



National Weather Service

Update on Winter Weather Initiatives

Partner Webinar

October 10, 2017

Dave Soroka: Winter Weather Program Lead



Outline

PART I:

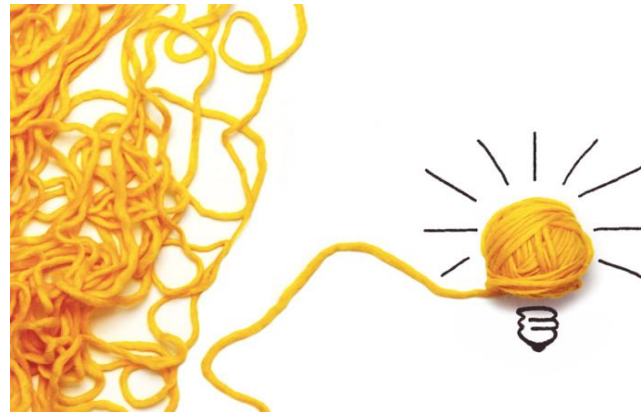
- What's new this winter
 - Hazard Simplification (Consolidation/Reformatting)
 - Snow Squall Warning
 - Operational Day 4-7 Winter Outlook
 - Expanded and Improved Probabilistic Snow
- Questions and comments

PART II:

- Where are we going?
- Experiments and Prototypes
- Best Practices
- Outreach/Awareness resources
- Questions and comments



What's new this winter: Hazard Simplification



Simplifying the Winter Products

Consolidating existing products

Consistent and impact based formatting

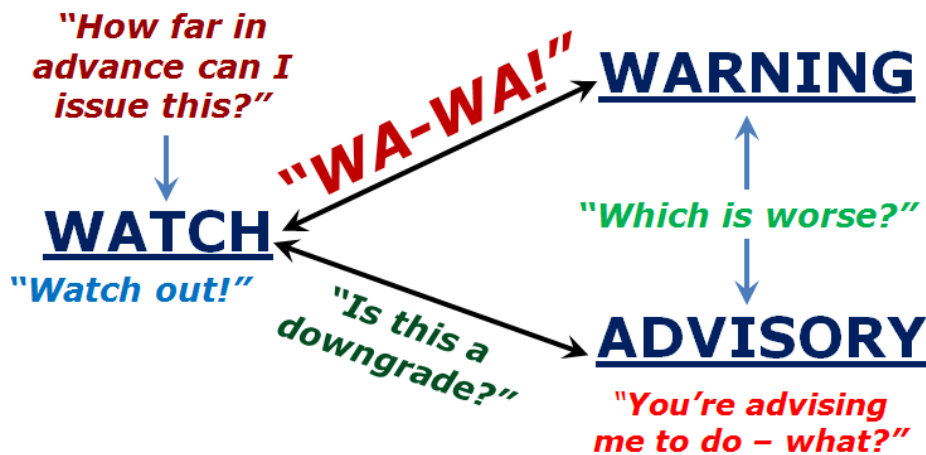


Why Hazard Simplification?

The WWA System...What Are The Issues?

Orthogonal Logic

Too Many Products!



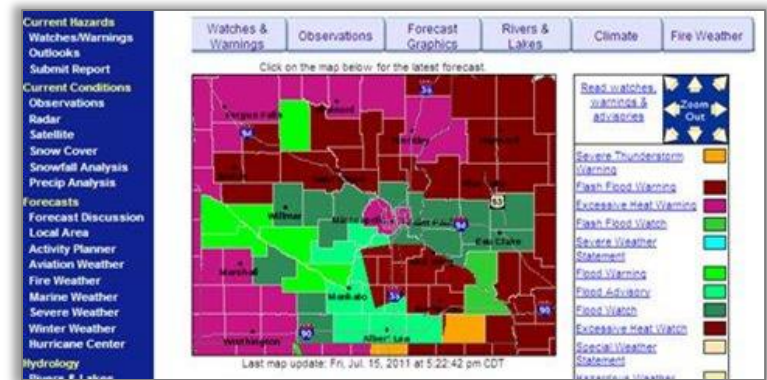
National Weather Service's Watch, Warning, Advisory Periodic Table

Ansorge, 2017

What Are The Issues?

