

National Weather Service FY 2011 Budget Request

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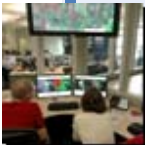
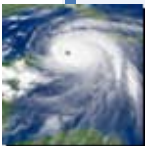
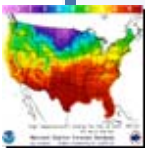
March 16, 2010

Silver Spring, MD



Outline

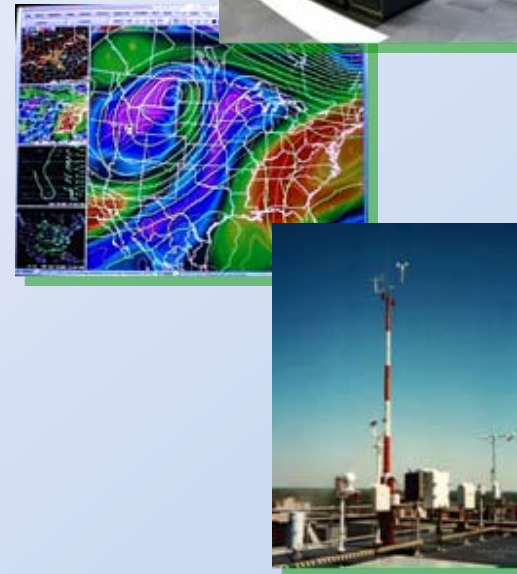
- **NWS Modernization & Its Impacts**
- **Key Trends**
- **FY 11 Budget Request**



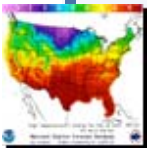
NWS Modernization

1970s...

1990s...



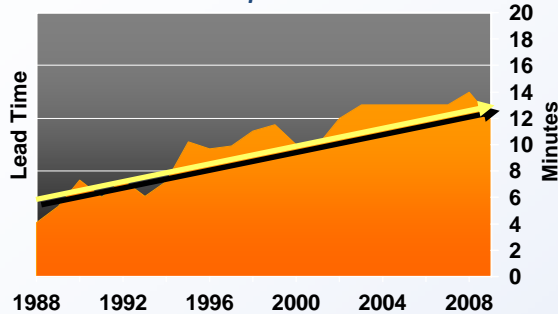
National Weather Service
Protecting Lives and Property



