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COMMENTARY

Demanding Epistemic Justice: Indigenous Youth as Indigenous Science Diplomats for a Sustainable Future

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This commentary begins with the author's background, which leads into explaining Indigenous Ways of Knowing, Knowledges, and Sciences. It examines the significance of Indigenous kinship perspectives offering a sustainable way to live, inherent in many Indigenous cultures. It then explores colonial epistemicide, evolving knowledge pluralism, and how to co-produce knowledge needed for evidence-based decision-making. It concludes with a discussion of the transformative role of Indigenous youth in demanding epistemic justice by serving as Indigenous Science Diplomats, promoting knowledge pluralism in evidence-based policy. These young leaders bridge ways of knowing and span power structures and cultural, epistemological, and disciplinary divides, fostering a more inclusive sustainability in the face of climate change. The commentary underscores the importance of empowering Indigenous youth as key actors in creating a sustainable future and advocates for greater recognition and integration of Indigenous Knowledges and Sciences in policy and practice, promoting a path toward epistemic justice and a sustainable planet.

Keywords: Indigenous youth; boundary spanners; science diplomats; knowledge pluralism; epistemic justice; science communication

Background

I am Iñupiaq and a Tribal citizen of the Nome Eskimo Community in Alaska. My Iñupiaq family has lived with colonization since first contact, including the 1900s flu epidemic and the cultural and language erasure imposed by assimilationist boarding schools. My family worked to maintain our culture and land-based life, and I grew up on my grandmother's homestead and reindeer ranch outside of Homer, Alaska, on Dena'ina Ełnena (Dena'ina homelands) in the Ninilchik Village Tribe's region. I sought higher education to advocate for Indigenous ways of knowing and life, which culminated in a PhD in Indigenous Studies, with a focus on Indigenous Sustainability Science. I wanted to know the world from the Iñupiaq way I was raised and to understand Euroamerican perspectives that my mother was from. I share this narrative to help the reader understand who I am (positionality) and my perspective (reflexivity) with an identity—rooted in place, family, and community—before my credentials, reflecting the Iñupiaq values (Iñupiat Ilitqusiat) I was raised with: sharing, knowledge of family tree, knowledge of language, humility, respect for Elders, respect for others, cooperation, hard work, love for children, avoiding conflict through openness, family roles, spirituality, humor, respect for nature, domestic skills, hunter success, and responsibility to Tribe (Topkok 2015). Through this lens, I acknowledge my relations, ancestors, mentors, and the knowledge keepers who have guided my journey.

My life has been a journey of learning. I learn Indigenous Knowledges through oral history stories and watching my family, observing, apprenticing, and doing (Kawagley 2006). I learn dominant society paradigms in schools through books and lectures. I have learned about different knowledge systems that have given me many lenses through which to view and attempt to understand the world and all those within it—human beings, non-human beings (i.e., plants, animals, clouds), non-human collectives (i.e., watersheds, prairies), and "more-than-human" beings (i.e., spirits) (Larsen and Johnson 2016; Whyte et al. 2016). I was immersed in

the dominant knowledge system (often called Western or Euroamerican) through schooling. These institutions are based on controlling knowledge access through colonial and systemically racist systems that have sought to devalue, silence, and destroy Indigenous Ways of Knowing through assimilation practices like past boarding schools and the ongoing exclusion of Indigenous Sciences, histories, languages, and cultures in formal schooling curricula (St. Denis 2007). Indigenous Ways of Knowing and knowledges are unmentioned, and our technology and innovation either unrecognized or appropriated, considered to come from dominant cultures (Roht-Arriaza 1995). This is epistemicide, an injustice that seeks to invalidate, destroy, and erase a system of knowledge. Absence does not mean these do not exist, and it is critical societally that we first unlearn that there is only one way of knowing, and take the time to relearn through pluralism.

