

MITIGATING EXTREME WEATHER IMPACTS TO SOLAR OPERATIONS

Presented by

Marty McKewon, Chief Meteorologist Indji Systems, marty.mckewon@indji.net



VISIT US ONLINE AT INDJIWATCH.COM

BACKGROUND

WITH THE INCREASINGLY VOLITALE WEATHER, THE SOLAR INDUSTRY IS TAKING NOTICE OF THE SIGNIFICANT IMPACTS WEATHER CAN HAVE. THE CONCERNS VARY AND HERE ARE A FEW;

- THE **DAMAGE** LARGE HAIL STONES AND HIGH WINDS CAN CAUSE TO A SITE THAT HAS NOT TAKEN ACTION TO MITIGATE THE IMPACTS
- THE **SAFETY** OF YOUR EMPLOYEES AND CONTRACTORS ONSITE WHEN LIGHTNING OR SEVERE WEATHER THREATENS
- THE **FINANCIAL LOSS** THAT CAN ARISE FROM DAMAGED MATERIALS AND COMPONENTS THAT WERE NOT PREPARED FOR THE WEATHER EVENT

THE GROWTH IN SOLAR FARMS WILL EXPLODE IN THE COMING YEARS WITH A SIGNIFICANT PORTION OF THE GROWTH OCCURRING IN TEXAS, THE OHIO VALLEY AND THE SOUTHEAST. ALL GEOGRAPHIC AREAS HAPPEN TO DEAL WITH EXTREME WEATHER. BILLION DOLLAR WEATHER DISASTERS SEEM TO GROW IN NUMBER EACH YEAR WITH NO SIGNS OF STOPPING. IN THE SOLAR INDUSTRY, COMPANIES INVOLVED IN EPC, OWNER/OPERATORS AND O&M PROVIDERS NEED TO INCREASE THEIR RESILIENCY TO EXTREME WEATHER NOW OR RISK LOSING MILLIONS BECAUSE OF POOR PLANNING, SUB PAR INFORMATION AND TOOLS, AND JUST PLAIN BEING CAUGHT OFF-GUARD. MANY EXCELLENT PUBLIC AND PRIVATE SOURCES OF WEATHER INFORMATION AND DATA EXIST AND THIS POSTER WILL EXAMINE SOME OF THE MORE EFFECTIVE TOOLS AND CONTENT TO RAISE YOUR AWARENESS LEVEL.

EXTREME HAIL AND WIND



The largest hailstone found in Colorado compared to a softball. [WWS](#)

HAIL – The key months for large, damaging hail are March through June in the United States with a migration from southern to northern states during those months. Studies have shown hail diameter size needs to approach 2" (size of an egg) before appreciable damage will occur at a solar site.

WIND – Damage to solar panels from Wind can be either from a convective induced wind such as a Derecho or a synoptic, pressure difference wind that one experiences in Hurricanes. The synoptic, pressure induced winds often increase more gradually allowing for weather stations in proximity to the solar site to trigger a stow position. Convective, severe storm winds can increase dramatically in seconds and shift 180 degrees in direction. Stow decisions for these type of winds require more proactive methods of detection.

