



RSS-Hydro

# Innovating geospatial intelligence to better manage floods and wildfires

## RSS-Hydro

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# RSS-Hydro

## **WHO ARE WE?**

Our international team comprises experts from various fields united by a common goal: to address the global challenges posed by natural disasters through innovative techniques.

From hydrologists and remote sensing professionals to AI specialists and GIS experts, our team collaborates seamlessly to

provide clients with accurate and actionable information.

With a proven track record of successful projects across borders, we take pride in our ability to navigate the complexities of flood modelling and earth observation, offering tailored solutions that make a lasting impact on communities and ecosystems alike.

## **WHAT DO WE DO?**

At RSS-Hydro, we redefine the boundaries of possibility through a relentless pursuit of innovation. Our passion for staying at the forefront of the industry is matched only by the collective experience of our international

team. With a commitment to cutting-edge solutions, we have embarked on a journey to redefine how flood modelling and Earth observation can positively impact our world.





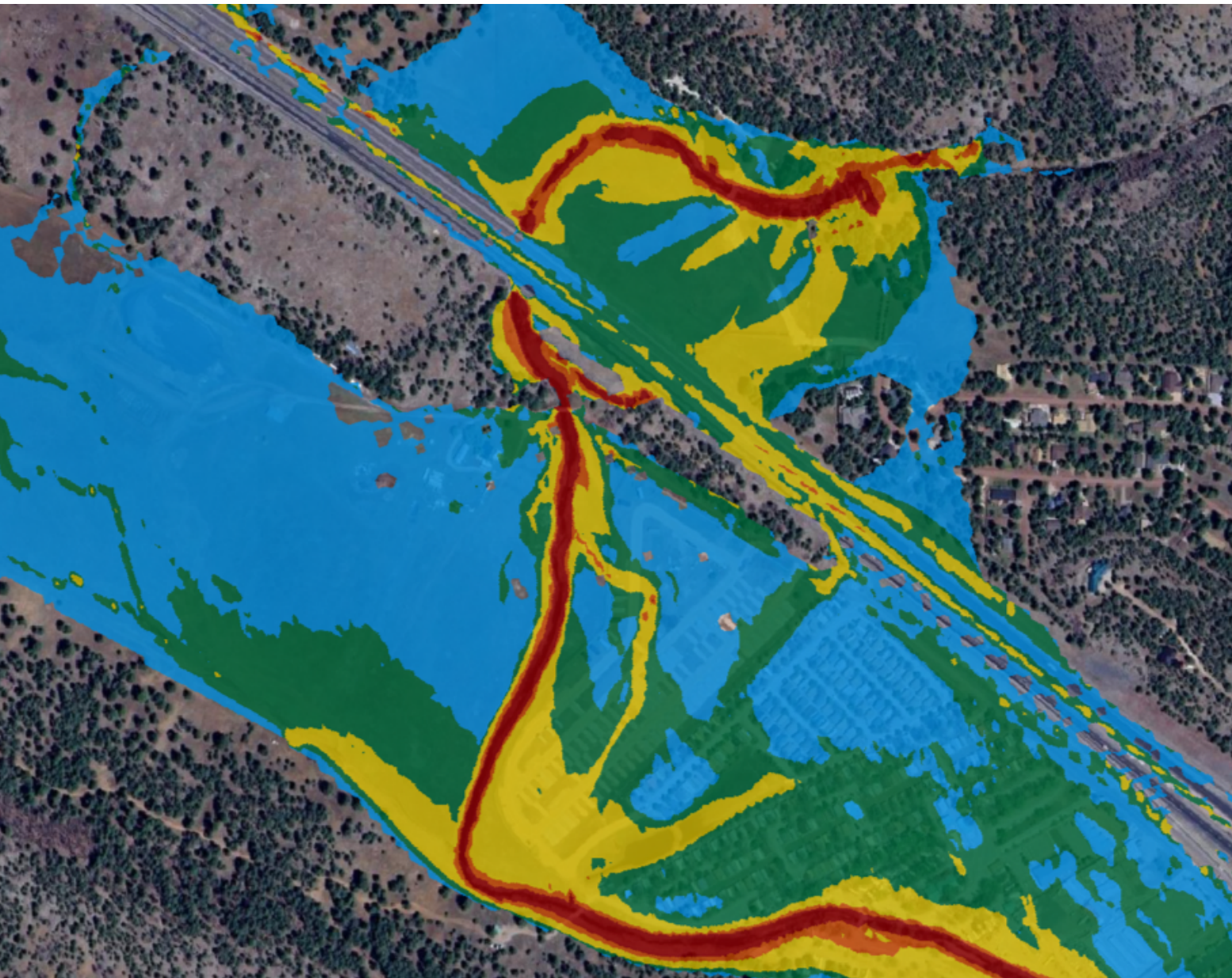
## Site-specific flood modelling

Our site-specific modelling services are designed to provide tailored flood modelling solutions that adjust to any needs and requirements.

