

# State of NOAA's National Weather Service:

## Serving the Nation's Environmental Forecasting Needs

**Brig. Gen. David L. Johnson, USAF (Ret.)**  
***NOAA Assistant Administrator for Weather Services***

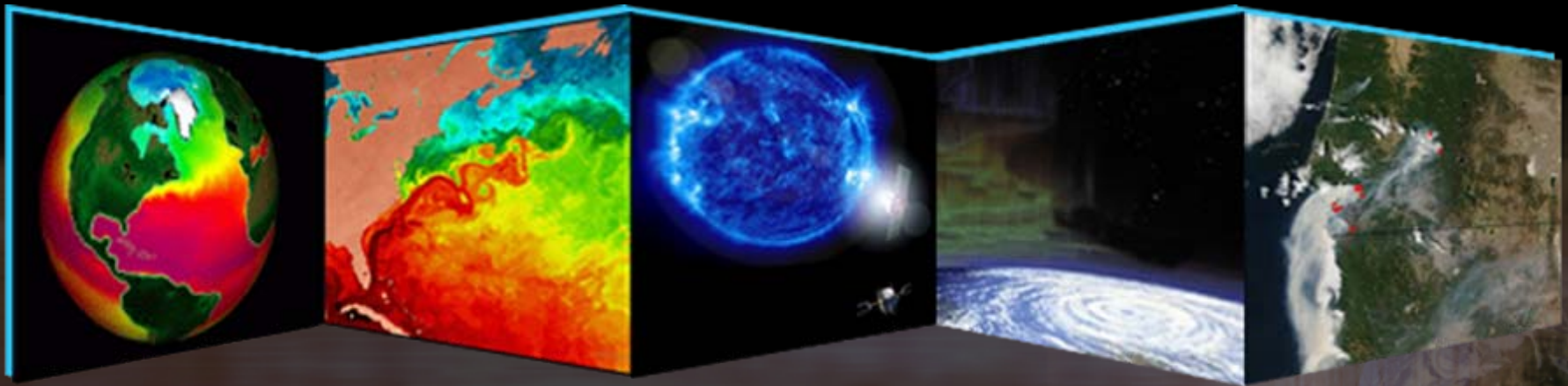
**AMS Annual Meeting**

***22nd International Conference on Interactive Information Processing Systems for  
Meteorology, Oceanography, and Hydrology  
January 30, 2006***

*"America's Weather Enterprise: Protecting Lives, Livelihoods, and Your Way of Life"*

# NOAA's National Weather Service *Presentation Overview*

- NOAA NWS Integrated Environmental Strategy
- 2005 in Review:
  - Extreme Climate, Weather, and Water
  - Service Improvement Progress
- The Weather Enterprise
  - *Partnership for America*

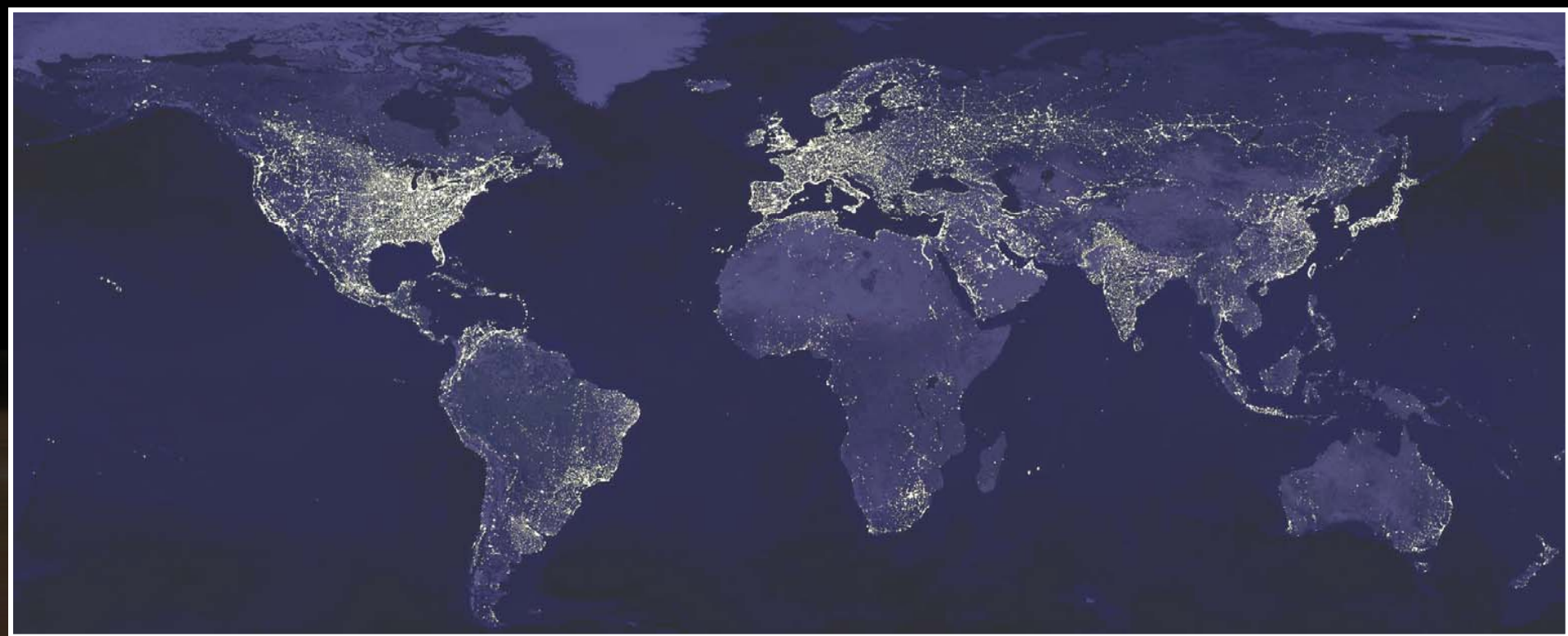


*“America’s Weather Enterprise: Protecting Lives, Livelihoods, and Your Way of Life”*

# NOAA NWS Integrated Environmental Strategy

## *Global Challenges*

*As society becomes more complex, we become more sensitive to natural and human induced variability.*



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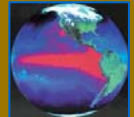
# NOAA NWS Integrated Environmental Strategy

## *Societal Benefits*

- **New observation systems will lead to 100-fold increase in data volume**
- **Increasing need for interdisciplinary use of data**
- **Integration of data among systems is needed to answer questions that address diverse societal benefits**
- **Current data management systems already face challenges**

