

Collaboration Between Indigenous and Research Communities in the Bering Strait Region

Collaboration entre les communautés autochtones et les chercheurs dans la région du Détroit de Béring

Сотрудничество между представителями коренных народов и исследователями в регионе Берингова пролива

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Chukotka: Understanding the Past, Contemporary Practices, and Perceptions of the Present

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Résumé de l'article

La région du Détroit de Béring est un territoire unique défini par des critères géographiques et socioculturels spécifiques. En étudiant cette région, les chercheurs impliquent souvent les peuples autochtones du lieu en tant qu'experts et co-chercheurs. Cet article examine la collaboration entre communautés de recherche et communautés autochtones ; il identifie les participants et décrit des exemples typiques de ces collaborations. Parce que cette collaboration a une nature transculturelle, l'article donne un aperçu de certains débats concernant la coexistence de deux types de savoirs : savoir scientifique global et savoir traditionnel des peuples de l'Arctique. Pour la même raison, l'article discute le savoir écologique traditionnel (connu en anglais sous l'acronyme TEK, Traditional ecological knowledge) à la fois en tant que phénomène étudié et outil de recherche. L'incorporation et la fusion de TEK dans les méthodes scientifiques et le système de gestion a fait émerger des résultats qui ne sont pas tous positifs mais qui peuvent aussi avoir des conséquences complexes et contradictoires pour ceux qui détiennent ce savoir et pour le savoir lui-même.

Collaboration Between Indigenous and Research Communities in the Bering Strait Region

Eduard Zdorⁱ

ABSTRACT

The Bering Strait region is a unique territory defined by its geographical and sociocultural features. In studying the region, researchers often involve local Indigenous peoples as experts and co-researchers. This paper examines collaboration between research and Indigenous communities, identifies contributors, and describes typical cases of these collaborations. Because this cooperation has a transcultural nature, the article provides an overview of the discussion about the coexistence of two types of knowledge: global scientific knowledge and Arctic peoples' traditional knowledge. For the same reason, Traditional Ecological Knowledge (TEK) is discussed as both a phenomenon being studied and a research tool. The incorporation and fusion of TEK into scientific methods and management systems has given rise not only to positive results but also to complex and contradictory consequences for both knowledge holders and the knowledge itself.

KEYWORDS

Bering Strait region, community, collaboration, grey literature, research, traditional knowledge, traditional subsistence

RÉSUMÉ

Collaboration entre les communautés autochtones et les chercheurs dans la région du Détroit de Béring

La région du Détroit de Béring est un territoire unique défini par des critères géographiques et socioculturels spécifiques. En étudiant cette région, les chercheurs impliquent souvent les peuples autochtones du lieu en tant qu'experts et co-chercheurs. Cet article examine la collaboration entre communautés de recherche et communautés autochtones; il identifie les participants et décrit des exemples typiques de ces collaborations. Parce que cette collaboration a une nature transculturelle, l'article donne un aperçu de certains débats concernant la coexistence de deux types de savoirs: savoir scientifique global et savoir traditionnel des peuples de l'Arctique. Pour la même raison, l'article discute le savoir écologique traditionnel (connu en anglais sous l'acronyme TEK, Traditional ecological knowledge) à la fois en tant que phénomène étudié et outil de recherche. L'incorporation et la fusion de TEK dans les méthodes scientifiques et le système de gestion a fait

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MOTS-CLÉS

Région du Détroit de Béring, communauté, collaboration, littérature grise, recherche, savoir traditionnel, subsistance traditionnelle

АННОТАЦИЯ

Сотрудничество между представителями коренных народов и исследователями в регионе Берингова пролива

Эдуард Здор

Район Берингова пролива — уникальная территория, определяемая своими географическими и социокультурными особенностями. При изучении региона исследователи часто привлекают представителей местных коренных народов в качестве экспертов и исследовательских партнеров. В этой статье рассматривается сотрудничество между исследователями и сообществами коренных народов, определяются участники и описываются типичные случаи такого сотрудничества. Поскольку это сотрудничество носит транскультурный характер, в статье представлен обзор дискуссии о сосуществовании двух видов знаний: глобальных научных знаний и традиционных знаний арктических народов. По той же причине традиционные экологические знания рассматриваются как изучаемое явление и инструмент исследования. Включение и слияние традиционных экологических знаний с научными методами и системами управления привело не только к положительным результатам, но и к сложным и противоречивым последствиям как для носителей знаний, так и для самих знаний.

