

US-Mexico Border Environment 2002



Sixth Report of the Good Neighbor Environmental Board

to the President and Congress
of the United States



April 2003

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Los miembros de la Junta incluyen a representantes de ocho agencias federales del gobierno y de cada uno de los cuatro Estados fronterizos estadounidenses — Arizona, California, Nuevo México, y Texas. La combinación de los conocimientos de las personas en la mesa refleja las perspectivas de varios sectores estadounidenses incluyendo al gobierno federal, tribal, estatal, y local; instituciones no gubernamentales; instituciones académicas; y negocios. Asimismo, la Junta Ambiental del Buen Vecino confiere regularmente con organizaciones mexicanas tales como el Consejo Nacional de Asesoría para Desarrollo Sustentable de la Región 1 (Consejo). El Consejo se reúne tres veces al año en varias localidades fronterizas.

La Junta del Buen Vecino presenta sus consejos al Presidente y al Congreso en forma de informes que contienen recomendaciones sobre acciones a tomar. Su primer informe fue publicado en 1995. Desde entonces, la Junta ha continuado articulando una voz objetiva, basada en el consenso, sobre las medidas estratégicas que deben ser utilizadas para abordar los asuntos de interés de la frontera México-EE.UU. Los temas que se repiten en sus recomendaciones incluyen los siguientes: un enfoque en las áreas de mayor necesidad; un mejor apoyo a los proyectos existentes; un apoyo de nuevas iniciativas que proporcionen valor agregado; la participación de varias organizaciones diferentes al inicio y durante el transcurso del proceso; y el establecimiento de un fundamento ambientalmente sustentable como base para la toma de decisiones.

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December 2002

The President
The Speaker of the House of Representatives
The Vice President

On behalf of the Board, I am pleased to present this Sixth Report of the Good Neighbor Environmental Board to the President and Congress of the United States. The Report responds to much-appreciated guidance contained in EPA Administrator Christine Todd Whitman's response, on behalf of the Office of the President, to our last report. Its contents reflect extensive deliberation on the part of our members and strong public input sought and gained throughout the year.

Our recommendations this year focus on four areas: water resources; power plants; human health; and conservation of natural resources. We also briefly address four issues that merit continued attention: BECC-NADBank reform; the Border 2012 program; the effect of security measures on the border-region environment; and progress in building dialogue with the Board's counterpart advisory groups for the northern border of Mexico, the Consejos.

Throughout this Sixth Report, our recurrent theme is that communities along our nation's southern border must play a pivotal role in shaping the region's environmental and infrastructure policy. Moreover, because the effects of increased trade, immigration, homeland security, and other national policies have an especially strong effect on these communities, ensuring that they have the resources required to fully exercise this role is in our national interest.

The Board appreciates the opportunity to offer these recommendations to you and respectfully requests a response. In order to measure our own effectiveness, and to evaluate the federal government's progress on issues within our scope, the Board will monitor follow-up to its recommendations. In our view, the time is ripe to begin taking the next steps we describe. We welcome ongoing dialogue with the Executive Branch and Congress on implementation of our advice.

Respectfully Yours,

Placido dos Santos,
Chair

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2002 Recommendations at a Glance

WATER RESOURCES

- **Watersheds** - Foster U.S.-Mexico cooperation on shared rivers and other surface waters, using a watershed approach. Place emphasis on sustainable management, more efficient use of water, conservation, innovative technology, and ecosystem needs.
- **Groundwater** - Initiate a border-wide groundwater assessment program to systematically analyze priority trans-boundary aquifers. Use this scientific foundation as a springboard for addressing complicated policy issues such as groundwater rights, protection, and competing uses.
- **Education, Research** - Increase public education to enable border-region residents to actively engage in the protection of their water supplies. Bolster binational research efforts by sharing U.S. technical knowledge and resources with Mexican water agencies and universities to develop comparable data sets that are readily available.

POWER PLANTS

- **Airsheds** - Pursue airshed-based emissions caps that address power plants and other pollutant sources affecting the border. Build on airshed discussions initiated by local partnerships, the U.S.-Mexico Binational Commission (BNC), and the North American Commission for Environmental Cooperation (CEC).
- **Public Involvement** - Increase public awareness of power plants' environmental and human health effects as well as their economic effects. Publicize emissions data, conduct trans-boundary environmental impact statements, and move discussions forward to harmonize different emissions standards, involving the public at each step.
- **Alternatives** - Intensify focus on other solutions besides power plants to meet energy supply needs. Promote wind and solar options; support dry cooling and emission-reducing technologies where appropriate; increase energy efficiency and conservation; and consider market-based incentives, including emissions trading.

(continued overleaf)

2002 Recommendations at a Glance *(continued)*

HUMAN HEALTH

- **Education** - Harness a variety of communications tools to increase public education about the links between the state of environmental infrastructure and the state of human health in the border region.
- **Data Gaps** - Fill data gaps in existing databases containing statistics on health issues in border communities on both sides of the border. Make emissions inventories more robust, and link exposure data to health data.
- **Infrastructure** - Step up the pace for improving the environmental infrastructure in the region, especially for air, water and solid waste, in the certainty that improvements in human health will result.

NATURAL RESOURCES CONSERVATION

- **Coalitions** - Assign top priority to natural resources conservation initiatives that bring together broad coalitions of consumers including ranchers, farmers, environmental groups, and other types of interest groups.
 - **Multidisciplinary Approach** - Foster a greater multidisciplinary approach to natural resources conservation policy, recognizing that federal policies on immigration, homeland security, and other issues may greatly complicate conservation work – especially on tribal lands.
-

Preface

The report that follows reflects the Good Neighbor Environmental Board's resolution, decided upon early in 2002, to make an even greater effort to hear directly from border-region residents whose daily lives, family health, and future are so profoundly affected by national policies that shape the region's environmental infrastructure.

Meeting sites during the past year were carefully chosen. For the first community meeting of the year, in February, the Board selected Calexico, California, opting to meet in the library of the downtown Calexico campus of San Diego State University. The second meeting took place in an historic hotel in downtown El Paso, Texas, close to public transportation to nearby neighborhoods including those in its sister city, Juárez, Chihuahua. And the final meeting of the year, thanks to the hospitality of local officials, was held in the Nogales, Arizona, Mayor and Council Chambers in October.

Public turnout at these meetings demonstrated the benefits of choosing accessible locations. People who attended ranged from the heads of major border institutions to concerned individuals from the local community to county officials and tribal representatives. In these community settings, during the Public Comment sessions, the Board heard what local residents thought about the water debt, new power plants, illegal immigrants on ranching and grazing land, and more. To complement this public input, the Board invited local experts to speak at each of its meetings on a specific environmental topic of broad interest. Speaker affiliations included local, state and regional governments; tribes; the private sector; academic institutions; and environmental and other non-profit groups on whatever theme they had chosen.

The result was an unprecedented level of information-sharing and constructive debate during 2002. The consensus the Board has reached in this report is shaped, more than ever, by what it heard. It also is shaped by the wide-ranging expertise of the Board members themselves. Many of the contributors are individuals who live with their families in one of the four U.S. border states, while others are senior officials in federal agencies who help to shape borderland environmental policies. Individually and collectively, Board members worked to put together recommendations this year that are both useful and timely.

The topics the Board has selected for its recommendations this year represent some of the most contentious issues the region and nation face: Water Resources, Power Plants, Human Health, and Natural Resources Conservation. The advice that follows reflects the Board's intent to decrease contention, to increase cooperation at all levels based on full participation, and to foster policies and actions that result in real improvements.

One final note: Under federal law, the Board is charged with advising the President and Congress on "the need for

implementation of environmental and infrastructure projects" in the four U.S. border states. The Board's view is that it can best serve that mission by broadly interpreting what is meant by the term "environmental and infrastructure projects." Thus, for the Water Resources section of this report, the debate underlying the recommendations encompassed not only supply delivery systems but also broad concepts that embody sustainability, such as watersheds and habitat. For Power Plants, it involved not only air emissions, but also alternative energy sources. In the case of the Human Health section, the connection to environmental and infrastructure projects includes the transportation infrastructure at border crossings, as well as data that suggests possible links between high levels of asthma in children living in border communities and the presence of brick kilns. And as for Natural Resources Conservation, which is featured for the first time in the Board's history in this report, the Board recognizes that managed lands are an integral part of the environment, that they include the plant and animal life that sustains ranching and grazing land, and that a love of open land and intergenerational land stewardship feature strongly in what might be called the area's rural "cultural infrastructure."

The Board welcomes feedback on this, its latest, set of recommendations.



Introduction

As our nation made great efforts during 2002 to respond to the events of September 11, 2001, the focus of our relationship with Mexico went through dramatic changes. Needless to say, these changes were felt all along the 2,000-mile border between the two countries and throughout tribal communities within the region.

Homeland security and immigration control were necessary components of the Administration's strategy for reducing the risk of terrorists using the border region to infiltrate or harm the United States. Pre-September 11, we were close to reaching mutual understandings on migration, trucking and security cooperation, which would have had an impact on our environmental dialogue with Mexico. Given that many of our trans-boundary environmental problems along the U.S.-Mexico border can be linked to inadequate border cooperation, the understandable attention to these other developments meant less focus on environmental cooperation. Longer wait times for vehicles at the border, increasing populations, and extensive agricultural water use all exacerbated an already complicated relationship.

Water issues remained at the top of the environmental policy chart. The year was characterized by drought along much of the border, and an acute water shortage on the main transnational river systems. Water no longer was only a technical issue between the two countries that was regulated through treaty obligations. Instead, it grew into a political discussion involving the highest levels of both governments. The year saw a new water agreement, International Boundary and Water Commission (IBWC) Minute 308, which provided South Texas with some immediate water relief, and established a framework and resources by which both countries could collaborate on improving their stewardship of the Rio Grande water basin. To enhance communication and public input on U.S. IBWC activities, the U.S. Commission created boards in San Diego and Southeast Arizona that were modeled on a three-year-old existing program in the El Paso-Las Cruces area called the Rio Grande Citizens' Forum. Late in 2002, applications were solicited for another new group, the Colorado River Citizens' Forum, covering Yuma County, Arizona, and Imperial County, California. And planning got started to create another board to give input on the Lower Rio Grande Valley of Texas.

Given the importance of freshwater resources throughout North America, the Commission for Environmental Cooperation (CEC) initiated a process to determine its role in watershed management, including consideration of affordable water-related technologies and water pricing. As part of this ongoing process, the CEC held its first public workshop on freshwater issues in North America in Albuquerque, New Mexico, on October 3, 2002. Water also remained a top focus for the border-region academic community. For instance, Border Institute IV, Binational Water Management Planning, was held

at Rio Rico in May and produced a series of recommendations for long-term planning.

Cooperation and partnerships to address other border-region environmental issues, such as emergency preparedness, also were strengthened. In a first of its kind, the City of Naco, Sonora, signed a binational emergency preparedness/prevention plan with neighboring Cochise County, Arizona, which includes Naco, Arizona, unique among sister-city plans in that it was the first between a municipality and a county.

The Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADBank), the two border-region institutions created under the North American Free Trade Agreement (NAFTA), began



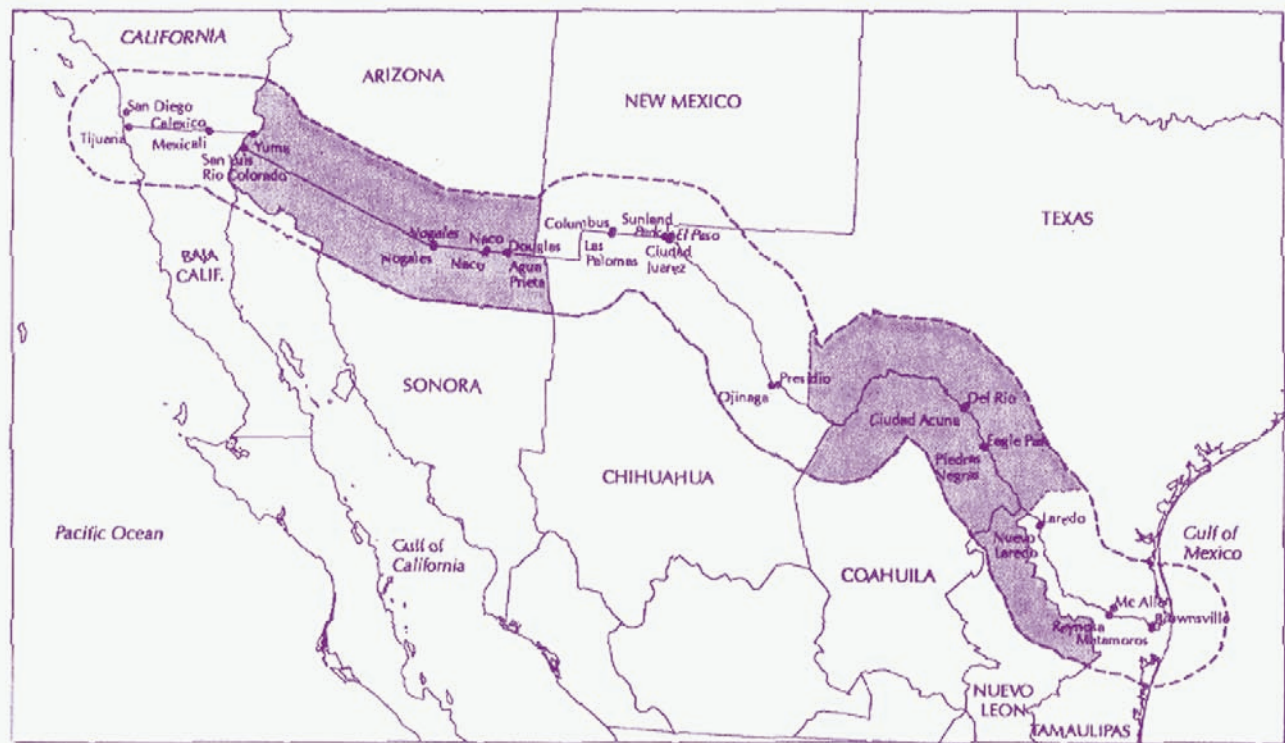
President George W. Bush and President Vicente Fox shake hands at the Palacio de Gobierno, Monterrey, Mexico, Friday, March 22, 2002. Among outcomes of the meeting was an agreement on an outline of basic reforms for both the Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADBank). *White House photo by Eric Draper.*

significant reforms in an attempt to improve their service to the border region by increasing project development and reducing delays. Presidents Bush and Fox met in Monterrey, Nuevo Leon, Mexico, in March and agreed to an outline of basic reforms for both BECC and NADBank. The Presidents directed that both institutions remain focused on environmental infrastructure priorities and continue their critical work on projects while recommended reforms were being implemented.

Communication between U.S. Environmental Protection Agency (EPA) Administrator Christine Todd Whitman and Mexican Environmental Secretary Victor Lichtinger (of Mexico's Secretariat of Environment and Natural Resources, or SEMARNAT) remained productive. EPA's work with SEMARNAT and state environmental agencies over the past several years to develop a framework for the next 10-year binational border environmental plan began to bear fruit. Based

on extensive preliminary discussions with many groups, and the desire of the 10 border states and the border tribes to play greater role in the next border plan, SEMARNAT, EPA, the 10 border states, and border tribes drafted a 10-year plan called Border 2012: U.S.-Mexico Environmental Program. A key new approach for Border 2012 will be to decentralize decision-making and priority-setting, shifting the focus to the different geographic regions along the border in order to better address local environmental issues. Binational regional workgroups will be created for this purpose, along with border-wide workgroups and policy forums that work on issues common to the entire region.

U.S.-MEXICO BORDER REGION



- Sister City
- Region Boundary
- State Boundary
- 100 km Border Buffer



Sources:
Digital Chart of the World
La Paz 100 km Border Buffer



WATER RESOURCES

RECOMMENDATIONS

- **Watersheds:** Foster U.S.-Mexico cooperation on shared rivers and other surface waters, using a watershed approach. Place emphasis on sustainable management, more efficient use of water, conservation, innovative technology, and ecosystem needs.
- **Groundwater:** Initiate a border-wide groundwater assessment program to systematically analyze priority trans-boundary aquifers. Use this scientific foundation as a springboard for addressing complicated policy issues such as groundwater rights, protection, and competing uses.
- **Education, Research:** Increase public education to enable border-region residents to actively engage in the protection of their water supplies. Bolster binational research efforts by sharing U.S. technical knowledge and resources with Mexican water agencies and universities to develop comparable data sets that are readily available.

How to effectively manage dwindling, and often impaired, water supplies remains one of the most daunting challenges faced by U.S.-Mexico border communities. This ever more complicated dilemma applies both to surface waters and groundwater. In its last two reports, the Good Neighbor Environmental Board called for handling surface supplies by adopting a watershed approach. In this latest, our Sixth Report, we re-state our call. Moreover, facilitating a watershed approach necessitates addressing gaps in knowledge about groundwater. Finally, we once again recommend that appropriate studies and research be increased to provide adequate data and a body of knowledge on which to make policy decisions. Progress has been made in some arenas during the past year, but some of the most-needed fundamental shifts in policy directions have yet to happen.

SURFACE SUPPLIES

More sustainable management of three trans-boundary rivers – the Colorado, the Rio Grande, and the San Pedro – holds the key to addressing much of the border region's surface water quantity and quality problems. While other important binational rivers such as the Tijuana and New River also must be factored into any policy decision on the region's water resources, the Board has selected the first three as its primary focus for this report.

All three rivers made U.S. media headlines during 2002 due to water competition and drought-related issues. For the Colorado River, attention focused on whether California would be able to reduce its use of surplus water beyond its 1929 allocation on a gradual schedule agreed to by all seven Colorado River Basin states. In the case of the



Base modified from U.S. Geological Survey HYDRO1k data set
Lambert Azimuthal Equal Area projection

0 100 200 300 KILOMETERS

EXPLANATION

- Basin
- Subbasin boundary

More sustainable management of three trans-boundary rivers — the Colorado, the Rio Grande, and the San Pedro — holds the key to addressing much of the border region's surface water quantity and quality problems. *Source: U.S. Geological Survey, Austin, Texas.*

Rio Grande, there were impassioned debates on what is called Mexico's "water debt" to the United States and what to do about it. And in the San Pedro River Basin, discussions largely sprang from the need to sustain and enhance an extraordinarily diverse riparian habitat.

The Colorado River is often described as the most controversial and regulated river in the United States. It flows primarily in the U.S., emptying into the Gulf of California in Baja California, 81.4 river miles south of the border. Stretching some 1450 miles, the Colorado River is the nation's fifth longest river, and its drainage basin includes an area of vast and diverse geography, human population, plant and animal species, and politics. Conflicts over water have long been a part of the basin's history. Today, the Colorado River provides water for more than 25 million people, 3 million acres of irrigated land, and 11.5 billion kilowatt-hours of hydroelectric power. Moreover, decisions about the area's water supplies have an impact on 34 Indian reservations.

For the past 100-plus years, users of the Colorado River have been involved in litigation. Multiple agreements establish the framework for managing the river's resources among seven basin states, tribes, and Mexico, and controversies over how these resources are shared remain very much alive. Even while agricultural use of water has remained a priority for the Colorado River Basin states and the U.S. as a whole, a competing demand for water has arisen from the region's increasing urban populations. Consider the growth of cities such as Las Vegas, Phoenix, Los Angeles and San Diego, all of which rely, in part, on Colorado River water.

The modern history of human use of the Colorado River is a story involving enormous change. Prior to damming of its flow, the river fluctuated widely from season to season and from year to year, coming largely from melting snow in the Rockies. Now, a series of major dams tightly controls river flow, and the nature of the river has been completely changed. Reservoirs dot

the landscape, and they trap and remove vast quantities of sediment from the river. The imposed controls on the river are now such that it seldom reaches its original coastal discharge in the Sea of Cortez in northern Baja, Mexico. The actual water needs of the Colorado River delta have never been scientifically determined; rather, the 1922 Colorado River Compact allocates water among compact states and the 1944 treaty determines the allocation of water between the U.S. and Mexico.

Water quality as well as water quantity remains a problem for the Colorado River. Salinity in the Colorado River has fluctuated significantly due to high runoff and flood-control releases, which tend to dilute the concentrations of material dissolved in the river water. Human development and nature contribute about equally to the levels of salinity. Natural sources include saline springs; erosion from saline geologic formations; reservoir evaporation; and riparian plants that consume large quantities of water (phreatophytes), leading to an increase in the concentration of salts. Human sources include irrigation return flow and effluent from municipal and industrial sources. Excessive salinity affects many users and activities: public health, irrigation use and efficiency, municipal and industrial use, wildlife health, tribal water rights, and the quality of water delivered to Mexico.