- We often replace one WWA with another:

***WINTER STORM WARNING IS
BLIZZARD WARNING
IN EFFECT UNTIL 11:30 PM...***



- And we also often upgrade/downgrade

***ICE STORM WARNING IS CANCELLED... WINTER WEATHER
ADVISORY IN EFFECT UNTIL 6 PM SUNDAY...***



First Significant Changes: Message Reformatting

| | | | |
|---|---|---|---|
| R | E | F | O |
| R | M | A | T |

- Past feedback indicates users prefer “bulleted” formats
- However, many of our messages are still long and repetitive – opportunity for improvement!
- Research has provided positive feedback on the use of a **“What”, “Where”, “When”** format
 - This format supports consistency, brevity and a focus on impact*



Consolidation of Watches/Advisories

First Significant Changes to Current System

Winter Consolidation

Note: Wind chill products not included

Current Winter Watch Products

Winter Storm Watch

Lake Effect Snow Watch

Blizzard Watch

Consolidate To →

Winter Storm Watch

Current Winter Advisory Products

Lake Effect Snow Advisory

Winter Weather Advisory

Freezing Rain Advisory

Consolidate To →

Winter Weather Advisory



Consolidation of Warnings

Warning Consolidation: Central Region Demonstration

Note: Wind chill products not included

| <u>Current Winter Warning Products</u> |
|--|
| Winter Storm Warning |
| Lake Effect Snow Warning |
| Blizzard Warning |
| Ice Storm Warning |



**Consolidate
To**

| <u>Current Winter Warning Products</u> |
|--|
| Winter Storm Warning |
| Blizzard Warning |
| Ice Storm Warning |



Product Examples

Example of Today's Message – Freezing Rain Advisory

...FREEZING RAIN ADVISORY IN EFFECT UNTIL NOON PST TODAY...

The National Weather Service in Pendleton has issued a Freezing Rain Advisory...which is in effect until noon PST today.

- * **LOCATIONS**...Pendleton, Walla Walla
- * **ICE ACCUMULATIONS**...Less than a tenth of an inch
- * **TIMING**...Occasional light freezing rain will continue through midday before temperatures will rise beginning in the afternoon.
- * **IMPACTS**...Roads and sidewalks will become ice covered and hazardous.
- * **TEMPERATURES**...In the upper 20s to lower 30s.
- * **WEB PAGE**... For a detailed view of the hazard area visit <http://www.wrh.noaa.gov/map/?wfo=PDT>.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

A Freezing Rain Advisory means that periods of freezing rain or freezing drizzle will cause travel difficulties. Be prepared for slippery roads. Slow down and use caution while driving.



Product Examples: New

...WINTER WEATHER ADVISORY IN EFFECT UNTIL NOON PST TODAY...

- * **WHAT**... Freezing rain expected. Ice accumulation less than a tenth of an inch. Temperatures will rise above freezing during the afternoon.
- * **WHERE**... Pendleton, Walla Walla
- * **WHEN**... Through midday
- * **ADDITIONAL DETAILS**... Roads and sidewalks will become ice covered and hazardous as temperatures hover in the upper 20s to lower 30s.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Be prepared for slippery roads. Slow down and use caution while driving. For a detailed view of the hazard area visit <http://www.wrh.noaa.gov/map/?wfo=PDT>.



Product Examples

Example of Today's Message – Blizzard Watch

...BLIZZARD WATCH IN EFFECT FROM SUNDAY AFTERNOON THROUGH LATE MONDAY NIGHT...

The National Weather Service in Caribou has issued a Blizzard Watch...which is in effect from Sunday afternoon through late Monday night.

