Weather Source Core Capabilities Overview

The OnPoint® Platform

Weather Source's patent-pending OnPoint Platform powers all of our dynamic products and services by seamlessly managing the complexities of ingesting, cleansing, and delivering weather and climate data for business intelligence.

Weather Source spent more than a decade perfecting its quality control processes to ensure your data is gap-free, easy to use, and globally uniform. It can be tedious and time-intensive to manually correct for inconsistencies when data is collected from numerous, disparate sources. By unifying inputs within the OnPoint Platform, your weather data is homogeneous and ready for immediate analysis.

Most weather data providers rely solely on airport observation station data to extend information from those stations to your location. This is ineffective because, among other reasons, airport observation stations are often too far from your location to provide meaningful insight. Weather Source starts with your exact location then ingests the best weather sensing technology available to reveal weather and climate insights tailored to your points of interest.

Figure 1. Other weather providers extend data to your location from airport observation stations, shown at left. Weather Source provides hyper-local data within 2.2 miles of your North American location using our high-resolution grid, shown at right.

The OnPoint Platform unifies a range of diverse inputs then stages them on the OnPoint Grid. This high-resolution grid covers every land mass in the world and up to 200 miles offshore. Each grid point—nearly 2 million in total—represents a "virtual" weather station with a unique OnPoint ID. At a resolution of 5 kilometers, our North American grid ensures your location of interest is never more than 2.2 miles away from an OnPoint ID—as opposed to potentially hundreds of miles away from the nearest airport observation station.

Weather Source has been processing, quality testing, and correcting weather observations for more than a decade. Data problems are inherent to any real-time data collection network, and up to 25% of the data collected via the global network of weather sensing technologies routinely has errors.

Weather Source ingests and processes data from thousands of North American and international weather-sensing inputs continuously then tests and corrects errors in real-time. The quality control process executes a battery of tests that include: observation consistency (i.e., it can't snow at 70°F); tests against companion datasets; and analyses. Observations that are missing or determined to be erroneous are replaced with estimates derived from surrounding data.

Figure 2. Weather Source data is homogenous and ready for immediate analysis.

OnPoint® Weather

OnPoint Weather can be described exactly as it sounds, weather data for any location at any point in time. OnPoint Weather is derived from a variety of inputs as shown on the next page in Figure 3, including airport observation stations, satellites, radar, the Internet of Things, and weather analyses and model outputs.
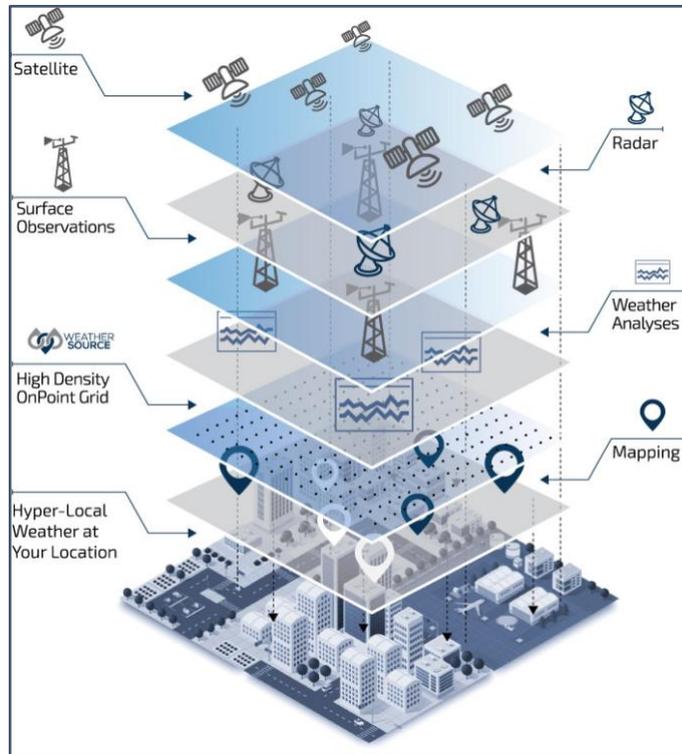
Figure 3. *Weather Source data is derived from a variety of reliable inputs.*

