

## Indigenous Peoples

**Team Leader** John Daigle

**Authors** John Daigle<sup>1</sup> and David Putnam<sup>2</sup>

**Reviewers** John Banks<sup>3</sup>, Steve Crawford<sup>4</sup>, Ivan Fernandez<sup>5</sup>, George Jacobson<sup>6</sup>, Alan Kimball<sup>1</sup>, Bonnie Newsom<sup>7</sup>, Darren Ranco<sup>8</sup>, Brian Robinson<sup>8</sup>, David Sanger<sup>8</sup>, Lois Stack<sup>9</sup>, and Sharri Venno<sup>10</sup>

A strong and multifaceted dependence on natural resources makes indigenous populations around the world, and in Maine, particularly vulnerable to climate change.

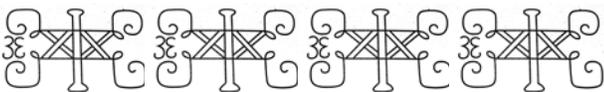
Maine's four recognized Wabanaki tribes face geographical range changes of plant and animal species, and a potential loss of traditional resources, affecting tribal culture, economies, and government budgets.

The livelihoods of Maine's indigenous peoples may very well depend on their abilities to help shape new economies and sustainable development, including decisions on natural resource management.

The Intergovernmental Panel on Climate Change recognizes that indigenous peoples of North America and those who are socially and economically disadvantaged are disproportionately vulnerable to climate change (Field *et al.* 2007). Although our focus here is on indigenous peoples of Maine, the potential effects of climate change are highly applicable and relevant to other residents in the state.

### Climate and indigenous peoples

Four tribes make up the indigenous peoples of Maine and have been allied for centuries in the Wabanaki Confederacy. Wabanaki means People of the Dawn, or East, and includes the Penobscot Nation, Passamaquoddy Tribes, Houlton Band of Maliseet Indians, and the Aroostook Band of Micmacs. All are federally recognized, with similar yet distinct languages and cultures.



Cheryl Daigle

Brown ash: Decrease in number of basket quality trees caused by damaging periods of drought and loss of protective snow cover is also threatened by an invasive species pest called the Emerald Ash Borer bringing fear to the Wabanaki people of losing a vital link to their ancestral ways.

Glooskap came first of all into this country, into the land of the Wabanaki, next to sunrise. There were no Indians here then. And in this way he made man: He took his bow and arrows and shot at trees, the basket trees, the ash. Then Indians came out of the bark of the ash tree.

— Wabanaki Creation Story

1 School of Forest Resources, University of Maine ; 2 University of Maine at Presque Isle; 3 Department of Natural Resources, Penobscot Indian Nation; 4 Environmental Department, Passamaquoddy Tribe; 5 Plant, Soil, & Environmental Sciences, University of Maine; 6 School of Biology & Ecology and Climate Change Institute, University of Maine; 7 Tribal Historic Preservation Office, Penobscot Indian Nation ; 8 Anthropology, University of Maine; 9 University of Maine Cooperative Extension; 10 Department of Natural Resources, Houlton Band of Maliseet Indians

Many important Wabanaki stories including the “creation story” are tied to specific natural features of the landscape. Modern Wabanaki artists continue to use birch bark from the forests, brown ash from the river banks, and sweetgrass from the salt marshes to create distinctive traditional arts. The plants and wildlife are still utilized for subsistence as well as for other important socio-cultural functions such as spiritual enlightenment, family bonding, and learning traditional lifeways.

Many indigenous communities in northern Canada and Alaska are already experiencing constraints on lifestyles and economic activity from less reliable sea and lake ice (for traveling, hunting, fishing, and whaling), loss of forest resources from insect damage, stress on caribou, and more exposed coastal infrastructure from diminishing sea ice (Field *et al.* 2007). It is believed that the strong and multifaceted dependence on natural resources that make indigenous populations as a whole particularly vulnerable to climate change will be highly applicable to the indigenous peoples of Maine. According to Houser *et al.* (2001), approximately 1.2 million (60%) of US tribal members live on or near reservations, and many pursue lifestyles with a mix of traditional subsistence activities and wage labor. Maine wild foods such as fiddleheads, deer, moose, birds, fish, berries, and seafood provide not only sustenance

but cultural connections through storytelling, harvesting, processing, and sharing of food sources.

