

Do Not Wait to Communicate: A New Model for Climate Change Literacy

Cathy Techtmann

Talking and teaching about climate change using the G-WOW Model

By 2007 it was becoming apparent something was happening within Wisconsin's Lake Superior coastal environment that was affecting communities, cultures, and economies. Both Great Lakes and inland lake levels had dropped to almost record lows. Intense storms and "gusher" rain events were becoming more common. Overall seasonal temperatures were increasing, punctuated by the number of high heat days. These "place-based" observations were supported by research from the Wisconsin Initiative on Climate Change Impacts (WICCI), which projected these trends would increase as Wisconsin's climate warms.

Several of the region's resource management and public outreach agencies took notice. The Chequamegon-Nicolet National Forest-United States Forest Service and Apostle Islands National Lakeshore-National Park Service (NPS) were concerned about how these changes were affecting resource management and public safety. The Great Lakes Indian Fish and Wildlife Commission (GLIFWC), which co-manages natural resources in support of treaty rights throughout the Ojibwe Ceded Territories of northern Wisconsin, Michigan, and Minnesota, realized the impacts of changing climate on treaty rights to hunt, fish, and gather. Educational outreach specialists from the University of Wisconsin-Extension suspected that traditional "science-only" educational models were not effective in helping people understand the issue of climate change and need for response. These diverse agencies teamed up to develop a new model for climate change literacy called *Gikinoo'wizhiwe Onji Waaban* ("Guiding for Tomorrow")

Changing Climate, Changing Culture Initiative. We call it "G-WOW" for short.

G-WOW – A new model for climate change literacy

The G-WOW strategy stems from Columbia University research stating ". . . local, place-based evidence of climate change gained through experiential learning is as, or more effective than, simply studying analytical climate change data to increasing climate change literacy" (Center for Research on Environmental Decisions 2009).

G-WOW is unique among climate change literacy models in several ways (Figure 1). It integrates place-based evidence people can observe on how climate impacts cultural practices they enjoy with scientific projections of how changes in climatic variables may affect the habitats and sustainability of species that support these practices. Developed for middle school to adults, G-WOW creates a culturally relevant climate change perspective that can directly resonate with any learner. This strategy also makes the model transferrable to

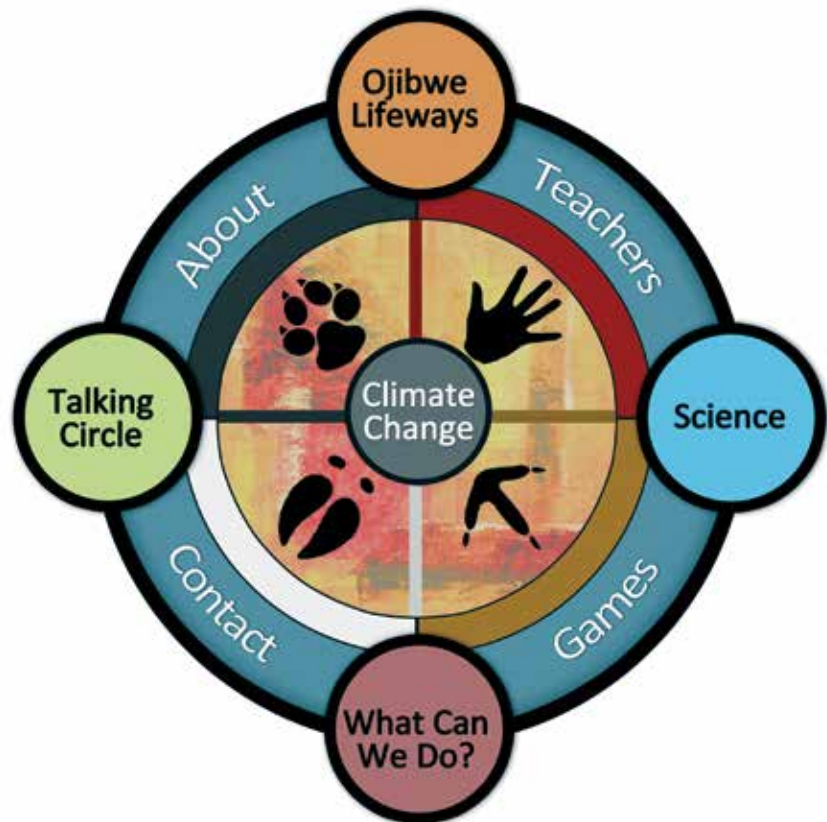


Figure 1. The G-WOW logo depicts the key components of this climate change literacy model, integrating culture and science to promote action on climate change.