- * **LOCATIONS**...The Bangor region and Downeast.
- * **HAZARD TYPES**...Heavy snow along with significant blowing and drifting snow.
- * **SNOW ACCUMULATIONS**...16 to 24 inches possible.
- * **TIMING**...Late Sunday afternoon through late Monday night. The worst conditions will be during the day Monday.
- * **IMPACTS**...Snow and strong winds will create very hazardous conditions, and travel may become impossible. Blowing and drifting snow will cause blizzard conditions and whiteouts at times.
- * **WINDS**...Northeast 25 to 40 mph. Gusts up to 50 mph inland with gusts up to 60 mph along the coast.
- * **TEMPERATURES**...In the 20s.
- * **VISIBILITIES**...Less than one quarter mile at times with whiteouts.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

A Blizzard Watch means there is a potential for falling and/or blowing snow with strong winds and extremely poor visibilities. This can lead to whiteout conditions and make travel very dangerous.



Product Examples: New

...WINTER STORM WATCH IN EFFECT FROM SUNDAY AFTERNOON THROUGH LATE MONDAY NIGHT...

- * **WHAT**...Blizzard conditions possible. Heavy snow along with significant blowing and drifting snow. Snow accumulations of 16 to 24 inches possible. Northeast winds 25 to 40 mph with gusts up to 50 mph inland and up to 60 mph along the coast.
- * **WHERE**...Bangor region and Downeast.
- * **WHEN**...Late Sunday afternoon through late Monday night. The worst conditions would be during the day Monday.
- * **ADDITIONAL DETAILS**... Snow and strong winds could create very hazardous conditions, and travel may become impossible. Blowing and drifting snow could cause blizzard conditions and whiteouts at times.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Travel may become impossible. Plan ahead accordingly.

What's new: Snow Squall Warning

- Intense short-lived burst of heavy snowfall
- Quick reduction in visibilities and is often accompanied by gusty winds and slick roads.
- Similar to blizzard conditions, but localized and much shorter in duration.
- Typically occur during the daytime hours.
- Often causes chain-reaction accidents resulting in injuries and deaths.





Snow Squalls Often Deadly

Southbound US-23 reopens after massive pileup: 'It was like someone threw a pillow case over your head'



MLive

Fox News

At least 10 injured in 30-plus car pileup on Indiana interstate



3 DEAD, AT LEAST 20 INJURED IN MULTI-VEHICLE CRASH ON I-94 NEAR MICHIGAN CITY

One dead, 23 hurt in fiery 193-vehicle I-94 pileup



WZZM Grand Rapids



ABC7 Chicago

Highway 400 reopened after massive 96-car pileup near Barrie caused by snow squall shut it down for most of day

Massive Canadian Pile-Up Crash Sends 100 People To The Hospital (Updated)



Jalopnik



National Post



How is the NWS addressing this danger?

New SNOW SQUALL WARNING

WWUS51 KBGM 132039
 SQWBGM
 BULLETIN – EAS ACTIVATION REQUESTED
 Snow Squall Warning
 National Weather Service Binghamton NY
 339 PM EST Sat Feb 13 2016

NYC007-023-107-109-132115-
 /O.NEW.KBGM.SQ.W.0001.160813T2039Z-160813T2115Z/
 Cortland NY-Broome NY- Tompkins NY- Tioga NY-
 339 PM EST Sat Feb 13 2016

The National Weather Service in Binghamton has issued a

- * Snow Squall Warning For...
 Southern Cortland County in Central New York...
 Northwestern Broome County in Central New York...
 Southeastern Tompkins County in Central New York...
 Northern Tioga County in Central New York...

* Until 415 PM EST

* At 338 PM EST, a dangerous snow squall was located over South Danby or 12 miles south of Ithaca, moving northeast at 50 mph.

HAZARD...White-out conditions in heavy snow and blowing snow.

SOURCE...Radar indicated and webcams.

IMPACT...Dangerous, life-threatening travel.

* The dangerous snow squall will be near...

- Caroline and Slaterville Springs around 350 PM EST.
- Berkshire, Richford and Harford around 355 PM EST.
- Whitney Point and Lisle around 405 PM EST.
- Marathon around 410 PM EST.
- Willet and East Freetown around 415 PM EST.

PRECAUTIONARY/PREPAREDNESS ACTIONS...

Conditions will deteriorate rapidly with near zero visibilities in snow and blowing snow. Travel will become impossible. You should wait until the squall passes before traveling or find a safe place to wait out the squall away from any road or highway indoors if traveling.

