Blog Post 2: The Building Blocks of a Smart Disaster Map

To build a comprehensive GeoPlatform for disaster management, PANTHEON integrates a range of modern technologies. Each component plays a vital, distinct role in collecting, processing, and visualizing data, moving from a large-scale view down to the ground level.

Here are the four key building blocks of our system as outlined in our deliverable:

1. **Geographic Information Systems (GIS):** This is the core infrastructure of the PANTHEON platform. GIS provides the framework for storing, managing, analysing, and visualizing all spatial data. It has evolved from simple desktop tools into a scalable web-based platform that leverages web services (like OGC standards) and interactive front-ends to support real-time decision-making for our first-responder users.
2. **Remote Sensing and Earth Observation (EO):** These technologies are critical for pre- and post-disaster assessment. Satellite systems, such as the Copernicus Sentinel-1/2, allow for wide-area, high-resolution data collection, often in near real-time. This is invaluable for mapping large-scale disaster impacts, such as mapping flood extents or the perimeter of a wildfire.
3. **Unmanned Vehicle Systems (UxVs):** Drones (UAVs) and other unmanned vehicles have become flexible and powerful tools for data acquisition in environments that are hazardous, remote, or inaccessible—all common features of a disaster zone. They are especially well-suited for acquiring real-time aerial imagery, monitoring specific infrastructure, or even supporting search-and-rescue operations. They provide the high-detail, "on-demand" view that satellites cannot.
4. **Internet of Things (IoT) and Sensor Networks:** IoT enables widespread, real-time environmental sensing through embedded sensor networks. In PANTHEON's geospatial applications, these devices capture crucial ground-level data that neither satellites nor drones can: things like temperature, humidity, air quality, water levels, and movement. This provides a vital "ground truth" to the aerial and space-based data.

By fusing these technologies—a strategy we'll explore later—PANTHEON creates a multi-layered, dynamic map that provides a richer, more accurate, and more timely understanding of an emergency than any single source could.

Up next: How do we technically connect all these different technologies? We'll dive into the open-source architecture that powers the PANTHEON GeoPlatform.