LIGHTNING AND WILDFIRES



Photo credits: Wildfire Today

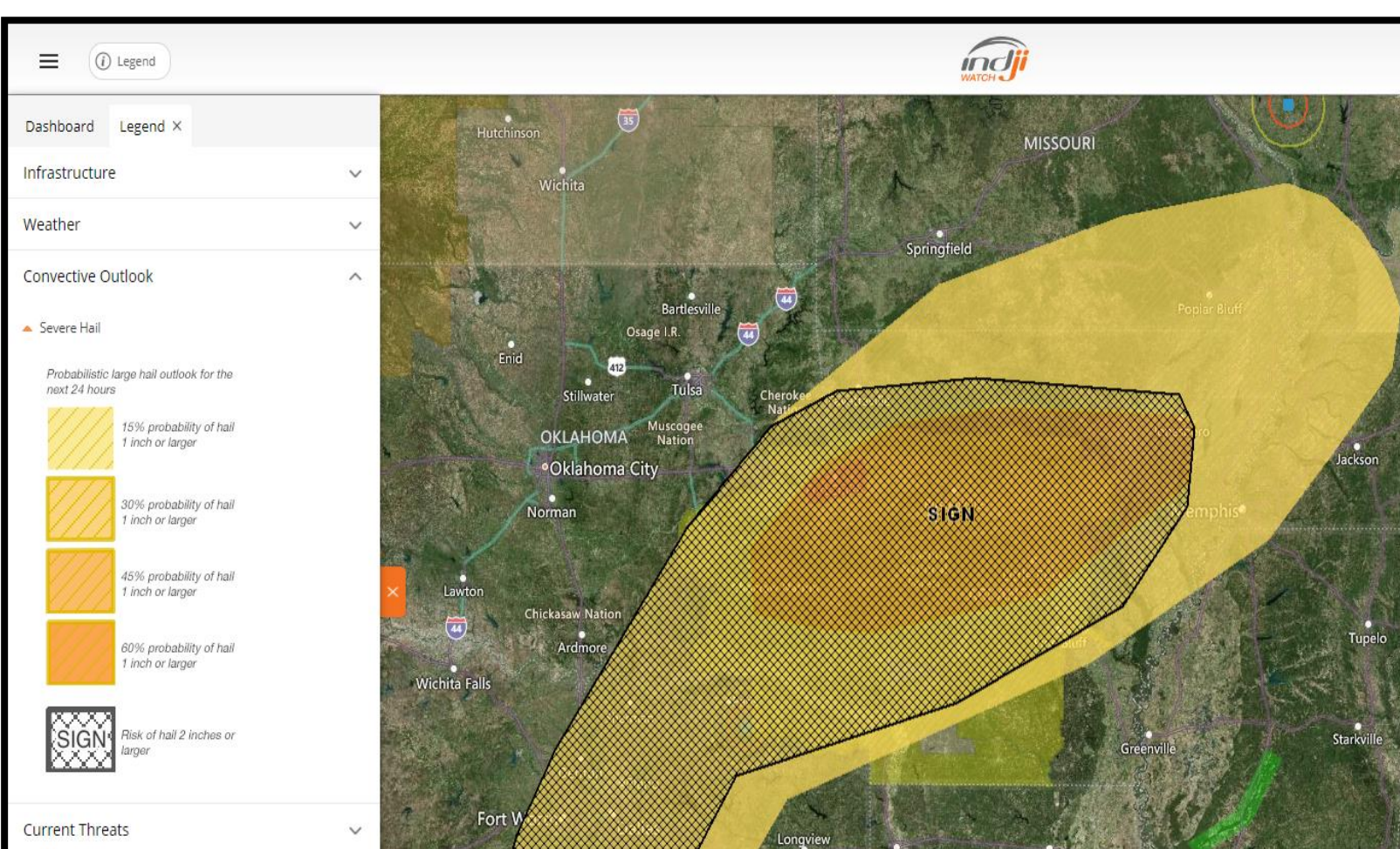
WILDFIRES – Climate change has led to the increased frequency and destructiveness of wildfires. They can no longer be only considered a threat to mountain west states as recent wildfires in Texas have encroached on solar site locations. Mitigative measures involving vegetation management and landscaping can be important in reducing the risk. Initial work in the siting of the solar farm can also assess future risks and behaviors from wildfire.



LIGHTNING – Risks from lightning impacts range from damaged or destroyed equipment to employee safety. Almost no area of the Utility scale solar footprint is immune from lightning. Employees and Contractors need alerts and all clear messages sent to their cell phones for lightning with access to mobile apps showing the strike location. Owner/operators can install lightning protection equipment and also have access to historical lightning data which proves the cause of damage for insurance purposes.

