

*Informing Marine Carbon
Dioxide Removal Projects:*

**BEST PRACTICES GUIDANCE
FOR TRIBAL AND
INDIGENOUS ENGAGEMENT**

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Finally, we acknowledge the Indigenous communities and Tribal nations whose leadership in stewarding marine ecosystems continues to inspire and guide efforts to address climate change with integrity and responsibility. This report is a reflection of our commitment to learning from and partnering with Indigenous Peoples to shape equitable and effective approaches as the marine carbon dioxide removal field advances.

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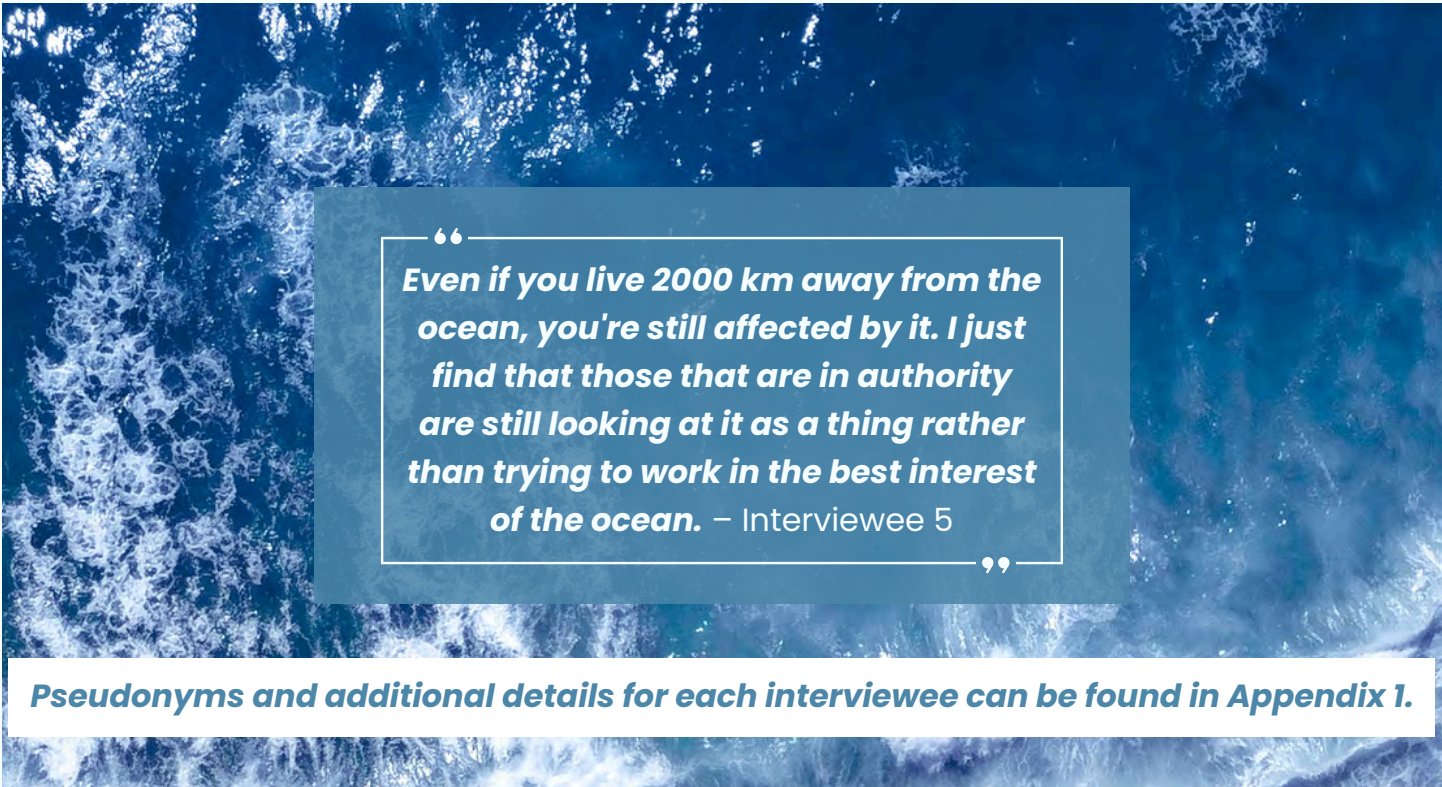
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Purpose of this Guide

As marine carbon dioxide removal science and pathways continue to develop and experimental pilot projects advance from the laboratory setting to the field, it is critically important that researchers and practitioners engage and seek to partner with members of the local Tribal and **Indigenous** communities where projects are being proposed and implemented, and who will most directly experience the outcomes and impacts of these efforts. A growing body of evidence supports that the inclusion of **Traditional Ecological Knowledge (TEK)** or **Indigenous Knowledge (IK)** improves research outcomes, particularly within the fields of ecology, environmental science, and environmental management. Research efforts that incorporate TEK as an integral part of enhanced understanding, will help address existing knowledge gaps about whether and how mCDR approaches will work in situ along the coasts and in the ocean, and their associated consequences.

The purpose of this guide is to foster partnerships and collaborations centered on mutual respect, prioritizing the health of marine environments, and the rights of coastal and inland communities with strong connections to marine ecosystems. Partnerships should also prioritize social, economic, and cultural opportunities for local peoples that are aligned with their values and needs during each phase of mCDR research and project implementation. To meet this need, we have developed the following best practices guidance document.



“
Even if you live 2000 km away from the ocean, you're still affected by it. I just find that those that are in authority are still looking at it as a thing rather than trying to work in the best interest of the ocean. – Interviewee 5
”

Pseudonyms and additional details for each interviewee can be found in Appendix 1.

Who Should Use This Guidance Document?

The Best Practices Guide for Tribal and Indigenous Engagement was developed for mCDR researchers and practitioners, including those from industry, agencies, and academia who are planning and/or implementing projects in the field. While it can serve as a reference tool to guide community engagement as project planning and implementation progresses, it should be utilized *prior* to final decision-making about siting and project determinations during the initial pre-planning and design phases. Tribal and Indigenous rights holders may also find value in these guidelines when being approached by researchers and practitioners about implementing mCDR projects in their communities and encourage the use of **Free, Prior, and Informed Consent**.

Overview of Best Practices

I. Commit to Free, Prior, and Informed Consent (FPIC)

- Honor FPIC by ensuring communities are active, respected participants.
- FPIC is not a one-time agreement, but an ongoing process.

II. Respect Tribal and Indigenous Sovereignty

- Take time to learn about Tribal and Indigenous governments, histories, and priorities.
- Respect Tribes' legal right to consultation, protected through Treaty Rights.

III. Understand Tribal and Indigenous Communities' Capacity Constraints

- Move at a pace that allows Tribes to participate.
- Refrain from interpreting silence as consent.

IV. Initiate Early and Transparent Engagement

- Begin at the earliest stages of a project's conception.
- Share project information promptly and transparently.
- Carefully consider communication methods, modes, what is critical to share, and culturally appropriate messaging.

V. Foster Long-Term Relationships that Strive for Consensus

- Consistently involve Tribal Partners through all stages of development.
- Engage in open dialogues to understand, address Tribal perspectives and concerns, and prepare for a range of potential scenarios.

VI. Recognize and Be Inclusive of the Diversity of Traditional Ecological Knowledge

- Recognize individual Tribal community diversity.
- Be inclusive of Indigenous perspectives to work towards mutual understanding.

VII. Provide Equitable Compensation for Tribal and Indigenous People's Time and Expertise

- Incorporate funding and culturally-appropriate forms of compensation into project plans.

“
The ocean is actually this living being. If you sit there and you watch the tides, watch the waves, it's almost like respiration, right? And if you treat it as a thing that needs to be fixed, then you're just going to try to come up with engineered solutions to fix this thing, instead of treating it as a living being with which we have a relationship...
”

– mCDR Focus Group Interviewee 5

Background

Marine Carbon Dioxide Removal (mCDR):

A suite of potential approaches to maintain and accelerate the ocean's uptake of atmospheric CO₂ and store it for long periods of time in the ocean. This includes hybrid pathways such as ocean alkalinity enhancement, macroalgae cultivation, electrochemical marine CDR, nutrient fertilization, and artificial upwelling and downwelling, that are being explored for their efficacy and safety.