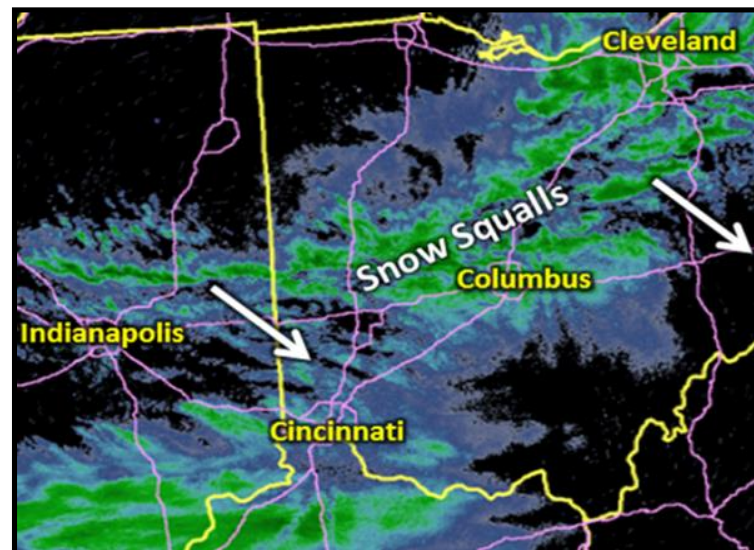
&&

LAT...LON 4260 7600 4242 7586 4235 7585 4214 7645

4225 7654 4228 7654 4228 7656 4230 7658

TIME...MOT...LOC 2038Z 240DEG 42KT 4227 7643

\$\$





What's new: Snow Squall Warning

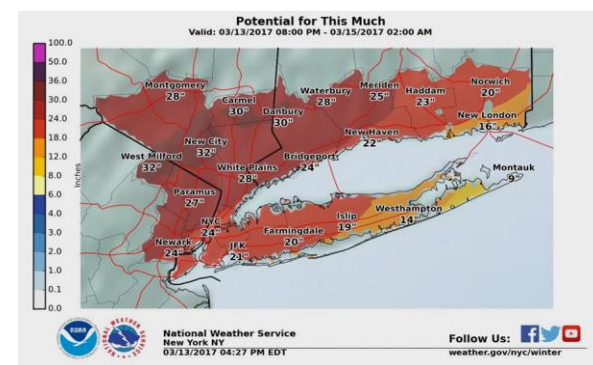
Weather Forecast Offices participating this Winter:

- State College, PA
- Buffalo, NY
- Binghamton, NY
- Burlington VT
- Pittsburgh, PA
- Cheyenne, WY
- Detroit, MI

Rest of NWS WFO's to begin issuing warning during winter 2018/2019

What's New: Expanded and Improved WFO Probabilistic Snow Experiment

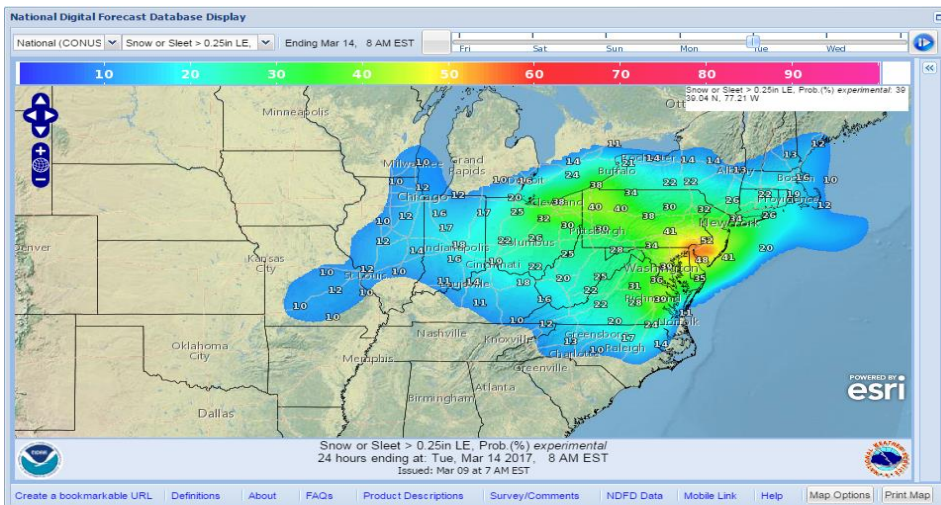
- Improved and expanded probabilistic snow experiment to all Regions
 - 44 Weather Forecast Offices provided information via web page last winter
 - Joint effort between our Weather Prediction Center and local offices
 - **Expect number of participating offices to increase for upcoming winter**
 - **Improved ensemble makeup will sharpen predictions**
 - **Additional runs of the WPC PWWF suite during the 2017-18 season will enhance collaboration between WFOs and WPC**
 - Provides graphics and tables for several scenarios – up to 72 hours in advance of system





