

United States–Mexican Borderlands

... facing tomorrow's challenges through USGS science



U.S. Department of the Interior
U.S. Geological Survey

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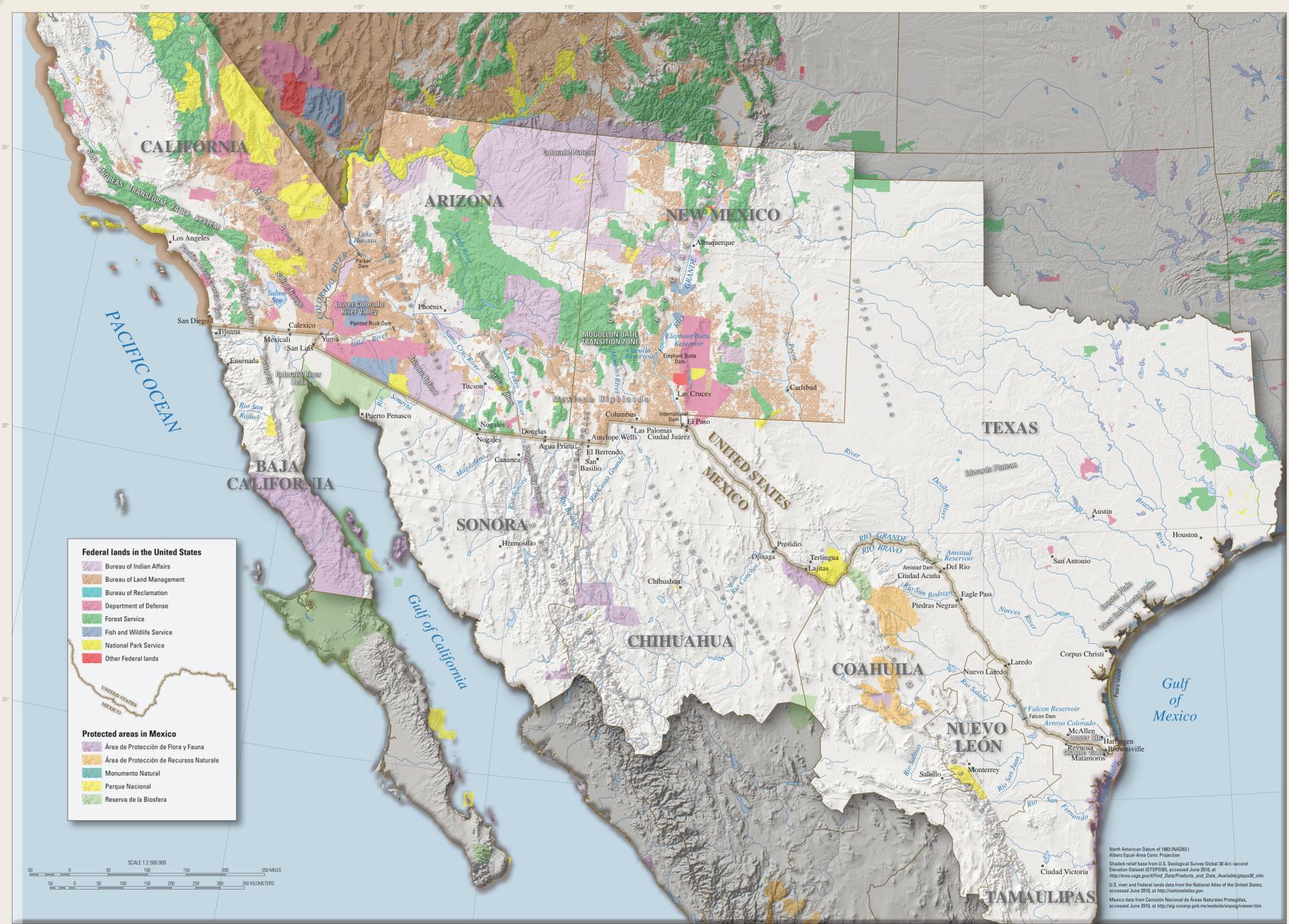
Poster to accompany Circular 1380

Along the nearly 3,200 kilometers (almost 2,000 miles) of the United States–Mexican border, in an area known as the Borderlands, we are witnessing the expression of the challenges of the 21st century. This circular identifies several challenge themes and issues associated with life and the environment in the Borderlands, listed below. The challenges are not one-sided; they do not originate in one country only to become problems for the other. The issues and concerns of each challenge theme flow in both directions across the border, and both nations feel their effects throughout the Borderlands and beyond. The clear message is that our two nations, the United States and Mexico, face the issues in these challenge themes together, and the U.S. Geological Survey (USGS) understands it must work with its counterparts, partners, and customers in both countries.