Our curated continuum of data offers a single source of truth for all your weather information needs. OnPoint Weather consists of several datasets, including:

- Historical
- Present/Previous Day
- Nowcast
- Forecast (NCEP & ECMWF)
- Historical Forecast
- Airport Reporting Station Data

OnPoint Weather Historical
OnPoint Weather Historical data provides hourly and daily weather values from the year 2000 to present. This database is a stable source of historical information because once the data is archived no changes or edits are made.

OnPoint Weather Nowcast
Current weather conditions at any point in time for any location. Access up-to-the-minute actuals as reported by weather sensing inputs.

OnPoint Weather Forecast
The standard OnPoint Forecast is based on the National Centers for Environmental Prediction (NCEP) Global Forecast System (GFS). The GFS forecast is processed by Weather Source then

staged on our OnPoint Grid for statistical consistency with our other datasets. The GFS-based OnPoint Forecast currently provides a forecast of 10 days in hourly format and 15 days in daily format. This data is fully refreshed every six hours.

- **NCEP Forecast**
  In addition to the NCEP-based OnPoint Forecast, Weather Source provides forecasts from other NCEP models such as the Global Forecast System (GFS), North American Mesoscale (NAM) forecast, the Rapid Refresh (RAP) forecast, and the High-Resolution Rapid Refresh (HRRR) forecast.

- **ECMWF Forecast**
  Weather Source also offers European Centre for Medium-Range Weather Forecasts (ECMWF) data. This includes the ECMWF 10-day forecast, which is bias corrected and staged on our OnPoint Grid, as well as an extended range ECMWF forecast with a forward view of up to 42 days.

Historical Forecast
Access historical forecast data dating back to January 2015.

Airport Reporting Station Data
Weather Source has "cleaned" data for all global airport reporting stations, including discontinued stations, dating back to 1973 (or earlier depending on when the station was initialized). Available in both hourly and daily format.

OnPoint® Climatology
Climatology is the statistical representation of weather over time. OnPoint Climatology offers valuable information such as: the "normal" or "average" (mean) weather for any location at any point in time; departures from normal (standard deviations); and frequency of occurrence for specific weather parameters such as precipitation or extreme temperatures.

Frequency of occurrence insights reveal how often certain conditions occur at your location of interest—for example, how often it snows within the range of 1 to 2 inches or how many times it typically rains on a given day. This information is extremely useful for business planning. Departures from normal can have significant influence on consumer behavior and business operations. Our revelations take the guesswork out of organizational decisions that may be affected by changes in weather.

