



An Indigenous approach to ocean planning and policy in the Bering Strait region of Alaska

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ABSTRACT

Bringing western science and policy together with Traditional Knowledge and values from indigenous communities for ocean planning is lacking and a framework is needed. This article articulates indigenous perspectives about the ocean and a culturally appropriate methodology developed in the Bering Strait region for a visioning process that can be used to bridge western and indigenous value systems. Recommendations for an indigenous approach focused on inclusion, the examination of values, adequate representation, and Tribal direction in ocean planning and policy are made. This approach is needed to move forward on a path to achieving more equitable, sustainable and inclusive ocean planning for the future.

1. Introduction

The Arctic has been experiencing the impacts of climate change disproportionately than other places on the planet [34]. Along with warming temperatures, loss of sea ice and changing landscapes [5], there are concomitant increases in anthropogenic activity such as Arctic shipping and vessel traffic. The Arctic has been home to Indigenous Peoples from time immemorial and they have adapted to this environment and developed distinct knowledge systems through living in and with the environment. These knowledge systems are multi-dimensional and include information, values and understandings of resource and environmental management, governance structures, cultural values, social roles and responsibilities, and many other aspects of human-environment relationships, among other things. The United Nations Declaration on the Rights of Indigenous Peoples [83] recognizes the sovereign rights of Indigenous Peoples to land, self-government and culture. An important aspect ensuring control over livelihoods is ensuring that Indigenous Peoples have the tools and ability to plan for the future. Ocean environments are critical to many Indigenous communities in the Arctic, and as such regional adaptation planning with an emphasis on marine environments should be prioritized. This type of regional focus has been successful across different northern regions including the Canadian Beaufort Sea [13], Haida Gwaii [39], and Bristol Bay [11]. These processes ensure that Indigenous values form the framework of a shared vision that is important to have in place

in advance of any processes involving multiple stakeholders (e.g., agencies, industry, non-profits) such as ocean planning. They also strengthen community-based efforts and provide a base for stronger governance.

The Bering Strait region in the U.S. Arctic is the focus of this paper. There has been little extensive ocean planning by federal or state agencies in the Bering Strait region to date. Given the rate of environmental change this region is experiencing from climate change (e.g. [14,77,85]) and other anthropogenic activities such as increased vessel traffic, there is an imperative to address the dramatic change communities have faced and may experience in the future. The aim of this paper is to illustrate the regional process that the Bering Strait region has advanced for ocean planning, the result of which is an equitable framework for such work that highlights collaborating with federal, state, non-governmental and other partners to plan for the change that communities are experiencing [48–50]. The Tribes in the region were successfully brought together to strategically contribute to a regional vision based on shared values and planning.

1.1. Background: ocean planning and Indigenous participation

Ocean planning is growing in importance in the United States, including in the Arctic,¹ as interest in and pressures on the marine environment grow. These pressures include various climate change impacts, increasing vessel traffic (e.g., from shipping, tourism and

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¹ The Arctic as defined by S. 373: Arctic Research and Policy Act of 1984 (98th Congress, 1983–1984).

research activities), potential development in the oil, gas, minerals and fisheries industries, and other forces [16].

The importance of global oceans to overall ecological and economic well-being has been widely acknowledged (e.g., [65]) and has led to the establishment of state-level national ocean policies [35]. By Executive Order the United States established a comprehensive policy for the oceans in 2010 with the National Policy for the Stewardship of the Ocean, Our Coasts, and the Great Lakes.² The Trump Administration has recently revoked the 2010 National Ocean Policy.³ The 2010 Order adopted the Final Recommendations of the Interagency Ocean Policy Task Force and directed federal agencies to implement these recommendations under the guidance of a National Ocean Council. This Policy encouraged all stakeholders, including Federally-recognized Tribes (Tribes) to come together to address challenges and to find solutions to manage multiple and often competing uses. Ocean planning was one of the key recommendations to address these problems. Ocean planning under the National Ocean Policy [58] required Tribal representation. None of these recommendations remain the policy of the United States, but they remain relevant to Tribal involvement in ocean planning.

