

## 4. Arctic communities in the face of change

Resilience, governance, and well-being

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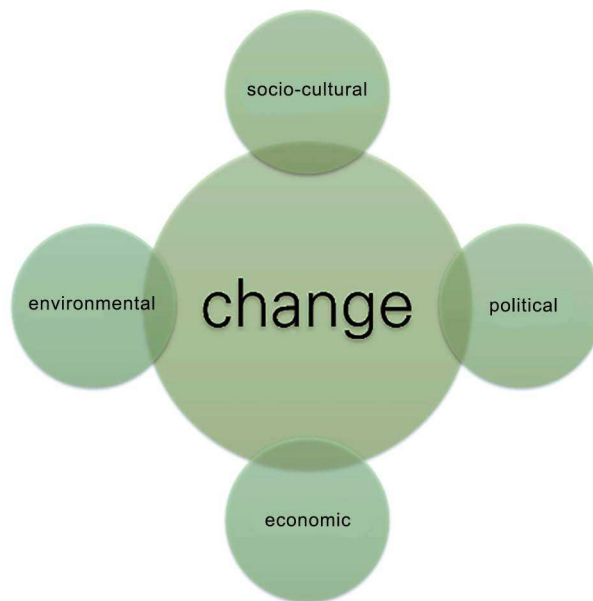
### 1. INTRODUCTION

Historically, multi-level governance has focused predominantly on overlapping jurisdictions within western or modern state contexts, often neglecting governance structures built upon non-western epistemologies and knowledge systems. In the Arctic, enduring institutions rooted in diverse Indigenous communities and their knowledge systems have existed since time immemorial. Today, these Indigenous institutions coexist, often in tension, with the modern state.

The experiences of Indigenous communities across the North Pacific vary, and tensions arise in every context between Indigenous communities and the modern states in which they exist. In Alaska, the establishment of Alaska Native Corporations in 1971 introduced new forms of governance related to economic development. This tension is evident between these frameworks and historic Indigenous institutions, with Native villages serving as federally recognized governance entities drawing upon Indigenous knowledge systems. In Russia, post-USSR political and administrative changes created an intricate system of non-Indigenous and Indigenous institutions with complex, frequently changing, and often overlapping jurisdictions and functions. A rise in power of some and the dismantling of other autonomous districts with a nominal Indigenous title, which represented a feature of so-called “matreshka” (or nested) federalism, is one of the examples of the dramatic changes in governance structures in the last twenty years. On the other hand, the development of Indigenous self-governing economic and political institutions vis-à-vis local

and regional administration is another source of tension embedded in the current system of governance.

Arctic communities, including and foremost Indigenous communities, do not merely experience rapid climate change (IPCC 2018). The changes faced by Arctic Indigenous Peoples are multidimensional, multiscalar, and multi-temporal. They encompass many different components of Arctic livelihoods and manifest in a variety of forms. They are also driven by various factors and processes, often originating outside the Arctic. As Figure 4.1 shows, community perceptions of change include environmental, sociocultural, political, and economic dimensions. Climate is only one of many dynamic elements that present challenges to Arctic communities, and to which they must respond and adapt. The other dimensions include local economies, governance, cultural vitality, and closeness to nature, encompassing the key elements of human well-being.



Source: Author's Own.

*Figure 4.1 Dimensions of change experienced by Arctic communities*

This chapter explores changes, challenges, and opportunities in multi-level governance, including various Indigenous governance forms. It emphasizes

the need for conversations that acknowledge unrecognized and marginalized forms of governance in the North Pacific. The chapter contributes to an effort to unveil and shift power inequities in multi-level governance structures to decolonize and ultimately Indigenize governance institutions in Arctic communities and regions.

The next two sections provide an overview of the challenges facing the region's communities and options for addressing them. In the sections that follow, a number of Indigenous individuals from the region provide personal reflections on these issues: Rodion Sulyandziga, a Udege scholar and leader from Russia's Pacific Coast; Tatiana Degai and Victoria Sharakhmatova, Itelmen scientists and knowledge holders from Kamchatka; Eduard Zdor, a Chukchi academic; Sean Asikluk Topkok, an Inupiaq researcher; Vera Metcalf, a Saint Lawrence Island Yupik knowledge holder; and Liza Mack, a Unangan (Aleut) scholar. The concluding section links these testimonies to the initial account of challenges and responses.

