



# State of the Border Region



## BORDER 2012: U.S.-MEXICO ENVIRONMENTAL PROGRAM *Indicators Report 2005*



*Note from the National Coordinators and Border Indicators Task Force Co-chairs*

With *State of the Border Region*, we are pleased to provide the first public release of Border 2012 indicators. This report reflects a commitment by the United States and Mexico to develop a set of rigorous, high-quality indicators to increase awareness of border environmental and health conditions and to measure progress toward goals established by the Border 2012 program in 2003. This report represents a great deal of collaborative effort and we thank everyone involved for their dedication to this process. We look forward to continuing this collaboration in the ongoing effort to improve the quality, timeliness, and comprehensiveness of border indicators as an integral component of the shared goal of improving border environmental conditions.

A handwritten signature in black ink that reads "Jerry Clifford".

Jerry Clifford  
National Coordinator, U.S.

A handwritten signature in black ink that reads "M. T. Bandala".

María Teresa Bandala  
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BITF Co-Chair, U.S.

A handwritten signature in black ink that reads "Armando Yañez".

Armando Yañez  
BITF Co-chair, Mexico

## Acknowledgments

We acknowledge the support of all Border 2012 partners that participated in the development of this report. Special acknowledgment goes to Salvador Sanchez, former Border Indicators Task Force Co-chair in Mexico, for his leadership in getting the indicators effort off the ground and to Sandra Duque - Office of Environmental Information, EPA - and Iris Jimenez - Office of Environmental Information and Statistics, SEMARNAT - for facilitating and managing the development of a binational indicators report.

Special acknowledgment also to the Border Indicators Task Force members, EPA and SEMARNAT program and border regional offices, Border 2012 coordinating bodies (Regional Border-wide Workgroups and Policy Fora), the Native American Environmental Protection Coalition, the Pala Band of Mission Indians, Mexico's Ministry of Health (Salud), the U.S. Centers for Disease Control and Prevention, the Pan American Health Organization-Border Field Office, the Southwest Consortium for Environmental Research and Policy, and the U.S. Geological Survey for their assistance in developing this publication.



Street paving with an asphalt and crumb rubber mix,  
Ciudad Juarez



National Coordinators Meeting 2005,  
Baja California

**\*This report is available at the Border 2012 web site:** [www.epa.gov/border2012/](http://www.epa.gov/border2012/) or [www.semarnat.gob.mx/UCAI/frontera2012/](http://www.semarnat.gob.mx/UCAI/frontera2012/).

For more information about this publication or to submit comments to help improve future editions, please contact us.

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Big Bend National Park, Texas



San Antonio Necua indigenous community,  
Baja California



Scrap tire pile, Ciudad Juarez

# Report Overview

## Informing the public

The purpose of the *State of the Border Region* Indicators Report is to inform the border communities and stakeholders about the state of the environment and progress made under the Border 2012: U.S.-Mexico Environmental Program. The six goals of Border 2012 are outlined in the program's Framework Document, signed on April 4, 2003. Thus, where appropriate and feasible, 2003 is used as the baseline year. This report presents available information to aid in understanding the status of the region, identifying data gaps, and better preparing policy makers to address the needs of the communities they serve.

This report incorporates environmental and public health information in the corresponding Border 2012 media and program sections: Water, Air, Land, Emergency Preparedness and Response, and Enforcement and Compliance. The indicator information is presented in an easy to understand format with brief data source information below each indicator. Complete underlying data and details are available on-line.<sup>1</sup>

### Border 2012 Goals

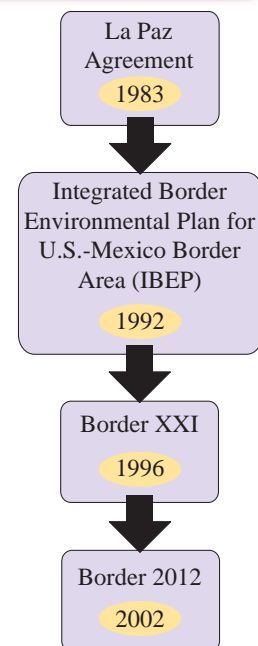
1. Reduce water contamination
2. Reduce air pollution
3. Reduce land contamination
4. Improve environmental health
5. Reduce exposure to chemicals and hazardous substances
6. Improve environmental performance

NOTE: Given the challenges involved in developing indicators for the border region, this initial report presents information on a limited number of indicators, representing specific objectives under each goal. As data comparability improves among the multiple data sources and data availability increases for the region, future reports will continue to improve upon the content and detail of this effort. This report is also intended to complement the information presented in the *Implementation and Mid-Term Report: 2007*.

## Border 2012: a binational effort

Border 2012 is a ten-year cooperative program designed “to protect the environment and public health in the U.S.-Mexico border region, consistent with the principles of sustainable development.” Federal, state, tribal and local institutions and agencies collaboratively work to produce prioritized and sustained actions that consider the needs of the border communities. The actions implemented under Border 2012 are guided through a series of results-oriented goals and objectives, and measured by environmental and performance indicators.

Border 2012 is the latest cooperative initiative implemented under the 1983 La Paz Agreement and builds upon the previous efforts, particularly Border XXI, which marked the first binational attempt to develop environmental indicators.<sup>2</sup> More information about the Border 2012 program is available at the Border 2012 Web site.



<sup>1</sup> Available at the Border 2012 Web site: [www.epa.gov/border2012/](http://www.epa.gov/border2012/)

<sup>2</sup> U.S.-Mexico Environmental Indicators 1997 and a Summary of Selected Environmental Indicators, December 2000.

## Border indicators

In cooperation with the various entities operating under the Border 2012 program, the Border Indicators Task Force (BITF) selects and develops environmental and performance indicators to communicate important information about the border region and to evaluate progress towards meeting Program goals and objectives.

Each of the indicators presented in this report is classified according to the Driving Forces-Pressures-State-Impact-Response (DPSIR) Framework.

DPSIR is based on the idea that Driving Forces such as socioeconomic factors lead to natural or human-induced Pressures, which lead to a State, which generates Impacts (sub-divided into Exposure and Effect) that evoke Responses. The Response compartment feeds back into every other compartment, showing that interventions can occur at each point along the causal spectrum. For more information see the *Strategy for Indicator Development*.

### Definitions

**Indicators** are a single variable or output value from a set of data that describes the state of the border region in a way that is meaningful for stakeholders. More specifically:

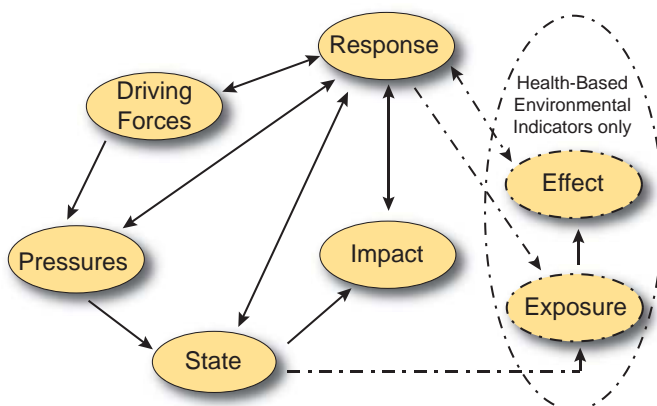
**Environmental indicators** communicate information regarding the region's environmental and health conditions.

**Classification:** Driving Forces, Pressures, State, or Impacts

**Performance indicators** communicate information regarding environmental management activities and targeted response measures.

**Classification:** Response

DPSIR Framework



A representative, integrated set of binational indicators helps to describe the system, increasing understanding of the U.S.-Mexico border region, assisting in highlighting data gaps, and providing a basis on which to make well informed decisions. The BITF aspires to improve and expand upon the 23 indicators presented in this initial report.

## What indicators are included in this initial report?

The report begins by presenting general information about border region characteristics such as population, demographics, language, trade, and biodiversity. This introduction leads to five report sections that present indicators aligned to specific Program goals and objectives (see text box). The report presents binational, border-wide indicators whenever possible. In this regard, the intent of the report is to aid in identifying gaps in order to work towards acquiring more comparable data, thus enabling the development of more meaningful indicators. These indicators together represent the initial set of border indicators that will continue to be refined and expanded over time.

