



GUIDE TO UNDERSTANDING AND UTILIZING THE NEW CONVECTIVE OUTLOOKS AND HIGH IMPACT WEATHER WARNINGS



CONVECTIVE OUTLOOKS FOR WIND AND HAIL:

The Storm Prediction Center is part of the National Weather Service and plays a vital role in identifying severe weather threats across the United States. Daily the SPC issues convective outlooks for the potential of severe hail and wind. Here are the definitions for each severe event:

- Damaging winds or speeds of 58 mph (50 knots) or greater.
- Hail 1 inch in diameter or larger.

The SPC further defines significant severe thunderstorms as any storm that produce one or more of the following elements:

- Wind speeds of 75 mph (65 knots) or greater.
- Hail 2 inch in diameter or larger.

Indji Watch will now display these outlooks for our clients so they can identify extreme weather threats early and begin preparing to mitigate the impact. These outlooks are STEP 1 of the large hail mitigation process that we have defined for solar operations. Contact info.indjiwatch@indji.net for a copy of the Large Hail Mitigation Checklist.

Forecast Update Times:

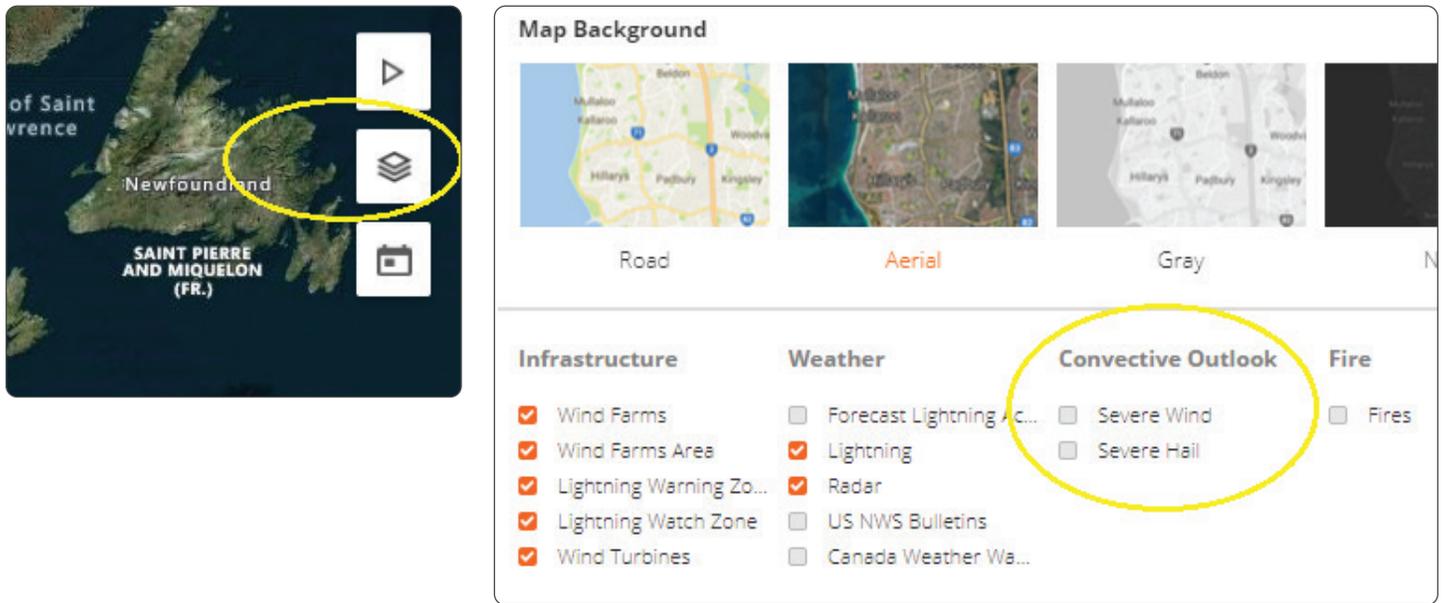
0600Z, 1300Z, 1630Z, 2000Z and 0100Z

The forecast you will view is always valid through 1200Z the following day. For example, if you live in the central time zone the forecast issued at 13Z (7 am Monday) is valid through 12Z (6 am) Tuesday morning. We recommend checking for updates (see forecast update times above) at least once during your workday. Severe weather threats can change.

