

NOAA's National Weather Service

*Building on Successes
...for our Future*

Jack Hayes

**NOAA Assistant Administrator For Weather Services and
National Weather Service Director**

AMS Annual Meeting

**24th Conference on
Interactive Information Processing Systems (IIPS)
for Meteorology, Oceanography, and Hydrology**



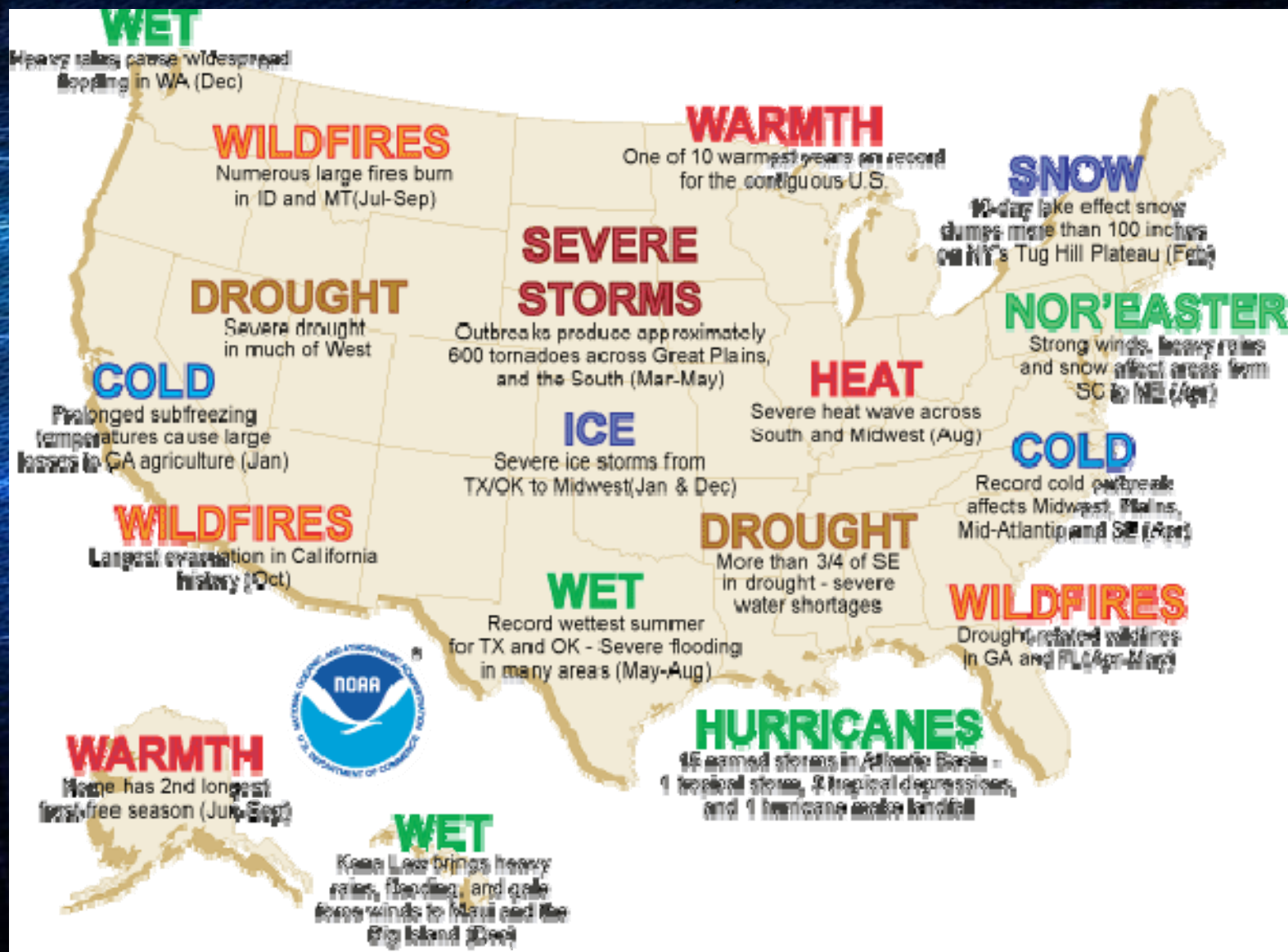
January 21, 2008

Overview

- 2007 top weather, water, climate stories
- 2007 report card
- 2007 accomplishments
- Where we're headed
 - *On the horizon*
 - *...And beyond*
- Research to applications

2007's Top Stories

Weather, Water, & Climate



2007's Top Stories: Weather, Water, & Climate

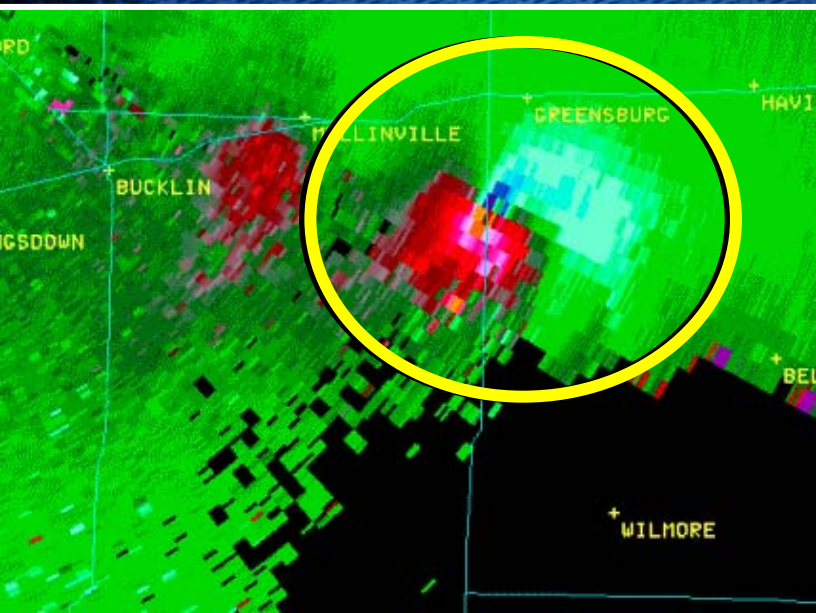
Winter Weather

- **February 3-12, 2007**
- **Northeast lake-effect winter storm**
- **10 days long**
- **100" of snow**