## 2. TRIPLE CHALLENGES: CLIMATE, ECONOMY, AND WELL-BEING

While the sustainability literature recognizes the interconnectedness of the environment, economy, and livelihoods, the sustainability framing is frequently shallow and focused on meeting particular thresholds in each domain (e.g., the sustainable development goals). Arctic sustainability research has explicitly considered the place-based aspects (Petrov et al. 2016), as well as the need to indigenize sustainability (Degai and Petrov 2021). Importantly, processes of governing, and more broadly living, are not necessarily reflected within the metrics, nor do these quantitative approaches align with Indigenous knowledge systems and governance. In each case, we examine three strands – climate, economics, and well-being – within a multi-level governance framework.

Climate has been a driver of change in the Arctic at the systemic level, but also locally. It is broadly accepted that the Arctic is warming two to four times faster than the rest of the planet, with the consequences ranging from melting sea and land ice to new species moving northward (Moon 2021). However, the most dramatic implications of climate change are likely observed at the community level. These changes also represent acute and formidable challenges to community well-being and Indigenous livelihoods. Coastal erosion is an example of a major issue faced by coastal Alaskan communities (Overbeck et al. 2020). Erosion, generally exacerbated by coastal permafrost thaw and intensified activity of the ice-free ocean, now threatens the existence of dozens of small villages, and relocation plans are being made to move some of them (Overbeck et al. 2020; Terenzi et al. 2014). In 2022, Typhoon Merbok,

one of the most impactful storms in Alaska in fifty years, devastated western Alaska (Thoman 2022) revealing the underlying physical and socioeconomic vulnerability of coastal communities to climate-induced hazards (Bronen et al. 2020). Responses to this and other short- and longer-term impacts of climate change by different community and government actors present an important case study for mitigation and adaptation policies and practices. They also often demonstrate Indigenous community resilience embedded in Indigenous knowledge and self-determination (Lezak and Rock 2024). Understanding resilience to climate change that is based on Indigenous ways of knowing is particularly important given the severity of the climate crisis and the limited resources available to Arctic communities. Elements of such resilience include robust Indigenous institutions, culturally driven support mechanisms (e.g., sharing), adaptability of subsistence practices, political self-determination, collaboration among rights- and stakeholders, and the strength of language and knowledge systems (e.g., Berkes and Jolly 2002; Huntington et al. 2017, 2021).

For Indigenous communities, there are significant economic changes, challenges, and opportunities. One example is the impact of increased shipping traffic, which creates both threats to wildlife and safety but also brings new economic development options such as ports (Pahl and Kaiser 2018). New economic opportunities are also arising from the growing engagement of Indigenous businesses, including Native and village corporations in Alaska and Indigenous-controlled companies across Canada, in resource extractive activities and other business ventures. The evolving benefit-sharing regimes often, although not always, provide opportunities for economic development, training, and capacity building in Arctic communities (Tysiachniouk et al. 2018). At the same time, extractivism may threaten traditional livelihoods, generate social issues, and impact community health. In combination with rapid climate change, changing economies trigger major transformations in Arctic communities that necessitate responses and policy actions to govern these transitions within multi-level structures to benefit local residents (Southcott et al. 2022; Tysiachniouk et al. 2020).

Well-being is a key component of sustainability in the Arctic (Graybill and Petrov 2020). Although there are systems of measuring and monitoring well-being across the Arctic (Larsen and Petrov 2015), community well-being can only be understood in a place-specific context. It may encompass health, material wealth, cultural vitality, robust human–nature relationships, and fate control, among others. In Arctic Indigenous communities, well-being is often interpreted holistically, and includes material, spiritual, mental, and emotional characteristics. Indigenous notions of well-being are built on respect, stewardship, and reciprocity between human and non-human beings and environments (Parlee and Furgal 2012). Therefore, it is critical to hear the voices and experiences of communities.

