

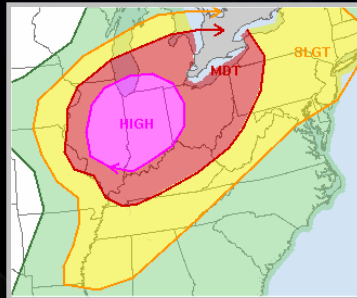
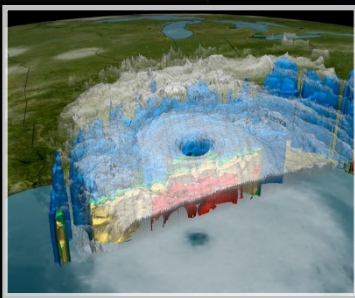
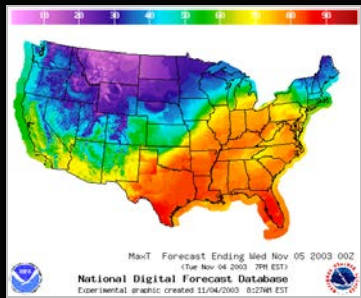
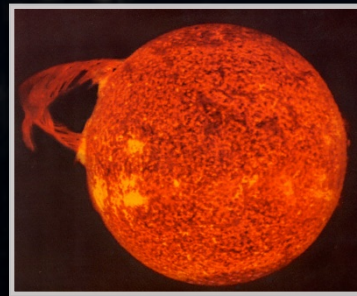
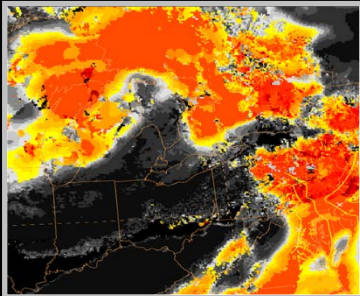
Building a Weather-Ready Nation For Aviation

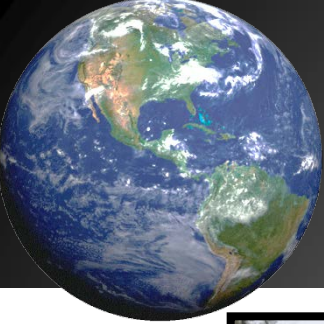
Laura Furgione

NOAA Deputy Assistant Administrator for Weather Services

Friends and Partners in Aviation Weather

July 22, 2014





Case for Change

"Average" Year and Trends in the U.S.



650 Deaths
\$15B in Losses



26,000 Severe
Thunderstorms



6 Atlantic Basin
Hurricanes



1,300 Tornadoes

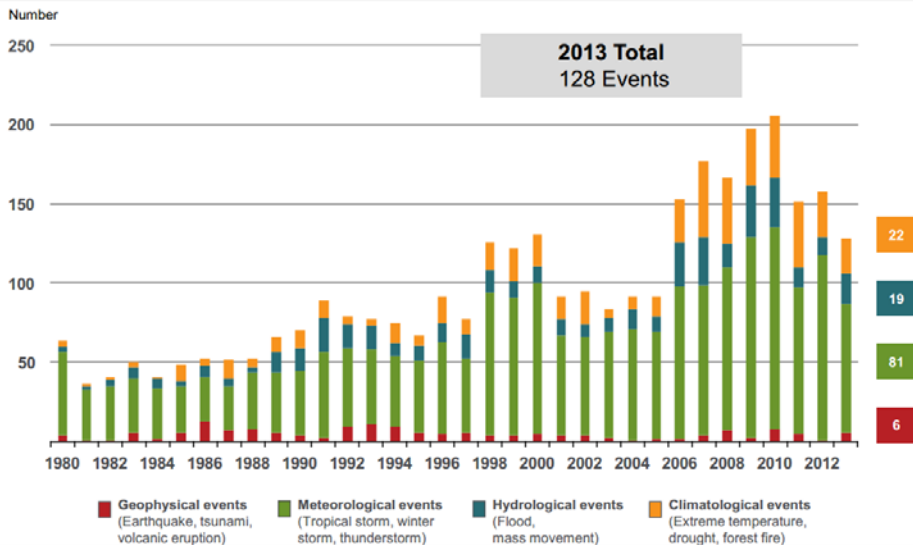


5,000 Floods

US Natural Catastrophe Update

Loss Events in the U.S. 1980 – 2013

Number of events



Regardless of the cause, the trend shows an increasing number of extreme weather events at increasing cost to the nation.

