

National Weather Service

Building a Weather-Ready Nation



2011: A Year of Extremes

~600 Fatalities

\$35 Billion in Economic Losses



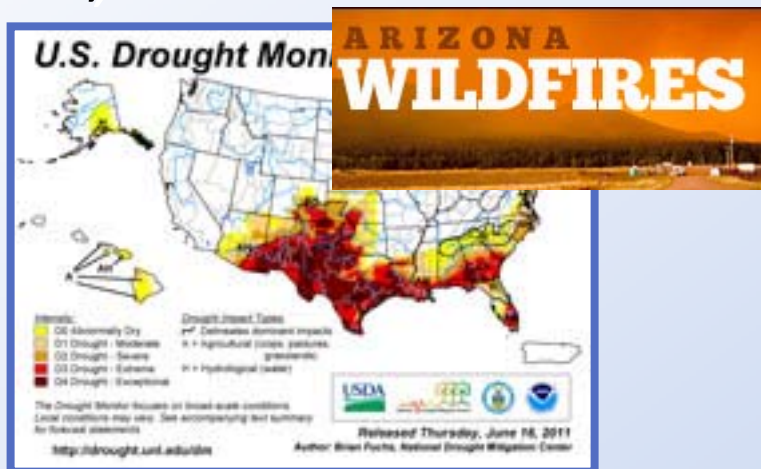
**546 Fatalities from
1,676 Tornadoes**