### 3. TRIPLE RESPONSES: MULTI-LEVEL GOVERNANCE, CO-MANAGEMENT, AND SELF-DETERMINATION

Multi-level governance is a tool that enables consideration of relationships across scales with more recent development of power relations as related to Indigenous communities and nations (Larsen and Petrov 2015). Settler nations and scholars studying governance within these territories have often defined Indigenous governance narrowly and limited its scope to consideration of local or regional concerns, relegating Indigenous governance to historical contexts. Pushing back against these narratives, new scholarship has reexamined Indigenous governance in climate, environment, and economic multi-level policy domains (see for example Curry 2018; Krupa et al. 2015; Latta 2018), including a rich literature on co-management (see for example, Breton-Honeyman et al. 2021; Shadian 2013; York et al. 2022). Within the Arctic, there may be a case for Arctic exceptionalism in terms of Indigenous governance, such as the role of Indigenous organizations as Permanent Participants in the Arctic Council (Zellen 2020).

Indigenous self-determination is a key principle in governing the Arctic. Although Indigenous sovereignty is not uniformly recognized among the Arctic states, self-governing structures are present in many Arctic Indigenous communities (Nuttall 2018). The right of Indigenous Peoples to exercise control over certain affairs, including lands and territories, resources, and knowledge, is enshrined in the UN Declaration on the Rights of Indigenous Peoples and other relevant international documents, as well as in national and regional laws across many Arctic states (Koivurova et al. 2021). The ability of Indigenous communities to define their own destiny is an important part of well-being and encompasses empowerment within political, economic, cultural, and environmental governance (Larsen and Petrov 2015). This “fate control” is sometimes achieved through direct governing powers or through co-management arrangements with non-Indigenous governing structures that belong within the multi-level governance systems in the Arctic (Kimmel 2014). One critical actor has been the Inuit Circumpolar Council, shaping Arctic governance and global Indigenous rights policies through the United Nations and international networks supported by local communities in Russia, the United States, Canada, and Greenland (Koivurova et al. 2021).

#### 4. RODION SULYANDZIGA: INDIGENOUS COMMUNITIES IN RUSSIA – CHANGES AND CHALLENGES IN THE GLOBAL AND NATIONAL CONTEXTS

During the turbulent 1990s, Indigenous activism was rather successful, developing in line with the global trend of Indigenous empowerment. Yet, thirty years later, as Indigenous peoples were seemingly in control of their fate, they became, once again, outsiders both politically and economically. After a brief moment of democratization in the 1990s–2000s, Indigenous hopes have been shattered by the government and profit-seeking industries. The 21st century brought deforestation, water pollution with industrial wastes, and degradation of reindeer pastures, putting Arctic diversity at risk.

During the first two decades of the new century, dozens of new laws were adopted to strengthen vertical power, and to control society, mass media, and non-governmental sectors. To varying degrees, all civil society sectors are affected, including human rights defenders, ecologists, journalists, and others. New regulations feature limits on freedom of the press, criminal prosecution of organizations or their members, and loss of judiciary independence. The result is a policy targeting economic modernization in a strong paternalistic state with a focus on national interests and intolerance toward a critical civil society.

By fiercely pushing forward Arctic projects amid hopes of becoming the engines of the national economy, Moscow launched a series of measures targeting its Indigenous peoples and Arctic development:

- Registry of Indigenous Peoples in Russia (January 2020)
- Federal Law on Government Support for Business Activities in the Arctic Area of the Russian Federation (July 2020)
- Decree on Compensation for Loss or Damage to Indigenous Environment (September 2020)
- Standards for Arctic Residents' Responsibility to Indigenous Peoples (September 2020)
- Strategy for the Development of the Russian Arctic Zone and Provision of National Security through 2035 (October 2020)

What is most remarkable is that the decrees provide a clear reflection and continuation of the state policy of paternalism. The government itself decides for the Indigenous peoples what they should do and where they live, takes on the task of deliberately confusing already complex and multilayered Indigenous identities, rules whether they are “incomplete,” and necessarily causes a

conflict between recognized and unrecognized groups. As a result, what we have now is an Indigenous identity that is inherently contested and devalued.

Such policies not only facilitate the cultural rupture of Russia's Indigenous peoples and degrade Indigenous voices; the erosion of Indigenous self also plays into the hands of politicians and businesses who use laws and affirmative action measures to render Indigenous claims secondary. Permitted to celebrate solely cultural markers of their identity and confined to certain "traditional" lifestyles, Indigenous peoples are not seen as a source of rights and political voice, but as objects of foreign exotic cultures and recipients of state support.