*Key terms and definitions are **bolded** and can be found in Appendix 2.*

The Intergovernmental Panel on Climate Change (IPCC) attested that there needs to be rapid escalation in carbon dioxide removal to limit warming to 1.5 degree Celsius above pre-industrial levels.¹ The United States must address climate change through both carbon dioxide emission reduction, mitigation and removal to achieve this goal. However, these efforts must be implemented in ways that do not further harm the most climate-impacted communities and ecosystems. As the White House Ocean Justice Strategy asserts, *"Ocean communities with a significant proportion of people who are Black, Latino, Indigenous and Native American, Asian American, Native Hawaiian, or Pacific Islander may be disproportionately affected by ocean related health and environmental harms and hazards, as may be communities with a significant proportion of people who experience persistent poverty or other forms of social inequality."*² Both coastal and inland Tribal communities are deeply connected with ocean ecosystems, relying on marine species for sustenance and materials, and incorporate marine species and locations within their cultural beliefs. Through Treaties and the rights enshrined for Tribes under the U.S. Constitution, Tribes consequently hold legal and customary rights to the health of these ecosystems, as they are essential for community survival.

As researchers and scientists explore the use of the ocean for carbon management, it is essential that frontline communities – including Tribal and Indigenous peoples – are able to participate in this process as equal partners, on their own terms. This collaboration not only supports their cultural survival, but also ensures the equitable advancement of science. Historically, Tribal and Indigenous communities have been excluded from the research and development of projects related to climate change, despite being among the most affected by its impacts. When they are included, it is often in ways that do not align with the communities' needs or priorities, leading to conflicts, **sacrifice zones**, harms to sacred sites, delays in research projects, distrust, and damaged relationships.

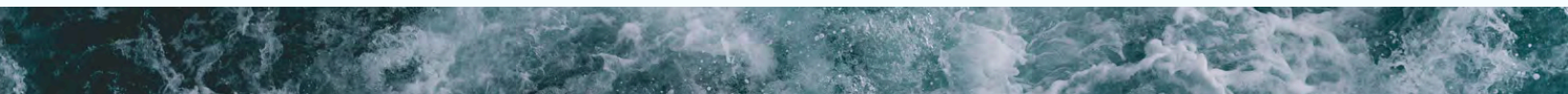
Exclusion and misalignment has extended to carbon sequestration efforts as well as other environmental initiatives. As the field of mCDR is still in its early stages, researchers and practitioners must proactively engage with these communities. Tribal and Indigenous peoples maintain deep cultural, economic, and social ties to the environments and ecosystems where mCDR projects may take place. Ensuring their inclusion from the outset consistently – and in ways that are truly meaningful – will not only strengthen these projects but also promote long-term sustainability, equity, and trust.



National Wildlife Federation and mCDR

While mCDR technology and pathways are still in the early stages of research and development, the National Wildlife Federation (NWF) is working to understand the efficacy and effects of these mCDR technologies, including both potential benefits and ramifications, on ocean and coastal communities, marine (and in some cases inland) ecosystems, and Tribal and Indigenous people. We believe that this research must be transparent, informed by best practices and aligned with a shared code of conduct for practitioners, researchers, and others working with communities. Best practices must be inclusive of the communities' interests, knowledge systems, and priorities, while incorporating **Free, Prior, and Informed Consent (FPIC)** and self-determination, as field trials move forward. Research must proceed with care and caution, as well as with respect and deference to Tribal and Indigenous knowledge holders, so as to ensure that these approaches are pursued in a way that is protective of and beneficial to the marine environment and affected communities. As the Aspen Institute Code of Conduct aptly states, *"Given the clear need to inform societal decision-making on the role mCDR can play in solving the climate crisis, it is imperative that researchers begin to answer questions about its effectiveness and impacts."*³

While some important codes of conduct have already been developed and serve as valuable underpinnings for ethical mCDR community engagement, in talking with researchers and practitioners and Tribal and Indigenous peoples from the United States and Canada, NWF identified a need for practical guidance for respectfully and effectively engaging and collaborating with Tribal and Indigenous community members as sovereign governments, unique **rights holders**, and with specific needs.



Our Methodology

This "Best Practices" document, developed by the National Wildlife Federation, provides key insights for equitable engagement with Tribal and Indigenous communities across all stages of mCDR projects, from the siting, planning and design phases to deployment,(including monitoring, reporting, verification), and beyond (post-project implementation phases). The recommendations are based on an extensive literature review, interviews, conference discussions, and focus groups facilitated by NWF. The focus groups, titled Tribal and Indigenous Perspectives on Marine Carbon Dioxide Removal, included representatives from coastal and inland Tribal and Indigenous communities in the Atlantic and Pacific regions of the U.S., as well as one Canadian participant. Of the 10 interviewees, two were non-Indigenous, who work with Tribal natural resource management commissions.

This guidance document is a first iteration, Version I, undertaken in 2024. This report and related work was made possible by support from ClimateWorks Foundation.

From Consultation to Consent

In early settlement, the United States engaged with **Tribal nations** through **consent** and treaty-making – however, over time, the United States disregarded Tribal sovereignty and reframed Tribal rights as granted by the government, rather than inherent. Current “**consultation**” policies by government agencies and industry still fall short of true consent, often reducing Tribal input to a mere formality. Moreover, consultation requirements are extremely inconsistent, and as one interviewee pointed out,

“
***A consultation can mean just as little
as an email gets sent. It doesn't
guarantee that a Tribe's going to be at
a table in the decision-making
processes.***
– Interviewee 10.
”

Tribal nations now call for a two-party consent model to ensure respect for sovereignty and meaningful, nation-to-nation relations.⁵ This model would replace today's “check-the-box” consultation approach with policies rooted in genuine collaboration and accountability, aligning with the United Nations Declaration on the Rights of Indigenous Peoples and the assertion of Free, Prior, and Informed Consent.

Free, Prior, and Informed Consent is a principle of international human rights that upholds the right of all peoples to self-determination, allowing them to freely pursue their economic, social, and cultural development. FPIC grants Native Nations the right to be fully informed and to give or withhold consent on any development impacting their lands, resources, and communities, including the terms that address economic, social, cultural, and environmental effects.⁶

FPIC principles and practices are at the heart of this guidance document. FPIC ensures Indigenous communities are considered not only stakeholders, but also critical partners in mCDR research and development. Through the use of FPIC, mCDR practitioners can help ensure self-determination is protected and respected in developing relationships with Tribal and Indigenous communities.

Honoring Consent: What if a Community Says “No”?

As practitioners move through the FPIC process, a key upfront consideration is preparing for the potential of a community to decide not to engage on the front end, or to deny consenting to the project all together.

As the Indigenous Environmental Network has aptly stated, *“The possibility that projects can be rejected must be acknowledged. At the core of the Free Prior, and Informed Consent standard is the acknowledgement that under certain circumstances, companies must accept that projects will not proceed – especially when our Native Nations/Indigenous Peoples say NO!”*⁷

Similarly, the United Nations Development Programme's Social and Environmental Standards Supplemental guidance on applying Free, Prior, and Informed Consent addresses what to do if the FPIC process does not result in consent, stating, *“In these cases, project developers/teams should first engage further to understand the basis for the rejection of the project or specific activities, and ascertain whether there are aspects that can be changed to address any potential concerns. If the lack of consent remains, then project developers/teams should carefully consider whether the project can continue while respecting Indigenous peoples’ rights and not impacting their territories as part of the project’s area of influence. If so, the project should be revised to ensure that the activities for which FPIC was not achieved are no longer included in the project. The project developers/teams should also provide clear justification and evidence that the remaining activities of the project will not negatively impact Indigenous peoples’ rights. Finally, if the project is occurring entirely on lands where communities have withheld consent, the project will need to be reconsidered, redesigned or canceled.”*⁸

So as to address potentially needed project planning contingencies, mCDR researchers and practitioners should develop alternative project plans for potential pursuit, in cases where Tribal and Indigenous **consent** is not given and an mCDR project is rejected by a local community.

Recurrent Questions and Concerns About mCDR

Within the focus groups there was a recurrent perspective expressed by participants that as an emerging field, mCDR carries many unknowns and uncertainties. Given the nascency of the mCDR field and associated technologies/methods, focus group participants conveyed extreme concern and skepticism regarding potential impacts and unintended consequences. Several insightful questions and concerns were voiced surrounding three key topic areas: vagueness and lack of specificity about mCDR technologies/methods; potential impacts on coasts, marine ecosystems and species; and cultural and environmental concerns. The best practices were guided by these questions and concerns, which are listed below, and it is advised that mCDR practitioners consider them before entering a community. These practices are intended as a foundation for transparent relationships and should be tailored collaboratively with Tribal and Indigenous partners for meaningful engagement.

