Blog Post 4: In Practice: How PANTHEON's GeoPlatform Works

The PANTHEON GeoPlatform is designed to deliver practical, actionable insights in various operational contexts. By integrating data, the system supports decision-makers throughout the disaster cycle. Here are a few key applications detailed in our deliverable:

1. Pre- and Post-Disaster Impact Mapping

Earth Observation (EO) data is a crucial tool for assessing disaster impacts and planning response efforts. For example, a compelling case study on Hurricane Dorian demonstrated how Sentinel-1 and Sentinel-2 imagery could be used to generate flood maps and vegetation indices. This analysis revealed risks to food security and housing in vulnerable communities. The PANTHEON platform can serve these types of risk profiles to stakeholders, supporting both pre-disaster planning (by identifying hazard-prone areas) and post-disaster damage assessment.

2. Fusing Drone and Satellite Data

Combining data from Unmanned Vehicle Systems (UxVs) with satellite imagery enhances both spatial resolution and temporal responsiveness. In PANTHEON's disaster scenarios, drones can rapidly collect detailed aerial imagery of affected zones, even when satellites are unavailable due to cloud cover or orbital delays. This fusion is highly effective for tasks like:

- Assessing building and infrastructure damage after an earthquake.
- Detecting land cover changes from wildfires.
- Monitoring inaccessible roads or hazardous zones.

This integration is facilitated by the GeoServer platform and bespoke backend processing pipelines that harmonize the different data types.

3. The Real-Time Command and Control System

Geospatial intelligence is essential for emergency response coordination. Our platform is designed to provide a **Common Operational Picture (COP)** for use in command-and-control centers. This system integrates live responder tracking, situational mapping, and building/terrain visualization. Key capabilities include the real-time geolocation of field teams and incidents, allowing commanders to make informed decisions under pressure .

Next: Building a unified platform like this isn't without its difficulties. We'll discuss the key challenges and how PANTHEON is solving them.