

I-4

Water Issues in the U.S.-Mexican Border Region

D. Rick Van Schoik, Amy Conner, and Elena Lelea

ABSTRACT

International boundaries, including the border between the United States and Mexico, are conduits of intangible things such as capital, electricity, ideas, pollution, and diseases, the transport of which poses unique challenges to human health, environmental quality, and especially water supplies. Water is arguably the issue on which the border region must place its most careful focus. As population explodes in the border region the demand for clean water increases. Several issues are created by the intersection of water with energy, biodiversity, economics, security, and health. These issues are further exacerbated by the inaction of institutions currently working in the region.

The border environment and quality of life for border residents are in danger of deteriorating significantly if “business-as-usual” trends continue for population and economic growth. While technologies like desalination offer some short-term solutions, substantial incentives are necessary to promote conservation. Several options exist that could serve as springboards to other initiatives that save water in the U.S.-Mexican border region. One approach involves a forecasting and backcasting (proactive planning now

based upon predictions to avoid worst-case scenarios) tool for stakeholders that allows them to understand the human, natural, and fiscal consequences of economic growth and development in the region. The Southwest Consortium for Environmental Research and Policy's (SCERP) Border Plus Twenty Years (B+20) Project works to this end.

Factores del Agua en la Región Fronteriza México-Estados Unidos

D. Rick Van Schoik, Amy Conner, y Elena Lelea

RESUMEN

Los límites internacionales, incluyendo la frontera entre México y los Estados Unidos, son conductos de factores intangibles como el capital, la electricidad, las ideas, la contaminación, y las enfermedades. El transporte de muchos de estos significa retos únicos a la salud humana y a la calidad del medio ambiente y especialmente a los suministros del agua.

Es debatible que el agua es uno de los tópicos en los que la frontera debe destinar un enfoque más detallado. Mientras que la población se expande en la región fronteriza, la demanda de agua limpia se incrementa. Diversos factores son creados con la intersección del agua con la energía, biodiversidad, economía, seguridad, y la salud. Estos factores son exacerbados con la pasividad de las instituciones actualmente trabajando en la frontera.

El medio ambiente fronterizo y la calidad de vida para los residentes fronterizos están en peligro de deteriorarse significativamente si las tendencias continúan igual para el crecimiento de la población y para la economía. Mientras que las tecnologías como la desalinización ofrecen soluciones a corto plazo, son necesarios incentivos substanciales para promover la conservación. Existen diversas

opciones que podrían servir como trampolines para otras iniciativas que conservan el agua en la región fronteriza México-Estados Unidos. Un de los planteamientos involucra una herramienta de pronóstico y de planeación en retrospectiva (planeación proactiva actual basada en predicciones para evadir el peor escenario posible) para las personas interesadas, que les permita comprender las consecuencias humanas, naturales y fiscales del crecimiento económico y del desarrollo en la región. El Proyecto Frontera Más Veinte Años (F+20) trabaja hacia esta finalidad.

INTRODUCTION

International boundaries, a prime example of which is the border between the United States and Mexico, are increasingly becoming conduits of intangible things such as capital, electricity, ideas, pollution, and diseases, the transport of which poses unique challenges to human health, environmental quality, and especially water supplies. Planning for a sustainable future requires that residents on each side of the U.S.-Mexican border consider the effects their choices will have on the other side of the political divide.

Water is arguably the issue on which the border region must place its most careful focus. Relations over this important resource have potentially serious implications for the bilateral relationship as a whole. Water is becoming such a major international issue that many foresee serious conflicts emerging from worsening tensions and disputes over it, as has happened on a smaller scale in the border region. For example, California, Arizona, Nevada, and Colorado have argued for years over Colorado River water allocations. Mexico as well continues to owe a water debt to the United States, which at times strains relations in the border community.

Groundwater issues have been especially problematic in the border region due to the involvement of different levels of government with conflicting perspectives on ownership. For example, jurisdiction over groundwater lying under the Paso del Norte region is owned by individual property owners in Texas, the state in New Mexico, and the federal government in Mexico (Lyndon B. Johnson School of Public Affairs 1999). In a state-to-state comparison, when

matched against the other border states, Arizona has a relatively progressive approach because it considers the watershed an administrative unit for groundwater extraction. In California, groundwater rules are further complicated by a distinction between water in a stationary aquifer and groundwater that moves with river systems above it. Neither the United States nor Mexico knows enough about groundwater resources to justify their current pumping rates. The aquifers in the border region are nearly unknown in quantity, quality, dimension, and flows. Yet, many locations that have exhausted their surface supplies are turning to their limited, and probably overdrawn, reserves. Few are replacing them.

