

**“Water and All My Relations”: Reimagining Indigenous Water Justice for Seven
Generations**

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Abstract

The *Ojibwe Gichigami* (Lake Superior) bioregion is the ancestral and contemporary homeland of the Anishinaabe Ojibwa. Harvesting and consuming fish has sustained people for millennia, but today, toxic risks due to fish contamination contribute to many burdens for both human and more-than-human worlds. For the Ojibwa, *nibi gaye nii'kinaaganaa* (“water and all my relations”) are the lived experiences of fish-reliant communities and emphasize sustaining good relations with water and relatives. Toxicity disrupts traditional harvest lifeways, violates treaty rights, and problematizes Ojibwa water relations. In this article, I describe diverging values attributed to water and conflicting norms of water quality relations between Ojibwa people and scientific practices of toxicology. Drawn from a study of institutional water decision making, I examine practices associated with water, fish, and risk and how these practices clarify ethics in water policy. The study of toxic substances, albeit invisible in water policy and fish advisories, raises broader issues of Indigenous water justice, particularly for sensitive populations (e.g., developing children, women of childbearing age, and fish-reliant communities). In proposing a broader justice framework for reimagining water lives and livelihoods, I argue for foregrounding Indigenous water justice ethics based on long-term wellbeing, a time period inclusive of seven generations.

Keywords: water justice, Indigenous, fish, toxic substances, policy

“Don’t you be another one of those people to come here and tell us to stop eating our fish. You need to go back there and tell them to stop polluting our waters” – Ojibwa elder

The above statement spoken by an Ojibwa elder interrupted my monologue on fish advisories and toxic contamination. At the time, I was a graduate student at Michigan Technological University. I was eager to examine toxic fish as an environmental justice issue in the Keweenaw Bay Indian Community (KBIC), Lake Superior Band of Ojibwa. This was my first, but not last, lesson in misframing the problems and solutions associated with toxicity. To do water justice, I would learn, means to engage in critical examinations of larger spatial, temporal, and ontological contexts, particularly Indigenous ones.

The elder’s words helped me to transition from a sole research focus on the Ojibwa to the policy world of water governance and toxic risk management. Before then, I had assumed that educating tribal members was a good way to do justice work. However, communicating risk so that it may be avoided is not health protection (O’Neill, 2004). To do justice, we must be clear on who the responsible actors are, recognize who bears the burden of harm, and acknowledge when unjust decisions are made (Gagnon et al., 2018). Contaminated water bodies result in contaminated fish bodies; fish accumulate, concentrate, and magnify a suite of heavy metals and chemical compounds at levels substantially higher than the water body itself (Van der Oost et al., 2003). Water decisions about Keweenaw Bay are negotiated elsewhere, in federal and state environmental quality institutions, and in research laboratories, regionally and abroad, where the harmful impacts of toxicity are studied one contaminant at a time (EPA, 2014). These decisions rarely include Indigenous water realities, nor do they consider Ojibwa conceptions of water justice and the relational ethics that extend well beyond the human (McGregor, 2014; Salmón, 2000).

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Doing justice requires situating the ethics of water policy practice with the ethics of those it seeks to protect. In Keweenaw Bay, contaminated waters transgress Ojibwa ethics of diplomacy, articulated as *nibi gaye nii'kinaaganaa* or “water and all my relations.” Because fish consumption is the primary route of human exposure to toxic substances (Huang et al., 2020; Wattigney et al., 2019), chemically contaminated fish disrupt Ojibwa harvest lifeways, violate treaty rights, and problematize water relations. Seasonal fish harvests structure practices across the landscape, affirming Ojibwa identity as a fishing community in Keweenaw Bay (Gagnon et al., 2017). Each spring, a Breaking of the Waters ceremony precedes the harvest season, and water walks along Lake Superior shores are held each summer and fall (Gagnon, 2016). As it has always been, water and people belong to each other. To know fish is to know water, and to protect fish is to protect water. Practicing justice is to ensure ethical water relations are sustained for future generations.

The Ojibwa situation raises broader issues of water justice and Indigenous sovereignty (Robison et al., 2017). Limiting or eliminating fish consumption does not equate with clean water, however, and the autonomy of Indigenous peoples cannot be honored by calculating or communicating toxic risk. Indigenous peoples retain a unique legal and political status in Canada and the United States, a nation-to-nation relationship with federal governments (Norman et al., 2015). Despite pervasive contamination, decisions affecting Indigenous waters are rarely informed by the sovereign status of Indigenous peoples, knowledge systems, or conceptions of justice (McGregor, 2014; Watts, 2013). Indigenous water realities are diverse, rooted within plural ontologies (Cohn et al., 2019; Viaene, 2021) and centered in kinship relations with specific ecologies (Salmón, 2000).

Policy decisions are often made miles and years apart from the contemporary lives and livelihoods of Ojibwa. Waters are governed by multiple jurisdictions, including federal governments, states and provinces, multiple municipalities, and some Tribal and First Nations. In the United States, contemporary water policy is rooted in the Clean Water Act of 1972, which provides a framework for regulating pollutants to improve water quality for “swimmable and fishable” goals (EIP, 2022). In the same year, the United States and Canada signed the Great Lakes Water Quality Agreement (GLWQA) as a commitment to govern water-related priorities. Initially, Indigenous peoples were not afforded engagement privileges with GLWQA or CWA. Two decades later, the Environmental Protection Agency established a program for Tribal Nation waters (EPA, 2023a), and a representative from the Great Lakes Indian Fish and Wildlife Commission (GLIFWC) began participating in GLWQA meetings (KBIC, 2020). Since 2010, many Tribal and First Nation government staff have worked alongside other GLWQA staff for water quality. However, United States monitored waters—specifically, 55% of the nation’s lake acreage, 50% of river and stream miles, and 25% of bays and estuaries—remain classified as “impaired” (EIP, 2022).

