Geophysical Research Abstracts
Vol. 21, EGU2019-2487, 2019
EGU General Assembly 2019

Water Demand of Desert Margin Farmlands; Remote Sensing and Modeling Approaches

Behnaz (Badieh) Noori (1), Hamideh Nouri (2), and Pamela Nagler (3)

(1) University of Tehran, Tehran, Iran, Islamic Republic Of (beh_nouri@alumni.ut.ac.ir), (2) Division of Agronomy, University of Gottingen, Germany (hamideh.nouri@uni-goettingen.de), (3) Southwest Biological Science Center, US Geological Survey & University of Arizona, Tucson, USA (pnagler@usgs.gov).

Water scarcity and population growth complicate ongoing challenges of food security and national self-sufficiency that most dry countries are facing these days. The severe water crisis in water-stressed countries escalates the battle between the agriculture sector and other main water users. In desert margin farming, evapotranspiration (ET) as the main component of water footprint and water productivity needs to be quantified accurately. Recently, ET estimation has been benefitted from advances in remote sensing (RS) and GIS techniques. Different algorithms and models have been introduced to study various biophysical parameters of vegetation such as Normalized Difference Vegetation Index (NDVI). This research explores the potential relationship between the ET of desert margin farmlands and RS vegetation index of NDVI in the Varamin Plain in Iran. A data set of cloudless Landsat 7 images of consecutive seasons in 2013-2014 was used to quantify NDVI values. ENVI software was used for image processing, georeferencing, atmospheric correction and generating NDVI maps. Local climate data and ground-based vegetation information were collected, and ET was modelled using CropWat model. The relationship between RS-based NDVI and model-based ET was investigated, and a strong positive correlation was found between these two approaches. We found remotely sensed NDVI an efficient indicator of ET estimation and water demand of desert margin vegetation.