WEATHER SOURCE

Weather & Climate Technologies
for Business Intelligence

OnPoint Analytics

2024

About Weather Source

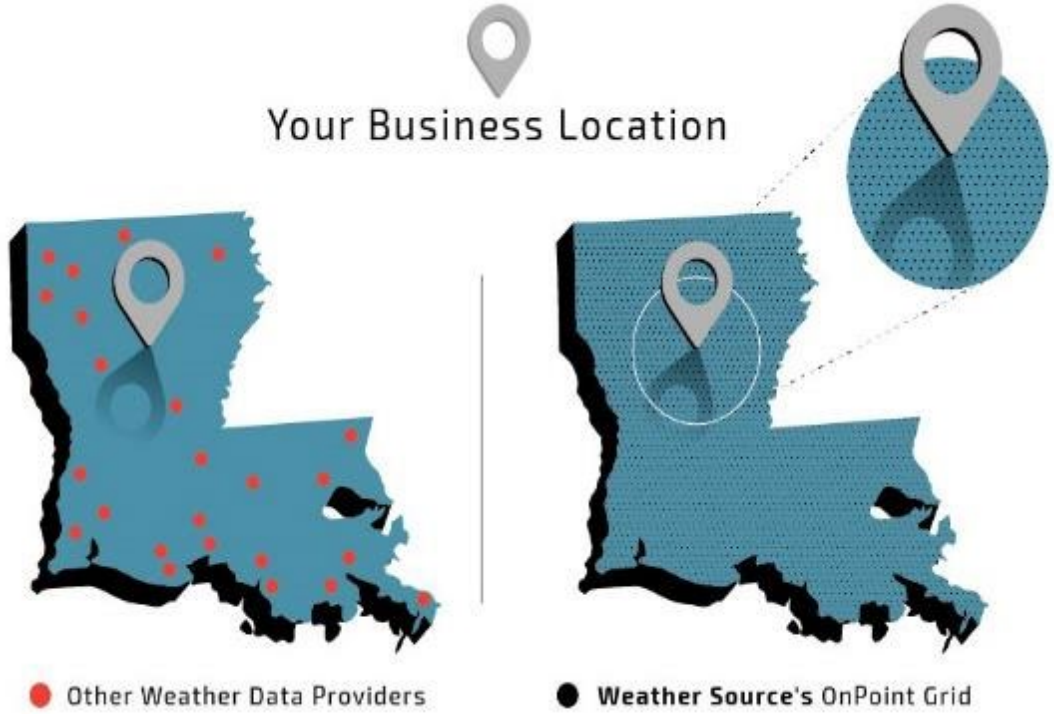
Weather Source is the B2B arm of The Weather Network / Pelmorex family of weather businesses where Pelmorex owns 52% of Weather Source. Pelmorex is the 3rd largest weather company in the world and collectively we have a staff of over 500, many of whom are meteorologists, data scientists, software engineers, and mathematicians. Currently Weather Source is leading the development of a dedicated Climate Risk Enterprise Solutions Group. This effort has been going on for the past few years but has now been officially formalized as a new group and provided with funding from Pelmorex.

Weather Source operates one of the most comprehensive weather information systems available in the world today. We have global reach and support a very wide range of weather parameters and features from real-time extreme weather, to seasonal climate anomalies, to wildfires, air quality, and everything in between. Our flagship OnPoint Weather Suite of data products provides hour-by-hour and day-by-day weather from decades in the past, up to current time, and seamlessly into a forward looking forecast. All of this data is accessible from our best-in-class OnPoint API that delivers weather information for any point on the planet at Google scale and speed.

At Weather Source a central tenet of our approach is making sure we do everything in our power to help our clients succeed. As weather experts with vast weather data assets to work with, we can often provide value in helping our clients solve weather challenges in ways they might not have imagined. Our clients appreciate our enthusiastic approach in helping them succeed, and that is why we have a 99+% client retention rate.

