

A study of the feasibility, benefits and limitations of using low-cost sensors to monitor temporary rivers

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CONTEXT

- NPRS (Non-perennial river and streams) or temporary rivers are characterized by intermittent flows.
- While intermittency is a natural phenomenon for NPRS, anthropogenic factors such as land use changes, water withdrawals, and climate change are extending dry periods and converting some perennial rivers into non-perennial systems (Larned et al 2010, Jorda-Capdevila et al 2021).
- NPRS constitute over half of the global river network (Messenger et al., 2021), support diverse and unique aquatic and riparian biota, and provide numerous ecosystem services and socio-cultural values (Koundouri et al 2017).
- In France, temporary rivers represent a third of the streams in the country (Snelder et al., 2013). They are experiencing longer dryer periods and suffer from pollution and development. While temporary rivers are not limited to southern regions, hydrological models predict a decrease of global flows in the South of France, and longer periods of dryness (Datry et al. 2012).



SCIENTIFIC OBJECTIVES

- Analyze the state of the art regarding hydrologic sensors to monitor the regime of NRPS : from the scientific and grey literature available in France and worldwide, identify the interests and limits of low-costs sensors applied to temporary rivers.
- Experiment with different prototypes of low-cost water sensors to assess the feasibility of their application in monitoring NPRS : based on existing technologies developed in previous projects, field work in Occitanie region will be carried out in order to explore the promises and limitations of such tools

THE MISSION

- State of the art regarding low-costs sensors and NPRS
- Analysis of interests and limits
- Identification of case studies where these sensors were implemented
- Proposal for an experimental setup to develop and test these sensors in the south of France (Occitanie)
- Preliminary field trials to assess the potential benefits and obstacles of such tools

REFERENCES

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THE RESEARCH UNIT: G-EAU

- G-EAU is an interdisciplinary research unit located in the North of Montpellier at the Agropolis campus
- It unites both social and natural scientists interested in the study of water – from hydrogeologists and remote sensing experts to human geographers and sociohydrologists
- Students will be able to integrate themselves into a rich and welcoming environment of scientific diversity. Weekly events include the Friday discovery seminar series (Vendredi Découverte), and the communal coffee social every Tuesday.