In this article, I describe diverging values attributed to water and conflicting norms of water quality relations between Ojibwa people and scientific practices in toxicology. Drawing from a long-term study of institutional water decision making in the Lake Superior region, I investigate the everyday institutional practices associated with doing water, fish, and risk justice and ask how these practices might clarify an ethics of water policy. The study began in 2009; here, I reflect on pivotal experiences from the summer of 2014. I recount ongoing experiences with the Ojibwa, such as participating in water-related events and ceremonies and experiencing a

guided tour at the Lake Superior Research Institute. Such work had vastly different purposes and contexts; hence, incongruence is sharply evident.

I begin with the theoretical foundations of the sciences of water and risk, a framework for Indigenous water (in)justice, and the context of the study location. I then provide my mixed methods research approach, including transdisciplinary experiences with the Ojibwa people. Next, I share results from a tour at the Lake Superior Research Institute, which conducts research on water quality, fish tissue toxicity, and a range of environmental policy science needs in the region. Proposing a broader justice framework for reimagining water lives and livelihoods, I argue for a foregrounding of Indigenous water justice ethics based on long-term well-being.

Water, Science, and (In)justice

Chemical contamination of fish is a transboundary and global problem with long-term impacts on ecosystems, wildlife, and human health, particularly impacting fish-reliant places and peoples (Perlinger et al. 2018). Resulting from industrial processes such as energy production, manufacturing, and mining, toxic compounds associated with contamination include methyl-mercury; industrial chemicals such as polychlorinated-biphenyl (PCB) compounds, toxaphene, chlordane, and per- and polyfluorinated substances (PFAS); and industrial activity by-products, such as dioxins (EPA, 2022a). Sometimes called “forever chemicals,” these are ubiquitous across the globe. Once released into the environment, they can be transported through cycles of deposition and re-emission, bioaccumulating in fish, especially at higher latitudes (Wania & Mackay, 1996). Even in relatively small quantities, toxic exposure is known to cause immune deficiencies, reproductive diseases, neurological disorders, and various cancers (EPA, 2014). Sensitive populations, those at higher risk, are developing children, women of childbearing age, and fish-reliant communities (EPA, 2014).

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Sciences of Water and Risk

Water-chemical relations continue to be mitigated by the science of risk, requiring the monitoring and analysis of water and fish to test for toxicity (EPA, 2014, 2023b). To counter contaminated fish in the early 1970s, public health officials in Michigan began issuing warnings. Initially viewed as temporary, stop-gap warnings transformed into routine fish-tissue monitoring programs for the ongoing implementation of risk communication, referred to as fish consumption advisories (O'Neill, 2004). In 2012, the last year national data were collected, there were nearly 5,000 fish advisories (EPA, 2022b). Currently, the FDA and EPA jointly issue mercury advisories for commercial fish products. All 50 states, the District of Columbia, some territories, and many Tribal Nations issue fish advisories to mitigate exposure to toxic chemicals (EPA, 2022b). The purpose is to communicate toxic risk so that the public can limit exposure by managing their fish consumption.

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Calculating and communicating toxic risk is a critical component of contemporary water governance (Nash, 2006; Vogel, 2012). However, current institutional structures of toxic risk management simply dilute health protection, displacing harm from some bodies to others (Liboiron, 2021; Murphy, 2017) and supplanting institutional responsibility with individual choice (Gagnon et al., 2017; Norman, 2018). As alternative subjects and objects are used to determine the variables and criteria for human bodies, bodies of harm are widened. Risk communication also diffuses risk responsibility. Since the 1970s, disseminating “safe fish” information has become a routine way to manage toxicity in water and fish bodies (Gagnon, 2016). Too often, institutional protection is a response to harm, and to maintain the process, the protection of some is accomplished by the continuous harming of others (Murphy, 2017).

Indigenous Water (In)justices

The ways in which water-chemical relations are configured and reconfigured have been highly contested by many, including Indigenous peoples. Characterized as “water colonialism,” science and policy privilege some and burden others (Robison et al., 2017). Often, policy injustices are hidden in the regulation of water and water relations. Focused on the politics of calculation, geographer Emma Norman (2013) asserts that particular calculative tools operate as a process of ecocolonization for Indigenous communities reliant on fish harvesting in traditional waters. Two factors have received particular attention in this calculation: the fish consumption rate (FCR) and the reference dose; both are used to determine ambient quality standards for safe fish consumption. The FCR is equated with the amount of fish consumed by individuals in a specific time period (e.g., “two six-ounce meals per month”), and reference doses stipulate contaminant levels considered to be safe. These factors disregard fish-dependent populations (Ranco et al., 2011), overlook historical and desired fish consumption (Donatuto & Harper, 2008), and do not account for Indigenous water rights and relations (Gagnon, 2016; Ranco et al., 2011).

The validity of Indigenous sovereignties has been well established (United Nations, 2007). Described as the “third sovereign” (Ettawageshik & Norman, 2019), Indigenous water rights predate the treaty era (Ranco et al., 2011). Treaties can only be negotiated between sovereigns; thus, the United States affirmed the sovereign status of many Indigenous nations through treaty-making. Yet, pathways to restoring Indigenous water justice have not been realized (Robison et al., 2017). Indigenous water justice is rooted in the autonomy of the people whose contemporary struggles remain connected to past ones (Cohn et al., 2019). Indigenous

water injustice is often tied to processes of exploitation, dispossession, and extraction, fundamental practices in colonialism, capitalism, and industrialization (Whyte, 2018b).

