

Water resilience challenges for groundwater dependent communities along the United States-Mexico Border

2021 Symposium on Resilience Research for Global Development Challenges

30 September 2021

Sharon B. Megdal, Ph.D., Director, UArizona Water Resources Research Center

smegdal@arizona.edu

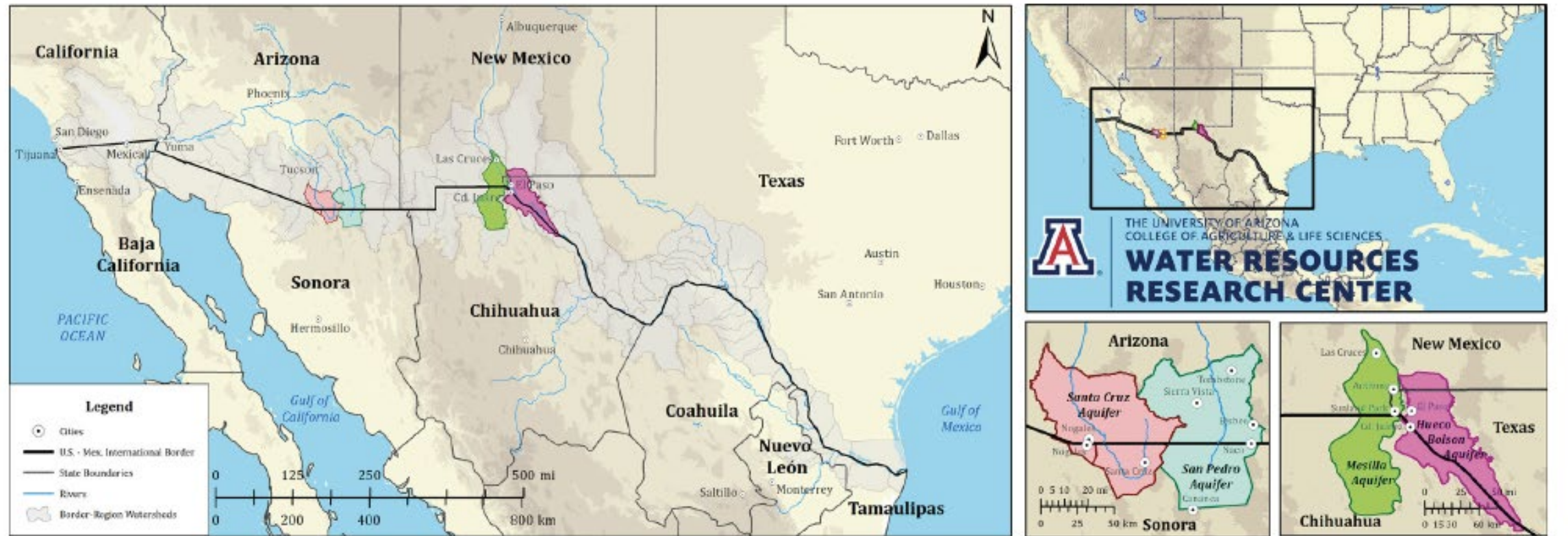
wrrc.arizona.edu

Communities along the US-MX border depend on groundwater but little historical cooperation on characterizing aquifer systems

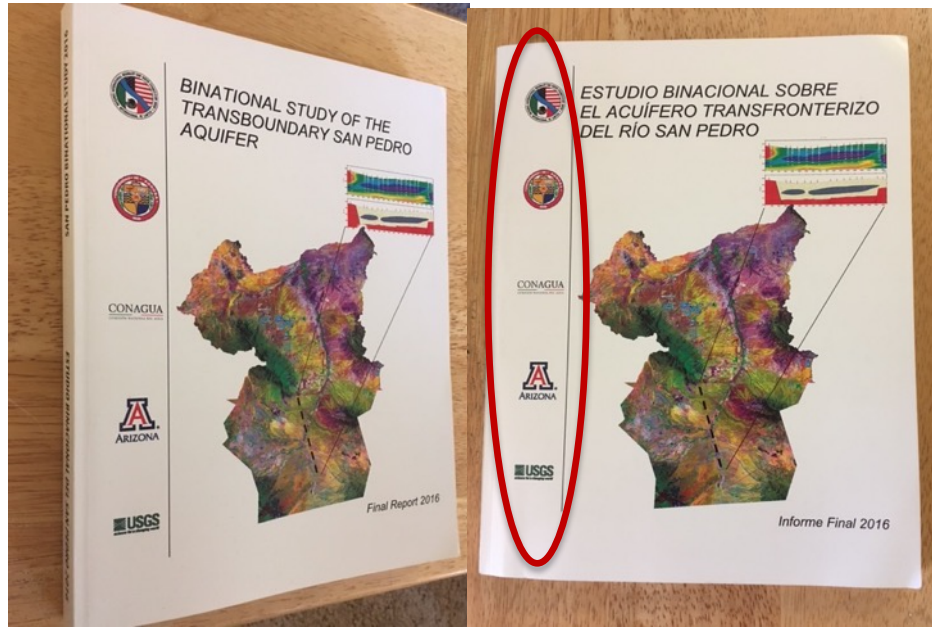
Transboundary Aquifer Assessment Program (TAAP) – est. 2009