OnPoint Climatology is also useful as a long-range forecasting tool. Using our cutting-edge climatological technology, Weather Source is able to provide accurate forecasts of up to 15 days with an enhanced and extended forecast out to 42 days.
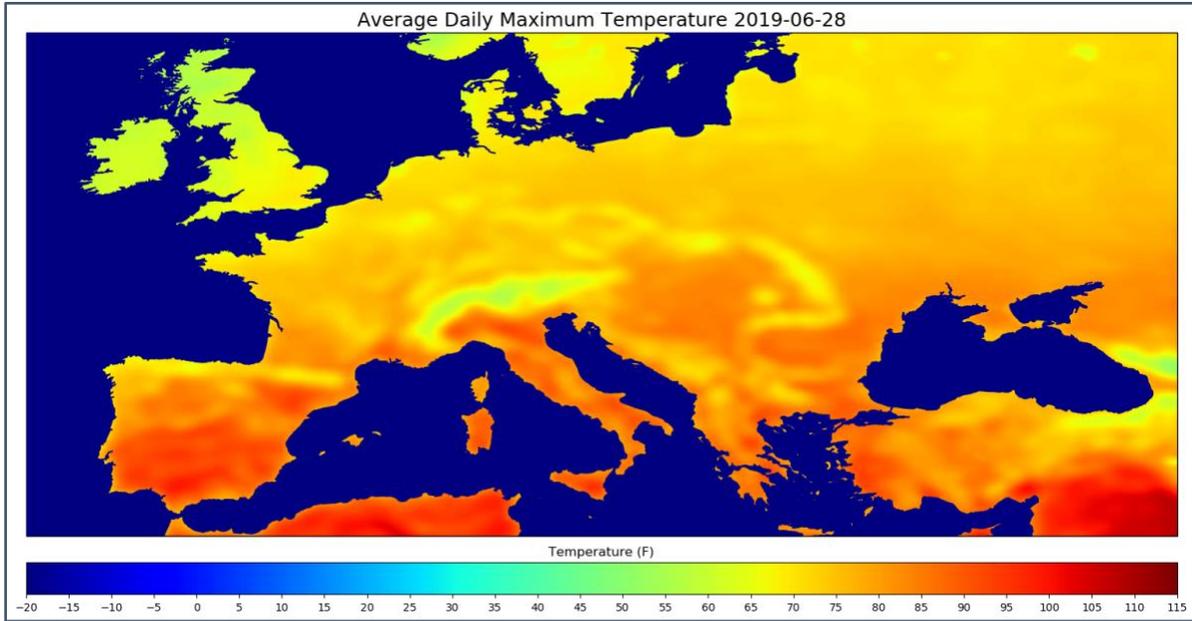
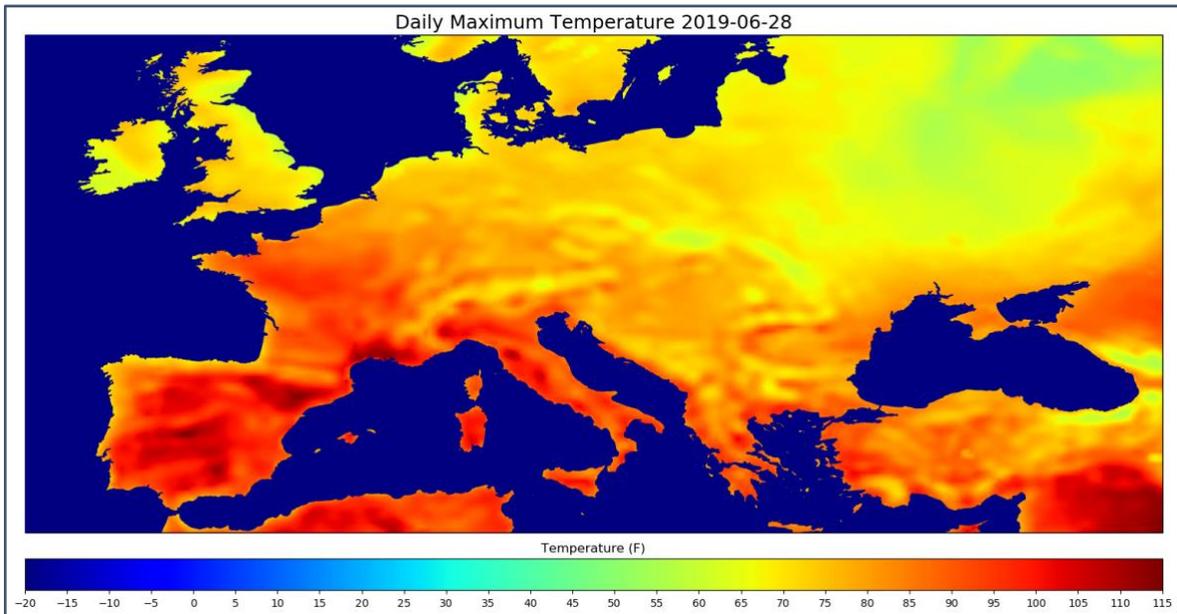***Figure 4.*** *Average daily maximum temperature for June 28 based on OnPoint Climatology data.*