What's New: Operational WPC Probabilistic Outlook for Days 4-7

- Successfully established experimental outlook in National Digital Forecast Database (NDFD) last winter:
 - Probability of 0.25" or greater snow/sleet in days 4-7
 - Display available on WPC web page and in gridded database
 - Provides users extended look at possible winter events
- **Transitioning to operational status for upcoming season**



General Information

NDFD
NWS National Digital
Forecast Database



Questions and Comments

Discussion on what's new!



Where are we going?



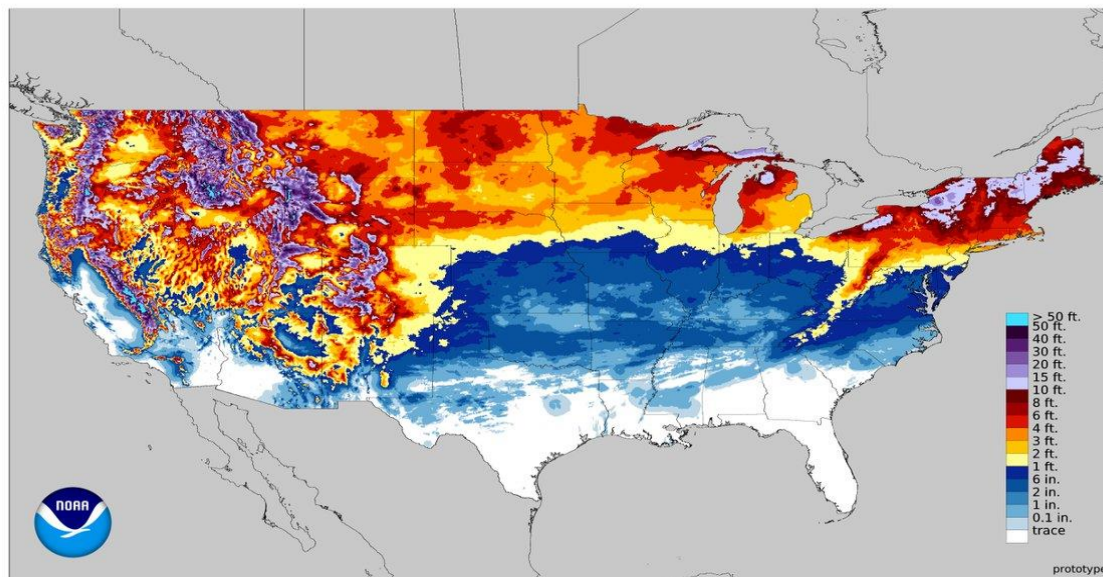
One collaborated NWS forecast that is probabilistic, impact-based, accurate and understandable

Improved Gridded Snowfall Analysis

- National Operational Hydrologic Remote Sensing Center (NOHRSC) V2 gridded analysis improved for internal situational awareness and partner briefings
 - Improved resolution around Great Lakes and higher terrain
 - Transition to winter program expected to harden infrastructure