There is always a concern about the extent to which governing structures within Indigenous groups truly reflect the interests and concerns of the communities being governed. The implication is that the state must engage not only with formal Indigenous representative bodies but also with grassroots community members in order to ensure representation of Indigenous interests. To magnify Indigenous voices, the support of human rights and other justice organizations ready to stand up as allies with Indigenous Peoples and advocates is essential.

Based on numerous legislative acts adopted in 2020–2023, it is hard to tell exactly what Russia's current Indigenous policy aims at. While seemingly aimed at the conservation of certain elements of Indigenous cultures and symbolic markers of national identity (folklore, museums, language, food), it takes the focus away from more substantive discussions regarding the reclamation of Indigenous territories, livelihoods, natural resources, and self-government, and most importantly, from the discourse of rights per se.

Inclusiveness and empowerment must be systemic, from drafting legislation on down, in order to be successful. Instead, Indigenous issues are handled in the usual paternalistic manner in hopes that the solution lies within short-term remedial provisions or ribbon cuttings. In no case will anyone expect that narrowly framing Indigenous rights and enacting laws that focus solely on a small fraction of what lies beneath (such as state support of traditional cultures) will ensure equality or magically fix the actual challenges of Indigenous peoples who have been structurally deprived of rights, power, privilege, voice, and the capacity to fight back.

Both western and Russian observers typically view the Arctic as a source of Russia's strength. In practice, it is more of the country's blind side. The Arctic is threatened on all fronts, from climate change to toxic contamination, plastic pollution, and extractive industries' projects. Moscow has cemented its Arctic future with oil and gas. Condemned to remain a mere raw material colony, whose greatest treasure is resources, not residents, what the Arctic needs now, in the absence of a powerful counterweight to state propaganda, is better protection and bold politicians.

## 5. TATIANA DEGAI: CLIMATE CHANGE AND INDIGENOUS COMMUNITIES IN KAMCHATKA

Climate change has been talked about for a long time, but in Kamchatka, there is not a lot of conversation or research. Kamchatka is a place that crosses borders with diverse global regions. From the physical science perspective, Kamchatka is surrounded by diverse air streams that bring different climates to different parts of the Peninsula. We have more rain, more precipitation, and more warmth on the Pacific coast. Then, there is the Sea of Okhotsk, known as the refrigerator of Kamchatka, which is one of the coldest seas. There is a colder climate and more tundra-like areas, and in the center of Kamchatka, there is a mountain range that protects the Pacific coast from the influence of the Sea of Okhotsk.

I invite you to travel with me to my homeland, the village of Kovran, where the Itelmen live. This is the place where my grandmother is from and where I lived and worked for some time. It's the place that made me who I am now. The village of Kovran is located on the shores of the Kovran River, a small community of about 250 people. The river is the core of our subsistence, where we fish for salmon and smelt. It flows into the Sea of Okhotsk. The sea freezes during winter, which is important for our salmon and smelt. Hunting has always been an important subsistence activity. It is also fun to go on the shore and talk to those little seals that are very curious and very friendly; they like to steal fish from the nets. We are a fishing community. At a spring ceremony for the opening of the river from the ice, we ask the river to provide us with fish throughout the fishing season. Smelt come first, indicating that the salmon will come into the river next. Then, we'll eat a lot of delicious food.

What does science tell us about climate change? From data developed by the Pacific Institute of Geography in Kamchatka, we see that the climate has changed. It is not as obvious in the community. However, we see in some areas less precipitation than usual, and more in other places. It's warmer, but in some localities, it's getting colder. We do see a lot of new invasive species, such as ticks, frogs, and strange plants that we have not seen before.

I asked the elders in the village: What does the change mean to them? With climate change, it becomes warmer every year. The temperature in summer sometimes exceeds 30°C. The plants grow even higher, and new birds have started to come. It becomes worrisome. You're waiting for a kind of danger, some kind of uncertainty about the future. And other friends from home also had this feeling of uncertainty and expectation of something unpredictable coming.

Sandpipers used to come and nest on our seashore, but we have not seen them for a while now. These have been culturally very significant birds for



the Itelmen people. We have legends about the sandpipers; they are associated with good times and community coming together. The spring starts when they come back, and that means the winter is over.