US involvement authorized by US Congress in 2006; funding follows a unique model, with the WRRC as the designated USGS partner for AZ

Transboundary Aquifer Assessment Program Aquifers of Focus



Data acquisition, harmonization, and analyses



First-ever binationally approved, bilingual study of a shared aquifer – The San Pedro (2016); finalizing the Santa Cruz (Note the logos)

Journal of Hydrology: Regional Studies 20 (2018) 60–73

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Journal of Hydrology: Regional Studies

journal homepage: www.elsevier.com/locate/ejrh

Findings and lessons learned from the assessment of the Mexico-United States transboundary San Pedro and Santa Cruz aquifers: The utility of social science in applied hydrologic research

J.B. Callegary^{a,*}, S.B. Megdal^b, E.M. Tapia Villaseñor^b, J.D. Petersen-Perlman^b, I. Minjárez Sosa^c, R. Monreal^c, F. Gray^a, F. Grijalva Noriega^c

^a USGS 520 N Park Ave, Tucson, AZ, 85719, USA
^b University of Arizona, 350 N Campbell Ave, Tucson, AZ 85719, USA
^c Universidad de Sonora, Calle Av. Rosales SN, Centro, 83000 Hermosillo, Son., Mexico

See wrrc.arizona.edu/TAAP

Journal of Hydrology 521 (2015) 18–33

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Climate change and water resources management in the Upper Santa Cruz River, Arizona

Eylon Shamir^{a,*}, Sharon B. Megdal^b, Carlos Carrillo^c, Christopher L. Castro^c, Hsin-I Chang^c, Karletta Chief^c, Frank E. Corkhill^d, Susanna Eden^b, Konstantine P. Georgakakos^{a,d}, Keith M. Nelson^d, Jacob Prietto^b

JOURNAL OF THE AMERICAN WATER RESOURCES ASSOCIATION

Vol. 56, No. 3 AMERICAN WATER RESOURCES ASSOCIATION June 2020

Impacts of Variable Climate and Effluent Flows on the Transboundary Santa Cruz Aquifer

Elia M. Tapia-Villaseñor, Eylon Shamir, Sharon B. Megdal, and Jacob D. Petersen-Perlman

Research Impact Statement: Conceptual water budget models are useful to guide and improve decision-making processes in transboundary settings.

Studies about governance and institutions

Water **2011**, *3*, 949-963; doi:10.3390/w3030949

OPEN ACCESS

<https://www.mdpi.com/2073-4441/3/3/949>

water

ISSN 2073-4441

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Article

The Importance of Institutional Asymmetries to the Development of Binational Aquifer Assessment Programs: The Arizona-Sonora Experience

Sharon B. Megdal ^{1,*} and Christopher A. Scott ²



<https://www.mdpi.com/2073-4441/13/17/2364>



Article

Science and Binational Cooperation: Bidirectionality in the Transboundary Aquifer Assessment Program in the Arizona-Sonora Border Region

Jacob D. Petersen-Perlman ^{1,2,*}, Tamee R. Albrecht ^{3,4}, Elia M. Tapia-Villaseñor ⁵, Robert G. Varady ³ and Sharon B. Megdal ²



<https://www.mdpi.com/2073-4441/13/4/530>



Article

The U.S.-Mexico Transboundary Aquifer Assessment Program as a Model for Transborder Groundwater Collaboration

Elia M. Tapia-Villaseñor ^{1,*} and Sharon B. Megdal ²

¹ Departamento de Geología, Universidad de Sonora, Hermosillo 83000, Mexico

² Water Resources Research Center, The University of Arizona, Tucson, AZ 85719, USA; smegdal@arizona.edu

* Correspondence: elia.tapia@unison.mx

Special issue in progress: Advances in Transboundary Aquifer Assessment

https://www.mdpi.com/journal/water/special_issues/transboundary_aquifer

Six papers published; several papers still under preparation and/or review.

