Data management system architecture for multiparameter scientific data: A prototype for seafloor observatories

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During the last ten years, with the extension of local and regional geophysical monitoring networks and the development of new scientific projects, INGV has experienced a significant growing of its data patrimony in terms of quantity and variety. Financial and human resources have been invested in order to make the data reachable and obtainable via queries. The first step included the creation of a data repository as a unique access point where to upload and store the data according to a predefined format. The scientist collecting measurements have been then requested to respect a strict organization and conversion of their datasets that usually come from different instruments and experiments. In a farther step the repository has been transformed into an advanced structure such as a Relational DataBase Management System (RDBMS) providing logical links among datasets originally independent.

The first prototype of the overall management system, has been developed around Italian volcanological time series respecting all the described organisational steps. The prototype allows for the first time, the simultaneous visualisation and cross-check of various time series for Italian volcanoes in a given interval. The system is a full-web architecture and can be joined using a web browser only, independently from any operating system. A user-friendly interface has been designed for the data upload, query and graphic outputs.

As the prototype system was conceived to manage a large variety of geophysical time-series, it soon appeared easily adaptable to the marine data management and a useful tool to investigate possible relations among Earth processes occurring at the Benthic Boundary Layer and along the water column. Accordingly, a new version of the data management prototype is now under development around the time-series acquired during the experiments with GEOSTAR-class observatories. A description of the prototype system will be presented and a demonstration of the progressing 'marine data specific prototype' will be shown to point out its capabilities.