Salinity concentrations became an international issue as early as 1964, when the Mexican government complained that the water deliveries with salt concentrations of 2,000 parts per million were affecting the farmers' ability to grow crops. To address the concern, in 1974, Mexico and the United States signed International Boundary and Water Commission (IBWC) Minute No. 242, which requires that the United States ensure that Colorado River water arriving at Morelos Dam will have an average annual salinity no more than 115 (+30) parts per million over the average annual salinity of water arriving at Imperial Dam.

The Rio Grande, or Río Bravo as it is known in Mexico, provides water to some 10 million people, 8 million of whom live in Mexico, and meets irrigation water needs for farmers in Colorado, New Mexico, Texas and Mexico. Along its 1254-mile international boundary, Rio Grande waters are allocated between the United States and Mexico by the Convention of 1906 for the upper 90 miles, and by the 1944 Water Treaty from Fort Quitman – downstream of El Paso-Ciudad Juárez in Hudspeth County – to the Gulf of Mexico. The river provides water for a rich assemblage of wildlife habitats and aquatic species, but this particular function is more and more difficult to sustain as human uses of water drain the river.

Like the Colorado River, the Rio Grande also is highly regulated. Water diversion infrastructure such as surface impoundments (dams) and channelization has greatly altered the river's natural systems. The Rio Grande originates as an alpine stream in the San Luis Valley of Colorado and travels south through New Mexico until it reaches Texas, where it forms the international boundary between the U.S. and Mexico. Its

traditional point of discharge is the Gulf of Mexico, 54 river-miles downstream of Brownsville, Texas. But beginning in February 2001, diminished flows in the river, combined with wave action in the Gulf of Mexico, created a sandbar blocking the river's flow from reaching the Gulf. The river finally re-opened naturally in October 2002, when rains in the lower Rio Grande Valley resulted in sufficient flow to re-open its mouth.

Unlike the Colorado River, only 54 percent of the Río Grande Basin is in the United States, and reservoirs exist in both the United States and Mexico. At Ojinaga, Chihuahua, and Presidio, Texas, the Río Conchos, which originates in the Sierra Madre mountains of Mexico, joins the Rio Grande. This river has traditionally been the largest contributor of flow into the Rio Grande in Texas. The Río Conchos contributed an average annual flow of 754,703 acre-feet to the Rio Grande over the period 1968-1997, or 85 percent of the combined historical annual flow. However, IBWC data shows that from 1994 to 2000, the Río Conchos averaged 142,900 acre-feet, 46 percent of the measured combined flow. This reduction of flow from the Río Conchos has been due to a persistent drought and to water being retained for Mexican users.

The hydrologic history of the Rio Grande shows a staggering variation in flows, typifying a river that experiences both flooding and drought. Such conditions require an adaptable management approach that accounts fairly for these fluctuations. Yet drought conditions and growing water demands in the border region are testing traditional water-management approaches. At the Law of the Rio Grande conference held in Albuquerque in January 2003, conflicts surrounding ownership, management and control of Rio Grande waters in the three U.S. and four Mexican states of the basin were discussed. Specific issues include disputes over the ownership of water stored in Elephant Butte reservoir, the nature of the Bureau of Reclamation delivery obligations to Texas, potential litigation between Texas and New Mexico, tensions between the city of El Paso and the El Paso County Water Improvement District No.1 (EPCWID) over the price and control of Rio Grande water, the implications of meeting priority tribal rights in times of drought, litigation involving releases of water to maintain wild populations of federally listed endangered species, and the conflict between the U.S. and Mexico involving 1944 Treaty deliveries.

Five stream segments of the Rio Grande have been placed by the Texas Commission on Environmental Quality (TCEQ) on the Clean Water Act 303(d) list of impaired bodies, primarily for bacteria and dissolved solids. While sewage treatment plants are well regulated in the U.S., many Mexican municipalities along the river have inadequate sewage systems. That being said, a number of plants have recently been constructed or are planned for a number of Mexican towns along the river.

The third river covered in this report, the San Pedro River, originates in the Mexican state of Sonora approximately 20 miles

south of the border and flows north into the United States. It is one of the last free-flowing rivers in the Southwest, and is one of only a few desert rivers that flow north into the United States. Approximately 28 percent of the basin lies in Mexico and is under solely Mexican jurisdiction.

The San Pedro supports a narrow corridor of riparian vegetation that is habitat for 400 birds, 84 mammals, and 47 amphibian and reptile species, as well as 14 fish species. Several of these species are designated as endangered. A 1998 study of riparian migratory bird habitat completed for the North American Commission for Environmental Cooperation (CEC) highlighted the unique ecological features of the San Pedro, especially as a migratory corridor providing an oasis in the desert for species traveling from north to south and back. Literature suggests that as many as 4 million songbirds fly through the San Pedro basin between wintering grounds in Mexico and Central America, and their summer breeding grounds in the United States.

Fortunately, the river's critical role as wildlife habitat already has received some recognition. The Nature Conservancy has declared this region as one of the 12 "Last Great Places" in the Western Hemisphere, and both the American Bird Conservancy and the CEC have officially recognized the area as an "Important Bird Area." In 1988, Congress designated almost 48,000 acres as a Riparian National Conservation Area (RNCA).

Now, however, the San Pedro is at risk due to increasing demand for water in Sierra Vista, Arizona, by a rapidly expanding population. Yet to maintain the many types of biotic communities that compose the Upper San Pedro's unique ecosystem, it is necessary to maintain flow in the River at all times, even during prolonged dry periods. Here again, competing uses for limited supplies has become a thorny dilemma with no easy solution.

GROUNDWATER SUPPLIES

Some of the same challenges faced by users of the Colorado, the Rio Grande, the San Pedro, and other surface-water resources in the border region also affect users of water supplies that lie underground. But there are additional issues as well. Groundwater supplies within the border region are contained in vast binational basins that span the international boundary. Many of these border-region aquifers are located in a very complex hydrologic setting. In many cases, little is known about the availability, sustainability and quality of these supplies, or how they interact with surface-water bodies. Knowledge also is lacking about characteristics such as depletion rates, recharge rates, level of use, level of conservation, and the impact of drought. Yet, the need to fully assess these trans-boundary aquifers is becoming more critical due to droughts, rapid population growth, and limited surface-water supplies.

Under Mexico's constitution and national water law, groundwater is a national resource, whereas in the United States, groundwater management and regulation largely are functions of

state laws and court rulings. Both nations currently abide by a number of treaties and binational agreements dealing with international boundary water issues. However, a specific agreement on groundwater management and allocation between the U.S. and Mexico does not exist. And in some sense, at this point in time, such an agreement could be seen as premature until more is known about the resource in question.

Some basic research has been carried out by the IBWC, the U.S. Geological Survey (USGS), and New Mexico State University on a select few trans-boundary aquifers. However, there are approximately 18 critical trans-boundary aquifers along the border, and for most of them data remain fragmentary at best.

POLICY ISSUES, PARTNERSHIPS, AND NEXT STEPS

Based on developments in water resources management activities during 2002, the Good Neighbor Environmental Board has identified several key policy issues and next steps it advises be taken to address these issues. Examples of effective partnerships also are included:

Issue 1

DISPUTE INVOLVING TREATY DELIVERIES. Dispute involving water ownership and treaty deliveries continues to dominate water management for both the Colorado and Rio Grande rivers. For the Rio Grande, the United States and Mexico continued their discussions during 2002 on the delivery by Mexico of waters obligated under existing agreements. These discussions resulted in development of Minute No. 308 (*see box on page 7*), which calls for both immediate and long-term actions for the efficient use of waters in the Rio Grande Basin. The two governments continue to have high-level discussions to develop measures necessary for achieving a fundamental and lasting solution to this very complicated and highly charged issue.

For the Colorado River, interstate compacts, international treaties including the same 1944 Water Treaty that applies to the Rio Grande (*see box on 1944 Treaty*), Congressional acts, and Supreme Court decrees – all collectively known as the "Law of the River" – govern the river's management activities. Allocation of its waters with the U.S. is governed by the Colorado River Compact (1922), negotiated by the seven basin states and the U.S. government. The Compact recognizes the need to divide the use of the Colorado River between the upper basin states (Colorado, New Mexico, Utah, Wyoming, and portions of Arizona) and the lower basin states (*California, Nevada, and a large portion of Arizona*), apportioning each the use of 7.5 million acre-feet per year.

The 1944 Treaty

The United States and Mexico entrust to the International Boundary and Water Commission (IBWC) the application of various boundary and water treaties and the settlement of any differences that arise. One of the most significant treaties is the Treaty for Utilization of Waters of the Colorado and Tijuana Rivers and of the Rio Grande. Signed on February 3, 1944, this agreement is commonly referred to as the "1944 Water Treaty." An earlier treaty, the Convention of 1906, provides for the delivery of waters to Mexico in the El Paso-Ciudad Juárez valley.

To carry out its responsibilities, the IBWC applies the provisions of a treaty through agreements called Minutes. An IBWC Minute establishes the legal basis for a binational project, further defines the funding source, and describes the binational approach for project development. The Minute is executed by the Commissioners and Secretaries of both sections of the IBWC. Minutes are approved by the U.S. State Department and its Mexican counterpart, the Foreign Relations Secretariat (SRE). Once approved, a Minute forms a binding obligation between the two governments.

Under the portion of the 1944 Water Treaty that governs trans-boundary allocation of Rio Grande surface waters, Mexico is to deliver a total of 350,000 acre-feet per year, from six Mexican tributaries, averaged over a five-year cycle, to the United States. Mexico fell behind on its obligation in the 1992-1997 accounting cycle and owed 1.02 million acre-feet at that time. During the subsequent cycle, from 1997 to 2002, Mexico fell further behind, and as of the end of 2002 owed a total of about 1.5 million acre-feet to the U.S.

Farmers in the Lower Rio Grande Valley of Texas use the majority of this water, and they, along with elected officials in Texas, have repeatedly called for resolution of the deficit. At the close of the latest accounting cycle, which ended October 2, 2002, the U.S. State Department issued a statement on the matter that called for "meaningful and rapid steps by Mexico" in resolving its treaty obligations. The Texas Commission on Environmental Quality, on October 30, 2002, released a statement outlining the state's position on the 1944 Water Treaty. In essence, the view of Texas was that Mexico was in material breach of the 1944 Water Treaty and outlined measures the U.S. could take for legal remedy against Mexico such as providing water out of non-tributary treaties. The U.S. and Mexico continue to seek resolution to the water-debt issue through active negotiations.

The 1944 Water Treaty requires the United States to deliver 1.5 million acre-feet to Mexico per year from the Colorado River, plus an additional 200,000 acre-feet in times of surplus. In recent years, California has consistently diverted and used more than its 4.4 million acre-feet apportionment; Nevada is close to diverting its full share, and Arizona is diverting its entire allocation.

For all three rivers – the Rio Grande, Colorado and San Pedro – dwindling water supplies are prompting other conflicts as well. For instance, the stretch of the Rio Grande running from the Texas state line to where the 1944 Water Treaty jurisdiction begins at Fort Quitman is cycled through the city of El Paso and two irrigation districts, all of which are trying to meet water delivery needs. The city of El Paso, which receives water from EPCWID, argues that EPCWID is charging too much and has



An historic moment: Mexican Ambassador F. Castillo Najera signs the 1944 Water Treaty in Washington, D.C., February 3, 1944. Seated at the table, left to right: Mexican Commissioner Rafael Fernandez MacGregor, Mexican Ambassador F. Castillo Najera, Secretary of State Cordell Hull, American Ambassador to Mexico George S. Messersmith, and U.S. Commissioner Lawrence M. Lawson. *Source: IBWC Archives.*

asked the state to intervene. Whether this water should be governed by the federal government because it originates at Elephant Butte Reservoir, which is managed by the Bureau of Reclamation, or whether the state of Texas has jurisdiction on this issue is a matter of opinion. New Mexico, Texas and the federal government all are seeking to determine the answer.

In the San Pedro River basin, the rapidly growing population and accompanying incremental demand on groundwater is in direct conflict with the need for a sustainable water supply to maintain the ecosystem that is protected within the RNCA. Economic and ecological values converge dramatically along the San Pedro River, and the community faces a complex challenge in balancing these needs.

Next Step

INCREASE VOLUNTARY BINATIONAL COOPERATION USING A WATERSHED APPROACH, SUPPORT CONSERVATION MEASURES.

Scarcity of surface supplies, combined with a different interpretation of certain treaty provisions, means that voluntary partnerships within shared watersheds are essential for managing these supplies. Moreover, decisions concerning management of surface-water supplies must be founded on consistent data that are acceptable both regionally and binationally.

The Good Neighbor Environmental Board notes that on a number of levels, particularly in Minutes 307 and 308 of the 1944 Treaty, both the U.S. and Mexico have declared their commitment to effective binational management of the Rio Grande Basin. In the view of the Board, it is especially critical now for both the U.S. and Mexico to step back and reassess current water-management scenarios. This reassessment should include an examination of reservoir operations, allocation priorities, water measurement, water quality and system controls. Both governments must direct sufficient financial, human and political resources toward ensuring that these commitments are met in the very short term so that sound management practices can be put into place and maintained.

In the United States, discussions are under way to establish a Federal Watershed Coordinating Committee for the Rio Grande River watershed. The purpose of this committee is to facilitate regular information exchange and collaboration among federal agencies to prevent duplication of effort and more efficiently utilize existing resources.

Partnering across existing organizations at other levels of government also can yield real benefits. For instance, border states should support access to the resources of border cities, or state-wide organizations with interests in Mexico. Case in point: The state of California established a cooperative relationship with the City of San Diego Metropolitan Wastewater Department related to industrial wastewater program development in Baja California. In addition, California State University, Sacramento, has been funded by U.S. Environmental Protection Agency (EPA) and the state of California to develop water and wastewater training materials for use in Baja California. And the Association of California Water Agencies has implemented a “Hands Across the Border” program through which its member agencies will provide technical resources to Baja California water utilities. Professional organizations such as the Water Environment Federation could be encouraged or assisted to provide translation services at conferences and meetings.

Concurrently, conservation efforts must continue to be a cornerstone of more efficient water use throughout the border region. Recent mandate expansion agreements for the Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADBank) have paved the way

for projects that result in water conservation to receive NADBank funding (*see Special Topics section, BECC-NADBank Reform*). At a special meeting of the Board of Directors from BECC, held on October 17, 2002, the Board unanimously certified its first water conservation project. The project will entail modernization and technical improvement for irrigation district 005, in Delicias, Chihuahua. This district is considered the most important of the three irrigation districts located in the Río Conchos sub-basin. Expected increased efficiency will reduce losses by 50 percent, according to BECC. Savings from projects such as these are expected to be applied to Mexico’s current water debt.

The Board advises that BECC funds directed toward water conservation continue to be directed toward where they are needed most within the framework of Minute 308 and where this need has been well documented. Disbursement of funds should be tied to clear commitments from recipients in the form of stated water savings. Close monitoring of such projects might include installing real-time stream-flow gauges and meters, sharing resulting data via web transmission with the public to increase transparency and promote public involvement in policy development.

Issue 2

COMPLEXITIES OF TRIBAL WATER RIGHTS: Native American groups have multiple interests in both the Rio Grande and Colorado River basins. Water development is important for tribal economic development on reservations. Conversely, tribes also support the establishment and protection of in-stream flows to protect fish and wildlife resources.

An already complicated scenario along the border is further complicated because the officially recognized status of tribes in the United States and in Mexico differs. The United States recognizes that U.S. tribes are separate sovereign governments, and that equity issues affecting tribal governments must be addressed in the United States on a government-to-government basis. By contrast, Mexico recognizes the historical debt it has with its indigenous communities and has said it will consider appropriate measures to address their particular concerns as well as protect and preserve their cultural integrity.

In the United States, for the most part, the specific rights of tribes as sovereign governments have not been verified and quantified by a court. Indian rights, if fully realized, could have a significant effect on water rights established under state law. Most western states follow what is called the prior appropriation (first-in-time, first-in-right) and beneficial-use doctrine (water must be used for a beneficial use). In 1908, a court case established the concept that Indian tribes are the senior rights holders in a basin (having resided there since “time immemorial”) and are exempted from the “beneficial use” clause generally required of water users by state law. Though the

potential exists, therefore, for tribes to claim their water rights, many have not done so to date. One of the main barriers is that most tribal water rights, in order to be adjudicated, must go through a General Stream Adjudication (GSA) process through which rights are recognized by both the states and the federal government. This process takes many years, is extremely expensive, and may be politically divisive. Many tribes are not fully prepared to adjudicate their water claims because they lack the funds to assess, plan and develop their rights. Moreover, the U.S. government does not have the obligation to develop tribal water resources.

Of note, at the January 2003 Law of the Rio Grande conference (mentioned above), the Isleta Pueblo in New Mexico reasserted their “prior and paramount” rights to Rio Grande water stored in El Vado reservoir and to certain deliveries made in the Middle Rio Grande Conservancy District. This is a position of the six Middle Rio Grande Indian pueblos (Cochiti, Santo Domingo, San Felipe, Santa Ana, Sandia and Isleta), which hold “prior and paramount” water rights collectively. The pueblos may have negotiated successfully with the Department of Interior and Bureau of Reclamation to ensure adequate storage of water in El Vado reservoir to make deliveries for the 2003 irrigation season, even as the Bureau predicts dire water shortages in 2003 deliveries due to low snowmelt. In this case, and in the silvery minnow case (*Rio Grande Silvery Minnow v. Keys*), the pueblos have asserted that because of the nature of their water rights, they are not subject to curtailment.

In addition, the Santa Ana Pueblo of New Mexico has successfully raised the funds for an extensive restoration project on its section of the Rio Grande River above Albuquerque. The project includes removal of redundant and ineffective bank stabilization structures that have prohibited natural river movement, the removal of salt cedar and other invasive non-indigenous flora, and the restoration of native vegetation and cottonwood bosque on approximately 1200 acres of riparian lands along 6.5 miles of the river.

For the Colorado River, the San Luis Rey Band of Mission Indians was given an allocation of 64,000 acre-feet/year in the Quantification Settlement Agreement that was to have been signed on December 30, 2002, by parties using Colorado River water in California. Colorado River Indian tribes continue to work to have their water rights adjudicated.

Next Step

PROMOTE FULL TRIBAL INVOLVEMENT IN WATER-MANAGEMENT DISCUSSIONS. Because of the importance of the resource to their development, and given their rights, tribes should be enabled to fully participate in border-region water-management discussions. In addition, tribes should be supported in undertaking restoration projects, bearing in mind that they may theoretically qualify for federal funding through

Minute 308

Minute 308, signed June 28, 2002, recommended establishing funding for water conservation projects and irrigation infrastructure improvements in both the U.S. and Mexico through the North American Development Bank (NADBank) and the Border Environment Cooperation Commission (BECC). These institutions, under an expanded mandate, have liberated \$80 million in interest on paid-in capital for the Water Conservation Investment Fund (WCIF), which will provide grant monies for such projects. Projects in Mexico receiving funds are subject to agreement within the International Boundary and Water Commission (IBWC) regarding surface-water flows that must be provided to the U.S. as a result of the water infrastructure improvements. As of the end of 2002, the NADBank was refining its guidelines for submitting projects to be funded through the WCIF.

grant programs but often lack the matching funds necessary to obtain such a grant.

Issue 3

CONTINUED DROUGHT. The seasonal U.S. drought outlook is not encouraging. According to some long-term projections, a slow improvement is likely in the Lower Rio Grande Valley border region. Yet according to a forecast by the Bureau of Reclamation, for the first time in more than 30 years the Rio Grande upstream from Fort Quitman, Texas, will experience drought conditions in 2003; if this scenario comes to pass, it could add to problems being experienced further south in the Rio Grande Basin. Meanwhile, for the Arizona, New Mexico and California portion of the border, the forecast is for persistent drought.

A number of current water supply and management practices were instituted when trans-boundary surface-water supplies still were relatively plentiful. Drought can test the limits of existing practices and often reveal their weaknesses, particularly a lack of longer-term thinking.

Next Step

INSTITUTIONALIZE DROUGHT-MANAGEMENT PLANS. A pressing need exists for drought-management plans that would supplement existing water management agreements. These plans must incorporate ecosystem needs within the mix of “user” needs to be satisfied. Dialogue among all parties at all levels across both countries is essential to such agreements.

During 2002, the IBWC took a step in this direction through its passage of Minute No. 308 (see box). The language



Non-native aquatic plants continue to challenge natural resource managers in the Rio Grand basin. This invasive shrub, called *salt cedar*, was photographed in May 2002 in Big Bend National Park, Texas. *Photo credit: Sarah L. Wynn, Research Botanist, U.S. Bureau of Reclamation*

in this document signals the intent of the Commission to form a technical committee for the exchange of information related to drought management. Minute 308 considered recommendations made in Minute 307 regarding both a binational summit of experts and the formation of an International Advisory Council to act as a forum for the exchange of information and advice to IBWC regarding sustainable management of the Rio Grande Basin. The Good Neighbor Environmental Board fully supports implementation of these recommendations. It is extremely important to maintain the focus on sustainable management of these waters, particularly as growth and drought continue to test the limits of existing international agreements.

