Groundwater Along the US-MX Border: Assessment and Opportunities for Binational Management

Sharon B. Megdal, Ph.D.

SNRE Seminar

October 9, 2024

THE UNIVERSITY OF ARIZONA
COOPERATIVE EXTENSION
WATER RESOURCES RESEARCH CENTER

smegdal@arizona.edu

WRRC HOME PAGE

wrrc.arizona.edu

WRRC's involvement in Transboundary Aquifer Assessment Program (TAAP)

WRRC TAAP

WRRC TAAP ESPAÑOL

2006

January-February 2007 Arizona Water Resource 11

Public Policy Review by Sharon Megdal

Front-Row View of Federal Water Lawmaking Shows Process Works

U.S. – Mexico Transboundary Aquifer Assessment Act pondered, passed and signed

Otto von Bismarck reportedly once said, "Laws are like sausages, it is better not to see them being made." I am not sure what to make of this remark since lawmaking, not sausage making, is my interest. It is an interest that recently broadened when I had the privilege of testifying before the Water and Power Subcommittee of the House Resources Committee on the United States-Mexico water resource issues. The program also will serve as a catalyst bringing together the human capital and financial resources necessary to characterize transboundary aquifers. The resulting increased understanding should help resolve many of the currently unquantified — and therefore unresolved — water resource issues.

I emphasized the importance of water to the growing, arid Southwest, especially along the border where population continues to grow rapidly on both sides. Water resource issues become more complex and acute along the shared border where understanding

120 STAT. 3328 PUBLIC LAW 109–448—DEC. 22, 2006

Public Law 109–448
109th Congress

An Act

Dec. 22, 2006
[S. 214]

To authorize the Secretary of the Interior to cooperate with the States on the border with Mexico and other appropriate entities in conducting a hydrogeologic characterization, mapping, and modeling program for priority transboundary aquifers, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

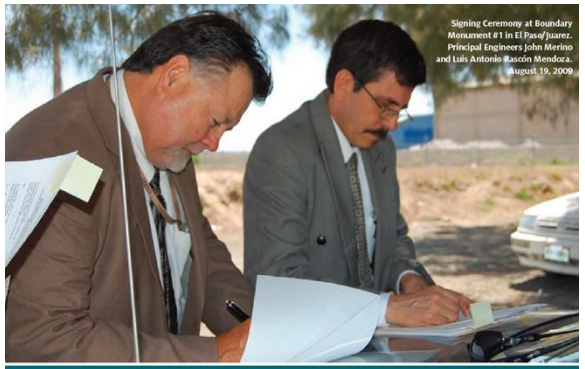
United States-Mexico Transboundary Aquifer Assessment Act.
42 USC 1962 note.
42 USC 1962 note.

SECTION 1. SHORT TITLE.

This Act may be cited as the "United States-Mexico Transboundary Aquifer Assessment Act".

SEC. 2. PURPOSE.

The purpose of this Act is to direct the Secretary of the Interior to establish a United States-Mexico transboundary aquifer assessment program to systematically assess priority transboundary aquifers.



Reflections on the 10th Anniversary of the Transboundary Aquifer Assessment Program and the Importance of its Joint Cooperative Process

by Sharon B. Megdal
08/23/2019

On August 19, 2009, the Principal Engineers representing the binational International Boundary and Water Commission (IBWC) signed the "Joint Report of the Principal Engineers Regarding the Joint Cooperative Process United States-Mexico for the Transboundary Aquifer Assessment Program" (Joint Report). The joint

118TH CONGRESS
1ST SESSION

H. R. 5874

To amend the United States-Mexico Transboundary Aquifer Assessment Act to reauthorize the United States-Mexico transboundary aquifer assessment program.

2023

IN THE HOUSE OF REPRESENTATIVES

OCTOBER 3, 2023

Mr. CISCOMANI (for himself and Ms. STANSBURY) introduced the following bill; which was referred to the Committee on Natural Resources

A BILL

To amend the United States-Mexico Transboundary Aquifer Assessment Act to reauthorize the United States-Mexico transboundary aquifer assessment program.

Sept. 25, 2024 - S.5230 introduced

TAAP Reauthorization Legislation (House Bill)

118TH CONGRESS
1ST SESSION

H. R. 5874

To amend the United States-Mexico Transboundary Aquifer Assessment Act to reauthorize the United States-Mexico transboundary aquifer assessment program.

IN THE HOUSE OF REPRESENTATIVES

OCTOBER 3, 2023

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A BILL

To amend the United States-Mexico Transboundary Aquifer Assessment Act to reauthorize the United States-Mexico transboundary aquifer assessment program.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1. SHORT TITLE.

This Act may be cited as the "Transboundary Aquifer Assessment Program Act" or the "TAAP Act".

SEC. 2. REAUTHORIZATION OF TRANSBOUNDARY AQUIFER ASSESSMENT PROGRAM.

(a) DESIGNATION OF PRIORITY TRANSBOUNDARY AQUIFERS.—Section 4(c)(2) of the United States-Mexico

Transboundary Aquifer Assessment Act (42 U.S.C. 1962 note; Public Law 109–448) is amended by striking "New Mexico or Texas" and inserting "New Mexico, Texas, or Arizona (other than an aquifer underlying Arizona and Sonora, Mexico, that is partially within the Yuma groundwater basin designated by the order of the Director of the Arizona Department of Water Resources dated June 21, 1984)".

(b) AUTHORIZATION OF APPROPRIATIONS.—Section 8(a) of the United States-Mexico Transboundary Aquifer Assessment Act (42 U.S.C. 1962 note; Public Law 109–448) is amended by striking "fiscal years 2007 through 2016" and inserting "fiscal years 2025 through 2035".

(c) SUNSET OF AUTHORITY.—Section 9 of the United States-Mexico Transboundary Aquifer Assessment Act (42 U.S.C. 1962 note; Public Law 109–448) is amended by striking "enactment of this Act" and inserting "enactment of the Transboundary Aquifer Assessment Program Act".

○

Testimony before
U.S. House of Representatives
Committee on Natural Resources
Subcommittee on Water, Wildlife and Fisheries
With respect to H.R. 5874
To amend the United States-Mexico Transboundary Aquifer Assessment Act to reauthorize the United States-Mexico transboundary aquifer assessment program.

Written Testimony of Sharon B. Megdal, Ph.D.
Director, Water Resources Research Center, A Cooperative Extension Center
Faculty Member, Department of Environmental Science and Cooperative Extension
The University of Arizona, Tucson, Arizona

October 25, 2023

November 9, 2023

Mr. Thomas Shipman, Jr.
thomas.shipman@mail.house.gov
U.S. House of Representatives
Committee on Natural Resources
Subcommittee on Water, Wildlife and Fisheries
Washington, DC 20513

Sent via email:

Dear Mr. Shipman,

Attached to this letter please find responses to the questions transmitted via letter dated October 30, 2023, from Representative Cliff Bentz, Chairman, Subcommittee on Water, Wildlife and Fisheries.

I thank Representative Ciscomani for these questions and Chairman Bentz for the opportunity to provide these written responses. Please let me know if you have any questions about these responses.