Indigenous Ways of Knowing

Indigenous Ways of Knowing (drawing from many similarities, not one monolithic way of knowing) approach the world through different cosmologies (belief of our origins), epistemologies (what we know), ontologies (what exists), and axiologies (values and ethics) than dominant society. We see all beings, human and non-human (i.e., animal, plant, water, air, fire, Mother Earth) as interconnected, with survival of one dependent on all the others (Salmón 2000). Within Indigenous cosmologies and ontologies, humans are one being in a world of many beings, part of broader ecological systems. All human and non-human beings sustain one another, caring for each other and Mother Earth, who houses all life (Muir et al. 2010). Indigenous epistemologies recognize that humans depend on Mother Earth, who relies on humans to nurture her so that she can continue sustaining life. Not only are all beings interconnected, but our axiologies see them as connected by kinship relationships, exchange, support, nurturance, and dependence on one another. Indigenous epistemologies and axiologies ultimately influence our praxeologies (how we act and practice); we approach non-human beings such as Water with respect, requesting access to take some, but not too much. Our cosmologies, epistemologies, ontologies, and axiologies are not anthropocentric; they do not center humans but draw on a broader perspective of life as an extended family kinship network which shapes how we act.

In Euroamerican society, decisions are often rooted in human exceptionalism, positioning humans as separate from and above all other beings (discussed by Kim et al. 2023). This view treats the non-human world as "resources" for human use, not kin. In contrast, Indigenous perspectives value humility and relationality (Topkok 2015). The Euroamerican system prioritizes humans before all other lives, selfish and unsustainable, neglecting the need to care for Mother Earth for future generations as our ancestors did for us (Kim et al. 2023). The contrast is between hierarchical systems (extractive societies) and kinship-based systems (typically Indigenous and circular) (Whyte 2021), where kinship recognizes all beings as relatives and honors the responsibility to care for them as we would our human families. Indigenous Ways of Knowing see the land, waters, and Mother Earth as sacred while a human exceptionalist approach prioritizes extraction and capitalistic profit, often at the expense of the natural world, polluting the lands, waters, and air for money.

This way of knowing guides Indigenous praxeologies and ultimately our sciences, specifically the cosmologies, epistemologies, ontologies, and axiologies that all center relationality and kinship (Kealiʻikanakaʻoleohaililani 2016; Salmón 2000). Dominant science paradigms revolve around the written word, ignoring oral history and the ability to share knowledge through story and example and to learn through apprenticeship and doing (Kawagley 2006). Indigenous Peoples employ protocols that guide us in how to approach, proceed, and behave, recognizing that science is inherently not objective in any culture, form, or way of knowing (Whyte et al. 2016). Relationships, decision-making, and choice in science make it subjective and tied to reciprocal relationships with the world. As Whyte et al. (2016) explain, "There are no strong reasons we can identify as to why approaching the world with humility, respect for the diversity of knowledges of humans and non-humans, and a responsibility to honor other beings, entities and collective as animate, is any less conducive to engaging in dialog with a range of forms of empirical inquiry, including those forms of empirical inquiry in sustainability science." Indigenous Ways of Knowing include Indigenous Sciences, of which the oft discussed Traditional Ecological Knowledges are only a small part.

Colonization and Epistemicide

When colonizers arrived in the United States, they viewed the land as a beautiful garden (Curry 2021), assuming it existed naturally and was uninhabited under the principle of *terra nullius*, which deemed lands empty if not occupied by Christians (Zukas 2005). Over time, as they forcibly removed and killed Indigenous Peoples, the landscape changed dramatically, no longer resembling the garden they once admired but instead becoming unmanaged and overgrown in areas and overused and polluted in others (Yonk et al. 2018). Despite this, the US government continued to corral Indigenous Peoples onto reservations, attempt

to assimilate us through erasing our Ways of Knowing, cultures, and languages, and exploit the natural world for wealth. Indigenous Knowledges had sustainably managed and protected these lands and waters for millennia. Yet, in just 250 years, the planet now faces climate change, record temperatures, devastating fires, undrinkable water, and other crises, leaving children fearful for their future and hopeless about reaching old age (Hickman et al. 2021).

This is deeply concerning for two reasons. One, epistemicide, the erasure of Indigenous Ways of Knowing within the US and replacing it with Euroamerican ways of knowing as the *only way of knowing* (Hatch et al. 2023). And two, when thinking of evidence used for policy and decision-making, if Indigenous Knowledges and Sciences are called anecdotal and ignored then Indigenous people are not considered experts or epistemic authorities. Indigenous Sciences are still *rarely, if ever, used* in evidence-based policy, and epistemic authority rests predominantly with written Euromerican systems, certifications like PhDs, and colonial governments.

