CASE STUDY | SUMMER 2024

Climavision's Horizon AI S2S Model Provides Critical Insights in ERCOT

Horizon AI S2S Forecasted Early Weather Anomalies to Enhance Energy Trading and Utility Operations

The summer of 2024 posed significant challenges for ERCOT, as Texas experienced unprecedented shifts in weather patterns, including extreme temperatures and wind anomalies. With the stakes high for energy traders and utility operators, the need for accurate and timely weather forecasts are more apparent than ever. Forecasts drive critical decisions, from portfolio management to grid reliability and renewable energy optimization.

Climavision's Horizon AI S2S model stood out during this period by delivering early insights into critical weather anomalies. Its ability to predict anomalies missed by staple models like SEAS5 provides traders and utilities with a unique edge, enabling them to anticipate and respond to extreme weather patterns sooner. By leveraging advanced AI technology, Horizon AI S2S offers data-driven decision support that minimized risks and maximized opportunities in ERCOT's high-stakes energy market.

Climavision

Early Anomaly Detection Provides a Competitive Edge:

- Horizon AI S2S delivered earlier signals of temperature and wind anomalies, giving traders and utilities using S2S a head start in optimizing strategies and mitigating risks.

Improved Operational Efficiency:

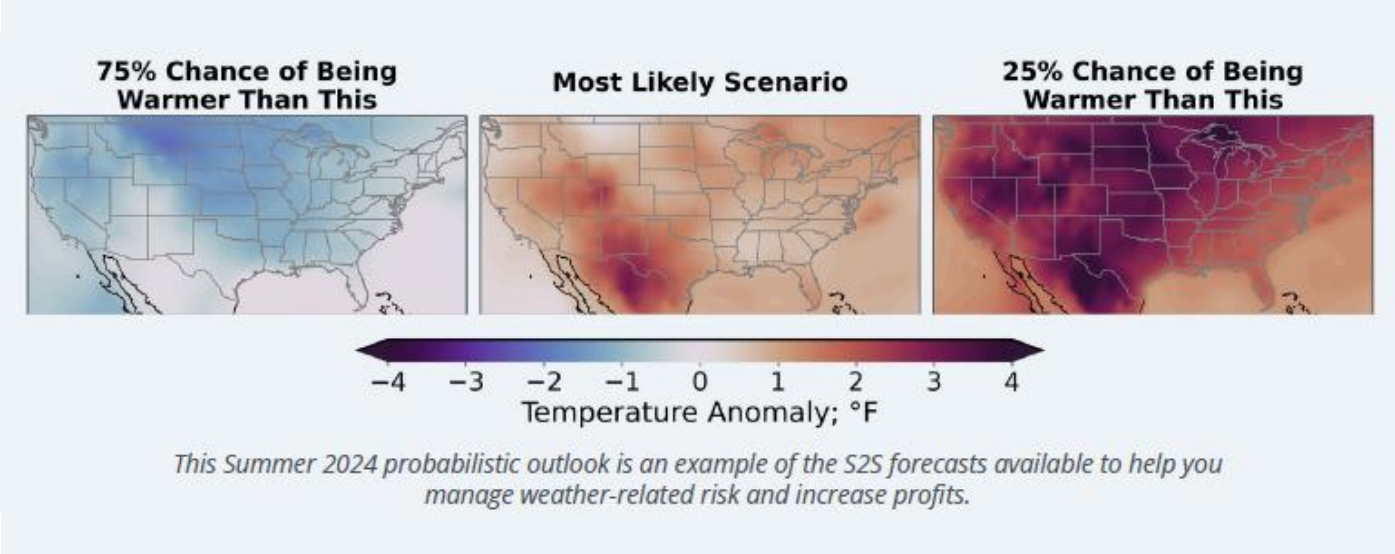
- Advanced AI-driven forecasts enable utilities to optimize renewable energy, plan maintenance, and manage resources more effectively.

Insights That Traditional Tools Miss

- Horizon AI S2S enhances decision-making by providing consistent, detailed insights that traditional models like SEAS5 may miss.

Background:

Horizon AI S2S is a state-of-the-art subseasonal-to-seasonal (S2S) forecasting model developed by Climavision. Designed with energy traders and utility operators in mind, the model combines cutting-edge AI technology with millions of observational data points to generate actionable, high-resolution forecasts.



This Summer 2024 probabilistic outlook is an example of the S2S forecasts available to help you manage weather-related risk and increase profits.