The United States recognizes that American Indian and Alaska Native Tribes, as the Indigenous Peoples of North America, were self-governing and autonomous.⁴ The United States holds a trust responsibility to federally recognized Tribes⁵ and “has charged itself with moral obligations of the highest responsibility and trust.” This means the United States holds a legal and moral obligation to protect Tribal treaty rights, land and resources. Through Executive Order in 2000 the executive office of the President of the United States upheld Tribal sovereignty, affirmed and committed to coordinating with Tribes, and developed protocols for consultation that have been espoused to this day.⁶ Alaska Native Tribes hold the same legal status as other Federally-recognized Tribes in the lower 48 contiguous states [7]. Alaska Native Claims Settlement Act (ANCSA) corporations have similar rights when their lands are directly impacted by Federal action.⁷ These for-profit corporations work to benefit their respective regions economically and typically do not carry out trust responsibilities. The regional non-profit Alaska Native Tribal consortiums provide services, offer expertise, and may carry out some trust responsibilities for Tribes. The regional non-profit organizations’ priorities are determined based on direction from the Tribes in the consortium.

Tribes face many challenges in actively participating in the governance and management of Tribal treaty rights, land and resources as sovereign entities. The legally enforceable fiduciary responsibility of the federal government to Tribes is often not fulfilled (e.g., [8]). The burden of participation usually falls on Tribes, who often lack capacity. The role that Tribes hold in an ocean planning context has been one of many stakeholders rather than as recognized sovereigns with each Tribe executing their sovereign status. Most Tribes are considered advantaged if they have one staff member working on environmental issues; it is not uncommon for Tribes to lack their own equivalent agencies and departments to address natural resource management as NOAA, DOI or other bodies have (e.g. [57]). In Alaska this also places burdens and

expectations (from government and society at large) on the regional Tribal non-profits to fill such roles with little funding or capacity.

1.2. The Bering Strait region

The Bering Strait region (BSR) is located in northwest Alaska (Fig. 1). The U.S. side of the Strait is home to three distinct Indigenous Peoples, the Inupiaq, St. Lawrence Island Yupik, and Yup'ik peoples. Approximately 10,000 predominantly Indigenous People live throughout the region in 16 year-round occupied communities [84]. There are 20 Federally-recognized Tribes in the BSR. Kawerak, Inc. is the regional Alaska Native non-profit Tribal consortium which provides services on behalf of the Tribes in the Bering Strait region. Kawerak is governed by a Board of Directors comprised of the 20 presidents of the Tribal or Traditional Councils, two elder representatives, and a representative from the regional health care provider.⁸ Kawerak, at the direction of the Board, addresses natural resource priorities for the region and is an important convener for Tribes to address issues in the region.

The BSR contains over 570 miles of coastline including Norton Sound, the northern Bering Sea (and its islands), and the southern Chukchi Sea. The region is located at the confluence of large water masses that are among the most productive northern latitude waters [17,79]. The shallow waters of the BSR are seasonally ice covered and experience large marine migrations including sea mammals, birds, and fish [19–21,63]. The Indigenous Peoples of the region have complex, important and generations-long connections to the marine environment in the region. The diverse cultures of the communities in the region today remain inextricably linked to the biodiversity, health and abundance of the marine environment, and particularly to marine mammals [14,28].

The BSR has been undergoing rapid **change**. Climate change continues to impact the Arctic region disproportionately [1,34]. Warming in Alaska is occurring at more than twice the rate of other places on the planet [85]. Increasing temperatures have led to the significant loss of sea ice and longer periods of open water. The impacts of climate change, and in particular the loss of sea ice, is significantly impacting Indigenous livelihoods [53,54,61]. Some examples of impacts include the inability to reliably access important **subsistence** resources such as ice seals, the occurrence of abnormalities in fish, the physical loss of communities or subsistence camps due to **eroding shorelines**, and increases in offshore industrial activity such as shipping, fishing and offshore exploration. **Open water** extends the time that vessels have to travel a shorter distance from Asia to Europe across the Arctic [6]. Increased vessel traffic presents a number of risks that could impact a subsistence way of life [14,33,47,68]. Industrial bottom trawling could result in damage to benthic **ecology** which forms the base of the food web in the northern Bering Sea [78,81].

Indigenous Peoples in the BSR of Alaska have a vision for ocean planning based on a proven Indigenous approach successfully applied in the region. This Indigenous approach is needed and was developed because federally recognized BSR Tribes have not been, or have not been adequately, included ocean planning and related processes, nor have their methodologies or Traditional Knowledge.⁹ The lack of

² Executive Order 13547. Stewardship of the Ocean, Our Coasts, and the Great Lakes, July 19, 2010.