Border states have the potential to play a key role in developing strategic approaches to drought management. For instance, the Texas Water Monitoring Council and the Texas Drought Preparedness Council will sponsor a working technical conference during 2003 to develop information to assist state-level managers in reporting and drought preparedness measures. Results from this symposium should be closely followed in light of potential best practices elsewhere and for their potential binational relevance.

Issue 4

ECOSYSTEM DEGRADATION. The endangered Rio Grande silvery minnow is now confined to a small stretch of the river below Cochiti Dam and above Elephant Butte. Environmental groups are engaged in pressing for appropriately timed releases of water to maintain a flow sufficient for the survival of the minnow, but some water users – particularly municipal and irrigation interests in the Albuquerque region – are opposed to releasing flows for the minnow.

Non-native aquatic plants, including an invasive shrub called salt cedar, continue to challenge natural-resource managers in the Rio Grande Basin. Not only does it consume tremendous water supplies, it prevents native species of riparian and wetland vegetation (cottonwood, willow and mesquite) from reestablishing in areas where flood flows have been eliminated, forming a monoculture and “taking over” long swaths of riverfront habitat. Other problems salt cedar can create include increased salination of riparian soils; diminishing wildlife and habitat diversity; and clogging the channel of rivers, irrigation ditches, seeps and springs so that flows are impeded, thus diminishing the quality of riparian lands.

A variety of contaminants also continues to threaten the region’s water resources and the ecosystems that depend on them. For instance, some 152 miles of the Rio Grande in New Mexico have been categorized as impaired, meaning they do not fully meet their designated water-quality uses according to Clean Water Act criteria stipulated in Section 303(d). And throughout much of its reach in Texas, according to the 2002 draft 303(d) list, the Rio Grande is impaired by bacteria, chlorides (salts), total dissolved solids, and ambient toxicity.

The Salton Sea, a geologic component of the Colorado River Basin, is sustained by agricultural, domestic and industrial wastewater from the Mexicali Valley in Baja California and the Imperial Valley and Coachella Valley in California. It is a key component of the Pacific Flyway, and is visited by more bird species than any other place in the U.S., except for the south Texas coast. The Salton Sea supports a major sport fishery and is a significant recreational resource in Southern California. Because the sea is a closed basin, its size and salinity are directly related to the amount of inflow. Salinity levels, which are already considered to be critically high, will rapidly increase, and the existing ecosystem food chain will collapse if inflows are reduced.

Next Steps

SUPPORT COMMUNITY-LEVEL EFFORTS TO PROTECT ECOSYSTEMS. Recently, efforts have focused on finding ways to eliminate salt cedar from the banks of Western rivers where it has gained a strong foothold. An extensive eradication effort involving the use of herbicides on the Pecos River has met with some success, but there is still a need for planning and implementation of more holistic restoration/enhancement strategies for all river basins affected by invasive species.

The binational Rio Grande/Bravo Ecosystem Working Group (BREW), administered by the IBWC and involving state, federal and NGO members, has been pursuing collaborative binational salt cedar control pilot projects, primarily on federal land adjacent to the Big Bend region in Texas. Expanding this specific effort to a larger-scale endeavor offers great potential and likely would receive support from a wide range of agencies, landowners and organizations. Among the many, often

contentious, issues facing the Rio Grande, an effort to reduce salt cedar infestation and enhance the riparian zone could provide immediate benefits and also be a stepping stone to addressing more divisive topics.

In a related initiative, the Agricultural Research Service of the U.S. Department of Agriculture is proceeding with plans to release the Chinese Leaf Beetle for biological control of salt cedar at selected locations in the Rio Grande River watershed, including locations on the U.S.-Mexico border. The start of this research is contingent on Mexican agreement to release sites near the border and assurances of funding for follow-up monitoring.

INCORPORATE ECOSYSTEM NEEDS FOR WATER IN ALL DECISION-MAKING AND IN MARKET INCENTIVES.

While existing treaties and water-management agreements recognize the water needs of different user groups, at the time they were written, these agreements did not take into account the needs of the fish and wildlife that the river systems support. These needs should be accounted for in all decision-making now and in the future, and must be given equal weight when considering how water should be allocated. In addition, a number of tools exist that could provide incentives for water to be “freed up” for the environment, such as forbearance contracts (farmers are paid NOT to irrigate, particularly on marginal land), water trusts (allowing for water to be “deposited” at a tax advantage to the water right owner and avoiding cancellation for non-use), and outright purchase of available water rights.

RECOGNIZE INSTREAM FLOW AS A WATER-QUALITY VALUE.

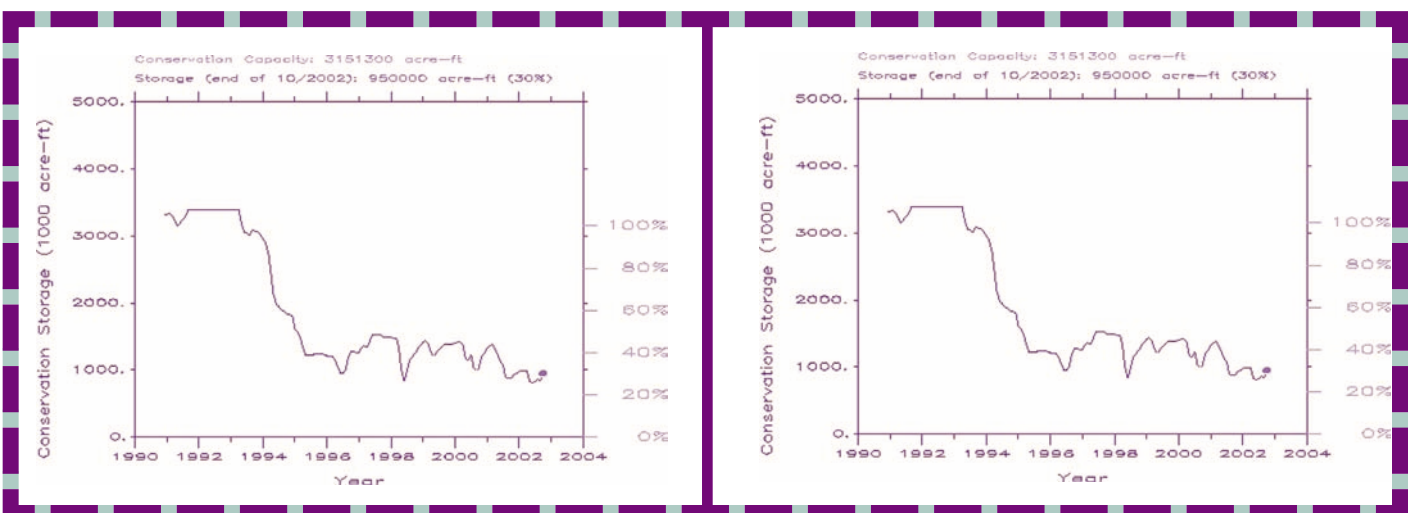
Increasing flows in rivers and streams helps lower salinity levels, dilute toxins and increase overall water quality. There are programs in place to identify and mitigate the effects of toxins (such as the Total Maximum Daily Load program implemented at the state level). These programs, while important, take many years and millions of dollars to implement. Purchasing available water for instream flows might in time also improve water quality in select areas.

Issue 5

LACK OF KNOWLEDGE ABOUT GROUNDWATER RESOURCES.

Instituting a strategy to share the region’s groundwater resources first requires a level of knowledge about their characteristics and availability, knowledge that currently is lacking. Without sound binational studies of trans-boundary aquifers, uncertainty about groundwater resources will only continue. Most of the aquifer systems have very complex hydrology, which creates a barrier to understanding how these border groundwater supplies function. More information is needed on groundwater quality, quantity, depletion rate, conservation, recharge, withdrawal, drought and usages.

Aside from the need for additional basic research, there also is a need to gather and disseminate best management practices. Interestingly, Mexico and the United States did agree in 1973 through Minute 242 to limit specific volumes of groundwater



Drought conditions in the Rio Grande Basin are testing traditional water management practices. Amistad International Reservoir, located on the Rio Grande/Ri6 Bravo near Del Rio, Texas and Ciudad Acuna, Mexico, was at about 30 percent of its capacity at the end of October 2002. Falcon International Reservoir, located on the Rio Grande/Ri6 Bravo near Zapata, Texas and Nueva Ciudad Guerrero, Mexico, was at about 25 percent capacity at the end of October 2002. Updates available at:

http://www.twdb.state.tx.us/publications/reports/waterconditions/conservationstorage/conservation_storage.htm

Source: Texas Water Development Board.

that could be pumped by each country within 8 kilometers of the Arizona-Sonora international boundary. This agreement called for additional consultation on actions that might adversely affect the other country.

Next Step

BUILD TRUST, BUILD ON PROGRESS TO DATE. Building trust is a key precursor for engaging in informed negotiations regarding shared trans-boundary groundwater resources. This effort should involve binational data collection, transparency, and a commitment to maintain a robust database concerning the interaction between ground- and surface-water resources. But besides filling these scientific, institutional and legal information gaps, other critical matters such as capacity building, raising awareness, and possible investment potential have to be addressed.

Water-management agencies in both the U.S. and Mexico undertook to construct an extensive database concerning shared groundwater resources in the El Paso-Ciudad Juárez region that was completed in January 1998. Following this example of a collaborative effort, the two governments and appropriate state agencies can undertake similar studies in other population centers along the border, prioritizing the areas of greatest need based on population and water-use projections.

On a global level, efforts are under way in Europe, Africa, and South America to develop effective management practices for internationally shared aquifers. Several international organizations have developed a project titled “International Initiative on Shared Aquifers” (ISARM), whose mission is to champion best practices for the management of groundwater resources shared between neighboring countries. The ISARM project aims to develop methods and techniques for improving the understanding of aquifers and the management of shared groundwater systems, bearing in mind both the technical and the institutional dimensions.

In the view of the Good Neighbor Environmental Board, the ISARM process has merit. Furthermore, it may be wise for U.S. and Mexican agencies to enter into the dialogue, placing the Hueco Bolson and other important trans-boundary U.S.-Mexico aquifers on ISARM’s inventory of internationally shared aquifers. Water-resource managers from the border region could both learn from and contribute to the dialogue.

Another potentially promising development: In response to a request from Congress, the USGS, Sandia National Laboratory, and the Water Resource Research Institutes in all four U.S. border states have prepared a joint concept proposal for a binational program to assess trans-boundary groundwater resources in the border region. This long-term study, if funded, would begin in 2004.

Issue 6

OVER-PUMPING OF GROUNDWATER SUPPLIES, DISCONNECT WITH SURFACE SUPPLIES.

Some groundwater supplies that *have* been identified are in danger of depletion. One example is the Hueco Bolson, the major trans-boundary aquifer in the El Paso-Ciudad Juárez area of the border region. In 1999, a total of 191,000 acre-feet were pumped from the Hueco Bolson, 63 percent by Mexico. The recharge rate is estimated to be only about 6,000 acre-feet, and much less than that during periods of prolonged drought. As pumping continues to increase due to the anticipated population growth on both sides of the border, the Hueco Bolson in Ciudad Juárez, Mexico, will become unusable without treatment due to total dissolved solids concentrations above acceptable standards. A USGS study estimated that by 2005, water levels in the aquifer will drop to a level that creates conditions for saline water to enter and contaminate it, resulting in degraded water quality in public supply wells in Ciudad Juárez. El Paso faces a similar situation, although it is projected to run out of groundwater by 2020 and is investigating a variety of alternatives, including desalination.

Moreover, traditional management approaches to the border’s water resources have not been based on the premise that surface water and groundwater are a single resource. Yet, the development of either of these resources profoundly affects the quantity and quality of the other. Because the hydraulic connection between surface- and groundwater often is difficult to observe and measure, this interdependence has been all too easy to ignore in water management considerations and policies.

Unfortunately, this disconnect is graphically illustrated by conditions in the San Pedro River Basin. Pumping of underground supplies in the basin to irrigate agriculture, supply private water companies, and supply domestic wells has an effect on ecosystem dynamics within the San Pedro RNCA above ground. When the base flow of the river is changed, so is the riparian habitat. Despite recommendations from area natural-resource managers that a certain level of flow be maintained throughout the perennial reaches of the upper San Pedro, growth in the nearby communities of Sierra Vista and Fort Huachuca continue to draw upon groundwater supplies and hence threaten the conservation area.

Next Step

ENCOURAGE BINATIONAL PLANNING TO PREVENT GROUNDWATER DEPLETION, INTEGRATED APPROACH TO MANAGING SURFACE AND UNDERGROUND SUPPLIES.

Strategic binational planning is needed to avoid over-pumping and to balance production, recharge and salinity of groundwater supplies. This balance should be achieved through joint development of a binational agreement that ensures one community’s water reductions not be offset by the other’s

overuse. The El Paso-Ciudad Juárez area is one of the few binational locations in which there are numerical models that can be used to evaluate a number of water optimization strategies. Moving ahead in this area could provide impetus and practical outcomes to guide efforts elsewhere.

To better protect and manage both surface- and groundwater supplies, water policy makers at all levels of government on both sides of the border should foster an integrated approach that is based on the premise that these supplies essentially are a single, interconnected resource.





POWER PLANTS

RECOMMENDATIONS

- **Airsheds:** Pursue airshed-based emissions caps that address power plants and other pollutant sources affecting the border. Build on airshed discussions initiated by local partnerships, the U.S.-Mexico Binational Commission (BNC) and the North American Commission for Environmental Cooperation (CEC).
- **Public involvement:** Increase public awareness of power plants' environmental and human health effects as well as their economic effects. Publicize emissions data, conduct trans-boundary environmental impact assessments, and move discussions forward to harmonize different emissions standards, involving the public at each step.
- **Alternatives:** Intensify focus on other solutions besides power plants to meet energy supply needs. Promote wind and solar options; support dry cooling and emission-reducing technologies where appropriate; increase energy efficiency and conservation; and consider market-based incentives, including emissions trading.

Events of the past several years such as the California energy "crisis," the White House Energy Plan, and the Enron scandal have increased national attention on energy supplies and power plants. And although, at least in the U.S., there seemed to be a slow-down during 2002 in the previous year's rush to build power plants, overall demand for power likely will continue to grow. Moreover, power plants are likely to play a significant role in meeting that demand. Therefore, the Good Neighbor Environmental Board believes that power-plant infrastructure should remain an issue that is closely tracked by border-region policy makers, particularly in light of the potential trans-boundary effects.

In its last report, its Fifth Report to the President and Congress, the Board examined how existing air-quality problems might be further exacerbated by elevated activity in the power sector and called for alternatives to such a scenario. For this report, the subject once again has been selected as a top issue for analysis.

As of autumn 2001, 13 new electricity-generating projects had been issued permits border-wide and 16 more were being planned to meet the region's anticipated needs. Cumulatively, these activities were projected to increase the region's generating capacity by more than 5,000 megawatts (MW) by 2003 and to almost double the current capacity from 14,000 to 26,000 MW by 2009, according to statistics from several U.S. and Mexican government sources.

These projections for the border region likely will be repeated on a larger scale throughout the interior of both countries, according to the CEC. In its June 2002 report

called “Environmental Challenges and Opportunities in the Evolving North American Electricity Market,” the Commission projects that electricity demand from 2000 to 2009 will increase by 21 percent in the United States and 66 percent in Mexico. The report goes on to say that as of August 2001, utilities, private developers, and energy planners were projecting that by 2007, approximately 2000 new electric generation units would be built across the three NAFTA countries, roughly a 50 percent increase over current installed capacity.

The implications of these projections are serious. While the need to meet energy demands to build and maintain a strong regional economy is widely acknowledged, so, too, is the need to protect the region’s environment and the health of its inhabitants. Power-plant fuels can introduce a number of potential problems. For example, coal-fired power plants produce numerous pollutants including sulfur dioxide (SO₂), which leads to acid rain; nitrogen oxides (NO_x), which can add soot and smog to the atmosphere; toxic mercury; and carbon dioxide (CO₂), which contributes to global climate change. Oil-fired plants produce many of the same pollutants, though in somewhat smaller quantities. Energy from natural gas is considered to be relatively cleaner, with negligible emissions of SO₂ and very low NO_x emissions. Burning natural gas, however, still produces CO₂ emissions, and natural gas itself, composed primarily of methane, can contribute to climate change if released to the atmosphere, according to the International Council on Local Environmental Initiatives (ICLEI).

Power plants in North America still are primary contributors of toxic releases, says the CEC in that same 2002 report, with the U.S. in the lead. In 1998, the U.S. emitted 12.3 million tons of SO₂ (Mexico emitted 1.6 million) and 5.8 million tons of NO_x (Mexico emitted 0.2 million). The U.S. electricity sector is responsible for 25 percent of all NO_x emissions in the nation, 70 percent of SO₂ emissions, 25 percent of mercury emissions, and 35 percent of CO₂ emissions.

These air pollutants, in turn, have been associated with a number of health problems (see also the *Human Health* section of this report). For instance, NO_x contributes to the formation of ozone, which is linked to respiratory illness and asthma, particular in sensitive populations such as the elderly and children. And microscopic particles of soot have been associated with heart and lung disease. Findings from specific studies back up the concern: One long-term study on children’s health evaluates the effects of chronic air pollution exposures on the health of children living in Southern California. The findings indicate that besides the acute effects of air pollution on asthma incidents and respiratory illness, there is evidence of decreased lung development and increased probability of developing asthma in the first place.

Wildlife also can suffer from the presence of power plants. It has been estimated that 80 million birds die in the U.S. each year as a result of collision with electric transmission lines or

through electrocution, as the lines can interfere with natural migratory cues (“Power Trip,” Weisman, *Harper’s Magazine*, October 2000). And from a purely aesthetic and economic perspective, transmission lines can mar scenic “viewsheds,” affecting the economy of a region that relies on nature tourism. Finally, evidence indicates that air pollution from power plants and other sources in the U.S. and Mexico is partially responsible for decreasing visibility in the Grand Canyon and other national parks on the Colorado plateau, as well as in Big Bend National Park in Texas.

POLICY ISSUES AND NEXT STEPS

Based on developments in the power-plant sector during 2002, the Good Neighbor Environmental Board has identified several key policy issues and next steps it advises be taken to address these issues:

Issue 1

COMPLEX LEGAL, INSTITUTIONAL AND ECONOMIC ARRANGEMENTS. A variety of different state and federal entities in the U.S. are responsible for issuing permits for power plants, monitoring and regulating emissions from power plants, issuing permits for trans-boundary pipelines and transmission lines, and conducting the appropriate oversight and federal review processes such as National Environmental Policy Act (NEPA) review. Especially when trans-boundary impacts are the focus, the process for review and public input is not always clear or well-defined. Moreover, in the view of critics, all too often it seems that a power plant has gotten approval for construction on one side of the border before the public on the other side is even aware of the project.

The concerned public, in some cases, is beginning to take action. In 2002, for example, a binational non-governmental group called the Border Power Plant Working Group gained significant attention. It carried out a locally waged battle against two power plants being constructed in Baja California near the border in Mexicali and Rosarito by two energy companies, Sempra Energy and Intergen Corporation. The group, with the help of Wild Earth Advocates and Earth Justice, filed suit against the U.S. Department of Energy (DOE) relating to the plants, which are scheduled to export some, if not all, of their electricity to California.

This suit revolved around the issue of presidential permits, which are mandatory documents issued by DOE granting permission to construct and operate electric transmission lines that cross the U.S. international border. The U.S. Environmental Protection Agency (EPA) submitted comments

during the public comment period. It should be noted that U.S. air-quality standards in both Imperial and San Diego Counties are in non-attainment for both CO and ozone. In building their case, filers drew on past case law that interprets the NEPA to include major actions outside the U.S. that nevertheless may have effects within the country. Using this NEPA interpretation, they contended that the presidential permits for these two plants were issued without due consideration of the potential cumulative impacts that the two plants and transmission lines would have on the environment and on local air quality.

As of the end of 2002, this lawsuit was still pending. However, early in 2003, Intergen announced it would install selective catalytic reduction equipment on its entire Mexicali plant.

Next Step

INCREASE INFORMATION-SHARING AND TRANSPARENCY. As increased energy production and cross-border energy trade is projected for the U.S.-Mexico border, governments should pursue a binational program using the best available science to establish officially recognized airsheds in the border region. Emissions caps should be set for these airsheds that reflect the variety of sources in the region, both from within the U.S. and also from Mexico.

Regardless of whether or not the NEPA can be applied within a cross-boundary context, the Board recommends that both the U.S. and Mexico consider potential trans-boundary environmental effects of proposed projects, and widely disseminate information to potentially affected border communities. In addition, the U.S. and Mexico should be encouraged to finalize negotiations on the Trans-boundary Environmental Impact Assessment (TEIA) agreement under the North American Agreement for Environmental Cooperation, which calls for notification of projects with trans-boundary environmental impacts.