Sincerely,

Sharon B Megdal

Sharon B. Megdal, Ph.D.
Director, University of Arizona Water Resources Research Center
Professor, Department of Environmental Science
C.W. and Modene Neely Endowed Professor
Distinguished Outreach Professor

https://wrrc.arizona.edu/publication/reflections-testifying-reauthorization-transboundary-aquifer-assessment-program

Policy and governance aspects are important

- National sovereignty
- Asymmetry in approaches to groundwater governance
- Multiple agencies and entities involved
  - International Boundary and Water Commission serves as facilitating binational agency
  - US Geological Survey implementing US federal agency
  - CONAGUA (Mexican National Water Agency) key agency in Mexico
  - Federally authorized Water Resources Research Institutes (WRRIs) for AZ (WRRC), NM, and TX written into the legislation
  - University of Sonora involved in assessment of Arizona-Sonora priority aquifers
- Development of the cooperative framework document took considerable time.

Photo taken 19 August 2009

https://www.ibwc.gov/wp-content/uploads/2023/05/Joint_Report_TAAP_081909.pdf

Six Principles of Agreement in Joint Report (Cooperative Framework)

1. Activities described under this agreement should be beneficial to both countries.
2. Aquifers to be jointly studied, as well as the scope of the studies or activities to be done on each aquifer, should be agreed upon with the framework of the IBWC.
3. The activities should respect the legal framework and jurisdictional requirements of each country.
4. No provisions set forth in this agreement will limit what either country can do independently in its own territory.
5. Nothing in this agreement may contravene what has been stipulated in the Boundary and Water Treaties between the two countries.
6. The information generated from these projects is solely for the purpose of expanding knowledge of the aquifers and should not be used by one country to require that the other country modify its water management and use.

water https://doi.org/10.3390/w13040530 MDPI

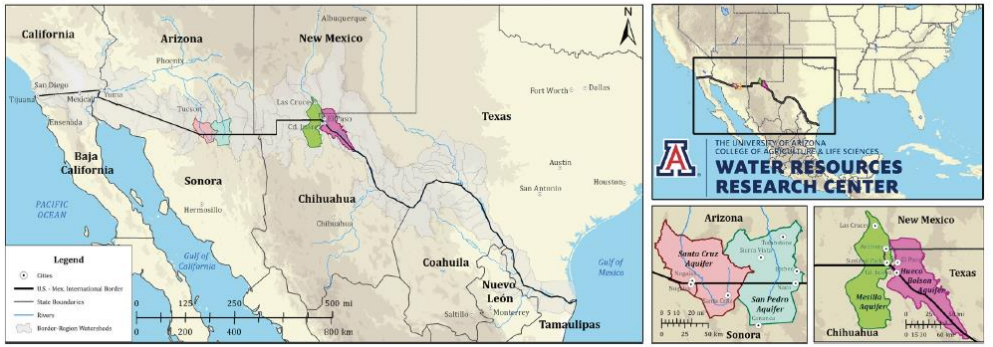
Article

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

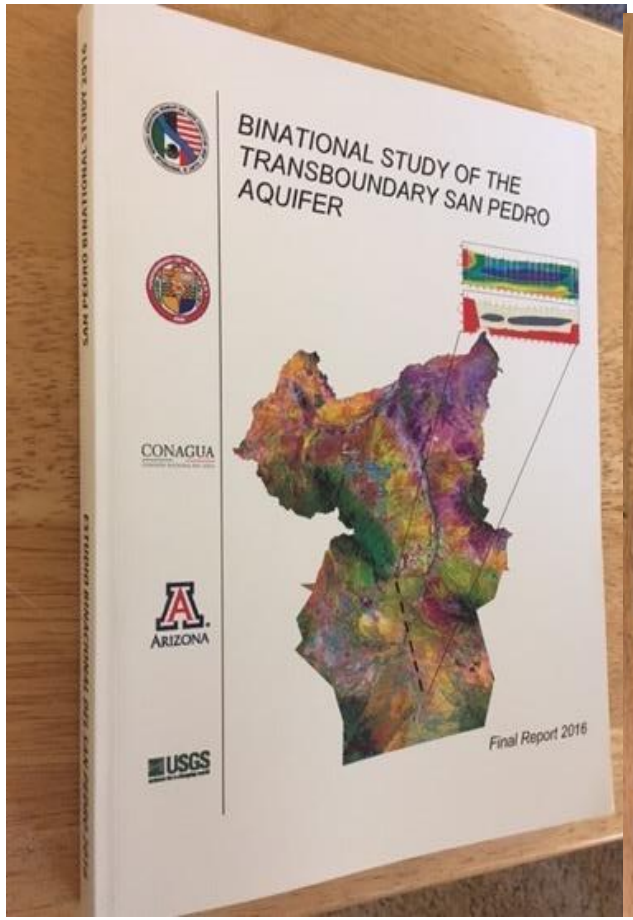
Elia M. Tapia-Villaseñor [1,*] and Sharon B. Megdal [2]

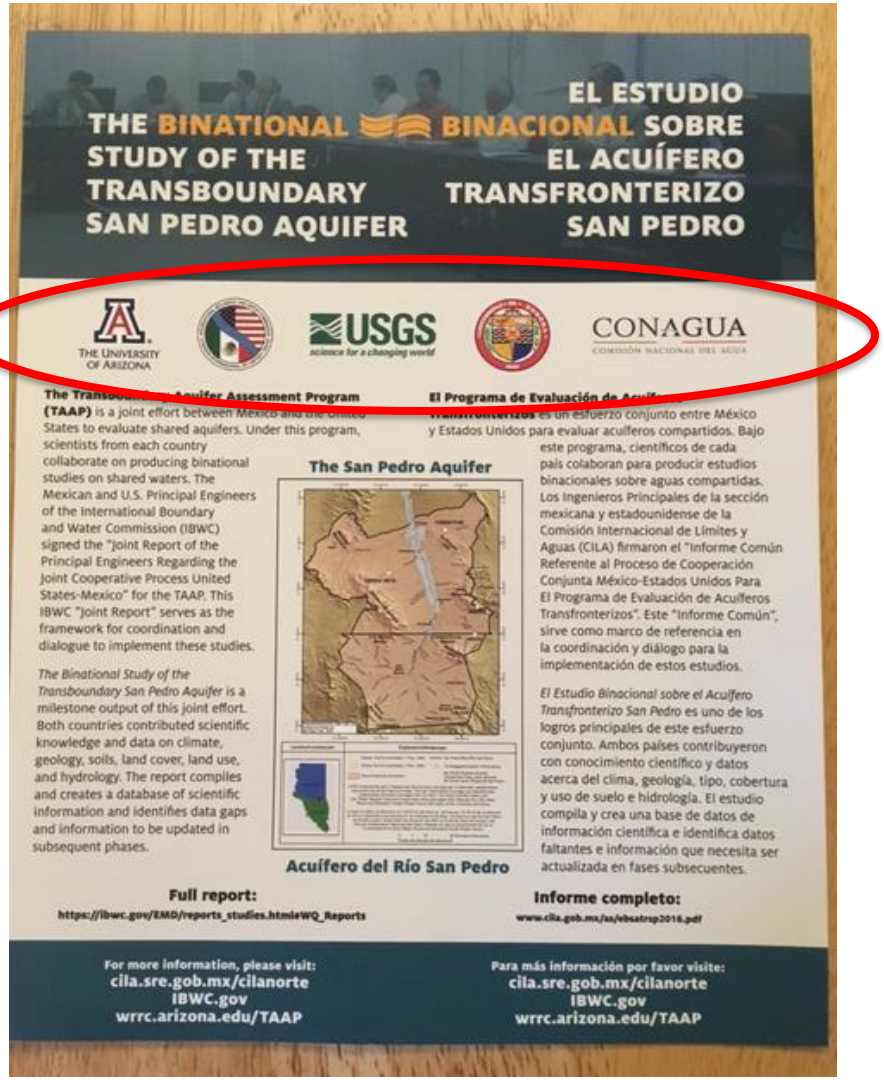
[1] Departamento de Geología, Universidad de Sonora, Hermosillo 83000, Mexico
[2] Water Resources Research Center, The University of Arizona, Tucson, AZ 85719, USA; smegdal@arizona.edu
* Correspondence: elia.tapia@unison.mx