(Image source: Munich Re, 2014)





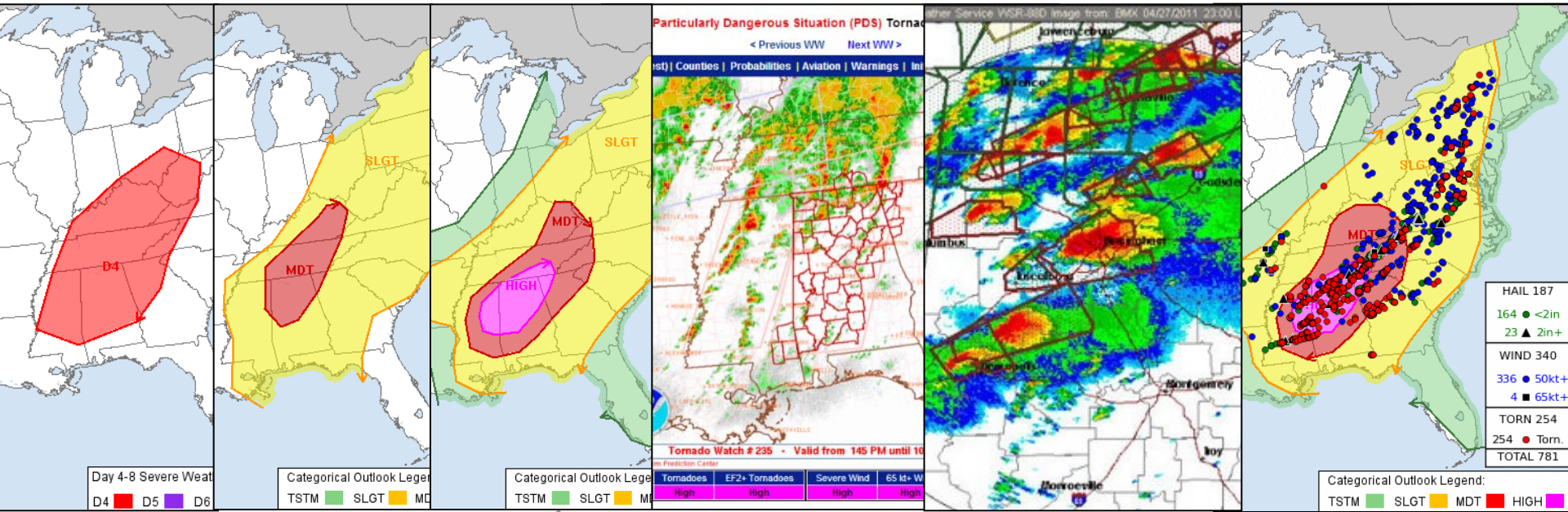
Case for Change

Southeast Tornado Outbreak April 27-28, 2011

Coordination calls with emergency managers beginning on day 3

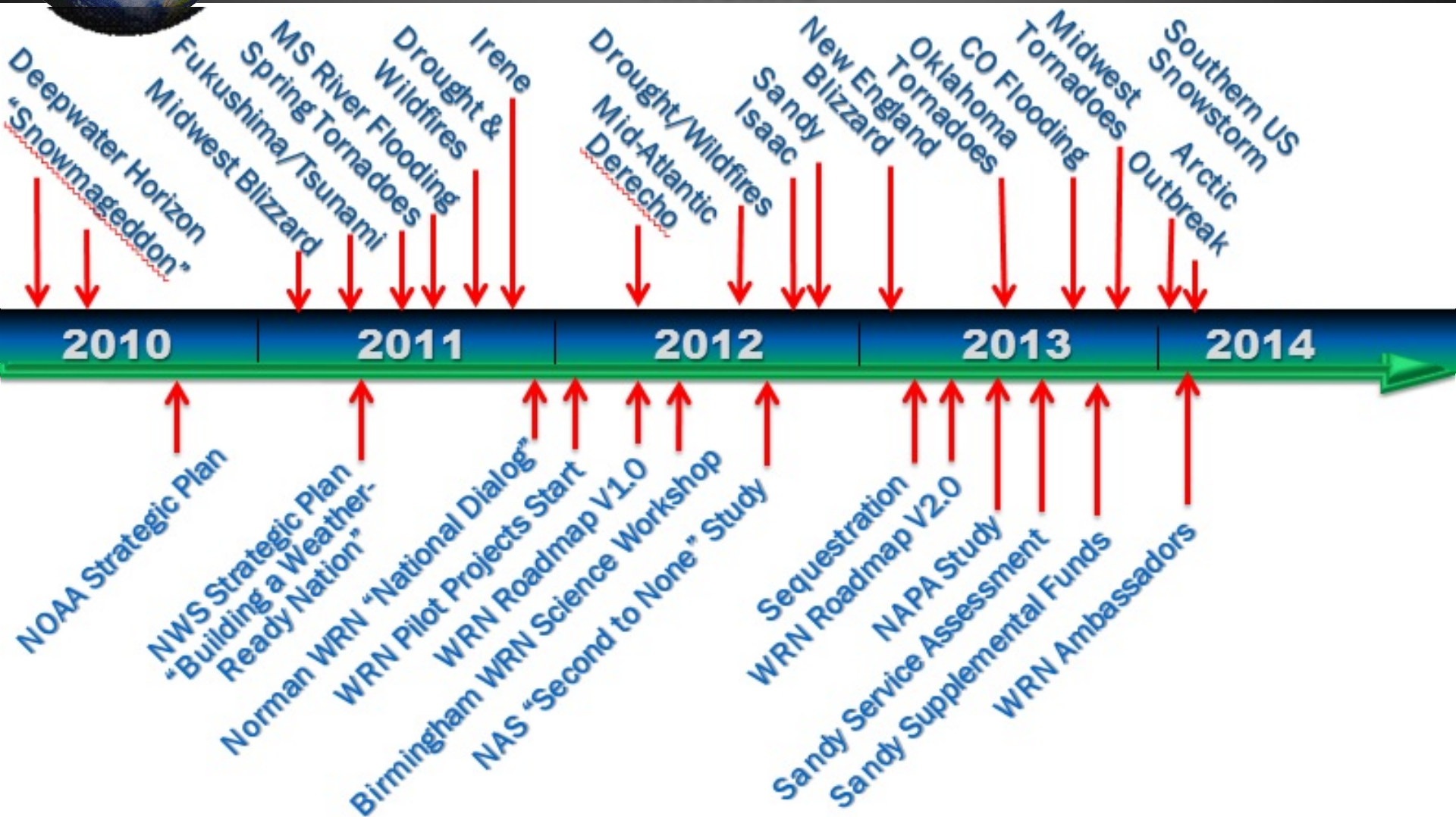
96% of tornadoes located within SPC Watch
Ave. Warning Lead Time = 24 minutes

Deadliest outbreak since 1936
~190 tornadoes
~311 fatalities





NWS Evolution Toward Building a Weather-Ready Nation Timeline





NWS Strategic Outcome: A Weather-Ready Nation

Becoming a Weather-Ready Nation is about building community resilience in the face of increasing vulnerability to extreme weather.



NOAA is developing new decision support services, improving technology to track and forecast storms, and expanding its dissemination efforts to achieve far-reaching national preparedness for weather events.

Decreasing Vulnerability by Increasing Resilience



Weather-Ready Nation

Five Major Focus Areas

Internal

- ✔ Impact-based Decision Support Services
- ✔ Communications/Outreach
- ✔ Science & Technology Advances
- ✔ Information Delivery

- ✔ Innovative Partnerships

External to NOAA





Taking NWS to the Next Level

Impact-based Decision Support Services

IDSS has four elements:

- ✔ Better understanding of societal impacts.
- ✔ Making our information more relevant to decision makers.
