



Satellite-based monitoring of cotton evapotranspiration

Nicolas Dalezios (1), Nicholas Dercas (1), Ana Maria Tarquis (2,3)

(1) Department of Natural Resources Development and Agricultural Engineering, Agricultural University of Athens, Athens, Greece (dalezios.n.r@gmail.com), (2) CEIGRAM, Universidad Politecnica de Madrid, Spain (anamaria.tarquis@upm.es), (3) Dept. Matematica Aplicada, ETSIAAB- UPM, Madrid, Spain.

Water for agricultural use represents the largest share among all water uses. Vulnerability in agriculture is influenced, among others, by extended periods of water shortage in regions exposed to droughts. Advanced technological approaches and methodologies, including remote sensing, are increasingly incorporated for the assessment of irrigation water requirements. In this paper, remote sensing techniques are integrated for the estimation and monitoring of crop evapotranspiration ET_c . The study area is Thessaly central Greece, which is a drought-prone agricultural region. Cotton fields in a small agricultural sub-catchment in Thessaly are used as an experimental site. Daily meteorological data and weekly field data are recorded throughout seven (2004-2010) growing seasons for the computation of reference evapotranspiration ET_o , crop coefficient K_c and cotton crop ET_c based on conventional data. Satellite data (Landsat TM) for the corresponding period are processed to estimate cotton crop coefficient K_c and cotton crop ET_c and delineate its spatiotemporal variability. The methodology is applied for monitoring K_c and ET_c during the growing season in the selected sub-catchment. Several error statistics are used showing very good agreement with ground-truth observations.