



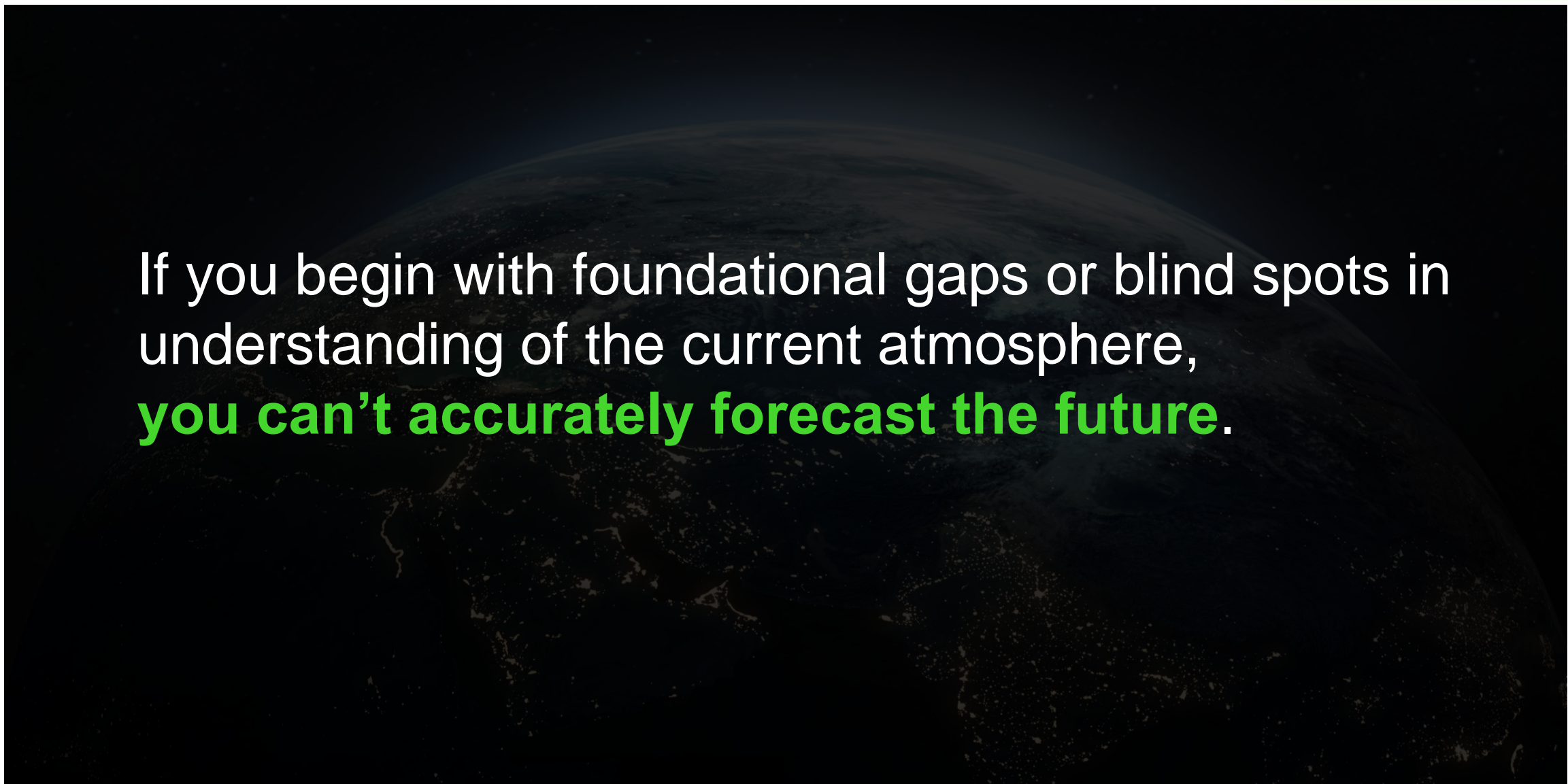
HORIZON AI

Weather Forecasting for Energy Applications

July 24th, 2024

Climavision[®]

Chris Goode, Founder & CEO



If you begin with foundational gaps or blind spots in understanding of the current atmosphere,
you can't accurately forecast the future.



Observations Are The Currency of Meteorology

We're **filling** the gaps...

... using innovative remote sensing, and science to create more accurate & actionable data to help protect people, communities and businesses from accelerating weather extremes.

Climavision: Company & Offering Overview

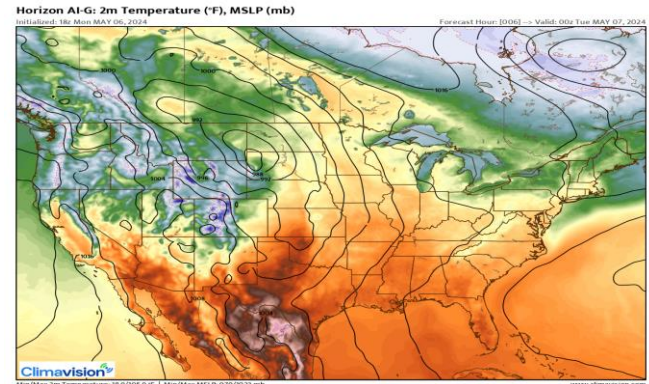
Building a nationwide proprietary radar network...

... and a new AI Powered approach to forecasting...

... to develop market leading analytics and forecasts



- Filling low-level data voids in the US NEXRAD network
- Solid State, Dual Pol, X-band weather radars at 10X the resolution of S-band radars



Leverage high-resolution observational data sets, advanced NWP & cutting-edge AI for precision weather insights across all timescales.

- 1.5 billion global observational datasets captured daily
- Rapidly assimilate new and novel third-party datasets



Leading point forecast solutions with top rated wind speed forecast and an asset-level database.



New approach to Numerical Weather Prediction that forecast the growth of major storm systems and big atmospheric changes with precision & speed.



