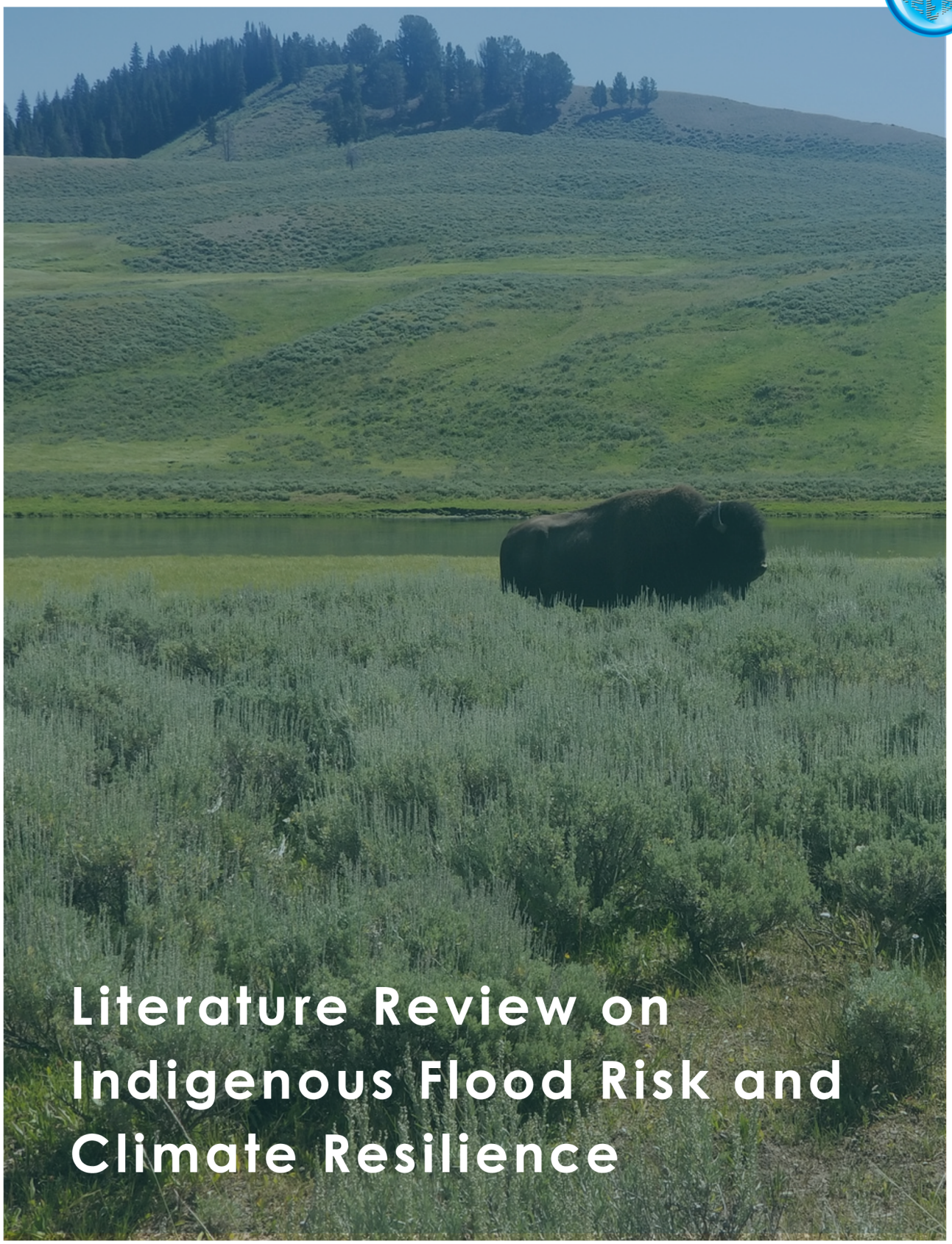

# Literature Review on Indigenous Flood Risk and Climate Resilience

ASSOCIATION OF STATE FLOODPLAIN MANAGERS
FALL 2025

*Last updated 9/9/25*

Margaret A. Cargill Tribal Engagement Project

# Literature Review on Indigenous Flood Risk and Climate Resilience

*Written by: Jacob Jett, Eleanor Rappolee, Jenna Moran, Allie Pouliot, and Bill Brown*

A complete list of the literature reviewed: https://airtable.com/appXeva6dZ13b3w7t/shrcC8JD698pirBcL

## Executive Summary

This literature review synthesizes existing research on flooding, climate change, and related environmental governance issues as they pertain to Tribal Nations in the United States. It highlights both the disproportionate risks faced by Indigenous communities and the systemic challenges in accessing equitable support for floodplain management and climate adaptation. The review draws from academic studies, federal and state reports, and Indigenous-authored perspectives to identify common findings, gaps, and opportunities for action.

Key findings indicate that Tribal Nations often occupy lands more exposed to flooding due to historical displacement, limited infrastructure investment, and governance barriers. Climate change is amplifying these vulnerabilities, with studies such as Li et al. showing significant, permanent increases in the probability of heavy rainfall, flooding, and flash flooding in areas where Native Americans live. These risks extend beyond infrastructure damage, threatening cultural resources, treaty rights, and traditional practices deeply connected to land and water.

The review underscores that many federal and state floodplain management programs operate from colonial or Western land-use frameworks, which often undervalue rural or “wilder” areas central to tribal lifeways. Funding mechanisms frequently exclude projects rooted in Indigenous priorities, and program requirements—such as non-federal cost matches—further limit access. Despite these barriers, many Tribal Nations lead significant restoration and protection efforts, often with limited external support.

From a tribal perspective, climate change, flooding, habitat health, cultural preservation, and sovereignty are interconnected issues. However, the literature reveals a lack of integrated research addressing these linkages. Much of the available work treats flooding and climate change separately, without fully accounting for the holistic Indigenous worldview in which environmental, cultural, and governance systems are interdependent. This gap underscores the need for future research, policy, and practice that address these challenges as interconnected rather than siloed issues.

Overall, the review calls for approaches that respect tribal sovereignty and Free, Prior, and Informed Consent (FPIC), build long-term relationships and trust, provide targeted and culturally relevant floodplain management resources, and ensure non-extractive, co-led engagement with Tribal Nations. Such strategies are essential to supporting Indigenous resilience, protecting treaty rights, and advancing equitable, culturally aligned flood risk management in the face of growing climate-driven threats.

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## Table of Contents

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## Background & Purpose

Flooding continues to be the most common and costly natural disaster in the country, with flood-related disasters causing more than $200 billion in damage and economic losses across the United States in 2021 and 2022. Like all states, and the communities within them, Tribal Nations are facing increasing flood-related challenges. In an effort to better support Tribal Nations in the face of climate change and its impacts on flood hazards and risks, ASFPM is working to increase engagement and improve relations with Tribal Nations within the United States. An initial goal of this work is to forge relationships with at least 10 of the 80 Tribal Nations in the Great Plains in order to better understand the perspectives and unique challenges that the peoples of Tribal Nations face. The ultimate goal is to ensure Tribal floodplain managers feel ASFPM programming and products address their unique needs. The goal of this literature review specifically is to aid in establishing a baseline knowledge within ASFPM staff on tribal engagement, cultural perspectives, and pre-colonial and colonial history, so that later relationship building activities will realize greater successes and the specific cultural contexts of individual Tribal Nations can be better represented in future ASFPM resources.

## Literature Review Process

A basic literature review process was utilized in which five pertinent themes were identified and used to define the review's scope and objectives. These five themes were:

- Theme 1: Insights into the cultural perspective(s) of Tribal Nations (i.e., TEK, Phenology)
- Theme 2: Insights into concerns around floodplain management of Tribal Nations
- Theme 3: Indigenous knowledge related to floodplain management and stewardship
- Theme 4: Previously identified support needs of Tribal Nations
- Theme 5: Insights into engaging with Tribal Nations as an external partner

With the themes in mind, the project team of five employed the Google search engine as their primary means of gathering documents. Google was supplemented by focused searches of the academic article databases Elsevier and Scopus. From these searches, a total of 44 documents were retrieved. This corpus comprises 6 academic white papers, 2 blog posts, 1 book chapter, 7 federal publications, 1 lesson plan, 9 NGO publications, and 18 peer-reviewed journal articles. Of these, 12 of the documents were identified as vital information resources to be read by all project staff, 25 of the documents were identified as relevant information resources to the project and read by a single project team member, and finally, 7 of the documents were

identified as not actually relevant to the project and were removed from the final literature review corpus. The adjusted corpus of 37 documents comprises 5 academic white papers, 2 blog posts, 1 book chapter, 7 federal publications, 1 lesson plan, 9 NGO publications, and 12 peer-reviewed journal articles. It must be noted that this literature review was not exhaustive. The project team acknowledges that there are more existing resources on these topics. As these 44 documents were reviewed, however, the ideas within them began to synthesize. With little to no new themes emerging with each resource, the project team determined that saturation had been met with these 44 documents.

During the review process, each of the documents was summarized and its major findings were listed out. From these summaries a series of topics and subtopics were identified. These topics and sub-topics were further distilled into keywords and intersecting topics were identified. The outcomes of this analysis follow.