Many Indigenous nations participate in the governance of shared waters today. However, engagement within an imposed governance system cannot be conflated with assertions of Indigenous sovereignty or achievements of water justice. Often, these structures conflict with Indigenous systems of equitable engagement relations (McGregor, 2014) and contrast with Indigenous conceptions of diplomacy between nations (Simpson, 2017). Articulating conceptions of Indigenous water justice, Anishinaabe scholar Deborah McGregor (2013) writes, “Only when the waters are well and able to fulfill their duties to all of Creation is water justice achieved” (p. 72). Thus, water justice extends beyond human-centered needs and includes water and more-than-human responsibilities. Bureaucratic participation, therefore, falls short of sovereign justice objectives (Nadasdy, 2004), and instead of replacing injustice with Indigenous self-determined empowerment, it reproduces unjust colonialist relations, albeit in reconfigured ways.

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Notwithstanding over 50 years of water legislation and scientific study to restore and protect water relations, toxicity (in)justice, and Indigenous sovereignty in the Great Lakes, much is in need of amelioration. The lack of progress suggests that water justice cannot be achieved by policy or science alone. A closer examination of frameworks underlying current systems of water governance may provide insights into the everyday practices of health protection. The ethical framework underlying contemporary water policy is situated to continue “polluting our waters.” I argue that this is incongruent with Ojibwa conceptions of (fish, risk, and health) justice and relations, which would “stop polluting our waters.”

Anishinaabe Ojibwa

The study region is within the ancestral and contemporary homelands of the Keweenaw Bay Indian Community (KBIC) Lake Superior Band of Ojibwa Indians. Located in present-day Upper Michigan, the landscape comprises large areas of forests, diverse aquatic and terrestrial plants and wildlife, and lake and river systems with several hundred tributaries (Sweat & Rheume, 1998). On the directive of KBIC in 2012, the study region expanded across the wider Ojibwa homelands. As signatories to treaties with the United States, Ojibwa Bands have reserved hunting, fishing, and gathering rights, usual privileges of occupancy, and permanent homelands within approximately 40 million acres of ceded territory. Ojibwa homelands include hundreds of rivers, streams, lakes, wetlands, and approximately 2,000 miles of Great Lakes shoreline.

Anishinaabe Ojibwa have resided here for millennia (Treaty with the Chippewa, 1837, 1842, 1854; Treaty with the Ottawa, etc., 1836). In both English and *Ojibwemowin* (the language of the Ojibwa), water relations are identified in the very names of Ojibwa as a people of the water (Gagnon, 2016). *Nii'kinaaganaa* describes Ojibwa ecology as diplomatic relations with others (Noodin, 2019). As words spoken at seasonal ceremonies, *nii'kinaaganaa* is also as common as an everyday introduction. “We are all related,” they say. Beyond human-centered relations, *nii'kinaaganaa* includes fish and wildlife, forests and plants, rocks and soil, birds, insects, and, especially, the giver of all life, water—we are all related.

Great Lakes Indigenous peoples have upheld treaty obligations since time immemorial; the First Treaty is the nation-to-nation agreement between *Gichi Manidoo* (the Creator), Anishinaabeg, and *nii'kinaaganaa* (Johnston, 1976). According to teachings, all created from rock, water, fire, and wind are obligated to care for and honor one another's autonomy. *Nibi* relations are especially significant, revered as the “lifeblood of Mother Earth” (KBIC, 2020) and

provider of all life (McGregor, 2014; Robison et al., 2017). Sustaining a constellation of relations with the physical cosmos and earthly relatives is central to being Ojibwa (Johnston, 1976). Water justice is inclusive of *nibi gaye nii'kinaaganaa*.

Anishinaabe Ojibwa have faced many challenges related to water. Federal assimilation policies, state regulatory control, and degradation and contamination have all impacted Ojibwa fishing rights. After decades of failed attempts to have treaty rights recognized, KBIC became the first Tribal Nation to have treaty harvesting rights reaffirmed (Gagnon, 2016; People v. Jondreau, 1971). Tribes in Idaho, the Pacific Northwest, and others in the Great Lakes followed. However, the reaffirmation of treaty rights ensued with warnings of fish contamination. KBIC viewed fish advisories as yet another State attack on tribal fishing (Gagnon, 2016). At the same time, some public groups actively protested the reaffirmation of treaty rights, resulting in adversarial encounters across Ojibwa homelands. Confrontations were especially hostile for Wisconsin Ojibwa (Nesper, 2002). Although traumatic, these contemporary events propelled the revitalization of treaty harvesting and, for many Ojibwa Bands, motivated the institutionalization of water and fisheries authority in their governments, such as GLIFWC.

Formed in 1984 by Ojibwa member tribes, GLIFWC is one of five intertribal commissions in the United States that assist in implementing off-reservation treaty rights (GLIFWC, 2023). Mercury monitoring was one of the first Ojibwa priorities. To determine contamination levels in ceded-territory waters, GLIFWC established a program to collect inland fish to inform mercury maps. The program continues today. GLIFWC, located near Ashland, WI, comprises 11 tribes with reserved hunting, fishing, and gathering rights from the treaties of 1836, 1837, 1842, and 1854. It conducts natural resources research and management, conservation enforcement, legal and policy analysis, and public information services to support the exercise of

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treaty rights throughout millions of acres of ceded territory. Ojibwa members serve on the Voigt Intertribal Task Force and Great Lakes Fisheries Committee to advise the Board of Commissioners on policy.

