



ENVIRONMENT AND THE BORDER REGION

Analysis to inform funders, policymakers, and stakeholders on environmental impacts that impact the health and well being of millions of Border crossers and residents between U.S. and Mexico.

Authored by:
Paul Ganster, Ph.D.



US • MEXICO
BORDER PHILANTHROPY PARTNERSHIP
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Philanthropy Partnership serves as
the leading binational organization
focused on building prosperity
along the U.S.-Mexico Border region
through leadership, collaboration,
and philanthropy.*

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SECTION ONE INTRODUCTION

We believe that the challenges and opportunities across the Border region demand informed civic participation, strong leadership and cross-border understanding, and collaboration.

For generations, the Border region between Mexico and the United States has been transformed from a lightly populated geographic area to a dynamic enterprise zone with a booming economy and population. Today, substantial numbers of residents on both sides of the Border interact on a daily basis, producing a society and geographic territory that is different from the rest of the United States and Mexico.

However, the Border contrasts a highly-developed, wealthy nation with a developing country and the issues are well known but persistent. Research indicates that if the region comprising the Border across the 10 states – Mexican and American – were America's 51st state, it would rank at or near the bottom in nearly all measures of prosperity, community health, educational opportunity, and quality of life. Further, negative stereotypes about the Border region are widely held throughout the United States and Mexico, and they frustrate possible solutions for many Border issues and justify imposition of federal and state Border policies and programs, often without adequate input from local stakeholders and often accompanied by unintended consequences.

This Border Brief, which is one in a series, highlights issues and offers critical insight to drive new solutions. It is our desire that this information will help foster greater philanthropic and corporate support, as well as our nonprofit partners to carry them out to address the need for coordinated philanthropic leadership, cross-cultural understanding, and public policy advocacy. The Border Briefs provide current and accurate information about health, environment, education, migration, philanthropy, and general Border dynamics.

SECTION TWO

BORDER CLIMATE AND NATURAL AREAS

The Border region is characterized by aridity, especially on the western and central portions of the Border, with increasing rainfall near the coast of the Gulf of Mexico on the east. Intensive agriculture is only possible through large federal government-built irrigation works that provide water from the Colorado and Rio Grande rivers and their tributaries to regions such as the Imperial-Mexicali valleys on the California-Baja California Border, Arizona’s Gila River area, and the Lower Rio Grande Valley of Texas and adjacent Mexican states. This aridity has also shaped the pattern of modern human settlement in the Border region, with some 90 percent of the population concentrated in 15 binational sister city pairs located along the boundary where water supplies are available.

The western part of the Border has scant rainfall with yearly averages of 10.3 inches in San Diego, 11.8 inches in Nogales, and 8.9 inches in El Paso. San Diego’s Mediterranean climate brings most rainfall in the winter months, often with intense storms. Nogales receives most of its annual rain in the monsoon season of July and August that produces flash flooding. El Paso also experiences monsoonal moisture in July, August, and September. Rain in the Lower Rio Grande Valley is year-round with most precipitation in the months of May and September. Laredo totals 20.7 inches yearly and Brownsville averages 27.4 inches yearly. Proximity to the Gulf of Mexico means that this area of the Border is impacted by hurricanes that made landfall in the vicinity as in 1967, 1980, 2008 (3 hurricanes), 2010, and 2020 and were accompanied by flooding that is sometimes catastrophic. Intensity of storm events will likely increase in the future with warming global temperatures, including the waters of the Gulf of Mexico. Increasing daytime and nighttime temperatures related to climate change are elevating health risks for Border areas. South Texas and the Lower Rio Grande Valley and adjacent areas of Mexico on the eastern borderlands and the greater Imperial Valley-Mexicali Valley region and adjacent Arizona-Sonora areas on the western borderlands regularly have dangerous levels of the heat index that is based on ambient temperature and humidity. The elevated heat index is amplified by the heat island effect in Border cities and has increased illness and death risks for vulnerable Border populations, including infants, the elderly, and low-income residents with marginal housing and who lack air conditioning.

