

PILOT SITE DESCRIPTION – LTER Auradé Experimental Catchment

The LTER “Auradé Experimental Catchment” (AEC) provides, on a relatively small area (320 ha), unique facilities and expertise to conduct long-term studies on the impact of climate change and agricultural practices on chemical and physical soil erosion, biogeochemical cycles of elements, stream fluxes, biodiversity and ecosystem services. It has also been instrumented to study the dynamics of agricultural contaminants (nitrates, pesticides, trace metals) and their impact on the quality of soils, surface waters, and aquatic and terrestrial ecosystems. Since 2010, the site has been a regional platform for research and innovation, and it belongs now to the OZCAR national RI and to the European infrastructure (ESFRI) eLTER. AEC has also a RENOIR station (Observation National Service, SNO) for the isotopic composition of precipitations. AEC is co-located with a flux tower site, part of the French ICOS-ecosystem network since 2015. AEC and its surrounding territory is covered by the Regional Spatial Observatory-OSR (SNO of RI OZCAR). Finally, AEC platform is included within the LTSER “Zone Atelier Pyrénées-Garonne” (ZA PYGAR, member of the RZA national RI).

The Auradé site is representative of the agricultural watersheds of the area “Vallées et Coteaux de Gascogne” of the LTSER ZA PYGAR (South-Western France). Its elevation gradient spans from 170 to 270 m, with rather steep slopes. A long-term agreement with a group of farmers, fully involved in the promotion of research, provides unique opportunities to experiment and document agricultural practices on the site. AEC has been monitored continuously for more than 35 years for stream flow, nitrate concentrations and agricultural practices, and for more than 15 years for several other physico-chemical parameters.

Several reasons justify the selection of the LTER AEC as a pilot site for WP5: (i) the agricultural landscape, which is both a major component of many socio-ecosystems and a relatively easy implementation site, (ii) existing facilities for the monitoring of soil, climate and hydrology, (iii) the well-established relationships with several stakeholders (municipality, farmers, chamber of agriculture, water agency) and (iv) the facilities and expertise provided by the research units involved in site operating, notably ECOLAB and CESBIO (see partners 12 and 6).



View of the Auradé catchment, mainly cultivated with wheat and sunflower crops in rotation (Côteaux de Gascogne, South-Western France). The site is highly instrumented and includes a nearby flux tower, two automatic samplers on the Montoussé stream and a multi-parameter probe equipped with various sensors to measure at high frequency water level, pH, conductivity, turbidity, and nitrates. These continuous measurements are calibrated weekly from field measurements and laboratory analyzes.