### U.S.- Mexico Border Region

1. Population Projections for the Border Region
2. Native American Population in the U.S. Side of the Border Region
3. Languages Spoken at Home in the U.S. Side of the Border Region
4. U.S. - Mexico Trade

### Water

5. Percentage of Households in the Border Region with Access to Piped Drinking Water Within the House
6. Wastewater Services in the Border Region

### Air

7. Number of Days Exceeding Air Quality Standards in Border Monitoring Areas
8. Ozone Concentrations in the Border Region
9. Particulate Matter (PM<sub>10</sub>) Concentrations in the Border Region
10. Prevalence of Physician Diagnosed Asthma in Calexico/Mexicali

### Land

11. Estimated Abandoned Waste Tire Piles in the Border Region
12. Amount of Pesticide Use in the Border Region
13. Number of Farmworkers Trained in Safe Pesticide Use in the U.S. Side of the Border Region
14. Cumulative Number of Farmworkers Trained in Safe Pesticide Use in the Border Region

### Emergency Preparedness and Response

15. Number of Emergency Incident Notifications in the U.S. Side of the Border Region Received by NRC
16. Number of Emergency Incident Notifications in the Mexican Side of the Border Region Received by COATEA
17. Progression of Signed Sister City Plans

### Enforcement and Compliance

18. Regulated Facilities in the U.S. Side of the Border Region
19. Number of Enforcement Actions in the U.S. Side of the Border Region
20. Inspection Results for Facilities in the Mexican Side of the Border Region
21. Pollution Reduction from Federal Enforcement Actions in the U.S. Side of the Border Region
22. Number of Inspections of Facilities in the Border Region
23. Penalties in Number and Dollar Value in the U.S. Side of the Border Region

Note: Environmental public health indicators are included in the corresponding media section.



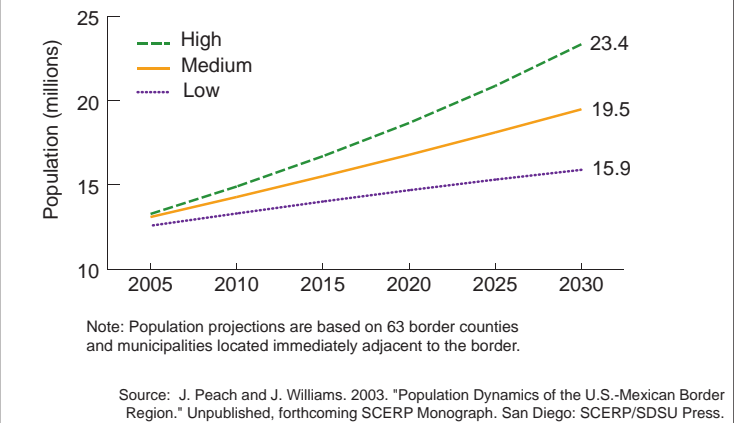


# The U.S.-Mexico Border Region

The U.S.-Mexico border region, as defined by the 1983 La Paz Agreement, is the area within 100 kilometers (about 62.5 miles) on either side of the international border and extends 3,141 km (1,952 miles) from the Gulf of Mexico to the Pacific Ocean. The border region is comprised of 10 states (4 U.S. and 6 Mexican) and 26 U.S. tribes.

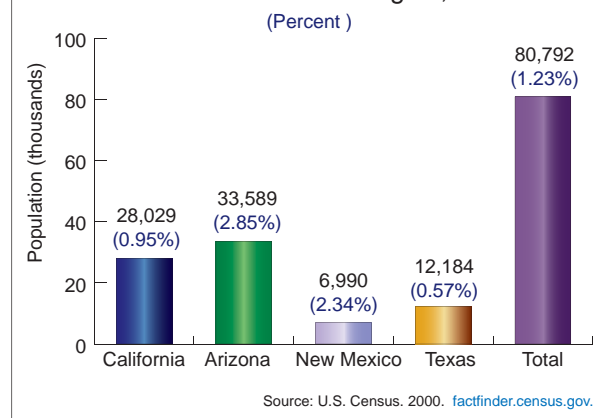
Originally, the cooperative initiatives implemented under the La Paz Agreement recognized 14 paired, inter-dependent “sister cities”. However, the border region now widely recognizes 15. Ninety percent of the border population resides in these sister cities. Population has grown rapidly in the border region to nearly 13 million people in 2005 from 6.9 million in 1980. From 1990 to 2000, the rate of population growth in the border region was over two times that observed for either country nationwide.

Figure 1. Population Projections for the Border Region



The remaining ten percent of the border population resides in rural areas. A major challenge will be providing services to isolated rural populations, colonias (unincorporated communities or settlements in rural areas as well as adjacent to cities and towns), and to tribal and indigenous communities, which may have substandard housing and unsafe drinking water or wastewater systems.

Figure 2. Native American Population in the U.S. Side of the Border Region, 2000



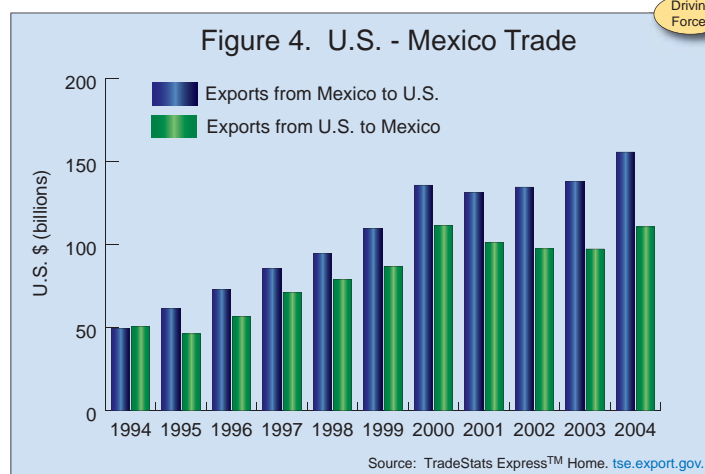
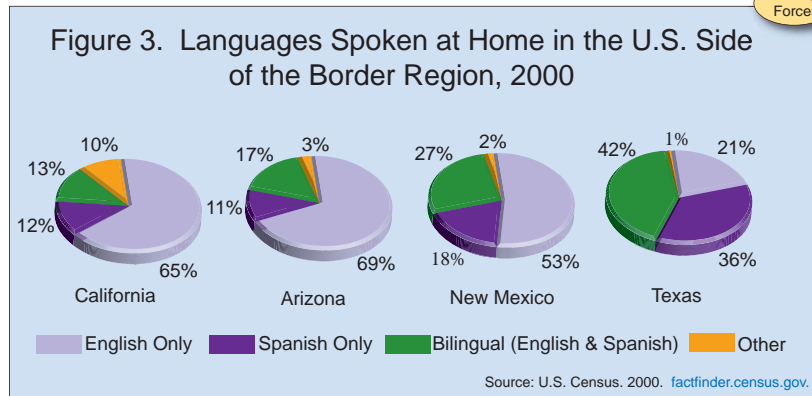
In 2000, Native Americans comprised 1.23% of the total U.S. border region population and were predominantly located in California and Arizona. On the Mexican side of the border region, there are several indigenous peoples, such as Pápagos, Kikapúes, Cochiní, Cucapá, Kiliwa, Kumiai, and Pai Pai, some of which share extensive family and cultural ties to U.S. tribes.



The U.S.-Mexico border region is characterized by many social, economic, and political contrasts between the people who share the natural resources of the area.

Languages spoken at home in the U.S. side of the border region are predominantly English. The exception is Texas where 78% of the border population speaks Spanish and 42.6% of this population is bilingual.

Trade between the U.S. and Mexico has been substantially increasing over the past 10 years. This economic activity is especially associated with the growth of the border industry, which has furthered the exchange of products, leading to increased border truck crossings. Consequently, trade can contribute to elevated vehicular emissions and reduced air quality for residents on both sides of the border.



### Biodiversity in the Border Region

#### Four Primary Types of Habitat

- Sonoran Desert
- California coastal sage & chaparral
- Chihuahuan Desert
- Tamaulipan mezquital

#### 10 Globally Endangered Species

- Blunt-nosed leopard lizard (*Gambelia sila*)
- San Esteban Island mouse (*Peromyscus stephani*)
- Coachella Valley Fringe-toed lizard (*Uma inornata*)
- Marbled murrelet (*Brachyramphus marmoratus*)
- Bryant's woodrat (*Neotoma bryanti*)
- Ashy Stormpetrel (*Oceanodroma homochroa*)
- Mexican long-nosed bat (*Leptonycteris nivalis*)
- Worthen's sparrow (*Spizella wortheni*)
- Coahuilan box turtle (*Terrapene coahuila*)
- Black-spotted newt (*Notophthalmus meridionalis*)

#### Two Critically Endangered Species

- Island gray fox (*Urocyon littoralis*)
- Flat-headed myotis (*Myotis planiceps*)

Source: 2004. IUCN Red List of Threatened Species. [iucnredlist.org](http://iucnredlist.org).

In the border region, increasing trade is also compounded by increasing population, production, and unplanned city expansion, which lead to greater environmental effects. This suggests that many border residents may be subject to unhealthy air, contaminated water, and lack of waste management services.