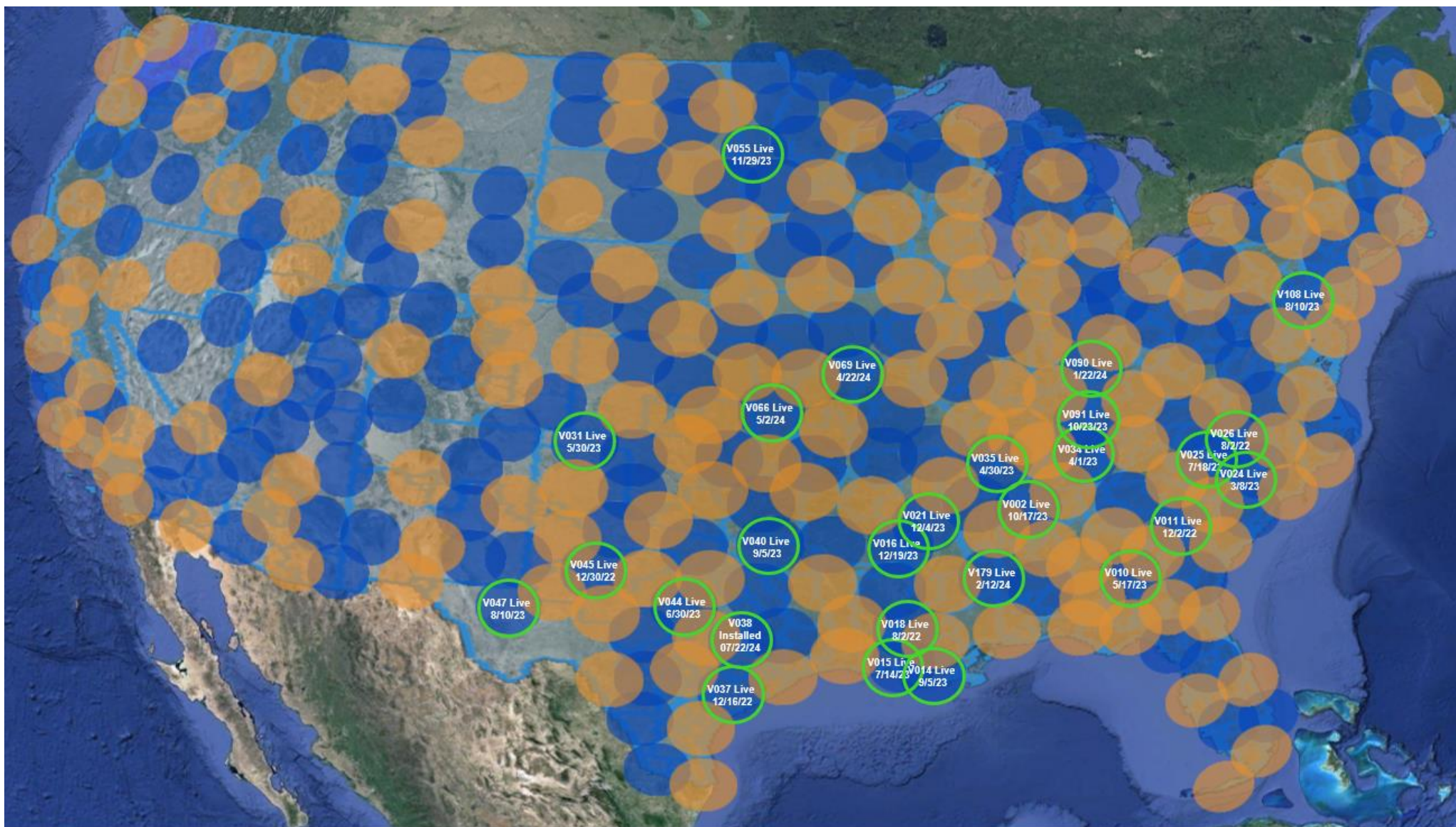
Groundbreaking AI-driven S2S probabilistic outlooks deliver a new era of weather forecasting



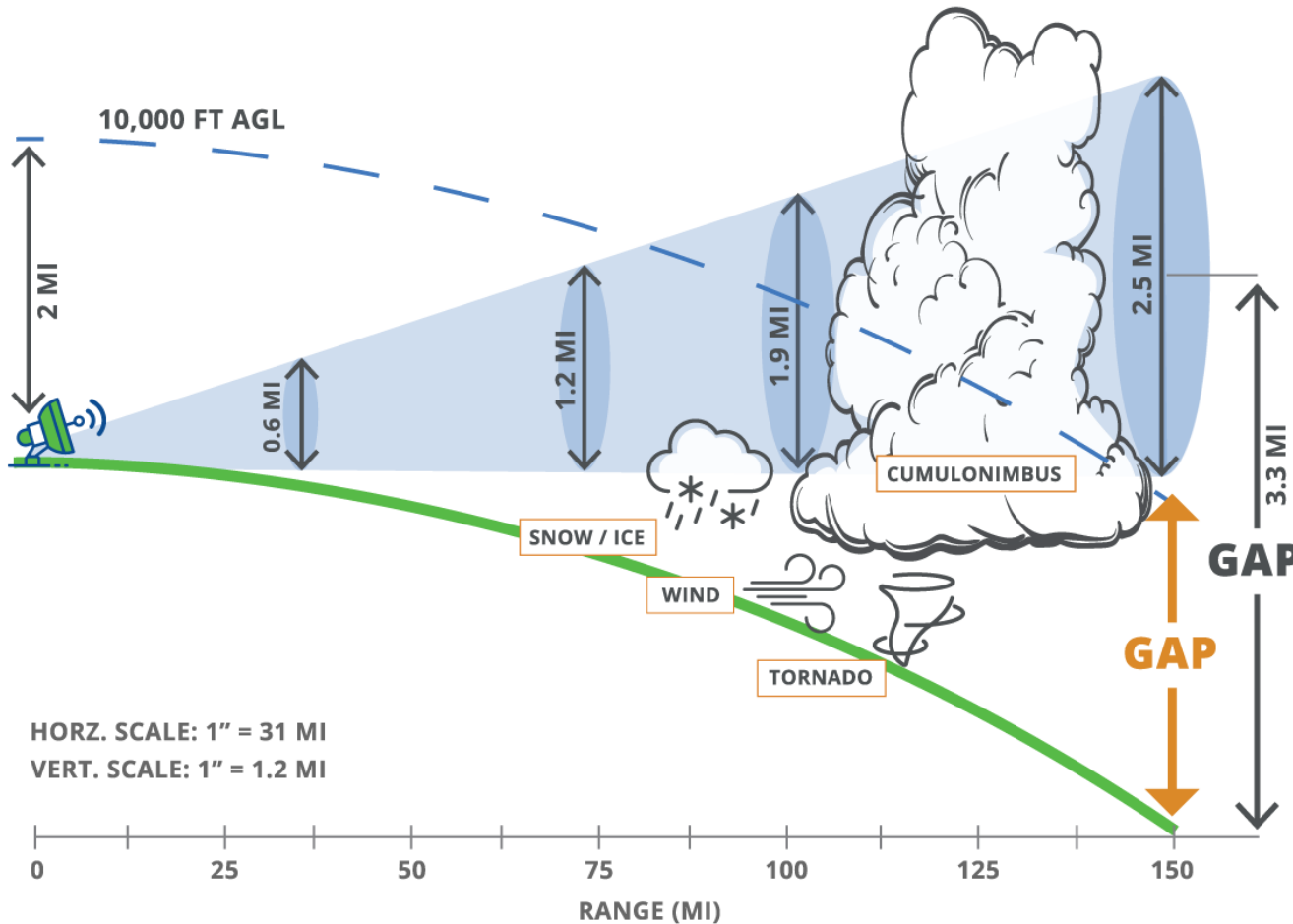
Powered by in-house and cloud-based super-computing capabilities

Climavision is building next-gen weather solutions to fill long-standing gaps and address the challenges of a changing climate and its impact on companies, governments, and communities alike.