As population explodes in the border region the demand for clean water increases. This increased demand intensifies competition among water users, including the economy, communities, and the environment itself. Water availability projections for major sister-city pairs in the border region are not optimistic. For example, in a typical year San Diego County, Calif., imports 90% of its water while Tijuana, B.C., imports about 95%; by 2010 San Diego will consume about 87% of the water in this area while Tijuana will consume 13%—that is, if infrastructure keeps up with demand (Bradley and de la Fuente 2003). El Paso, Tex., and Ciudad Juárez, Chih., are likely to exhaust fresh water from the Hueco Bolson, the major source of supply for these two cities, by the mid-2020s (Boyle Engineering Corp. 1992). Agricultural use is relatively constant, measuring between 60% and more than 80% of surface waters while municipal withdrawals range from 10% to 30%, depending on location. Per capita use is higher in U.S. border cities than Mexican border cities. Likewise, information quality, institutional capacity, and budget size is better on the U.S. side.

As this chapter will demonstrate, several issues are created by the intersection of water with energy, biodiversity, economics, security, and health. These issues are further exacerbated by the inaction of institutions currently working in the region. However, several options do exist that could serve as springboards to other initiatives that save water in the U.S.-Mexican border region.

THE STATUS QUO

Water is related to everything and everything is related to water. The hydrological cycle provides surface water, which is the lifeblood for all natural capital and over time replenishes groundwater. Water supply affects water quality parameters and water quality affects ecosystem health, how much water is readily available to humans, human health, and the vitality of the economy—all of which are interrelated.

Disturbing the hydrological cycle or any component of it disrupts almost all other water features. Drawing down an aquifer leaves populations more vulnerable to future demands, risks salination from nearby salty groundwater, and could cause the permanent loss of underground storage capacity. Thus, tapping surface water or groundwater sources on one side of the border affects the other, just as disposal of wastewater on one side affects the other.

Unfortunately, the workings of binational aquifers are not known or understood well enough to draw them down; researchers have to determine how big they are, which way they flow, and the contaminants in or salinity of them. As well, the full dynamic of human response to drought and water shortages is not understood on either side of the border. Arguments already exist for the meteorological and climatic definition of normal and severe drought, but the economic, health, and social dimensions of lost water have yet to be pondered.

Energy

The border region lacks sufficient indigenous energy sources. Production of the energy needed depends on available water while the access, treatment, and distribution of water depends on energy. Thus, clean water depends on energy to generate it and energy depends on water to generate it. One of every seven watts of electricity used in California is dedicated to pumping or treating water (Rohy 2003). As water is mined deeper or farther away, that component increases in a region already starved for electricity. As the availability of both energy and water becomes more stressed, the sectors related to them become stressed as well.

Biodiversity

Many desert rivers around the world are literally biological lifelines. For example, in the vast 630,000 square kilometer Chihuahuan Desert, the transboundary Rio Grande/Río Bravo and its tributaries provide essential aquatic and riparian habitats, as well as supply water for municipal, agricultural, and industrial needs. In this arid region, fresh water is a critical resource for both aquatic and terrestrial species. Many of the highest priority terrestrial conservation sites in the Chihuahuan Desert overlap with freshwater priority sites. Some 450 endemic species and 700 migratory species are found in the border area, 31% of the species listed as threatened or endangered by the U.S. Department of the Interior are found in the borderlands, and the rates of endangerment are the highest for those species found along the international boundary (Van Schoik, et al. 2004a). Riparian woodlands are a keystone habitat, exerting powerful influence on the biodiversity of surrounding areas and serving as migration corridors for large mammals, songbirds, bats, and butterflies. The aquatic fauna that have evolved to live under the Rio Grande's variable flow conditions—from drought and low flow to large flood events—exhibit a high degree of endemism. As ground- and surface waters are depleted, little, if any, water remains for nature. Unknown billions of dollars are lost in biodiversity due to habitat destruction.

