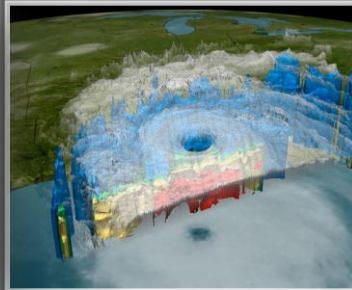
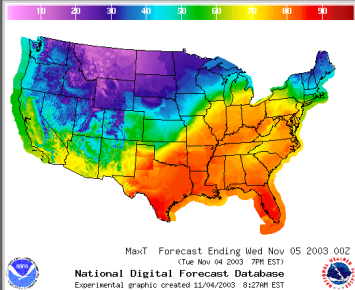
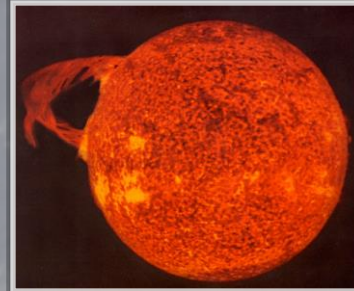
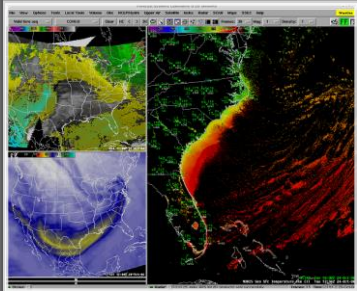
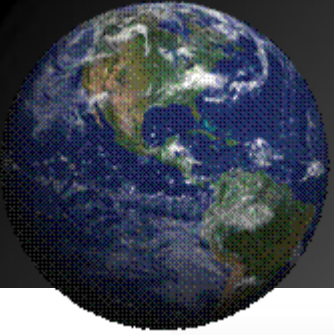


NOAA National Weather Service Building a Weather-Ready Nation



National Weather Service Overview
February 12, 2016





NWS Vision/Mission

VISION

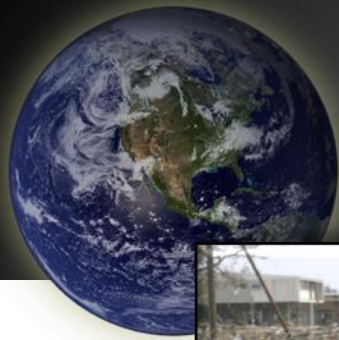


Build a Weather-Ready Nation where Society is prepared for and responds to Weather-Dependent Events

MISSION



Provide weather, water, and climate data, forecasts and warnings for the protection of life and property and the enhancement of the national economy.



Increase in Extreme Events

“Average” Year and Trends in the U.S.



650 Deaths
\$15B in Losses



26,000 Severe
Thunderstorms



6 Atlantic Basin
Hurricanes



1,300 Tornadoes

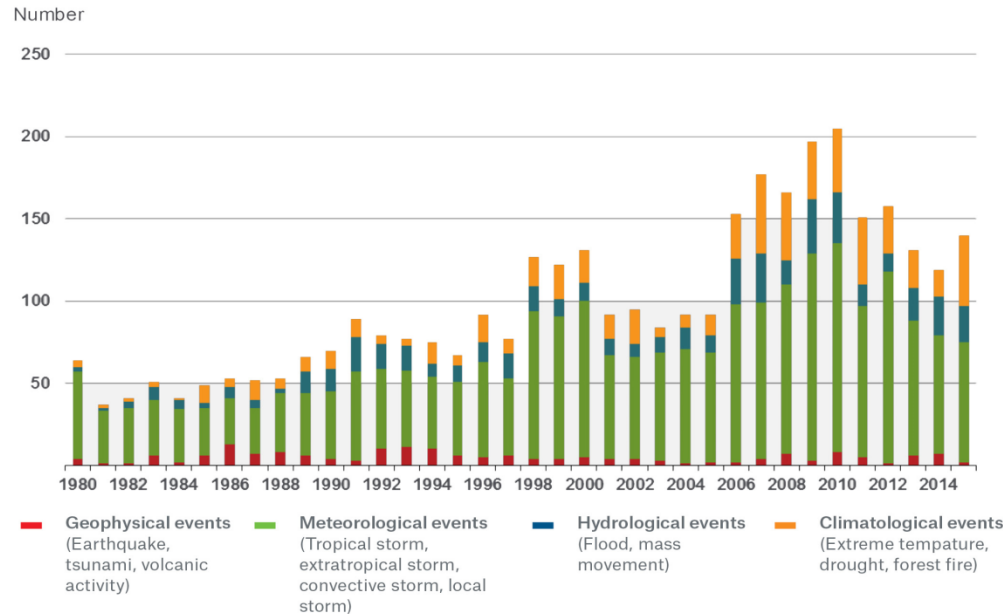


5,000 Floods

Munich Re NatCatSERVICE

Loss events in the U.S. 1980 - 2015

Number of events* *Excludes last week of December 2015



© 2016 Münchener Rückversicherungs-Gesellschaft, Geo Risks Research - As at January 2016

- Increasing population
- Increasing vulnerability
- More infrastructure at risk
- Signs of climate change

- Improved forecasts of extreme events 4-8 days in advance
- Need to take these forecasts to the next level for effective decision support





Is the U.S. Weather-Ready?

