

# Storm Surge/Coastal Inundation State of the Union

HURRICANE  
EVACUATION  
ROUTE

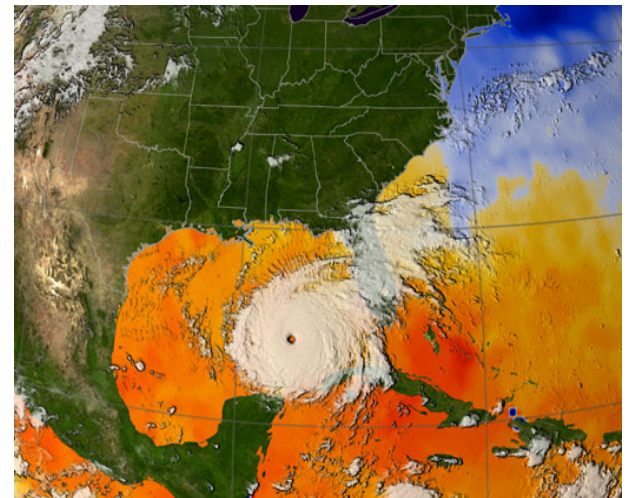
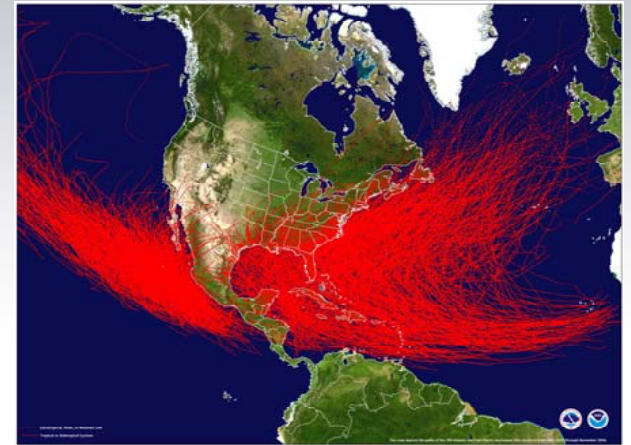
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# Presentation Outline



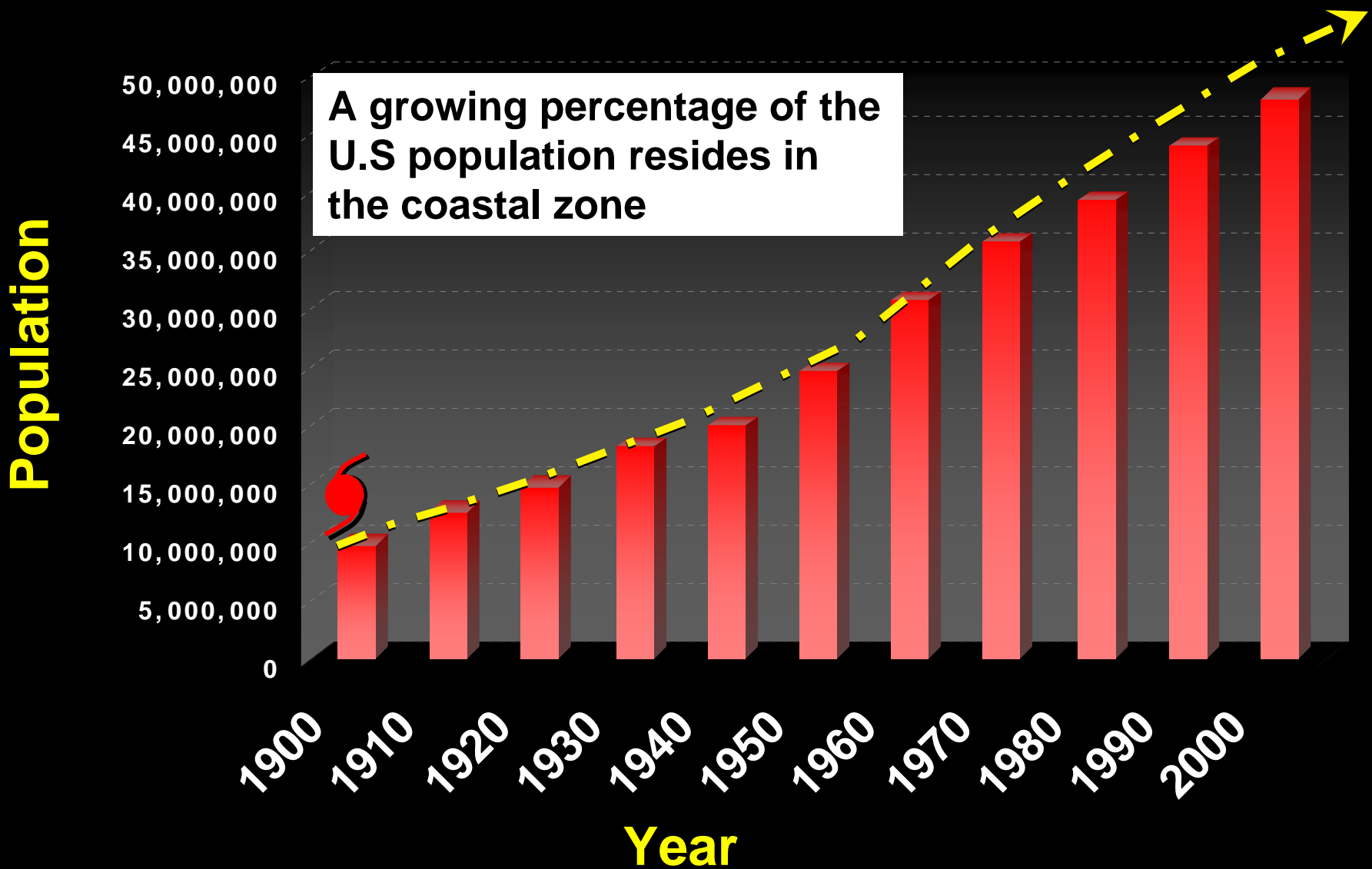
- “Houston, We Have a Problem”
  - Coastal population trends and sea-level rise (SLR)
    - Increased vulnerability to storm surge/inundation
  - Lack of Federal level coordinating body
    - Disjointed data sources
    - Conflicting efforts
    - Insufficient coordination
    - Inefficient integration of new S&T
- A Possible Way Forward