Supplemental Radar Network



Why Do Coverage Gaps Exist?



- The Earth is not flat – the planet's curvature in tandem with radar beams that climb higher into the atmosphere the further you move away from each radar are the key factors
- Blockage can also be significant in mountainous regions or urban areas.
- Filling in these blind spots is critical for:
 - Flash floods
 - Low-level winds
 - Tornadoes
 - Improved forecast modeling which depend on measurements near the surface

WindBorne Partnership

An unparalleled novel atmospheric data set



Complete Access, From Surface to Stratosphere

The only technology that can capture in-situ atmospheric profiles everywhere, including over oceans and the Earth's most remote places. Each balloon can maintain or transition between any altitude from sea level to 20km, autonomously flying for weeks at a time.

- 1K Flights to Date
- 15 Years Cumulative Flight Time
- 9M Kilometers Cumulative Ground Track
- 250,000km Vertical Distance Travelled



Forecasts Tailored for Energy Applications

- 1) **Enhanced Grid Reliability and Stability:** Our forecasts help grid operators anticipate and prepare for extreme weather conditions, such as heatwaves or storms, which can strain the grid. Knowing when and where these events will occur, operators can take preemptive measures to balance supply and demand, reducing the risk of blackouts and ensuring a stable electricity supply.
- 2) **Optimized Renewable Energy Integration:** Better predictions regarding the availability of renewable energy sources like solar and wind. Improved forecasting allows for better scheduling and integration of these intermittent energy sources into the grid, ensuring that their potential is maximized even during extreme weather events.
- 3) **Informed Decision-Making for Market Participants:** Our insights help traders make informed decisions regarding electricity trading and pricing. This leads to more efficient market operations, as participants can adjust their strategies based on expected supply and demand fluctuations caused by extreme weather conditions.
- 4) **Improved Demand Response Management:** Utilities can better predict and manage electricity demand, especially during extreme weather events that significantly impact consumption patterns. This allows for more effective demand response programs, where consumers are incentivized to reduce or shift their electricity usage, thereby alleviating stress on the grid.



HORIZON AI

PRECISION WEATHER INSIGHTS FOR ENERGY
and UTILITIES ACROSS ALL TIMESCALES.

POWERFUL. ACCURATE. DEPLOYED.



RADAR AS A SERVICE



HIRES



POINT



GLOBAL



SUBSEASONAL/SEASONAL



NOWCASTING [0-6 HOURS]

SHORT-RANGE [0-72 HOURS]

MID-RANGE [1-15 DAYS]

LONG-RANGE [2 WEEKS – 2 YEARS]

Real-time weather data from our nationwide supplemental X-band radar network

Highly customizable high-resolution domains, for detailed surface information that global models can miss.

Most advanced site-specific weather forecasting system available powered by proprietary data inputs and AI bias correction.

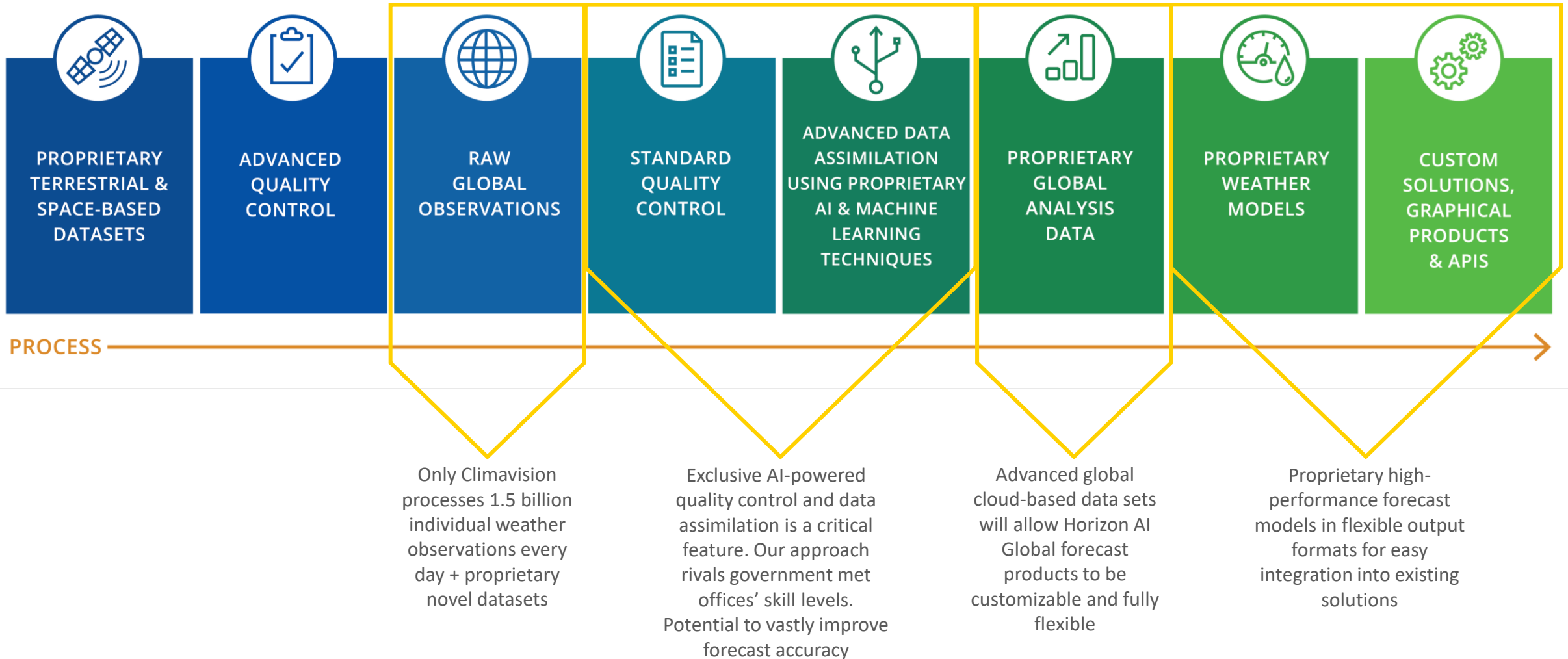
Latest AI tech to assimilate billions of obs into our advanced NWP to more accurately forecast threats with precision and speed.