Transboundary Aquifer Assessment Program Aquifers of Focus



Focus on the Arizona-Sonora border…
Binational San Pedro Report completed in 2016
Santa Cruz Report nearing finalization





Much work went into harmonizing maps and data

BINATIONAL INFORMATION

Topics Covered in Report

- Physical Geography
- Surface-Water Hydrology and Hydrometeorology
- Conceptual Geologic Model
- Hydrogeology
- Piezometry and Hydraulic Parameters
- Hydrogeochemistry
- Conceptual and Numerical Groundwater Models

Recommendations from the Technical Team

- Monitor water use and groundwater extractions
- Measure piezometric levels
- Measure surface flows
- Expand climate observation network
- Measure evapotranspiration and vegetation change
- Monitor water quality and sample for stable isotopes
- Use of geophysical and remote sensing methods
- Research drilling
- Generate a binational soils map
- Create a standardized database
- Update the existing binational groundwater flow model

INFORMACIÓN BINACIONAL

Temas Cubiertos en el Reporte

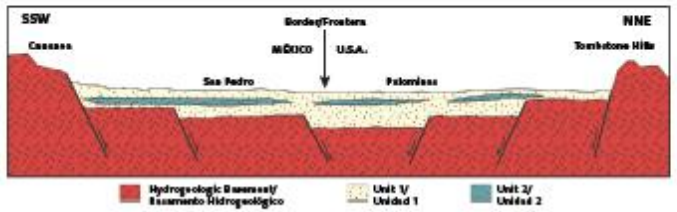
- Geografía Física
- Hidrología Superficial y Subterránea
- Modelo Geológico Conceptual
- Hidrogeología
- Piezometría y Parámetros Hidráulicos
- Hidrogeoquímica
- Modelos de Agua Subterránea: Conceptual y Numérico

Recomendaciones del Equipo Técnico

- Monitoreo de uso y extracción de agua subterránea
- Medir niveles piezométricos
- Medir el flujo superficial
- Expandir la red de observación climatológica
- Medir evapotranspiración y cambios de vegetación
- Monitoreo de calidad de agua y muestreo de isótopos estables
- Utilización de métodos geofísicos y de sensoría remota
- Perforación exploratoria
- Generar una carta binacional de suelos
- Crear una base de datos estandarizada
- Actualizar el modelo binacional de flujo de agua subterránea existente

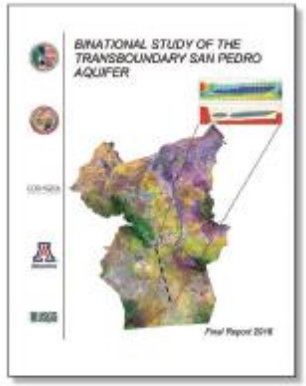
Schematic Interpretation of the Binational San Pedro Basin
Interpretación Esquemática de la Cuenca Binacional San Pedro

For more information on the schematic cross section please see Section 4.6 in the report.
Para más información sobre la sección esquemática, vea la Sección 4.6 en el informe.



BINATIONAL COLLABORATION

The San Pedro Report is the first-ever binational aquifer study prepared and released simultaneously in English and Spanish by the International Boundary and Water Commission.



Mapping Efforts

- 20 binational maps about climate, hydrology, geology, land use, soil distribution, vegetation, etc.
- 12 binational water quality maps
- 2 binational maps with information on depth and surface groundwater level for the year 2011

Binational Efforts

18 binational meetings between 2010 and 2016

COLABORACIÓN BINACIONAL

El Informe Binacional sobre el acuífero San Pedro es el primer estudio binacional sobre este acuífero preparado y publicado simultáneamente en inglés y español por la Comisión Internacional de Límites y Aguas.

Esfuerzos Cartográficos

- 20 mapas binacionales acerca del clima, hidrología, geología, uso y tipo de suelo, vegetación, etc.
- 12 mapas binacionales de calidad de agua
- 2 mapas binacionales con información de profundidad y elevación de agua subterránea para el año 2011

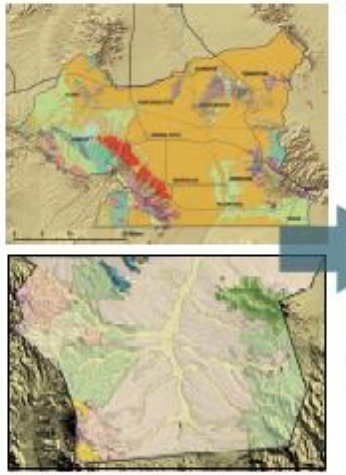
Esfuerzos Binacionales

18 reuniones binacionales entre 2010 y 2016

BINATIONAL COLLABORATION

Harmonization Efforts

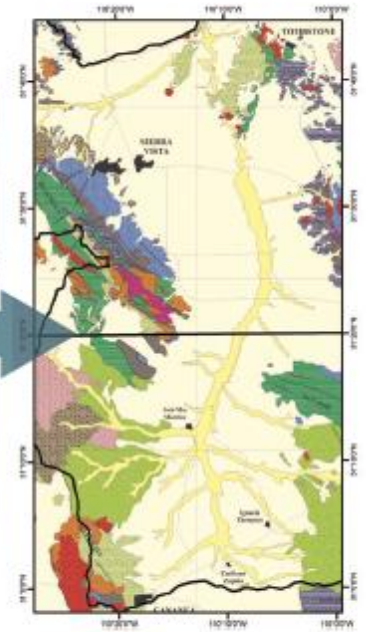
Merging different classification systems to create unique and harmonized maps for the U.S. and Mexico for geology and hydrostratigraphic units



