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## Downstream VRE for multidisciplinary applications: Land and Marine domain toolboxes.

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As part of the ITINERIS project, funded by the NextGenerationEU programme (2022-2025), the downstream effects of climate and environmental change are being investigated. The Virtual Research Environment VRE (Assante et al., 2021) on downstream impacts of environmental change is dedicated to the use of Research Infrastructures providing tools for the visualisation, analysis, and data sharing. The Downstream VRE hosted by the D4Science infrastructure (Assante et al., 2019) and toolboxes have been developed for the marine and terrestrial domains.

The marine domain toolbox will take advantage of the available data in order to generate an integrated dataset for temperature, salinity, pH and CO<sub>2</sub> in the gulf of Trieste (Italy) with a focus on the National Institute of Oceanography and Applied Geophysics – OGS data for the last 10 years as use case. Once the data is harvested a subsequent data validation, quality control and merging will be performed using *erddap-navigator*, a web application that allows the user to visualize, assign quality control flags, analyze and merge data. The integrated dataset will then be used to calculate climate change indicators, such as ocean acidification and ocean carbon cycle budget.

The land domain toolbox aims to analyse areas subject to hydrogeological hazards (landslide phenomena). In this context, a geoserver and a geonetwork have been implemented containing maps at regional level of the NE-Italy region of Friuli Venezia Giulia. At the local level, different monitoring systems (interferometric radar, 1 GPS, 2 extensometers and 2 inclinometers, date coordinator) were installed at the Passo della Morte in Forni di Sotto to detect possible ground instabilities. The instruments provide geodata in various formats that define trends in slope displacement through interpretation, e.g. of time series. Each product has its own description and can be downloaded.

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