The U.S.-Mexico border region is also characterized by vast biological diversity, including many rare and locally distinct species. According to the International Union for the Conservation of Nature and Natural Resources (IUCN), four primary types of habitat compose most of the U.S.-Mexico border region. Within these habitats there are 2,143 animal species, of which ten are listed as globally endangered species and two are critically endangered.

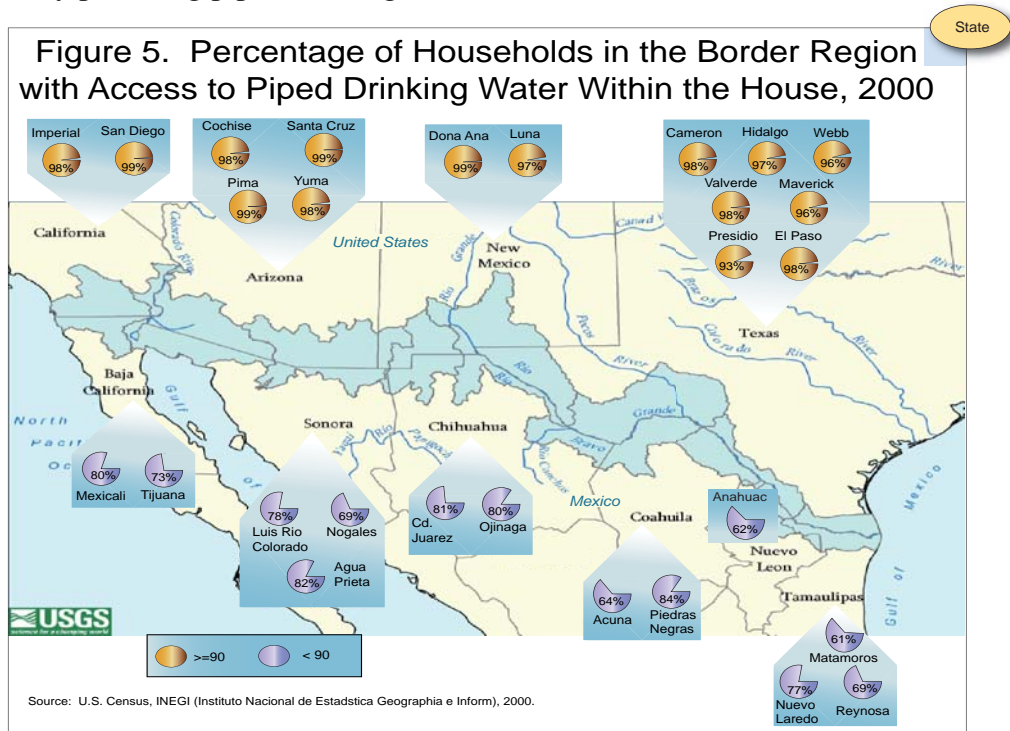


# Water

Population and industrial growth along the border have created large demands for safe drinking water. Water is an extremely limited resource in this primarily arid region, further emphasizing the need to protect it through such means as adequate infrastructure and efficient and responsible use.

## Do border communities have access to safe drinking water?

**Objective 1.1** Water utilities test the drinking water before, during, and as it leaves the treatment plant as well as out in the distribution system to ensure that water reaching the households is safe to drink. In some areas, drinking water is not piped into the house, but is made available at a yard tap on the lot or nearby at a communal watering point. Hauled drinking water, even if supplied by a safe public water system, is susceptible to contamination during transport and storage at the house. Binational efforts in the border region seek to measure and improve access to safe drinking water by providing piped drinking water within the house.



Based on each country's national census, in 2000, the percentage of households with access to piped drinking water within the house was 93% or higher in U.S. border communities. Access in Mexican communities ranged from 61% in Matamoros to 84% in Piedras Negras.

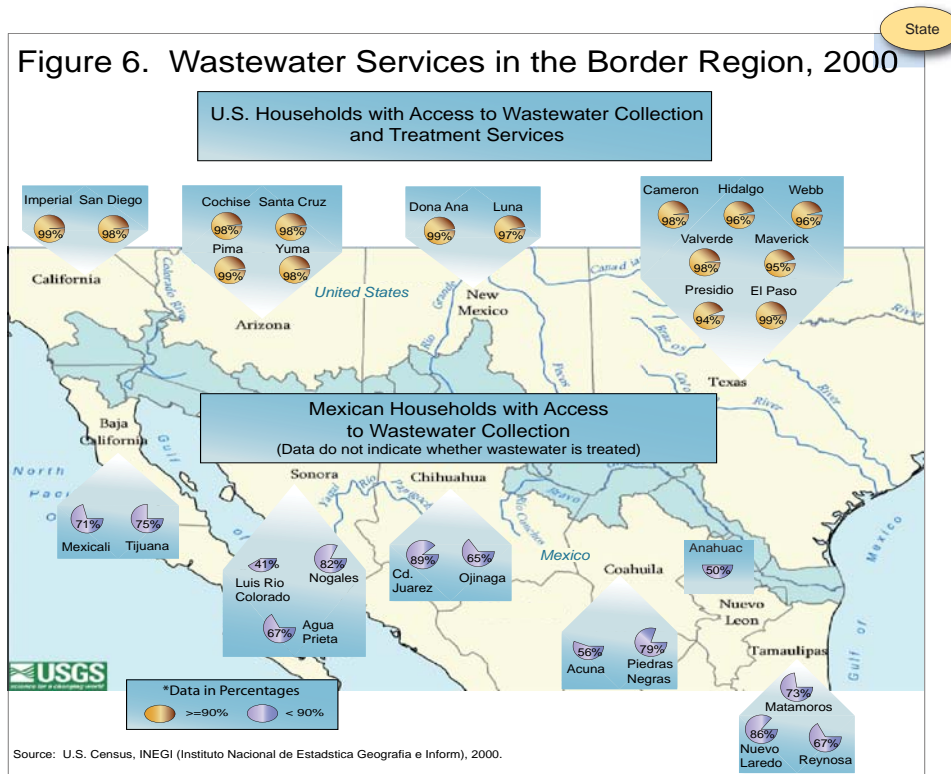
Mexico's National Water Commission (CONAGUA) defines "access" to drinking water as households that obtain drinking water within the house, on their lot, or from a public water intake or hydrant. Using this definition, the percentage of households with access to drinking water in 2000 was 94%. The percentages for the border region of each state were 92% in Baja California, 94% in Sonora, 94% in Chihuahua, 96% in Coahuila, 92% in Nuevo Leon, and 96% in Tamaulipas.

## Do border communities have adequate wastewater collection and treatment services?

### Objective 1.1

Access to adequate wastewater collection and treatment services in the border region is important as it prevents adverse effects to human health from exposure to excreta and the disease-causing microorganisms that it contains. The collection and treatment of wastewater is also significant as it prevents discharge of untreated waters to surface water and groundwater, preventing detrimental effects on human health and the environment.

In 2000, the percentage of U.S. households with access to wastewater collection and treatment services was 94% or higher. In the Mexican side of the border, the census only reports households with access to wastewater collection services and does not indicate whether the wastewater collected is treated. CONAGUA estimates that in 2000 only 38% of all wastewater collected received treatment.<sup>3</sup>



CONAGUA defines wastewater collection service as the percentage of people in houses connected to the public wastewater network or a septic tank. Using this definition, 82% of the population had wastewater collection service. The percentages for the border region of each state were 80% in Baja California, 84% in Sonora, 88% in Chihuahua, 76% in Coahuila, 75% in Nuevo Leon, and 79% in Tamaulipas. These percentages do not reflect how much of the wastewater collected is actually treated.

For more information on binational water infrastructure projects see [www.nadb.org/projects/projportfolio.html](http://www.nadb.org/projects/projportfolio.html).

<sup>3</sup> CONAGUA, 2000. "Estrategias de Gran Visión para el Abastecimiento y Manejo del Agua en Ciudades y Cuencas de la Frontera Norte en el Periodo 1999 - 2025"



## Are there health problems possibly associated with water quality?

**Objective 4.2** Many health problems are associated with poor water quality and insufficient quantity. While many diseases are caused by direct ingestion of contaminated water, they can also be spread through inadequate hygiene and the contamination of food. The idea of multiple exposures was recognized in the Commission for Environmental Cooperation's 2006 report on Children's Health, which expressed the need for better surveillance and tracking systems to be able to distinguish between diseases related to water-based exposures and to those caused by food exposures.