TOOLS AND RESOURCES TO HELP WITH IDENTIFICATION OF EXTREME WEATHER EVENTS

LARGE HAIL THREATS



Forecasts of significant hail threats are created daily by the Severe Storms Prediction Center and available through public and private sources. Daily review of these forecasts are step 1 in the hail mitigation process.

Indji Alert: *** SEVERE HAIL *** NWS Bulletin affecting Solar D **Alert**

notification-america@indji.net to support

5:43 PM (13 minutes ago)

*** SEVERE HAIL *** NWS Bulletin Alert

Indji has detected a Tornado Warning affecting Solar

Summary: Tornado Warning issued May 1 at 5:44PM CDT until May 1 at 6:30PM CDT by NWS Midland/Ozona TX

Description: The National Weather Service in Midland has issued a "Tornado Warning for... North central Pecos County in southwestern Texas... Southeastern... County in western Texas... Southeastern... County in western Texas...". Large hail (2.00" to 2.50" dia) is expected to accompany the storm. The storm is moving east at 30 mph. HAZARD: Tornado and baseball size hail. SOURCE: Radar indicated rotation. IMPACT: Flying debris will be dangerous to those caught without shelter. Mobile homes will be damaged or destroyed. Damage to roofs, windows, and vehicles will occur. Tree damage is likely. This tornado threat will remain over many rural areas of north central... southeastern... and southwestern... Counties, including the following locations: Battlefield and Grinn. This includes Interstate 10 between mile markers 295 and 296.

