Hydrometeorological and vegetation indices for the Drought monitoring system in Tuscany Region, Italy

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It is known that drought is a complex phenomenon whose impacts have different time scales. For this reason, the computation of precipitation deficit alone is not sufficient for the evaluation of possible drought conditions. Vegetation stress and soil moisture status have to be considered, as well as effects on surface water bodies and groundwater. We present here an integrated system that is under development for drought monitoring in Tuscany Region in Central Italy. The system is based on the cross-evaluation of meteorological indices (SPI, standardized precipitation index), vegetation indices from remote sensing (from SEVIRI-MSG), and outputs from the distributed hydrological model MOBIDIC, that is used in real-time for water balance evaluation and hydrological forecast in the major basins of Tuscany. Furthermore, a telemetric network of aquifer levels is near completion in the region, and data from more than 50 stations are already available in real-time for the drought monitoring system. Drought indices over Tuscany in the period 2006- 2007 are shown, and correlation between patterns of crop water stress, precipitation deficit and groundwater conditions are discussed.