Powered by an innovative AI approach and trained on vast amounts of historical data for superior accuracy and updated daily.

Differentiated Approach

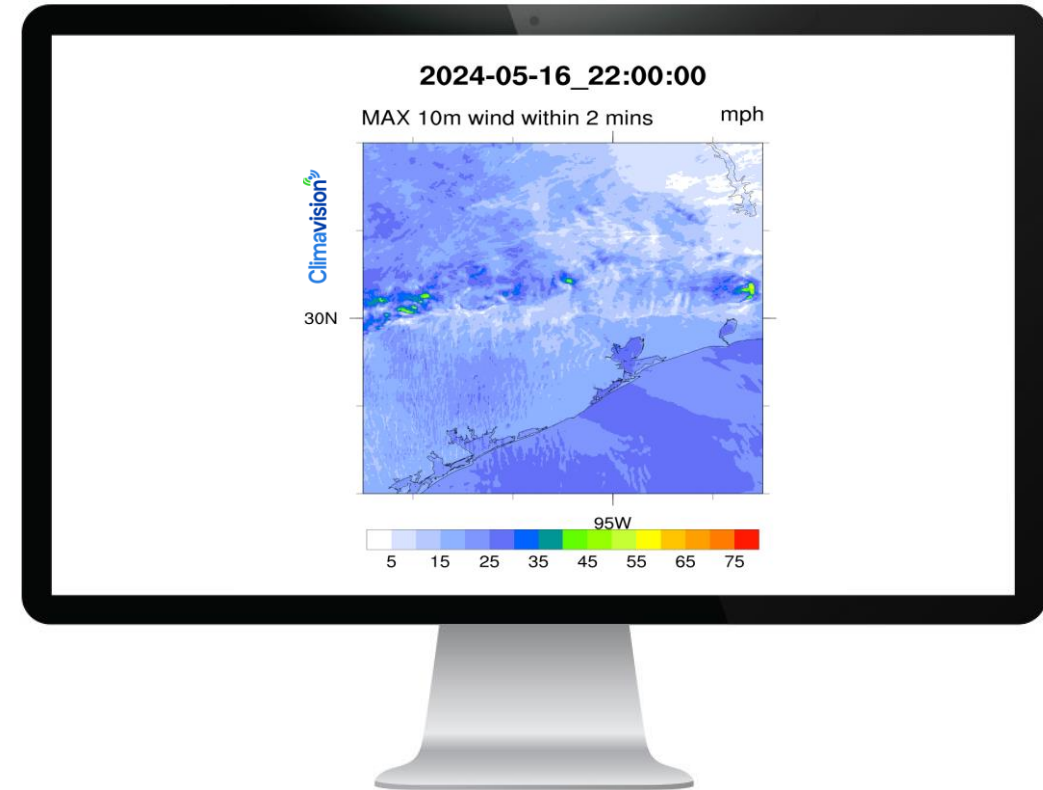


NEW APPROACH TO NUMERICAL WEATHER PREDICTION THAT UTILIZES MORE ADVANCED MATHEMATICAL EQUATIONS THAT AI ALONE CANNOT REPLICATE



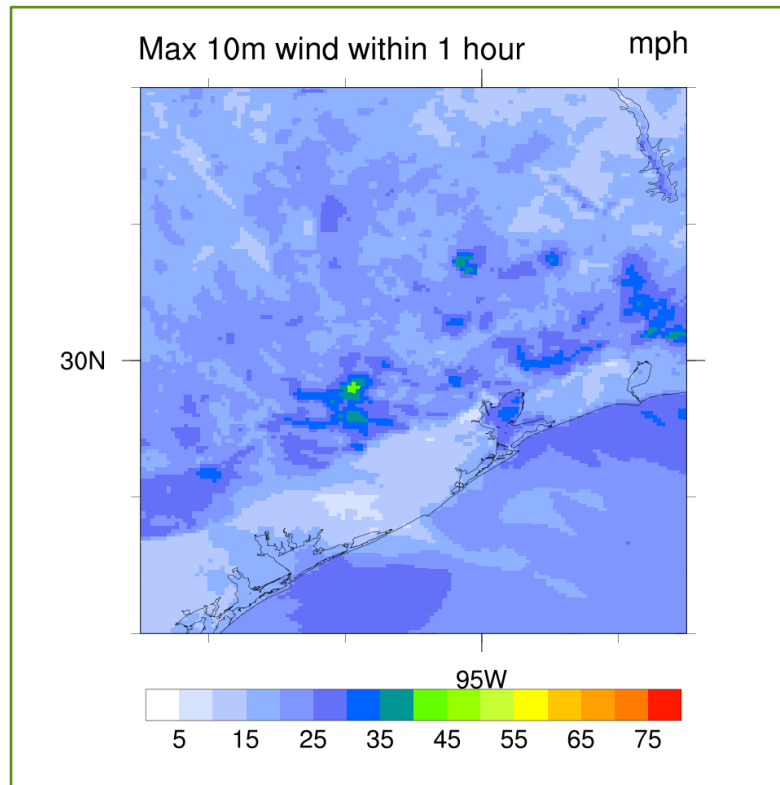
HORIZON AI HIRES

- Better resolve topography and land surface characteristics, therefore, better simulate terrain-induced weather/climate
- Improve accuracy of moist convection through convection-permitting physics parameterizations
- Resolve most meso-gamma (2-20km) scale weather systems and better simulate micro-weather
- Powered by in- house and cloud-based supercomputer for faster and more efficient forecasts