Start: Sun May-01 5:44 PM

Effective: Sun May-01 5:44 PM

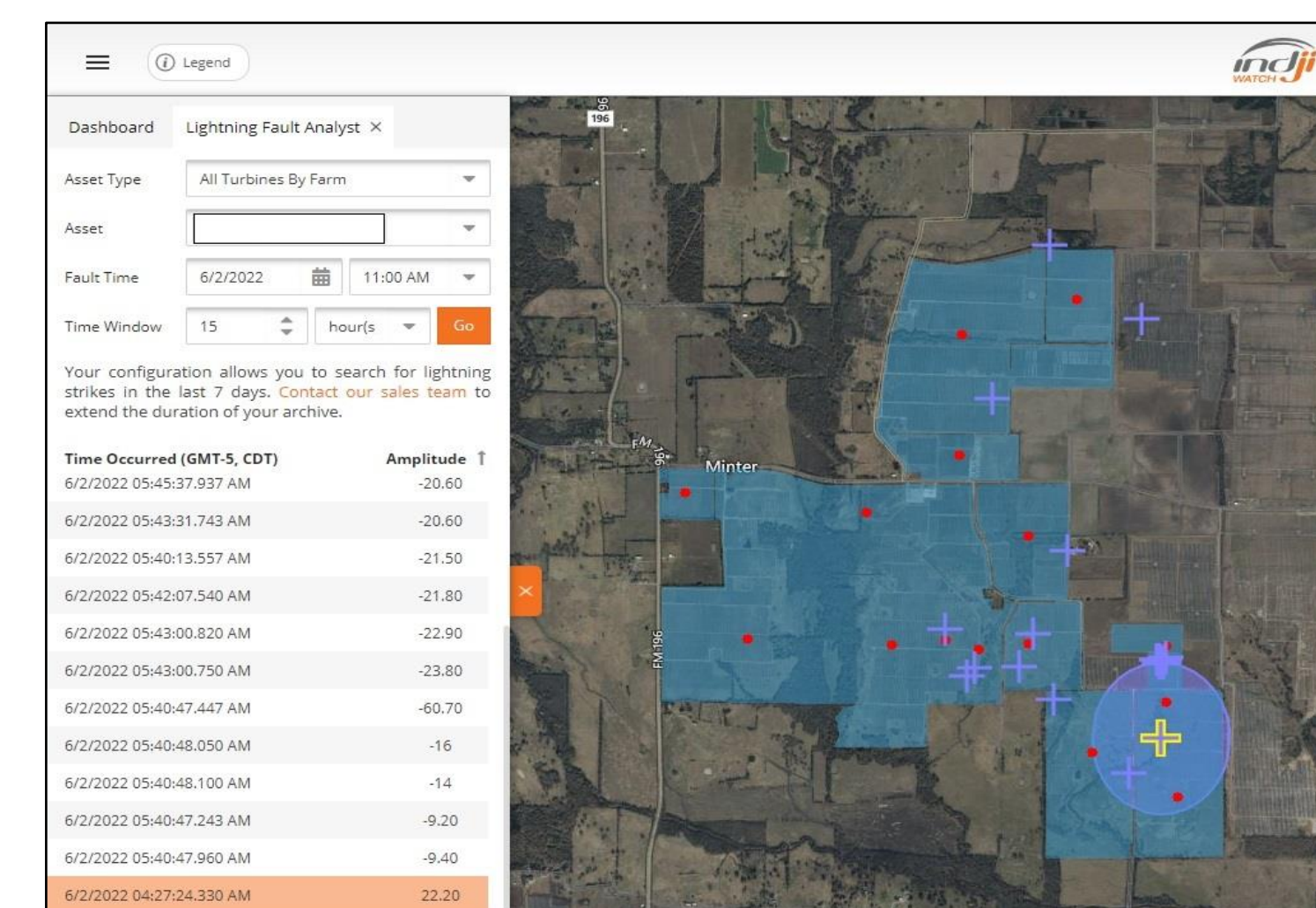
Expires: Sun May-01 7:30 PM

Go to <https://www.indji.net/alerts> to view further details in the Indji Watch client.

Copyright © 2022 Indji Systems. All rights reserved.
You are viewing the email because you are subscribed to email alerts for the Indji Watch business via Conditional Mail