OPERANDUM at a glance

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 Adapting landscapes to climate change

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-project.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.



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AUSTRIA Wattental - Vögelsberg









Wattental - Vögelsberg

An OAL to test solutions against landslides

This Open-Air Laboratory is located in the lower Watten valley (Tyrol, Austria), specifically in the area of the **slope of Vögerlsberg**. This slope has a continuously **moving part** that can cause landslides.

The activity of the landslides is mainly controlled by the incoming **ground water**, but it accelerates in prolonged **moist periods** and during **snow melt**, threatening the agricultural land, forested areas and several buildings in that region. In fact, many buildings already show severe damages due to the ground motion.



Co-creation of the NBS A whole area involved in the process

Operandum collaborated with **local partners**, **expert stakeholders**, **provincial environment authorities** and **manufacturers** from the selection of the NBS to the **co-design** of the experiment through several field trips and online meetings.

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

Natural sealing of leaky streams



1. Conventionally, **pipes**, **half shells** or **sheets** made of **polyethylene** are used to prevent water filtration into the ground. However, they may **pollute** the hydrological system of the slope.

2. To deal with infiltrations, Operandum has developed a **mat** made of the fully **bio-degradable** material **bentonite** enclosed with needle-punched geotextile layers. The mat is only about 1 centimetre thick.

3. Bentonite is a mixture of different **clay minerals** with **high swelling potential** once it absorbs water. This way, it captures water and prevents the filtrations.

Operandum has waterproofed the slope with **bio-degradable** material to prevent infiltration losses into the soil that

contribute to the origination of landslides.

4. To evaluate the performance of the solution, the **soil moisture** is continuously **monitored**. Also, there have been monitoring campaigns to document the situation before and after the implementation of the NBS.