Economy

Significant economic costs for human populations accrue every year because of accelerated environmental degradation, particularly degradation of water. Nearly \$1 billion in productivity is lost directly due to water contamination. This, in turn, leads to a probable loss of approximately \$1 billion due to decreased recreational and leisure use of water bodies.

The border region also faces a severe environmental infrastructure deficit. The U.S. General Accounting Office (GAO) and others have estimated a shortfall of anywhere from \$1.3 billion to \$8.5 billion in water supply, wastewater, solid waste, and municipal infrastructure to treat wastes and protect the environment (Van Schoik 2002).

Those funds will be needed by 2030 to address the current shortfall and meet growing needs for water, sewage treatment, and landfill infrastructure.

Health

All the issues described above combine to negatively affect the single most important aspect of the border: The health of its citizens. Without regard for the political boundary, pollution and disease travel easily across it, causing sickness in border communities. Deficiencies in water treatment and delivery infrastructure perpetuate poor water quality, which contributes to increases in the number of waterborne and water-associated diseases. Diminished water supply also exacerbates health risks because pollutants and pathogens become concentrated in water bodies. Disease and pathology know no borders, yet political borders constrain the process of mitigating health risks and resolving the problem of ensuring a sustainable, healthy water supply for residents on both sides of the political boundary.

Although the demonstrated link between human exposure to environmental pollution and human health is a tenuous one, the suffering is real. Hepatitis A, a waterborne disease, causes many symptoms—diarrhea being one of the most serious and, in the border region, life-threatening. Incidence of Hepatitis A in the border region is 37.1 per 100,000, while nationwide in the United States it is 12.6 per 100,000 and in Mexico it is 50.1 per 100,000 (EPA 2000).

BINATIONAL SUSTAINABILITY INSTITUTIONS

In addition to the issues of the status quo, there are binational obstacles and barriers to sustainability created by institutions currently working on the border. Although well-conceived, in practice the groups cannot or will not take the actions necessary to begin providing remedies.

IBWC-CILA

In 1944, the Treaty Between the United States of America and Mexico Respecting the Utilization of the Colorado and Tijuana Rivers and the Rio Grande, commonly known as the 1944 water treaty, turned the International Boundary Commission into the International Boundary and Water Commission (IBWC) and established a formal procedure for sharing water resources in these three international watersheds. However, because the drafters of the treaty could not imagine current population growth and commensurate water demands, nor persistent and peaked drought cycles, the treaty and the commission, along with its Mexican counterpart the Comisión Internacional de Límites y Aguas (CILA), are thought of by critics and friends alike as anachronistic and unable to deal with today's problems. Recent successes—including a minute (the format under which IBWC-CILA drafts binational agreements) recognizing the ecological significance of the lower Colorado River delta and actions to protect it—juxtapose with failures to reconcile the often conflicting political primacy that exists at the local, state, national, and international levels.

In addition to the formal structure of IBWC-CILA detailed above, scholars of border water resource issues have suggested alternate means by which IBWC-CILA can address water resource management issues. Many advocate for some form of a border-wide science advisory council or board that would more aggressively bring academia-based research into the debate. IBWC-CILA has established a range of regional technical advisory groups that focus on specific regional challenges, but the prospect of the science advisory council or board has only recently been suggested to IBWC staff, with limited interest to date (Spener 2003).

BECC-NADBank

Pre-NAFTA negotiations ingeniously created an organization, the Border Environment Cooperation Commission (BECC), to help develop and certify projects as financially and environmentally sound and to ensure community involvement in their development. It then created and urged binational funding of a bank known as the

North American Development Bank (NADBank). Both were created as government-appointed boards with positions specified by the NAFTA side-agreement. The creation of BECC was truly unique as it promised—through public participation and transparency—to guard against the excesses of past development projects of the World Bank and other agencies that advanced economic development activities without adequate safeguards for the environment. This structure and intent for BECC and NADBank are notable, but the record of these institutions is mixed at best. Several years after BECC's creation, the lack of progress and performance prompted Congress to commission a study by GAO (GAO 1999), which strongly recommended that BECC develop a strategic plan.¹ But that has yet to happen. Additional uncertainty has recently become evident due to a reorganization effort advanced by the Bush Administration. In 2003, the BECC and NADBank boards intended to merge after the then-current performance review, thus threatening the public participation clauses, transparency, and regulatory and financial flexibility of the institutions.