Based on the questions and concerns listed below, see Appendix 3 for a concise list of questions that should be asked about your mCDR project before entering or engaging with a community.

Vagueness and Lack of Specificity About mCDR Technologies/Methods

- "Actually taking something from somewhere and placing it somewhere else when [...] we don't know the effects that will happen and how it all affects our way of life in the Pacific, that's a pretty hard pill to follow and, and stand behind." – Interviewee 1
- "Some of the problems are, of course, that this effort is being used as [...] a way to monetize the environment. And that's what I'm concerned about, that we've seen the carbon credit, the blue carbon initiatives and monetizing the air, the water and now the oceans, and what that has turned into is really a big system that's been in place to allow corporations and others to evade responsibilities by essentially putting the burden onto somebody else for doing the conservation and conserving, rather than reducing their impact on the environment on their own." – Interviewee 3

Vagueness and Lack of Specificity About mCDR Technologies/Methods

- "There are lots of ideas out there. Some of the science is unknown at this point in terms of the effectiveness and the duration in which carbon actually can be sequestered. One of the concerns that I have is actually unintended consequences. You're probably well aware of the controversy surrounding geoengineering, and when we're talking about impacting the oceans at the scale that would be actually required to try to offset or capture the accumulation of greenhouse gasses in the atmosphere. That's a big project, and there's a real potential for unintended consequences." – Interviewee 3
- "What are the recommendations and processes that need to be put in place for proper governance of things like mCDR?" – Interviewee 3
- "How do you actually demonstrate and verify and validate whatever carbon is being removed? How do you quantify that?" – Interviewee 3
- "I worry about it not being durable even with the terrestrial stuff like planting trees, growing kelp. Right. [When] sequestering carbon dioxide this year, does that really mean that we're sequestering it for 100 years? [...] Is it going to keep that carbon dioxide in the ocean for a year or 100 years or 1000 years? And will it cause more harm [...] just worsening ocean acidification and those deeper layers." – Interviewee 7
- "There's just very large unknowns and some unknowns that we're not aware of because this is geoengineering on a very large scale." – Interviewee 8
- "Do you have to do this into perpetuity? You know, because you start sequestering, but if you stop, do you just go back to where you were?" – Interviewee 8
- "Is this [mCDR] part of the larger blue carbon sort of ideology?" – Interviewee 10
- "Because of the vagueness. So I guess that's what I'm getting at [...] it's hard to know, what do we watch out for? But we want to. We do want to watch out for the impacts of not just the marine underwater biomes, but what's happening, what could potentially happen in the [...] terrestrial spaces." – Interviewee 10

Potential Impacts on Coasts, Marine Ecosystem and Species

- “How many things are you going to need to bring in one after another, adding input on input to try to rebalance the ecosystem? Because anytime you're putting a bunch of [foreign materials] in anywhere, it's going to throw off the balance.” – Interviewee 4
- “The subtle but widespread impacts to primary production in ways that we don't understand, especially since we have issues with harmful algal blooms, including PSP and domoic acid and some other emerging ones, is of great concern.” – Interviewee 4
- “What's going to happen to the fish? [...] when you work with Indigenous peoples, coastal communities, that's the number one question they're going to ask. And so far, nobody's been able to answer that question for me.” – Interviewee 5
- “How do these methodologies impact the microbiome, where there's baby shellfish in the tide, in the upper waters, and then the baby salmon eat those, and then our salmon? [...] How does that impact that?” – Interviewee 6
- “How will the ocean food web be impacted and will it be a worse food web for salmon?” – Interviewee 7
- “There's also worries around water intakes and impacts on larval crab and other small species that basically get sucked into the water intake.” – Interviewee 8
- “[...] skeptical on maybe some of [...] what industry wants to pursue out in the ocean, just because of the potential impacts it can have on the shellfish, on just any of the marine species, whether it be mammal, fish, shellfish, and what potential it can have on the food web. [...] All marine life depends on what's in the food web and the different ecological impacts that could, what could be impacted by the phytoplankton and the zooplankton that the larger species depend upon. And hopefully, if these mCDR or different strategies are going to be implemented, there's going to be for sure [known impacts].” – Interviewee 9
- “What kind of impacts would those kinds of facilities [mCDR infrastructure] have? In the littoral, not just the littoral space, but just like the beach landscapes, for example? What kind of impacts would they have on the local environments of those landscapes?” – Interviewee 10
- “[...] how would MCDR impact [...] the already increasing and rapidly increasing coastal erosion?” – Interviewee 10



Cultural and Environmental Concerns

- "We also have concerns about how changes in uptake would impact contaminant availability to higher trophic levels and how bioaccumulation and biomagnification could make contaminants—we're already concerned about, like mercury—potentially more available for us as people, but also for the seabirds and the marine mammals who are so important to us." – Interviewee 4
- "I want people to understand that we have to look at this ocean as a complex ecosystem. And rather than something that is fixed because it needs to be fixed, because it's inconveniencing us, I don't want that to be the prevalent motivation going forward, because we're going to cause more problems for ourselves if we take that approach." – Interviewee 5
- "I work with a lot of ocean scientists, number of ocean engineers and ocean companies, and I keep trying to explain to them that the ocean is not a thing that needs to be fixed [...]. The ocean is actually this living being [...]. And if you treat it as a thing that needs to be fixed, then you're just going to try to come up with engineered solutions to fix this thing. Instead of treating it as a living being with which we have a relationship, then you're going to have a different kind of approach because then you're going to try to work in the best interest of the ocean." – Interviewee 5
- "Yeah. So right off the bat, my immediate concern is that, I mean, it's pretty common knowledge in our Tribe that CO₂ absorption by the ocean causes acidification, which directly impacts our bivalve farms. Like, we have holes in our seafood when we go out and dig for it. And that's my first concern." – Interviewee 6
- "I worry a lot about the moral licensing part of all of this, that I understand that to hit these goals, these are very important, like the Paris Agreement, goals of cutting emissions." – Interviewee 7
- "What about [...] the impacts to shellfish populations or to other kinds of populations here in Southern California? For, as you might or might not know [...] abalone has been [...] hunted to extinction pretty much, and it's illegal. [...] That's a food source, a very traditional food source for California Native people. And [...] they haven't had access to it for decades now. [...] What kind of harms could happen that would mirror that kind of harm?" – Interviewee 10

I. Best Practice: Commit to Free, Prior, and Informed Consent (FPIC)

HONOR FPIC BY ENSURING COMMUNITIES ARE ACTIVE, RESPECTED PARTICIPANTS.

“
So the beginning point is to have Tribes in the room with the power of consent, not just consultation. –
Interviewee 10
”

FPIC is essential for respecting Indigenous sovereignty and fostering equitable collaboration on projects impacting Tribal lands, waters, and cultures. Focus group participants articulated the necessity of FPIC by explaining that consultation alone is insufficient. Genuine consent is critical to prevent the repeat of historical injustices that treated Indigenous lands as sacrifice zones. This was expressed by Interviewee 10:

“I care that Native people [...] don't continue to be considered the sacrificial lambs. I mean, that's really what we've always been like. [...] Our lands have always been sacrifice zones. We have always been the ones expected to sacrifice.”

Tribal and Indigenous communities are often subject to decisions about projects that affect their local environment and natural and cultural resources being made without their input, which reinforces power imbalances and marginalization. FPIC is not merely a procedural formality, but a critical safeguard that ensures that communities are active participants in shaping the future of their lands, waters, and cultures. This participant emphasized the need for FPIC to protect Indigenous rights, referencing the U.S. endorsement of FPIC through the United Nations Declaration on the Rights of Indigenous Peoples and the corresponding responsibility of federal and state authorities to uphold this commitment, ***“FPIC has got to be normalized as procedure. [...] The U.S. endorsed the United Nations Declaration on the Rights of Indigenous People in 2010. Obama did that, but he did so with a 15 page disclaimer about what that means. [...] The United Nations, United States says it supports Free, Prior, and Informed Consent. So, now we have to hold their feet to the fire.”*** To truly honor FPIC, researchers and practitioners should make special efforts to understand how projects and administrative policies impact previously marginalized groups. Decision-makers must make sure that decisions do not deepen pre-existing community divisions.

Indigenous rights lawyer and international law professor Vincent Nmehielle quoted, *“Indigenous Peoples’ rights have been so violated in the past by those who felt they knew what’s best for Indigenous Peoples, it becomes a concept to allow them to make the decision on their own as to whether a project or action is beneficial to them. [...] We want to make sure Indigenous Peoples are not taken for granted, are consulted regularly, and make decisions based on what they know to be true—the positives and negatives about the particular initiative that affects them. That is the bottom line.”*⁹

FPIC IS NOT A ONE-TIME AGREEMENT, BUT AN ONGOING PROCESS.