Anishinaabeg Ojibwa values form the foundation for GLIFWC (2010) policy and decision making, particularly the Seven Generations philosophy. As guidance for peace, leadership, and governance, short- and long-term planning consider the implications for seven generations. Some say the responsibility is to the future seven generations; others say that, as the current generation, we must seek to honor our ancestors while protecting future ones (Whyte, 2018a). However, Ojibwa institutions joined an existing governance regime, one not of their own making. Thus, reimagining Indigenous water justice is ongoing work, and in reality, the future of shared water governance is yet to be determined.

Positionality, Ethnography, and Transdisciplinarity

Intersectional Identity

Acknowledging positionality is foundational to good research (Absolon & Willett, 2005). An intentional statement of self-identity acknowledges the influence of one's personal experiences as a part of the research process (Massoud, 2022). Positionalities inform research motivation and biases, those we know and ones we may be unaware of. Well into adulthood, I realized that being a good researcher (and an effective ally) meant that learning about my own ethnicity was crucial. My identity is rooted in the land of my ancestors; born in Seoul, South Korea, I belong(ed) to the Shin clan. I am a Korean adoptee and a naturalized United States citizen.

Today, I belong to a place. Physically and intellectually, I am a community member living within the ancestral and contemporary homelands of the Anishinaabe Ojibwa. My

knowledge is informed by the gift of living within the Lake Superior basin all Her life. I continue to learn with/by/as Lake Superior fishers, the lands and waters, and the many more-than-human beings who call the Great Lakes home. I also serve as an Assistant Professor in the College of Forest Resources and Environmental Science and the Director for University-Indigenous Community Partnerships at Michigan Technological University. My interdisciplinary expertise in environmental policy, human dimensions, and community-engaged research remains focused on socioecological dynamics of legacy toxic compounds. I aim to elevate Indigenous peoples and knowledges, facilitate equitable research practice and design, and guide partnerships that prioritize land and life in the Great Lakes region. My work is a long-term commitment to the KBIC and Ojibwa priorities.

Multi-Sited Ethnography

Widening context contributes to better understandings of place-based, particular lives (Blasco & Wardle, 2007; Falzon, 2012). To examine practices in the science and policy of water, fish, and risk, I conduct multi-sited institutional ethnography throughout the southern Lake Superior region. Since 2009, and continuing in 2023, I have engaged in mixed-methods research rooted in the priorities of the Keweenaw Bay Indian Community. Focusing on water values, norms, and ethics, the primary objective is to identify differences in policy and science frameworks to bridge Western and Indigenous expertise and co-create pathways for meaningful, action-oriented engagement. Currently, with a diverse research team including KBIC and GLIFWC, we are creating a tribal landscape system model by mapping inland lake contamination levels, climate-related changes, and priority Ojibwa practices to inform Ojibwa management options. Also, as the first Tribal Nation in Michigan to achieve Treatment in a Similar Manner as a State (TAS) for water quality (KBIC, 2020), I serve on the KBIC water

team. Under authority of the Clean Water Act and in partnership with the EPA, we are in the process of developing water quality standards for the KBIC L'Anse Indian Reservation.

Research with/by/as Indigenous peoples are long-term commitments to Indigenous priorities (Shaw et al., 2022), including Indigenous sovereignty and nation-building (Wilson & Hughes, 2019). Research practice can also align with the broader goals of reconciliation within Indigenous homelands (Liboiron et al., 2021). To better understand the policies that affect Lake Superior's Keweenaw Bay, my research inquiries continue to be directed by KBIC and Ojibwa priorities, which center on restoring regional waters and protecting treaty resources.

On the wishes and consent of KBIC, I spent a week with GLIFWC in July 2014. I was particularly focused on learning more about GLIFWC's Mercury Program and the annual Anishinaabe Healing Circle Run/Walk. The Mercury Program is responsible for sampling fish and monitoring mercury levels for inland lakes, information used in the development of Mercury Maps, the Ojibwa fish consumption advisory (GLIFWC, 2020). Distributed to Tribal Nations throughout ceded territory, the goal is to promote the exercise of treaty fishing rights in priority inland lakes for Ojibwa subsistence fishers. Mercury maps display each water body with color-coded advice for harvesting and safely consuming *ogaa* (walleye), which ranges from 0 to 64 ounces per month (GLIFWC, 2020). GLIFWC also organizes the annual Anishinaabe Healing Circle Run/Walk, and 2014 marked its 25th anniversary. Since 1989, over eight days, runners and walkers connect eight Ojibwa reservations across Wisconsin, Michigan, and Minnesota. The event was initiated to heal from trauma associated with violent, racist protests on Ojibwa treaty fishing. These protests, also called the Walleye Wars, culminated at Wisconsin boat landings from 1986-1990 (GLIFWC, 2014; Nesper, 2002). At the end of the week with GLIFWC, I would learn more about the Mercury Maps by traveling to the Lake Superior Research Institute located

at the University of Wisconsin-Superior. Called the “tox lab” by GLIFWC staff, I accompanied the biologist to drop off fish samples for analysis. As a courtesy, the tox lab agreed to provide me with a guided tour of their facility.

Transdisciplinarity with the Ojibwa

As a transdisciplinary scholar, I am accustomed to being on the fringe of anthropology. Yet, ethnography serves me well. The experiences in 2014 marked a paradigm shift in my everyday researcher lens, one that I continue to wear. Sharpening ethnographic vision requires challenging assumptions and refining skills as a listener, especially one’s intuition.

I had worked closely with Ojibwa people before 2014, but I did not fully understand my responsibilities. As an agreement in perpetuity, First Treaty obligations to *nibi gaye nii’kinaaganaa*, water, and all my relations serve as an underlying ethic in remembering and revitalizing Ojibwa identity. As a traditional lifeway practiced in contemporary governance, the First Treaty informs Ojibwa natural resource institutional decision making throughout the ceded territory. In what follows, I share some of my participatory experiences to highlight an Ojibwa framework for seeing water and fish, and all relations, as kin.