## Findings

As the first step in the literature review process, the team identified 26 topics within the corpus that spoke to the themes that had been identified as being important to the project's success. These topics are listed below:

1. Climate Change Adaptation (21 documents) → Themes 2, 3, and 4
2. Indigenous and Local Knowledge (20 documents) → Themes 1, 2, 3, and 5
3. Tribal Ecological Knowledge (20 documents) → Themes 2 and 3
4. Land Connection (11 documents) → Themes 2 and 3
5. Indigenous Sovereignty (11 documents) → Themes 1, 4, and 5
6. Bridging Knowledge systems (10 documents) → Themes 4 and 5
7. Indigenous Rights (10 documents) → Themes 1, 2, 4, and 5
8. Indigenous and Local Peoples (9 documents) → Themes 1 through 5
9. Colonialism (8 documents) → Themes 4 and 5
10. Free, Prior, and Informed Consent (8 documents) → Themes 4 and 5
11. Climate Change (8 documents) → Themes 2 and 3
12. Justice and equity (7 documents) → Themes 3, 4, and 5
13. Capacity and self-sufficiency (6 documents) → Theme 4
14. Climate Change Mitigation (5 documents) → Themes 2, 3, and 4
15. Holistic Sustainability (4 documents) → Themes 1, 4, and 5
16. Sustainable Economic Development (4 documents) → Themes 1, 4, and 5

17. Agroforestry (4 documents) → Themes 2 and 3
18. Relationship building (3 documents) → Theme 5
19. Climate Change Health Impacts (3 documents) → Theme 4
20. Climate-Smart Agriculture (3 documents) → Themes 1, 2, and 3
21. Multi-evidence base (3 documents) → Theme 5
22. Ethics (3 documents) → Themes 1 through 5
23. Co-creation (2 documents) → Theme 5
24. Systematic Review (2 documents) → Theme 4
25. Participatory Research (3 documents) → Themes 4 and 5
26. Indigenous Sentinel Networks (1 document) → Themes 1 and 4

During the review process, the team also identified a series of intersecting topics that directly or indirectly overlapped with the primary topics above. These intersecting topics were:

1. Autonomy
2. Co-production/co-creation
3. Cultural sites
4. Data sovereignty
5. Engagement methods
6. Ethical engagement
7. Ethical research
8. Governance value
9. Justice and Equity
10. Knowledge/context
11. Motivation to mitigate
12. Partnership
13. Process
14. Terminology
15. Westernization

Using these organizing concepts, the team distilled the corpus's information for use in developing their understanding of the study's five principle themes.

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## Theme 1: Cultural Perspective of Tribal Nations

In what is likely to be an unsurprising result, most of the selected literature reviewed by the team touched on this important aspect. That said, the following six works provided many insights into Tribal Nation cultural perspectives, frequently because the authors were members of Tribal Nations and were able to directly include their perspectives in their works.

1. Sustainable development education, practice and research: an indigenous model of sustainable development at the College of Menominee Nation, Keshena, WI, USA. (Dockry et al. 2016).
2. "A return to and of the land": indigenous knowledge and climate change initiatives across the Canadian Prairies. (Cameron et al., 2021).
3. Indigenous knowledge in climate adaptation planning: reflections from initial efforts. (Ciocco et al. 2024).
4. Indigenous peoples: traditional knowledges, climate change, and health. (Redvers et al. 2023).
5. On the role of traditional ecological knowledge as a collaborative concept: a philosophical study. (Whyte 2013).
6. Indigenous perspectives on climate change. (Wall 2009).

The concept of Tribal Ecological Knowledge (TEK) was a recurring facet of these six papers. In particular, the contrast between the Western academic view of TEK and indigenous understandings of TEK was discussed at length. There are many barriers to reconciling Western traditions with indigenous ones. Wall (2009) focuses on the perspective of indigenous ecologist Dennis Martinez and tells us that Matinez "believes 'traditional ecological knowledge (TEK) and western science cannot be integrated and cannot be bridged.'" (Wall, [p 1]). It is difficult to argue that Martinez's reported perspective is unassailable when there are works within this literature review that suggest collaboration is possible (e.g., the U.S. Department of Interior's *Procedures for the Inclusion and Application of Indigenous Knowledge in the Actions of the Department[,] Handbook* [USDoI 2024]) in this literature review.

In contrast to Martinez's reported perspective, Whyte (2013) takes a stance that, "Cross-cultural divides are simply the differences in worldview, language, lifestyle, and so on that obtain between indigenous and non-indigenous populations" (Whyte, [p 8]). Whyte focuses on the "possibility of meaningful collaboration" [p 8], and, from this perspective, he argues that TEK can itself form the basis for collaboration and the development of successful co-management

frameworks. We can see in Whyte's work the struggle and effort to weave Tribal cultural perspectives into Western knowledge traditions.

Dockry et al. (2014) take a similar approach in their development of a theoretical model (itself a feature of Western knowledge traditions) for sustainable development for Tribal lands. They base their work on the lived experiences of Menominee Nation. By incorporating these experiences they developed a six-dimensional model that focuses on both factors that are familiar to Western traditions, i.e., economics, technology, and institutions, and those that are more clearly informed by indigenous cultural perspectives, i.e., land & sovereignty, the natural environment, and human perceptions, activities, and behaviors. Dockry et al., showcase examples of how the Menominee cultural perspective drives the model's shape and successfully distills the process into an academic synthesis that is quite familiar to students of Western knowledge traditions, ultimately using the model to inform post-secondary education courses.

Cameron et al. (2023), Ciocco et al. (2024), and Redvers et al. (2023) all examine the hurdles faced by both indigenous peoples trying to preserve their cultural traditions and researchers seeking to integrate cultural perspectives into their work. As with the cases showcased in these three papers, understanding and respecting the perspectives and knowledge of Tribal Nations with regards to flooding, floodplains, and successful flood mitigation are vital for ASFPM to successfully collaborate with them in the future.

### Theme 2: Concerns Around Floodplain Management of Tribal Nations

Relatively few of the documents in the corpus spoke directly to flooding and floodplain management issues facing Tribal Nations. The four that do speak directly to this theme include:

1. Addressing inequities and meeting needs of indigenous communities in floodplain management. (Zimmerman et al. 2024).
2. Climate change and water resources: what it means to tribes and how we can adapt. (ITEP 2014).
3. Environmental justice beyond 2°C. (Villa 2024).
4. Future heavy rainfall and flood risks for Native Americans under climate and demographic changes: a case study in Oklahoma. (Li et al. 2024).

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Northern Arizona University's Institute for Tribal Environmental Professionals' fact sheet "Climate change and water resources" (2014) broadly sets context for floodplain management issues that many Tribal Nations are already facing or will be facing in the near future. Specifically, the energy being added to the atmosphere through global warming is making rainfall patterns more difficult to predict. In the decade since the ITEP's fact sheet, there has already been an observable change in how rain falls, with more frequent and more extreme rainfall events occurring in some places while other areas are becoming increasingly dryer with briefer intervals of rainfall (Li et al. 2024).

Recent research underscores the urgency of addressing these concerns. Li et al. found that the chance of each rain event being "heavy" is now five times greater than in the past. The likelihood that a given rainfall will exceed the 2-year flood event (e.g. flood levels that have a 50% chance of occurring in any given year) is six times higher, and the odds of triggering a flash flood are roughly three times greater. For Oklahoma's Native American communities specifically, these shifts translate into a 68% higher risk of heavy rainfall and a 64% higher risk of flash flooding. These increases represent permanent changes to baseline risk, meaning that every future rainfall carries significantly greater flood potential than before [Li et al., p 143].

Villa (2024), writing in *Adapting to High-Level Warming: Law, Governance, and Equity* (Kuh & Roesler, eds.), explores the issues of equity and environmental justice through the lens of relatively recent weather disasters, such as 2017's Hurricane Harvey. Villa observes that Harvey damaged or destroyed over 203,000 homes and goes on to report that, "...commentators observed: 'Resource-rich communities returned to normal relatively quickly, while communities of color and low-income communities were still a mess one year later'" [Villa pp 215-6]. Controversially though, Villa also points out that in some studies, coastal flooding caused by hurricanes disproportionately impacts more affluent communities because affluent residents are more likely to own coastal property. The implication is that equity and justice is a complex topic that hinges on the local perspectives of those affected by flood disasters.

Finally, Zimmerman et al. (2024) examine inequities in floodplain management directly through the lens of Washington State's Floodplains by Design[1] project. Their goal was to: 1) learn the needs of and inequities experienced by Tribal natural resource managers; 2) assess which, if any, of those needs and inequities were already addressed by Floodplains by Design; and 3) identify

[1] https://floodplainsbydesign.org/

how Floodplains by Design could adjust to better address the identified needs and inequities. One of Zimmerman et al.'s key findings was that, "The wellbeing of humans and nature are inseparable in many Indigenous cultures ([multiple citations]), and our research indicates that this reality has not been fully incorporated into regional floodplain management" [Zimmerman et al., p 8]. They report that the ultimate goal is to create an "iterative pluralistic, collaborative, and adaptive [floodplain] management conducted with Tribes [that] will support just environmental governance that is rooted in community needs" [Zimmerman et al., p 8].

### Theme 3: Indigenous Knowledge Related to Floodplain Management and Stewardship

While there are no papers in the corpus (or that were found during the retrieval process) that directly discuss how the traditional knowledge and practices of Tribal Nations can inform floodplain management practices, there are papers that discuss how indigenous knowledge can be used to inform land stewardship practices and climate adaptation strategies.