BECC's inaction and NADBank's inability to act on some fundamental fronts threatens the health of people on the border, who risk being sickened by waterborne diseases. Funding for the Border Environmental Infrastructure Fund (BEIF) has slipped from the initial proposed level of \$100 million to \$50 million. BEIF is funded by the U.S. Environmental Protection Agency (EPA) to support grants from other institutions that can be combined with loans and guaranties to facilitate project financing through NADBank. This decrease in funding has constrained the ability of NADBank to make the critical investments in infrastructure that many border residents have demanded.

In addition to these funding problems, accountability of BECC and NADBank is also of concern to residents of the border and observers of border environmental policy. Performance accountability can be shown with surveys of environmental health before and after projects are completed. Without them, the true effectiveness of BECC and NADBank remain unknown, and opportunities to optimize investment may be missed. There can be little assurance that

the millions of dollars invested in health in the region have had any effect because BECC has not performed these surveys among its proposed beneficiaries.

THE NEXT SOLUTIONS

The myriad issues described herein create a particular challenge to meet the needs of an increasingly thirsty economy and populace. The move to bolster security activities and infrastructure makes the border less permeable to almost everything, including water. The continuing, if not widening, economic asymmetry means one side can continue to afford plentiful and clean water while the other may not. But there are several solutions specific to water that may provide some remedy to the situation.

Transboundary Environmental Impact Assessments

The trinational Commission for Environmental Cooperation (CEC) was formed to ensure that trade did not interfere with environmental enforcement within each NAFTA-signatory nation. One of the most useful tools CEC has at its disposal are Transboundary Environmental Impact Assessments (TEIAs), which are powerful mechanisms that can address negative environmental actions on one side of a political boundary that unfairly and adversely impact the other. TEIAs are moving ahead in Europe, the Baltic states, and Russia. With the knowledge gleaned from these assessments, minimization and mitigation of impacts can occur. The problem is, despite mandates to implement these assessments, little in this regard has occurred in the U.S.-Mexican border region, begging the question, Why? Some suggest that CEC has had a tacit agreement with U.S. and Mexican federal government officials who believe that the border is receiving enough attention from BECC, NADBank, and BEIF, and so further investment of time and resources is unwarranted (Vaughan 2003).

AQUIFER ASSESSMENT

As the culmination of the three-day Border Institute VI conference, sponsored by the Southwest Consortium for Environmental Research and Policy (SCERP) in April 2004, participants developed policy recommendations to enhance the management and conservation of transboundary ecosystems. Chief among them was the recognition that water for nature must be sufficient and sustained. Rivers must no longer be seen as water supplies and must be valued for their own sake. Both the United States and Mexico should pass legislation recognizing international rivers, dedicating water to them, and allowing the purchase of water to maintain their flows—all the way to their mouths. The legislation should include consideration of drought and flood years, as well as long-term global climate change predictions.

Border Institute participants recommended that a binational watershed assessment for the entire Rio Grande/Río Bravo, from Colorado to the Gulf of Mexico, should be undertaken to determine how much water is needed to sustain life. It is also important to determine which stakeholders need to be at the table to make decisions about the river and plans for future conservation, which ongoing assessments can provide helpful information, and to elect a body to oversee the assessment, such as IBWC-CILA. The assessment should be divided into subbasin levels, and then the coordinating body can harmonize the data. In conjunction with or after the assessment is complete, stakeholders should identify key areas in need of protection. Several successful small watershed pilot projects exist along the border and they can be replicated for development in other areas of the region. Existing organizations on both sides of the border should work together to develop long-term, holistic visions for their watersheds. As well, a water budget should be developed for the border region and tribal input on it should be sought aggressively.

Water Trades

Permits to emit air pollution are currently being traded across the international border. An exchange of water pollution permits across the border could be conducted in the same way. Wastewater can be used for agriculture, treated water can be recharged into the ground instead of dumped into the ocean, and excess municipal flows can be diverted to nature's use in winter, at night, or during other off-peak times. If agricultural waters can be conserved through various practices on one side, they could be made available to the other.

For example, a Mexican farmer should be compensated for saving water (or perhaps temporarily fallowing) and "delivering" the saved water to a broker. The broker, in turn, could sell the water to a farmer in Texas or to a government agency restoring a habitat. In 2000, for example, agencies paid \$61 million for nearly 397 million cubic meters of water for habitat restoration. The possibilities of moving water across the border are many and wasted, as reclaimed water can be engineered to serve either side without topographical hindrances and associated costs.