2007's Top Stories: Weather, Water, & Climate Tornadoes

- **May 4, 2007**
- **Greensburg, Kansas**
- **EF-5 tornado**

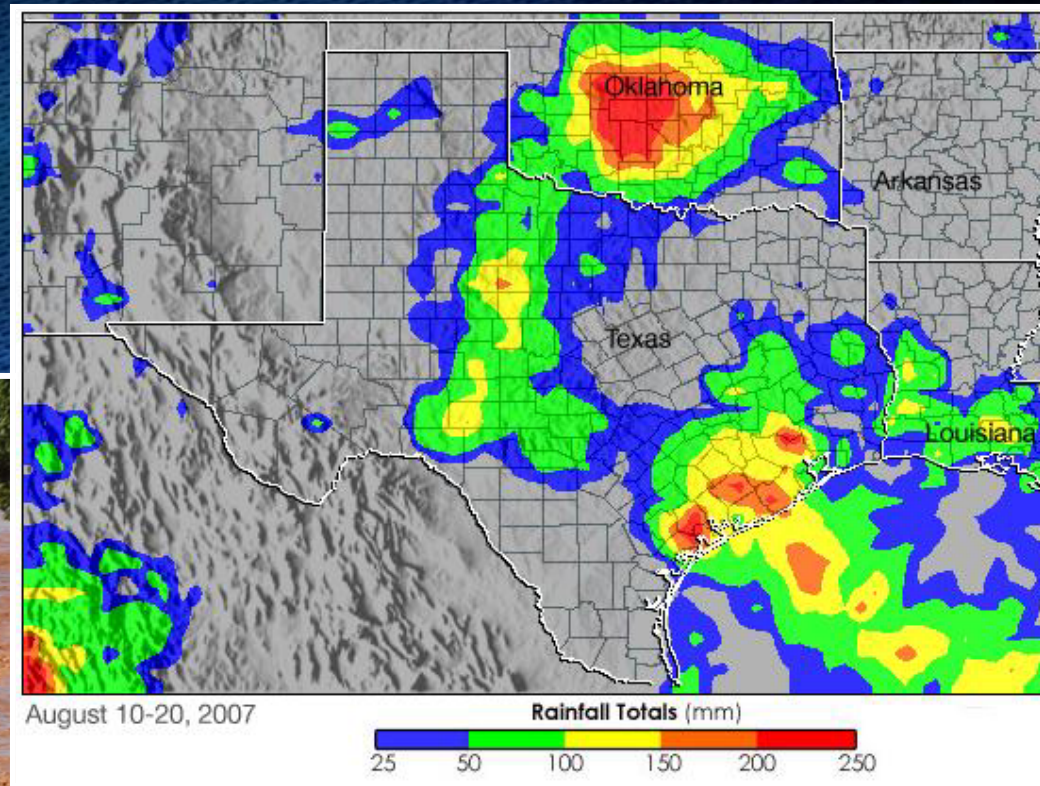


3rd Grade students of Greensburg volunteer by making new street signs for their town of Greensburg

2007's Top Stories: Weather, Water, & Climate

Texas, Oklahoma Flooding

- **May to August 2007**
- **Record wettest summer**



2007's Top Stories: Weather, Water, & Climate Fires

- **Late October 2007**
- **Calif. wildfires**
- **500,000 acres burned**

2007 nationwide: Over 9 million acres burned



2007's Top Stories: Weather, Water, & Climate

Pacific Northwest Storms

- Dec. 1-3 2007
- Ore. & Wash.
- Record-breaking winter storms



Dec. 2
Cape Blanco
Storm Watch



Trees snapped by hurricane force winds, North Oregon Coast.
(Austin Environmental/ODOT)



2007's Top Stories: Weather, Water, & Climate

Flash Floods and High Winds in Hawaii

- **Dec. 4-7, 2007 Kona Storm**

- *Kula District Flooding, Maui*

Waiohuli watershed debris flow. Flash flood warning lead time 4 hrs 51 mins.



Waiohuli watershed. 15 foot wall of water, mud and debris in Keokea.



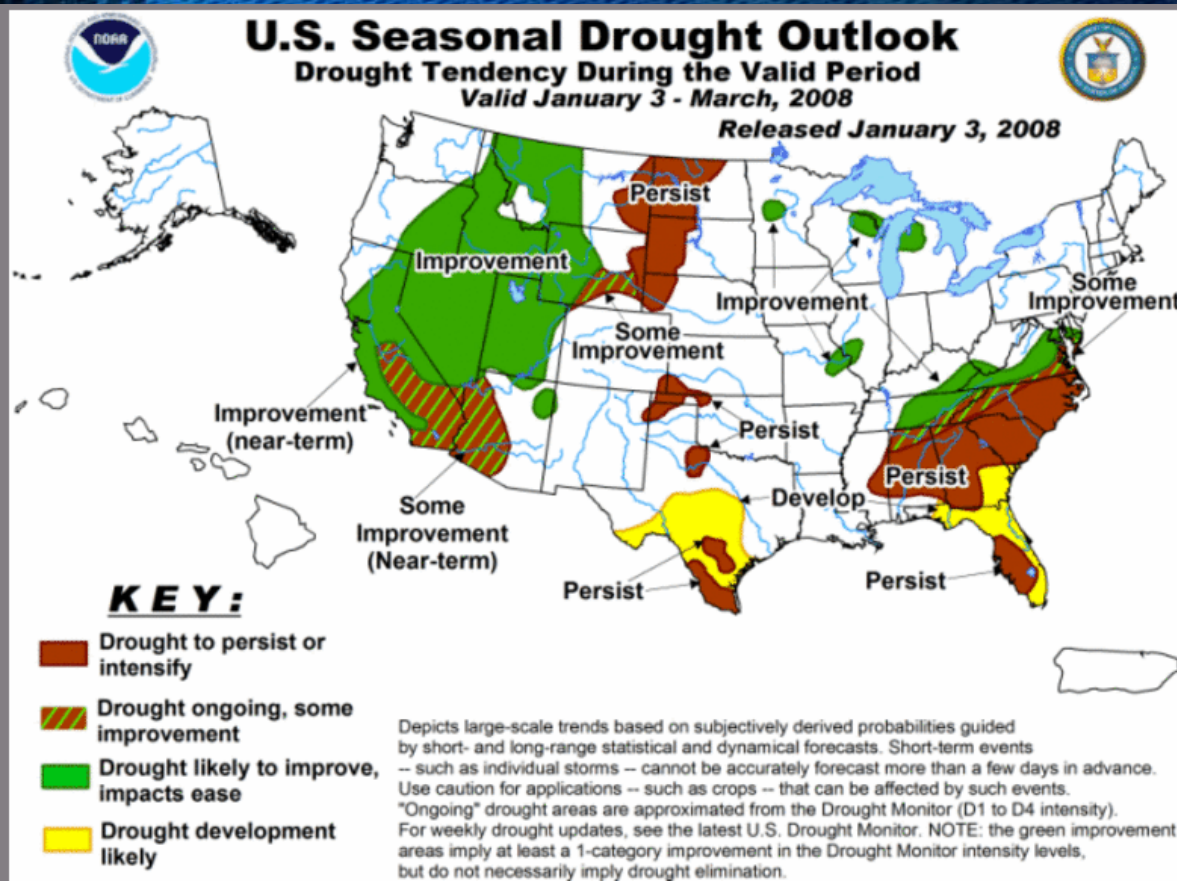
1 Keokea home swept off its foundation.