National Snowfall Analysis: accumulation from 2016-09-30 to 2017-04-09

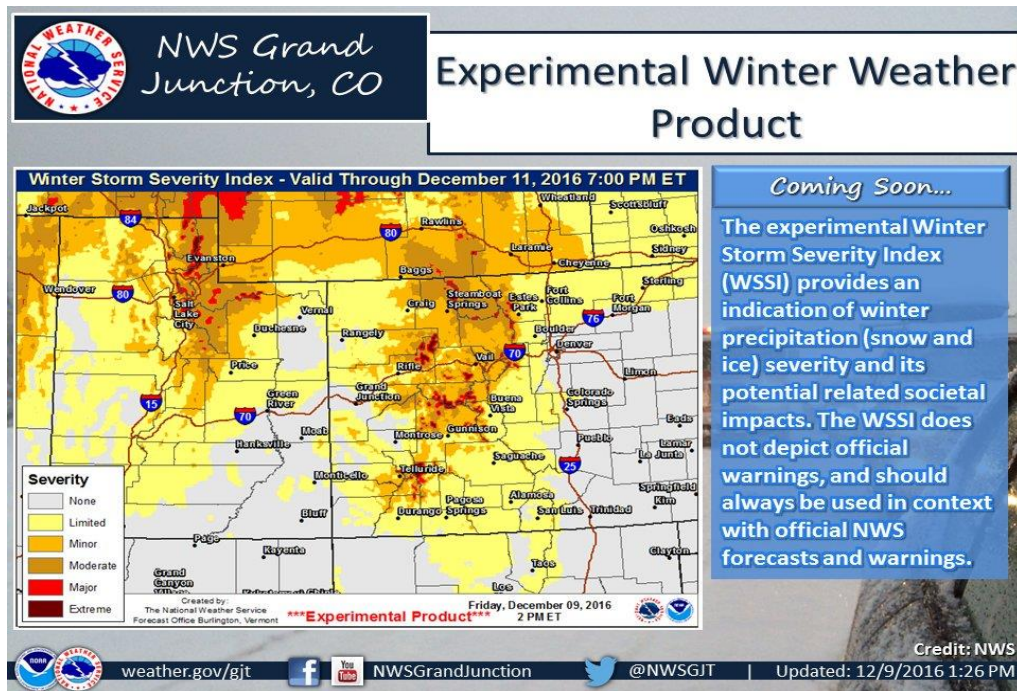
Issued 2017-04-09 16:29:58 UTC





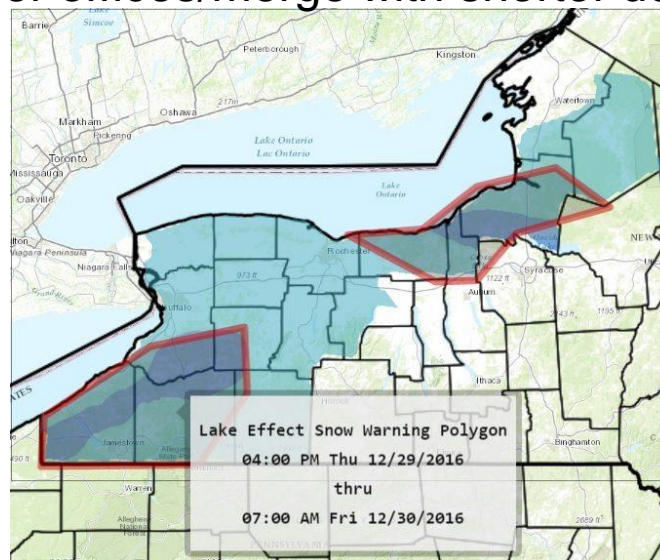
Ongoing Prototype: Winter Storm Severity Index

- Provides level of winter storm “impact” up to 72 hours in advance
 - Includes both meteorological and non-meteorological factors
 - Six levels of impact provided in color-coded scale
 - 15 prototype offices will display this winter, national internal review
 - Improving methodology and adding new non-met variables



