# LEVERAGING EARTH OBSERVATION DATA FOR ROBUST SUPPLY CHAIN RESILIENCE

RESEARCH POSTER AT THE LIVING PLANET SYMPOSIUM 2025 - FROM OBSERVATION TO CLIMATE ACTION AND SUSTAINABILITY FOR EARTH

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## Introduction

Global supply chains are increasingly vulnerable to disruptions arising from systemic risks, including geopolitical conflicts, climate change, pandemics, raw material depletion, and supply shortages. Recent geopolitical tensions and climate-induced disasters have demonstrated how even minor disruptions in one region can ripple across global supply networks, impacting industries and economies. This rising complexity highlights the urgent need to build resilience into supply chains.

Here, modern technologies such as cloud computing and Earth Observation (EO) become essential for achieving data-informed, long-lasting resilience. When combined, they enable real-time risk monitoring, scalable and cost-efficient data processing, and enhanced collaboration across supply chains, while also supporting sustainability reporting and compliance with emerging regulations, i.e., Corporate Sustainability Reporting Directive (CSRD).

## Methodology

Our methodology uses EO data (ERA5, Copernicus Marine, Copernicus Atmosphere, and ECMWF forecast data) to enhance supply chain services following the four step approach:

1. EO Data Ingestion & Processing, implemented using earthkit-data
2. earthkit API Integration, allowing users to access EO insights using existing supply chain tools and in real-time
3. Visualization & Decision-Making with intuitive presentation of relevant climate and weather risks
4. Collaboration & Alerts for sharing risk insights promptly.
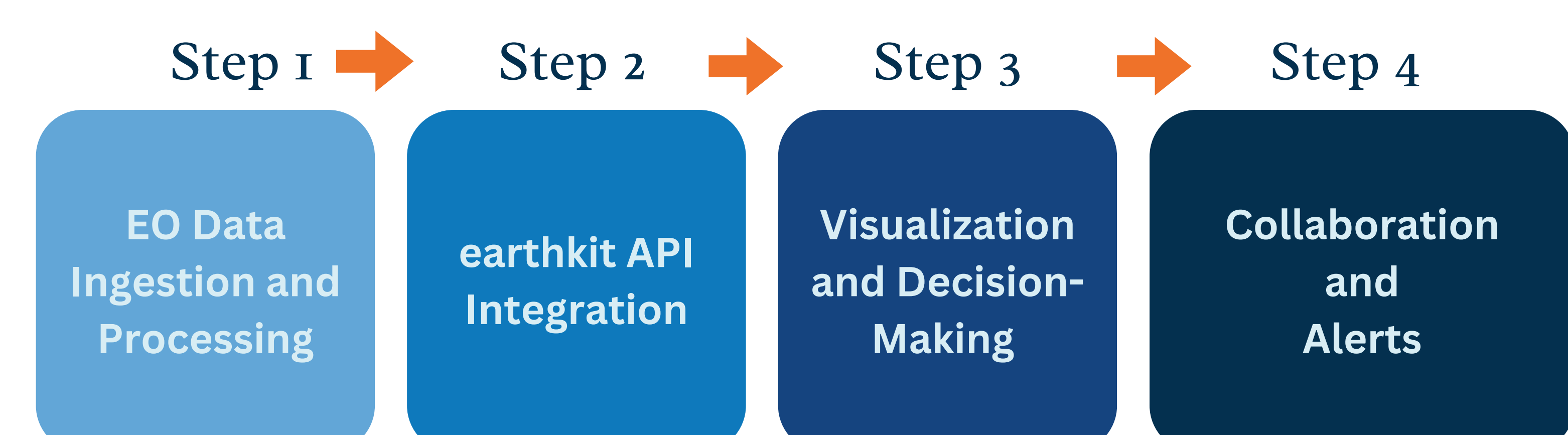


## Results

We have integrated EO data within our supply chain platform, developed for the Horizon Europe project ResC4EU[1], and can now provide companies with deeper insights into climate and weather-related supply chain risks. The EO data can then be correlated with other risk factors, thus enabling more informed risk mitigation strategies and strengthening supply chain resilience.

The implementation leverages the open-source earthkit[2] tools for simplifying EO data access, processing, analysis, and visualisation.