One example of an existing agreement that might serve as a model is Annex III of the La Paz Agreement, which deals with notification about the shipment of trans-boundary hazardous materials. A similar notification process might be instituted for new and expanded power plants. The increased transparency in the environmental review process, in turn, would generate greater confidence among companies and investors hoping to capitalize on an expanding electricity sector.

Issue 2

INSUFFICIENT FOCUS ON ALTERNATIVE SOLUTIONS.

The Energy Plan introduced by the administration in 2002 tends to be heavy on supply-side solutions and light on conservation. In addition, the plan relies heavily on new generation capacity using traditional fuels rather than using alternative sources of energy.

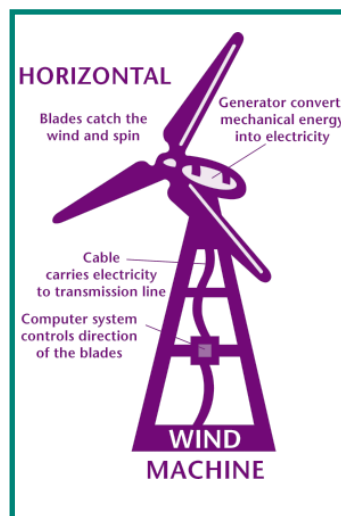
Fortunately, some progress in harnessing alternatives is being made on a state level. For instance, all four U.S. border states have taken steps to promote renewable energy development. They have put into place minimum renewable energy standards, so-called “renewable portfolio standards,” that have a goal of a certain percentage of electricity to be obtained from renewable sources. Each state also has developed and implemented energy efficiency and conservation programs, such as Senate Bill 7, 76th Texas Legislature. In addition, the state of California passed a new law (SB1078) in 2002 that requires electricity vendors to increase solar, wind, and other renewable sources to 20 percent of all electricity sold by 2017, with at least 1 percent increase each year until then.

These efficiency and conservation measures are being introduced not a moment too soon. The CEC’s June 2002 report (see above) includes a table summarizing national emission totals for new electric utility generation. Even the “low boundary” projections (i.e. those incorporating only a small percentage of the total plants projected, or those already in “advanced stages of development”) show that by 2007, CO₂ emissions for Mexico will increase by 29 percent, and in the U.S. by 14 percent from base year 1999 levels.

Next Step

HIGHLIGHT PROVEN ALTERNATIVES, EXPLORE OTHERS.

Energy policy experts and scientists studying global climate change have recommended a range of what are called market-based incentives to encourage development of renewable electricity. Candid discussion of existing and potential alternative options, highlighting their advantages and exploring potential barriers, would provide the momentum to institute what works and to find solutions to barriers. For example, in Austin, Texas, if a customer signs up for the Green Power option, which entails receiving a portion of your electricity from alternative energy sources such as wind and solar power, you can



Candid discussion of existing and potential alternative energy options such as solar and wind power would provide the momentum to institute what works in the border region and to find solutions to barriers. *Graphic courtesy of Department of Energy website.*

lock in your electricity rates even if natural-gas prices, for example, were to rise.

The media is doing its part to disseminate information on alternatives. In a five-part series on renewable electricity in spring 2002, the Dallas Morning News discussed wind and solar power and the status of these renewables in the current electricity market. According to the program, wind power appeared to be gaining a foothold in the marketplace; Texas developed 900 megawatts of new wind power during the 1990s. Also in Texas, consumers have been able to choose wind power as part of their energy source since the advent of restructuring in 2001. Wind farms have been established in West Texas, providing another source of income to landowners in that region.

Solar power also is making some gains. For instance, California has had a Renewable Energy Resources Program since 1995, giving partial rebates to help defray the costs of solar or photovoltaic energy collectors installation. There is a special program for schools and affordable-housing developments. San Diego County is showing the way with several solar projects: in Del Mar at the fairgrounds, 7000 solar panels have been installed at the horse barns; the U.S. Navy has a 750 kilowatts (kW) solar energy system lighting up 935 homes in Coronado; and the municipal building in San Diego incorporates solar-powered electricity.

The state of Arizona also continues to harness solar energy: in Tucson, the Electric Power Company has a 2.4 milliwatts (mW) solar array. And across the border, the Comisión Federal de Electricidad (CFE) is embarking on building a 25 mW solar-energy unit in San Luis Río Colorado, Sonora, Mexico.

Issue 3

NATIONAL PROGRAMS MAY FALL SHORT OF ADDRESSING BORDER-REGION SCENARIOS. Two changes introduced this year, the Clear Skies Initiative and the rule change in the New Source Review (NSR) program under the Clean Air Act, seem on the surface to be designed to cut emissions nationwide from both power plants and other sources. The Good Neighbor Environmental Board is concerned that these programs may actually do very little and, in fact, may worsen border air quality in non-attainment areas.

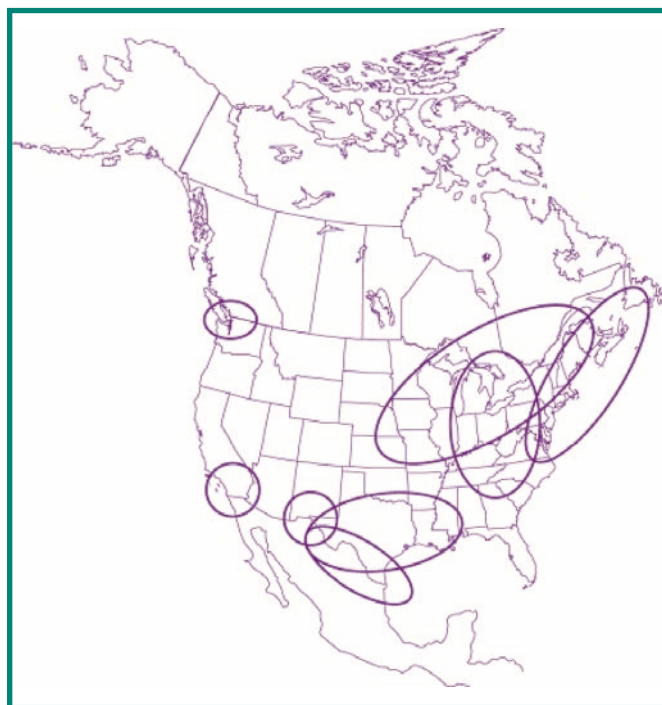
The Clear Skies Initiative was unveiled in February 2002. It proposed a “cap and trade” approach to emissions, under which pollution sources would be able to transfer authorized emission limits among themselves to achieve the required reductions at the lowest cost. The goal of this emissions trading program is to cut SO₂ emissions by 73 percent from current levels, NO_x emissions by 67 percent, and mercury by 69 percent. Vigorous public debate on the plan has revolved around whether the Clear Skies Plan truly achieves emissions reductions, or whether the same or better success could be achieved through strict enforcement of existing Clean Air Act regulations. Concerns are that 1) the plan proposes emission reductions relative to the rate of growth in the

industry rather than reducing the total volume of emissions; 2) the program is voluntary; and 3) given the effectiveness of available emission-control technology, the emission-reduction targets are not aggressive enough.

The other national program announced during 2002 of concern to the Board is the NSR program within the Clean Air Act, which was unveiled by the EPA in November. Supporters of the revisions, due to take effect in March 2003, say they reflect how business has changed and will result in greater environmental benefit. Attorneys general in nine Northeastern states filed suit at the end of the year, claiming that the revisions will result in more acid rain, smog, asthma, and respiratory disease. California opposed the changes on the basis that they threatened the state’s more stringent state and local NSR rules by requiring EPA to find that state NSR programs were “equivalent” to the EPA rules.

Next Step

STRENGTHEN NATIONAL INITIATIVES, DEVELOP BINATIONAL AIRSHED APPROACH. Strengthening, not weakening, national programs will benefit the border region and the nation as a whole; however, only when strong national programs are combined with a binational airshed approach along



Identification of shared cross-border airsheds like these could lead to binational agreement on acceptable levels of emissions for a particular airshed. Source: “Environmental Challenges and Opportunities of the Evolving North American Electricity Market,” Commission on Environmental Cooperation (CEC), June 2002, page 11. Paul Miller, 2001.

the border will real long-term success be achieved. Such a strategy, if adopted, could include cross-border consensus on the definition of a particular airshed, agreement on acceptable levels of emissions for that airshed, and a plan that includes enforcement actions for reaching these standards. The CEC report mentioned earlier (see above) includes a map that illustrates shared cross-border airsheds. Notably, a cross-border airshed approach is recommended in the section of the report entitled “Opportunities for Environmental Cooperation.”

Support for the airshed concept took another step forward at the annual BNC conference in Mexico City in November of 2002. A U.S.-Mexico Border Air Quality strategy was unveiled by the governments of Mexico and the United States that underscores “the importance of coordinated border airshed management.” Officials were directed to develop pilot trans-boundary projects and report back by April 1, 2003.

Without a comprehensive airshed-based air-quality plan, emissions trading may only result in shifting pollution sources. Once an overarching plan is in place, however, emissions trading regimes and other tools may be appropriate to consider. Under the right circumstances, they may offer flexibility and the potential to lower the cost of emission reductions. The CEC report includes a section on opportunities for cooperation that includes a discussion of innovative economic instruments, including trans-boundary emissions trading.

Issue 4

POWER-PLANT OPERATIONS MAY PUT STRESS ON WATER SUPPLIES. Large volumes of water are consumed by power plants for cooling purposes. According to the California Energy Commission, a conventional 500 MW natural gas-fired combined cycle power plant using water for cooling consumes between 2,000 and 4,000 acre-feet of water per year, which is equivalent to the amount used by 4,000-8,000 homes (California Energy Commission, “Energy Facility Licensing Process: Water Supply Information,” Staff Paper/Draft, December 2000). Most of this water, up to 90 percent, is used in a closed loop wet-cooling system and emerges as steam and lukewarm water. The large majority of currently operating power plants in the border region are of this type.

Alternatives such as co-generation plants, simple cycle plants, and facilities that employ dry-cooling systems typically use less water during operation. But the quantity of water consumed and returned is only one of the environmental issues. Often, surface water used for cooling is returned to the source at a higher temperature. Aquatic habitats and species are highly sensitive to temperature changes; thus, power plant cooling water can significantly alter an aquatic environment over time. Finally, the brine stream generated as a by-product of water heating and other water treatment required for power plant processes will contain concentrated salts. This waste stream will degrade the quality of any water body into which it is discharged.

Recognizing that power-plant operations can put an extra demand on the quantity and quality of already depleted freshwater supplies, some U.S. states have adopted policies specifying preferred sources of water for power plants. California, for example, has had a policy since 1975 to minimize the use of freshwater for power plants. The policy instead states a preference for (1) inland power plants to use brackish water from natural sources of irrigation return and inland treated wastewater, and (2) for coastal power plants to use wastewater destined for discharge to the ocean. The non-governmental sector also is working to research and present alternative designs for power plants that may have fewer adverse effects on water supplies. For example, the Border Power Plants Working Group is promoting the use of dry-cooling technologies for power plants in arid regions.

Next Step

SUPPORT POWER-PLANT TECHNOLOGIES THAT REQUIRE LESS WATER. To the extent possible, electric-utility operation should incorporate technologies such as air-cooled condensers that reduce water consumption and protect water quality at the discharge point. In some cases, such an approach would require amending state law to enable potential water-conservation benefits to be taken into consideration when issuing an air permit.

In addition, citizen pressure to stop diverting precious water supplies for power-plant operations can be an effective deterrent. For example, in November 2001, the Arizona Corporation Commission turned down a proposed electric generating plant in Western Arizona because of concern over how the plant would affect scarce water supplies. The proposed natural gas-burning plant would have produced 720 MW of electricity, but would have required pumping 4,000 acre-feet of groundwater each year for cooling. Residents who opposed the construction of the plant were concerned about drawing down the local aquifer and about affecting the riparian habitat of the Southwestern willow flycatcher, a migratory bird that is on the federal endangered-species list. Opponents of the project also stated that most of the power was to have been supplied to Nevada and California.

PROJECTS AND PARTNERSHIPS

Communities along the border continue to work together to address cross-border air pollution caused by power plants and other sources. Previous Good Neighbor Environmental Board reports described initiatives such as the Joint Advisory Committee (JAC) for Improvement of Air Quality in the El Paso-Ciudad Juárez-Doña Ana County, New Mexico Air Basin. A similar effort, the Binational Air Quality Alliance (BAQA), is under way in the San Diego-Tijuana-Rosarito metropolitan

area, and nascent efforts are in evidence in the Mexicali-Imperial Valley.

Other developments to watch include efforts to incorporate economic incentives as a means of reducing air pollution. Through new legislative authority (Senate Bill 1561, 77th Legislature), the Texas Commission on Environmental Quality (TCEQ) approved an international emissions trading program in November 2002. Under its terms, the TCEQ allows the use of emissions reductions achieved outside the U.S. for the purposes of compliance with the Emissions Banking and Trading of Allowances program, a state cap and trade program for grandfathered electric generating facilities. Under this program, the El Paso Electric Company (EPE) was required to reduce its historical emissions of NO_x by 50 percent beginning May 2003.

This same TCEQ emissions trading program also has an inter-pollutant component. Under its terms, emissions from a complex mix of pollutants (CO, NO_x, PM, VOCs) emanating from open brick kilns in Ciudad Juárez, Chihuahua, Mexico are being reduced. According to the terms of the trade, EPE will convert 60 existing brick kilns to a newer, technologically appropriate kiln design. The emission reductions generated will then be substituted for the NO_x allowances needed by EPE.

Reactions to the TCEQ project have been mixed: Although it has been lauded by the El Paso and Ciudad Juárez communities as an innovative method of improving air quality in



Residents who opposed the construction of a proposed electric generating plant in Western Arizona were concerned about affecting the riparian habitat of the Southwestern willow flycatcher, a migratory bird that is on the federal endangered species list. *Photo credit: US Fish & Wildlife Service website, Suzanne Landgridge, USGS.*

the binational airshed, the group Environmental Defense has criticized the project, saying it will not result in greater health benefits, nor will it bring overall improvement to air quality in the area.

On another front, new binational state-to-state partnerships on energy are forming within the Ten States coalition, a group that includes the four U.S. and six Mexican border states. A joint declaration was issued at the June 2002 binational Border Governors' meeting that called for the states to "work with federal officials on both sides of the border to ensure a steady supply of energy and to adhere to the principles of sustainable development and appropriate distribution." The governors decided to create an energy workgroup, and then directed the

existing environment workgroup to "promote the development of an environmental strategy for new electrical generation plants in the border region with the goal of protecting air quality, and, where possible, conserving water resources in the region." In response to these declarations, the Environmental Secretaries of the Ten States have approved an action plan that calls for the development of environmental guidelines for border power plants, and adoption of these guidelines at the 2003 Border Governors' meeting.

Binational energy policy work at the federal level took place under the Border XXI Program (1997-2002) and continues in the next phase of the program, called Border 2012 (2003- 2012). In April 2002, the Border XXI Air Workgroup convened a binational Energy Workshop in Mexicali, Baja California, in response to an earlier charge from the BNC to "examine ways of assuring that new energy projects in the border are consistent with applicable environmental regulatory structures and that they do not cause unacceptable impacts to border communities." The next step is to release a report on environmental issues related to energy plants in the border region. Border 2012 plans to continue addressing border energy issues during the coming year through its border-wide Air Policy Forum as well as through its regionally based workgroups.

And in June 2002, the CEC affirmed a decision to continue working on renewable energy as well as other initiatives to improve air quality in North America.





HUMAN HEALTH

RECOMMENDATIONS

- **Education:** Harness a variety of communications tools to increase public education about the links between the state of environmental infrastructure and the state of human health in the border region.
- **Data Gaps:** Fill data gaps in existing databases containing statistics on health issues in border communities on both sides of the border. Make emissions inventories more robust, and link exposure data to health data.
- **Infrastructure:** Step up the pace for improving the environmental infrastructure in the region, especially for air, water and solid waste, in the certainty that improvements in human health will result.

Health problems continued to surface among border-region residents during the year at a level viewed by many as disproportionate to what was happening in the rest of the nation. The probable links between these health problems and the poor quality of the region's environmental infrastructure were cited as continued cause for concern. For in spite of significant efforts by institutions such as the Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADBank), the area's water systems, sewerage systems, and solid waste and wastewater treatment facilities remained unable to keep pace with the rapidly growing border population's needs.

One of the ongoing results was that border residents remained more likely to be exposed to untreated and contaminated water than in most other parts of the country. Particularly at risk were residents of colonias, unincorporated communities that lack basic infrastructure (*see box on colonias*). In Texas alone, for instance, it is estimated that the colonia population now numbers around 500,000. Despite some improvements, many border residents still are without adequate plumbing and, according to the U.S.-Mexico Border Health Commission and the U.S.-Mexico Border Health Alliance, suffer from waterborne diseases such as hepatitis and parasite infection. These illnesses are caused by microorganisms that are transmitted through contaminated water.

Health in Border-Region Colonias

The term “colonias” is used to describe unincorporated communities along the U.S.-Mexico border that lack basic infrastructure, including public water supplies, proper sewage disposal and treatment, stormwater drainage, electricity, paved roads, and safe and sanitary housing. Colonias are outside town limits and, therefore, often do not receive community services. Probable links between poor environmental infrastructure and poor health are especially apparent in colonias. For example, recent studies in Texas and New Mexico show both elevated concentrations of water contaminants in the groundwater and elevated concentrations of health problems.

To help fill these and other gaps in services, infrastructure projects continue to be funded by agencies such as Rural Utility Service, Environmental Protection Agency (EPA), Border Environment Cooperation Commission (BECC), North American Development Bank (NADBank), and a host of state and local funding mechanisms. Much of the effort of installing infrastructure, particularly water and sewer lines, within these colonia neighborhoods has focused on the more significant-cost items such as water and wastewater treatment facilities. Although these facilities are an extremely valuable addition to these communities and provide the backbone for ultimate service to the residents, they don't directly and immediately relieve existing public-health problems.

Besides these health problems linked to water pollution, another set of health problems has been linked to high levels of air pollution along some parts of the border. For example, it has been found that pollutants such as ozone and particulate matter can exacerbate asthma and other respiratory conditions, leading to higher medical costs, lower productivity and poorer quality of life. Ozone is a gaseous chemical formed when another gas (oxides of nitrogen) interacts with volatile organic chemicals such as solvents or certain components of gasoline in the atmosphere under warm sunlight. Particulate matter consists of small particles in the air, such as dust and smoke.

Ozone exposure also can lead to increased susceptibility to respiratory infections and inflammations of the lining of the lungs, particularly in small children, the elderly, and those with pre-existing medical conditions. Exposure to particulate matter, such as soot from combustion exhaust and dust, has been associated with serious health effects, including premature death due to respiratory and cardiovascular diseases. A recent study of pediatric respiratory illness in the Paso del Norte airshed (Hart, et al.) found

that the number of asthma-related emergency-room visits among children aged 1-17 years was directly associated with ambient PM10 concentrations. In other words, there is a statistical correlation between increases in PM10 concentrations in outdoor air and increases in the number of emergency-room visits.

POLICY ISSUES AND NEXT STEPS

Based on border-region developments in the human health sector during 2002 and their probable links to the region's environmental infrastructure, the Good Neighbor Environmental Board has identified several key policy issues and next steps it advises be taken to address these issues:

Issue 1

LACK OF PUBLIC AWARENESS, EDUCATION ON LINKS BETWEEN ENVIRONMENT AND HEALTH.

The state of understanding about waterborne diseases in the border area could be improved by educating the general public about disease transmission and prevention, as well as by educating health professionals about disease identification, disease reporting, and the value of patient education to promote prevention. Many local residents lack a basic understanding of how such diseases are transmitted, as well as how they can be prevented. National advertising campaigns in Mexico and promotoras-based outreach efforts (*see box on promotoras*) in both countries' border communities have attempted to close this gap; however, many residents have yet to be reached effectively. Misconceptions even exist among members of the medical profession, some of whom have not received sufficient continuing education to have up-to-date knowledge about waterborne diseases affecting their area.



Promotoras, or community health workers, talk with border-community residents about health issues such as asthma management and prevention. *Photo credit: Courtesy of La Clinica de Familia.*

The Promotora Approach

Promotoras, or community health workers, are people who have been trained by health professionals to communicate with community members about health issues and disease prevention methods. They usually are lay people with little or no prior technical background but with strong ties to many people in the community. These ties establish the basic trust that is necessary to gain access to people's homes and persuade them to listen and learn, trust that may elude "experts." By using plain language and simple, hands-on demonstrations, promotoras are able to educate a lot of hard-to-reach people about issues such as asthma management and prevention, lead-poisoning prevention, cancer management, drinking-water sanitation and the prevention of waterborne diseases, and a host of other health and environmental health issues facing residents of border communities.

