

Regional ET Estimation from Satellites

Zohrab Samani, Max Bleiwies, Rhonda Skaggs

New Mexico State University

zsamani@nmsu.edu

Crop evapotranspiration (ET) is a major component of the hydrologic system. The ET values are used in irrigation water management, water right allocation, hydrological modeling and water resource planning and management. Traditionally, ET has been estimated using crop coefficient and climatic parameters. Point measurement of ET can also be made through soil moisture monitoring, vapor flux measurement or energy balance using the eddy-covariance method. However, traditional methods will only provide point measurements of ET and does not account for spatial variability of ET in large scale. Recent advances in remote sensing have made it possible to develop regional maps of ET with high precision. A procedure was developed to use the combination of satellite data, ground level weather stations and point measurements of ET, to estimate and develop regional ET maps. The Regional ET Estimation Model (REEM) is based on energy balance at the crop canopy. The model uses incidental values of NDVI, near infrared temperature and albedo, from satellites to calibrate the sensible heat flux equation. The sensible heat flux equation is calculated daily and is modified spatially using well defined nodes in the watershed based on an optimization technique. The REEM based ET values were compared with direct measurement of ET in Pecan in Southern New Mexico. The comparison showed that the crop ET can be calculated from RE