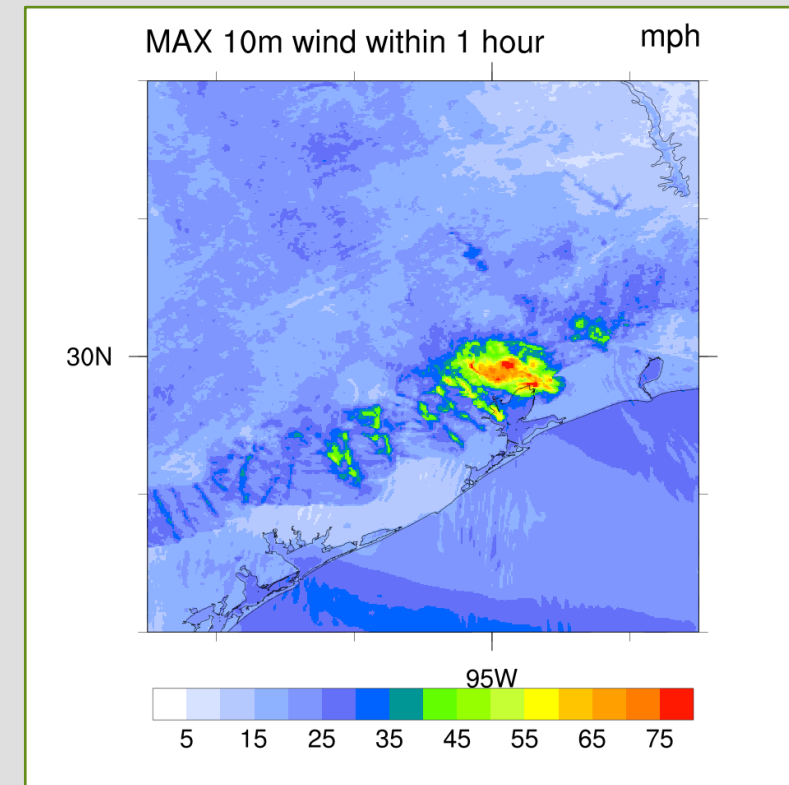


Customizable Horizon AI HIRES weather model delivers asset-level predictions tailored to specific locations and parameters, providing unprecedented insights to optimize operations and maximize the bottom line. Our revolutionary approach to weather forecasting and HPC capabilities maintain unwavering accuracy without sacrificing speed. Don't settle for one or the other – Climavision delivers both.

HRRR 8-Hour Forecast

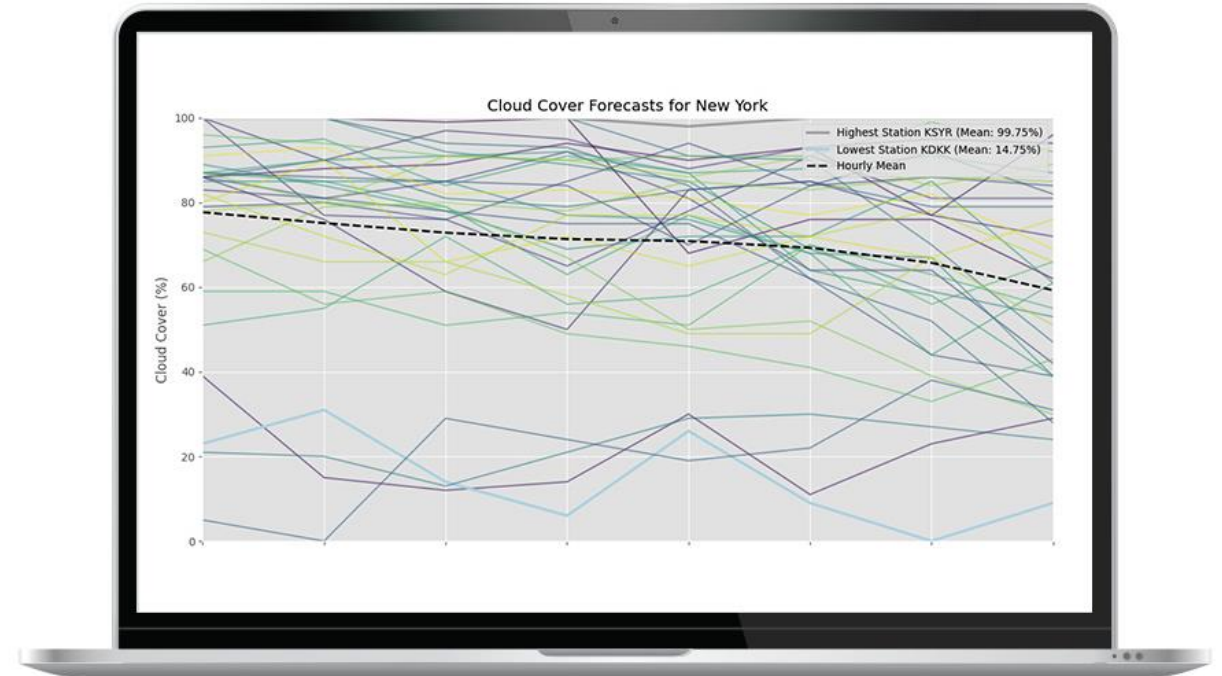


HORIZON AI HIRES 8-Hour Forecast



HORIZON AI POINT

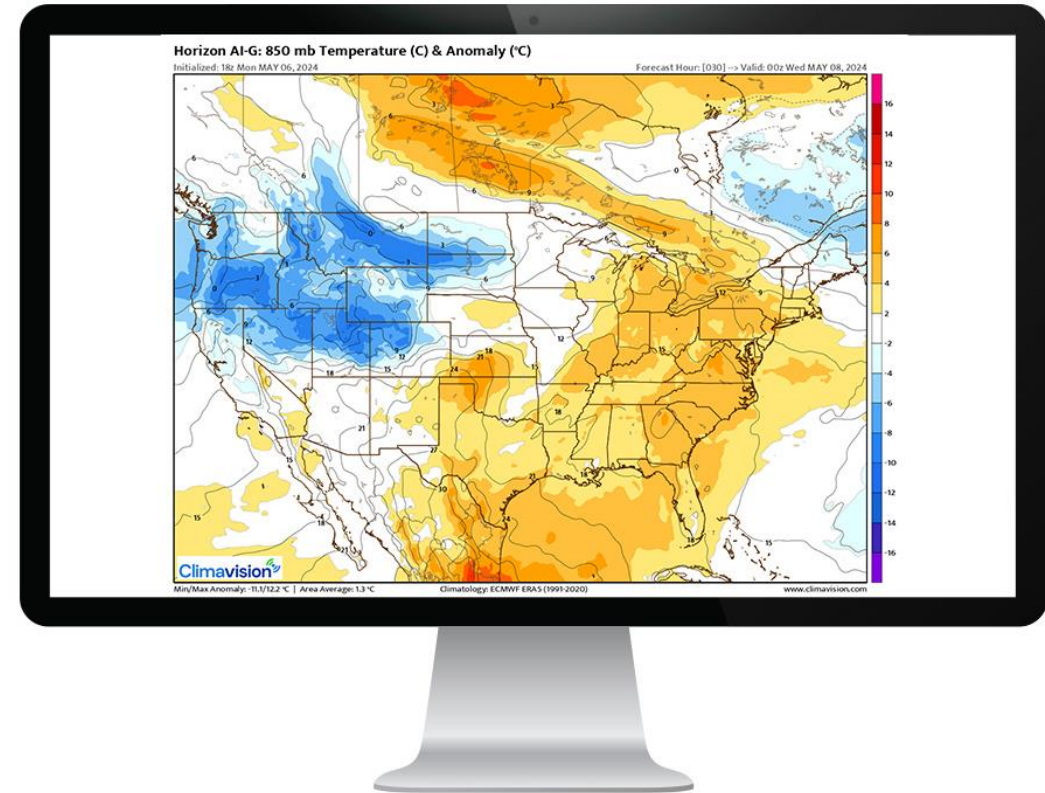
- Fully configurable
- Generates custom forecasts over specific location and time intervals
- Utilizes proprietary forecast models
- Integrates multiple observational data networks
- Leverages AI bias correction
- Maintains daily improvements to system outputs
- Produces easy-to-interpret visualizations



Horizon AI Point Forecast delivers unbeatable accuracy, tailored to any asset level location. Using local observational datasets and cutting-edge AI trained by historical data gives a clearer picture of what's coming. No matter where the operation, access to this level of granular detail minimizes the risk of relying on generalized forecasts that may not accurately reflect local weather conditions, leading to more reliable outcomes.