Sandy



Katrina



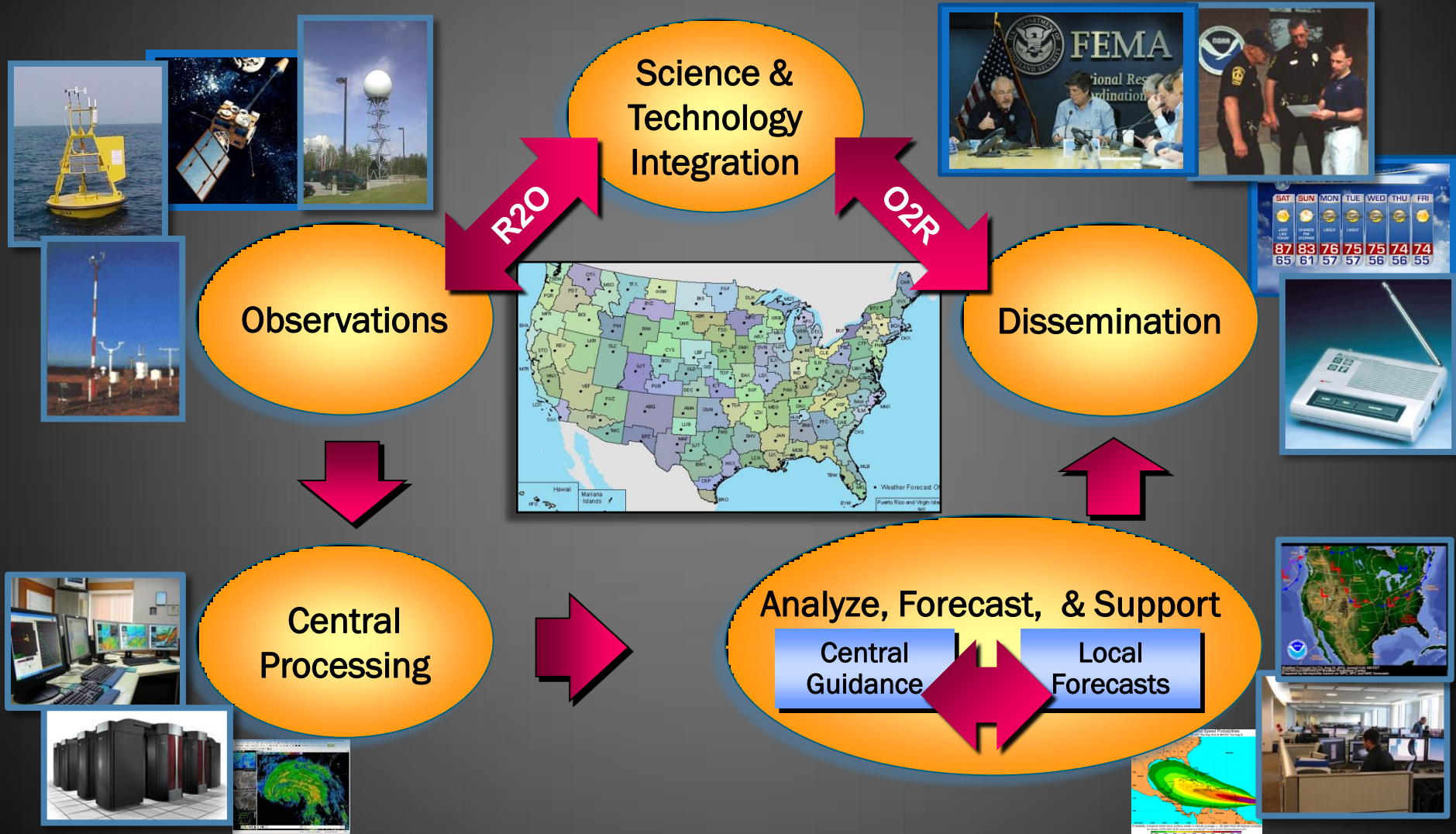
Eastern Colorado Floods



Atlanta - Commutageddon 2



The Forecast Process





National Weather Service Overview

The average person only sees the tip of the iceberg

TV
INTERNET
CELL PHONE RADIO NWR
PRIVATE WEATHER COMPANIES

**Weather Forecast Offices Local
Forecasts & Warnings**

**NATIONAL CENTERS FOR
ENVIRONMENTAL PREDICTION**

**MODEL SIMULATIONS/SPACE WEATHER
CLIMATE & SEASONAL OUTLOOKS
AVIATION & MARINE FORECASTS
STORM & TORNADO PREDICTION
HURRICANE TRACKS**

**NATIONAL
WEATHER
SERVICE**

River Forecast Centers
River Forecasts,
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



Today's Weather Forecast

Everything you read, see or hear about weather, climate and ocean forecasts is based on numerical prediction models

Four Essential Components of the Prediction Enterprise

• Global Observations

- ~ 2 billion/day
- 99.9% remotely sensed, mostly from satellites

• Data Assimilation & Modeling/Science

- Computing: Primary/Backup each @ 2.8PF runs with 99.9% reliability
- Earth System model - coupled

