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## **Synching Science and Policy to Address Climate Change in Tribal Communities**

*Synching science and policy is critical in order to address threats to tribal communities from climate change.*

Heather J. Tanana and John C. Ruple\*

Climate change is a global environmental problem, and within the United States, the adverse impacts of our changing climate are falling disproportionately on minority and low-income communities. Native Americans and tribal communities are being impacted in unique ways because of their long and deep ties to landscapes that are subject to rapid environmental changes.

There are 574 federally recognized tribes in the United States. While each tribe is unique and an independent sovereign, many tribes share experiences of colonization and have a deep connection to the land—both legally and culturally. The majority of tribal nations were removed from their traditional homelands and placed on reservations by the federal government. Although these reservations were intended to be a permanent home for the tribe, in places like Alaska, villages are being lost to sea level rise, and that homeland is now threatened by climate change. This article discusses the federal government’s legal obligations to protect Native Americans and the lands they occupy as well as the disproportionate impacts climate change is having on tribal communities. Based upon a review of over 100 articles and other publications on the nexus between science and law, we identify three crosscutting recommendations for how to better synchronize science and policy to address climate change. While these recommendations are made through the lens of climate change, we explore how they apply more broadly to the special relationship between tribal nations and the federal government.

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American Indians and Alaskan Natives are the original inhabitants of the vast majority of land that we now call the United States. The native communities that these groups of people form—whether an American Indian tribe or Alaska Native village—are legally recognized as sovereign nations that predate the formation of the United States. Tribal sovereignty continues today, with native people retaining tribal citizenship that is undiminished by their concurrent status as United States citizens.

Each tribe is unique, with its own creation story, language, governmental structure, and laws. Despite these differences, many tribes share a common history of forced removal from their homelands, treaty making with the federal government, and establishment of reservations. From 1776-1871, the United States entered into more than 400 treaties with tribes. During this timeframe, the federal government also implemented various federal policies with the goal of removing tribes westward to open up land to white settlers. To that end, treaties between tribes and the United States often established a reservation as a permanent home for the tribes and reserved to the tribes other rights related to the tribes' resources (e.g., hunting and fishing rights). These are lands and resources that were reserved by sovereign tribal nations, not lands that were granted to those nations by the federal government.

Today, the term Indian country is used to encompass all lands within the exterior boundaries of any reservation, including non-Indian owned private land. 18 U.S.C. § 1151. American Indian reservation and trust lands constitute over 56 million acres, extending across 35 different states. U.S. Department of the Interior, Bureau of Indian Affairs, "Frequently Asked Questions." Under the Alaska Native Claims Settlement Act, another 44 million acres of public land were "transferred" to Alaska Natives (though it is probably more accurate to say that these lands were taken from Alaskan Natives and later returned to their possession). 43 U.S.C. § 1601 *et seq.* Together, these Native lands represent an area the size of California, and are home to 4.5 million American Indians and Alaskan Natives.

In a series of cases, known as the *Marshall* trilogy, the U.S. Supreme Court recognized a special relationship between tribes and the federal government. *Johnson v. M'Intosh* 21 U.S. 53 (1923); *Cherokee Nation v. Georgia*, 30 U.S. 1 (1831); and *Worcester v. Georgia*, 31 U.S. 515 (1832). The Court recognized tribes' inherent sovereignty and right to govern their own people and land, while setting forth the basis of the federal trust responsibility. The Court identified tribes as "domestic dependent nations" reliant upon the federal government for protection. This relationship has been compared to that of a ward and guardian or beneficiary and trustee. Stemming from this special relationship, the federal government has a

trust responsibility to protect tribal lands, assets, resources, and treaty rights. Climate change poses unique threats to Indian country, raising important questions regarding the federal government's obligations to Indian tribes.

Speaking generally, tribes have a strong connection to their land and the environment. From Mother Earth to Father Sky, the environment upon which tribes depend is a living being to be cared for and respected. Many tribal traditions and practices are also tied to the environment. Climate change not only threatens the physical environment, but also tribal culture and traditions tied to the environment. While climate change is a global environmental problem, tribal communities are impacted disproportionately by the changes it brings. These impacts include increasing temperatures; changing precipitation patterns; sea level rise and coastal flooding; ocean acidification; forest habitat changes; and negative impacts to human health, such as shifting tribal demographics, as well as air and water pollution.

