

## GENESIS: Geological nature-based solutions for facing climate change-induced water scarcity in European outermost regions

The EU-funded project, GENESIS “Geologically Enhanced NaturE-based Solutions for climate change resiliency of critical water InfraStructure”, kicked-off between the 24th – 26th of September. The project’s coordinator, the Instituto Geológico y Minero de España – Spanish Geological Survey (IGME-CSIC) hosted the meeting in the Museo Geominero – Geomineral Museum, in Madrid. The 20 project partners, coming from different European countries and outermost regions, enjoyed an excellent opportunity to meet in person, discuss and organise the work for the upcoming 4 years.



*Figure 1. Deep demonstrator of Genesis presentation.*

The main goal of GENESIS is to support regions, local authorities, and communities in addressing climate change vulnerabilities related to potential natural disasters and long-term climate changes, impacting groundwater-dependent systems by showcasing local and regional nature-based solutions (NbS). GENESIS will develop 9 demonstrators in Macaronesia islands, specifically in La Palma, Gran Canaria and El Hierro (Canary Islands), Faial (Azores), Madeira (Madeira) and Santiago (Cape Verde), and 5 replication sites, 2 of them in Azores (Santa Maria and Graciosa), and 3 more in Reunion, Guadeloupe and Martinique.

The project will test to their limits and bring to the table innovative NbS, including dry gallery and underground dike-impounded dam systems conceived in the region. The ultimate objective is to create a 3D hydrogeological model, which will integrate all the obtained data. This model will facilitate the simulation and quantification of the infiltration process. Additionally, sustainable water reuse will maximise resource efficiency by treating and repurposing wastewater, stormwater, and reclaimed water for non-potable uses like irrigation, industry, and urban landscaping.

La Palma will become a deep demonstrator with 4 innovative NbS, and a digital twin of the hydrogeological system of the island, to test the synergies between different NbS and predict future scenarios of water storage. La Palma Living Lab will channel the participation of key players in the island's water management system. Public engagement and knowledge-sharing will be a key aspect of the whole project by means of the annual celebration of La Palma Bootcamp and the continuous communication between experts and citizens through the Citizen Science Hub.

Furthermore, the project's Macaronesia Water Climate Risk Observatory will identify trends and patterns in temperature, precipitation and extreme events across Macaronesia, and propose adaptation measures and emergency response plans to protect critical water infrastructure.



*Figure 2. Consortium of GENESIS.*

During the 2-days meeting, the project's coordinator and WP leaders provided an overview of the whole project and the expected tasks and milestones. By discussing among the partners, several ideas and future activities emerged, and made possible a commitment on finding solutions for upcoming tasks, collaborating on the execution of joint assignments.





*Figure 3. Field visit.*

Finally, on the third day, partners had the opportunity to visit two local hydrogeological NbS: the “Neutralization Plan of the Manzanares River”, led by Madrid City Council, and the “Bluebloqs circular water system”, led by the Technical University of Madrid (UPM), learning about their challenges and successes, and the current after-project continuity.

To learn more about GENESIS, follow its social media channels [@genesishbs](#) (Instagram, X and LinkedIn). All updates will be also posted on the GENESIS website <https://genesishbs.eu/>.