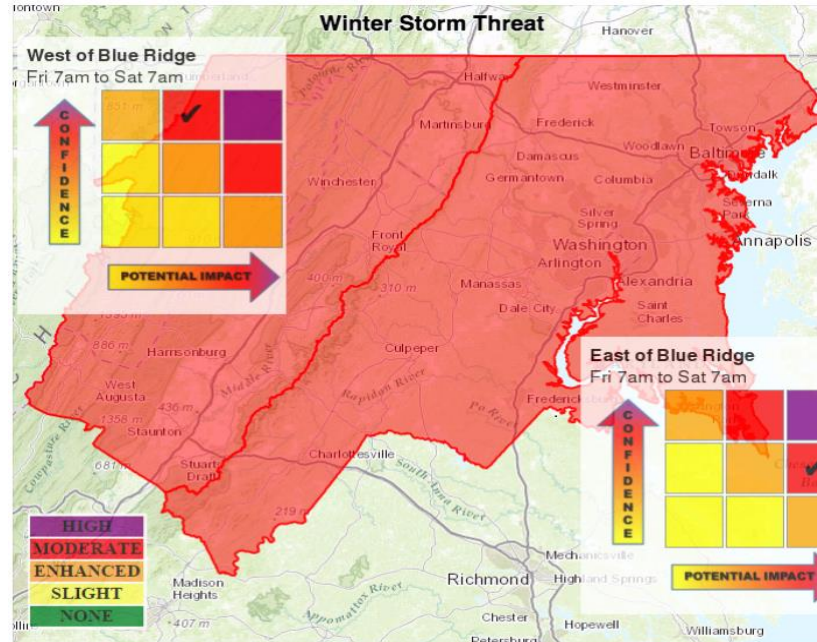
Ongoing Experiment: Lake Effect Snow Polygons

- WFO Buffalo experiment:
 - Lake effect snow warnings appear as polygons.
 - Reduces “false alarms” produced by large scale (zone based) products.
 - Allows for shifting areas of heaviest snow to provide more targeted information for users.
 - Possible expansion to other offices/merge with shorter duration Snow Squall Warning.



Ongoing Experiment: Day 3-7 Winter Storm Threat Index

- WFO Baltimore/Washington DC experiment:
 - Day 3-7 Winter Storm threat index.
 - Provides users heads up of possible major winter event.
 - Divides county warning area with each having separate index.
 - Merges forecaster confidence with potential impact.



Pathfinder

- Multi-year collaboration between NWS, State DOTs, and support contractors to share and translate forecasts into consistent public transportation impact statements
- Disseminates road weather information that is clear, concise, impact-based, and consistent
- Intended Outcome - Drivers are well informed and able to make safe and efficient travel decisions





Regional Successes: Midwest Ice Storm IDSS (Jan 2017)

Though this ice storm presented many challenges, overall performance by our Central Region offices lessened impacts to public. Thanks to effective IDSS, awareness among our core partners and the general public was high, lead times were significant, and many took action to mitigate the impacts of the ice.

For example:

- The start time of a high-profile NFL game in Kansas City was pushed forward by several hours in order to minimize potential risk to life and property that may have occurred had the earlier kickoff time not been changed.
- A hospital at risk for significant icing sheltered approximately 100 members of their staff Friday and Saturday to ensure essential medical services.
- Additionally, roads were pretreated across a multi-state area, which likely minimized impacts to motorists.

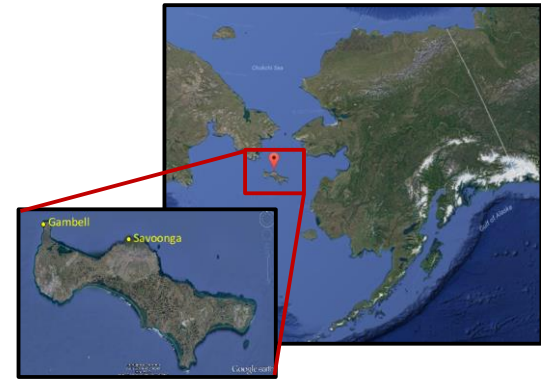




Regional Successes: Alaska January 2017

January 2017 DSS Success Story → St. Lawrence Island (Winter Storm/On-Land Freezing Spray Event)