It is imperative that mCDR practitioners do not misconstrue a community’s interest in learning more about a proposed mCDR project as consenting to a project – rather, mCDR practitioners should engage Tribes early and with the intention of building long-term relationships. As one interviewee stated, ***“What needs to happen is the Tribes need to be at the table. The Tribes need to be helping site these, you know, say mCDR projects. They need to be there at the beginning.”*** – Interviewee 9. This participant also expressed frustration that FPIC is often sidelined by financial, political, and influential agendas, rather than being prioritized as a means of genuine engagement with Tribes. A recurring concern among focus group members – whether mCDR projects would be conducted “to us or with us” – captured this sentiment. This question resonates with issues that have arisen in other marine industries, such as offshore wind development, where insufficient consultation, at times, led to resistance and legal challenges. ***“And energy transfer partners came in [...] and said, ‘Here’s the plan, this is what we want to do.’ And [the Tribes] said, absolutely not. We do not agree. But there was no veto power. There was absolutely nothing they could do. They could disagree all they wanted, but it didn’t matter ultimately. And so that’s why FPIC has got to be normalized as procedure.”*** – Interviewee 10. Reflecting on these experiences, participants emphasized that pursuing full consent is especially crucial for projects with potential ecological impacts on marine and coastal environments, which often extend beyond immediate project sites, necessitating a comprehensive, inclusive FPIC process. For an in-depth look into the FPIC process, we encourage readers to utilize the following resources.

Additional Resources

- **Free, Prior, and Informed Consent (FPIC) Protocol.** Blue Action Fund.¹⁰
- **Guidelines for the Implementation Of Free, Prior, and Informed Consent (FPIC).** National Wildlife Federation.¹¹
- **Second Wave Due Diligence: The Case for Incorporating Free, Prior, and Informed Consent into the Deep Sea Mining Regulatory Regime.** Stanford Environmental Law Journal.¹²
- **SES Supplemental Guidance: Frequently Asked Questions (FAQs) on Applying Free Prior Informed Consent (FPIC).** United Nations Development Programme.⁸

II. Best Practice: Respect Tribal and Indigenous Sovereignty

TAKE TIME TO LEARN ABOUT TRIBAL AND INDIGENOUS GOVERNMENTS, HISTORIES, AND PRIORITIES.

“
We believe that everything happens in circles. We have this wording called we take care [...] from mauka to makai, which means from the mountains to the sea. And what that really means is that everything works in a circle. So whatever you do in the mountains [...] affects what happens in the ocean, and it all comes back. – Interviewee 1
”

To build a foundation for meaningful engagement, it is important to first understand before attempting to be understood. Before initiating the engagement and FPIC process, researchers and practitioners should research the Tribe’s ancestral land holdings, treaties, current lands under management, and priorities through formal Indigenous-authored sources. This information will determine what legal processes researchers and practitioners must follow before moving forward and identifies who a proposed project may impact and how it may affect Tribal interests. This includes lands in which Tribes have hunting, fishing, and gathering rights, ancestral lands, sacred sites, and cultural systems as well as provide a starting point and context to better understand Tribal input.

To gain insights into the potentially affected community, ensure that a broad range of sources are utilized, such as local Tribe websites, analyzing up-to-date local and regional news pieces, and academic and government documents. On the Tribes’ website, there may be information on who the best point of contact may be for a community. This is imperative to know as the community’s decision-maker will change depending on the Tribe’s governance and representation structures. Common contacts in a Tribe include Tribal chairpersons, presidents, elected representatives, and elders or spiritual leaders. Doing this baseline research before starting the FPIC process, ensures that communities are not expected to take on the task of educating interested parties from the ground up.



RESPECT TRIBES' LEGAL RIGHT TO CONSULTATION, PROTECTED THROUGH TREATY RIGHTS.

Learning about a Tribe's specific background also highlights the importance of treaty rights – a point emphasized by another participant, who noted that these rights extend beyond the act of gathering resources, but also include preserving and protecting said resources. Environmental changes impacting these resources and their ecosystem infringe on these rights. ***"[...] Treaty rights are just so important. [...] The court system has defined that Tribes have a right to salmon –, not just that they have a right to try to catch salmon, but they have a right for there to be salmon coming up in the river and to a certain fraction of that. So if we are modifying the ocean in a way that it's not as supportive for salmon, that violates the Tribe [and] their treaty rights."*** – Interviewee 7. It is important to be cognizant of the fact that some Tribal and Indigenous communities may have already had negative experiences with other climate-related industries and projects, and that these experiences may influence a community's perspectives. Utilizing the best practices outlined in this document can provide approaches to help address this challenge.

As emphasized in the focus groups, ***"There should have been [...] Tribal consultation in advance of any type of public discussion. Treating Tribes as domestic sovereigns, not as stakeholders. [...] Tribes should be involved in the decision making at all levels. Both prioritization of both various approaches, prioritization of research and where funds are done, where work is done or being proposed, and then locally all the way down."*** – Interviewee 8. Tribes are not simply stakeholders or interested parties. Rather, Tribes have legal, cultural, and sovereign status through government-to-government relationships with regulatory agencies. Treating Tribes as **domestic sovereigns**, rather than as one of many stakeholder groups, is essential.

Additional Resources

- **EPA Policy on Consultation and Coordination with Indian Tribes: Guidance for Discussing Tribal Treaty or Similar Rights. Questions to Raise About Tribal Treaty or Similar Rights During the Consultation Process.** Environmental Protection Agency.¹³
- **Native Lands Map.** Native Lands Digital.¹⁴
- **Tribal Governments Today. Indian Country 101.** The Nature Conservancy.¹⁵
- **Tribal Sovereignty: Why it Matters for Teaching and Learning about Native Americans.** National Museum of the American Indian. Smithsonian.¹⁶

III. Best Practice: Understand Tribal and Indigenous Communities' Capacity Constraints

MOVE AT A PACE THAT ALLOWS TRIBES TO PARTICIPATE.

Many Tribes operate on a limited budget and staffing capacity. researchers and practitioners should factor in this reality when managing their project timeline and facilitating outreach. Given the many responsibilities that Tribal governments manage, mCDR practitioners should provide project information in a clear and concise manner, with as much advance notice as possible.

It was expressed by an interviewee that agencies often fail to account for Tribal time constraints, such as travel, cultural, and resource commitments, disregarding requests to slow the pace of the FPIC process. They continued to explain that despite this, agencies frequently issue last-minute requests for Tribal review of complex technical documents with short turnaround times, leaving staff stretched thin: ***“It was the pace, a lot of it was not listening to what the Tribes were asking for and not being willing to take the time to slow down. And the other excuse you hear is this is a presidential mandate so it’s becoming an agency priority and therefore [...] your concerns don’t matter because we’re going to push this through regardless.”*** – Interviewee 7. This lack of consideration for Tribal capacity not only strains existing staff but limits the quality of input they can provide. There may be unanticipated challenges on the part of Tribal and Indigenous community members and decision-makers in allocating time for new initiatives as well as balancing this work with existing commitments. Certain times of the year may impact availability, this may coincide with the seasonality of species of concern or times during the year when Tribal natural resource staff are heavily engaged in the pre-season planning process, as explained by this participant: ***“Things need to happen at a time that works for the Tribes. They are busy and different times of the year, there are different demands on Tribal time. For the Pacific Northwest, January through April, most Tribal natural resources folks who are dealing with fisheries often tend to be the same people dealing with climate change and are busy with the salmon preseason planning process. That’s a very time intensive thing that happens, you know, and takes up two, three, four months of people’s time each year [...]”*** – Interviewee 8.

It may be difficult for Tribal contacts to find dedicated time to review associated project materials for informed engagement. New projects require additional resources that may strain these already limited or taxed expertise and capacities. Communities not only need ample time to engage effectively, which involves learning about and thoughtfully considering the details of proposed mCDR projects, but also support to expand capacity.



These projects often mean participating in multiple discussions, often over extended periods. Providing in-kind donations of staff hours or paying for travel and consultation costs, can help build the necessary capacity for engagement. Ultimately, it should be up to each Tribe to determine what type of support would be most beneficial for their participation.

REFRAIN FROM INTERPRETING SILENCE AS CONSENT.