2007's Top Stories: Weather, Water, & Climate

Drought

- *Exceptional drought in S.E.*

- 2007 Drought
- N.C. driest year
- Ga. 4th driest



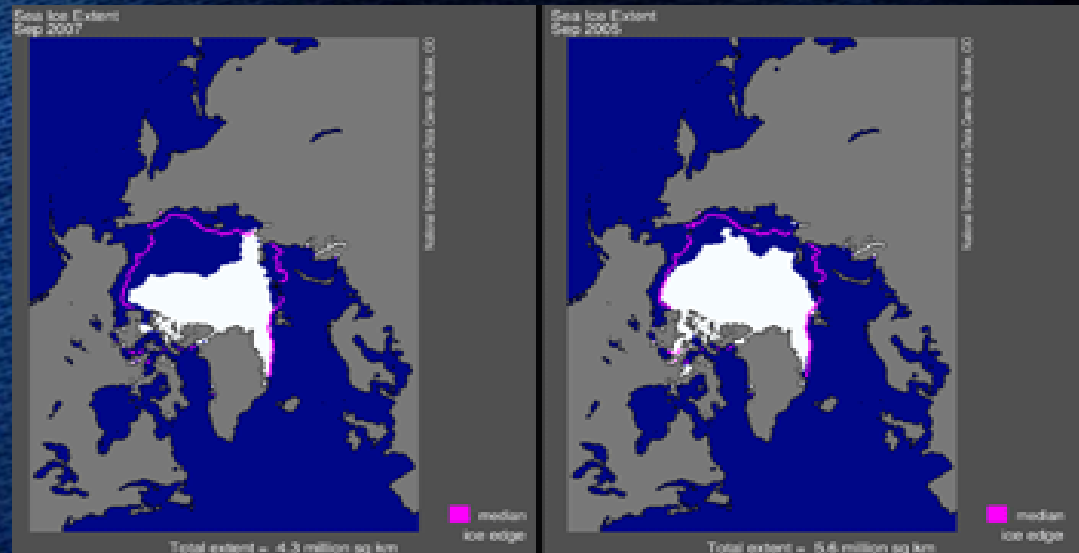
Lake Lanier in Buford, Ga.
(John Bazemore, AP)

2007's Top Stories: Weather, Water, & Climate

Alaska Events

- **Southeast Record Annual Snowfall**
- **Record Arctic Sea Ice Minimal Extent**

- Juneau Airport recorded 197.8 inches for the season
- 220% of average, old record 194.1 inches in 1964-65



- More than 4 times greater than previous record (Sept 2005)
- NW Passage completely open, first in recorded history

2007 Performance Report Cards

Hurricane Season Report Card

	Goal CY 2006	Actual CY 2006	Goal CY 2007	Actual CY 2007
Hurricane Track Forecasts (48-Hour Forecast Error, nm)	111	97	110	86 est.
Hurricane Intensity Error at 48 Hours (kts)	—	15.3 kts	—	18.5 kts

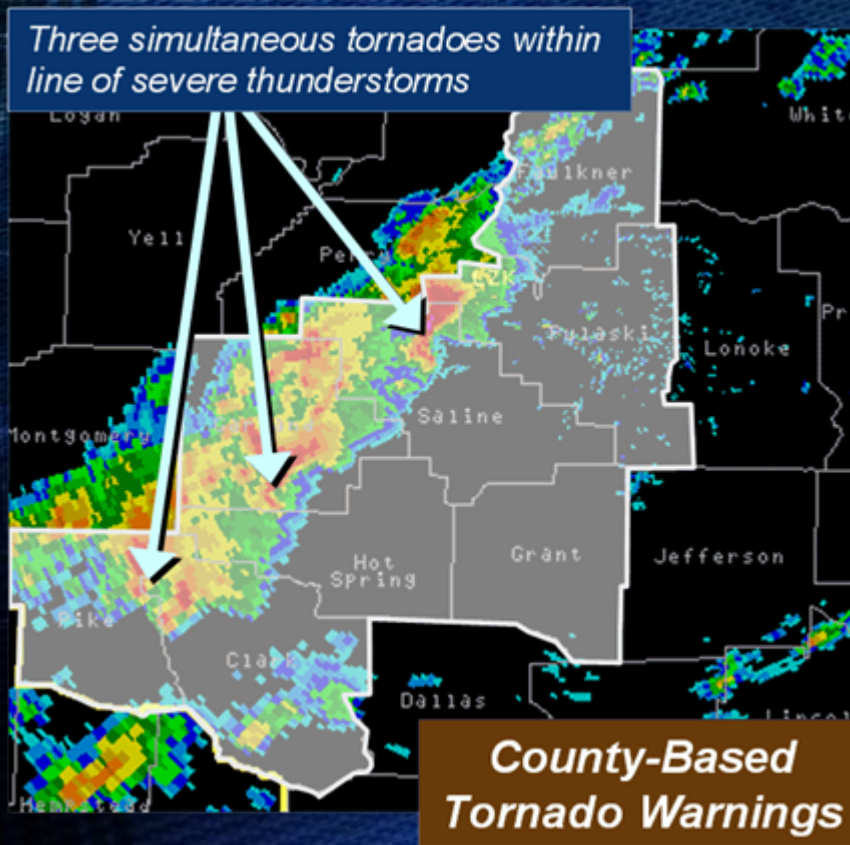
Severe Weather, Water Report Card

	Goal FY 2006	Actual FY 2006	Goal FY 2007	Actual FY 2007
Tornado Warnings - Lead Time (min)	13	13	13	13
Flash Flood Warnings - Lead Time (min)	48	49	48	60
Winter Storm Warnings - Accuracy (%)	90	89	90	92
Winter Storm Warnings - Lead Time (hours)	15	17	15	18

2007 Enhancements

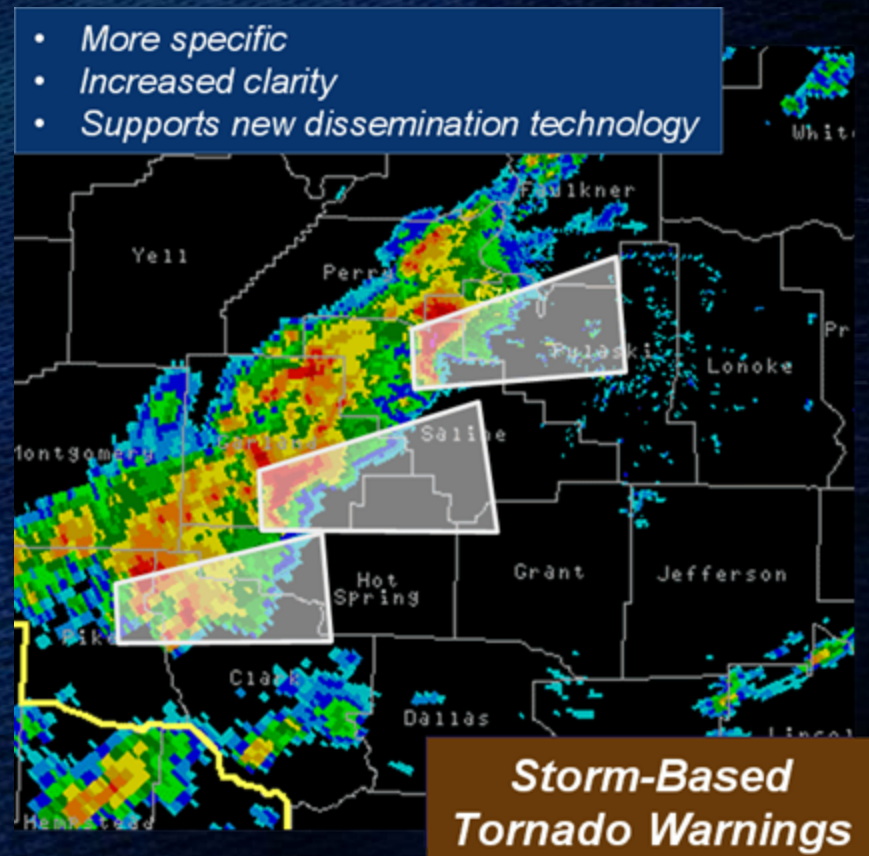
- More specific warning information for severe weather