- ✔ Participating directly in decision making for those decisions fundamental to the role of government, especially the protection of life and property.
- ✔ Counting on market forces to provide diverse decision-support services across the entire economy.





Taking NWS to the Next Level

Impact-based Decision Support Services

Recent Successes:

- ✔ Integrated Impact Decision Support Unit embedded at the FAA's Command Center
- ✔ Improved consistency of services at NWS's 21 Center Weather Service Units
- ✔ New Decision Aids for Traffic Flow Management
- ✔ Focused efforts at the Aviation Weather Testbed (AWT) to address IDSS
 - ✔ Operational Bridging
 - ✔ Aviation Weather Statement





AWC National Aviation Mets at FAA ATCSCC



Decision support @ ATCSCC



Support Collaborative Decision Making



Focus on greatest NAS weather impacts



FAA Air Traffic Control System Command Center (ATCSCC)



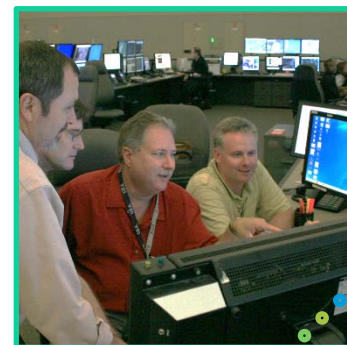
• NOAA Administrator Award Winners

• Secretary of Transportation Anthony Foxx

• Decision Support

• AWS

• WOW- Wall of Weather





Strengthening Partnerships

We need partners' help in transforming society to become ready, responsive and resilient to increasing extreme weather threats.

NOAA will continue to improve outreach, IDSS, S&T, and dissemination methods.