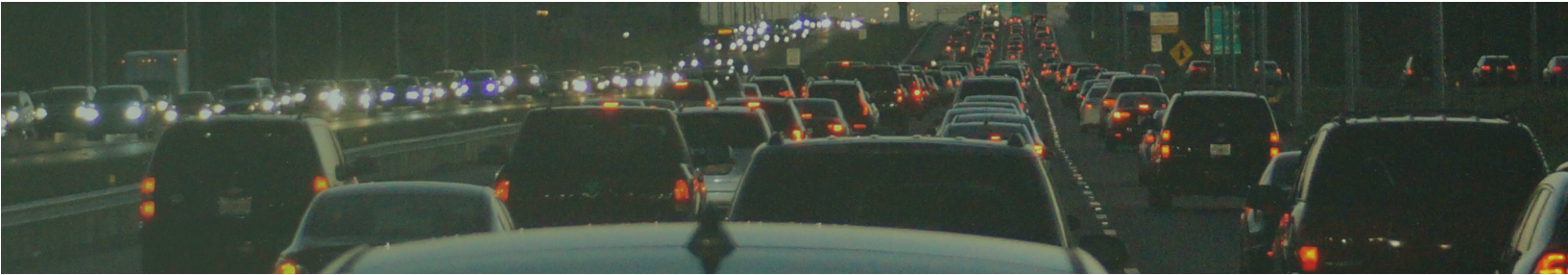
The Border has great biodiversity shaped by climate and topography and is home to diverse and fragile ecosystems that have been heavily impacted by centuries of human activities. Ecoregions of the Border, from west to east, are the California coastal region, the Sonoran Desert, the Madrean Archipelago, the Chihuahuan Desert, the Southern Texas Plains, and the Western Gulf Coastal Plain. Two countries have discussed development of international parks across the Border to protect contiguous ecosystems, including the Big Bend National Park-Sierras del Carmen and the Pinacate/Gran Desierto del Altar-Organ Pipe Cactus National Monument/Cabeza Prieta National Wildlife Refuge. However, given the current emphasis on Border security in the United States, it is unlikely there will be much movement toward creation of binational protected areas.

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Urban sprawl, agricultural activities, mining, and other human enterprises impact natural areas along the Border, threatening endangered and emblematic species. Unintended consequences of construction of some 700 miles of security barriers along the Border is the fragmentation of habitat into patches that cannot support some species.¹ The wall and associated infrastructure have blocked migration corridors for emblematic species such as the jaguar, jaguarundi, brown bear, ocelot, and Peninsular bighorn sheep, among others. Increasing human demands and decreasing supplies of water in many areas of the binational Border region have drastically reduced water available for maintenance of natural systems, and protection of many flora and fauna species. The historically important wetlands of the Colorado River delta have been devastated by reduced flows of the river that now seldom reach the Sea of Cortez. The Rio Grande delta system has also felt the effects of upstream water removal for irrigation and municipal use and land use changes that have modified sediment loads and vegetation. Riparian ecosystems everywhere have been impacted by reduced surface water and groundwater extraction has lowered the water table everywhere, eliminating vital sources of water for flora and fauna. Efforts by public agencies and conservation groups have had some success at restoring water through purchase of water rights, utilizing treated wastewater to restore river flows and riparian ecosystems, or employing water harvesting techniques to improve water production in watersheds to benefit nature.²



SECTION THREE

ENVIRONMENTAL FRAMEWORKS

Burgeoning human population and economic growth at the Border have combined to produce numerous environmental impacts with transboundary effects. For example, growth of binational urbanized areas was accompanied by spillover effects, where environmental contamination such as sewage or air pollution from one side of the Border caused effects on the other side of the international line. Problems with particulate matter (PM10) linked to respiratory problems were common in the desert region of El Paso-Ciudad Juárez. Beginning in the 1950s these growing issues raised public awareness and increased activism of Border stakeholders, eventually forcing the two governments to address shared environmental problems.

Border environmental concerns, especially on the U.S. side, increased in step with world and national environmentalism. Contamination of surface water, the air, and the land was increasingly noticeable to Border residents and nationally in the United States. In the early 1970s, Congress passed the National Environmental Quality Act (NEPA, 1979), the Clean Air Act (1970), and the Clean Water Act (1972). The U.S. Environmental Protection Agency (EPA) was established in 1970 and developed environmental standards and enforcement to protect the environment and human health.