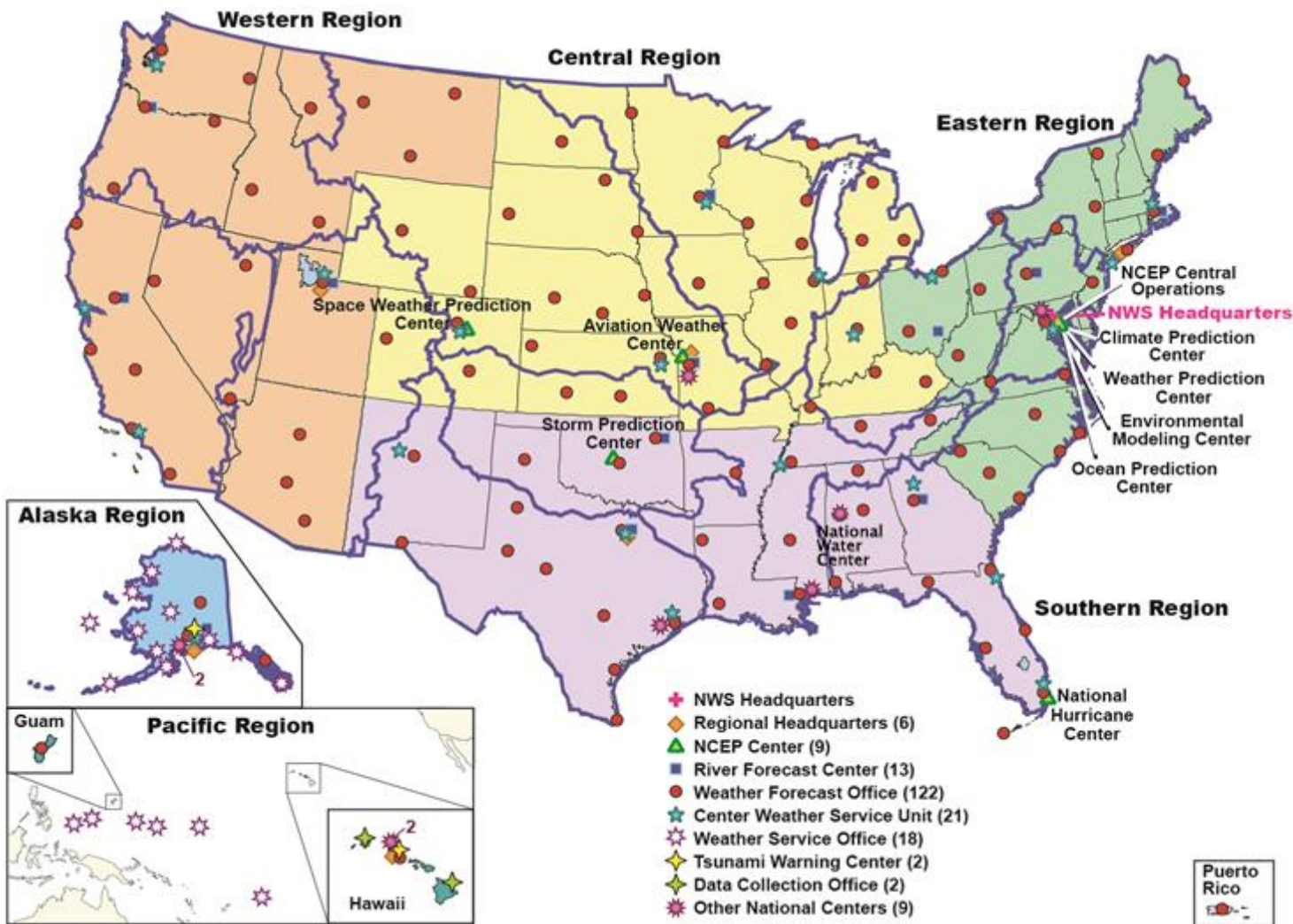
• Supercomputers

• Forecaster Skill





NWS Operations Community Based Services

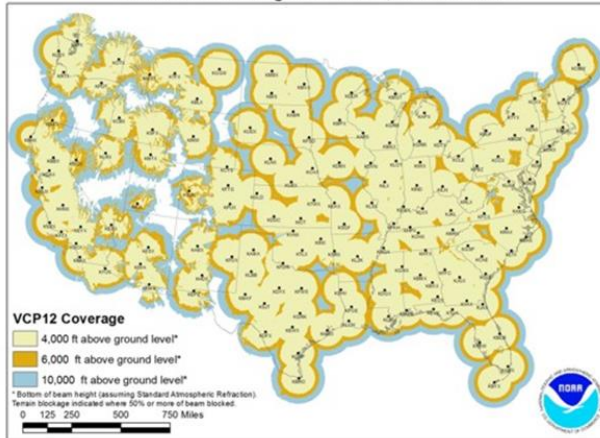




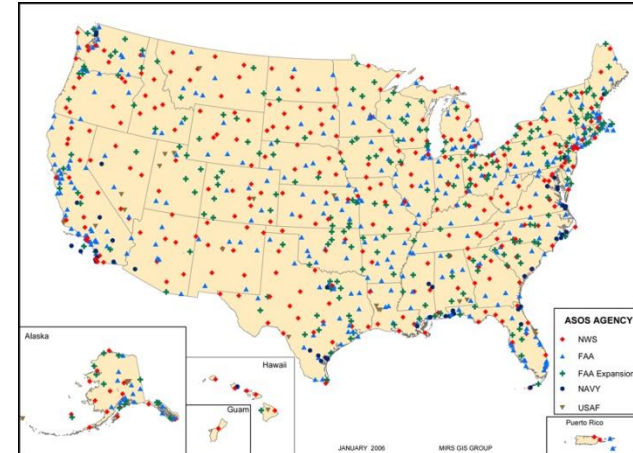
NWS Across the Nation

Doppler Radars

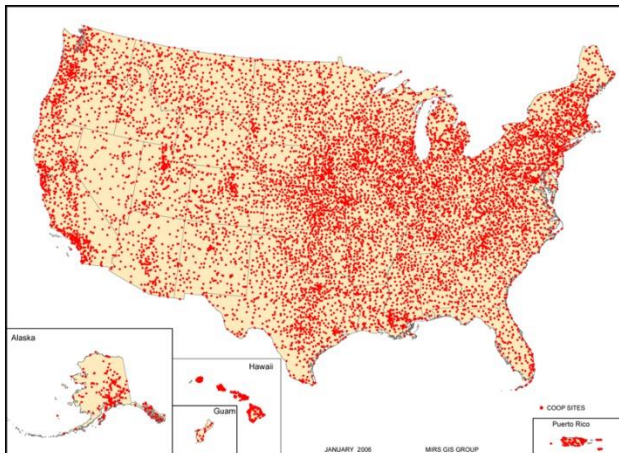
NEXRAD Coverage Below 10,000 Feet AGL



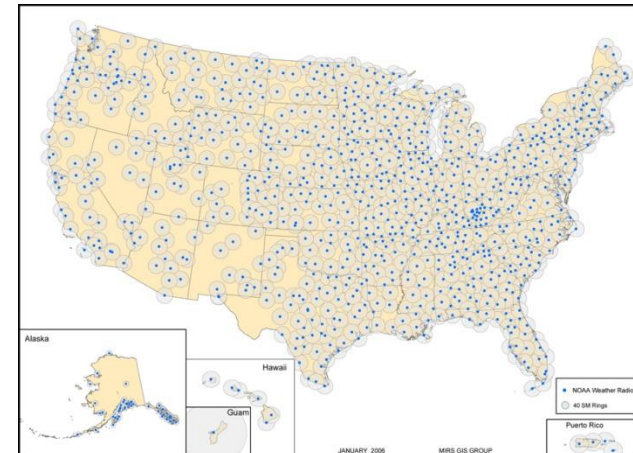
Automated Surface Observing Sites



Cooperative Observer Sites



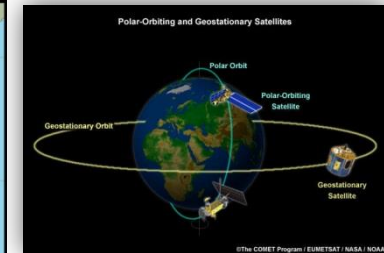
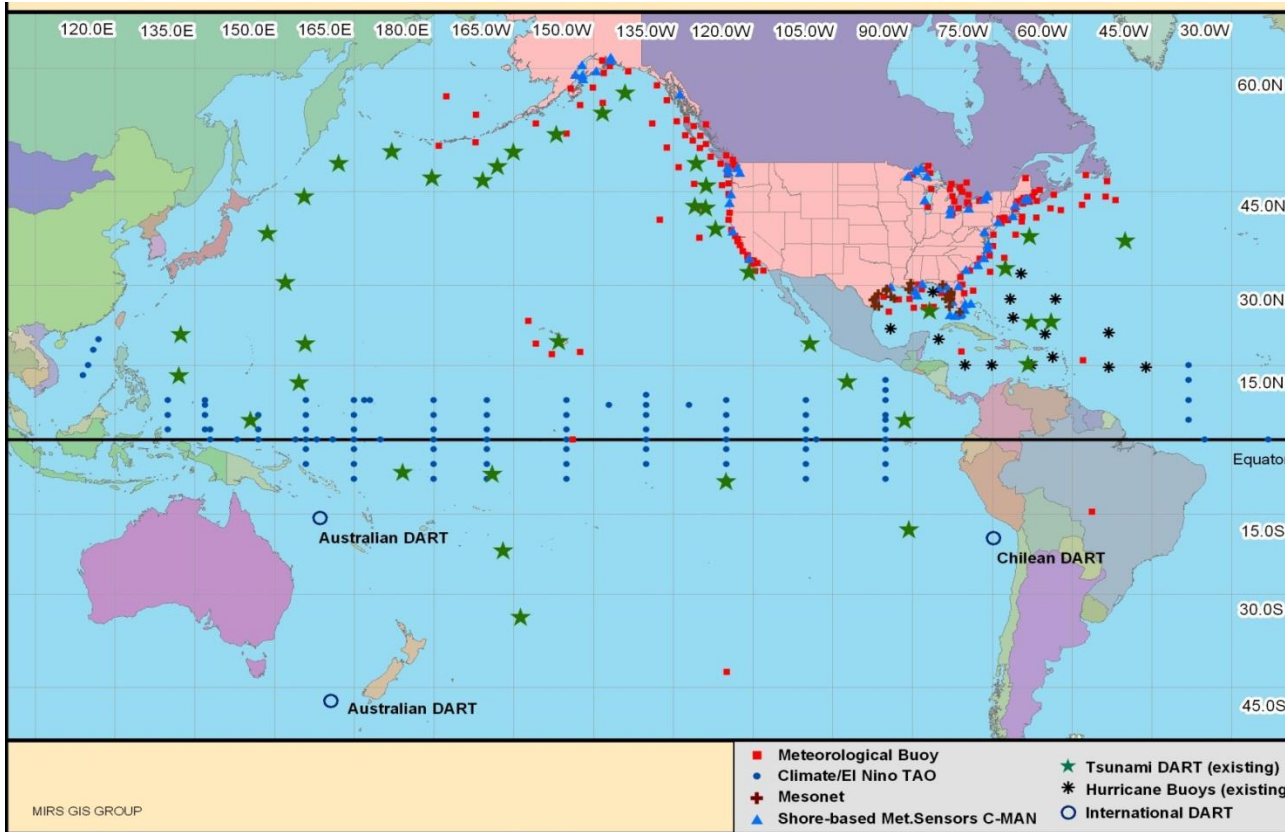
NOAA Weather Radio Transmitters