Being cognizant of the limitations of Tribal resources, it is imperative to make meaningful and patient efforts to secure a response through appropriate communications. Silence is often a reflection of capacity limitations, not disinterest. Moreover, silence **does not** indicate consent. To mitigate the demands on individuals, engagement should occur with Tribal governments, who can delegate requests and expertise, as emphasized by a focus group participant. ***“They don’t have a lot of time especially to take on new work. But they do know their areas very well and the resources there. So, just working through Tribal government and Tribal technical experts recognizing they do have capacity limitations.”*** – Interviewee 7. Another participant emphasized the importance of talking directly to their commission or council, ***“As a Tribal fisherman, I have a lot of trust in my Tribal council and my Tribal natural resources department. And so I would say talk to them.”*** – Interviewee 6. Ultimately, these projects need to operate at the “speed of trust”, recognizing that timelines driven by research may not align with the needs of local communities and governments. The FPIC process takes time with respect for Indigenous governance structures and decision-making processes, recognizing that building mutual understanding is an ongoing process.

As author Agnes Portalewska states in her article Free, Prior and Informed Consent: Protecting Indigenous Peoples’ Rights to Self-Determination, Participation, and Decision-Making, *“A true consultation with a goal of obtaining FPIC takes time. It has to respect the local governance and decision-making processes and structures, and it has to occur in Indigenous languages, on Indigenous people’s time frames, free of coercion and threat. Mapping Indigenous territory from Indigenous Peoples’ perspectives is another essential element. Indigenous people are the ultimate judges on whether the consultation process has been meaningful.”*⁸

Additional Resources

- **Centering Indigenous Peoples’ Self-Determination in the Energy Transition and Sustainable Development.** Cultural Survival.¹⁷
- **Module 1: Learning & Early Discussions. Human Rights Guide for Working with Indigenous People and Local Communications.** The Nature Conservancy.¹⁸

IV. Best Practice: Initiate Early and Transparent Engagement

BEGIN AT THE EARLIEST STAGES OF A PROJECT'S CONCEPTION.

“
The Tribes need to be there early in the process, rightfully consulted, and when they submit their letters, their concerns need to be addressed. – Interviewee 9
”

The FPIC process must begin as early as possible in the project's conception and exploration phase to ensure that Tribal and Indigenous priorities, rights, and access to cultural and natural resources are upheld. Initiating engagement at the earliest possible point allows for researchers and practitioners to identify and address Tribal interests and concerns, including the degree to which the community wants to be involved in the planning and co-design, construction/implementation, and monitoring, reporting and verification phases of the project.

SHARE PROJECT INFORMATION PROMPTLY AND TRANSPARENTLY.

When sending invitations for consultation and collaboration, project information needs to be provided so that the community can determine whether and to what degree they may be impacted, the extent to which and how involved they want to be in the project, and if interested, the resources they may need to allocate. While providing clear and concise information is necessary for any type of project considerations, it is especially critical for experimental and pilot mCDR projects, given the many unknowns and uncertainties regarding impacts for all mCDR methods. As one participant articulated, ***“Here are things that [mCDR researchers and practitioners] are actively pursuing, and they need to talk about them in concrete terms in the locations, in the sciences, in the anticipated impacts, and they're not doing that. [...] We don't need an idealized picture of what these sciences might be. We need a very realistic picture of the dirty parts of what these sciences or these technologies are going to be.”*** – Interviewee 4.

Invitations to Tribal and Indigenous communities need to include clear communication, avoiding jargon, about what mCDR is, the specific proposed project method, proposed project timeline, location, potential impacts and benefits, etc. Graphics and clear, consistent messages on mCDR may aid in people's understanding of the different methods and project plan. There are varying levels of understanding of mCDR within Indigenous communities and that baseline education and continued information sharing is critical throughout.

Moreover, information should ideally flow both ways, to the extent that Indigenous communities want to be involved and share knowledge, data, and other resources. As Interviewee 4 stated ***“Even if things are well tested in the lab, until we start doing it in the real world, [...] with the investment in the chemical and biological and outcome monitoring that would allow us to see what these changes are and to understand these non-intuitive and complex interactions, we're not going to know.”*** Sharing data to support baseline environmental conditions allows communities to make an informed decision. Withholding or distorting information does not respect the Tribe's right to informed consent, and disables a communities ability to make an informed decision to decline, support, participate, or partner.

CAREFULLY CONSIDER COMMUNICATION METHODS, MODES, WHAT IS CRITICAL TO SHARE, AND CULTURALLY APPROPRIATE MESSAGING.

When contacting Indigenous partners, use multiple methods of communication, and to the extent possible, interact directly with community members. Share information through email and other digital formats, and consider calling points of contact within the Tribal government or representative organization to speak with someone directly. Ensuring that Tribal and Indigenous communities are contacted on the front end of project development during the concept and planning phase is paramount to setting the engagement process on the right path. ***“But we hope that they will find it valuable guidance to inform their process and involving the Tribes to have a seat at the table early and consistently and honor Free, Prior, and Informed Consent.”*** – Interviewee 9.

Additional Resources

- **From the Ground Up: Recommendations for Building an Environmentally Just Carbon Removal Industry. Recommendations for Carbon Removal Developers.** XPrize Carbon Removal.¹⁹
- **Initiative Enhancement Tool. Resilient Communities Framework.** Minderoo Foundation.²⁰
- **The Impact of Words and Tips for Using Appropriate Terminology: Am I Using the Right Word?** National Museum of the American Indian. Smithsonian.²¹

V. Best Practice: Foster Long-Term Relationships that Strive for Consensus

CONSISTENTLY INVOLVE TRIBAL PARTNERS THROUGH ALL STAGES OF DEVELOPMENT.

“
The other thing of course, that's important in terms of involvement of Indigenous communities is their worldview of stewardship and responsibility towards the generations to follow. – Interviewee 3
”

Engagement and collaboration should be woven into every phase of a proposed project's design, development, and implementation (including the post-implementation monitoring and evaluation phase). It is not enough to focus solely on early planning – long-term relationship building with the community is equally critical. Embedding this work into job descriptions, strategic plans, and funding agreements enables mCDR researchers and practitioners to move toward co-design and shared management with Tribes and Indigenous communities on their terms. As stated by one focus group participant, ***“I feel like a big friction point with the way that Western scientific processes sort of approach answering questions is there's this big emphasis on building boxes and looking in this limited context. What happens if I press this lever or pull this lever? [...] But it really doesn't do a great job of understanding what the broader implications are.”*** – Interviewee 2. Such insights underscore the importance of moving beyond narrow frameworks to adopt a more holistic view – one that aligns with community priorities and values and recognizes the interconnectedness of the project's environmental impacts on the larger cultural and ecological landscape.

Building meaningful relationships with Tribal and Indigenous communities requires engagement at all levels – between leadership, staff, Tribal governments, and community members. It is essential to ensure that Tribes have the appropriate contacts for both informal, staff-level discussions and formal consultations. As emphasized by a focus group participant about an energy project, ***“When Tribes had requested and pointed out that they need additional capacity and support. [A federal agency] unilaterally decided, oh, we can't give them additional capacity and support but we will give an indefinite contract to three consultant firms who can then do stuff for them basically***

taking away all Tribal sovereignty and free agency by a very colonial paternalistic approach [...] We're just going to pay it into this and you can go talk to these consultants that we hired to do this for you. Where that wasn't the request. It was a willful ignoring of what was being asked for." – Interviewee 7. When opportunities for engagement are optimized so that both Tribal and researcher and practitioner decision-makers actively participate throughout the mCDR project process (from the initial phase through to project completion and post-project monitoring and evaluation) this fosters mutual understanding, transparency, and trust. Having key Tribal and Indigenous community members present during meetings enables on-the-spot problem-solving and dialogue, helping to prevent miscommunications and may reduce the need for additional meetings. This approach acknowledges the often limited time and resources that Tribes can or may want to dedicate to project discussions and aspects of project execution.

ENGAGE IN OPEN DIALOGUES TO UNDERSTAND, ADDRESS TRIBAL PERSPECTIVES AND CONCERNS, AND PREPARE FOR A RANGE OF POTENTIAL SCENARIOS.

