

NOAA National Weather Service

Serving the Nation's Environmental Forecasting Needs

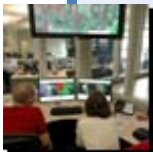
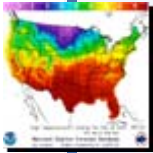


Dr. Jack Hayes
Assistant Administrator for Weather Services
April 3, 2009



Outline

- **Mission**
- **Impacts on Society**
- **NWS Overview**
- **Issues & Challenges**



Mission

- Provide climate, water, weather forecasts and warnings to **protect life and property** and **enhance the economy**.
- NWS **information and infrastructure** are vital for other government organizations, private sector, public, and global community
- **76 billion observations**
- **1.5 million forecasts**
- **50,000 warnings**

U.S. Weather Bureau—1870



Impacts on Society

In the News

Southeast gets a soaking

More showers and storms are forecast for parts of the Gulf Coast with heavy rainfall last week. Twenty river gauges in the region are reporting major flooding today.

Major flooding

Extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations.

Moderate flooding

Some inundation of structures and roads and streams. Some evacuations of people and/or property necessary.



Sources: National Weather Service

The New York Times

River Receding Despite Snowstorm

By KIRK JOHNSON

Published: March 31, 2009

FARGO, N.D. —A powerful spring snowstorm that began on Monday here intensified into Tuesday, with blowing and drifting snow and blizzard conditions in rural areas near the city. But neither the storm nor the accompanying winds were expected to immediately affect water levels in [Red River](#), which have fallen more than two feet since a record-setting crest level set over the weekend, and continued to fall into the morning.

National Weather Service confirms tornado touch down

Posted: Monday, March 30, 2009 3:27 pm

Email Print

The National Weather Service confirmed a tornado touched down on Street and wreaked havoc for about a mile before striking Clark boulevards.

"It was a really short lived tornado," explained Tim County Emergency Services.

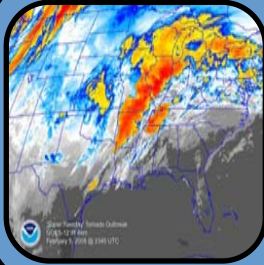
The NWS classified the tornado as an EF-0 with maximum width of 50 yards and path of one mile. It is estimated more than \$4.4 million in property damage.



Giving a voice to Tennessee's most dynamic city

Impacts on Society

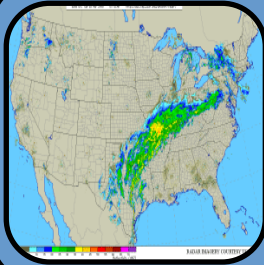
Increased National Needs—2008



Devastating Tornado Year

More Than 1,600 Tornadoes | 125 Fatalities

- Feb. 5-6 “Super Tuesday” Outbreak | 57 Fatalities
- May 10-11 “Mother’s Day” Outbreak | 24 Fatalities



Record-Breaking Floods

Heavy Rainfall Across Central and Southern U.S.

- 36,000 people affected | Millions of acres of land submerged
- 20 Fatalities | Floods exceeded 500-year levels in some



Record-Breaking Hurricane Season

16 Named Storms (incl. 8 Hurricanes) in Atlantic

- Fourth most active season on record
- Six consecutive named storms made landfall on U.S. mainland
- NWS issued accurate pre- and mid-season outlooks




Impacts on Society

Increased National Needs

- **1/3 of US GDP sensitive to weather and climate (\$4.5 trillion*)**

A Typical Year Brings

 6 Hurricanes	 1270 Tornadoes	 5000 Floods
 10,000 Violent Thunderstorms	 Drought Conditions	 500 Deaths 5000 Injuries \$14B in Losses