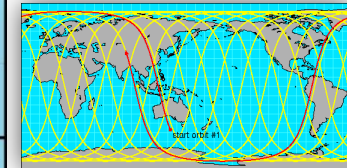


Observations

Buoy Networks and NESDIS Satellites

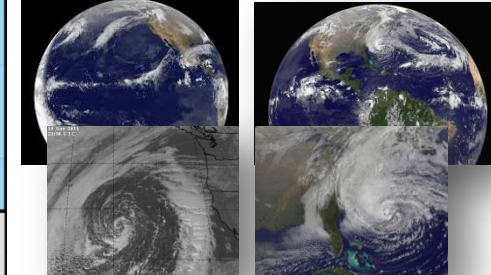


GOES
and
POES



GOES W

GOES E





NWS Overview

Weather Forecast Offices (WFOs)

- ✔ Issue all Local Forecasts and Warnings
- ✔ Build and Maintain Relationships With Local and State Governments
- ✔ Provide Expert Advice to Emergency Managers and other Decision Makers
- ✔ Solicit Customer Feedback on Products and Services
- ✔ Conduct Community Awareness and Education Programs
- ✔ Train Volunteer Observers and Storm Spotters

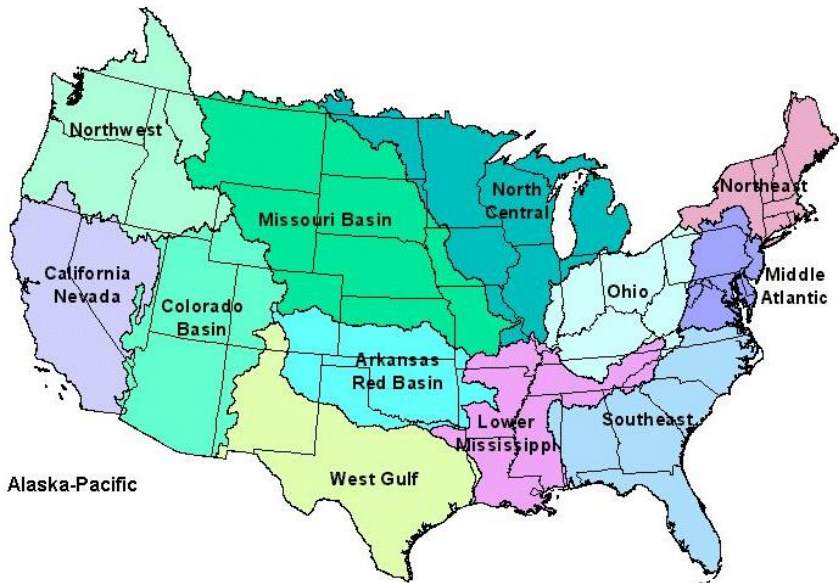




NWS Overview

River Forecast Centers (RFCs)

- Issue river, reservoir and flood forecasts based on computer models
- Provide forecast guidance to Weather Forecast Offices (WFOs)
- Work with water managers and other Federal Agencies





NWS Overview

National Centers

Weather Prediction
Center
College Park, MD

National Hurricane
Center
Miami, FL

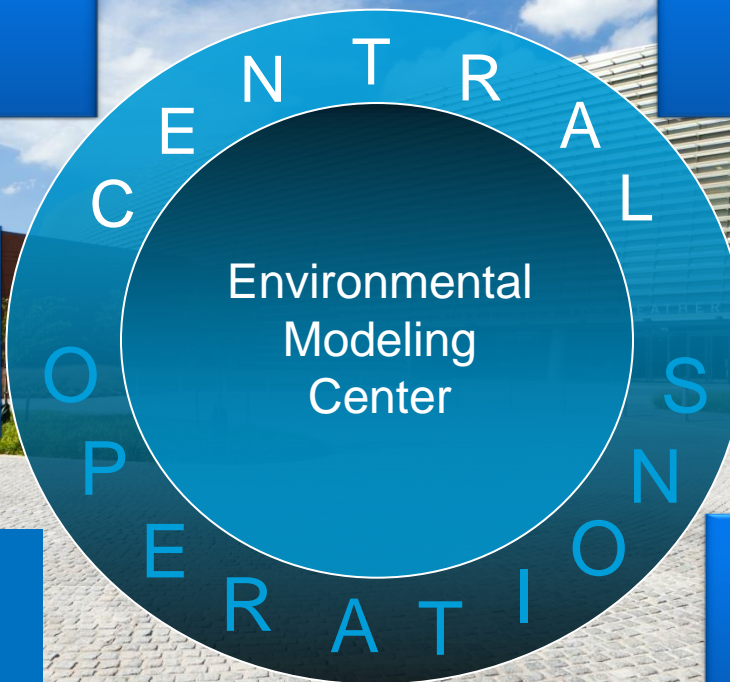
Storm Prediction
Center
Norman, OK

Ocean Prediction
Center
College Park, MD

Aviation Weather
Center
Kansas City, MO

Climate Prediction
Center
College Park, MD

Space Weather
Prediction Center
Boulder, CO





National Water Center

Initial Operating Capability: May 26, 2015



VISION: Scientific excellence and innovation driving water prediction to support decisions for a water resilient nation.