Detailed designs, new and existing infrastructure or plots of land can be included in our modelling and assess the potential risk to what they are exposed to, allowing the improvement of the designs, understanding

of possible damages or the inclusion of protection measures.

The modelling results represent water depth, velocity, and flood extent, which can be analyzed to obtain hazard, vulnerability, and risk maps for the site of interest for different scenarios and flood events. The methodology of the assessment can be adapted to comply with local and national regulations.





## Capabilities

The capabilities of our site-specific modelling are significantly broad, suited to be applied across different sectors and can benefit both companies and private owners:

- Flood studies based on national/local legislation
- Urban design Flood Risk Assessment for planning permission
- Flood risk during construction
- Damage assessment
- Environmental Impact Assessments
- River restoration
- Riverbank protection
- Natural flood management
- Dam break analysis
- Roads and rails drainage design and analysis
- Hydraulic capacity check
- Mitigation and protection measures
- And other customised flood modelling solutions

**Contact us to discuss your flood modelling needs and receive a tailored quote.**





# SafeCity



*SafeCity* is our award-winning solution, which we originally developed as a licensable 'living' flood modelling service for towns and cities.

SafeCity is tailored to serve the public sector as well as the private corporate sector, including municipalities, utility companies, engineering and architect offices, the financial services industry as well as the insurance and re-insurance markets.

## The main features of SafeCity include:

- A complete picture of the flood risk in an entire municipal area with all the individual buildings and infrastructure features.

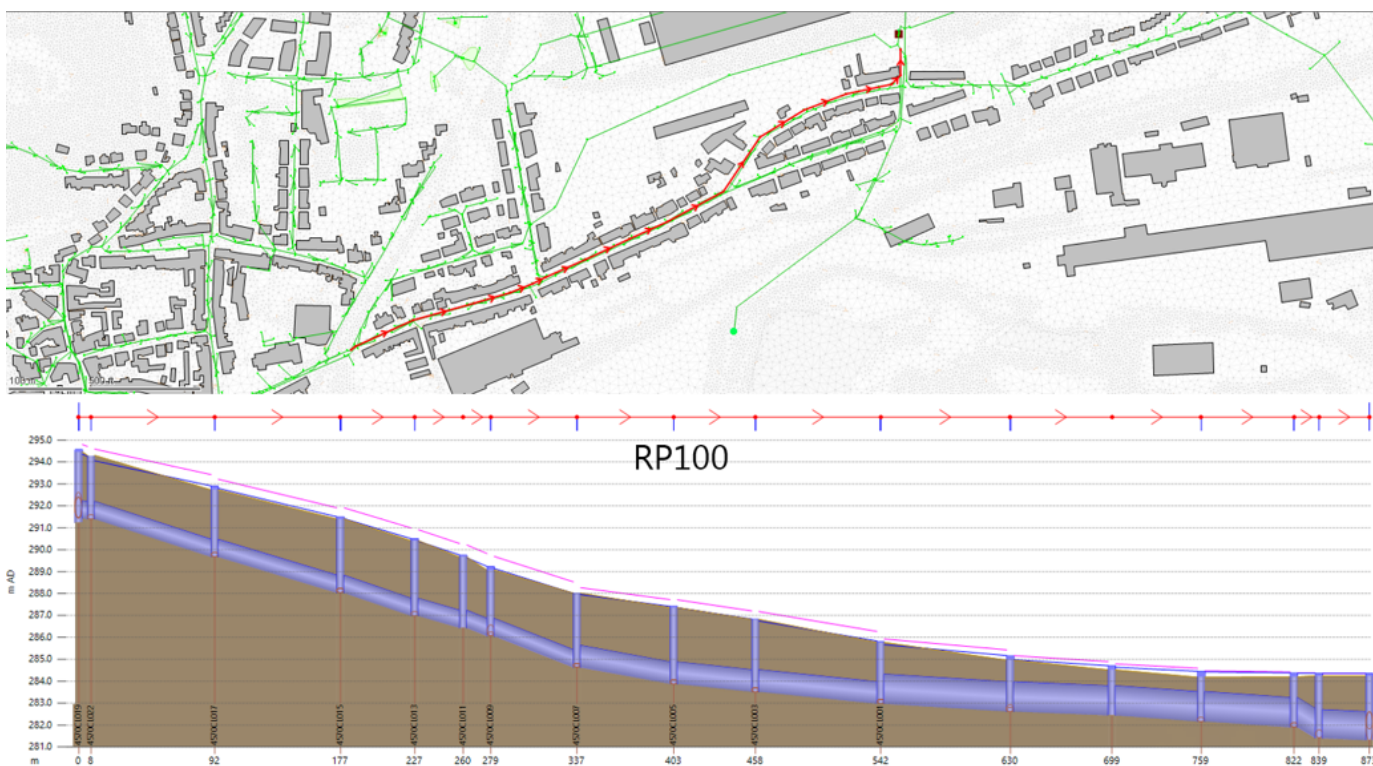
- Integration of the underground network (rainwater/mixed pipe network) with the surface flooding.
- Detailed analysis of different return periods and historical events.
- Integration of new and existing areas designated for future urban development.
- A complete report with a detailed catalogue of suggested measures for flood protection.
- Testing of all types of scenarios on the network in addition to external changes
- 3D visualisation of model simulations and scenarios (digital twin).
- Possibility to run the model as a forecast.