Previously



8 Counties under warning
almost 1 million people warned

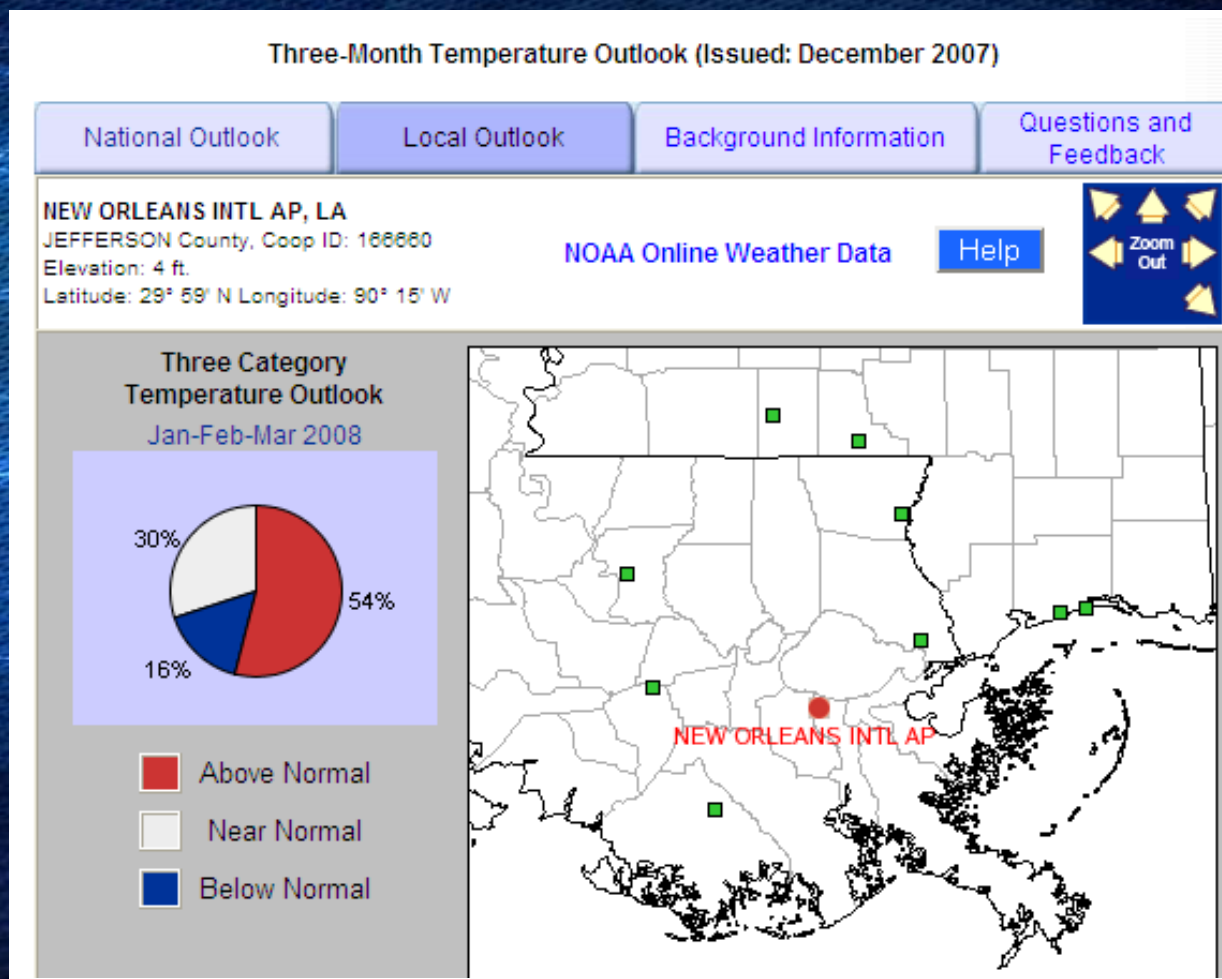
Currently



70% less area covered
~600,000 fewer people warned

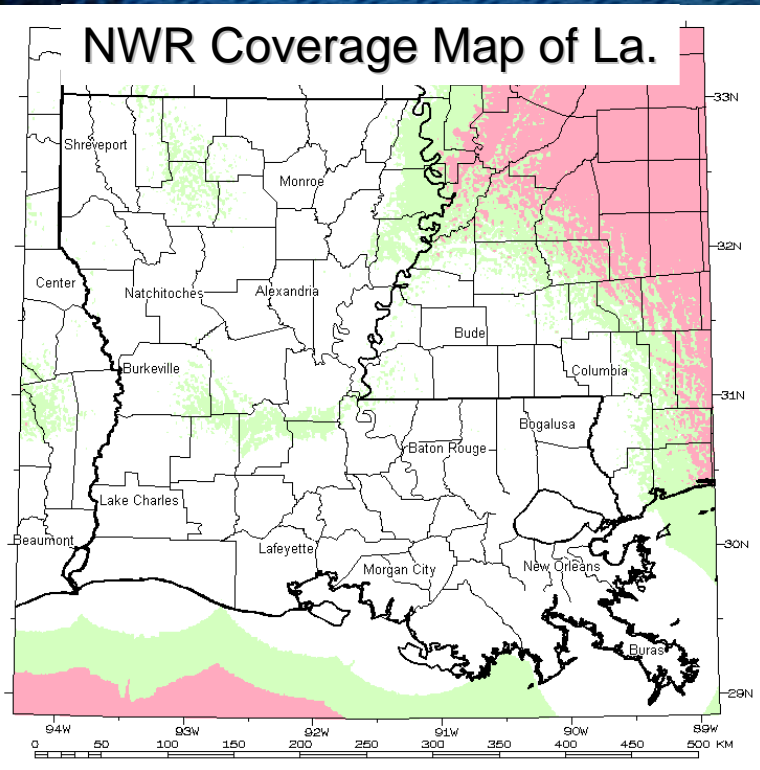
2007 Enhancements

- New 3-month Local Temperature Outlook product



2007 Enhancements

- Increased NOAA Weather Radio All Hazards coverage to 100% of high risk areas
- NWRs distributed to all public schools