COLABORACIÓN BINACIONAL

Esfuerzos de Armonización

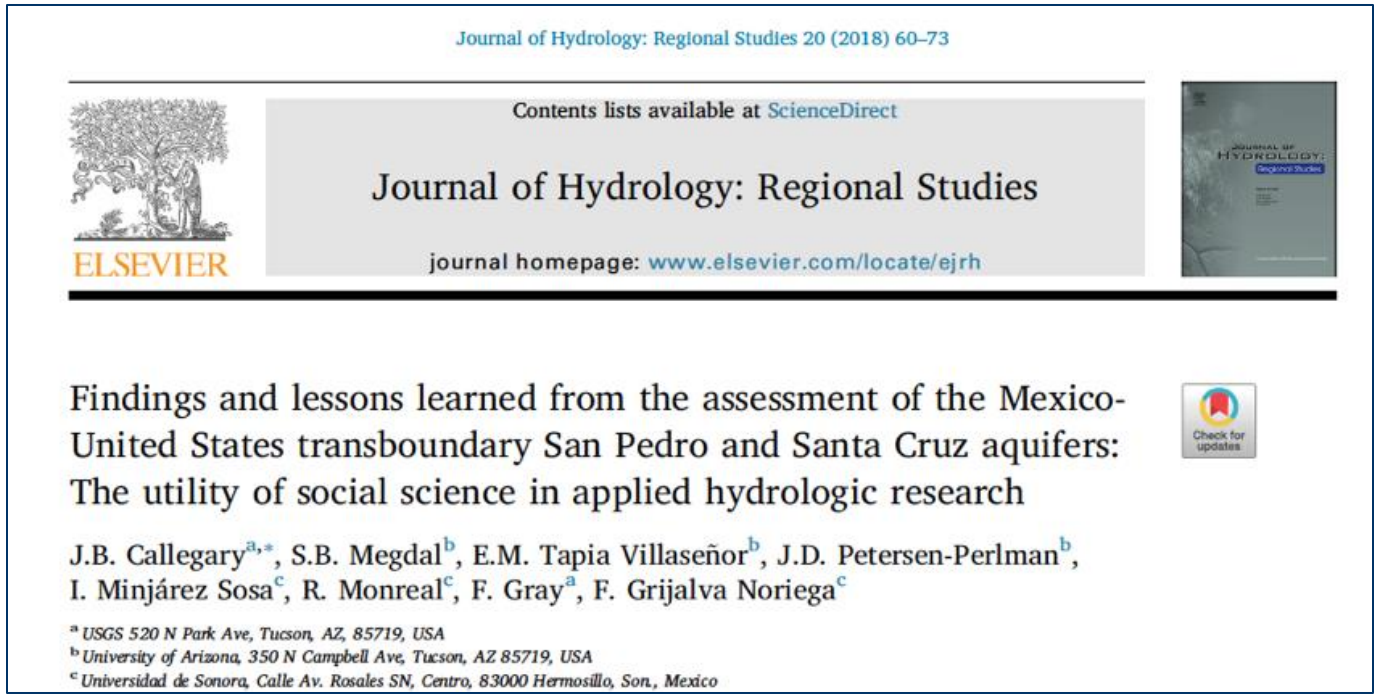
Combinar diferentes sistemas de clasificación para crear mapas únicos y armonizados para los Estados Unidos y México sobre geología y unidades hidroestratigráficas



Documenting the collaboration – 2018

Callegary et al.

https://doi.org/10.1016/j.ejrh.2018.08.002



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

Contents lists available at ScienceDirect

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

"We feel that the methods developed in this paper, if used appropriately and flexibly, will help to fill data gaps, add skill sets, and build relationships in those areas in which typical aquifer assessments are weakest and where transboundary aquifer assessments are most in need: socio-political and historical information, governance, legal and institutional frameworks, cultural sensitivity, communication and stakeholder engagement among others."

Documenting the science – impacts of variable climate and effluent flows – 2020

Tapia et al.

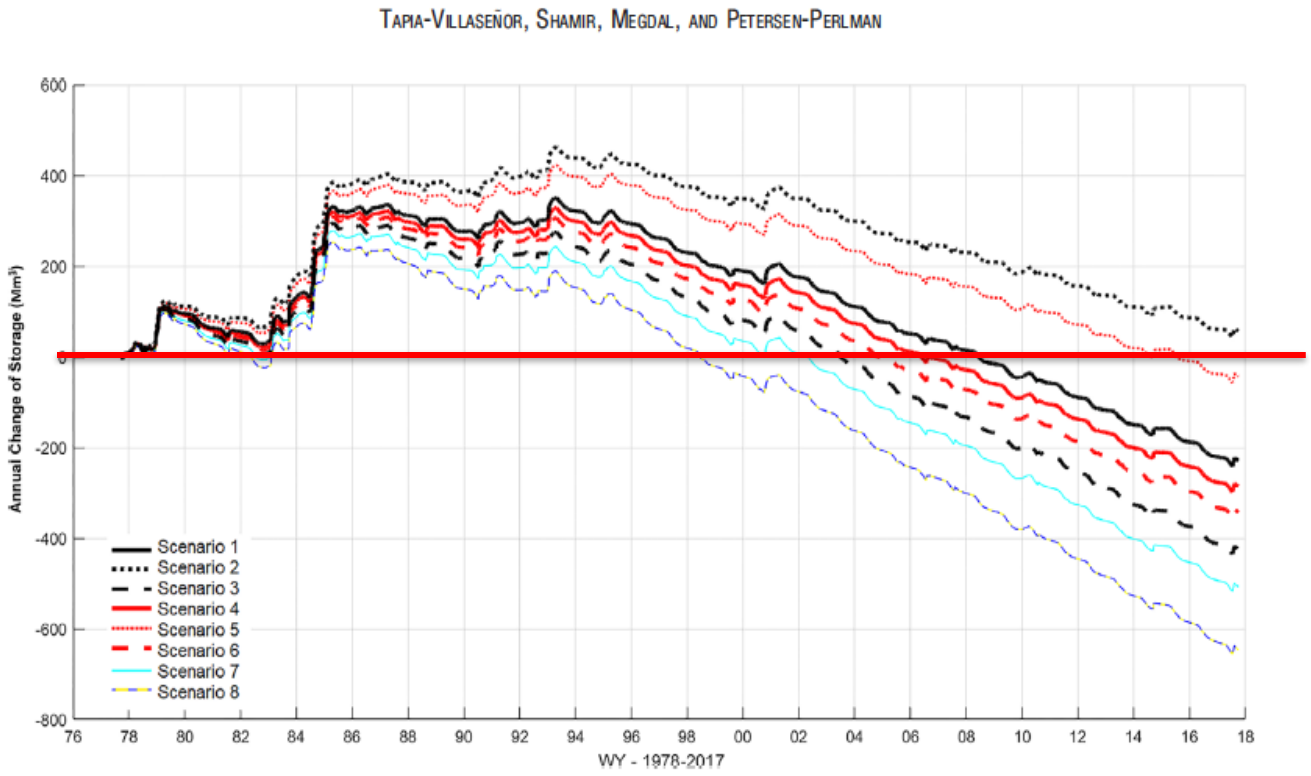


FIGURE 7. Cumulative water budget for 1978–2017 with different treated effluent discharge scenarios and 1997–2002 average pumping.