The following papers speak directly to this relationship between indigenous knowledge, land stewardship, and adapting to climate changes:

1. *Tribal Climate Adaptation Guidebook.* (OCCRI 2025).
2. Synthesis of traditional ecological knowledge and climate change. (Dondrub [2021]).
3. Tribal Leaders Summit on Climate Change: A Focus on Climate Adaptation Planning and Implementation: University of Arizona, Tucson, Arizona, 12-13 Nov. 2015: Report. (Black et al. 2015).
4. Uncovering implicit Western science and indigenous values embedded in climate change and cultural resource adaptation policy and guidance. (Oh et al. 2024).
5. Advancing the national fish, wildlife, and plants climate adaptation strategy into a new decade. (Burns et al. 2021)

Of these five documents, the *Tribal Climate Adaptation Guidebook* provides the best example of indigenous knowledge integrated throughout the hazard mitigation planning and implementation processes. Its breaks-down monolithic planning and implementation steps into a series of smaller "bite-sized" activities that are easier to grasp, providing how-to guidance for these processes and examples of Tribal Nations carrying out each step. A wide variety of Tribal Nations with a broad array of different governance models, dwelling in many different natural

environments that range as far west as Hawai'i and east to the Great Plains, are showcased. Importantly, this is a knowledge resource for Tribal Nations by Tribal Nations.

Black et al. (2015) describe a summit meeting wherein the leaders of Tribal Nations gathered at the University of Arizona to discuss climate adaptation concerns, planning, and mitigation efforts. During the course of the summit, eight Tribal Nations presented their existing adaptation plans for feedback from their peers. These plans, "were at various stages of planning, development, and implementation" [Black et al., p 9]. During the discussion of each plan, an important aspect of the planning process was highly visible–how each Tribal Nation's mitigation and planning experts achieved community buy-in of the plan and support for it going forward. As with the *Tribal Climate Adaptation Guidebook*, Black et al.'s summit report is an excellent example of indigenous knowledge integrated throughout the hazard mitigation planning and implementation process in a manner that is both for and by indigenous peoples.

Dundrub ([2021]), writing as a graduate student research assistant at the North Central Climate Adaptation Science Center, combines the work of dozens of Western scientists, agroforestry professionals, and indigenous scholars. In this synthesizing work, Dundrub's focus is on "braiding" Western knowledge traditions with indigenous knowledge traditions in order to provide a holistic approach to climate adaptation planning. Like the previous two works, community culture and identity is an important aspect that not only needs to be acknowledged, but needs to be a foremost consideration, in order for mitigation planning to work. If the mitigation plan does not match the community's values the challenges for adoption are much higher.

Oh et al. (2024) is the scholarly work of this group of papers that is most thoroughly grounded in the Western knowledge tradition. Oh et al. are grappling with the need to integrate indigenous perspectives into risk analysis and mitigation planning processes. Above, Wall (2009) observes indigenous ecologist Dennis Martinez remarking that, weaving indigenous knowledge traditions together with Western knowledge traditions is impossible. On some level this is true, as Oh et al.'s struggle to reconcile terminology showcases. It is likely the case that these two knowledge systems can never achieve a state of total (100%) compatibility; however, this does not imply that a reconciliation of these two knowledge traditions is impossible. And so, Oh et al. advise that, "...stewardship agencies take the time to define the terms, concepts, expressions they use, describe the values embedded in that terminology, seek the ways in which those and

other words are understood by Indigenous peoples and citizens of Tribal Nations, and co-construct values-explicit definitions to improve collaboration and strategies for climate adaptation and co-management of traditional use areas and ancestral objects located on Federal lands" [Oh et al., p 73]. This advice is valuable for those seeking to better integrate indigenous knowledge into mitigation planning and practices.

Burns et al. (2021) reports on efforts to develop a broad climate adaptation strategy for fish, wildlife, and plant natural resources within the U.S. Among the 12 example plans showcased in this report are three addressing efforts by Tribal Nations:

- Karuk Climate Adaption Plan
- Tribal Climate Adaptation Menu
- Climate Change Vulnerability Assessment and Adaptation Plan: 1854 Ceded Territory Including the Bois Forte, Fond du Lac and Grand Portage Reservations

While Burns et al. only provide brief descriptions of these three exemplar projects, both the Tribal Climate Adaptation Menu and the Climate Change Vulnerability Assessment and Adaptation Plan in particular include frank discussions of adapting to future flood risks and the role careful community planning plays in successfully managing these risks.

### Theme 4: Tribal Support Needs

Tribal support needs in this context refer to the specific types of assistance, resources, and capacities that indigenous and tribal communities require to effectively plan for, respond to, and recover from the impacts of flooding in ways that honor their sovereignty, culture, knowledge systems, and self-determination.

A wide range of topics fell under the theme of Tribal Support Needs. These topics included: Indigenous Sentinel Networks, Systematic Review, Participatory Research, Ethics, Climate Change Health Impacts, Sustainable Economic Development, Holistic Sustainability, Climate Change Mitigation, Capacity and Self-Sufficiency, Justice and Equity, Free, Prior, and Informed Consent, Colonialism, Indigenous and Local Peoples, Indigenous Rights, Bridging Knowledge Systems, Indigenous Sovereignty, and Climate Change Adaptation.

The following papers spoke to the range of tribal support needs that have been identified through scientific research, partnerships, and case studies:

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1. Facing the Storm: Indian Tribes, Climate-Induced Weather Extremes, and the Future for Indian Country. (NWF, 2011)
2. How Indigenous Communities Are Adapting To Climate Change: Insights From The Climate-Ready Tribes Initiative. (Schramm et al., 2020)
3. Addressing inequities and meeting needs of Indigenous communities in floodplain management. (Zimmerman et al., 2024)
4. Indigenous Peoples: Traditional Knowledges, Climate Change, and Health. (Redvers et al., 2023)
5. Indigenous knowledge in climate adaptation planning: reflections from initial efforts. (Ciocco et al., 2024)
6. Synthesis of Traditional Ecological Knowledge and Climate Change. (Dondrub, 2021)

The literature consistently identifies a range of critical support needs for tribes engaged in climate adaptation and floodplain management. Central among these is the need to uphold tribal sovereignty and self-determination, ensuring that adaptation efforts are tribally led and grounded in Indigenous definitions of health, resilience, and cultural continuity (Schramm et al., 2020). Tribes also require sustained and flexible funding, along with technical assistance to navigate complex federal systems and to support internal capacity-building, including staffing, training, and long-term planning infrastructure. A recurring theme is the importance of integrating Traditional Ecological Knowledge (TEK) into adaptation strategies in ways that are respectful, consensual, and governed by Free, Prior, and Informed Consent (FPIC). The literature warns against extractive approaches and highlights the necessity of formal agreements and protective protocols around TEK and data sovereignty (Schramm et al., 2020). Additionally, support must account for the holistic nature of tribal adaptation, which includes not only infrastructure and environmental planning but also the preservation of language, food systems, mental health, and cultural practices. Equitable partnerships with agencies and researchers, structured around co-production and shared governance, are essential for empowering tribes in their climate work. Finally, access to localized climate data and decision-support tools, adapted to tribal contexts and capacities, is a foundational need across case studies. Together, these findings suggest that supporting tribal adaptation requires a transformation in how institutions engage with Indigenous nations—moving from consultation to collaboration, and from service delivery to sovereignty-centered support.

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## Theme 5: Tribal Engagement Best Practices

Tribal engagement best practices are principles and actions that guide respectful, effective, and culturally appropriate collaboration with indigenous and tribal nations. These practices acknowledge tribal sovereignty, honor cultural values, and build long-term, trust-based relationships - especially important in fields like climate adaptation, natural resources management, and disaster planning.

A wide range of topics fell under the theme of Tribal Engagement Best Practices. These topics included: Co-Creation, Participatory Research, Ethics, Multi-Evidence Base, Relationship Building, Sustainable Economic Development, Holistic Sustainability, Justice and Equity, FPI Consent, Colonialism, Indigenous and Local Peoples, Indigenous Rights, Bridging Knowledge Systems, Indigenous Sovereignty, and Indigenous and Local Knowledge.

The following papers summarized the best practices for ethically engaging with tribal communities.

1. Synthesis of Traditional Ecological Knowledge and Climate Change. (Dondrub, 2021)
2. Shifting Landscapes: A Guide to Developing Academic and Research Relationships in Oklahoma Indian Country. (Taylor et al., 2020)
3. Tribal Engagement Strategy of the South Central Climate Science Center. (Andrews et al., 2014)
4. Guidelines for Considering Traditional Knowledges in Climate Change Initiatives. (CTKW, 2014)
5. Tribal Climate Adaptation Menu. (Swanston et al., 2019)
6. Indigenous knowledge in climate adaptation planning: reflections from initial efforts. (Ciocco et al., 2024)
7. Ethical collaboration and the need for training: Partnerships between Native American Tribes and climate science organizations. (Kirby et al., 2019)

Best practices for tribal engagement in climate adaptation emphasize the importance of co-production of knowledge, long-term relationship building, and respect for tribal sovereignty and traditional ecological knowledge (TEK). The Climate and Traditional Knowledges Workgroup (CTKW, 2014) outlines ethical guidelines for engaging Indigenous knowledge systems, emphasizing consent, control over data, and culturally grounded processes. Multiple sources, including the South Central Climate Science Center (2013) and the Shifting Landscapes report

(2020), highlight the necessity of collaborative, trust-based partnerships and institutional support structures that enable tribal leadership in adaptation planning. Documents such as the Tribal Climate Adaptation Menu (2020) offer concrete frameworks for integrating Indigenous values into climate adaptation strategies, with a focus on self-determination, cultural revitalization, and environmental stewardship. Throughout the literature, researchers and agencies are urged to shift from extractive models of engagement toward practices that are reciprocal, respectful, and rooted in Indigenous priorities and governance systems.

