



**WATER POLICY RESEARCH ON
THE UPPER SAN PEDRO
RIVER BASIN:**

**An Annotated Bibliography
of Contributions by the
Udall Center for Studies
in Public Policy**

1997-2006

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WATER POLICY RESEARCH ON THE UPPER SAN PEDRO RIVER BASIN:

An Annotated Bibliography of Contributions by the Udall Center for Studies in Public Policy 1997-2006

This bibliography provides a chronology and synopsis of research on the Upper San Pedro River basin published by investigators at the Udall Center for Studies in Public Policy at the University of Arizona (names in **bold**) and their collaborators over the past decade. Together, these documents explore the roots of conflict and cooperation in the basin around water-resources management, as identified and examined during the Center's engagement in the region. Items are listed in reverse chronological order with forthcoming or most recently published items appearing first.

The San Pedro River is one of the most ecologically diverse areas in the Western Hemisphere, containing as many as 20 different biotic communities and supporting a number of endangered plant and animal species.¹ The basin also is embedded in a rich and complex transboundary social setting, which is a central concern of the work included herein.

PUBLICATIONS

In Press and 2006

JOURNAL ARTICLE

Browning-Aiken, A., A. Davis, F. Delgado, R. Carter, R.G. Varady, B.J. Morehouse, M. Wilder, R. Merideth, D. Goodrich, D. Moreno, E. Dellinger, A. Rodriguez, F. Villaseñor, M. Cons. Under review (2006). Climate, water management, and policy in the San Pedro basin: results of a survey of Mexican stakeholders near the U.S.-Mexico border. Special issue of *Climatic Change*, ed. By P. Kabat.

This article presents the results of research performed under the auspices of the Netherlands-based Dialogue on Water and Climate and NOAA. The research helps to fill a knowledge gap about how stakeholders interpret and use climate and water information available to them in the Mexican portion of the San Pedro basin. It assesses the perceived vulnerability of urban and rural populations to water and climate conditions, including the complicating roles played by shortcomings in water infrastructure or management. It makes recommendations meant to improve climate-information delivery and water service planning based on the survey's findings. The article also includes data from water managers and related surveys conducted in the U.S. portion of the basin.

Keywords: Mexican stakeholders, climate, urban water service, water managers, rural ranchers, wastewater treatment, vulnerability, water consumption practices

BOOK CHAPTER

Browning-Aiken, A., R.G. Varady, D. Goodrich, H. Richter, T. Sprouse, and W.J. Shuttleworth. 2006. Integrating science and policy for water management: A case study of the Upper San Pedro River basin. In *Hydrology and Water Law — Bridging the Gap: A Case Study of HELP Basins*, ed. by J.S. Wallace and P. Wouters. IWA Publishing, pp. 24-59.

This chapter is part of an edited volume on hydrology and water law in several international geographic contexts. The chapter presents evidence of positive results when scientists and policy researchers work closely with water

managers and stakeholders in the Upper San Pedro River HELP (Hydrology for the Environment, Life and Policy) basin, and provides examples from informal, binational approaches to watershed management. It points out key differences in current water law and policy in Arizona and Sonora, assesses the advantages and challenges presented to two key watershed groups and to scientific researchers, summarizes efforts toward integrated basin management, and offers lessons learned from the San Pedro experience to the broader HELP agenda.

Keywords: water law, watershed initiatives, science and policy, HELP basin, informal, binational approach

BOOK CHAPTER

Richter, H., D.C. Goodrich, A. **Browning-Aiken**, R.G. **Varady**. In press (2006). Riparian area conservation in a semiarid region: The San Pedro example. Chapter 21 in *Ecology and Conservation of Desert Riparian Ecosystems: The San Pedro River Example*, ed. by J.C. Stromberg and B.J. Tellman. Tucson, AZ: University of Arizona Press.

This chapter contributes to a new book on the San Pedro's riparian ecosystems, as part of a section on conservation and management of specific reaches of the river. It analyzes key processes leading toward the integration of science and policy for water management desired by many scientific researchers and decisionmakers in the basin. The chapter identifies specific internal and external drivers of water management policy and describes, through a case study of the Upper San Pedro Partnership and scientists, the results so far of scientist-decisionmaker collaborations. Overall, it provides a template for using the techniques of collaborative learning, adaptive management, applied scientific research, proactive communication, and community involvement to work toward long-term conservation and water managements goals.