Bulletin "Watch". Please notify your corporate help desk contact if you would like to unsubscribe from these alerts.

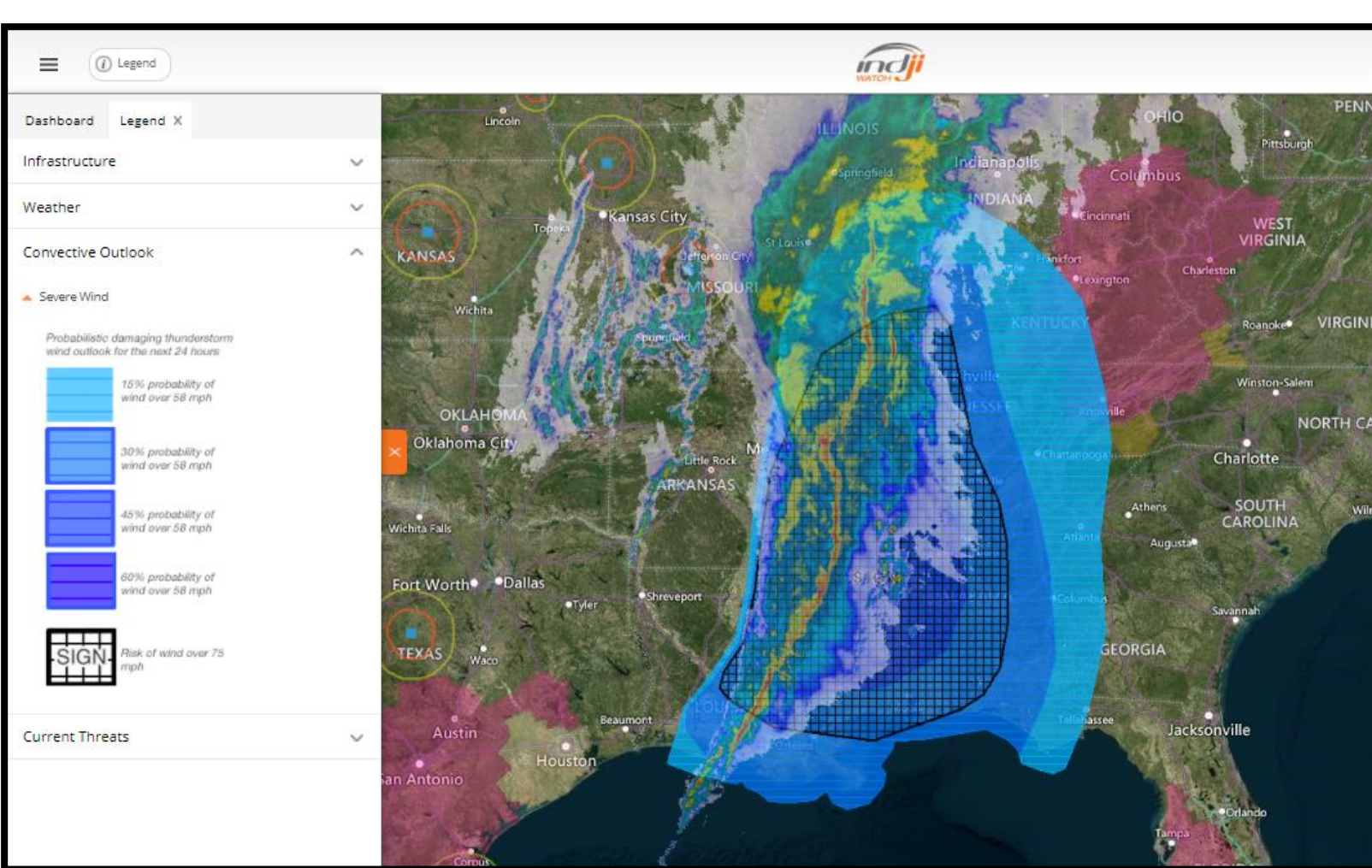
Vendors to the industry can now provide customized alerts for extreme hail events. These alerts will emphasize the urgency of the situation including hail size so that a stow decision can be triggered before the hail arrives onsite.