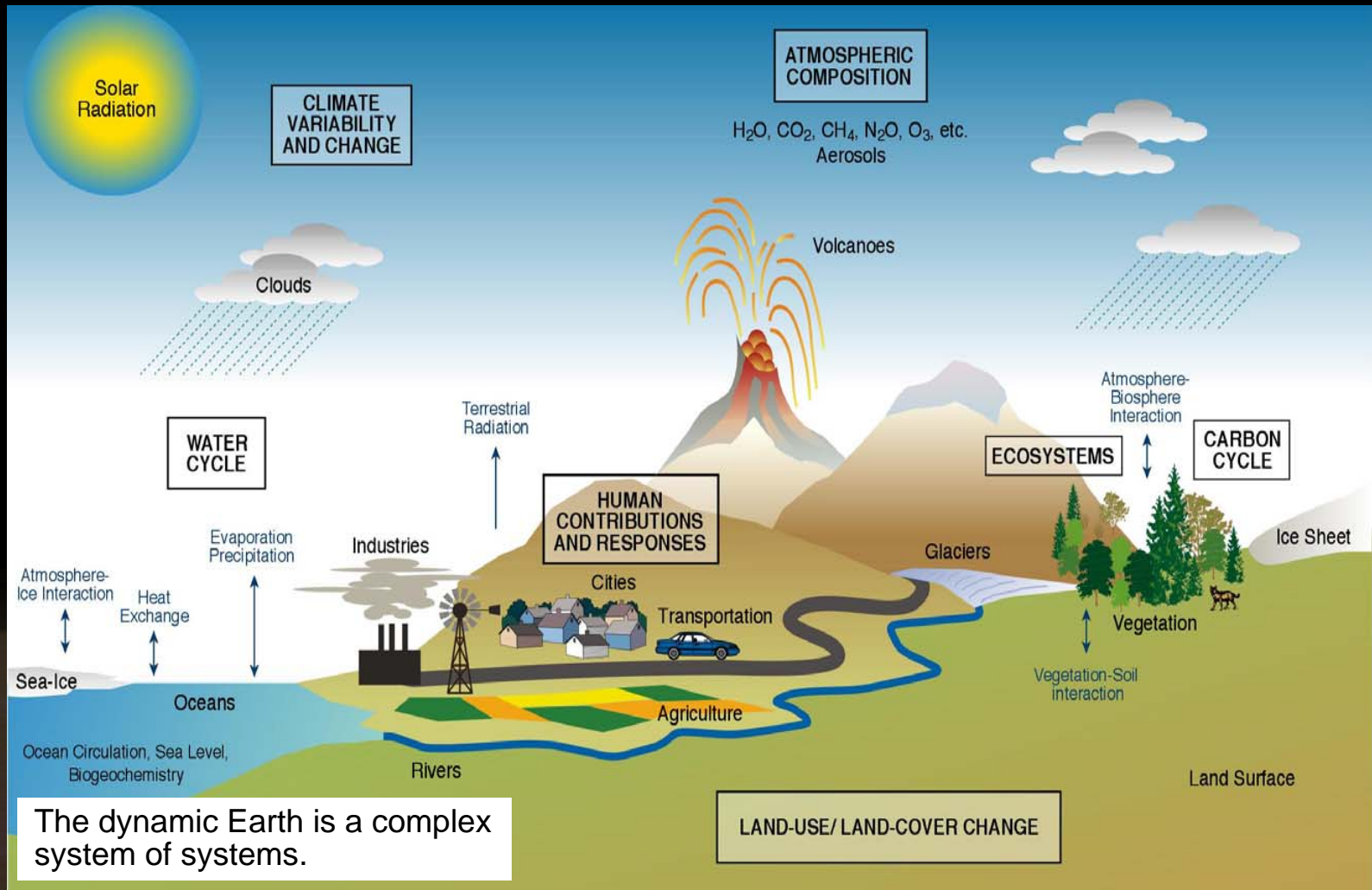
### Societal Benefits

- **Improve weather forecasting**
- **Reduce loss of life and property from disasters**
- **Protect and monitor our ocean resources**
- **Understand, assess, predict, mitigate and adapt to climate variability and change**
- **Support sustainable agriculture and combat land degradation**
- **Understand the effect of environmental factors on human health & well being**
- **Develop the capacity to make ecological forecasts**
- **Protect and monitor water resources**
- **Monitor and manage energy resources**



# NOAA NWS Integrated Environmental Strategy

## Total Environmental Awareness



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# NOAA NWS Integrated Environmental Strategy

## *End-to-End Process Management*

**NOAA Research Integration** 

Research      Information Technology      Data Assimilation      Dissemination



Observations      Modeling      Predictions      **Action**

 **Feedback**



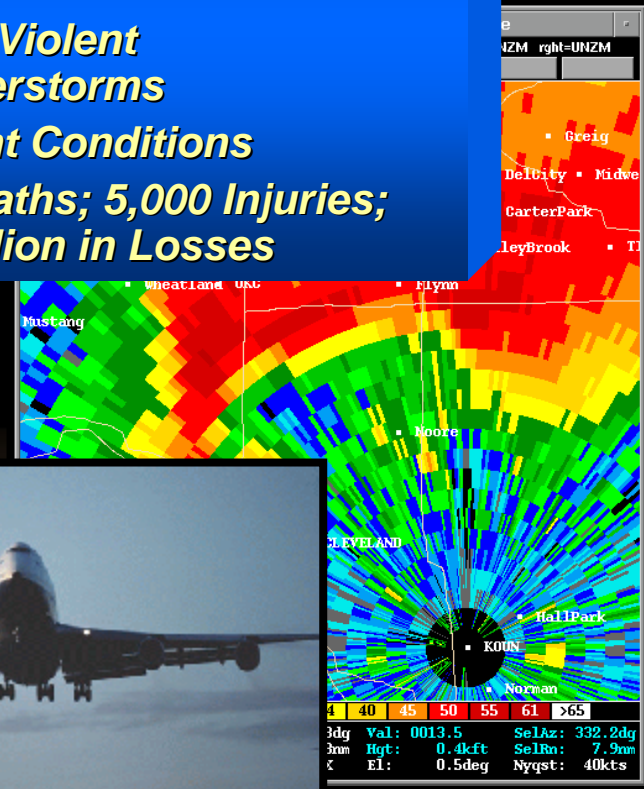
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# NWS Overview