Doing the work necessary to determine where there are points of alignment or misalignment with project goals and Tribal values up front, is not only the right thing to do – it is the most effective thing to do. This requires actively seeking and incorporating feedback, owning and communicating mistakes, data outcomes and lessons learned, maintaining transparency, and consistently fostering inclusive dialogues. Understanding Tribal and Indigenous concerns is a critical step, but it must go beyond recognition. What a researcher or practitioner may perceive to be a potential impact or benefit of their particular project, may differ significantly from the community's perspective. Consistent communication requires not only conveying information, but also actively listening to the community's concerns, which may highlight issues or insights that the researchers or practitioners had not previously considered. As one focus group participant described, ***"[...] To engage Indigenous peoples is like a way to be more inclusive, to potentially get at different kinds of knowledge systems, understanding different paradigms [...]"*** – Interviewee 5. They went on to explain that where there are areas of tension, that is where there is the most productive ground for collaboration. ***"[...] What people are missing is the integrative part of that [of Western and Indigenous Knowledge]. The areas where there's going to be conflict, disagreement. And in that area is where most of the work is. And if you can work through that, that's where you're going to find the innovation. But it is a way of sort of equating the fact that we need both a western approach to solving problems and Indigenous approach and trying to figure out ways to make them work together."***



When Western and Indigenous approaches “work together,” they can address issues in more comprehensive ways, bridging the gaps left by each system on its own. So, strive to reach a consensus where possible, seek clarification and/or confirmation of the Tribe’s views, and collaboratively explore solutions, aiming to prioritize avoidance and protection, not mitigation of impacts. When concerns cannot be fully addressed, explore every alternative before providing a clear, respectful explanation of the limitations. Sustained engagement based on trust, consistency, and adaptability is essential to building meaningful, long-term relationships.

Additional Resources

- ***Themes Involved in Relationship Building. Best Practices for Tribal Engagement in Marine Protected Area Stewardship.*** MPA Collaborative Network.²²
- ***Indigenizing Coastal Conservation.*** Natural History Museum.²³
- ***Objective 1: Promote responsible mCDR research that involves communities and minimizes environmental risks. National Marine Carbon Dioxide Removal Research Strategy.*** Fast Track Action Committee on Marine Carbon Dioxide Removal.²⁴

VI. Best Practice: Recognize and Be Inclusive of the Diversity of Traditional Ecological Knowledge

RECOGNIZE INDIVIDUAL TRIBAL COMMUNITY DIVERSITY.

Native Americans and Indigenous peoples are not a monolithic group. According to Urban Native Collective, *“There are over 700 Tribes and nations in the United States alone, each with its own distinct culture, language, and traditions. Treating Indigenous peoples as a single entity oversimplifies and distorts the importance of our Indigenous cultures.”*²⁵

Just as the local, baseline environmental conditions and considerations are unique to each and every site where mCDR projects are piloted, so too is each Tribal and Indigenous community along with their individual cultural and ecological values. As put by one focus group participant, **“[...] You can't ask a Southwestern Tribe if you're in Washington, and bring their TEK and apply it to Washington to our area. It's not going to work because we're all different.”** – Interviewee 9. How communities view and define what constitutes impacts and benefits, management, co-design, knowledge, and collaboration, and the extent to which they may want to be or have capacity to be involved will vary, even if they are located within the same state. This diversity calls for adaptable mCDR project frameworks and engagement plans that recognize an approach effective for one Indigenous group may not be suitable for another.

BE INCLUSIVE OF INDIGENOUS PERSPECTIVES AND KNOWLEDGE TO WORK TOWARDS MUTUAL UNDERSTANDING.

Through dialogues with each community, seek to understand the equitable and non-extractive methods of incorporating Traditional Ecological Knowledge (TEK) or Indigenous Knowledge (IK) into mCDR projects. Researcher and practitioner professionals are often unfamiliar with the local environment and ocean where these projects take place, whereas Tribal stewards are experts in these areas. It should not be underestimated the connections, knowledge, and insights that Tribal and Indigenous community members have with the environment and species. In several cases, focus group participants emphasized deeply-rooted, ancestral connections to the sea and ocean-based origin stories. As one participant shared the values and beliefs most important to Native communities in the context of environmental changes are about maintaining the relationships to places and food sources. From this Indigenous perspective, a concern is maintaining those relationships to those places. **“In many instances, these have already been disrupted. The values and beliefs most important to Native communities considering the context of environmental changes are about maintaining**

relationships. Coming from a relational worldview, from an Indigenous perspective, is maintaining those relationships to those places. And so whatever mCDR is or does, it cannot further disrupt those. – Interviewee 10.

Local Traditional Ecological Knowledge from Tribes is crucial for identifying important natural resource areas and understanding ecosystem changes. This expertise aids in siting infrastructure, considering risks like storms and other local environmental factors, and should be integrated through Tribal governments despite capacity limitations. TEK is not a universal concept that can be applied uniformly across different communities; it is unique and reflective of their direct relationship with their specific environment. As Interviewee 9 explained, ***“Now you have all these people in the federal and the state world asking, how can I get TEK? Can I learn it in college? Can I learn it from a book? It’s not that way. TEK is applicable only to the Tribes who are affected or whose usual accustomed lands and waters are you in. You know, that’s what TEK is. [...] TEK is something that is taught from generation to generation. TEK is something you learn in your religion and from your elders. And TEK is actually living on the land and watching things happen. TEK is when the salmon are coming in, when these certain flowers are going to come out in the spring and these medicines are going to be ready to harvest, that’s what TEK is.”***

When communities choose to share their knowledge, it can significantly benefit the project – provided it is done in a way that respects their autonomy and is non-extractive. This also includes understanding whether the community has established research, data collection, and management protocols. Inclusive, equitable data management practices are essential to addressing these concerns and building trust with the community.

Additional Resources

- ***Data Management. Indigenous Engagement Guide.*** Ocean Frontier Institute.²⁶
- ***Indigenous Data Sovereignty in the United States.*** Global Indigenous Data Alliance.²⁷
- ***Overview of Traditional Ecological Knowledge. Guidance and Responsibilities for Effective Tribal Consultation, Communication, and Engagement.*** West Coast Ocean Alliance.²⁸
- ***The First Nations Principles of OCAP (Ownership, Control, Access, and Possession).*** FNIGC.²⁹

VII. Best Practice: Provide Equitable Compensation for Tribal and Indigenous Peoples' Time and Expertise

INCORPORATE FUNDING AND CULTURALLY-APPROPRIATE FORMS OF COMPENSATION INTO PROJECT PLANS.

Recognizing the value of Indigenous expertise means that equitable compensation is not optional – it is essential. In order to work with Tribes, researchers and practitioners need to build funding into their project plans, as was explained by Interviewee 5, ***"I'm telling people if they're going to partner with their communities, that they should actually bring funds and they should invest in the communities, invest in our knowledge systems, invest in our elders as a way to sort of equate or try to level up the power structures and the inequities between like big corporations and big governments coming into a community and asking for information."*** Another participant emphasized that as **consultation** demands grow, additional support and funding will be essential to facilitate meaningful engagement, ***"[...] You get notification out of nowhere that they need [...] a review of a very large technical document within 30 days. And, you know, just people don't have the time on the technical side [...] people are busy, they have limited bandwidth. And if this is becoming a bigger body of work, there needs to be support for additional Tribal staff to engage in these things."*** – Interviewee 8. Compensation and funding will not look the same for each Tribe and needs to be aligned with Tribal and Indigenous community values, meaning that Indigenous partners must have the opportunity to determine their own payment structures. Beyond monetary compensation, Tribes may prefer non-financial forms of support, such as capacity-building efforts, healthcare, childcare, recreational resources, transportation, access to technology, or others. Offering this flexibility ensures that engagement is mutually beneficial and responsive to each community's needs. Establishing these respectful, collaborative relationships lays the foundation for long-term partnerships that are equitable, inclusive, and sustainable.

Additional Resources

- ***Negotiate Mitigation, Compensation, Restoration, and Benefit Sharing. Guidelines for the Implementation Of Free, Prior, and Informed Consent (FPIC).*** National Wildlife Federation.¹¹
- ***Valuing Indigenous Knowledge. Working Respectfully with Indigenous People and Their Knowledge Systems.*** IPCA Knowledge Basket.³⁰

Looking Forward

In closing, we hope that this guidance document provides valuable information, perspectives, and insights for mCDR researchers and practitioners, and Tribal and Indigenous communities that may be impacted by mCDR projects. Ideally, the intended suggested use and recommendation is to implement the FPIC process and associated recommendations in full, to ensure that project processes and engagement are undertaken in the most equitable, efficient and effective way possible to the mutual benefit of all involved. This could include saving both Tribes and Indigenous peoples and mCDR researchers and practitioners time, money, and other limited resources, and navigating and potentially mitigating risks as they explore and consider mCDR projects.

