1: Snowstorms and Urban Hazards
Mean number of >4" snowfall events per season

Source: Kocin and Uccellini (2004)
Albany Seasonal Snowfall (1884-2019)

Year

Snowfall (inches)

0 20 40 60 80 100 120

Data source: NWS Albany
Type-A Storm

Source: Kocin and Uccellini (2004)
ATLANTIC COASTAL REDEVELOPMENT PATHS

18-20 MAR 1956
02-05 MAR 1960
10-13 DEC 1960
02-05 FEB 1961
11-14 JAN 1964
08-10 FEB 1969
05-07 FEB 1978
05-07 APR 1982
18-20 FEB 1979
08-11 FEB 1994
03-04 FEB 1995
31 MAR-1 APR 1997
30-31 DEC 2000

Source: Kocin and Uccellini (2004)
COMMON UPPER-LEVEL SIGNATURES
3, 2 and 1 DAYS PRIOR TO NOtheast SNOWSTORMS

Source: Kocin and Uccellini (2004)
What The Winter Storm Severity/Impact Index Is

- **A tool** to assist NWS operational forecasters in maintaining situational awareness of the possible significance of weather related impacts based upon the current official forecast.

- **A tool** to help communicate a general level of potential societal impacts and their spatial distribution.

Website: https://www.wpc.ncep.noaa.gov/wwd/wssi/wssi.php
<table>
<thead>
<tr>
<th>Potential Winter Storm Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No Impacts</strong></td>
</tr>
<tr>
<td>Impacts not expected.</td>
</tr>
<tr>
<td><strong>Limited Impacts</strong></td>
</tr>
<tr>
<td>Rarely a direct threat to life and property. Typically results in little inconveniences.</td>
</tr>
<tr>
<td><strong>Minor Impacts</strong></td>
</tr>
<tr>
<td>Rarely a direct threat to life and property. Typically results in an inconvenience to daily life.</td>
</tr>
<tr>
<td><strong>Moderate Impacts</strong></td>
</tr>
<tr>
<td>Often threatening to life and property, some damage unavoidable. Typically results in disruptions to daily life.</td>
</tr>
<tr>
<td><strong>Major Impacts</strong></td>
</tr>
<tr>
<td>Extensive property damage likely, life saving actions needed. Will likely result in major disruptions to daily life.</td>
</tr>
<tr>
<td><strong>Extreme Impacts</strong></td>
</tr>
<tr>
<td>Extensive and widespread severe property damage, life saving actions will be needed. Results in extreme disruptions to daily life.</td>
</tr>
</tbody>
</table>

Website: [https://www.wpc.ncep.noaa.gov/wwd/wssi/wssi.php](https://www.wpc.ncep.noaa.gov/wwd/wssi/wssi.php)
WSSI Components

Snow Amount Index

**PURPOSE:** This component is designed to highlight areas in which impacts, especially transportation, could become overwhelmed due to either:

1) The total amount of snow.
2) The rate at which the snow is falling.

Prior to making calculations based upon the amount or rate of snow, climatology based factors are determined. Climatology is an important aspect to the level of impacts a winter storm brings. Those areas of the country less accustomed to snowfall will be less prepared to deal with snow, resulting in higher level of impacts compared to the same amount of snow in a snowier part of the country.

Snow Load Index

**PURPOSE:** This component is to highlight areas where the weight of the snow could result in damage to trees and powerlines. In general, the lower the snow-liquid ratio (SLR) is and the greater the total snow accumulation, the higher the index.

Blowing Snow Index

**PURPOSE:** This component highlights areas where blowing/drifting snow is expected to occur and result in transportation related problems. In general, the blowing snow significance increases as the SLR and winds both increase. Prior blowing snow research indicates that in general it takes just under 20 mph of wind to start to move snow around.

Website: https://www.wpc.ncep.noaa.gov/wwd/wssi/wssi.php

The National Weather Service
Weather Prediction Center
WSSI Components

Ground Blizzard Index

**PURPOSE:** This component is to highlight areas where pre-existing snow combined with very strong winds results in ground blizzard conditions, which result in a significant impact to transportation.

Ice Accumulation Index

**PURPOSE:** This component was developed to account for the combined effects of ice accumulation and wind which can produce widespread tree damage, transportation shutdowns and utility problems.

Flash Freeze Index

**PURPOSE:** The component depicts severity primarily to transportation of situations where temperatures rapidly fall below freezing during or just after precipitation.
Bottom Right: WSSI depiction of all threats.
Top Left: The snow amount component matches the total WSSI around southern VT, western MA and NY.
Top Right: The ice accumulation component matches the WSSI for southeastern MA and northern RI.
Top Middle: The snow load component matches the WSSI for central MA and southeast NH.
Final interpretation: Expect the primary impacts to come from ice accumulations across northern RI northeastward toward Boston, MA. Expect impacts to come from heavy snowfall for VT and NY. There is a major threat for impacts from snow load across central MA through southeast NH.

Website: https://www.wpc.ncep.noaa.gov/wwd/wssi/wssi.php

The National Weather Service
Weather Prediction Center
Case Study: Blizzard of Jan. 2016
RSI Category 4 (NE Region)

Source: NASA
Here Comes Winter

Above: minimum wind chills through Tuesday morning

Right: Winter storm threat

weather.gov/washington
weather.gov/baltimore
facebook
US National Weather Service Baltimore/Washington
twitter @NWS_BaltWash
Winter storm threat: **HIGH**

- We can say with confidence that a high impact winter storm will affect most, if not all of the area Friday through Saturday.