Keywords: science and policy, collaborative learning, adaptive management, watershed planning

2005

PROCEEDINGS CHAPTER

Goodrich, D., E.Z. Stakhiv, A. **Browning-Aiken**, K. Vache, J.R. Ortiz-Zayas, J.F. Blanco, F.N. Scatena, R.G. **Varady**, W.B. Bowden, and W. Howland. 2005. The HELP (Hydrology for Environment, Life and Policy) experience in North America. *Proceedings of the EWRI (ASCE Environmental and Water Resources Institute) Watershed Management Conference*. Williamsburg, VA.

For those unfamiliar with the HELP agenda, this conference paper explains HELP's attempt at bridging the "traditional separation between water policy, water-resources management, and scientific communities" to affect research agendas and improve the flow of information for use in management. The paper then explains the application of a HELP framework to five basins in North America: the Willamette River basin (Oregon), Luquillo Mountains basin (Puerto Rico), Upper San Pedro River basin (U.S.-Mexico), Lake Champlain basin (U.S.-Canada), and the Lake Ontario-St. Lawrence River (U.S.-Canada). Based on a survey of the basins, it presents the diverse set of issues and institutional settings in the basins, with equally diverse results. The analysis also identifies common themes among the basins and highlights the complications of transboundary management. It identifies key scientific innovations that have directly assisted planning in each basin, while emphasizing the need for further consultation and better understanding between scientists and stakeholders. The paper helps to inform more recently formed North American HELP basins and provides a basis for future evaluation.

Keywords: HELP basin, North America

Varady, R.G., and A. Browning-Aiken. 2005. The birth of a Mexican watershed council in the San Pedro basin in Sonora. In *Planeación y Cooperación Transfronteriza en la Frontera México-Estados Unidos (Transboundary Planning and Cooperation in the U.S.-Mexico Border Region)*, ed. by C. Fuentes-Flores and S. Peña-Medina. Ciudad Juárez, Mexico: El Colegio de la Frontera Norte & Universidad Autónoma de Ciudad Juárez. pp. 165-183.

This chapter shows how, in the case of the Upper San Pedro basin, certain recent policy and planning developments at the local, regional, and federal levels in Mexico and the U.S. have resulted in a growing momentum toward coordinated, transboundary water-resources management. It also exposes a number of weak points that must be addressed to ensure the success of a watershed council and other initiatives. It focuses on the challenges and opportunities of using watershed councils as a management model for transboundary basins seeking to achieve sustainable development conditions. It does so in part by examining the cross-border dialogues and other events leading up to the formation of ARASA (the *Asociación Regional Ambiental Sonora-Arizona*, Sonora-Arizona Regional Environmental Association), an incipient Mexican counterpart to the Upper San Pedro Partnership in Arizona. The piece also describes several economic and policy developments in Mexico that have affected prospects for a watershed council in the San Pedro basin, summarizes the results of a 2001 water-use survey, and makes recommendations to improve the chances of success of transboundary resource management by focusing on communication, promoting cross-border understanding, and information exchange.

Keywords: transboundary watershed, watershed councils, water-resources management, public participation, Mexico

2004

Browning-Aiken, A., H. Richter, D. Goodrich, B. Strain, and R.G. Varady. 2004. The Upper San Pedro basin: Fostering collaborative binational watershed management. Special issue of *International Journal of Water Resources Development* 20(3), ed. by L. Andersson and D.W. Moody. pp. 353-367.

Access via Academic Search Premier online database.

Much of the potential for successful binational planning and management of water resources lies in the processes of decisionmaking. This article maintains that one recommendation for a successful process is for policymakers to have access to information based on long-term, in-depth collaboration with social and physical scientists. Another is to utilize an informal, bottom-up approach to binational resource planning. Both require trust and relationship-building. The article also identifies seven steps within the decisionmaking process as it has unfolded in the Upper San Pedro basin, which may be loosely applicable to other basins. Even more likely to be applicable from basin to basin is the value of finding a common vision for the future among collaborators, and the importance of effective leadership and participants with professional facilitation skills. Any recipe for successful collaboration should address questions in six key areas, which are suggested in the text: participation, representation, group dynamics, decisionmaking, adaptive management, and sustainability.

Keywords: collaborative process, binational management

Browning-Aiken, A., R.G. Varady, B.J. Morehouse, and A. Davis. 2004. Pioneering a binational dialogue on water and climate: Implementing institutional change. Presented at the American Water Resources Association and International Water Law Research Institute, International Specialty Conference on Good Water Governance for People and Nature, What Roles for Law, Institutions, Science and Finance? Dundee, Scotland. 30 August.