Though the mission of the USGS is not to serve as land manager, law enforcer, or code regulator, its innovation and creativity and the scientific and technical depth of its capabilities can be directly applied to monitoring the conditions of the landscape. The ability of USGS scientists to critically analyze the monitored data in search of signals and trends, whether they lead to negative or positive results, allows us to reach significant conclusions—from providing factual conclusions to decisionmakers, to estimating how much of a natural resource exists in a particular locale, to predicting how a natural hazard phenomenon will unfold, to forecasting on a scale from hours to millennia how ecosystems will behave.

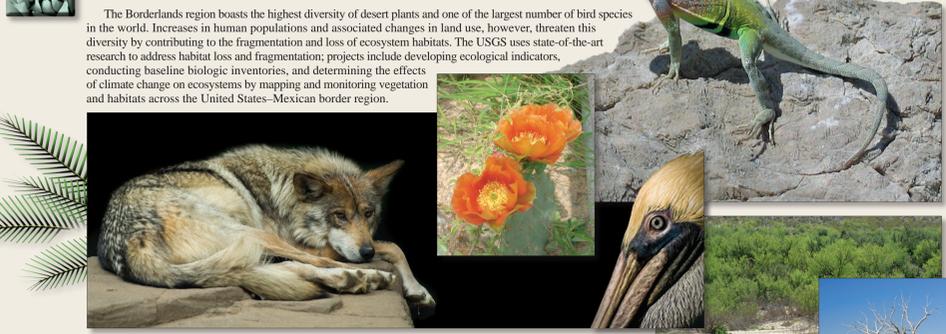
None of these challenge themes can be addressed strictly by one or two science disciplines; all require well-integrated, cross-discipline thinking, data collection, and analyses. The multidisciplinary science themes that have become the focus of the USGS mission parallel the major challenges in the border region between Mexico and the United States. Because of this multidisciplinary approach, the USGS possesses a unique set of capabilities that can address these challenges. The USGS can apply geographical, geospatial, biological, hydrological, and geological sciences to these complex issues and thereby provide insight into the area's natural systems and their relation to human activity.

As we come to better understand the complexities of the components of these challenge themes, we discover that each part is inextricably intertwined with other overarching issues. Because of the complex interactions of the human, ecological, political, and economic exigencies associated with this area, the status of the Borderlands has become an ever-present concern for most American citizens and for Mexican and United States Federal, State, and local governments. This circular is intended to provide you—citizen, local decisionmaker, government leader, or private entrepreneur—an overview of what the USGS considers the current and future challenges in the United States–Mexican border region and examples of how the USGS can make a difference in understanding and addressing these issues.