As the Best Practices Guidance Document is shared, feedback from all interested parties will be critical in further shaping and refining this guidance, and help to encourage its responsible use to support positive Tribal and Indigenous engagement as the field of mCDR develops.

References

1. International Panel on Climate Change. (n.d.). *FAQ Chapter 4*.
<https://www.ipcc.ch/sr15/faq/faq-chapter-4/>
2. Prabhakar, A., & Mallory, B. (March 2023). *Ocean Climate Action Plan*. Ocean Policy Committee. The White House. https://www.whitehouse.gov/wp-content/uploads/2023/03/Ocean-Climate-Action-Plan_Final.pdf
3. Boettcher, M., Chai, F., Conathan, M., Cooley, S., Keller, D., Klinsky, S., Lezaun, J., Renforth, P., Scobie, M., Webb, R. M. (2, November 2023). *A code of conduct for marine carbon dioxide removal research*. Energy and Environment Program. Aspen Institute.
https://www.aspeninstitute.org/wp-content/uploads/2023/11/110223_Code-of-Conduct_FINAL2.pdf.
4. Jessen, T., Ban, N. C., Claxton, N. X., Darimont, C. T. (2021, November 15). Contributions of Indigenous Knowledge to ecological and evolutionary understanding. *Frontiers in Ecology and the Environment*, 20(2), 93-101. <https://doi.org/10.1002/fee.2435>
5. Carroll, K. A., & Malerba, L. (2016 December). From consultation to consent. *United South and Eastern Tribes, Inc.* <https://www.usetinc.org/general/from-consultation-to-consent/>
6. United Nations Department of Economic and Social Affairs. (2016, October 14). *Free Prior and Informed Consent: An Indigenous peoples' right and a good practice for local communities*. <https://openknowledge.fao.org/server/api/core/bitstreams/8a4bc655-3cf6-44b5-b6bb-ad2aeede5863/content>
7. Indigenous Environmental Network. (n.d.). *Free, Prior, and Informed Consent (FPIC)*.
<https://www.ienearth.org/fpic/>
8. United Nations Development Programme's Social and Environmental Standards. (June 2022). *SES supplemental guidance: frequently asked questions (FAQs) on applying Free Prior Informed Consent (FPIC)*. <https://ses-toolkit.info.undp.org/sites/g/files/zskgke446/files/SES%20Document%20Library/Uploaded%20October%202016/FINAL%20FPIC%20FAQ%20Guidance%20-%20June%2015%202022.pdf>
9. Cultural Survival. (2021, November 27). *Free, Prior, and Informed Consent: Protecting Indigenous peoples' right to self-determination, participation, and decision-making*.
<https://www.culturalsurvival.org/publications/cultural-survival-quarterly/free-prior-and-informed-consent-protecting-indigenous>
10. Blue Action Fund. (n.d.). *Free, Prior, and Informed Consent (FPIC) Protocol*.
https://www.blueactionfund.org/wp-content/uploads/2021/08/BAF_ESMS_FPIC-Protocol.docx



11. Tribal and Indigenous Partnerships Enhancement Strategy (TIPES). (2024, August 22). *Guidelines for the implementation Of Free, Prior, and Informed Consent (FPIC)*. National Wildlife Federation. https://www.nwf.org/-/media/NEW-WEBSITE/Shared-Folder/People/TIPES/2408220_NWF-FPIC-Guidelines.pdf
12. Aguon, J., & Hunter, J. (2019, February 10). Second wave due diligence: The case for incorporating Free, Prior, and Informed Consent into the deep sea mining regulatory regime. *Stanford Environmental Law Journal*, 38(1), 3-55. <https://law.stanford.edu/publications/second-wave-due-diligence-the-case-for-incorporating-free-prior-and-informed-consent-into-the-deep-sea-mining-regulatory-regime/>
13. Environmental Protection Agency. (2023, December 7). *EPA policy on consultation with Indian Tribes: Guidance for discussing Tribal treaty or similar rights*. <https://www.epa.gov/system/files/documents/2023-12/epa-guidance-for-discussing-tribal-treaty-or-similar-rights-2023.pdf>
14. Native Lands Digital. (2024). *Native lands map*. <https://native-land.ca/>
15. The Nature Conservancy. (2024). *IC 101 (b): Tribal governments today*. <https://rise.articulate.com/share/vv7QLFkjHvsbg2QXH9D8JUjjEvswOdUJ#/>
16. Native Knowledge 360 Summer Webinar Series. (2022, July 20). *Tribal Sovereignty: Why it matters for teaching and learning about Native Americans*. National Museum of the American Indian., Smithsonian. <https://www.youtube.com/watch?v=xg-G3jwuxys>
17. Cultural Survival. (2024, September 13). *Centering Indigenous peoples' self-determination in the energy transition and sustainable development*. <https://www.youtube.com/watch?v=QplmSFvQU3Y>
18. The Nature Conservancy. (2024). *Human rights guide for working with Indigenous people and local communications. Module 1: Learning & early discussions*. <https://www.tnchumanrightsguide.org/module-1-learning-early-discussions/>
19. Aronowsky, L., Batchelor, N., Chunev, A., Extavour, M., & Kosar, U. (n.d.). *From the ground up: Recommendations for building an environmentally just carbon removal industry*. The XPRIZE Foundation & Carbon180. https://carbon180.org/wp-content/uploads/2023/08/From-the-Ground-Up_Recommendations-for-Building-an-Environmentally-Just-Carbon-Removal-Industry.pdf
20. National Museum of the American Indian., Smithsonian. (n.d.). *The impact of words and tips for using appropriate terminology. Am I using the right word?* <https://americanindian.si.edu/nk360/informational/impact-words-tips#:~:text=Not%20all%20individuals%20from%20one,ask%20what%20terms%20they%20prefer>

21. Minderoo Foundation. (June 2022). *Resilient communities framework; Version 1.0*.
<https://cdn.minderoo.org/content/uploads/2022/05/25130720/FFR-Resilient-Communities-Framework.pdf>.
 22. North Coast Native Protectors., RAM Consulting., Humboldt County MPA Collaborative., Del Norte County MPA Collaborative., MPA Collaborative Network. 2022. *Best practices for tribal engagement in marine protected area stewardship*.
https://www.mpacollaborative.org/wp-content/uploads/2022/11/Best-Practices-for-Tribal-Engagement_2022.pdf.
 23. Natural History Museum. (2024, June 28). *Indigenizing coastal conservation*.
<https://thenaturalhistorymuseum.org/events/indigenizing-coastal-conservation/>
 24. Fast Track Action Committee on Marine Carbon Dioxide Removal. (November 2024). *National marine carbon dioxide removal strategy*. The White House.
<https://www.whitehouse.gov/wp-content/uploads/2024/11/U.S.-Marine-Carbon-Dioxide-Removal-Research-Strategy.pdf>
 25. United Native Collective. (n.d.). *Being an Indigenous ally*.
<https://urbannativecollective.org/indigenous-ally-toolkit>
 26. Ocean Frontier Institute, Dillon Consulting. (2021). *Ocean frontier institute's Indigenous engagement guide*. https://cdn.prod.website-files.com/61082dc068d2d4fd1cc4461e/62e00785b157e79dea871c0f_indigenous-guide-2021_revised_06-2022.pdf.
 27. Rainie, S. C., Rodriguez-Lonebear, D., Martinez, A. (2017). *Policy brief: Indigenous data sovereignty*. Tucson: Native Nations Institute, University of Arizona.
<https://static1.squarespace.com/static/5d3799de845604000199cd24/t/5d6f93c9c5442b00013e4b69/1567593418017/Policy%2BBrief%2BIndigenous%2BData%2BSovereignty%2Bin%2Bthe%2BUnited%2BStates%2BV0.3%2Bcopy.pdf>
 28. FNIGC. (n.d.). The first nations principles of OCAP (ownership, control, access, and possession). <https://fnigc.ca/ocap-training/>
 29. West Coast Ocean Alliance. (July 2020). *Guidance and responsibilities for effective Tribal consultation, communication, and engagement. A guide for agencies working with West coast Tribes on ocean & coastal issues*.
https://static1.squarespace.com/static/5bc79df3a9ab953d587032ca/t/5f0cdc876f40e375a32305af/1594678422449/WestCoastTribalEngagmentGuidance_July2020.pdf
 30. IPCA Knowledge Basket. (n.d.). *Beyond conservation: Working respectfully with Indigenous people and their knowledge systems*.
<https://ipcaknowledgebasket.ca/resources/working-respectfully-with-indigenous-people-and-their-knowledge-systems/#references>
- IHRB. (2022, December 13).

