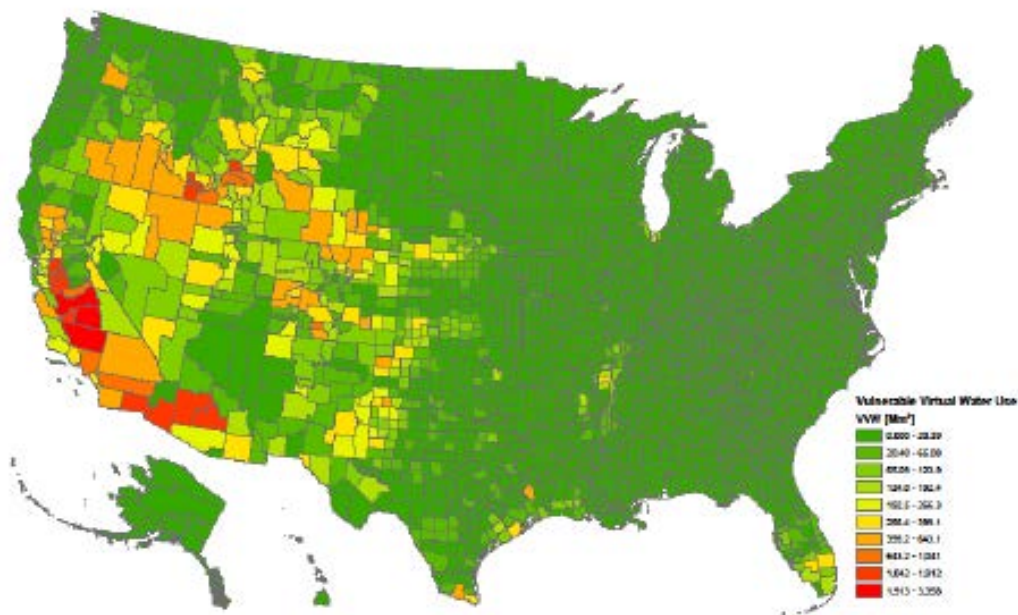


RECLAMATION

Managing Water in the West

Mapping the Indirect Economic Impacts of Climate Change and Water Supply Shortages: Supplementing the Colorado River Basin Study with Innovative Information

Research and Development Office
Science and Technology Program
Final Report ST-2016-5222



U.S. Department of the Interior
Bureau of Reclamation
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Mission Statements

The U.S. Department of the Interior protects and manages the Nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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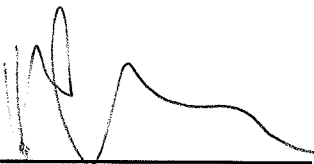
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Peer Reviewer: I have reviewed the assigned items/sections(s) noted for the above document and believe them to be in accordance with the project requirements, standards of the profession, and Reclamation policy.

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Executive Summary

Problem

Generally, water managers evaluate future water demands based on direct water use. However, water is embedded in the products that we use and this indirect use is not commonly tracked or integrated into economic analyses of water resource studies. The Colorado River Basin Water Supply and Demand Study (CRBS) indicated that challenges related to water supply and demand imbalances in the Colorado River Basin will increase over the next 50 years. It could be informative to understand the indirect economic impacts of water use associated with potential imbalances identified in the CRBS and include these impacts in economics analyses of adaptive management alternatives.

Dr. Benjamin L. Ruddell, Director of the National Water Economy Project (NWEF), developed the NWEF during five years of research investment at Arizona State University (ASU). The NWEF compiles indirect water use data at the county level from across the country for potential use to assess impacts of climate change and drought on water resources for management decisions, including allocation, reallocation, trade, and conservation. The NWEF has not yet been used in water resource management decision making.

The Principal Investigator partnered with Dr. Ruddell and submitted a conducting proposal to the Science and Technology Program titled “Mapping the Indirect Economic Impacts (IEI) of Climate Change and Water Supply Shortages” in FY2015. During review of the proposal, the value of the study was acknowledged; however, review comments identified that the proposal did not establish collaborations with proposed partners; lacked information about the scope, need, and capability of the NWEF to produce outcomes; and did not clearly identify results. Although the conducting proposal was not accepted, funds were made available contingent upon the conducting proposal being converted to a scoping proposal to address the review comments.

The scoping study assessed the potential for the Bureau of Reclamation (Reclamation) to use the NWEF to map direct water use and impacts on indirect water use for the CRBS and apply the information in economics analyses of adaptive management strategies under climate change. The proposed study would provide information that could be used to manage risk by identifying indirect water use and strategies to diversify water resource use during imbalances to support local and national water resource sustainability.

Reclamation scoping proposal review comments included the following recommendations: develop collaborations with Reclamation staff in the Lower Colorado Region, Upper Colorado Region and the WaterSMART Program; identify budget details for valuation of partner Dr. Ruddell’s in-kind data sharing;

conduct a workshop and literature search; and develop a refined scope of work for preparation of a potential conducting proposal.

In addition, it was advised that any follow-up research and activities to supplement CRBS-related activities should include coordination and support from the CRBS team. Recommendations were made to coordinate with Reclamation staff working on the CRBS Moving Forward effort to ensure that there was no overlap or stakeholder objection. Further, recommendations were made for the research team to partner with Reclamation Technical Service Center staff who have expertise and knowledge of CRBS-related activities.

Scoping Study

The first scoping study task was to identify partners within Reclamation who would participate with the process.

Reclamation CRBS staff and economists were identified as points of contact who may be interested in participating with the study.

The following outreach was completed for the study:

- November 3, 2015, meeting with Ben Ruddell. Planning meetings were held and preparations made to conduct informational meetings with Reclamation staff.
- November 18, 2015, meeting with West Salt River Valley Basin Study and Lower Santa Cruz River Basin Study program managers to discuss value of IEI. The consensus was that it was unclear how the NWEP could be used and what the outcome would be.
- December 10, 2015, meeting with CRBS staff to identify if the IEI study could provide information to supplement CRBS-related activities..
- January 12, 2016, planning meeting with Ben Ruddell.
- February 22, 2016, meeting with Ben Ruddell and Reclamation's economists and CRBS staff.
- March 24, 2016, meeting with Ben Ruddell and Reclamation CRBS and Economist staff.
- April 4, 2016, meeting with Ben Ruddell and Reclamation CRBS and Economist staff.

Scoping Study Results

Following six months of coordination with Reclamation CRBS staff and economic analysts, no partnerships were formed and a potential study was not identified. Based on a lack of interest and support for the study, it was determined that no further work would be completed and the study was terminated.

Scoping Study Recommendations

Based on the lack of interest during the scoping proposal, the study was discontinued and subsequently, a conducting proposal was not submitted. The lack of participant interest may have been due to insufficient planning prior to submitting the proposal. Based on this, it is recommended that the following tasks be completed prior to submittal of any future proposals to study IEI:

- Develop a more in-depth understanding of Reclamation studies and proposed methods to integrate NWEF into current Reclamation planning efforts.
- Coordinate with Reclamation staff to identify potential partnerships and on-going or future Reclamation study needs.
- Collaborate with partners to identify approaches to utilize the NWEF and build on or augment economic analyses for Reclamation studies.
- Support student projects (through Dr. Ruddell and ASU) to assess CRBS-related activities could benefit from use of the NWEF and assess how NWEF data may be used to develop water resource management alternatives.

Reference

Reclamation, 2012. Colorado River Basin Water Supply and Demand Study. December 2012. U.S. Department of Interior, Bureau of Reclamation.