Mexico’s environmental legal and administrative framework lagged a decade or so behind the United States until the 1988 General Law of Ecological Equilibrium and Environmental Protection (LGEEPA) was enacted in Mexico. By the early 21st century the neighbors had established effective coordination on Border environmental issues, although priorities and funding availability differed.



SECTION FOUR

THE LA PAZ AGREEMENT

In 1983, presidents Ronald Reagan of the United States and Miguel de la Madrid Hurtado of Mexico met in city of La Paz in Baja California Sur and signed the Agreement between the United States of America and the United Mexican States on Cooperation for the Protection and Improvement of the Environment in the Border Area. The specific provisions of the La Paz Agreement provide an important foundation for bilateral cooperation on environmental issues and is the framework for current collaborative actions that have evolved over the years.

“The La Paz Agreement helped create an institutional framework and significantly enhanced U.S. and Mexican cooperation on specific environmental issues.”

National Coordinators for the La Paz Agreement are the heads of the U.S. Environmental Protection Agency (EPA) and of its Mexican counterpart, now known as SEMARNAT, who meet annually to review Border environmental programs and establish new initiatives. The La Paz agreement established binational work groups and provides for negotiation of annexes for specific Border environmental issues. Over the next decade, annexes were developed for sewage flows from Tijuana (1985), joint response for hazardous materials emergencies (1985), transboundary shipment of hazardous materials (1986), Arizona-Sonora Border copper smelter pollution (1987), and joint management of the Paso del Norte Airshed (1996). These annexes created an institutional framework and significantly enhanced U.S. and Mexican cooperation on specific environmental issues and provided an opening for more participation by local actors from government as well as the larger community.³

SECTION FIVE

NAFTA AND THE ENVIRONMENT

Efforts to pass a free trade agreement for North America gathered momentum in the late 1980s and produced the North American Free Trade Agreement (NAFTA) that took effect in 1994. U.S. environmental organizations, labor unions, and community groups opposed the agreement, citing likely environmental impacts of increased trade flows across the Border as well as increases in numbers of maquiladoras, or Mexican Border assembly plants, and related pollution. The U.S., Mexican, and Canadian negotiators overcame this opposition by creating the trilateral Commission on Environmental Cooperation (CEC) and the United States and Mexico established what became the binational North American Development Bank (NADBank) to address current and future environmental infrastructure problems in the Border region. These institutions represented a new model of cooperation where officials of three or two countries work side by side as a trinational or binational bureaucracy, instead of separate entities. At the same time, the U.S.-Mexico Border Environmental Program was established by EPA and SEMARNAT (Mexico’s environmental ministry) under the authority of the La Paz Agreement. This program developed as a series of multi-year plans to improve the Border environment; Border 2025 is the most recent of these plans.⁴ The plans are driven by specific strategies, goals, and measurable outcomes and increasingly are receptive to public participation from Border communities. Through a small grants program and leveraging other federal funding, they have supported U.S. and Mexican Border community organizations for targeted environmental projects. Managed by EPA Border offices in San Diego and El Paso, the plans have facilitated community engagement and crossborder stakeholder cooperation on environmental issues. The plans have also helped maintain continuity of both federal governments on Border environmental issues in the face of turnover of presidential administrations.

As part of the NAFTA process, Congress also established other programs related to the Border environment during the 1990s. In 1992 two important organizations were authorized. The Border academic research Southwest Consortium for Environmental



Research and Policy produced scientific studies about the Border environment until it ended operations in 2013.⁵ The binational United States-Mexico Foundation for Science (USMFS) was established by an endowment from the two countries and continues its work today.⁶ The Good Neighbor Environmental Board was created in 1996 and has produced regular reports on the state of the Border environment.⁷ Finally, the United States-Mexico Border Health Commission was authorized in 1997, but the U.S. component was only partially funded and by 2023 it was moribund.⁸ Mexico, however, continued to support the Mexican part of the commission that carried out important work during the COVID-19 pandemic beginning in 2020.