Key Features:

- **Proprietary Ensemble Forecasting**: Produces 500 ensemble members for probabilistic and deterministic forecasting, helping users identify extreme weather events with confidence.
- **Advanced Machine Learning**: Utilizes proprietary neural networks trained on extensive climate data to ensure accurate and interpretable results.
- **Frequent Updates**: Delivers daily forecast updates, ensuring users have the latest data for decision-making.

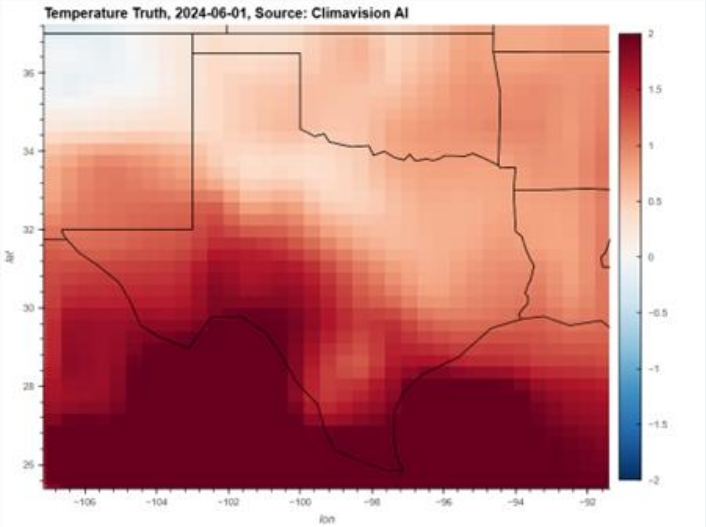
The Horizon AI S2S model's unique approach enables early detection of weather anomalies, providing critical lead time for energy professionals to adapt their strategies. By complementing traditional tools like SEAS5, Horizon AI S2S ensures decision-makers have the most comprehensive forecast insights at their fingertips.

Performance Overview: Summer 2024 in ERCOT

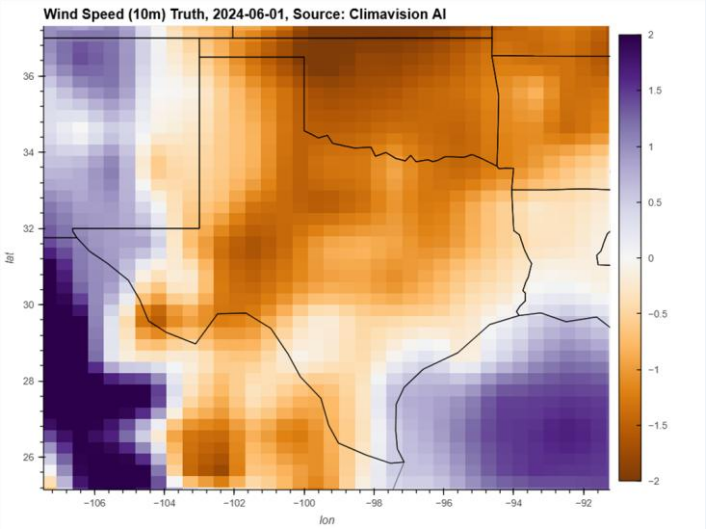
The summer of 2024 was marked by significant temperature and wind anomalies across the ERCOT region, creating challenges for grid operators and energy traders alike. Horizon AI S2S demonstrated its value by delivering early and consistent signals of these anomalies, helping users stay ahead of evolving weather conditions.

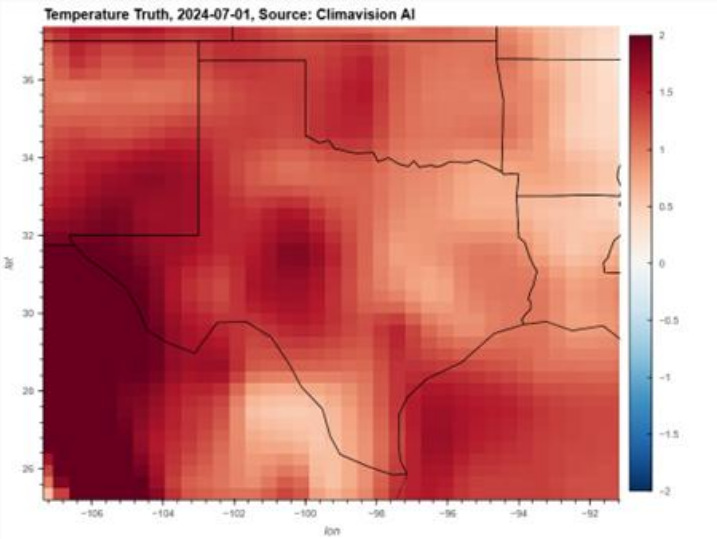
June 2024

Horizon AI S2S consistently forecasted a warmer-than-average June, particularly in west and central Texas. While SEAS5 trended cooler in northern Texas, Horizon AI S2S provided accurate early indications of stronger warm anomalies, aligning closely with observed conditions.