*in 2007 dollars



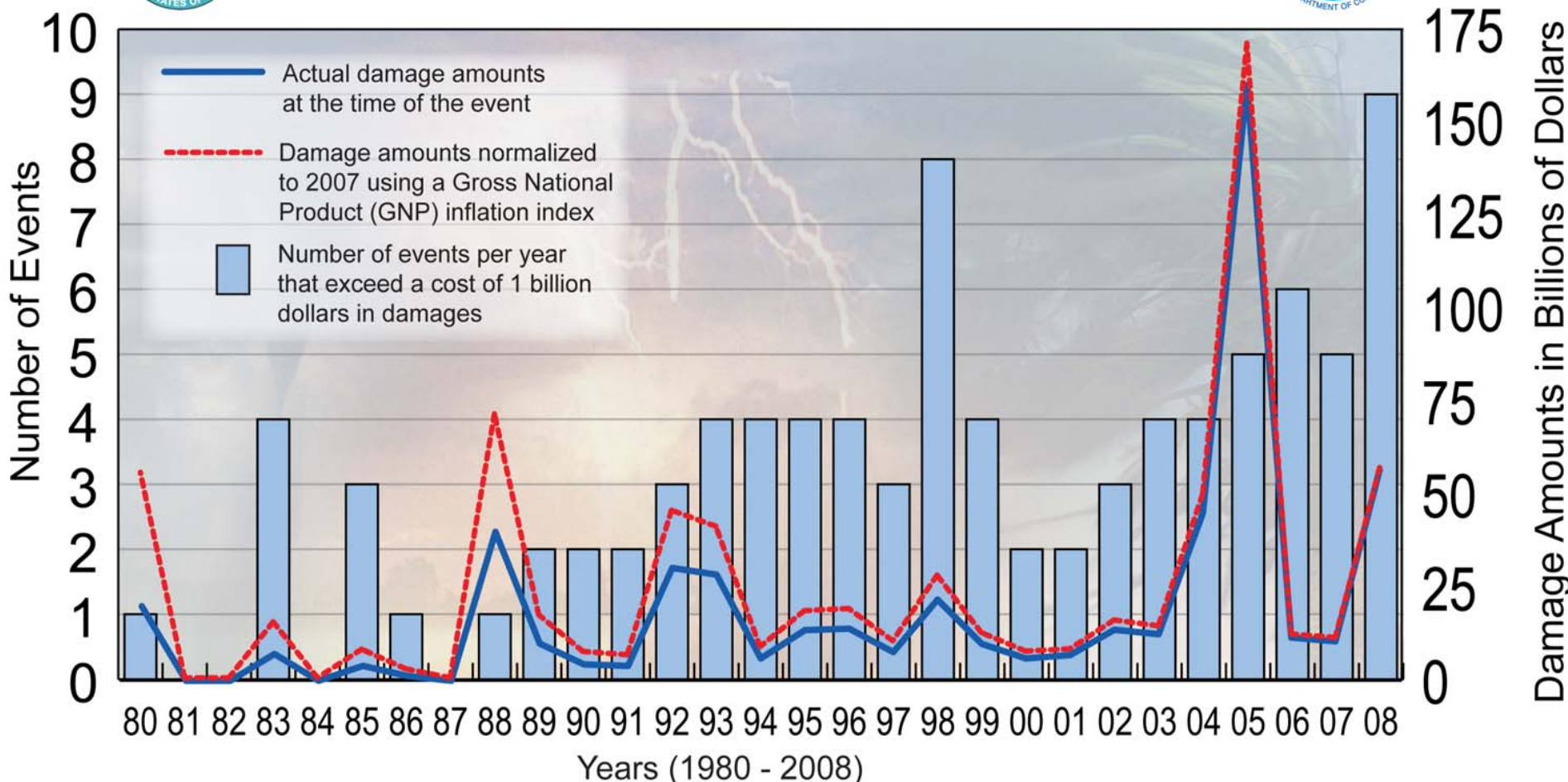
Impacts on Society

Economic Losses



Billion Dollar U.S. Weather Disasters 1980 - 2008

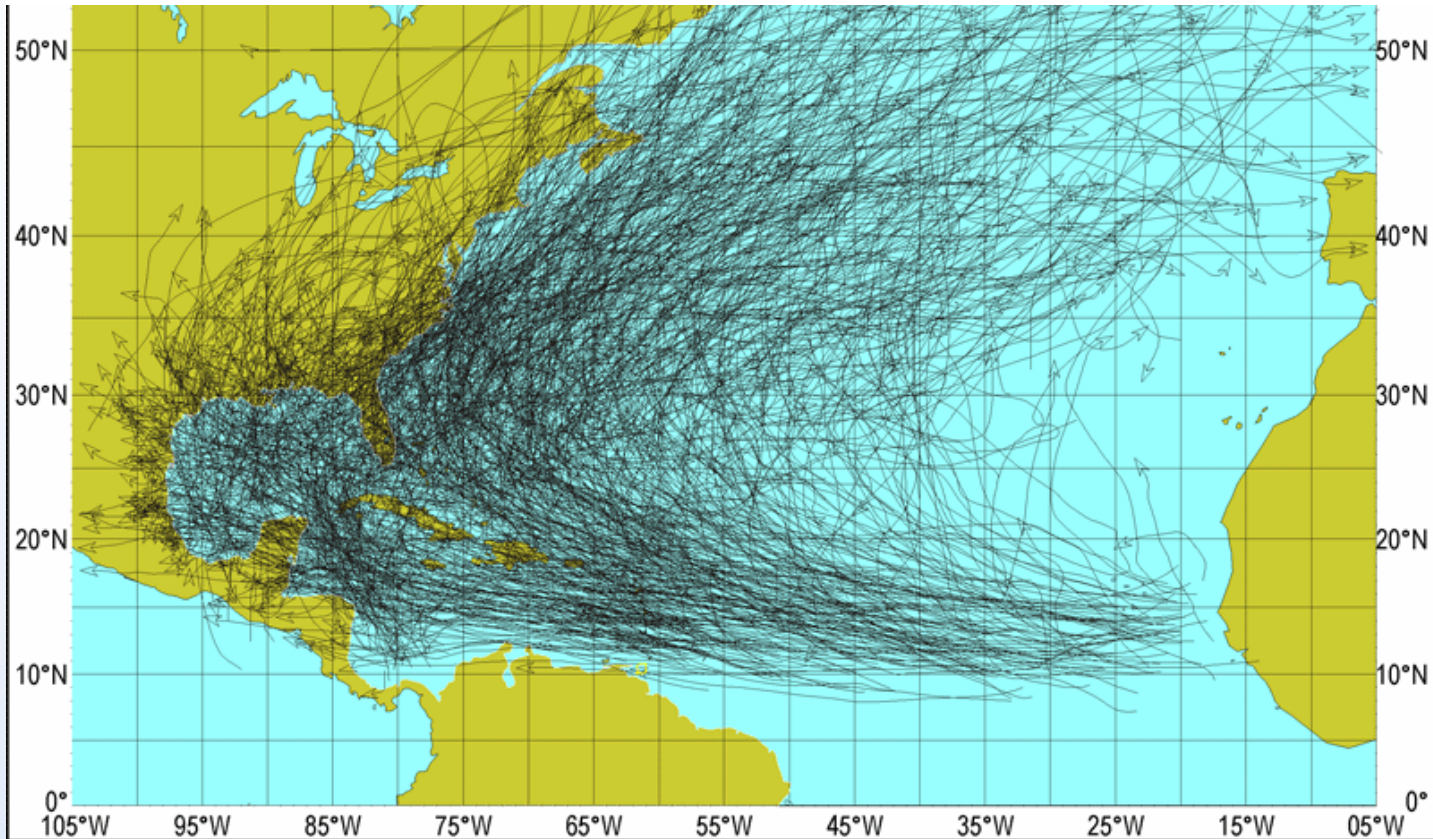
NOAA/NESDIS/NCDC



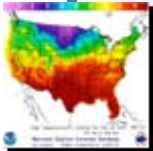
Impacts on Society

Hurricanes

Atlantic Tropical Cyclones since 1886



National Weather Service
Protecting Lives and Property



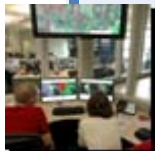
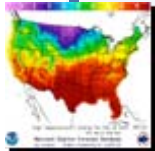
Impacts on Society

Severe Weather

➤ **January 10,
2008**
Caledonia, MS



