

# Understanding Our Environment Requires an Indigenous Worldview



As geoscience and policy-making communities begin to recognize the importance of including indigenous knowledge into their work, we must place the proper value on it through equitable time and funding.



The author, her brother Angapak Daniel, and grandmother Paiyuq Daniel after picking cloudberry (*atsaq* in Yup'ik) on a boat off the coast of their Alaskan village circa 1980. Credit: David Daniel

By Raychelle Daniel © 5 December 2019

*This article is part 4 of a series produced in collaboration with AGU's [Diversity and Inclusion Advisory Committee](https://www.agu.org/Learn-About-AGU/About-AGU/Governance/Committees/Diversity-Committee) (<https://www.agu.org/Learn-About-AGU/About-AGU/Governance/Committees/Diversity-Committee>) to highlight perspectives from underrepresented communities in the geosciences. Read the introduction [here](https://eos.org/agu-news/why-diversity-matters-to-agu) (<https://eos.org/agu-news/why-diversity-matters-to-agu>) along with [part 1](https://eos.org/opinions/creating-spaces-for-geoscientists-with-disabilities-to-thrive) (<https://eos.org/opinions/creating-spaces-for-geoscientists-with-disabilities-to-thrive>), and [part 2](https://eos.org/opinions/promoting-racial-diversity-in-geoscience-through-transparency) (<https://eos.org/opinions/promoting-racial-diversity-in-geoscience-through-transparency>), and [part 3](https://eos.org/opinions/laying-proper-foundations-for-diversity-in-the-geosciences) (<https://eos.org/opinions/laying-proper-foundations-for-diversity-in-the-geosciences>). Attendees of AGU's Fall Meeting 2019 can also use this [field guide to Ethics, Diversity, and Inclusion events](https://www.agu.org/Fall-Meeting/pages/ethics-diversity-and-inclusion-field-guide) (<https://www.agu.org/Fall-Meeting/pages/ethics-diversity-and-inclusion-field-guide>).*

I grew up in a Yup'ik village at the intersection of the Kuskokwim River and the Bering Sea in Alaska. I was named after my grandmother's father, Aluaq, and my grandmother's youngest son, Suvv'aq, or Ray. In our culture, that meant that I assumed the identity of my ancestors: I was Aluaq and I was Suvv'aq. I grew up close to my grandmother, and this relationship was important in establishing my identity as a Yup'ik woman and the values that I carry with me today.

The Yup'ik way of knowing transcends environmental observations. It includes interconnected and systematic knowledge about abiotic and biotic systems and the relationships of those systems with cultural and spiritual aspects of life. This knowledge and way of viewing the world have been evolving over thousands of years and hundreds of generations. This way of knowing informs all aspects of our society, including Yup'ik governance structures used for decision-making in spheres ranging from education and justice to natural resource management, in the same way that Western concepts of science inform federal and state governance systems, including those here in Alaska.

These federal and state governance frameworks have been imposed on indigenous Arctic peoples across

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almost all factors that influence daily life, even something as simple as where one lives. Traditionally, our peoples migrated with the changing seasons as the animals and plants shifted across the land and seascape; we moved with the salmon up the river in summer and back toward the marine mammals near the coast in winter. Places in between were visited in the spring and fall to hunt birds and forage for plants and berries.

Although our identities and well-being remain strongly connected to our environments, the decisions concerning these environments are often made thousands of kilometers away and are beyond our control.

Today's laws require physically fixed communities with schools, post offices, and airport runways. We must follow rules established by either regulations or agency policy about how fish and wildlife are managed; what information, including scientific data, can be used to inform those decisions; and who can hold the decision-making authority. Indigenous knowledge has been largely excluded from decision-making. Although our identities and well-being remain strongly connected to our environments, the decisions concerning these environments are often made thousands of kilometers away and are beyond our control.

In recent years, however, people in charge of these systems have been developing a growing awareness and interest in indigenous peoples' knowledge systems (what we call indigenous knowledge or traditional knowledge) and the importance of including them in the development of scientific research, policies, and natural resource management. A [statement from the Arctic Observing Summit 2016](https://www.arcticobservingsummit.org/sites/default/files/AOS%20Conference%20Statement_Final_RELEASED-2016-03-23.pdf) ([https://www.arcticobservingsummit.org/sites/default/files/AOS%20Conference%20Statement\\_Final\\_RELEASED-2016-03-23.pdf](https://www.arcticobservingsummit.org/sites/default/files/AOS%20Conference%20Statement_Final_RELEASED-2016-03-23.pdf)) recognized the importance of including indigenous knowledge in the framework that monitors change in the area. The National Science Foundation's [Navigating the New Arctic program](https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505594) ([https://www.nsf.gov/funding/pgm\\_summ.jsp?pims\\_id=505594](https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=505594)) is drawing on diverse knowledge sources, including indigenous knowledge, in its development stage to address challenges now facing a region radically affected by climate change.

Although these statements of inclusion of indigenous knowledge are a start, there are significant challenges in ensuring that inclusion is done equitably. Not all of these issues can be solved quickly, but we can certainly take several steps to begin working toward a more equitable relationship between indigenous and nonindigenous knowledge. These steps include ensuring that indigenous peoples' voices and knowledge are involved in the concept stage of new systems; that they continue to be included in every stage of development, execution, and assessment of a project or system; and that funding is available to bring these groups from different worldviews together and ensure that indigenous peoples and communities are paid equitably for their contributions.

