NORTHERN ARIZONA UNIVERSITY
Institute for Tribal Environmental Professionals

Climate Change and Water Resources

What it means to tribes and how we can adapt

Tribes and Water Resources

For many indigenous peoples of the United States, water is not just a physical necessity; it is sacred, and essential to many cultural traditions. In the early 1800s, in an effort to protect access to this vital resource, many tribes secured water rights in treaties with the United States government for water found on tribal lands[1]. Despite this, many tribal water resources have been exploited by industry, ranchers, farmers, and communities, creating water shortages and leading many tribes to file legal claims in an effort to re-assert their rights. Additionally, poor land and water resource management practices have led to the degradation of many water resources that are vital to tribes. Climate change is likely to have a variety of impacts on both freshwater and oceanic water resources that could further threaten tribal economies, traditions, and subsistence activities.

Climate Projections & Implications for Water Resources

Droughts and Floods

With climate change, precipitation patterns are likely to become less predictable and more extreme[2]. This may result in an increase in the number of floods and droughts, depending on the season and the geographic region. Impacts to tribes may include changes in the abundance and health of plant and animal species used for traditional foods and medicines. For instance, in Wisconsin, extreme storm events, fluctuating lake water levels, and warmer temperatures are disrupting vulnerable wild rice populations that are sacred and culturally vital to the Ojibwe[3].

Extreme and less predictable precipitation patterns may lead to impacts on drinking water supplies, water scarcity for agricultural purposes, increased soil erosion and an increase in community safety hazards[2]. Some tribes may lack the water supply and stormwater management infrastructure necessary to cope with these future impacts. Further complicating tribal water access, many tribal water rights cases remain unresolved. In light of this fact, tribes may find their rights sacrificed or overlooked as climate change leads to water shortages.

Water Quality Impacts

Climate change is leading to warmer water temperatures, which can directly impact the stability of ecosystems. Higher water temperatures affect water quality because warmer water holds less dissolved oxygen, which is essential for many aquatic biota[2]. Additionally, warmer water temperatures compound the effects of nutrient pollutants, leading, for example, to an increase in detrimental algal blooms that affect aquatic habitats and may pose health hazards to human populations[2]. Warmer temperatures alone can create conditions in which some cold water fish species simply cannot survive.

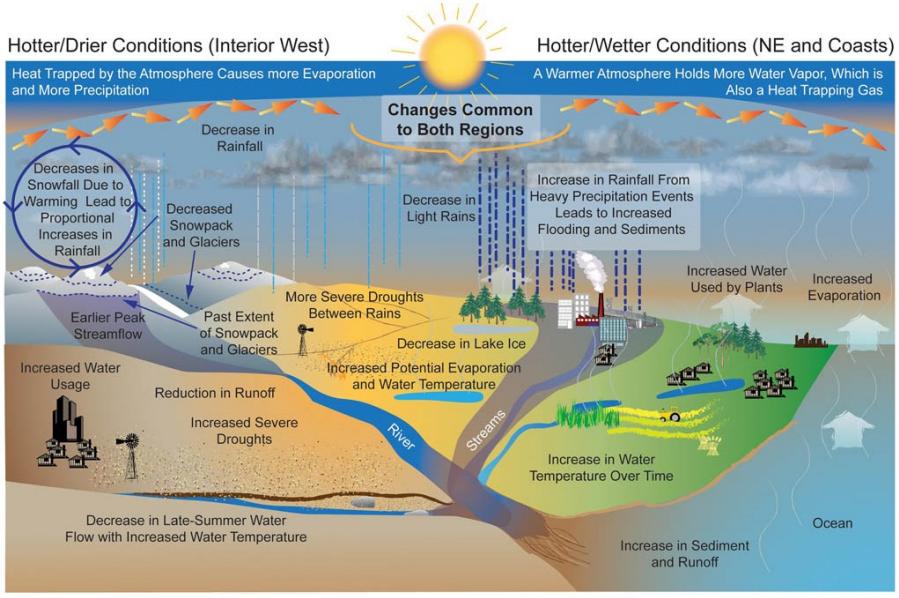

Image: Climate Change Impacts on Water Resources, Courtesy of US Environmental Protection Agency

Sediment loads are also likely to increase as a result of more frequent heavy storms[2]. Sediment eroded from upland areas is transported and deposited in lakes, streams, and eventually, the ocean. Increased sediment can lead to decreased water quality and affect aquatic habitats. It can also reduce the water-holding capacity of both natural and man-made reservoirs.

