Update on Winter Weather Initiatives

Partner Webinar
October 29, 2020
Stephen Baxter
Winter Weather Program Lead
Outline

● Winter Program Overview

● Operational Winter Storm Severity Index

● What’s Being Tested?
  ○ Winter Storm Outlook
  ○ Winter Key Messages
  ○ Local Probabilistic Winter Precipitation Forecasts

● Snow Squall Warning Updates

● Updated Outreach Materials
Winter Program Overview

- The Winter Weather Services Program is one of 11 National Service Programs in the NWS. The Winter Program works with internal and external stakeholders to facilitate improvements to winter weather products and services.
- The program goals include moving toward a consistent suite of products and services that are collaborative, probabilistic, and impact-based.
Winter Program Overview

● Permanent HQ Staff:
  ○ Stephen Baxter, Winter Program Lead (Stephen.Baxter@noaa.gov)
  ○ Michael Muccilli, Winter Program Coordinator for Evolving Service and Outreach (Michael.Muccilli@noaa.gov)
  ○ Sarah Perfater, Winter Program Coordinator for Research to Operations and Training (Sarah.Perfater@noaa.gov)

● Weather Prediction Center Contact:
  ○ Alex Lamers, Warning Coordination Meteorologist (Alex.Lamers@noaa.gov)
Operational Winter Storm Severity Index (WSSI)

- Transitioned to operational status on September 29, 2020.
- Winter Storm Severity Index:
  - Assists NWS forecasters in maintaining situational awareness regarding potential significance of weather related impacts based upon the current forecast.
  - Enhances communication to external partners, media, and general public of an event’s expected severity (e.g., societal impacts) and spatial extent.
- Provides winter storm “impact” information out to 72 hours, and in 24 hour intervals
  - Includes meteorological & non-meteorological factors.
  - Six levels of impact provided in color-coded scale
  - Summary graphic is a composite of the maximum impact from any of the six components.

Output available here: https://www.wpc.ncep.noaa.gov/wwd/wssi/wssi.php
- Updates every 2 hours
WSSI - Components & Scale

**Snow Load**
Indicates potential infrastructure impacts due to the weight of snow

**Snow Amount**
Indicates potential impacts due to the total amount of snow or snow accumulation rate

**Ice Accumulation**
Indicates potential infrastructure impacts due to combined effects and severity of ice and wind

**Ground Blizzard**
Indicates the potential travel-related impacts of strong winds interacting with pre-existing snow cover

**Flash Freeze**
Indicates the potential of flash freezing during or after precipitation events.

**Blowing Snow**
Indicates the potential disruption due to blowing and drifting snow

### Potential Winter Storm Impacts

<table>
<thead>
<tr>
<th>No Impacts</th>
<th>Moderate Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impacts not expected.</td>
<td>Often threatening to life and property, some damage unavoidable. Typically results in disruptions to daily life.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Limited Impacts</th>
<th>Major Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rarely a direct threat to life and property. Typically results in little inconveniences.</td>
<td>Extensive property damage likely, life saving actions needed. Will likely result in major disruptions to daily life.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Minor Impacts</th>
<th>Extreme Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rarely a direct threat to life and property. Typically results in an inconvenience to daily life.</td>
<td>Extensive and widespread severe property damage, life saving actions will be needed. Results in extreme disruptions to daily life.</td>
</tr>
</tbody>
</table>
WSSI: Webpage

- Clickable tabs
  - Loads WSSI components upon click
  - Day Period tabs
- Zoom to WFO
  - Dropdown Box
- Print Image button
  - Creates a PDF of the map with your specifications
- Variety of basemaps
  - Switch Basemap dropdown button
- Browse static images
- Links to GIS data (SHP and KML)

https://www.wpc.ncep.noaa.gov/wwd/wssi/wssi.php
WSSI - What’s Next?

- Experimental extension of WSSI to Day 7 is in development.
- Probabilistic WSSI is also in development. This will serve as a key input into collaborative Winter Storm Watches.
- Social science improvements - how can WSSI better align with impacts and successfully communicate forecast severity?
- Public training material will soon be available to improve understanding and usability among a broad base of users.
What’s Being Tested?

Winter Storm Outlook

- The WSO launched last winter, providing the probability of realizing hazardous snow/ice accumulations using WFO-specific Watch/Warning criteria as a proxy threshold.

- The WSO establishes the missing national scale “Outlook” product in the winter program, serving as a unifying outlook for both external messaging and internal collaboration for consistent and collaborative Winter Storm Watch issuance.

- 50+ percent chance of meeting warning criteria triggers enhanced coordination between WPC & affected WFOs.

- Enhancements this year include a Day-4 outlook, new 80% threshold, and maximum probability over the four-day forecast period.

*The WSO is one of a few key factors considered in the issuance of Winter Storm Watches.*

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Experimental WSO

Here is an example of the WSO leading to Ice Storm Warnings on October 26.

