Monitoring global changes and water management strategies in Mediterranean mountain environments: hydro-socio-eco-meteorological observations in the Cévennes Mountains (Southeast France)


To cite this version:
Valentin Wendling, Pierre-Alain Ayral, Juliette Cerceau, Judicaël Arnaud, Guillaume Artigue, et al.. Monitoring global changes and water management strategies in Mediterranean mountain environments: hydro-socio-eco-meteorological observations in the Cévennes Mountains (Southeast France). 2nd TERENO-OZCAR Conference, Sep 2023, Bonn, Germany. 2023. hal-04285490

HAL Id: hal-04285490
https://imt-mines-ales.hal.science/hal-04285490
Submitted on 15 Nov 2023

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Monitoring global changes and water management strategies in Mediterranean mountain environments: hydro-socio-eco-meteorological observations in the Cévennes Mountains (Southeast France).


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** Mont Lozère **
Hydrology in Mediterranean Mountainous experimental catchments

Five experimental catchments (0.2 to 12.8 km²) located on granite substrates have been monitored since 1983. Ranging from 900 to 1,500 m of altitude, these catchments have different land covers: grassland, resins, deciduous and mixed forests.

Parameters:
- Atmospheric: rain, insolation, relative humidity, temperature, wind speed and direction
- River Flow: level, discharge, water temperature, geochemistry

** Galeizon **
Flash flood, low flow

Galeizon is a meso-scale catchment (85 km²) mostly forestry with some farmland and villages. There is no large hydraulic structures in the watershed and the flow is in natural (“wild river site” label).

Parameters:
- Atmospheric: rain
- River Flow: level, discharge, temperature, sedimentary fluxes (n=2023)

** Les Plantiers **
A living Lab dedicated to water scarcity resilience

Les Plantiers (350 inhabitants, 1 km² during summer; 35 km²) was one of the municipalities particularly impacted by floods in 2020 and the severe drought in 2022 in the Cévennes area. Created in June 2020, the living Lab’s main objective is to cross local and scientific knowledge for helping inhabitants to use, save and manage the water in the context of resource scarcity.

Planned observations:
- Socio-hydrology: survey, participative cartography, participative hydro-meteorological measurements, hydro-soil trajectories, identification of local hydrological knowledge
- Atmospheric: rain
- River Flow: level, discharge
- Partners: citizens and officials

** Ceyrac **
Evapotranspiration in Mediterranean scrubland

The Ceyrac site was instrumental to improve our knowledge of the adaptation of native plants (perrier, thistle, boxwood...) to the Mediterranean climate in 2015. The various components of the water and energy cycles are monitored with a high time resolution. This site is located down to an intermittent river.

Parameters:
- Atmospheric: temperature, humidity, pressure, wind speed and direction, solar and thermal radiation, photosynthesis radiation, surface temperature, precipitation, gases concentrations (CO2, CO)
- Soil: temperature, moisture, heat flux
- River Flow: level, discharge

Under climate and global change, the Cévennes socio-ecosystems suffer from water scarcity and sometimes poor water quality. We are setting up socio-eco-hydrological observatories to monitor the adaptation evolution to these issues. This set up began 15 years ago with the study of flash floods risk and matter transport risk awareness and human behaviours during and between hydroclimatic crises. The ongoing socio-eco-hydrological monitoring is co-constructed with citizens and local policymakers in order to use science to advise decision making toward durability and resilience.

Cévennes sites are part of the upcoming e.TER platform P3M : Mediterranean Plain, Piedmont and Plateau.

In addition to long-term monitoring, these sites are privileged supports to test new measurement techniques and build interdisciplinary and participatory research projects. We welcome collaborations and provide a local expertise to projects requiring sites in Mediterranean mountains.

Data are free access on observatories website:
- OHM-CV: https://ohmcv.osug.fr/
- SNO KARST: https://osokar.org/sites/medcypress/