Accepted Manuscript

Assessing the Effects of Water Restrictions on Socio-Hydrologic Resilience for Shared Groundwater Systems

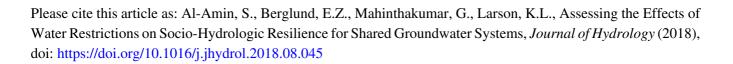
Shams Al-Amin, Emily Z. Berglund, G. Mahinthakumar, Kelli L. Larson

 PII:
 S0022-1694(18)30641-3

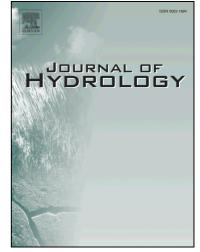
 DOI:
 https://doi.org/10.1016/j.jhydrol.2018.08.045

 Reference:
 HYDROL 23059

To appear in: *Journal of Hydrology*



This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



ACCEPTED MANUSCRIPT

Assessing the Effects of Water Restrictions on Socio-Hydrologic Resilience for Shared Groundwater Systems

⁴ Shams Al-Amin[†], Emily Z. Berglund[†], G. Mahinthakumar[†], Kelli L. Larson[‡]

⁵ [†]Civil, Construction, and Environmental Engineering, North Carolina State University,

8 Abstract

Groundwater resources are shared across management boundaries. Multiple management units that differ in scale, constraints and objectives may manage a shared resource in a decentralized approach. The interactions among water managers, water users, and the water resource components influence the performance of management strategies and the resilience of communitylevel water supply and groundwater availability. This research develops an agent-based modeling (ABM) framework to capture the dynamic interactions among household-level consumers and policy makers to simulate water demands. The ABM is coupled with a groundwater model to evaluate effects on the groundwater table. The framework is applied to explore trade-offs between improvements in water supply sustainability for local resources and water table changes at the basin-level. A group of municipalities are simulated as agents who share access to a groundwater aquifer in Verde River Basin, Arizona. The framework provides a holistic approach to incorporate water user, municipal, and basin level objectives in evaluating water reduction strategies for long-term water resilience.

Keywords:

¹⁰ agent-based model, complex adaptive system, groundwater management,

¹¹ demand management, water shortage, sustainability index

⁶ [‡]School of Geographical Sciences and Urban Planning and School of Sustainability, ⁷ Arizona State University

Download English Version:

https://daneshyari.com/en/article/11024777

Download Persian Version:

https://daneshyari.com/article/11024777

Daneshyari.com