## Conclusion & Reflection Points

The reviewed literature underscores that meaningful tribal engagement in climate change initiatives is an ethical obligation grounded in principles of sovereignty, respect, and reciprocity. Indigenous peoples possess unique and place-based knowledge systems—Traditional Ecological Knowledges (TEK)—that are essential for informing culturally appropriate and ecologically effective climate adaptation. However, engagement must be guided by Indigenous-defined processes that ensure Free, Prior, and Informed Consent (FPIC), protect sensitive knowledge, and promote equitable partnerships. Effective engagement requires moving beyond consultation checkboxes toward relationship-centered, co-developed frameworks that recognize tribal governments as sovereign entities and knowledge holders as authorities in their own right.

Tribal Nations face unique and pressing challenges in managing flood risks, requiring targeted support that respects sovereignty, integrates Indigenous knowledge, and addresses structural inequities in funding and policy. Support must include advocacy for federal program reforms—such as reducing or eliminating non-federal match requirements—and ensuring that funding criteria prioritize culturally significant floodplain preservation and restoration. Building capacity through tailored technical assistance, peer-to-peer learning, and training that bridges Western floodplain management practices with Indigenous perspectives is essential. Strengthening partnerships between Tribal Nations, federal agencies, and other levels of government can improve access to resources, enhance representation in policy dialogues, and promote resilient, culturally aligned floodplain management strategies. Such efforts can help ensure that flood risk reduction upholds treaty rights, protects critical ecosystems, and honors the interconnected institutional, biophysical, and sociocultural systems central to Indigenous lifeways.

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A notable gap in the literature is the limited integration of flooding and climate change impacts within the context of Tribal Nations, despite the fact that many tribes are already experiencing these challenges firsthand. Much of the available research treats these issues in isolation—focusing separately on infrastructure, environmental impacts, or cultural preservation—without fully recognizing how they are deeply interconnected from a tribal perspective. For Indigenous peoples, climate change, flooding, water management, habitat health, cultural continuity, and treaty rights are not separate issues but part of an interdependent system in which changes to one element reverberate across the whole. This holistic understanding underscores the need for future research and policy to address flooding and climate impacts not as discrete hazards, but as interwoven challenges that demand integrated, culturally grounded solutions.

Across the literature, a consensus emerges: tribal engagement must be long-term, iterative, and tailored to each Nation's governance structures, cultural protocols, and capacity. The importance of capacity-building, ethical knowledge sharing, and institutional reforms—such as Freedom of Information Act exemptions for TEKs (e.g., sensitive cultural, spiritual, or place-based knowledge that Tribal Nations do not intend for public disclosure)—are consistently emphasized. Tools like the Tribal Climate Adaptation Menu and guidelines from the Climate and Traditional Knowledges Workgroup (CTKW) offer concrete pathways for federal agencies, researchers, and other partners to implement these values in practice.

**Reflection Points**

- **Institutionalize Tribal Engagement Standards:** Agencies and research institutions should adopt clear engagement protocols informed by CTKW, UNDRIP, FPIC, and tribal research policies.
- **Support Tribal-Led Initiatives:** Prioritize funding and technical assistance for tribally developed and led adaptation strategies, planning, and knowledge governance.
- **Build Capacity on All Sides:** Provide sustained training for staff on tribal sovereignty and TEKs, and offer funding for tribal governments to build internal capacity for climate work.
- **Center Indigenous Knowledge Systems:** Promote co-production of knowledge that respects TEKs as distinct, valid, and protected systems—not to be extracted, but honored and applied through tribal leadership.

- **Create Long-Term Partnerships:** Foster sustained, trust-based relationships that extend beyond project timelines and support holistic, intergenerational resilience.

Combined, these steps offer a foundation for just and effective tribal engagement that supports Indigenous self-determination, strengthens climate resilience, and reshapes how adaptation is pursued in the U.S.

## Project Next Steps

**1. Acknowledge Tribal Sovereignty**

All project activities will be guided by a commitment to respecting and upholding tribal sovereignty. This includes following the principle of Free, Prior, and Informed Consent (FPIC) to ensure that Tribal Nations have the opportunity to fully understand, consider, and voluntarily decide whether and how to participate. Engagement will be approached as a parternship, with tribes determining their own priorities and shaping the direction of project activities.

**2. Build Relationships and Trust Over Time**

Trust is the foundation of any meaningful partnership, and building it requires time, consistency, and presence. The project will prioritize long-term relationship building by maintaining open lines of communication, participating in tribal-led events and meetings, and engaging in ongoing dialogue before project decisions are made. Success will be measured not only by deliverables but also by the strength and durability of these relationships.

**3. Provide Resources to Fill Floodplain Management Gaps**

Many Tribal Nations face barriers to accessing tailored, culturally relevant floodplain management resources. This project will focus on developing and sharing practical, accessible materials—such as guidance documents, training modules, and hazard mapping tools—that reflect both Indigenous and Western knowledge systems. These resources will be designed to address gaps in technical capacity, funding awareness, and regulatory understanding while aligning with each tribe's governance and cultural values.

**4. Commit to Non-Extractive, Co-Led Engagement**

The project will reject extractive approaches where information, stories, or data are taken without reciprocal benefit. Instead, all activities will be co-designed and co-led with Tribal Nations from the earliest planning stages through implementation and evaluation. This ensures

that outcomes are jointly owned, benefits are clear and direct for participating communities, and the process reflects mutual respect, shared decision-making, and equitable collaboration.

# Literature Review on Indigenous Flood Risk and Climate Resilience

*Written by: Jacob Jett, Eleanor Rappolee, Jenna Moran, Allie Pouliot, and Bill Brown*

A complete list of the literature reviewed: https://airtable.com/appXeva6dZ13b3w7t/shrcC8JD698pirBcL

## References

Andrews, William J., April Taylor, and Kimberly T. Winton. *Tribal Engagement Strategy of the South Central Climate Science Center, 2014.* Norman, OK: South Central Climate Adaptation Science Center, 2014. DOI: https://doi.org/10.3133/cir1396

Black, Mary et al. *Tribal Leaders Summit on Climate Change: A Focus on Climate Adaptation Planning and Implementation: Report: held at the University of Arizona[,] Tucson, Arizona[,] Nov. 12-13, 2015*. Tucson, AZ: Native Nations Climate Adaptation Program, 2015. Online: https://nativewaters-aridlands.com/wp-content/uploads/2017/04/NNCAPSummitFinal.pdf

Burns, Joe et al. *Advancing the National Fish, Wildlife, and Plants Climate Adaptation Strategy into a New Decade.* Washington, D.C.: National Fish, Wildlife, and Plants Climate Adaptation Network (2021). Online: https://www.fishwildlife.org/application/files/4216/1161/3356/Advancing_Strategy_Report_FINAL.pdf

Cameron, Laura et al. "'A Return *to* and *of* the Land': Indigenous Knowledge and Climate Change Initiatives across the Canadian Prairies." *Journal of Ethnobiology 41,* no. 3 (2021): 368-388. DOI: https://doi.org/10.2993/0278-0771-41.3.368

Chanza, Nelson, Walter Musakwa, and Clare Kelso. "Overlaps of Indigenous Knowledge and Climate Change Mitigation: Evidence from a Systematic Review." *Frontiers in Climate 6,* (2024). DOI: https://doi.org/10.3389/fclim.2024.1344931

Ciocco, Tony W. et al. "Indigenous Knowledge in Climate Adaptation Planning: Reflections from Initial Efforts." *Frontiers in Climate 6* (2024): 1-8. DOI: https://doi.org/10.3389/fclim.2024.1393354

Climate and Traditional Knowledges Workgroup. "Guidelines for Considering Traditional Knowledges in Climate Change Initiatives," Climate and Traditional Knowledges Workgroup, 2014, https://climatetkw.wordpress.com/

Department of Interior. *Procedures for the Inclusion and Application of Indigenous Knowledge in the Actions of the Department[,] Handbook [DRAFT]*. Washington, D.C.: Department of Interior, 2024. Online: https://www.bia.gov/sites/default/files/dup/tcinfo/301_dm_7_draft_indigenous_knowledge_handbook_consultation_11.8.24_508.pdf

Dockry, Michael J. et al. "Sustainable Development Education, Practice, and Research: An Indigenous Model of Sustainable Development at the College of Menominee Nation, Keshena, WI, USA." *Sustainability Science 11* (2014): 127-138. DOI: https://doi.org/10.1007/s11625-015-0304-x

Dondrub, Phurwa. *Synthesis of Traditional Ecological Knowledge and Climate Change.* Boulder, CO: North Central Climate Adaptation Science Center, 2021. Online: https://nccasc.colorado.edu/sites/default/files/2024-03/TEK_Synthesis.pdf

Ermine, Willie. "The Ethical Space of Engagement." *Indigenous Law Journal 6,* no. 1 (2007): 193-203. Online: https://utoronto.scholaris.ca/server/api/core/bitstreams/f8a0441d-2b9f-49dc-b30d-a6439a5cb142/content

Food and Agriculture Organization of the United Nations. *Free Prior and Informed Consent: An Indigenous Peoples' Right and a Good Practice for Local Communities: Manual for Project Practioners.* New York: NY: Food and Agriculture Organization of the United Nations, 2017. Online: https://openknowledge.fao.org/server/api/core/bitstreams/8a4bc655-3cf6-44b5-b6bb-ad2aeede5863/content

Fourth National Climate Assessment. "Indigenous Peoples Terminology for the Fourth National Climate Assessment [supplement]," in *Fourth National Climate Assessment,* edited by D.R. Miller et al. United States (2018). Online: https://nca2018.globalchange.gov/

Hatfield, Samantha Chisholm. "The Importance of Traditional Ecological Knowledge (TEK) when Examining Climate Change," Union of Concern Scientists, 2017, https://blog.ucs.org/science-blogger/the-importance-of-traditional-ecological-knowledge-tek-when-examining-climate-change/