This conference proceedings chapter summarizes the findings of a 2002 survey of Mexican stakeholders. It focuses on the role played by climate in vulnerability to water scarcity and water quality problems in the Sonoran portion of the Upper San Pedro basin, in comparison to other factors.

BOOK CHAPTER/PROCEEDINGS

Varady, R.G., and B.J. Morehouse. 2004. *Cuánto cuesta?* Development and water in Ambos Nogales and the Upper San Pedro basin. In *The Social Costs of Industrial Growth in Northern Mexico*, ed. by K. Kopinak. La Jolla, CA: Center for U.S.-Mexican Studies, UCSD. pp. 205-248. **Also published in:** *Proceedings of the XXV International Congress of LASA (Latin American Studies Association)*. Las Vegas, NV. 25 p.

This chapter was included in an edited volume on northern Mexico's experience of industrial growth, in a section on the health and environmental costs of development. It provides a comparative study of development and water in Arizona's cross-border basins (the San Pedro and Santa Cruz). It also includes a consideration of vulnerability and sensitivity in the two basins, as well as a discussion of policies, coping strategies, and prospects for the future. The chapter is useful in providing a detailed history of policy, stakeholder mobilization, and management actions in the two watersheds.

Keywords: development, basin comparison

2003

UDALL CENTER MONOGRAPH

Brott, E., and A. Browning-Aiken. 2003. *Elusive Identity: Case Study of a Binational Environmental Non-Governmental Organization on Mexico's Northern Border*. Tucson, AZ: Udall Center for Studies in Public Policy. 27 p.

Access via udallcenter.arizona.edu/publications/pubs_usmex.htm

This monograph presents the results of a 2002 survey of members of ARASA, a fledgling Mexican environmental grassroots group based in Cananea, Sonora, that faced substantial threats to its survival and efficacy. The research assesses the group's goals and obstacles, and presents strategies for strengthening the group, based on social psychology and Mexican civil-society literature. These strategies center on establishing consensus about key terms of the group's identity, which were in question at the time of the survey. The paper offers potentially useful suggestions for other organizations facing similar issues. It also provides a useful theoretical background on NGOs in Mexico and their recent historic relationships to the Mexican government, which affect a group's chances of survival.

Keywords: NGO capacity, binational, Mexico

JOURNAL ARTICLE

Browning-Aiken, A., R.G. Varady, D. Moreno. 2003. Water-resources management in the San Pedro basin: Building binational alliances. *Journal of the Southwest* 45(4): 611-632.

Access via udallcenter.arizona.edu/publications/pdf/JSWwater_resource_mgmt.pdf

This article assesses water issues faced in the current binational setting, with challenges and conflicts that fall into three basic categories: multiple uses, demand, and quality. These are illustrated by a case study examining two

watershed initiatives in the Upper San Pedro basin (ARASA and the Upper San Pedro Partnership). In order to help answer the question, “What makes local initiatives successful?” the authors evaluate the two organizations using criteria drawn from a comparative literature review. The authors also use the San Pedro example to discuss organizational constraints that might face any developing grassroots organization: the need for focus, organizational skills, access to (scientific) information, and the lack of funding. The article concludes with a look at the implications for coordinated binational resource management of three major components of the basin’s historical context: 1) in Arizona, the role of Fort Huachuca and historic attitudes to private property rights, resource use, and development, 2) in Sonora, the Cananea mine and its historic relationship to other stakeholders, and 3) the CEC-sparked planning process. The authors also anticipate that the scale of government at which resource-management problems are addressed will have an important impact on management effectiveness.

Keywords: binational alliances, coordinated resource management

POWERPOINT PRESENTATION

Goodrich, D., R. Strain, H. Richter, R. Lawford, W.J. Shuttleworth, **R.G. Varady**, and **A. Browning-Aiken**. 2003. Integration of science and decision making for watershed management: A case study of the Upper San Pedro basin, a binational HELP pilot basin. Presented at EGS-AGU-EUG (European Geophysical Society-American Geophysical Union-European Union of Geosciences) Joint Assembly. Nice, France.