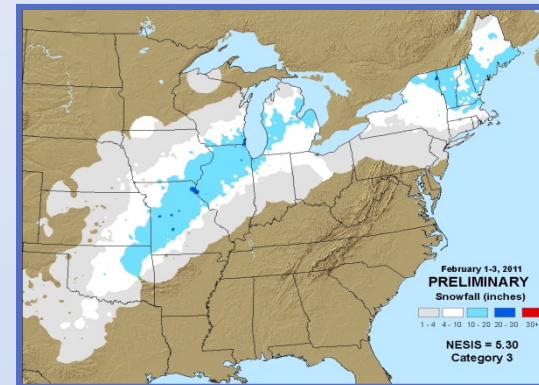
Historic U.S. Floods



Pacific Tsunami



6 Million Acres Burned



Devastating Blizzards

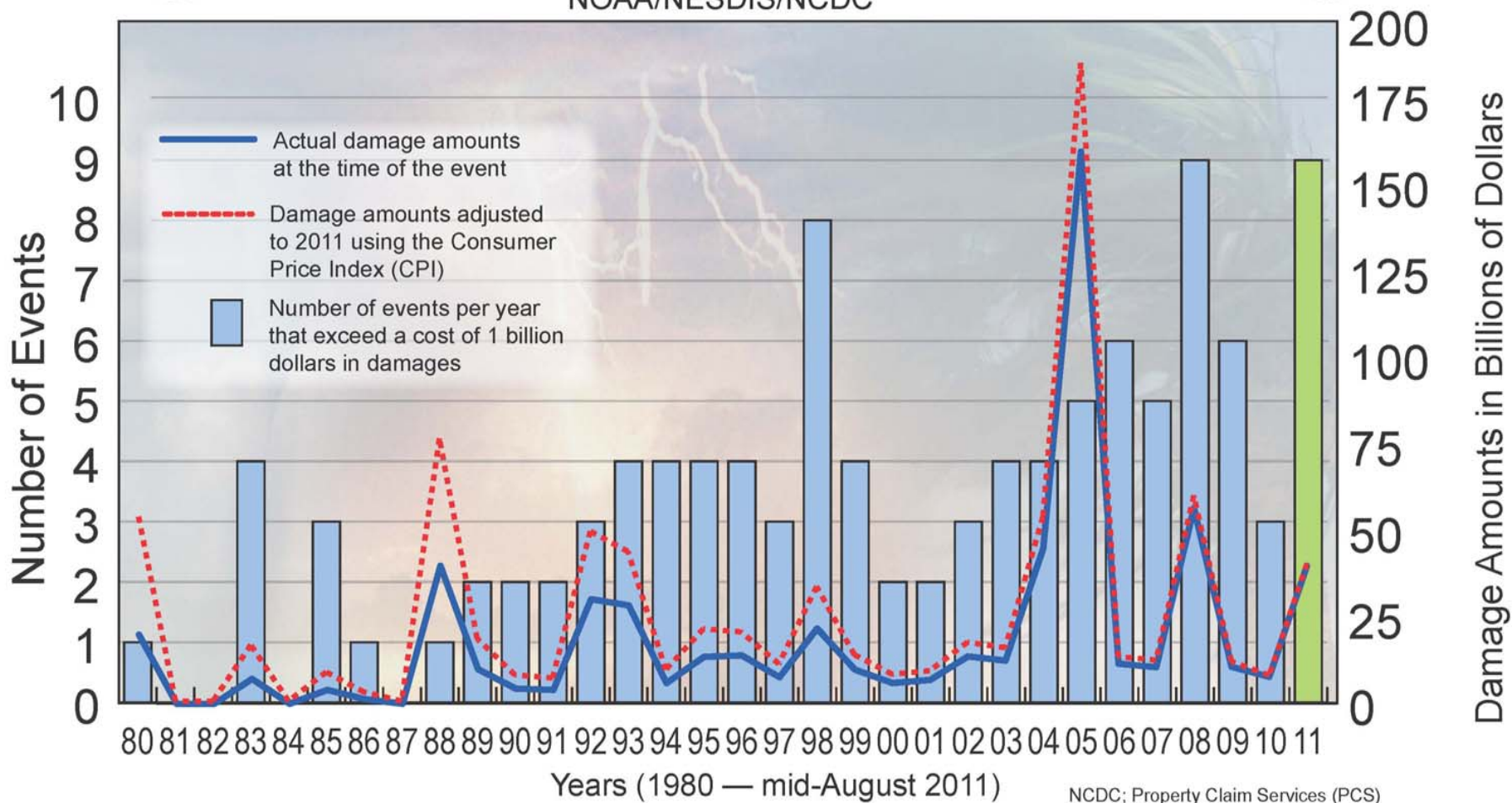
2011: A Year of Extremes