Building a Weather-Ready Nation requires the entire Weather Enterprise to work together to deliver information for better community, business, and personal decision making.



▪ **SOCIETAL RESPONSE EQUAL TO RISK** ▪



Reenergized General Aviation Safety Emphasis

NTSB MOST WANTED

CRITICAL CHANGES NEEDED TO REDUCE TRANSPORTATION ACCIDENTS AND SAVE LIVES

ADDRESS UNIQUE CHARACTERISTICS OF HELICOPTER OPERATIONS

What is the Problem?

Every day, there are hundreds of helicopter operations in which pilots transport themselves and others. The U.S. civil helicopter industry continues to see overwhelming growth and demand for emergency medical services, law enforcement support, electronic news gathering, offshore oil and gas support, as well as a variety of other applications.

Helicopters are used for a variety of operations, each of which presents unique challenges. For example, helicopter emergency medical services (HEMS) operators transport seriously ill patients and donor organs to emergency care facilities, often creating pressure to conduct these operations safely and quickly in various environmental conditions, such as in inclement weather, at night, or at unfamiliar landing sites for helicopter operations. Air tour operators and law enforcement support operators face similar obstacles. On September 24, 2004, in Kalaheo, Hawaii, the pilot of a non-stop sightseeing air tour flight lost control of his helicopter after flying into a turbulent area with reduced visibility leaving him disoriented. And, in June 9, 2009, in Santa Fe, New Mexico, a helicopter operated by the New Mexico State Police on a search and rescue mission crashed after the pilot decided to take off from a remote, mountainous landing site on a dark, windy night.

These and other operational issues have led to an unacceptably high number of helicopter accidents. Since 2004, more than 1,600 accidents occurred involving helicopters used as air ambulances, for search and rescue missions, and commercial helicopter operations such as tour flights. As a result of these crashes more than 500 people lost their lives. There is no simple solution for reducing helicopter accidents but safety improvements to address helicopter operations have the potential to mitigate risk to thousands of pilots and passengers each year.



Photo of a Bell 206 northeast of McClellan.

What can be done?

The NTSB is concerned that a concert of operations. This by key stakeholder operators, and by

Helicopter operators should consider the need for flight and flight-following

Operators should training that include meteorological conditions of the presence of investigators, request went wrong and

for more information, visit: www.ntsb.gov/mostwanted

NTSB MOST WANTED LIST

CRITICAL CHANGES NEEDED TO REDUCE TRANSPORTATION ACCIDENTS AND SAVE LIVES

2014

GENERAL AVIATION: IDENTIFY AND COMMUNICATE HAZARDOUS WEATHER

What is the Problem?

The overwhelming majority of aviation-related deaths in the United States occur in general aviation (GA) accidents. In 2011, there were 1,466 GA accidents, of which 263 were fatal. 444 people were killed, and the accident rate per 100,000 flight hours remains substantially higher in GA than in commercial aviation (6.51 for GA compared to 1.5 for on-demand Part 135 operations and 0.162 for scheduled Part 121 operations). Historically, about two-thirds of all GA accidents that occur in instrument meteorological conditions (IMC) are fatal—a rate much higher than the overall fatality rate for GA accidents.

A frequent cause of or contributing factor to these accidents is hazardous weather. For example, on December 19, 2011, a Piper carrying the pilot and four passengers impacted terrain following an in-flight break up near Bryan, Texas. NTSB investigators determined that the probable cause of the five-fatality accident was the pilot's inadvertent encounter with severe weather, which caused a failure of the left wing. One of the issues identified in the investigation was the presentation of weather radar data in the cockpit, obtained through the pilot's subscription to satellite-based weather services.

The NTSB continues to examine the Federal Aviation Administration's (FAA) weather information dissemination practices in recent investigations as well as the consistency of National Weather Service (NWS) weather advisory products for the aviation community. While having weather information available to pilots, air traffic controllers, and meteorologists is crucial, improper understanding and misutilization of this information can prove just as dangerous (if not more dangerous) as not having that information at all. Examples of such dangerous misutilization include the use of weather information that may lead them



Photo of post-accident cockpit and engine sections of a Socata TBM 700 aircraft following its encounter with severe icing conditions near Morristown, New Jersey on December 20, 2011.

What can be done?