**Winner of the 12th edition of the Luxembourg Government *Fit4Start Accelerator***



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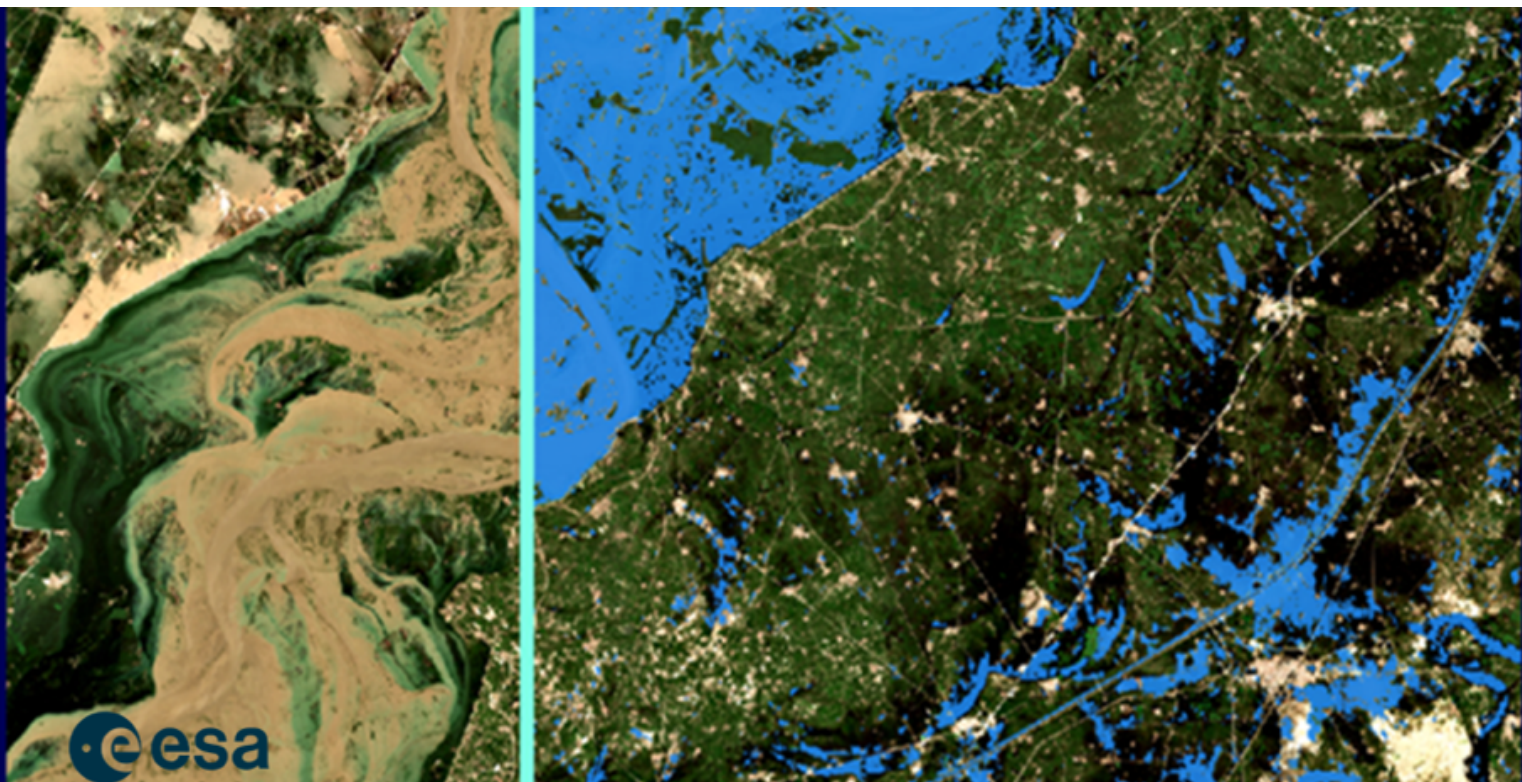
# FloodSENS

