



NATIVE PEOPLES AND HOMELANDS

American Indians and the indigenous peoples of Alaska, Hawaii, and the Pacific and Caribbean islands comprise almost 1% of the US population. The federal government recognizes the unique status of more than 565 tribal and Alaska Native governments as "domestic dependent nations." The relationships between these tribes and the federal government are determined by treaties, executive orders, tribal legislation, acts of Congress, and decisions of the federal courts. These agreements cover a range of issues that will be important in facing the prospects of climate change, from responsibilities and governance, to use and maintenance of land and water resources.

Of the approximately 1.9 million people formally enrolled in federally recognized tribes, over half live on hundreds of reservations throughout the country. Within the 48 conterminous states, tribal lands total about 56 million acres, an area about the size of the state of Minnesota. Those who do not live on tribal lands, but instead live in cities, suburbs, and small rural communities across the US, will face the same set of challenges identified in the preceding regional sections. This section focuses on the special set of challenges facing those living on and associated economically, culturally, and spiritually, with reservations and Native homelands. Although the diversity of land areas and tribal perspectives and situations makes generalizations difficult, a number of key issues illustrating how climate variability and change will affect Native peoples and their communities have been identified.

KEY ISSUES

- Tourism and Community Development
- Human Health and Extreme Events
- Rights to Water and Other Natural Resources
- Subsistence Economies and Cultural Resources
- Cultural Sites, Wildlife, and Natural Resources

Observed Climate Trends

Reservations are present in every region of the US, and Native peoples have been experiencing the vagaries of climate on this continent for many thousands of years. Native peoples have developed unique cultures based on the prevailing regional climate, from ice-covered areas of Alaska to the tropical Pacific and Caribbean islands. In each region, however, the climate is starting to change, and Native peoples are aware of these changes. For example, Natives of Alaska are already experiencing significant warming, with the melting of permafrost and sea ice altering subsistence lifestyles (see box on page 74), and changes in the timing of bird and waterfowl migrations as a result of changes in season length are being noticed in many regions.

The Reality of Living with Ecosystem Shifts

For centuries, the Anishinaabeg (Ojibway or Chippewa) who live around Lake Superior and along the upper Mississippi River have depended upon the natural resources of the forests, lakes, and rivers of the region. Many of the reservation locations were selected to ensure access to culturally sig-

nificant resources, such as maple sugar bushes and wild rice beds, whose locations were thought to be fixed. As drier summer conditions cause the western prairies to shift eastward toward the western Great Lakes, the extents of maple, birch, and wild rice habitats in the US are likely to be significantly reduced. Because Ojibway communities cannot, as a whole, move as ecosystems shift, climate change is likely to

reduce the resources needed to sustain their traditional culture and impact their economic productivity and the value of established treaty rights.

For example, the wild rice that grows abundantly in shallow lake and marshy habitats of northern Wisconsin and Minnesota is likely to be adversely affected. Wild rice plays a critical role in the economic and

Scenarios of Future Climate

Most of the large Indian reservations are located in the central and western US. The Canadian and Hadley model scenarios project warming of as much as 5 to 10°F over the 21st century, with more warming during winters than during summers in many areas. These models also project that, particularly in the Southwest, warmer winters will bring increasing wintertime precipitation, a rising snowline, and earlier springtime runoff, thereby affecting the timing and volume of river flows. Warmer conditions are also projected to lead to increased evaporation, especially in summer, that will dry summer soils and vegetation, more than offsetting the increase in precipitation in some regions. For example, warmer summer conditions are likely to lead to lower river and lake levels in the northern Great Plains and Great Lakes.

Key Issue: Tourism and Community Development

The most urgent priority for tribal governments and communities over the past thirty years has been economic development and job creation. The 1990 census indicated that 31.6% of all Indian people lived below the poverty line, compared to 13.1% of the total population. The sustained growth of the American economy over the past decade has, for the most part, bypassed Indian households and reservations.