"The cumulative 40-year water balance for the eight likely scenarios of effluent discharge and 1997–2002 average pumping indicate that wet years during the mid-1980s created a substantial surplus that has been …This trend of increased water deficit that follows the wet years of the early 1980s is evident in several wells near the northern boundary of the TSCA aquifer."

http://dx.doi.org/10.1111/1752-1688.12853

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.

Documenting climate change impacts – 2021

Shamir et al.

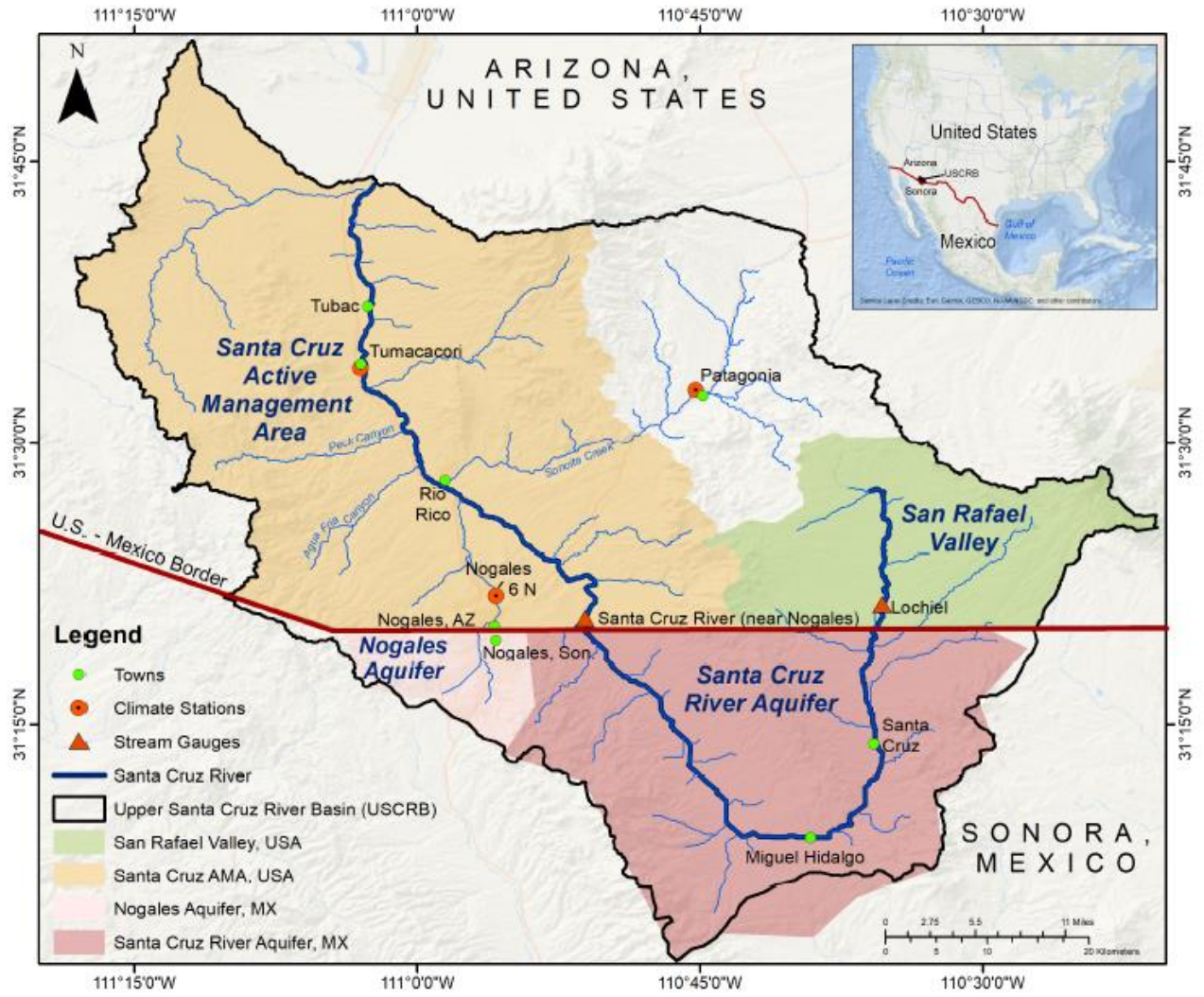


Figure 2. Map of the study region.

https://doi.org/10.3390/w13101390

water

MDPI

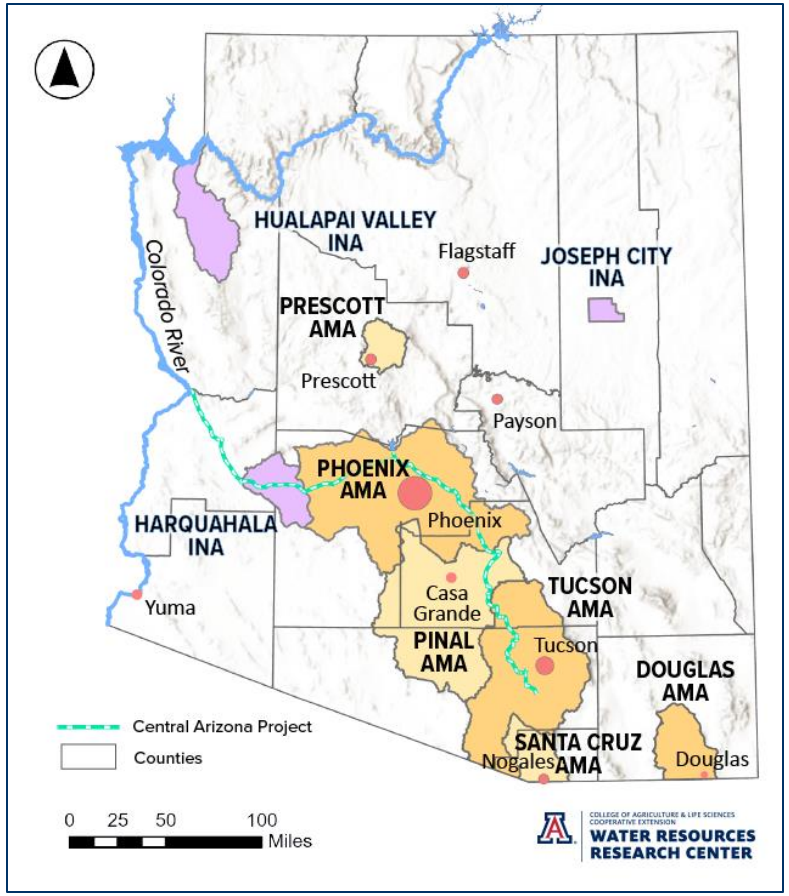
Review

A Review of Climate Change Impacts on the USA-Mexico Transboundary Santa Cruz River Basin

Eylon Shamir [1,*], Elia M. Tapia-Villaseñor [2], Mary-Belle Cruz-Ayala [3] and Sharon B. Megdal [4]

"..given the projected uncertain future and the worrisome observed historical trends, we stress the urgency and the severe risk of water shortages that the region may potentially undergo. This urgent risk for water shortages calls for proactive and collaborative binational planning to achieve a sustainable transboundary aquifer system."

