Operandum at a glace

Research for a more resilient Europe

OPERANDUM is a European research project that aims to demonstrate the efficacy of **sustainable solutions** inspired by nature to **adapt territories** to hazards derived from **extreme weather events**, such as floods, droughts, landslides and storm surges, making human communities more resilient to climate change.

Nature-Based Solutions Using nature to adapt landscapes

The frequency of severe hydro-meteorological events is rising in many regions of the world as a consequence of **climate change**. Society must be ready to make landscapes more resilient. **Nature-Based Solutions** (**NBS**) are inspired and supported by nature and provide environmental, social and economic benefits, while helping to **build resilience against climate change**. OPERANDUM has been built to deliver **tools and methods** to demonstrate the efficacy of a variety of **locally-adapted** NBS, involving **multiple stakeholders** in the process, such as citizens, associations, business players and policy makers.

The Geospatial Information Knowledge Platform

The project offers a **Geospatial Information Knowledge Platform** (GeoIKP) as an online **open hub** to exchange knowledge about Nature-Based Solutions. This way, OPERANDUM provides the basis to strengthen **adaptation policies** whilst boosting **new business opportunities** to build more resilient landscapes and communities.

Find out more

- www.operandum-project.eu
- info@operandum-project.eu
- www.geoikp.operandum-projet.eu

The project in numbers



International Open-Air Labs 10 areas to examine Nature-Based Solutions

OPERANDUM **tests the efficacy** of multiple NBS through 10 Open-Air Laboratories (OALs) distributed across the world. Based on the concept of **living lab**, the OAL is an original multidisciplinary framework that connects research institutes, enterprises and stakeholders to co-design, co-develop and co-deploy NBS. The OALs provide the framework to build **scientific evidence** of the efficacy of the NBS to mitigate the impact of hydro-meteo hazards, thereby enabling their replication and upscaling in other regions.



+39 051 209 0541

@OPERANDUM EU

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ITALY Volano Beach









Volano Beach

An OAL to test solutions against storm surges and coastal erosion

This Open-Air Laboratory is located in the **Po di Volano Natural Reserve** (Northeast coast of Italy), specifically in the Volano Beach. Close to the Po river delta, this spot features a **rich natural heritage** with vegetated dunes and coastal pine forests. Exposed to **storm surges** related to the Sirocco wind, this low-lying, sandy beach suffers frequent **marine floods** and **coastal erosion** that threaten both the ecosystem and the local community, reliable on farming and tourism.



Co-creation of the NBS

A whole area involved in the process

This Operandum OAL has relied on **local efforts**, especially the Land Security and Civil Protection Regional Agency (ARSTePC), to define technical aspects and manage authorisation processes, as well as to **build engagement with citizens** and local associations to codesign, co-deploy and co-monitor the NBS.

If you want to find out the updated results, visit www.geoikp.operandum-project.eu

Artificial dunes

An NBS to adapt areas to storm surges and coastal erosion.

Operandum has built a 50-metre long **sand structure** covered with **vegetation** to protect natural and agricultural lands and inland infrastructures from **extreme sea levels**.



1. Artificial dunes are frontline beach protections made up of biodegradable materials -wood logs and coconut geotextile- and sand. They mimic natural dunes in acting as barriers between the sea and the land.

2. An additional coconut geotextile is placed atop the sandy dunes to control both runoff water and erosion and to hold **moisture** for the vegetation to grow.

3. The structure's front, top and back are covered with **native vegetation** that traps sand, **stabilising** and **reinforcing** the dunes.

4. Monitoring the dune's inner structure with fibre-optic sensors helps evaluate the NBS' resistance against storm surges as well as its protective efficiency.