Billion Dollar U.S. Weather Disasters 1980 — mid-August 2011



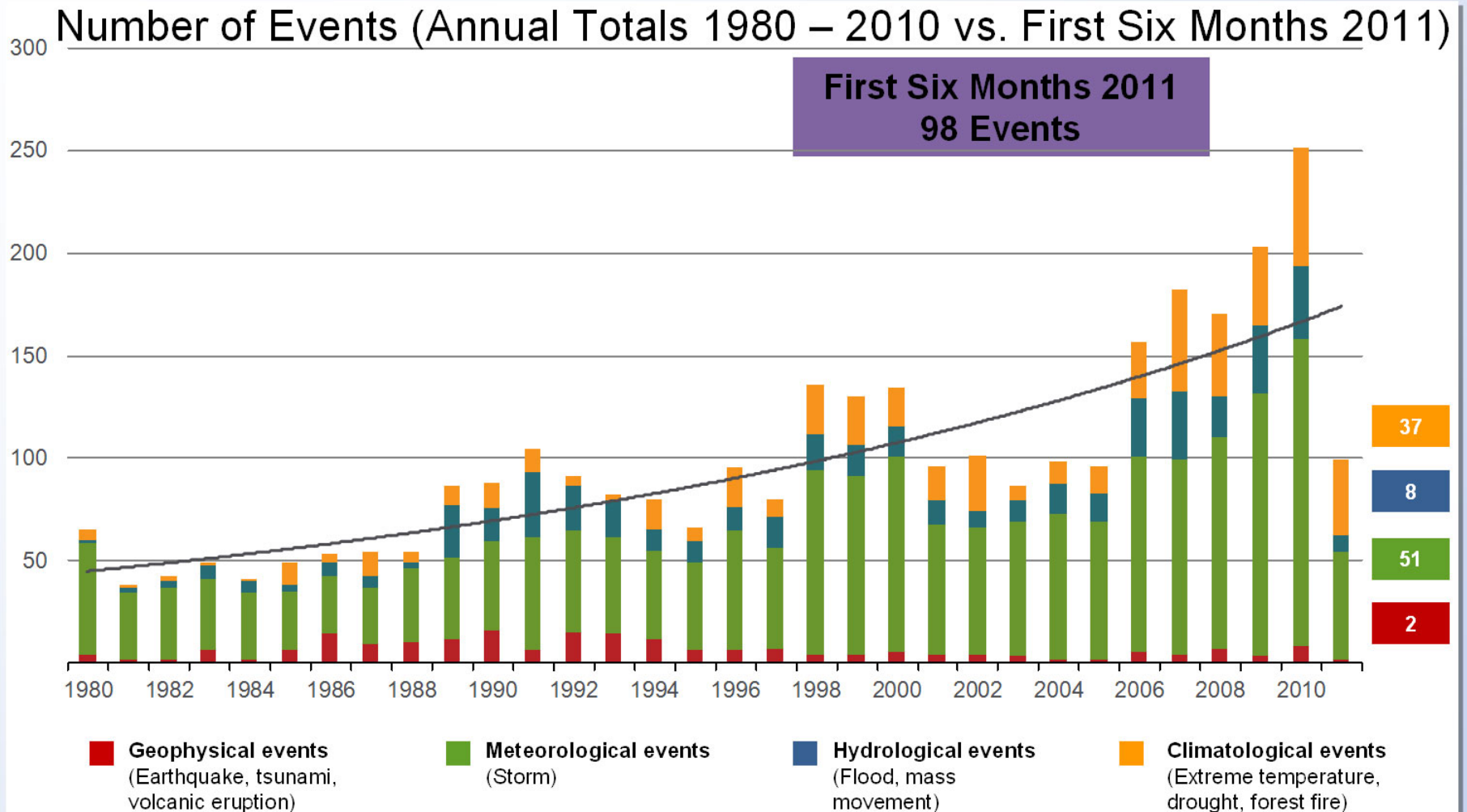
NOAA/NESDIS/NCDC



A Changing World

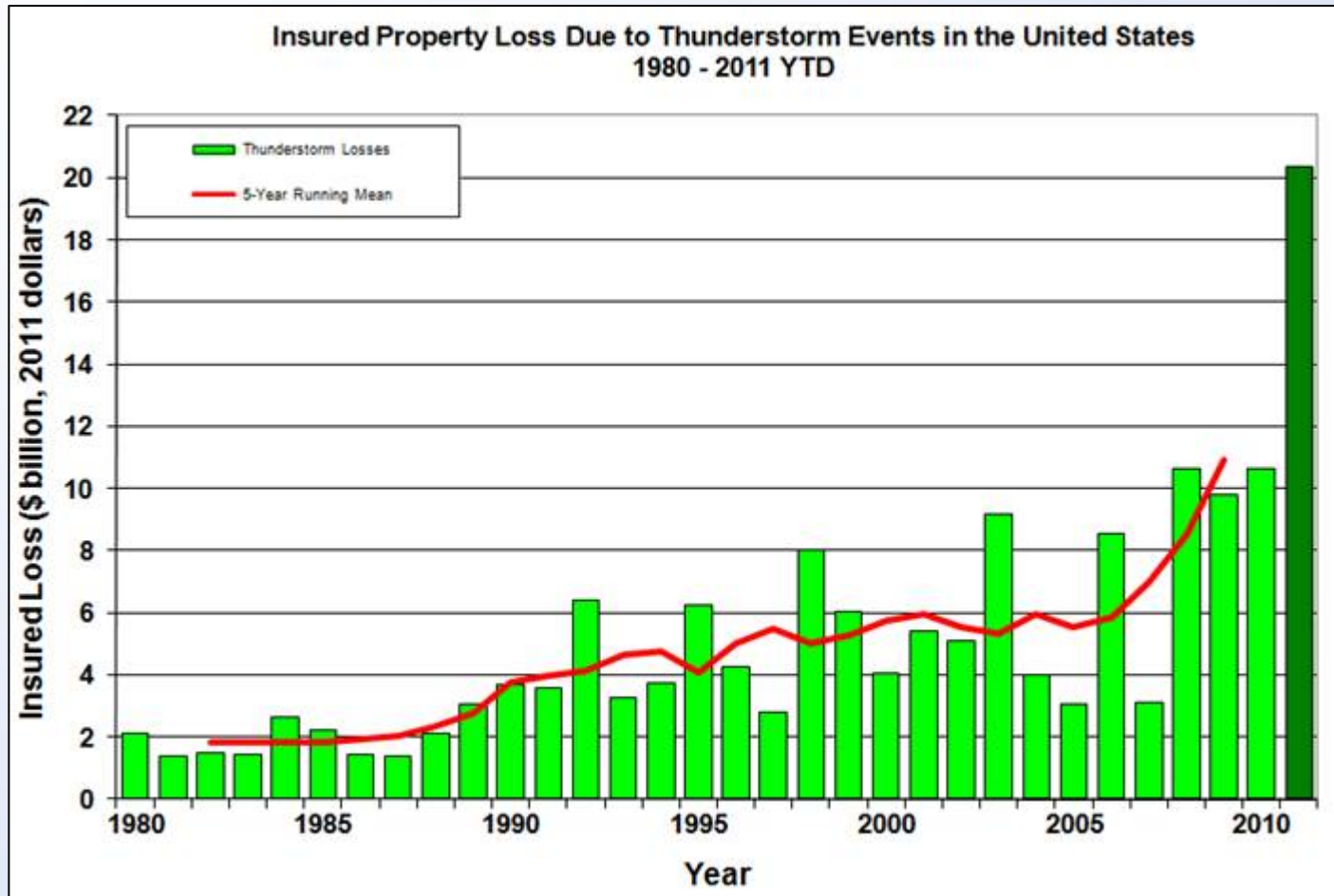
Increased Vulnerability to High-Impact Weather