Institute for Tribal Environmental Professionals. "Climate Change and Water Resources: What It Means to Tribes and How We Can Adapt [fact sheet]," Institute for Tribal Environmental Professionals, 2014, https://www7.nau.edu/itep/main/tcc/docs/resources/om_WaterFactSheet_022414.pdf

Kirby, Caitlin K. et al. "Ethical Collaboration and the Need for Training: Partnerships between Native American Tribes and Climate Science Organizations." *Gateways: International Journal of Community Research and Engagement 12,* no. 1 (2019): 1-12. DOI: http://dx.doi.org/10.5130/ijcre.v12i1.5894

Leonard, Sonia et al. "The Role of Cultural and Traditional Knowledge in Climate Change Adaptation: Insights from East Kimberly, Australia." *Global Environmental Change 23,* no. 3 (2013): 623-632. DOI: https://doi.org/10.1016/j.gloenvcha.2013.02.012

Li, Zhi et al. "Future Heavy Rainfall and Flood Risks for Native Americans under Climate and Demographic Changes: A Case Study in Oklahoma." *Weather, Climate, and Society 16,* no. 1 (2024): 143-154. DOI: https://doi.org/10.1175/WCAS-D-23-0005.1

Makondo, Cuthbert Casey and David S.G. Thomas. "Climate Change Adaptation: Linking Indigenous Knowledge with Western Science for Effective Adaptation." *Environmental Science and Policy 88* (2018): 83-91. DOI: https://doi.org/10.1016/j.envsci.2018.06.014

National Socio-Environmental Synthesis Center. "Co-Evolutions Lesson: Indigenous Knowledge and Scientific Research," Co-Evolutions Lesson, 2023, https://www.sesync.org/resources/co-evolutions-indigenous-knowledge-and-scientific-research

National Wildlife Federation. *Facing the Storm: Indian Tribes, Climate-Induced Weather Extremes, and the Future for Indian County.* Reston, VA: National Wildlife Federation (2011). Online: https://www.nwf.org/~/media/PDFs/Global-Warming/Extreme-Weather/NWF_TribalLandsExtremeWeather_FINAL.ashx

Novak, Rachel et al. "Chapter 16: Tribes and Indigenous Peoples," in *Fifth National Climate Assessment,* edited by A.R. Crimmins et al. United States, 2023. Online: https://nca2023.globalchange.gov/chapter/16/

Oh, Selin et al. "Uncovering Implicit Western Science and Indigenous Values Embedded in Climate Change and Cultural Resource Adaptation Policy and Guidance," Climate Adaptation Knowledge Exchange, 2024, https://www.cakex.org/documents/uncovering-implicit-western-science-and-indigenous-values-embedded-climate-change-and-cultural-resource-adaptation-policy-and-guidance

Oklahoma Climatological Survey. *Oklahoma Climate Adaptation Planning Kick-Off Meeting Summary Report.* Norman, OK: Oklahoma Climatological Survey (2010). Online: https://www.southernclimate.org/wp-content/uploads/Climate_Adaptation_Meeting_Summary_Report.pdf

Oregon Climate Change Research Institute. "Tribal Climate Adaptation Guidebook," Tribal Climate Adaptation Guidebook, Oregon Climate Change Research Institute, 2018, https://tribalclimateadaptationguidebook.org/

Redvers, Nicole et al. "Indigenous Peoples: Traditional Knowledge, Climate Change, and Health." *PLOS Global Public Health 3,* no. 10: e0002474. DOI: https://doi.org/10.1371/journal.pgph.0002474

Schramm, Paul J. et al. "How Indigenous Communities are Adapting to Climate Change: Insights from the Climate-Ready Tribes Initiative." *Health Affairs 39,* no. 12 (2020): 2153-2159. DOI: https://doi.org/10.1377/hlthaff.2020.00997

Taylor, April et al. *Shifting Landscapes: A Guide to Developing Academic and Research Relationships in Oklahoma Indian Country.* Norman, OK: South Central Climate Adaptation Science Center, 2020. Online: https://southcentralclimate.org/wp-content/uploads/2025/05/ShiftingLandscapes2020withcover.pdf

Tribal Adaptation Menu Team. *Dibaginjigaadeg Anishinaabe Ezhitwaad: A Tribal Climate Adaptation Menu.* Odanah, WI: Great Lakes Indian Fish and Wildlife Commission, 2019. Online: https://forestadaptation.org/sites/default/files/Tribal%20Climate%20Adaptation%20Menu%2011-2020%20v2.pdf

United Nations. *United Nations Declaration on the Rights of Indigenous Peoples.* New York, NY: United Nations (2007). Online: https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf

United States Government Accountability Office. *Flood Insurance: Participation of Indian Tribes in Federal and Private Programs: Report to Congressional Committees.* Washington, D.C.: United States Government Accountability Office (2013). Online: https://www.gao.gov/assets/gao-13-226.pdf

Villa, Clifford. "Environmental Justice Beyond 2°C," in *Adapting to High-Level Warming: Law, Governance, and Equity,* edited by Katrina F. Kuh and Shannon M. Roesler. Environmental Law Institute, 2024. Online: https://digitalrepository.unm.edu/law_facultyscholarship/956/

Wall, Dennis. "Indigenous Perspectives on Climate Change," Tribal Knowledge, 2009, https://www7.nau.edu/itep/main/tcc/Tribes/tdk_indig

Whyte, Kyle Powys. "On the Role of Traditional Ecological Knowledge as a Collaborative Concept: A Philosophical Study." *Ecological Processes 2,* no. 7 (2013). DOI: https://doi.org/10.1186/2192-1709-2-7

Zimmerman, Olivia et al. "Addressing Inequities and Meeting Needs of Indigenous Communities in Floodplain Management." *Frontiers in Climate 6* (2024): 1306542. DOI: https://doi.org/10.3389/fclim.2024.1306542

# Literature Review on Indigenous Flood Risk and Climate Resilience

*Written by: Jacob Jett, Eleanor Rappolee, Jenna Moran, Allie Pouliot, and Bill Brown*

A complete list of the literature reviewed: https://airtable.com/appXeva6dZ13b3w7t/shrcC8JD698pirBcL

## Appendix A: Key Literature by Theme

**Table 1:** Essential reads for Theme 1 on Cultural Perspectives of Tribal Nations. An asterisk (*) next to the literature title indicates that it was deemed by the project team as a "must read" or considered essential or highly recommended to read because of its importance, value, or relevance to the project as a whole.

| Theme 1: Cultural Perspective of Tribal Nations Literature | | | |
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| **Literature** | **Year Published** | **Description** | **Highlights** |
| On the role of traditional ecological knowledge as a collaborative concept: a philosophical study | 2013 | TEK has a variety of definitions; this paper reviews the most common definitions and propose that, rather than coming to a consensus on a definition, TEK should be viewed as a collaborative concept and an invitation to facilitate discussion about cultural differences and learn more about the way different knowledge systems can be used in environmental governance / the way that these concepts encourage or squash collaboration. | • Traditional Ecological Knowledge (TEK) has varied definitions in science and policy, shaped by differing assumptions about how it should be mobilized (as an archival body of knowledge vs. a living system of responsibilities) and its relationship to science (as distinct, complementary, or indistinguishable), leading to difficulty in reaching consensus.<br>• These definitional differences affect whose expertise is prioritized, how TEK is integrated into environmental governance, and the extent of Indigenous participation in decision-making processes.<br>• The author argues TEK should be treated as a *collaborative concept*—a tool to invite cross-cultural and cross-situational learning between Indigenous and non-Indigenous institutions, fostering mutual respect and long-term cooperative stewardship.<br>• Rather than seeking a single universal definition, emphasis should be on building ongoing processes and relationships that bridge divides, respect diverse approaches to knowledge, and adapt governance to meet both Indigenous and non-Indigenous priorities. |
| *Sustainable development education, practice and research: an indigenous model of sustainable development at the College of Menominee Nation, Keshena, WI, USA. | 2016 | This paper provided a native (the Menominee nation) generated framework for sustainable development. The proposed model integrates six interconnection dimensions: land and sovereignty, natural environment, institutions, technology, economy, and human perception, activity, and behavior. This model is used as the cornerstone of certain academic courses at the College of the Menominee Nation. | The model recognizes how its six dimensions are connected and sensitive to changes in one another. The model integrates indigenous values, especially with regards to autochthony. The model offers a structured approach for both indigenous and non-indigenous communities to apply their own values to sustainability challenges. |
| "A return to and of the land": | 2021 | This paper describes a series of 10 case studies describing the | Indigenous communities integrate their cultural resilience with environmental restoration by adopting land-based |