All too often, there is an attempt to integrate indigenous peoples' knowledge into existing structures and systems that were originally developed outside an indigenous worldview. Western leadership and decision-making systems are built with a top-down hierarchy. Indigenous knowledge, on the other hand, recognizes connectivity between different roles and responsibilities within a system. When one tries to integrate a complexly interlinked system into a top-down one, cross-connections and valuable information may be missed or lost entirely.

## Equitably Including Expert Indigenous Knowledge

The mathematical equation doesn't fully take into account the worldview and immersive experience of indigenous knowledge.

In 1972, the U.S. Congress enacted the Marine Mammal Protection Act

([https://en.wikipedia.org/wiki/Marine\\_Mammal\\_Protection\\_Act](https://en.wikipedia.org/wiki/Marine_Mammal_Protection_Act)) to protect the health of these ocean creatures from unregulated hunting. It included exceptions for indigenous peoples like my ancestors who have sustainably harvested marine mammals for millennia. These animals are an integral part of our cultural practices and food security. The goal of this law is to keep these animal populations at a "sustainable" level, using an indicator of population status derived from the potential biological removal ([https://www.fisheries.noaa.gov/laws-and-policies/glossary-marine-mammal-protection-act#potential-biological-removal-\(pbr\)-level](https://www.fisheries.noaa.gov/laws-and-policies/glossary-marine-mammal-protection-act#potential-biological-removal-(pbr)-level)) equation, which calculates how many animals can be sustainably removed through nonnatural deaths. But the mathematical equation doesn't fully take into account the worldview and immersive experience of indigenous knowledge. The indigenous hunter may have information about the animal's relationship to different types of sea ice, its specific habitat, or its behavior. Furthermore, the hunter's spouse, often the one who will process the animal, may have more information on the quality of the organs, the blubber layer, or the stomach contents. This combined knowledge from the hunter and the spouse is also important for determining the health of a marine mammal population, providing a more holistic view.

Even when government leaders do attempt to include indigenous knowledge in their decision-making, that attempt to fit it into existing frameworks and research structures is often done without persons who have experience in navigating both knowledge systems. When indigenous peoples offer their knowledge, they need to understand where their information is going and how it will be used, because that information is an important part of their peoples' identity. Furthermore, without the consultation of expert knowledge holders, the meaning of the information risks being misinterpreted. Editing or changing words can risk losing their meaning. Our language is intimately tied to how we see and interact with the world. To engage with existing frameworks, we are actively translating our concepts into English language terminology that may not necessarily carry over all the important information.

For example, Yup'ik has different words across the life stages of bearded seals, and our perspective provides a conceptual map that connects those stages of life with variables in the ecosystem. Those variables might include knowledge about how the seal moves across the ocean as it forages, how a hunter has shared harvesting traits through generations, and information about seal health based on its stomach contents and the quality of its flesh or fat layer. When indigenous knowledge is integrated into a new law or policy, the lack of expert guidance during the legal drafting process could create an untenable rule for a community that might not adequately provide protection for the animal population.

The resulting designation recognized the need to protect the region using the knowledge and worldview of the indigenous peoples who call this area home.

How does one bring this equitable approach into the development of resource management or research priorities? One example is a location-based approach that brings together governing agencies and the indigenous communities and expert knowledge holders in regular, structured conversations. In 2016, President Barack Obama signed an executive order creating the Northern Bering Sea Climate Resilience Area (<https://usa.oceana.org/northern-bering-sea-climate-resilience-area>) in Alaska. The process began with the creation of the Northern Bering Sea Intergovernmental Tribal Advisory Council, representing over 70 tribes, that would work closely with the White House steering committee. The resulting designation recognized the need to protect the region using the knowledge and worldview of the indigenous peoples who call this area home.

We also need to ensure that governing structures and the science they're built on are creating spaces for indigenous peoples to participate throughout a research project or the process of federal resource management. Participation might include recruiting indigenous research assistants from the community who collect observations or carving out time for community members to analyze data and share the results for broader feedback. Just as any researcher's time is accounted for in a project, an expert indigenous knowledge holder contributing to a project should have their contribution recognized and valued in proposals. Community members may be taking time away from hunting and gathering to share their knowledge, so we must consider and appropriately compensate those members for their time.

Governance structures recognizing the inclusion of indigenous knowledge must include providing support for the researcher, from the beginning of the project, about how to effectively engage with indigenous peoples. The researcher may need funding and time to learn about cultures, values, and epistemologies and then time to travel and build and maintain relationships with those communities. Funding agencies need to recognize that they have the authority here to set the policy and guidelines to equitably include indigenous knowledge and peoples.

Each of us, as individuals, is in a position to make a difference within our own organizations, and I challenge us all to facilitate a shift in our agency and academic culture to seek out equitable relationships with indigenous peoples as we conduct our work. This shift starts with valuing the perspectives that science and indigenous knowledge offer. In a time in which climate change is increasingly disrupting our ecosystems—along with food and shelter security in so many communities—we need all knowledge sources available if we are to adapt.

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**Citation:** Daniel, R. (2019), Understanding our environment requires an indigenous worldview, *Eos*, 100, <https://doi.org/10.1029/2019EO137482>. Published on 05 December 2019.

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