Natural Disasters in the United States, 1980 – 2011



U.S. Thunderstorm Loss Trends Annual Totals 1980 – 2010 vs. First Half 2011

Average thunderstorm losses have increased fivefold since 1980.



A Changing World

Society Increasingly Vulnerable

- **Extreme impacts from weather, water, climate events**
- **Population growth and demographic changes**
- **Technological dependence**
- **Water Availability—too much, too little, quality**

A Changing World

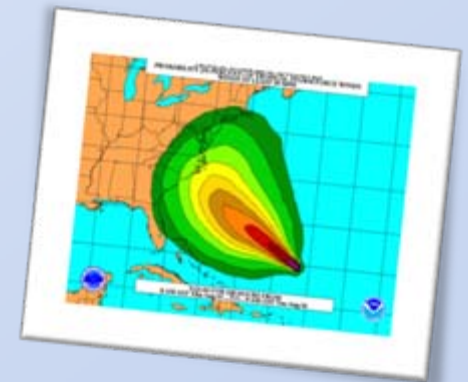
The Extreme Impacts

- **Threat: The Extreme Impacts**
 - *Extreme impact events across the country*
 - *Blizzards affecting up to 100 million people*
 - *Weeks of tornado outbreaks*
 - *Months of floods*
 - *Months of heat, drought, and wildfires*
 - *Deepwater Horizon requiring 400 NWS staff deployments*
- **Goals: Improved forecasts and adaptable community presence**
- **What We're Doing:**
 - *Introducing new science and technology*
 - **Dual polarization radar**
 - **Joint Polar Satellite System**
 - **Hurricane Forecast Improvement Project early model integration**
 - *Running test projects*
 - **Deployable Emergency Response Specialists**
 - **Test new warning process designed to increase warning lead time into the 30-minute to 3-hour range**
 - **Integrating environmental services to save more lives, promote coastal community resilience and help sustain ocean and coastal environments and their economic benefits**
 - **Improving quantitative precipitation forecasts**

A Changing World

Population Growth & Demographic Changes

- **Threat: Population Growth & Demographic Changes in high-risk areas**
 - *Intense Hurricanes*
 - Hurricane Katrina: 2,000 deaths, \$125B in damages
- **Goal: Improve preparedness, reduce loss of life, increase forecast accuracy and timeliness**
- **What we're doing:**
 - *Hurricane Forecast Improvement Project*
 - 50% improvement in track and intensity forecast accuracy
 - Improve storm surge forecasts and warnings
 - Extend forecast reliability out to 7 days
 - Reduce forecast uncertainty to enable earlier risk management decisions