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| indigenous knowledge and climate change initiatives across the Canadian Prairies. | | experiences of Canadian Indigenous communities in Alberta, Saskatchewan, and Manitoba. It uses a community-based participatory approach and through video interviews, the authors note observations of climate change that Indigenous peoples have made and how they have employed their cultural knowledge to adapt to them. In particular, Indigenous communities have focused on land-based education, renewable energy projects, grassroots activism, cross-cultural dialogues, and ecological restoration as methods to adapt to climate change. | education practices, renewable energy projects, grassroots activism, cross-cultural dialogues, and ecological restoration strategies. Observations of different initiatives across different Indigenous communities revealed common themes that included: the important of Indigenous leadership, community independence through capacity and self-sufficiency, creation of economic opportunities through sustainable economic development, reaffirmation of their connection to the land, sharing of knowledge across generations and communities, and merging Indigenous approaches with Western ones in the development of holistic solutions. |
| Indigenous knowledge in climate adaptation planning: reflections from initial efforts. | 2024 | This document summarizes lessons learned from attempts to incorporate Indigenous Knowledge into climate adaptation planning, including necessary considerations regarding who to engage within the tribe, how and when to incorporate IK, potential implications of risk-based planning approaches, and support for tribal priorities, despite academic timelines. | • Tribal engagement must be done on multiple levels and groups of people to ensure ethical incorporation. This can include informing, consulting, participating, and empowering.<br>• Bridging tribal and western knowledge systems can be difficult - social scientists can/should be involved, too.<br>• Using a risk-based approach to climate adaptation planning can cause tension in certain cultures<br>• All IK incorporation should be built around relationships and based on tribal priorities and capacity, despite the pressure imposed by grant timelines |
| Indigenous peoples: traditional knowledges, climate change, and health. | 2023 | A review of literature describing the negative impacts of climate change on Indigenous peoples' mental and physical health and the potential role for traditional knowledges in developing climate change adaptation strategies, if done by acknowledging Indigenous rights. | • Increased Indigenous governance autonomy and authority<br>• Promoting knowledge sharing amongst communities (e.g. share TEK within and outside of Indigenous communities WHILE acknowledging their rights / not being extractive - it is a powerful source of climate knowledge)<br>• Promoting adaptive co-management across governances<br>• Developing learning platforms for climate change impacts and adaptation strategies |
| Indigenous perspectives on climate change. | 2009 | A discussion of how to bring to light the value of TEK to western scientists. | • Collaborative research and problem solving across TEK and western science is necessary to adapt to the changing climate<br>• Indigenous knowledges often take into account factors that Western science and values don't and due to longstanding connection with place, often see changes earlier (not exhausting food sources, types of ice and |

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| | | | nuances of changes across communities and wildlife species)<br>• Dennis Martinez typically organizes roundtable discussions and conversations between experts in western science and TEK wisdom holders - even if their interests diverge, they show they are open to listening by being present<br>• Typically more popular with western scientists than expected, possibly because it is different than the usual PowerPoints. There is a cohort of dedicated scientists who want to learn about/from TEK |
| *UN General Assembly, United Nations Declaration on the Rights of Indigenous Peoples | 2007 | This declaration from the United Nations sets out a number of general principles and 41 articles concerning indigenous sovereignty. While it doesn't speak directly to disaster preparedness, the core tenets of the articles set forth important ideals concerning indigenous self-determination. These ideals will be important for us to keep in mind as we build and realize the collaborative work of our project and its after effects. | • Indigenous peoples have the right to self-determination, including autonomy and self-government in matters affecting their internal and local affairs.<br>• They have rights to their traditionally owned, occupied, or used lands, territories, and resources, with legal recognition, protection, and fair redress when taken without consent.<br>• States must consult and cooperate in good faith to obtain FPIC before adopting measures that affect indigenous peoples.<br>• Indigenous peoples have the right to practice, revitalize, and protect their cultural traditions, languages, spiritual practices, and traditional knowledge, including intellectual property rights.<br>• Indigenous peoples are equal to all other peoples and individuals entitled to all human rights and freedoms without discrimination based on identity or origin. |
| *Procedures for the Inclusion and Application of Indigenous Knowledge in the Actions of the Department Handbook | 2024 | This handbook provides guidance on how to include and elevate Indigenous Knowledge (IK) alongside other scientific approaches in decision-making, research, and program implementation. It emphasizes the respect, equity, and collaboration with Tribal Nations, Indigenous communities, and Knowledge Holders, ensuring that engagement is grounded in free, prior, and informed consent (FPIC), cultural sensitivity, and compensation. This handbook also draws on historical context, outlines ethical frameworks, and offers promising practices for planning, engaging, applying, and protecting IK in federal, state, and local | • Indigenous Knowledge is dynamic, evolving, and should be placed on equal footing with other scientific approaches.<br>• Engagement with Knowledge Holders must follow FPIC, respect sovereignty, and ensure fair compensation for contributions.<br>• Historically, federal policies have disrupted IK transmission, with impacts that still continue today.<br>• This handbook promotes relationship building, capacity assessments, respectful engagement, and co-production of knowledge as pathways to equitable collaboration.<br>• IK must be safeguarded from misuse, with attention to indigenous data sovereignty, and appropriate methods for storing and citing IK. |

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| | | decision-making. | |

**Table 2:** Essential reads for Theme 2 on Concerns Around Floodplain Management of Tribal Nations. An asterisk (*) next to the literature title indicates that it was deemed by the project team as a "must read" or considered essential or highly recommended to read because of its importance, value, or relevance to the project as a whole.

| Theme 2: Concerns Around Floodplain Management of Tribal Nations Literature | | | |
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| **Literature** | **Year Published** | **Description** | **Highlights** |
| Addressing inequities and meeting needs of Indigenous communities in floodplain management | 2024 | This paper describes the needs of and inequities seen by tribal floodplain managers in the implementation of a floodplain management grant program. | Indigenous communities are often frontline communities in the face of flooding, with deep cultural, subsistence, and treaty-based connections to water and the surrounding landscapes. Yet many floodplain management and grant programs are designed around colonial, Western, and modern land-use values, prioritizing development or economic output over Indigenous worldviews that recognize the inherent value of land, waters, and all living beings. This bias means that projects in rural or "wilder" floodplain areas—often vital to tribal lifeways—are less likely to receive funding or technical support. From a floodplain management perspective, it is far more effective to preserve these areas now than to attempt costly and often incomplete restoration later. Many Tribal Nations already lead significant restoration and protection efforts to uphold treaty rights and safeguard the lands and waters central to their sovereignty, yet they often face federal neglect in fulfilling legal responsibilities. Reducing or eliminating non-federal match requirements could help address this inequity. For Indigenous peoples, effective floodplain management must recognize that institutional, biophysical, and sociocultural systems are inseparably connected, and that protecting these relationships is essential for both resilience and justice. |
| Climate Change and Water Resources | 2014 | A short summary of the ways climate change will affect the availability of water and water resources for tribes | Climate change is causing more extreme storms and changes in water levels. Indigenous peoples tend to have connections with coastal areas in their lands but are losing access due to the changing circumstances. It is also affecting farming and fishing. Many tribes do not have codified water rights in their treaty and thus are vulnerable to exploitation/losing their water. |

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| Environmental justice beyond 2°C. | 2024 | A review of literature related to environmental justice in order to determine the role of environmental justice (still very necessary, not a tradeoff we can let go) in a world that is warming and changing beyond what we hoped or planned. | • Environmental justice frameworks must evolve to address intersecting vulnerabilities like land tenure, cultural identity, and climate-related displacement.<br>• Climate impacts don't follow expected patterns—vulnerable populations can include rural, elderly, and culturally rooted communities, not just urban minorities.<br>• Disaster response systems often fail marginalized communities, especially when documentation, land ownership, or cultural values aren't recognized.<br>• Place-based relationships and cultural identity (e.g., querencia) are vital to understanding community-level climate resilience needs.<br>• Justice must guide climate action, even in a world beyond 2°C, to ensure adaptation and recovery efforts do not deepen inequities. |
| Future heavy rainfall and flood risks for Native Americans under climate and demographic changes: a case study in Oklahoma | 2024 | A research paper investigating future flooding hazards in Oklahoma and the impact these will have on Indigenous populations. | • Climate change is projected to increase the frequency and intensity of heavy rainfall events across much of the United States, disproportionately affecting Native American communities, many of which are located in flood-prone areas.<br>• Native American lands are often more vulnerable due to historical displacement to marginal lands, limited infrastructure investment, and governance challenges that complicate flood risk management.<br>• Increased flood risks threaten not only physical safety and infrastructure but also cultural resources, subsistence practices, and treaty-protected rights tied to water, land, and ecosystems.<br>• Many Tribal Nations face significant barriers to flood risk mitigation, including inadequate funding, restrictive program requirements, limited technical capacity, and the need for culturally aligned solutions.<br>• Addressing future risks will require collaborative, government-to-government approaches that respect tribal sovereignty, increase flexible funding, incorporate Indigenous knowledge, and prioritize resilience in both infrastructure and cultural preservation. |

**Table 3:** Essential reads for Theme 3 on Indigenous Knowledge Related to Floodplain Management and Stewardship. An asterisk (*) next to the literature title indicates that it was deemed by the project team as a "must read" or considered essential or highly recommended to read because of its importance, value, or relevance to the project as a whole.