A long-standing practice throughout Latin America, the promotora approach has been employed in Yuma/San Luis-San Luis Río Colorado, Ambos Nogales, El Paso-Ciudad Juárez and a number of other sister cities along the U.S.-Mexico border. This approach relies on one of the most basic social work and public health concepts: "Start where the client is." Because of the nature of their work, promotoras achieve health objectives among socially disenfranchised communities, overcome barriers to health access, link poor communities with primary health services, and bring providers to poor people.

Similarly, in some border communities, there also is a poor understanding about the relationship between the local air quality and public health problems. For example, particulate matter – which is the most common air pollutant in all U.S.-Mexico border communities – is often thought to be completely natural in the desert and of little consequence for public health. Some residents do not understand that particulate matter levels have been increased substantially by human activities, or that long-term exposure can lead to significant respiratory health problems, particularly among the elderly, children, those who regularly exercise outdoors, those who have a pre-existing lung or heart condition such as asthma, and smokers.

Besides these public education issues, a better understanding also needs to be developed within local planning and zoning departments regarding environmental conditions and disease prevention. In many cases, these departments have the power to make decisions that have consequences for the environment and

public health, yet they are sometimes unaware of the health consequences of their policies and/or unfamiliar with planning and zoning practices that would promote better health. While few would contest the need for stronger, sustainable economies in border-region communities, instances of unmanaged or loosely managed growth too often have led to local environmental conditions that tend to discourage certain good health practices.

Rapid growth without appropriate planning is often at the root of inadequate water supplies, inadequate wastewater collection and treatment infrastructure, inadequate waste management and drinking-water contamination issues because communities simply lack sufficient resources to keep up with the persistently exceptional growth rates that border communities have experienced. As an example, the common absence or scarcity of walking trails, open space and other infrastructure for recreation and exercise in border communities – which is an environmental condition directly related to planning and zoning practices – can contribute to high rates of obesity and diseases such as diabetes and cardiovascular conditions. To put this issue in perspective, diabetes and heart disease are two of the three leading causes of death in the Arizona-Sonora border region, according to the Arizona Department of Health Services.

Next Step

USE AN ARRAY OF COMMUNICATION AND EDUCATION VEHICLES TO RAISE AWARENESS, INCREASE EDUCATION ON ENVIRONMENT-HEALTH LINKS.

Given that the benefits of some environmental infrastructure improvements have yet to be realized, and that other infrastructure remains in poor condition, general public education should focus on affordable solutions to problems at least partly within individual control, such as waterborne diseases and air quality-related illnesses. Use of the proven promotora approach to health and environmental health education should be increased significantly, and health insurance organizations should be tapped to help fund this increase. Examples of important public education themes that could help address waterborne diseases and air quality-related illnesses include hand washing and sanitary handling of drinking water, simple car maintenance practices, trip planning to reduce traffic congestion, and workers' use of appropriate personal protective equipment.

Continuing education for medical professionals and promotoras alike, as well as for planning and zoning professionals, is also needed. For medical professionals, continuing-education programs should include a greater focus on environmental health issues in the border area. Training opportunities to create better coordination between medical professionals and promotoras also would be fruitful. Workshops for planning and zoning professionals should be held to present basic information about the health consequences of growth-

management practices and to provide tools that can be used to promote better environmental health. To demonstrate these tools, pilot projects should be conducted in interested communities to demonstrate the potential for growth-management techniques to improve environmental and health conditions in border communities. Examples of such techniques include restrictive landscaping laws to make clean drinking water more available, thermally-designed housing that eliminates the need to burn wood for home heating, integrating open space and recreational facilities with traditional development, and identifying means of making regular garbage collection available in urbanized areas that are not yet incorporated into municipalities. Local planners should be assisted in developing partnerships with community organizations that could increase the capacity for effective growth management.

Issue 2

LACK OF TECHNICAL DATA. The U.S. Centers for Disease Control and Prevention (CDC) has indicated that “[c]urrently, no systems exist at the state or national level to track many of the exposures and health effects that may be related to environmental hazards. In addition, in most cases, existing environmental hazard, exposure, and disease tracking systems are not linked together. Because existing systems are not linked, it is difficult to study and monitor relationships among hazards, exposures, and health effects.” (CDC, December 17, 2002) For instance, the ability to understand and predict the movements of contaminants from a variety of pathways into the food chain remains limited, thwarting efforts to design prevention and intervention strategies.

This problem is exacerbated in the border area. First, various kinds of reporting that are federally or state-required may not always be implemented as thoroughly as in the nation’s interior, for various reasons. With regard to air quality data, for instance, of the 14 sister-city pairs along the U.S.-Mexico border, only four are large enough on the U.S. side (with populations over 350,000) for daily Air Quality Index (AQI) reporting to be required (San Diego-Tijuana, El Paso-Ciudad Juárez, McAllen-Reynosa and Laredo-Nuevo Laredo). Although many border residents are familiar with AQI reporting via media outlets in larger cities, they rarely see any kind of data about their own areas. In addition, air quality data monitoring networks are considered to be insufficient, and the few binational emissions inventories that have been done tend to contain significant gaps.

Second, the fact that many border residents legitimately lead binational lifestyles makes data harder to track. For example, a resident of one side of the border may be exposed to a food- or waterborne illness in one country, but seek medical treatment in the other. When these services are sought in Mexico (which happens frequently due to the lower cost of medical care for those without health insurance), the illness is not tracked with

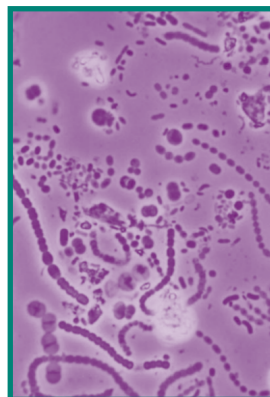
U.S.-based data, even though exposure may have occurred in the United States.

Next Step

IMPROVE DATA COLLECTION, REPORTING AND EVALUATION. The CDC and the Council of State and Territorial Epidemiologists (CSTE) have initiated a laudable project to address these data gaps (*see Projects and Partnerships section*). This project needs to be fully implemented in the border region. For example, ongoing (not just project-related) monitoring efforts new to border communities (such as hazardous air pollutants in outdoor air, one of the program’s indicators) will need to be established. In addition, border states and cities need to be more fully involved in developing the national tracking network. Additional data sources should be considered for certain indicators: for example, the Border Patrol for data on deaths attributed to extremes in temperature, and farm-worker organizations for data on pesticide-related poisoning and illness. In addition, active collaboration with a variety of data sources in Mexico should be sought, so that cases do not fall through the cracks as described above.

Issue 3

CONTINUED HEALTH PROBLEMS LINKED TO CONTINUED ENVIRONMENTAL INFRASTRUCTURE INADEQUACIES. Unfortunately, in many border communities, conditions remain ripe for continued health problems. For instance, given a shortage of potable water, alternatives increasingly include the use of groundwater contaminated by fecal matter or industrial or agricultural chemicals, or the use of shallow hand-dug wells that become easily contaminated with agricultural and mining runoff as well as by failing or improperly constructed septic systems. A number of colonias residents have to bring in their own drinking water, and poor water-storage practices can create conditions that lead to contamination.



A number of colonias residents have to bring in their own drinking water, and poor water storage practices can create conditions that lead to contamination. *Photo credit: Frank Dazzo, 1995.*

Continued air-quality problems are another likely contributor to new and ongoing health problems. More vehicular traffic, unpaved roads, vehicles idling at border crossings, wood burning for heating and cooking purposes, and an older, less well-maintained fleet of personal vehicles all contribute to degraded air quality throughout the region, with the attendant potential effects on health. To complicate matters further, health problems likely caused by specific types of emissions sources can make the air quality issues facing each sister city pair unique. For example, brick-kiln emissions are an important factor in El Paso-Ciudad Juárez-Doña Ana County, while they are not found in Ambos Nogales. Ambos Nogales, for its part, used to be greatly endangered by landfill fires, but the landfill in Nogales, Sonora, that was the source of the fires was closed in early 1995. By contrast, landfill fires remain probably the most important air-quality concern in Ambos Naco.

A third health-related concern is continued inadequate garbage management. High rates of littering in urban areas, combined with unprotected bags of garbage that are foraged in and strewn about by animals – as well as lack of adequate collection services in some areas – all merge to create significant garbage problems and associated unsanitary conditions and health hazards. Some residents respond to these problems by burning garbage, which further reduces air quality. In addition, stockpiles of used tires, common in certain border communities, are breeding grounds for mosquitoes; they also create fire hazards and ensuing potential air pollution.

Next Step

STEP UP PACE OF INFRASTRUCTURE IMPROVEMENTS TO IMPROVE BORDER-COMMUNITY HEALTH. Institutions at all levels can play a part in further improving infrastructure to create healthier living conditions. On a local level, for example, municipalities should be assisted in finding ways to provide regular garbage collection services in urbanized areas that are unincorporated. More local recycling programs, and greater involvement in those that already exist, is another step. Better public education about sanitary garbage management, as well as improved enforcement to discourage illegal dumping and illegal burning, can also play a part.

More broadly, BECC and NADBank reform should be closely monitored to ensure that both of these institutions are better able to execute their responsibilities as key players in infrastructure improvements. On yet another front, greater binational cooperation is needed to address industrial contaminants; activities should include implementing industrial pretreatment, installing drinking-water treatment systems, cleaning up historical sources where possible, and preventing future sources through training and outreach for larger maquiladoras and smaller “mom and pop” businesses alike.

The real bottom line, however, remains the issue of funding. As the Board discussed in its last report, the Border Environment Infrastructure Fund (BEIF) has been a key grant instrument for developing projects and preparing them for loan-based financing through the NADBank, but it can only be used for water and wastewater infrastructure projects. Therefore, given the need for air-quality improvements, the Board once again this year recommends that an appropriate source of funding be identified to develop a similar grant fund for developing air-quality projects that will seek financing through the NADBank. This BEIF-like fund, which could be called the Border Air Quality Fund, could make a real difference in improving air quality throughout the region and lead to significant health improvements.

PROJECTS AND PARTNERSHIPS

Border-wide, a number of notable projects were carried out during 2002 that contributed to improved public health in the region, and public education remained a cornerstone of these efforts. One of them, the Ambos Nogales Clean Air Calendar produced by the Arizona Department of Environmental Quality, is based on a novel concept: The first and only calendar of its kind along the U.S.-Mexico border, it includes student artwork and written opinions selected through a binational contest open to students at all grade levels.

Approximately half of the Ambos Nogales Clean Air calendars are distributed in each country, focusing primarily on the students, teachers and schools who participate in the contest. Other recipients in both countries include local community-service organizations, doctors and other medical professionals, members of the press corps, elected officials, and local, state and federal agencies that are working to improve air quality in the sister-city pair. Because participating students receive calendars, the clean-air message contained in the calendar reaches many families who would otherwise be hard to reach in a community with limited mass media outlets.

The region’s Binational Health Councils also continued to play a major role in public health education during the year. A total of 12 sister-city pairs along the U.S.-Mexico border have organized Binational Health Councils that engage public and private parties to bilaterally address health and disease issues that affect the quality of life. A number of these councils, such as the El Paso-Ciudad Juárez-Las Cruces Binational Health Council, have active subcommittees that specifically address environmental issues.

Individual community-based endeavors such as one called *Platicamos Salud* also deserve to be noted for the difference they are making, and should be examined for possible replication elsewhere in the region. Based in Nogales, Arizona, *Platicamos*

Salud is the Mariposa Community Health Center's health promotion and disease prevention department. It consists of several parallel efforts that focus on women as consumers and stewards of their family's health. Established in 1991, its promotora programs have improved the health of community members and have been recognized at many levels, including the Department of Health and Human Services, Office of Women's Health. Through "Proyecto M Ambiente," it is working with the Secretaría de Salud Pública in Nogales, Sonora, Mexico, to utilize the expertise of promotoras to implement a Binational Environmental Health Promotion Plan. In addition, Platicamos Salud is working with the communities of Ajo and Somerton, located in western Arizona, to implement promotora-delivered community-based education on safe water concepts.

Public-health education and training activities also were carried out by the Border Health and Environment Network (La Red Fronteriza de Salud y Ambiente). This consortium of citizen groups, non-profit organizations and universities in Northern Mexico and the Southwestern United States is now incorporated and based in Hermosillo, Sonora. It offers training and technical assistance to citizen groups working on environmental concerns at the community level. Its programs are in four areas: citizen's training in environmental issues, toxics and pesticides, gender and environmental justice, and sustainable development. The consortium also participates in regional and national coalitions such as the Río Bravo/Rio Grande Basin Coalition and the Pesticide Action Network of North America.

To help improve health and other quality-of-life conditions in colonias, the Colonias Development Council continued its community development, organizing, and economic development work. This non-profit was begun 12 years ago by the Catholic Diocese of Las Cruces, New Mexico, Office of Catholic Social Ministries. Its projects during 2002 included working with Dia del Sol and Anthony Water and Sanitation District to bring in natural gas, a clean-burning fuel, to three communities in the southern part of the county. It also provided organization support for the Chaparral Community Health Council in opposing construction of a landfill it said was 500 feet away from the nearest residence.

Along with these public education projects, complementary efforts to collect, integrate and manage public health and environmental exposure data also gained ground during the year. Case in point: As mentioned briefly above, CDC and the CSTE have begun a nationwide tracking initiative called the Environmental Public Health Indicators Project. Its goal is to improve data collection and evaluation on environmental conditions and their possible associated health effects. The indicators being used include a wide variety of data on environmental conditions and a limited list of health effects.

During fiscal year 2002, CDC provided competitive grants to selected state and local health departments to help them begin to develop this national tracking network. Border-region



New design concepts like that shown above are being deployed to address brick kiln emissions, a major air quality issue in the El Paso-Ciudad Juárez-Doña Ana County area. *Source: Marquez Brick Kiln, Ciudad Juárez, U.S. Department of Energy National Border Technology Partnership Program.*

participants include the states of California and New Mexico. These grants will help recipients build capacity, increase collaboration between environmental and health agencies, evaluate existing data systems, build partnerships with community organizations, and develop model data-linking systems. In addition, CDC funded three centers of excellence at university-based schools of public health, including the University of California at Berkeley. The universities will help state and local officials investigate possible links between health effects and environmental conditions.

Complementing these national efforts, border-specific studies also were begun during the year. One of particular note, on asthma in children, was initiated by women living in Doña Ana County, New Mexico, who are members of a non-profit advocacy group called the Border Environmental Health Coalition (BEHC). Funded by the Center for Border Health Research and the Paso del Norte Foundation, the goal of this study is to estimate the prevalence of selected indoor asthma triggers in households of children with respiratory symptoms, and then evaluate the effectiveness of an intervention to improve household air quality.

Five indoor asthma triggers are under investigation: environmental tobacco smoke, dust mites, dander-producing indoor pets, household pests, and irritants from combustible heating sources such as stoves and appliances. Intervention consists of home visits in which the child's care-giver and community health worker (promotora) jointly inspect the home to identify indoor triggers, then, they develop an action plan to reduce exposure to each acknowledged trigger. In the study, the target population consists of Hispanic, low-income, rural residents, the majority of whom live in substandard

housing along the U.S.-Mexico border. The cross-sectional intervention study is based in the Gadsden Independent School District, with promotoras from La Clinica de Familia's Promotora Program conducting the survey and education in the homes of participating families in southern Doña Ana County. Additional partners include the Nursing Department at New Mexico State University. The pilot project is scheduled for completion by May 2003.

Yet another group of note in terms of research and data collection is the U.S.-Mexico Border Health Commission (USMBHC), an organization created by the U.S. and Mexican Congresses. It consists of presidential appointees from both countries drawn from all of the border states and representing both the public and private sectors. During the past year, the USMBHC developed a "Healthy Border 2010" program, which sets out measurable health objectives for the border region to be attained by the year 2010. Among these are three environmental health objectives and two respiratory-disease objectives that are directly related to environmental infrastructure such as safe water service, sanitary sewer service, and road paving.

The objectives are divided by country, as the U.S. and Mexico are at different points in their progress. U.S. infrastructure objectives are to 1) reduce to zero the number of households not connected to compliant public sewage systems or septic tanks, 2) reduce by 25 percent the hospital admissions for acute pesticide poisoning, and 3) reduce the hospital admissions rate for asthma by 40 percent. The Mexican objectives are to 1) reduce the proportion of households not connected to compliant public sewage or septic-tank systems or septic tanks, 2) work to prevent increases over the current level of hospital admissions for acute pesticide poisoning, and 3) prevent increases over the hospital admission rate for asthma at current levels.

In addition, the Las Cruces field office of the New Mexico Environment Department (NMED) worked together with the Las Cruces Department of Health and the state's Department of Health Office of Epidemiology to form the Acute Disease Response Team. Within one hour of receiving notice that an outbreak may be occurring, team members assemble in a conference call to plan their course of action, select a team leader for that response, and designate a spokesperson to work with the press. Within two hours after the initial notice, appropriate team members are in the field conducting inspections and/or interviews. Response work includes a variety of acute diseases, including environmental health concerns such as enteric diseases from contaminated food or water- and vector-borne diseases.

The team brings together NMED staff responsible for facilities inspections, health department public-health nurses who work with patients, and Office of Epidemiology staff who work on statistical assessments to coordinate response efforts without overlapping work. Over the past two and a half years, the team has collaborated on seven confirmed food-borne illness outbreaks involving over 250 individuals. It now is looking into

expanding its membership and participation to include Mexican partners.

Academic institutions also did their part to fill the data gaps, often partnering with groups from other sectors. For instance, the U.S.-Mexico Foundation for Science and the University of Sonora collaborated with the Environmental Health Division and the International Cooperation Division of the Secretariat of Health. Together, they conducted meetings with the USMBHC to define research priorities and help strengthen research groups on the Mexican side of the border. Another goal was to establish a network of researchers interested in this topic and to explore developing specific research projects involving institutions from the two countries.

Another example of cross-sector partnering involved the National Institute of Environmental Health Sciences (NIEHS), the University of California, the City of San Diego, the San Diego Association of Governments, the Southwest Center for Environmental Research and Policy (SCERP), and a variety of departments from the University of California at San Diego (UCSD). This diverse group investigated the idea of establishing a small number of U.S.- Mexico Binational Centers that would collaborate on environmental problems relating to human health. And in a separate endeavor, the U.S. Geological Survey designed its own study to gather data for more clearly understanding the links between environmental quality and human disease.

Finally, in Texas, the University of Texas Health Science Center at San Antonio has developed a program called South Texas Environmental Education and Research (STEER) to bring together medicine and public health. STEER offers hands-on medical training and community service. It is designed for students in any health field, as well as health professionals, who seek advanced education in issues that affect residents of the U.S.-Mexico border. Participants visit families living in the border's colonias, where they learn about the difficulty of acquiring access to medical services.

Besides these public education, data collection, and direct service projects, the year 2002 also witnessed some progress in addressing the probable underlying cause of a number of public health problems: environmental infrastructure that either is nonexistent or is in poor condition. Numerous U.S. agencies and organizations continued their work to improve drinking water quality, wastewater treatment, air quality and waste management.

Binational cooperative efforts to address infrastructure problems also remained strong. For example, the governors of the states of Arizona and Sonora continued their discussions through a bi-state mechanism known as the Arizona-Mexico and the Sonora-Arizona Commissions. These sister commissions are the only formalized state-to-state mechanism along the border that enables binational infrastructure projects and other kinds of cooperation without a formal, lengthy federal negotiation process. During 2002, the Commission's Environment

Committee recommended the following: support a more efficient BECC/NADBank project certification and funding process, support efforts by Agua Prieta to seek BECC certification and NADBank financing for a road-paving project to improve air quality, and support a binational air-monitoring program in the Yuma/San Luis-San Luis Río Colorado area.