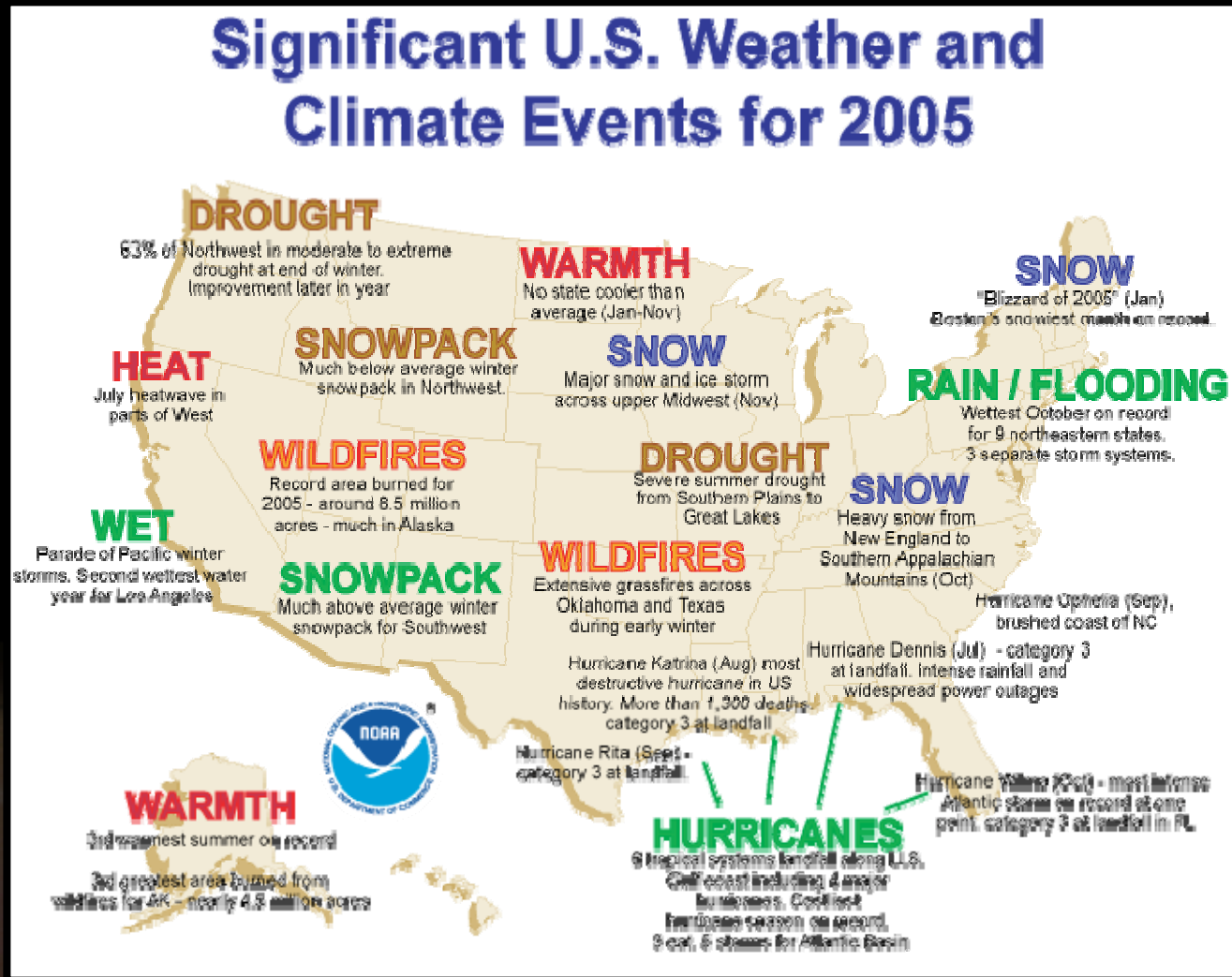
- Provide climate, water, weather forecasts and warnings to protect **life** and **property** and enhance the economy
- 76 billion observations
- 1.5 million forecasts
- 50,000 warnings

## A Typical Year Brings:

- 6 Hurricanes
- 1,000 Tornadoes
- 5,000 Floods
- 10,000 Violent Thunderstorms
- Drought Conditions
- 500 Deaths; 5,000 Injuries; \$14 Billion in Losses



# 2005 in Review: Extreme Climate, Weather, and Water



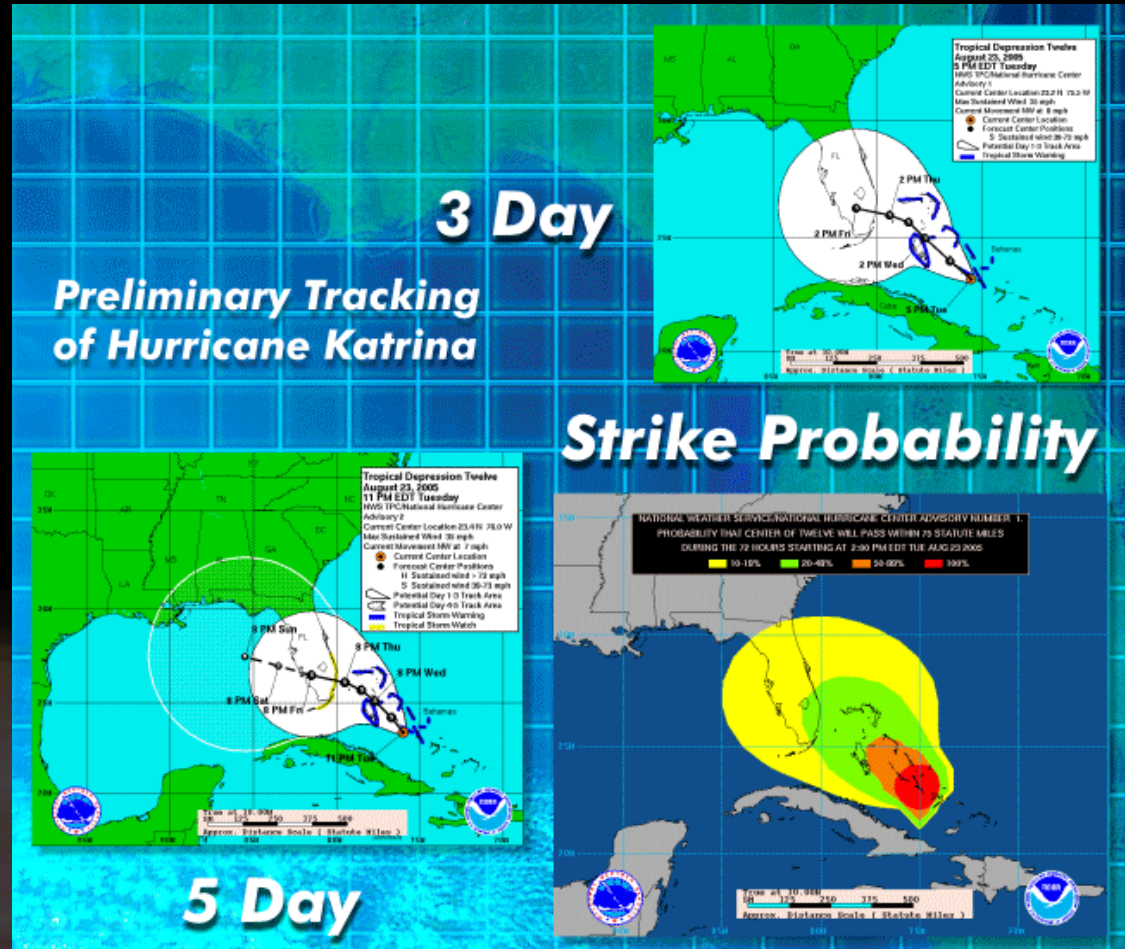
"America's Weather Enterprise: Protecting Lives, Livelihoods, and Your Way of Life"





