

## Flood Simulation and Forecasting for Sustainable Planning of Response in Municipalities

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**Abstract :** We will present one of the first use cases on the DestinE platform, a joint initiative of the European Commission, European Space Agency and EUMETSAT, providing access to global earth observation, meteorological and statistical data, and emphasize the good practice of intergovernmental agencies acting in concert. Further, we will discuss the importance of space-bound disruptive solutions for improving the balance between the ever-increasing water-related disasters coming from climate change and minimizing their economic and societal impact. The use case focuses on forecasting floods and estimating the impact of flood events on the urban environment and the ecosystems in the affected areas with the purpose of helping municipal decision-makers to analyze and plan resource needs and to forge human-environment relationships by providing farmers with insightful information for improving their agricultural productivity. For the forecast, we will adopt an EO4AI method of our platform ISME-HYDRO, in which we employ a pipeline of neural networks applied to in-situ measurements and satellite data of meteorological factors influencing the hydrological and hydrodynamic status of rivers and dams, such as precipitations, soil moisture, vegetation index, snow cover to model flood events and their span. ISME-HYDRO platform is an e-infrastructure for water resources management based on linked data, extended with further intelligence that generates forecasts with the method described above, throws alerts, formulates queries, provides superior interactivity and drives communication with the users. It provides synchronized visualization of table views, graphviews and interactive maps. It will be federated with the DestinE platform.

**Keywords :** flood simulation, AI, Earth observation, e-Infrastructure, flood forecasting, flood areas localization, response planning, resource estimation

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