BENEFITS:

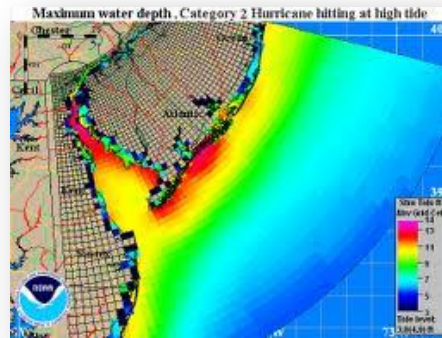
- State-of-the science modeling for global to street level predictions (*from 6,000 forecast locations to 2.7 million stream reaches*)
- Operations Center to establish common operating picture within NOAA and among water agencies; decision support for floods to droughts (*flood mapping to street level*)
- Proving ground to accelerate research to operations; partnerships with research communities (e.g. *CHUASI, National Flash Flood Interoperability Experiment*)
- Data integration and service backup



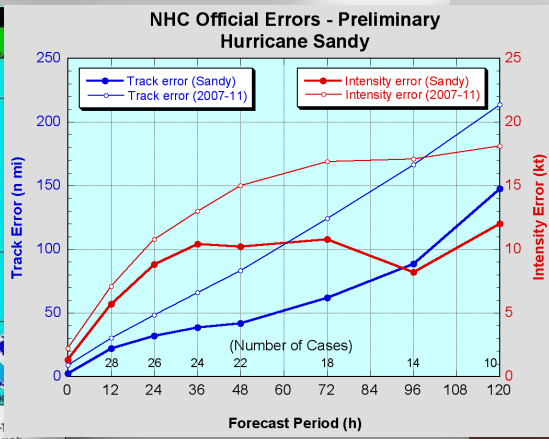
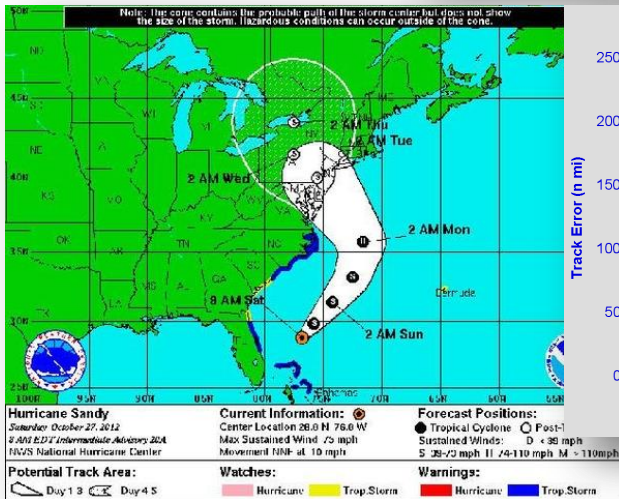
Warnings and Forecasts From the Sun to the Sea

Delivering life-saving weather forecasts and warnings

Improved Hurricane forecasts



Tornado Tag	
TORNADO...RADAR INDICATED	Evidence on radar and near storm environment is supportive, but no confirmation.
TORNADO...OBSERVED	Tornado is confirmed by spotters, law enforcement, etc.
Tornado Damage Threat Tag	
TORNADO DAMAGE THREAT...SIGNIFICANT	When there is credible evidence that a tornado, capable of producing significant damage, is imminent or ongoing.
TORNADO DAMAGE THREAT...CATASTROPHIC	When a severe threat to human life and catastrophic damage from a tornado is occurring, and will only be used when reliable sources confirm a violent tornado.
Tornado Tag In Severe Thunderstorm Warnings	
TORNADO...POSSIBLE	A severe thunderstorm has some potential for producing a tornado although forecaster confidence is not high enough to issue a Tornado Warning.



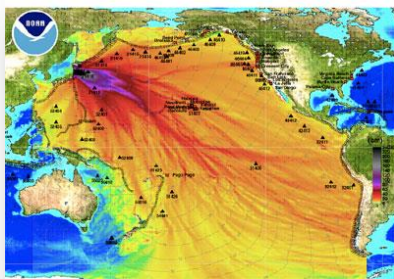
Impact-based tornado warnings





Warnings and Forecasts From the Sun to the Sea

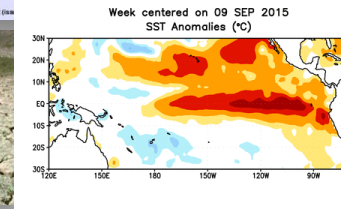
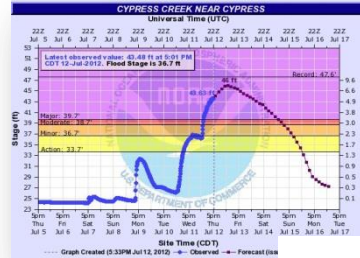
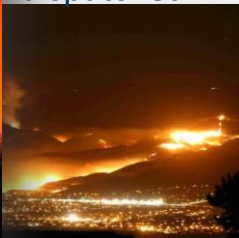
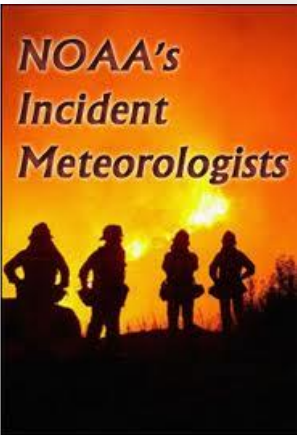
2011 Japan Tsunami:
California Impacts



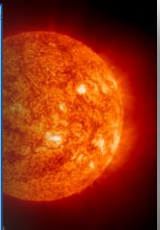
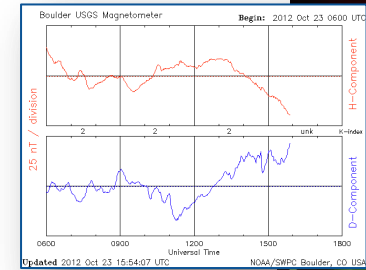
Winter Storm Forecasts
-Lead time of 2-3 days
-Close coordination with EMs
-Public prepared and aware



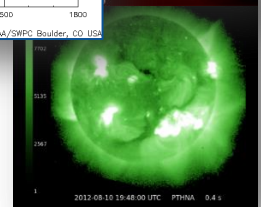
Wildfire Support
IMETs
dispatched



Drought and flood forecasting



Improved
space weather
forecasting





NWS Strategic Outcome: Weather-Ready Nation

NWS Strategic Goals

- Improve Weather Impact-Based Decision Support Services
- Improve Water Forecasting Services
- Enhance Climate Services and adapt to climate-related risks
- Improve sector-relevant information in support of economic productivity
- Enable environmental forecast services supporting healthy communities and ecosystems
- Sustain a highly skilled, professional workforce equipped with training, tools, and infrastructure to meet mission

Interdisciplinary

1. Water Quality, 2. Food 3. Health



Prediction is what makes NOAA/NWS unique and indispensable!