When considering knowledge, how can one society or culture extinguish another knowledge system, stating theirs is superior to any other and denying that any other way is not knowledge at all (Redvers et al. 2024)? This is a practice of colonization, where brute force is used instead of *earned,* or what can be considered *legitimate,* epistemic authority (Clifton et al. 2018). Many colonizing groups have established boarding schools aimed at erasing Indigenous Ways of Knowing, cultures, and languages (Marker 2009). This tactic reflects a broader trend of epistemic injustice, where dominant knowledge systems extinguish another way of knowing. First, colonizers call the colonized savage and unintellectual, claiming colonial knowledge will civilize them (Memmi 1965). Then they work to discredit the idea that the savage people had any way of knowing beyond anecdotes and thus have no knowledge holders, knowledge, evidence, scientists, experts, or epistemic authorities (Fricker 2007). This strategy not only seeks to delegitimize Indigenous Knowledges and Sciences but erase them, excluding them entirely from decision-making for the most informed future (Wheeler and Root-Bernstein 2020). This epistemic oppression that Indigenous Peoples face through epistemic exclusion, which infringes on their epistemic agency to engage in knowledge production and inform decision-making, is steeped in ongoing colonization and systemic racism, requiring epistemic decolonization (Berenstain et al. 2022; Dotson 2014; Mitova 2024; Tobi 2022).

Pluralism, Two-Eyed Seeing, Multiple Ways of Knowing for Informed Decision-Making

Indigenous and Euroamerican cosmologies, epistemologies, ontologies, and axiologies are not the same. One does not encompass the other, and they do not necessarily overlap. They are incommensurate, with no standard to measure them against one another. It is an apples and oranges situation, with the one commonality being that they are fruit but there being no way to judge one according to the standards of the other. Each of them has different conceptions of what they consider science, evidence, expertise, and epistemic authority, as explained above. This does not mean one way of knowing is right and another is wrong, or one is better than the other; these are both able to exist separately from one another. Indigenous Peoples recognize the importance of braiding knowledge systems together through our youth learning their cultures' oral histories as well as attending schools and universities. We do not see a weakening of one knowledge system when complemented with another because we are not focused on the hierarchy of epistemic authority; instead, our priority is identifying the most accurate and relevant information to guide decision-making. This is especially crucial as we confront climate-related disasters such as typhoons, hurricanes, permafrost melt, fires, and erosion, which exacerbate the ongoing challenges of colonialism as an ongoing disaster faced by our communities.

However, many decision-makers are used to quantified information in graphs and tables. Indigenous storytelling as evidence challenges people not used to engaging in multiple ways of knowing, whether referred to as epistemological pluralism (Ahenakew 2014), heterogeneous knowledge systems (Tsuji and Ho 2002), or two-eyed seeing (Peltier 2018). Heterogeneous knowledge systems specifically call out that there are not only two ways of knowing and that knowledge systems are more than only epistemology. Heterogeneous knowledge systems recognize pluralism in ways of knowing with distinct knowledge systems existing separately from one another, with different epistemologies, ontologies, and axiologies, that are each able to provide epistemic value and have experts. These lead to different praxeologies that produce distinct forms of evidence, which, when used together, result in a broader evidence base and support better decision-making. This pluralistic approach is not seeking to prove anyone wrong but to bring everyone to the table to discuss and share. Indigenous Knowledge holders seek epistemic justice, to have their knowledges and histories recognized as legitimate, taught in schools instead of being marginalized, and for knowers to be respected in their capacity as epistemic agents (Tsosie 2012). This outcome requires decolonizing knowledge by removing

hierarchy, dismantling oppressive power structures upheld through epistemic supremacy, and bringing to the center marginalized knowledge systems to engage with currently dominant systems (Manathunga et al. 2021). Epistemic justice is necessary for the empowerment of Indigenous Peoples to be self-determining, essential for well-being (Dudgeon and Bray 2023). It not only supports anti-racism and decolonization in decision-making but creates a society based on epistemic pluralism, one that recognizes multiplicity and diversity in knowledges and draws on all ways of knowing for the most informed decision-making (Guibrunet et al. 2024).