By the second decade of the 21st century, the United States and Mexico had reconfigured old and created new institutions to address Border environmental challenges and had made significant investments in environmental infrastructure and environmental programs, particularly in the Mexican side where access to basic infrastructure such as drinking water and sewer has increased substantially. But relentless population, urban, and economic growth, compounded by climate change effects, has outpaced efforts to resolve many environmental problems. Especially problematic are transborder issues that require transborder solutions from institutions that do not coordinate seamlessly across the international boundary. The section that follows briefly discusses the major contemporary environmental problems and challenges that the Border faces.

SECTION SIX

CLIMATE CHANGE

Scientific analysis in combination with more than a century of observable data for temperature and precipitation suggest that the Border region will likely continue to experience increasingly severe effects related to climate change and climate variability, including drought cycles.⁹ Higher daytime and nighttime temperatures, decreased and more variable precipitation, increased evaporation, decreased water deliveries from the Rio Grande and Colorado river systems, less replenishment of groundwater resources, decreasing soil moisture, more frequent and intense wildfires, and more powerful weather events and flooding are expected impacts. The Gulf of Mexico and Pacific ends of the Border will confront greater storm surge from more frequent severe storms, compounded by sea level rise. These changing conditions will affect critical physical infrastructure and animal and plant communities that many traditional Borderland tribal members depend upon for their traditional economies and culture. There will be widespread human health effects as new vectors and diseases arrive in the Border region and more illness and death related to excessive heat. Low-income urban and rural residents, tribal peoples, and other vulnerable groups in Border society will be most impacted by these effects. Some of the future migration to the region may be stimulated by climate impacts elsewhere in the Americas and the world.

U.S. Border states and local governments have responded to climate change through plans to reduce greenhouse

gas emissions and specific mitigation efforts and some Mexican governments have similar plans. The North American Development Bank has launched a new initiative to fund green infrastructure, though the lending levels fall far short of the potential investments.¹⁰ There remains much specific work to be done on mitigation actions such as installing green infrastructure, increasing green urban areas, improving water security, enhancing flood protection, addressing public health concerns, and other challenges. Unfortunately, the seriousness of climate challenges is not widely understood in Border communities.



SECTION SEVEN

BORDER WATER SUPPLY

The availability of reliable water supplies for drinking, municipal needs, agriculture, and industry is a fundamental and critical issue for the Border. Water availability everywhere in the Border has diminished, so competition among a growing number of users has increased. U.S. federal and state water laws and policies, along with evolving federal jurisdiction, treaty allocations for transboundary water resources, and conflicts over water access by tribal, traditional Hispanic residents, farmers, industrial users, urban areas, and natural areas, are all part of a water apportionment system in the United States that is difficult to change. The current and likely continued shortfall in water availability has triggered growing domestic and international conflicts over water in the Border region. Treaties between Mexico and the United States in 1906 and 1944 allocated surface

to the discharge into the Gulf of Mexico, is also under severe stress. The northern portion from the headwaters to southeast of El Paso-Ciudad Juárez is primarily in the United States and the lower portion is fed by some U.S. tributaries but mainly from the Conchos River and smaller rivers from Mexico. Water deliveries from Mexico via the Conchos River to the Rio Grande under the 1944 Treaty that benefit users in Texas have chronically been irregular and usually less than specified by treaty. As of August 2022, Mexico's deliveries to the Rio Grande River were the lowest of the last 30 years, impacting agriculture and urban users of river water in Texas. Mexico's water debt for deliveries to the Rio Grande is a significant bilateral issue that will not be easy to resolve. As surface water supplies in the Border region decline, many users have turned to groundwater to supplement supply,

“ Growing water demand for urban, agricultural, recreational, industrial, and ecosystem uses have increased conflict over domestic and international allocation of this key resource.