КЛЮЧЕВЫЕ СЛОВА

Берингов пролив, сообщество, сотрудничество, серая литература, исследования, традиционные знания, традиционное жизнеобеспечение

Traditional ecological knowledge (TEK) is one of the key components of the cultural heritage accumulated by the Chukchi, Inupiat, and Siberian Yupik over many generations. Scholars have collaborated with Indigenous peoples from the first contact, initially for purposes of geographic and ethnographic research. Over time, local communities have become partners—sometimes even leaders—in the cooperation research efforts in the region by setting research topics, raising funds, and overseeing research activities. In this paper, I review collaboration between research and Indigenous communities in the Bering Strait region. As collaborative research in these two countries of the Bering Sea Region is broad in scope and quite variable, my review focuses primarily on cross-border projects and on comparable studies involving Alaskan and Chukotkan communities. Yet, even in such a narrowed scale, I am forced to limit myself to a brief general

description and refer those wanting to expand their knowledge of the topic to the links of the corresponding online resources.

Because this relationship has a transcultural nature, I give an overview of the discussion about the coexistence of two types of knowledge: science and TEK. The main topics of research are local communities, ecosystems, and the interactions between the two. Collaborators are classified according to the nature of their participation in the research. I conclude by discussing TEK as both a phenomenon being studied and a research tool and by examining some current gaps and prospects for further collaborations between researchers and communities.

The main objectives of this study were to outline the collaboration between Indigenous communities and researchers, describe the contribution of each side, name the most noteworthy research results, and illustrate the life and career aspirations of stakeholders in the socio-cultural context of the Bering Strait region. In order to collect information regarding their achievements in joint research, I explored a variety of publications, conducted a qualitative analysis of interviews with some collaborators, and reflected on the outcomes of my participant observations during more than two decades. Because the research covers the American and Russian parts of the Bering Strait, both English and Russian publications are referenced in this study. Unfortunately, I found no research papers published in Indigenous languages.

A significant source of information for this paper was grey literature (Rothstein and Hopewell 2009, 104). Indeed, these publications provide a wealth of materials, some of which are unique and detailed. Although these works are often not peer-reviewed and therefore may be biased, most of them are built on ground-based and reliable sources of information. For example, local government websites, such as North Slope Borough and Kawerak Inc., provide specific and detailed reports about local ecosystems, wildlife, and TEK. Other sources include the websites of government agencies and universities. The inclusion of grey literature therefore significantly increased the amount of scientific material available. Given the sheer volume of information, this paper focused on technical reports and, to some extent, dissertations, particularly by Indigenous researchers.

Collaboration Contributors

Today, research in the Bering Strait region is carried out by a wide range of stakeholders, including Indigenous communities. Collaborative research is initiated by the synergistic efforts of authorities, research institutions, and Indigenous nongovernmental organizations (NGOs) in various configurations. Government, educational, industrial, and nongovernmental institutions conduct research to provide society with relevant information for management purposes. Federal services focus on wildlife and habitat research, while local

authorities, mostly Alaskan, prioritize community welfare and identity. Environmental organizations cooperate with authorities and communities for conservation purposes. Indigenous NGOs concentrate their efforts on traditional subsistence, knowledge, and wildlife co-management. To describe the Indigenous contributors, I primarily used the experience gained during my fieldwork in Chukotka, although the portrait is supplemented with studies of coastal Alaska settlements by Jolles and Oozeva (2011), Druckenmiller (2011), and Raymond-Jakoubian (2019), as well as my participant observations and conversations with locals during my visits to Alaskan Indigenous villages.

TEK Holders

Typically, children in Chukotka and Alaska settlements enter into the traditional subsistence lifestyle as equal members of the community at about the age of 12. The harsh conditions of the Arctic and the exorbitant manual labor in marine hunting and reindeer herding are the reasons why most villagers moderate their direct participation in traditional subsistence activities after they turn 50. This represents about forty years of practicing subsistence, which I have divided into three categories using age and experience as criteria. The three main groups of TEK holders are young knowledge *recipients*, mature knowledge *producers*, and elder knowledge *keepers*.

The group of *TEK recipients* includes young people aged 10 to 30 years. Many children begin to participate with their parents in hunting, herding reindeer, or fishing as observers, between the ages of seven and ten. At this age, they already understand what danger is and are able to stay near mentors without adding difficulties. Their main task is to regularly attend the subsistence activity. They can watch hunting, reindeer herding, and fishing, can copy mentors, and, in some cases, even help. Thanks to this strategy, by the age of 12, when children are physiologically and mentally transformed into adolescents, they have gained enough knowledge and skills to practice subsistence under the supervision of a mentor. Around this age, boys in coastal communities catch their first seal, and their peers in reindeer herding camps commence to graze reindeer on their own during the summer holidays. At the same age, girls begin to confidently engage in household chores, process fish, birds, and seals, and collect plants and berries.

The first prey of a novice hunter is a distinctive event that marks a liminal period in their life. In some families, adolescents undergo a detailed initiation ritual that may include fighting for prey, special distribution of prey, and blood anointing. In other families, the ritual can be short and symbolic. For a teenager, the transition to a new stage means that traditional subsistence has ceased to be a game, and that they have now become breadwinners for the family. Over time, they acquire not only the highly specialized knowledge of a harpooner, mechanic, navigator, or shepherd, but also a deep

knowledge of the sea, tundra, biology in animal behavior, and seasons of subsistence activity. This combined knowledge also includes rules for ensuring the safety of subsistence practices and survival in an emergency.

