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Flood risk and water resources management with nature-based solutions on Florence city environment

Tommaso Pacetti¹, Matteo Pampaloni¹, Giulio Castelli², Enrica Caporali¹, Elena Bresci², Matteo Isola¹, and Marco Lompi¹

¹Department of Civil and Environmental Engineering, University of Florence, Firenze, Italy (tommaso.pacetti@unifi.it)

²Department of Agriculture, Food, Environment and Forestry (DAGRI), University of Florence, Firenze, Italy (giulio.castelli@unifi.it)

Increasing urbanization, evolving socio-economic scenarios and the impacts of climate change require innovative strategies to adapt urban and peri-urban environments, making them more resilient and sustainable. In this context, Nature Based Solutions (NBS), i.e. actions inspired or supported by nature, can be designed to adapt and provide integrated responses to the environmental, social and economic future challenges.

The FLORENCE (FLOod risk and water Resources management with Nature based solutions on City Environment) project evaluates the possibility of including NBS as an innovative tool for the management of the territory of the City of Florence (Firenze), Italy. The project develops a quantitative evaluation methodology that clarifies the benefits and co-benefits of NBS, highlighting the limitations and exploring the possible synergies with existing infrastructures.

Starting from the existing literature on the NBS siting, a set of parameters to be considered in order to map Ecosystem Services (ES) priority areas (main functions and co-benefits) is derived. This analysis is then coupled with the identification of the constraints (regulatory, urban planning, economic, environmental, social) which determine the boundary conditions for the inclusion of NBS in the Florence city urban environment. Once the most suitable implementation areas of NBS are identified, the hydraulic modeling of multiple NBS implementation scenarios using EPA SWMM is implemented. This allows the definition of the scenario that best respond to the city's green development needs and that maximize the production of ES.