Figure 5. *Actual daily maximum temperature for June 28, 2019, during the record-breaking European heat wave. Based on OnPoint Climatology data.*
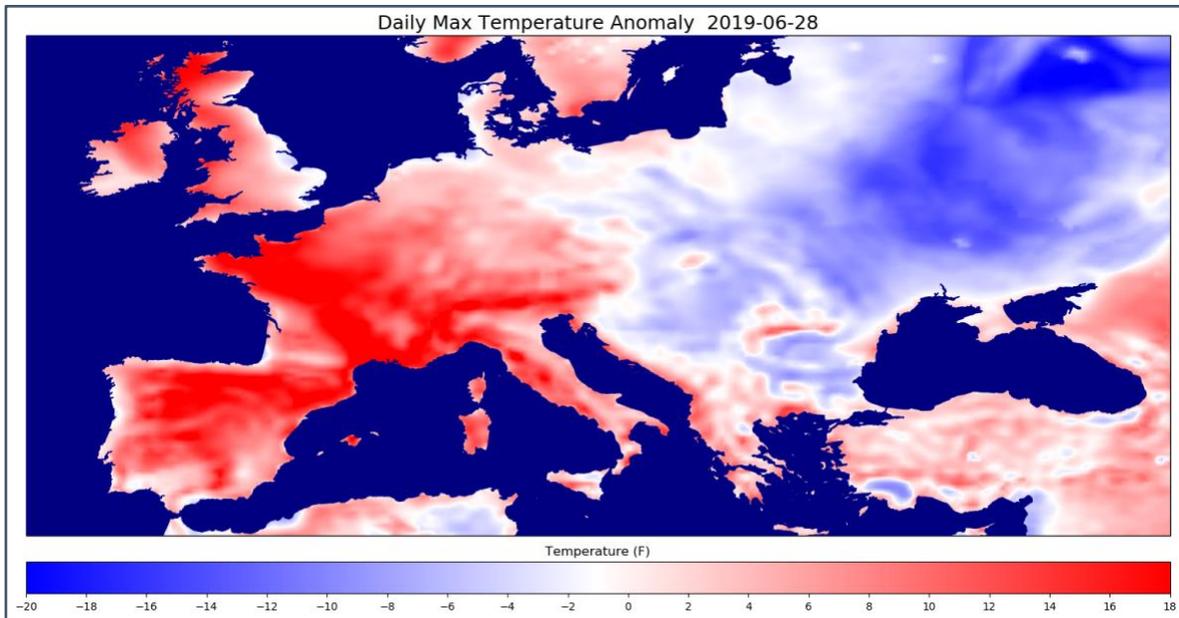
Figure 6. Daily maximum temperature anomalies for June 28, 2019, during the record-breaking European heat wave. Based on OnPoint Climatology data.

OnPoint® Alerts

Receive alerts in real time about weather conditions that could potentially affect your business. OnPoint Alerts, powered by the U.S. National Weather Service (NWS), ensure you are never surprised by an extreme weather event at your U.S.-based locations of interest.

OnPoint Alerts include your location's coordinates as well as the exact times an alert is issued, becomes active, and will expire. The alerts also include the type of phenomena predicted (e.g., flooding, dense fog, blizzard) and the anticipated level of significance (e.g., advisory, watch, or warning).

