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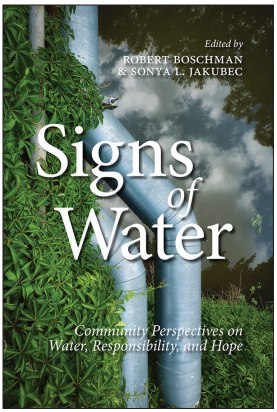

SIGNS OF WATER: COMMUNITY PERSPECTIVES ON WATER, RESPONSIBILITY, AND HOPE

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When Water Isn't Life: Environmental Justice Denied

Denise L. Di Santo

Water and Cultural Continuity are Linked

I looked around the hamlet of Fort Chipewyan, nestled on the vast and beautiful shores of Lake Athabasca in northern Alberta. Commonly referred to as Fort Chip, it is also known by some to be the oldest settled community in Alberta, established in 1788. For those who know the real history, this place was occupied much earlier in time, named in recognition of its inhabitants, here long before European fur traders arrived. In the midst of thought, and seeing for the first time the area as it is, dominated by water, the words of my new friend, local to the area, resonated oddly. He said very directly to me, "don't drink the water." But what struck me most was that this wasn't the first time I had heard of this advice being given.

As the conversations continued during my visit to Fort Chip, it became very apparent that illness affecting the community was being linked to the local drinking water. Driving past the graveyard in town, I noticed most spaces within the confines of the white picket fence were taken. When I asked if the rare bile duct cancer mentioned was occurring in one segment of the population, I was told that it was showing up in all ages in the members of the community. There seemed to be no question in my friend's

mind and in the minds of others with whom I spoke: this full graveyard reflected the health of the local residents and the health of the water.

The perception that the illnesses presenting in the community were connected to local waters mirrored another community's observations I had come to know in another place and time. The residents of South Tucson had contended with a similar situation, where many believed that the aquifer that served as their water supply was tainted and was bringing illness and death. These perceptions were questioned and negated by government officials and others in the region for decades, but the community was eventually proven correct. Indeed, there was much to be concerned about, and it was in the water.

A common theme observed in the field of environmental studies is one in which Native American and minority communities are disproportionately affected by environmental contamination. All too often, untenable situations unfold where irresponsible and unaccountable development and industrial practices persist over time, resulting in degraded watersheds and water resources. In other words, local surface and groundwaters become a source of concern rather than a source of reliable drinking water. For Indigenous communities, this often translates more broadly and more profoundly. The connection with water, land, and the natural world forms the critical, supportive structures of culture and spiritual belief systems.

Across Canada and the United States, Indigenous and underserved communities continue to find themselves in local battles to conserve their way of life and livelihoods. For the community of South Tucson, accepted industrial practices that led to the contamination of the sole water supply resulted in widespread impacts on community health. Expansive oil and gas development and other extractive industries in northern Alberta have led to the disconnection of First Nations communities with traditional lands and practices, and subsequently, threatened cultural continuity. In other places, such as the Pacific Northwest, ecosystems that once supported salmon have been degraded to such an extreme that millions of restoration dollars and over a decade of efforts by dedicated experts have not restored watersheds or recovered species to the extent that local tribes can harvest their "crop." Indigenous communities have found themselves on the frontlines to protect water and land, their very means of existence, since the arrival of early settlers. Despite regulation and protective

guidelines to manage water, decisions that benefit the economy fail to account for how they adversely affect the environment—the very foundation of all human economies. There is a lack of accounting and accountability for the costs ultimately borne by local communities. It is time to change our relationship with water.

This chapter provides environmental justice context for the characterization of impacts that stem from decisions made without regard for ecosystem or human health. What follows are watershed-based examples highlighting the lack of consideration for local expertise and values, and failure to integrate key perspectives into decisions affecting local waters. Also included is an exploration of community response to impacts and approaches taken—and not taken—to address the effects of pervasive and flawed decision-making approaches to managing natural resources.

Environmental Justice and the Evolving Frontline

Involving people in decisions that affect their community is needed along the path toward achieving the goals of environmental justice. Traditionally, environmental organizations and groups typically did not address the concerns of minority and Indigenous communities. This is changing. Those citizens and groups historically concerned with *environmental equity*—community leaders and associations, labour groups, and some religious organizations—are pushing for meaningful involvement in decisions that affect underserved communities. Recently, Canadian First Nations as well as Native Americans have been pushing for the opportunity to set environmental policies and direction by leading the dialogue to make decisions that affect water in their communities. Here lies the opportunity to shift to a trajectory of sustained watershed health.

