

Team: Weather Not Found

Challenge: Will It Rain on My Parade?

<https://www.youtube.com/watch?v=pURU4D8Zwtk>

https://github.com/Omar-Mega-Byte/404_WeatherNotFound

1. High-Level Project Summary

Provide a high-level summary of your project.

- What did you develop?
- How does it address the challenge?
- Why is it important?

We developed “**Weather Vision**”, an intelligent weather prediction platform designed to support seamless outdoor event planning. The system integrates **NASA’s POWER** (Prediction of Worldwide Energy Resources) API with a modern Spring Boot backend and React frontend to deliver accurate, location-based, and event-specific forecasts. By transforming raw meteorological data such as **temperature** and **precipitation** into personalized, actionable insights, our platform directly addresses the challenge of uncertainty in planning outdoor activities. Unlike generic weather apps, it focuses on event relevance, helping users anticipate weather conditions with confidence. This project is important because it reduces the risks, costs, and stress associated with weather-dependent events. For event planners, it ensures better decision-making and enhanced attendee experience. For outdoor enthusiasts, it improves safety and enjoyment. More broadly, it demonstrates how NASA’s open Earth observation data can be transformed into practical solutions that create real-world impact.

2. Project Details

Provide additional details about your project.

Some questions to consider are:

- What exactly does it do?
- How does it work?
- What benefits does it have?
- What do you hope to achieve?
- What tools, coding languages, hardware, or software did you use to develop your project?

What exactly does it do?

“Weather Vision” is an intelligent weather prediction platform built to support outdoor event planning. It provides users with personalized, location-based forecasts that go beyond generic weather apps by focusing specifically on event-related needs.

How does it work?

The system integrates with NASA’s POWER (Prediction of Worldwide Energy Resources) API to fetch daily meteorological data such as temperature and precipitation. Our Spring Boot backend queries the API, processes the time series data, and returns actionable insights. These forecasts are then displayed through a clean and intuitive React frontend, where users can authenticate, manage profiles, and save multiple event locations.

What benefits does it have?

The platform reduces uncertainty and risk for weather-sensitive activities. Event planners gain confidence in decision-making, reducing financial risks and improving attendee experience. Outdoor enthusiasts benefit from safer and more enjoyable adventures. By simplifying complex scientific data into easy-to-use insights, the app empowers users to plan events with confidence.

What do you hope to achieve?

Our goal is to make weather prediction more personal, precise, and practical. We aim to reduce stress for people planning events, help communities host safer outdoor gatherings, and demonstrate how NASA’s open Earth data can be transformed into meaningful, real-world solutions.

What tools, coding languages, hardware, or software did you use to develop your project?

Backend: Java 21, Spring Boot 3.5.5, Spring Security, Spring Data JPA, Maven

Frontend: React 18.2.0, React Router, Axios, Modern CSS

Database: MySQL 8.0+

Data Source: NASA POWER API

Development & DevOps: Git, npm, Swagger/OpenAPI 3

Hardware: No specialized hardware required

3.NASA Data

Provide specific details about what NASA data you used in your project, how you used it, or how it inspired your project.

You are welcome to use any open data in your project. However, to be eligible for a Global Award, you must use data or resources from NASA.

NASA Prediction of Worldwide Energy Resources (POWER): <https://power.larc.nasa.gov/>

4. Space Agency Partner & Other Data

List all of the data, resources, and tools used in your project.

Backend Technology: The server-side logic is powered by Java 21 and the Spring Boot 3.5.5 framework, creating a powerful and efficient RESTful API. We use Spring Security to manage user authentication and secure endpoints, while Spring Data JPA handles data persistence with a MySQL 8.0+ database. This robust backend is responsible for processing user requests, managing data, and communicating with external data sources.

Frontend Technology: The user interface is a dynamic and responsive single-page application built with React 18. We utilize React Router for seamless client-side navigation and Axios to handle asynchronous communication with our backend API. The result is a fast, intuitive, and modern user experience that works flawlessly across devices.

Data Source: The core of our weather forecasting service is powered by data from NASA's Prediction of Worldwide Energy Resources (POWER) API. This provides us with access to a vast repository of reliable, scientifically-validated meteorological data. By integrating this high-quality data source, we can deliver accurate and trustworthy weather predictions to our users.

5.Use of Artificial Intelligence (AI)

Did you utilize any Artificial Intelligence tools and software in preparing your project? If yes, which ones and how did you use them?

1. Code Generation and Refactoring: GitHub Copilot assisted our developers by generating boilerplate code, suggesting implementations for standard functions, and helping to refactor existing code for better readability and performance. This allowed our team to focus more on the core logic and creative aspects of the project, such as the integration with NASA's POWER API and the user interface design.

2. Documentation and Descriptive Text: The AI assistant was used to help draft and format project documentation, including the README.md file and other descriptive texts. It helped generate content, structure the information, and ensure clarity, which accelerated the process of creating comprehensive documentation for our project.