other cultures. Most importantly it links cultural, place-based evidence with scientific climate research as equally valuable ways of examining this issue. Unlike other climate literacy models, G-WOW prompts learners to move from awareness to action by engaging in mitigation or adaptation practice.

The G-WOW online curriculum (www.g-wow.org) applies this model by examining climate impacts on four seasonal cultural practices or “lifeways” of the Lake Superior Ojibwe as examples of how climate change is affecting all people. These practices include maple sugaring and birch bark harvesting (spring), fishing (summer), wild rice harvesting (fall), and respecting culture (winter). The Ojibwe people have relied on the sustainability of key plant and animal species for generations to support subsistence, cultural, and spiritual practices. Their traditional ecological knowledge (TEK) of natural systems provides long-term, place-based indicators of climate change. This is evaluated together with climate science from sources such as WICCI and the Northern Institute on Applied Climate Science–United States Department of Agriculture (USDA). Learners are encouraged to weave in place-based observations within their culture with scientific evidence of climate change, and share their responses via the website’s service learning interactive blog. The website provides additional resources, including activity guides and training materials that apply the G-WOW model.

“Teaching about climate change can be difficult because it’s a global issue, and therefore it’s too easy to pass it off as a distant problem despite its impact to each of us individually. G-WOW is novel and effective because it turns the process on its head: G-WOW begins with a culturally relevant and experiential perspective, then builds in understanding of climate change and potential actions that we can take to mitigate or adapt. This approach is especially effective at engaging students and practitioners in thinking about and taking action on climate change”, states Dr. Dan Vimont, Bryson Distinguished Professor of Climate, People, and the Environment and Associate Professor, Atmospheric and Oceanic Sciences at the University of Wisconsin–Madison.

Communicating climate impacts on lakes and rivers

The G-WOW curriculum’s wild rice harvesting and fishing units investigate climate impacts on cultural practices that rely on lake and river habitats.

The Ojibwe cultural practice of wild ricing relies on the sustainability of wild rice (or “manoomin”) and the aquatic habitats where it grows (Figure 2). This species holds significant culture importance for the Ojibwe not only for subsistence, but also for its spiritual value. In their migration stories, the Lake Superior Ojibwe were told by prophecies to leave their original homeland along the Atlantic coast and move westward until they found the place where “food grows on the water,” which would be their new home. The food that they found was wild rice, growing along the northern Great Lakes coastal wetlands and inland rivers and lakes. That is why the Ojibwe are here today.

Wild rice, an aquatic grass, thrives in shallow water environments with moderate water level fluctuations and cool growing seasons. However, from 2007-2012 the Lake Superior Ojibwe experienced disruptions in wild rice harvesting due to drought, flooding, and fungal disease unprecedented in

tribal knowledge. These place-based observations can be integrated with projected changes in climate variables from WICCI models. The models indicate increasing temperature, drought, and intense two-inch rainfall events from 1980-2055, especially within the Ceded Territory of the Lake Superior Ojibwe. Culture and science agree that climate change is impacting the sustainability of wild rice and the Ojibwe cultural practice of wild ricing.

Fishing for subsistence is another important cultural practice for the Lake Superior Ojibwe that is protected by treaty rights. Giigoonh (“fish” in the Ojibwe language) are an important aspect of Ojibwe lifeways, both traditionally and today. They are also an important clan totem animal for the Lake Superior Ojibwe. Cold water species such as lake trout, coaster trout, and brook trout grow best in chilly (50 to 60°F) oxygen-rich water that does not exceed 71°F. Cool water fish such as walleye, northern pike, and muskellunge can tolerate slightly warmer water. Sport fishing in Wisconsin is a \$2.3 billion industry that supports more than 26,000 jobs and generates \$75 million in state tax revenue.