Environmental racism is a term coined by Robert Bullard (1993). *Environmental justice* has evolved and expanded out of this term. Environmental racism refers to a state in which some racial or visible minority groups are environmentally worse off than other groups within the broader society. The term focuses on unequal protection from environmental hazards and identifies the conditions that lead to environmental racism. According to Bullard: "Ecological inequities in the United States result from a number of factors, including the distribution of wealth, housing, and real estate practices, and land use planning … . Taken together,

these factors give rise to what can be called 'environmental racism': practices that place African Americans, Latinos, and Native Americans at greater health and environmental risk than the rest of society" (1993, p. 319). While problem identification is associated with Bullard's definition of environmental racism, solutions and ideal states are associated with the term *environmental justice*. For the purposes of this discussion, environmental justice is defined as the achievement of equal protection from environmental and health hazards for all people, regardless of race, income, culture, or social class.

Moreover, another related term employed above, *environmental equity*, asserts that no person, group, or community should hold greater privilege or right to environmental resources over others, and refers to the "equal protection of environmental laws" (Bryant, 1995). Defining environmental equity merely in terms of risk becomes problematic, as the location of environmental hazards does not simply correlate with risk to health. Therefore, epidemiological evidence must also be weighed in order to determine risk to communities and individuals. This is part of the solution to achieving environmental justice. Environmental racism and inequity are sometimes used interchangeably with environmental justice, but it is important to note that they have different meanings, that there are differences in what constitutes "discrimination" and "inequity" so that practical policies and decisions can be made to address the problem of environmental inequity.

In a discussion of government-based remedies for "environmental injustice" by Ringquist (1997), the point is made that it is necessary to look at discrimination either in terms of intent or in terms of outcomes. When the decision-making process produces discriminatory outcomes, a question arises: Are these decisions always legally actionable or only if there is actual discriminatory intent behind the decision? As Bullard (1995) points out, not only is the burden of proof on affected individuals or communities to prove harm and discrimination, but proving intentional or purposeful discrimination in a court of law is next to impossible.

While the environmental movement began in the late 1960s and 1970s, the environmental justice movement came to the fore in the 1980s. During this time, residents of the predominantly African-American Warren County, North Carolina, fought the disposal of polychlorinated biphenyl

contaminated soils in a local landfill (Bullard, 1990). This is considered a watershed event in the movement in the United States, as it called national attention to the association between toxics and poverty.

The environmental justice movement is fundamentally different from the environmental movement. Participants in the environmental justice movement generally claim working-class roots, focus on local environmental problems, are concerned with human health, employ a grassroots style, and attempt to democratize science and politics (Gottlieb, 1993). The environmental justice movement has its roots in minority and low-income community participation. This is in contrast to the environmental movement in which middle- and upper-middle class individuals are typically involved with issues affecting natural environments in general. Furthermore, the environmental justice movement may be credited with redefining "environment" since environmental justice concerns include all aspects of an individual's living environment, natural or urban, including in a recreational or occupational setting. The environmental justice movement is a response to environmental and social issues at a local level, with the potential to expand globally to national and international levels as natural resources and the natural capital base, in general, are depleted.

As early as 1971 federal regulators in the United States recognized that exposure to environmental pollutants was not distributed equally: minority communities experienced disproportionally high levels of environmental risk (Ringquist 1997, citing U.S. Council on Environmental Quality, 1971). Yet it was not until 1990 that the first national gathering on environmental justice occurred. This event, a conference held by the University School of Natural Resources, resulted in the formation of the Michigan Coalition. This coalition then drafted a letter to the United States Environmental Protection Agency (USEPA) demanding action on environmental risks in minority and low-income communities as well as on tribal lands. William Reilly, then administrator of USEPA, set up a working group, which resulted in a two-volume report, *Environmental Equity: Reducing Risk in all Communities*, one of the first steps taken by the agency to formally recognize a link between minority, low-income, and underserved populations and potential exposure to environmental toxins. The 1992 report recommended that USEPA and other government agencies expand their outreach programs to ensure that minority and

low-income communities are included in the policy process. In order to achieve such an outcome, the report recognized the need to work with local and regional grassroots organizations. In addition, the report made clear that "the language, format and distribution of written materials, media relations, and efforts in two-way communication could all be improved." The National Environmental Justice Advisory Council (NEJAC), a federal advisory group to the USEPA, thus developed a Model Plan for Public Participation.