³ Executive Order 13840. Ocean Policy to Advance the Economic, Security, and Environmental Interests of the United States, July 19, 2018.

⁴ Cherokee Nation v. Georgia, 30 U.S. 5 Pet. 1 1 (1831).

⁵ Seminole Nation v. US, 1942 and Cherokee Nation v. Georgia, 1831.

⁶ Executive Order 13175, Consultation and Coordination with Indian Tribal Governments (2000); Executive Memorandum on Government-to-Government Relationship With Tribal Governments (2004); Presidential Memorandum on Tribal Consultation (2009).

⁷ Department of the Interior Policy on Consultation with Alaska Native Claims Settlement Act (ANCSA) Corporations, 2012: https://www.fws.gov/alaska/external/native_american/doi_ancsa_policy.pdf (Accessed 11–21–2017).

⁸ Kawerak, who we are: <http://kawerak.org/about-us/who-we-are/> (Accessed 6–25–2018).

⁹ Traditional Knowledge can be defined as “a living body of knowledge which pertains to explaining and understanding the universe, and living and acting within it. It is acquired and utilized by Indigenous communities and individuals in and through long-term sociocultural, spiritual and environmental engagement. TK is an integral part of the broader knowledge system of Indigenous communities, is transmitted intergenerationally, is practically and widely applicable, and integrates personal experience with oral traditions. It provides perspectives applicable to an array of human and non-human phenomena. It is deeply rooted in history, time, and place, while also being rich, adaptable, and



Fig. 1. The Bering Strait Region of Alaska.

inclusion in current policy decisions and many previous processes in the region has been problematic from the perspective of subsistence-focused communities and Tribes [70,75,80]. Policy input is needed across different scales of governance; the lack of appropriate analysis and engagement can lead towards maladaptive policy when it does not consider the multiple dimensions of a subsistence way of life and the current rate of environmental change [2].

To date, in the BSR there have not been extensive ocean planning efforts by state or federal agencies to address the dramatic change communities have faced and may experience in the future. Kawerak has advanced an equitable framework for such work by collaborating with federal, state, non-governmental and other partners to plan for the change that communities are experiencing and to contribute to successful planning [48–50]. As a convener, Kawerak has the ability to bring Tribes in the region together to strategically work towards a regional vision based on shared values.

2. Ocean values

Many different groups of people value the oceans, but not always for the same reasons or in the same ways. For Indigenous Peoples of the Bering Strait region, the northern Bering and southern Chukchi Seas are highly valued because of their deep connections to region cultures. Some of these connections and values are described below and in Table 1. It should be recognized that these categories are not mutually exclusive and are only used to facilitate an understanding of Bering Strait Inupiaq, Yup'ik and St. Lawrence Island Yupik connections to the ocean.

2.1. Ecosystem values

On an **ecosystem** level, the Indigenous residents of the Bering Strait region value a healthy ocean for what it provides to animals; clean water and habitat (e.g., [28]). Because various marine resources that Bering Strait Indigenous People rely on for food are harvested from the ocean, healthy oceans means healthy animals, which means healthy food for people. Region residents also recognize that these Seas provide food not just to them, but to people around the world. Provided that

(footnote continued)

dynamic, all of which keep it relevant and useful in contemporary life. This knowledge is part of, and used in, everyday life, and is inextricably intertwined with peoples' identity, cosmology, values, and way of life. Tradition – and TK – does not preclude change, nor does it equal only 'the past'; in fact, it inherently entails change" [75]: 33).

these other harvests and activities do not negatively impact the health of the marine environment or the animals that live in it, the important cultural value of sharing resources is prevalent.

2.2. **Health** and **well-being** values

As noted, the Indigenous People of the region rely on the ocean for a large part of their diet. As one measure of this, the most recent estimates (from 2005 to 2006) indicate that across the region an average of approximately 636 pounds of marine mammals are harvested per person in one year ([3]: 189). This is in addition to marine fishes, invertebrates, seabirds, and marine plant life (and, of course, terrestrial resources). This amount varies year to year depending on environmental conditions, household needs, changes in regulations, and other factors. The ocean provides a variety of healthy, nutritious and culturally preferred foods to Bering Strait Indigenous residents. Traditional foods have been demonstrated to be healthier than store-bought foods [31,51,10] and these foods are shared between region communities and far beyond (e.g., [52]). Participation in subsistence-related activities is also important to the physical and mental well-being of Indigenous Peoples in the Bering Strait region. The practices of hunting, fishing, gathering, processing and consuming foods from the marine environment promote physical exercise, cooperation, sharing, intergenerational communication, relationships between communities, knowledge and skill-building and self-confidence (e.g., [37,69,71]). As one region resident recently expressed, "Marine mammals make us happy" (personal communication with first author, March 13, 2017 during Expert Meeting for NPRB project A95-01a).