More about groundwater management on the AZ side of the border



Map showing current Active Management Areas (AMAs) and Irrigation Non-expansion Areas (INAs) pursuant to the Groundwater Management Act

Journal of Hydrology 521 (2015) 18–33

Contents lists available at ScienceDirect

Journal of Hydrology

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

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 [e], Frank E. Corkhill [d], Susanna Eden [b], Konstantine P. Georgakakos [a,f], Keith M. Nelson [d], Jacob Prietto [b]

[a] Hydrologic Research Center, San Diego, CA, United States
[b] Water Resources Research Center, The University of Arizona, Tucson, AZ, United States
[c] Atmospheric Science Department, The University of Arizona, Tucson, AZ, United States
[d] Arizona Department of Water Resources, Phoenix, AZ, United States
[e] Soil, Water and Environmental Sciences, The University of Arizona, Tucson, AZ, United States
[f] Scripps Institution of Oceanography, University of California, San Diego, United States

https://www.sciencedirect.com/science/article/pii/S0022169414009846?via%3Dihub

water

MDPI

https://www.mdpi.com/2073-4441/8/5/216

Article

Opening the Black Box: Using a Hydrological Model to Link Stakeholder Engagement with Groundwater Management

Susanna Eden [1,*], Sharon B. Megdal [1], Eylon Shamir [2], Karletta Chief [3] and Kelly Mott Lacroix [1]

[1] Water Resources Research Center, College of Agriculture and Life Sciences, University of Arizona, Tucson, AZ 85719, USA; smegdal@email.arizona.edu (S.B.M.); klacroix@email.arizona.edu (K.M.L.)
[2] Hydrologic Research Center, San Diego, CA 92130, USA; EShamir@HRCwater.org
[3] Department of Soil, Water and Environmental Science, University of Arizona, Tucson, AZ 85719, USA; kchief@email.arizona.edu
* Correspondence: seden@email.arizona.edu; Tel.: +1-520-621-5670

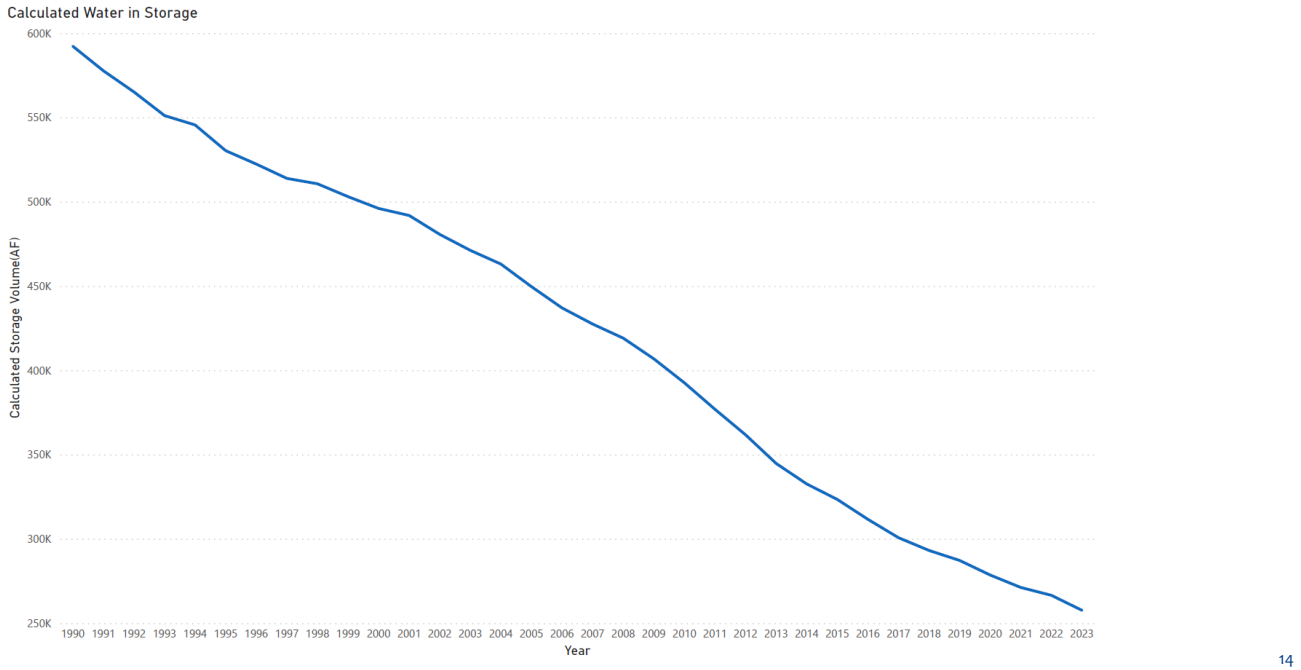
Academic Editor: Ashok K. Chapagain
Received: 7 March 2016; Accepted: 10 May 2016; Published: 23 May 2016

Arizona Department of Water Resources Presentation – August 21, 2024

ADWR Supply and Demand Program

Kennedy Shepard, Statewide Planning Supervisor, ADWR

Santa Cruz AMA Storage Volumes Estimate



14

One acre foot of water equals 325,851 gallons or 1,233 cubic meters

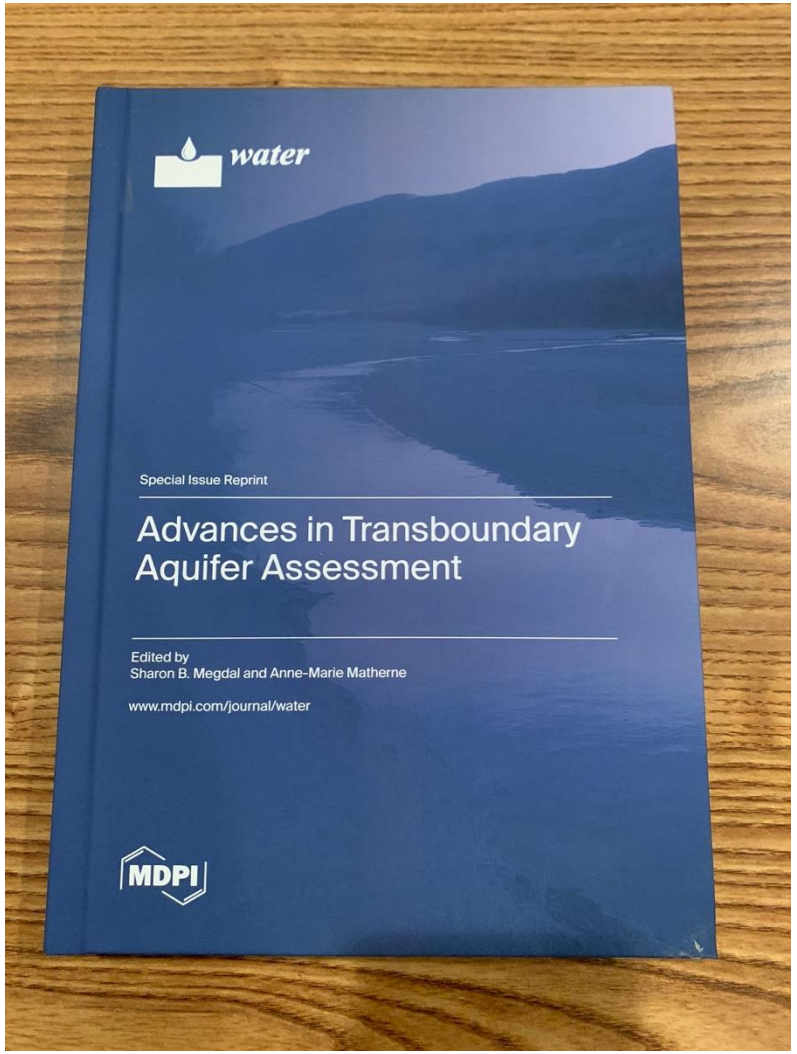
Vertical axis runs down from about 600,000 acre feet to just over 250,000 acre feet of groundwater in storage
Horizontal axis 1990-2023