Indigenous Youth Science Diplomats: Building Bridges Through Knowledge Translation and Science Communication

Having been raised in multiple knowledge systems with different cosmologies, epistemologies, ontologies, and axiologies, I have spent my life learning to communicate concepts across multiple ways of knowing, in different disciplines, at different power levels, and across value systems. These experiences in boundary spanning, knowledge translation, and science diplomacy have coalesced into what I call Indigenous Science Diplomacy, something unique requiring a combination of the above skills. This includes understanding multiple knowledge systems, translating between different ways of knowing, bridging gaps across silos (whether disciplinary, institutional), and spanning power structures and systems (such as between minoritized and marginalized communities and scientists and policy makers) (Hatch et al. 2023; Hoffman et al. 2024; Safford et al. 2017). Indigenous Science Diplomacy also requires translating knowledge, science, and evidence into different epistemologies, ontologies, and axiologies, not only code-switching but decontextualizing and then recontextualizing knowledge (Burke 2009; Kennedy et al. 2024). This practice moves information in both directions and is relevant to multiple ways of knowing and those in different power structures and systems (i.e., the community and policy-makers). However, without science communication skills, translating complex scientific concepts across ways of knowing to non-experts would also not be possible (Hatch et al. 2023). Finally, science diplomacy is a critical skill, bringing science into policy space and using "science cooperation to help build bridges and enhance relationships between and amongst societies" (Turekian as cited in CORDIS 2009). But what makes an Indigenous Science Diplomat unique? They can boundary span, translate knowledge, communicate science, and be science diplomats for scientific concepts in multiple ways of knowing. Additionally, Indigenous Science Diplomats seem to be expected to be educators, without other parties putting in the work themselves to learn about other ways of knowing.

Being an Indigenous Science Diplomat comes with heavy burdens and multiple expected roles, which makes it challenging and often leads to burnout. Rudolf et al. (forthcoming) explain that Indigenous individuals in boundary-spanning roles are pulled in many directions as they serve their community and multiple organizations in addition to caring for themselves. These people are "in between," making change, liaising, building relationships, engagement experts and so much more (Rudolf et al., forthcoming). When the challenges of boundary spanning are combined with science diplomacy, science communication, and knowledge translation, they are further compounded. As Hatch et al. (2023), Peltier (2018), Rudolf et al. (forthcoming), and Itchuaqiyaq (2022) explain, some challenges put on these individuals include:

- Having an intricate understanding of multiple ways of knowing and an ability to see the world through multiple lenses at the same time
- Advocating for Indigenous Knowledges and Sciences, combating stereotypes, colonization, and racism in the process
- Knowing how to translate knowledges, interpret, and contextualize values and actions to contextualize data and evidence
- Having the confidence to speak up for and be responsible to both communities and other parties, which involves standing up for their own community, addressing power dynamics, and holding other parties accountable
- Being perceived as actual diplomats, and understood as speaking on behalf of all their Nation or even all Indigenous Peoples against their wishes
- Suffering emotional labor and burnout
- Dealing with inequitable funding and exclusion

Indigenous Youth as Indigenous Science Diplomats

Indigenous communities and Tribes have identified their youth as key actors in creating a sustainable future, advocating for greater recognition and integration of Indigenous Knowledges and Sciences in policy

and practice, advocating on behalf of their Tribes, and promoting a path toward epistemic justice and a sustainable and healthy planet (Redvers et al. 2024; Sogbanmu et al. 2023). These youth have grown up learning multiple ways of knowing, and it is critical to prioritize their voices as they face an uncertain future many of us will be absent from. Indigenous youth are taking up this responsibility and honor, inserting themselves into spaces where Indigenous people have been excluded for years. They are fighting to be at the table; even if not invited, they show up and pull up their own chair (Arctic Youth Ambassadors 2023). Indigenous youth are not *asking* for epistemic justice as much as they are striving for it, requiring and *demanding* it.