A Changing World

Vulnerability from Technological Dependence

- **Threat: Space Weather impacts critical infrastructure and national security (power grids, communications, air travel, satellites)**
 - *Expect vulnerabilities to grow with growing technological advances*
 - *Next solar maximum expected in 2013*
- **Goal: Increase National and International preparedness for solar storms**
- **What We're Doing**
 - *Increase real-time space situational awareness as solar disturbances trigger potentially high-impact space weather*
 - *Increase operational space weather warning accuracy and lead time for vulnerable infrastructure and missions*
 - *National and international research-operations partnership*

A Changing World

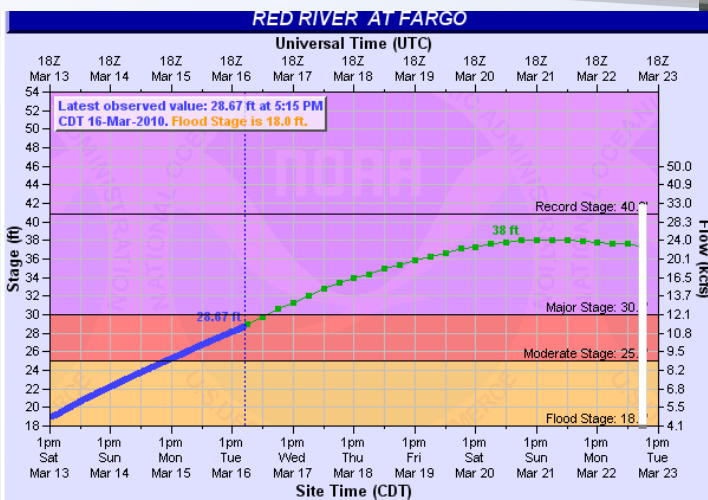
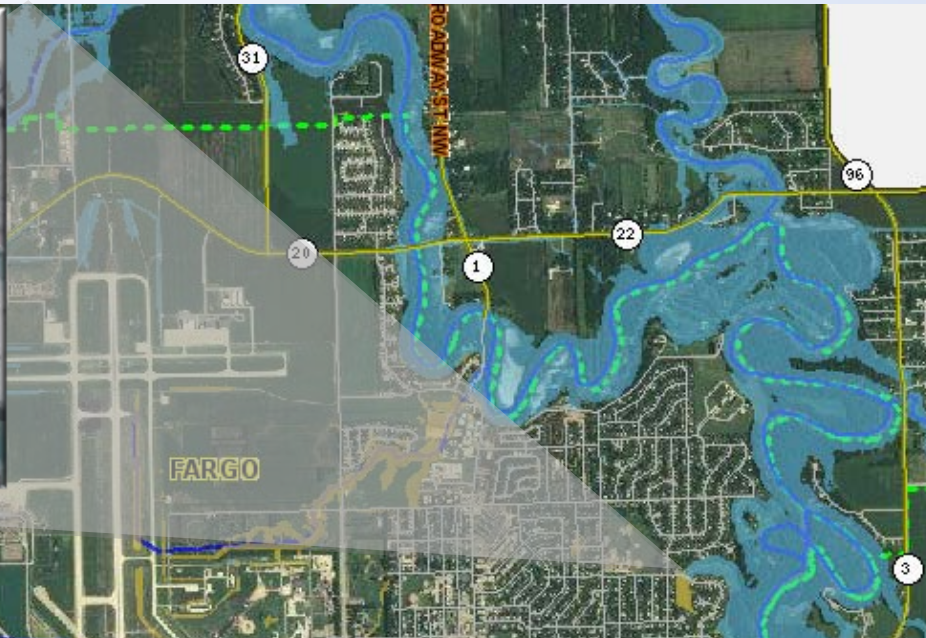
Water Availability and Quality

