

FY16 NM WRRI Research Progress Report Form

Report Due Date: 9/8/2015

1. **Project Title:** Improving Evapotranspiration Estimation Using Remote Sensing Technology

2. **Investigators (names, university/agency):**

Dr. Zohrab Samani, Civil Engineering Dept., New Mexico State University

Dr. Salim Bawazir, Civil Engineering Dept., New Mexico State University

3. **Brief description of project, research objectives, and impacts on New Mexico (provide performance measures and outcomes):**

Remote sensing technology will be used to estimate the evapotranspiration (ET) component of the State's water budget. The objective is to modify the remote sensing model known as SSEBop model in collaboration with Gabriel Senay of Colorado USGS office to create a more accurate model which can estimate water use of crops and other vegetation in New Mexico. The specific objectives are;

1. To modify the SSEBop model for better estimation of ET in agricultural and riparian vegetation.
2. To validate the accuracy of the modified SSEBop model by using results from ground ET and micrometeorological measurements, and REEM generated ET values in New Mexico LRG and MRG.
3. Organize a workshop to demonstrate the application of the SSEBop model for regional estimation of ET based on Landsat as well as MODIS images

The impact of this project will be improved accounting of New Mexico water which is necessary for better management of water resources in NM.

4. **Brief description of methodology**

The methodology uses satellite multispectral images to estimate water use on the land surface. Satellite images are available every two weeks. The satellite images have a resolution of 30 m. The remote sensing model uses the information from the satellite image to account for surface energy balance and calculate the ET and crop coefficient (Kc). For days where satellite image is not available, Kc combined with climate data is used to interpolate the ET. The end result is a consistent high resolution ET map which can be used in various aspects of water budget assessment.

5. Brief description of results to date and work remaining

We have set up an outline of the process that we need to follow. But since we received the notice of award recently, we are still in the process of setting up an account. As soon as the account is set up, we will proceed with hiring students and starting the model development.

6. Student participation - List all students participating in the project, their classification level (undergraduate, master's, Ph.D., post doc) and their field of study (degree major)

We plan to hire one Ph.D. from computer science and one M.S. student from water resource to work jointly in the project.

7. Provide special recognition awards or notable achievements as a result of the research. Include publications in progress (all published work supported wholly or in part of NM WRRRI must bear an acknowledgment of support)

N/A

8. Include references as needed (limit to one additional page)

N/A

9. Provide a few sentences on progress toward uploading data to a common/standardized platform, if applicable.

N/A

10. Provide two PP slides that provide summary information on your project appropriate for viewing by state legislators.

The main objective of this project is to develop remote sensing tools for estimating crop water use (ET). The specific benefits of the project are to improve;

- 1. water budget calculations in various watersheds in New Mexico**
- 2. agricultural water management in New Mexico**
- 3. water conservation in New Mexico**
- 4. economic return in New Mexico Agriculture**