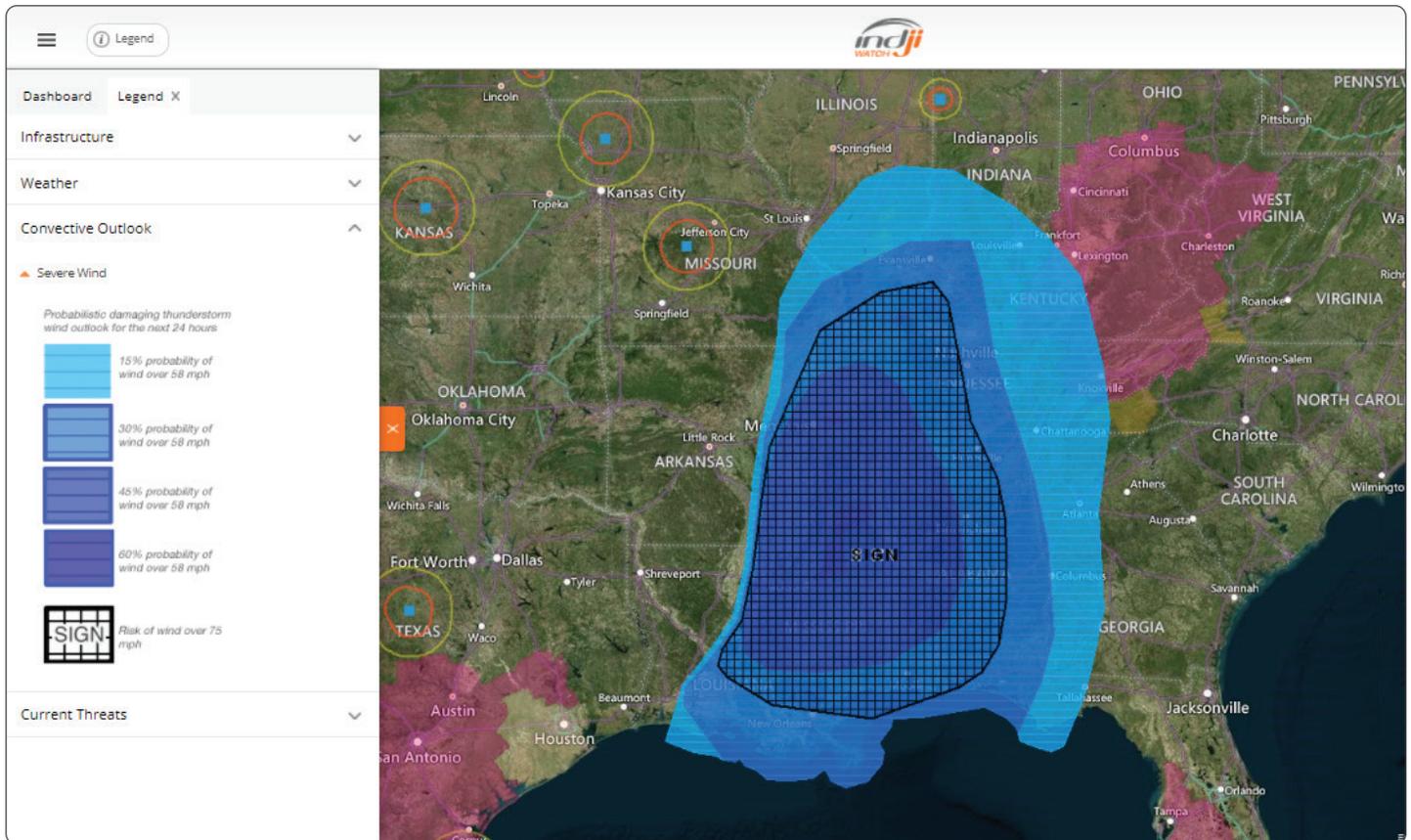
The following pages will provide you guidance and instruction on accessing these products in Indji Watch.