- **Threat: Too much, Too little, Poor Quality**
- **Goals:**
 - *Improve Nation's ability to manage water resources*
 - *Reduce economic losses due to floods and droughts*
 - *Increase economic benefits from water forecasts and information*
- **What we're doing**
 - *IWRSS: Partnership of 21 federal agencies.*
 - **Improving warnings, better season and extended drought and heavy precipitation outlooks**
 - **Developing Common Operating Picture**
 - **Creating Single portal for Water Information**
 - **Sharing technology, information, models, best practices**
 - **"Tool Box" for forecasts, data, mapping and programs**

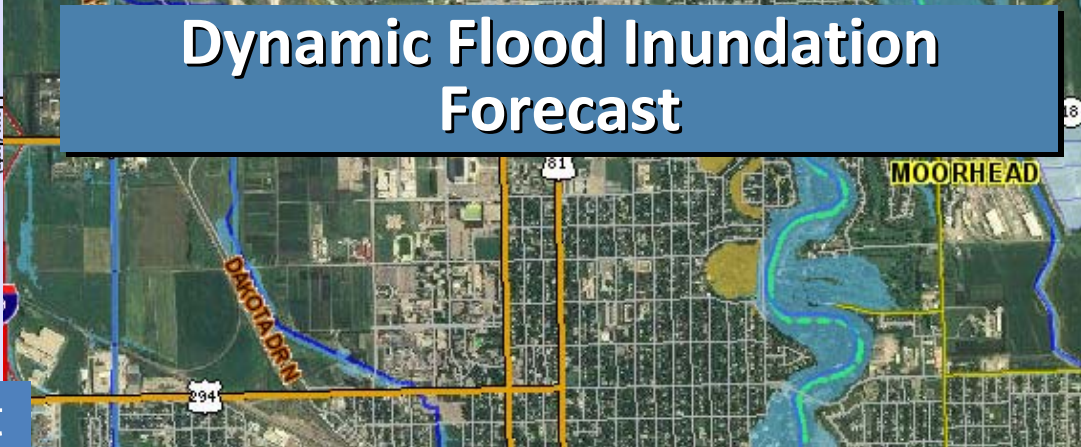


A Changing World

Water Availability and Quality



Dynamic Flood Inundation Forecast

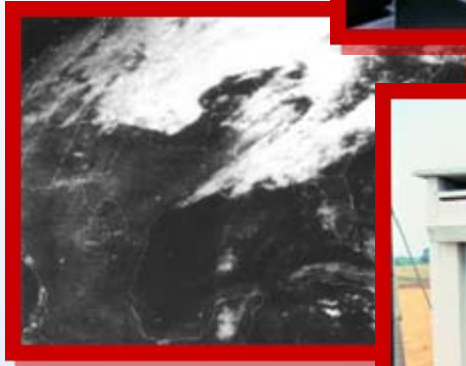
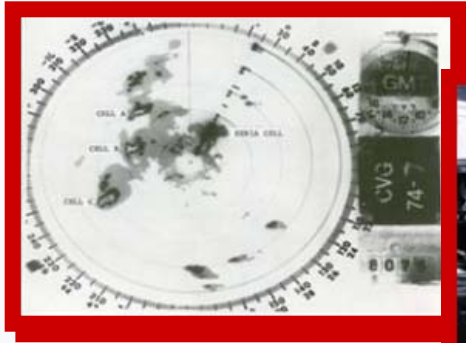


Conventional Flood Forecast

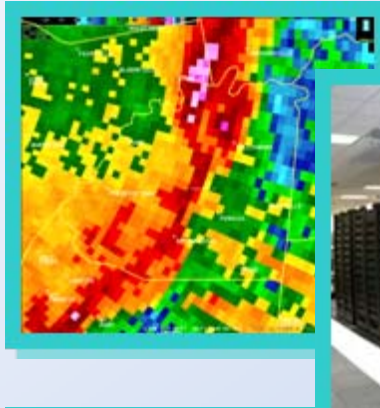
NWS Modernization

Enabled Successes

1970s...