According to my observations, the school remains a competitor to TEK. Classes at school not only create a gap between the parents' subsistence activity and the education of their children but also bifurcate goal-setting. After graduating from high school, many young villagers choose an urbanized way of life, which in small villages contributes to higher unemployment. Meanwhile, elders argue that the quality of the subsistence-oriented knowledge and skills acquired during childhood and adolescence varies significantly. Children who begin to hunt or graze deer early with their older relatives perceive this knowledge as the first and, therefore, the cornerstone. Conversely, young people who start hunting and herding reindeer after the age of 20 have already acquired stable habits and skills learned from school standards.

TEK producers are villagers from 30 to 40 years old, with approximately 20 years of experience in traditional subsistence. Most of them do not yet have rheumatism, arthritis, sciatica, or other physical ailments caused by frequent and long-term exposure to cold and humid environments, as well as the tremendous physical activity due to the dominance of manual labor. During this period, villagers are normally married and raise their children in a traditional way. Having a family and raising children is both a marker and a criterion for a new transition period from carefree youth to responsible adult life. Together, these factors motivate sustainable subsistence, which in turn ensures the production of traditional knowledge.

This age group is the core of Indigenous communities. A notable feature of this group is that they have adapted high-tech and electronic equipment and internet for use in traditional subsistence. This circumstance contributes to bridging the transcultural gap between Indigenous villagers and scholars, and thus facilitates research collaboration. The combination of TEK and general education makes this category of villagers attractive for providing transportation for expeditions, observing wildlife, collecting biological samples from marine mammals, and even conducting sociological research.

Most *TEK keepers* today are elders born in the 1950s and 1960s. This was a time of drastic sociocultural changes in Chukotkan communities (in Alaskan coastal communities, these alterations began several decades earlier). There was a significant shift in food culture, casual clothing, and housing. Boarding schools created a generations gap that influenced TEK. Russian and English began to rule in Indigenous villages. Traditional beliefs passed into a latent phase as Christianity dominated in Alaska for almost half a century and atheism continued to displace animism in Chukotka.

Experience, knowledge, and age-related physical limitations determine the position of elders in the local hierarchy. Villagers at this age are often captains of hunting teams and leaders of reindeer herding camps. Over time,

their role changes to that of mentor. Representatives of this group are often recruited as interviewees and consultants for research on TEK.

Indigenous Assistants

The next group of research contributors is villagers, who assist scholars by providing transportation services, wildlife observations, biosample collections, and even sociological research. Such cooperation is in demand due to the remoteness of research sites in the Arctic and because researchers require transportation, security, and assistance. Experienced local crews are experts in weather, sea, and ice conditions, and therefore can facilitate safe exploration. Teamwork is essential for scientists because villagers are able to supply data routinely collected over long periods of time and on large spatial scales, rather than short-term studies limited to one place. In addition, surveys have indicated that villagers trust their fellow villagers as co-researchers more than they do outside researchers, particularly with regard to sensitive topics such as family rituals and the hunting of endangered marine mammals. Many successful research projects are conducted on the Alaskan coast, such as the Alaskan Arctic Observatory and Knowledge Hub (AAOKH n.d.) and the Alaskan Polar Bear Patrol (NSBWMD n.d.-b.). The most notable projects along the Chukotkan coast regard the monitoring of whale migration (Melnikov and Zdor 2018), the monitoring of walrus harvesting (Kochnev 2010), and the Chukotkan Polar Bear Patrol project (ibid.).

Although there are many hunters in the local communities, researchers put much effort into finding suitable assistants. A potential assistant is required to own a boat and to be an experienced captain. The local associate is expected to be interested in research activities and have a familiarity and willingness to conduct the documentation process to the researcher's standard. Researchers require observers to document observation outcomes as soon as possible on the same day. Hunters are perfect observers, as they endlessly monitor the sea horizon and can regularly exchange information with each other on what they see while traveling, hunting, and fishing. Unfortunately, villagers often postpone documentation for various reasons, which leads to inaccurate and irrelevant data. I have noticed that this situation is conducive to cooperation within families: the hunter observes the wildlife, and a family member, whether his wife, sister, or daughter, fills out the observation log.