DISPLAYING THE CONVECTIVE OUTLOOKS FOR WIND AND HAIL:

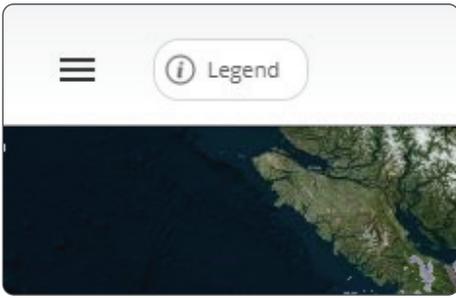
Access the Layers button and then locate the convective wind and hail layers as shown below.



We recommend viewing the layers one at a time by selecting them and then returning to the main screen. In the example below the Severe Wind layer has been chosen for display.



Note: It is important to turn on the legend so that you understand the display of the high wind threat. To access the legend while displaying the data, follow the steps on the next page.



Step 1:

Access the “Legend” button in the upper left portion of the screen

Step 2:

Choose the “Convective Outlook” tab and then open the “Severe Wind” tab. This will display the legend below

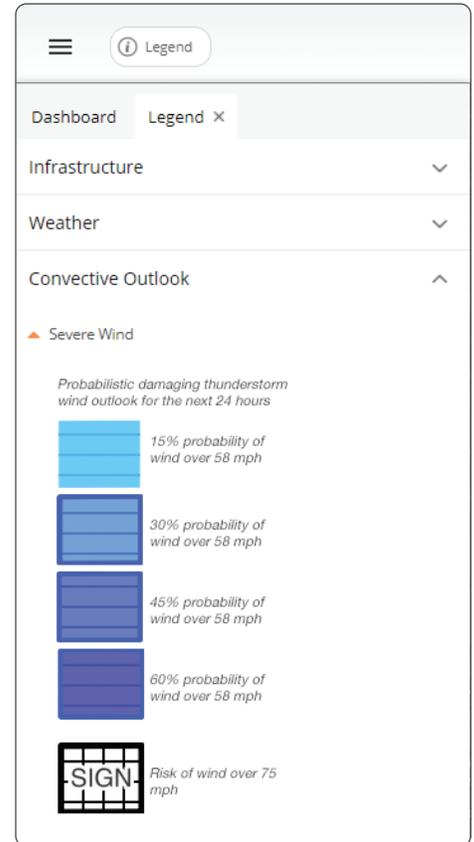
The legend shows you the threat of high winds as a probability. The probabilistic forecast directly expresses the best estimate of a high wind event occurring within 25 miles of a point within the shaded zone. For example, if you are seeing the 45% probability color display, that indicates there is a 45% chance of winds greater than 58 mph occurring within 25 miles of any point in that region.

If you see the “Significant” hatching in black, that indicates there is a 10% or greater chance of winds greater than 75 mph occurring within 25 miles of any point in that region. The significant areas identify areas of greatest concern for you. Determine if any of your assets fall in that region.



Convective Outlook for Hail:

The procedures just described for wind are the exact same steps you use for the Hail Outlook, however, the hail data will display in a different color. To the left is the legend for Severe Hail so you can see what the data is depicting.



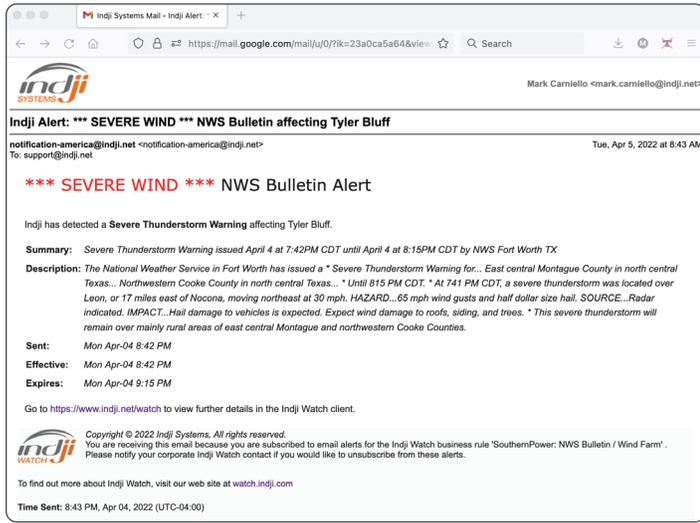
Additional Guidance on the Convective Outlook Layers:

Extreme weather is now the norm and renewable energy professionals need to take additional steps to raise their awareness of these events early and have a plan to mitigate the impact.