The U.S. Centers for Disease Control and Prevention (CDC) report that some of the more common diseases that can be spread through contaminated water are cryptosporidiosis, *Escherichia coli* infection, giardiasis, viral Hepatitis A, cholera, shigellosis, salmonellosis, and typhoid fever.<sup>4</sup> A range of syndromes, including acute dehydrating diarrhea and prolonged febrile illness with abdominal symptoms, are associated with these diseases. The CDC reports that significant decreases over the last decade in the incidence of cholera and giardia among children in Mexico may be attributed to advances in the availability of wastewater infrastructure and pre-treatment of drinking water.<sup>5</sup>

However, in the U.S.-Mexico border region there are limitations and differences between definitions and reporting requirements, as well as timely access to the data. Additionally, the available data may not accurately represent the level of disease in the border region population due to differing behavioral patterns of seeking medical care when sick. For these reasons, the indicator on waterborne diseases is still being developed.

Recognizing that contaminated drinking water sources and recreational waters present significant health risks to the public, EPA and SEMARNAT continue to work towards increasing the collection and treatment of wastewater and providing access to safe drinking water to all border residents.

For more information on Environmental Health see [www.epa.gov/ehwg/projects\\_publications.html](http://www.epa.gov/ehwg/projects_publications.html) or contact your state's department of health.

### Increasing Water Health Awareness

In addition to improvements in infrastructure, health education can be an effective tool to improving infectious diseases. In the US-Mexico border region, the "Agua para beber" project focuses on safe hygiene, water purification, and storage practices as means of solving and avoiding drinking water-related health problems. *Promotoras* also distribute low-cost, 5-gallon, drinking water containers and bilingual educational materials.

For more information:

[www.migrantclinician.org/\\_resources/safe\\_drinking.pdf](http://www.migrantclinician.org/_resources/safe_drinking.pdf)

<sup>4</sup> CDC, "Preventing Bacterial Waterborne Diseases" [www.cdc.gov/ncidod/dbmd/diseaseinfo/waterbornediseases\\_t.htm](http://www.cdc.gov/ncidod/dbmd/diseaseinfo/waterbornediseases_t.htm).

<sup>5</sup> Doyle TJ, Bryan RT. Infectious disease morbidity in the U.S. region bordering Mexico, 1990-1998. *J. Infect Dis.* 2000; 182: 1503-10.

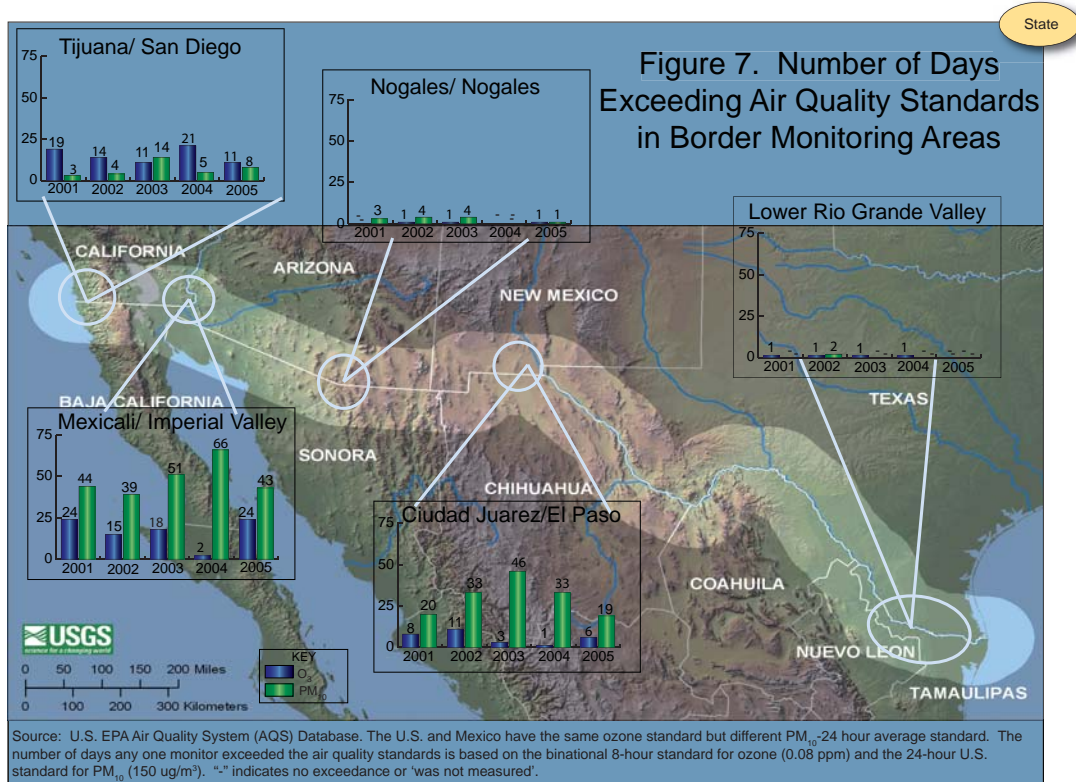


# Air

Air quality is a major concern throughout the border region. Pollutants from a number of sources including motor vehicles, power plants and industrial facilities, agricultural operations, dust from unpaved roads, and open burning of trash affect urban and regional air quality in the border region.

## What is the quality of the air?

**Objective 2.1** Air quality standards are set to protect people from potential harmful exposures to air pollutants. The quality of the air can be inferred by the number of days that a standard is exceeded within a monitored area. Data are presented for five regional monitoring areas with monitors located on both sides of the border. The most persistent and pervasive pollutants found in the sister cities are ozone and particulate matter (PM<sub>10</sub>), which is why these are highlighted.



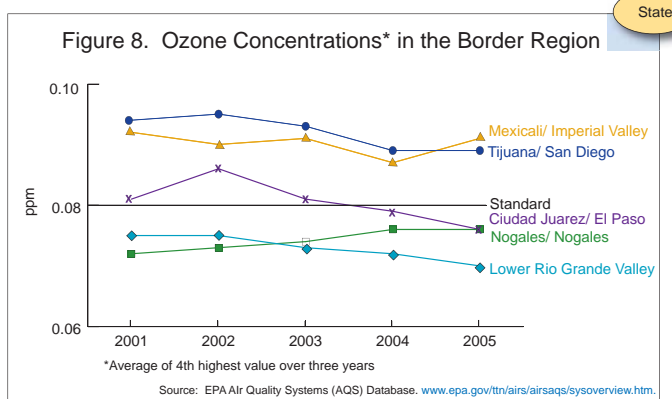
Based on the analysis of the number of days exceeding the ozone and PM<sub>10</sub> standards, air quality varies geographically. The regions of Tijuana/San Diego and Mexicali/Imperial Valley had the highest number of days exceeding the ozone standard. The regions of Mexicali/Imperial Valley and Ciudad Juarez/El Paso had the highest number of days exceeding the PM<sub>10</sub> standard. In contrast, Nogales/Nogales and the Lower Rio Grande Valley had better air quality with only a few days where standards were exceeded over a five year period.



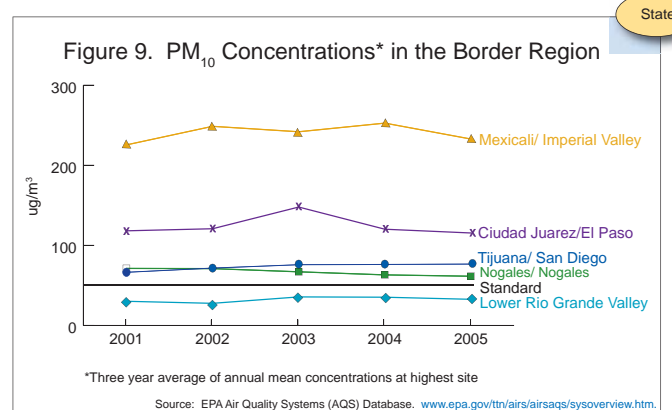
## What is in the air?

### Objective 2.1

Pollutants that are released into the air from emission sources may stay in the environment for hours or even years, in a stable form or transformed into other compounds. They can remain near the point of release, move long distances by wind, or transfer to other environmental media, resulting in soil or water pollution. The amount of pollutants emitted, pollutant properties, and atmospheric conditions influence pollutant levels and distribution in the atmosphere, which are typically measured as concentrations.



From 2001 to 2005, ozone concentrations remained above the binational standard of 0.08 ppm in Mexicali/Imperial Valley and Tijuana/San Diego. The Ciudad Juarez/El Paso air shed improved, decreasing below the standard as of 2004. Ozone concentrations were lower than the standard in Nogales/Nogales and in the Lower Rio Grande Valley.



During the same time frame, PM<sub>10</sub> concentrations were lower than the binational standard of 50 µg/m<sup>3</sup> in the Lower Rio Grande Valley. Concentrations in the other four monitoring areas exceeded the standard with the highest concentrations observed in the Mexicali/Imperial Valley.