- **EF-3 Tornado**
- **41 min. lead time**
- **2,000 people inside
no fatalities, 3 minor
injuries**

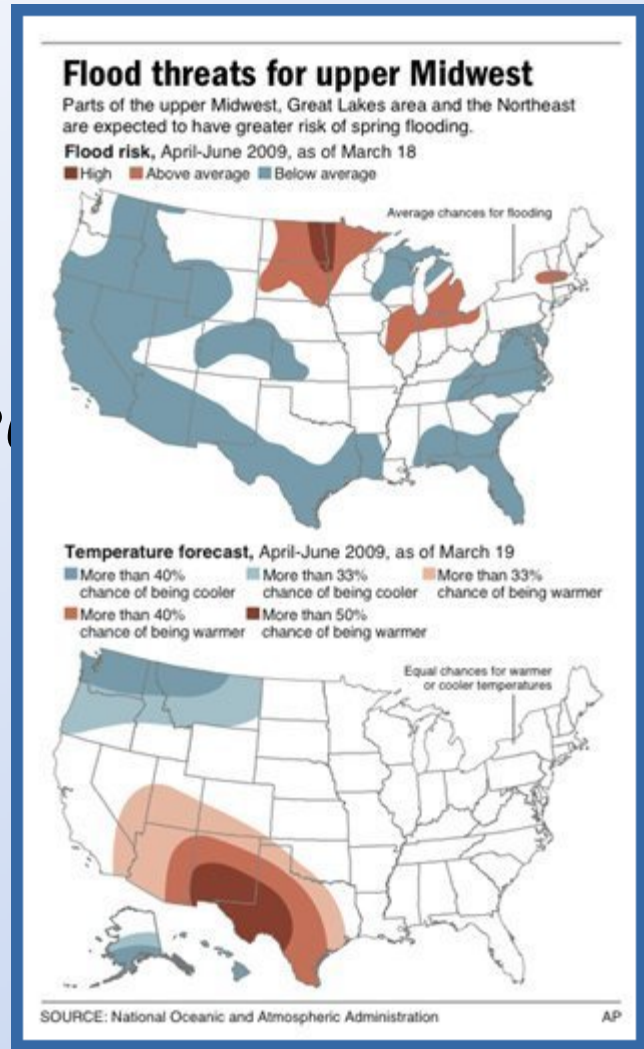


Impacts on Society

Water Resources

➤ Red River of the North Flooding

- Outlook Issued January 9
- Warning Issued March 19
- Warning Updated March 20



Impacts on Society

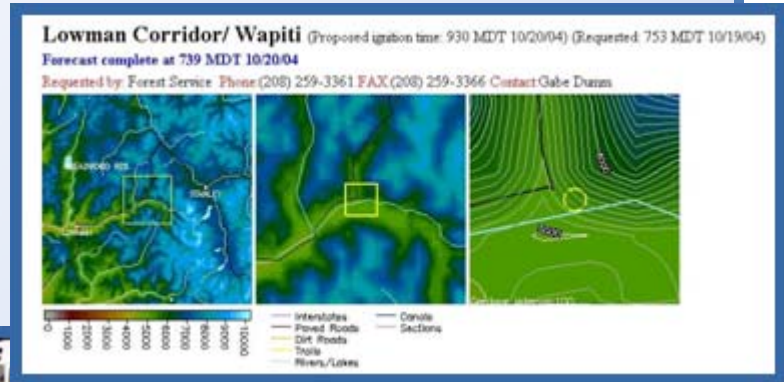
Wildfires

National Weather Service

Protecting Lives and Property

➤ Fire Weather Support 2008

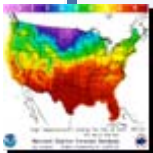
- 1,781 *IMET* days
- 20,025 *Red Flag Warnings*