WILDFIRES AND LIGHTNING



Knowing what panel or inverters lightning may have struck can be determined using software that plots the strikes in relation to the client asset. The software can also provide other key information such as the time and date of the event, strike intensity and polarity.

DAMAGING WIND THREATS



Forecasts of damaging wind threats are created daily by the Severe Storms Prediction Center and available through public and private sources. Daily review of these forecasts will help identify the likelihood of the event and if your assets are at risk.

Dashboard

Location

Lightning Warning
Wind Forecast
US NWS Warnings

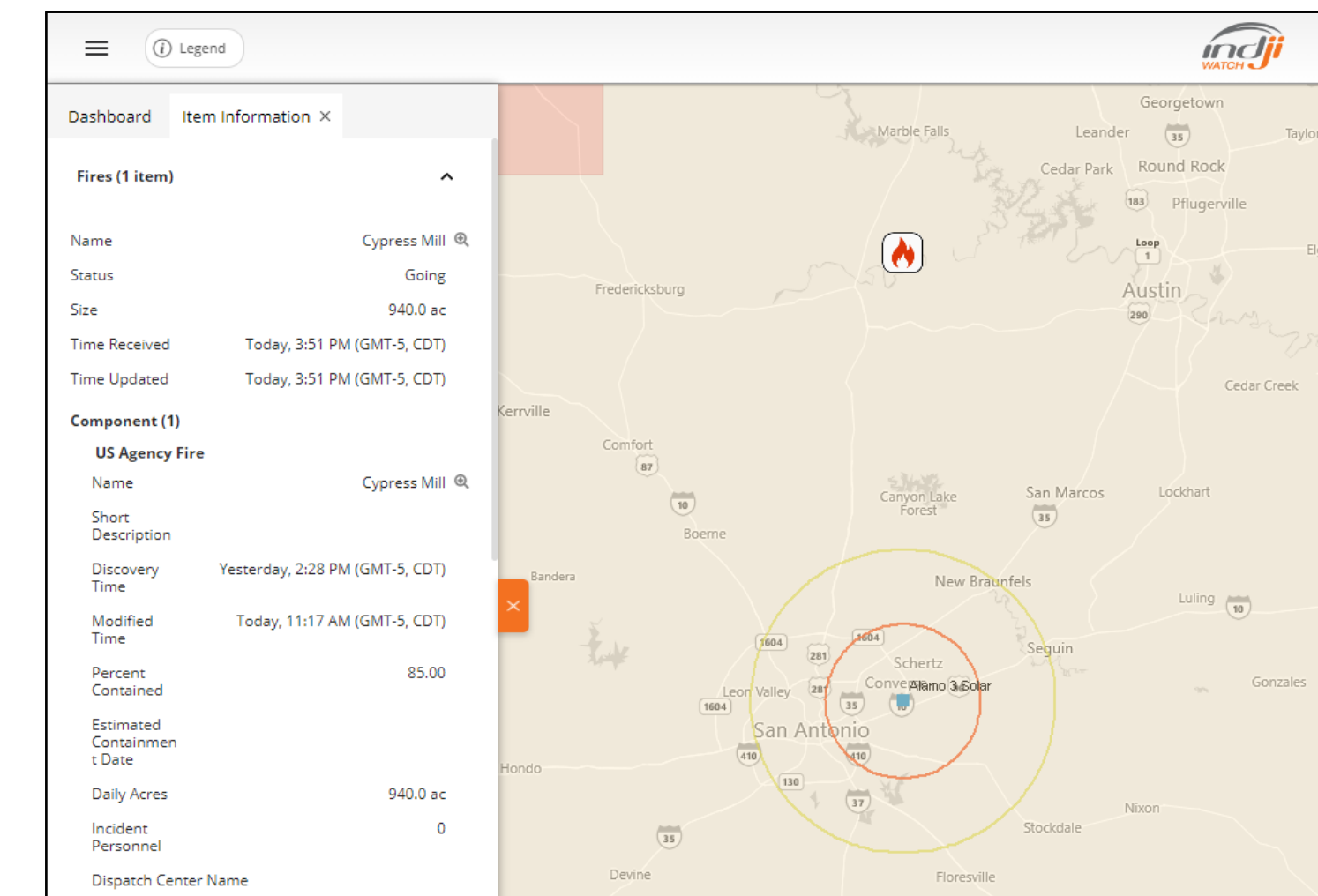
US NWS Warnings

Severe Thunderstorm Warning issued today, 10:59 PM (GMT-5, CDT) Expires Today, 11:00 PM (GMT-5, CDT)

Severe Thunderstorm Warning issued April 4 at 10:39PM CDT until April 4 at 11:00PM CDT by NWS Fort Worth TX

at 10:39 PM CDT a severe thunderstorm was located over... (Sulphur Springs) moving east at 30 mph. HAZARD: 50... (Sulphur Springs) moving east at 30 mph. HAZARD: 50...

Interactive displays combining warnings of impending high wind events and visual displays of the storm on radar give solar operators clarity on the location and impact time of the event to effect stow decisions can be made.

