Geophysical Research Abstracts
Vol. 15, EGU2013-11662, 2013
EGU General Assembly 2013


# Relationship between soil moisture and surface temperature under semiarid Mediterranean conditions

Insaf Mekki (1), Rim Zitouna Chebbi (2), Frédéric Jacob (3), Laurent Prévot (4), Moncef Masmoudi (5), and Netij Ben Mechlia (6)

(1) INRGREF, Ariana, Tunisia, insaf.mekki@laposte.net, (2) INRGREF, Ariana, Tunisia, rimzitouna@live.fr, (3) IRD, UMR LISAH, Montpellier, France, frederic.jacob@supagro.inra.fr, (4) INRA, UMR LISAH, Montpellier, France, laurent.prevot@supagro.inra.fr, (5) INAT, Tunis, Tunisia, masmoudi.med@inat.agrinet.tn, (6) INAT, Tunis, Tunisia, netij.benmechlia@iresa.agrinet.tn

Soil moisture is an important variable of the water and energy balances and for the understanding of the global change. This work focuses on the investigation of interactions between the spatiotemporal variability of soil moisture and soil surface temperature. The main objective is to assess the relationship between soil moisture and soil surface temperature patterns aiding in predicting water content variation at vegetation rooting depth. This study is based on in situ data measured at two fields within the Kamech catchment, north-eastern Tunisia (semiarid Mediterranean). The site belongs to the OMERE observatory for environmental research and it is monitored for the different hydrological cycle components under influence of anthropogenic forcing. Continuous surface temperature and soil surface moisture measurements are carried out from March 2010 to August 2010, to capture the transition period between the typically wet and dry seasons of semi-arid Mediterranean environments. In addition to all the components of the energy budget over vegetated and bare soil conditions, the soil moisture and surface temperature are averaged over 30mn time spans. The observations on soil moisture and surface temperature at 5 cm and 10 cm depths are analysed. The results highlight the spatiotemporal changes in soil moisture and soil temperature depending on soil types, land use, and climate (the structure and amount of rainfall, net radiation). In general, the mean temperature decreased with soil depth. We observe a diurnal and seasonal variation of soil temperature and moisture following an inverse relationship. Linear models for prediction of soil moisture (at both depths) using surface temperature observations are examined.