Serge, an elder of the village, said, “We are powerless. We can only watch and feel sad.” This is so true, with the climate changing and so many unknown things happening around the world. It creates a lot of sadness, uncertainty, and feelings of powerlessness. But it is also important to understand what we can do, how we can adapt, and how we can move forward as a community. While there are many ways to address this, I believe that the community is the strongest player in addressing these challenges. It’s about bringing the community members together, making decisions together, and understanding that climate change is happening. It’s important for us to address it as a community and understand that there are certain things we cannot control, but there are things we can adapt to and manage together.

## 6. EDUARD ZDOR: CLIMATE CHANGE AND INDIGENOUS COMMUNITIES IN CHUKOTKA

Sea ice is a key factor in cultural life in the Bering Strait region. This is due to the fact that sea ice determines the diet, lifestyle, and accompanying cultural practices of Indigenous coastal communities. The villagers have not seen multi-year ice for many years. Thick sea ice from the North in October no longer comes to the coast, as it did ten years ago. Currently, the sea gradually freezes over toward the end of December, and sometimes in January. Such sea ice breaks easily and melts even during the winter due to sea currents and winds; the remnants of the ice fields quickly move north with the end of winter. It is a different ice, a completely different habitat that local communities and wildlife are trying to adapt to. The changing ice has shifted the spring–autumn seasonal migration of marine mammals and even brought new species such as humpback whales and sea lions far north. As sea ice quickly breaks down or moves north, the winter distribution of marine mammals in the southern region lasts for a shorter time than Indigenous communities are used to.

The sea hunters of the southern part of the region – Saint Lawrence Island, the Chukotka settlements of Anadyr Bay – have a shorter hunting period and do not have time to provide the villages with traditional food. The situation is aggravated against the backdrop of expensive food in Alaska’s rural stores and the poor supply of grocery stores in Chukotka villages in the spring and early summer, since fresh store food is delivered only at the end of summer by ship. Due to limited sea hunting, village residents are forced to switch to fishing, plant gathering, hunting birds, and collecting eggs. This diet is significantly different from the traditional one and affects the local population. Due to the change in subsistence activity to a more female-oriented activity, I

can also speculate that this may influence community hierarchies and cultural practices. Women have been a significant source of cash income in Indigenous villages for decades due to government programs to support motherhood, childhood, and the elderly. In addition, the life expectancy of women is at least ten years longer than that of men.

The melting of sea ice, its early northward movement, and late ice formation have caused a shift in the migratory patterns of marine mammals. The Arctic coastal communities of Chukotka were forced to switch from traditional summer walrus hunting to whaling. While gray whales used to be only a source of additional food and were considered a delicacy, now they have become the main source of meat during the summer. Whale life celebrations have been reinstated in many coastal villages. Autumn walrus hunting has become more dangerous because there is no sea ice and storms pose a threat to the safety of sea hunters. During migrations, walrus gather in huge coastal rookeries, which creates new challenges that local communities must adapt to. Almost the entire walrus population is concentrated in one or two places, rather than evenly distributed along the coast. This distribution of walrus increases their vulnerability and deprives local communities of access to traditional food sources.

The lack of multi-year sea ice around Saint Lawrence Island in winter has meant that local residents are unable to hunt walruses and bowhead whales in the same numbers as before to meet their nutritional and cultural needs. The change in the ocean food chain has damaged local seabird colonies and deprived residents of a significant food source. Villagers are now forced to rely on caribou hunting, fishing, and store-bought food. Overall, these climate change events are changing local diets, seasonal and daily routines, and cultural traditions.

Due to the thawing of the permafrost, most coastal villages have lost their ice cellars. They were forced to turn to the authorities for help in purchasing 20- or 40-foot freezer containers. This partially solved the problem but still affected the traditional ways of preparing and storing food. These events contributed to the emergence of new trends in the Indigenous cultures. Traditional fermented foods have become “tastily rotten” for urbanite Indigenous residents, and the more adaptable among them have learned to cook whale meat almost “like a steak” (Yamin-Pasternak et al. 2014). These phenomena, caused by both global and climatic changes, are a clear indicator of a radical change in local cultures.