Impacts on Society

Marine and Coastal Use

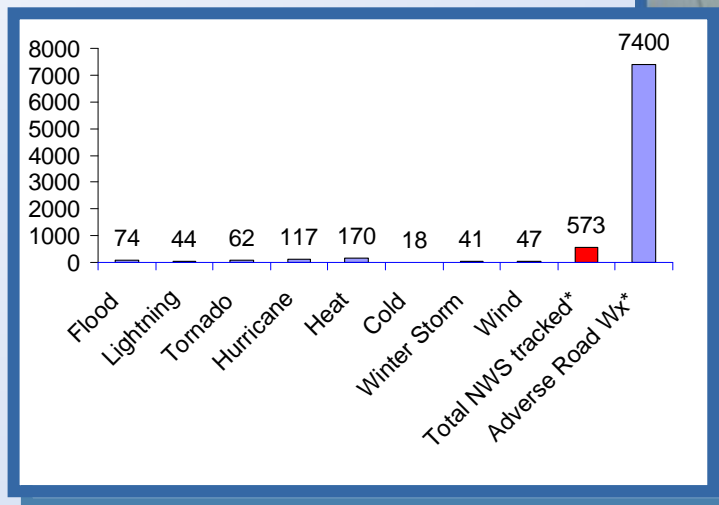
- Coastal & Ocean weather
- Tsunami detection and warning
- Ocean wave forecasts



Impacts on Society

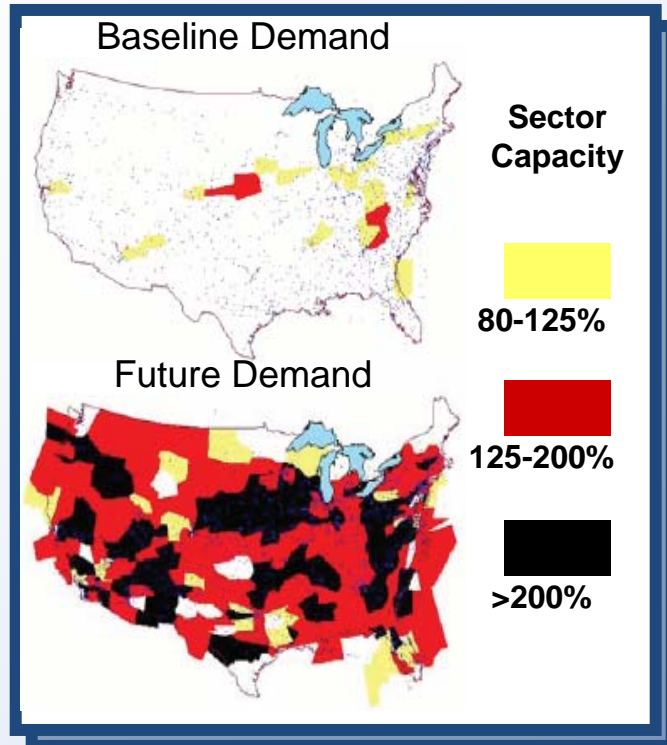
Surface Transportation

- The impacts of adverse weather, annually, on the Nation's roads are significant
 - *7,400 deaths*
 - *1.4 million crashes*
 - *More than 600,000 injuries*
 - *\$42 billion in economic losses*



Impacts on Society

Air Transportation



➤ \$41B cost of Air Traffic Delays

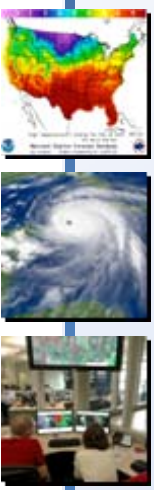
- *67% of delays are weather related 2/3 avoidable*
- *Improved Forecasts offer potential savings of \$18B annually*



