

ABSTRACT

Rheticus Safeland is an operational service supporting risk management through the integration of Earth Observation products and ancillary hazard information. The platform combines ground deformation, flood and landslide hazard maps, burned areas and environmental indicators to identify critical locations requiring inspection and monitoring activities. The output is an Inspection Priority Score (IPS) allowing authorities to quickly prioritize intervention areas.

OVERVIEW

Rheticus® is an automatic cloud-based geoinformation service platform, designed to deliver fresh and accurate data and information for monitoring the evolution of the Earth's surface. The platform includes services for dynamically monitoring the Earth's morphology, vegetation, infrastructure as well as coastal areas and seawater, covering both environmental and production aspects. Access to Rheticus® is made available by subscription and allows users to have continually updated information. Services update is guaranteed through the use of satellite images, mapping data and environmental information available online as open data.

ACKNOWLEDGEMENTS

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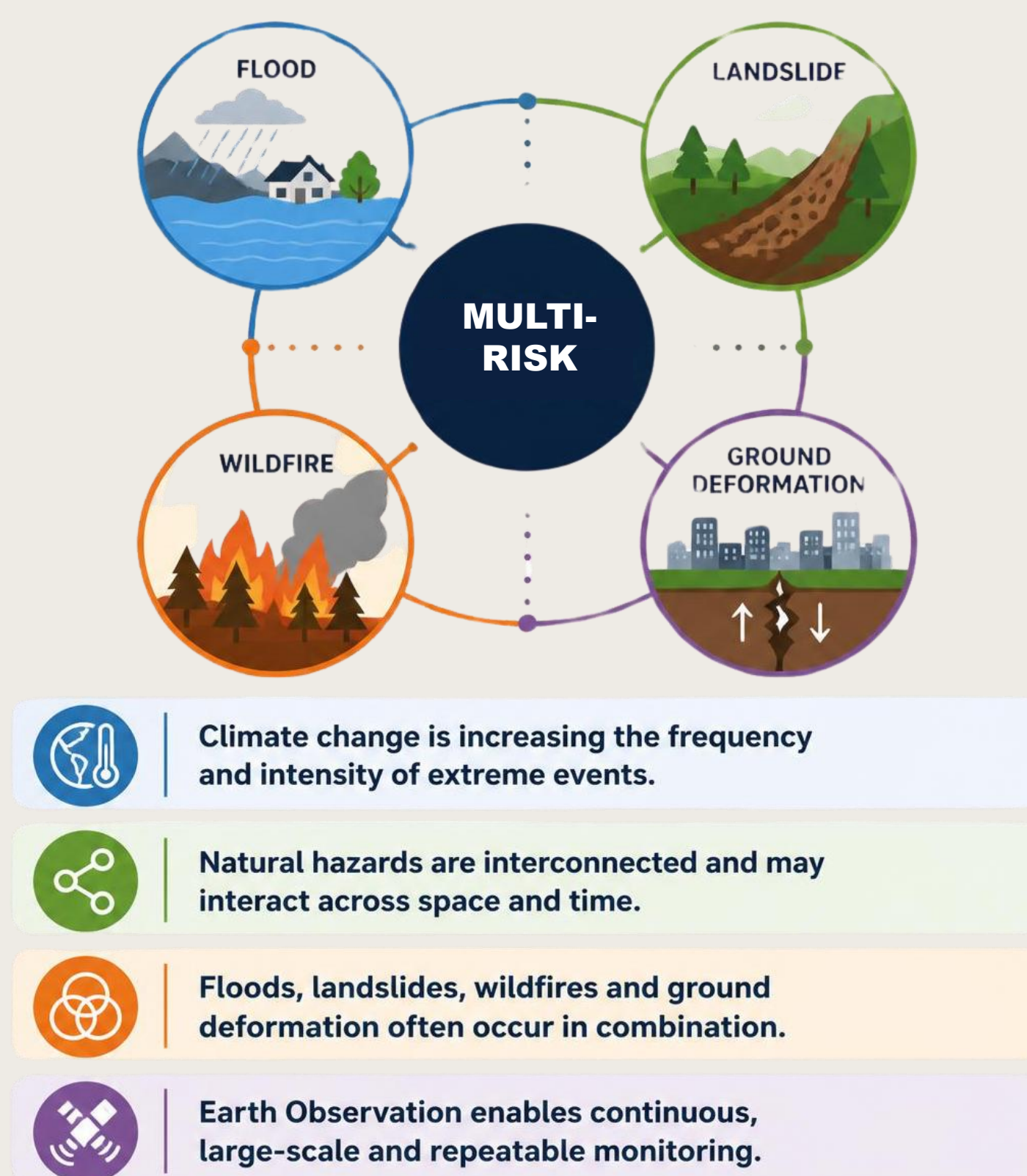
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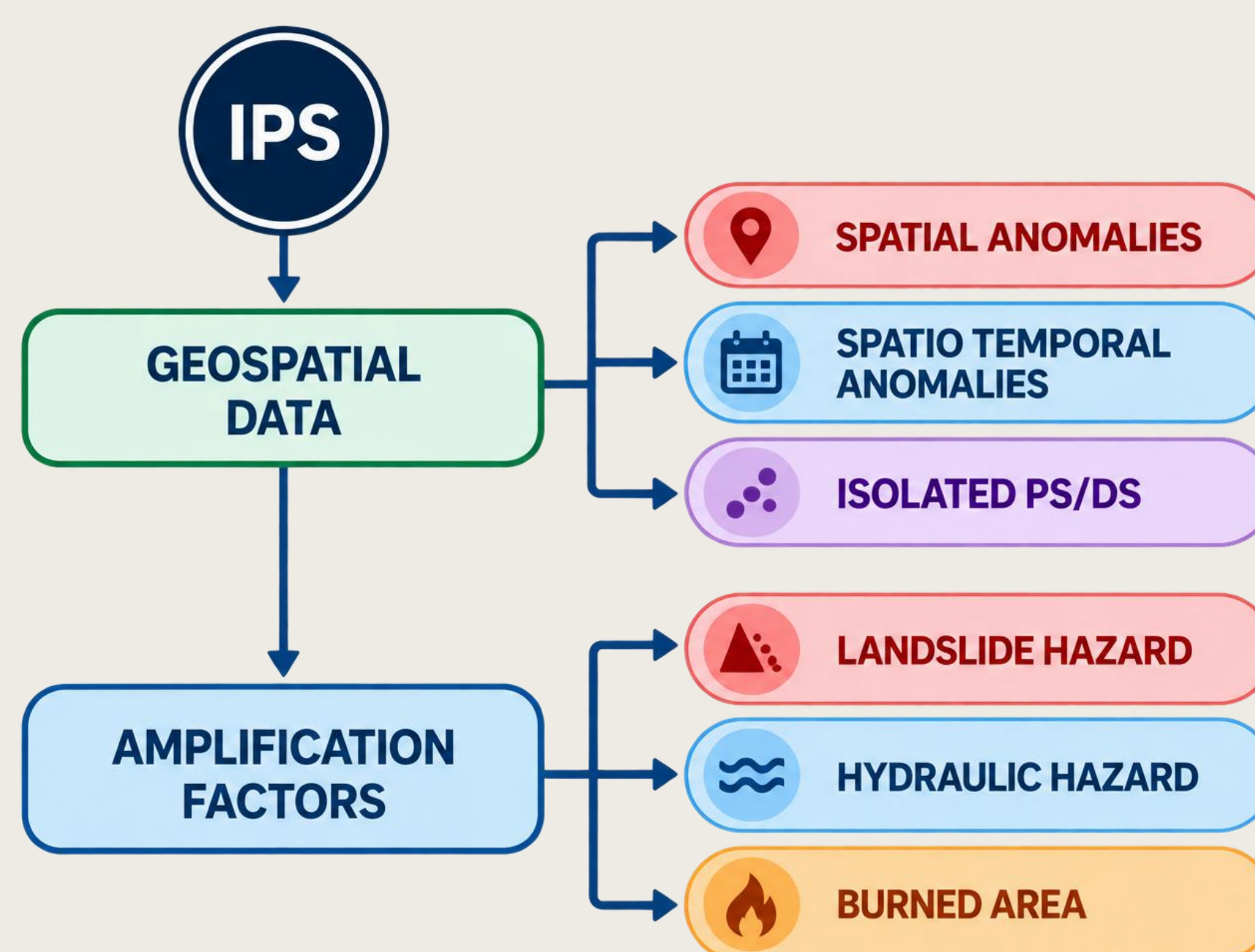
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1 WHY A MULTI-RISK APPROACH?