The improvement of cooperation has led to the appearance of publications with co-authors from among the villagers. The primary reason for involving villagers in co-authorship is their significant contribution to the study (Noongwook, Huntington, and George 2007). The first group of co-authors includes TEK keepers. Although most often elders, they may also be experienced middle-aged villagers who provide the researcher with in-depth and detailed information about TEK on wildlife and their habitats

(Noongwook, Hungtington, and George 2007; Krupnik, Apangalook, and Apangalook 2010; Voorhees et al. 2014). This area of collaboration between villagers and researchers has developed to such an extent that some recent publications are authored only by villagers (see, for example, contributions in Bogoslovskaja and Krupnik 2013 and Gearheard et al. 2013). The second group of co-researchers includes wildlife observers, biosample collectors, and interviewers who provide researchers with observation logs, field data, and interview records. The contributions of this group are sometimes so valuable that they are invited to be co-authors. Finally, the third group of co-authors is composed of individuals who, in addition to collecting field data, independently write part of the research report. The principal investigator includes these reports or a substantial portion of them in the body of the publication or as annexes.

Indigenous Scholars

According to Perea (2013), over the entire history of education, 57 Alaskan Indigenous persons have graduated with PhDs. Almost all of the Indigenous people of Chukotka who have received a PhD—just over half a dozen—are listed in this section. A review of the publications revealed that despite the considerable amount of research in the region, there are not many highly qualified Indigenous researchers involved.

Oscar Kawagley (University Alaska Fairbanks, see UAF n.d.) made a major contribution to the theoretical justification of research on the role of TEK in Alaska. Along with Barnhardt, he supported the founding of the Center for Cross-Cultural Studies at the UAF. The most prominent Chukotkan scholars were linguist Pëtr Inenlik'ei (Zorinanata.ru n.d.) and archaeologist Tasian Tein (Ogryzko 2013). Regrettably, publications on their research activities are rare. Both had exclusive knowledge of their Chukchi and Yupik cultures, respectively, and worked hard to preserve it. In 1992, the Chukotkan Far East Branch of the Russian Academy of Science (SVKNIIFEBRAS n.d.) was established, which included a laboratory for the study of traditional subsistence. Vladimir Etylin (Gray 2001, 12), the first head of the laboratory, gathered Indigenous researchers to ensure the development of research on Chukotkan TEK. Over time, in line with the general trend of Russian funding for science, the laboratory downsized and the scholars reduced their research volume.

Linguistic research was the foremost topic of 20th century Chukotkan scholars who began with teaching at village schools and then became engaged in either the development of regional education or the study of Indigenous languages (Biruikova 2019). In the second half of the 20th century, Inenlik'ei conducted a large-scale linguistic study, developing several versions of Chukchi-Russian dictionaries in collaboration with the linguists Skorik and Moll. The advantage of Inenlik'ei's study was that he worked at a time when

there was still a solid language environment in Chukchi settlements, while the Yupik language in Indigenous settlements was already under the influence of the Russian language (Ogryzko 2013). After Inenlik'ei, another prominent Chukchi linguist was Idea Kulikova. She began her vocabulary study of the reindeer herding Chukchi (Kulikova 1984, 2016) in the late 20th century, when the language environment in reindeer herding camps was still dominated by Chukchi, even though Russian was already the lingua franca in most villages. Currently, the Russian language dominates every Chukotkan settlement, including the reindeer herding and hunting camps. Therefore, even Indigenous speakers mix their own language with Russian, while theirs is reduced. Indeed, in most recent studies on the Yupik language (Inuit Traditions 2016) and the Chukchi language (Weinstein, 2019), linguists have had to rely on previous research carried out in the middle of the 20th century.

The Alaskan Indigenous anthropologists best known for their publications are Gordon Pullar (1999) and Sven Haakanson (2015), while in Chukotka, the most famous illustration of an Indigenous ethnographer was PhD Tein (1988), “the first Eskimo ethnographer and archaeologist” (Ogryzko 2013, 55).

In contrast to the widespread involvement of villagers as assistants in marine wildlife research, there are almost no educated Indigenous biologists in the region. According to Perea (2013), there are only four Alaskan Indigenous PhDs related to marine study. Two of them are currently conducting research outside the region: University of Alaska Anchorage professor Kathryn Milligan-Myhre, an Inupiat from Kotzebue, conducts genetic research (Department of Biological Sciences 2019), and UAF professor Milo Adkison, a Yup'ik from Dillingham, studies salmon interactions in southern Alaska (College of Fisheries and Ocean Sciences, 2019). Not a single Chukotka Indigenous person has received a doctorate in marine biology. Currently, only Andrei Riabov, a Chukchi from Lorino, works as a laboratory assistant in the Chukotka branch of the All-Russian Research Institute of Fisheries and Oceanography (TINRO 2018).

