multi-Risk sciEnce for resilienT commUnities undeR a changiNgclimate

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1. Technical references

Project Acronym	RETURN
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*   PU = Public

        PP = Restricted to other programme participants (including the Commission Services)

        RE = Restricted to a group specified by the consortium (including the Commission Services)

        CO = Confidential, only for members of the consortium (including the Commission Services)

Document history

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0.1	27/11/2023	Sonia Silvestri (UNIBO)	First draft
0.2	28/11/2023	Giovanni Besio (UNIGE)	Critical review and proofreading
0.3	28/11/2023	Giovanni Besio (UNIGE)	Edits for approval
1.0	28/11/2023	Francesco Ballio (POLIMI)	Final version

2. ABSTRACT

The Spoke VS1-Water is developing a number of outreach products / services for technological transfer of the knowledge developed within the research project. Such products will be demonstrated through the Digital Twin. This report includes sections related to monitoring and data management for outreach product National Coastline Evolution Tool, a common dataset for the analysis of the coastal evolution in time at different scales, either spatial or temporal. In order to analyze the different scales, it is necessary to rely on data coming from different types of surveys that can provide different coverage and resolution, from the national scale (like national databases and satellite images) to the local scale for specific risk analysis (coming for example from regional databases, costal webcam monitoring or citizen science projects through the use of mobile phones, topographic and bathymetric surveys, morpho-sedimentological surveys, infiltrometric surveys, etc.).

The dataset is implemented starting from already available features and images (available in the framework of the PNRR project or through partners of the RETURN project or through open access databases, e.g., ESA Copernicus), associated with selected study areas. The process of digitalization and geo-referencing of data is standardized with the purpose of developing a consistent dataset with solid and clear metadata, recurring over different scales and different typologies of seashore data. The development of the analysis and the production of quantitative results for coastal evolution trends benefit from the activities developed in the framework of the project and by the use of already existing open-source tools like, among others, CoastSat. High-resolution mapping, based on local data and/or regional aerial photos is applied to coastal areas with particular socio-economic and cultural interest employed as Proof-of-Concept (PoC) case studies. It is recommended that we don't have to study the whole Italian coastal area in the same way, but in some cases, like the Sardinian coastal systems, we have to choose the adequate study scale by the local specificity. The historical evolution of a study area should be carried out for each beach using the interpretation of historical aerial photographs, in order to identify "macroindicators" such as: extension of the dune area, position of the shoreline, distribution of marine phanerogams (e.g. Posidonia etc.), anthropological elements (buildings and coastal infrastructure, for example) and hydrography. This allows us to evaluate the coastal evolution of the studied area in the short and medium term.