# 2005 in Review: Extreme Climate, Weather, and Water

## Hurricane Katrina



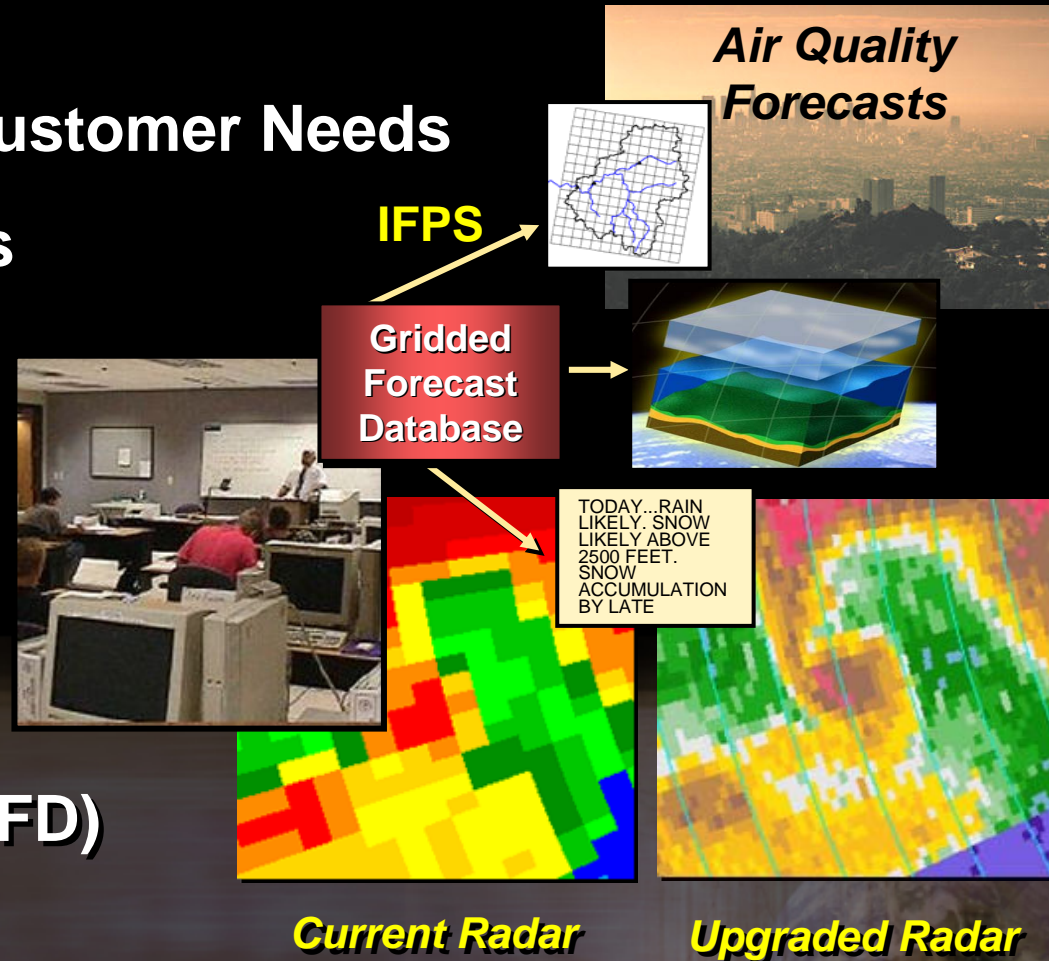
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# 2005 in Review:

## *Service Improvement Progress*

### *The Right Tools at the Right Time*

- Know and Anticipate Customer Needs
- Research to Operations
- Balanced Skill Mix
- Infuse Proven Science and Technology
- Grow National Digital Forecast Database (NDFD)
- Better Radar



# 2005 in Review:

## *Service Improvement Progress*

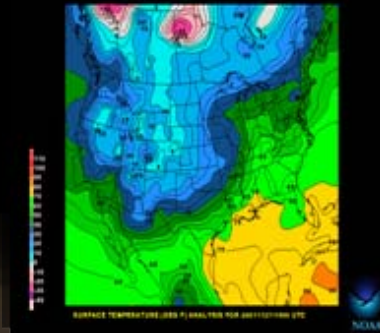
### *Digital Services*

#### Different Products for Different Customers



*Commercial weather companies & emergency managers use grids to generate tailored products*

- ✓ More weather data
- ✓ Higher resolution forecasts
- ✓ Visual displays of probability
- ✓ User-defined products create business opportunities



*The public, emergency managers and city planners use WWW. graphic products for detailed forecasts*

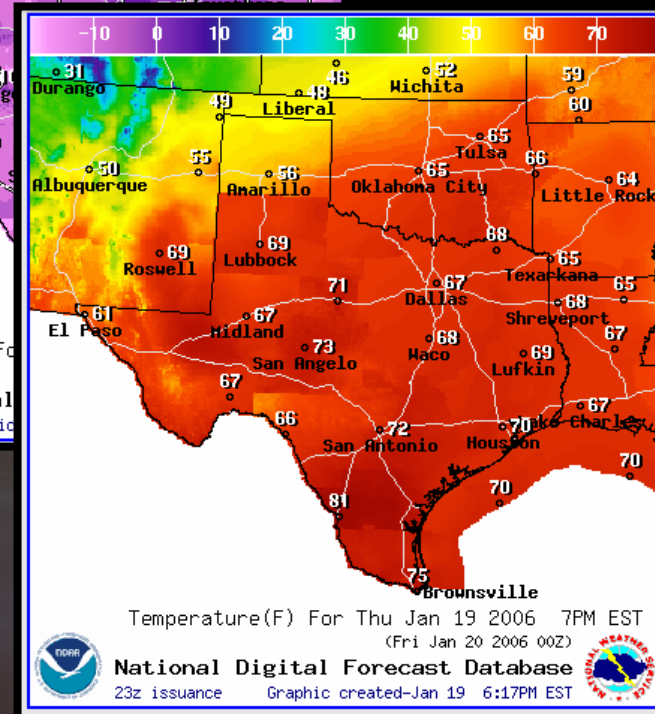
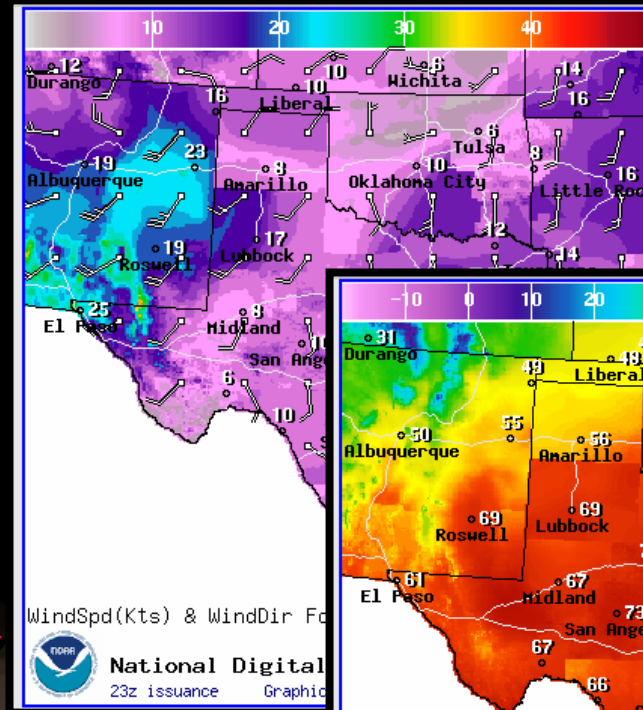
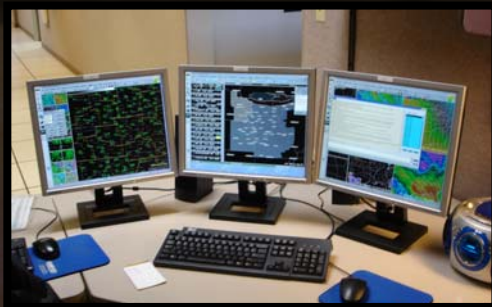
TODAY... RAIN LIKELY. SNOW LIKELY ABOVE 2500 FEET. SNOW ACCUMULATION BY LATE AFTERNOON 1 TO 2 INCHES ABOVE 2500 FEET. COLDER WITH HIGHS 35 TO 40. SOUTHEAST WIND 5 TO 10 MPH SHIFTING TO THE SOUTHWESTEARLY THIS AFTERNOON. CHANCE OF PRECIPITATION 70%.