AP

# Coastal County Population, Texas to Maine 1900 - 2000



# Miami: Then and Now

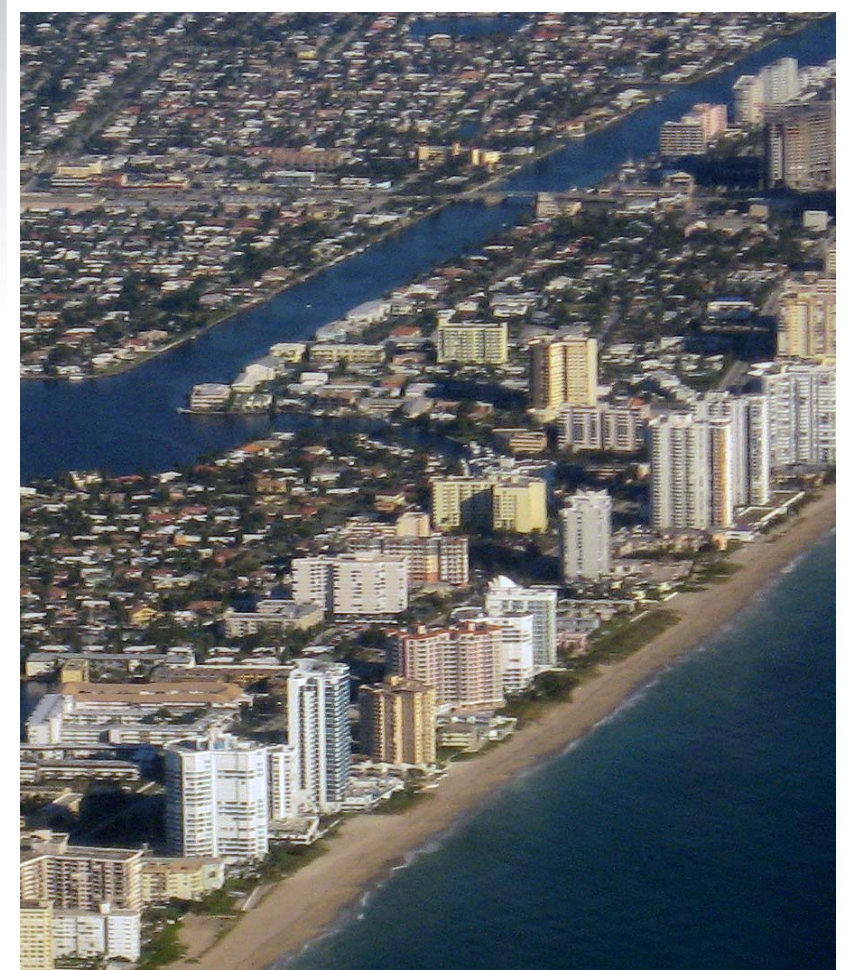
The 1926 Miami Hurricane: \$140-157 Billion Today



Miami Beach 1926



Miami Beach 2006



# Sea-Level Rise (SLR)



- Combination of SLR and increasing coastal population density is making our Nation increasingly vulnerable to storm surge/coastal inundation
- Why: rising sea-level provides a higher “base” for future surge/inundation events thus producing an increasing threat to:
  - Coastal communities
  - Ecosystems (wetlands, critical species, habitat loss, etc)
  - Transportation systems (highway systems, ports, rail)
  - Economic viability (tourism, transport of goods, natural resources)
  - Energy