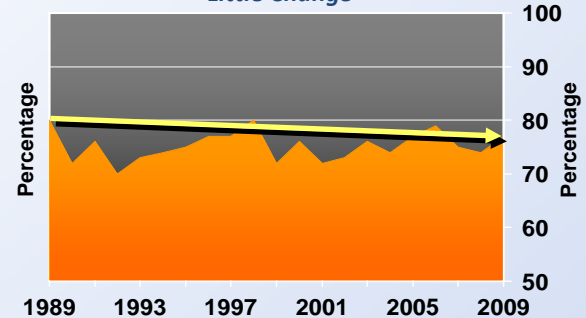
Return on Investment

National Weather Service
Protecting Lives and Property

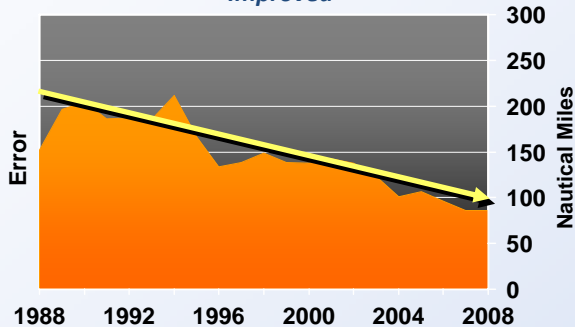
Tornado Warning Lead Time
Improved



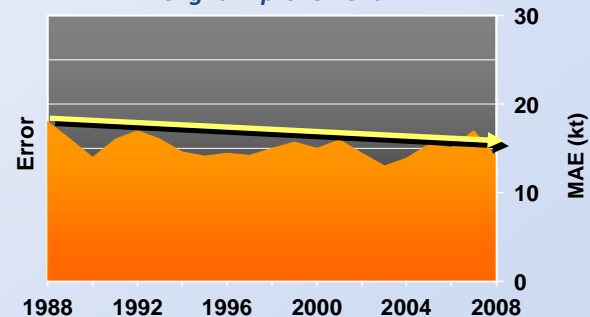
Tornado Warning FAR
Little Change



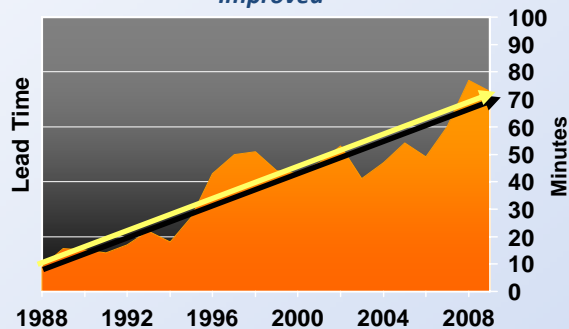
Hurricane Track Forecast
Improved



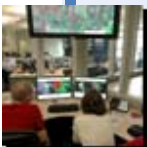
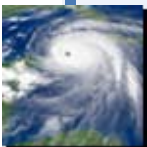
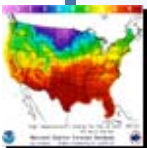
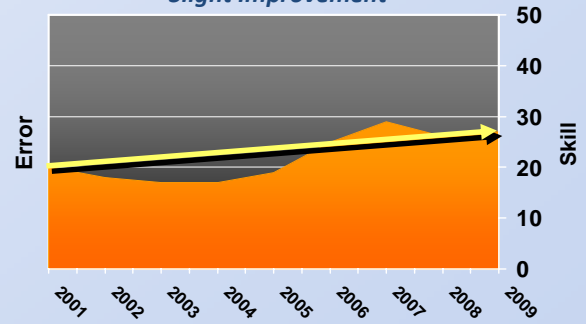
Hurricane Intensity Forecast
Slight Improvement



Flash Flood Warning Lead Time
Improved



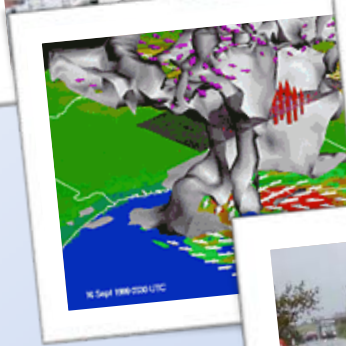
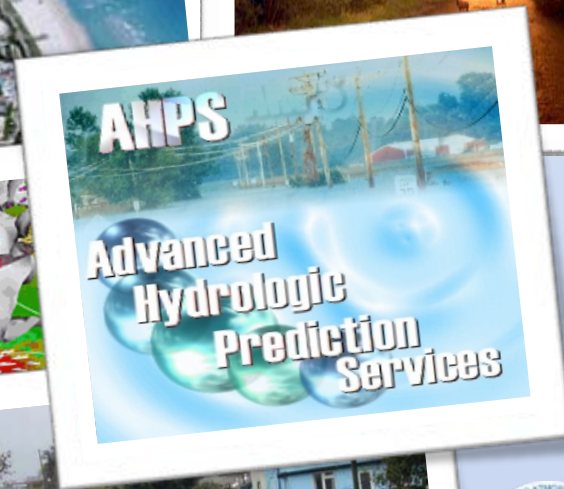
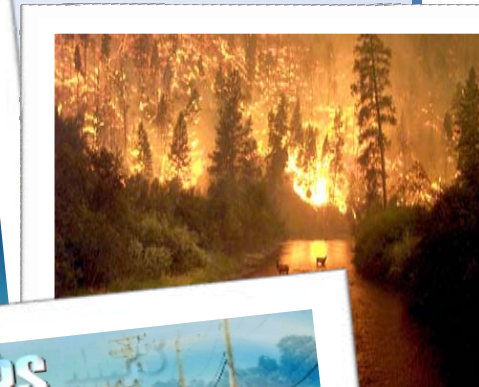
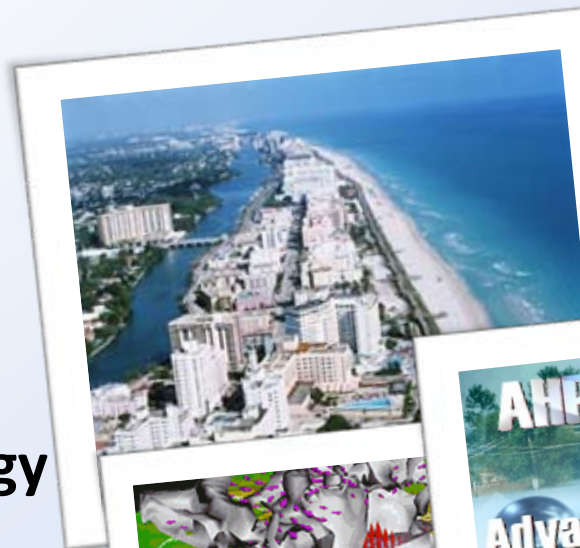
Seasonal Temperature Forecast
Slight Improvement



