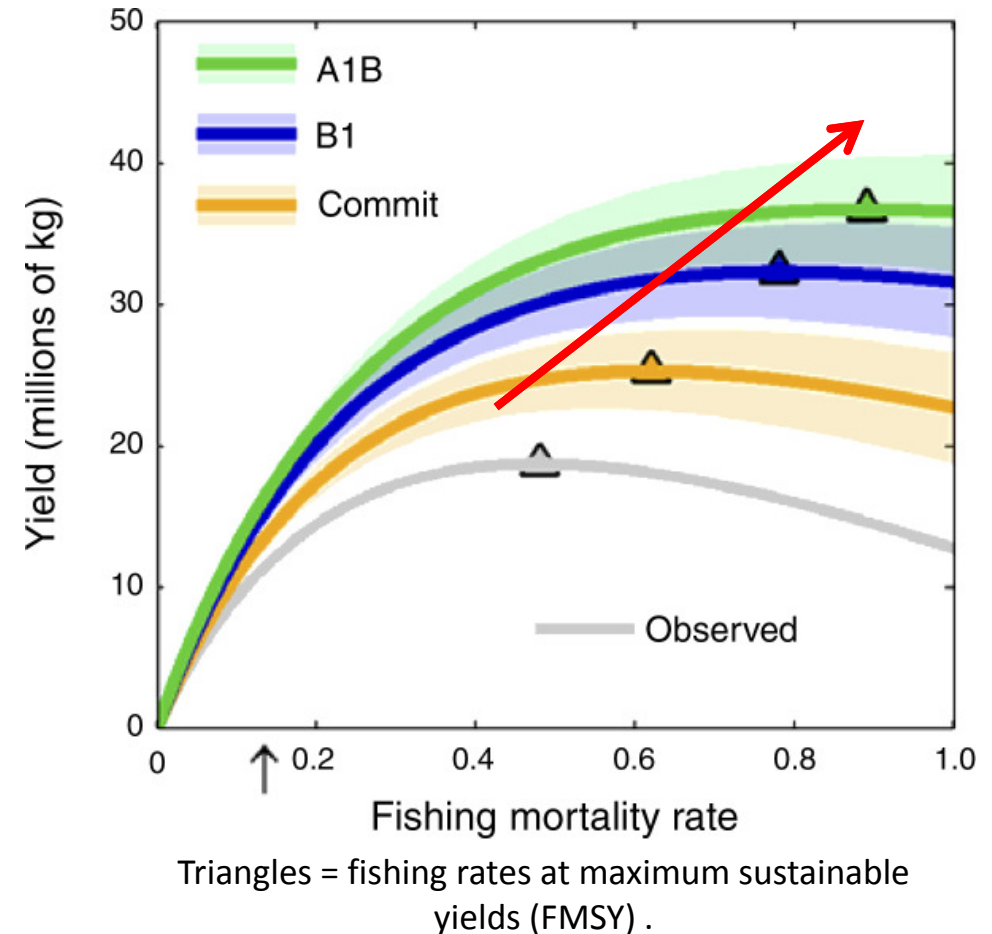


# Will Some Species Thrive In A Changing Climate?

## Projected Increase in Atlantic Croaker Populations

### Projections:

- Increased juvenile recruitment
- 50-100 km northward shift in distribution (2010-2100)
- 60-100 percent increased biomass
- 30-100 percent increased maximum sustainable yield
- Potential increased fisheries?



Source: Hare et al. 2010

# National Academy of Sciences Recommendations

## *Disaster Resilience: A National Imperative*

- Federal government agencies should incorporate national resilience as an organizing principle to inform and guide the mission or actions of the federal government and the programs it supports at all levels.
- The public and private sectors in a community should work cooperatively to encourage commitment to and investment in a risk management strategy that includes complementary structural and nonstructural risk-reduction and risk-spreading measures or tools. Such tools might include an essential framework (codes, standards, and guidelines) that drives the critical structural functions of resilience and investment in risk-based pricing of insurance.