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waters of the Rio Grande and Colorado river systems.¹¹ However, the agreements were made during wet years when natural production of water was high. However, when water production returned to long-term averages and when long-term periods of drought developed, available supplies were overallocated. By 2023 the dams of the Colorado River were at historic lows and allocations to Mexico and other users were reduced. More than 40 million U.S. and Mexican users of Colorado River water faced the likelihood of ongoing reductions. Native American claims to water rights as specified in treaties with the U.S. government were increasing in number as tribal peoples sought to provide water for their communities. The Rio Grande system, from its source in the San Juan Mountains in southwestern Colorado

resulting in depletion of some as well as degradation of groundwater quality in others. Groundwater regulations and management practices vary by U.S. state jurisdiction, some of which are very incomplete, and largely fail to protect aquifers. In some agricultural areas, water levels in aquifers have fallen so much that the overlying land has subsided, causing damage to irrigation and transportation infrastructure. The groundwater situation in the Mexican Border region is similarly compromised by overuse and ineffective management attempts.¹² There is no binational groundwater treaty that controls the aquifers that underly the international boundary, mainly because groundwater is a federal jurisdiction in Mexico and a state responsibility in the U.S. Border region. Yet such transboundary aquifers are a shared resource, and water in most cases

moves freely across the Border according to where the drawdown is strongest. Without proper transborder aquifer management, this valuable resource will not be sustainable under the current scheme of where those that pump the most water win.

Many Border communities face increasing water insecurity due to extended drought, over allocation of available resources, and infrastructure inadequacies. Some regions, such as San Diego County, have moved to diversify water supply through purchase agreements for Colorado River water, construction of a large desalination plant, enhancing storage in the region, and increasing

water reuse through massive public investment. El Paso has added a desalination plant to supplement the surface waters of the Rio Grande and groundwater. However, some large Border cities rely primarily on a single source. Tijuana, for example, depends on most of its supply from an aqueduct over the mountains from the Colorado River, an aqueduct that is vulnerable to interruption from earthquakes or other natural disaster. These existing and new water resources are costly, posing challenges to ensuring an affordable water supply for the poor.¹³ Mexico formally considers access to water a basic human right, although that is not codified in the United States.



SECTION EIGHT

WATER AND WASTEWATER INFRASTRUCTURE

Historically, poor areas of the U.S. Border region such as colonias¹⁴ have had deficits in water supply and wastewater infrastructure and services. At the same time, the deficit was far greater in Mexican Border communities where extremely rapid urbanization and small budgets for these vital urban services could not meet demand. Debates about environmental impacts of NAFTA led to creation of the binational North American Development (NADBank) in 1994. NADBank and partners EPA, International Boundary and Water Commission (IBWC), state and local governments, and the Mexican national water agency CONAGUA have been able to build significant water and wastewater infrastructure with critical funding from the U.S. Congress and the Mexican federal government, but that investment has declined in recent years. By 2020, water service coverage averages about 96% for Mexican Border residents and about 99% of U.S. Border residents.¹⁵ At the same time, 93% of Mexican Border residents had access to wastewater collection systems and the figure was 99% for U.S. Border residents.

Growth of Border communities along with chronic lack of operation and maintenance resources has stressed water and wastewater services, especially in Mexico. Many of the underserved communities on both sides of the Border lack local administrative, technical, and financial capacity to build and maintain local potable water and wastewater treatment systems and the cost of extending these services from the nearest large urban settlements is excessive for local, state, or federal governments. Potable water is not available to users in some Mexican Border cities 24 hours a day due to deteriorated and leaking distribution systems and scarcity of supply and sewage collector and treatment systems are often in disrepair. One recent estimate suggests that U.S. underserved Border communities include some 300,000 people in colonias, rural areas, and small cities; 50,000 Native Americans; and more than one million residents of U.S. cities on the international boundary.¹⁶ The numbers are much larger for Mexican Border populations. The Bipartisan Infrastructure Law (BIL) of 2022 and Inflation

Reduction Act (IRA) of 2022 provide billions of dollars in once-in-a-generation U.S. federal grants and loans for water and wastewater investment that will help larger and some smaller U.S. Border cities resolve infrastructure deficits. Unfortunately, many smaller and rural communities as well as tribes lack the administrative and technical capacity to access these funds. Current EPA initiatives aim to address these administrative and technical capacity needs, and the EPA and other federal agencies are addressing the needs of these underserved communities more generally. These funds are not approved for projects on the Mexican side of the boundary, even if they would improve the environment in U.S. communities.