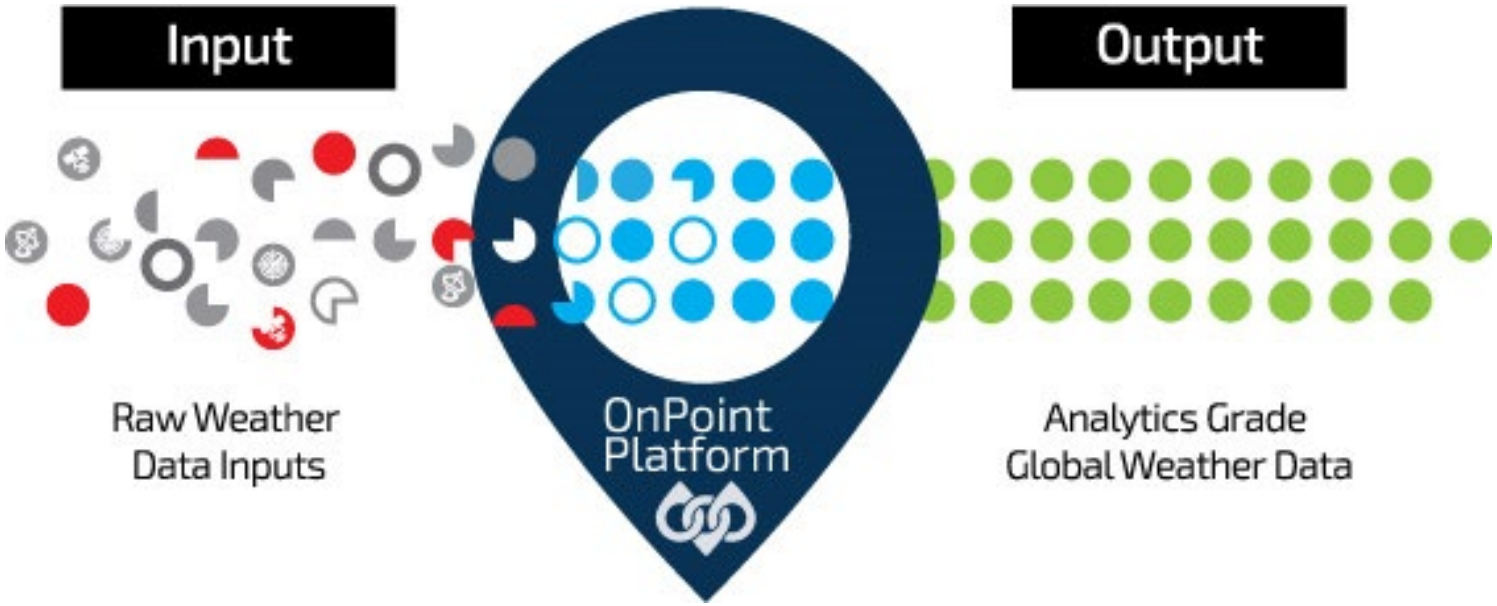
Why Weather Source?

- Weather Source's OnPoint® Grid offers the highest resolution on the market.
- Our grid covers every land mass in the world and up to 200 miles offshore.
- Your North American locations of interest are never more than 2.2 miles from an OnPoint ID.