In the almost 50 years of NTSB accident investigations, NTSB's recommended solutions to weather issues fall into three broad areas:

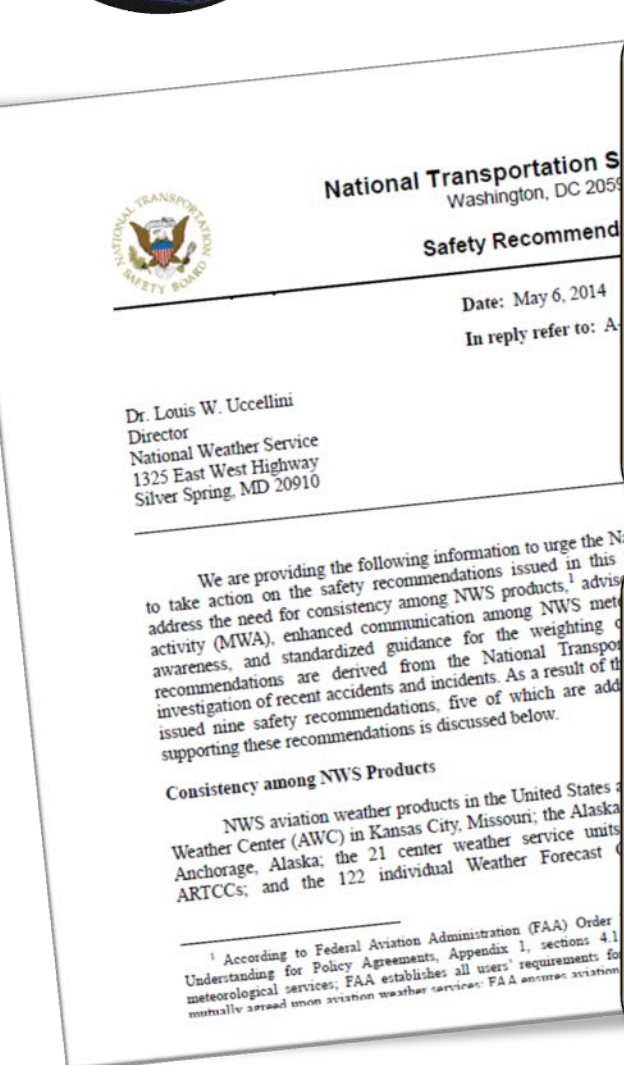
1. pilot training and operations;
2. the creation of weather information and advisories; and
3. the collection and dissemination of weather information particularly by the NWS and the FAA.

The first line of defense in preventing a GA weather-related accident is the GA pilot; he or she makes the decision of when and where to fly the aircraft. Therefore, appropriate training on how to obtain and use the proper information to address hazardous weather is critical. In addition, granting pilots, as well as FAA-contracted weather briefers, access to real-time weather information through weather cameras and situational awareness.





NTSB Safety Recommendations



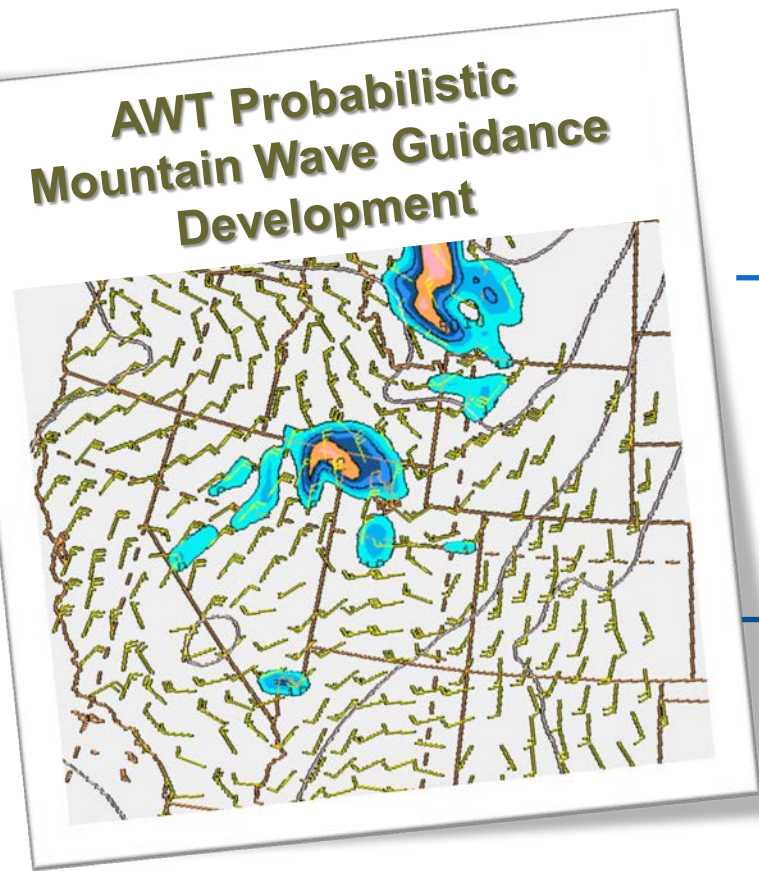
On May 6, 2014, NTSB provided thoughtful recommendations identifying challenges facing the NWS and FAA in providing weather information for safe and efficient flight