Some U.S. Border cities that share binational metropolitan ecosystems with Mexican sister cities that have rapidly growing populations and inadequate resources for public services. The U.S. sister cities are unable to address environmental flows effectively and proactively from across the Border, including renegade sewage spills, storm water, sedimentation, trash, and other contaminants. In other words, Border location brings special difficulties in providing wastewater infrastructure that other cities in the United States do not face. Management of the international Border and what crosses it is a federal responsibility so wastewater problems, many of which are chronic and predictable, can only be resolved by intervention of U.S. and Mexican federal authorities. Arranging federal support for urgent problems that require immediate attention is complex, costly, and inefficient. Typically, it might take a decade or more to resolve a significant crossborder sewage flow problem, condemning far too many Border residents to long periods of poor surface water quality that contaminates urban and natural areas as well as important recreational beaches as in the case of Imperial Beach, California. Persistent transborder flows of contaminated water are testimony that Border realities and needs have outgrown the existing institutional capacities.

SECTION NINE

AIR QUALITY

Binational air basins fail to meet U.S. and Mexican air quality standards. The mixing and movement of pollutants in air currents from different sources in Mexico and the United States creates air quality problems in binational air basins that include San Diego-Tijuana, Imperial Valley-Mexicali, Yuma-San Luis Río Colorado, Ambos Nogales, and Paso del Norte (El Paso-Ciudad Juárez-Sunland Park).¹⁷ Twin cities such as Brownsville-Matamoros and Laredo-Nuevo Laredo on the Rio Grande also have air quality problems as does Big Bend National Park where reduced visibility from coal burning plants in Texas and Northern Mexico is an ongoing problem. Emissions from the transportation sector are the main cause of air quality problems in the Border. This is exacerbated by long waits with idling vehicles at Border crossings. However, power plants, some industries such as smelters, agricultural burning, wildfires, and dust from deserts, exposed dry lake beds, agricultural operations, and unpaved roads all contribute to unhealthy air. Typically, the vehicle fleet of the Mexican sister city is older and in poorer condition

averages at the regional level and Mexican monitoring is similar; both do not always detect local pollution hot spots in neighborhoods impacted by local industrial pollution, agricultural contaminants, or nearby highways and ports of entry that produce large amounts of vehicular pollution. Academic researchers, community groups, and local and federal authorities have undertaken citizen-based monitoring to document these local air impacts. One example is the air-sampling program initiated in 2010 for the community of San Ysidro in the city of San Diego that surrounds the port of entry at Tijuana; another is ongoing air sampling by community groups in the Imperial Valley region.

Fed up with dirty air, in 1993 business and community leaders in the El Paso-Ciudad Juárez region came together in a binational committee to work on binational air pollution problems. In 1996, the two federal governments established a formal agreement based on the 1983 La Paz Agreement to create the Joint Advisory Committee for the Improvement

The **close collaboration of agencies from both countries through the U.S.-Mexico Border Environmental Program** has produced air-quality monitoring networks, cleaner fuels, newer vehicle fleets in border cities, and more paved roads.

and produces more contamination per vehicle than the vehicle fleet on the other side of the Border. Inadequate public transportation systems in Mexican Border cities means that many residents are forced to rely on older and more polluting vehicles often purchased in the United States. These Mexican Border urban areas have the highest numbers of vehicles per capita in the nation.

Poor air quality is linked to high rates of asthma and other respiratory diseases of Border residents, particularly among the elderly, young children, or others with underlying health conditions. Air pollution also has cardiovascular impacts that can include hypertension, coronary artery disease, heart attack, and stroke. Air monitoring under the U.S. federal Clean Air Act is designed to detect air-quality

of Air Quality in the Ciudad Juárez, Chihuahua / El Paso, Texas / Doña Ana County, New Mexico Air Basin. This group is made up of local, state, and federal officials as well as business leaders and environmental groups, to address transborder solutions.