The Convective Outlooks are an important first step in identifying threats in the next 12 to 24 hours. Areas depicted as “Significant” should get special attention when they overlap existing assets, especially solar assets which can be significantly damaged by high winds and large hail. It is recommended that each day or shift is started with a review of the Convective Outlooks as a good first step in extreme weather threat recognition.

UNDERSTANDING THE NEW HIGH IMPACT WEATHER WARNINGS:

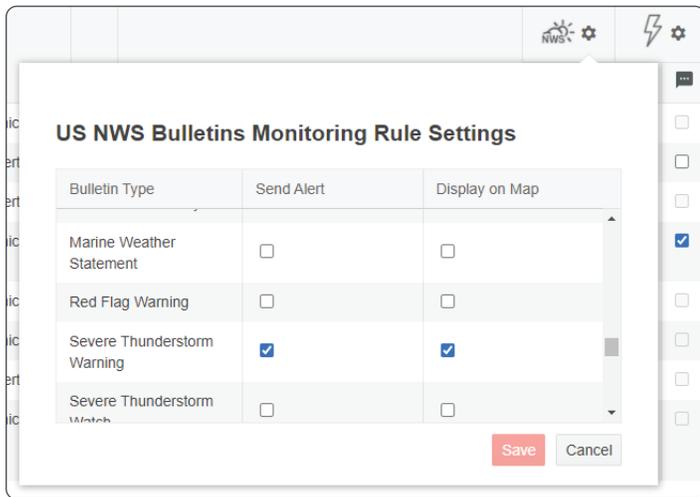
Indji Watch will now deliver enhanced alerts highlighting an imminent weather threat to one of your assets. We have enhanced the alerting for the NWS Bulletins monitoring rule to highlight situations where damaging wind or hail are imminent at your sites. These alerts will usually arrive 30-60 minutes before the extreme weather will impact your asset. If wind gusts above 60 mph or hail 2 inches or larger are being reported, the alert messages will highlight this as follows:



- email subject will include the words “*** SEVERE HAIL ***” and / or “*** SEVERE WIND ***”
- email body will include the words “*** SEVERE HAIL ***” and / or “*** SEVERE WIND ***” in red
- SMS alert will include words “SEVERE HAIL” and / or “SEVERE WIND”

To the left is an example of the new alert for severe wind.

To ensure relevant stakeholders receive these alerts, they must be configured to receive alerts for the NWS Bulletins monitoring rule in the Admin area. In the NWS Bulletins section of the Admin, it is VERY important that you have the Severe Thunderstorm Warning and Tornado Warning alerts turned on. The screenshot to the center left shows how this would look:



The final step to ensure key stakeholders (asset managers, control center personnel, site managers) receive these alerts is to make sure they are activated in the admin page to receive NWS bulletins. See the screenshot below for an example:

T...	Name	Bu...	Sites	NWS
A	WFODemo Admin		Amazon, Broadview, Gulf, Hatchet Ridge, Logans Gap, Lost Creek, Ocotillo, Panhandle 1, Panhandle 2, Post Rock, Santa Isabel, Spring Valley	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A		0...	Amazon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A	Mark Carniello			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
E	Martin McKewon	(...	Gulf, Hatchet Ridge, Lost Creek, MM, MMLakehouse, Panhandle 1, Post Rock	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Martin McKewon is activated to receive these NWS bulletins while the other users are not. Again, make sure you have your key stakeholders activated.

ADDITIONAL GUIDANCE

The High Impact Weather Alerts will bring the greatest value to solar asset management. Solar sites are often not manned and can be severely impacted by high winds and large hail. Solar operators can take steps to stow tracking panels remotely that will shed high wind events and lessen the direct impact large hail has on a panel, thereby reducing the potential damage. The procedure to stow panels in either event is often a manual process because storm driven winds arrive too fast for weather stations to send panels into an auto-stow position. Large hail is a micro-scale event compared to wind and therefore brings a much lower threat of a direct impact, however, a direct impact can result in substantial damage. The new high impact weather alerts will help solar operators take action before the storm arrives.

The High Impact Weather Alerts are an important step in your extreme weather mitigation plan. These alerts are part of the large hail mitigation process that we have defined for solar operations. Contact info.indjiwatch@indji.net for a copy of the Large Hail Mitigation Checklist.