There is place-based evidence that lake habitats may be changing. “A



Figure 2. Bad River elders teach tribal youth how to harvest wild rice. Photo credit: Great Lakes Indian Fish and Wildlife Commission.

warming climate may be causing a proliferation of bass populations, which are adapted for warm water, in some lakes in northwestern Wisconsin,” states GLIFWC Inland Fisheries Biologist Ben Michaels.

Climate projections of warming temperatures, lower lake levels, flooding events, and drought mean habitat loss for cold and cool water fish species, and the cultural practices that rely on their sustainability. WICCI climate models project Wisconsin warming by 4-9°F by the middle of this century (Figure 3). Northern Wisconsin is projected to warm the most. These models project up to 95 percent of Wisconsin’s brook trout habitat could be lost if the average annual summer air temperature increased just over 5°F. What does the future hold for the sustainability of the Lake Superior region’s cold and cool water fish species and the cultural practices and economies they support?

Fighting change with change

While the G-WOW model presents a unique opportunity to facilitate climate change awareness through communication and education, its real purpose is prompting changes in individual behavior to mitigate or adapt to climate change. The online curriculum provides a template for developing service learning projects to address climate change and the opportunity to showcase them through its “Talking Circle” blog. Evidence of change as a result of the G-WOW model has been contributed, by educators and individuals who have used it, to increase climate literacy through project-based educational outreach. These projects include documentaries produced by students at the Marathon Wisconsin Ed-Venture Academy about the impact of climate change at the local, national, and global levels through field work, conversations with global climate experts, and local observations; videos using the Oneida Nation Thanksgiving Address and how

each of the elements are being affected by climate change; a Chequamegon Bay Northern Wisconsin yearlong phenology study, a research project on ice cover change at Bayfield, WI high school students, and a DVD produced by Ashland, WI, high schoolers on how to reduce global warming.

A big part of fighting climate change is teaching others about impacts and response using the G-WOW model. In addition to the online curriculum, the G-WOW team developed a major Changing Climate, Changing Culture Discovery Center at the Northern Great Lakes Visitor Center in Ashland, Wisconsin that hosts approximately 100,000 visitors, community members, and students annually. The Discovery Center applies the G-WOW model through an interactive exhibit and touch screen kiosk featuring Ojibwe language and cultural components and place-based evidence of climate change integrated with WICCI science (Figure 4).

The annual G-WOW Changing Climate, Changing Culture Institute offers a four-day professional development opportunity in Wisconsin’s Lake Superior communities and tribal lands to train educators in using the model in their classrooms and communities. Educators receive follow-up support to develop climate service projects and can return for Coastal Climate Camps for hands-on climate investigation with their students.

Superintendent Bob Krumenaker of the Apostle Islands National Lakeshore-NPS has made the Apostle Islands one of the leading national parks in the nation in their approach to climate change communication, mitigation, and adaptation. The Park has developed and posted climate and sustainability resources, such as the Apostle Islands National Lakeshore Sustainability Policy, educational videos and Powerpoints, and management plans that specifically address climate impacts and adaptation (<http://www.nps.gov/apis/learn/nature/climate-change-and-sustainability.htm>).

“Spending quality time with the G-WOW Institute participants every year is important to me,” Krumenaker said. “The most effective way to raise awareness about the impact of climate change is by sharing what we know about places people care about, and the national

Projected Change in Annual TMEAN (°F) from 1980 to 2055 (SRESA1B)

