

Why mountains matter for North America



North America's mountains are a primary source of fresh water. Other natural resources, such as coal and natural gas, are pillars of North American energy economies. The recreation and tourism industry – the lifeblood of many mountain communities – contributes significant revenues for state and province budgets. And for many, mountains provide solace and a spiritual connection, and are treasured as places to experience the wonders of nature. But a warming climate, human encroachment, and some business practices present severe challenges to these fragile ecosystems.

How current trends threaten sustainable mountain development in North America

The North American West is heating up even more than the world as a whole. From 2003 to 2007, global temperatures averaged 1.0°F warmer than the 20th century average while the average temperatures in 11 western U.S. states were 1.7°F warmer, 70% more warming than the rest of the world (Table 1). Along with temperature increases, the West is getting drier as evidenced by decreases in snowpack and snowfall, earlier snow melt, more winter rain events, increased peak winter flows, and reduced summer flows.

Evidence of significant decreases in the length and volume of glaciers raises the question of climate change and its impact on future water supplies. The Colorado River and its tributaries are the primary water providers for the western United States. However, water shortages have now reached the point where cities such as Los Angeles, Las Vegas, and Phoenix, have acquired all possible water-use rights in the Colorado River system all the way to the Colorado Rockies. In some cases, entire watersheds in mountains are being earmarked as water supplies for the mega-cities.

Fast population growth in mountains and their valleys and an increase in mountain tourism are impacting the biodiversity of mountain ecosystems. Generally accompanied by new infrastructure such as reservoirs, roads, and fences, such development has focused on the valleys and foothills that provide key winter habitat or movement corridors for seasonal migrations of native fauna and can be barriers to essential seasonal movements. One effect of such fragmentation includes loss of fauna fitness due to isolation and inbreeding.

Mining is an important economic driver in North America's mountains; however, its impacts often are profound. Mountaintop removal (MTR) coal mining in the Appalachian Mountains in the United States can involve removing 200 meters or more of a mountain summit to get at buried seams of coal and dumping the remaining earth into neighboring valleys. Mining also poses other threats to mountain environments. Most extraction processes use toxic chemicals (cyanide, arsenic) that create poisonous run-off. Tailing ponds try to contain the toxins, but have been notorious in their frequent failures over time, causing serious downstream damage to land, water, and people.



High-volume hydraulic fracturing, or "fracking," is the process of injecting millions of gallons of water, chemicals, and sand into shale rock formations deep underground at high pressures to break open the rock and release natural gas, which is considered by many to be the clean energy alternative to coal and oil. In addition to concerns about the depletion of local water supplies, fracking, like coal mining, produces hazardous wastewater. There have been more than 1,000 documented cases of water contamination near fracking sites in the United States.

Policy action for North America's mountains – and the future we want



The challenges to sustainable mountain development are many. Most inroads to promote sustainability have been made by public and private organizations at the local and regional levels. For example, in the area of climate change, both Canadian and United States federal governments have considered climate-change laws, but legislation in both countries is neither comprehensive nor certain to pass. In the absence of adequate federal programs, states and provinces have stepped in with their own climate change initiatives. Not surprisingly, however, federal, state, and provincial governments hold different views about the specifics of measures to control greenhouse gases, even when they agree on the broad objective.

There is no shared vision within North America for mountains and their desired future state. Given the diversity of the people, cultures, values, economies, etc. within Canada, the United States, and Mexico, it is unlikely that a shared vision is possible in the near future. But of greater concern is that there is little dialogue taking place at the national level that integrates all of the issues facing mountain ecosystems. The challenges facing North America's mountain regions are not going away – they are only increasing. A major obstacle to moving forward to address these challenges is a lack of leadership and direction at the federal level.

Missing from the equation is a national focus on mountains that includes the contributions they make to North America's environmental, economic, and social well-being and the importance of protecting mountain

environments. In the United States, the administration's National Oceans Council has developed priority objectives and an implementation plan that the country will pursue to address some of the most pressing challenges facing the oceans, the coasts, and the Great Lakes. A similar policy focus is needed for mountain ecosystems. If Canada, the United States, and Mexico were to adopt National Mountain Policies, which include overarching guiding principles for management decisions and actions that ensure that mountains and their downstream regions are healthy and resilient, safe and productive, and understood and treasured so as to promote the well-being, prosperity, and security of present and future generations, they could provide the necessary catalyst to bring stakeholders together to work towards sustainable mountain development throughout North America.

Table 1:

**More Rapid Warming in the
American West**

**2003 to 2007 5-Year Average
Temperatures Compared to
20th Century Averages**

Planet	+1.0°F
Western United States	+1.7°F
Colorado River Basin	+2.2°F
Arizona	+2.2°F
California	+1.1°F
Colorado	+1.9°F
Idaho	+1.8°F
Montana	+2.1°F
Nevada	+1.7°F
New Mexico	+1.3°F
Oregon	+1.4°F
Utah	+2.1°F
Washington	+1.4°F
Wyoming	+2.0°F

Source: Saunders, Stephen et al. "Hotter and Drier: The West's Changing Climate" (March 2008).