

FY15 NM WRI Research Progress Report Form

Report Due Date: September 8, 2014

1. **Project Title:** Statewide Water Assessment: Surface-Water Inflow, Outflow, Gains, and Losses in New Mexico.
2. **Investigators (names, university/agency):** Nathan Myers, Matt Ely, and Joe Affinati, U.S. Geological survey, Albuquerque, NM
3. **Brief description of project, research objectives, and impacts on New Mexico (provide performance measures and outcomes):** Surface water is the primary source of water for irrigators along major stream corridors in New Mexico and is increasingly being utilized by large municipalities, such as Albuquerque and Santa Fe, for potable water supply. Minimum surface-water flows into and out of the State are regulated by interstate compacts, but the total quantity of surface water can vary widely from year to year. In addition, the timing and volume of peak surface-water flows is changing because of changes in precipitation patterns and increases in mean annual temperatures.

The objectives of the proposed work are to

- Quantify the volume of streamflow entering and leaving New Mexico at selected stream gages at or near State borders and at Interstate Compact gages and
- Quantify streamflow gains and losses between selected gages in New Mexico.

The data will be provided as a set of Geographic Information System (ArcGIS) files, suitable for integration into a Statewide Water Assessment database. Within a Statewide Water Assessment database streamflow data and derived statistics could be used by water managers to plan for the best patterns of storage and use of surface water within the State while still meeting Compact obligations.

4. **Brief description of methodology:** Daily mean streamflow data will be obtained from the network of USGS streamflow gages in New Mexico and adjacent states. Gages selected for data analysis will include gages along major streams and selected tributaries in the State. Where major streams cross State borders, a gage near the border, either in New Mexico or in the adjoining State, will be included in the set of gages selected for analysis. Daily mean streamflow data and derivative products will be stored in ArcGIS files that are compatible with others being prepared for the Statewide Water Assessment database. Differences in monthly mean streamflow at selected gages will be analyzed for gains and losses in streamflow. For visualization of patterns of streamflow gains and losses, stream reaches between selected gages will be categorized on a seasonal basis as strongly gaining, gaining, no gain/loss, losing, and strongly losing.

5. Brief description of results to date and work remaining:

- **Results to Date**
 - An initial selection of candidate streams has been done.
 - Gages along the candidate streams have been identified.
 - Initial streamflow data for analyses has been obtained.

- **Work Remaining**

- Screen candidate streams to eliminate those without substantial quantities of surface water or that are part of a drainage system that does not cross the State's borders.
- Screen gages and select those to be used for study.
- Download streamflow data for selected gages.
- Load streamflow data into GIS files.
- Explore temporal and spatial aspects of streamflow data.
- Determine feasible time interval for analyses.
- Compute differences in streamflow between gages.
- Identify gaining and losing stream reaches.
- Document digital data sets (metadata).
- Write report.

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

- Joe Affinati, Masters Candidate, University of New Mexico Water Resources Program.

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 WRRI must bear an acknowledgment of support):

- NA

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

- NA

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

- Data will be provided in GIS format and will be documented according to Federal Geographic Data Committee (FGDC) and USGS standards for release of digital data sets.