

Food Security and Sovereignty in Climate Change
Through the Lens of Nitrogen

Lyle Fogg
MES Application submission
December 10, 2022

Nitrogen as focus. When seeking climate justice, how we focus on people's needs provides insight. Since Standing Rock and Flint, Michigan, national attention in the United States has been on water. The way we work with water, and its cycles, can help us understand how we work with any substance or even entire ecosystems. Because human populations are wholly involved in their environment, "Human life is ecologically embedded, albeit in different ways, in every temporal and spatial context" (Yaka, 2019, p. 362).

Another cycle that can and should be interrogated, considering the impacts of climate change, is nitrogen. Nitrogen sits at the center of human nutrition in protein molecules, in agriculture as fertilizers, and in the infrastructure of waste management. We can use nitrogen as a lens of understanding our relationship with the land, and each other. Where humans source protein, it is typical to find open marine stretches and countryside sparse with the infrastructures of the modern world. Looking at areas where sourcing is difficult means examining urban areas too. Mapping those helps to relate ideas and concepts from multiple concerns. With habitat, we are simply adhering to the biological truth that things happen at boundaries. That said, habitat provides boundaries for the focus of multiple issues, histories, sciences, ontologies, or even worlds.

Defining the shapes of Justice. How an ecosystem stores and cycles nitrogen, together with how humans fit into the cycles, creates intimate and dynamic patterns for consideration. Food source habitats can be drawn on maps delineating edges of migration, and best known field measurements. And those lines we draw on a map frame relationship, "human and non-human" (Yaka, 2019, p. 356). There too, people are seeking equity and inclusion in their governments' responses to climate change. We can also see the shapes of the confounding forces, the shapes of a colonial world Winona La Duke calls Wiindigo, the cannibal monster of Anishinaabe legend, "Wiindigo infrastructure has worked to carve up Turtle Island, or North America, into preserves of settler jurisdiction, while entrenching and hardening the very means of settler economy and sociality into tangible material structures" (LaDuke, Cowan, 2020, p. 244).

In effect, our drawn lines contain the shape of people's foods, myths, lives, and their activism. Within those arenas, people seek out the protein they need.

Among macronutrients, carbohydrates and fats are biological sources of fuel for the body, while protein makes up the building blocks for the body itself. All these macronutrients are available in various proportions in most foods. Focusing on each type can give differing ranges of human minimum requirements. Looking at protein can give an idea of what it takes for a population to thrive and grow.

Proteins are composed of carbon, hydrogen, oxygen, and nitrogen. The availability of nitrogen is tied to the capability of an ecosystem to cycle and store nitrogen, moving it into usable matrices of cells that humans can consume. The capacity of this nitrogen cycle in the land, or aquatic environments, available to the human populous, largely determines the food security of the population. We exist in relation to protein and nitrogen in our environment as inextricably as we do to our own bodies. The authors of "Molecular Decolonization: An Indigenous Microcosm Perspective of Planetary Health" say this goes "down to the molecular level of being which needs to be honored and restored" (Redvers et al, 2020, p. 3). From the soils or waters of habitat, through our food source species, to the uptake and use of amino acids in our bodies, lines of source molecules flow. Looking at protein can give an idea of what it takes for a population to thrive and grow. What is the shape of a relationship of a people's ties to range or ecosystem? How does the honoring of cultural lineages in habitat affect security and sovereignty? Those are the lines on the map we are looking for.

Where those lines are thick, as in the North American cases of Salmon and the Salish, or the Buffalo and the plains tribes, we can learn much. But where those relationships are so thin, distributed, or diffuse as to constitute a seemingly geographical "no shape", the urban setting, we can still look for meaning. In the urban setting the focus on nitrogen, protein, and land itself (the ecological side of the lens), becomes less defined but more important. Lacking protein makes it so. Let's look at those three shapes, one of river and sea, another of grass and fences, the last of asphalt and concrete.

Salmon habitat as corporeal. Salmon are carnivores, they sit near the top of a dense food web in both salt water and fresh. Nitrogen, assimilated in phytoplankton in illuminated zones of the marine environment is mixed in ocean currents and taken up through multiple trophic levels. Similar cycles exist in rivers. The salmon of the Puget Sound in North America cover a range that begins in mountain rivers. Upon reaching salt water, they work their way Northward and spread out into the Pacific. The shape on a map looks like a big leaf structure in the Pacific, on a stem of the Puget Sound, with roots reaching up into the river systems of the mountains.

