Project title: Regional estimation of soil moisture using satellite data, ground measurements and climate modelling, Case study: Iran

Soil moisture is of fundamental importance for many hydrological, biological and biogeochemical processes. Soil moisture is a key variable in controlling the exchange of water and heat energy between the land surface and the atmosphere through evaporation and plant transpiration. Information about soil moisture can be used for irrigation scheduling, and crop yield forecasting. Despite the importance of soil moisture information, accurate land surface soil moisture observations are lacking, due to an inability to economically monitor spatial variation in soil moisture from traditional point measurement techniques. The lack of a convincing approach of global measurement of soil moisture is a serious problem. Therefore one of the best ways to have soil moisture data is using of climate models.

The main aim of project is estimating soil moisture in Iran using regional climate model COSMO-CLM, which will be validated using satellite data and ground measurement for the period of 1988 – 2017.

Then using RCP 4.5 and RCP 8.5 the simulation for the future time slice 2021 to 2050 will be calculated, which gives agriculture sector an important hint about the future trend of soil moisture in Iran.

The model validation will be carried out using two groups of data: Ground measurements and satellite data. Ground measurements are divided into two categories: 1-Insides of field, 2- Outsides of field. There are 30 years satellite data to be compared with the past simulation of soil moisture by COSMO-CLM model. A comparison of trends of soil moisture in different depths and to vegetation indices will be also carried. The other aim of this project is to use soil moisture data to calculated drought index for Iran.