Impacts on Society

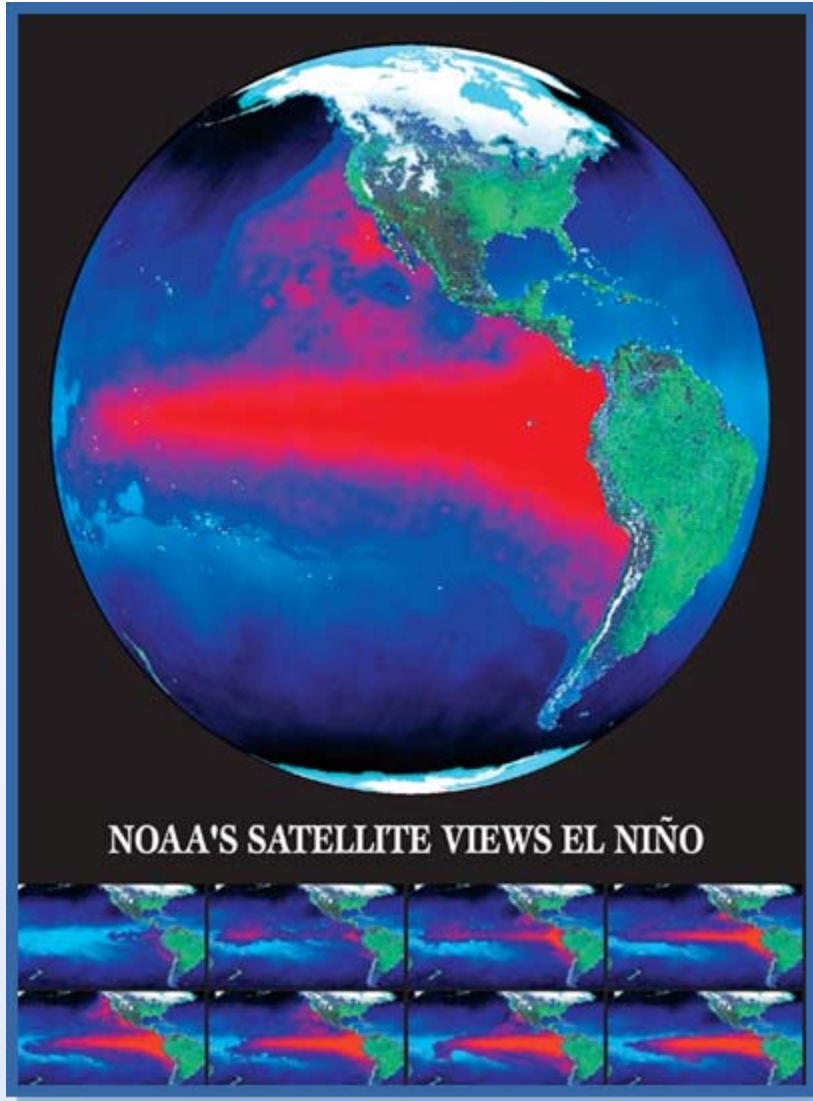
Solar Activity

- **Rapidly growing National need for Space Weather forecasts**
 - *Aviation – polar routes*
 - *GPS used in drilling, surveying, agriculture, aviation, DoD operations, much more*
 - *Space Operations – commercial space industry, commercial human space flight*



Impacts on Society

Climate Variability



Climate Services

➤ Seasonal Outlooks

- *Hurricanes*
- *Drought*
- *Precip/Temperature*
- *Spring Flood Outlook*

➤ Broad Societal Impacts

- *Agriculture*
- *Wildfires*
- *Energy*
- *Water resources*



Impacts on Society

Energy Resources

USATODAY.com

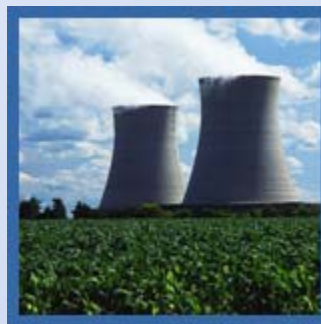
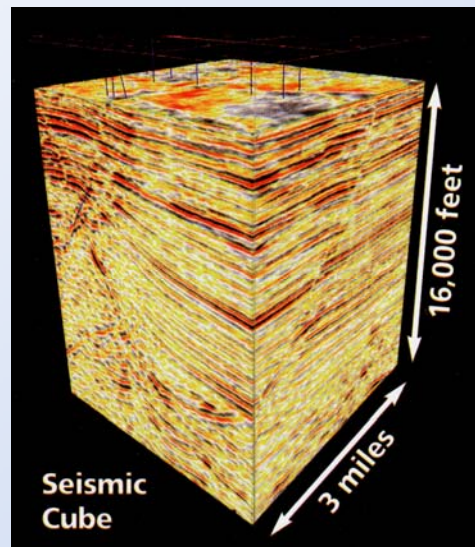
Money

06/19/2001 - Updated 09:29 AM ET

Forecast: 1 degree is worth \$1B in power savings

By Del Jones, USA TODAY

CHATTANOOGA, Tenn. — The annual cost of electricity could decrease by at least \$1 billion if the accuracy of weather forecasts improved 1 degree Fahrenheit.



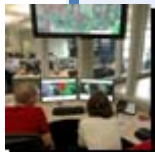
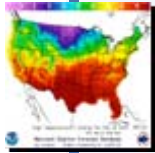
NWS Overview

Then...

Now...



National Weather Service
Protecting Lives and Property



NWS Overview

The average person only sees the tip of the iceberg

National Weather Service
Protecting Lives and Property

TV
Radio
NWR Internet
Private Weather Companies

**NATIONAL
WEATHER
SERVICE**

122 Weather Forecast Offices
Issue Local Forecasts &
Warnings

National Centers for Environmental Prediction

Model Simulations

Climate & Seasonal Outlooks

Aviation & Marine Forecasts

Storm & Tornado Prediction

Hurricane Forecasts

Space Weather Forecasts

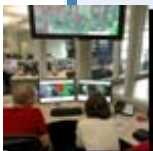
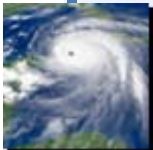
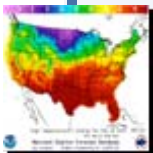
13 River Forecast Centers