Nine recommendations (5-NWS & 4-FAA) designed to prevent accidents and save lives

NWS will respond to these recommendations within 90 days



NTSB Recommendations



Consistency

(esp. between aviation and public information)

NWS Coordination

Mountain Wave Activity





Consistency Between 155 NWS Aviation Support Offices



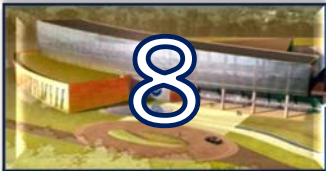
Aviation Weather Center (AWC)



Alaska Aviation Weather Unit (AAWU)



Volcanic Ash Advisory Center (VAAC)



Specialized National Centers (NCEP Centers)



Center Weather Service Units (CWSUs)



Weather Forecast Offices (WFOs)

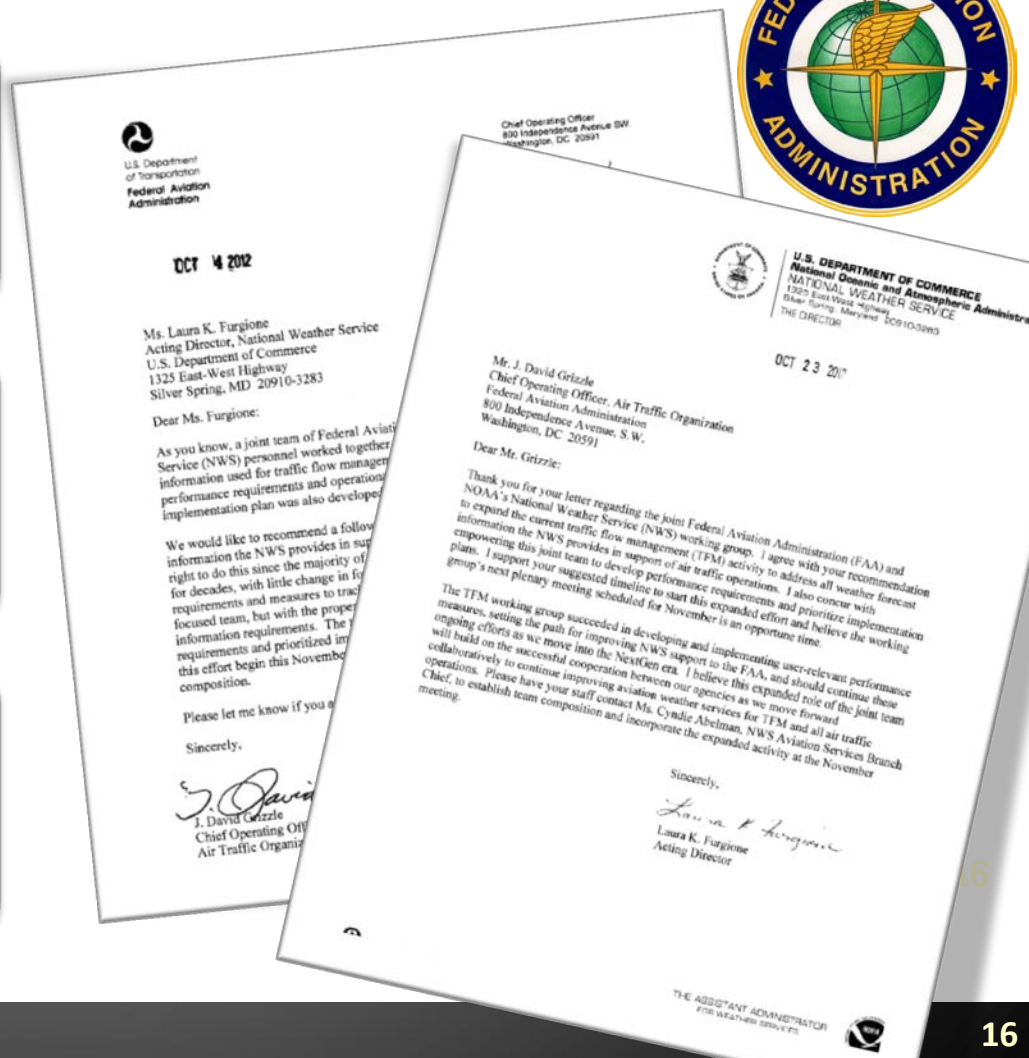


Reviewing all Weather Information for Aviation

FAA and NWS Aviation Weather Requirements Working Group (ARWG)