Sea Level Rise and Ocean Acidification

Rising sea levels as a result of warmer ocean waters pose various threats to coastal tribes. These threats include coastal erosion, salinization of

groundwater, changing coastal ecosystems, and threats to tribes' ability to inhabit, recreate and perform subsistence and traditional activities in coastal areas[2]. In Alaska, sea level rise coupled with delayed fall sea ice development has resulted in coastal erosion occurring at alarming rates of tens of feet per year, leading some communities to have to consider relocation[2].

Ocean acidification – a process in which elevated levels of atmospheric carbon dioxide (CO2) affect oceans by chemically interacting with seawater and reducing its pH[4] – may also have severe impacts on marine water resources and marine species, especially shell-building species. For instance, the Treaty Tribes of the Olympic Coast in Washington have submitted comments to the National Ocean Council declaring climate change-based impairment of coastal resources which threaten traditional life ways.

What can Tribes do?

To prepare for climate change impacts on water resources, tribes can develop a water resources management plan that includes climate change considerations, quantify tribal water rights, evaluate water infrastructure deficiencies, and develop strategies for adaptation and water allocation. Examples of such plans include the Nez Perce Tribe's Clearwater River Sub-basin Climate Change Adaptation Plan[5], the Swinomish Indian Tribal Community's Climate Adaptation Action Plan[6], and the 2011 Navajo Water Resource Development Strategy[7].

When developing water resource plans, tribal managers can consider strategies to plan for changes in precipitation patterns, reduce the amount of sediment that gets eroded into riparian systems, address increases in water temperature, and protect coastal resources that may be impacted by sea level rise. Furthermore, tribal staff can identify cultural resources, lands, and facilities that may be at risk during climate-related weather events such as floods or extreme drought.

Tribes may find that collaborative processes can strengthen water resources planning and protection. Forming partnerships with other tribes or agencies can lead to comprehensive and effective management solutions. Also, accessing resources such as the Environmental Protection Agency's (EPA) Climate Change and Water webpage[8], can help build tribal capacity to address these issues.

Tribes can protect water resources by asserting treaty rights. The Treaty Indian Tribes of Western Washington, for example, have developed a multimedia initiative known as Treaty Rights at Risk in which salmon-related treaty rights are kept in check and non-tribal governments are held accountable[9]. Through Government-to-Government interaction with State and Federal governments, tribes can quantify and negotiate tribal water needs, revisit or further define treaty rights, and set claim on tribal waters, thereby strengthening their resilience in the face of climate change.

Resource List:

1) National Congress of American Indians, Native Resources - Water: http://www.ncai.org/policy-issues/land-natural-resources/water
2) US Global Change Research Program Impacts by Sector and Regional Climate Impacts—Water Resources: http://nca2009.globalchange.gov/water-resources
3) Yeager, Codi. 2011. Where Food Grows on Water: Environmental and Human Threats to Wisconsin's Wild Rice. Circle of Blue. http://www.circleofblue.org/waternews/2011/world/where-food-grows-on-water-environmental-and-human-made-threats-to-wisconsins-wild-rice/
4) Washington State Blue Ribbon Panel on Ocean Acidification, Ocean Acidification: From Knowledge to Action, Washington State's Strategic Response: https://fortress.wa.gov/ecy/publications/SummaryPages/1201015.html
5) Nez Perce Tribe Water Resources Division. 2011. Clearwater River Subbasin Climate Change Adaptation Plan. http://www.mfpp.org/wp-content/uploads/2012/03/ClearwaterRiver-Subbasin_ID_Forest-and-Water-Climate-Adaptation-Plan_2011.pdf
6) Swinomish Climate Change Initiative - Climate Adaptation Action Plan: http://www.swinomish-nsn.gov/climate_change/Docs/SITC_CC_AdaptationActionPlan_complete.pdf
7) Navajo Nation Department of Water Resources. 2011. Water Resource Development Strategy for the Navajo Nation (Draft). http://www.tribesandclimatechange.org/docs/tribes_357.pdf
8) Environmental Protection Agency. 2012. Climate Change and Water. http://water.epa.gov/scitech/climatechange/
9) Treaty Indian Tribes of Western Washington. 2013. Treaty Rights at Risk. http://treatyrightsatrisk.org

⇒ For the complete reference list that informed this fact sheet, refer to the Tribal Climate Change Adaptation Framework: http://tribalclimate.uoregon.edu/publications/

For more information, contact:
Sue Wotkyns, Climate Change Program Manager, Institute for Tribal Environmental Professionals, susan.wotkyns@nau.edu
Kathy Lynn, University of Oregon Environmental Studies Program, PNW Tribal Climate Change Program Coordinator, kathy@uoregon.edu
Cristina Gonzalez-Maddux, Research Specialist, Institute for Tribal Environmental Professionals, cristina.gonzalez-maddux@nau.edu

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