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Monitoring of ETo and crop coefficient Kc based on satellite data over Thessaly, Greece

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Water for food production represents by far the largest share among all uses and its demand keeps growing with increasing population. The lack of water can affect disfavour the economic and social stability of entire regions. New technologies (Earth Observation, Geographic Information Systems) provide the possibility of time and spatial observation for the decision support and management. PLEIADeS (Participatory multi-Level EO-assisted tools for Irrigation water management and Agricultural Decision –Support) addresses the efficient and sustainable use of water for food production in water – scarce environments with the use of satellite data and GIS. To the present study is described the process that applied for the computation of crop coefficient Kc that constitutes the basic parameter for the computation of evapotraspiration and accordingly the water needs of crops. Monitoring of Kc with ground based measurements is a time-consuming process and almost unfeasible to apply in large scale areas. Satellite data provide the cover capability of large scale areas and monitoring of crop during growth stages. The process that was followed is based on the methodology of Project PLEIADeS. Study area was Thessaly, Central Greece, a high agricultural productivity area. For the data collection a cotton field was used with two experimental stations. Weekly ground based measurements carried out during growth stages and satellite images (Landsat TM) process for the corresponding time period. Combing the tables of FAO (paper 56) and ground based measurements computed the cotton coefficient Kc. An empirical relation between NDVI and Kc was extracted. Methodology can be applied in large scale areas for the calculation of Kc and extend to other crops using satellite data.