Agreed to in 2012 by FAA Chief Operating Officer and NWS Director

Goal: Improve NWS products in support of Aviation





ARWG Preliminary Analysis

Non-ICAO products with high potential for change(s):

Area Forecast

Freezing Level Graphic

Weather Depiction Chart

Radar Summary Chart

Aviation Watch Notification Message

Non-ICAO products with some potential for change(s):

Convective SIGMET

Center Weather Advisory

Winds and Temperatures Aloft

Meteorological Impact Statement

Additional products with constraints—little potential for change(s):

International Aviation Route Forecast

Collaborative Convective Forecast Product

Current Icing Potential

Forecast Icing Potential

Graphical Turbulence Guidance

Products required under international obligation—little potential for change(s):

SIGMET

AIRMET

Graphical AIRMET

Aviation Tropical Cyclone Advisory

Volcanic Ash Advisory

Terminal Aerodrome Forecast



Transitioning the Area Forecast (FA) to Digital Products

1. ARWG identified a suite of existing equivalent NWS graphical information that can be used
 - Acceptable alternatives for flight planning
 - Not necessarily identical information
2. Federal Register notification published 6/19
 - Currently Soliciting feedback through 8/4
3. FAA will ...
 - Continue to consult with users
 - Complete a Safety Risk Assessment
 - Provide recommendations to NWS
4. NWS 'Change of Service' notification will be submitted for an early 2015 transition date



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FAUS41 KKCI 130845
FA1W
BOSC FA 130845
SYNOPSIS AND VFR CLDS/WX
SYNOPSIS VALID UNTIL 140300
CLDS/WX VALID UNTIL 132100...OTLK VALID 132
ME NH VT MA RI CT NY LO NJ PA OH LE WV MD DC
SEE AIRMET SIERRA FOR IFR CONDS AND MTN OBSO
TS IMPLY SEV OR GTR TURB SEV ICE LLWS AND IFR
NON MSL HGTS DENOTED BY AGL OR CIG.
SYNOPSIS...LOW OVER MI UP WITH WRMNT ESE TO
CONTG SE TO SERN NY-LOW 150S NOVA SCOTIA. TRC
ATLC HIGH PRES E OF NC WITH RDG WNW TO WRN VA
BUF-CNTRL PA BECMG CDFNT SE ACRS DE...THEN ES.
SIE. CDFNT DTW-CVG AND SSW TO NERN MS.
ME NH VT
ERN ME...SCT015. TIL 12Z OCNL VIS 3SM BR. 12Z
NW ME...SCT025. 12Z SKC. OTLK...VFR.
SWRN ME/SERN NH...BKN100 TOP 170. 20Z BKN070. C
RMNDR NH/VT...BKN100 TOP FL180. BECMG 1416 BKN0
ISOL -SHRA. OTLK...VFR.
MA RI CT
WRN MA...BKN150 TOP 170. 12Z BKN060 OVC110. WDLY
OVC060. OTLK...VFR SHRA.
SRN CT...BKN100 TOP 170. 15Z BKN040 OVC060. OTLK
SRN CT...BKN100 TOP 170. 20Z BKN070. OTLK...VFR.





CCFP Evolution & Aviation Weather Statement (AWS)

Scheduled Collaboration



Continuous Collaboration

Human Produced CCFP



Scheduled Automated Guidance Product

CCFP Issued Every 2 Hours



Event-based Impact Product - AWS

Initial Aviation Weather Statement Needs for an TFM Area of Concern*

- Onset: Thunderstorm activity is expected within 4 hours
- Cessation: Thunderstorm activity expected to end within 4 hours
- Consistency: Conflicting thunderstorm forecasts
- New Information: Thunderstorm activity is expected to cease earlier

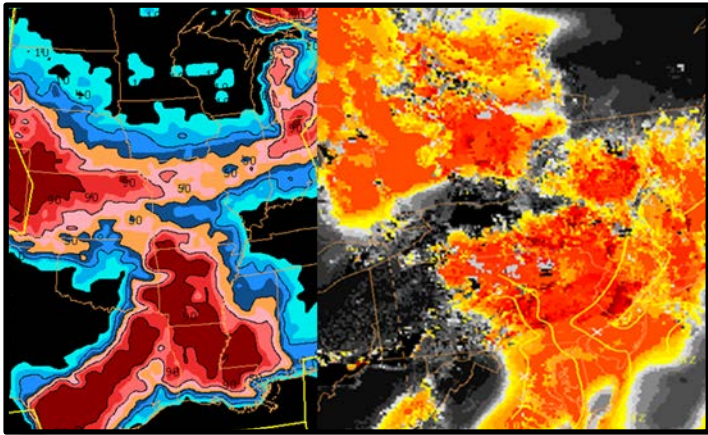
**An area of concern includes en route traffic flows, Core 30 terminal operations and special event airspace.*