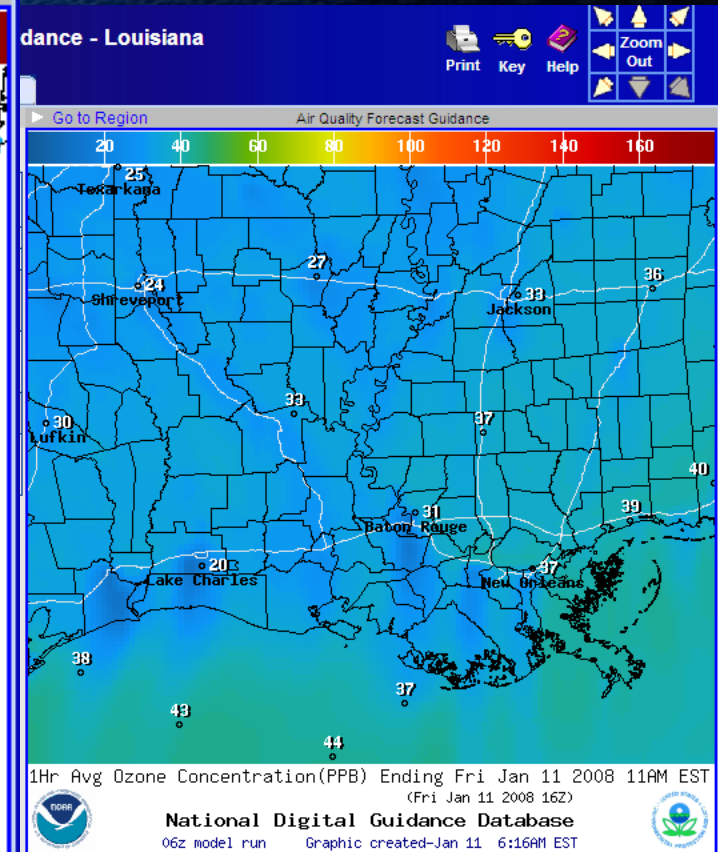
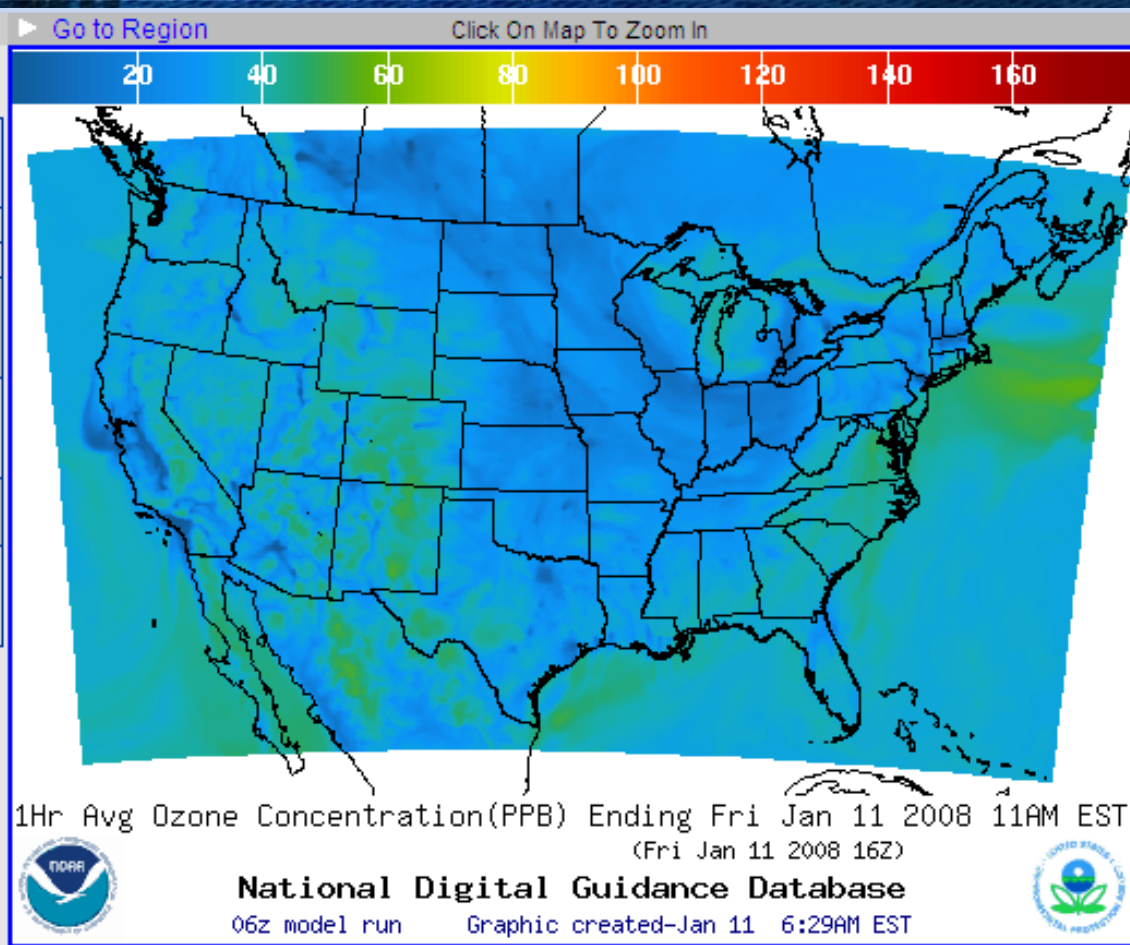