*Radio stations & public read text forecasts*

# 2005 in Review: Service Improvement Progress Digital Services

## Operational Elements:

- *Max/Min Temperature*
- *Apparent Temperature*
- *Relative Humidity*
- *Probability of Precip.*
- *Temperature*
- *Dewpoint*
- *Wind Speed/Direction*
- *Weather*



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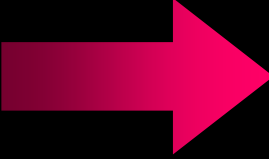


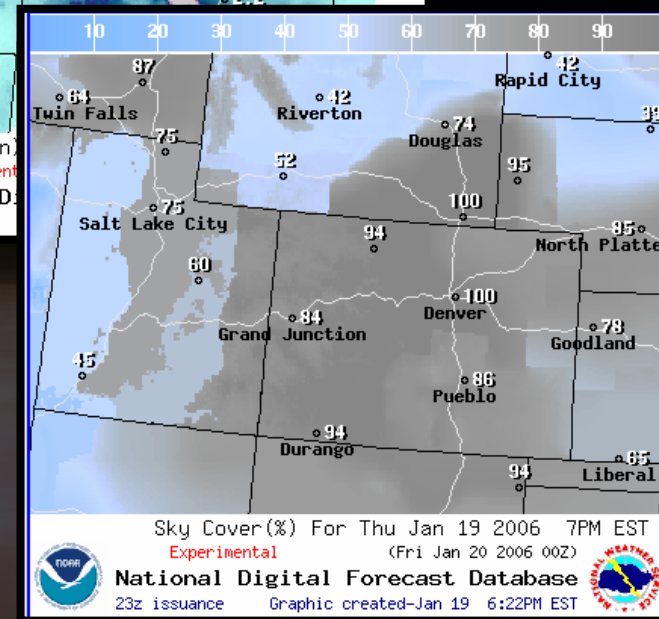
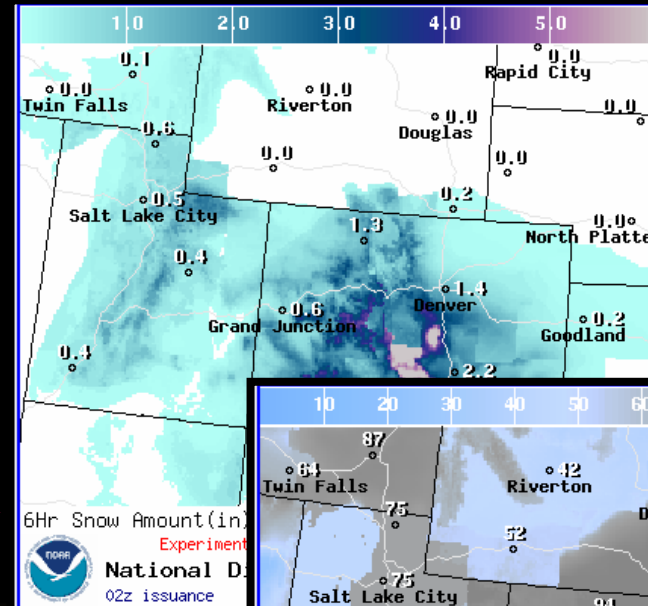
# 2005 in Review:

## *Service Improvement Progress*

### *Digital Services*

## Experimental Elements:

- *Sky Cover*
- *Quantitative Precipitation Forecast*
- *Snow Amount* 
- *Significant Wave Height*