There the salmon hatch and grow until migrating to the ocean, returning only to mate and spawn in the rivers of their origin. Despite efforts by the state of Washington to limit fishing by the tribes, the Boldt decision of 1974 ensured that the native peoples would be able to continue their stewardship of their fishing territories. The treaties ensure that the salmon migrations are respected and the tribe's claims extend throughout that range where the salmon run. How that range may be affected by encroachment, due to human population migrations; continuing pollution, and possible temperature changes in the water due to climate change are now embedded in how the area is managed, and how the tribes there pursue nutritional goals, and trade.

Biological, legal, and human worlds interact where “the rivers are not only instrumental means of subsistence but also significant elements of cultural heritage, geography and identity formation; of rituals, mythologies and belief systems” (Yaka, 2019, p. 357). Though Yaka is speaking of another river, we see how closely the natural world and the people are tied, such that “Interconnection with the non-human world is not merely instrumental but intimate, sensual, affective, and corporeal” (Yaka, 2019, p. 360). Where Salmon run, peoples thrive, and their physical relationship anchors how they relate to others, even colonizing powers. That tangible consideration anchors native justice seekers in ecosystem and foreshadows Tuck and Yang's admonishment that decolonization is not metaphor (Tuck, Yang, 2021, p. 1). It is that same deep molecular level where “Restoring Indigenous sovereignty and practice around

food is a crucial component to decolonization “(Redvers, et al, 2020, p. 6), referring directly to Tuck and Yang’s calls for repatriation. In these calls, focusing on land and molecules begins to merge.

Buffalo ranges and separation. On the plains of Turtle Island, soils enriched by nitrogen fixing bacteria and animal dung provide lush grasses for consumption of the once large herds that roamed the land. The near-extinction slaughter of American Buffalo by the United States government in order to subdue native tribes is well known. The tribes were sequestered on reservations without their herds in the aftermath. In 1991 the InterTribal Buffalo Council (ITBC) was granted funds and surplus buffalo from national parks (previously slaughtered to control populations) to help restore their herds. Recently, despite repeated blocking efforts from the state of Montana, the tribes’ rights to continue these efforts have been upheld in courts.

The map of tribes included in the ITBC stretches across a range of thousands of miles. These are where the herds are now, physically separated, compared to the near open continental range they inhabited prior. Considering the combined shapes of fenced ranges at each of the map points, one word emerges, non-contiguous. It is not the range of free-roaming buffalo, but a habitat of separation, closed off by property lines, roads, fences, and reservation boundaries. The tribes conduct buffalo transfers to the reservation’s herds by truck. Nowhere are large populations so dependent on technologies embedded in LaDuke’s’ Wiindigo infrastructure. "The transformation of ecologies of the many into systems of circulation and accumulation to serve the few is the project of settler colonial infrastructure. Infrastructure is the how of settler colonialism, and the settler colony is where the Wiindigo runs free" (LaDuke, Cowan, 2020, p. 245). Against that backdrop, the tribes are beginning the task of growing their herds. The survival of those herds and tribes during a warming planet’s expected water shortages and possible desertification create multiple sets of intersecting social, agricultural and justice challenges.

Urban food, a diffuse landscape. Food sovereignty of the urban poor is the most tenuous and hard to grapple with of all the concepts related to habitat and protein. Multiple protein sources require their own infrastructure. People are forced to track multiple means of finding adequate protein, from often too

sparse grocery stores, fish and farmers markets, community supported agriculture, to growing their own urban gardens. The quality of the protein will often depend on its source. Acquiring enough becomes a multitasking orchestra.

The supply lines, hard to identify, are easy to attribute to the story of Wiindigo. But even in what has been called “food deserts” the urban poor seek to reinforce a more secure relationship to food. In colonized urban settings, the poor are often settlers, often all manner of racial and mixed heritage people, or former slaves, without a prior relationship to land. It is true that the shapes of chicken coops, small plots, containers, community and guerilla gardens may not take into account “settler-native-slave” triads used by colonizing governments to populate territory (Tuck, Yang, 2021, p.18). It is also true that they may. The occupy movements’ “Claiming land for the commons” that Tuck and Yang say “erases existing, prior and future native rights” (Tuck, Yang, 2021, p.28) is valid too. It stands in apparent contrast to LaDukes words in the preface to *Marxism and Native Americans*, where she says “You’re not likely to go away” (LaDuke, 1983, preface). La Duke’s acceptance of a resident populous and the idea that there are useable frameworks of “incommensurability” (Yang, Tuck, 2021, p. 28) does bridge a gap between recognizing the importance of repatriating land and taking care of multiple other social needs. The distant food source agricultural lands, and backyard home gardens, of the urban poor still anchor them to habitat, and the protein needs of their bodies create the real relationship we can focus on, trusting that it is not a metaphor. It means we can have common work that is real within the focus of a struggle for habitat - as real as the bag of fertilizer, or bucket of dung, a city dweller is carrying home to keep their soils alive with nitrogen.