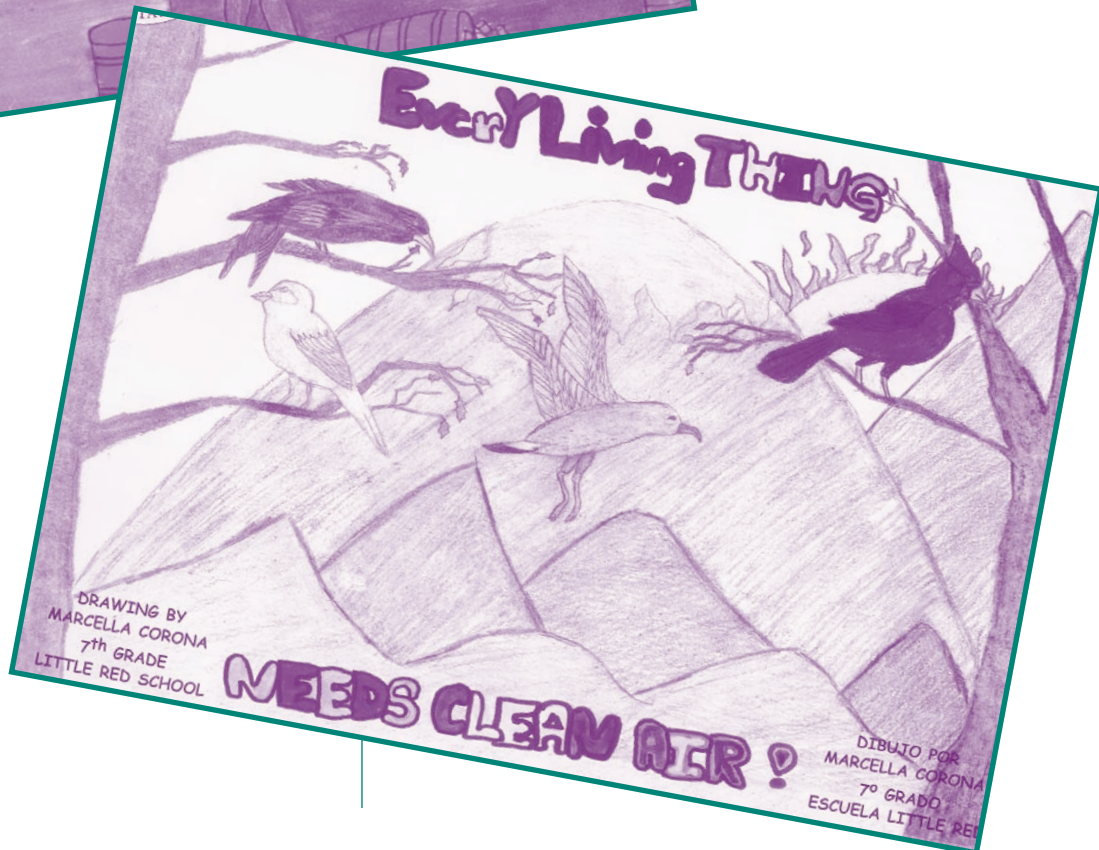


The Ambos Nogales Clean Air Calendar spreads the clean air message throughout the sister-city region and beyond.

Drawings from Arizona Department of Environmental Quality 2003 Calendar.

Drawing 1 by R. Paula Lopez Valenzuela, 6th Grade.

Drawing 2 by Marcella Corona, 7th Grade.





NATURAL RESOURCES CONSERVATION

RECOMMENDATIONS

- **Coalitions:** Assign top priority to natural resources conservation initiatives that bring together broad coalitions of consumers, including ranchers, farmers, environmental groups, and other types of interest groups.
- **Multidisciplinary Approach:** Foster a greater multidisciplinary approach to natural resources conservation policy, recognizing that federal policies on immigration, homeland security, and other issues may greatly complicate conservation work – especially on tribal lands.

A state of continued drought along much of the U.S.-Mexico border during 2002 took its toll on the region's natural resources. This stress from scarce water supplies was exacerbated by the ever-increasing demands on the landscape posed by the region's continually expanding human population. In addition, undocumented immigration continued to literally leave its mark in the form of trash, habitat destroyed by vehicle tires, and, in the most tragic of instances, human bodies.

Maintaining a health infrastructure within a renewable natural resources context along the border essentially entails maintaining healthy ecosystems. The flora and fauna of the borderlands co-exist in a delicate ecological balance. Because of the juxtaposition of the Sierra Madre, the Great Plains, and the Rocky Mountain Region, as well as influences from the Pacific Ocean and the Gulf of Mexico, a unique association of plants and animals can be found there. Examples include animals such as the Elegant Trogon, Gould's Turkey, Coati Mundi, Mexican Jaguar, and Ocelot, and plants such as Arizona Rosewood, Canelo Ladyslippers, Sabal Palm, and Pima Pineapple Cactus.

The plants and animals across this vast land mass recognize no political boundaries, and to some extent, neither do borderlands human residents, whose common trans-boundary cultural and family ties run long, deep and strong. One of the greatest forces uniting the rural human population of "La Frontera" is a love of natural, open spaces, and the pastoral livelihoods and lifestyles that can be enjoyed in these settings.

Ranching is a key component of the current rural economic base. It also is a primary consumer of the border region's natural resources. For example, the border-region livestock industry is supported by an infrastructure that includes mostly native vegetation, vast areas of open space, and various "range improvements." These range improvements include fences, corrals, roads and trails, and small reservoirs created for livestock and domestic purposes. Another significant consumer of borderlands' natural resources, especially its water, is the farming sector. And with increasing frequency, a third type of open-land consumer in the Borderlands comes in the form of families and the infrastructure to support them: housing, roads, schools, places to shop, and more.

POLICY ISSUES AND NEXT STEPS

Based on border-region developments in the natural resources conservation sector during 2002 and their probable links to the region's environmental infrastructure, the Good Neighbor Environmental Board has identified several key policy issues and next steps it advises be taken to address these issues:

Issue 1

MULTIPLE JURISDICTIONS CONTROL CONSERVATION POLICY. Much of the land on the U.S. side of the border in California, Arizona and New Mexico is controlled by a myriad of state and federal agencies, with interspersed private lands. In Texas, by contrast, the vast majority of all land is in private ownership, although the federal government does have significant holdings in Big Bend National Park and some recreational lands associated with two Rio Grande reservoirs.

Some of the key U.S. agencies that help to shape conservation policy for the region are the U.S. Department of Agriculture, including the Forest Service and Natural Resource Conservation Service (NRCS); the U.S. Department of the Interior (DOI), including the National Park Service (NPS), the Bureau of Land Management, the U.S. Geological Survey, the U.S. Fish and Wildlife Service, and the Bureau of Indian Affairs; state-level land offices; and state-level parks and wildlife departments.

On the Mexican side of the border, land is mostly privately owned, although some federal and state parks do exist. The primary organization controlling conservation policy in Mexico is the national environmental agency, the Secretaría de Medio Ambiente y Recursos Naturales, or Secretariat of Environmental and Natural Resources (SEMARNAT). Responsibility for stewardship of the land lies with the ranchers and farmers, with technical support from SEMARNAT. Unlike in the United States, significant land areas in Mexico currently are allocated to what are called "ejidos," in which a number of small landowners share a communal area. These common-use areas are used for farming, ranching and forestry. Some of the more successful ones are those with significant timber resources. When they are used for grazing, there can be a tendency for each stockman to try to get his share first, resulting in overgrazing.

In both countries, as is the case for other governmental policy issues, non-governmental organizations (NGOs) are playing an increasingly significant role in helping to shape natural resource conservation approaches and practices. Singly, or as coalitions that sometimes span the border, representatives from these groups raise environmental and ecological concerns at public meetings, raise public awareness through their publications, and sometimes harness litigation as a tool for promoting responsible land stewardship of the borderlands.

Although individual natural resources organizations in both countries continue to carry out laudable work, the composite plethora of policy players with sometimes overlapping, or even conflicting, responsibilities can result in policy measures that are less than optimal.

Next Step

FOSTER COOPERATION ACROSS NATURAL RESOURCES AGENCIES, PROMOTE SUSTAINABLE PRACTICES SUCH AS PRESCRIBED BURNING. Greater cooperation across agencies will enhance the opportunity to institute best management practices along different portions of the border in a cost-effective manner. It also will provide an opportunity to air any concerns about particular management approaches and increase public education about the costs and benefits of each approach.

One example of a management approach that is gaining widespread support, but is not without its critics, is a technique called "prescribed burning." Drought years are especially vulnerable to fires, when the vegetation is dry and brown from lack of rain. Prescribed burning for maintenance of rangelands and watershed cover, as well as burning of crop lands, have become common practices on both sides of the border. It is believed by most scientists and land managers that some combination of natural and prescribed fire is essential for the maintenance of productive ecosystems in the area. What it comes down to, its proponents say, is the choice between smoke at carefully controlled and monitored times, or significant wildfires with little or no constraints.



Most scientists and land managers believe that prescribed burns like this one are an essential component for the maintenance of productive ecosystems in the border region. *Photo credit: Natural Resources Conservation Service (NRCS) website photo gallery.*

But prescribed burning does not have universal support. In the eyes of its detractors, it can contribute to temporary air-quality problems, increasing particulate matter and thereby posing potential health threats. What's more, say those who are skeptical, prescribed burning has the potential to destroy homes and forests should it not be adequately controlled. Local residents can be difficult to convince that choosing to introduce a low risk – a prescribed burn – is better than doing nothing to prevent a much more devastating, though admittedly, potential, scenario.

On the rare occasions in which prescribed fires have escaped control and caused damage, a great deal of public concern has resulted. The classic example of this was the disaster at Los Alamos, New Mexico, resulting from an NPS-controlled burn. It has been found that each time such a scenario has occurred, the loss of control resulted from significant violations of policies and standard procedures.

In the United States, state and federal agencies routinely provide fire suppression training for local fire organizations. In some cases, this training stretches across the border: For example, the Coronado National Forest has a fire suppression and training agreement with SEMARNAT in Sonora, Mexico. In addition, U.S. Forest Service firefighters annually conduct fire training throughout the state of Sonora for Mexican fire personnel. These training sessions have included instruction in the ecology of fire and prescribed fire techniques, including some on-the-ground burning in Mexico.

It is imperative that such cross-border cooperation continues to be supported and funded. Fire should continue to be used as a management tool, with emphasis on both training of fire managers and public education. Not only would this best management practice bring benefits in its own right, it also may serve to foster cooperation across agencies in other arenas, as well.

Issue 2

TENSIONS BETWEEN CATTLE RANCHERS AND ENVIRONMENTALISTS. One of the most contentious discussions about the open spaces of the borderlands remains the one between some of the region's cattle ranchers and some of its environmentalists. In the eyes of ranching critics, range improvements such as fences and roads, together with potentially destructive effects from livestock movement, consumption of precious water for ranching, and overgrazing, are grave cause for concern. For some of these critics, the only solution is to remove grazing animals from all "natural" ecosystems in the border region. They also contend that ranching activities can further endanger both threatened and endangered species. They point to predator control for protection of livestock, including wolves and jaguars, and destruction of poisonous plants.

Those who support ranching as a way of life in the borderlands say that great strides have been made in range management and stocking rates during the last century.

Moreover, they affirm, the significant stewardship contributions of many ranchers often are overlooked. The daily presence of ranchers on the land, some of whom have been caring for the same land for several generations, provides eyes and ears to managing agencies and a certain policing of visitors. And, in the arid Southwest, they point out, most water available to wildlife (and transient humans) has been provided by ranchers. Finally, perhaps the greatest contribution of rural people with acreage, they say, is maintenance of open space and protection from subdivision. From their perspective, in much of the Western United States and parts of Northern Mexico, land-use choice often comes down to one of two options: "cows or condos."

Next Steps

PROMOTE DIALOGUE ACROSS GROUPS TO INCREASE UNDERSTANDING OF DIFFERING VIEWS, IDENTIFY COMMON GROUND.

In part for economic reasons, a growing number of ranches in the border region have opened their gates to visitors and overnight guests. In some cases, guests are invited to participate in ranching activities, while in others, they are encouraged to pursue hobbies such as birding. One border-region cattle ranch that welcomes guests is Price Canyon Ranch in the Chiricahua Mountains of southeastern Arizona; it attracts many guests from Germany and other parts of Europe. Other ranches that informally enable interaction among individuals and groups with diverse views include Grapevine Ranch in the Dragoon Mountains; Rancho de la Oso, near Sasabe, Arizona/Sonora; and Warner and Wendy Glen's Malpai Ranch in Arizona, which provides accommodations, mules and guides to mountain lion and javelina hunters during the winter months.

Controversial issues such as preservation of species diversity, including endangered species, must be aired in constructive settings and led by trusted figures from within each faction. The borderlands are rich in species diversity, including rare organisms that are relatively obscure, such as the Robinson's pincushion cactus and the Huachuca water umbel. Others such as the jaguar and the Mexican wolf are so-called "charismatic mega fauna," meaning that public support for their protection can be relatively easy to garner. Those who work to preserve endangered species, both charismatic and less so, point out that these species can serve as indicators of overall ecosystem health, and that extinction is forever. At the same time, from the perspective of some ranchers whose livelihoods can be threatened by their presence, efforts to preserve species must be tempered by practical considerations.

Progressive ranchers along the Arizona/New Mexico border are making great strides on keeping their livestock safe from natural predators, as well as on other challenges they face as they work to be successful in their business and also conserve ecosystems. Their primary tools: use of the best available science, together with a cooperative attitude and a willingness to

compromise. In every case, they have found it possible for cattle-raising to coexist with birds, bats, frogs, rattlesnakes, fish and jaguars. Across the border, Mexico is promoting ecotourism by identifying bird and animal species that would interest bird watchers and wildlife enthusiasts. About 350 species of birds and 84 reptiles have been identified and will be monitored.

ENCOURAGE SUSTAINABLE GRAZING. Those ranchers who practice sustainable grazing should receive public recognition for their contributions. A sustainable level of well-managed, moderate grazing can perpetuate the open spaces so important to many wildlife species of the borderlands. In fact, in some cases, unencumbered travel corridors are essential to the survival of certain individual populations or even entire species. Moreover, for those who take pride in the unique cultural history of the region, the continued presence of cattle ranches will serve to preserve this facet of the region's history for current and future generations.

Issue 3

STRESS ON NATURAL RESOURCES FROM ILLEGAL IMMIGRATION. Significant environmental degradation is occurring in the borderlands as a result of widespread illegal immigration and attendant law-enforcement activities. Illegal immigrants are damaging fences and vegetation, and leaving behind trash and litter at an unprecedented rate. At the same time, the many law-enforcement agencies charged with locating and returning undocumented immigrants are using existing roads and creating new ones, with the attendant soil loss, dust, noise and aesthetic problems.

As immigration enforcement at many of the major border crossings has been tightened, those crossing illegally, either with drugs or simply to look for a better way of life, have resorted to making their attempts in more remote locations. One of these areas, stretching between southern Arizona and the Mexican state of Sonora, is tribal land owned by the Tohono O'odham Nation.

The Tohono O'odham Reservation encompasses close to three million acres and includes approximately 70 miles of border fencing along its southern U.S. portion. This stretch of land increasingly has become a major point for illegal entries and drug trafficking, with estimates of 1,000-1,500 crossings each day. According to Reservation conservation officials, wildlife is being killed for food, plants are being damaged by off-road vehicles and pedestrians, and, sadly, corpses are being found. Cattle are being rustled off the Reservation and, in some instances, when people have tried to intervene their homes have been burned. Trash in many forms remains a major concern; approximately 3,700 abandoned vehicles were towed from Reservation land during 2002. Hoof-and-mouth quarantines are more frequent due to fence-cuttings and to border crossers who may track the disease onto the Reservation.

Besides causing damage and costing money, the illegal activities have profoundly affected the way of life for the Tohono O'odham people. Members may be hindered from crossing the border to visit family, and traditional practices such as harvesting of the saguaro cactus fruit are being disrupted as the open land increasingly becomes a dangerous place to venture.

Finally, a point of concern among rural residents is that dangerous drug runners are sometimes interspersed within this flood of humanity. Residents fear for the safety of their families and friends.

Next Step

ENCOURAGE IMMIGRATION OFFICIALS AND CONSERVATION MANAGERS TO WORK TOGETHER MORE CLOSELY, SUPPORT TRIBAL INITIATIVES TO PROTECT AND SUSTAIN RESERVATION LAND. Under the Border 2012 binational program (*see Developments section*), the regional workgroups that have been set up may offer one venue for this increased cooperation. Further, because the Border Patrol is now part of the Department of Homeland Security, within the Directorate of Border and Transportation Security, opportunities should be seized to leverage resources around common goals and increase understanding of how one agency's actions may affect another's. More frequent direct dialogue with tribal groups such as the Tohono O'odham Nation, as well as organizations representing other affected rural residents, is called for.

Issue 4

ECOSYSTEMS ON UNDEVELOPED LAND FACE MULTIPLE THREATS. Plants and wildlife of the borderlands face numerous threats to their well-being, both natural and human-caused. One example of a natural threat is the climate. In many areas of the border region, rainfall is minimal, which can be greatly exacerbated by droughts.

As portions of the border region experience their fifth year of drought, water demands for irrigation, cattle, municipal and industrial purposes exceed availability (*see Water Resources section*). Many impoundments are at less than 40 percent of their normal capacity; more water is being pumped out of the aquifers without recharge. Additionally, some well water from the aquifer in Southwestern New Mexico has a high concentration of salts, which in turn damages cropland due to high salinity. In fact, aquifer withdrawal in the border area is an international issue and the center of debate. The Mimbres Underground River Basin, from which New Mexico regulates withdrawal, is being used both by the U.S. and Mexico. The aquifer has a limited amount of water, and there may be mining occurring, but it is not known at what rate or where.

A main source of water in the California borderlands is the Mojave River watershed, which has been in an overdraft

condition since the early 1950s. As a result of this condition, the area is under a water adjudication decree in which any agricultural producer or urban water user pumping more than 10 acre-feet per year is required to cut back on base water allocation. Currently, water users can only use 20 percent of their base allocation, with an additional 5 percent cut being proposed.

When it *does* rain, it can rain very hard. The results of a heavy downpour on parched land can be flash flooding; severe erosion; damaged property; and, in extreme cases, endangered lives. Like elsewhere, border-region soil requires a specific level of moisture and balance of nutrients to provide an optimal environment in which plants can grow and thrive. Many forms of wildlife, in turn, depend upon the presence of these plants for food and shelter. Changes in soil texture, structure, nutrients and moisture can occur both from climate changes as well as land management activities such as overgrazing and irrigation. Desired plant species can disappear, and noxious weeds can invade the land. Lack of adequate cover on the soil can cause severe erosion due to water and wind.

Problems caused by invasive species continue to be a another major concern to natural resource conservationists. For instance, officials in New Mexico report that both Hidalgo and Luna Counties are experiencing noxious-weed invasions that appear to be originating in Mexico. Examples of noxious weeds include African rue and Malta star thistle. Other plants such as Buffelgrass can have detrimental effects: When Buffelgrass invades desert ecosystems, the resulting increase in vegetative matter increases risk of fire. Native desert plants are not adapted to frequent fires, and should they occur, the result can be monocultures of Buffelgrass. Ironically, this invasive species still is being promoted as a grazing-resistant pasture grass by some officials in Mexico and the southwestern United States.

Numerous pathways exist for the introduction of invasive species. For example, farm implements for planting, cultivating and harvesting are transported back and forth across the border, introducing a risk of transporting the seed of noxious weeds to fields on both sides. In addition, insect pests could be



When introduced plants such as Buffelgrass invade desert ecosystems, the resulting increase in vegetative matter increases risk of fire. *Source of sketch: Pima Exotic Species Council, Sonoran Desert Conservation Plan website*

transported on these weeds or be attracted to them once they are established in their new habitat.

Livestock movement can inadvertently contribute to the problem. As animals cross the border, either by free ranging or being transported, they can distribute noxious-weed seeds that have become attached to their hair; these seeds then may become dislodged, drop to the ground, and germinate. In addition, seeds can be spread through livestock waste, as some harder seeds pass through and out of their systems without being injured. Yet despite these concerns about invasive species, public interest in the issue often is absent. The cause may well be a lack of awareness and/or the fact that human health and economic needs pose all too immediate a threat by comparison.

Finally, one of the greatest challenges to ecosystem conservation during 2002 remained urban sprawl. Land historically devoted to agricultural pursuits continues to be subdivided into “ranchettes,” tracts of between 10 and 100 acres that tend to be sold to urban dwellers wishing to experience a Southwestern rural lifestyle. Ironically, should this trend continue, what is being sought virtually will disappear.

Next Step

PROMOTE PLANNING, MANAGEMENT PRACTICES THAT REDUCE THREATS TO NATURAL RESOURCES. Though adverse climate conditions will continue to threaten border-region natural resources, planning and cooperation can help with preparing and responding well. Adequate flood-control measures, watershed protection plans that are actively implemented, good ground cover, and sound conservation measures on cropland and rangeland all can mitigate the threat of floods, for example. What is called a “total resource approach” to addressing these issues on both sides of the border is needed if sustainable management plans are to be effective in the longer term.

Water conservation, utilization and capture need to continue to be addressed. Agricultural producers are looking at various ways to cut back their water usage, which is laudable, and such efforts should continue. NRCS in California, through the local resource conservation districts, has been working with producers to provide both technical and financial assistance to improve their irrigation systems. Producers have converted less efficient flood and impact sprinkler irrigation systems to Low Energy Precision Application (LEPA) pivot systems. These new systems operate at very low pressures (17 to 20 psi), with system efficiency of approximately 83 percent. Many of the producers who have installed these systems have saved 25-30 percent of their water, and 30-50 percent of their electrical energy.