### Selected Air Quality Pollutants

#### Ozone (O<sub>3</sub>)

Ozone is a photochemical oxidant and the major component of smog formed through complex chemical reactions between precursor emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO<sub>x</sub>) in the presence of sunlight. These pollutants are emitted by transportation and industrial sources. O<sub>3</sub> is reactive and damages lung tissue, reduces lung function, and increases sensitivity to other irritants.

**8 Hour Average Standard = 0.08 ppm (U.S. and Mexico)**

#### Particulate Matter (PM)

Particulate matter (PM) with an aerodynamic diameter of 10 microns or less (PM<sub>10</sub>) consists of ground geologic material entrained into the air by agricultural processes, unpaved roadways, and quarry and cement manufacturing. Fine PM (diameter of 2.5 microns or less) or PM<sub>2.5</sub> consists of sulfates, nitrates, other gases, soot and finer ground geologic materials. Exposure to PM is a major human health concern including effects on breathing, aggravation of respiratory and cardiovascular disease and premature death.

**Annual Standard = 50 µg/m<sup>3</sup> (U.S. and Mexico)**  
**24-Hour Average Standard = 150 µg/m<sup>3</sup> (U.S.) and 120 µg/m<sup>3</sup> (Mexico)**

For more information on U.S.-Mexico Air Quality and other air pollutants see [www.epa.gov/ttn/catc/cica/airq\\_e.html](http://www.epa.gov/ttn/catc/cica/airq_e.html).

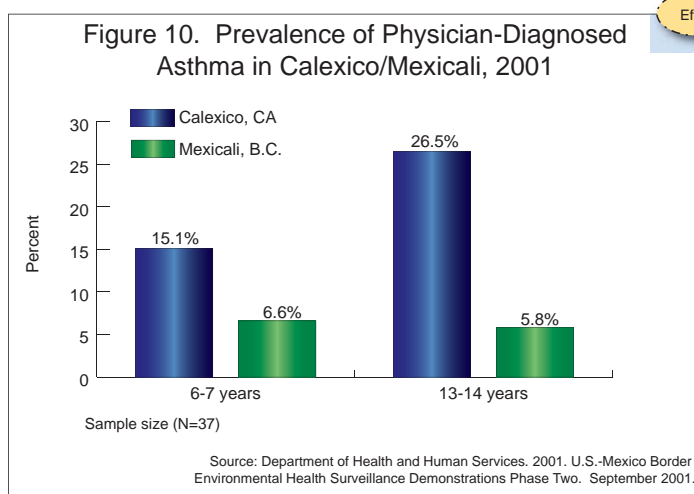
## Are there health problems possibly associated with air quality?

Objective 4.1

While air quality standards provide a platform to understand current air quality conditions, it is important to understand the impacts of air pollution on human health. Long-term exposure to elevated air pollution is associated with diminished lung function and cardiovascular disease. Vulnerable groups (children, the sick, and the elderly) are more likely to suffer ill effects. A number of epidemiologic studies have linked changes in air pollutant concentrations with increased risk of pneumonia, respiratory infections, and exacerbation of asthma. For example, evidence indicates that exposure to vehicle emissions aggravates or triggers asthmatic symptoms and airway reactivity. Asthma is a complex disease and multiple factors are implicated in the development and exacerbation of this disease. Thus, at this time it is not possible to directly relate air pollution to the onset of asthma.

Despite an abundance of information regarding asthma prevalence, data are not reported in a standardized format. Reporting mechanisms and disease definitions vary considerably between border states and countries, limiting the ability to make comparisons.

The data shown in this graph represent a small sample study of school aged children to assess the prevalence of asthma diagnosis within one sister city pair. However, asthma may result from a combination of air quality and other contributing factors.



For more information on U.S.-Mexico air quality see [www.epa.gov/usmexicoborder/org.htm#air](http://www.epa.gov/usmexicoborder/org.htm#air) and for Environmental Health information see [www.epa.gov/ehwg/projects\\_publications.html](http://www.epa.gov/ehwg/projects_publications.html).

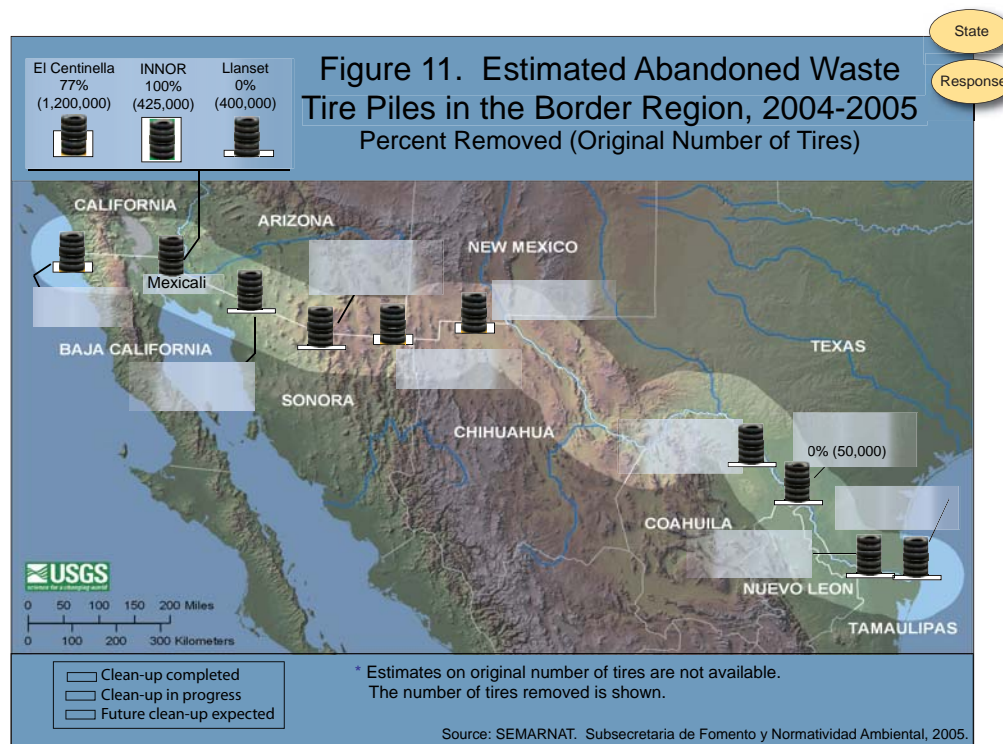


# Land

Land absorbs contaminants from the air, water, and human/industrial activities that can alter the condition of the land. For instance, land is affected by construction, transport, agriculture and pesticide use, housing, and unplanned development. Pressing concerns of the Border 2012 program are the presence of tire piles and the use of pesticides along the border region, for they pose both environmental and health problems.

## Are the waste tire piles being cleaned up?

**Objective 3.3** Throughout the border region, millions of scrap tires have accumulated in several waste tire piles. Composed of tires from both Mexico and the U.S., the piles tend to result from a robust market for partially used tires. The exact number of tires at some locations is difficult to estimate. Border 2012 is developing a *U.S.-Mexico Border Scrap Tire Integrated Management Initiative* to manage scrap tires within a sustainable development vision. The Program is focusing on clean-up at three of the largest piles in Mexico (INNOR, El Centinela, and Ciudad Juárez) as their relative size and proximity to more densely populated areas increases the risks to human health and the environment.



Tire piles create ideal breeding grounds for mosquitoes, rodents, and other vectors of disease, which leads to a potential increase in the incidence of malaria, dengue fever, and encephalitis diseases such as West Nile Virus. Further, tire pile fires are difficult to extinguish and can burn for months, emitting noxious fumes and generating liquid wastes that contaminate soil, groundwater, and surface water.