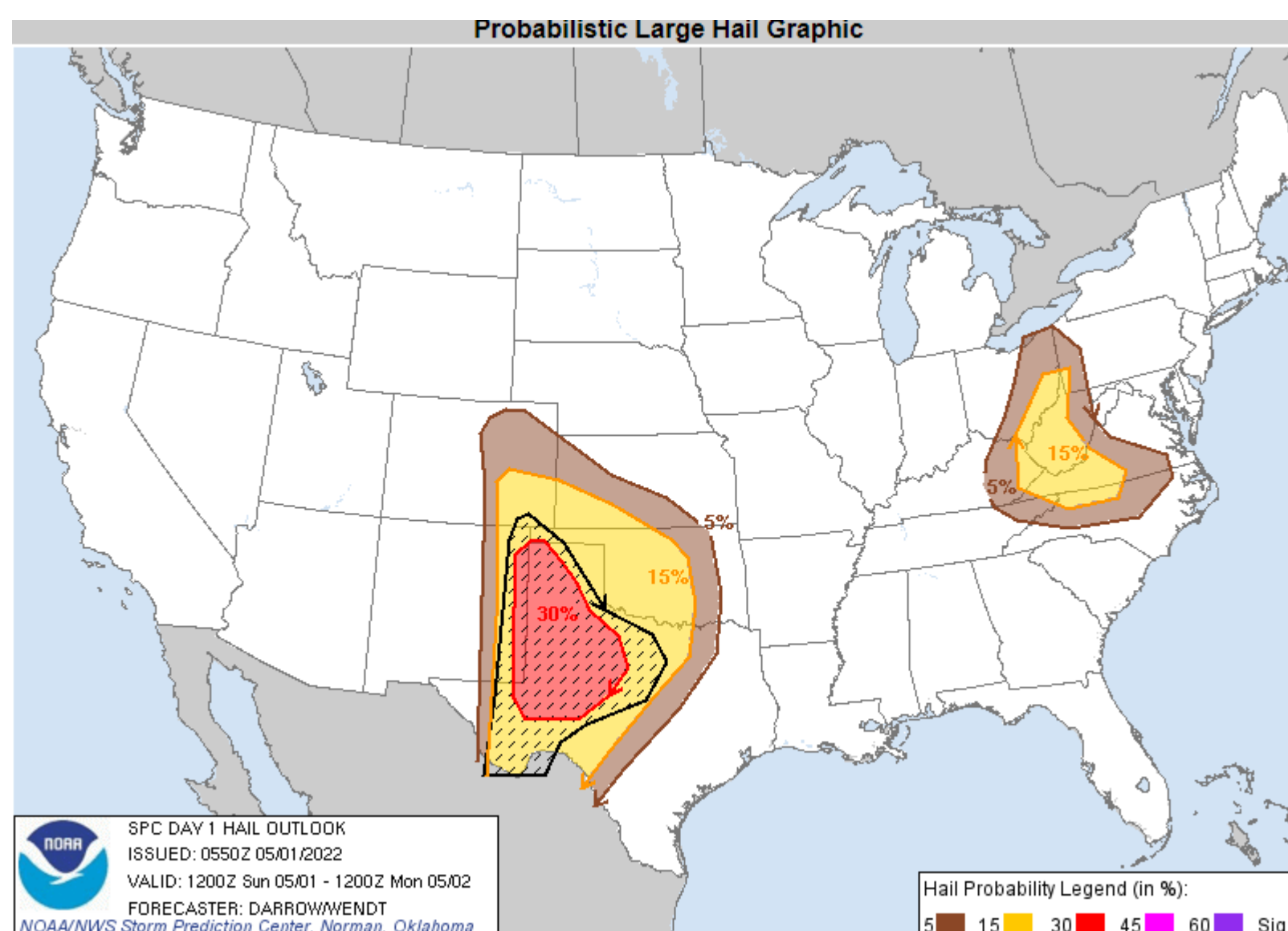


Tracking wildfires in real-time in relation to your solar assets and being warned when the threat is too close is a service that industry providers can deliver. Information about the fire size, behavior, amount contained and even actively burning areas is all available to solar owner/operators.

CONCLUSIONS

The growth of the solar industry will outpace all other renewable energy sources through 2030. The geographic footprint of the growth falls heavily in areas that experience extreme weather. To secure favorable financing and insurance rates, companies developing, owning and operating solar tracking sites will need to prove they have resources for extreme weather mitigation and a plan of action for these events. The good news is many public and private sources of information exist along with vendors who have packaged this information into easy to use solutions for effective decision-making.

A REVIEW OF THE RESOURCES IN ACTION May 1st, 2022



At 7 a.m. CDT morning of May 1st, 2022 the Severe Storms Prediction Center issued this outlook for large hail. You can see a large area was under a 30% threat as shown in red and an even larger area had the risk of 2" or greater size hail.