Increasing temperatures are, for example, resulting in diminishing sea ice, which in turn causes sea level rise and coastal flooding. This issue has been particularly challenging for communities in Alaska and the Pacific Northwest. In Alaska, permafrost is also melting, destabilizing the ground upon which villages have long stood. As tribal lands become uninhabitable due to flooding and erosion, tribes are being forced to either remain and endanger human lives, or relocate. In 2009, the federal government identified 31 Alaskan native villages that were imminently threatened by erosion, 12 of which had considered migrating to reduce their exposure. GAO, *Alaska Native Villages: Limited Progress has Been Made on Relocating Villages Threatened by Flooding and Erosion*, GAO-09-551 (June 2009). The threat has only grown more severe over the last decade. As sea levels continue to rise, "retreat or migration will become an unavoidable option" in coming decades for some areas along the U.S. coastline. GAO, *Climate Change: A Climate Migration Pilot Program Could Enhance the Nation's Resilience and Reduce Federal Fiscal Exposure*, GAO-20-488 (July 2020). But retreat from environmental threats also means abandoning a landscape that has been home to the ancestors of today's Native Americans since time immemorial. The cultural impact is incalculable.

The effects of climate change also put traditional food sources at risk. For example, in the Pacific Northwest, salmon populations have decreased due to rising water temperatures and streamflow pattern changes. Changes in wildlife habitat also have impacted the availability of traditional food sources. Climate impacts on forests – longer fire seasons and more frequent and severe wildfires – contribute to species

losses and shifts in species ranges for both plants and animals. Garrit Voggesser et al., *Cultural Impacts to Tribes from Climate Change Influences on Forests*, 120 *Climate Change* 615 (2013). Such loss of traditional foods “is directly related to loss of morale, and cultural health and well-being.” Swinomish Indian Tribal Community, *Swinomish Climate Change Initiative Climate Adaptation Action Plan*, 10 (Oct. 2010). Overall, the continued viability of tribal communities and their traditional ways of life are under threat, and the federal government’s trust responsibility to Native Americans obligates the government to act.

### **Integrating Science and Policy**

The federal government has a legal obligation to protect tribes, their land, and their people. Efforts to fulfill that responsibility will be more successful if science – including indigenous science – is incorporated into federal climate change policies. Science plays a particularly important role in environmental policy where statutes like the Clean Air Act, Clean Water Act, and Endangered Species Act are grounded in a scientific understanding of environmental and ecosystem health, and where regulators and courts must grapple with complex scientific evidence to set standards or determine statutory compliance. However, the relationship between science and policy can at times be strained by divergent objectives, decision making timeframes, and lexicon. These differences can frustrate the successful integration of science and policy. Looking to improve this relationship, we reviewed legal, public policy, and scientific scholarship on the nexus between law and science. Several important and reoccurring themes arose, providing practical advice for policy making. Three key recommendations are summarized below.

### **The Role of Science**

Science is both the process of inquiry, and in the minds of many, an immutable conclusion. Scientific inquiry plays a critical role in helping us to understand the risks to human health and the environment. For example, scientific inquiry is used to answer complex questions like the dose-response curve associated with common pollutants and how to accurately measure those pollutants in the environment. In the climate change context, scientific inquiry helps us understand the relationship between fossil fuel combustion, emissions of gasses and pollutants that lead to changes in climate, and the likely effect of various scenarios designed to adapt to our changing climate. With that understanding in place, we can then turn to developing appropriate regulatory standards and other policies.

But different groups see and use science in different ways, and the various creators, consumers, and communicators of scientific information must account for those differences. To members of the public, science is, if not that which we accept as fact, likely the justification for why we accept information as fact. It is why we wear face masks and get vaccinated to thwart a pandemic, as much or more than the process that led to mask mandates or breakthroughs in vaccination technology. Policy makers seek clear lines and certainty from which to make decisions balancing the tradeoffs between protective measures, impacts over time, and potential impacts on the economy. Policy makers also need to consider distributional impacts and broader issues involving social justice. Lawyers seek clear standards for their clients, but lawyers may be called upon to argue for outcomes benefitting individual clients with limited regard for broader societal concerns. Lawyers may therefore find themselves focusing on the gaps in scientific knowledge or endeavoring to take advantage of scientific uncertainty to the benefit of their clients. Scientists, in contrast, are more likely to see science as an ongoing and iterative process characterized by constant refinement. The search for refinements necessarily focuses on uncertainty, but viewed through this lens, uncertainty may be less of a shortcoming than it is to the lawyer or policy maker. The scientists may therefore be leery of policy makers' demand for certainty or a lawyer's propensity to treat uncertainty as a limit on informational usefulness. And of course, lawyers and policy makers may find the scientific lens equally frustrating. The lawyer, the policy maker, and the scientist may all be looking upon the same metaphorical forest, but one may be focused on the trees where the others look to spaces between those trees.