Taking NWS to the Next Level

Science and Technology Advances



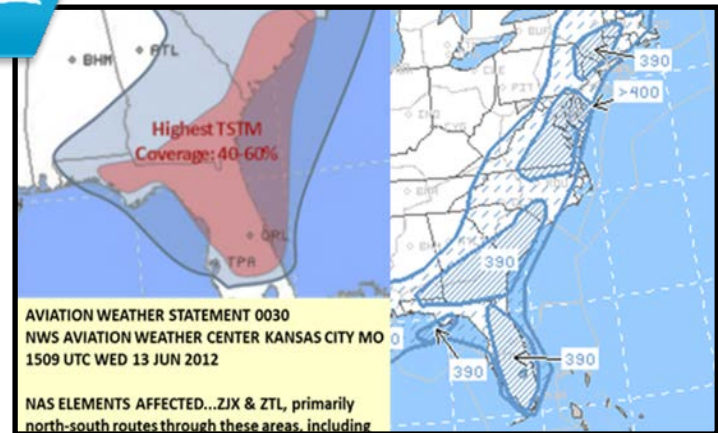
Probabilistic
Forecasting

	Sat 21Z	Sun 00Z	Sun 03Z	Sun 06Z	Sun 09Z	Sun 12Z	Sun 15Z	Sun 18Z	Sun 21Z	Mon 00Z	Mon 03Z	Mon 06Z	Mon 09Z	Mon 12Z	Mon 15Z	Mon 18Z	Mon 21Z	Tue 00Z	Tue 03Z	Tue 06Z	
KIAD										S	S	SV	SV	SV	SV	SV	SV	S	S		
KBWI										S	S	SV	SV	SV	SV	SV	SV	S	S		
KDCA										S	S	SV	SV	SV	SV	SV	S	S			
KCLT																					
KROA							S	S							V	SV	S	S	S		
KAVL																			V		
KTRI																					
KCHO						S	S	S	S	SV	SV	SV	SV	SV	SV	S	S	S			
KRIC							S					V					S	S	S		
KTYS																					
KGSO											F	F	F							S	S

Decision
Support Tools



Collaborative
Experiments

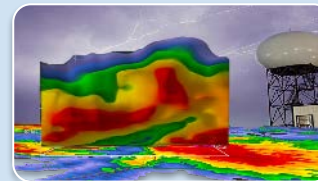


New Products



Taking NWS to the Next Level

Integrated Dissemination Program

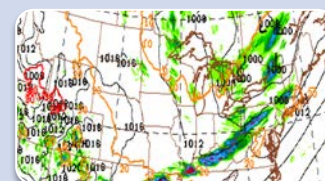


**NextGen IT
Web
Services
(NGITWS)**

**High Speed
Networking**

**Multiple-
Radar
Multiple
Sensor
(MRMS)**

**Meteorological
Assimilation
Data Ingest
System
(MADIS)**



**AWC Web
Services**

- ADD5
- WIFS
- IFFDP

**NWS Web
Presence**

- NIDS

**National
Operational
Model Archive
& Distribution
System
(NOMADS)**

**Model
Analysis &
Guidance
(MAG)
Web Site**





Strengthening Partnerships

WRN Ambassador Initiative

- ✓ **How can organizations be a part of and contribute toward building a Weather-Ready Nation?**
 - ✓ All levels of government
 - ✓ Weather, Water, Climate Enterprise
 - ✓ Academia
 - ✓ Businesses & non-profits
- ✓ **Formal recognition of organizations that work with NOAA toward building a Weather-Ready Nation**
 - ✓ Promote WRN messages and themes
 - ✓ Engage with NOAA on potential collaborations
 - ✓ Share success stories
 - ✓ Serve as an “Example”



Visit: www.noaa.gov/wrn



Strengthening Partnerships

WRN Ambassador Initiative

✔ Early Successes

- ✔ Outreach during preparedness weeks
- ✔ Press releases and media interviews
- ✔ Community events
- ✔ WRN Ambassador Congressional testimony
- ✔ More consistent WRN messaging
- ✔ Expansion of stakeholder engagement to non-traditional sectors
 - ✔ Insurance
 - ✔ Health
 - ✔ Real-Estate
 - ✔ Museums/Science Centers



Visit: www.noaa.gov/wrn



Strengthening Partnerships

WRN Ambassador Initiative



Visit: www.noaa.gov/wrn

WRN Ambassador
Information and
Application





wrn.feedback@noaa.gov

www.weather.gov

www.noaa.gov/wrn