The commitment to Ojibwa water relations is acknowledged throughout the seasons. In Lake Superior’s Keweenaw Bay, I have had the privilege to engage in annual events for water relations. For example, I have participated in the Breaking of the Waters ceremony, an event that takes place across Lake Superior shorelines as the winter’s ice begins to open for spring fishers. As the traditional caretakers of water, *kwe* (women) lead with song and prayer in gratitude for the gifts that will be shared in the upcoming harvest season (Gagnon, 2016). I have also joined countless water walkers in sunrise ceremonies for Lake Superior. Inspired by Anishinaabe grandmother Josephine Mandamin (1942-2019), water walks take place across Turtle Island for

the healing of waters. Each summer, growing numbers of Michigan Tech students and colleagues have joined me to walk with Ojibwa community members for 13 miles around the head of Keweenaw Bay. The fall water walk spans three days and 90 miles, from the KBIC reservation to the tip of the Keweenaw. Ojibwa *kwe* lead while Michigan Tech volunteers support walkers with meals, rest, and other needs. The event presently concludes on Indigenous Peoples' Day, when participants celebrate as an inclusive community reliant on Lake Superior.

Water and fish relations are foundational to strengthening Ojibwa solidarity, as exemplified in the annual Healing Circle Run/Walk. Through the years, healing has expanded more widely across families, nations, *Aki* (Earth), and relations of many kinds. In honor of the 25th anniversary in 2014, additional ceremonies took place, acknowledging long-term Ojibwa efforts to reaffirm fishing rights throughout the region. Today, the Run/Walk path includes 10 Ojibwa reservations, of which the Keweenaw Bay Indian Community is one. Like the water walks, members of the Michigan Tech community participate in annual Healing Circle Run/Walks with the Ojibwa people. Each year, I remember 2014 and reaffirm my commitment to Ojibwa water relations.

In 2014, I joined the Healing Circle Run/Walk with GLIFWC staff at Lac Vieux Desert (LVD). Like other Ojibwa gatherings, there were songs, drums and prayer, a dinner feast, and a gifting ceremony honoring Ojibwa leaders. As people accepted gifts, they shared gratitude and tears. Some shared first-hand accounts at Wisconsin boat landings during the protest years.

The next morning, "Talking Circle" participants gathered at the LVD gymnasium. As a traditional way of sharing with each other, the intention is to speak from the heart on matters of the mind. On this day, more than 80 people were instructed to focus on gratitude. Elders lit *opwaaganag* (pipes) and with the *dewe'igan* (drum) and *nagamonan* (songs) opened with prayer.

Sacred medicines passed through the Circle as participants received *asemaa* (tobacco), smudged with *mshkodewashk* (sage), and shared *opwaaganag*.

“*Minogizhebaawagad*; Good morning to all my relatives, all my relations,” was spoken first in Anishinaabemowin, then in English.

The speaker held *miigwanantig* (staff) by his side and introduced himself according to Ojibwa protocol; others followed his lead: “*Nindonjibaa* (I am from)...; *nindizhinikaaz* (I am called/my name is)...; *nindoodem* (my clan I belong to...); *nindaa* (I currently live)....”

He expressed gratitude for *manidoo* (spirits): “*Miigwech, chi miigwech, gichi manidoo*. (Thank you, thank you so much, Creator.)”

Speaking Anishinaabemowin and English, he acknowledged many relations, *dewe'igan manidoo, mashkiwan* (medicines) *manidoo, opwaaganag manidoo, manidoo nii'kinaaganaa*. He shared gratitude for *bimaadiziwin*, specific ways of being Ojibwa as hunters, fishers, and gatherers in the lands and waters of his ancestors and relatives of today and tomorrow. *Miigwanantig* passed to the next person in the Circle.

One by one, gratitude was expressed around the Circle. Elders talked about relearning *bimaadiziwin* and *Anishinaabemowin*; younger people talked about learning from elders. Gratitude for healing is shared, getting through difficult struggles, overcoming addiction, bringing back *opwaaganag*, and for restored families.

“*Miigwech* to the water,” said a young participant, about 10 years old. “*Miigwech* to the deer, foxes, skunks, and their forests...”

She shared gratitude for the Run/Walk path of wildlife, landscapes, and waters. She instructed us to lay *asemaa* beside animals we may pass on the Run/Walk path. “Thank them for the life they gave so that we can have roads...” she explained.

The Circle concluded after almost two hours.

To ensure every step from LVD to the Red Cliff reservation was traveled by Healing Circle participants, leaders organized mile sections of United States Highway 2. In the next hours, Run/Walk partners completed their sections, and at specific places, we gathered to rest together. At mile marker 41, an elder from Lac du Flambeau (LdF) passed me *miigwanantig*: “You carry this staff in this leg. Remember, keep it above your heart.”

This *miigwanantig*, as all others, has a story rooted in the 1989 Solidarity Relay. In remembrance of Ojibwa water and fish relations, an honor that I did not take lightly, I ran with *miigwanantig* above my heart for one mile on United States Highway 2. As instructed, I remained focused on *nii'kinaaganaa*. I ran for plants and trees, animals, birds, and insects. I ran in reverence for the sun, the moon, and every breath of air that is exchanged between forests and lungs of many kinds. I extended my thoughts to *nibi*, the streams, rivers, and water body movements from lakes to cumulus clouds. My steps included the rocks and algae, fish, turtles, and frogs of today and of tomorrow. When I passed *miigwanantig* to my partner, I realized that I was now a part of the Ojibwa story. The Ojibwa story is one of living with/by/as the water.