Focus of WRRC efforts (Current team members: Sharon Megdal, Elia Tapia and Eylon Shamir)

1. Collaborative efforts identified through the TAAP Cooperative Framework
   a) Participate in the completion of the Binational Study of the Transboundary Santa Cruz Aquifer (Santa Cruz Study)
   b) Participate in binational and regional TAAP meetings, workshops, roundtables, focus groups, etc.
2. Hydrologic and hydrogeologic characterizations
   a) Transboundary San Pedro and Santa Cruz data collection and monitoring efforts
   b) Assessment of climate variability and water resources management impact on groundwater availability
3. Transboundary San Pedro and Santa Cruz data collection and monitoring efforts
   a) Inventory of available science, GIS layers, and hydro-meteorological data
4. Socioeconomic characterization of selected border communities and examination of modes of governance
   a) Basic demographics of border communities and the importance of groundwater to local and regional economic activities
5. Stakeholder engagement
   a) Develop a map of key stakeholders involved in transboundary groundwater activities and decision-making
   b) Stakeholder engagement activities

Work effort depends on available funding.

Special Issue of the Journal *Water* includes 16 papers



https://www.mdpi.com/books/book/7794

water

MDPI

Article

Assessing Groundwater Withdrawal Sustainability in the Mexican Portion of the Transboundary Santa Cruz River Aquifer

Elia M. Tapia-Villaseñor [1,*], Eylon Shamir [2], Mary-Belle Cruz-Ayala [3] and Sharon B. Megdal [3]

water

MDPI

Article

Hydrogeomorphologic Mapping of the Transboundary San Pedro Aquifer: A Tool for Groundwater Characterization

José Ismael Minjárez Sosa, Grisel Alejandra Gutiérrez Anguamea, Rogelio Monreal, Francisco Javier Grijalva Noriega and Elia M. Tapia-Villaseñor *

water

MDPI

Article

Transboundary Aquifers between Baja California, Sonora and Chihuahua, Mexico, and California, Arizona and New Mexico, United States: Identification and Categorization

Rosario Sanchez [1,*] and Laura Rodriguez [1,2]

Coordinating work across the border
Draft USGS/WRRI Joint 5-year Strategic Plan, FY23-27

Five tasks, with subtasks identified.

1. Stakeholder Engagement and Capacity Building
    1. Binational workshop
    2. Stakeholder mapping
    3. Stakeholder engagement activities
2. Socio-Economic Context, Governance, and Policy
    1. Basic demographics of border communities
    2. The importance of groundwater to regional economic activities
    3. Cultural beliefs and practices related to shared water resources
    4. Governance structures or frameworks and relevant policy
3. Binational Groundwater Atlas: Data Management, Mapping, and Visualization
4. Aquifer prioritization and vulnerability assessment
5. Hydrologic Studies to Understand Water Availability Challenges Facing Transboundary Aquifers – Stressors from Population, Industry, Agriculture, Drought, and Climate Variability
    1. Improve understanding of water availability and risks to sustainable resource development

Mexico =
Has expressed interest in collaboration

Binational modeling vs single-country modeling of a transboundary aquifer

Opportunities and challenges

Opportunities

- Desire to work binationally
- Greater recognition of the role of groundwater
- Increased stakeholder engagement


Binational Workshop November 2009

Challenges

- Funding
  - Inconsistent across the countries
  - Inconsistent over time
  - Level and predictability
- Coordinating schedules


AZ-Sonora Meeting. June 2023, Nogales AZ


Binational Summit on Groundwater at the United States-Mexico Border. April 2019

September 2024 Workshop in Hermosillo focused on Arizona-Sonora portion of TAAP

Confirmed interest in working together to update data for the San Pedro, with a look toward future binational modeling.

Coordinating work across the border
Draft USGS/WRRI Joint 5-year Strategic Plan, FY23-27

Five tasks, with subtasks identified.

Mexico = Has expressed interest in collaboration

1. Stakeholder Engagement and Capacity Building
   1. Binational workshop
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   4. Governance structures or frameworks and relevant policy
3. Binational Groundwater Atlas: Data Management, Mapping, and Visualization
4. Aquifer prioritization and vulnerability assessment
5. Hydrologic Studies to Understand Water Availability Challenges Facing Transboundary Aquifers – Stressors from Population, Industry, Agriculture, Drought, and Climate Variability
   1. Improve understanding of water availability and risks to sustainable resource development

Binational modeling vs single-country modeling of a transboundary aquifer 12

What about binational groundwater management?? (outside the scope of TAAP)

TOPIC 2/Paper 5

Reaching Groundwater Agreements on the Border Between Mexico and the United States: Science and Policy Fundamentals

Sharon B. Megdal[1], Stephen Mumme[2], Roberto Salmon[3], Rosario Sánchez[4], Elia M. Tapia-Villaseñor[5], Mary-Belle Cruz Ayala[6], and Óscar Ibañez[6]

Figure 2.
Elements and conditions for a Binational Groundwater Agreement between the United States and Mexico

https://unesdoc.unesco.org/ark:/48223/pf0000383775/PDF/383775eng.pdf.multi

OPEN ACCESS
Water Economics and Policy, (2023) 2371007 (11 pages)
© The Author(s)
DOI: 10.1142/S2382624X23710078

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Crafting Binational Groundwater Agreements: Preconditions for Progress Along the Mexico-U.S. Boundary

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More about policy and water diplomacy

Reflections: On Participating in the 10th World Water Forum

by Sharon B. Megdal
06/07/2024

Water for shared prosperity was the theme of the **10th World Water Forum**, which was held May 18–25 in Bali, Indonesia. My work has taken me to Europe and the Near East, but this was my first visit to Indonesia. A country of over 17,000 islands and more than 275 million people, it is the

Delivering comments to session, Monday, May 20, 2024, Transboundary and Cross-Sectoral Dialogue for Peace and Water Resilience

World Water Forum
May 2024

DRAFT – Not for citation or circulation – Prepublication version of chapter in *Handbook of Water Diplomacy*, Shafiqul Islam, Kevin Smith, Martina Klimes, and Aaron Salzberg, eds., Routledge Press.