The Model Plan for Public Participation, as outlined by NEJAC, contained two guiding principles and four critical elements. According to the NEJAC Model, the two guiding principles of public participation are to (a) encourage public participation in all aspects of environmental decision-making; and (b) maintain honesty and integrity in the process and articulate goals, expectations, and limitations. The guiding principles of the model stress equal partnerships among stakeholders and agencies. How does this model regard Indigenous communities and recognize the unique position they hold as rights holders? There was also a stated recognition that building successful partnerships is important, and that "interactions must encourage active community participation, institutionalize public participation, recognize community knowledge, and use cross-cultural formats and exchanges" (National Environmental Justice Advisory Council, 1994).

During the same year, in 1990, the Indigenous Environmental Network (IEN) was established. This organization is an example of grassroots response to environmental degradation in the context of cultural-environmental injustice. The IEN is currently based in Bemidji, Minnesota, but works across the United States and Canada, and more recently has operated more globally. According to their website, the mission of the Indigenous Environmental Network "is to protect the sacredness of Earth Mother from contamination & exploitation by respecting and adhering to Indigenous Knowledge and Natural Law."

In 1994, U.S. President Bill Clinton issued executive order 12898, "Federal Actions to Address Environmental Justice and in Minority Populations and Low-Income Populations." It called on federal agencies to make environmental justice part of their mission. Twenty years later, under the Obama Administration, the USEPA launched Plan EJ 2014, a

set of strategies to recommit and reinvigorate the environmental justice efforts of that agency. Fast forward to 2017 and contrast this history of presidential action on environmental justice to the newly formed U.S. administration's expressed intent and actions to roll back those efforts initiated under the Obama Administration. Citing concerns of the impacts of the proposed policy shift, and the anticipated failure to address environmental justice, the USEPA Environmental Justice Director resigned.

In Canada, attention has turned in recent years to the plight of First Nations relative to water supply and other natural resource issues. Of all the drinking water advisories in Canada, almost 10% were in First Nations communities, yet Indigenous populations make up just four percent of the total population (Jeffrey, 2016). Many First Nations have been on boil water advisories for decades; more than a significant percentage of communities have been forced to boil water for their daily use on a continuous or repeated basis. This lack of access to water can be attributed to many factors and often under different scenarios. However, in many instances, these communities are not equipped with adequate treatment facilities, or lack trained operators to maintain existing facilities so that they can safely treat and serve water to their communities. Further, many communities draw drinking water from wells and from a questionable or, in some cases, a clearly contaminated water source. The Safe Drinking Water for First Nations Act of 2013 is an example of federal legislation not delivering on its name, in part because it was developed and enacted without collaboration or consultation with First Nations.

In late 2015 through early 2017, the Standing Rock Sioux Nation drew support from both Canada and the United States when they were faced with a potential threat to the local river and waters they rely on. "Water is life" became the battle cry of the water protectors. The Dakota Access Pipeline (DAPL) was proposed for hazardous hydrocarbon conveyance through traditional lands. This route was chosen after the citizens of Bismarck, North Dakota protested the pipeline that would cut through lands about ten miles away from the town. These conflicts continue to play out, as decision-making approaches and regulatory frameworks do not provide for inclusive and meaningful dialogue that reflects community interests and the realities of critical connections with water.

Tucson Basin, American Southwest

Tucson Tide
Blue darkening skies
Monsoon's precious water falls
Desert dust swirls

Water as Currency in the Lifeblood Exchange Economy

The Tucson basin stretches approximately 1,000 square miles within the Sonoran Desert in the American Southwest. A land of intrinsic beauty, it is also home to a diverse human population, including the Tohono O'odham Nation that comprises the second largest Native American land holding in the United States (their lands are now fragmented through artificial divisions that have come under further threat with a proposed border wall between the United States and Mexico). This division of Tohono O'odham lands has resulted in an artificial division of the society. Adjacent to the designated reservation lands of the Nation is South Tucson, a small, racially diverse city, with over 80% of the population identifying as Hispanic or Latino.

Expanding on my research and study of the extent of groundwater contamination in Tucson, I had reached out to a long-time resident and community leader of South Tucson. She looked across the table at me. I listened to her account of the community's experience that had begun years earlier and was continuing to unfold. When she said the words "economic extortion" I understood, with a new appreciation, the level of complexity and impact that contaminated groundwater can have on an affected population. The observation and connection being made was stated very clearly to me that day in 1997 in the dry desert lands of Arizona.

Health problems among south-side Tucson residents are connected to the indiscriminate and unregulated dumping of industrial wastes that occurred over a period of 30 years beginning in the 1950s. It has been estimated that more than 4,000 gallons of the volatile organic compound, trichlorethylene, drained into the aquifer near the Tucson International Airport during that time. At the time of discovery, the toxic plume had

migrated to reach a length of over six miles underground. The areas in greater Tucson most affected by hazardous wastes are where low-income households are located, and where the vast majority of residents are visible minorities, namely in South Tucson.

