



ALMA MATER STUDIORUM  
UNIVERSITÀ DI BOLOGNA

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## **NATURE BASED-SOLUTIONS**

*Living solutions that are inspired and supported by nature, which are efficient and cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience.*



The research of the University of Bologna embraces a large spectrum of expertise ranging from concept development in the area of social science and humanities to innovative engineering solutions and it covers:

- Development and assessment of methodologies for testing blue/green/hybrid NBS efficacy against climate extremes at urban and non-urban territories via laboratory, field and multi-scale numerical simulations
- Development and assessment of new NBS products for a wide range of applications such as re-enforcement of river embankments through bio-engineering solutions, salt intrusion mitigation at transition territories i.e. river/sea transition, coastal erosions, landslides prevention, flood risk reduction
- Development and assessment of blue/green/hybrid infrastructures in the urban environment against heat waves, for the promotion of water and energy saving
- Development of innovative approaches for the replication of NBS in different environments such as coastal and mountain cities, river catchments
- Development and application of new methodologies of data fusion including geophysical, economic, social media data for the mapping and potential risk reduction analysis using NBS in worldwide territories
- Multi-disciplinary research for the assessment of climate adaptation strategies using NBS
- Integration of NBS and ecosystem services into urban planning accounting for their climate, environmental, social and health related benefits for a just transition of urban areas

## HIGHLIGHTS

**At the University of Bologna are currently available several laboratories such as:**

- the atmospheric lab equipped with cutting-edge instrumentation for the in-situ and remote sensing monitoring of the atmosphere, as well as a front-end computational capacity for climate simulations and NBS climate scenarios
- the hydraulic lab for the realization of scaled experiments using NBS

**The University of Bologna has been involved in several solutions-oriented national and European funded projects** in which the usage of natural membranes can be used as substitute of current materials in engineering applications, among them:

**[H2020-OPERANDUM](#)** - (*Open-air laboratories for nature-based solutions to manage hydro-meteo risks*) a project coordinated by the University that demonstrates NBS efficacy in the reduction of environmental risks caused by meteorological extreme events while clustering territorial innovation potential and socio-economics values through the establishment of Open-Air Laboratories; **[FP7-WATER4CROPS](#)** - *Integrating Bio-Treated Wastewater Reuse with Enhanced Water Use Efficiency to Support the Green Economy in EU and India* a project that investigates the re-usage of waste waters using NBS; **ACTonNBS** - *Adaptive Cities through Nature Based Solutions*.