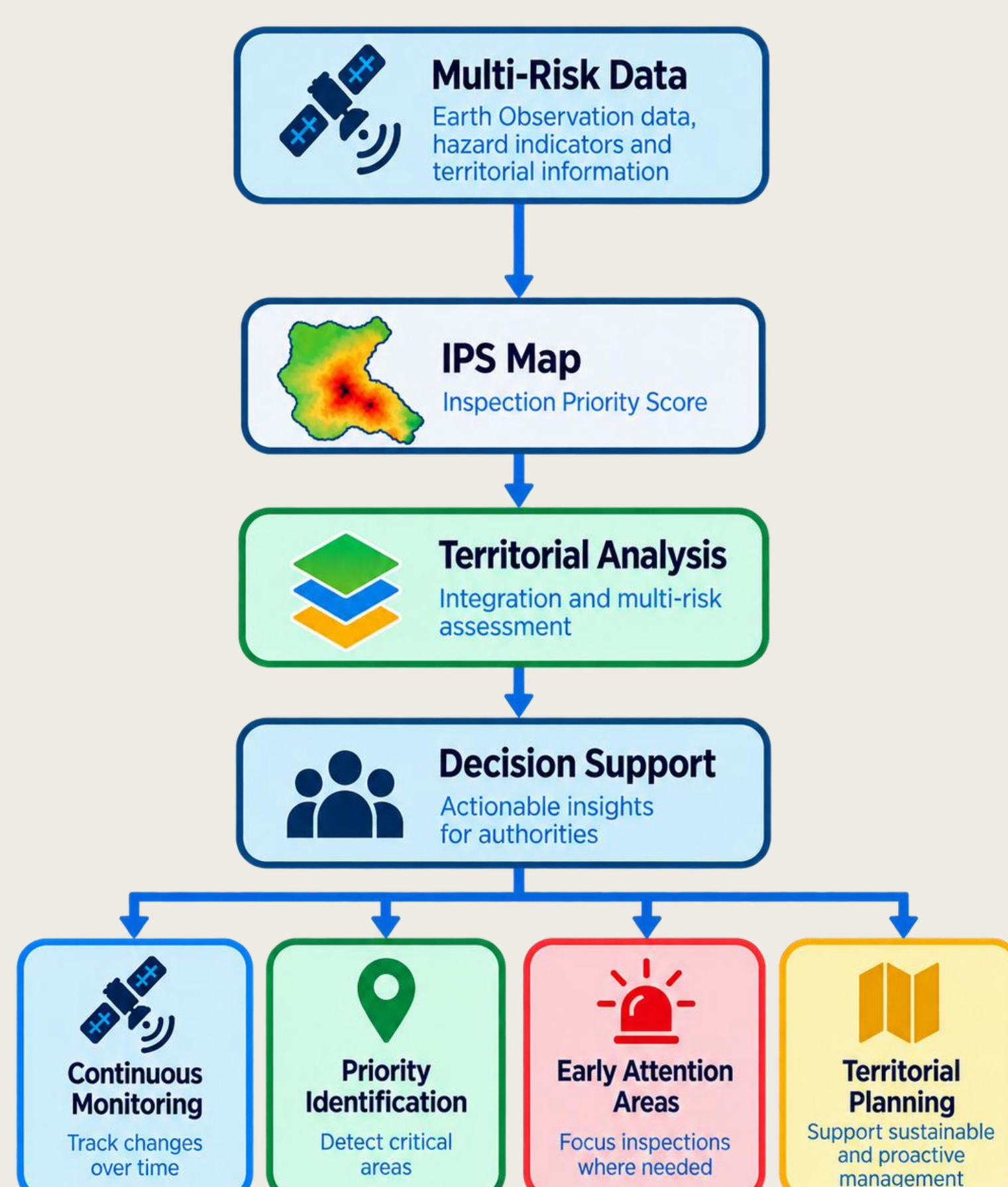
Climate change and increasing human pressure are amplifying the occurrence and interaction of natural hazards. Floods, landslides, wildfires and ground deformation often affect the same territories, generating complex risk scenarios that require integrated monitoring and assessment.