HORIZON AI GLOBAL

- Fueled by 1.5 billion global observational datasets captured daily
- Rapidly assimilates new and novel third-party datasets
- New approach to Numerical Weather Prediction that utilizes more advanced mathematical equations that AI alone cannot replicate
- Powered by in-house and cloud-based super-computing capabilities



Climavision's advanced Horizon AI Global forecast model leverages the power of AI to unlock insights you need to protect communities and businesses worldwide from the threats of major weather systems, like hurricanes, heatwaves, and blizzards.

ERCOT Harnesses Renewables & Secures Power Grid Resilience

June 27, 2023: Grid Operator Stable During Triple Digit Heat

Highlights:

On June 27th ERCOT set a record for power demand at 80,828 MW from 6-7pm.

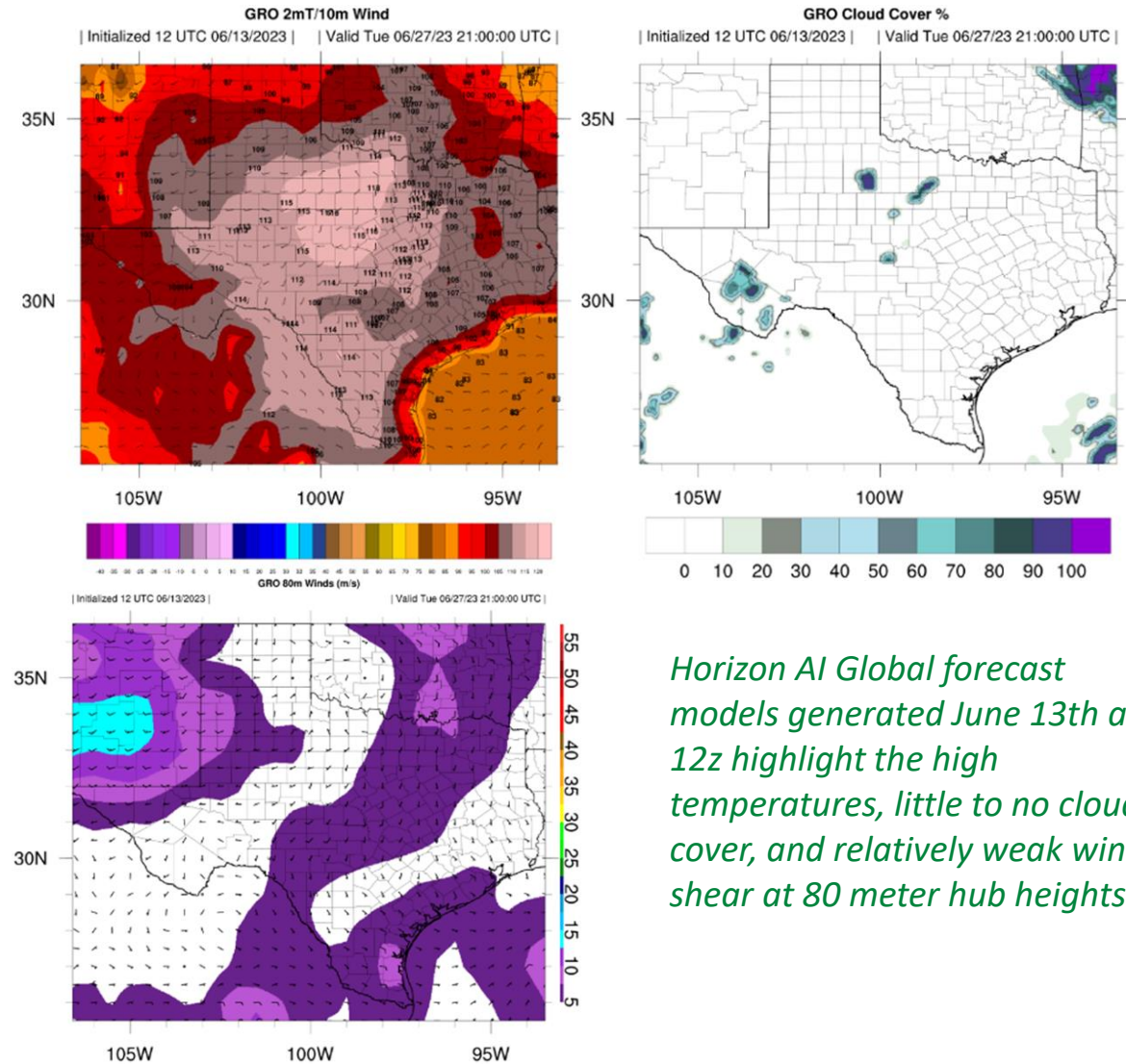
Wind and Solar provided 35% of the power in ERCOT.

2 weeks out, Climavision's proprietary Horizon AI Global Forecast Model indicated triple digit heat, weak wind speed, BUT low cloud cover to allow for strong solar power generation.

This 2023 scenario was much different than the strain the grid operator faced on July 13th, 2022 when they had to issue a plea for consumers to reduce power usage to avoid rolling blackouts.

High Temperatures:

- Dallas: 102
- Fort Worth: 101
- El Paso: 109
- Houston: 96



Horizon AI Global forecast models generated June 13th at 12z highlight the high temperatures, little to no cloud cover, and relatively weak wind shear at 80 meter hub heights.