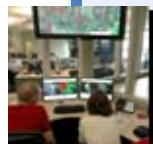
Key Trends

New Demands & Opportunities

- **Users needs growing**
 - *Demographic shifts*
 - *Changing climate*
 - *New vulnerabilities*
- **Science and technology continue to advance**
 - *Improved observations*
 - *Improved science*
 - *Improved information technology*



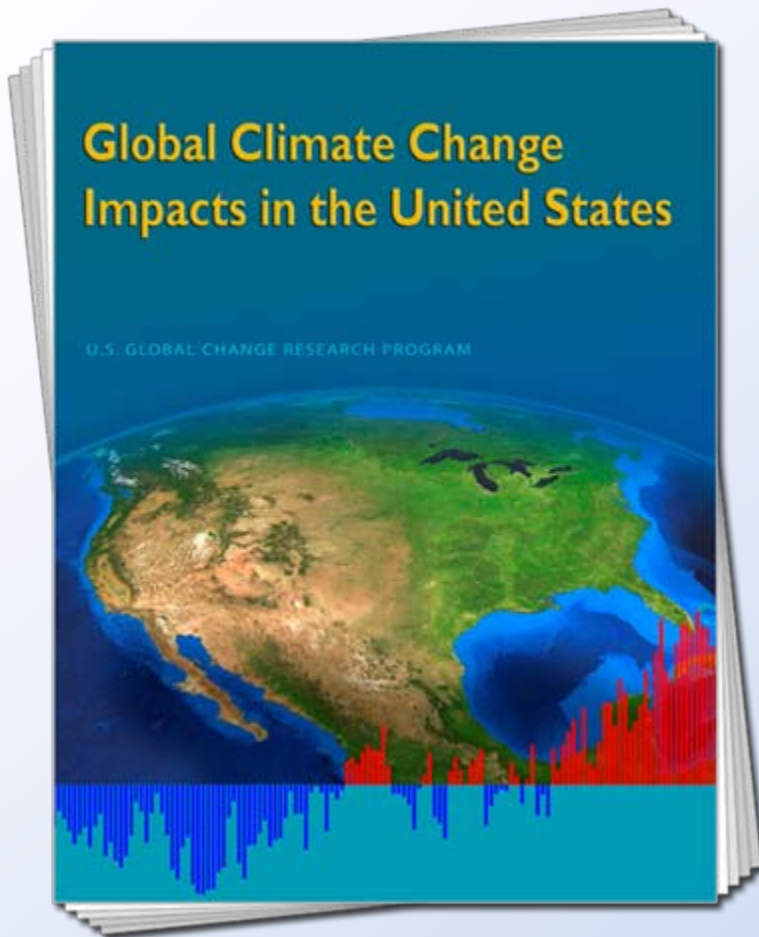
National Weather Service
Protecting Lives and Property