Improved technology is only one part of the multi-pronged approach needed. Best management practices also are a critical component. For instance, timing of irrigation is critical: Water should be applied at night when there is less chance for evaporation and the plants can most efficiently utilize the water.

By regularly monitoring soil moisture, irrigation can be turned on only as needed. Homes, businesses and industry need to be educated about how to wisely use water, how to recycle and reuse, and how to decrease their usage.

In tandem with these technology and management approaches, agencies at all levels who help to shape water policy in the border region must continue to step up communication and bilateral coordination. Steps already taken to institute a watershed approach should become a touchstone for all other activities undertaken (*see Water Resources section*).

To address invasive species problems, the most effective management strategies are those that integrate several types of control methods to provide the safest, most effective treatment possible. It is critically important that the technique is applied across the entire infestation, instead of focusing on only one portion within a particular geopolitical boundary. Given that the forecast is for available vectors for the spread and dissemination of invasive species to continually increase, efforts to synchronize management and improve communication on invasive species across international borders must be stepped up.

To combat sprawl, documents called “conservation easements” can provide an attractive alternative to selling off land and giving up a rural livelihood. These documents prohibit future subdivision of a tract of land, usually in perpetuity. Normal agricultural uses and other rural livelihoods are permitted, but further division of the land is prohibited. These easements often are traded for other valuable considerations, such as leased rangeland, or purchased for cash. In some cases it is advantageous to donate a conservation easement to a government agency or non-profit organization for tax purposes.

One challenge to obtaining easements lies in the fact that most western ranchers are partially dependent on state and/or federal lands for grazing. Placing an easement on the involved private land could destroy the value of the land, should the government agencies cease to permit grazing on public lands. Legislation is needed at the state and federal level to protect the interest of well-meaning landowners who are willing to place easements on their private lands.

PROJECTS AND PARTNERSHIPS

Cooperation across sectors is integral to advancing virtually all environmental issues in the border region, but it may be particularly critical to conserving renewable natural resources. Whether perceived or actual, friction between environmental and economic goals has become heightened and, therefore, multisector cooperation is all the more essential.

One such cross-sector initiative is the Quivira Coalition, a non-profit organization incorporated in New Mexico. It is composed of ranchers, environmentalists, scientists and others who seek to end

hostilities about rangeland management and move toward cooperation on the grazing issue. The stated purpose is to teach ranchers, environmentalists, public land managers, and other members of the public that ecologically healthy rangeland and economically robust ranches can be compatible. The Coalition pursues educational efforts through a regular newsletter, conferences, workshops, lectures, and variety of public affairs efforts.

The Malpai Borderlands Group is another example of partnership in action. Composed of ranchers from the border region of Arizona and New Mexico, the group builds communication bridges between ranchers who also consider themselves environmentalists and those who view environmentalists with distrust. The group’s goal is an “unfragmented, healthy landscape to support a diverse, flourishing community of human, plant and animal life in our borderlands region.” The path to this goal, says the group, is “profitable ranching and other traditional livelihoods, which will sustain the open-space nature of our land for generations to come.” Activities include ecological research, beef marketing, fire management, range and watershed management, and conservation easements. Emphasis in 2002 was on conservation easements. According to its leadership, the Malpai Group has protected 50,000 acres of private land, affecting 111,000 additional acres of commingled state and federal land on ten ranches from development through the use of conservation easements. The combination of these easements, together with a large easement on a single ranch facilitated by an environmental group called the Nature Conservancy, resulted in more than half-a-million-acres coming under protection as of the end of 2002.

The Altar Valley Conservation Alliance, a group of neighbors in the Altar Valley of south central Arizona, is yet another example of a conservation partnership that is making a difference. The non-profit Alliance is promoting collaborative planning and management involving a combination of landowners and state and federal agencies. During 2002, the Alliance worked closely with Pima County on its Sonoran Desert Conservation Plan.

To increase understanding about prescribed burning activities in Texas, the Edwards Plateau Prescribed Burning Association, a landowner cooperative in Crockett, Val Verde and Sutton counties, has conducted more than 40 prescribed burns on 25,000 acres. Members, primarily local landowners, are encouraged to attend prescribed-burn schools. They also must develop a burn plan for each prescribed burn and their own fire lines. On a broader level, the interagency Border Fire Suppression agreement promotes collaboration across agencies.

To address noxious weeds, the Interagency Weed Action Group (IWAG) was formed to facilitate communication among federal, state and local agencies involved in weed management. The IWAG group focuses on clearing bureaucratic obstacles on specific issues. One IWAG project was the removal of federal obstacles that prevented state highway departments from controlling noxious weeds on highway rights-of-way passing through federal lands.

COMMENTS ON KEY DEVELOPMENTS

- 1) BECC-NADBank Reform
- 2) Homeland Security
- 3) Border 2012
- 4) Environmental “Consejos”

1) BECC-NADBank Reform

The activities of both the Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADBank) continued to receive attention from leaders at the highest levels of both nations last year. An extensive operational review by a binational working group, begun in 2001, came to a close in March 2002 in Monterrey, Mexico, where both Presidents had gathered for the U.N. Conference on Financing for Development. At Monterrey, Presidents Bush and Fox approved the working group’s recommendations, which were developed after considerable input from stakeholders, including the Good Neighbor Environmental Board. To implement the recommended reforms, both governments sent legislation to their respective Congresses. This legislation called for incorporating the recommended reforms into the original binational agreement that established BECC and NADBank.

As the year drew to a close, neither the United States (U.S.) nor the Mexican Congresses had completed action on the reform package, due to the press of other business. The proposed legislation was scheduled for re-introduction before both Congresses early in 2003. Also, in an action not requiring implementing legislation, both governments developed Terms of Reference for a Business Process Review, which then were made available for a 45-day public comment period. BECC and NADBank were expected to solicit proposals for the Review early in 2003.

Even as this process was unfolding, BECC and NADBank continued to carry out their responsibilities. BECC, under its Technical Assistance Program, thus far has approved more than US\$28.17 million to assist 113 communities in the development of 196 infrastructure projects. In addition, since its inception, BECC has certified 70 environmental infrastructure projects, 41 in the U.S. and 29 in Mexico, which will cost an estimated US\$1.58 billion to build.

NADBank, for its part, approved US\$119.88 million in project financing during 2002, nearly twice the amount approved during the previous year, according to NADBank officials. To meet the need for water conservation in the border region, NADBank also established the Water Conservation Investment Fund (WCIF). This \$80 million fund, created out of the retained earnings of NADBank’s capital, will be equally divided between the U.S. and Mexico and will be a grant funding mechanism solely devoted to improving water conservation infrastructure along the border region. Since its inception, say NADBank officials, NADBank has approved almost US\$476 million in loans and/or grants to partially finance 53 infrastructure projects along the U.S.-Mexico border estimated to cost a total of US\$1.35 billion.

Comment from the Good Neighbor Environmental Board:

In response to the Monterrey reforms for BECC and NADBank, the Board proposes that 1) all U.S. grant contributions to BECC and NADBank continue to remain within the 100-kilometer (km) original mandate; 2) the use of low-interest BECC and NADBank loans (as opposed to grants) in Mexico up to 300 km from the border be seen as acceptable; 3) border-region policy makers incorporate a broad, long-term watershed approach in all environmental infrastructure planning; 4) access be improved to project funding rates and terms; 5) the Board be involved in the design and execution of the Business Process Review; 6) given that the two boards will be merged, those responsible for the merger should remain aware of any negative effects and take corrective action if detected; and 7) with noted exceptions, private-sector projects should not be financed using grant funding (see Comment Letter in Business Report section for more details).

2) Homeland Security and the Border Environment

Security measures maintained their prominent position on the U.S. national agenda throughout 2002, as federal officials made preparations to create a new federal Department of Homeland Security. The tragic events of September 11, 2001, changed the world in ways that may not have been imaginable before. As local, state and federal governments all sought ways to protect our nation by eliminating real and present threats, much attention was understandably focused on the nation's northern and southern international borders.

The complex nature of the U.S.-Mexico border presents undeniable risks from a homeland-security perspective. With heightened awareness of the need to protect water supplies, eyes are quickly drawn to the important watercourses and reservoirs associated with the Rio Grande and the Colorado River. The need to protect food supplies takes on a new meaning with the awareness that vast amounts of produce pass through the ports of entry and are processed in U.S. border communities. Infrastructure such as pipelines, rail lines, dams, canal systems, and the like, may easily be viewed as targets by those with ill will. In addition, the heavily industrialized nature of some border communities raises concerns about the dangers posed by the transport and storage of hazardous materials. Governmental attention to these potential risks and others is prudent. So, too, is attention to the environmental consequences of security measures implemented to protect our country.

The merits and effectiveness of specific homeland security measures implemented throughout the United States and abroad are subject to debate. But there is no question that some of those measures have had unintended adverse consequences for the environment along the U.S.-Mexico border. And although the effects are felt across the entire nation, it would be difficult to deny that they are especially strongly felt by U.S.-Mexico border communities.

Day-to-day liberties of crossing the border to visit family and friends, to work, and to shop became a much less pleasant experience as the security measures put into place at border crossings resulted in traffic waits of up to four hours at some ports of entry. These prolonged waits, in turn, compounded existing air-quality problems as emissions from idling vehicles increased, hampering compliance with federal air-quality standards and further raising concerns about potential effects on community residents' health.

The post-September 11 closing of several unofficial border-crossing points in small rural towns along the Texas-Mexico border has had profound effects. The neighboring towns of Paso Lajitas, Mexico, and Lajitas, Texas, provide one such example. Family members can no longer cross the river to visit each other and must travel four hours to get children to school and to access medical care, workers with permits must also travel four hours to the nearest official bridge crossing, the once-popular tourist sites

in Paso Lajitas have all closed, and businesses in Lajitas, Texas, are suffering from lack of customers.

To a much lesser extent, the increased resources targeted for homeland security resulted in what some viewed as isolated benefits. For instance, concern that hazardous-cargo shipments could be used for acts of terrorism accelerated efforts already underway to establish what are called "binational contingency and emergency preparedness" plans for the 14 sister-city pairs of communities along the border. In the Arizona/Sonora region, for instance, the completion of these plans for all four sister-city communities was accomplished. The final plan was signed in October 2002 between Cochise County, Arizona (which includes the community of Naco), and Naco, Sonora.

Economic, environmental and other impacts were quickly noted by representatives of border communities and the governors of the four U.S. border states. Even during the early months of the year, concern was mounting that the economies of the border communities would continue to deteriorate in the wake of security measures and other fallout from the tragic events of September 11, 2001. To bring these concerns to the attention of both federal governments, the U.S.-Mexico Border Governors Conference (BGC) released its "U.S.-Mexico Border States September 11 Impact Report" in February 2002. The report included recommendations such as: 1) that the U.S. sign a "Smart Border Declaration" with Mexico, in keeping with one signed with Canada in December 2001; 2) that the U.S. Congress pass and quickly implement an "Enhanced Border Security and Visa Entry Reform Act"; 3) that President Bush establish a Special Director for the Southwest Border within the Office of Homeland Security to manage relevant federal activities along the U.S.-Mexico border; 4) that the U.S. and Mexico improve trans-boundary tracking of hazardous waste by developing a unique database for all hazardous-waste shipments crossing the border; and 5) that the U.S. and Mexico create a grant fund for air-pollution projects related to traffic congestion in the border ports of entry.

The following month, in March, the White House issued the Administration's "Smart Border: 22 Point Agreement – U.S.-Mexico Border Partnership Action Plan." The agreement included points such as: 1) strategically plan for growing cross-border traffic; 2) develop a prioritized list of infrastructure projects, with immediate action to relieve bottlenecks; 3) revitalize existing bilateral coordination mechanisms at the local, state and federal levels with a specific focus on operations at border crossing points; and 4) continue to develop a joint in-transit shipment tracking mechanism.

Government agencies attempted to respond to both the need for increased security measures and the desire to keep commerce flowing steadily. For example, the U.S. Customs Service set up a new program beginning in April 2002 called the Customs-Trade Partnership Against Terrorism (C-THAT) program. This program incorporated many elements of the Service's existing Border

Release Advanced Screening and Selectivity (BRASS) process. Under BRASS, high-volume cargo from manufacturing companies in northern Mexico en-route to the U.S. is pre-screened and bar-coded, then given “fast-lane” treatment.

In October, the U.S. Environmental Protection Agency (EPA) released its own “Strategic Plan for Homeland Security.” The plan outlines four distinct mission areas: critical infrastructure protection; preparedness, response, and recovery; communication and information; and protection of EPA personnel and infrastructure. Under the preparedness, response and recovery mission are two goals on border-region security as it relates to environmental infrastructure: 1) EPA will support and develop the preparedness of state, local and tribal governments and of private industry to respond to, recover from, and continue operations after a terrorist attack; and 2) EPA will advance the state of knowledge in areas relevant to homeland security to provide the first responders and decision-makers with tools and the scientific and technical understanding they need to manage existing or potential threats to homeland security.

Comment from the Good Neighbor Environmental Board:

Good Neighbor recognizes the enhancement of homeland security measures along the border with Mexico. Although some of these measures have had beneficial effects for environmental protection, some have caused adverse environmental impacts. The Board believes that effective communication and coordination between those agencies that focus on security measures and those that focus on environmental protection are essential. Such coordination should take place at all levels of government so as to maximize scarce resources and to ensure that one type of goal is not achieved at the expense of the other.

To further progress already in hand, the Board advises that policymakers take additional steps to implement the recommendations contained in the Border Governors’ February 2002 report that can benefit the environment in the region, and that potential effects on tribes be factored into all policy decisions in this arena. It also advises that the pre-clearance system for goods implemented in the California-Baja California section of the border be replicated elsewhere along the border, with appropriate adaptations. Finally, the Board advises that the U.S. and Mexico continue to support the development of sister-city binational emergency-preparedness plans, including addressing communication needs and liability issues for equipment and personnel when responding to a binational emergency scenario.

3) Border 2012 Program

Border 2012, the next iteration of the Border XXI program, continued to take shape during 2002. As a U.S.-Mexico binational partnership involving federal, state, local and U.S. tribal governments, the program’s mission is to protect public health and the environment in the U.S.-Mexico border region,

consistent with the principles of sustainable development. Having received a commitment from both President Bush and President Fox late in 2001 to develop a new program that was more regionally focused, Border 2012 shapers spent much of 2002 embedding this principle into a draft framework for operation and getting feedback on the draft.

Border 2012 will operate as a regionally based border program working to achieve a specific set of environmental and human health objectives. A three-tiered level of organization, consisting of regional workgroups, local task forces and border-wide policy forums, will carry out the programmatic work.

Regional workgroups will convene in Baja California/California, Sonora/Arizona, Chihuahua/New Mexico/Texas, and Coahuila/Nuevo León/Tamaulipas/Texas to develop a mechanism that coordinates work along the border while maintaining regional focus. For instance, the effects of brick kiln operations are of special concern in the El Paso-Ciudad Juárez area, while overdraft and contamination of groundwater is a special concern in the San Pedro River watershed. Stakeholders representing diverse sectors will bring their perspectives to bear in the evaluation and support for projects proposed to address the environmental health priorities within each region. The stakeholders will represent local, state, tribal and federal governments, as well as communities, businesses, environmental organizations, academia and other interested entities. U.S. and Mexican federal agencies will participate in the four regional workgroups.

The regional workgroups will be informed by local task forces that will either continue ongoing work, as in the case of the Border XXI Hazardous Waste and Enforcement Sub Workgroups, or reconvene sub workgroups, such as Water, as local task forces. At the same time, U.S. and Mexican federal agencies will address issues that may be more effectively approached from a border-wide perspective in a series of policy forums. EPA, Mexico’s Secretariat of Environmental and Natural Resources (SEMARNAT), the ten border states, U.S. border tribes, and other federal and state agencies will lead this effort. These forums will be able to consider such broadly relevant topics as the integration of sustainable development principles into border programs. Funding for Border 2012 will include support for task forces, workgroups and policy forums. A competitive grant program will be open to locally supported project proposals.

During the fall of 2002, public meetings took place all along the U.S.-Mexico border to elicit public comment on the draft framework. Meetings were held from Tijuana/San Diego to Ambos Nogales to Ciudad Juárez/El Paso and Matamoros/Brownsville. The framework also was available for review on the EPA website, and hundreds of copies were mailed out to policy makers and interested members of the public.

Attendance at these public meetings ranged from 20 to more than 100 people. On the U.S. side, citizens expressed a range of

concerns including water quality and quantity, wastewater, power plants, unpaved roads, wood burning, exposure to pesticides and toxic metals, used-tire piles, and hazardous-materials transportation through populated areas. They called for air basin and watershed approaches to problems. Programatically, they supported the proposal for regional task forces but expressed concern about sufficient funding. Tribal participation, industry involvement, participation of natural resources agencies, and environmental education also were named as priorities. After revising the border plan to reflect stakeholder input, the draft plan was finalized for distribution early in 2003 in preparation for a signing ceremony.

Comment from the Good Neighbor Environmental Board:

The Board applauds the commitment of the U.S. and Mexican federal governments to allow significant devolution of border environmental planning and priority-setting to the regional level, and to provide the support needed to let local stakeholders solve their problems. As mentioned in its Comment Letter on the Border 2012 draft framework, early and ongoing support on a community level is essential for capacity-building to enable communities to fully engage in the new, more regionally focused program and to maximize the opportunities for success.

4) Environmental Consejos: Good Neighbor's Mexican Counterparts

Since 1997, the Good Neighbor Environmental Board has taken steps to stay in close touch with counterpart advisory groups in Mexico. This two-way communication has ranged from a formal binational session in 1999 to more informal dialogue during and after the last change of Mexican Administration, when these advisory organizations were being reconstituted.

Advisory groups established by the Mexican federal government (often referred to as Consejos, meaning advisors) are charged with formulating advice on improving environmental conditions and submitting it to SEMARNAT. Collectively, they advise on sustainable development throughout Mexico and, individually, each has responsibility for a particular region. Currently, the six Mexican states that form that nation's northern border are covered by two Consejos, the northeastern and the northwestern groups. Their full names are Consejos Consultivos Regionales de Desarrollo Sustentable del Noreste y Noroeste (Regional Advisory Boards for the Sustainable Development of the Northeast and the Northwest). The groups work on both border issues and issues affecting the interior of their Mexican states.

During 2002, the Board maintained dialogue with border specialists from both of these groups. Consejo representatives attended the Good Neighbor Environmental Board's meeting in

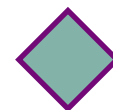
El Paso in June as well as its final meeting of the year in Nogales, Arizona, and Board members attended several Consejo meetings during the year.

A significant development took place toward the end of the year, when the Director of Border Affairs at SEMARNAT's Office of International Activities contacted Good Neighbor's Chair to convey that a decision had been reached to establish a Technical Committee for Border Issues. This Committee, it was said, would be composed of representatives from both the northeastern and northwestern Consejos, and would focus strictly on border issues.

Comment from the Good Neighbor Environmental Board:

The Board continues to value its dialogue with the northeastern and northwestern Consejos and looks forward to targeted dialogue with the Technical Committee for Border Issues once it is in operation. Much is to be gained by exchanging information with its Mexican advisory counterparts. Sharing information with Consejos on border-region environmental issues can strengthen the spirit of increased binational cooperation being called for from many quarters in both countries. Although some conditions within the two national regions may differ, and although Good Neighbor and the Consejos submit their advice to their own national entities, there is much in common and therefore much to be shared.

During its last meeting of 2002, the Board decided to plan a special joint session with its Consejo counterparts during the Board's last meeting of 2003. The meeting is scheduled for October 22 and 23 in San Diego, California.



BUSINESS REPORT

MEETINGS RECAP, BOARD IMPACT

Meetings

The local campus of a state university, an historic downtown hotel, and a mayor's council chambers temporarily became meeting sites for the Board during 2002, as members gathered in Calexico, California; El Paso, Texas; and Nogales, Arizona, for the Board's three meetings it holds each year in border communities.

The first meeting of the year, in **Calexico, California**, took place February 20-21 at the San Diego State University-Imperial Valley Campus. Calexico Mayor Victor Carillo gave opening remarks, followed by presentations from guest speakers on two topics: energy and water issues. Public attendees and speakers represented the following groups: Imperial County Agriculture Department; California Regional Water Control Board; two energy companies, InterGen and Sempra Energy Resources; Imperial Valley Irrigation District; Region 9 Office of the Environmental Protection Agency (EPA); California Center for Border-Region Economic Studies at San Diego State University; Institute of the Americas; United States-Mexico Chamber of Commerce; Tones Martinez Desert Cahuilla Indians; non-governmental organizations called Alianza Indigena and Centro Regional Estudios Ambientales y Socioeconómico (CREAS); the International Boundary and Water Commission (IBWC); state government of Mexicali, Baja California; the U.S. Congress; U.S. Department of Agriculture (USDA)/Forest Service; the Center for U.S.-Mexican Studies at the University of California-San Diego; and others. Media coverage included spots on the evening news of local stations Channel 11 KYMA and Channel 13 KSWT, as well as a newspaper article in the Imperial Valley Press.