1990s-Present

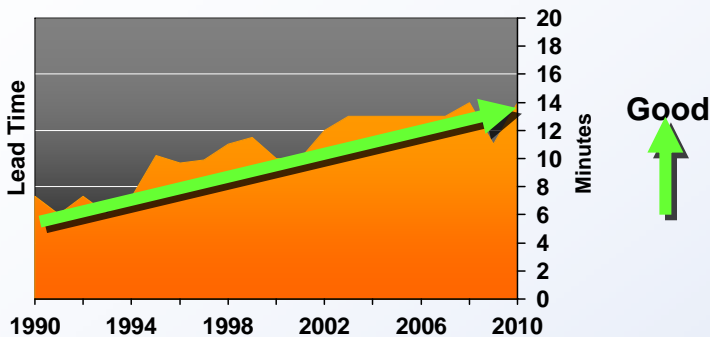


Some Services Improved

Others Have Not

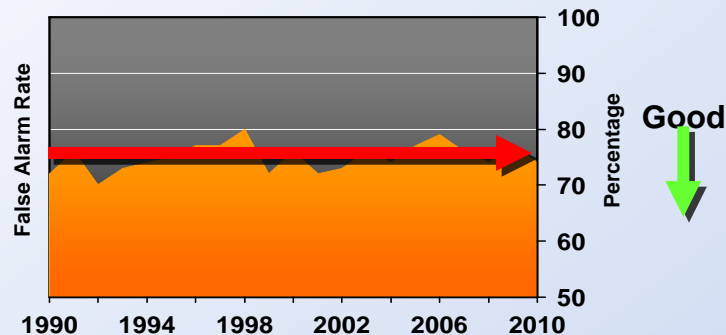
Improved

Tornado Warning Lead Time

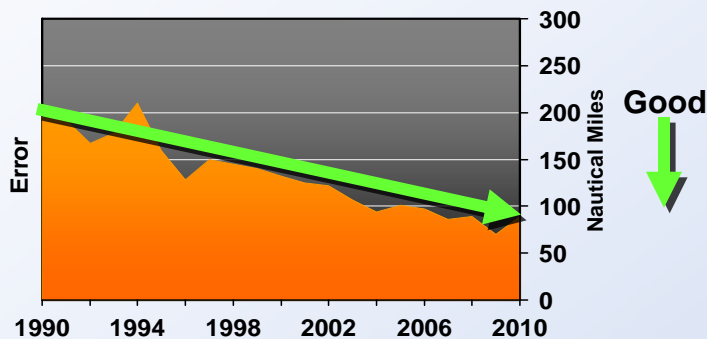


Not Improved

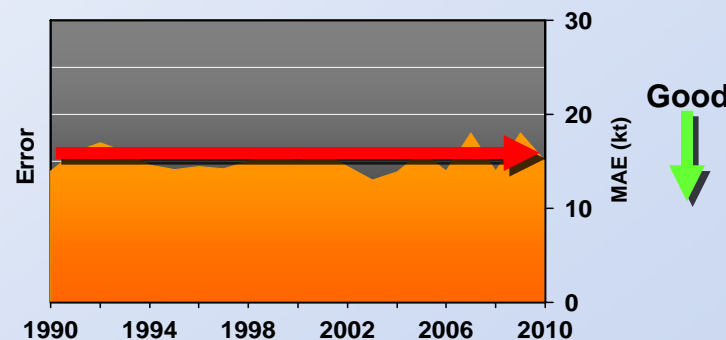
Tornado Warning FAR



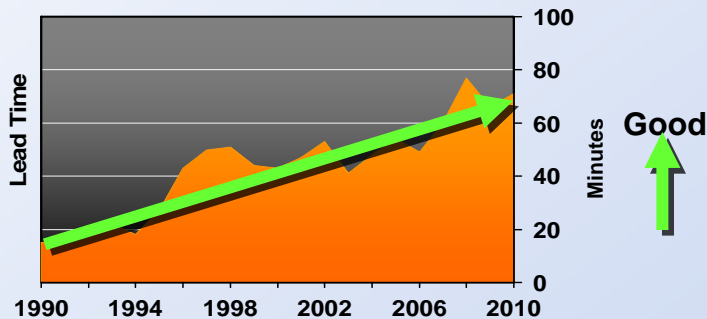
Hurricane Track Forecast



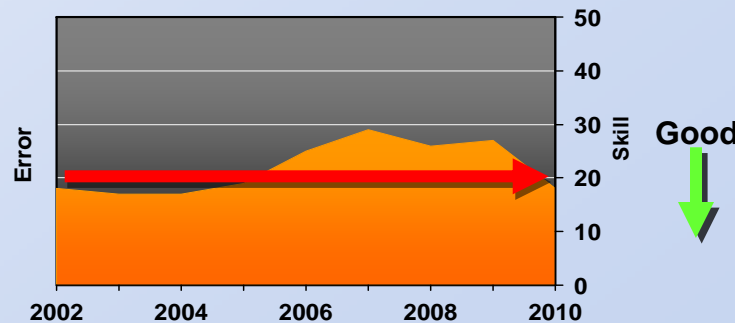
Hurricane Intensity Forecast



Flash Flood Warning Lead Time



Seasonal Temperature Forecast



Is the U.S. Weather-Ready?

***The Vision:
Build a Weather-Ready Nation***

Building a Weather-Ready Nation

Vision & Mission

Vision

**A Weather-Ready Nation:
Society is Prepared for and
Responds to Weather-
Dependent Events**

Mission

**Provide weather, water, and
climate data, forecasts and
warnings**

- **Protect life and property**
- **Enhance national economy**



Meeting the Nation's Needs

Building a Weather-Ready Nation

NWS Strategic Plan:

- Improve **weather**, **water**, and **climate** decision services for events that threaten lives and livelihoods
- Improve **accuracy** and **lead times** for high-impact events
- Better **communicate levels of confidence** in our forecasts
- Help improve community **preparedness and response**
- **Enable** the Weather Enterprise
- Develop a **sustainable** business model



NAS Committee: The Assessment of the National Weather Service's Modernization Program

Meeting the Nation's Needs

Building a Weather-Ready Nation

GOAL 1: *Improve weather decision services for events that threaten lives and livelihoods*

- Improve warning accuracies and lead times for high-impact weather and water events
- Exploit probability information to communicate uncertainty
- Improve community emergency preparedness and response



Meeting the Nation's Needs

Building a Weather-Ready Nation

GOAL 2: *Deliver a broad suite of improved water forecasting services to support management of the Nation's water supply*

- **Develop Integrated Water Resources Science and Services with partners**
