

New possibilities in hydrological monitoring offered by experiences of Citizen Science: CITHYD, a web application for hydrometric measurements in rivers

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In addition to the data commonly used in hydrological predictions (such as the peaks over a threshold or the annual maximum series or the daily average values of the variables of interest), it is now clear the importance of using all available information, integrating different kinds of data, with appropriate methodologies, including non-systematic measurements and historical values recorded in the past.

This is of particular interest in ungauged or poorly gauged basins, often of small size, where there are very few data, but often high hydraulic risk.

The wide spread of technologies and sensors useful for data collection (e.g. via smartphones) enable the involvement of citizens in the measurement, transmission and analysis of data. The research concerns the development of a web – application, called CITHYD (Citizen Hydrology) for the collection of hydrometric measurements in rivers from citizens.

CITHYD is an application that receives water level data, collected and sent by citizens, in river cross sections instrumented with a staff gauge and an information panel, performs simple reliability checks, stores the data, publishes them and creates statistics freely available for all (under Italian Open Data License 2.0).

The application needs an information panel containing a unique QR code for every staff gauge. Through smartphones and TLC network the citizen can transmit the water level seen on a staff gauge existing on a river basin to a geodatabase with web interface. The user, thanks to the QR code, immediately accesses the data entry mask form related to that staff gauge and can insert the water level just read. Data are published almost in real time on a map and the data, inserted by all users, can be read and downloaded, as text files, tables and graphics. The Open Data stored in the DB can be used for scientific research, for calibration and validation of models, to improve the knowledge of the territory and for planning and design.

The Citizen Science experience supports the involvement of local communities in living and take care of the rivers of their territory and can promote the creation of a virtuous circle in data collection through social networks, educational and communication events.

It can also be used during emergencies, by authorized users, to collect level measurements for risk management and flood protection.

The application has been fully developed and is now at the end of the testing phase. Some Italian local administrations are evaluating the use of CITHYD in small catchments in their territories in order to improve community engagement and resilience.