Access via udallcenter.arizona.edu/publications/pubs_usmex.htm

This presentation gives a detailed overview of the Upper San Pedro HELP basin, providing an example of a functioning HELP basin, describing a variety of scientific efforts used to better understand the basin, and summarizing successful strategies and models for collaboration within a multi-dimensional partnership. It is enhanced by several maps, photographs, data, and conceptual diagrams.

Keywords: HELP basin, North America

PROJECT REPORT

Varady, R.G., A. Browning-Aiken, and **R. Merideth**. 2003. Scoping Studies for the Upper San Pedro River Basin (Including the ARS Walnut Gulch Basin and Headwaters Portion of the River in Mexico) and the Red River Catchment (Including the ARS Little Washita Basin). Final Report (GC01-020) to National Oceanic and Atmospheric Administration. Tucson, AZ: Udall Center for Studies in Public Policy. 49 p. + appendices.

Access via udallcenter.arizona.edu/publications/pubs_usmex.htm

This report documents the results of a two-year program for NOAA that included scoping studies in two basins – the Upper San Pedro (in Arizona and Sonora), and the Red River catchment (in Oklahoma). The studies assessed the nature and extent of water-resources issues and identified relevant stakeholders and institutions in the basins. The report stresses efforts that took place throughout the research to promote public participation and collaboration between research scientists and watershed groups, examine the level of integration of science into policy structures (especially in Mexico), and identify ways to increase this integration (see also: the related Browning-Aiken, Varady and Moreno 2003 article, above).

Keywords: NOAA, scoping, Walnut Gulch basin, headwaters

Varady, R.G., A. Browning-Aiken, R. Merideth, B.J. Morehouse, D. Goodrich, and C. Conde. 2003. *Water and Climate in the San Pedro River Basin of Mexico and Arizona: Pioneering an Informal Binational Dialogue*. Final Report to the Dialogue on Water and Climate. Tucson, AZ: Udall Center for Studies in Public Policy. 6 p.

Access via udallcenter.arizona.edu/publications/pubs_usmex.htm

This report describes the results of a one-year program (2002) in the Upper San Pedro basin, funded by the Dialogue on Water and Climate, which included: organization of two informal binational workshops (“Dialogues”) on water and climate, which brought together the Arizona-based Upper San Pedro Partnership and Sonora-based ARASA; climate and water surveys of the Mexican portion of the basin; and other products. It also summarizes the organization used for the Dialogue workshops, providing a potential model for other basins. It concludes by identifying lessons learned and the next steps, and by stressing the value of establishing informal channels of communication between stakeholders and their counterparts across an international boundary.

Keywords: Dialogue on Water and Climate, informal, binational, transboundary waters

2002

PROCEEDINGS CHAPTER

Browning-Aiken, A., R.G. Varady, and D. Moreno. 2002. *Binational coalition-building: A case study of water-resources management*. *Proceedings of the First International Symposium on Transboundary Waters Management*, ed. by A.A. Aldama, F.J. Aparicio, and R. Equiha. *Avances en Hidráulica* 10. Tlalpan and Jiutepec, Mexico: Asociación Mexicana de Hidráulica (AMH) and Instituto Mexicano de Tecnología del Agua (IMTA). pp. 387-96.

This conference paper contributes to a broader discussion of effective governance structures in transboundary watershed settings by assessing two local initiatives. It first presents the historical setting and current water-resources issues in the Upper San Pedro basin, including environment vs. development conflicts, rural vs. urban water conflicts, and cross-border suspicions. The paper then compares the Upper San Pedro Partnership of Arizona and the Sonoran NGO, ARASA, in terms of each group’s organizational concerns, representation of stakeholder interests, and linkages to other stakeholders and scientists. The paper also discusses the effects of recent policies by Mexico’s environmental ministry, SEMARNAT, and CNA (*Comisión Nacional del Agua*), such as the institution of a new “culture of water” and guidelines for decentralized management through watershed councils.

Keywords: binational, coalition, conflict analysis

DIRECTORY

Moreno, D. 2002. *San Pedro River Basin Directory: A Guide to Agencies and Organizations*. Tucson, AZ: Udall Center for Studies in Public Policy. 30 p.

Access via udallcenter.arizona.edu/programs/usmex/publications/SanPedroDirectory.pdf

The directory provides contact and background information on more than 100 international, federal, state, and local entities in the United States and Mexico that are involved in environmental work in the San Pedro River basin. Organized geographically, it includes key agency, research, NGO, and media contacts. Each entry is annotated to provide researchers and residents alike with a basic understanding of the individual organization’s main focus and, taken together, the basin’s policymaking setting.