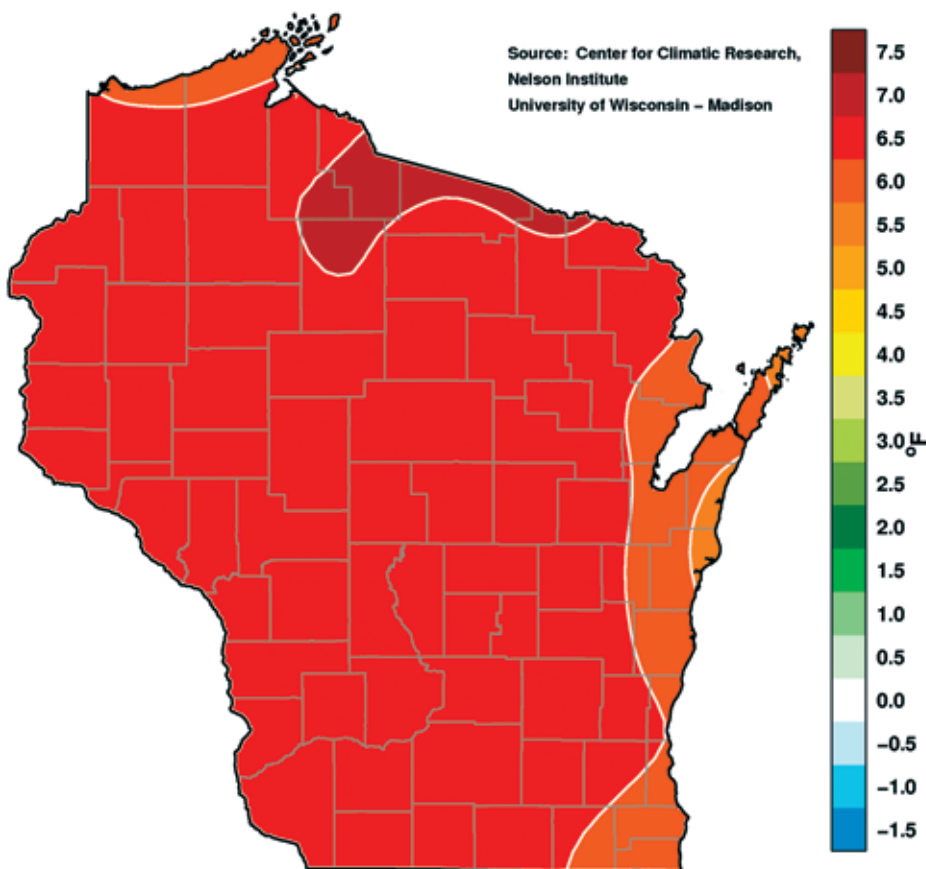


Figure 3. WICCI climate modeling provides mapping tools that visually integrate climate science into the G-WOW model.



Figure 4. The G-WOW Discovery Center promotes hands on investigation of cultural and scientific evidence of climate change, while encouraging action to mitigate its impacts. Photo credit: Apostle Islands National Lakeshore-NPS.

parcs are near the top of most peoples' lists. The G-WOW model works and I hope we can export it to other national parks and protected lands. The seamless partnership is also a big part of both the success and the satisfaction."

The G-WOW model development and outreach has been supported by grants from the National Parks Foundation and the Wisconsin Coastal Management Program-National Oceanic and Atmospheric Administration (NOAA). The G-WOW team is working to expand the G-WOW model across the Ojibwe Ceded Territory and beyond through partnerships with the Chicago Botanic Garden using an Environmental Protection Agency (EPA) grant and the Fond du Lac Tribal and Community College with support from National Aeronautics and Space Administration (NASA).

The Ojibwe believe that we must think seven generations ahead when

making decisions today. All cultures share responsibility for protecting their home, the Earth. We cannot eliminate all the risks that climate change presents, but we can make a difference in slowing its impacts. The culture and lifeways of future generations will be affected by the choices we make.

Do culture and science agree? The G-WOW model weaves together these two important perspectives, creating a culturally relevant climate change communication tool for engaging people of all cultures in this critical issue.

For more information, contact Cathy Techtmann-University of Wisconsin-Extension Environmental Outreach State Specialist, catherine.techtman@ces.uwex.edu, phone 715.561.2695.

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Cathy Techtmann is a University of Wisconsin-Extension Environmental Outreach State Specialist and professor of community resource development. She received the 2012 UW-Colleges and Extension Chancellor's Award for Excellence, the 2013 US Forest Service's Eastern Region Honor Award for "Courageous Conservation," and a UW-Extension Distinguished Service Award in 2015. She is a member of the Wisconsin Consortium for Environmental Education, the WI Association of Environmental Education Board, and an NOAA Climate Steward. 🌱

