

A critical zone observatory dedicated to suspended sediment transport: the meso-scale Galabre catchment (southern French Alps)

Cédric Legout¹, Guilhem Freche¹, Romain Biron², Michel Esteves², Oldrich Navratil³, Guillaume Nord¹, Magdalena Uber¹, Thomas Grangeon⁴, Nico Hachgenei¹, Brice Boudevillain¹, Céline Voiron², and Lorenzo Spadini¹

¹Université Grenoble Alpes

²Institut de Recherche pour le Developpement IRD

³Université Lumière Lyon 2

⁴BRGM

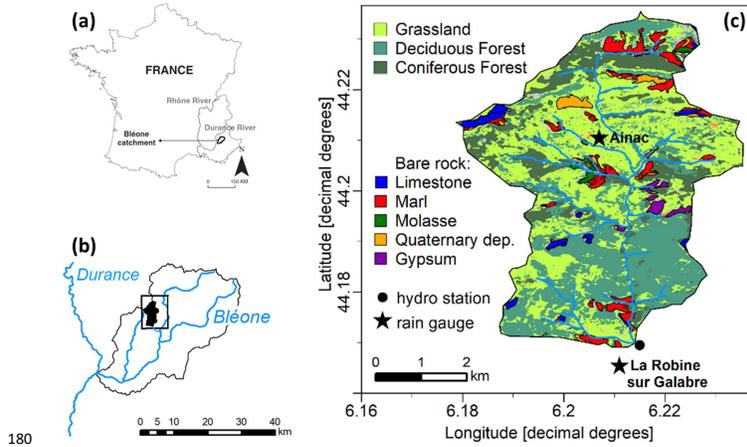
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Abstract

The 20 km² Galabre catchment belongs to the French network of critical zone observatories. It is representative of the sedimentary geology and meteorological forcing found in Mediterranean and mountainous areas. Due to the presence of highly erodible and sloping badlands of various lithologies, the site was instrumented in 2007 to understand the dynamics of suspended sediments (SS) in such areas. Two meteorological stations including measurements of air temperature, wind speed and direction, air moisture, rainfall intensity, raindrop size and velocity distribution are installed both in the upper and lower part of the catchment. At the catchment outlet, a gauging station records the water level, temperature and the turbidity (10 min. time-step). Water and sediment samples are collected automatically to estimate SS concentration-turbidity relationships, providing SS fluxes quantifications with known uncertainties. The sediment samples are further characterized by measuring their particle size distributions (PSD) and by applying a low-cost sediment fingerprinting approach using spectrophotometric tracers. Thus, the contributions of badlands on different lithologies to total SS flux are quantified at a high temporal resolution providing the opportunity to better analyze the links between meteorological forcing variability and watershed hydrosedimentary response. The set of measurements was extended to the dissolved phase in 2017. Both the river electrical conductivity and its major ion concentrations are measured each week and every three hours during storm events. This allows progress in understanding both the origin of the water during the events and the partitioning between particulate and dissolved fluxes in the critical zone.

Hosted file

Data_note_Galabre_observatory_Legout_main.pdf available at <https://authorea.com/users/360629/articles/482250-a-critical-zone-observatory-dedicated-to-suspended-sediment-transport-the-meso-scale-galabre-catchment-southern-french-alps>



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182 **Figure 1 :** (a) Location of the Bléone catchment including (b) the Galabre catchment. (c) Land
183 cover map of the Galabre catchment adapted from CESBIO land cover data (Inglada et al.,
184 2017). Badland areas were delineated in Legout et al. (2013) and classified according to their
185 geology.

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Compartment	Site name	Measurement	OSUG doi data access	BDOH data visualization	Period
Meteorology	La Robine sur Galabre	Temperature, moisture, wind speed and direction, precipitation	https://doi.org/10.17178/DRAIXBLEONE_GAL_ROB_MET_1420	https://bdoh.insee.fr/DRAIX/ROBINE	14-20
		Drop size distribution	https://doi.org/10.17178/DRAIXBLEONE_GAL_ROB_DSD_1420	-	14-20
	Ainaç,	Temperature, moisture, wind speed and direction, precipitation	https://doi.org/10.17178/DRAIXBLEONE_GAL_AIN_MET_1920	https://bdoh.insee.fr/DRAIX/AINAC	19-20
		Precipitation	https://doi.org/10.17178/DRAIXBLEONE_GAL_AIN_PRECIP_1920	https://bdoh.insee.fr/DRAIX/AINAC/PREP	08-19 19-20
Hydrology	La Robine sur Galabre,	Liquid discharge	https://doi.org/10.17178/DRAIXBLEONE_GAL_ROB_DISCH_0719	https://bdoh.insee.fr/DRAIX/GALABRE/DEB	07-19
		Water temperature	https://doi.org/10.17178/DRAIXBLEONE_GAL_ROB_TEMP_1519	https://bdoh.insee.fr/DRAIX/GALABRE/TEMPE	15-19
		Suspended sediment concentration	https://doi.org/10.17178/DRAIXBLEONE_GAL_ROB_SSC_0719	https://bdoh.insee.fr/DRAIX/GALABRE/CMES	07-19
Particulate matter	La Robine sur Galabre	Particle size distribution	https://doi.org/10.17178/DRAIXBLEONE_GAL_ROB_SEDPSD_0809	-	08-09
		Sediment fingerprinting	https://doi.org/10.17178/DRAIXBLEONE_GAL_ROB_SEDSOURCE_0719	-	07-19
		Water electrical conductivity	https://doi.org/10.17178/DRAIXBLEONE_GAL_ROB_COND_1719	https://bdoh.insee.fr/DRAIX/GALABRE/COND	17-19
Dissolved matter	La Robine sur Galabre	Major ion concentrations	https://doi.org/10.17178/DRAIXBLEONE_GAL_ROB_ION_1719	-	17-19

188 **Table 1:** Summary of the data set of the Galabre watershed of the Draix-Bleone observatory.