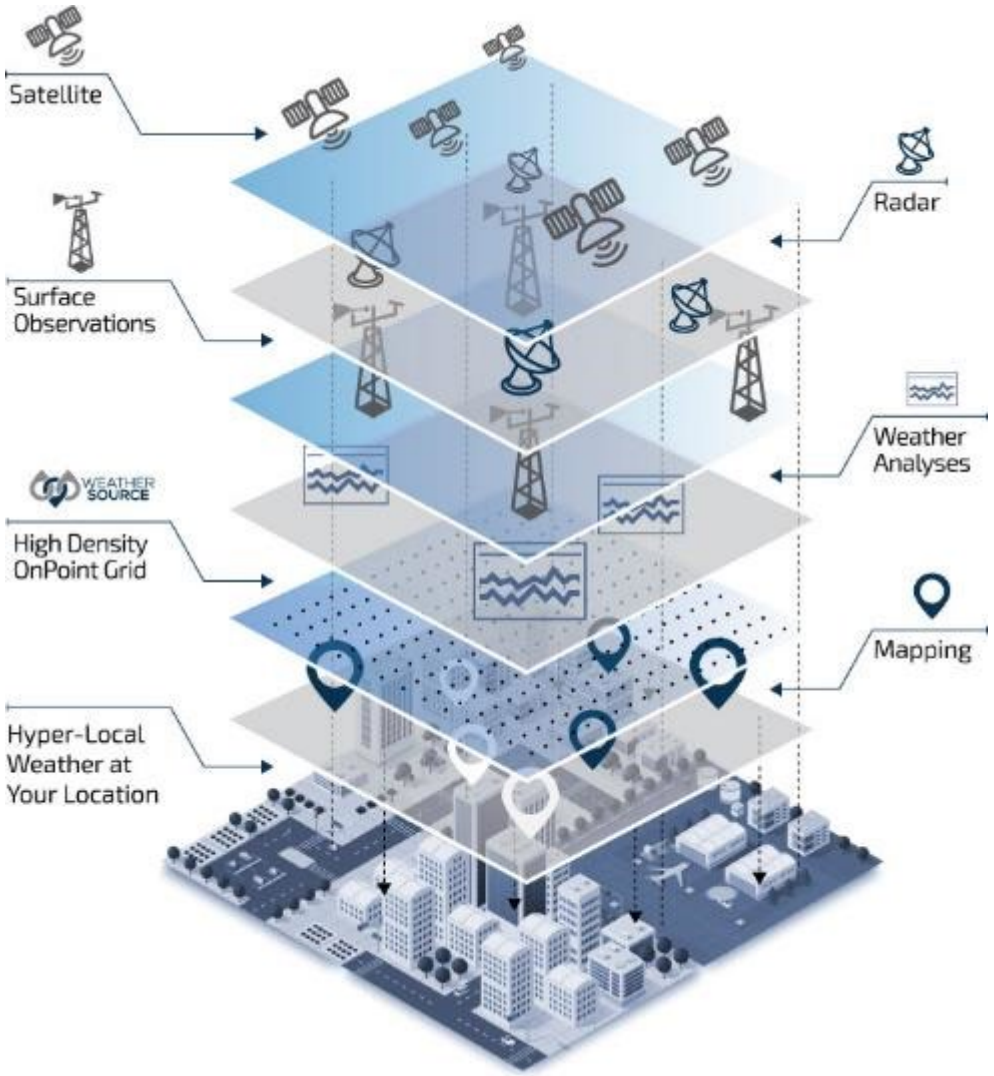


Analytics-Grade Data Cleansing

- Ensuring data that is gap-free, easy to use, and globally uniform.
- By unifying inputs within the OnPoint Platform, our data is homogeneous and ready for immediate analysis.



OnPoint® Weather Product Suite



For any point on the globe:

- **OnPoint® History:** Hourly and daily weather history time series.
- **OnPoint® Forecasts:** Hourly and daily weather forecast time series.
- **OnPoint® Forecast History**
- **OnPoint® Climatology:** Statistics describing normal or typical weather down to the hourly or daily level.
- **OnPoint® Geospatial:** Geospatial products for weather events and perils such as hurricanes, hail, tornadoes, flooding, and more.

How Weather Source is Working with Current Clients on Climate & Physical Risks

We are actively working with many leading global financial institutions including international banks, hedge funds and investment managers on a global scale. Weather Source supports Bloomberg, Factset, S&P Global, Dun and Bradstreet, TRowe Price, Jefferies, MScience and other leading investment firms and we provide data and services for climate stress tests, portfolio alignment with climate trajectories by defining coherent climate scenarios, scenario planning, weather impact probabilities, and more.

Event Risk Modeling

We have the ability to provide accurate risk statistics on:

- Tropical Cyclones
- Extratropical Storms
- Hail
- Tornadoes
- Lightning
- Storm surge for the U.S.
- Wildfires
- Drought Stress
- Heat Stress
- Precipitation Stress
- Earthquakes
- Volcanoes
- River Flooding
- Sea Level Rise
- Flash Flooding
- Global Storm Surge
- Tsunamis

All Modelling is based on analysis of event history data and/or the use of physics-based models.