Key Trends: New Needs

Changing Climate

National Weather Service
Protecting Lives and Property



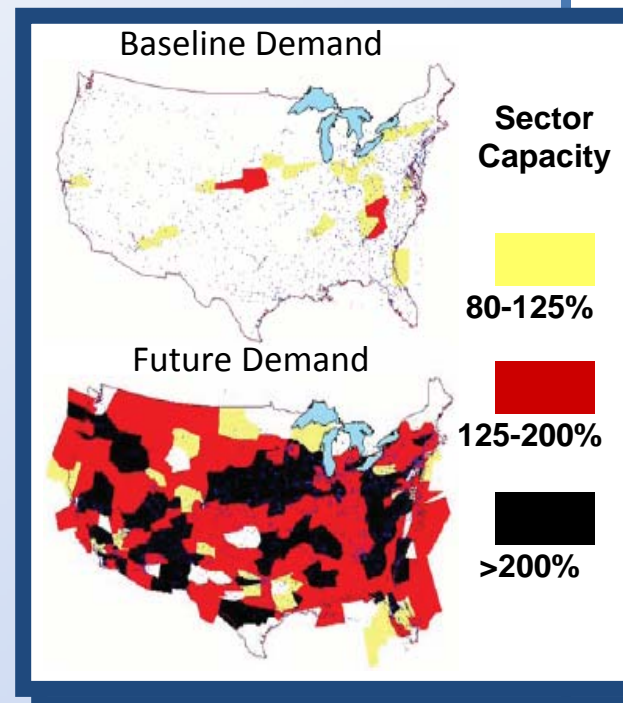
- **Societal Impacts**
 - *Agriculture*
 - *Wildfires*
 - *Energy*
 - *Water resources*
- **Seasonal Outlooks**
 - *Forecasts & warnings months in advance:*
 - **Hurricanes**
 - **Drought**
 - **Precip/Temperature**
 - **Spring Flood Outlook**
- **NOAA Climate Service**



Key Trends: New Needs

Increasing Air Traffic

- Air traffic doubling by 2025
- Delays cost \$41 billion/year
- 70% are weather related
 - *NextGen goal of 2/3 reduction with better weather services by 2025*
 - Requires more timely, accurate & consistent weather information



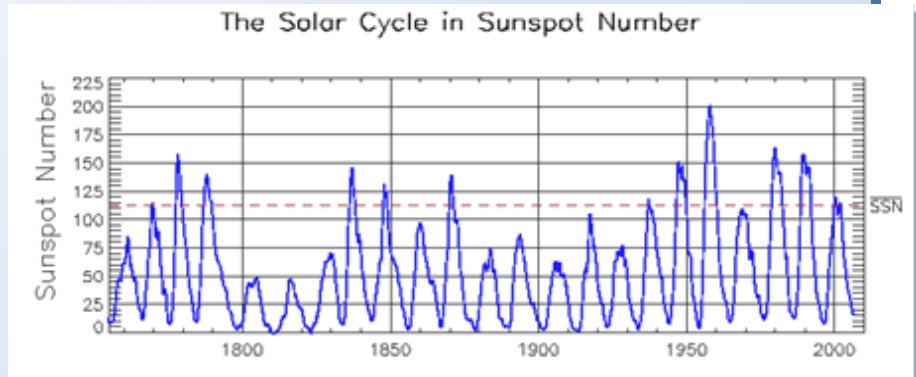
Key Trends: New Needs

Increasing Vulnerability to Solar Activity

- Next solar maximum is expected 2012-2013

- Space weather impacts:

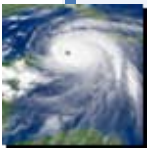
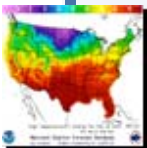
- U.S. Satellites
(GPS, Comms. etc.)
- Aviation
- Energy distribution
- Terrestrial Communication



- Lack of warning can disrupt:

- Satellites: national and economic sectors
- Aviation: radiation at poles
- Energy: disrupts power grids—potential regional blackouts