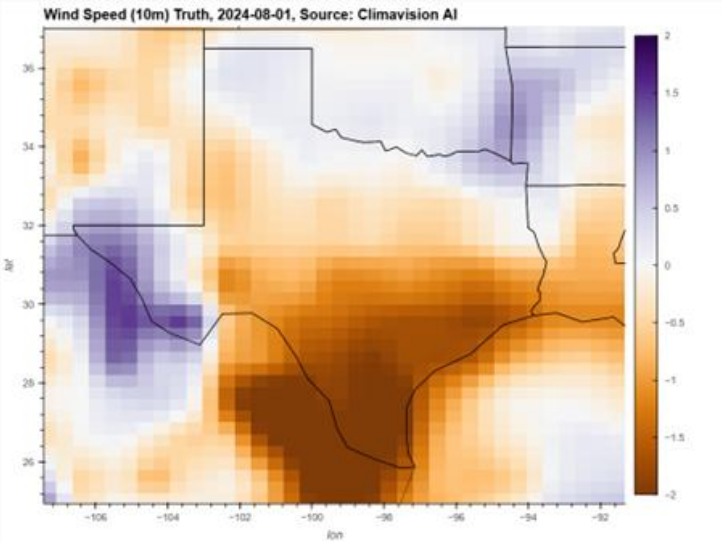
Additionally, S2S identified near to below average winds, which matched observed anomalies. While the strength and coverage of the calm conditions was not captured, S2S still outperformed SEAS5, which lacked consistency in its wind forecasts and expected winds to be slightly above average.





July 2024

Temperatures were warmer than average across ERCOT in July, which S2S forecasted consistently and well in advance. In contrast, SEAS5 forecasted lower warm anomalies and gradually trended towards a cooler than average July in northeast Texas, which did not verify.



August 2024

Horizon AI S2S identified higher wind speeds in western Texas and lower speeds in the east and south as early as May. These forecasts provided actionable insights for grid optimization and renewable energy planning.

Horizon AI S2S ERCOT Performance Value

Energy Trading

Horizon AI S2S equips energy traders with early signals that enhance portfolio optimization, risk management, and market positioning. The model's ability to consistently predict stronger warm anomalies, where SEAS5 has fallen short, can provide traders with a data-driven edge in a competitive market.

For example, in June 2024, Horizon AI S2S forecasted extreme heat anomalies in west and central Texas, which would enable traders using S2S to anticipate higher electricity demand and adjust their positions accordingly. This advantage translates into reduced risk and maximized returns.

Horizon AI S2S ERCOT Performance Value

Comparative Insights: S2S vs. SEAS5

While SEAS5 remains a staple for seasonal forecasting, Horizon AI S2S offers distinct advantages as shown during summer 2024:

- **Temperature Forecasting:** S2S provided earlier and more consistent signals of warm anomalies, aligning closely with observed conditions in June and August.
- **Wind Anomalies:** S2S captured wind trends in western and northern Texas months in advance, providing critical lead time for planning and decision-making.
- **Operational Value:** Even when accuracy differences were minimal, the actionable insights and early warnings provided by Horizon AI S2S proved invaluable for both traders and utilities.

Conclusion: Filling In Critical Data Gaps

Horizon AI S2S delivered measurable value during the summer of 2024 in ERCOT, empowering energy traders and utilities with early insights into critical weather anomalies. By filling in the insights that traditional models like SEAS5 miss, Horizon AI S2S enhances decision-making and operational efficiency, enabling users to mitigate risks and capitalize on opportunities in a high-stakes market.

The ability to identify weather anomalies early and consistently provides a significant competitive advantage. Whether optimizing trading portfolios or ensuring grid reliability, Horizon AI S2S equips energy professionals with the tools they need to stay ahead of the curve.

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About Climavision

Climavision is a well funded, Louisville-based startup, rebuilding climate technology from the ground up and combining terrestrial sensors with space-based observations. Our team of renowned meteorologists, leading scientists, and passionate weather enthusiasts are changing weather forecasting as we know it by uncovering the clearest, most accurate picture of weather intelligence. Our offerings put next-generation climate technology to work to fundamentally change weather forecasting.

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