

Inclusion of climate-change effects on lake levels in management plans of tribal fisheries

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For Indigenous peoples in the Great Lakes region (including federally-recognized Tribes), water is a fundamental element of spiritual, cultural, economic and political significance. Tribal governments, Indigenous organizations and individual Indigenous families are active in the protection of water quality. Freshwater ecosystems also play a role in the physical sustenance of Indigenous populations, both as a food source and as an important source of economic stability. Water is a key component of the governance of federally-recognized Tribes, or Tribal governance, which denotes the idea of a Tribe's organizational capacity to exercise self-determination over, and protection of, the spiritual, cultural, economic and political dimensions of Indigenous ways of life.

Our changing climate has the potential to impose a wide spectrum of impacts on aquatic ecosystems. In an assessment of climate changes within the Midwestern United States from the 1951-1980 to the 1981-2010 climatological periods, the Great Lakes Integrated Sciences + Assessments (GLISA) found that temperatures across this region have been warming, with the greatest warming being observed during the winter months across the upper Great Lakes, + 2.0 to +4.0°F (GLISA 2014a; GLISA 2014b). Over this same period, decreases in total precipitation have been observed across the Upper Great Lakes during the Winter through Summer seasons, with an increase in precipitation observed across the entire Midwest in the Fall. Warming temperatures impact thermal stratification of lakes, which in turn impacts the levels of oxygen and nutrients within freshwater ecosystems. Such changes pose a challenge not only for the fish that inhabit these waters, but also for the Tribal fisheries that are responsible for protecting and maintaining such fish populations. Warming temperatures also play an important role in controlling the levels of freshwater lakes, as air-water temperature differences drive evaporation from these lakes. Additionally, as has been observed across the Great Lakes in recent years, differences in the extent of seasonal ice coverage also have a profound impact on evaporation and water levels within the Great Lakes.

Typical climate change mitigation strategies employ both engineering and best practices solutions. For Indigenous peoples, the sovereignty and jurisdiction of Tribal governments, Tribal governing and economic capacity, and cultural and spiritual considerations must be applied in any response that seeks to protect Indigenous ways of live and the flourishing of Tribal citizens in the face of a changing climate.

This project seeks to engage federally-recognized Indigenous Tribes within the Great Lakes region to explore whether a collaborative relationship with the Graham Sustainability Institute would be a welcome and accepted approach in efforts to obtain a better understanding of the potential impact of climate-related variability on Great Lakes water levels and on the vulnerabilities of Tribal communities, fisheries and thus on Tribal governance. Given the complexity of these interwoven elements, a first step in this process will be to engage several federally-recognized Tribes in the Great Lakes in a way that respects their political sovereignty, governance needs and challenges, their long history of experience in the Great Lakes, and the use of their own scientific discovery and tools for bolstering Tribal governance. By engaging in this process, we hope to find points of collaboration where the scientific discovery and tools of the Graham Sustainability Institute can be combined with those of the Tribes in: (a) assessing the impact of changing water levels on this population and (b) the exploration of acceptable mitigation practices which effectively address such vulnerabilities while also respecting Tribal culture and governance.