Numerous Indigenous researchers without PhDs are studying various sociocultural aspects of the local communities using interdisciplinary approaches. Raychelle Daniel (ARCUS n.d.-a.), a marine zoologist, works with Bering Sea Indigenous communities, and Zona Spray (2016) studies the Arctic food history. Vladislav Nuvano (2009) studies the modern reindeer herding camp, Viktoriya Golbtseva (Golbtseva and Iarzutkina 2015) investigates the TEK of coastal settlements, and Nadezhda Vukvukai (2012) explores the features of modern traditional fur clothing. There is also a group of Indigenous researchers who, without specific credentials, has achieved significant results in their research on TEK. Typically, a large research team carries out such work, in which participate both professional researchers and villagers interested in research. Two books unfolding traditional

knowledge regarding sea ice were written by large teams of researchers and villagers (Gearheard et al. 2013; Krupnik et al. 2010). A prominent example of a non-academic Indigenous researcher is Vladilen Kavry, author of *The Clan of the Polar Bear*, published in Russian in 2017 (Kavry 2017, Nagatkin n.d.).

Indigenous NGOs

Chukotkan and Alaskan NGOs collaborate with government agencies, local authorities, and research institutions to ensure that they adequately address challenges that are crucial to the communities they represent (i.e., TEK and wildlife co-management) and that the cultural and nutritional needs of local communities are met. Organizations such as the Inuit Circumpolar Conference Alaska (ICCA n.d.) and the Association of Chukotkan Indigenous People (Narody Chukotki n.d.) protect the political rights of Indigenous peoples; others such as the Alaska Eskimo Whaling Commission (AEWC n.d.), the Alaska Nanuuq Commission, the Eskimo Walrus Commission (Kawerak n.d.), and the Chukotkan Union of Reindeer Herders (Omruvie 2020) co-manage traditional subsistence; and still others preserve the cultural heritage of the region. NGOs focus on coordinating collaboration between communities, researchers, and authorities, as well as providing scholars with Indigenous co-researchers, TEK keepers, logistic services, and moral support.

ICC Alaska is an illustration of how Indigenous organizations coordinate research related to the protection of local communities' rights. In accordance with the ICC Alaska Strategic Plan, one of the organization's priorities is to "promote and teach the ethical and equitable use and involvement of indigenous knowledge" (ICCA n.d.). ICC Alaska (2016) achieved great success by implementing a project called *Alaskan Inuit Food Security Conceptual Framework: How to Assess the Arctic from an Inuit Perspective*. Hunters' organizations in the region also focus on collaborative research. The common marine mammal populations called for the joint management of wildlife and became the main topic of cooperation between the region's Indigenous communities. The Alaska Eskimo Whaling Commission, the Alaska Nanuuq Commission, and the Eskimo Walrus Commission (Kawerak n.d.) all collaborate with local communities in Chukotka and their NGOs, such as the Yupik Eskimo Society (Kochnev 2010) and the Naukan cooperative (NAMMCO n.d.), which have collaborated for many years with the Chukotkan branch of the All-Russian Research Institute of Fisheries and Oceanography [ChukotTINRO], while the Alaska Nanuuq Commission and the Eskimo Walrus Commission work with the US Fish and Wildlife Service (USFWS n.d.), and the Alaska Eskimo Whaling Commission cooperates with the National Oceanic and Atmospheric Administration and the North Slope Borough. Integrating TEK into a wildlife management strategy is the primary motivation of collaboration. Marine hunters participate in the satellite-tagging

program (for bowhead whales, beluga whales, and seals) that has been operating for many years in the region (NSBWMD n.d.-a.).

Environmental NGOs

Environmental NGOs, such as the World Wildlife Fund (WWF n.d.), the Wildlife Conservation Society (WCS n.d.), Pacific Environment (n.d.), and others, support the collaboration of researchers and Indigenous people to protect the environment. They raise funds for research in which scientists and villagers jointly study regional ecosystems. A notable feature of these projects is that the research activities are combined with educational and conservancy endeavors. For example, ChukotTINRO and the Chukotka Association of Traditional Marine Mammal Hunters, observing a decrease in sea ice in the region, deemed that research and protection of walrus coastal rookeries was necessary. Pacific Environment supported Chukotkan scholars and Indigenous NGOs through the multi-year research project *The Guardian of the Walrus Haulout* (Haulout Keepers n.d.) during which researchers and hunters built a network of observation posts along the Chukotka coast of the Bering Strait. In addition, areas of mass concentration of walruses during autumn migrations were documented, and potential threats to the walrus population were identified.

The Alaskan office of the WWF is closely associated with the Alaskan and Chukotkan Indigenous communities. Together with Indigenous NGOs and government, WWF organizes research and seminars, and promotes the good practices of communities in protecting particularly vulnerable animals and their key habitats. The main goal of these activities is to prevent conflicts between polar bears and local communities. WWF supported the Chukotkan communities of Vankarem and Nutepelmen, which initiated the *Umka Patrol* project in the mid-2000s, based on the Alaskan experience (NSBWMD n.d.-b.). Subsequently, this project was expanded along the entire Arctic coast of Chukotka.