ERCOT Harnesses Renewables & Secures Power Grid Resilience

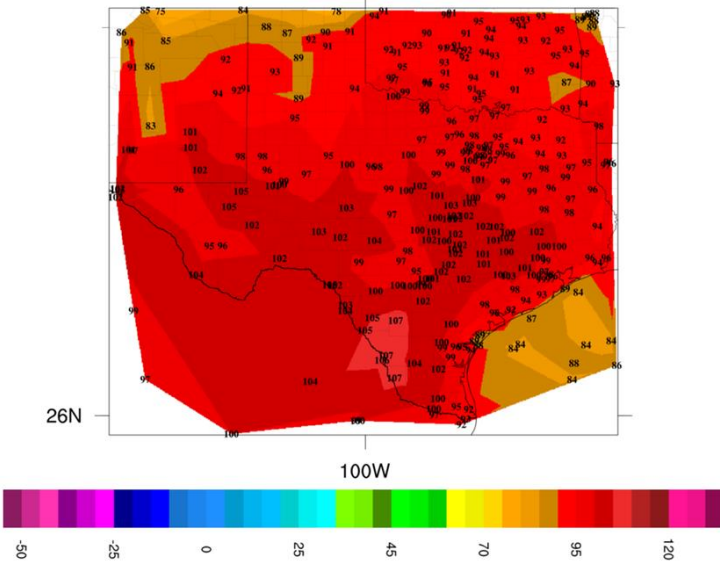
June 27, 2023: Grid Operator Stable During Triple Digit Heat



In agreement with Horizon AI global forecast output, Climavision's Point Forecast system furthered the confidence that triple digit heat was anticipated, while also indicating high irradiance values as far out at June 17th that benefit solar power production.

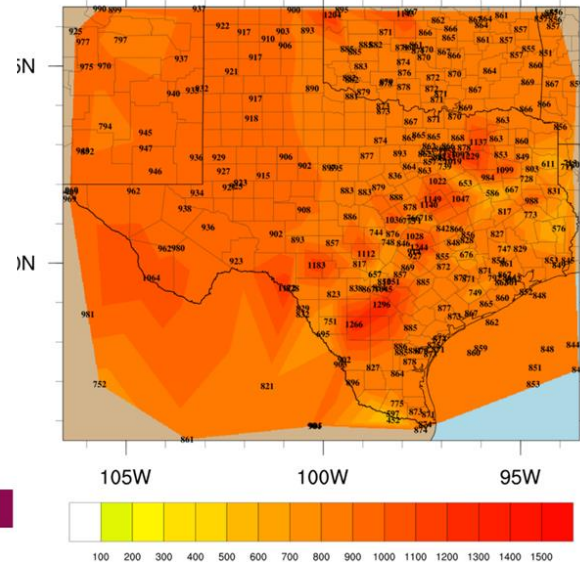
PFS 2m Temperature(F)

| Initialized 06/17/23 12:00:00 UTC | Valid Tue 06/27/23 22:00:00 UTC |



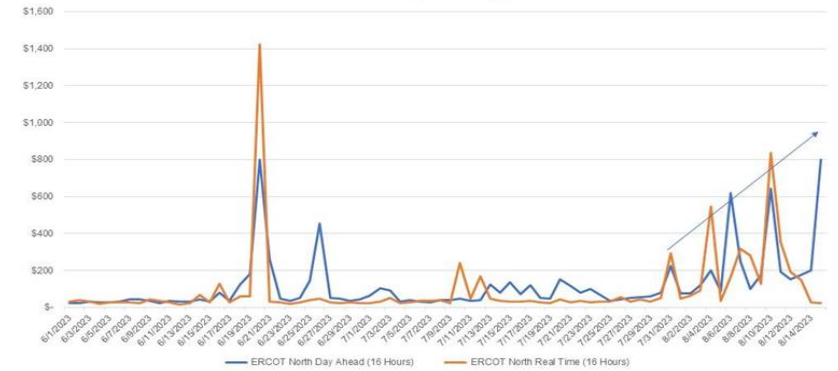
Solar Irradiance GHI

| Initialized 06/17/23 12:00:00 UTC | Valid Tue 06/27/23 21:00:00 UTC |



Structured Transactions

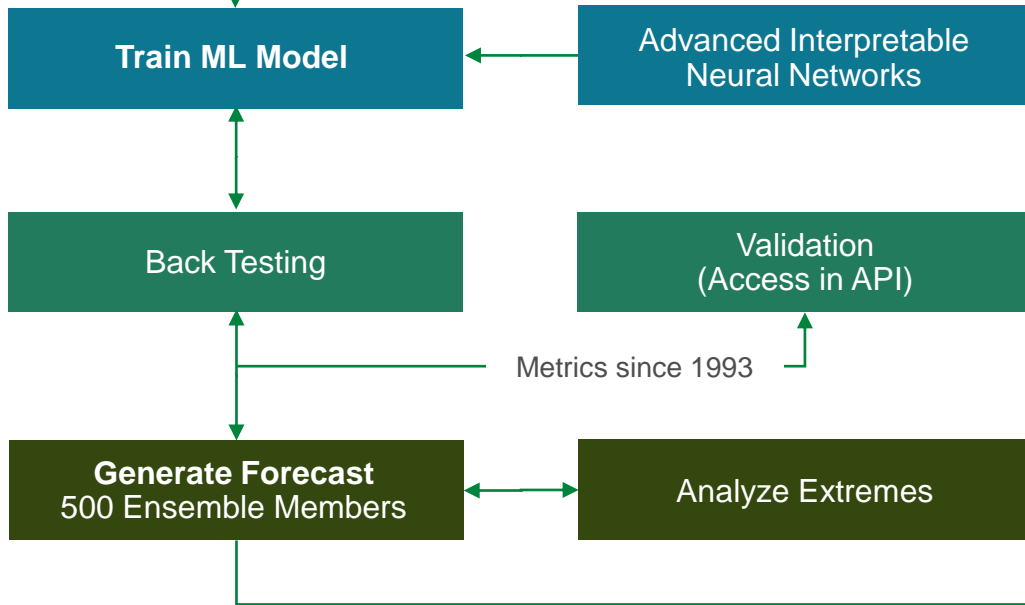
June-YTD August 2023 (76 days trading): ERCOT North Day Ahead and Real Time (16 hours) \$/Mwhr