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A complete list of the literature reviewed: https://airtable.com/appXeva6dZ13b3w7t/shrcC8JD698pirBcL

| Theme 3: Indigenous Knowledge Related to Floodplain Management and Stewardship Literature | | | |
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| **Literature** | **Year Published** | **Description** | **Highlights** |
| *Synthesis of Traditional Ecological Knowledge and Climate Change | 2021 | This document provides a foundational high-level view of the issues involved in collaborating with tribal nations in the development of mitigation strategies in the course of climate change adaptation. In particular, tribal ecological knowledge (TEK) is a cornerstone in collaborative processes. | TEK is complementary to Western Science, TEK supports indigenous governance, successful integration requires respecting TEK, FPIC (free, prior, and informed consent) is essential, anti-colonial strategies are needed as colonialism has and continues to disrupt TEK, collaborative frameworks like multi-evidence base approach allows TEK to be "braided" together with Western scientific epistemologies, and indigenous leadership must be prioritized. |
| Tribal Leaders Summit on Climate Change | 2015 | This document summarizes outcomes from a 2022 summit focused on advancing climate resilience and adaptation efforts for the Navajo Nation. Key themes included the need for interdepartmental coordination, cross-generational knowledge exchange, and stronger partnerships between Navajo communities, tribal leadership, and external agencies. The report emphasizes the importance of integrating Traditional Ecological Knowledge (TEK) with Western science in climate planning and highlights challenges such as data accessibility, capacity limitations, and the need for sustainable funding. Recommendations from the summit include establishing a centralized adaptation team, improving climate communication across communities, and ensuring Navajo youth engagement in | • Cross-sector collaboration is essential for effective climate adaptation across Navajo Nation departments, chapters, and agencies.<br>• Traditional Ecological Knowledge (TEK) should be integrated alongside Western science to guide culturally relevant and place-based adaptation strategies.<br>• Youth engagement and education are critical for long-term resilience and climate leadership.<br>• Data gaps and limited access to localized climate information hinder effective planning and decision-making.<br>• Sustainable funding and institutional support are needed to build adaptation capacity and implement long-term strategies.<br>• Clear governance structures and a centralized adaptation team would strengthen coordination and implementation across the Nation.<br>• Community-level communication and planning tools are needed to ensure that adaptation is accessible, actionable, and inclusive of all voices. |

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| | | long-term planning. Overall, the report reflects a commitment to sovereignty-driven, culturally grounded climate action within the Navajo Nation. | |
| Uncovering implicit Western science and indigenous values embedded in climate change and cultural resource adaptation policy and guidance | 2024 | This paper analyzes terminology used in indigenous-created and US federal documents to examine differences in values and definitions that may lead to miscommunication around climate change. | • Federal adaptation guidance often prioritizes Western scientific approaches, marginalizing Indigenous values, knowledge systems, and definitions of cultural resources.<br>• Language in federal climate policies is shaped by Euro-American legal and scientific traditions, which can unintentionally obscure or devalue Indigenous worldviews and practices.<br>• Indigenous cultural resources are dynamic and relational, including practices, places, and identities that evolve with environmental and social change—contrasting with static definitions often used in federal frameworks.<br>• There is a need for more explicit inclusion of Indigenous perspectives and governance structures in the development of adaptation policies and guidance.<br>• Collaborative, co-produced frameworks that respect tribal sovereignty and traditional knowledge can lead to more just, culturally relevant climate adaptation strategies. |
| Tribal Climate Adaptation Menu | 2019 | This document is a listing of various ways indigenous communities and those working with them can adapt to the changing climate while factoring in culturally important places and species | • Respect and reciprocity are very important concepts - gift-giving (to people and other relatives) can be an important way of conducting business in tribal communities<br>• Compensation may go above and beyond items or money to time and ceremonies to thank knowledge holders<br>• Be willing to put in the time to develop relationships, rather than rushing (even though climate change fosters an inherent sense of urgency)<br>• Boundary spanning organizations can help foster and strengthen partnerships between tribes and county/state/federal government agencies by addressing some of the cultural and administrative barriers<br>• Indigenous and tribal peoples care for an estimated 22% of the Earth's surface, and protect nearly 80% of the remaining biodiversity on the planet, while representing only 5% of the world's population. —International Labour Organization, 2017<br>• Monitor wildlife to learn about how they are changing and adapting<br>• Ensure cultural sites and uses are taken care of in the wake of a disturbance<br>• Recognize the interconnectedness of ecosystems when managing them - managing just one species is often ineffective<br>• TEK can support sustainable management of natural and cultural resources, especially when combined with Scientific |

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| | | | Ecological Knowledge, but be sure to be respectful of the sensitive nature of TEK.<br>● Creating cross-tribal partnerships is important to manage at-risk beings and habitats<br>● Seek information about species that are new to an area from the stewards of the areas to which they were previously native<br>● It is often a good practice to establish an array of post-disturbance recovery plans to thoughtfully manage land and species immediately after a disturbance occurs<br>● Planting species across a range of ages will increase resilience, as will increased biodiversity |
| Advancing the national fish, wildlife, and plants climate adaptation strategy into a new decade. (Burns et al. 2021) | 2021 | This paper describes changes in climate science and recommends ways to update the 2012 National Fish, Wildlife, and Plants Climate Adaptation Strategy, including consideration of indigenous knowledge. | ● Add a goal to include local communities in climate adaptation planning.<br>● Wildlife health is central to Indigenous cultural, physical, and spiritual well-being.<br>● Indigenous Knowledges (IKs) provide deep awareness of land changes and species interconnectedness.<br>● IKs guide holistic, ecosystem-wide adaptation beyond species-specific science.<br>● Engage communities early with FPIC and protect sensitive knowledge (“cause no harm”). |
| *Tribal Climate Adaptation Guidebook | 2018 | This Guidebook follows a holistic approach to adaptation planning called community-driven climate resilience planning. Step 1 offers guidance to Center the Tribe’s Adaptation Effort in the tribe’s vision and priorities. Also covered in Step 1 is guidance on engaging tribal leadership and community members and ways the tribe may consider incorporating TKs in climate change adaptation planning. The next four steps constitute the climate adaptation planning process: Identify Concerns and Gather Information (Step 2), Assess Vulnerability (Step 3), Plan for Action (Step 4), and Implement and Monitor Actions (Step 5). Each step is connected to and emanates from the tribe’s vision and | ● The guidebook provides a five-step framework—center the tribe’s effort, identify concerns, assess vulnerability, plan for action, and implement/monitor—rooted in tribal values, vision, and sovereignty.<br>● It emphasizes braiding TKs with Western science while ensuring respect, free prior and informed consent (FPIC), and tribal intellectual property protections when working with knowledge holders.<br>● Tribes are leaders in climate resilience, demonstrating adaptation grounded in cultural traditions, long-term ecological knowledge, and community priorities despite facing disproportionate climate impacts.<br>● The guidebook includes checklists, checkpoints, guiding questions, and examples from dozens of tribes to illustrate diverse approaches to adaptation planning and implementation.<br>● Federal programs (e.g., BIA Tribal Resilience Program), intertribal networks, and external partners play critical roles in providing funding, capacity, and collaboration for adaptation planning and action. |

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| | | priorities and considers multiple knowledges and perspectives. | |

**Table 4:** Essential reads for Theme 4 on Tribal Support Needs. An asterisk (*) next to the literature title indicates that it was deemed by the project team as a "must read" or considered essential or highly recommended to read because of its importance, value, or relevance to the project as a whole.

| Theme 4: Tribal Support Needs Literature | | | |
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| **Literature** | **Year Published** | **Description** | **Highlights** |
| Facing the Storm: Indian Tribes, Climate-Induced Weather Extremes, and the Future for Indian Country | 2011 | This document examines how increasing climate-related weather extremes—such as heatwaves, droughts, wildfires, floods, and storms—disproportionately threaten tribal communities across the United States. It highlights that Tribal lands often suffer from under-resourced infrastructure, persistent poverty, treaty-area constraints, and a deep cultural reliance on local ecosystems, which together severely inhibit their capacity to respond and adapt to these intensifying hazards | Despite these challenges, the report emphasizes tribal resilience rooted in traditional ecological knowledge, enduring land stewardship practices, and sovereign governance structures. It advocates for empowering tribes to lead adaptation strategies, form equitable partnerships with federal and state entities, and secure the technical and financial resources necessary to prepare for, respond to, and recover from increasing weather extremes. In essence, "Facing the Storm" calls for proactive, tribe-led climate preparedness that acknowledges federal trust responsibilities and centers Indigenous knowledge and sovereignty as critical foundations for resilience. |
| How Indigenous Communities Are Adapting To Climate Change: Insights From The Climate-Ready Tribes Initiative | 2020 | This case study summarizes the lessons learned from two Native American groups implementing the CDC and National Indian Health Board's (NIHB) Climate-Ready Tribes Initiative (CRTI). The initiative provided funding and technical assistance to ten tribes. The case study examines the experiences of the Pala Band of Mission Indians and the Swinomish Indian Tribal Community. | Policies are more effective when driven by tribal experts instead of outside experts (like state and federal experts). Funding should be set aside specifically for the unique needs of tribal nations. Tribes should be involved in federal and state-level climate policy in order to improve adaptation effectiveness. |

# Literature Review on Indigenous Flood Risk and Climate Resilience

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A complete list of the literature reviewed: https://airtable.com/appXeva6dZ13b3w7t/shrcC8JD698pirBcL

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| Addressing inequities and meeting needs of Indigenous communities in floodplain management | 2024 | This paper describes the needs of and inequities seen by tribal floodplain managers in the implementation of a floodplain management grant program. | Indigenous communities are often on the frontlines of flooding, with essential cultural, subsistence, and treaty-based connections to water and the surrounding landscapes. To address their floodplain management needs, support must go beyond standard grant and management frameworks that prioritize colonial or Western land-use values. These approaches frequently overlook Indigenous perspectives that recognize the intrinsic value of land, waters, and all living beings, resulting in underinvestment in rural or "wilder" areas that are vital to tribal lifeways. Tribes need resources to proactively preserve these areas—an approach far more effective than attempting costly restoration later. Many Tribal Nations are already engaged in extensive restoration to protect treaty rights and critical lands, yet face significant gaps in federal responsibility and funding. Targeted support could include reducing or eliminating non-federal match requirements, increasing investment in preservation and restoration of culturally significant floodplains, and ensuring that funding criteria reflect Indigenous priorities. Recognizing that institutional, biophysical, and sociocultural systems are interconnected is essential for designing support strategies that strengthen resilience, uphold sovereignty, and honor treaty obligations. |
| Indigenous Peoples: Traditional Knowledges, Climate Change, and Health | 2023 | A review of literature describing the negative impacts of climate change on Indigenous peoples' mental and physical health and the potential role for traditional knowledge in developing climate change adaptation strategies, if done by acknowledging Indigenous rights. | • Increased Indigenous governance autonomy and authority<br>• Promoting knowledge sharing amongst communities (e.g. share TEK within and outside of Indigenous communities WHILE acknowledging their rights / not being extractive - it is a powerful source of climate knowledge)<br>• Promoting adaptive co-management across governances<br>• Developing learning platforms for climate change impacts and adaptation strategies |
| Indigenous knowledge in climate adaptation planning: reflections from initial efforts | 2024 | This document summarizes lessons learned from attempts to incorporate Indigenous Knowledge into climate adaptation planning, including necessary considerations regarding who to engage within the tribe, how and when to incorporate IK, potential implications of risk-based planning approaches, and support for tribal priorities, despite academic timelines. | • Tribal engagement must be done on multiple levels and groups of people to ensure ethical incorporation. This can include informing, consulting, participating, and empowering.<br>• Bridging tribal and western knowledge systems can be difficult - social scientists can/should be involved, too.<br>• Using a risk-based approach to climate adaptation planning can cause tension in certain cultures<br>• All IK incorporation should be built around relationships and based on tribal priorities and capacity, despite the pressure imposed by grant timelines |
| *Synthesis of Traditional | 2021 | This document provides a foundational high-level view of the | TEK is complementary to Western Science, TEK supports indigenous governance, successful integration requires |