- Potential impacts include significant travel delays, closures, and threats to life and property. Plan ahead.

  - Threats include:
    - Heavy snow
    - High winds
    - Coastal flooding

Finer scale details like amounts and timing will be fine tuned over the next couple days.
BLIZZARD AND WINTER STORM WATCHES

- **Blizzard Watch** in green and **Winter Storm Watch** in blue from Friday through Saturday night.
- Potential for widespread snowfall amounts of more than a foot.
- Strong winds may lead to blizzard conditions and visibility near zero within the blizzard watch.
- Moderate coastal flooding also possible Friday night into Saturday.

Prepare for possible closures and power outages as well as heavy snowfall amounts!

weather.gov/washington
weather.gov/baltimore

US National Weather Service
Baltimore/Washington

twitter @NWS_BaltWash
Major Winter Storm Will Bring Heavy Snow Friday through Saturday Night

Winter Storm Watch and Blizzard Watch in Effect

Main Threats:

- Snow is expected to move to our SW counties Friday Morning, into the DC metro area early afternoon, and across all MD early evening.
- Heavy and blowing snow will cause dangerous conditions and will be a threat to life and property.
- Travel is expected to be severely limited if not impossible during the height of the storm Friday night - Saturday.
- Winds will be gusting 35 to 50 mph, with highest gusts near the bay.

Snow Amounts

weather.gov/washington
weather.gov/baltimore

US National Weather Service
Baltimore/Washington
twitter.com/NWS_BaltWash
BLIZZARD AND WINTER STORM WARNINGS

- Blizzard Warning in red and Winter Storm Warning in pink from Friday through Saturday night.
- Travel will be severely limited or impossible Friday night into Saturday!
- Heavy snowfall area-wide
- Strong wind gusts 35-50+ mph, visibility less than a quarter mile in Blizzard Warning

Prepare for possible closures and power outages as well as heavy snowfall amounts!

Updated accumulation and timing maps will be available at: www.weather.gov/lwx/winter

1/21/16

weather.gov/washington
weather.gov/baltimore
Blizzard and Winter Storm Warnings in effect for the Mid-Atlantic Region Friday & Saturday

Snow Onset Time Friday:

- 7-9 AM
- 9-11 AM
- 11 AM-1 PM
- 1-3 PM
- 3-5 PM
- 5-7 PM

Snowfall Totals (inches):

- 12-18
- 18-24
- 24-30

4AM 1/22 UPDATE:
- Snow will move into the region slightly faster today
- Snowfall accumulation 1-3 feet (see above map)

1/22/16
Snow onset time ranges on Friday

- **Northern Zone**: 1 to 5 p.m.
- **D.C. Zone**: 11 a.m. to 3 p.m.
- **Southern Zone**: 8 a.m. to 12 p.m.

**Timeline of precipitation**

- **South of D.C.**:
  - Snow begins: 8 a.m., Friday
  - Heavy snow begins: 7 p.m.
  - Tapers: 1 a.m., Saturday

- **D.C.**:
  - Snow begins: 10 a.m.
  - Heavy snow begins: 7 p.m.
  - Tapers: 1 a.m., Sunday

- **North of D.C.**:
  - Snow begins: 11 a.m.
  - Heavy snow begins: 10 a.m.
  - Tapers: 7 p.m.

Source: Capital Weather Gang

STEPHANIE STAMM/THE WASHINGTON POST
D.C. area likely to be hobbled for days

Battered by historic blizzard, region begins a monumental dig out

The blizzard is over, but massive amounts of snow remain. How to move it all? Where to put it? Officials continue to warn it could take days for all roads to become passable after the weekend storm that brought down more than two feet of snow on the region.

By Shawn Boburg, Michael E. Ruane and Peter Hermann · 1 hour ago

- Fatal storm wreaks havoc up and down East Coast
- Live power-outage tracker

LIVE Latest updates

- 3 minutes ago
  Maryland's Lt. Gov.: a snow day with a shovel and Chuck Norris
- 13 minutes ago
  Metro sounding less confident about a return to full service
- 28 minutes ago
  Here's where D.C. snowplows went in the past hour

LIVE UPDATES

18m  Duquesne Basketball Team Makes It Home

32m  Broadway Shows Will Go On

32m  Christie Makes Snowstorm Part of His Presidential Pitch

See All Updates

Near-Record Blizzard Hit New York

By SARAH MASLIN NIR, JAMES BARRON and RICK ROJAS 28 minutes ago

The travel ban in New York City and Long Island ended Sunday morning, and the 26.6 inches of snow that fell in Central Park was the second-highest total ever recorded.

Graphic: How Much Snow Has Fallen

By MATTHEW BLOCH and TOM GIBATRAN

The snowfall approached or surpassed record levels in some places.

Watch: Times Square Gets Blanketed
NOAA/NOS/CO-OPS
Observed Water Levels at 8557380, Lewes DE
From 2016/01/22 00:00 LST to 2016/01/24 23:59 LST

Height in feet (MHHW)

00:00 12:00 00:00 12:00 00:00 12:00 00:00 12:00
1/22 1/22 1/23 1/23 1/24 1/24

NOAA/NOS/Center for Operational Oceanographic Products and Services

- Predictions - Verified - Preliminary - (Observed - Predicted)