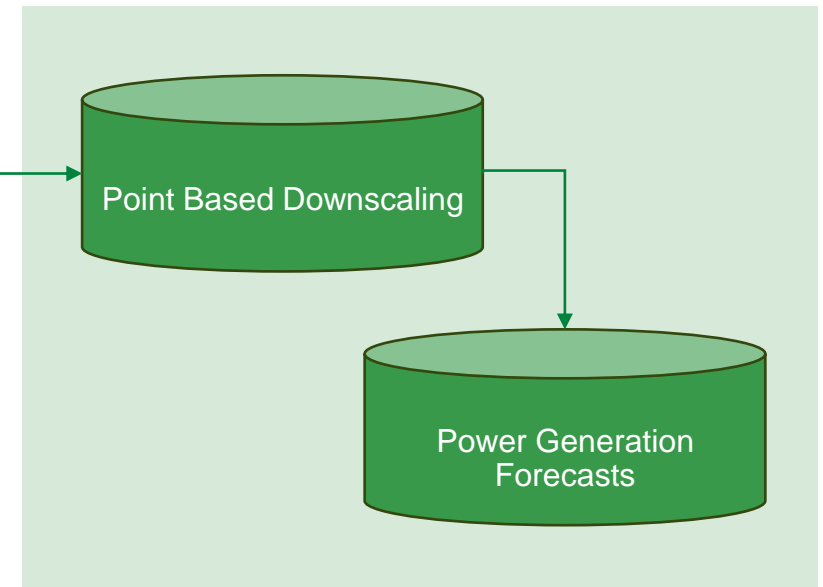
Day ahead prices were expected to spike on June 27th. Thanks to renewable energy production, pricing stayed rather stable. *Image via Evolution Markets on LinkedIn.*

With better data, energy traders are empowered with the confidence that supply and demand will not intersect, and are able to avoid paying high premiums to keep the grid powered, and AC units running for valued customers.

CLIMAVISION DATA LAKE



Horizon AI Subseasonal to Seasonal Forecasts: Taking The Mystery Out Of AI Forecasting



ADVANCED S2S API

Horizon AI S2S Data Details



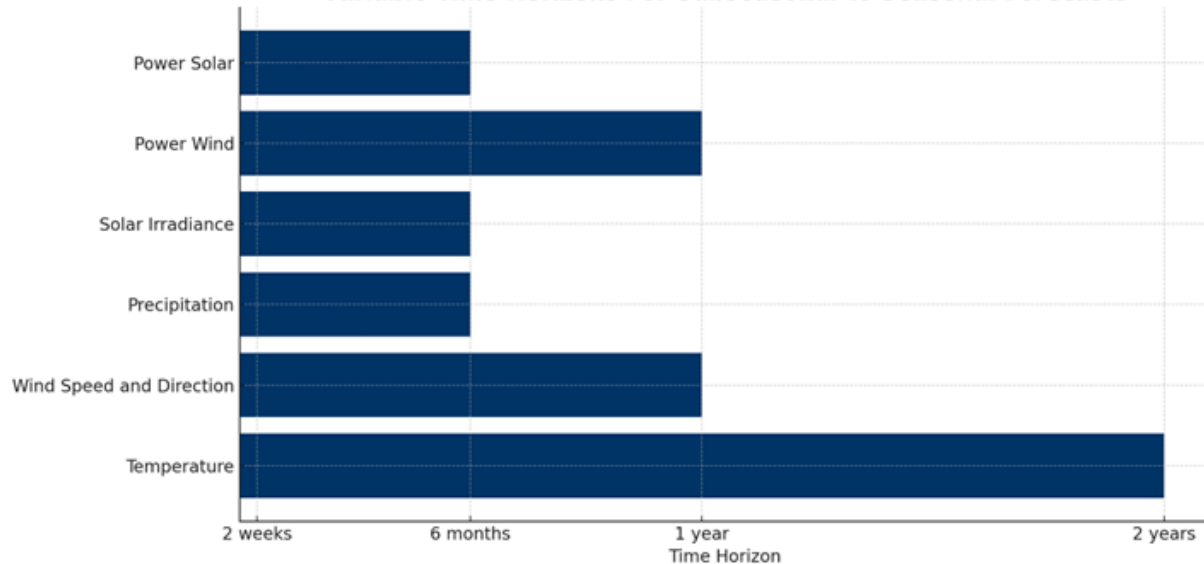
DATA INPUT SOURCES

NWP Reanalysis	ERA-5
Simulations	Proprietary Climate Simulations
METARs	Synops, Custom Observations, Wind/Solar Farms (power production, winds, irradiance, etc.); Includes over 50,000 energy assets that update every quarter

SPECIFICATIONS

Domain	Global
Forecast Increments	Hourly
Update Frequency	Daily
Outputs	Probabilistic
Gridded Output	25km
Point Output	Point Optimization
API Validation Stats	CRPSS, MAE and ACC back to 1993 in API

Variable Time Horizons For Subseasonal to Seasonal Forecasts

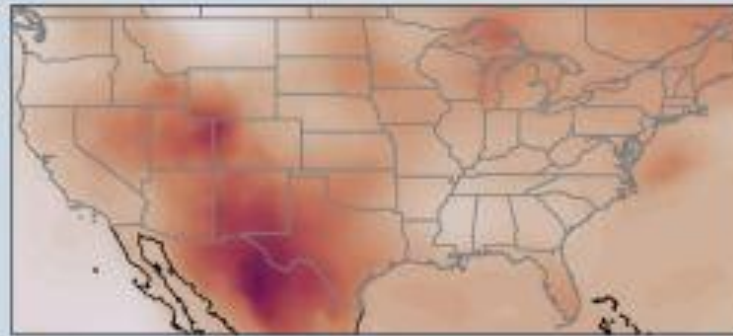


Summer 2024 S2S Probabilistic Outlook

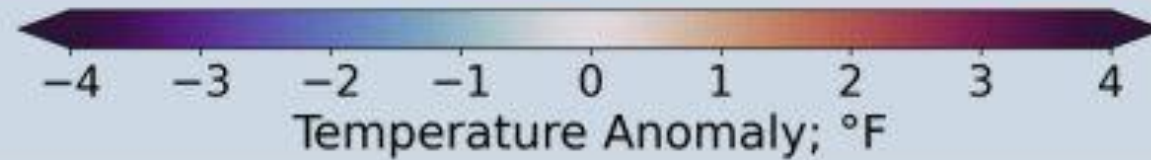
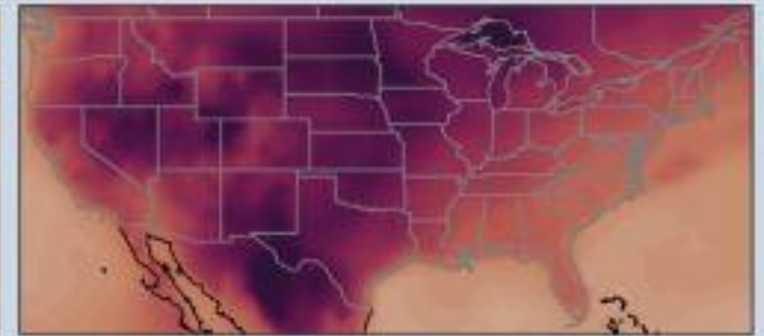
**75% Chance of Being
Warmer Than This**



Most Likely Scenario



**25% Chance of Being
Warmer Than This**





Thank You

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