Day 2 Outlook issued 3pm Oct. 25

Day 1 Outlook issued 4am Oct. 26

WWA Map at 8am Oct. 26

WSO Product Survey:
https://www.surveymonkey.com/r/ExpWinterStormOutlook

WSO Webpage:
https://www.wpc.ncep.noaa.gov/wwd/wso

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Experimental WSO: Webpage

- Clickable tabs
  - Loads WSO for Snow/ICE
  - Day Period tabs
- Dynamic Display
  - Can adjust transparency
  - Multiple basemap options
  - Adjustable zoom
- Map Overlays
  - Multiple overlays can be added to the map
- Print Image button
  - Creates a PDF of the map with your specifications
- Downloadable GIS data layers
What’s Being Tested?
Winter Key Messages

● Building on Success with Tropical Cyclones, WPC began coordinating Winter Key Messages last winter.
  ○ Galvanize partners and media around consistent, coordinated message
  ○ Coordinated among operational units
  ○ Available as slide on WPC homepage and integrated into WFO & WPC messaging
● We are in the process of gathering feedback from stakeholders to improve the product and process.
Testing Winter Key Messages

Initiated for: **High-impact** scenarios that have a significant chance of travel disruptions or posing a hazard to life and property and/or **Significantly anomalous** events likely to generate substantial media attention.

**Common Trigger:**
>500 mile long swath of >30% probability of local warning criteria being exceeded in the Winter Storm Outlook including at least one metropolitan area with at least 500,000 people
Or, a similarly extensive swath of >50% probability, not necessarily encompassing a metro area
Questions so far?
What’s Being Tested?
Local Probabilistic Winter Precipitation Forecast (PWPF)

- **Goal:** Provide customers and partners a range of snowfall amounts to better communicate forecast uncertainty during winter weather events.
- **61-member ensemble**
  - Expert first guess forecast provided by WPC; WFOs add local knowledge.
- **Significant model diversity contributes to a range of possible outcomes.**
- **Experimental 10th and 90th percentile graphics are available on NDFD.**

Local office Experimental PWPF page: [https://www.weather.gov/btv/winter](https://www.weather.gov/btv/winter)
Experimental PWPF

- No additional sites added in 2020-21.
- Plan for operational transition is in progress.
- One key issue is defining national and local roles in generating probabilistic snow and ice forecasts.
- We are planning to test a new process for generating and disseminating these products.

Provide feedback [here](#).
Winter Program Vision - Putting Everything Together

- Future versions of WSSI will inform the WSO as a starting point for collaborated, consistent Winter Storm Watches.
- A Collaborated Forecast Process leads to nationally-consistent snow and ice forecasts that inform a consistent suite of probabilistic forecasts.
- National and local strengths are leveraged to provide state-of-the-art forecast information and decision support services to end users.
- Winter forecast products are **probabilistic**, **collaborative**, and **impact-based**.
Consistent, Collaborated Forecasts

Collaborated Snow and Ice
Deterministic Forecasts

National
Probabilistic
Snow and Ice
Forecast

Local
Probabilistic
Snow and Ice
Forecast

Consistent and Collaborated
Watches

Winter Key
Messages

Probabilistic
WSSI

Winter Storm
Outlook
Updates to Snow Squall Warnings

• Snow Squall Warnings are still a relatively new product, providing motorists and other stakeholders with critical warnings about suddenly reduced visibility due to heavy snow and gusty winds.
• There are new 360-character messages (English and Spanish) disseminated over the Wireless Emergency Alert system to provide more detailed information to those within the warned area.
• The Winter Program is working within the NWS to allow for Snow Squall Local Storm Reports (LSR) that will allow for objective verification of Snow Squall Warnings.
• Users may now report Snow Squalls in mPING under ‘Reduced Visibility.’
NWS Winter Seasonal Safety Campaign

- NWS Winter Seasonal Safety Campaign launches on December 1 (first day of meteorological winter)
- Contains content on winter hazards including infographics, social media plans, presentations and videos
- Encourage partners to use and share this information
- See: https://www.weather.gov/wrn/winter_safety
The NWS Winter Program coordinated with the NWS Office of Communications and the Centers for Disease Control to develop cold weather messaging and graphics that are especially relevant during the pandemic:

- Bundling up and staying dry are two of the best things you can do to stay safe from cold temperatures this fall and winter. Wear layers to stay warm and continue to follow CDC guidelines on how to protect yourself and stop the spread of COVID-19, including wearing a mask. Learn to protect yourself from the cold at weather.gov/safety/cold.
Updated Outreach Materials

**SNOW SQUALLS**
- Intense bursts of snow and wind
- Short duration
- Whiteout visibility
- Rapidly deteriorating road conditions

National Weather Service **SNOW SQUALL WARNINGS**
- Issued when a snow squall is occurring or imminent
- Typically in effect for 30-60 minutes in a small, targeted area
- Can trigger a Wireless Emergency Alert to your phone
- When issued, slow down or delay travel

**WHY DO BRIDGES FREEZE FIRST?**
- No ground underneath means the entire structure can be surrounded by cold air
- Freezing isn’t uniform: shaded parts can be icy while sunny parts aren’t
- Slow down before the bridge, as changing speed on ice is dangerous

**Staying warm when the power is out**
- Close blinds or curtains to keep in some heat.
- Close off rooms to avoid wasting heat.
- Wear layers of loose-fitting, lightweight, warm clothing.
- Eat and drink food provides energy to warm the body. Avoid caffeine and alcohol.
- Stuff towels or rags in cracks under doors.
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Links:

WPC PWPF page:
https://www.wpc.ncep.noaa.gov/pwpf/wwd_accum_probs.php

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Questions? Stephen.Baxter@noaa.gov

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