Keywords: stakeholders, directory

2001

UDALL CENTER REPORT

Moote, M.A., and M. Gutiérrez. 2001. Views from the Upper San Pedro River Basin: Local Perceptions of Water Issues. Tucson, AZ: University of Arizona Udall Center for Studies in Public Policy. (Spanish version available). 57p.

This report offers a preliminary assessment of public perspectives on water management, policy, and research in the San Pedro River basin based on interviews, surveys, and meetings conducted between April 1998 and December 2000. Informants included Arizona residents (in Sierra Vista and its surroundings), Sonora residents (in Cananea, Naco, and several ranches and *ejidos*), and professional scientists and policymakers from both sides of the basin. The study provided a basis for much subsequent research and planning work in the basin. The report also includes a seven-page glossary of key terms. A Spanish translation is available (*Opiniones desde la Cuenca Alta del Rio San Pedro: Percepciones Locales sobre Temas Relacionados con el Agua*).

Keywords: stakeholders, perception, Arizona, water

UDALL CENTER REPORT

Moote, M.A., M. Gutiérrez, A. Howarth. 2001. Sustainability of Water Resources in the Upper San Pedro River Basin: Results of a Survey of Mexican Residents. Tucson, AZ: Udall Center for Studies in Public Policy, University of Arizona.

This document contains questionnaires and complete statistical results of a public survey of Mexican residents in the Upper San Pedro River basin conducted between April 1998 and December 2000. Analysis is presented in the accompanying document, Views from the Upper San Pedro River Basin: Local Perceptions of Water Issues (see above). A Spanish translation is available (*Sostenibilidad de los Recursos del Agua en la Cuenca Alta del Rio San Pedro: Resultados de una Encuesta de Residentes Mexicanos*). 65 p.

Keywords: stakeholders, survey, Mexico, sustainability

PROCEEDINGS ABSTRACT

Varady, R.G., A. Browning-Aiken, and M.A. Moote. 2001. Watershed councils along the U.S.-Mexico border: The San Pedro basin. In *Proceedings of AWRA/Dundee University of Dundee International Water Conference, Globalization and Water Management: The Changing Value of Water*, (7 Aug. 2001), ed. by P.K. Wouters, D.W. Moody, and F. Anderson. Dundee, Scotland.

Access via udallcenter.arizona.edu/publications/pubs_usmex.htm

Originally delivered as a conference presentation, this document provides a brief summary of developments in the San Pedro basin. It includes details on precursors to the watershed organizations that later came to predominate in the basin. It also presents a synopsis of the results of the basinwide surveys conducted in the U.S. and Mexico between 1998 and 2000.

Keywords: watershed councils, border, water surveys

Varady, R.G., and M.A. Moote. 2001. Community Outreach and Capacity-building in the Upper San Pedro River, Arizona and Sonora. Final Report to the Ford Foundation. Tucson, AZ: Udall Center for Studies in Public Policy, University of Arizona. 19 p. + addenda.

Access via udallcenter.arizona.edu/publications/pubs_usmex.htm

The effects of community outreach and collaboration are incremental, with the formation of interlinkages often becoming more and more fruitful as time goes on. This report documents the accomplishments of the Udall Center and its collaborators in the area of community outreach and capacity building in the San Pedro basin from 1998-2001. It provides a comprehensive summary of specific initiatives, activities, and events in the Upper San Pedro basin during this time period, each of which made concrete advances in improving stakeholder communication and collaboration. It explains how each strategy was implemented, and includes quotes from participants about the results. Activities were primarily transboundary in nature, and fell into three main categories: discussion forums (including study tours, the San Pedro Conference: Divided Waters – Common Ground, and the Dialogue San Pedro meetings), stakeholder analyses (consisting of surveys and interviews), and the generation and dissemination of information. Overall, the report summarizes the organization and interrelationships of the various initiatives and events, providing a potential model for other basins.

Keywords: community, outreach, capacity-building, transboundary waters

2000

PROCEEDINGS

SALSA (Semi-Arid Land Surface-Atmosphere Research Program). 2000. *Proceedings of the San Pedro Conference: Divided Waters – Common Ground, November 8-10, 1999.* Tucson, AZ: USDA Agricultural Research Service.