By 2023, progress on addressing Border air pollution has been made. The close collaboration of agencies from both countries through the U.S.-Mexico Border Environmental Program has produced air-quality monitoring networks, and cleaner fuels, newer vehicle fleets in Border cities, and more paved roads had improved air quality. However, Border urban growth, more trade-related truck traffic, and long delays in crossing the Border northbound all generate additional pollution. Long lines of idling and slow-moving

commercial and passenger vehicles waiting to cross into the United States regularly produce dangerously high levels of ozone and fine particles that are known to increase the risk of cardiovascular illness and asthma. These levels of pollutants affect the health not only of car passengers and pedestrians waiting to cross the Border but also of people in the surrounding, densely populated areas adjacent to the ports of entry.¹⁸ Slow movement of southbound traffic into Mexico produces similar air pollution problems at San Diego and El Paso ports of entry. The nearby communities are largely low income Hispanic and these communities bear a disproportionate exposure to the localized air pollution, making this an environmental justice issue. Although Executive Order 12898 (1994) requires that environmental justice be considered in federal planning, air pollution continues to plague disadvantaged Border communities. The Justice 40 Initiative of the Biden Administration sets a goal that 40 percent of the overall benefits of federal climate, clean energy, clean water, and other investments flow to disadvantaged communities.¹⁹

These federal programs, if applied properly, should bring improved air quality to both sides of the Border.

Electrification of the U.S. and Mexican Border vehicle fleets will benefit air quality in Border communities, but this will take decades. More immediate improvement of air quality at Border ports of entry and surrounding communities can be achieved through efficient administration of the ports by U.S. Customs and Border Protection to reduce the long wait times for crossing of vehicles and people. Distrust in both nations has prohibited alternatives such as clearing trucks by U.S. CBP in Mexico in secure facilities away from the Border to speed up their crossing. Targeting heavy duty diesel trucks, especially drayage vehicles that haul containers back and forth across the Border, should be a priority in reducing this pollution source. Not only do Border delays have a huge negative economic impact on the Border and national economies, but also on the health of Borderlanders who cross the Border and who live nearby.²⁰



SECTION TEN

HAZARDOUS WASTE

The Border region, with a few exceptions, has not experienced many decades of heavily polluting industries and other activities and does not have large areas with severe land contamination, or “brownfields,” except for mining and smelting industries. Some Mexican Border maquiladoras were identified by environmental groups as sources of toxic discharges discussions during the NAFTA approval process. Under pressure by community activists, in 1994 the Mexican government shut down a company in Tijuana that melted old vehicle batteries to recover the lead, Metales y Derivados.²¹ The U.S. owners then abandoned the site and returned to the United States, leaving behind some six thousand metric tons of toxic waste. The abandoned site was not remediated and in 1998 a coalition of U.S. and Mexican environmental groups filed a submission with the trilateral Commission for Environmental Cooperation of North America (CEC), which was created as part of the NAFTA process, charging that the Mexican government had failed to enforce its environmental laws. After the CEC published its findings, the Mexican government, with the assistance of the U.S. Environmental Protection Agency through the U.S.-Mexico Border Environmental Program, fully remediated the site by 2008.

In the face of community pressure and increasing Mexican and U.S. oversight, by 2000 many Border maquiladoras had implemented modern environmental management systems and followed required governmental regulations. In 2004 and 2005, for example, a joint California-Baja California government water-testing program revealed that there were few unauthorized discharges of industrial waste into the sewage systems of Ensenada, Tecate, Tijuana, and Mexicali. However, stormwater runoff in Mexican and U.S. Border cities continued to discharge contaminants and solid waste into Border waterways.

Concerned about hazardous materials incidents in the Border region, beginning in 1985 the two federal governments developed contingency plans in all the sister cities for emergency response. Long a component of the U.S.-Mexico Border Environmental Program, emergency response is a significant focus of Border 2025 that includes renewal of joint response plans, training of emergency response personnel, and development of protocols to move equipment and personnel across the Border rapidly.²² An emerging concern is response at the Border to battery fires of the growing number of electric vehicles.

SECTION ELEVEN

SOLID WASTE

Most Mexican Border communities and some U.S. Border communities do not have properly engineered sanitary landfills and effective residential and industrial trash collection as well as systems for sustainable materials management. Accordingly, trash and litter are problems in all Border cities, especially in the poorer areas. Significant amounts of solid waste end up in arroyos and streams and are transported across the Border by storm events. Overburdened landfills and the need to limit greenhouse gas production by organic matter through diversion of organic materials from the waste stream began slowly in U.S. and Mexican Border communities, with perhaps more progress north of the boundary. Mexico's northern Border has also struggled with the huge problem of disposal of scrap tires, many of which were imported as used tires from the United States. EPA and SEMARNAT moved to clean up huge tire piles near Mexican Border cities in the early 2000s, concerned about the potential of fires and major air pollution problems. However federal authorities and U.S. state governments in cooperation with Mexican counterparts have failed to develop a sustainable solution for the problems caused by the transborder sale of used tires.²³