Understanding the shape of relationship. In the three cases we’ve looked at, humans are active intimate participants, firmly in relation to their ecosystems. “The self, no matter whether indigenous, rural or urban, is formed in relation to the other, within a world of encounters, not only with human but also with non-human bodies and entities” (Yaka, 2019, p. 362). The partitioning of resources and safety that climate change induces brings those relationships to the fore in vulnerabilities. The tribes and their efforts

to bring back the buffalo herds are only beginning. Failure to provide adequate management and protections from water shortages and mismanaged land use can still easily stop those efforts. The tribes of Puget Sound have stood up for and have a long history of protecting their fishing rights; but climate change, with its temperature changes to both saltwater and stream ecosystems, could still spell the end of those traditions. The urban poor only seem to be lacking a lineage connection to the land, but may still be in the most tenuous situation, with little government attention given to anything beyond the store shelf. How they support themselves, claim sovereignty over their own food, and enjoy the security of their own hands faces an unknown future.

We began this discussion with water. The current focus on water has fostered engineering efforts and social movements to protect the aquatic environments and provide clean drinking water in the face of poverty and colonial power. It may be that extending our efforts to nitrogen, protein, animals, and plants that are so rich in supporting human populations can create further success. Using a simple drawing, understanding range and relationships, human and non-human, are critical to rather we succeed or fail.

Taking the ontology further, next steps. Further social, environmental and climate justice work can follow from these comparisons. Because we are creating a soft focus with our habitat boundaries, we should be able to do this without succumbing to the weaknesses of bounded socio-ecological system (SES) models where “Relational power, interest, multiple social identities, and the interplay of structure and agency, are difficult to represent and thus easy to lose sight of” (Yeh, 2015, p. 4), important when examining issues of justice.

These considerations can be built into how we develop our “alimentary infrastructure—infrastructure that is life-giving in its design, finance, and effects” (La Duke, 2020, p. 245). We’ve grown used to the idea of carbon buybacks and carbon tracking. Ledgers and mass balances prove to be useful tools in defining and negotiating just and fair solutions for communities and nations across the world. If we can apply the same understanding and conversation to the rights and protections around food-bearing efforts and areas, then we should be able to aid in preserving not just land, but the peoples attached to the land.

"Our planet's health and very existence depends on our remembering where we came from." (Redvers, et al, 2020, p. 10) It may be that as we garden, bring in harvests, fish, hunt, shop and cook we are enacting where we came from, building our bodies and our very identities at the same time.

Bibliography

Redvers, Nicole, Michael Yellow Bird, Diana Quinn, Tyson Yunkaporta, and Kerry Arabena. 2020. "Molecular Decolonization: An Indigenous Microcosm Perspective of Planetary Health" __International Journal of Environmental Research and Public Health__ 17, no. 12: 4586. <https://doi.org/10.3390/ijerph17124586>

Yaka. "Rethinking Justice: Struggles for Environmental Commons and the Notion of Socio-ecological Justice." Antipode. 51, no. 1 (2019).0

Tuck, Eve, and K. Wayne Yang. "Decolonization is not a metaphor." *Tabula Rasa* 38 (2021): 61-111.

Yeh, Emily T. "'How can experience of local residents be 'knowledge'?' Challenges in interdisciplinary climate change research." *Area* 48, no. 1 (2016): 34-40.

LaDuke, Winona, and Deborah Cowen. "Beyond wiindigo infrastructure." *South Atlantic Quarterly* 119, no. 2 (2020): 243-268.

LaDuke, Winona. *Marxism and Native Americans*. Preface, South End Press, edited by Ward Churchill, 1983.

NOAA Fisheries, 2022, "Ocean's Influence on Salmon Plays Out in Varied Returns to Different Rivers and Regions," <https://www.fisheries.noaa.gov/news/oceans-influence-salmon-plays-out-varied-returns-different-rivers-and-regions>

ITBC Facebook, Intertribal Buffalo Council,

https://www.facebook.com/nationalbuffalomuseum/photos/a.10150272321763684/10158773552288684/?type=3&paipv=0&eav=AfZMrvHFCLrrzWM1cLFA_kQ3PLuJQwMQ_RGOI0W73_AogFnK62GJeOPkN0hIW4G9xsA&_rdr

Lin, Xiaowen, Paul J. Ruess, Landon Marston, and Megan Konar. "Food flows between counties in the United States." *Environmental Research Letters* 14, no. 8 (2019): 084011.