Access via tucson.ars.ag.gov/salsa/news/announce/proceedings.pdf

Proceedings of a 1999 binational conference held in Cananea, Sonora, and Bisbee, Arizona, which the Udall Center helped to sponsor (along with many other partners).

JOURNAL ARTICLE

Varady, R.G., M.A. Moote, and R. Merideth. 2000. Water management options for the Upper San Pedro basin: Assessing the social and institutional landscape. Special issue of *Natural Resources Journal* 40(2), Spring 2000, ed. by S. Mumme. pp. 223-235.

Access via Hein Online database.

Part of a special issue on transboundary groundwater management on the U.S.-Mexico border, this article examines water-management options for the basin surrounding the Upper San Pedro River, the groundwater vs. surfacewater nature of the resource, and the social and institutional elements of the controversy over appropriate uses. The paper provides a detailed, retrospective discussion of the 1998 CEC study² and public comment process, by recounting the historical chain of events that followed the study, including detailed descriptions of various stakeholder perspectives. It offers a critical look back at events in the Upper San Pedro, and begs comparison to processes in other transboundary basins.

Keywords: social, institutions, management options

1999

PROCEEDINGS ABSTRACT

Varady, R.G., L. Evans, **M.A. Moote**, and **R. Merideth**. 1999. Interbasin water transfers in the southwestern United States: The case of the San Pedro River. *Proceedings of the International Workshop on Interbasin Transfer: Looking for Solutions for the Future* (25-27 Apr. 1999). International Hydrological Programme of UNESCO. IHP-V Technical Documents in Hydrology, No. 28. Paris, France: UNESCO. pp. 71-72.

Access via udallcenter.arizona.edu/publications/pubs_usmex.htm

This document abstracts a paper presented at a UNESCO International Hydrological Programme conference, covering the controversial subject of water transfers in the San Pedro case, and placing the issue in global context.

Keywords: interbasin water transfers, southwest U.S.

1998

PROJECT REPORT

Emerson, K. and Udall Center staff. 1998. Public Input Digest for the Upper San Pedro River Initiative. Prepared for the Commission for Environmental Cooperation. Tucson, AZ: Udall Center for Studies in Public Policy, University of Arizona. 29 p.

This digest of a public input survey conducted for the CEC deepened the Udall Center's work in the basin. It helps to document firsthand one of the key policymaking processes to focus on San Pedro water resources, and thereby provides a baseline and a snapshot in time of the issues that brought stakeholders to the table eight years ago. The digest introduces and provides a historical perspective on many of the conflicts, stakeholder groups and opportunities that are still extremely relevant to the future of the basin. Read alongside the initial CEC report², the digest offers an excellent background on the issues and developments taking place in the basin today, in 2006.

Keywords: public input, stakeholders, survey, CEC

1997

PROJECT REPORT

Liverman, D., **R. Merideth**, A. Holdsworth, L. Cervera, and F. Lara. 1997. An Assessment of the water resources in the San Pedro River and Santa Cruz River Basins, Arizona and Sonora. A Report to the Commission on Environmental Cooperation, Montreal, Quebec. Tucson, AZ: University of Arizona Latin American Area Center and Udall Center for Studies in Public Policy. 75 p. **Also published as:** Liverman, D., **R. Merideth**, A. Holdsworth. 1997. Climate variability and social vulnerability in the U.S.-Mexico border region: An integrated assessment of the water resources of the San Pedro River and Santa Cruz River basins. Tucson, AZ: University of Arizona Latin American Area Center and Udall Center for Studies in Public Policy.

Marking one of the Udall Center's first involvements in the San Pedro River basin, this report was commissioned by the CEC, and helped to establish the Center's record of research in the area and assist policymakers to better understand Arizona and Sonora's transboundary basins. The report explicates state and federal laws affecting groundwater and surfacewater. It points to information gaps about hydrologic and hydrogeologic conditions, especially conditions in Mexico. Using a wide variety of data sets, including ADWR (Arizona Department of Water Resources) and USGS, it identifies water overdrafts in parts of each basin, reveals the incompleteness of water quality information, and provides a baseline of population and of water use in a number of sectors (domestic,

industrial, agricultural). In addition, it points out a lack of information on in-stream uses of water. Perhaps most significantly, the report also brings a discussion of social vulnerability, drought potential, and climate change scenarios to research in the basin.

Keywords: resources assessment, transboundary waters

Serials

Dialogue San Pedro. January – October 2000. Occasional newsletter published by the Udall Center for Studies in Public Policy, The University of Arizona, Tucson, AZ.

