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

+39 051 209 0541

@OPERANDUM_EU

The project in numbers

10	26	4 +	14M
Open-Air Laboratories	International partners	Years (2018-2022)	Funding

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.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 776848.

OPERANDUM

OPEn-air laboRAtories for Nature baseD solUtions to Manage hydro-meteo risks

UK

Catterline Bay

Catterline Bay

An OAL to test solutions against landslides

This Open-Air Laboratory is located in Aberdeenshire (Northeast coast of Scotland), specifically in the **Catterline Bay**, a renowned spot for its outstanding natural beauty. Due to a sand-and-clay soil and a low percentage of green cover, this area suffers from **shallow landslides** and **coastal erosion**. When **heavy rain** and **high waves** hit the coast, water infiltrates and liquifies the earth. Such instability poses a threat to the local community's lives and homes –built right atop the sea cliffs—as well as to the overall landscape.

Co-creation of the NBS

A whole area involved in the process

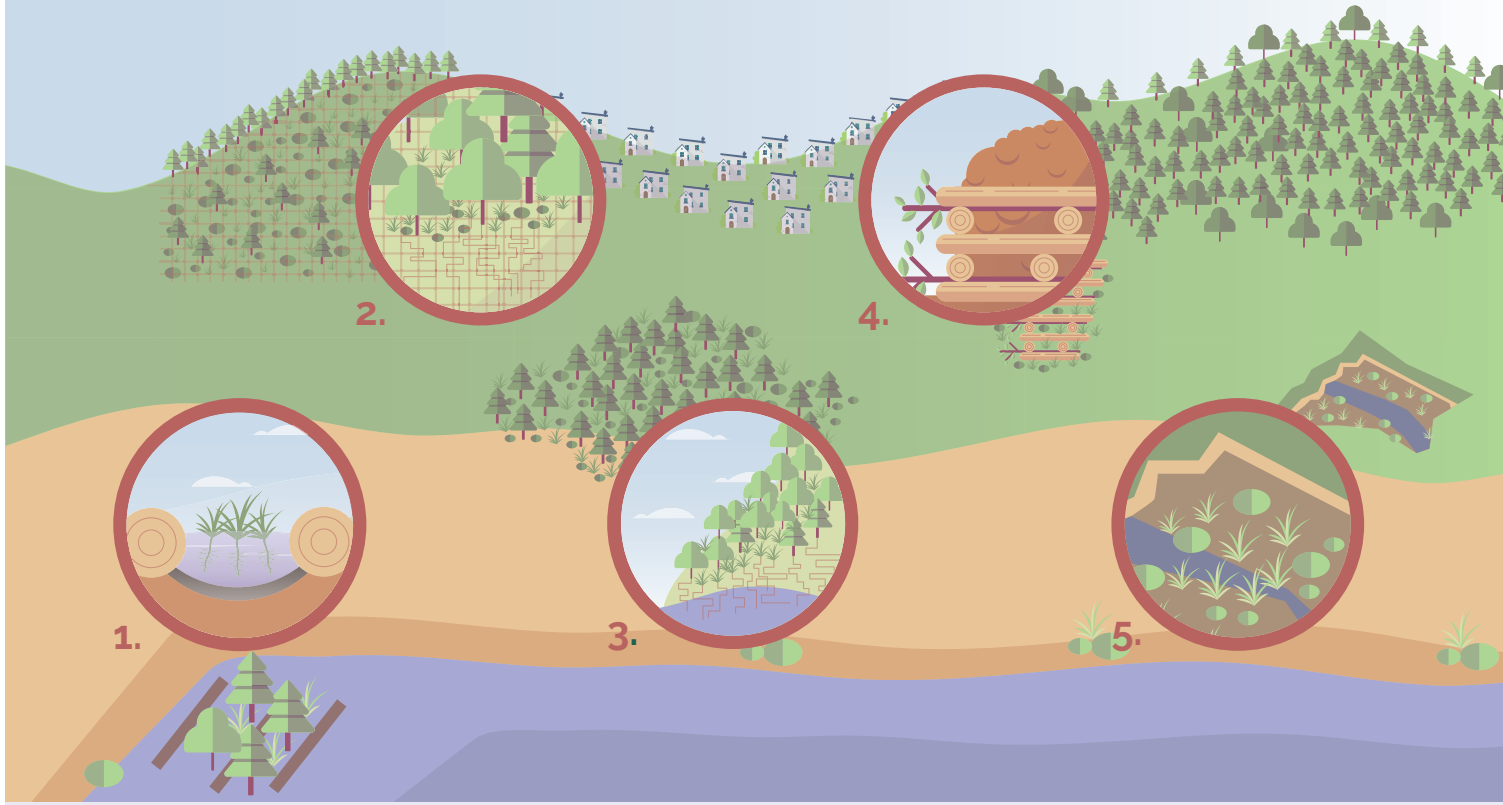
As the people who raised the alarm, **Catterline residents** are key to the success of this Operandum OAL. Together with the Glasgow Caledonian University (GCU), Naturalea, the Università di Bologna (UNIBO) and the University of Glasgow (UoG), local partners are actively participating in the co-design and implementation of the proposals.

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

Live ground stabilisation

An NBS to adapt areas to landslides

Operandum has covered the cliffs with moisture-loving plants that produce an **extensive root system**, creating a **stabilizing and protective structure** against landslides and erosion.



1. **Live pole drains** are ditches filled with plant fascines that can regrow from cuttings, such as willows. **Moisture-loving species** in these structures **drain surface and ground water** and retain sediments at the toe of slopes, preventing landslips.

2. Operandum is anchoring temporary grids to the crest of slopes to protect them from erosion. Holding seeds and plant fascines, these **live ground anchors** offer a **stable structure** for the vegetation to develop roots.

3. With **high density planting** of saplings and cuttings all over the slopes, the local community can contribute to stabilizing them, controlling erosion and **regulating the soil water cycle**.

4. Building a retaining **live crib wall** with timber logs over the cliffside gives immediate support to the soil and offers a **stable ground** for plants to grow.

5. To slow the flow of runoff water downslope, the local community can implement **brush layering**, building terraces and covering them with woody-plant fascines that will regrow and **rehabilitate eroded braes**.