Climate monitoring and the IPCC CMIP5 and CMIP6 climate model scenarios will be used to adjust climate related risk event statistics going forward in bands of 5, 10, 20, 30, 40, and 50 years.

Event Risk Modeling Limitations

- We can provide useful and valuable support for flash flooding, however this phenomenon is very challenging to model, and can be affected by local infrastructure changes that can be extremely difficult to account for. That said, we have the means to develop useful risk scores for flash flooding.
- Our support of Tsunami modeling will need to be developed. We do have access to the needed data history and can develop this into a useful Tsunami risk dataset. Outsourcing may also be an option.
- We have knowledge on how to do storm surge modeling for locations outside the U.S., however if this is a requirement, we will need to build this.

Modeling of Climate Risk Scores

- Our approach to developing climate risk scores includes the use of quality historical datasets, scientific expertise in the given risk phenomenon (such as tropical cyclones), and expertise in modeling. The result of each climate risk modeling effort is a dataset that describes the probability of the risk phenomenon occurring at a defined point over some period of time.
- This information can be used, for example, to provide guidance on the probability of an extreme weather event happening at a location during a 1, 10, or N year period.
- Our climate risk modeling approach is data driven and we used a variety of quantitative approaches including data testing methods such as outlier tests, regression, frequency analysis, and distribution fitting tests to name a few.

Event Risk Scoring

Annual Risk – Years 2025 - 2030			
	Impact	Return Frequency (per year)	Score
Tropical Cyclones	75	0.1	7.5
Extratropical Storms	25	1	25
Hail	10	0.05	0.5
Tornadoes	25	0.001	0.025
Lightning	10	0.001	0.01
Storm surge	75	0.05	3.75
Wildfires	75	0.001	0.075
Drought Stress	25	0.1	2.5
Heat Stress	25	0.1	2.5
Precipitation Stress	25	0.1	2.5
Earthquakes	50	0.01	0.5
Volcanoes	25	0.01	0.25
River Flooding	50	0.1	5
Flash Flooding	50	0.2	10
Tsunamis	100	0.001	0.1
		Total Risk Impact Score:	60.21