Many tribes are basing a significant share of their economic development on recreation and tourism, taking advantage of culturally and historically significant sites and ceremonies and the natural aesthetic beauty of many reservations. These activities provide income while also encouraging the re-establishment of customs and traditions. The economic viability of many of these activities, however, is based on the prevailing climate – water-based recreation on rivers and lakes, forest campsites and trails, and diverse wildlife experiences based on migrating fish and birds and seasonal flowering of plants. As climate changes, these relationships are very likely to change: reduced summer runoff is likely to reduce the flow in many streams, drier summers are likely to increase fire risk and require closure of campgrounds, and the combined effects of climate and ecosystem changes are likely to disrupt wildlife and plant communities.

ceremonial life of many tribes. The hand-harvested and processed seed is highly prized as a gourmet food and adds significant commercial value to the rural reservation economy. Federal treaties guarantee the right of the Anishinaabeg to gather wild rice in their aboriginal territories, which cover much of the states of Wisconsin and Minnesota. As the climate changes, deep or flooding waters in early spring could



delay germination of the seed on lake or river bottoms, leading to crop failure. Lower water levels later in the summer could

"We are the ones that live closest to the land, to Mother Earth. We live with it, we experience it, with our hearts and souls, and we depend upon it. When this Earth starts to be destroyed, we feel it."

*Caleb Pungowiyi
Yupik Native from Nome, Alaska*

For many tribes, particularly those in the Southwest, long-term changes in water resources are likely to have significant consequences for resource-based sectors that depend on stable water supplies.

cause the wild rice stalks to break under the weight of the fruithead or make the rice beds inaccessible to harvesters. Extended drought conditions could encourage greater natural competition from more shallow water species. During the dry summer of 1988, conflicts over water pitted federal river management policies against tribal treaty rights and state demands for water.



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KEY ISSUES

Human Health and Extreme Events

The rural living conditions of many Native Peoples amplify exposure to variations in the weather. Housing on many reservations is old and offers only limited protection from the environment. Although many traditional structures are designed to take advantage of the natural warmth or coolness of the landscape (for example, by being located below ground, having thick walls, or being selectively exposed to or sheltered from the Sun), acclimation, both physiologically and through use of appropriate clothing, is critical, because homes in many areas lack effective heating and cooling systems. While warming in colder regions will relieve some stresses, some acclimation has already occurred. In the presently hot regions, however, there is likely to be a significant increase in stress that will require new responses as new extremes are reached. While an increase in the presence of air-conditioned facilities would help, it would require changes in behavior toward a more indoor lifestyle.

Changes in climate are also likely to create new challenges for community health systems. Drier summer conditions would likely lead to increased lofting of dust and dust-borne organisms and an increase in forest fire incidence. The poorer air quality resulting from increases in smoke and dust could possibly increase respiratory illnesses such as asthma.

Sequences of unusual weather events can also be disruptive. Unusual weather conditions in 1993 led to an outbreak of hantavirus in the Southwest, affecting both human health and perceptions of risk. The infection did not predominantly affect Indian people, but the event caused a significant drop in tourism to southwestern reservations, reducing income for several communities.

Rights to Water and Other Natural Resources

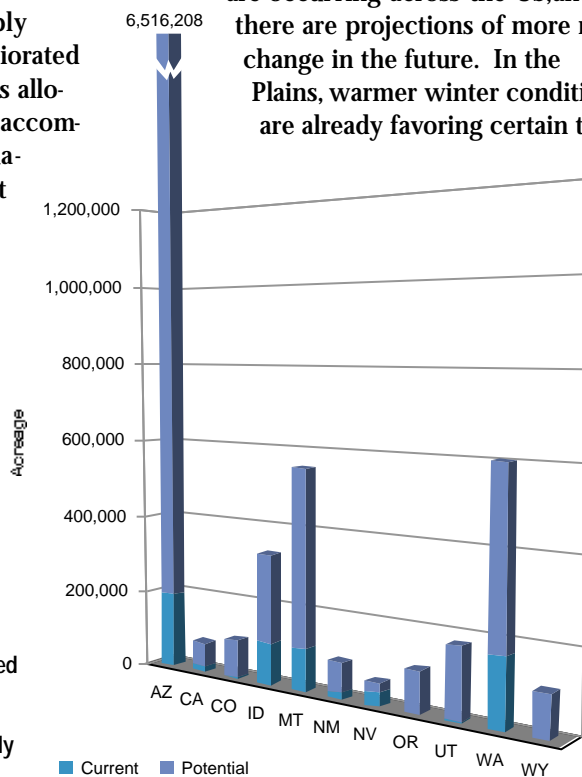
Treaty rights between tribes and the US government provide for allocation of significant amounts of water for use on reservations. As snowmelt and seasonal runoff patterns change, it is possible that water allocations would have to be modified. This would be extremely problematic in the western US if water resources were to become more limited. Because overall precipitation and runoff are projected to rise in some basins, however, it is also possible that water supply problems could be ameliorated if the additional runoff is allocated to users who can accommodate the larger fluctuations in water flows that are projected to occur. For many tribes, particularly those in the Southwest, long-term changes in water resources are likely to have significant consequences for resource-based sectors that depend on stable water supplies.