Hydropower, Flood warnings

Irrigation, River Navigation

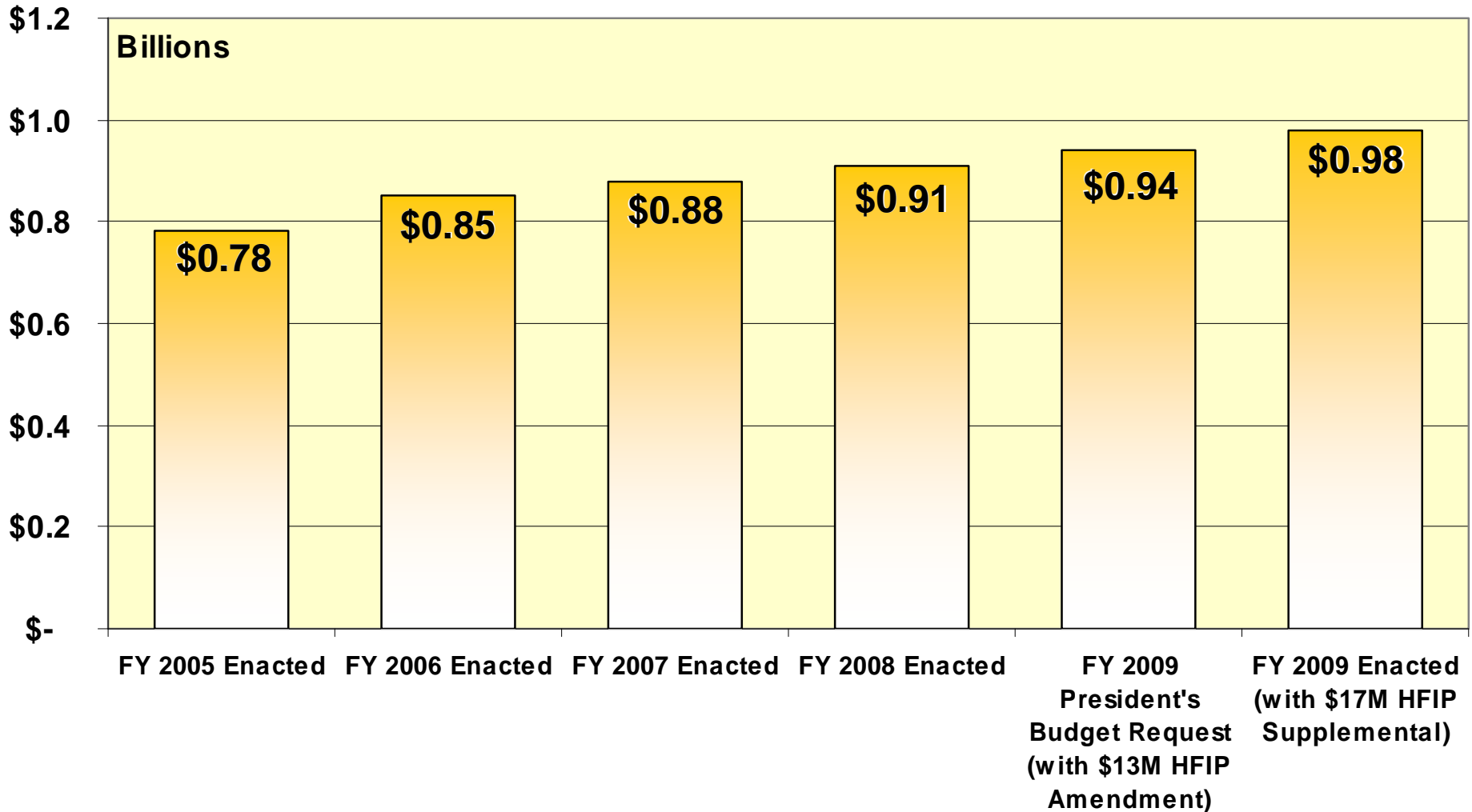
Observations

Radar Network, Satellites, Weather Balloons, Ground-level Observations at Airports, Aircraft, Lightning Network, Data Buoys, Stream Gauge Network, 11,000 Volunteer Daily-data Collectors, Thousands of Volunteer Storm Spotters