Seeing Science at the Tox Lab

The space between contaminated waters and fish advisory information can often be obscured by the complex procedures of risk science. Yet, it is highly structured, with intricate measures and state-of-the-art technology, which aim to sideline human judgment. Two days after my 2014 Run/Walk, I accompanied a GLIFWC biologist to the Lake Superior Research Institute, locally referred to as the “tox lab.” In taking fish samples for mercury analysis, a researcher at the Institute gave us a tour of the facilities. Unfamiliar with actual laboratory settings in 2014, I imagined little of what I might actually see. Primarily, I expected an informational but mundane

tour. In what follows, I use my tox lab observations to highlight a different framework for seeing water and fish, water as a tool and medium for science, and fish and other aquatic beings as scientific subjects and objects.

On the 75-mile journey to the Institute, two red ice chests carry additional passengers—264 walleye, northern pike, and muskellunge (“muskie,”) individually packed, labeled, and frozen. These fish are ready for mercury (Hg) testing. Earlier in the spring, about 450 walleye and other Lake Superior fish took this same journey. From 1989 to this writing, approximately 9,700 fish have traveled to various tox labs from 493 ceded territory waters (Ackley, 2023). Costing \$100 each for the process, these fish undergo Hg analytical testing to inform consumption advice provided in Mercury Maps for GLIFWC’s (2020) 11 member tribes. Funded primarily by federal dollars, only 100 fish per season could be afforded to take this journey for many years. Given that fish are contaminated by a range of organic toxics (e.g., PCBs, dioxins, toxaphene, and more), the tox lab has the capacity to test for additional compounds. However, toxicology analysis for organics raises the price tag to \$300 or more per fish and per toxic substance.

The 264 passengers in the back of the truck, and all those who journeyed before or will in the future, originate from Lake Superior and other inland water bodies throughout the Ojibwa ceded territory. Over the course of weeks, GLIFWC staff have collected fish samples from specific water locations. Some are provided by tribal agencies and collected while conducting seasonal fish population assessments. The remaining fish, one by one, have come from tribal fishers and spearers as they engage in subsistence harvesting. Collecting 12 fish from each lake, GLIFWC compensates willing tribal members \$10 per fish.

In one transaction, subsistence harvesting is transformed into data collection. What was once intended to provide sustenance for an Ojibwa family becomes a scientific “sample.” Various *ogaa*, *ginoozhe*, and *mashkinoozhe* are now lake-specific walleye, northern pike, and muskie who have begun their journey into science.

When we arrived, the GLIFWC biologist proceeded with the tox lab routine. The red ice chests were loaded onto a dolly, wheeled onto an elevator, and escorted to the basement. About halfway down the wide hallway, we stopped by an office to announce our arrival. They were expecting us, and after introductions, they welcomed me to the facility. Following their lead, the samples were carted to data storage. This room has a wall lined with large chest freezers.

My eyes were drawn to laminated signs on the chest freezer lids: “WARNING!” As they readied their paperwork, I walked closer to read the bold printed signage: “WARNING! Hazardous Materials Storage.” Chemist warning symbols, such as the common skull-and-crossbones pictorial, and additional warnings are bulleted, bolded, italicized, and capitalized on the sign as follows:

- **NO FOOD FOR HUMAN CONSUMPTION ALLOWED**
- **NO FLAMMABLE/COMBUSTIBLE MATERIALS ALLOWED**

May Contain: Biological Hazards, Toxic Materials, Carcinogens

Our frozen passengers are bound for these chest freezers. Netted and speared by Ojibwa fishers across territory waters, their fate has become “Hazardous Materials Storage.” Originally bound for a dinner plate, science has deemed them (potentially) unfit for human consumption. The explanation is clear: any item that enters the freezer “may contain biological hazards, toxic materials, [or] carcinogens.”

The ice chest and freezer chest are opened simultaneously. GLIFWC and tox lab researchers have their paperwork ready for synchronized checkmarks.

“Mille Lacs, Muskie,” calls out the GLIFWC biologist after grabbing the top sample.

“Mille Lacs, Muskie,” repeats the researcher and makes notes on their paperwork.

One by one, each sample is announced by name in succession—the lake and the species—then passed from the red ice chest to the realm of biological hazards. This process is repeated 264 times until the ice chests are empty. The chests are placed back onto the dolly and rolled into the hallway. It is time for the tox lab tour.

The first room of the tour contained lab equipment on all four walls: this is where the fish processing begins. Two lab technicians are preparing for GLIFWC fish mercury testing, as they explained. In part or as whole filets, fish are “grinded” together with a standard Kitchen Aid blender, washed, then grinded again, three times in all. The tox lab can grind about 24 batches of samples per day. Afterward, they are considered “homogenized” and ready for “Hot Block” preparation. The batch is divided into samples, and two oxidizing reagents, concentrated nitric acid and sulfuric acid, are added. The Hot Block reaches 150° Celsius and results in sample “digestion,” dissolving any metals contained in the samples. For quality assurance purposes, dogfish samples are added to others in the Hot Block. There, all the samples remain overnight under the “hood.” After digestion, Hg is in its elemental state, and samples are ready for the “FIMS” analyzer. FIMS can only analyze Hg but can do so even in trace amounts.

The tour continued, entering and exiting laboratories with wall-to-wall equipment and technology in various sizes. In one lab, I was introduced to studies on preventing the spread of aquatic invasive species. Filled with water, large metal vessels simulate ballast waters in ships and are used to test varying doses of pesticides on the lives of different invasive fish.