Source: Committee on Increasing National Resilience to Hazards and Disasters; Committee on Science, Engineering, and Public Policy; The National Academies



# Recommendations, Continued

- A national resource of disaster-related data should be established that documents injuries, loss of life, property loss, and impacts on economic activity. Such a database will support efforts to develop more quantitative risk models and better understand structural and social vulnerability to disasters.
- The Department of Homeland Security in conjunction with other federal agencies, state and local partners, and professional groups should develop a national resilience scorecard.

Source: Committee on Increasing National Resilience to Hazards and Disasters; Committee on Science, Engineering, and Public Policy; The National Academies

# Recommendations, Conclusion

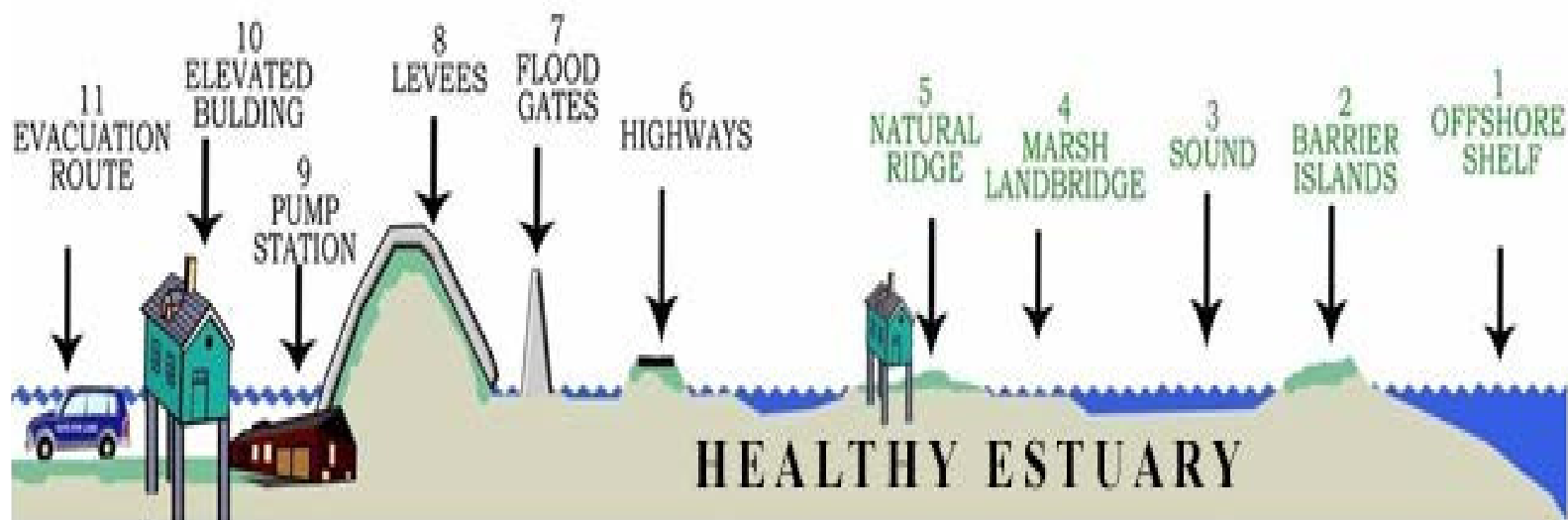
- Federal, state and local governments should support the creation and maintenance of broad-based community resilience coalitions at local and regional levels.
- All federal agencies should ensure they are promoting and coordinating national resilience in their programs and policies. A resilience policy review and self-assessment within agencies and strong communication among agencies are keys to achieving this kind of coordination.

# Green/Gray Infrastructure





# Multiple Lines of Defense



HAPPY HOUR,  
April 22<sup>nd</sup>



ANOTHER MUDSLIDE!

I'LL HAVE A DARK AND STORMY!

ONE MORE HURRICANE!

HOW CLIMATE CHANGE SCIENTISTS DROWN THEIR SORROWS.

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# Change Is Here: Time to Act Is Now



# Questions?

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