## The smart sensing of floods

**FloodSENS** is a cutting-edge machine learning algorithm designed to precisely identify and map flood extents using satellite imagery<sup>1</sup>. By incorporating topographic data, the model ensures hydrologically accurate flood delineations. FloodSENS demonstrates global applicability, effectively mapping floods across diverse biomes and weather conditions. By providing timely and

accurate flood information, FloodSENS supports critical decision-making in insurance, humanitarian aid, and disaster management.

**FloodSENS** additionally offers customisable solutions featuring flood depth measurement, integration of commercial imagery, and GIS data for in-depth risk assessments.



**FloodSENS estimation of the 2022 Pakistan flood, featured during the final review of an ESA InCubed supported development**  
<https://incubed.esa.int/portfolio/floodsens>

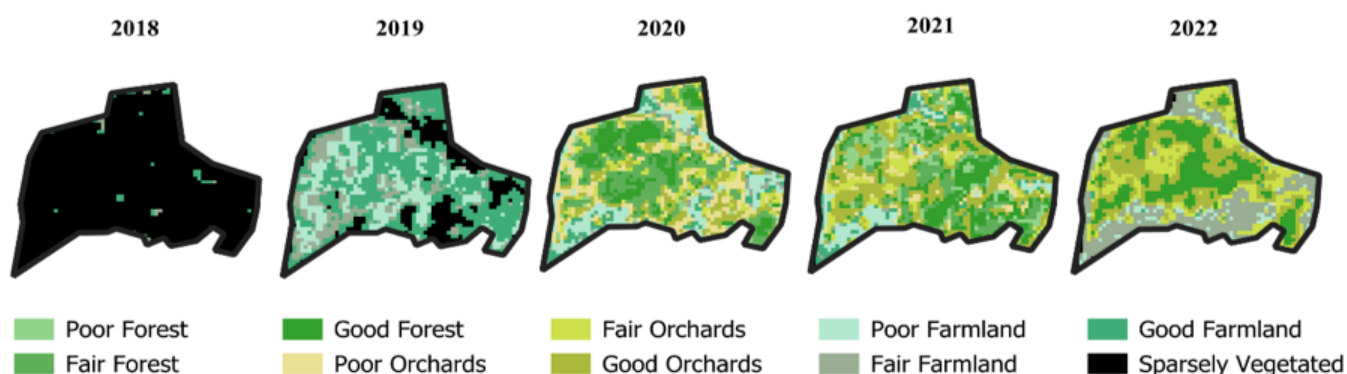
<sup>1</sup> Gaffinet, B., Hagensieker, R., Loi, L. & Schumann, G. Supervised Machine Learning for Flood Extent Detection with Optical Satellite Data. in *IGARSS 2023 – 2023 IEEE International Geoscience and Remote Sensing Symposium* 2084–2087 (IEEE, Pasadena, CA, USA, 2023). doi:10.1109/IGARSS52108.2023.10282274.

# HydroSENS

## Vegetation health and runoff monitoring

**HydroSENS** seamlessly extracts fractional cover and spectral indices from satellite imagery, enabling subpixel-level vegetation

health and runoff analyses over various spatiotemporal scales<sup>2</sup>.

