



Establishing a Critical Zone Observatory site in Turkey

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The Earth's Critical Zone (CZ) is the planetary veneer that extends from the air above our treetops to the layers of rocks below, which supports human activity. This includes life-sustaining resources for energy, food, and water. The CZ also includes places where we dispose and store toxic materials, and expose to other contaminants. The fate of change in the CZ is important to the government and business planners to help respond to effects of disease, drought, and land degradation in agricultural and urban settings. Critical Zone Observatory's are outdoor laboratories that are highly instrumented and becoming integrated into a global network. Turkey has a diversified landscape, representing most terrestrial ecosystems on Earth. Turkey is unique because some regions have been subject to high-impact human influence for thousands of years. This millennial-scale anthropogenic affect on the CZ does not exist at most other CZO's. In this study the establishment of a CZO at a basin located in the south part of Turkey which the instrumentation that has been already completed is presented. The mean altitude of the basin is 1601 m and it has 526km² area. The cherry trees along the river, agricultural areas and the natural vegetation composed of pasture and shrub are the main land cover in the basin. The brown forest and brown soil are the main soil types. The basin has a complex geology. There are two main tributaries of the stream: one of them is fed by gypsum ground waters and mine drainage and the other one is fed by shallow fresh ground water. Three meteorological stations were established within this project at 1246 m, 1580m and 1790m. At these stations besides the meteorological variables, soil water content are measured. The discharge observations are carried out at three discharge observation stations where the water stage, temperature and electrical conductivity values are measured. A CRS200B soil moisture probe is installed at 1459 m and the soil water content is monitored through the cosmic ray sensor and ML3 ThetaProbe soil moisture sensors established at several depths within the sensor. There is EC 150 open path eddy covariance system with energy balance sensors installed at the field. We present the first analyses done to understand the hydrological processes in the basin. The project is funded by the Scientific and Technological Council of Turkey.