# 2005 in Review:

## *Service Improvement Progress*

### *Digital Services*

## Weather Enterprise Success Stories

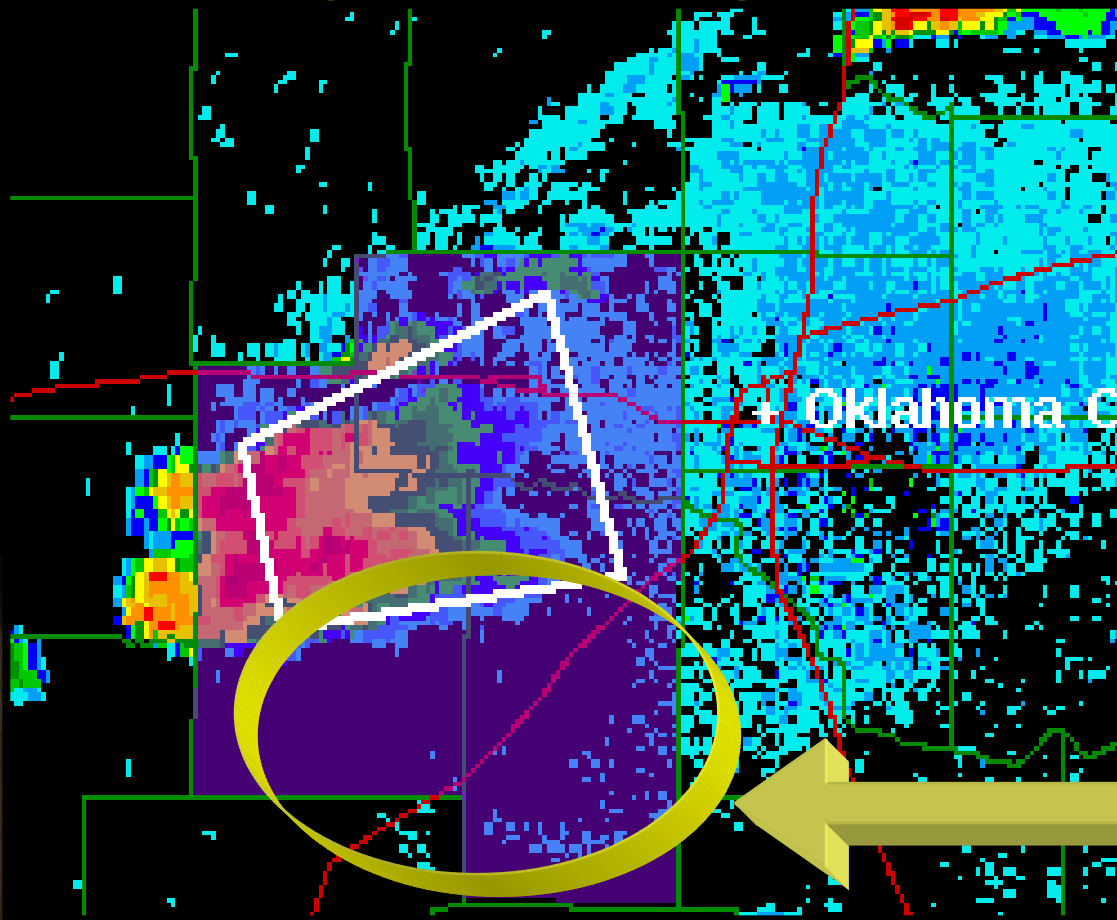
- **Mark Hoekzema, Chief Meteorologist, WeatherBug, AWS Convergence Technologies, Inc.:**
  - *“At WeatherBug we have decided to do some significant development this coming year using the NDFD data. We see this is a fantastic product and significant value to our customers.”*
- **Mark A. Gollin, President / CTO, Gecko ID: Developing e-mail services which will alert users of weather conditions and forecasts.**
  - *“As a web developer I can tell you that this product is capable of being a universal data source that could allow weather information to be easily integrated into any geographically aware software.”*

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# 2005 in Review: Service Improvement Progress Severe Weather Operations

## Polygon Warnings & Demographic Data



National Weather Service Forecast Office - WFO, Ft. Worth, Texas - Microsoft Internet Explorer

http://www.srh.noaa.gov/fwd/gpaw/WGUS54\_KFWD\_090707\_200406.html

National Weather Service Forecast Office  
Fort Worth, TX

Site Map News Organization Search Enter Search Here

North Texas Graphical Warning Information Wednesday, June 09, 2004 6:10:11 AM  
(Experimental)

National Weather Service WGUS54 KFWD 090707 200406 Warning Profile

FLASH FLOOD WARNING  
Issued: Wednesday 6/9/2004 2:05:00 AM Expires: Wednesday 6/9/2004 6:00:00 AM

Status	WARNING
Event	Flash Flood
Area	2,861.37 Sq. Miles
Counties	Denton Parker Tarrant Wise
Impacted Population	1,341,104
In Homes	75,164
In Multi-Family Units	14,215
In Mobile Homes	6,625
English Spoken Well	97.0%
English Not Spoken	2,995
Urban	88,918
Rural	11,095
Not Living in Texas in 1995	8,785
Source	2000 Census

Flash Flood Warning - WGUS54 KFWD 090707 200406 - 2:05 AM

DESCRIPTION  
At 2:05 AM CDT... Law Enforcement Officials Reported Flash Flooding Of Some Service Roads Near Hudson Oaks... And Willow Park... In Parker County. Excessive Runoff From This Storm Will Cause Flash Flooding Of Small Creeks And Streams... Highways And Underpasses. Additionally... Country Roads And Farmlands Along The Banks Of Creeks And Streams And Other Low Lying Areas Are Subject To Flash Flooding. Do Not Drive Your Vehicle Into Areas Where The Water Covers The Roadway. The Water Depth May Be Too Great To Allow Your Car To Cross Safely. Vehicles Caught In Rising Water Should Be Abandoned Quickly. Move To Higher Ground. A Flash Flood Warning Means That Flooding Is Occurring Or Is Imminent. Most Flash Flood Deaths Occur In Automobiles. Do Not Attempt To Cross Bridges... Dips... Or Other Low Spots If Water Covers The Roadway. Never Try To Cross A Flowing Stream... Even A Small One... On Foot. To Escape Rising Water Move Up To Higher Ground.

**Polygon  
Eliminates  
False Alarm Area**



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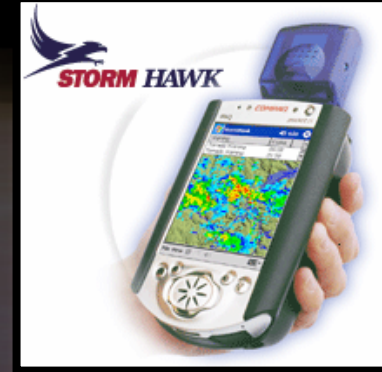
# 2005 in Review:

## *Service Improvement Progress*

### *Severe Weather Operations*

## WFO Study:

- **Tornado Warnings Covered:**
  - 31,990 square miles & 494 towns
- **Study Revealed polygon warnings would have **reduced** area warned **by 70%!****
  - Reduction of 22,490 square miles and 242 fewer towns