- **Two weeks** prior to this event, long range models were capturing pattern for significant event, including freezing sea spray blowing onto land and causing power outages
- Addressed potential impacts & confidence through phone and email briefings
- Core partners pre-staged supplies, including technical experts
- Similar storm in Dec 2010 left remote community w/o power for 6 days; this time the community was prepared due to DSS and lessons-learned from 2010



WCM discussing storm impacts with Mayor of Gambell



Regional Successes: Western Region Winter 2016-2017

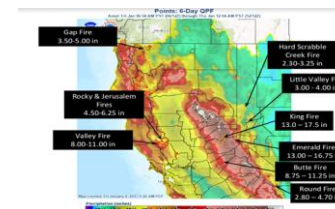
- **Weather Forecast Office (WFO) On-Site Support**
- Multiple offices/staff engaged in service delivery for high impact weather events, large population events and exercises (to name a few):
 - Oroville Dam Incident & Flooding, CA State Flood Ops Center - Sacramento
 - Norovirus Outbreak, Spokane County EOC - Spokane
 - Major Flooding, State EOC and Incident Command - Boise, ID, Pocatello, ID
 - Vigilant Guard Exercise, Multi-Agency Command Center - Las Vegas, NV
 - IMET Dispatch, CalFire Unified Command - Oroville Dam, Sacramento, CA
 - New Years Eve, 3 location Multi-Agency Command Support - Las Vegas, NV



California OES Impact Threat Matrix
Jan 06, 2017 – Jan 13, 2017

| DAY/THREAT | FRI | SAT | SUN | MON | TUE | WED | THU |
|----------------------------|---------|---------|---------|---------------|----------------|---------------|---------------|
| Freezing Rain | | Nim CA | | | | | |
| Winds | | | | | Nim & Crit CA | Nim & Crit CA | |
| Extreme Cold | N CA | | | | | | |
| Snow | | Sierra | Sierra | N CA/ Sierra | N CA/ N Sierra | Nim & Crit CA | Nim & Crit CA |
| Heavy Rain/ Flash Flooding | Crit CA | Crit CA | Crit CA | Nim & Crit CA | N CA/N Sierra | | |
| Debris | | Burn | Burn | Burn | Nim Half | | |

Legend: High Threat (Red), Moderate Threat (Yellow), Slight Threat (Green), No Discernible Threat (White)





NWS Winter Seasonal Safety Campaign

- NWS Winter Seasonal Safety Campaign launches on December 1 every year (first day of meteorological winter)
- Contains content on winter hazards including infographics, social media plans, presentations and videos
- See: https://www.weather.gov/wrn/winter_safety





Outreach Resources:

https://www.weather.gov/wrn/winter_safety

Warning Signs of Hypothermia

- Confusion
- Shivering
- Difficulty Speaking
- Sleepiness
- Stiff Muscles

weather.gov/cold

Closing for COID

9 Coldville, USA

| Hourly Forecast | Temperature |
|-----------------|-------------|
| 5 AM | -10° |
| 6 AM | -11° |
| 7 AM | -9° |
| 8 AM | -8° |
| 9 AM | -5° |

weather.gov

Winter Travel

- aviationweather.gov
By AIR
- weather.gov/marine
By SEA
- weather.gov
By LAND

DRESSING FOR COLD WEATHER

adding layers will help keep you warm as the temperature drops

- CHILLY**
 - 1-2 layers
 - outer layer to keep out wind, rain
 - long layer
 - warm shoes water proof
- COLD**
 - 2-3 layers
 - warm hat
 - outer layer to keep out wind, wet snow
 - gloves
 - boots water proof
 - 1-2 layers
- EXTREME COLD**
 - 3+ layers
 - 1 insulating
 - warm hat
 - face mask
 - outer layer to keep out wind
 - gloves
 - boots water proof
 - 2+ layers

weather.gov/safety



Closing Summary: New this Winter!

- Consolidated and Reformatted Winter Weather Products
- Polygon based Snow Squall Warning at seven offices
- Operational NDFD Day 4-7 Winter Weather Outlook
- Improved and expanded Probabilistic Snow Forecasts





Thank You!



Dave Soroka: Winter Weather Program Lead
david.soroka@noaa.gov

301-427-9346