2.3. Economic values

The marine environment also contributes to the economic health of individuals, households and communities. Region communities have also set economic development priorities [44] and want to pursue them in conjunction with subsistence activities and priorities. Region residents participate in small scale commercial fisheries throughout the region (e.g., salmon, halibut, and crab). Various parts of marine mammals and other animals harvested from the ocean are used by the Indigenous Peoples of the region to make art, clothing and other items that are used and sold locally as well as around the world (e.g., [67]). Walrus ivory, whale baleen, and seal skins are most frequently used. The earnings from commercial fisheries and from the sale of handicrafts and other items are often applied to the costs of practicing subsistence¹⁰ and to other household needs and community activities. For example, earnings may be used to purchase boats, fuel, ammunition, and other necessary tools and items for subsistence.

2.4. Cultural values

For the Inupiaq, Yup'ik and St. Lawrence Island Yupik people of the region, there are many cultural values associated with the ocean, including those already mentioned above. The ocean is also highly valued because of its connection to language (e.g., [45]), identity (e.g., [67,38]) culturally preferred foods (e.g., [41]), and ties to **spirituality** (e.g., [76]), for example.

The Indigenous languages of the region are rich in their vocabulary and meaning related to the marine environment. The use of Indigenous languages while out on the sea is highly effective for the often rapid and

¹⁰ The term subsistence is used to refer to "the senses commonly used by Indigenous residents of this region (as opposed to, for example, the State of Alaska's understanding). The Indigenous perspective encompasses hunting and gathering related activities which have a deep connection to history, culture, and tradition, and which are primarily understood to be separate from commercial activities" ([72]: 133).

Table 1

Ocean values from the Bering Strait region and example applications to the governance and decision-making component of ocean planning.

Ocean Values	Example	Application to ocean planning
<i>Ecosystem</i>	Knowledge of food web connections	Along with science, provides the knowledge base to better understand impacts
<i>Health and well-being</i>	Time on the water observing and hunting marine mammals	Informing vessel traffic routing measures
<i>Economic</i>	Walrus ivory carving	Provides means and ability to actively participate in walrus management
<i>Cultural</i>	Knowledge of ocean currents	Ability to effectively plan for and respond to maritime disasters

detailed communications needed between members of a hunting crew, for example [67,74,87]. Foods harvested from the ocean are culturally preferred and many are unique to the region (as are their storage and processing), for example dishes created from fermented marine mammals [45].

The individual and group identities of the Indigenous People of the region are highly connected to the marine environment (e.g., [36]). This is the case for many reasons, including because a large proportion of the foods they eat come from the ocean, because highly detailed knowledge is needed to successfully interact with the ocean (e.g., knowledge of currents, weather, boat building, clothing construction), because most region communities are located along the coast, and because the cosmologies of the cultures in the region have deep associations with the ocean (e.g., [76,67]: 38–39; [67,56]). The ocean is also a transportation corridor for people and animals, is a graveyard for ancestors, and is a spiritually imbued marinescape.

Knowledge of the marine environment has been developed by Bering Strait Indigenous residents over the course of millennia of interaction and relationships with that environment. Values are part of that relationship and are communicated, along with culturally specific bodies of knowledge, through the sharing of Traditional Knowledge. These culturally specific bodies of knowledge are part of a broader understanding of the Arctic marine environment and its interconnected nature. This has important implications for ocean management decisions.

In order for these complex and important human-ocean relationships to exist the Bering Strait marine environment must remain healthy and Indigenous People must have equitable opportunities to participate in and direct ocean planning. Management of ocean ecosystems requires a bridging of different value systems; those of Indigenous and non-Indigenous peoples, conservation and development interests, the US and other states, and many others. A first step in making that bridge is an acknowledgement of those values [32]. Acknowledgement of values provides a baseline of trust and understanding. Taking the time to listen and learn will help build an understanding of Traditional Knowledge and Indigenous values.