NWS Strategic Outcome: A Weather-Ready Nation

Becoming a Weather-Ready Nation is about building **community resiliency** in the face of increasing vulnerability to extreme weather, water and climate events

“Ready, Responsive, Resilient”

REQUIRES NWS TO:

- Fully integrate our field structure to produce:
 - *Better forecasts and warnings*
 - *Consistent products and services*
 - *Actionable environmental intelligence*
- Provide Impact-based Decision Support Services (IDSS)
- Deliver through multiple and reliable dissemination pathways
- Work with partners to **gain needed response**; includes embedding NWS in Emergency Operations Centers and incorporating Social Sciences

WRN

**We have 2400
WRN Ambassadors**

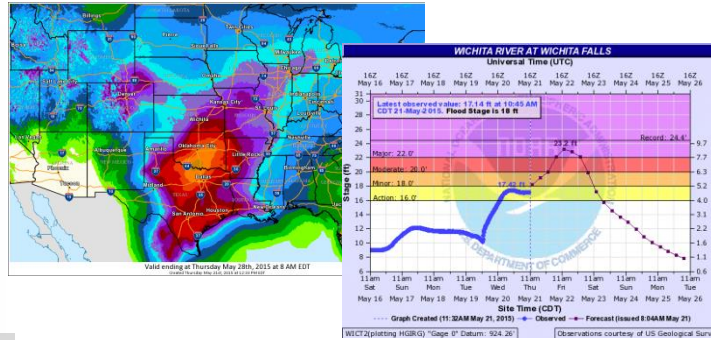
***Involves entire US Weather, Water and Climate Enterprise WORKING TOGETHER
to achieve far-reaching national preparedness for weather events***



Extending Decision-Support Services



FEMA Prepositions
recovery assets



State & local
Emergency Managers
prepare local communities



State & local authorities
harden priority assets &
respond to event



Providing impact based decision-support services must account for “shifting risk preferences” and related options.



Information Delivery → Success

Midwest Tornado Outbreak

November 17, 2013

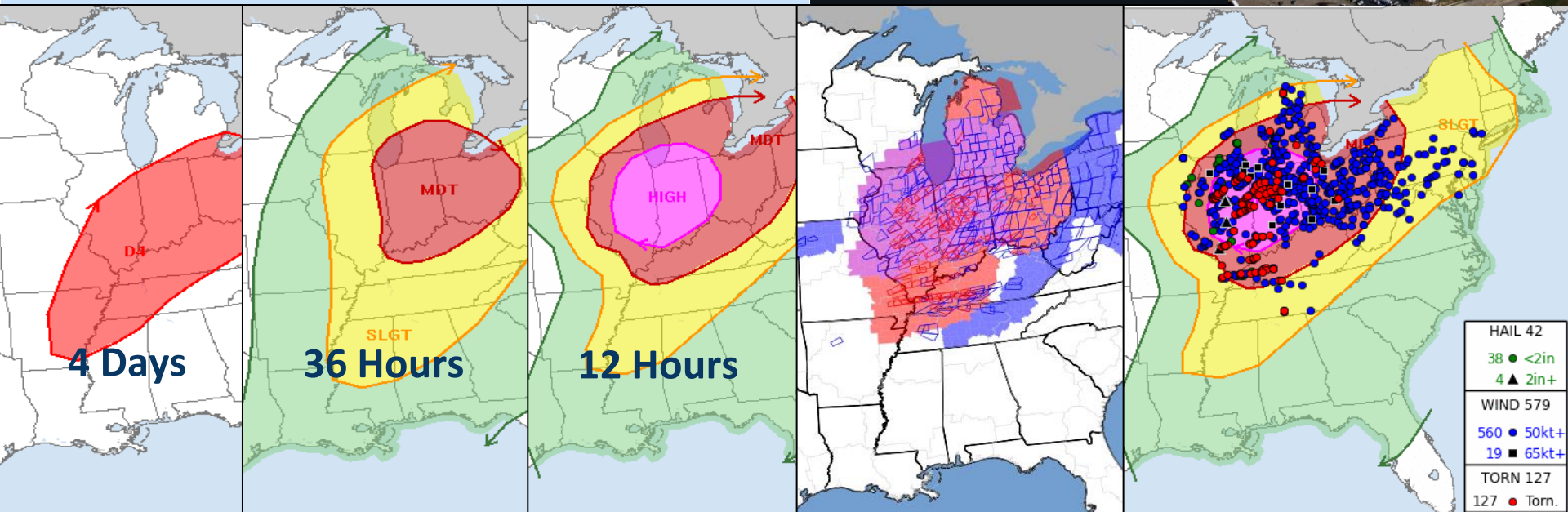
- 4th Largest November Tornado Outbreak: ~71 tornadoes, **8 fatalities**
- Coordination calls with FEMA and state emergency managers 3 days in advance
- Successful dissemination - Washington, IL

< Extreme alerts

03/04/2013 Mon

Wireless Emergency Alerts (WEA)