Weather Source also allows you to create user-defined OnPoint Alerts for any location around the globe. For example, a cafe that receives an alert when the temperature at one of its locations will exceed 90°F can confidently order extra inventory for iced drinks. Or, a real estate agency that receives an alert when one of its properties is expected to receive precipitation in excess of 1 inch per hour can enact cost-saving flood mitigation measures.
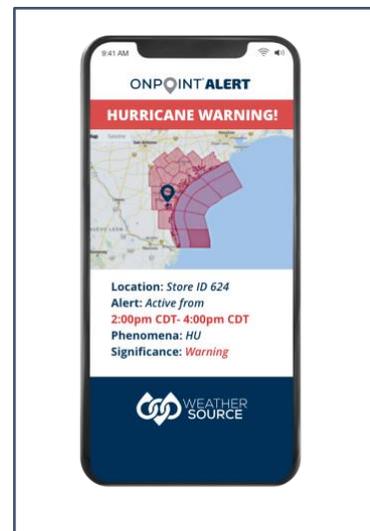

Figure 7. A text OnPoint Alert.

OnPoint Alerts can be delivered via text and email, S3 download, or Weather Source's Weather Impact Ranking System (WIRS).

OnPoint® Geospatial

Weather Source can provide its dynamic weather and climate data in a variety of geospatial products, including GIS layers for ease of integration into any GIS application or environment. OnPoint Geospatial products help your organization effectively visualize weather and climate trends. For example, geospatial products can illustrate what path a hurricane took on a particular day or where in a region people will be affected by certain temperatures. OnPoint Geospatial products can incorporate deep, historical data with present and forecast data to provide powerful context.
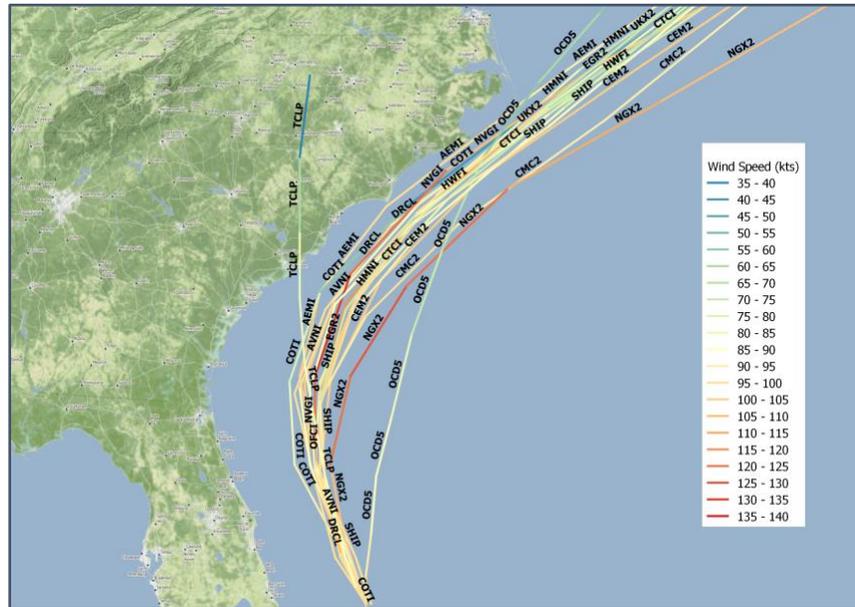