3 INSPECTION PRIORITY SCORE (IPS)



The Inspection Priority Score (IPS) is a synthetic indicator designed to support territorial screening and inspection planning. For each hexagonal cell, the IPS combines information derived from ground motion analysis, hazard indicators and environmental conditions, providing a relative measure of inspection priority. The score ranges from 0 to 1, where higher values identify areas requiring greater attention and more detailed investigation.

5 DECISION SUPPORT FOR RISK MANAGEMENT



Rheticus Safeland supports decision makers by converting multi-risk assessments into clear inspection priorities, enabling efficient monitoring and proactive risk management

2 FROM MULTI-RISK DATA TO TERRITORIAL SEGMENTATION

Territorial segmentation is based on a grid of hexagonal cells. These cells are classified by automatic procedures based on the analysis that assess displacement trends and anomaly patterns. Each cell is assigned an attention level calculated by an Inspection Priority (IPS) score used to rank inspection urgency.

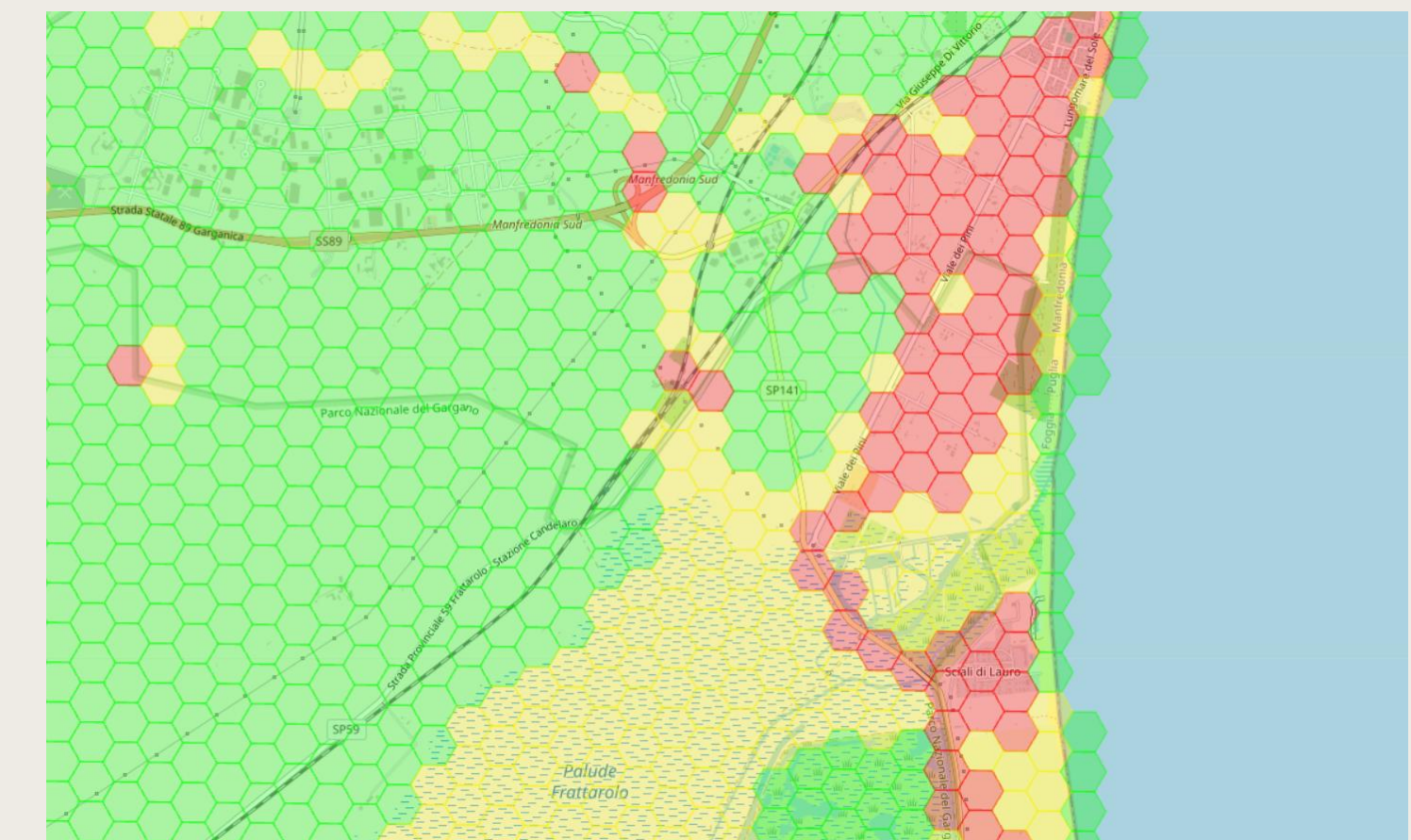
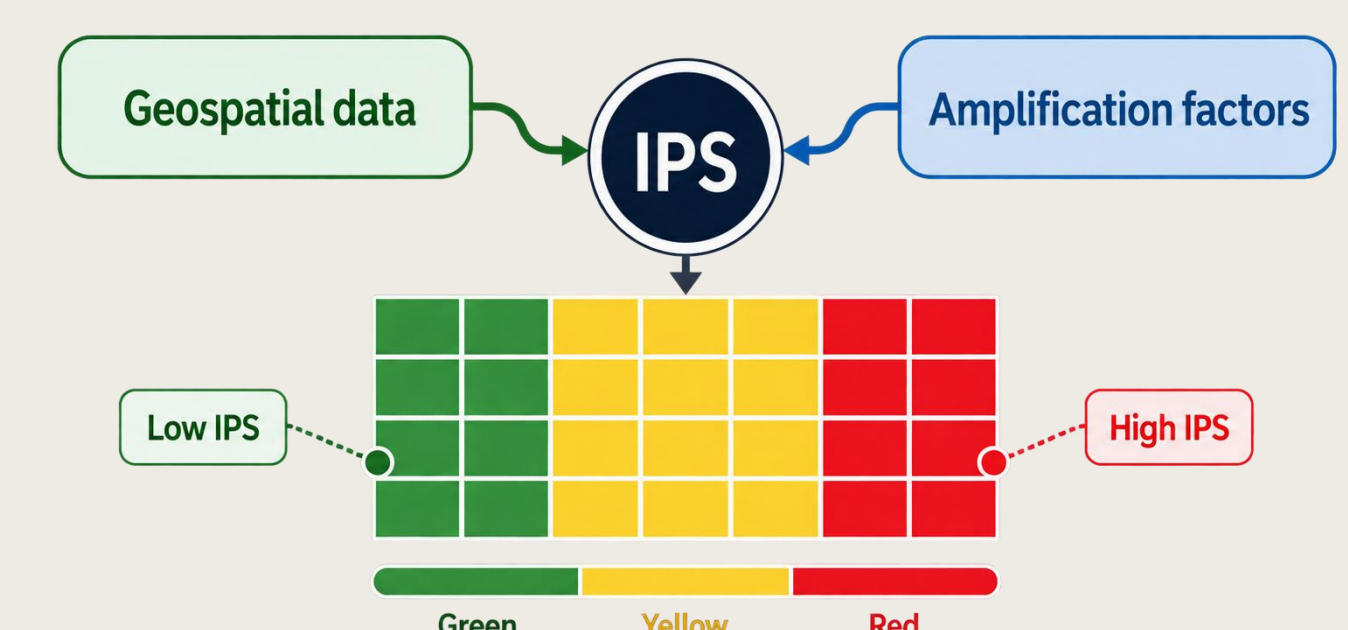
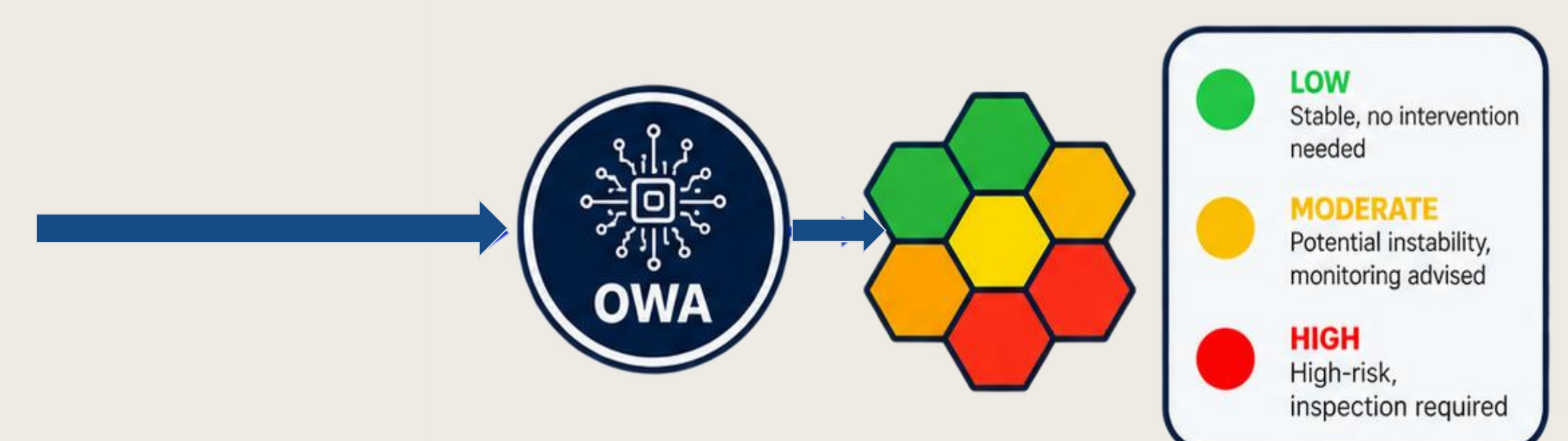