Given the important role of the scientific process and scientific information, it is imperative that we acknowledge the different lenses through which different groups view science. It is also critical that we endeavor to minimize outside interference (e.g., political and special interests) with the scientific process in order to maintain decisional integrity. On March 19, 2021, the Environmental Protection Agency relaunched its climate change website after it had been removed in April 2017. The Biden Administration has expressed a commitment to combating the climate crisis through three Executive Orders and a Memorandum. *See* Tackling the Climate Crisis at Home and Abroad, Exec. Order No. 14008, 86 Fed. Reg. 7619 (Feb. 1, 2021) (calling for a whole-of-government approach to climate change in both domestic and foreign affairs while pursuing racial justice and equity across the board, including in environmental justice); Climate-Related Financial Risk, Exec. Order No. 14030, 86 Fed. Reg. 27967 (May 25, 2021) (supporting policies associated to physical and transition risks related to climate change); President's Council of Advisors on Science and Technology, Exec. Order No. 14007, 86 Fed.

Reg. 7615 (Feb. 1, 2021) (establishing the Administration policy to make evidence-based decisions guided by the best available science and data); and Memorandum on Restoring Trust in Government Through Scientific Integrity and Evidence-Based Policymaking (requiring review of any instances in which scientific-integrity policies have not been followed or enforced). As part of that effort, the “EPA is restoring the role of science[.]” EPA, Climate Change webpage. We are optimistic that this re-grounding of policy in science will result in better integration of science and, and in turn, improve our ability to adapt to a changing climate.

### **Communication is Critical**

Communication – between the public and scientists, legal professionals, and policy makers – is critical for promoting science and integrating scientific considerations into policy. Returning to the forest analogy, we must be careful to articulate whether we are talking about the trees, the spaces in between the trees, the ground in which they are rooted, or something entirely different. We must also articulate why our framing matters and allow for other, equally meaningful framings.

Subtle improvements in communication techniques can produce outsized benefits in advancing scientific information and the decisions which grow from that fertile soil. Academic literature defines specific opportunities for improving communication in terms of framing messages in a way that connects with the intended audience, and literature from multiple disciplines identified similar tools for building connections. Science, law, and public policy sources alike identify the need to use anecdotes and narratives; metaphors; imagery; and structured storytelling with a beginning, middle, and end. *See generally* Chris Shaw, et al., *Principles for Effective Communication and Public Engagement on Climate Change: A Handbook for IPCC Authors* (January 2018).

Effective communication can also help bridge the gap between different systems of thought. Legal professionals, policy makers, and scientists are all interested in facts, though they may see facts through different lenses. Scientists often tend to focus on uncertainty when certainty is what most legal professionals and policy makers seek. Both recognize and appreciate the forest, but approach the view of the forest from different but equally important perspectives. Recognizing this fundamental difference in perspective can strengthen the foundation for building collaborative partnerships.

### **Build Collaborative Partnerships**

Multiple players must come together to address climate change, and this is particularly true in Indian country, where land is often held in trust and administered by federal agents. Collaborative partnerships can help ensure that policy decisions are effective and informed by science, and maximize the chance that they produce the desired end. In order to promote collaborative partnerships, it is important that each player understand the various roles played and served by others. Scientists have expertise that can help inform policy and ensure that the intended outcomes are achieved. Legal professionals lean heavily on science to understand the causal relationship between actions affecting the environment and their effect on public health and the economy in order to develop policies and set regulatory standards. Because legal professionals need sound science upon which to act, stronger partnerships with the scientific community can provide significant dividends. Legal professionals can also help scientists identify pressing research questions and work with them to facilitate knowledge exchange across disciplines and to varied audiences.

Collaborators should be open to other systems of thought and committed to listening and communicating in multi-way dialogue. And these collaborations begin with an understanding of the ways others understand and utilize science. Lawyers and policy makers should ask about consensus and confidence rather than fixate on uncertainty. Scientists should lean into the messy world of lawmaking and adjudications to ensure that their conclusions are understood and considered rather than shy away for fear that their work will be misconstrued. In the end, work happens at the speed of trust, and understanding begets trust. It should go without saying that when it comes to climate change, there is a lot of work to be done. *See generally* Gemma Dunn and Matthew Laing. Policy-Makers Perspectives on Credibility, Relevance and Legitimacy (CRELE), 76 Environmental Science and Policy 146 (2017).

