UNICORN

End-users' requirements report

NEWS ARTICLE

"Turning User Needs into Action: How UNICORN Builds EO Services for Disaster Resilience"

Across Europe and globally, natural disasters are becoming more frequent and intense, posing escalating threats to communities, economies, and ecosystems. While modern disaster risk management tools have advanced significantly, limited investment in early warning and detection systems continues to result in delayed, resource-intensive emergency responses.

The **UNICORN** project directly addresses this gap by developing cutting-edge emergency applications powered by **Copernicus** services and **Earth Observation** (EO) technologies. Focusing on extreme weather events—such as wildfires and floods—as well as geohazards like volcanic activity, UNICORN aims to enhance Europe's preparedness, climate resilience, and long-term sustainability.

Tailored EO Services for Real-World Impact

UNICORN is building **scalable, adaptable, and user-driven services** that empower local authorities, policymakers, industries, and citizens to better anticipate and respond to natural hazards. By incorporating user feedback throughout development, the project ensures that services are practical, high-impact, and aligned with real-world needs.
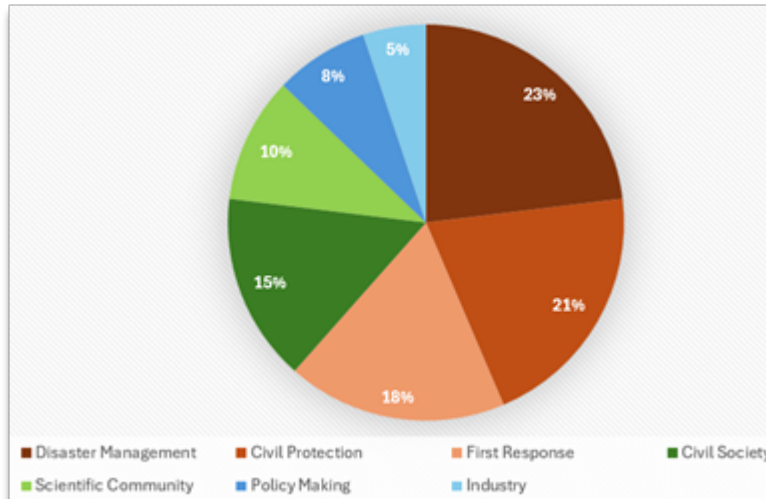
To validate these solutions, the project is implementing **four use cases across Europe**, each addressing different hazard types and involving diverse stakeholders. This approach ensures that the resulting tools are both functional and widely applicable.

User-Centric Approach to Service Design

UNICORN follows a structured methodology to translate user needs into actionable EO services:

1. **Review of existing EO applications** at global, national, and local levels to assess current capabilities.

2. **Analysis of EU-funded projects and surveys** in the emergency management domain to identify the best practices and lessons learned.

3. **Mapping of user requirements** regarding information content and service functionality, informed by a multilingual online survey (EN, FR, GR, IT).

4. **Direct end-user engagement** to ground the service development and use case definitions in real, validated needs.

The survey gathered responses from 17 participants, representing entities involved across the full spectrum of emergency management—from civil protection and first response to operational planning. Notably, 60% of respondents are directly engaged in disaster response activities, with some covering multiple roles within a single event.

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| UNICORN | Copernicus emergency Applications for Resilience addressing businesses' needs and policy making |

User's responsibilities allocation (within the survey participants)

Key Insights from Stakeholder Engagement

A clear preference emerged for **web-based service access**, allowing users to efficiently interact with the tools. Stakeholders involved in disaster management expressed a strong need for **continuous service operation**, while those from the private sector and the public favored **on-demand access**.

Approximately **76% of users** emphasized the importance of continuous, systematic data supply. This would release users' workflows from complex procedures often required by current services and platforms such as subscriptions, event-based data requests, or specialized efforts for data retrieval and integration, and (eventually) data adjustments implementations—allowing them to focus on effective emergency management.

Hazard-Specific Needs and Use Cases

UNICORN tailors its tools to specific hazard types, recognizing that each disaster scenario requires unique preparedness and response strategies:

- **Floods (Greece):** Integration of Copernicus data with weather forecasts for real-time flood prediction.
- **Wildfires (Spain, France, Portugal):**
  - Early detection and mapping using EO data
  - High-resolution forecasting of fire danger
- **Volcanic Activity (Italy):** A lava flow management tool combining EO data with numerical modeling.

Although preferences vary across the use cases, the baseline request/ specification could be drawn as in the following.

- **Large Scale products**, serving the disaster management operations planning, before and during an emergency at local scale.
- **Daily to sub-daily** feed and updates towards adjusting and optimizing their plans.
- **Meteorological information** referring to temperature, humidity, wind speed and direction, and precipitation is requested for all the event types.
- A time lap of **two (2) days** before the event could be a baseline for forecasts and early warnings.