Prior to 1981, groundwater wells drawing from the federally designated sole source aquifer (SSA) within the area provided drinking water for over 47,000 people. An SSA is the only water available and therefore critical to supply a local population. It would be decades before the connection between groundwater contamination and health of the South Tucson community was officially recognized. This public unveiling of the impacts of standard industrial practices was the result of water monitoring required under new legislation in 1980. It was then that the federally designated sole source aquifer became part of the ten-square mile federally designated "Superfund" site.

The legislation that governs these officially designated contaminated sites is known as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). It is more commonly known as Superfund, referring to the federal trust fund from which moneys are allocated yearly to sites under the federal cleanup program. CERCLA, and its amendments, established prohibitions and requirements concerning closed and abandoned hazardous waste sites and provides for liability of persons responsible for releases at these sites.

In the case of the Tucson International Airport Area (TIAA) Superfund site, listed in 1983, the contaminated water and soil were the result of aircraft refitting and manufacturing operations by several aircraft companies—primarily contractors of the U.S. Department of Defense. These contractors provided a very significant portion of jobs in the area, ultimately at the expense of public health. Thus, the phrase "economic extortion" resonates. In other words, the externalized costs to the local environment—or costs of doing business—were borne by local residents over time through contact with the toxins in the water and living environment.

Stages of Community Response to Contaminated Water

Public participation at the TIAA site began long before CERCLA legislation was enacted or TCE was officially recognized to be in Tucson's municipal water supply, and so it was, in a sense, unscripted for many years

prior to the Act. Brown's Model of Popular Epidemiology (Brown, 1993) is useful to put the community response and history of community involvement into perspective. The model explains how laypeople or communities detect and act on environmental hazards and diseases. It is based on a similar case of water contamination in Woburn, Massachusetts, which is strikingly similar to the South Tucson situation.

In the 1970s, local Tucson residents like Melinda Gonzales noticed that several of her neighbours were being diagnosed with lupus and cancers, including leukemia (Kay, 1985). She began to identify clusters in the neighborhood where the affected people lived. By this time, residents had noticed, separately, both pollutants and the illnesses. This is identified as the first stage in "popular epidemiology," the phenomenon in which non-experts detect and act on environmental hazards (Brown, 1993).

Residents then began to hypothesize that there was a connection between their illnesses and their environment. In popular epidemiology, this is identified as the second stage of community response (Brown, 1993). Some local people thought that they may have been exposed to radiation in the area. Speculation that health problems may be linked to the water supply began with one resident suggesting that a high salt content was causing his plants to do poorly. A more dramatic statement was made by an eighteen-year old, days before he died from cancer; his words to his sister were "don't drink the water" (Kay, 1985).

In the third stage, community residents share information and gain a common perspective. This third stage is also evident in the Tucson situation. People with access to information and links in the neighborhood, such as public health nurses, teachers, and the clergy, showed others their findings. After her husband died of lymphoma, a volunteer nurse at a church school who lived in the affected area made a list of local people afflicted with serious illnesses (Kay, 1985). Other residents found that the health of their neighbours became a common topic of discussion during local gatherings.

The next stage that is apparent as a community response is the pursuit of knowledge from health officials and scientific experts (Brown, 1993). Doctors were contacts as a matter of course when people became ill. Aside from this, *The Arizona Daily Star* newspaper enlisted the help of experts to pursue health surveys and to interpret the results of their findings.

Dr. Michael Gallo, Chairman of the Department of Environmental and Community Medicine at Rutgers Medical School in New Jersey, noted in 1985 that the clusters of illnesses were significant. However, he also stated that he could not cite any scientific or experimental evidence linking TCE to the diseases. A researcher at the National Cancer Institute and a local brain surgeon suggested that there might be some links, but that the population size was not large enough to make the findings statistically significant (Kay, 1985).

Angry residents eventually organized into groups to pursue their investigation; this occurred in Tucson after the 1981 detection and public announcement of TCE in some private and public wells. Organizing in this way is seen by Brown (1993) to be the next stage in popular epidemiology practice. News articles in *The Arizona Daily Star* published as a reprint series in May 1985 led to heightened awareness and anger among the affected residents of Tucson's south side. At this time, a primary interest group called Tucsonans for a Clean Environment organized in response to the contamination problem and health concerns of the community. The group sent a petition to the USEPA in July 1987 pressing for government support for health services and medical monitoring of south side residents who had been exposed to trichloroethylene. By 1992, this group had a mailing list of over 600 citizens (U.S. Environmental Protection Agency).