*Example of Event Risk Scoring for a specific location

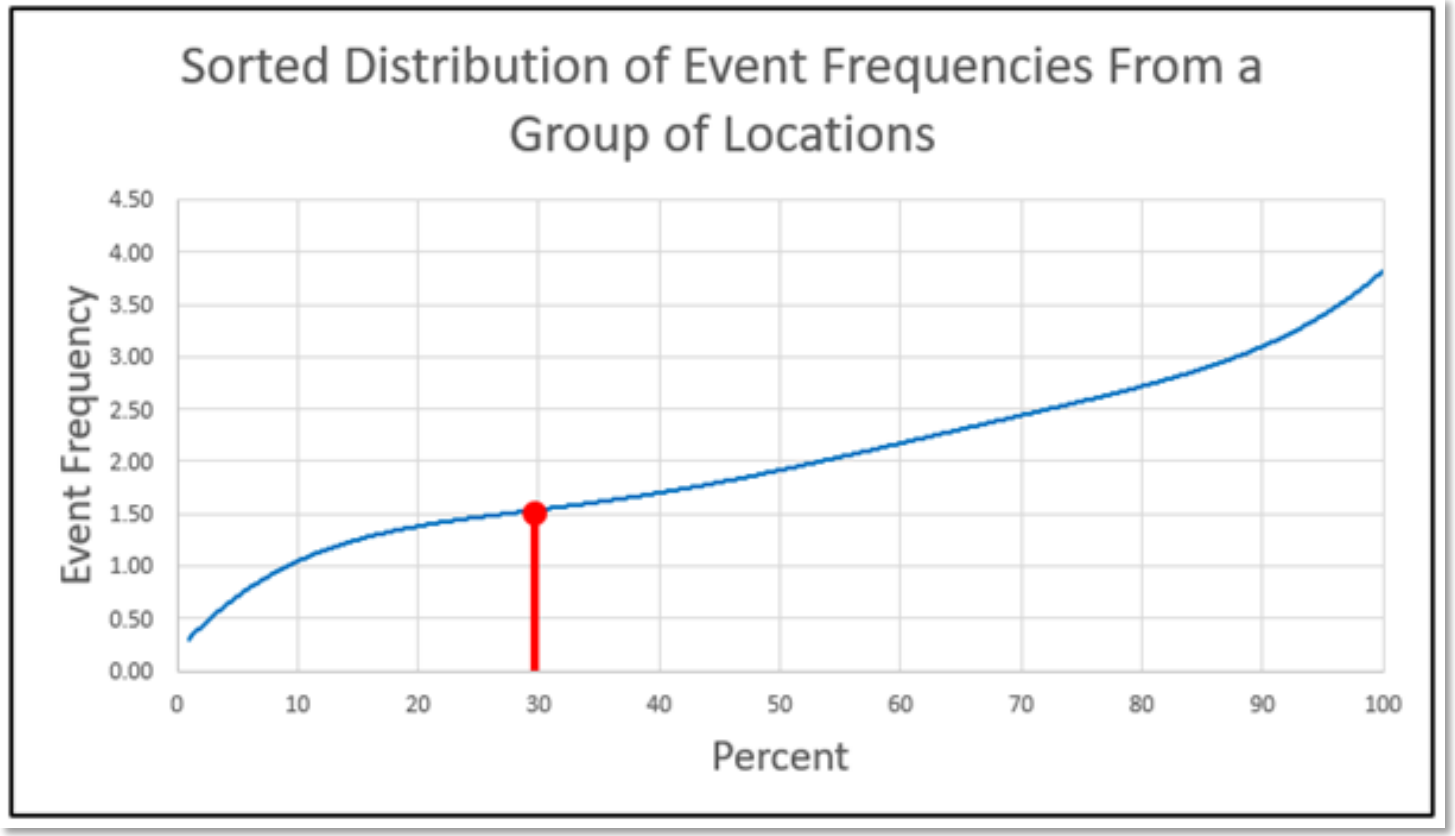
This is an example of the scoring summary method.

The Impact component will need to be more tightly defined and may vary by region as a function of variation of asset value.

The Return Frequency component will come from the Weather Source Risk Models on a per location basis.