3. Bering Strait example of ocean planning

The Tribes of the Bering Strait region have been working towards a vision of bridged value systems as realized through Indigenous ocean planning. At Kawerak, there is a Natural Resources Division (Natural Resources) that focuses on many of these issues. Natural Resources has been taking a deliberative approach towards the long-term goals of protecting a subsistence way of life that can inform other ocean planning initiatives that want to prioritize Indigenous values and concerns. The success of ocean planning, similar to other governmental-led efforts such as co-management, is highly dependent on the steps taken prior to and during implementation (e.g. [15,64]). These steps include who initiates the conversations and how the conversations are initiated.

Kawerak's Social Science Program collaborates with Tribes to document, analyze and apply their Traditional Knowledge (www.kawerak.org/socialsci.html; [75]: 133) to a variety of issues and challenges facing the region. This Program has been working to help

provide a baseline of knowledge linking the marine ecosystem with cultural values (e.g., [14,28–30,42,43,45–47,63,67–73,76]). Kawerak's Marine Program (<http://kawerak.org/natural-resources/marine-program/>) was established in 2014 and focuses specifically on applying documented Traditional Knowledge about the marine environment, Indigenous perspectives, as well as policy and management expertise, through advocacy efforts that support continued access to healthy marine resources.

The Marine Program, in collaboration with the Social Science Program and other partners, has recently led a series of three workshops with Tribal representatives to discuss and examine many pressing marine issues (increasing vessel traffic, development activities and climate change) identified previously (e.g., [47–50]), their current and potential future impacts on the communities of the region, and to think about how the region frames solutions going forward in the format of a regional vision [50]. The gatherings were structured to allow the Tribes to guide content and outcomes. Tribal councils chose the workshop representatives. The agendas were iterative and developed based on previous meetings where Tribes discussed concerns related to the ocean. Some of the participants were youth, which was a way to incorporate learning with action and to engage young people in issues and planning that will impact their futures. Youth involvement in decision making and planning is important to region Tribes. The intent of the workshops was for participants to engage in detailed discussions on ocean planning issues. The focus was on small group (“cohort”) discussions followed by plenary discussions and decision-making. This approach allowed for conversations surrounding a vision of the Bering Strait by Tribal leaders in the region rather than by outsiders imposing a top-down perspective. These convenings, while not government-to-government consultation (because they are a collaboration between the regional non-profit, Tribes and other partners), produce products and information that Tribes can then use in any formal consultations with the Federal government that they pursue.

As the regional non-profit, Kawerak organized and facilitated all of the workshops [48–50] in order to gain a fuller understanding of the concerns, values, and goals of Bering Strait region Tribes related to the marine environment. Each workshop had its own goal, but were collectively designed to work towards development of a regional vision that could be applied to ocean planning and other related issues; this is the vision noted below. The Tribal participants in all three gatherings emphasized the need to maintain a healthy and resilient ocean ecosystem, protect the unique Bering Strait subsistence practices and food security,¹¹ effectively communicate this vision to shape current decision-making, and provide a strong foundation for more comprehensive,

¹¹ Food security has recently been defined by the Inuit Circumpolar Council Alaska, from an Alaskan Inuit perspective, in part, as “the natural right of all Inuit to be part of the ecosystem, to access food and to care-take, protect and respect all of life, land, water and air. It allows for all Inuit to obtain, process, store and consume sufficient amounts of healthy and nutritious preferred food – foods physically and spiritually craved and needed from the land, air and water, which provide for families and future generations through the practice of Inuit customs and spirituality, languages, knowledge, policies, management practices and self-governance” ([37]: 9).

consultative planning of industrial activities.

These gatherings have led to the collaborative development of a distinct vision for the region [50]:

Guided by Yupik and Inupiaq values and traditions, we will continue to build sustainable capacity to uphold our spiritual and cultural traditions and relationships, by inspiring healthy choices, and protecting our natural resources to ensure food security for our future generations. We proactively adapt to climate and other changes experienced by our people.

Bering Strait region Tribes and Kawerak strongly believe that Indigenous People should be equal partners in ocean planning, that Tribes should lead planning processes, and that ocean planning should incorporate Tribal visions, objectives and goals related to the marine environment. Through the gatherings, development of regional agreement on ocean issues and a Tribal vision for the region have laid a clear path forward and are an example of the right way to approach ocean planning in Alaska.