Universities

The Bering Strait region is a unique place for natural and social science research, including topics related to Indigenous people. A significant milestone in the modern research activities of universities is that they now involve Indigenous communities in the research. For example, the goal of the Alaska Arctic Observatory and Knowledge Hub project initiated by the UAF International Arctic Research Center (IARC n.d.) is to provide “tools and science support to help northern Alaska coastal community residents turn their local observations and expertise into a public, online resource that tracks changes in snow, ice, and wildlife” (AAOKH n.d.). The Sea Ice Walrus Outlook Project (ARCUS n.d.-b.) is another example of collaboration between universities and communities. The Project provides weekly reports from April

through June, with information on weather and sea ice conditions relevant to walrus in the northern Bering Sea and southern Chukchi Sea regions of Alaska.

According to Vitebsky and Alekseev (2015), Western science in the 1990s studied the Far East mainly through the efforts of graduate students. Many social researchers spent a long time in the studied communities. Recently, scholars have begun to conduct multidisciplinary studies that combine the natural and social sciences with TEK (Druckenmiller 2011). In sharing their knowledge and social life with researchers, Indigenous communities have opened new horizons for the topics studied. In turn, research outcomes are incorporated into management models that regulate the life of settlements and contribute to the adaptation of communities to climatic and sociocultural changes. Villagers explain that long-term productive partnerships are built on the trust and respect researchers gain when villagers see a genuine interest in getting to know the communities. Such relationships produce fruitful synergistic collaborations between researchers and villagers, resulting in jointly published scientific papers.

Federal, State, and Local Agencies

As the Bering Strait is located between the US and Russia, the international coordination of research is vital. Regular studies of marine mammals are carried out under the Agreement on Cooperation in the Field of Protection of the Environment and Natural Resources (USFWS n.d.). Other agreements also provide collaborative research. In 2000, the US and Russia signed an agreement on the joint management of the Alaskan-Chukotka polar bear population (USFWS n.d.; AO Codex n.d.). In this agreement, research on polar bears is coordinated by a scientific group that includes Indigenous representatives. The Russian Ministry of Natural Resources and Environment and the National Oceanic and Atmospheric Administration co-govern the bowhead and gray whale populations (IWC n.d.). Pursuant to this agreement, Alaskan and Chukotkan NGOs were engaged to conduct population studies.

Federal and state agencies (ADFG n.d.; BOEM n.d.; Russia MNRE n.d.; USGS n.d.; USFWS n.d.) manage wildlife and are therefore the leading architects and explorers of animals and their habitats. They study the status of animal populations to determine their vulnerabilities as well as propose conservation measures. These circumstances have led to the initiation of collaborations between Federal Agencies and local communities and their NGOs. The US National Park Service Shared Beringian Heritage Program has made a major contribution in studying regional Indigenous peoples for over 25 years. The program also organized biennial *Beringia Days* conferences (USNPSSBHP n.d.), where scientists, environmentalists, politicians, and Indigenous contributors could exchange views on the cultural and natural heritage of the region, discuss research, and report on their studies. Other

government agencies, such as the US Fish and Wildlife Service (USFWS n.d.), the US Geological Survey (USGS n.d.), the National Oceanic and Atmospheric Administration (NOAA n.d.), and the Alaska Department of Fish and Game (ADFG n.d.), have funded a study for wildlife management. The study examined the size and status of wildlife populations and habitats (ADFG n.d.; NOAA n.d.; USFWS n.d.) as well as interactions and conflicts between wildlife and local communities. The Russian Ministry of Natural Resources and Environment has funded research to study the nutritional and cultural needs of Chukotkan peoples for presentation at the International Whaling Commission meetings (IWC n.d.).

Local authorities are of great importance in the cooperation process between scientists and villagers. While federal governments and environmental NGOs prioritize research for management purposes, municipalities are motivated to collect and maintain TEK and traditional subsistence to preserve the identity of the Indigenous population that dominates there. Browsing the regional municipal government websites reveals that the most diverse contribution to research collaboration is by the North Slope Borough Wildlife Management Department, which conducts long-term and large-scale studies for the benefit of Indigenous peoples. A key objective of these studies is the conservation of the bowhead whale population and other marine mammals to ensure the sustainable cultural and nutritional needs of local communities. Much attention is paid to TEK, traditional subsistence, and the interaction between wildlife and Indigenous communities (NSBWMD n.d.-a.). The Department makes significant efforts to include local residents in research as both assistants and co-researchers (NSBWMD n.d.-a.). As per agreements between the US and Russia (IWC n.d.), the Department collaborates with Chukotkan scholars and Indigenous whalers. A long-term coastal observation project on whale migration monitoring and a biosample collection project was conducted in the region (NSBWMD n.d.-c.).

