

Monitoring of water resources and a better understanding of the eco-hydrological processes governing their dynamics are necessary to anticipate and develop measures to adapt to climate and water use changes. For this purpose, a research project carried out within the frame of French-Moroccan cooperation (The Joint International Laboratory, LMI TREMA) focuses on the monitoring and modelling of water resources in semi-arid Mediterranean regions. The study area is the Tensift Basin located near Marrakech (Morocco), a typical Southern Mediterranean catchment with water production in the upstream mountainous part of the catchment and downstream consumption due to agriculture and irrigation. The activities of TREMA are supported by a combination of *in situ* hydro-climatologic observations and satellite data used in combination with modelling tools to understand and model the hydrological functioning of the watershed. The scientific activities are supported by an in-situ observatory, including a network of about ten meteorological stations ranging from 450 to 3200 m.a.s.l., but also intensive flux measurement campaign conducted at seasonal scale for the main crops encountered in the area (olive, citrus, wheat). These data are completed by the partners of the LMI who are also managers, namely the office in charge of irrigation providing irrigation volumes and the watershed agency providing with runoff measurements at the outlet of the main rivers of the area and piezometric data in the plain. The main researches conducted are focused on: (1) methodological development for the retrieval of key components of the water cycle from remote sensing imagery, (2) the use of remote sensing products together with land surface modelling for the evapotranspiration and water budget monitoring and (3) the development of operational tools based on remote sensing for irrigation advisory at plot scale (SAT-IRR), for water monitoring at irrigated perimeter scale (SAMIR) or for integrated water management at watershed scale coupling for example SAMIR-WEAP-MODFLOW or Safran-Isba-Modcou.

Mots-Clés: Remote sensing, water resources, Agriculture, Irrigation, climate change, modelling, management tools