Some of the specific threats to indigenous peoples of Maine inherent in climate change scenarios involve the potential loss of traditional resources and geographical range changes of plant and animal species. For example, moose populations are likely to be affected by an increase in ticks as well as less than optimal habitat conditions. Rising sea levels may endanger Native American coastal middens or damage Wabanaki coastal petroglyph sites. Coastal lands likely will continue to be highly attractive and potential for housing development both on the coast and inland will lead to further land-use changes that may restrict access to traditional resource gathering areas.

Many reservation economies and budgets of indigenous governments depend heavily on agriculture, forest products, and tourism. The availability and access to birch, brown ash, and sweetgrass utilized by the indigenous peoples of Maine for making fancy baskets and other artistic works are an important component within the tourism industry. However, climate change is expected to affect tree health due to two major processes: damage to tree tissues resulting in diebacks and declines, and increased survival of tree pests due to warmer winter temperatures. Maine's current climate of abundant moisture throughout the year predisposes trees to drought damage. This occurs when trees can regenerate on sites that have enough moisture in normal years but inadequate moisture during drought extremes. Such a situation occurred with brown ash (or black ash, *Fraxinus nigra*) when a “100-year” drought in May 1985 and 1987 resulted in severe dieback in trees growing on sites where high water tables resulted in shallow rooting (Livingston 2008). Future scenarios predict more frequent drought cycles that may further magnify this relationship and reduce future availability of brown ash (Prasad *et al.* 2007).

### Opportunities & Adaptation

For indigenous peoples around the world, climate change brings different kinds of risks, threats to cultural survival, and undermines indigenous human rights (IWGIA 2008). As illustrated above, the consequences of ecosystem change have potential implications to indigenous peoples of Maine for the use, protection, and management of wildlife (*e.g.*, moose), fisheries (*e.g.*, Atlantic salmon), and forests (*e.g.*, brown ash), that may affect customary uses of culturally and economically important species.

Part of the risk assessment that specifically identifies indigenous peoples as being disproportionately vulnerable to climate change are other issues faced such as political and economic marginalization, loss of land and resources, human rights violations, discrimination, and unemployment. Native Americans historically have suffered higher mortality rates as a result of epidemics such as influenza, smallpox, measles, and diphtheria. Climate change is projected to directly and indirectly



Cheryl Daigle?

**Picking sweet grass** Sea level rise and human development along the coast may impact opportunities for the Wabanaki people to collect sweet grass utilized for fancy baskets and tribal ceremonies.

## Economic and Health Disparities

**Compared to all of the state's population, Maine's indigenous peoples: have lower per capita incomes (\$12,700 versus \$19,727);**

- experience higher rates of unemployment (on average double—14.4% versus 6.6%);
- drop out of school at higher rates and attain higher education at lower rates (more than 50% fewer complete a degree once starting college as compared to other Maine students);
- experience higher rates of teen births (on average much higher and nearly doubled within the 1993-1997 time period to 67.1% as compared to 34.1%);
- die at a younger age (on average 60 years old versus 74 years old for all Mainers);
- may die at higher rates from cancer, particularly lung cancer; and
- experience higher rates of tobacco addiction, problem alcohol use, and obesity.

Barriers to health identified by Maine tribal health directors include transportation; low income; prejudice and racism; shortages of qualified health personnel; inadequate state and federal funding; lack of access and/or culturally appropriate health care, especially for substance abuse treatment and nursing home care; threats from environmental toxics such as dioxin, mercury, lead, arsenic, and cadmium; and inadequate public policy in part due to an absence of voting representation in the Maine legislature.

(Kuenhnert 2000, Mills 2002)

promote the mutation and spread of pathogens responsible for epidemic diseases. Significant economic and health disparities exist between the indigenous peoples of Maine and all of Maine's population (see box). Climate change will likely magnify these existing problems and this in turn will likely influence adaptive capacity of the indigenous peoples of Maine.

