# An open source tool to estimate regional and field-scale evapotranspiration

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With the intensifying stresses on our water supply due to climatic and anthropogenic changes, it is paramount that we have tools to monitor water use. Evapotranspiration (ET) from vegetation is an important hydrologic process used to establish the water balance in basins, estimate water demand of irrigation systems, as well as crop biomass production and yield at field scales. There is a need to monitor these processes from basin to field scales and therefore the use of remotely sensed data from satellite platforms such as Landsat for ET modeling has been utilized. Here we describe a new satellite-based daily ET product developed for the Middle East and North Africa (MENA) region, using the Atmosphere-Land-Exchange Inverse (ALEXI) model. ALEXI is based on the Two-Source Energy Balance (TSEB) land surface model. TSEB partitions fluxes and surface temperature between nominal soil and canopy components within a scene. The MENA region ET product consists of a regional product (375 m) estimation based on the Visible Infrared Imaging Radiometer Suite (VIIRS) sensor and a high-resolution field scale disaggregation (30 m) of the ALEXI product using the Landsat platform. Estimation of ET at field scales using the DisAggregated ALEXI (DisALEXI) downscaling approach has been developed over the past 15 years in various open (Fortran and Perl) and proprietary (IDL and Modtran) software programs and as such is difficult to share with colleagues and stakeholders. Therefore, a pythonic implantation of the DisALEXI disaggregation scheme has been developed (PyDisALEXI) to downscale the regional ALEXI ET to field scale resolutions using the Landsat platform. A description and initial results from the new open source algorithm will be shown.