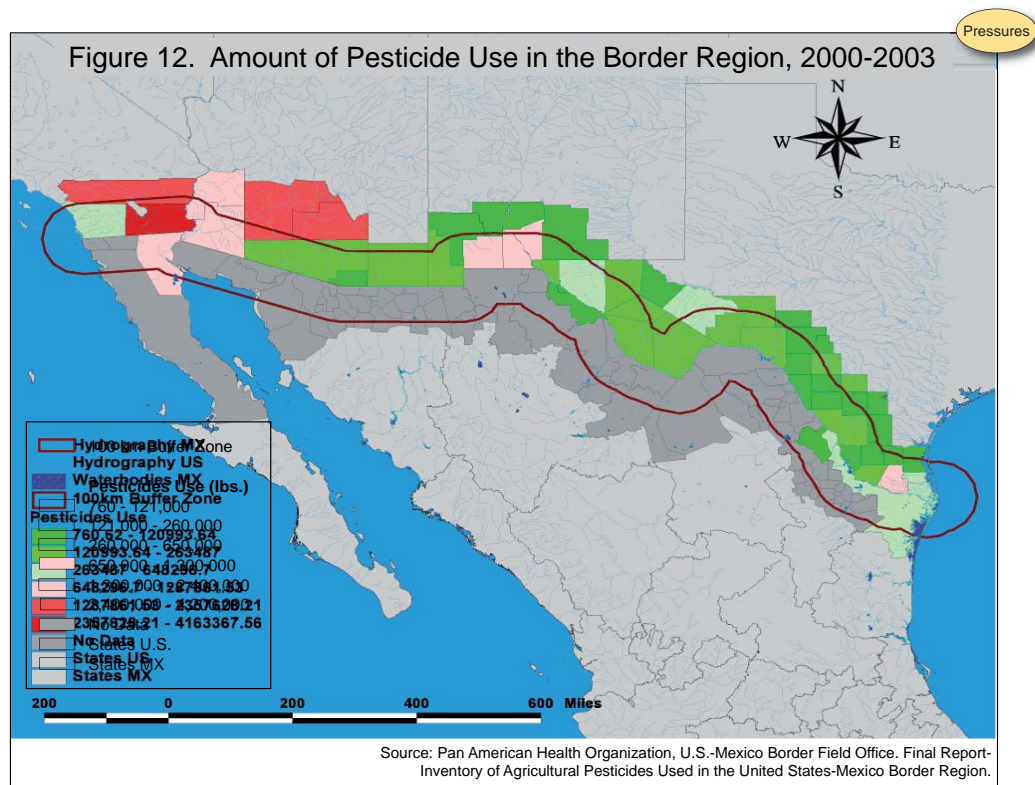


Through the combined efforts of EPA, SEMARNAT, regional waste task forces, affected states, and tribes, tire piles are being cleaned up. As of December 2005, over two million tires had been removed from the border region. This includes the complete clean-up of the INNOR tire pile, resulting in the removal of 425,000 tires. In addition to focusing on the largest tire piles, clean-up efforts are also ongoing at several smaller sites. For example, the Pala Band of Mission Indians, with assistance from the California Integrated Waste Management Board, removed 34,000 tires from their reservation. Removed tires are being put to productive uses as part of Border 2012's commitment to recycling and reuse. They are used in cement kilns as fuel, in asphalt as crumb rubber, and in erosion control embankments in bales, among other creative uses.

## Are farm workers trained on pesticide safety?

Objective 4.3

Communities along the border are confronted with a host of environmental problems, including pollution from agricultural activities. Border residents may suffer health problems related to environmental factors including the improper management of toxics, hazardous and solid wastes, and pesticides.



This map appears to show significant variation in the amount of pesticides used in the border region. However, it may not be completely representative of the situation, as data were difficult to collect and often lacking due to reporting practices. For example, data were often lacking for Texas and Mexican states.

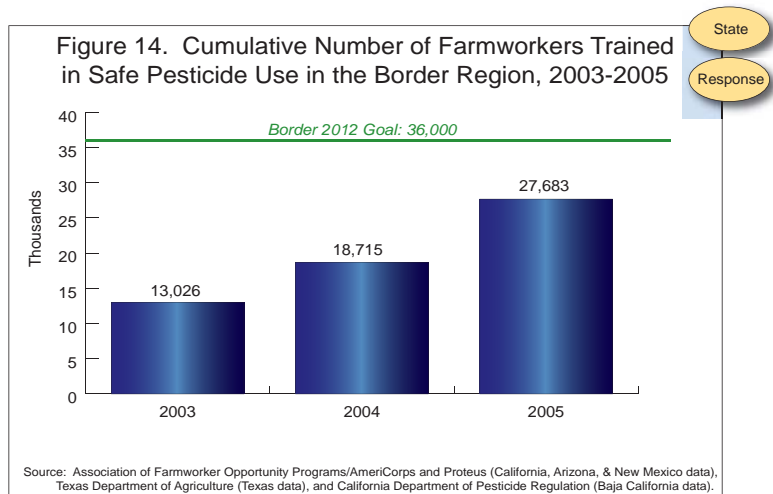
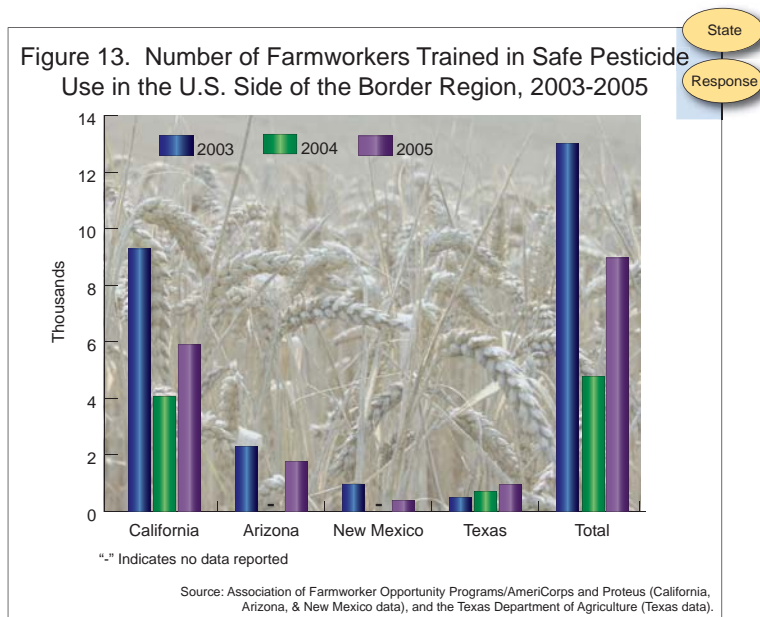


Pesticide exposure can cause a variety of occupational illnesses in farm workers, including eye injuries, cancer, respiratory illnesses, and dermatitis. Proper training in pesticide handling and use results in the protection of workers and their families from potential exposures and adverse health effects.

Both the U.S. and Mexico have instituted various programs to train workers and instructors in the safe handling of pesticides. In the U.S. side of the border region, 26,760 farm workers were trained from 2003 to 2005 with the majority in California. Data are based on attendance at training sessions in several border cities.

In Mexico, the *Programa Nacional Contra Los Riesgos por el Uso De Plaguicidas* conducts training courses throughout the country. In 2004, courses were provided in Ensenada and Mexicali, training a total of 850 workers and 73 trainers (600 workers and 38 trainers in Ensenada and 250 workers and 35 trainers in Mexicali). The persons attending these training sessions include field workers, growers, and handlers, pest control advisors, employees of pesticide distributors, and members of the public.

Since 2003, a total of 27,683 farmworkers were trained in the U.S.-Mexico border region. As the Border 2012 goal is to train 36,000 farmers, this sum represents 76.9% of the goal.



For more information on the Waste Policy Forum see [epa.gov/border2012/org.htm#forums](http://epa.gov/border2012/org.htm#forums).

# Emergency Preparedness and Response

Preparing for a possible environmental or hazardous emergency improves the probability of adequately responding to incidents and protecting the environment and public from exposure to harmful contaminants and serious environmental or health impacts.

The U.S.-Mexico Joint Response Team (JRT), established by the La Paz Agreement, is composed of representatives from U.S. and Mexico federal, state and local agencies responsible for emergency prevention, preparedness, and response in the border region. The JRT developed a Joint Contingency Plan (JCP) that established a federal mechanism for cooperation for responding effectively to polluting incidents that may pose a significant threat to both countries or affect one to an extent that justifies a request for assistance. The first JCP was issued in 1988, revised in 1999, and is currently being updated.

## Is there an advisory communication mechanism for the border region?

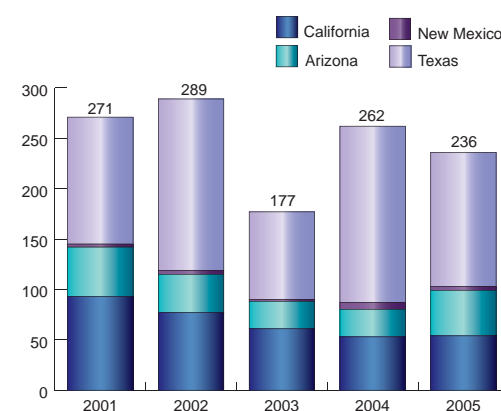
Objective 5.1

A notification system was established as part of the JCP. Any actual or threatened incident involving releases of contaminants from non-mobile machinery, refineries, manufacturing plants, and other fixed facilities that has the potential to affect the other country is reported.

Notifications are received by the National Response Center (NRC) in the U.S. and the National Communications Center (CENACOM) in Mexico. Both centers run 24 hours a day, 7 days a week. In Mexico, the Center for Environmental Emergencies (COATEA), of the Federal Attorney General for Environmental Protection (PROFEPA) also receives notifications and runs from 9-6 pm Monday-Friday. In the near future, COATEA will also be operating 24 hours a day.