<https://iopscience.iop.org/article/10.1088/1748-9326/ab29ae>

Appendix

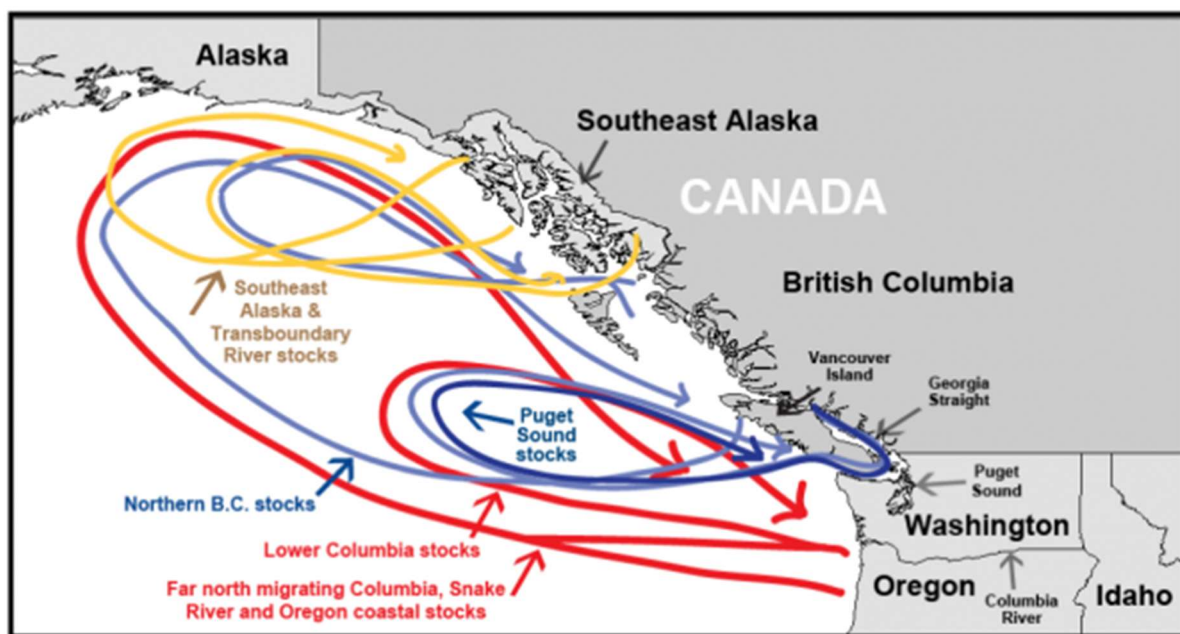


Figure 1
Salmon Ranges (NOAA fisheries, 2022)

Figure 2

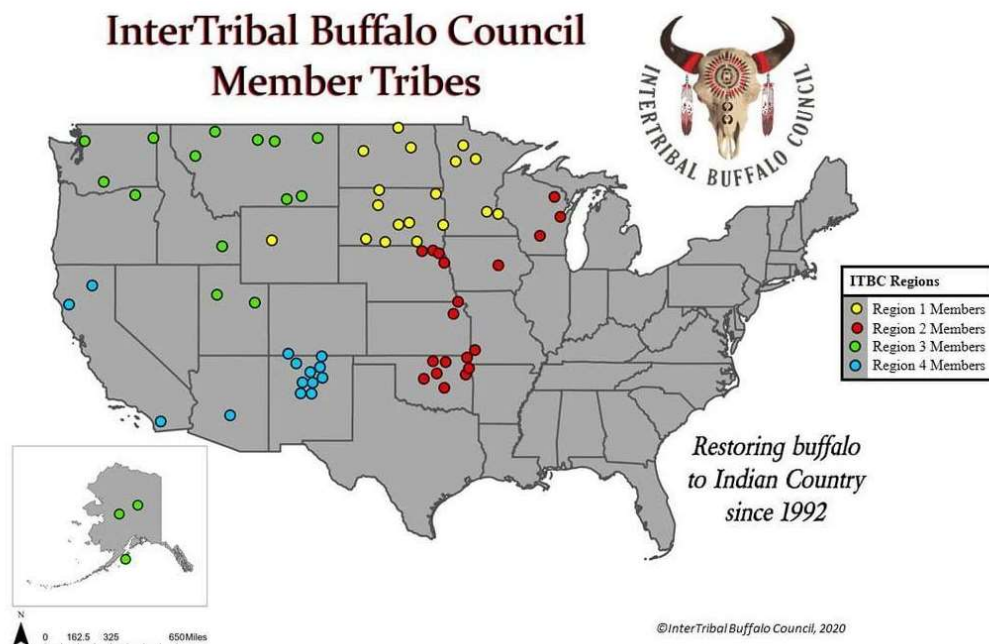


Figure 2

InterTribal Buffalo Council Members

Figure 3



Food Supply Chain
(Lin, 2019)