 - *Establish National Water Center*
- **Deploy Community Hydrological Prediction System**



Meeting the Nation's Needs

Building a Weather-Ready Nation

GOAL 3: *Support climate services to help communities, businesses, and governments understand and adapt to climate-related risk*

- **Climate-quality observations**
- **NCEP's Climate Forecast System and Reanalysis Capability**
- **User engagement from 122 WFOs and 13 RFCs**



Meeting the Nation's Needs

Building a Weather-Ready Nation

GOAL 4: *Improve sector-relevant information in support of economic productivity*

- **Deploy NextGen Weather Products & Services**
- **Develop 4-D environmental database to support all missions and America's Weather Industry**
- **Enhance partnerships with Gov, Private Sector, Academia, EMs**



Meeting the Nation's Needs

Building a Weather-Ready Nation

GOAL 5: *Enable integrated environmental forecast services supporting healthy communities and ecosystems*

- Establish enhanced weather-dependent health decision support services
 - *Partnerships: other NOAA offices, federal agencies, and private sector*
- Develop new weather and water forecast capabilities to enhance NOAA ecological prediction and ecosystem decision support services



Meeting the Nation's Needs

Building a Weather-Ready Nation

GOAL 6: *Sustain a highly-skilled, professional workforce equipped with the training, tools, and infrastructure to meet our mission*

- Strengthen training, tools, and infrastructure
 - *Hydrology, climate*
- Strengthen labor involvement in upfront planning
- Integrate social sciences throughout the agency



Summary

- **Nation facing a extreme impacts from weather, water, and climate events**
- **NOAA NWS performance today based on the 1980-90s Modernization and satellite investments**
- **NOAA Building a Weather-Ready Nation with near-term actions, test projects to evaluate concepts, and a national dialogue with partners to develop the next generation ideas**