SECTION TWELVE

NATURAL AND OTHER DISASTERS

Natural disasters are a persistent challenge for communities in the Border region and some are exacerbated by the effects of climate change including wildfires, extreme weather events and floods, coastal inundation and flooding, droughts, heat waves, and some infectious diseases. Proximity to the Gulf of Mexico means that this area of the Border is impacted by hurricanes and tropical storms that are accompanied by heavy rainfall and severe flooding.

Earthquakes are a potential threat for parts of the Border, especially in the seismically active San Andreas fault area in the California-Baja California region. Dense populations on both sides of the boundary are vulnerable to a major earthquake, both from human casualties and damage to buildings and infrastructure. The Colorado River supplies for millions of people in northern Baja California. The aqueduct from the Mexicali Valley across the high mountains and the San Andreas fault to the coastal zone of Tecate, Playas de Rosarito, Ensenada, and Tijuana is especially vulnerable to earthquakes. The San Diego region also imports much of its water from the Colorado River as well as from northern California. However, it does have a large desalination plant, significant reservoir storage capacity, and growing reuse programs so it is better prepared to recover from water supply interruption than Tijuana or other Border cities that depend on a single source. Earthquake damage to transmission lines that connect the power grids on both sides of the Border would also threaten Border communities, interrupting water and wastewater services,

among other effects. Other faults on or near other areas of the Border pose rare but serious risks. The Border region governments are not well prepared to respond to a major transboundary environmental emergency as suggested by the lack of binational governmental response during the COVID-19 Pandemic that hit the region early in 2020. Although there are sister city emergency response agreements in place and the United States and Mexico have protocols for national coordination, there are not regular table top nor in-person binational trainings for transborder response.



SECTION NINE

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ABOUT THE AUTHOR

Dr. Paul Ganster is director of the Institute for Regional Studies of the Californias at San Diego State University. In 2022, he was honored with the Ohtli award, the highest recognition granted by the Government of Mexico to individuals who have opened pathways to Mexicans abroad, particularly in the United States of America.

Dr. Ganster is the author of numerous articles, chapters of books, and edited works related to Border regions. Recent publications include The U.S.-Mexican Border Today: Conflict and Cooperation in Historical Perspective (Lanham, MD: Rowman and Littlefield, 2016) and with Kimberly Collins, “Binational Cooperation and Twinning: A View from the US-Mexican Border, San Diego, California, and Tijuana, Baja California” (Journal of Borderlands Studies, 32:4, 2017). His ongoing research is on management of the binational Tijuana River Watershed, air quality at Border crossings, crossborder collaboration, the binational problem of used tires, and sustainable tourism in the peninsula of Baja California. He has been a Fulbright professor in Costa Rica and a visiting professor at the Autonomous University of Baja California in Tijuana. He received his bachelor’s degree from Yale University and his doctorate from the University of California, Los Angeles. Ganster is chair of the Good Neighbor Environmental Board, a federal panel that advises the president and congress on the Border environment. He is also chair of the Committee on Binational Regional Opportunities (COBRO) of the San Diego Association of Governments (SANDAG). In 2016, he was recognized with the Association for Borderlands Studies (ABS) Lifetime Achievement Award. In 2017, the Autonomous University of Baja California awarded him the honorary degree of Doctor Honoris Causa for his scholarly work in the binational region and for his work linking UABC and SDSU. Also in 2017, Tijuana Innovadora recognized him in the induction ceremony to the Paseo de la Fama / Walk of Fame at the Palacio Municipal of Tijuana for his binational leadership.

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SECTION TEN

ENDNOTES

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US • MEXICO
BORDER PHILANTHROPY PARTNERSHIP
ALIANZA FRONTERIZA DE FILANTROPÍA
MÉXICO • EEUU

Phone: +1(619) 814-1388
Fax: +1(619) 814-1389

Email: info@borderpartnership.org
Web: www.borderpartnership.org