Indigenous peoples worldwide are vital to, and active in, the many ecosystems of their lands and territories and may therefore help to enhance the resilience of these ecosystems (IWGIA 2008, UNPFII 2008). This is critically vital as most of the plant and animal species diversity is located predominantly in these natural environments where indigenous populations co-exist. Wabanaki ancestors have lived in and around Maine for more than 12,000 years and have exhibited resilience to changes in their local climate. Wabanaki people have survived mass immigration, economic destitution, environmental degradation, and political, social, and cultural domination. Some of indigenous peoples' contemporary solutions may help society at large to cope with impending changes.

In North America, some indigenous groups are striving to cope with climate change by focusing on the economic opportunities that it may create (IWGIA 2008, UNPFII 2008). For example, the increased demand for wind and solar power could make tribal lands an important source of renewable energy. This has been explored by indigenous peoples of the western and midwestern US, and could be done in Maine. In addition, opportunities exist for carbon sequestration with tribal forest lands in Maine, as well as increases in summer tourism potential as other parts of the country become warmer. Ultimately, lessons and approaches undertaken by

the indigenous peoples of Maine may contribute to efforts being made by indigenous peoples worldwide.

Despite being among the most affected by climate change, indigenous peoples' rights and concerns in most parts of the world have so far been almost silent in the climate change discussions and solutions proposed at the national, regional, and international level (IWGIA 2008, UNPFII 2008).

It will be important to examine closely any legal or institutional barriers that may inhibit involvement of indigenous peoples of Maine in decision-making processes as well as design and implementation of initiatives to address climate change. The livelihoods and cultures of the indigenous peoples of Maine may very well depend on their abilities to participate and provide input in the shaping of the new forms of economies and sustainable development,

including decisions on management of natural resources.

Indigenous peoples are spiritually and culturally invested in specific areas of Maine and many of their values, meanings, and identities are closely interlinked with features of the natural landscape and physical interactions with that landscape. Potential ecosystem responses to climate change may alter livelihoods and traditions of indigenous peoples in Maine and may require monitoring of certain social pathological phenomena such as anomie that is sometimes associated with rapid and profound cultural changes in society. Additional financial resources will be necessary to assist with adaptive capacity and mitigation scenarios for the potential responses to climate change.

Combinations of public policy (national security, health) and climate changes may further challenge indigenous peoples of Maine. Increasing restrictions on the US-Canadian border have been problematic for indigenous peoples, hampering access to traditional hunting and gathering areas and maintaining connections with relatives on both sides of the border. As noted previously, culturally significant plant and animal species will likely migrate northward and near the international boundaries of Maine and Canada. The fragmentation of communities due to border restrictions, economic reasons in part related to availability and access to natural resources, may negatively result in further loss of language and cultural identity.

Challenges still exist in the recognition and application of indigenous knowledge systems. How this might be recognized and applied in Maine as we move forward seems critical for success and this cooperative endeavor may ultimately be a showcase for others to learn from around the world. Indigenous

human culture in Maine must be considered one of our most precious natural resources. It should be protected, fostered, and supported in a manner commensurate with its high value.