- **\$1-2 Trillion potential impact**



Key Trends: New Needs

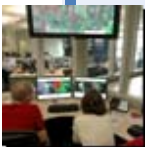
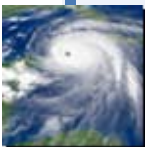
Energy Resources

➤ Administration Priority

- *Renewable Energy Initiative*
- *Goal: doubling our country's supply of renewable energy*

➤ NWS Role

- *Earth observations, models, and forecast services*
- *Partnership with private sector*

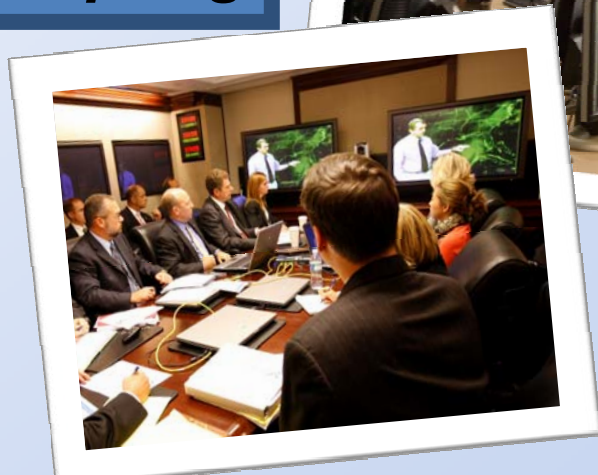


Key Trends

Looking Ahead

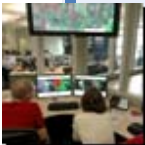
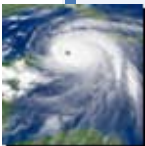
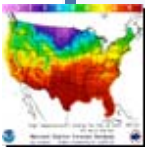
- **NWS Focus Areas:**
 - *Improving forecasts & warnings*
 - *Improving Decision Support Services*

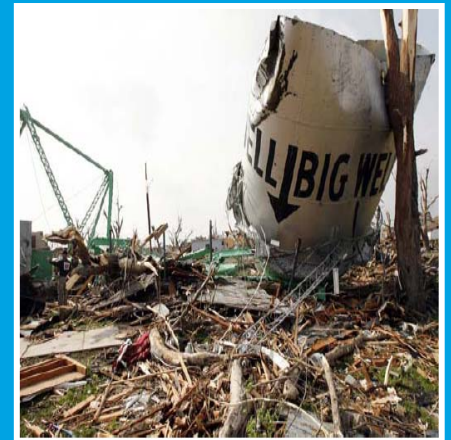
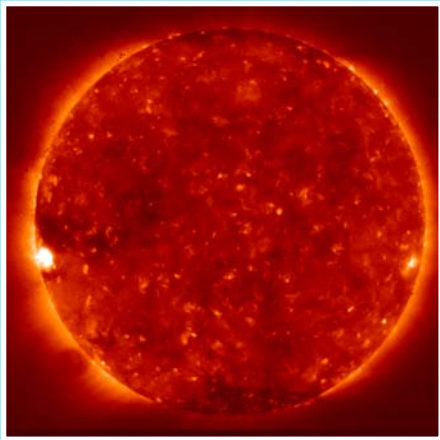
NWS Strategic Plan
Public Comment in Spring



Looking ahead- FY 2011

- **Improving Technology**
- **Improving Infrastructure**
- **Improving Services**





NATIONAL WEATHER SERVICE

FY 2011 President's Budget Request

March 16, 2010

Dr. John L. "Jack" Hayes



FY 2011 Budget Overview

FY 2011 Budget provides \$1,003.2M for NWS, a \$3.3M (0.3%) increase over the FY 2010 Enacted. Includes:

- \$14.6M for inflationary Adjustments to Base
- \$28.0M for Program Changes

This request supports the priorities of the Administration, Department of Commerce and NOAA. In meeting these priorities, NWS is:

- Investing in Science and Technology to provide a National common weather operating picture and provide a viable Space Weather System to transmit vital information on the upcoming solar maximum.
- Enhancing Timely & Accurate Weather Forecasts through investments in tornado, flood and winter storm forecasts improvements, warning dissemination systems, and in observational network maintenance.
- Funds improvements in aviation weather information in support of the Next Generation Air Transportation System (NextGen) identified in the President's "Strategy for American Innovation" as a key part of building a leading physical infrastructure to connect our people and businesses.