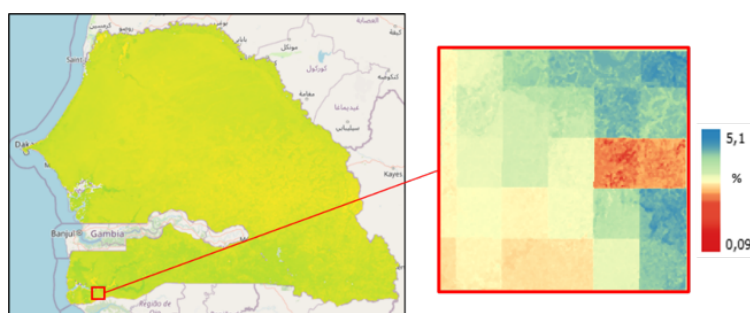


### HydroSENS analysis of a greening initiative in Tanzania

## Track water stress with ease

The HydroSENS-SWS application generates soil moisture and evaporative water loss outputs from Sentinel-3 imagery.

The derived water stress indicators are downscaled to a 20m resolution for practical applications.



**HydroSENS-SWS soil moisture analysis for Senegal**

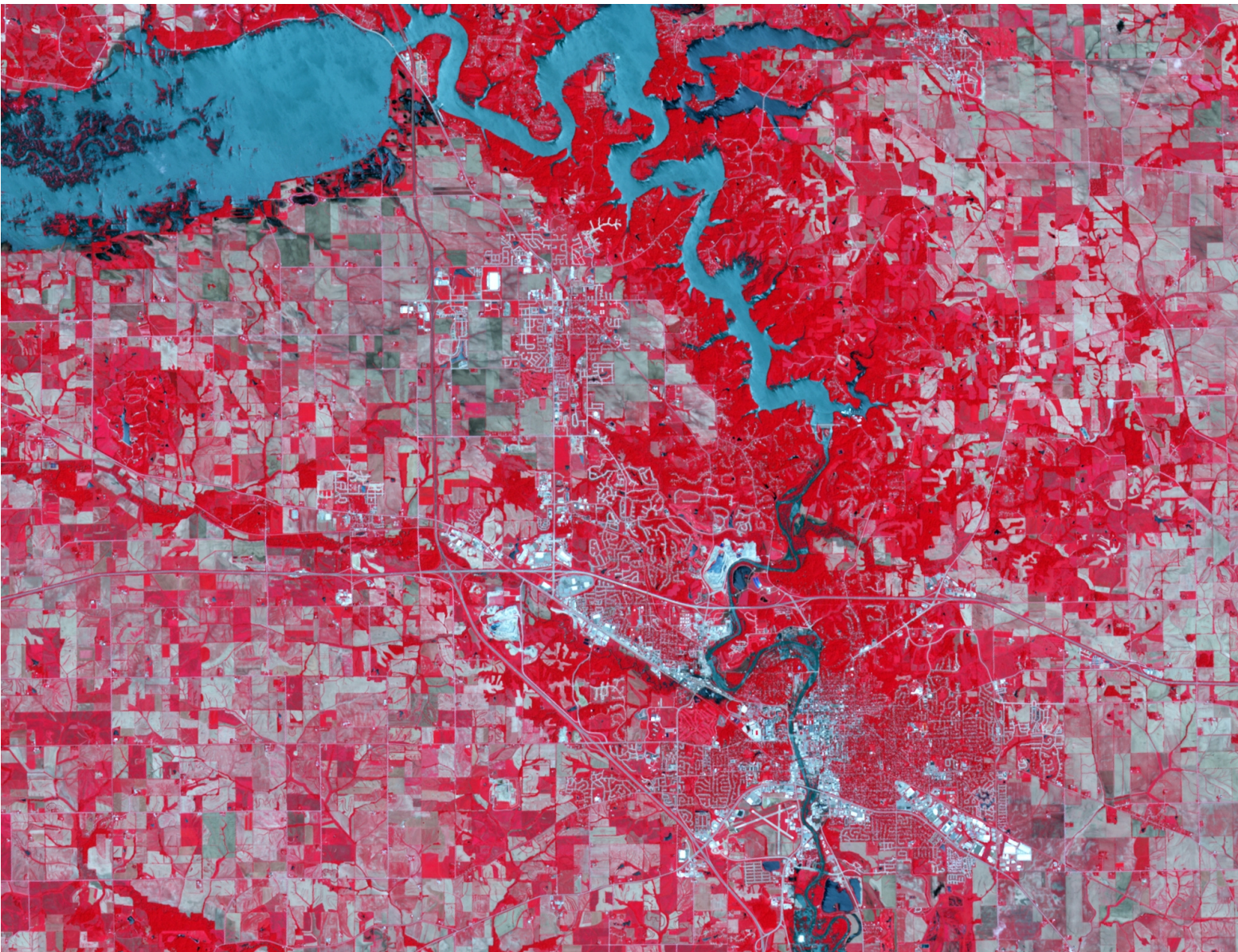
<https://wascia.ssl.telespazio.com>





**HydroSENS** delivers precise insights into vegetation and runoff alterations. To gain a deeper understanding of water stress, leverage the specialised capabilities of HydroSENS-SWS.