### **Responding to Climate Change in Indian Country**

Literature addressing climate change strategies has predominantly focused on the federal and state levels. However, tribes have long utilized indigenous science to protect their communities. Also known as traditional ecological knowledge (TEK) or indigenous knowledge (IK), indigenous science is the multigenerational knowledge of ecosystem phenology (the study of cyclic and seasonal natural phenomena) and ecological shifts. Many tribes are employing indigenous science in their climate change adaptation and mitigation strategies. *See e.g.*, Confederated

Salish and Kootenai Tribes of the Flathead Reservation, CLIMATE CHANGE STRATEGIC PLAN (Sept. 2013). Rampant wildfires in California – an occurrence tied to climate change and the resulting warmer and drier conditions – brought national attention to indigenous science practiced by California tribes. State and federal wildfire management historically focused on wildfire suppression until the late 1970s. Rebecca Miller, Prescribed Burns in California: A Historical Case Study of the Integration of Scientific Research and Policy, 3 Fire 44 (2020). But fire has long been used by the Karuk, Yurok, and Hoopa Tribes of Northern California to achieve ecological balance and restore landscape resilience.

As sovereign nations, tribal governments are empowered to incorporate indigenous science into their tribal laws, regulations, and policies. However, given the trust relationship between the federal government and tribes, federal policy plays a significant role in protecting tribal public health and the environment. Tribes can demand that the federal government give greater consideration to indigenous science, at least when managing trust resources. Accordingly, any efforts to address climate change in Indian country should incorporate the three key recommendations discussed above.

First, federal government officials, as well as state and local government officials, should recognize that indigenous science *is* science. Science is both process and methodology, and Native Americans have been stewarding vast landscapes since time immemorial. They have witnessed and survived profound environmental change, amassing a vast body of information on resistance, resilience, and adaptation to environmental change. Native Americans have also implemented interventions impacting natural resources, learning about the efficacy of those interventions and their consequences in a vast living laboratory.

Science is also, in the minds of the public that consumes scientific information, equated with knowledge and immutable fact. While this perspective may cause scientists to cringe, the pervasive nature of this interpretations means that it cannot be ignored. Both interpretations must be recognized and validated as we seek to adapt to a changing climate.

Second, the federal government should build collaborative partnerships with tribes. “Social, sacred, and cultural aspects of ecosystems have historically been overlooked in land management decision making but are crucial to Native Americans.” David Flores & Gregory Russell, Integrating Tribes and Culture into Public Land Management, USDA Forest Service RMRS-GTR-409, at 179 (2020). Building partnerships will ensure that Native American perspectives will be

included in land management decisions and tribal values protected. Collaboration will also create trust, and in our experience, trust greatly reduces the risk of litigation.

Finally, the federal government should engage in meaningful consultation with tribes. The federal government has an affirmative legal obligation, as trustee over lands and resources that are central to Native American physical, spiritual, and economic wellbeing. In addition to these treaty-based obligations, consultation requirements are also found in multiple statutes, like section 106 of the National Historic Preservation Act, as well as Executive Order 13175 (Consultation and Coordination With Indian Tribal Governments). Furthermore, shortly after taking office, President Biden reaffirmed the federal government's commitment to fulfilling federal trust and treaty responsibilities to tribes and "regular, meaningful, and robust consultation" with tribes. Memorandum on Tribal Consultation and Strengthening Nation-to-Nation Relationships (Jan. 26, 2021). According to the Memorandum, "[h]istory demonstrates that we best serve Native American people when Tribal governments are empowered to lead their communities and when Federal officials speak with and listen to Tribal leaders in formulating Federal policy that affects Tribal Nations."

The impacts of climate change on tribal communities must be considered within the context of the special relationship that tribes have with the federal government as well as the spiritual and cultural relationship that that tribes have with the environment. Lessons learned about the nexus between law and science can help in reconciling divergent perspectives. The common thread connecting multiple disciplines involves an understanding of the different definitions of and roles for science, the need to improve scientific communication and tailor that communication to the appropriate audience, and the need to foster collaboration across groups. Several tribes have already begun incorporating indigenous science into their climate change responses. The federal government is simultaneously expending vast resources on climate change adaptation. The next step is to integrate these efforts.