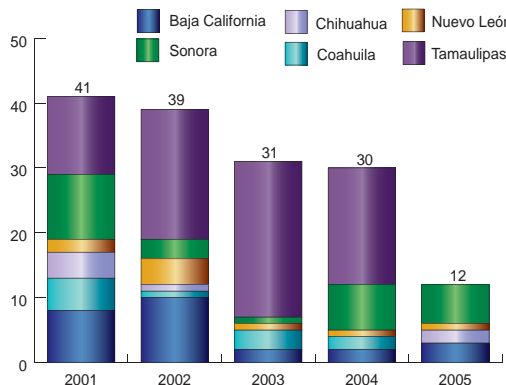
Upon receipt, notifications are responded to in an appropriate manner through the execution of local response plans (Sister City Plans) and the U.S.-Mexico Joint Contingency Plan.

Figure 15. Number of Incident Notifications in the U.S. Side of the Border Region Received by NRC



Source: National Response Center. [www.nrc.uscg.mil/nrchp.html](http://www.nrc.uscg.mil/nrchp.html). May 2006.

Figure 16. Number of Incident Notifications in the Mexican Side of the Border Region Received by COATEA



Source: Centro de Orientación para la Atención de Emergencias Ambientales. PROFEPA, 2005. Notifications received by CENACOM are unavailable.



## Do border cities have an emergency response plan?

**Objective 5.2** The JCP recognizes that all hazardous materials incidents and/or emergencies affect the local community first, and thus, provides the foundation for establishing Sister City Binational Emergency Response Plans (SCP). Fourteen sister city pairs were originally identified by the JCP along the U.S.-Mexico border. At a later date an additional sister city pair was added for Rio Bravo/Weslaco.

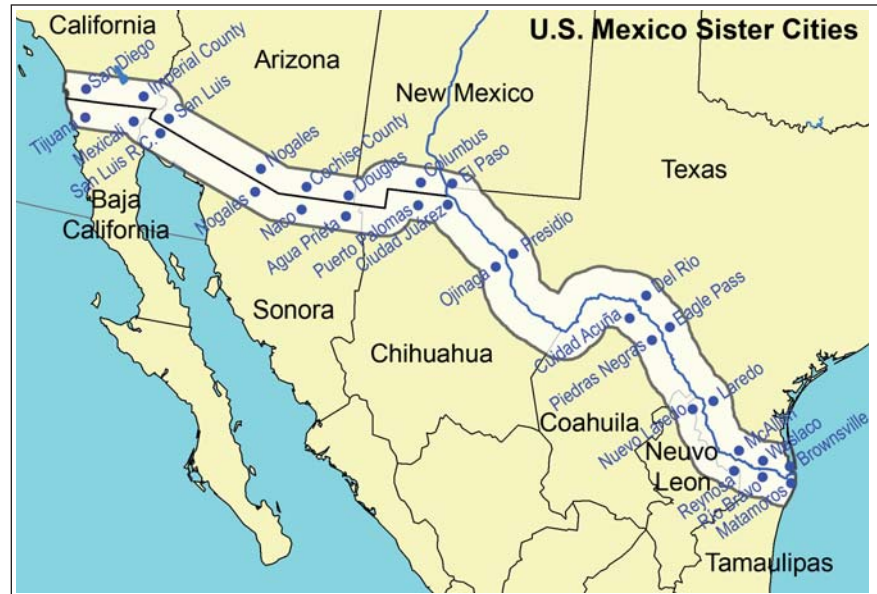
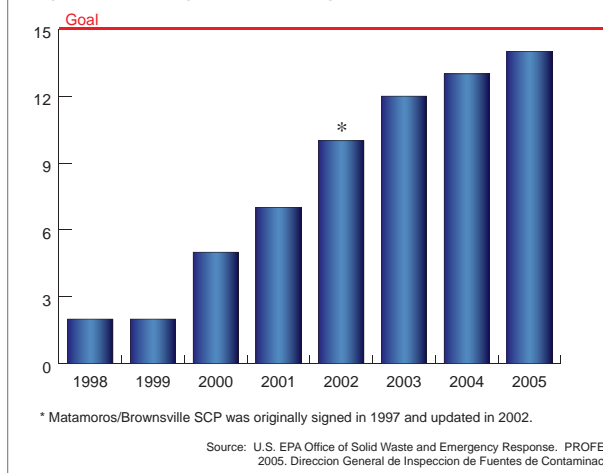


Figure 17. Progression of Signed Sister City Plans



Response

The plans provide local emergency response teams with a mechanism for addressing issues and concerns, consisting of cooperative measures and recommendations, including emergency response planning, exercises, and training. Considerable progress has been made since 1998 in establishing the SCPs. Two plans were signed in 1998 and by 2005, 14 plans were in place. Ciudad Juarez/El Paso is currently pending. Adding Rio Bravo/Weslaco increased the Border 2012 goal to 15.

To ensure that both the Joint Contingency Plan and the 15 Sister City Plans are up to date and can be implemented during emergencies, binational exercises are conducted by federal, state and local agencies. The most likely scenarios are developed and the agencies in charge simulate a response, either in the field or indoors (table top exercise). Also, phone advisory tests verify that all required parties receive adequate notice. Results are used to prepare reports, which set the stage for JCP and SCP revisions. Since 2001, Mexico and the U.S. conducted 12 binational emergency exercises. “*Amigos in Peligro*,” a 2005 binational exercise, is described at [www.epaosc.net/operacionaguila](http://www.epaosc.net/operacionaguila).

For more information on Emergency Preparedness and Response see [www.epa.gov/border2012/epr\\_bwvg.htm](http://www.epa.gov/border2012/epr_bwvg.htm) and [yosemite.epa.gov/oswer/ceppoweb.nsf/content/ip-bilateral.htm#mexicoborder](http://yosemite.epa.gov/oswer/ceppoweb.nsf/content/ip-bilateral.htm#mexicoborder).



# Enforcement and Compliance

Environmental laws exist on both sides of the border to regulate issues such as chemical production, pollutant discharge to air and water, and the generation, transportation, storage, and treatment of hazardous wastes. These environmental regulations are complex, but have a simple aim of protecting human health and the environment. On both sides of the border these laws and their implementing regulations are enforced by federal governments, with much authority delegated to states and in some cases to counties and municipalities.

## How many facilities are in my community?

**Objective 6.2** There are at least 19,000 regulated facilities in the U.S.-Mexico border region with an estimated number of 8,689 facilities in the U.S.<sup>6</sup> and 11,059 facilities in Mexico.<sup>7</sup> As shown geographically, most facilities in the U.S. are located near cities with the highest number near San Diego followed by El Paso. Data indicate that 49% of the facilities are located in the California border region followed by Texas (31.2%), Arizona (15.4%), and New Mexico (4.1%).<sup>6</sup> The majority of the facilities in both the U.S. and Mexico are regulated for handling hazardous waste.



Facilities in the U.S. are regulated through permits issued under various statutes and statutory programs: the Clean Air Act or Clean Water Act for possible impacts to air and water; the Resource, Conservation, and Recovery Act for the generation, storage, treatment, or disposal of hazardous waste; and/or the Toxic Release Inventory for the reporting of pollutant releases.

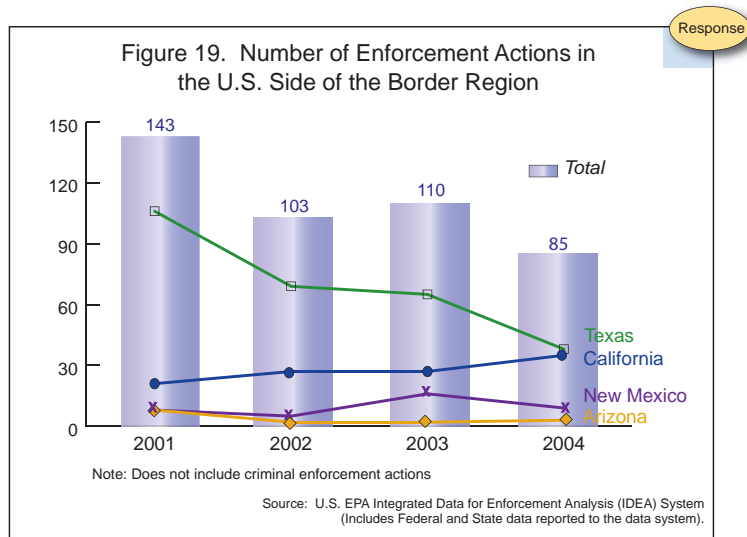
<sup>6</sup> .S. EPA IDEA System, 2005.

<sup>7</sup> PROFEPA, 2005.