Ongoing border work and dialogues

- Coauthor on a *Water International* paper (Sanchez et al. (binational authorship)) looking at groundwater security and resilience along the border
- Megdal et al. (binational authorship), “Reaching Groundwater Agreements on the Border Between Mexico and the United States: Science and Policy Fundamentals,” has been selected for presentation at the December 2021 UNESCO conference on shared aquifers. The final version of the paper will be included in a UNESCO publication.
- **MUCH** other work at the University of Arizona and elsewhere.
- Binational Forum on Transboundary Waters:
<https://binationalwaters.tamu.edu/>



Binational work group for the states of Arizona, US and Sonora, MX 11 April 2019

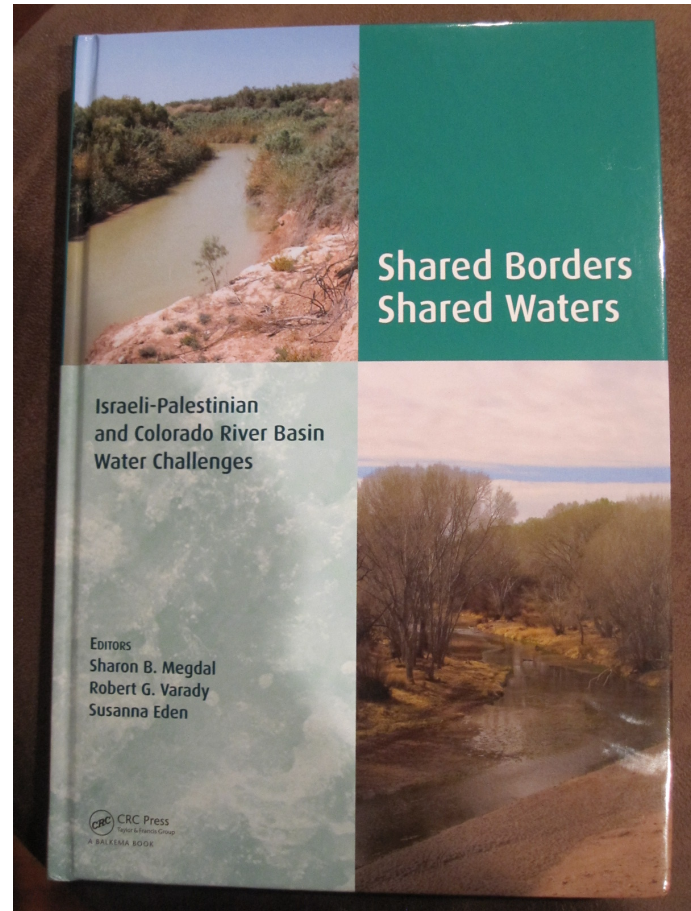
Taken at Binational Groundwater Summit convened by the International Boundary and Water Commission, El Paso, Texas USA

Reliance on groundwater is growing. Sustainable groundwater management and resilience of communities dependent on this invisible water supply are of critical importance globally.

Have connected binational and groundwater efforts to other parts of the world



Workshop, The Hashemite University, Zarqa, Jordan with HRH Prince El Hassan bin Talal 14 April 2019



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- “Local” collaborators: Elia Tapia-Villaseñor, Mary-Belle Cruz Ayala, Eylon Shamir, James Callegary
- Thanks to the many partners, who are too numerous to list here. Many can be found on the prior slides. More details can be found on the TAAP website noted below.
- Lead agency partners for Arizona-Sonora efforts: US Geological Survey, International Boundary and Water Commission, CONAGUA, and University of Sonora.

smegdal@arizona.edu
wrrc.arizona.edu/TAAP
Twitter @SBMWater