Access via udallcenter.arizona.edu/sanpedro/dialogue.html

This newsletter was produced over the course of one year as a communication tool for members of Dialogue San Pedro, a community-based water initiative that was later subsumed by the Upper San Pedro Partnership.

San Pedro News and Comment. 2000-2005. Newsletter published by the Udall Center for Studies in Public Policy, The University of Arizona, Tucson, AZ.

Access via listserv.arizona.edu/archives/san_pedro.html

The Udall Center began the *San Pedro News and Comment* in conjunction with its work to improve communication and coordination of basin stakeholders, with partial support from the NSF-funded SAHRA (Sustainability of semi-Arid Hydrology and Riparian Areas) project. This online publication provided a weekly digest of newspaper articles, editorials, and letters to the editor related to the Upper San Pedro River basin.

PRESENTATIONS

2006

Browning-Aiken, A. 2006. Managing water resources in semiarid ecosystems along the U.S.-Mexico border: Regional responses to climate changes in an Arizona-Sonora transboundary basin. Western Social Sciences Association conference panel, Current Challenges on the Binational Water Agenda: Regional Responses along the U.S.-Mexico Border. Phoenix, AZ. 21 April.

Serrat-Capdevila, A., J.B. Valdes, J. Gonzalez Perez, A. Browning-Aiken. 2006. Merging climate knowledge into water resources management and decision support systems. Third International Symposium on Transboundary Waters Management. Ciudad Real, Spain. 30 May-2 June. **Also presented at:** NOAA Monsoon Regional Applications Workshop, Guaymas, Sonora, Mexico. 8-11 May.

Browning-Aiken, A., and R.G. Varady. 2006. Challenges to implementing transboundary water planning: The process of institution building along the U.S.-Mexico border. Society for Applied Anthropology, 66th annual conference, as part of a panel on Neighborly Waters: Lessons from Water Research in Northern Mexico and the Southwestern United States. Vancouver, BC, Canada. 31 March.

2005

Goodrich, D., E.Z. Stakhiv, **A. Browning-Aiken**, K. Vache, J.R. Ortiz-Zayas, J.F. Blanco, F.N. Scatena, **R.G. Varady**, W.B. Bowden, W. Howland. 2005. The HELP (Hydrology for the Environment, Life and Policy) experience in North America.

EWRI (ASCE Environmental and Water Resources Institute) Watershed Management Conference. Williamsburg, VA. 20 July (see also: Goodrich, et. al. 2005 proceedings chapter, page 2, above).

Browning-Aiken, A. 2005. Presentation on San Pedro basin at Workshop on Options for Use of Climate Vulnerability Index (CVI), UNESCO International Hydrologic Programme (IHP)/HELP. Guayaquil, Ecuador. 21-23 March.

2004

Browning-Aiken, A. 2004. HELP presentation on the San Pedro (U.S.-Mexico) and Lake Peipsi (Estonia/Russia). Second International Symposium on Transboundary Water Management. Tucson, AZ. 16-19 November.

Varady, R.G., and B.J. Morehouse. 2004. *Cuánto cuesta?* Environmental costs of development in the U.S.-Mexico border region. XXV International Congress of LASA (Latin American Studies Association). Las Vegas, NV. 9 October (see also: Varady and Morehouse 2004, page 4, above).

Browning-Aiken, A. 2004. Invited panelist and presenter on social issues regarding water and climate in the U.S.-Mexico San Pedro basin. *Seminário Internacional Sobre Gestão Social De Bacias Hidrográficas* (International Seminar on Social Management of Watersheds). Santa Catarina, Brazil. 6-14 August.

2003

Browning-Aiken, A. PowerPoint presentation. Third Border Environment *Encuentro*. 2003. Tijuana, Mexico.

Varady, R.G., **A. Browning-Aiken**, D. Goodrich, H. Richter, A.L. Ross, and W.J. Shuttleworth. 2003. Integrating science and policy for water management: A case study of the Upper San Pedro, a binational HELP pilot basin. Poster presented at International Union of Geodesy and Geophysics (IUGG) 2003 Conference. Sapporo, Japan. 7-11 July.

Browning-Aiken, A., and **R.G. Varady**. 2003. Binational cooperation and community participation in the San Pedro River basin. International Forum on Social Management of Hydrological Basins. Hermosillo, Mexico. 4 April.

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ENDNOTES

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