**HydroSENS and HydroSENS-SWS** provide tailored solutions for monitoring runoff, vegetation, and soil conditions, enhanced by the integration of commercial data



<sup>2</sup> Campo, C., Tamagnone, P. & Schumann, G. Automated Surface Runoff Estimation with the Spectral Unmixing of Remotely Sensed Multispectral Imagery. *Remote Sensing* 16, 136 (2023).



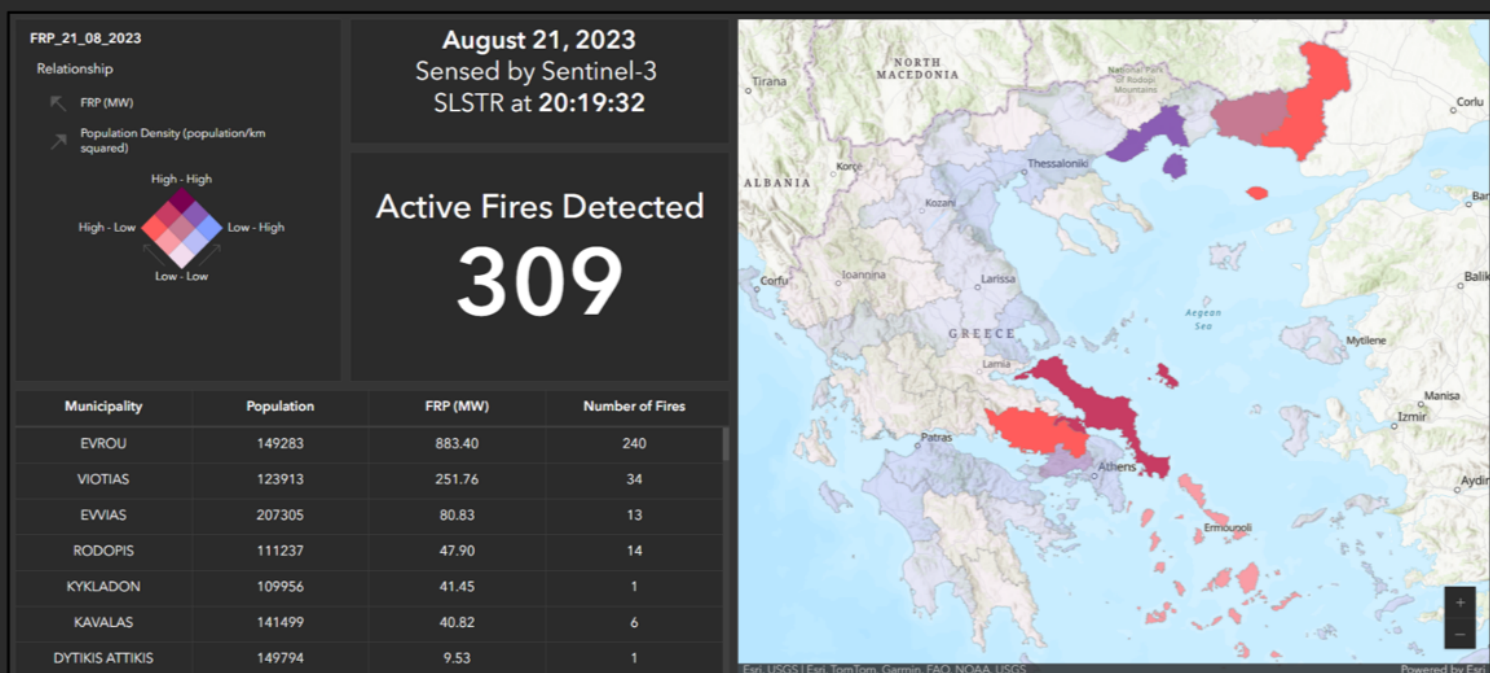


# FireSENS

## Active wildfire health risk assessment

Wildfires pose a significant threat to public health, particularly for vulnerable populations. Smoke inhalation, respiratory issues, and existing health conditions can be exacerbated by wildfire exposure. **FireSENS** addresses these health threats head-on by using near-real-time thermal data and demographics to pinpoint fire risks for vulnerable populations, offering a critical, up-to-date assessment<sup>3</sup>.