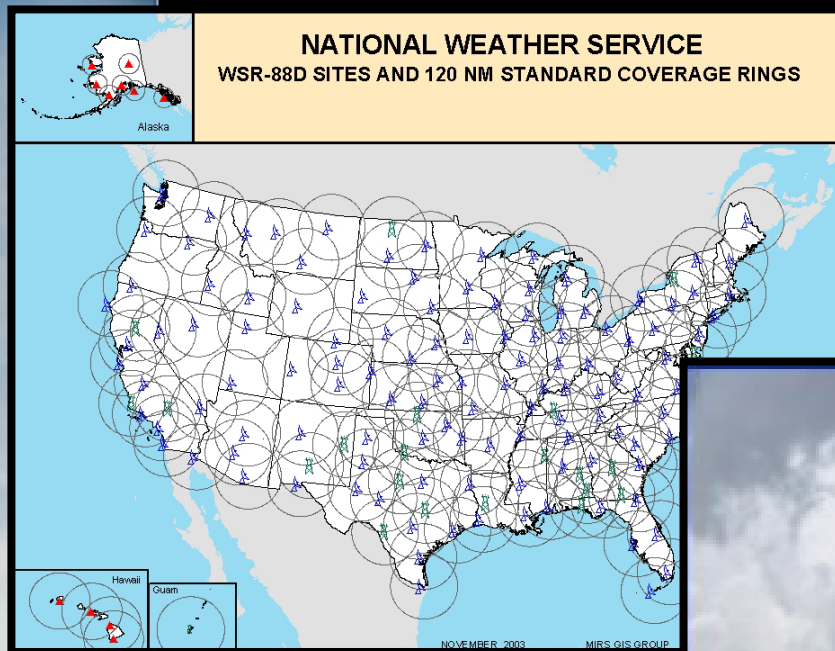
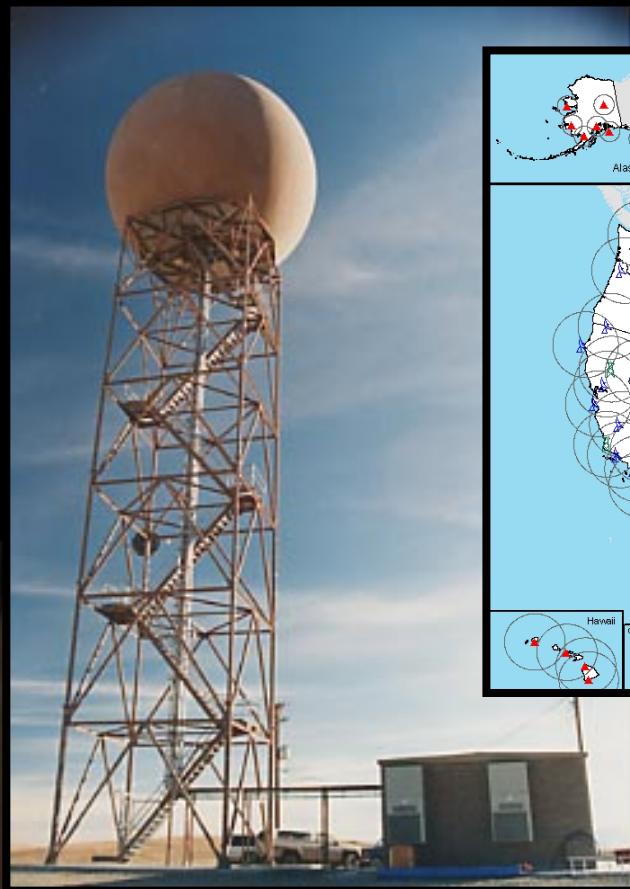
**Future graphical displays???**

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# 2005 in Review: *Service Improvement Progress* *Radar* **NEXRAD**



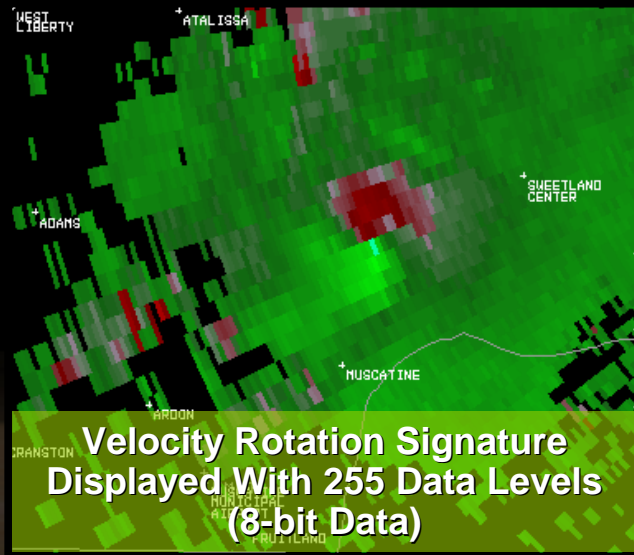
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# 2005 in Review: *Service Improvement Progress Radar*

**Improved tornado signature detection  
with better spatial resolution data.**

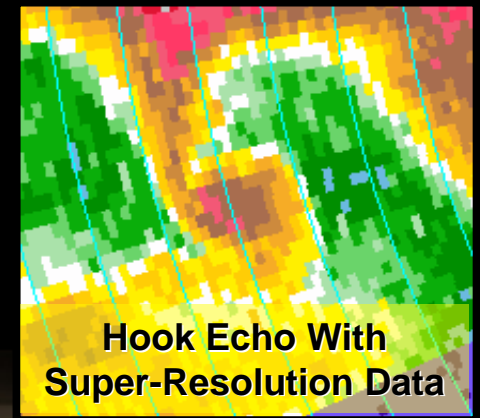
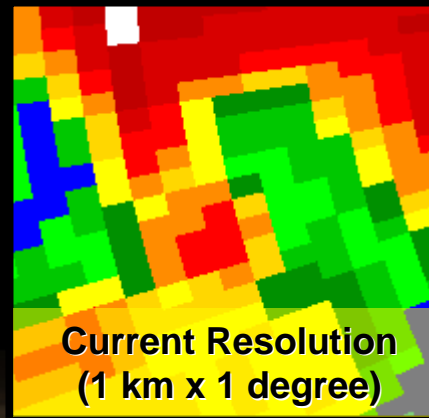
**Implemented In 2002**

**255 Data Levels vs Current 16**



**Implementation Began in 2005**

**Super Resolution Data (1/4 Km x 1/2 Degree)**



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# 2005 in Review: *Service Improvement Progress Radar*

## Phased Array Radar



# 2005 in Review: Service Improvement Progress Radar

## Experimental RIDGE Radar Web Page



<http://www.srh.noaa.gov/ridge>

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# 2005 in Review: *Service Improvement Progress Space Weather*