Water and fish relations are quite different in the tox lab. Water is used as a scientific tool to grind and wash, homogenize, and digest fish, an overnight process that reconfigures the relationship between fish bodies and toxicity. Lab water is also used as a medium for deliberate toxic exposure on invasive fish. Simulating natural bodies of water relations with invasive species, the objective will be to sever relations between fish and a ship's ballast waters, invasive or otherwise.

As I walked through another doorway, I heard aquarium-like bubblers. Dimmer and cooler than previous labs, glass tanks lined industrial utility shelves. On a lower shelf, there were also six gallon-sized tanks in a Rubbermaid container (Figure 1). Each gallon tank was filled with a liquid the color of Mountain Dew; a tube was inserted into the top of each and secured by nylon. To see what was swimming around, I squatted down to read: *C dubia* and *D magna* (water fleas) (Figure 2). The water fleas were suspended specks in this fluorescent liquid habitat. But some jars appeared to be empty, so I asked, "Do all these jars have something in them?"

"Oh yeah, those are our *Ceriodaphnia dubia* and *Daphnia magna*. The different jars contain different ages of those species. If you look over here...."

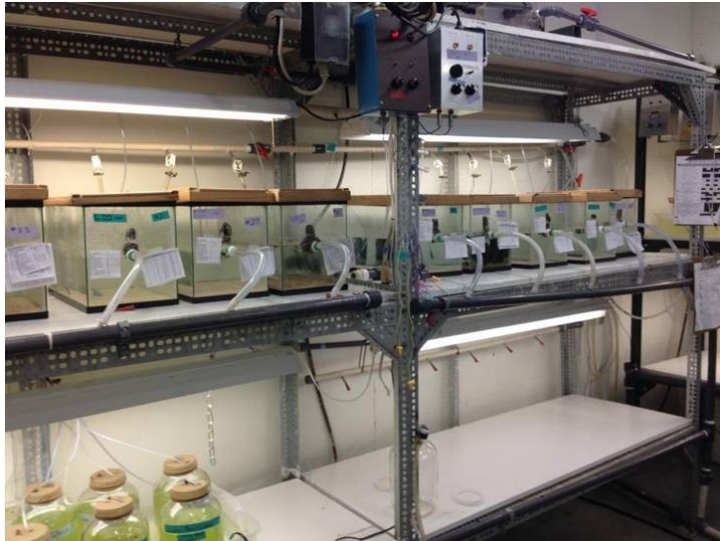


Figure 1. Industrial utility shelving with glass-sided tanks and gallon jars each with their own pump. UW-S LSRI.

(Source: Photo by Author 2014).



Figure 2. "Mass Culture" in Rubbermaid Clever Storage on floor shelf. UW-S LSRI. (Source: Photo by Author

2014).

She drew my attention to hanging clipboards near the tanks and an adjacent wall of charts, tables, and graphs. I recognized some of the acute toxicity terminology and acronyms, such as LD50. LD50 indicates the amount of a toxic substance, the “lethal dose” that would kill 50% of a test population. She explained that these different species are used for toxicity testing of heavy metals and other chemicals.

“Someone comes in and feeds them every day. See the feeding charts?” She pointed to a clipboard. “Even on weekends and holidays, they’re fed every day. It’s usually the grad students or an intern.”

I pointed to the gallon tanks near the floor and asked, “What are they used for?”

“Those are our sensitive populations. The *C. dubia* are our most vulnerable population. Those,” she pointed, “are less than 24 hours old.”

Language and practice in the tox lab separate water, fish, and toxicity. These disconnections are routine in contemporary water policy and the science of toxic risk. The tour ended shortly after I observed water flea lives organized by utility shelves, feeding charts, and toxic exposure. These practices are starkly different from those I experience with the Ojibwa. Running on Highway 2 in the Healing Circle Run/Walk, I likely ran for the fish “samples” and the water fleas with *miigwanantig* above my heart. I am almost certain of it. Two days later, I observed toxic samples allocated to a chest freezer and water fleas in a liquid-gallon habitat awaiting an inevitable toxic exposure.

Reimagining Water Justice for Seven Generations

As the KBIC elder stated at the beginning of this article, responsibilities associated with contaminated fish reside with decisions related to water, which, thus far, have burdened Ojibwa communities with impossible decisions on harvesting and consuming fish. Restoring the well-

being of water and fish bodies cannot be resolved by those presently burdened by contamination. Scientific frameworks used in tox labs are integral to contemporary water governance and the systemic paradigms that guide this work. Yet, these practices were early reactions to learning about contamination, constructed to address the reality of living and working within toxic environments (Nash, 2006). Living with contamination is highly contentious for some yet routine work for others. Water justice must be reimagined.

Inclusive of Indigenous peoples, the current governance regime presents a timely opportunity to do justice. My engagement with Lake Superior Ojibwa, coupled with an examination of science and policy practices, allowed me to discern different ways of seeing and doing water justice. In what follows, I provide a broader justice framework for water lives and livelihoods, arguing for a foregrounding of Indigenous water justice ethics based on the well-being of seven generations.

Justice Seeks to Make the Invisible Visible

The obscurity of calculating toxic risk for water policy is as clear as Mountain Dew: toxic lives are subtracted from toxic deaths. Decades of life-and-death ratios have contributed to scientifically sound and legally defensible knowledge caused by a range of toxic compounds. Contemporary water quality standards could, in theory, protect Ojibwa fishing desires. However, approaches used to determine water quality and “safe fish” merely reshuffle subjects and objects, and protection and harm, across an immense world of life. Consequently, burdens accumulate and are invisibly reconfigured in novel ways (Nash, 2006). In various realterations (Murphy, 2017), harm is redistributed in particular places and lives: in *Gichigami* and waterscapes worldwide; in *ogaa*, *ginoozhe*, and *maashkinoozhe*; and dogfish, “invasives” suspended in ballast waters, in fish-reliant community decisions, and in water fleas less than 24 hours old. Altering

lives and livelihoods does not align with *nii'kinaaganaa*. Transferring harm, toxic or otherwise, from one body to another is not justice. Yet, as the tox lab experience revealed, these practices have been made essential to contemporary water policy and everyday decisions on “safe fish.”