NWS

ADJUSTMENTS TO BASE (ATBS)

Calculated ATBs

Why \$18.1M increase

- Critical support for 122 nation-wide WFOs which provide, 24/7 weather information and warnings essential to the Nation's well being
- NWS operations budget is 65% labor
- Fund adjustments to current programs for NWS

What

- Funds the FY 2011 requested annual pay adjustment of 1.5%. (\$14.6M)



NWS Budget Change Table



Budget Line – Program Change	Program Change (\$ in millions)
Aviation Weather: Next Generation Air Transportation System	\$15.1
Weather Forecast Office Construction	\$3.2
NEXRAD – Product Improvement	\$3.2
Local Warnings & Forecasts Base - National Critical Space Weather System	\$2.0
Complete & Sustain NOAA Weather Radio	\$1.6
NOAA Profiler Conversion	\$2.2
NEXRAD - Operations and Maintenance	\$0.1
ASOS - Operations and Maintenance	\$0.2
AWIPS - Acquisition	\$0.4
Total NWS FY11 Program Changes	\$28.0

NEXT GENERATION AIR TRANSPORTATION SYSTEM



(\$ in millions)	FY 2010 Enacted	Terminations	Total ATBs	Program Change	FY 2011 President's Request
PPA: Aviation Weather	\$11.4	-	\$0.2	\$15.1	\$26.7
Next Generation Air Transportation System	\$11.4	-	\$0.2	\$15.1	\$26.7

Why

- Critical/Integral Aviation Weather component of the Administration's Priority to re-engineer the National Airspace System (NAS) to address increasing demand.
- Air traffic Delays cost the U.S. Economy over \$41B in 2007.
 - 70% of these delays are related to adverse weather accounting for \$29B.
 - With more timely, accurate & consistent weather information, 2/3 of these delays could be eliminated resulting in savings of \$19B per year.

What

- Improvements to aviation weather observations, analyses, and forecasts.
- Improvement of access to information.
- Integration of weather information into FAA and user decision support systems.
- Development of forecast verification capabilities.

NWS

NEXRAD PRODUCT IMPROVEMENT



(\$ in millions)	FY 2010 Enacted	Terminations	Total ATBs	Program Change	FY 2011 President's Request
PPA: NEXRAD – Product Improvement	\$8.0	-	-	\$3.2	\$11.1

Why

- Dual Polarization technology will provide significant improvements in detection of severe weather events leading to increased severe weather warning lead times.
 - Improve tornado detection.
 - Increase precipitation estimation accuracy from $\pm 35\%$ to $\pm 20\%$, improve flash flood warning.
 - Improve probability of hail detection improves from 88% to 94%, decrease false alarm rate from 39% to 8%.
 - Improve winter weather warning including snow estimation and detection of rain-snow line.
- Estimated \$690M in annual benefit from better flash flood forecast and water management.

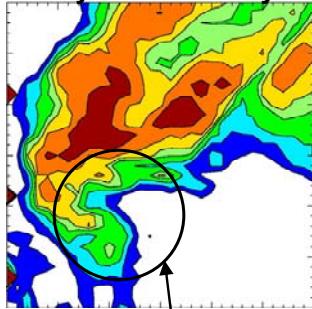
What

- Deploy Dual Polarization technology to all 122 operational NWS-NEXRADs.