### Knowledge gaps

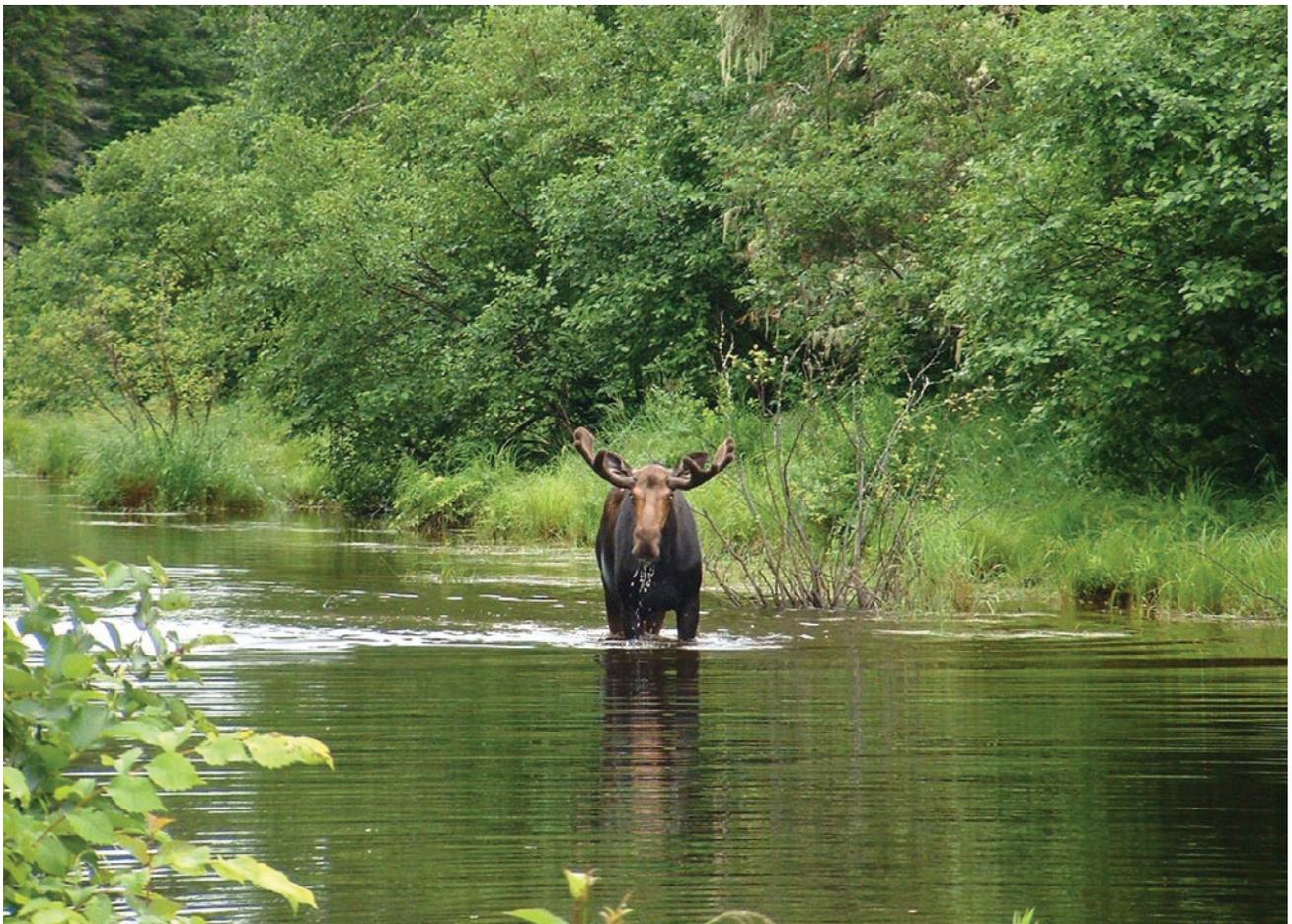
Projections of climate changes still have important uncertainties regarding the range of effects on ecosystems and specifically the frequency and amounts of precipitation as compared to temperature (Christensen *et al.* 2007). For example, will increased precipitation and other climate-related changes exacerbate health-related concerns with mercury and other harmful air pollutants that interfere with people's ability to consume freshwater fishes?

A better understanding of the stressors of climate change and interrelationships with land-use changes are important. For example, the health of brown ash is dependent on a number of factors such as human utilization levels, tree disease, and hydrology modifications as a result of dams and other human development. Opportunities exist to better understand these

effects, especially on hydrological influences with dams planned for removal on lower portions of the Penobscot River. Finally, more research is needed on culturally significant animal species as well as other important plant species such as fiddleheads and sweetgrass.

Most of the current climate change research focuses on impacts to single sectors (*e.g.*, tourism, wildlife, forests, health). More studies are needed to address the interacting responses of diverse sectors to climate change. As illustrated above, the indigenous peoples of Maine have complex and intertwined relationships with multiple sectors. A better understanding of these relationships and culturally compatible ways of communicating this information will improve adaptive capacity and mitigation scenarios.

What is the level of adaptive capacity and mitigation most helpful to the indigenous peoples of Maine? There are important lessons to be learned from indigenous peoples of the polar region and other parts of the world where the magnitude of change caused by climate change is most prevalent (UNPFII 2008).



**Moose** An iconic species of Maine – moose are likely to be negatively impacted by tick populations with social, cultural, and economic implications to Wabanaki people and residents of Maine as well as the tourism-related branding and visitor viewing opportunities.

Cheryl Daigle ?