DOC, DHS, DOE Secretaries



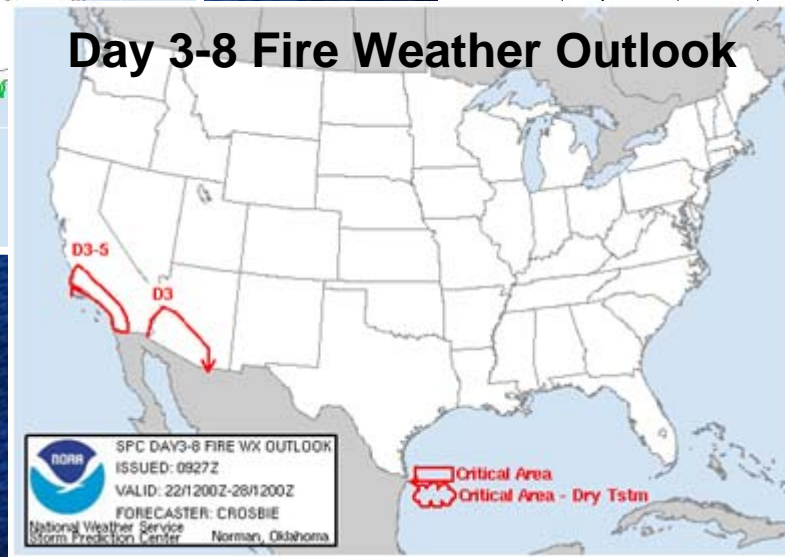
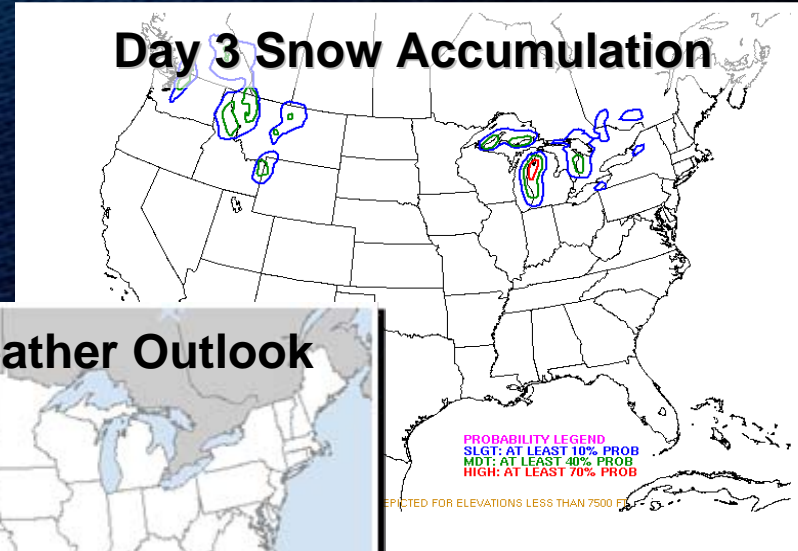
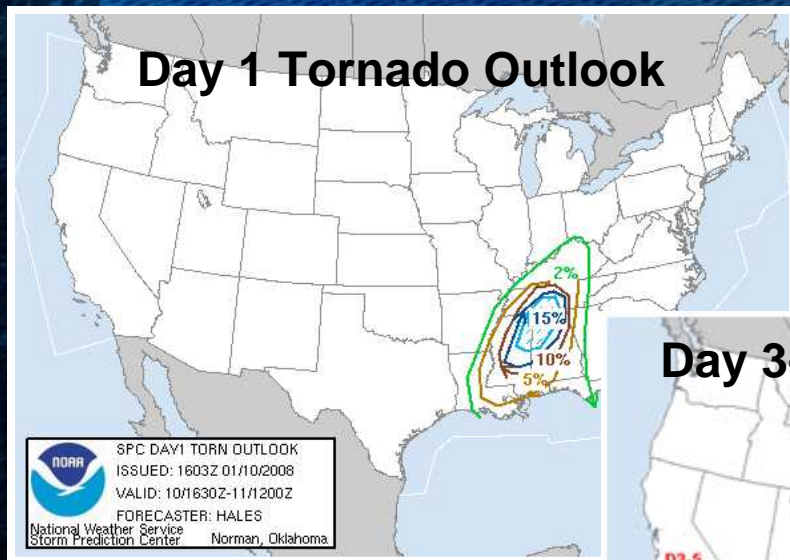
2007 Enhancements

- NOAA hourly Air Quality Ozone and Smoke Forecasts now available coast-to-coast



2007 Enhancements

- New Probabilistic Forecast Products (Convective Outlooks, Probabilistic Winter Weather)
- Fire Weather Outlooks

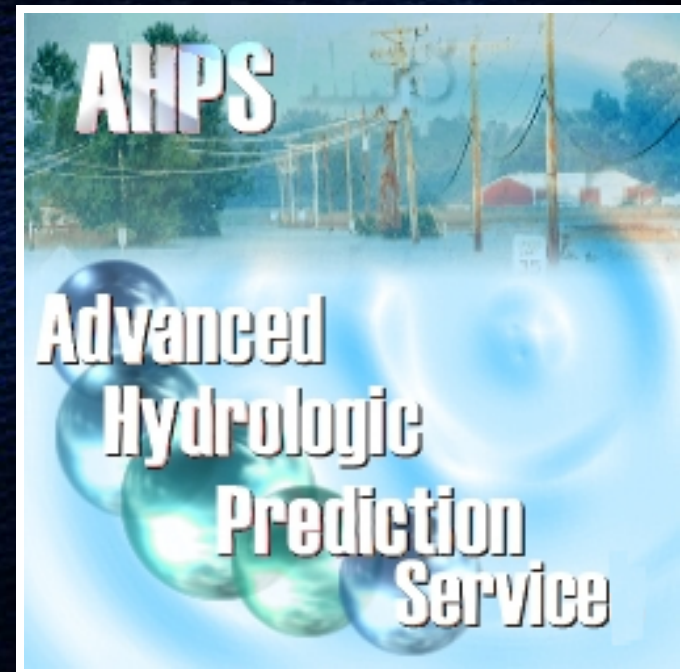


Where We're Headed

On the Horizon...

Products and Services

- **Common Alerting Protocol (CAP)**
- **AHPS Static Flood Inundation Map libraries**
- **Improved aviation services**
- **More products in GIS format**
- **More probabilistic products**

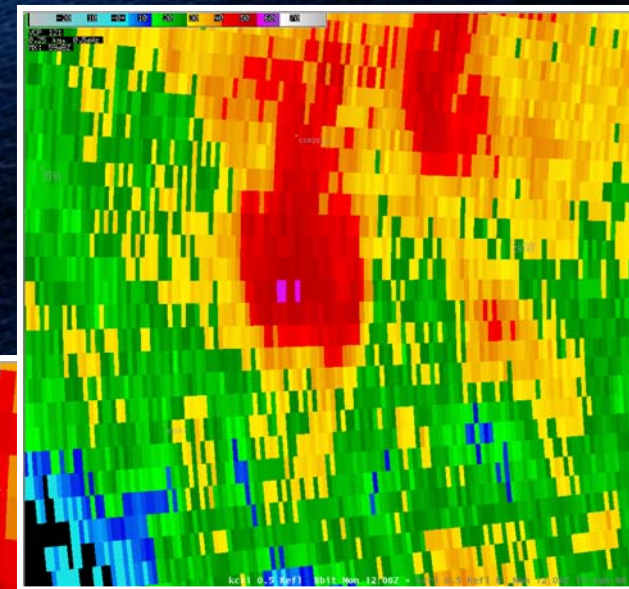
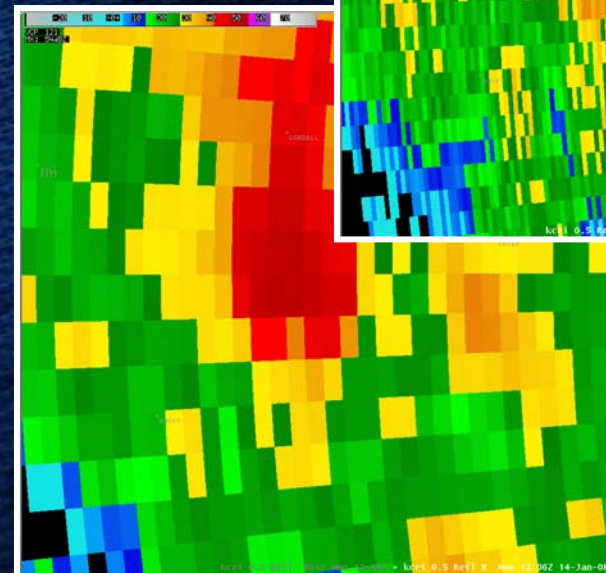


Where We're Headed

On the Horizon...