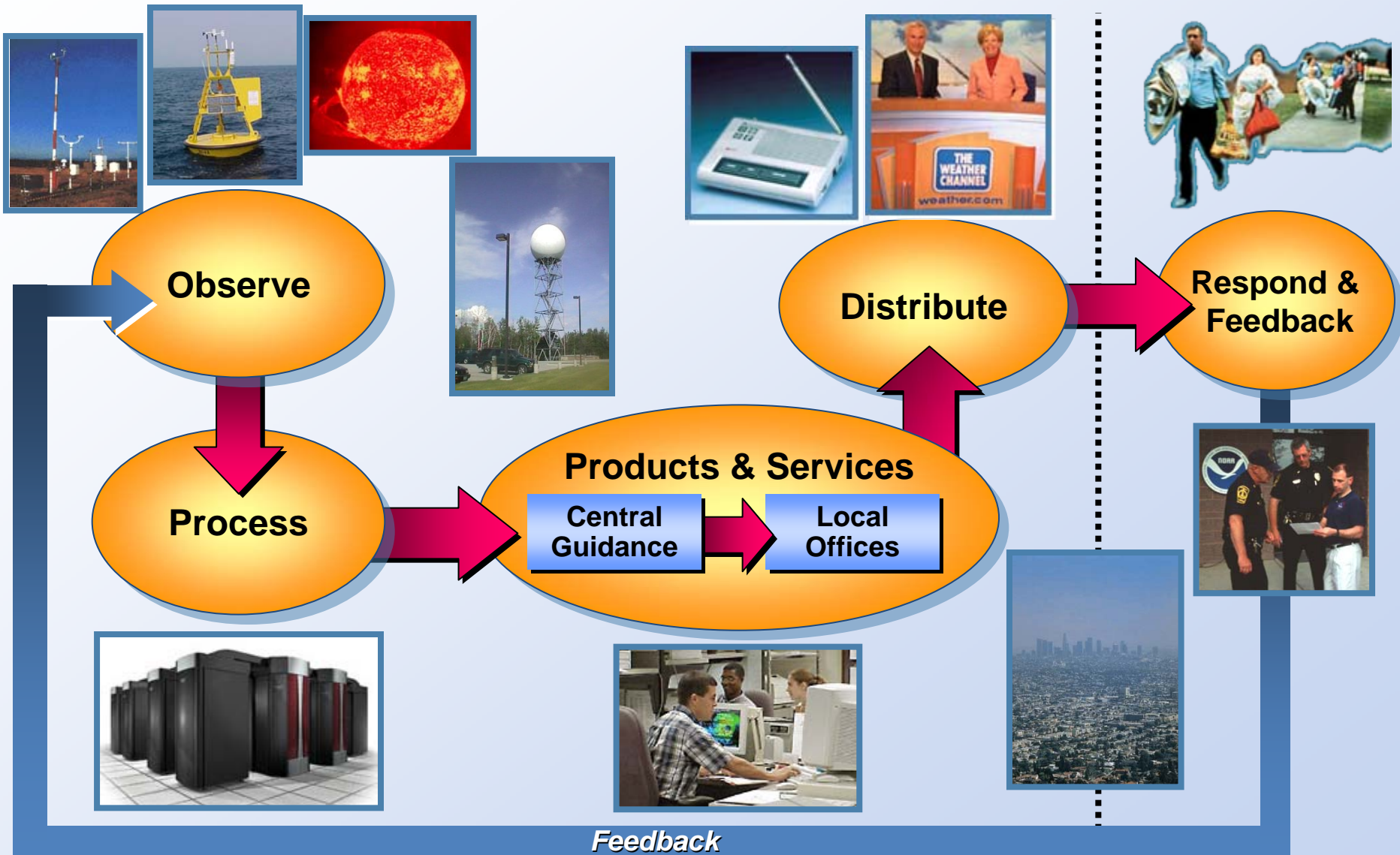


NWS Overview

Budget



NWS Overview



NWS Overview

National Weather Service
Protecting Lives and Property

Observe



ASOS—1,003



Coop Observers—11,000



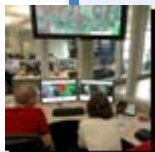
Buoys—204



NEXRAD—159



Satellites



NWS Overview

National Weather Service
Protecting Lives and Property

Process



High Performance Computing



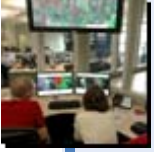
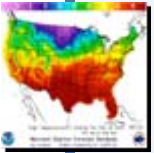
AWIPS