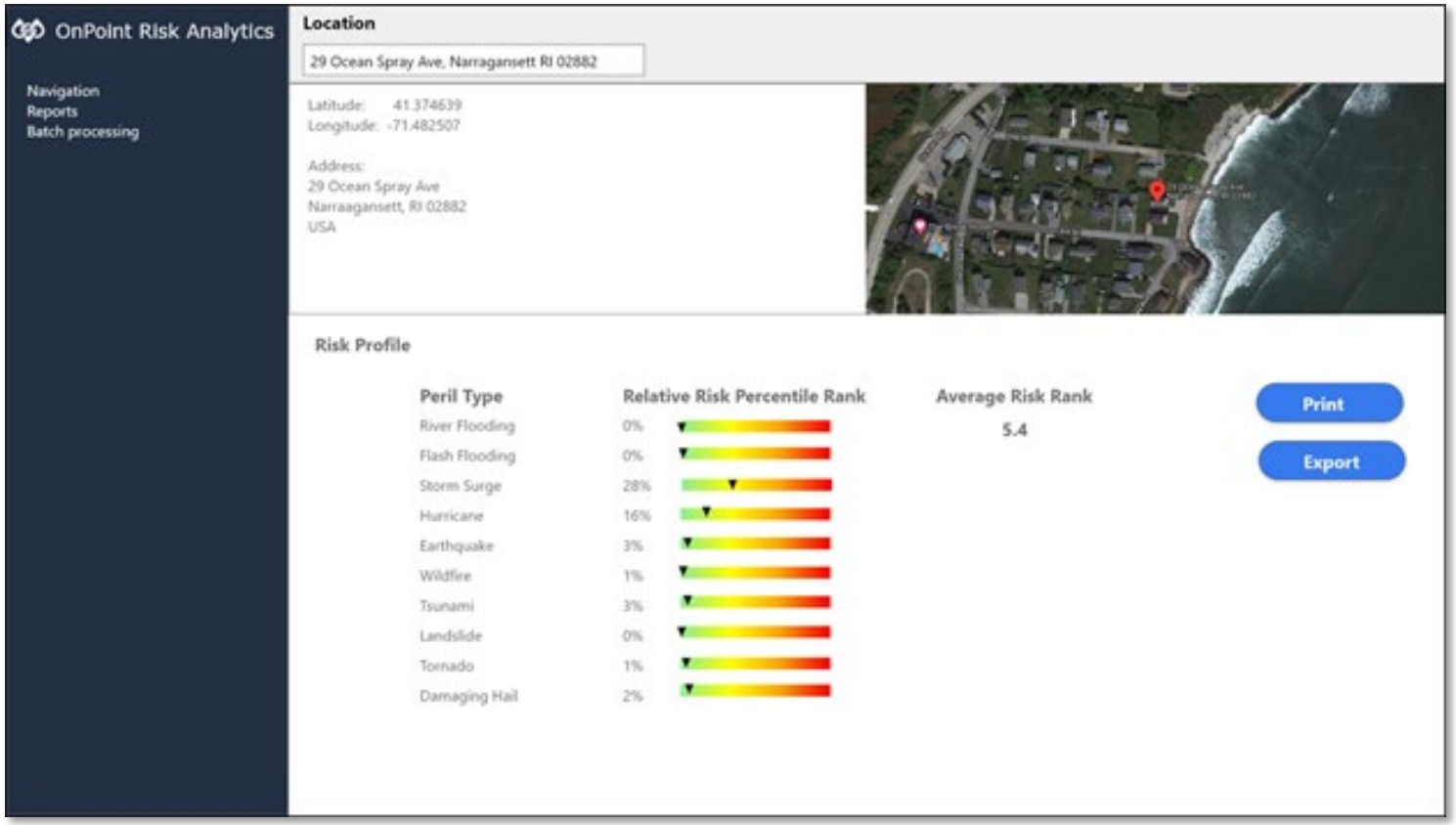
How Weather Source Benchmarks its Climate Risk Models

- Weather Source tests against various available datasets and, where possible, we test against the theoretical physics of the underlying phenomenon.
- Test results are evaluated on a case-by-case basis; however we do strive to adhere to common statistical tests of significance.
- All source data is thoroughly evaluated and tested. The evaluation includes a review of published evaluations of the data to learn what we can from the scientific community.
- With this knowledge we then test the data internally to verify our understanding and look for data problems and inconsistencies. Most of the time this approach simply verifies the published works, occasionally we find issues that haven't been previously discovered.



Data Sources used by Weather Source for Climate Risk Scores

- Weather Source uses freely available historical event data from various governments and organizations for the underlying data.
- When direct data is not available or is insufficient, Weather Source will use proxy data.
- A good example of this is hail risk. In the U.S., we have access to a substantial hail observation database. However, in many other countries these observations have not been systematically collected, and thus don't exist. However, we do have access to global weather history datasets such as the ECMWF ERA5 reanalysis (and others) that can be used to extract the weather conditions that are strongly associated with hail.



Weather Phenomenon History Archive

- This can vary depending on the phenomenon, the frequency of the phenomenon, and the impact of global climate change on the phenomenon.
- Higher frequency weather events have enough sample such that stable statistics can be achieved using 10 years of data. Lower frequency phenomenon such as tropical cyclones require a longer span of time. For hurricanes, we have computed climate risk for them based on the past 40 years and the past 100 years of data.
- It is important to contemplate the impact of climate change, as the statistical parameters of some phenomenon have changed over time, and this can lead to biases compared to real world probabilities given the current climate state.

Pricing Model

- The recommended pricing model will be based on the volume of risk scores consumed.
- The pricing schedule will have a tiered structure where higher volumes can be purchased at a discount.
- We can provide a discount capacity contract to purchase blocks of scores at an additional discount.

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