Other groups eventually contributed their support to the community residents. Included were the Toxic Waster Investigative Group/Arizona Environmental Coalition, the Human Ecology Action League, the Sierra Club, and the Southern Arizona Environmental Council. In response to community interviews conducted by the EPA in June of 1989, the community listed several concerns, which had not changed significantly since the community relations plans were completed for the Superfund process in 1982 and 1986 (U.S. Environmental Protection Agency, 1992). Among these concerns were health effects, total cleanup of groundwater contamination, air quality, property values, the credibility of government agencies, and the potentially responsible parties.

The sixth stage of community response develops when government agencies get involved as a result of citizen group pressure. As studies are conducted, there is often inconclusive evidence linking the contaminant to health problems (Brown, 1993). This is certainly true in the case of

Tucson. In 1985, Pima County's Health Director dismissed the community's concerns during a public meeting, blaming their ills on lifestyle practices. Residents were offended and outraged at the flagrant response. Lloyd Novick, Director of ADHS from 1984 to 1986, responded to concerns by forming a committee made up of ADHS and County Health officials, outside scientists, and interested parties to review available health data. The Committee on Suspected Illness in Southwest Tucson completed the review in 1986. As recommended, a two-part study on the health effects and past TCE exposure was carried out by the ADHS.

The research indicated that there were "no adverse health problems or unusually high number of deaths that would have received exposure to TCE." But there was one exception to this first phase of study: there was a statistically significant increase in leukemia for males aged five to nine (U.S. Environmental Protection Agency, 1992) during the period between 1969 and 1985. However, a second study for the period of 1970 to 1986 concluded that there was no significant increase in rates of various cancer types in the community. Enraged residents chose not to accept this finding. This led to the next stage, in which residents enlisted the help of experts to conduct their own study.

Community residents insisted on "more accurate" future studies and monitoring of their community health. The residents brought in nationally known scientists as part of the legal process of the lawsuit that was to follow. In response to community concerns, the state and county funded the TCE Program at the El Pueblo Clinic in a south Tucson neighbourhood. As described in a clinic information pamphlet, the program "provides outpatient primary care services for individuals who have lived, worked, or attended school in the contamination area between 1945 and 1981." The public funding is limited to aid those who do not have other health insurance coverage, and not all services are funded.

The lawsuit brought in federal court represents the eighth stage of litigation and confrontation as identified under Brown's model. In 1991, after six years of litigation, the residents of the affected south Tucson neighborhood were successful in their pursuit of problem recognition and compensation. Hughes Aircraft Company agreed in an out of court settlement to pay 84.5 million dollars. After legal fees and court costs, approximately

1,600 litigants were awarded 49.2 million dollars (Coile, 1991). Other lawsuits followed.

In this stage of the popular epidemiology model, the community pressed for corroboration of their findings by officials and government agencies. For its part, USEPA officially identified trichloroethylene as a "B2 Carcinogen" which means "probable" based on animal studies. The agency approved a Maximum Contaminant Level (MCL) of 5 parts per billion (ppb) in drinking water in 1989.

In 1991 it was announced that four new studies tied south side illnesses to the tainted water supply (Bagwell, 1991). The Dallas law firm that handled the lawsuit paid for the studies to be conducted by three researchers. One study found that the contaminated water "caused or substantially contributed to" illnesses in the local residents including cancer, lupus, multiple sclerosis, and scleroderma (Bagwell, 1991). The other studies reported similar findings and added that the presence of fourteen other chemicals in the water may have had a synergistic effect. Since the Tucson community is the largest to be affected by widespread contamination of a primary water supply in the United States, it continues to be under study by medical researchers and the Agency for Toxic Substances and Disease Registry (ATSDR).

The controversy over the health effects of TCE continued with two reports issued by the ATSDR in 1996 in which no conclusive evidence of TCE effects in the Tucson community is reported (ATSDR, 1996). This was received with skepticism and anger among the community. Local doctors disagreed on the hazards of TCE and human health (Nash, 1997; Abrams, 1998; Orient, 1998). To many residents of the South Tucson community, the effects of TCE on their community are very real and most report knowing someone whose health has been compromised or has lost family members due to illnesses connected to TCE exposure.