4. Policy to action

The details of how ocean planning activities might proceed under the current administration, and in light of the recent Executive Order [26], are not yet clear. The authors believe that aspects of the National Ocean Policy implementation plan (2013) remain important to consider, particularly if regional governing entities take the lead. Key areas for successful implementation include: the importance of economic growth to coastal communities and industries, the need for safety and security along the coastline, importance of science and information informing decisions, coastal resilience and protection of sensitive habitats, and importance of local choices informing the entire process. For regional planning to move forward, the National Ocean Council recognized with utmost importance the need for regional support as a prerequisite. Regional support includes a wide range of regional interests that include the voices of states, Tribes, and Federal agencies as members of Regional Planning Bodies, and stakeholders such as resource development industries. The implementation plan included a commitment by the Federal government to support and engage interested Tribes and included consideration of co-management and protection of subsistence rights and the incorporation of Traditional Knowledge [58]. To date, two regional ocean plans have been completed along the eastern seaboard; the Northeast [59] and Mid-Atlantic [55]. The Northeast and Mid-Atlantic regions are significantly different than the Bering Strait region; they are highly developed regions with few subsistence-based Tribal economies in existence today. The people that reside in the Bering Strait region are predominantly Indigenous [4] with most State and Federal entities based outside of the region. It is also one of the economically poorer regions of the country [22]. As such, the Bering Strait region calls for a different approach moving forward.

Ocean planning typically brings all stakeholders together under one umbrella [13,27,40]. This umbrella frequently includes groups that often share the same cultural lens, but which differs from Tribal values. Ocean governance, including marine planning often excludes marginalized sectors of society, including Indigenous Peoples [9]. Bering Strait region Tribes would prefer an approach that gives appropriate recognition of their status and an equitable role in ocean planning in the Alaska region, should ocean planning efforts move forward. Indigenous and Tribal approaches to governance and science differ in that they are generally more inclusive and often have different value systems offering different perspectives, including how knowledge is obtained [62], and this expertise should be tapped to inform policy [12,18] as process is as important as outcomes [9].

It is an on-going challenge to ensure that decisions and policies are developed with Indigenous Peoples' values (i.e., government-to-government consultation, Traditional Knowledge). As discussed earlier, in

the United States the Federal government has an obligation to consult with Federally-recognized Tribes through a process by which each party may address mutual areas of concern as sovereign-to-sovereign. Current decision-making governance systems in the United States recommend (but do not mandate) that agencies consult with federally recognized Tribes if any decision or policy may impact Tribes, their homelands or resources. Each agency is responsible for developing consultation policies, as a result these differ both across agencies and even within individual offices located in the same agency [23]. Furthermore there are very few requirements and policies that require the use of Traditional Knowledge along with other scientific information. The use of Traditional Knowledge in the context of research is much more widespread [82], but not without issues. One ongoing challenge is developing and addressing research questions from a Traditional Knowledge lens rather than solely from a western researcher's perspective.

It is clear that there is a need for models that successfully bring together different value systems with each system contributing equally to the outcome [66] that goes beyond integrating one into another (Plaganyi et al., 2013). Successful natural resource management in this context does not come from a top-down approach, but rather one that comes from the Indigenous People who have the Traditional Knowledge and experience with the environment or resource [15].

5. Opportunities moving forward in the Bering Strait Region

Presently, there are opportunities from existing efforts across different knowledge systems that could inform and improve policy and decision-making in the BSR. The ocean planning and visioning effort conducted by Kawerak in the BSR provides a foundation from which ocean planning can move forward in the northern Bering Sea and Bering Strait region. In addition to the ocean planning work by Kawerak, there are governance frameworks and scientific efforts currently starting and underway that, if more fully developed and better integrated, could help inform a larger policy framework.

One of these efforts is the Northern Bering Sea Climate Resilience Area (NBSCRA) which was established by Executive Order 13754 in 2016 [24]. The BSR region overlaps with the northernmost portion of this designated area. The NBSCRA designation provides an example of Indigenous values informing policy and the potential for Traditional Knowledge informing subsequent decision-making. Importantly, it provides a potential model of bridging different value systems that include complex political and knowledge systems [66]. The Order recognized the "...communities, rich Indigenous cultures, and unique marine ecosystems, each of which plays an important role in maintaining resilience..." [24]. And as a result, Traditional Knowledge was expressly included; "Section 6. Traditional Knowledge in Decision making. It shall be the policy of the United States to recognize and value the participation of Alaska Native Tribal governments in decisions affecting the Northern Bering Sea Climate Resilience Area and for all agencies to consider Traditional Knowledge in decisions affecting the Northern Bering Sea Climate Resilience Area. Specifically, all agencies shall consider applicable information from the Bering Intergovernmental Tribal Advisory Council in the exercise of existing agency authorities. Such input may be received through existing agency procedures and consultation processes."