Kawerak (n.d.), a regional non-profit corporation based in Nome, Alaska, has focused its research activities on preserving cultural heritage. The Kawerak Social Science Program collaborates with communities in the Bering Strait region to study the TEK of subsistence and human-environment relationships. One of the core objectives of this research is to incorporate TEK into the wildlife management plan (Alaska Public Media 2019). This is the unprecedented result of more than 40 years of collaborative efforts by Kawerak, researchers, and communities. Kawerak has a long-term experience of cooperation with Chukotka research and Indigenous organizations. Since the 1990s, on the initiative of Kawerak, these organizations have studied the subsistence harvest of walruses and Chukotkan TEK about walruses.

Although the Chukotka government currently has no research strategy for studying TEK or using TEK methods for biological and environmental research, the authorities support the research needed by Indigenous

communities. For example, the government funded the monitoring of the Kolyuchin Island walrus rookery (Kochnev 2006). This project was in demand because, due to the melting of sea ice, coastal rookeries had become the only habitat for walruses during autumn migrations. This government initiative sparked the methodological monitoring of key walrus rookeries on the entire Chukotka coast. Later, researchers and Indigenous assistants expanded this monitoring along the entire coast of the Chukotka Peninsula (Haulout Keepers n.d.; Vasilev n.d.). Chukotka authorities also support projects on the preservation of Indigenous languages carried out by local NGOs (ANOIA Chukotka 2018).

Discussion

A comprehensive and detailed review of the challenges and trends of cooperation between Indigenous and research communities is beyond the scope of this paper. I have instead outlined the most significant benchmarks in the collaborations brought on by sociocultural differences between regional communities and American/Russian societies. TEK was originally a source of information for geographical and ethnographic research. Over time, this knowledge began to be used in science as a source of additional information about wildlife and the environment. In the natural and social disciplines, collaboration between researchers and Indigenous peoples has contributed to the emergence of interdisciplinary sciences such as ethnobotany, ethnozoology, and ethnobiology. Huntington and Noongwook (2013, 2) explain the demand for TEK by the fact that, in science, “the natural world cannot be easily manipulated in controlled experiments.” This statement suggests that TEK can function not only as a unique database, but also as a research method.

According to the Encyclopedia Britannica (n.d.), science is “any system of knowledge that is concerned with the physical world and its phenomena and that entails unbiased observations and systematic experimentation.” Apart from the lack of written documentation, TEK appears to generally fit this definition. To test this assumption, I collated different points of view on this topic.

Daston (2008, 97) and Wenzel (1999, 113) state that Western science and TEK are similar in that they both utilize empirical observation, maintain extensive data sets, and study knowledge by similar methods, namely, through experiments and observation. Purcell (1998, 258) concludes that “[Indigenous knowledge] has come to signify a methodology, a social science perspective, and even philosophical and ideological positions.” Still, “there is a lack of consensus among scientists on whether indigenous knowledge can be brought into the realm of science” (Bohensky and Maru 2011, 10).

Descola (1996, 89), Viveiros de Castro (1998, 473), Bird-David (1999, S67), and Huntington and Watson (2012, 8) are unanimous in their conclusion that the key to understanding Indigenous philosophy is its ontology. According to this approach, TEK postulates the social nature of the relationship between humans and non-humans, and for this reason some researchers believe that science is incompatible with TEK. Indeed, the inclusion of TEK in science generates complex and contradictory consequences not only for the scientific community but also for the Indigenous community. For Vitebsky (1995) and Nadasdy (1999), in the process of integration, TEK is compartmentalized, distorted, and takes on the fragmentary nature of the society by which it is appropriated. Cruikshank (2001, 391) argues that the differing approaches of local knowledge and Western science are due to cultural models; however, “we need bridges of knowledge that work from both local concepts and science” (ibid).

One thing is certain: collaboration between researchers and their local partners in the Bering Strait region is accompanied by mutual influence and borrowing. Villagers use science and technology for traditional subsistence, while global science embeds TEK in research and governance. The use of modern technology is motivated by the need to ensure the safety and efficiency of hunting for the well-being of communities. An illustration of this is the Sea Ice Walrus Outlook project (ARCUS n.d.-b.), which provides local communities with detailed online information on ice conditions and weather relevant to walrus migrations. However, the side effect of this combined process is a decrease in the demand for TEK, which in turn has influenced the social hierarchy of hunting communities. Young hunters, well trained in modern technology, are now able to mediate critical information that ensures safe and successful hunting, while the important role of older hunters in the hunting team has declined. The Alaska Arctic Observatory and Knowledge Hub project has succeeded in carefully combining scientific and traditional methods in coastal observations of marine mammal migration. The joint efforts of scholars and Indigenous observers thus seamlessly integrate traditional and scientific knowledge to the benefit of global and coastal communities. The advantage of this system is the wide branching of the observation network.

