Analysis and Predictability of Drought in Northwest Africa using Optical and Microwave Satellite Remote Sensing Products

Michel Le Page (1) and Zribi Mehrez (2)

(1) Institut de Recherche pour le Développement, CESBIO (UPS/CNRS/IRD/CNES), Toulouse, France
(michel.le_page@ird.fr), (2) Centre National de Recherche Scientifique, CESBIO (UPS/CNRS/IRD/CNES), Toulouse, France
(mehrez.zribi@cnrs.fr)

The Mediterranean region is a hot spot of climate change; it is also characterized by a scarcity of water resources that places intense pressure on agricultural productivity. We propose to analyze the potential of multi-remote sensing sensors for the quantification and predictability of drought for the period 2007-2018 at the monthly time step in northwest Africa. Three satellite products are considered: the Normalized Difference Vegetation Index (NDVI), Soil Moisture Index (SWI), and Land Surface Temperature (LST) on which anomalies are computed. An analysis of the inter-variable correlation and the time lagged correlation are performed. We then propose a method to classify drought intensity and apply it on the administrative areas. Finally, we propose the use of the analog statistical approach to identify similar evolutions of the three variables in the past. Although this technique is not a forecast, it provides a strong indication of the plausible future trajectory of a given hydrological season.