**FireSENS** offers real-time insights to support populations affected by wildfires and tracks long-term impacts like air quality degradation. With the option to customise and integrate demographic and infrastructure data, FireSENS provides tailored information for communities and monitors post-fire effects such as biomass loss.



<sup>3</sup> Campo, C., Schumann, G. & Tamagnone, P. ENHANCING NEAR REAL TIME WILDFIRE HEALTH RISK ASSESSMENT WITH EARTH OBSERVATION. in *IGARSS 2024-IEEE International Geoscience and Remote Sensing Symposium* (IEEE, 2024).





## Data authentication service add-on

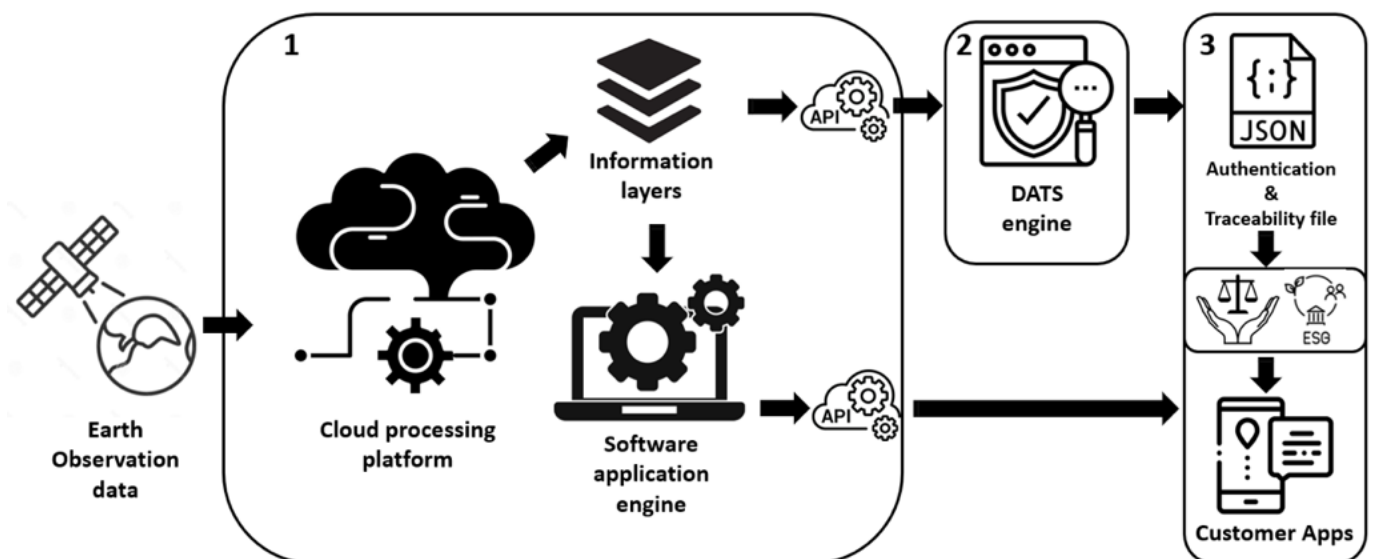
### End-to-end EO data assurance

Leading the way in creating trust and transparency in Earth observation (EO) data. We address a critical need in the market by providing customers with certified, end-to-end, traceable and audited EO data and analysis products. This approach ensures the highest level of safety, reliability, and transparency for a wide range of clients, including those in the financial industry, reinsurance, healthcare, emergency response,

environmental, social, and governance (ESG) investing, government agencies, and humanitarian organisations.

The EO data assurance process integrates a Digital Authentication and Traceability Services (DATS) engine into RSS-Hydro's EO applications, uniquely providing EO data trustworthiness.

### Our secure process



supported by  
**STARION**

metricsat



**NVIDIA**  
INCEPTION PROGRAM

<https://business.esa.int/projects/hemaneio>



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# CONTACT US

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