Technical language also contributes to the invisibility of toxicity and harm. Often hidden in policy language, some terms represent existing toxicity and risks. For example, various “health criteria” are used in the development of protective standards; criteria as ratios of “acceptable risk” refer to the acceptance of potential harm. Similarly, water quality “standards” are the permissible levels of various toxic compounds accumulated in particular water bodies. Harm is also rendered invisible by scientific terms (and more quickly by their acronyms). Terms such as “reference dose (RfD)” or “risk associated dose (RAD)” and “lethal dose (LD50)” were/are determined by real harm. Accidental in reality or intentional in laboratories, exposure results inform policy decisions for the public. However, protection is rarely intended for those subjected to the initial harm; it is intended for others who may be potentially exposed elsewhere (Nash, 2006; Vogel, 2012). This elucidates the experience of “sensitive populations” as lives unrecognized and/or not prioritized: no consent has been given (Whyte, 2020). Accepted as routine toxicology, harm becomes erased in scientific language, translated into “thresholds” and/or labeled as “cohorts.” These terms represent actual bodies of harm that span broader spatial and temporal scales but are invisible in the everyday work of water policy. I encourage us researchers and policymakers to take pause when using these terms, acknowledging the lives and livelihoods harmed so that we may know.

Justice Restores and Protects Relationships of Many Kinds

Acceptable practices in science cannot be assumed to be acceptable practices for others. Contemporary frameworks calculating protection for water bodies (and fish consumption)

directly counter lifeways centered on *nii'kinaaganaa*. For the Ojibwa, water is life, and *Gichigami* practices enact desires to be in good relations with, and restore healing of, more-than-human life and livelihoods. Contemporary water policy goals articulate “swimmable, drinkable, and fishable” waters, often undervaluing and/or fatally disregarding more-than-human relatives to achieve (a subset of) human-centered goals. Restoring fishable waters currently requires widening harm to countless aquatic species as unconsenting subjects in standard acute toxicity tests. Gifts of *ogaa*, *ginoozhe*, and *maashkinoozhe* become hazardous, homogenized waste, while dogfish lives are reduced to quality assurance. For the Ojibwa, water and aquatic life are relatives, lives and livelihoods not intended for deliberate toxic exposure. This raises serious ethical implications for some contemporary sciences to be used in restoring water bodies and, indirectly, Indigenous fishing practices.

For water justice to be realized, priorities need to be inclusive of relationships of many kinds. Indigenous water justice necessitates a shift from anthropocentric goals to governance that considers the well-being of more-than-human bodies (McGregor, 2014; Robison et al., 2017; Watts, 2013). Water and fish bodies relations, for example, are rarely accounted for and unrecognized as communities in need of justice (Abram, 2021; Mueller, 2021). In an era of revitalization, contemporary Ojibwa nations enact practices to strengthen relationships, disembodying harm for relatives of many kinds (Gagnon & Ravindran, 2023). Exemplified in annual water walks and Run/Walks, healing relationships between lands, waters, and human bodies are deliberate engagements. We also are witnessing *nii'kinaaganaa* solidarity at larger scales. Judicial cases on the legal personhood of ecological systems and water relatives are growing. Citizens of Ohio are aiming for legal personhood of Lake Erie (Chiasson, 2019); Ojibwe citizens are exerting rights on behalf of *manoomin* (wild rice) (LaDuke, 2019); and legal

personhood for Magpie River in Canada is now official (Townsend et al., 2021). Across the world (e.g., Florida and California in the United States, India, Ecuador, and New Zealand), exerting human law in recognition of natural law illustrates water justice (Van Horn et al., 2021). To ameliorate *nii'kinaaganaa*, healing across human generations will be an important first step.

Justice Remembers So That We May Never Forget

Indigenous governance principles are rooted in thousands of years of living with the water to inform decisions for the future (McGregor, 2014). The seven generations philosophy is shared among Great Lakes Indigenous peoples and beyond. This commitment ensures that Indigenous rights and responsibilities are sustained for generations to come while simultaneously honoring generations past (GLIFWC, 2020; Whyte, 2018a). Similar ideas were put forward in the Precautionary Principle. Born out of substantial global concerns about contamination, extinction, and depletion, the Wingspread statement on the Precautionary Principle states (SEHN, 1998): “When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.” The intention is for this Principle to be applied in decisions by governments, corporations, communities, and scientists even while scientific certainty is absent.

Indigenous peoples retain inherent responsibilities to water and water relations, a commitment from time immemorial and in perpetuity. This commitment was maintained and remains sustained in seven generations of treaty rights to water and water resources. In doing so, Indigenous nations agreed to share water governance rights and responsibilities with others.

Accepting contemporary conventions of water as environments, ecosystems, or natural resources does not mean that water cannot be known as more. Water’s importance in socioecological relations extends beyond water as a medium, habitat, or resource for human-

centered needs. Scientific water paradigms can be transformed as they have always been. We can (re)learn to recognize water as a living force and to respect water teachings in humility. Lakes and rivers are water bodies living in relation to local and global forests, relatives of migrating birds and monarchs, and in constant reciprocity with seasonal moons and wind currents in ways we may never understand (Abram, 2021). *Nibi gaye nii'kinaaganaa* are the waters of which I am a part. Indigenous water justice must be remembered so that we may never forget.

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