Figures below show the flow of EO data through the platform: After route creation between two or more suppliers, the user selects the source of data, e.g. ERA5, Copernicus Marine, Copernicus Atmosphere, or ECMWF forecast data. The application then fetches selected EO data using earthkit, processes the data to extract key parameters (temperature, precipitation, wind speed) and calculates derived metrics like risk levels for different weather conditions . The system correlates the processed weather data with the supply chain route to identify potential disruption risks and generates risk factors with severity ratings and probability assessments.
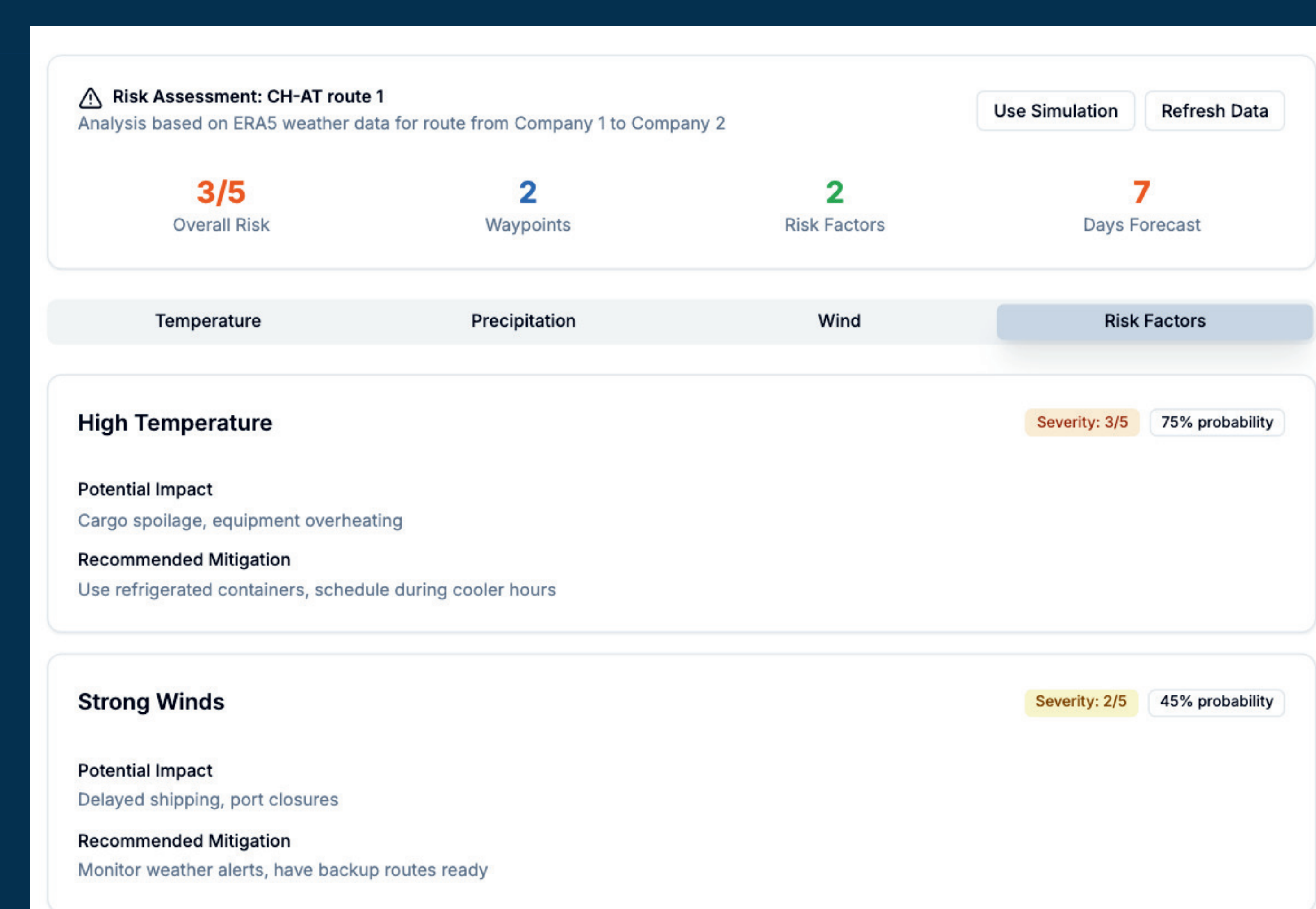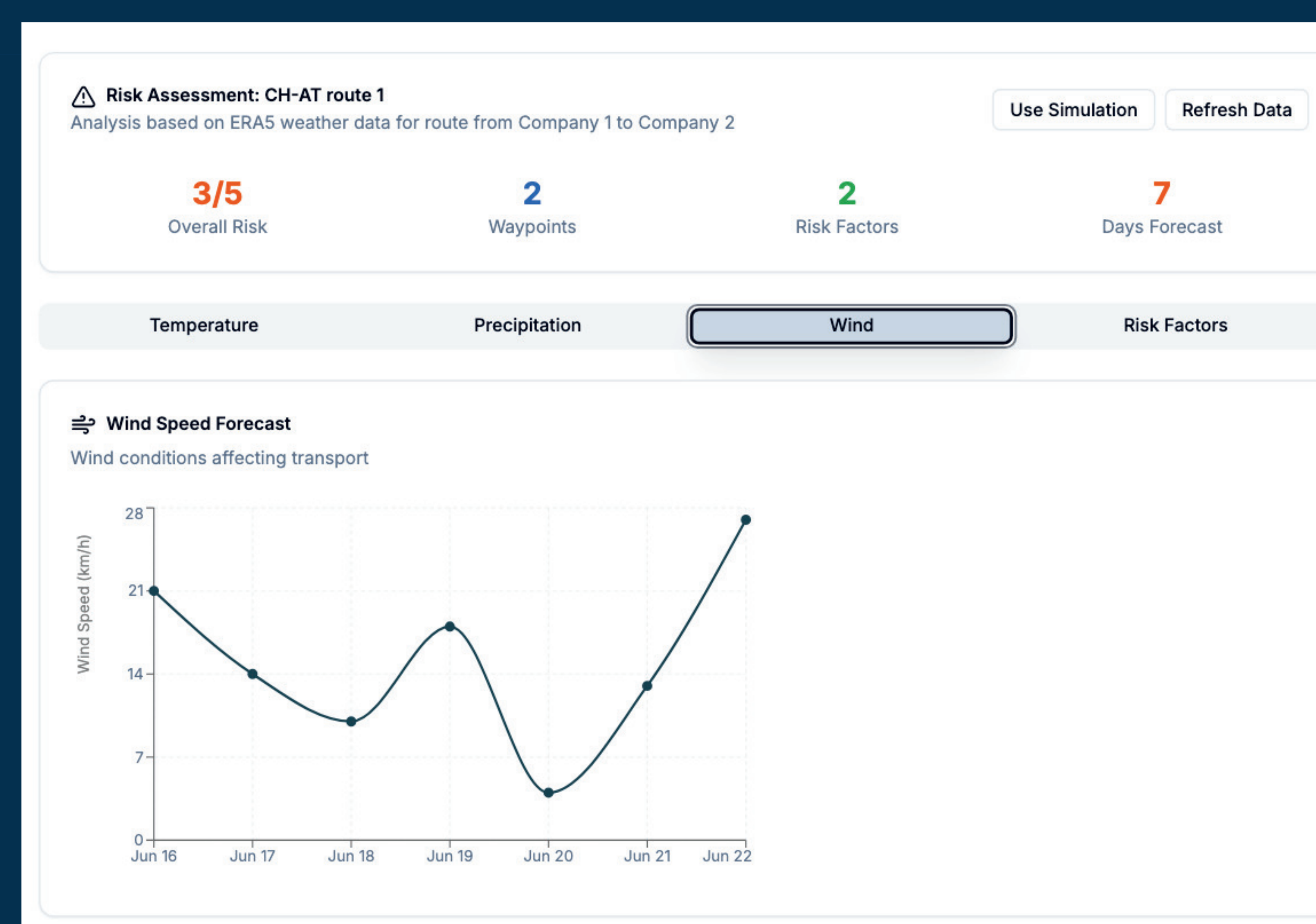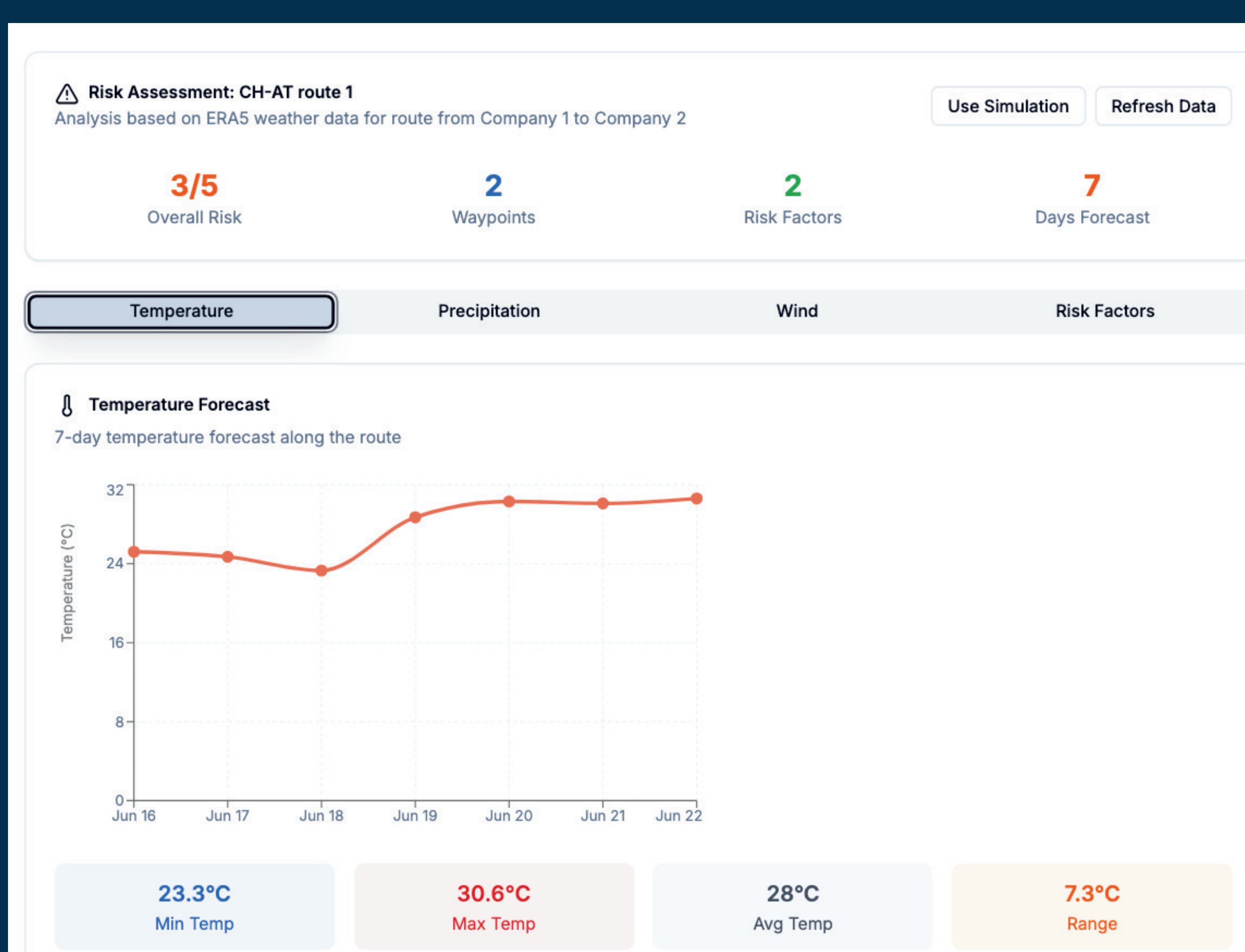


## Conclusion

This presented approach enables supply chain managers to make informed decisions based on near real-time environmental data, anticipate disruptions before they occur (based on climate and weather data), and implement proactive mitigation strategies to maintain operational resilience. Our next step is to implement shared mirror caching for cross-user cache sharing and support for alerts.

## Acknowledgements

## References

1 ResC4EU project: https://www.resc4eu.com/
2 earthkit tools: https://github.com/ecmwf/earthkit

ResC4EU RESILIENT SUPPLY CHAINS FOR EUROPE