Several years later, the south Tucson community became a model for EPA's public participation process at Superfund sites. On the heels of a long history of calls for answers from local leaders and health practitioners regarding the effects of the hazards placed in their community, it became a positive part of the story, at least in terms of increased involvement of the community in remediation decisions. Although progress has been made at great expense to residents, corporations, taxpayers, and local

ecosystems, the aquifer will never be recovered to its pre-contaminated state. More recent news reports that the community of South Tucson is embroiled in a new struggle, again linking illnesses in the community to another industrial contaminant found in the water (Davis, 2017).

Athabasca Watershed, Northwestern Canada

This place, Chipewyan
Pain, love, and beauty
In the sands and water shine
To be reconciled

Cultural Discontinuity as an Outcome of Watershed Degradation

The Athabasca glacier is part of the family of glaciers that make up the Columbia Icefield in the Rocky Mountains and serves as the headwaters of the river that carries its name to the Peace-Athabasca Delta and into Lake Athabasca. The Athabasca River, unhindered by dams, flows for over 1,200 kilometres. It is the largest river set entirely in Alberta, although a small portion of its approximately 100,000 square kilometre watershed crosses into Saskatchewan. A water basin rich and diverse with pristine mountains, plains, wetlands, and boreal forest connecting the landscape, it is juxtaposed with one of the most intensive and extensive industrial developments on the planet. The same could be said for the basin's polarized and conflicting socio-cultural make up of rich traditional cultures existing alongside wealth traded for the health of land and waters. The importance of natural hydrologic connectivity to ecosystems and culture in this landscape cannot be overstated.

On the eastern shore of Lake Athabasca is Fort Chipewyan, a community primarily shared by First Nations and Métis people who have settled over time along the water. Transportation into and out of the community is limited to air travel and winter roads, but accessibility by land may change as the climate warms. The rich ecological setting of this lower basin area is protected to a limited extent through the protected areas of Wood Buffalo National Park and the Athabasca Dunes Ecological Reserve. Although this watershed begins and ends with artificially delineated and

reserved areas of special interest with "protected" status, including Jasper National Park in the headwaters, landscape alterations made outside of those areas are in sharp contrast to the relatively intact, but vulnerable ecosystems of these reserve and park lands. The effects of intensive mineral extractive operations permeate the land and water beyond developed project areas, and the fallout includes the uprooting of Indigenous people and culture.

There is a long history of cultural disruption here. Problems seen today stem from imposed societal structures that replaced fundamental ways of being and knowing. Taking land from the people and taking people from the land are a pervasive theme and reality. Changes in ecosystem health within this watershed have been observed and documented by people that are most connected to the land—fishers, trappers, hunters, and gatherers of food and medicines. Perhaps the most politicized situation came in 2009 with the reporting of fish caught in Lake Athabasca with physical deformities. The official closure of the fishery followed in more recent years. One resident of Fort Chipewyan described the loss of species noted more recently in his thirty years of working his traplines; birds, beetles, and fish seem to be nearly non-existent and water levels are not predictable as they once were. A local Dene hunter also explained that government officials have advised that the organ meats of ungulates, significant for traditional use and food source, are no longer safe to eat (Jerry Adam, Personal communication, June 2017). To make the matter worse, rare bile duct cancers rates within the community are perceived to be connected to the water, and many residents no longer trust their water supply. The impacts on culture and community health are in lock step with the degradation of ecosystems.

The irony of these situations brings into question the criteria for decisions that are made, and to what and at whose expense. Consider the loss of the commercial fishery: the much anticipated and newly constructed fish processing plant in Fort Chipewyan stands mothballed and is never used. Consider the seventy-year-old elder and former fisher who, with little choice in means to support himself and his family, asks the land for forgiveness while he operates heavy machinery in the oil sands industrial development in the lower Athabasca. Meanwhile, large blue plastic containers of water are carried into the Athabasca Chipewyan First Nation

elders lodge, adjacent to the sandy shores of Lake Athabasca, this lake once the provider of water and food security. This is "cultural genocide"—people are disconnected from land and water that make up their very essence and way of life. What happens to the relationship between land and spirit when access to traditional lands is removed and spiritual practice is hampered?

Environmental and ecosystem changes in the Athabasca basin have been widely studied and documented. Evidence of anthropogenic landscape change is contained in historic and contemporary maps, volumes of scientific and personal journals, satellite imagery, monitoring and observational data collected by scientists and local people over time, and perhaps most revealing, in the stories told by First Nations and Métis people of the area. These sources are all key pieces that exist to inform and guide decisions that are needed today, and are, in fact, necessary to improve watershed and community health going forward.

