



Climate Change and Forestry

What it means to tribes and how we can adapt

Tribes and Forestry

Forests are vital economic and cultural resources for many American Indian and Alaska Native tribes in the United States. Of the 18 million acres of tribal forest lands held in trust, 5.7 million acres are designated for commercial forestry¹. Climate change has the potential to both compromise the health of forests across the country, and paradoxically, increase their productivity. For tribes whose culture, traditions, and ways of life may be heavily dependent on forest resources it is important to build an understanding of how climate change may impact forests and other ecosystems.

Climate Projections – Implications for Forestry

Temperature and Precipitation

Climate change will continue to influence temperature and moisture regimes, both of which have important implications for tribal forestry. Every region of the United States will be affected differently, but in general, it is likely that temperatures will increase and precipitation patterns will become more extreme². Tribes and public land managers can utilize down-scaled regional climate models to address potential impacts of climate change on tribally valued forest resources.

Rising temperatures are likely to lead to longer growing seasons for many regions. This trend, coupled with elevated carbon dioxide (CO²) concentrations in the atmosphere, will likely lead to increased timber productivity in some forests³. Conversely, some forest species will have difficulty adapting to rising ambient temperatures. Such species will likely adjust their range and/or distribution northward or to higher elevations to compensate for these changes. For some mountain plant species and coldwater fish, such as salmon, it is highly likely that climate change will lead to significant habitat contractions². Indeed, in Alaska, rising temperatures are already impacting delicate tundra ecosystems whose characteristic open landscapes are being encroached upon by northward shifting tree lines².

Extreme weather events are also likely to increase in frequency. These events, including severe storms, may damage timber and forest habitats, cause major erosion on forest floors, and consequently threaten the stability of forests. Cases of extreme weather events impacting

forests abound. For example, in 2005, hurricanes Rita and Katrina damaged a total of 5,500 acres of forest³ in affected regions.

Parasites and Invasive Species

Longer growing seasons and warmer winters will increase the ability of opportunistic pests, such as the pine beetle or the hemlock woolly adelgid, to survive year-round and threaten forest ecosystem health³. In some regions of the country, such as the Southwest, prolonged periods of drought may compromise forest health and increase ecosystem vulnerability to detrimental parasites³.

As climate change impacts combine with other anthropogenic factors to alter forest ecosystems, native forest species may be replaced by non-native species that are more tolerant to rapid changes in ecosystem conditions². Non-native species, which often lack natural predators, may thrive in these new conditions and ultimately become invasive further compromising the stability of forest ecosystems.

Wildfire

Prolonged periods of drought combined with rising temperatures are likely to make forests more vulnerable to wildfire⁴. Many regions of the country are already experiencing warmer springs and drier summers. Not surprisingly, studies indicate that wildfires have increased four-fold since the mid-1980s⁵. This means that on average, the fire season is 78 days longer and individual fires are up to 30 days longer.



Prescribed burn in the Southwestern US. Photo courtesy of the Southern Ute Tribe, Forestry Department.

What can Tribes do?

Tribes can prepare for climate threats by carrying out periodic forest assessments that take inventory of

observed climate change impacts and assess species' vulnerability to climate change. The Indian Forest Management Assessment Team developed two comprehensive reports (see "Resources" section) which serve as excellent models for forest assessments on tribal or regional scales. Another outstanding resource is the climate change impact assessment report produced by the Swinomish Indian Tribal Community of WA in 2009⁶. Their forest resources vulnerability assessment investigated several forest ecosystem health parameters including wildfire risk, potential for proliferation of pests and diseases, and susceptibility of forest trees to drought-related die off.

Forest assessments can be followed by the development of adaptive forest management plans that specify adaptation strategies in response to the projected climate impacts identified in the assessment. Considerations for such plans might include:

- ◇ How can we incorporate adaptation measures for culturally and economically significant species?
- ◇ How can tribal forests be managed to:
 - Decrease the likelihood of catastrophic wildfires?
 - Decrease the likelihood of tree damage from pests and diseases?
 - Reduce the potential for extreme forest floor erosion?

Federally recognized tribes can improve forest management strategies related to climate change by engaging in meaningful government-to-government relationships with relevant federal agencies, such as the US Forest Service. One example of this approach is the Tribal Effectiveness Monitoring (TEM) assessment for the 15-Year Report of the Northwest Forest Plan. The TEM



section of the report examines the extent to which tribes had access to and use of forest species, resources, and places of import for tribal culture and economies under the Northwest Forest Plan⁷. The tribes provided feedback to federal agencies on barriers to collaboration and subsequently submitted recommendations to the agencies on possible improvements. The success of the TEM assessment highlights the fact that by sharing tribal concerns and jointly addressing them with agency staff, tribes can better ensure the protection of off-reservation forest resources in a changing climate.

Resources

- 1) National Congress of American Indians, Native Resources: <http://www.ncai.org/policy-issues/land-natural-resources/native-resources>
 - 2) US Global Change Research Program Impacts by Sector and Regional Climate Impacts: <http://www.globalchange.gov/what-we-do/assessment/previous-assessments/global-climate-change-impacts-in-the-us-2009>
 - 3) US Environmental Protection Agency (2012). Forest Impacts and Adaptation: <http://www.epa.gov/climatechange/impacts-adaptation/forests.html>
 - 4) National Wildlife Federation (2011). Facing the Storm: Indian Tribes, Climate-Induced Weather Extremes, and the Future for Indian Country: http://www.tribesandclimatechange.org/documents/nccc/nccc_361.pdf
 - 5) National Wildlife Federation (2011), Climate Change Hurts Indian Tribes Disproportionately: <http://www.nwf.org/News-and-Magazines/Media-Center/News-by-Topic/Global-Warming/2011/08-03-11-Climate-Change-Hurts-Indian-Tribes-Disproportionately.aspx>
 - 6) Swinomish Climate Change Initiative (2010). Climate Adaptation Action Plan: http://www.swinomish-psn.gov/climate_change/Docs/SITC_CC_AdaptationActionPlan_complete.pdf
 - 7) Northwest Forest Plan (2011) Interagency Regional Monitoring Program - 15 Year Report for the Northwest Forest Plan, Tribal Effectiveness Monitoring: <http://www.reo.gov/monitoring/reports/15yr-report/tribal/index.shtml>
- ⇒ For the complete reference list that informed this fact sheet, refer to the Tribal Climate Change Adaptation Framework: <http://tribalclimate.uoregon.edu/publications/>

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