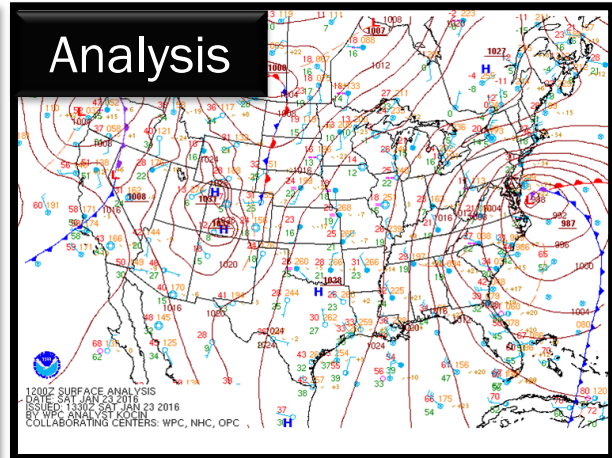
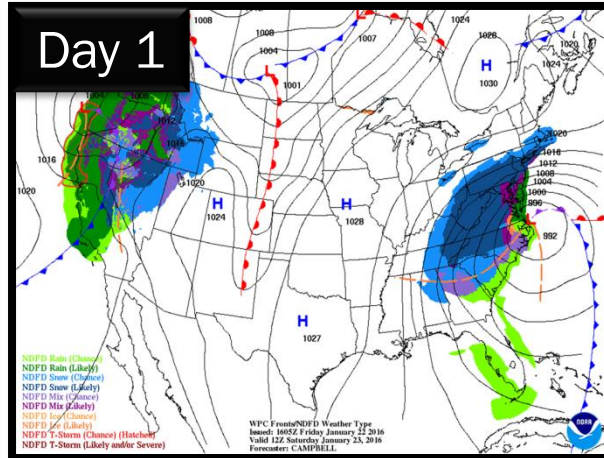
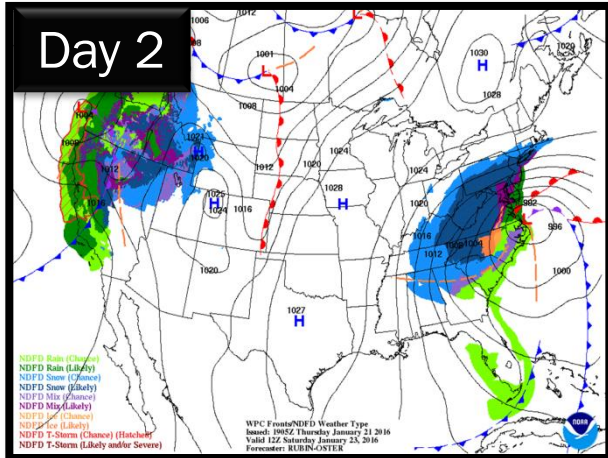
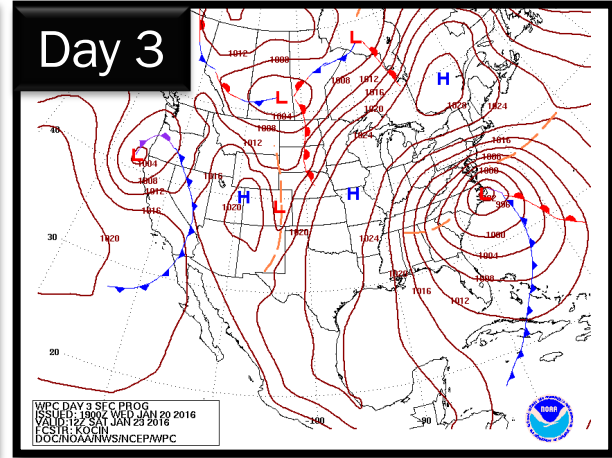
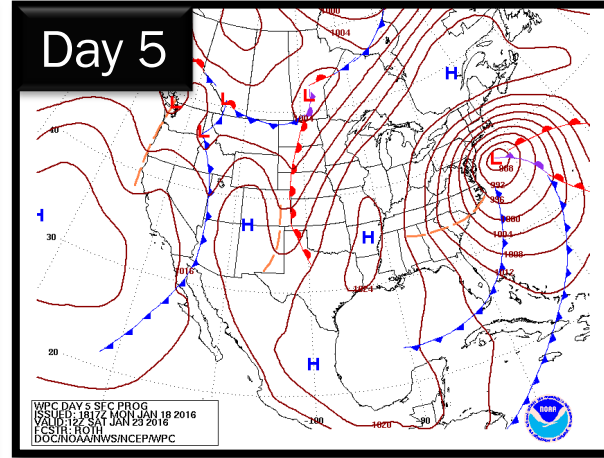
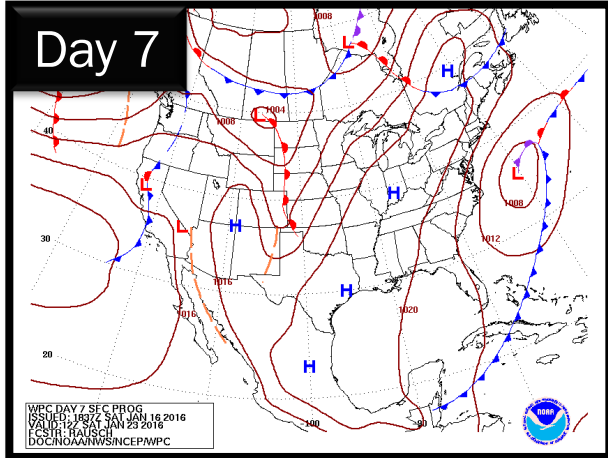
Tornado Warning in this area til 10:45 AM CST.
Take shelter now. Check local media. -NWS





Forecasting the Storm Days in Advance

Jan. 2016 Blizzard/Coastal Storm

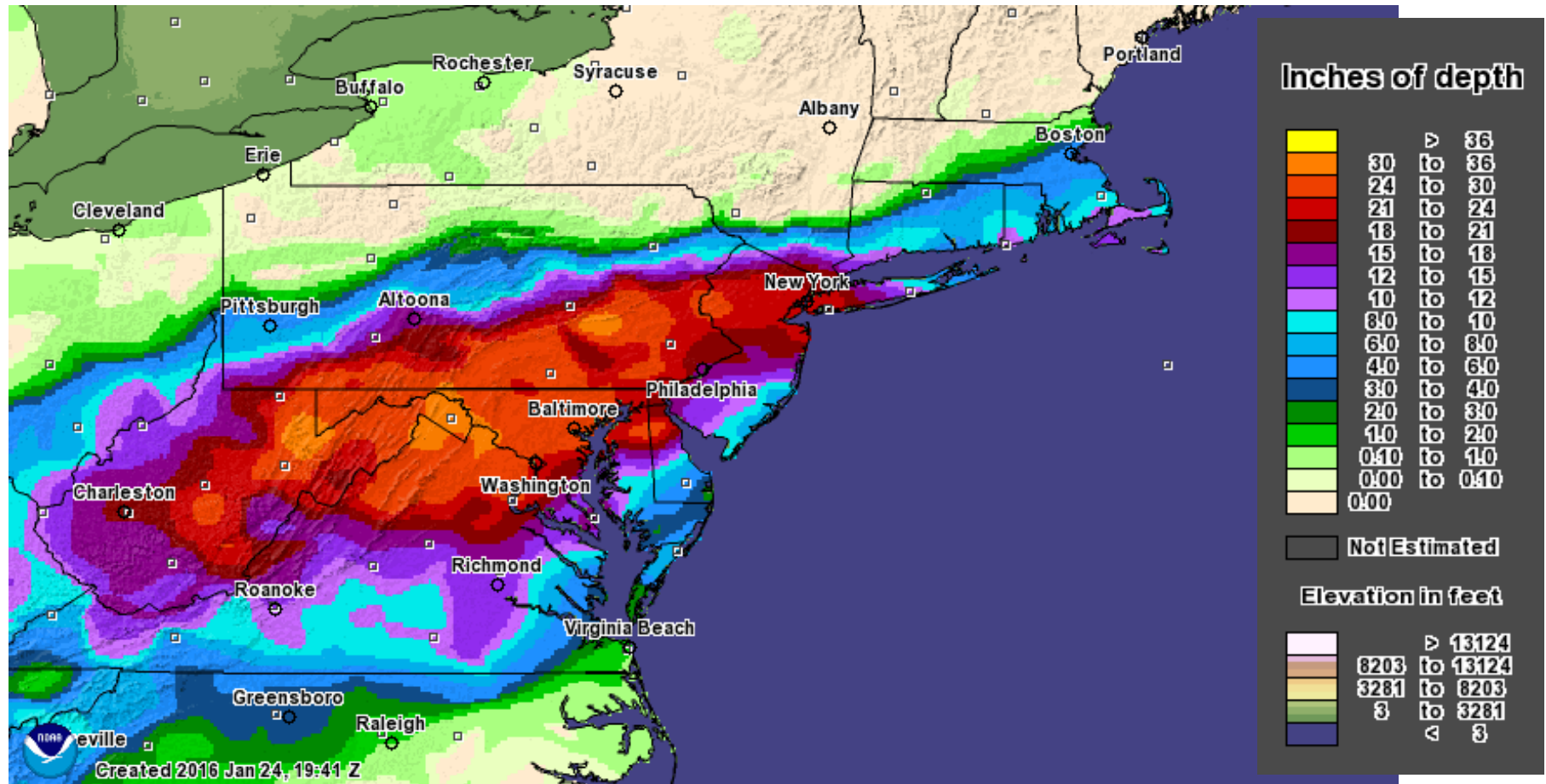




Forecasting the Storm Days in Advance

Jan. 2016 Blizzard/Coastal Storm

48-hour observed snowfall
(ending 7am EST, Sun. Jan. 24, 2016)