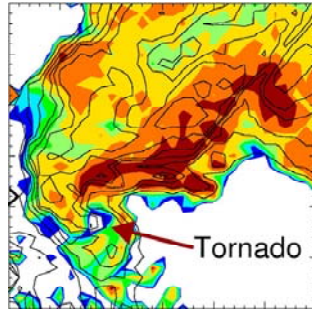
Specific Location of Tornadoes

Today's Reflectivity



Possible Tornado
Anywhere in Circle

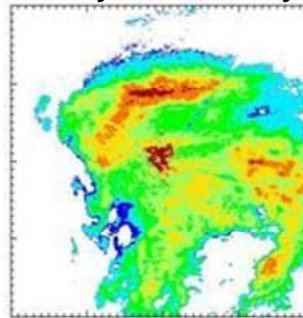
Dual Polarization Data



Actual Tornado
Debris Cloud

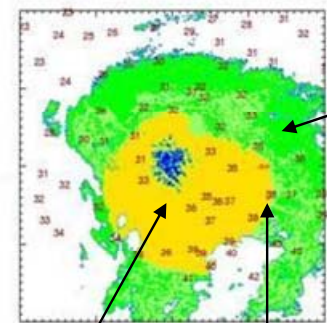
Better Rain/Snow Discrimination

Today's Reflectivity



Rain/Snow Line
Not Clear

Dual Polarization Data



Rain

Freezing
Rain

Snow



Dual Polarization Components

NWS

THE NATIONAL CRITICAL SPACE WEATHER SYSTEM



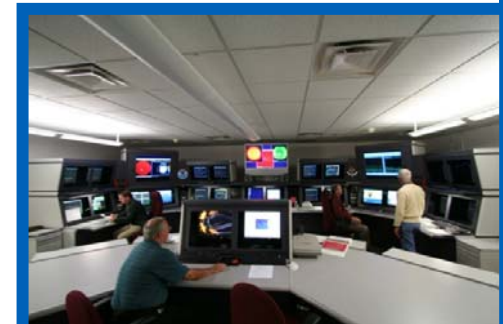
(\$ in millions)	FY 2010 Enacted	Terminations	Total ATBs	Program Change	FY 2011 President's Request
PPA: Local Warnings and Forecasts Base	\$617.8	-	\$16.5	\$2.0	\$636.4
National Critical Space Weather System	\$11.0	-	-	\$2.0	\$13.0

Why

- System provides timely and accurate critical space weather forecasts and warnings needed to protect our satellite constellations, power grids, and transportation and communication systems.
- Need for elimination of Information Technology security risks and modernization of obsolete equipment.
- Maintains viability of National Critical Space Weather System (SWS) in advance of the next Solar Maximum.
- System is operating under an interim Authority to Operate, loss of which would result in the shutdown of NOAA's space weather predictions and forecast program.

What

- Additional funding and redirection of base funds will be used to:
 - *acquire hardware and software for the Space Weather Forecast*
 - *Center backup, modernize hardware and software to support*
 - *satellite data ingest, and update unsupportable legacy software.*



NOAA's Space Weather Prediction Center

Summary



- ☑ Funds the development of the Weather Information Data Base - critical to the Administration's priority to NextGen and aviation weather.
- ☑ Funds National Critical Space Weather System Certification & Accreditation requirements—maintaining the criticality of the SWPC for the upcoming Solar Max.
- ☑ Restores WFO Construction program funding.
- ☑ Fully deploys NEXRAD Dual Polarization upgrade.
- ☑ Supports continuity of the Nation's "All Hazards Emergency Alert System"
- ☑ Continues the planned technology refresh and operating frequency conversion of the NOAA Profiler Network.



June 2009 funnel east of Williams, Iowa – Photo Credit: Mike Hollingshead

Where We're Going

Industry

- ✔ Improved characterization of current and future weather at finer scales
 - ✔ *Better observations*
 - ✔ *Better models*
 - ✔ *Better data access*
- ✔ Will lead to huge productivity gains

Emergency Managers

- ✔ Improved decision support services
- ✔ Forecast office of the future
- ✔ Better collaboration tools
- ✔ Virtual on-demand connectivity

Public

- ✔ Better communication to elicit better response from the public
 - ✔ *Social sciences*
 - ✔ *Social media*
- ✔ Leads to better informed and capable public