The idea is not so far-fetched as some claim. Very recently, when the California and Arizona water managers met with the Secretary of the Interior's water official regarding the river, they realized that innovation and so called "breaking the rules" was necessary to avoid disaster for all concerned. They agreed that takes and returns to the river at different locations and times could indeed solve some current and future demand woes. As well, water transfers have become a popular research topic, with teams discerning the fluctuations in price, transaction costs, and the value of such trades to both countries.

SCERP recently completed a study that seriously explored an international water market with a bank-and-exchange philosophy and found that indeed there is the opportunity to match and trade across the border. By comparing a hypothetical market institution to current non-market allocations of water, the study reports the economic benefits and costs of an international water market—run by an agency tasked with monitoring, moving, pricing, and accounting for flows—along the reach of the Rio Grande from Elephant Butte in New Mexico to Fort Quitman in Texas.

SCERP appreciates all the challenges and transaction costs to such a trading scheme, but consortium researchers have worked on and seen a successful trade of air emission reduction credits across the international boundary. Such cooperative leanings could lead to trades of water, water pollution reduction credits, water-related habitat mitigation credits, and other water-associated assets, and maybe even end tensions between the national governments, among water managers and users, and ultimately lead to secure and sustainable water for all.

OUTLOOK

The border environment and quality of life for border residents are in danger of deteriorating significantly if “business-as-usual” trends continue for population and economic growth. The Border Plus Twenty Years (B+20) system dynamics model describes three scenarios for the future: business-as-usual, increasing and improving technologies and economic impacts, and changes in societal values. As expected, the business-as-usual picture is dismal. By 2020, with no dramatic changes in regional development, the border region will be one of greater traffic congestion, poorer water quality and the attendant human health effects, water shortages, increasing numbers of endangered and threatened habitats and species, hazardous and solid waste disposal crises, sewage infrastructure shortfalls, and contaminated beaches and oceans (Ganster, et al. 2000). More and larger transfers of water away from relatively unpopulated and agricultural watersheds to the more populated and urban ones are expected, and these transfers will cause ecosystems to suffer greatly, cause major declines in agricultural productivity and attendant social problems, and negatively impact the urban poor.

While technologies like desalination offer some short-term solutions, substantial incentives are necessary to promote conservation. Considerable research must also examine the complex interactions and outcomes of water transfers to ensure that the end results of these transfers are rational for the parties involved.

The best options for long-term sustainability are those hardest to achieve—changes in individual and corporate behavior. Residents in the arid border region must recognize and behave as if they live in a

desert and begin to value water as a precious resource rather than a mere commodity. Many border residents do not perceive their water supply as dwindling, nor do they understand the effects of their water-intensive habits on local water availability. Discouraging the use of potable water for lawn irrigation and encouraging the use of drought-resistant vegetation for landscaping is an unpopular message for people who treasure their green lawns and lack an appreciation for landscaping with plants native to the desert region of the U.S. Southwest. Currently, water is simply priced too cheaply to promote conservation. To spark major changes in water use patterns, it must be priced to reflect the actual costs involved in generating needed supplies and its value as a life spring. Academia, in its role as educator and facilitator of sustainability science and research, is performing the task of instilling a water "culture" in the residents of the border region. Its message will be heard best when border residents begin to perceive water scarcity as a threat and change water use behavior.

Clearly, to make sense of the present and future stresses on the region, some sort of forecasting and backcasting (proactive current planning based upon predictions to avoid worst-case scenarios) tool is needed by stakeholders that allows them to understand the human, natural, and fiscal consequences of economic growth and development in the region. SCERP's B+20 Project works to this end. The purpose of the project is to create a systems modeling framework that provides an environment for imagining and exploring alternate futures for the border region and motivating prudent decision-making. This model will evaluate the interactions between human, environmental, and ecological systems. The prototype system will help stakeholders better understand changes in various environmental systems in response to population growth and industrial development. It will also account for the unique challenges associated with implementing binational environmental policy in the U.S.-Mexican border region.

ENDNOTE

¹ SCERP has developed a model that performs some of the same functions.