Enhanced Capabilities

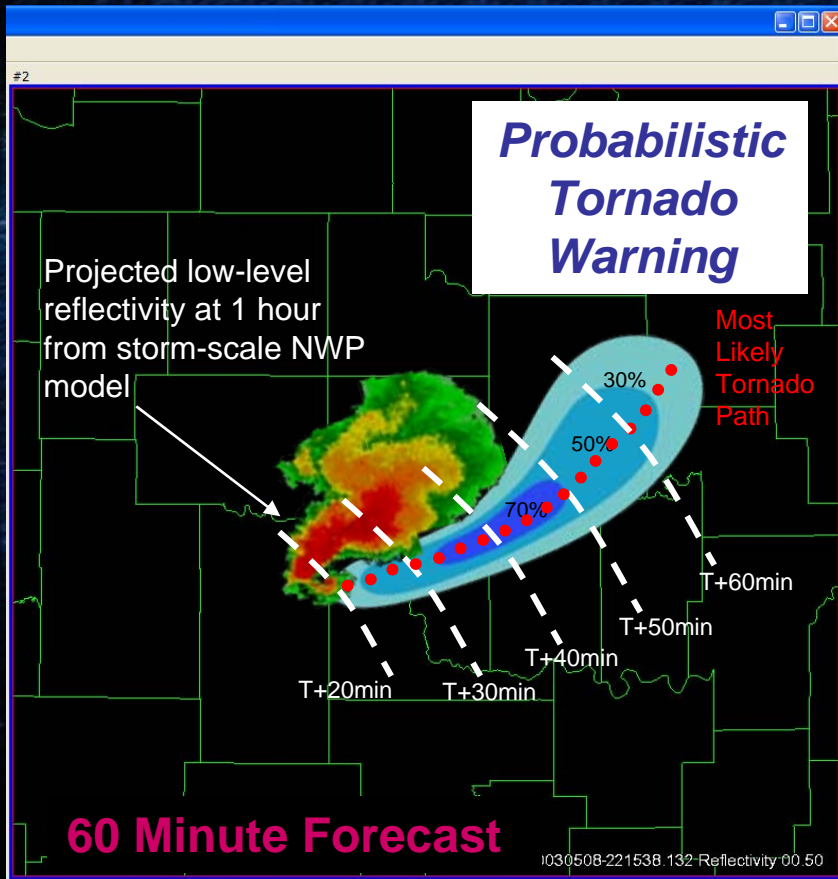
- Super resolution radar
- NOAA Center for Weather and Climate Prediction
- Wind profilers
- Water vapor sensors



Where We're Headed

...And Beyond

Storm-scale Model Forecast at 60 min



Severe Weather

- *Warn-On Forecasts: Tornado warning lead time increases from an average of 13 minutes today to as much as 1 hour*
- *Severe Thunderstorm Warning lead time increases from an average of 18 minutes to as much as 2 hours*

- **Enables Emergency Managers to energize community response**
- **Lives saved and millions in savings**

Where We're Headed

...And Beyond

Tropical Cyclone Services

- *Warning lead time for landfall increases from less than 24 hours to 3 days*
- *50% reduction in 48 hr intensity error (~8 kts)*
- *50% reduction in 48 hr track error (~50 nm)*



- **Saves lives/enhances public safety**
- **Improves response capability of emergency managers**
- **Mitigates property loss**
- **Economic impact increasingly complex (coastal development....)**

Where We're Headed

...And Beyond



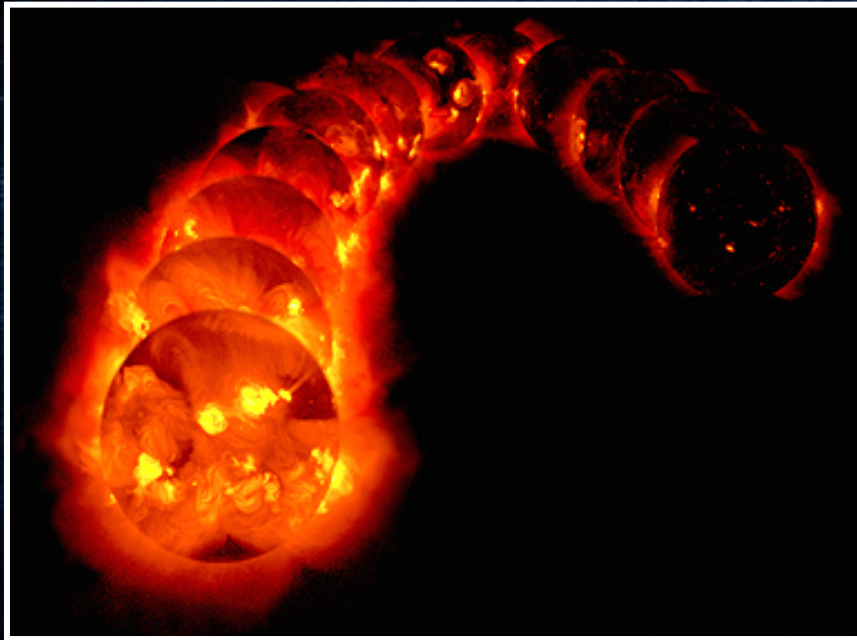
Aviation Weather Services

- *Aviation forecasts to exceed 80% accuracy*
- *New metric with FAA to determine weather impact on operations*
- *Weather support for Next Generation Air Transportation System*
 - 4D weather cube

- **FAA REDAC report indicates 2/3 of NAS weather delays Preventable—10% reduction translates to savings of \$600M/year**
- **Reduce general aviation weather-related fatalities by 25%**

Where We're Headed

...And Beyond



Space Weather Services

- *Seamless integration of space weather into our suite of products and services*
 - Meeting new space weather service needs of fast-growing customer base

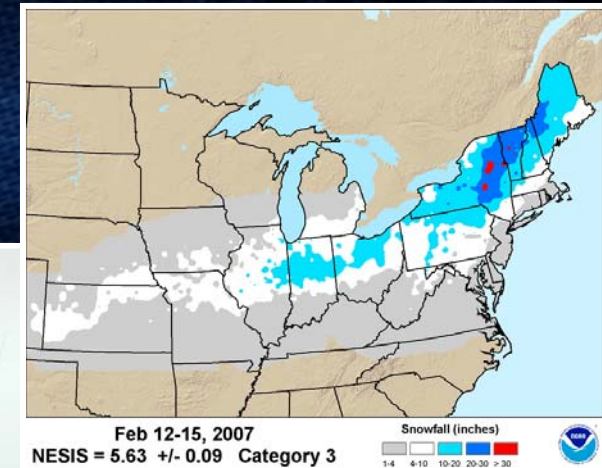
- **Building hazard-resilient communities is NOAA-wide priority**
- **High-tech communities should be hazard resilient as well**