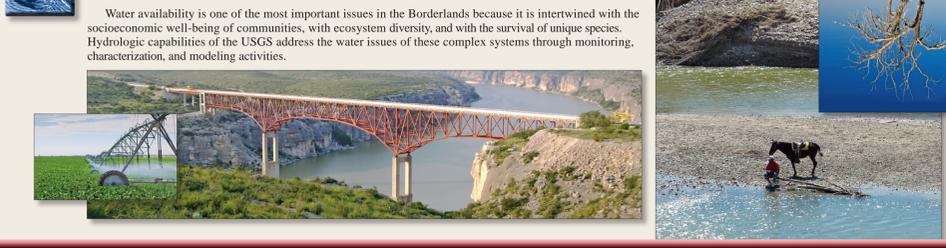
borderlands challenge themes

Ecological Resources



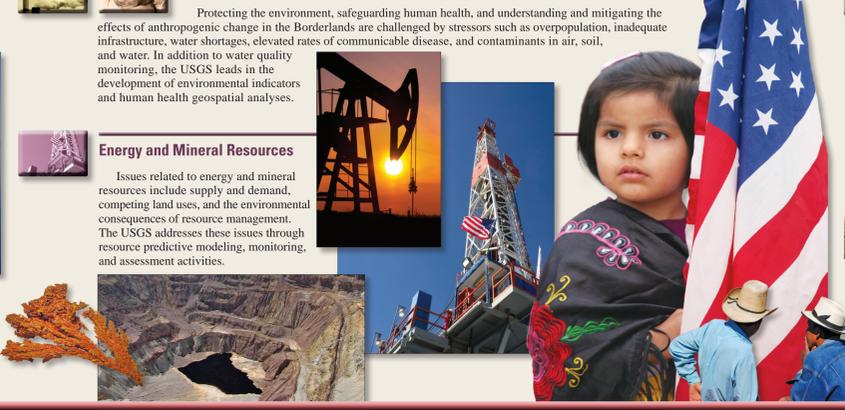
The Borderlands region boasts the highest diversity of desert plants and one of the largest number of bird species in the world. Increases in human populations and associated changes in land use, however, threaten this diversity by contributing to the fragmentation and loss of ecosystem habitats. The USGS uses state-of-the-art research to address habitat loss and fragmentation; projects include developing ecological indicators, conducting baseline biologic inventories, and determining the effects of climate change on ecosystems by mapping and monitoring vegetation and habitats across the United States–Mexican border region.

Water Availability and Quality



Water availability is one of the most important issues in the Borderlands because it is intertwined with the socioeconomic well-being of communities, with ecosystem diversity, and with the survival of unique species. Hydrologic capabilities of the USGS address the water issues of these complex systems through monitoring, characterization, and modeling activities.

Environment and Human Health/People in the Borderlands

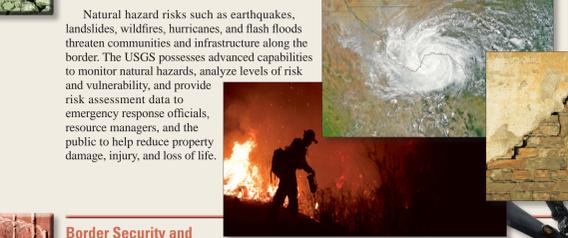


Protecting the environment, safeguarding human health, and understanding and mitigating the effects of anthropogenic change in the Borderlands are challenged by stressors such as overpopulation, inadequate infrastructure, water shortages, elevated rates of communicable disease, and contaminants in air, soil, and water. In addition to water quality monitoring, the USGS leads in the development of environmental indicators and human health geospatial analyses.

Energy and Mineral Resources

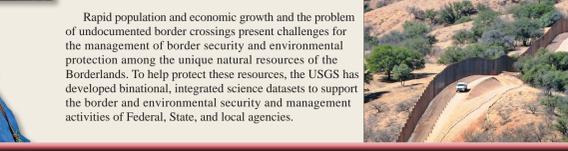
Issues related to energy and mineral resources include supply and demand, competing land uses, and the environmental consequences of resource management. The USGS addresses these issues through resource predictive modeling, monitoring, and assessment activities.

Natural Hazards



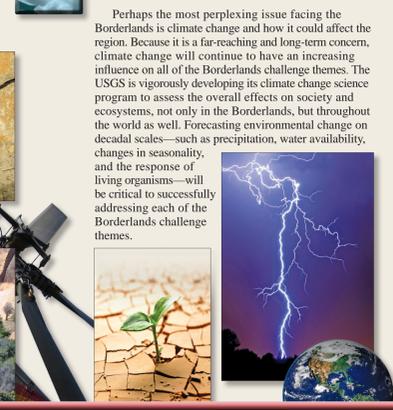
Natural hazard risks such as earthquakes, landslides, wildfires, hurricanes, and flash floods threaten communities and infrastructure along the border. The USGS possesses advanced capabilities to monitor natural hazards, analyze levels of risk and vulnerability, and provide risk assessment data to emergency response officials, resource managers, and the public to help reduce property damage, injury, and loss of life.

Border Security and Environmental Protection



Rapid population and economic growth and the problem of undocumented border crossings present challenges for the management of border security and environmental protection among the unique natural resources of the Borderlands. To help protect these resources, the USGS has developed binational, integrated science datasets to support the border and environmental security and management activities of Federal, State, and local agencies.

Climate Change



Perhaps the most perplexing issue facing the Borderlands is climate change and how it could affect the region. Because it is a far-reaching and long-term concern, climate change will continue to have an increasing influence on all of the Borderlands challenge themes. The USGS is vigorously developing its climate change science program to assess the overall effects on society and ecosystems, not only in the Borderlands, but throughout the world as well. Forecasting environmental change on decadal scales—such as precipitation, water availability, and the response of living organisms—will be critical to successfully addressing each of the Borderlands challenge themes.

For photo credits, see Circular 1380, p. 316.