-
31. IHRB. (2022, December 13). What is Free, Prior, and Informed Consent (FPIC)?
<https://www.ihrb.org/resources/what-is-free-prior-and-informed-consent-fpic>
 32. Federal Bar Association. (2017, March 1). Understanding Tribal Sovereignty.
<https://www.fedbar.org/blog/understanding-tribal-sovereignty/>
 33. Permanent Forum on Indigenous Issues. (n.d.). Indigenous peoples, Indigenous voices factsheet. United Nations.
https://www.un.org/esa/socdev/unpfii/documents/5session_factsheet1.pdf
 33. The Climate Reality Project. (n.d.). Sacrifice zones 101.
<https://www.climateRealityproject.org/sacrifice-zones>

Appendix

Appendix 1: Focus Group Participant Pseudonym Table

All identifying information for participants in the focus groups was anonymized and participants were given pseudonyms based on their focus group month, regional location, and how they identified their role in their community.

Interviewee Number	Focus Group	Regional Location	Role in Community
Interviewee 1	September 2024	Pacific	Tribal/Indigenous Community Leader/Member
Interviewee 2	September 2024	South Atlantic	Tribal/Indigenous Community Leader/Member & Government Representative
Interviewee 3	September 2024	Pacific Northwest	Tribal/Indigenous Natural Resource Manager/Agency Contact
Interviewee 4	October 2024	North Pacific	Tribal/Indigenous Community Leader/Member
Interviewee 5	October 2024	North Atlantic	Tribal/Indigenous Community Leader/Member
Interviewee 6	October 2024	Pacific Northwest	Tribal/Indigenous Community Member & Fisher
Interviewee 7	October 2024	Pacific Northwest	Non-Indigenous Tribal Organization Staff
Interviewee 8	October 2024	Pacific Northwest	Non-Indigenous Tribal Support Agency Contact
Interviewee 9	October 2024	Pacific Northwest	Tribal/Indigenous Natural Resource Manager/Agency Contact
Interviewee 10	October 2024	Pacific	Tribal-Affiliated Educator and Community Member

Appendix 2: Key Terms and Definitions

The meanings of the following terms vary nation to nation. Therefore, it is of utmost importance to consult with each Tribe and Indigenous community to understand how they define these terms within their own cultural, legal, and social contexts. “The best term is always what an individual person or Tribal community uses to describe themselves. Replicate the terminology they use or ask what they prefer.”²⁰

Consent: A voluntary, collective decision made by rights holders through their community’s decision-making processes, free from coercion, manipulation, or undue influence. Requires that those involved have access to all relevant information, the time needed to deliberate, and the autonomy to approve, reject, or propose modifications to a project or initiative based on what aligns with their values, priorities, and well-being.³¹

Consultation: Overall process of sharing information, coordination, engagement, and dialogue that occurs between Tribal Governments and governmental or administrative entities within the United States. Tribal consultation occurs before an agency commits itself to a path of action that will affect Tribal rights, lands, resources, governance, or interests. Consultation is a process that ultimately leads to the development of a decision.²⁹

Domestic Sovereign: Self-governing entities that are separate from state governments but under the jurisdiction of the federal government. The U.S. Constitution recognizes Indian tribes as distinct governments with sovereignty over their people, property, and activities that affect them.³²

Free, Prior, and Informed Consent: A framework and a legal condition for ensuring that the rights of Indigenous peoples are guaranteed in any decision that may affect their lands, territories or livelihoods. Composed of four separate and interrelated components:

Free: Without coercion, intimidation, manipulation, threat or bribery.

Prior: Consent has been sought sufficiently in advance, before any project activities have been authorized or commenced, and that the time requirements of the Indigenous community’s consultation/consensus processes have been respected.



Appendix 2: Key Terms and Definitions, Continued

Informed: Information is provided in a language and form that are easily understood by the community, covering the nature, scope, purpose, duration and locality of the project or activity as well as information about areas that will be affected; economic, social, cultural and environmental impacts, all involved actors, and the procedures that the project or activity may entail.

Consent: The right of Indigenous peoples to give or withhold their consent to any decision that will impact their lands, territories, resources, and livelihoods.

Indigenous: People who are self-identified and accepted by their community. They have historical continuity with pre-colonial or pre-settler societies and maintain strong connections to their territories and natural resources. Their social, economic, and political systems, as well as their languages, cultures, and beliefs, are distinct from those of the “dominant” society. These communities often exist as non-dominant groups within larger societies, with a shared commitment to preserving and reproducing their ancestral environments and cultural systems for future generations.³³

Rights holder: A rights holder in the context of Free, Prior, and Informed Consent (FPIC) is an Indigenous person or community that has the right to give or withhold consent to activities that may impact their rights, land, or resources.¹¹

Sacrifice Zone: Populated areas with high levels of pollution and environmental hazards thanks to nearby toxic or polluting industrial facilities...the health and safety of people in these communities is being effectively sacrificed for the economic gains and prosperity of others.³⁴

Traditional Ecological Knowledge (TEK) or Indigenous Knowledge: A body of observations, oral and written knowledge, innovations, practices, and beliefs that promote sustainability and the responsible stewardship of cultural and natural resources through relationships between humans and their landscapes.¹¹

Tribal Nation: A Tribal Nation is a sovereign nation with the authority to govern its members and issues in Indian Country. Tribal nations are distinct political entities with their own cultures, governance systems, and places. They are also part of the United States government system, and have a government-to-government relationship with the U.S. In this document, “Tribe” refers to Indigenous nations with ancestral claims to territory, regardless of their recognition status with federal or state government.¹¹

Appendix 3: Questions for mCDR Projects

The following are AI-generated questions based on the focus group participants' responses. These are questions that researchers and practitioners need to consider about their project before entering a community.

Vagueness and Lack of Specificity About mCDR Technologies/Methods

- Does mCDR encompass both technological intervention and nature-based solutions like mangrove restoration?
- What are the various alternative mCDR approaches available, and what are their key uncertainties, advantages, and disadvantages?
- Can detailed explanations be provided on each mCDR technology and its potential impacts?
- How are the risks of environmental tipping points being considered in the planning and assessment of mCDR technologies?
- How might different mCDR interventions affect various marine and coastal environments?
- How do mCDR technologies relate to existing ocean conservation concepts like blue carbon?

Potential Impacts on Coasts, Marine Ecosystem and Species

- How might changes in ocean alkalinity or acidity from mCDR affect marine ecosystems at all levels?
- What are the potential cascading effects on the food chain, including plankton, fish, and higher trophic levels?
- How can we assess and mitigate the ecological impacts of mCDR on marine biodiversity?
- Given the uncertainties and lack of information, how can we adequately assess the ecological impacts of different mCDR methods?
- How could mCDR interventions affect primary productivity in the marine environment?
- Is there a risk that mCDR technologies might exacerbate harmful algal blooms?
- What implications might these changes have on species that are integral to community economic and cultural life?

Appendix 3: Questions for mCDR Projects, Continued

Potential Impacts on Coasts, Marine Ecosystem and Species

- How might mCDR technologies impact fish populations in the oceans?
- What studies have been conducted to assess the ecological consequences of mCDR on fisheries?
- What are the potential impacts of mCDR on species integral to Tribal diets and cultural practices, such as shellfish and salmon?
- Could mCDR interventions disrupt the habitats or health of these marine species?
- How might mCDR interventions affect coastal erosion in areas like Southern California?
- Are factors like mCDR and coastal erosion interrelated? If so, in what ways?
- How will mCDR projects influence access to coastal areas for Tribal communities?

Cultural and Environmental Concerns

- How might mCDR initiatives impact environmental justice, particularly regarding Indigenous communities?
- What measures are in place to prevent corporate exploitation and ensure equitable benefits from the commercialization of ocean resources?
- How can Indigenous rights be upheld in the context of mCDR initiatives?
- What are the legal obligations in the U.S. regarding engagement with Tribal Nations on environmental projects like mCDR?
- What mechanisms are currently in place to secure Free, Prior, and Informed Consent from Tribes regarding mCDR projects?
- How can the involvement of Tribes move beyond consultation to consent?
- How will mCDR projects influence access to coastal areas for Tribal communities?
- What measures are in place (or will be put in place) to protect cultural sites along the coast amid mCDR activities?
- What are the important cultural sites, fishing areas or high use areas for the Tribe?
- Will there be impacts that potentially impede access or the current viewsheds that people use and rely on? For example, will there be potential impacts to fish, shellfish, and/or other marine species that serve as traditional food sources for Native peoples?