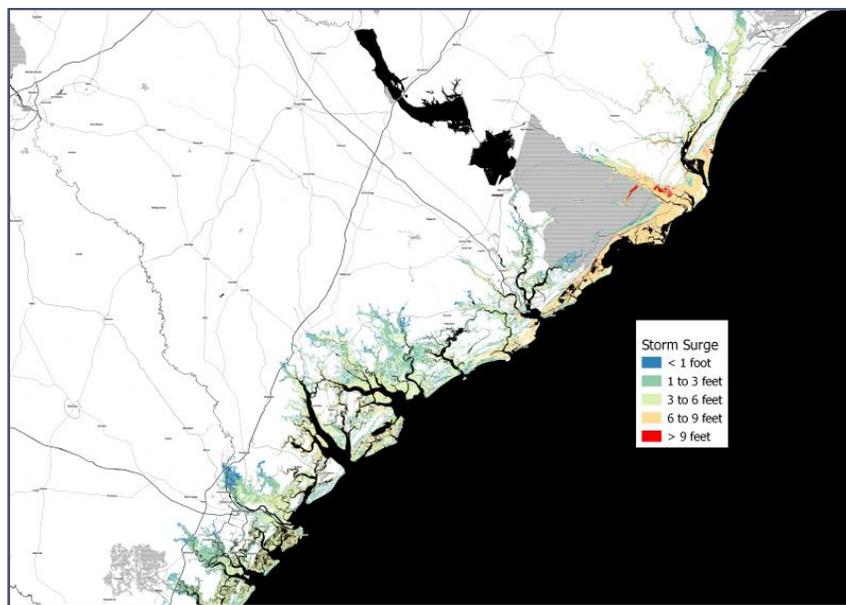*Figure 8.* Projected spaghetti tracks for Hurricane Dorian, 2019.

Figure 9. Projected storm surge along the Carolina Costs during Hurricane Dorian, 2019.

OnPoint® Machine Learning (ML)-Ready Weather

OnPoint ML-Ready Weather is an extension of Weather Source's OnPoint Weather that is engineered for direct use in AI- and machine learning (ML)-based applications. Incorporating weather data into AI and ML workflows has been historically difficult because of varying weather values and the challenge of providing context for anomalies.

OnPoint ML-Ready Weather uses feature engineering to create a suite of datasets (storm, temperature, wind, cloud cover, and more) that help organizations analyze the effects of specific weather conditions on a wide range of weather-sensitive activities.

For example, the ML-Ready Storm dataset provides a location-based time series of storm activity that reflects the variations of storminess at a location over time. This information includes the level of storminess as well as whether the level is above or below normal and by how much. Additional options include the ability to weight workdays and non-workdays differently (i.e., theme parks are more financially sensitive to severe weather conditions on weekends).

ML-Ready Weather datasets are also available in formats beyond the traditional daily and hourly—to include weekly, monthly, and quarterly—offering greater flexibility for industries such as finance.

The Weather Impact Ranking System (WIRS)®

The Weather Impact Ranking System (WIRS) is a turnkey web application that enables your business to identify weather conditions or perils that have the potential to impact operations or to cause damage to physical assets.

Our patent-pending visualization tool works by establishing a baseline for how weather affects your organization. Using OnPoint Climatology and historical OnPoint Weather data, WIRS ranks the potential impact of each weather parameter and peril then monitors conditions in real time to provide notifications tailored to your business.

WIRS is highly configurable to nearly any industry, empowering you to identify and track the weather conditions most relevant for your business needs. Maintain real-time communication with your management, staff, contractors, and customers to maximize the most efficient use of company resources. WIRS visualizes your business locations and weather rankings in an interactive and dynamic dashboard that includes:

- Real-time monitoring of weather events and perils that exceed your designated WIRS ranking thresholds.
- The ability to efficiently view and monitor all of your locations of interest, including facilities, distribution points, supply routes, and more, all from a single pane of glass.
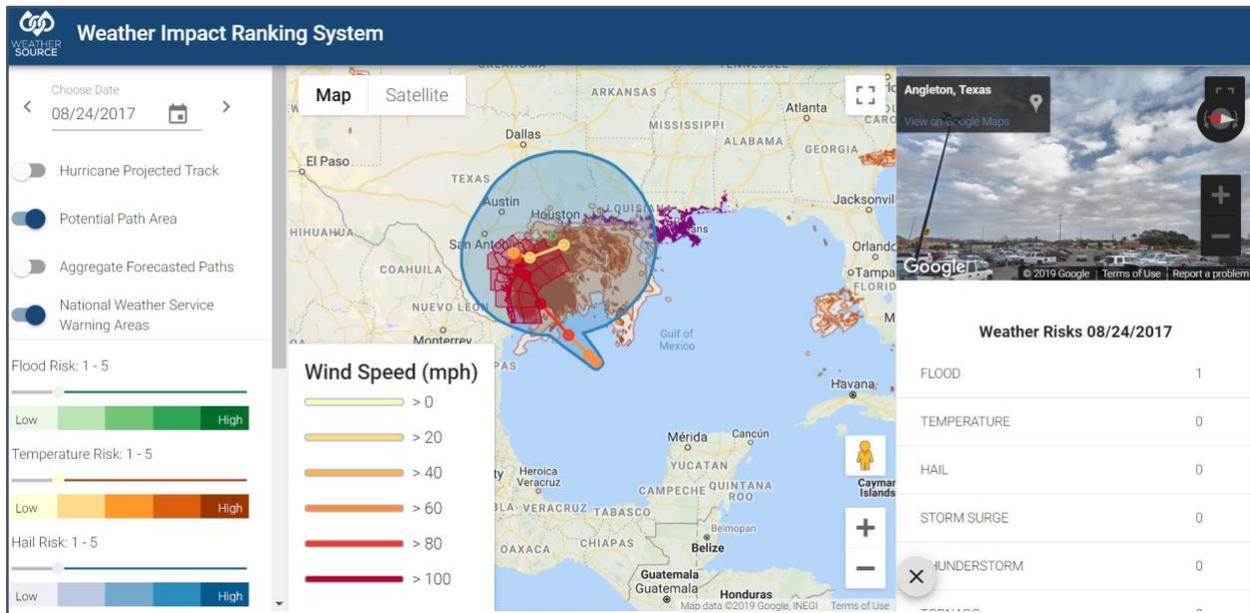- Automated notifications via email, text messages, or text to speech.

Figure 7. The Weather Impact Ranking System (WIRS) dashboard.

The Weather Insights Platform (WIP)

The Weather Insights Platform (WIP) is a dynamic, web-based application designed to provide a competitive edge for retailers, restaurants, and e-commerce. Leverage WIP to track operations and sales against weather and ultimately to increase revenue. Plot and track assets and locations to understand how each is affected by weather. Create sales forecasts, review model performance, quantify the impact of weather on sales, and more with easy-to-use modules accessed via a single dashboard. Demographics and geo-fenced location data are also available.

Condition-Based Ad Triggering (C-BAT)

This conditions-based ad triggering system gives customers the ability to showcase relevant product messaging within predetermined weather conditions. Apply hyper-localized targeting to connect customers with your brand where and when it matters most.

Data Delivery

All Weather Source data can be accessed via our OnPoint API or as CSV files. Weather Source also has strong strategic partnerships with data delivery platforms such as Snowflake and business intelligence platforms such as Qlik and Looker.

24/7/365 Call Center

Weather Source offers a meteorological call center that is staffed 24 hours a day, 7 days a week, 365 days a year. We are available around the clock to assist customers with any technical, customer support, or meteorological questions.

Supported Weather Parameters

- Air Temperature
- Wet Bulb Temperature
- Dew Point Temperature
- Feels Like Temperature
- Wind Chill Temperature
- Heat Index Temperature
- Relative Humidity
- Specific Humidity
- Surface Pressure
- Pressure Tendency
- Mean Sea Level Pressure
- Wind Speed
- Wind Direction
- Cloud Cover
- Solar Radiation
- Precipitation Amount
- Probability of Precipitation
- Precipitation Indicator
- Snowfall Amount
- Snowfall Depth
- Probability of Snow
- Snow Indicator

Supported Weather Perils and Hazards

- Blizzard
- Earthquake
- Extreme Temperatures
- Hail
- Hurricane/Tropical Cyclone
- River Flooding
- Severe Convective Weather (Thunder & Lightning)
- Storm Surge
- Tornado
- Wildfire
- Volcanic Activity
- More

Contact Us

sales@weathersource.com
support@weathersource.com

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