REFERENCES

- Amnesty International USA. No Date. "Intolerable Killings: Ten Years of Abductions and Murders in Ciudad Juárez and Chihuahua." <http://www.amnestyusa.org/women/juarez/>.
- Boyle Engineering Corp. 1992. "El Paso Water Resource Management Plan Executive Summary ii." Unpublished.
- Bradley, B., and E. de la Fuente. 2003. "Water Without Borders: A Look at Water Sharing in the San Diego-Tijuana Region." Pages 247–278 in *Binational Water Management Planning* SCERP Monograph No. 8, S. Michel, ed. San Diego, Calif.: SDSU Press.
- Ganster, P., D. Pijawka, P. W. Rasmussen, and R. Van Schoik. 2000. "Overview." Pages 37–72 in *The U.S.-Mexican Border Environment: A Road Map to a Sustainable 2020* SCERP Monograph No. 1, P. Ganster, ed. San Diego, Calif.: SDSU Press.
- Ganster, P. 2004. "State of the Border Environment Report." In *The State of the Border and the Health of its Citizens: Indicators of Progress 1993–2023*, Forthcoming SCERP Monograph. San Diego, Calif.: SDSU Press.
- Lyndon B. Johnson School of Public Affairs. 1999. *Navigating the Waters of the Paso del Norte: A People's Guide*. Austin, Tex.: The University of Texas at Austin.
- Michel, S., ed. 2003. *Binational Water Management Planning* SCERP Monograph No 8. San Diego, Calif.: SDSU Press.
- Peach, J., and J. Williams. 2000. "Population and Economic Dynamics on the U.S.-Mexican Border: Past, Present, and Future." Pages 37–72 in *The U.S.-Mexican Border Environment: A Road Map to a Sustainable 2020* SCERP Monograph No. 1, P. Ganster, ed. San Diego, Calif.: SDSU Press.

- Peach, J., and J. Williams. 2004. *Population Dynamics of the U.S.-Mexican Border Region* Forthcoming SCERP Monograph. San Diego, Calif.: SDSU Press.
- Pijawka, D., ed. 2002. *Overcoming Vulnerability: The Southwest Center for Environmental Research and Policy's Research Program (1990–2002) and Future Agenda* SCERP Monograph No. 5. San Diego, Calif.: SDSU Press.
- Rohy, D. A., ed. 2003. *The U.S.-Mexican Border Environment: Trade Energy and the Environment: Challenges and Opportunities for the Border Region, Now and in 2020* SCERP Monograph No. 7. San Diego, Calif.: SDSU Press.
- Spener, S. 2003. Personal communication with the authors. El Paso, Texas, 19 September.
- Treaty Between the United States of America and Mexico Respecting Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande. 1944. <http://crc.nv.gov/1944mex-icanwatertreaty.htm>.
- U.S. Environmental Protection Agency. 2000. *Protecting the Environment of the U.S.-Mexico Border Area*. Cited 14 September 2004. <http://www.scerp.org>.
- U.S. General Accounting Office. 1999. *U.S.-Mexico Border: Issues and Challenges Confronting the United States and Mexico*. GAO/NSAID-99-190. Washington, D.C.: GAO.
- Van Schoik, D. R., E. Lelea, and J. Cunningham. 2004a. "Sovereignty, Borders, and Transboundary Biodiversity: Turning a Potential Tragedy into a True Partnership. An Introduction to the Theory and Practice of Conservation Biology in the U.S.-Mexican Border Region." In *The U.S.-Mexican Border Environment: Transboundary Ecosystem Management* SCERP Monograph No. 13, K. Hoffman, ed. Forthcoming. San Diego, Calif.: SDSU Press. Paper available at <http://www.scerp.org>.
- Van Schoik, D. R., C. Brown, E. Lelea, and A. Conner. 2004b. "Barriers and Bridges, Managing Water in the U.S.-Mexican Border Region." *Environment* 46:1.

Water Issues in the U.S.-Mexican Border Region

- Van Schoik, D. R. 2002. "A Verification and Meta-Analysis of Past Border Environmental Infrastructure Needs Assessments." Pages 143–164 *The U.S.-Mexican Border Environment: Economy and Environment for a Sustainable Border Region: Now and in 2020* SCERP Monograph No. 1, P. Ganster, ed. San Diego, Calif.: SDSU Press.
- Vaughan, S. 2003. Personal communication with the authors. Washington, D.C.
- Vélez-Ibáñez, C. G. 1996. *Border Visions: Mexican Cultures of the Southwest United States*. Tucson, Ariz: University of Arizona Press.