The second meeting, whose theme was innovative partnerships, took place June 5-6 in **El Paso, Texas**, at the Hilton Camino Real Hotel. It began with an official welcome from Joyce Fineburg from the Mayor of El Paso's office, followed by speakers showcasing successful partnerships. Speakers and public attendees were from the following institutions: Center for Environmental Resource Management at the University of Texas-El Paso; New Mexico/Texas Water Commission; Joint Advisory Committee for the Improvement of Air Quality in the El Paso del Norte Air Basin; USDA Bureau of Reclamation; Mexico's Secretariat of Environmental and Natural Resources (SEMARNAT); a non-governmental organization called the Alliance for the Rio Grande Heritage; the Colonias Development Council; the City of El Paso; the Texas Commission on Environmental Quality; the Border Environment Cooperation

Commission (BECC); North American Development Bank (NADBank); the Southwest Center for Environmental Research and Policy (SCERP); U.S. EPA's border program; and others. Local officials, including Congressman Silvestre Reyes, sent representatives. One of the outcomes of the meeting was a Board Comment Letter to the U.S. President and Congress requesting that the Board be involved in discussions about potential changes to BECC and NADBank (see Comment Letter). The *Los Angeles Times* published an article on the meeting and the Letter. In addition, ABC News local affiliate, KVIA Channel 7, and Univision affiliate, KTSM Channel 26, also covered the meeting.

The third and last border-community Board meeting during 2002 took place in **Nogales, Arizona**, October 9-10. This meeting had two themes: conservation, and health. The first day began with greetings from Marco A. Lopez, Mayor of Nogales. Next, the conservation theme was discussed by speakers from the following institutions: the Malpai Borderlands Group, Arizona Cattlegrowers Association, the Nature Conservancy, Arizona Department of Game and Fish, Pima County Administrators Office, and the Natural Resource Department of the Tohono O'odham Nation. The health theme was elaborated by representatives from the Office of Border Health in the Arizona Department of Health Services; the Mariposa Community Health Center; Cochise County Health Department; Arizona Department of Environmental Quality; and a representative from Water for People, a non-governmental organization. During the afternoon, the Board received a status update on developments within Consejo organizations, Mexican counterparts to the Good Neighbor Environmental Board. On the second day, the Board discussed three topics of special importance: the Border 2012 Plan, the U.S.-Mexico water debt, and BECC-NADBank reform. The meeting received news coverage from two local television stations, a local affiliate of Univision and a local affiliate of NBC News.

Besides these three border-community meetings, the Board also met early in the year in **Washington, D.C.**, for a Strategic Planning Session. Following the session, it sponsored an expert panel discussion called Border Forecast 2002 to gain input from senior officials on the top environmental infrastructure issues it should closely track during the year ahead.

Membership, Staff Changes

The year saw numerous membership changes, including that of the Chair. In January, highly respected Chair **Judith Espinosa** resigned. Another long-serving member, **Jennifer Kraus**, agreed to serve as Acting Chair for the Board's meeting in Calexico in February, then resigned later in the year. In March, EPA representation on the Board rotated from the Region 6 Office to the Region 9 Office; **Gregg Cooke**, Regional Administrator for Region 6, stepped down, and **Laura Yoshii**, Deputy Regional Administrator for Region 9, took his place at the table.

As the process for appointing a new Chair continued during the spring and early summer, member **Diana Borja** stepped in to be Acting Chair for the Board's meeting in El Paso in June. In July, **Placido dos Santos** of the Arizona Department of Environmental Quality was appointed as the Board's new Chair to serve a one-year term.

In September, two federal agencies appointed representatives to the Board: **Steve Nesmith** from the Department of Commerce, and **Shannon Sorzano** from the Department of Housing and Urban Development. Also during that month, **Karen Chapman**, **Ed Ranger** and **Nancy Sutley** were re-appointed for a second term, and **Valecia Gavin** was appointed as a new member. In November, long-serving IBWC Alternate **Bob Ybarra** retired and resigned from the Board.

Board management saw several changes, as Daiva Balkus became the Director of the EPA Headquarters Office of Cooperative Environmental Management, which manages the Board on behalf of the EPA Administrator. In addition, Oscar Carrillo was hired to serve as Associate Designated Federal Officer. Elaine Koerner remained in her position of Designated Federal Officer, relocating to the EPA Region 9 Office in San Francisco at the end of the year.

Publications

The Board held a press event January 24 in Washington, D.C., to launch its **Fifth Report to the President and Congress**. The Fifth Report advises the President and Congress to take action in three areas of border-region policy: water resources, air quality and hazardous materials. For water resources, the Board's advice is to step up binational cooperation on water problems, including more sharing of data on trans-boundary surface and groundwater supplies. To help improve border-region air quality, the Board recommends greater cooperative planning to minimize adverse air-quality impacts from power plants. And to reduce risks from hazardous materials crossing the border and moving through border communities, the Board points to capacity-building at a local level as a key ingredient for preparedness and prevention. Throughout the year, Board members continued to distribute copies of its Fifth Report at border-region events and throughout their organizations. In total, more than 4,500 copies were distributed to local, regional and national policymakers on both sides of the border. And for the first time in the history of

the Board, it received an official response to its Fifth Report. The response was issued by EPA Administrator Christine Todd Whitman on behalf of the Office of the President.

To supplement its recommendations, the Board issued several **Comment Letters** (see full text). For the first one, the topic was the reforms taking place within two key border-region institutions, BECC and NADBank. Among its recommendations are improved access to project funding. In addition, it requests to be involved in discussions about the proposed business plan for the two institutions. The second Comment Letter, drafted in December, concerned the framework of the new Border 2012 Program.

And on a monthly basis, the Board continued to publish a monthly e-mail newsletter called the **Round Up**. Each issue contained an update on Board activities; local, regional and national news affecting the border-region environment; and a calendar of relevant upcoming events.

Impact

If indicators of effectiveness such as visibility among border-region policymakers and across border communities are any measure, it can be said with certainty that the Board's impact grew during 2002. Its work was cited in research publications and newspaper articles, public attendance at its three border-community meetings was up, and subscriptions-by-request to its Round Up newsletter increased. That being said, the extent to which the Board's advice was heeded remained difficult to measure. Much of what it called for, such as adoption of a watershed approach border-wide, will require many incremental steps over what is likely to be a long period of time. The Board expressed interest in continuing to measure its impact in the year ahead.



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20450**

September 17, 2002

Good Neighbor Environmental Board
c/o Placido DosSantos, Chair
Border Environmental Manager
Arizona Department of Environmental Quality
400 W. Congress Street, Suite 521
Tucson, AZ 85701

To the Members of the Good Neighbor Environmental Board (GNEB):

On behalf of the Executive Office of the President, I submit the following remarks in response to the *Fifth Report of the Good Neighbor Environmental Board to the President and Congress of the United States*.

The Bush Administration appreciates your sage and timely advice concerning environmental infrastructure along the U.S.-Mexico border and values your discussion of the potential impact of water, air, and hazardous material issues on the health of border-region residents. We applaud your recognition of the need for partnerships, information sharing, and input from border communities and the reflection of those needs in the recommendations you make in the report.

During the meeting between President Bush and Mexican President Vicente Fox in Monterrey, Mexico, in March 2002, they reaffirmed their shared commitment to cooperating on environmental infrastructure issues. Upon his return, President Bush issued a statement defining the United States' relationship with Mexico as our nation's most important international relationship.

A prime example of this shared commitment is the agreement to reform the North American Development Bank (NADBank) and Border Environment Cooperation Commission (BECC) – reforms that will help those institutions enhance environmental infrastructure along the border. The Administration commends GNEB for its continued focus on the operations of the NADBank and BECC and appreciates the Comment Letters submitted by GNEB last year on the need for public input – including that of communities along the U.S.-Mexico border – as part of the reform process. We hope that in the coming year you, as a highly respected, non-partisan advisory group, will offer advice on both the implementation of this reform agreement and the new U.S.-Mexico Border Environmental Program.

On behalf of President Bush and the millions of people living along the U.S.-Mexico border, I thank you for a job well done and offer best wishes for continued success as you prepare the *Sixth Report of the Good Neighbor Environmental Board to the President and Congress*.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Christine Todd Whitman".

Christine Todd Whitman



Designated Federal Officer
Elaine Koerner
Telephone: (202) 564-1484
Koerner.elaine@epa.gov

May 14, 2002

The President
The White House
Washington, DC 20500

RE: Comments on Implementing Reforms to the Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADBank)

Dear Mr. President:

As your advisory board on environmental infrastructure projects along the U.S. border with Mexico, we request that the Good Neighbor Environmental Board (GNEB) continue to be consulted during implementation of BECC and NADBank reforms. Specifically, we request the opportunity to contribute input during implementation of the recommendations for reform that were agreed upon on March 22, 2002, in Monterrey, Mexico, during your bilateral discussions with President Fox.

Our initial input on the Monterrey agreements is as follows:

Geographic Scope: We would propose that all U.S. *grant* contributions to BECC and NADBank continue to remain within the 100-km original mandate. We also understand that Border Environmental Infrastructure Fund (BEIF) funds will remain within this scope. On the other hand, the use of low-interest BECC and NADBank *loans* in Mexico up to 300-km is acceptable, provided that both grants and loans are concentrated in the poorest communities and those with the most critical needs.

In addition, while BECC-NADBank financial resources will be disbursed only within these geographic areas — and justifiably so — the Board urges border-region policy makers to extend their strategic thinking beyond these confines to incorporate a broad, long-term watershed approach to all environmental infrastructure planning. GNEB called for this approach in its Fourth Report to the President and Congress and stands by this earlier advice.

Financial Instruments: GNEB has consistently recommended improving access to project funding rates and terms, and this proposal by the President is supported within the limits noted above.

Organizational Structure and Process: The development and application of the comprehensive business process review is an area in which GNEB takes special interest, and we propose that we be involved in its design and execution. From the perspective of the Board, consideration of potential impacts such as effects on watersheds must be included in any business process review.

The Good Neighbor Environmental Board advises the President and Congress of the United States. Administrative support is provided by the U.S. Environmental Protection Agency, Office of Cooperative Environmental Management, Mailcode 1601A, 1200 Pennsylvania Avenue, N.W., Washington, DC 20004 * 202-564-9741 *(FAX) 202-501-066

GNEB reiterates its earlier position expressing concern about merging the two Boards; given that this process will go forward, we encourage those responsible for the merger to remain aware of any negative effects, including perspectives and voices that may become sidelined in the process.

Private Sector: Private sector participation in environmental projects along the border is encouraged, so long as there are application preferences for the original mandated projects of water, wastewater, and solid waste. Private sector projects should not be financed using grant funding, except in the case of private/non-profit organizations that re-invest all excess revenue back into the project for improved sustainability.

We look forward to opportunities to continue to be part of the dialogue, and appreciate the efforts made by the binational working group to obtain extensive public input before submitting their recommendations. We encourage similar robust public involvement during the implementation process.

Sincerely,



Jennifer Kraus
Acting Chair

cc Vice President
Speaker of the House
Fernando Macias, Director, BECC
Raul Rodriguez, Managing Director, NADBank



Designated Federal Officer
Elaine Koerner
Telephone: (202) 564-1484
Koerner.elaine@epa.gov

January 22, 2003

Jerry Clifford, Deputy Administrator
EPA Office of International Affairs
Ronald Reagan Building
1200 Pennsylvania Ave. N.W.
Washington, D.C. 20460

Dear Mr. Clifford,

As Chair of the Good Neighbor Environmental Board, I am writing to thank you for your attentiveness to the Good Neighbor Environmental Board's review of Border XXI in our 2000 annual report, particularly our recommendations on how the next border program should be designed. After reviewing the framework document for Border 2012, we wish especially to commend the following components:

- a more focused goal;
- increased public and tribal participation;
- increased regional participation;
- extensive public input, witnessed through the large and diverse public meetings recently held to get feedback on the framework;
- a longer strategic planning horizon of ten years, as well as the program implementation plans;
- development of environmental indicators; and
- development of operational guidance.

We note that the success of this new approach will depend upon local capacity-building. In the Board's view, this effort must be carried out soon if the program is to ultimately be successful. EPA and SEMARNAT are in the position to implement this capacity-building in order to ensure that local, tribal, and state representatives are enabled to fully carry out their responsibilities.

The Board looks forward to playing an active consultative role as the Border 2012 Program continues to unfold.

Sincerely,

Placido dos Santos
Chair

The Good Neighbor Environmental Board advises the President and Congress of the United States. Administrative support is provided by the U.S. Environmental Protection Agency, Office of Cooperative Environmental Management, Mailcode 1601A, 1200 Pennsylvania Avenue, N.W., Washington, DC 20004 * 202-564-9741 *(FAX) 202-501-066

Membership Roster

(as of 12/02 - see website for updates)

CHAIR

Placido dos Santos

Border Environmental Manager
Arizona Dept. of Environmental Quality
400 W. Congress Street, Suite 521
Tucson, AZ 85701
520-628-6744; 520-770-3540 fax
email: dossantos.placido@ev.state.az.us

NONGOVERNMENTAL, STATE, LOCAL, TRIBAL MEMBERS

Larry Allen

Board of Directors
Malpai Borderlands Group
13004 North Pioneer Way
Oro Valley, AZ 85737
520-575-9869; 925-666-2227 fax
email: Larry9869@msn.com

Diana Borja

Director, Border Affairs (MC 121)
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711-3077
512-239-3603; 512-239-3515 fax
email: dborja@tceq.state.tx.us

Karen M. Chapman

Environmental Defense
44 East Avenue, Suite 304
Austin, TX 78701
512-478-5161; 512-478-8140 fax
email: kchapman@environmentaldefense.org

Gedi Cibas, Ph. D.

Manager, Border Programs
New Mexico Environment Department
1190 St. Francis Drive, P.O. Box 26110
Santa Fe, NM 87502-6110
505-827-2176; 505-827-2836 fax
email: Gedi_Cibas@nmenv.state.nm.us

Irasema Coronado, Ph.D.

Department of Political Science
University of Texas- El Paso
El Paso, TX 79968
915-747-7980 (office) 5227 (dept); 5400 fax
email: icoronado@utep.edu

Judith M. Espinosa

Director, ATR Institute
University of New Mexico
1001 University Blvd. Suite 103
Albuquerque, NM 87106
505-246-6410; 505-246-6001 fax
email: jmespino@unm.edu

William G. Fry

Vice President
Quality Assurance & Environmental Affairs
H-E-B Grocery Company
P.O. Box 18020
5105 Rittiman Road
San Antonio, TX 78218-0020
210-938-6511; 210-938-6508 fax
email: fry.bill@heb.com

Valecia Gavin

President, Border Environmental Health Coalition
P.O. Box 224
Fairacres, NM 88033
505-524-3154
email: valeciagavin@aol.com

Susan Kunz

802 N. Longfellow
Tucson AZ 85711
520-325-6392 (phone and fax)
email: skunz54@aol.com

Jerry Paz

Corporate Vice-President
Molzen-Corbin & Associates, P.A.
880 S. Telshor, Suite 220
Las Cruces, NM 88011
505-522-0049; 505-522-7884 fax
email: jpaz@molzencorbin.com

Dale Phillips
Vice Chair
Cocopah Tribe
County 15th and Avenue G
Somerton, AZ 85350
928-627-2102; 928-627-3173 fax
email: dalephillips_85350@yahoo.com

Ed Ranger
President
LexRadar, Inc.
2303 N. 44th Street, #14-1198
Phoenix, AZ 85008
480-784-6886; 708-570-6949 (fax)
email: edranger@lexradar.com

Diane Rose
Mayor
City of Imperial Beach
825 Imperial Beach Boulevard
Imperial Beach, CA 91932
619-423-8303; 619-429-9770 fax
email: dianehome loans@yahoo.com

Nancy H. Sutley
Deputy Sec. For Policy and Intergovernmental Relations
California Environmental Protection Agency
1001 I. St. 25th floor
Sacramento, CA 95814
916-322-7215; 916-445-6401 fax
Nsutley@calepa.ca.gov

FEDERAL MEMBERS

M.J. Fiocco
Office of Intermodalism
Room 6316
U.S. Department of Transportation
400 Seventh Street S.W.
Washington, D.C. 20590
202-366-8018; 202-366-0263 fax
email: m.j.fiocco@ost.dot.gov

John Klein
Assistant Regional Hydrologist
U. S. Geological Survey, DOI
520 North Park Avenue
Room 106 C
Tucson, AZ 85719
520-670-5018; 520-670-5006 fax
e-mail: jmklein@usgs.gov

Dennis Linskey
Office of Mexico Affairs
U.S. Department of State, Room 4258-MS
2201 C Street N.W.
Washington, D.C. 20520
202-647-8529; 202-647-5752
e-mail: linskeydm@state.gov

Carlos M. Ramirez
U.S. Commissioner
International Boundary and Water Commission
4171 N. Mesa, Suite C-310
El Paso, TX 79902
915-832-4105; 915-832-4191 fax
email: carlosramirez@ibwc.state.gov

Shannon H. Sorzano
Deputy Asst. Secy. for International Affairs
U.S. Department of Housing and Urban Development
(HUD)
451 7th St. S.W. - Room 8118
Washington, D.C. 20410
202-708-0770; 202-708-5536 fax
email: shannon_h._sorzano@hud.gov

Rosendo Treviño III
State Conservationist
Natural Resources Conservation Service
U.S. Department of Agriculture
6200 Jefferson Street, Northeast
Albuquerque, NM 87109-3734
505-761-4401; 505-761-4481 fax
email: Rosendo.Trevino@nm.usda.gov

Richard Walling
Director, Office of the Americas
and the Middle East
Office of Global Health Affairs
U.S. Department of Health and Human Services
Room 18-74, Parklawn Building
Rockville, MD 20857
301-443-4010; 301-443-6288 fax
email: rwalling@osophs.dhhs.gov

Laura Yoshii
Deputy Regional Administrator
U.S. EPA, Region 9
75 Hawthorne Street
San Francisco, CA 94105-3901
415-947-8702; 415-977-3537(fax)
email: Yoshii.Laura@epa.gov

DESIGNATED FEDERAL OFFICER**Elaine M. Koerner**

Designated Federal Officer
 Good Neighbor Environmental Board
 U.S. Environmental Protection Agency
 Duty Station: EPA Region 9 Office
 Mail Stop WTR-4 75 Hawthorne St., 11th floor
 San Francisco, CA 94105-3901
 415-972-3437
 email: koerner.elaine@epa.gov

RESOURCE SPECIALISTS

(Non-Board members who actively contribute to the work of the Board)

Federal Agency Alternates**Ginny Gidi**

(works with HHS Member Dick Walling)
 Office of Global Health Affairs
 U.S. Department of Health and Human Services
 Room 18-74, Parklawn Building
 Rockville, MD 20857
 301-443-4010; 301-443-6288 fax
 email: ggidi@osophs.dhhs.gov

Christina Machion

(works with HUD member Shannon Sorzano)
 Program Analyst
 U.S. Department of Housing and Urban Development (HUD)
 Office of International Affairs - Policy, Development and Research
 451 7th St. S.W. - Room 8118
 Washington, D.C. 20410
 202-708-0770; 202-708-5536
 email: cmachion@hud.gov

Nancy Woo

(works with EPA member Laura Yoshii)
 US EPA, Region 9
 75 Hawthorne Street (WTR-1)
 San Francisco, CA 94105-3901
 415-972-3409; 415-947-3537 fax
 email: woo.nancy@epa.gov

Benjamin Muskovitz

(works with State Dept. Member Dennis Linskey)
 Office of Mexico Affairs
 U.S. Department of State, Room 4258-MS
 2201 C Street N.W.
 Washington, D.C. 20520
 202-647-8529; 202-647-5752
 e-mail: muskovitzbi@state.gov

EPA Regional Office Contacts**Region 9****Nancy Woo**

Region 9 - San Francisco
 (see Federal Agency Alternates listing)

Tomas Torres

Border Liaison Office
 U.S. EPA Region 9
 610 W. Ash Street, Suite 905
 San Diego, CA 92101-3901
 619-235-4775; 619-235-4771 fax
 email: torres.tomas@epa.gov

Region 6**Gina Weber**

US-Mexico Border Coordinator
 U.S. EPA Region 6
 1445 Ross Avenue, 12th Floor
 Dallas, TX 75202-2733
 214-665-8188; 214-665-7373 fax
 email: weber.gina@epa.gov

CarlosM Rivera

El Paso Border Liaison Office
 U.S. EPA Region 6
 4050 Rio Bravo
 Suite 100
 El Paso, TX 79902
 915-533-7273; 915-533-2327 fax
 email: rivera.carlosm@epa.gov