Telecommunications Gateway



Telecommunications NOAA net

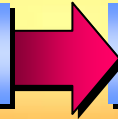


NWS Overview

National Weather Service
Protecting Lives and Property

Products & Services

Central
Guidance



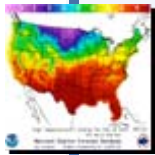
Local
Offices



NCEP Central Guidance

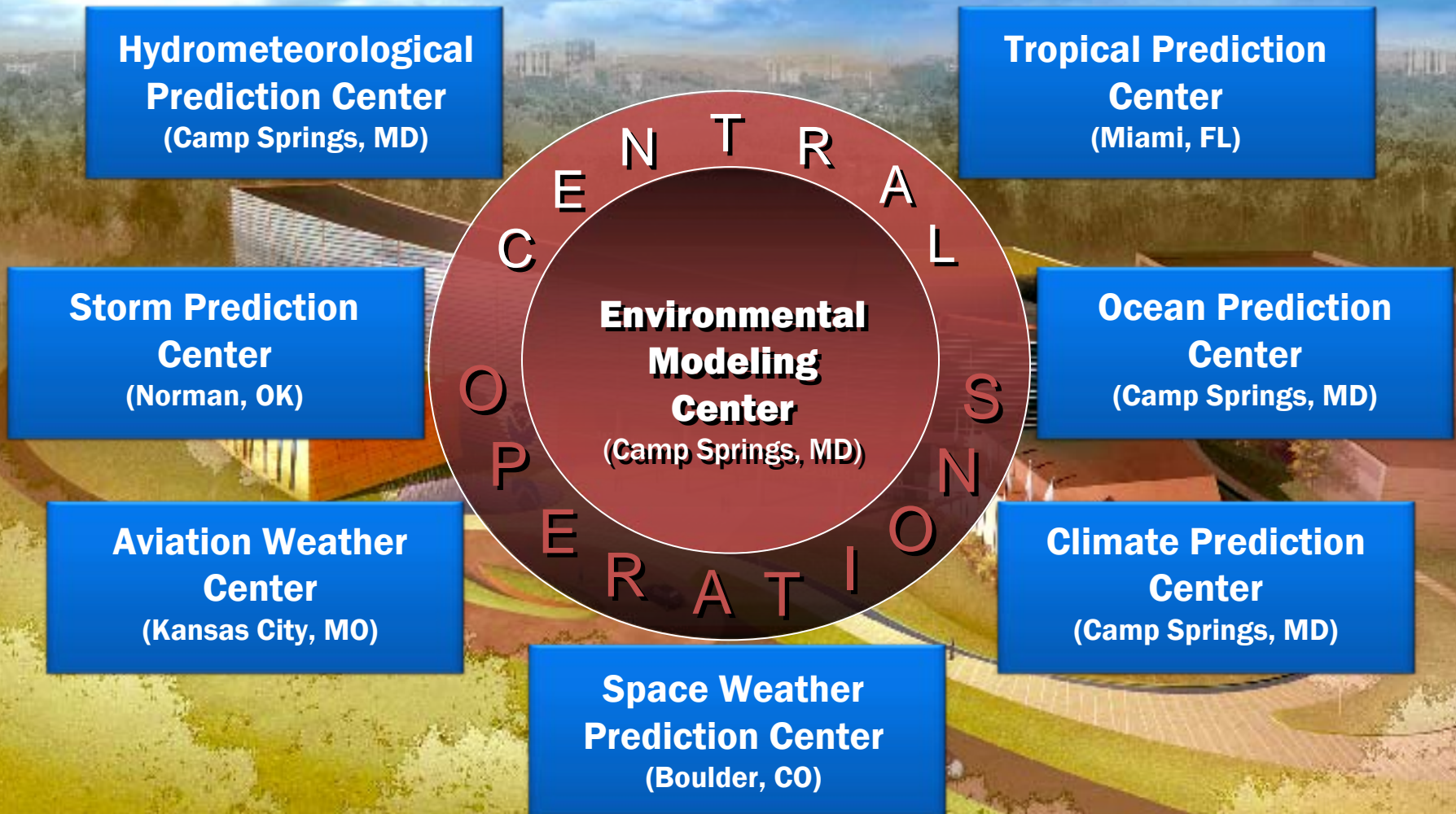


Local Offices
WFO/RFC



NWS Overview

NCEP-Centralized National Guidance



NWS Overview

Regional & Local

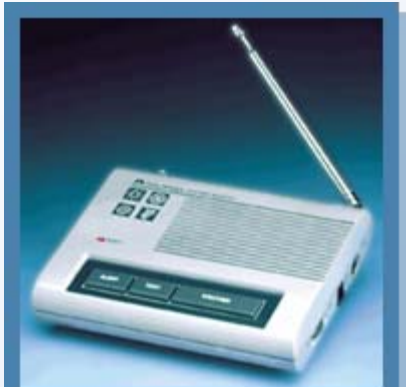
National Weather Service
Protecting Lives and Property



NWS Overview

National Weather Service
Protecting Lives and Property

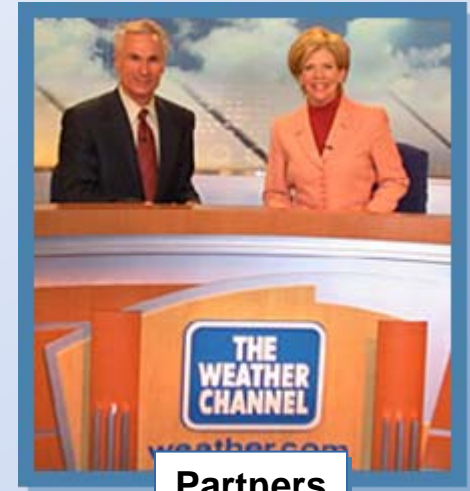
Distribute



NOAA Weather Radio
All Hazards



Internet



Partners

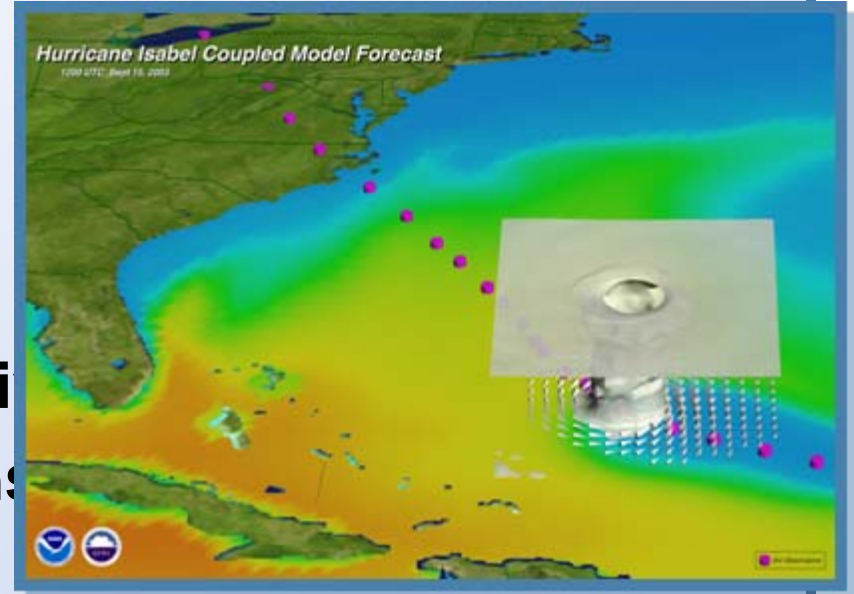


NWS Overview

NWS Next

➤ Key 2009 Goal: Update NWS Strategic Plan

- *Respond to:*
 - Anticipated National needs
 - One NOAA perspective
 - Enterprise operations
 - Partnerships
- *Target date:*
 - Fall 2009

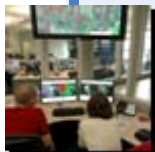
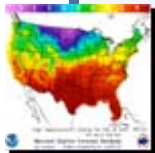


NWS Overview

NWS Next

Transformational Concepts

- **Focusing on decision support services**
- **Delivering customer-centric information**
- **Integrating and improving earth system models**
- **Implementing next generation science and technology**



Issues & Challenges

- **Hurricane Forecast Improvement Project**
- **Next Generation Air Transportation System**
- **Center Weather Service Units supporting FAA**
- **Water Resources**
- **NWS infrastructure**
 - *Buoy recapitalization*
- **IT Security**
 - *Space Weather Prediction Center*
- **Radar coverage in Pacific Northwest**