Indigenous peoples have established protocols and practices under which they manage themselves and coexist with other species in the landscape. But unlike others, who make decisions that run counter to nature, Indigenous knowledge and experience span thousands of years, wherein they belong to the land, not the other way around. Spiritual, physical, and mental well-being are at the heart of decisions made by Indigenous leaders and communities, with actions held to a long-term multigenerational standard of care. As such, respect is given to the relationship with other species and effects on others long into the future. A Dene elder with roots in the Fort Chipewyan area describes the sacred connection and dialogue with nature and all its beings as creating a "spiritual symbiotic relationship with the land" (Patrick Deranger, Personal communication, October 2017). This relationship and regard for nature aligns with true sustainability, in ways necessary for maintaining life across landscapes and temporal scales. However, under pressure that comes with increasingly scarce resources, and specifically with reduced access to land, water, and food, a sustainable way of life is in critical disarray in the Athabasca basin. It follows that disconnection from land results in a loss of "sense of place" and may then translate into a profound loss of "sense of self."

Adding to the burden of lack of access to resources, large swaths of the lower Athabasca basin have been taken into production, with developed

sites left in a degraded state over long periods of time. New hydrocarbon extraction projects come on line and developed oilsands project areas remain non-functional. Pipelines built to carry the extracted hydrocarbons from the area create additional, linear disturbances at the physical sites they occupy, along with the access roads that interfere with habitat. Taken together, these features impose disruption to hydrology and access to land. Developed oil project areas no longer provide ecosystem goods and services; where habitat has not been taken, unhealthy habitat for a multitude of species has been created. The cumulative impacts to the watershed known as "death by a thousand cuts" are mostly unabated and continue to mount under obliteration that compounds on a massive scale.

There seems to be no hard deadlines to decommission projects and rehabilitate lands and water that have been extensively degraded. In spite of a requirement for land reclamation plans, there is little movement by industry toward large-scale reclamation due to assigned activity status, let alone toward rehabilitation, remediation, and the ultimate state of restoration. A very small percentage of affected land and water has been reclaimed. Restoring ecosystem and watershed health and, more specifically, hydrologic function and processes is not realistic under current technological and financial capability, or corporate willingness. This landscape, with its reduced capacity for supporting life, has deep scars that may never be healed in current lifetimes. The enabling conditions and incentives for restoring water and land to the previous state that would support healthy, sustained ecosystems and communities in these areas of the basin do not currently exist.

Water is a treaty right, also enshrined in the Canadian *Charter of Rights and Freedoms* but this right seems largely unsupported in regulatory systems, which have been implemented with little Indigenous input. The federal *Safe Drinking Water for First Nations Act*, a Canadian legislation developed under the Harper tenure in 2013, has been met with criticism by First Nations leaders for its lack of consultation (Jeffrey, 2016). This is indicative of the disconnect between policy and practice, particularly when it comes to water. The Act also allows for the transfer of liability of broken water treatment systems to First Nations. Ironically, broken natural systems are what led to the necessity of the Act in the first place; ecosystem services that once assured clean water for over a millennium

were decommissioned by way of industrial development and land-based practices that have been taking place over a few decades.

Under the United Nations Declaration of the Rights of Indigenous Peoples (UNDRIP), of which Canada is a signatory, there is hope that there will be processes and actions that transcend the current system. A transformed system is needed where there is meaningful dialogue, voices are heard, and perspectives are reflected in water-related decisions and outcomes going forward. Shared natural resource decision-making is called out in UNDRIP and this serves as a mandate for all government levels to intentionally engage and share space at the table. Traditional Ecological Knowledge (TEK) gained and passed on for generations, representing another way of knowing, has been nearly entirely ignored in policy and decision-making at all levels. To continue along this path is our peril.

Salish Sea, Pacific Northwest

Unto the Salish Sea
Rain running on rock
Seeps into sweet cool earth
Dark glistening sea

It is Cheaper to Protect Than Restore

The watersheds of the Georgia Strait, the Strait of Juan de Fuca, and Puget Sound have supported a rich ecosystem that sustained Indigenous communities of the Salish Sea for a long period of time. To many who know the Pacific Northwest, salmon is an iconic species of the region. The infrastructure necessary to support competing land uses such as agricultural, urban, and forest industry development has disrupted the journey of this anadromous fish species. Alterations to watersheds have also resulted in degraded water quality to the point of being toxic in many areas. This loss in habitat and watershed health was a highly significant factor in the listing of Puget Sound salmon species under the U.S. Endangered Species Act in the late 1990s.