This effort was led by Tribes, regional Alaska Native non-profit organizations, elders, and Traditional Knowledge holders from across the northern Bering Sea region. Their concern over the current and projected future changes and activities in the region prompted a wide-scale effort for policy that both protected the region, but also included an Indigenous framework for future decision-making in the region. Support for this effort was widespread from State elected officials and regional leadership, to executive-level officials. This Executive Order was revoked by the Trump Administration [25], but efforts continue to establish similar roles and rights for Tribes in the management of the northern Bering Sea.

Another effort underway that overlaps the BSR is the Arctic Program of the North Pacific Research Board (NPRB). The NPRB funds marine research related to the North Pacific marine ecosystem. The NPRB, in a previous congressionally authorized project, undertook large-scale ecosystem-based research program in the Bering Sea that had a social science component [86]. Their current Arctic Program effort includes the northern Bering Sea and Bering Strait region in a more integrated approach that includes ANOs [60]. A goal of the social science component of the Arctic effort is to provide an opportunity to involve Indigenous community representatives in the conduct and interpretation of science to identify the mechanisms and processes that structure the Arctic marine ecosystem, and apply that understanding to ocean planning and policy and to regional community plans and strategies for adapting to climate change and other pressures on the ecosystem. This Arctic effort is newly initiated and the success of the approach is not yet known. The Arctic Program is connected to numerous other agencies and organizations that fund and conduct marine research in the Arctic. Continuing and expanding research efforts of this nature, with even more (and more meaningful and deliberate) participation of Indigenous People, is crucial to moving towards equitable, sustainable and inclusive ocean planning and policy.

6. Conclusions

Tribes have a strong desire, and legal and moral justification, for a large role in ocean planning processes. Tribes have typically had a limited role because of a lack of recognition of their sovereignty, of their potential contributions, and their limited capacity. These challenges remain today. In the Bering Strait region different groups with various responsibilities and governance frameworks (Tribal, ANO, federal agency, state) may associate different values with the marine environment. Most of these entities share the mutual goal of healthy, sustainable oceans. This shared goal can be used as the basis of moving forward with effective and inclusive ocean planning where Indigenous People take a leading role. There are several actions that can be taken to meet this objective.

6.1. Valuing Traditional Knowledge on the same level as science

Valuing Traditional Knowledge on the same level as science will ensure overall better decision-making to sustain future generations to come. This is particularly important given the rate of climate change and the potential for increasing industrial development in the region. Rather than conducting science based solely on researcher's interests and understandings, which often come from institutions based hundreds and thousands of miles away, better information can be produced that includes the values and information from Traditional Knowledge.

6.2. Supporting Indigenous capacity in the Arctic

Building in-region, Indigenous capacity has been one of the most valuable contributions to long-term success and program sustainability. This includes enhancing the capacity that is already exists, in addition to supporting the development of additional capacity. This may take the form of financial support for Tribes and ANOs to develop programs. The work that Kawerak has conducted is one example of building towards this type of success. Having in-house ecological, policy, and social science capacity has meant that Indigenous priorities are better supported.

6.3. Accepting the use of Indigenous methodologies

Accepting the use of Indigenous methodologies, such as those used in the regional gatherings described in this paper is an important component of recognizing the inherent self-determination of Tribes. Indigenous methodologies can help identify regional priorities that could inform western approaches to ocean planning. Indigenous

methodologies were practiced for millennia and have supported strong sovereign nations that still exist today.

6.4. Working collaboratively with Indigenous governments and other ocean stakeholders as equal partners

Working collaboratively with Indigenous governments and other ocean stakeholders as equal partners is important for successful implementation of ocean planning in the long-term. The current efforts by agencies and other organizations in the BSR, to be successful, should ensure collaborative relationships with the Tribes and the ANOs that operate in and care-take the waters of the BSR.

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