# Vulnerability



- From 1980-2003, population density increased in coastal counties by 28% (Crossett et al., 2004)
- Over half of the Nation's economic productivity is located within coastal zones
- 72% of ports, 27% of major roads, and 9% of rail lines within the Gulf Coast region are at or below 4 ft elevation (CCSP, SAP 4-7)
- Storm surge of 23 ft: 67% of interstates, 57% of arterials, almost half of rail miles, 29 airports, and virtually all ports in the Gulf Coast area subject to inundation (CCSP SAP 4-7)

# Current Challenges



- Insufficient inter/intra-governmental coordination and communication on S&T
- Lack of standards
  - Models
  - Observations
  - Verification
- No storm surge/coastal inundation coordination body
- Poor linkage between government/academia



# Partnering Agencies



- FEMA
  - Mitigation, planning, mapping, response & recovery, post-storm observations, and education,
- NASA
  - Remote sensing (LIDAR, altimetry)
- USGS
  - Storm tide observations, mapping
- U.S. ACE
  - Modeling, S&T, shore/community protection
- NOAA
  - Prediction, warning, S&T, modeling, mapping, real-time water observations, remote sensing, and outreach/education
- NIST
  - Risk-based storm surge maps for design in coastal regions



# Do we currently have a “Community Approach?”

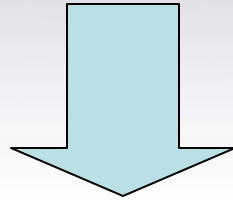


- “Community Approach”
  - A team drawn from all parts of the community
  - Common ownership
  - Group of participants having common interests and goals
  - Group of interdependent individual/entities efficiently interacting with each other

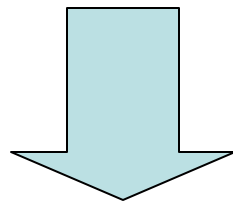
# Conclusion



We don't have a functional community-based method



The lack of a community approach is hindering progress  
and limiting opportunity



We are not adequately servicing the needs of our  
constituents/customers

# Example



- HAZUS
  - FEMA's software program for estimating potential losses from disasters
  - Included models: earthquake, hurricane wind, and floods
    - Currently lacks a storm surge component
- If surge could be added to HAZUS
  - Which model would we use?
  - What would be basis of decision?
  - Who would develop/maintain model?
  - Would that model incorporate the collective expertise of the entire community?



# Establishing a Community Approach



- Communication: effectively translate findings into coherent information that can be easily understood by decision makers, the general public, and other scientists
- Coordination: consider findings not in isolation but as part of a broader knowledge base
- Sharing: strengthening collective efforts by pooling resources and expertise
- Governance: a body of individuals which consists of members from the “community” whose purpose is to set goals, develop plans, and oversee progress

# A Proposed Plan

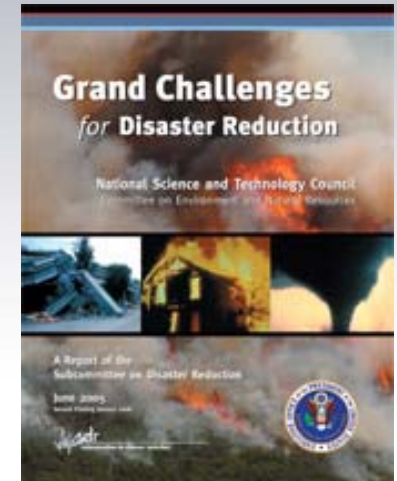


- Develop an interagency working group (IWG) under the auspices of the President's National Science and Technology Council/Committee of Environment and Natural Resources/Subcommittee on Disaster Reduction (SDR)
- Why SDR?
  - The SDR facilitates US Government and private/academic activities to reduce vulnerability to natural hazards
  - SDR has already developed priority science and technology interagency actions for coastal inundation that will help the Nation become more resilient
    - IWG could facilitate the development of a more detailed interagency plan, promote improved coordination, and oversee progress

# SDR Inundation Grand Challenges



- Provide hazard and disaster information where and when it is needed
- Understand the natural processes that produce hazards
- Develop hazard mitigation strategies and technologies
- Reduce the vulnerability of infrastructure
- Assess disaster resilience
- Promote risk-wise behavior





# IWG Purpose



- Evaluate existing storm surge/coastal inundation research, data, and agency operating plans
  - Identify gaps and areas of improvement
  - Define overall needs going forward
- Establish a road map and set priorities
- Establish clear roles for the participating agencies based on available resources, expertise, and infrastructure
- Coordinate agency priorities, planning, and budget processes
- Serve as the primary channel for communicating collective expertise and fostering sound policy making at the National level

# Expected Benefits of SDR/IWG



- Coastal communities will be safer from storm surge/coastal inundation:
  - Through improved observations, modeling, and decision support tools, forecasters will have the necessary information to improve forecasts, warnings, and lead time
  - Coastal communities provided with necessary information, spanning appropriate time scales, to protect life and property
- Disaster resilient communities experience less loss of life and help protect our communities:
  - Improved tools, datasets, and other coastal management information will promote sound coastal planning, policy making, and decisions

# Partnerships for the Protection of Coastal Communities



The objective is to:

- provide the right information
- in the right format
  - at the right time
- to the right people
- to make the right decisions