Factors that Contribute to Successful Diplomatic Outcomes: Case Study of the Colorado River Basin Cross-boundary Institution

Sharon B. Megdal
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SIWI Seminar, August 27, 2024. Featured from left to right: Session Moderator Nancy Eslick, Global Water Coordinator,

Stockholm
World Water
Week
August 2024

The seven factors in the case study

1. A functioning mechanism for cooperation, including knowledge co-production
2. Mutual respect contributing to trust
3. Involvement of interested parties (stakeholders)
4. Good communication
5. Persistence and Patience
6. Eating with your partners
7. Leadership

- Some additional factors:
  - Transparency
  - Sharing lessons learned (both + and -)

TAAP Partners Eating Together in Hermosillo, Sonora, MX
September 10, 2024

ENVS 596B – Water Policy in Arizona and Semi-arid Regions

3-unit class cross-listed as GEOG, HWRS, LAW, and PLG 596B

Professor Sharon B. Megdal smegdal@arizona.edu

Spring Semester on Fridays from 9:00 am – 11:30 am (enrollment limited)

Meets at the Water Resources Research Center, 350 N. Campbell Ave., Tucson

Testimonials from 2024

"I really enjoyed your class this semester. I like the variety of topics covered in such a short period of time, as well as the quality of speakers. You're one of only a few people in Arizona who have that type of network, and it really benefits the class."

> "I learned so much in your class! It was very interesting and I loved the guest speakers and the pragmatic conversations that we had!"

"Thank you for…a wonderful course this semester - by far one of my favourites despite my (initial) lack of "policy" knowledge!"

> "I learned so much from this class that has already been directly applicable in my work."

"I really enjoyed the class and the opportunity to be surrounded by great people from many disciplines."

Course Objectives

Students will develop an understanding of the development of water policy using Arizona, the Colorado River Basin, and other semi-arid regions for in-depth case study. Student writing and presentation skills are developed through leading and participating in discussions, presentations, and writing an individual research paper and completing related assignments.

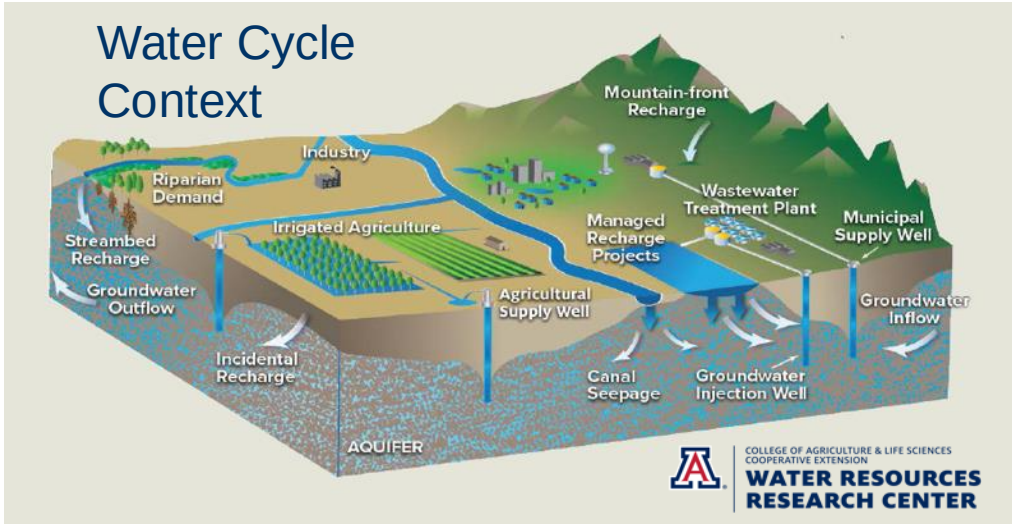
Course Outcomes

- Interpret the role of regulation, institutions, and the legal framework for water allocation and use in determining the utilization of water across types of uses, geography, and time.
- Synthesize the complexities associated with developing and implementing water policies to address water challenges.
- Evaluate how policies and policy proposals meet public policy objectives.

Water policy and management reflect many determining factors

- Resource Availability
- Location of water demands and supplies
- Economics
- Historic and Current Legal/Institutional Framework
- The nature of involvement of multiple governmental and non-governmental entities, including the extent of centralized versus decentralized decision making
- Politics of Area
- Public values and socio-cultural factors
- Historical context
- Information
- Etc…

Importance of Context



Connect with WRRC programming

WRRC Water Webinar: Meaningful Engagement with Aboriginal and Torres Strait Islander Peoples on Inland Waters in Australia – *Lessons Learned from Australian Government Policy Developers and How They Are Learning to Work on Genuine Efforts to Engage Effectively*

Date & Time
USA: Wednesday, October 16, 2024; 3:30–4:45 pm Arizona/MST
Australia: Thursday, October 17, 2024; 9:30–10:45 am AEDT
Location: Webinar Only

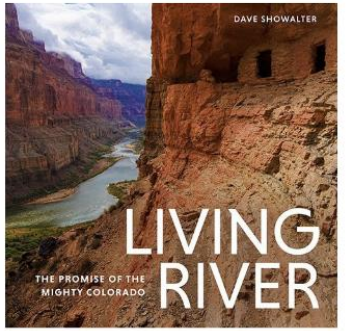
Speakers:
Sheryl Hedges, *Branch Head, Australian Government Department of Climate Change, Energy, the Environment and Water*
Brandon Etto, *Director, First Nations Engagement, Department of Climate Change, Energy, the Environment and Water*

October 16, 2024, 3:30 pm on Zoom

WRRC WEEKLY WAVE SUBSCRIBE

WRRC HOME PAGE

WRRC Special Event: Living River: The Promise of the Mighty Colorado
Author Talk and Book Signing



Date: Thursday, October 31, 2024
Time: 3:00–4:30 pm Arizona Time
Location: Hybrid Event: In-Person Attendance is Limited (please register in advance): 350 N. Campbell Ave, Tucson AZ

Speaker:
Dave Showalter, *Author and Photographer of Living River: The Promise of the Mighty Colorado*

Join the WRRC and conservation photographer Dave

October 31, 2024, 3:00 pm in-person talk and book signing at WRRC and on Zoom

2025 ANNUAL CONFERENCE

SAVE *the* DATE

WRRC 2025 Annual Conference
May 20–21
SHARED BORDERS SHARED WATERS
Working Together in Times of Scarcity

2024 Photo Contest

The WRRC is excited to announce our 2024 Photo Contest. We invite you to showcase your talent by capturing anything from nature and wildlife to industry and agriculture, including people at play and at work. It's totally up to you. Just make sure your picture relates to water and it's in Arizona!*

All submissions must be received on or before Dec. 20, 2024.

*"Borders" category images can be from any location.

e-News Digest

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THANK YOU!!

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