Figure 1 – Territorial segmentation with IPS score



4 OWA-BASED PRIORITISATION AND CELL CLASSIFICATION

The Inspection Priority Score is computed through an Ordered Weighted Averaging (OWA) approach, which combines multiple indicators.



The methodology allows different sources of information to be integrated into a single score while accounting for their relative importance. Based on the resulting IPS value, each hexagonal cell is assigned to a priority class and represented through a colour-coded map, enabling rapid identification of areas requiring attention.

KEY TAKEAWAYS

- Rheticus Safeland integrates Earth Observation products, hazard information and territorial factors within a unified multi-risk framework.
- The Inspection Priority Score enables systematic screening and prioritization of areas requiring attention.
- The OWA-based approach translates complex geospatial information into actionable decision-support products.
- The service supports proactive and scalable Risk Management activities.

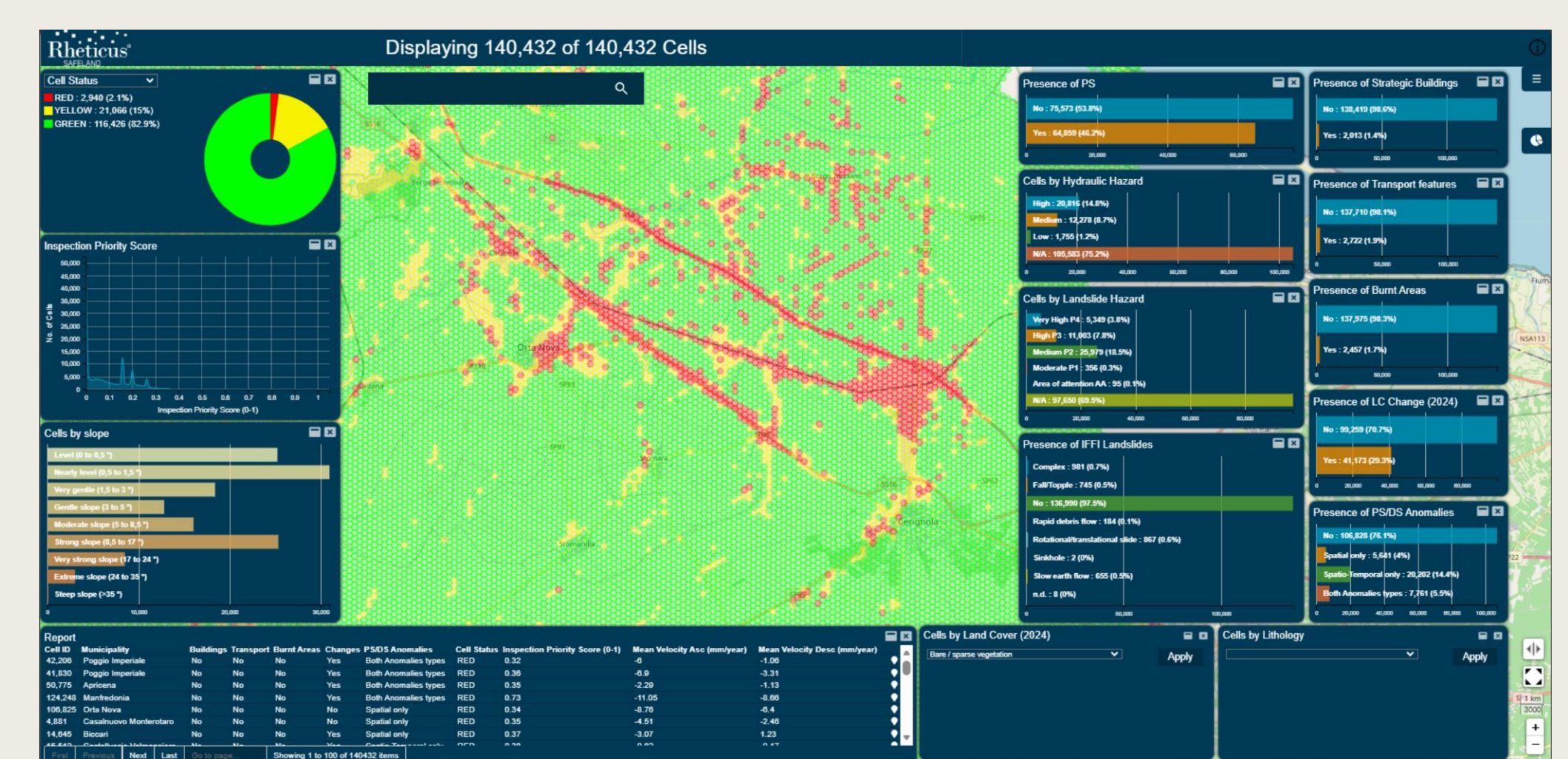


Figure 2 – Rheticus Safeland platform interface