Where We're Headed

...And Beyond

Winter Weather Services

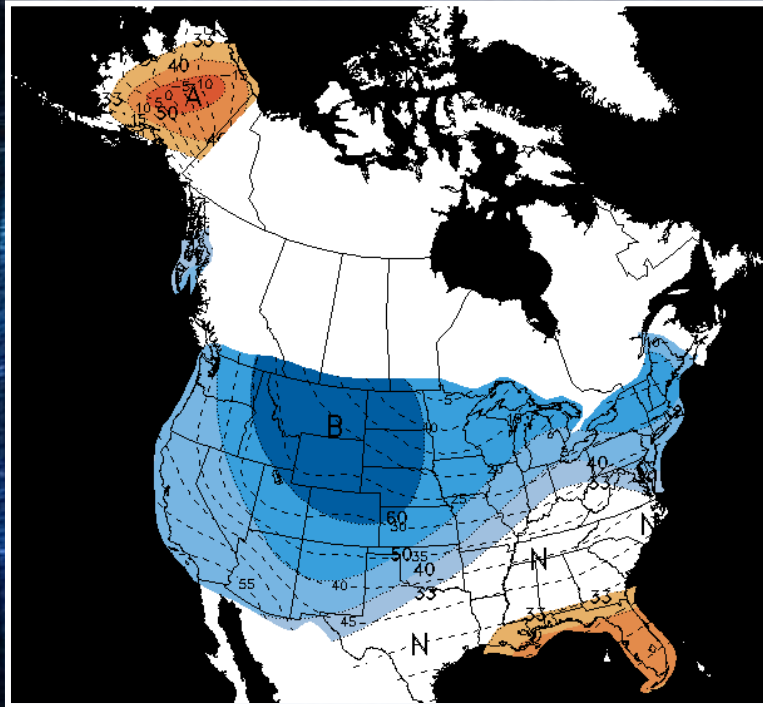
- *Warning lead time increases from an average of 18 hours to days*
- *Better forecast accuracy of storm onset and duration*



- **Reduce \$Billions in losses and improve safety for Air and Surface Transportation Ind.**
- **Better decisions by public prior to arrival of inclement Wx**

Where We're Headed

...And Beyond



Climate Services

- *Enhance products and services with climate change information*
- *Local outlooks for temperature, precipitation, El Niño/La Niña*
- *Seamless Climate, Water, and Weather products and services*

- **Reduce losses from wildfires**
- **Save lives and reduce property damages caused by major climate anomalies including drought**
- **Meet new needs with end-to-end suite of climate products and services**

Where We're Headed

...And Beyond

Water Resource Services

- *Provide high-resolution water quantity, quality, and soil moisture forecasts*
 - Emergency and resource managers mitigate losses for conditions ranging from droughts to floods



- **Enables NOAA to meet our Nation's growing needs for water forecasts**
- **Provides forecasts for consumption resources**
- **Provides important resource protection capabilities**

Where We're Headed

...And Beyond



Ecosystem Impact Information

- *Provide forecasts of weather, water, and climate impacts for management decisions*
 - Management decisions reflect relationships among humans, nonhuman species, and the environments in which they live

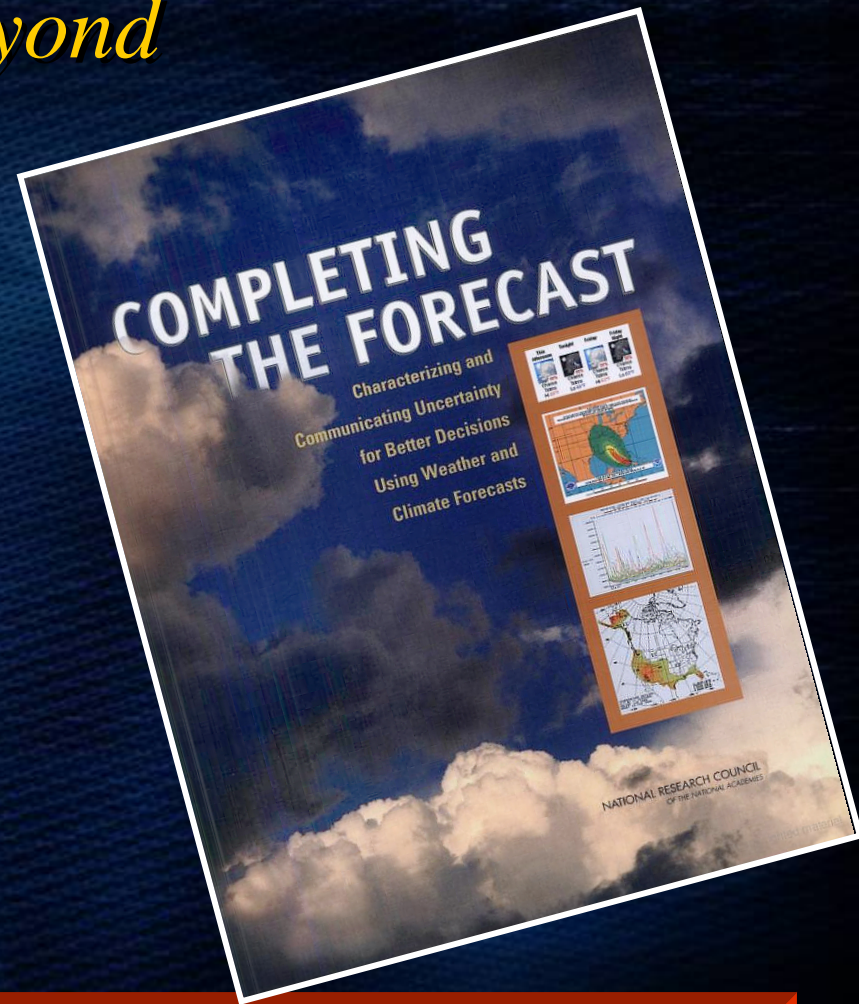
- **Benefits through innovative approaches to spill preparedness, response, damage assessments and restoration, NOAA contributes approximately \$75 million annual to the U.S. economy.**

Where We're Headed

...And Beyond

Forecast Uncertainty Information

- *Integral and essential part of all forecasts*
- *Enterprise-wide partnership to generate and communicate forecast uncertainty to decision makers and public*
- *Expressed in terms of probabilities*



- **Users decide whether to take action and appropriate level of response**
- **Thresholds unique to decision maker – based on mission risk**

Research to Applications

Needed Advances

● **Observations**

- *Improved spatial, temporal, spectral resolution (National Mesonet,...)*
- *Integrated surface, upper, ocean obs. (Next generation satellites,...)*

● **Modeling**

- *Fine scale, earth system, ensemble (HWRF,...)*

● **Forecast generation**

- *IT systems & applications (AWIPS II, 4D,...)*

● **Service delivery**

- *Decision support assistance (IMETs,...)*
- *Product dissemination (CAP, GIS,...)*

● **Training and customer education**

- *Weather Enterprise and public*



Working Together *...for our Future*