## Society Needs Space Weather Services



Navigation



Manned Space Flight

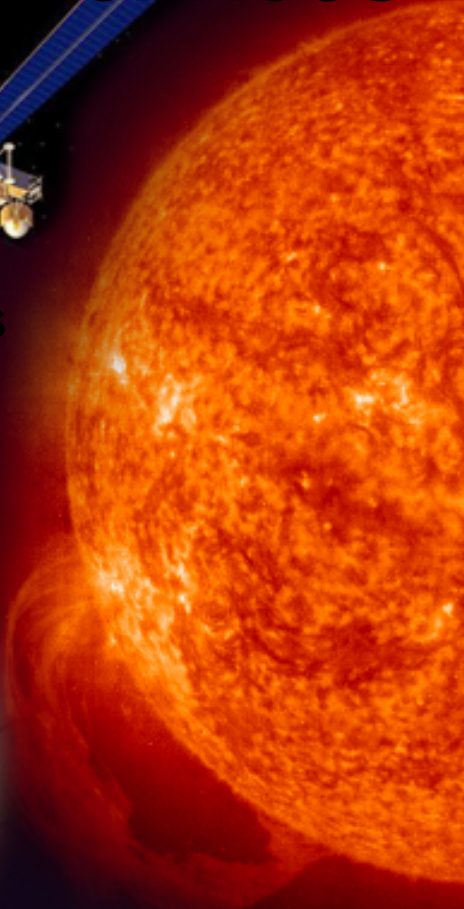


Satellites

Terrestrial Effects

Communications

Power



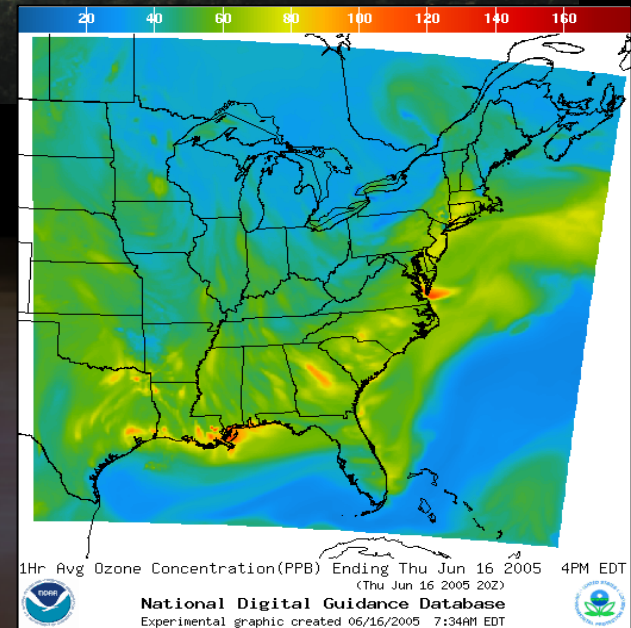
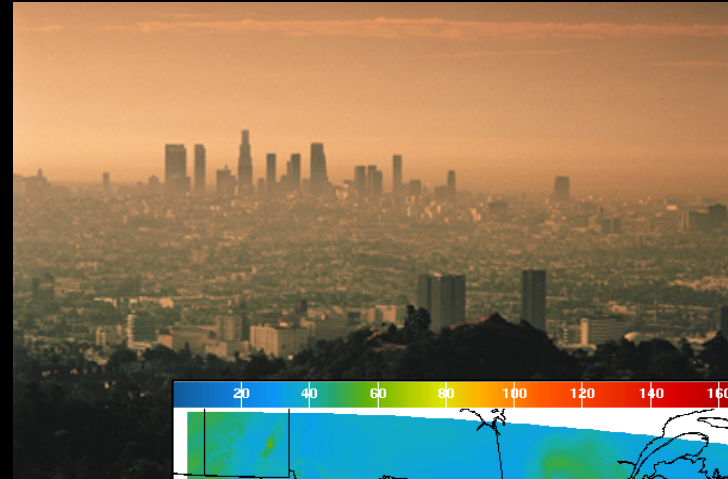
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# 2005 in Review:

## *Service Improvement Progress*

### *Air Quality Forecasting*

- Lives and property at risk from poor air quality
- Ozone air quality forecasts produced 2 times daily
- Phased deployment
  - *In FY 2004: Northeastern US, next-day, ozone*
  - *In FY 2005: Expanded to cover entire Eastern US*
  - *Five years: Nationwide coverage; begin particulates forecasts*



# 2005 in Review: Service Improvement Progress Tsunami Services



**National  
Tsunami  
Hazard  
Mitigation  
Program**



**TSUNAMI RISK  
REDUCTION FOR  
THE UNITED STATES:  
A FRAMEWORK FOR ACTION**

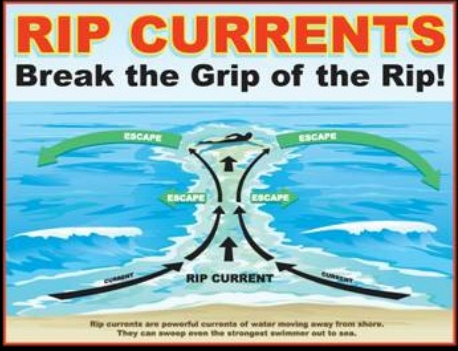
National Science and Technology Council  
A Joint Report of the Subcommittee on Disaster Reduction  
and the United States Group on Earth Observations  
December 2005



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# 2005 in Review: Service Improvement Progress Community Preparedness



~1,000 Stormready Co  
26 TsunamiReady Co



StormReady communities or counties  
TsunamiReady communities  
Ready Communities  
Red dots are StormReady Industrial Sites  
Green dots are StormReady  
Purple dots are StormReady  
Yellow dots are StormReady primary sites



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# The Weather Enterprise

## Partnership for America

### Saving Lives Through Partnerships

**NOAA TEAM**

**PARTNERS**

**END USERS**

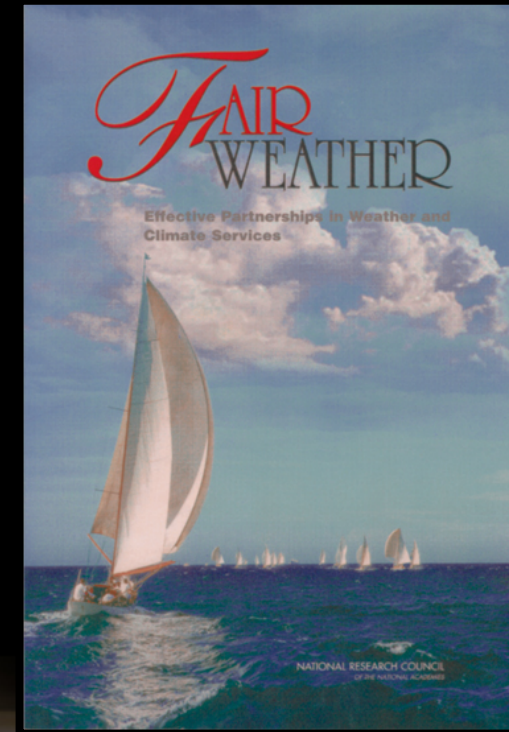


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# The Weather Enterprise

## *NOAA Partnership Policy Revision*

- **New NOAA Partnership Policy commits NOAA to:**
  - ***actively seek and give due consideration to all views when we make decisions to create, modify, or discontinue products and services;***
  - ***develop our decisions with the goal of optimizing the environmental information enterprise as a whole; and***
  - ***serve the public interest in the decisions we make about NOAA’s environmental information services.***



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# **The Weather Enterprise**

## *NOAA Partnership Policy Revision*

***“NOAA recognizes cooperation, not competition, with private sector and academic and research entities best serves the public interest and best meets the varied needs of specific individuals, organizations, and economic entities. NOAA will take advantage of existing capabilities and services of commercial and academic sectors to support efficient performance of NOAA’s mission and avoid duplication and competition in areas not related to the NOAA mission.”***



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# The Weather Enterprise

## *Partnership for America*



Private Sector

NOAA  
NWS



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