



Mapping of the Reconnaissance Drought Index (RDI) based on Remote Sensing and GIS over Greece

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Droughts are regional phenomena and have been referred to as
drought events

because their basic cause is the lack of precipitation events in a region over a period of time associated with a higher than normal temperatures. The severity of drought depends upon the degree of moisture deficiency, the duration and the size of the affected area. Drought impacts significantly affect the ecosystems, social - economic environment and mainly agricultural areas which necessitate the monitoring and assessment of drought's onset, duration, severity and areal extent. There is a variety of drought indices provided in literature. Among them the Reconnaissance Drought Index (RDI) has been recently developed and applied. RDI is used to estimate the hydro-meteorological drought conditions based on precipitation and potential evapotranspiration. This index is already applied in several areas of Greece using conventional ground measurements. In order to map the drought conditions over a large area, Remote Sensing and GIS techniques could be utilized. This work estimates RDI based on remotely sensed and GIS data for the spatial detection of drought in Greece. The data set consists of monthly air temperature derived from NOAA/AVHRR satellite image of Land Surface Temperature (LST) in 1 x 1 km pixel size, and monthly cumulative precipitation maps extracted from daily ground measurements values. The timeseries covers an eight years time period from 1998 to 2005 due to the limited availability of satellite data. Monthly potential evapotranspiration is estimated by the Blaney – Criddle method for the whole Greece, using maps of air temperature, crop coefficients and day- hours for each pixel with 500 x 500 m resolution. Monthly RDI maps for 3-, 6-, 9 and 12-month are extracted from 1998 to 2005 hydrological years and they compared with the conventional data based RDI in selected areas. The correlation between conventional and satellite RDI in these areas indicates that RDI seems adequate to estimate and monitor the hydro- meteorological drought spatially variation.