In Arctic spaces they engage with non-Indigenous youth through organizations like Arctic Youth Ambassadors, Arctic Youth for Environmental Action, and Students on Ice as well as through social media videos and posts. These youth expand the praxis of Indigenous Science Diplomacy by building allies in the non-Indigenous community, teaching them about other ways of knowing and about how to see the world through pluralism (see Figure 1 for the path of the Indigenous Science Diplomat). As youth today face an uncertain future due to climate change—an existential threat—they are beginning to share a perspective of the world that centers relationality and recognizes the damage of anthropocentrism and human exceptionalism, to ultimately create a unity across ways of knowing (Gienger et al. 2024; Nelson 2020). Indigenous and non-Indigenous youth are speaking together, co-developing messages and expressions grounded in multiple ways of knowing (Stirling et al 2023; Lee and Chen 2014; Pellett 2023).

Organizations like those in the Arctic as well as the Global Indigenous Youth Summit on Climate Change—a global conference held for twenty-four hours across three eight-hour time zones by, for, and among Indigenous youth, broadly inclusive of all attendees—create spaces for relationship and trust-building between Indigenous and non-Indigenous youth (Sogbanmu et al. 2023). In these spaces youth learn about each other, share with one another, and create trust across ways of knowing, languages, national borders, and racial/ethnic boundaries. Together these young people can support one another and build a critical mass to create change, emphasizing that systems change is key, that it is the role of everyone to understand multiple ways of knowing.

These youth are our future, our science diplomats, science communicators, boundary spanners, epistemic agents, and leaders. They propose solutions and actively engage in learning, encouraging others to unlearn stereotypes, biases, colonialism, xenophobia, racism, ethnocentrism, and notions of epistemic authority. In doing so, they advocate for learning what we need to unlearn in order to relearn, a process that embraces the pluralism of ways of knowing, enabling more informed decisions that promote the survival of all beings in a sustainable manner. We must empower Indigenous youth to be leaders, building relationships with non-Indigenous youth for a sustainable future, advocating for greater recognition and integration of Indigenous Knowledges and Sciences in policy and practice, promoting allyship and a path toward epistemic justice and a sustainable planet. I am hopeful for the future; the futurist in me knows there are countless futures and possibly even more ways to move towards epistemic justice than away from it.

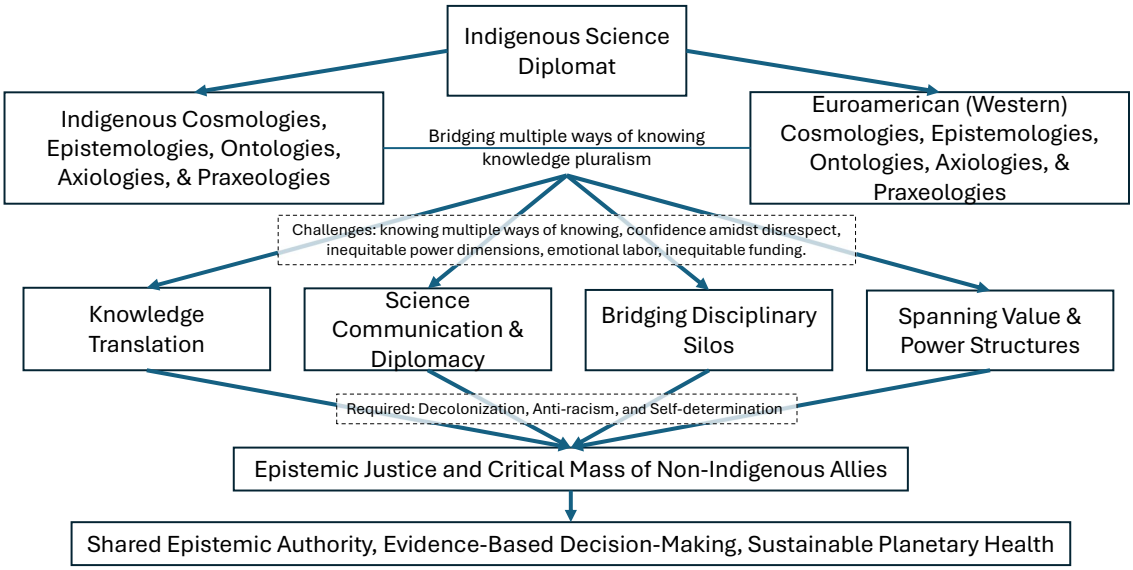

Figure 1. The pathway of the Indigenous Science Diplomat. Created by Heather Sauyaq Jean Gordon.

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Competing Interests

The author has no competing interests.

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