It takes a long time to establish collaboration between researchers and local partners. The success of cooperation depends on the researcher’s genuine interest in the topic being studied, as well as their respect for the Indigenous way of life (Albert 2001; Noongwook, Huntington, and George 2007; Jolles and Oozeva 2011; Kochnev and Zdor 2016). One notable example of how local communities and researchers worked together was in the census of bowhead whales. In the 1970s, researchers did not have much clarity about the animal population, which led to the restriction of local whaling. According to Albert (2001, 269), a successful study of the bowhead

whale was possible because the census was “formed on the basis of Eskimo traditional knowledge.” Elders informed the scientists that bowhead whales migrated along the coast of Utqiagvik in early spring, even though the sea was almost completely covered in ice. Years of multidisciplinary research have confirmed this information. The outcome of this collaboration was a detailed body of data on the abundance and distribution of bowhead whale populations, resulting in the International Whaling Commission authorizing Indigenous communities to engage in traditional whaling for their food-based and cultural needs.

Based on the complex history of interaction between the Indigenous and scientific communities in the Bering Strait region, as well as current trends—the gradual progress on the American side (NSF 2018) and the lack of this agenda on the Russian side—I believe that cooperation between researchers and Indigenous peoples still has a viable future if both parties are careful and respectful of each other’s approaches and their own heritage.

Conclusion

Given its cultural, geographical, and environmental attributes, the Bering Strait Region may be seen as a historical example and a potentially sustainable blueprint of the coexistence of humans and other species in a natural setting. Despite a fluctuating climate, the survival of Indigenous people in this region demonstrates that they have a successful method of finding knowledge and applying it to a steady cohabitation with wildlife. The approach of Chukotkan Indigenous people is based on an animist attitude toward non-human beings, and its productivity proves the success of the model—which may be what the global world needs to be successful in the long run.

Interaction between the Indigenous and research communities in the Bering Strait region has come a long way toward cooperation, the general configuration of which I have tried to outline within the limited scope of this paper. Indigenous people are represented as individuals, communities, and their nongovernmental organizations and tribal authorities, while the research community is composed of a wide range of agencies, from academic and government to nongovernmental scholar organizations.

Indigenous people have entered into collaborations with the research community in a variety of roles, from logistics assistance to leadership participation. The development of cooperation has also provided Indigenous people with the opportunity to conduct research on key topics, such as wildlife and their habitats. This type of collaboration plays a key role in preserving not only local knowledge but also aspects of local cultural selves. Research communities and Indigenous people set the agenda and raise funds to attract research agencies, which in turn helps to preserve traditional lifestyles and identity.

The examples I have reviewed here show that collaboration between researchers and Indigenous communities makes it possible to deepen the scientific understanding of the region's ecosystem. Through partnerships, research agencies have gained access to additional information and at the same time have revealed TEK's unique perspective to the general public. Long-term collaborations between Indigenous people and research institutions demonstrate that TEK is not only a body of knowledge but also a research method, thus providing new perspectives and increased productivity for research. However, the inclusion of TEK into governance and the synthesis of knowledge has led to complex and contradictory consequences for both the holders of knowledge and the knowledge itself. These difficulties are caused mainly by the fragility of TEK, which, according to some researchers, is viable only in a strictly limited socio-cultural space.

I have observed that the inclusion of technology in the life of Indigenous communities—in part due to cooperation—has reduced the role of TEK among knowledge holders, and has to some extent changed the customary social hierarchy. The elders, who used to be the custodians of TEK and respected members of the community, are not as much in demand today as they were a generation ago. This shift is due to the fact that TEK regarding the weather and marine mammals and their habitat sometimes cannot compete with the scientific knowledge and the help provided by technical innovation. At the same time, very few Indigenous researchers from the Bering Strait region have university degrees; they are more likely to be co-author with other researchers than to publish on their own. This trend echoes the original collaboration model, in which local co-researchers are the primary source of information, while their partners provide analysis and synthesis of research results.

Overall, the current state of cooperation can be described as follows. Government and environmental agencies have begun incorporating TEK into local ecosystem administration, building on years of successful research and management collaborations with Indigenous communities. Collaboration between Indigenous organizations in Alaska and Chukotka, as well as research agencies in Russia and the United States, has promoted research and has expanded knowledge about the shared ecosystem of the Bering Strait region. However, in Alaska and Chukotka, cooperation occurs with different intensities and approaches. In Chukotka, in particular, collaboration between researchers and Indigenous communities is rather fragmented and often depends on the individual efforts of stakeholders. This is most likely because Russian government agencies do not view TEK as a significant source of information about ecosystems nor a useful tool for wildlife management. In contrast, collaboration between researchers and Alaskan Indigenous communities takes place on a regular basis and is strictly regulated

as part of the decolonization strategy. US federal and regional government agencies regularly incorporate TEK into the wildlife management system.

As I conclude, I have found recently published articles on collaboration between researchers and Indigenous communities. This means that the combination of partner research efforts and the synthesis of knowledge and research methods are not only relevant but in demand. It also indicates that regular systematization and analysis of research collaboration is needed to facilitate the adjustment of stakeholder strategies to reasonably involve all available research components and achieve research objectives.

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