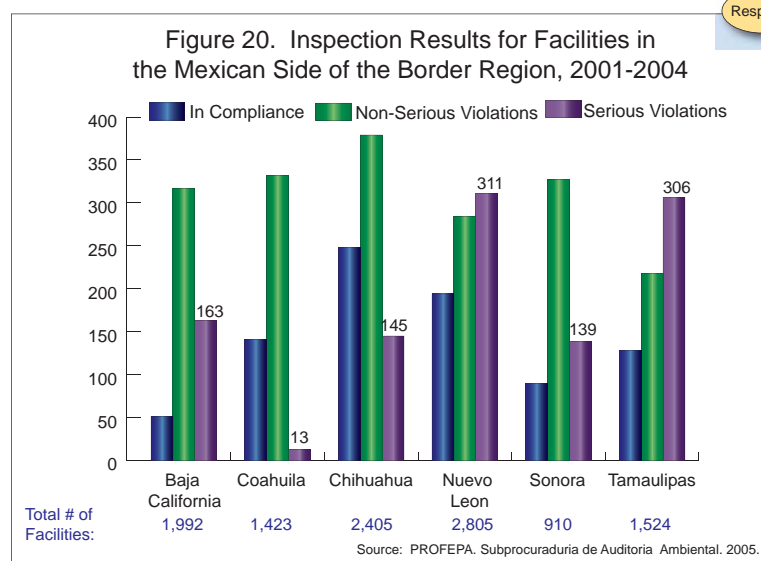


## What happens when a facility violates environmental law?

**Objective 6.3** When a facility violates environmental law, the regulating agency may impose actions to enforce compliance and may also impose monetary penalties and/or criminal sanctions. Enforcement actions cannot be imposed unless a violation has occurred and has been detected by the regulatory agency. There is, however, not always a clear connection between a facility polluting the environment and compliance with the law, as facilities may legally pollute under the conditions of a permit and violations may not always result in releases.

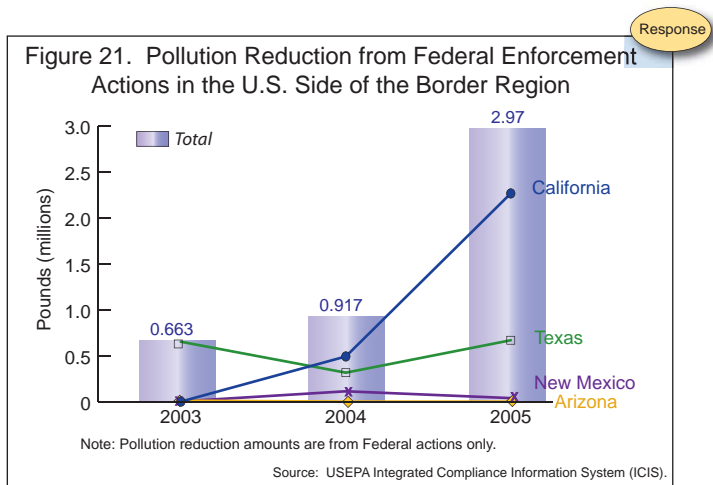


Formal enforcement actions in the U.S. may be administrative, civil judicial, or criminal actions. In aggregate, the number of formal enforcement actions in the U.S. side of the border region has decreased from 2001 to 2004, with differences within individual border states. When examining trends over time and differences among states, it is important to consider factors such as: federal, state, and local environmental priorities; the number and type of facilities operating in each state; and other environmental management activities not reflected in this indicator such as compliance assistance and informal enforcement actions (e.g. notices of violations).

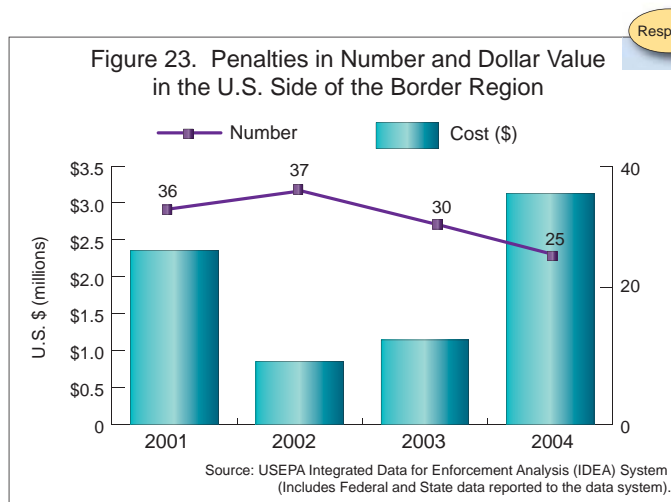
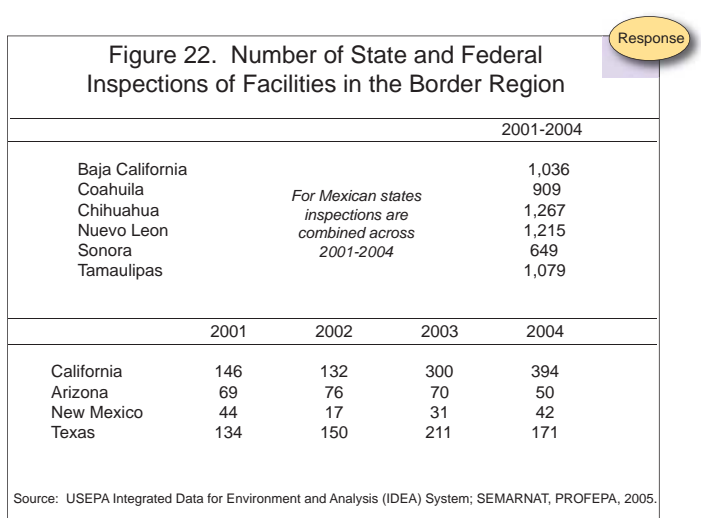


In Mexico, inspection and monitoring for industrial and service establishments under federal jurisdiction is conducted through an Annual Environmental Program of Inspection. Inspections result in the classification of facilities to be in compliance or not in compliance. This may result in a determination of non-serious or serious violations, which may lead to temporary, partial, or total closure of facilities.

In order to enforce environmental laws and protect human health and the environment, regulatory agencies may take actions that compel facilities to implement pollution reduction activities. The resulting amount of pollution reduction depends upon the type of violation and the remedy achieved, and may not correlate with the number of enforcement actions taken.



Regulatory agencies may conduct inspections to verify a facility's compliance status. In addition, facilities may conduct their own audits to ensure environmental compliance and to improve pollution prevention. Due to the different regulatory policies and legal systems between the U.S. and Mexican governments, the information on enforcement actions, compliance, pollution reduction, inspections, and penalties as presented cannot be directly compared.



Penalties are monetary assessments paid by a regulated entity in response to a violation or noncompliance. Penalties act as deterrence to violating the law, and an incentive for staying in compliance with the environmental statutes and regulations. Penalties are designed to recover the economic benefit of noncompliance as well as account for the seriousness of the violation. Note that not all enforcement actions require a penalty; other remedies may be specified.

For more information on the Enforcement and Compliance Borderwide Workgroup see [www.epa.gov/usmexicoborder/org.htm#borderwide](http://www.epa.gov/usmexicoborder/org.htm#borderwide).



# About the Border Indicator Development Process

This first binational indicators report developed under the Border 2012 program represents an initial effort to provide important information about the region. The report marks the completion of the first quarter of the Program, 2003 to 2005. It presents an initial set of indicators, identified after a comprehensive review of potential indicators and consensus building. For more information about the border indicator selection and development process up to date, please visit [www.epa.gov/border2012/indicators.htm](http://www.epa.gov/border2012/indicators.htm).

## Future Direction

Production of a subsequent, more comprehensive indicator report covering up to the Program's mid-term (2003 to 2007) is anticipated for release in 2008. This next report will provide a more complete view of the environmental and public health conditions of the border region and progress made towards meeting Program goals and objectives. Work towards the next report as well as other future reports will result in an improved and expanded binational indicator set. In order to accomplish this, BITF's goal is to further refine the existing indicators and continue to identify and develop optimal, quality indicators while increasing transparency and seeking harmonization across the various entities.

Broad public participation and representation are essential for developing and reporting indicators that are relevant and beneficial to border communities. Stakeholder input was instrumental in the development of this initial report, and the Border Indicators Task Force will continue to count on stakeholder involvement. However, more awareness and participation are needed as there are many data gaps and research needs for ongoing development of binational indicators. Through the Program's outreach efforts, Border 2012 will build relationships with and invite citizens, governmental and non-governmental entities, tribes, academia, the private sector, and others to be partners in this indicators initiative. Data from all these sources are vital to building a sustainable long-term effort that effectively measures and reports on the environmental and public health conditions of the U.S.- Mexico border region.

Future indicator reports will continue to be available in both electronic and print formats to provide stakeholders with broader access to U.S.-Mexico border information. Supporting documentation will be available at the Web page listed above.