Acres of Indian lands that are currently being irrigated (brighter blue at bottom of bars) and that could potentially be irrigated (blue at top of bars). Substantially increasing the area of irrigated lands would significantly increase water demand.

Subsistence Economies and Cultural Resources

Native lands have provided a wide variety of resources for Native peoples for thousands of years. Forests, grasslands, streams, and coastal zones have provided, and for many groups still provide, substantial amounts of food, fiber, fish, medicines, and culturally important materials. Native traditions are very closely tied to natural events and resources. Although subsistence economies remain a significant basis for family life only in the far north of Canada and Alaska, many tribal communities support themselves by a combination of subsistence, welfare, and market economies.

The subsistence component of Native economies in the Arctic and sub-Arctic is already being threatened by changes in the global climate (see box p.74). Changes in climate, coupled with other human influences, are occurring across the US, and there are projections of more rapid change in the future. In the Plains, warmer winter conditions are already favoring certain types



of grasses, thereby changing the mix of vegetation types. Shifting away from the subsistence components of their economies is very likely to cause both economic and cultural disruption for many Native peoples.

Cultural Sites, Wildlife, and Natural Resources

The character of local landscapes and weather shapes people's sense of place and how they relate to what surrounds them. While Native peoples have no monopoly on love of land, water, and the sea, their interests started from different premises that have developed over thousands of years of living, moving, and defending their presence on this continent. Although these special connections are frequently explained in spiritual terms, the differences also include intellectual knowledge and historical familiarities extending over thousands of years that continue to be transmitted from generation to generation through oral histories and ceremonies. Many Native peoples perceive humans to be an integral, not dominating, part of the environment.

While there have been significant changes in local environments over past centuries, changes in climate, coupled with other human influences, are likely to bring much larger changes in land cover and wildlife than have occurred in the past. These changes will have practical consequences, but also, at a deeper level, the whole environmental experience that supports religious traditions and the connections to histori-



cally significant sites is likely to start to diverge from what has been sustained through many generations. For Native peoples, externally driven climate change will be disrupting the long history of intimate association with their environments.

Adaptation Strategies

Responding to substantial changes in climate will require technologies and resources, two items desperately scarce in many tribal communities. Most tribal communities are limited in their ways of creating wealth and rely heavily on transfer payments from the federal government. In these communities, adjusting plans for economic and social development to account for climate change may require fresh thinking in federal policies and budgets. In addition, three important steps could be taken.

Enhance Education and Access to Information and Technology

Indian people are significantly underrepresented in scientific and technological professions. They need to develop the understanding and skills to deal with a changing climate. It is especially important to improve the quality of science and technology education in schools and tribal colleges that serve Native youth. It will also be essential to enlist individuals within each Native community to assist in the integration of contemporary information and traditional values.



Promote Local Land-use and Natural Resource Planning

Tribes that have developed strong natural resource management programs for their lands have more substantial bases from which to respond to changes in climate than other tribes. Cost-effective ways, using existing networks and organizations, need to be developed to inform decision-makers in tribal communities, and provide shared access to adequate technical resources.

Participate in Regional and National Discussions and Decision-making

The consequences of changes in climate are rarely contained within reservation boundaries. Serious discussions about climate change must include informed stakeholders from every relevant jurisdiction. A model of interaction and collaboration has been developed between tribes in the northern Great Plains and the University of North Dakota. Their success in broadening participation and making knowledge available in useful ways can provide helpful lessons for other states, tribes, and regions.