Evolving the NWS: Striving for a Weather-Ready Nation



Framework for Change

- **2012 National Academies of Science (NAS) Reports**
 - NAS highlighted the need for continuous change in the NWS and the need to evaluate our function and structure
- **2013 National Academy for Public Administration (NAPA) Report**
 - NAPA's extensive stakeholder research revealed widespread consensus that NWS needs to change in order to meet society's rapidly changing demands for impact-based weather information.
 - NAPA also found no stakeholder consensus for what to change, how to change, or how fast to change.
 - NAPA recommended NWS establish a transparent process to govern significant change, including extensive stakeholder engagement, to build stakeholder trust, participation, and support in guiding change.



Way Forward -- Next Steps

- **Continue Operations and Workforce Analysis**
- **Energize stakeholder engagement to embrace Weather-Ready Nation goals and enhance the secondary value chain**
- **Expand capacity for testing and demonstration to support change**



Operations & Workforce Analysis (OWA)

- **NWS conducting an agency-wide operations and workforce analysis, including extensive engagement with stakeholders, to identify gaps in capacity and build recommendations for improved service delivery approaches and staffing models.**
- **There has been no change in baseline staffing since the early 90s, despite NWS' significant shift in services and technology (NAPA finding)**
- **Analysis to be completed in FY 2016, followed by testing and demonstration with implementation to begin in FY 2018**

Key Milestones to Evolve the NWS and Build a Weather Ready Nation



- FY 14 Included:**
- ✓ Submit NWS Budget Restructuring
 - ✓ National Water Center Staffing Initiated
 - ✓ NWS HQ Reorganization requested
 - ✓ Dissemination systems assessment and consolidation initiated
 - ✓ WRN Ambassador Initiative launched
 - ✓ Establish a Transformational Change Framework

FY14

- FY 15 Includes:**
- ✓ New budget structure implemented
 - ✓ NWS HQ reorganization underway
 - ✓ Develop Transformational Change process and governance
 - ✓ Operations & Workforce Analysis underway
 - ✓ National Water Center Initial Operating Capability
 - ✓ AWIPS II Deployment complete
 - ✓ NEXRAD SLEP underway
 - ✓ Initiate Strategic Office Relocations
 - ✓ Initiate facilities assessment

FY15

- FY 17 Includes:**
- Test & evaluate recommendations from Operations & Workforce Analysis
 - Continue National Water Center baseline staffing
 - Expand geographic domain and breadth of water information
 - Sustain/enhance integrated dissemination systems
 - Complete facilities assessment

FY17

- FY 16 Includes:**
- Operations & Workforce Analysis complete w/recommendations
 - ✓ Supercomputing capacity increased
 - New integrated dissemination system operational
 - Communications upgrade to field offices complete
 - Implement National Blend of Models v1.0
 - Conduct Operational Test & Evaluation of Impact-Based Decision Support Catalog
 - Implement Experimental NWC Centralized Water Forecast Modeling System v1.0
 - Develop weeks 3-4 experimental temperature and precipitation outlook products
 - Prototype coupled ocean-atmosphere-ice model

FY16

FY18 -23+

- FY 18 and Beyond Includes:**
- Implement Operations & Workforce Analysis recommendations
 - Fully Integrated Field Structure delivering consistent products and services
 - FACETS and Warn-on-Forecast
 - National Water Center baseline staffing complete
 - Complete NEXRAD and ASOS SLEP



Saving Lives Through Partnerships

NOAA TEAM


PARTNERS

END USERS






www.weather.gov



NATIONAL WEATHER SERVICE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION



HOME
FORECAST
PAST WEATHER
WEATHER SAFETY
INFORMATION CENTER
NEWS
SEARCH
ABOUT

Local forecast by "City, St" or ZIP code

[Location Help](#)

Strong Pacific Storm Impacts the West Coast

A storm system centered off the Pacific Northwest coast will bring rain and snow to parts of the West Coast and interior Northwest on Monday and Tuesday. Rain is expected across lower elevations, especially in the northern California and southern Oregon coastal regions, while as much as two feet of snow is possible in the northern Sierra Nevada, with 4-10 inches possible in the interior Northwest.

[Read More...](#)

Customize Your Weather.gov

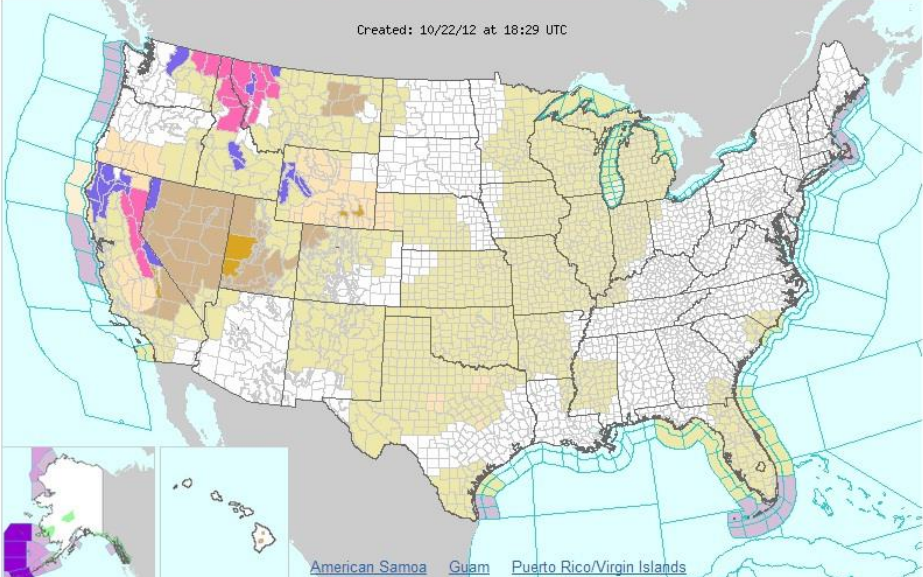
Enter Your City, ST or ZIP Code

 Remember Me

Privacy Policy

ACTIVE ALERTS
FORECAST MAPS
RADAR
RIVERS, LAKES, RAINFALL
AIR QUALITY
SATELLITE
PAST WEATHER

Created: 10/22/12 at 18:29 UTC



American Samoa
Guam
Puerto Rico/Virgin Islands

Click on the map above for detailed alerts or [Public Alerts in XML/CAP v1.1 and ATOM Formats](#)

Winter Storm Warning
 Small Craft Advisory
 Special Weather

National Weather Service