Efforts to restore habitat and recover listed salmon species have been taking place across watersheds on both sides of the border between Canada

and the United States. Watershed-based, multi-stakeholder groups focus on recovering salmon under fifty-year plans include targets for restoring and protecting environments critical to the species, such as riparian, wetland, estuary, and nearshore marine environments. Multiple millions of dollars and hours of dedicated experts, government officials, stewardship groups and citizens have been invested in the implementation of these watershed-based salmon recovery plans. It is indeed cheaper to protect watersheds than it is to restore them. Hydroclimatic change is bringing another layer of challenge to restoration efforts. There is still a long way to go to increase salmon species abundance and ensure the continuance of Pacific Northwest culture.

The dialogue and relationship that have formed under the effort to restore and protect watersheds and recover salmon species have resulted from a nearly twenty-year commitment of many organizations and individuals. Although not always in perfect alignment in terms of policy, timelines, and approach, the goal to recover salmon through various actions, including protection and watershed function-based restoration, is shared. Efforts are limited by inadequate funding, opportunistic-reliant projects, voluntary-based implementation, and politics. The *Treaty Rights at Risk* white paper came out as a shot across the bow from tribes in the Puget Sound region in 2011. The message communicated to Washington state and local governments was clear: habitat restoration is not on pace with what is needed or reflective of supportive court decisions for the recovery of salmon. The collaborative effort and long-term commitment to recover salmon is to be lauded; however, a shift in focus toward protection of water, along with the integration of other ways of knowing and practices, is necessary now.

A New Relationship With Water as the Way Forward

Watershed health and community resilience are inextricably linked. As we move into the future, it will be evermore critical to protect and restore water. Watershed function is critical in the provisioning of water, yet restoring lost landscapes is a very costly endeavour. There is no economy in the misuse of water going forward. The idea that water is an unlimited resource is a concept only suited to a past in which natural resources were regarded as solely ours for the taking. The current trajectory that we are on

is a result of policy not keeping pace with the realities of the carrying capacity of ecosystems, and of decisions not founded in inclusivity. Watershed health is a key determining factor of how resilient a community will be under a changing climate.

Climate change is bringing a decrease in weather predictability and an increase in extreme events, such as flood, drought, and temperature shifts, creating an urgency to make decisions that provide net environmental benefits over the long run. Natural resource management decisions must account for long-term impacts—perhaps adopting the "seven generations rule" to guide us toward equilibrium in our natural and economic systems would be wise. A longer term, sighted approach is what climate adaptation and resiliency planning demand. This is not a new concept.

In our every deliberation,
we must consider the impact of our decisions
on the next seven generations.
(Iroquois Confederacy Maxim)

Indigenous communities and leaders of Native American tribes have long held that a multi-generational view provides a necessary basis for sound decision-making. Beyond that, we cannot ignore nature. As an elder of the Tsuut'ina Nation has stated, "natural laws supersede man-made laws" (Bruce Starlight, Personal Communication, January 2018). We can make all the laws we want and manage ourselves how we wish based on those rules, but ultimately the outcomes of our actions show up in the form of balanced or degraded ecosystems. As long as environmental and economic policies and regulations are disconnected from the realities of the carrying capacity of the Earth, we will see inequitable and unsustainable actions and impacts on water and land and ecosystems of which we are a part.

Watershed resilience and environmental justice are linked. Policies and practices that promote the externalization of costs to our environment are not sustainable. Decisions that result in degraded environments cannot continue to be borne by those who happen upon the mess—now or in future—or by those who call these places "home." It is members of underserved communities who are disproportionally impacted. This is

playing out as we witness more dislocation of people from marginalized lands and degraded watersheds. Adding to the vulnerability of communities is the recognition that coastal and low-lying areas are more prone to storms, flooding, and sea level rise. It is time to choose a different path guided by principles of equity, justice, and sustainability rooted in wisdom and experience, and set a trajectory leading to a more resilient future.

There is a need to employ alternative approaches in natural resources decision-making processes that consider long-term impacts on water and communities. The goal of ensuring that watersheds retain the capacity to provide clean water must be shared. Indigenous knowledge, as rooted in adaptive tendencies and in basic principles of sustaining life in complex systems, are a key to unlocking enduring solutions. Redistribution of power is needed, and this is best begun in a process where there is space and time for meaningful and inclusive dialogue. Local perspectives are integral to water-related decisions and management actions, and must be taken into account under ever more challenging, environmental conditions. Just as tributaries come together as part of a dynamic system to form a vibrant river, what is needed is to identify a confluence of ideas where cross-cultural knowledge provides a way forward, toward enduring solutions for water—the shared resource necessary for life, yet not assured for all.

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