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| Ecological Knowledge and Climate Change | | issues involved in collaborating with tribal nations in the development of mitigation strategies in the course of climate change adaptation. In particular, tribal ecological knowledge (TEK) is a cornerstone in collaborative processes. | respecting TEK, FPIC (free, prior, and informed consent) is essential, anti-colonial strategies are needed as colonialism has and continues to disrupt TEK, collaborative frameworks like multi-evidence base approach allows TEK to be "braided" together with Western scientific epistemologies, and indigenous leadership must be prioritized. |

**Table 5:** Essential reads for Theme 5 on Tribal Engagement Best Practices Literature. An asterisk (*) next to the literature title indicates that it was deemed by the project team as a "must read" or considered essential or highly recommended to read because of its importance, value, or relevance to the project as a whole.

| Theme 5: Tribal Engagement Best Practices Literature | | | |
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| **Literature** | **Year Published** | **Description** | **Highlights** |
| ***Synthesis of Traditional Ecological Knowledge and Climate Change | 2021 | This document provides a foundational high-level view of the issues involved in collaborating with tribal nations in the development of mitigation strategies in the course of climate change adaptation. In particular, tribal ecological knowledge (TEK) is a cornerstone in collaborative processes. | TEK is complementary to Western Science, TEK supports indigenous governance, successful integration requires respecting TEK, FPIC (free, prior, and informed consent) is essential, anti-colonial strategies are needed as colonialism has and continues to disrupt TEK, collaborative frameworks like multi-evidence base approach allows TEK to be "braided" together with Western scientific epistemologies, and indigenous leadership must be prioritized |
| ***Shifting Landscapes: A Guide to Developing Academic and Research Relationships in Oklahoma Indian Country | 2020 | A discussion of the context, principles, collaborative approach, and protocols needed for meaningful, sustainable interaction with the Native community, informed by work with tribes in Oklahoma | • Be sensitive and pay attention<br>• Long history of negative associations with Western society, particularly researchers and scientists<br>• Actively listen and ensure that projects are beneficial to you and them<br>• Native science is often tied into language and other important parts of culture, the ecosystem is "sacred"<br>• Meet them in their space and respect their traditions/ways of being (can vary immensely between tribes/Nations)<br>• Don't put unnecessary burden on tribes - is the project necessary? Should you be doing it? If so, make sure Native people are in positions of power within the project, too.<br>• Try to reach out in person before calling - cold emails are NOT |

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| | | | the way to go.<br>• Keep contact and follow up regularly, respect data sovereignty and share all products for feedback and once finalized.<br>• Be flexible about the project (timeline and goals)<br>• Be genuine and own any potential discomfort/lack of knowledge, be open to humor<br>• Try to research the specific Nation's traditions before engaging<br>• Gifts/honorariums can go a long way |
| Tribal Engagement Strategy of the South Central Climate Science Center | 2014 | This paper describes the priorities and methods of the South Central Climate Science Center in working with and empowering local Indigenous people. | • Goals of the CSCs are to understand vulnerability to climate change and predict the changes in natural and cultural resources through work with people and models. They also work to ensure that projects are relevant to those who live in the region and that data generated by CSCs are shared with appropriate decision makers<br>• Landscape Conservation Cooperatives (LCCs, public-private partnerships formed by the Department to provide shared science to ensure the sustainability of the Nation's land, water, wildlife, and cultural resources)<br>• CSCs are based at host universities or university consortiums with specialists from multiple tribes, agencies, and colleges<br>• Stakeholder Advisory Committees (SACs) guide strategic science plans and research priorities and also provide feedback about how well the products serve the audience's needs<br>• Science Implementation Panels (SIPs) composed of subject matter experts from tribes, LCCs, and other groups provide advice on annual science priorities and review proposals for funding.<br>• CSCs promote inclusion of indigenous knowledge when appropriate and outreach/education/funding to empower indigenous communities to do their own research |
| *Guidelines for Considering Traditional Knowledges in Climate Change Initiatives | 2014 | This document provides guidelines on how to Increase understanding of the role of and protections for TKs in climate initiatives; Provide provisional guidance to those engaging in efforts that encompass TKs; and Increase mutually beneficial and ethical interactions between tribes and non-tribal partners. Including, corresponding recommended actions for agencies and researchers. | • TKs are essential to climate adaptation but require strong protections to prevent misuse or misappropriation.<br>• Free, Prior, and Informed Consent (FPIC) is a fundamental right—tribes must be able to say "no" without consequence.<br>• "Cause No Harm" is a guiding ethical principle—projects must not endanger TKs, cultures, or communities.<br>• Tribes hold sovereignty over TKs and define what can be shared, how, and with whom.<br>• Formal agreements and clear protocols are required for ethical collaboration.<br>• Federal staff must be trained on TKs, tribal laws, and cultural protocols.<br>• TKs and Western science are distinct systems and should be used together respectfully and equitably. |

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| | | | • Grants and climate initiatives must center tribal leadership and not force disclosure of TKs. |
| Tribal Climate Adaptation Menu | 2019 | This document is a listing of various ways indigenous communities and those working with them can adapt to the changing climate while factoring in culturally important places and species | • Respect and reciprocity are very important concepts - gift-giving (to people and other relatives) can be an important way of conducting business in tribal communities<br>• Compensation may go above and beyond items or money to time and ceremonies to thank knowledge holders<br>• Be willing to put in the time to develop relationships, rather than rushing (even though climate change fosters an inherent sense of urgency)<br>• Boundary spanning organizations can help foster and strengthen partnerships between tribes and county/state/federal government agencies by addressing some of the cultural and administrative barriers<br>• Indigenous and tribal peoples care for an estimated 22% of the Earth's surface, and protect nearly 80% of the remaining biodiversity on the planet, while representing only 5% of the world's population. —International Labour Organization, 2017<br>• Monitor wildlife to learn about how they are changing and adapting<br>• Ensure cultural sites and uses are taken care of in the wake of a disturbance<br>• Recognize the interconnectedness of ecosystems when managing them - managing just one species is often ineffective<br>• TEK can support sustainable management of natural and cultural resources, especially when combined with Scientific Ecological Knowledge, but be sure to be respectful of the sensitive nature of TEK.<br>• Creating cross-tribal partnerships is important to manage at-risk beings and habitats<br>• Seek information about species that are new to an area from the stewards of the areas to which they were previously native<br>• It is often a good practice to establish an array of post-disturbance recovery plans to thoughtfully manage land and species immediately after a disturbance occurs<br>• Planting species across a range of ages will increase resilience, as will increased biodiversity |
| Indigenous knowledge in climate adaptation planning: reflections from initial efforts | 2024 | This document summarizes lessons learned from attempts to incorporate Indigenous Knowledge into climate adaptation planning, including necessary considerations regarding who to engage within the tribe, how and | • Tribal engagement must be done on multiple levels and groups of people to ensure ethical incorporation. This can include informing, consulting, participating, and empowering.<br>• Bridging tribal and western knowledge systems can be difficult - social scientists can/should be involved, too.<br>• Using a risk-based approach to climate adaptation planning can cause tension in certain cultures<br>• All IK incorporation should be built around relationships and |

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| | | when to incorporate IK, potential implications of risk-based planning approaches, and support for tribal priorities, despite academic timelines. | based on tribal priorities and capacity, despite the pressure imposed by grant timelines |
| *****Ethical collaboration and the need for training: Partnerships between Native American Tribes and climate science organizations | 2019 | This article outlines the context of climate change adaptation, Indigenous peoples, and their relationships with scientific research organizations. | • Any organization or Indigenous community seeking research partners must be prepared to engage in partnership-building conversations during project development. Engaging in this process in an explicit manner, for example through written data-sharing agreements that emphasize relationship building, equal collaboration and Tribal sovereignty, can help facilitate a smooth partnership.<br>• Regardless of the venue of training, intentional programs are necessary to ensure that CSOs and other scientific researchers can ethically partner with Indigenous peoples.<br>• Scientific organizations should systematically utilize this training for their employees who will be working with Indigenous peoples. Distinct power differentials exist in the relationships between research organizations and Indigenous peoples, with organizations often having more access to the resources needed to carry out scientific research and challenges burdening Tribes more than CSOs. |

Cover image:  A buffalo in  Yellowstone National Park along the Yellowstone River. July 27, 2020.  Bill Brown.