Today in Russia, it is no longer possible to use international leverage to draw attention to the challenges facing Indigenous Peoples. In years past, Indigenous activists from Chukotka have attended UN meetings such as the Permanent Forum on Indigenous Peoples, the International Whaling Commission, and the International Maritime Organization. In the last couple of years, the only way for Indigenous communities to prevent negative impacts on their land is

to write to the authorities protesting that foreign companies are affecting their territory. The resultant practice of using pseudopatriotism is very problematic. Indigenous Peoples no longer have the means to defend their identity. The Russian authorities have shut down all independent Indigenous non-governmental organizations (NGOs) and restricted the activities of environmental NGOs.

## 7. VICTORIA SHARAKHMATOVA: INDIGENIZING THE ECONOMY – ECONOMIC CHANGE AND INDIGENOUS COMMUNITIES' WELL-BEING IN KAMCHATKA

The growing global interest in Arctic natural resources has a significant impact on local economies. The Arctic economy is a unique phenomenon that includes Indigenous practices, local economic activities, and industrial development. Indigenous economies vary across the Arctic states and exhibit diverse economic mixtures. In globalizing societies and full market economies, traditional Indigenous economies are changing. They are often perceived by non-Indigenous people as a tribute to old customs rather than a way of life being followed by the younger generation. However, certain contemporary Indigenous populations in the Arctic continue to preserve their culture and way of life. The continuation of Indigenous ways of life is closely linked to the economic well-being, culture, and traditions of Indigenous communities (Gladun et al. 2021).

The entire territory of Kamchatka is designated as the place of traditional residence and traditional economic activity for the Indigenous peoples of the North. The areas of compact settlement of the numerically small Indigenous peoples of the North include the Koryak District, the Aleuts (Commander Islands), and the Bystrinsky District. Kamchatka is inhabited by Aleuts, Olutortsy, Itelmen, Kamchadals, Koryaks, Chukchi, Evenks, Siberian Yupiks, and representatives of other Indigenous peoples of the North.

The number of *rodovye obshchiny* has remained constant over the past decade, with approximately 300 *obshchiny*. The traditional economy of Indigenous peoples in Kamchatka is characterized by complex natural resource use, with fishing being the predominant activity. This economy can be classified as a mixed commodity–money economy.

In the past, reindeer herding was the primary source of income for the Indigenous peoples of the North. However, after the collapse of the Soviet Union, reindeer herds declined significantly. In the Koryak and Bystrinsky districts, where reindeer herding has traditionally been the primary activity of Indigenous peoples, only a few are currently involved in this practice. Most Indigenous families receive their income from paid employment, while other family members spend a significant amount of time engaged in subsistence

food production, such as fishing, hunting, gathering, and gardening. While subsistence food production comes primarily from salmon fishing, no family can rely solely on fishing to make a living.

Indigenous governance is channeled through *obshchinas* – voluntary Indigenous collectives created to pursue traditional subsistence activities and maintain Indigenous livelihoods. Through *obshchinas*, elements of Indigenous governance are incorporated at the local level. *Obshchiny* collectives are an institution that has no analogue anywhere else but Russia. According to the Civil Code of the Russian Federation, *obshchiny* are voluntary associations of citizens belonging to the small numbered Indigenous peoples of Russia (Gosudarstvennaya Duma 1994).<sup>1</sup> They are united on the basis of consanguinity and kinship (*rodovie obshchiny*) and/or territory (*territorialno-sosedskie obshchiny*) and are established to protect traditional livelihoods and to preserve and develop traditional lifestyles, traditional subsistence, handicrafts, and culture (Federal Law 104-FL 2000).<sup>2</sup>

According to the Ministry of Justice of Kamchatsky Krai, from 2010 to 2021, the number of *rodovye obshchiny* ranged from 298 to 348. Most *rodovye obshchiny* are registered in the Yelizovsky and Karaginsky municipal districts, and the Petropavlovsk-Kamchatsky municipal district. The main type of traditional economic activity in all municipal districts of the region is fishing. Fishing is also chosen by *rodovie obshchiny* to carry out entrepreneurial activities. The basis of the traditional way of life and traditional economic activities of the Indigenous peoples of Kamchatka are fishing, reindeer husbandry, hunting, sea mammal hunting, gathering, and processing of wild plants.

Reindeer husbandry is one of the main traditional activities of Kamchatka's Indigenous peoples. Reindeer husbandry is carried out on a vast territory in extreme natural and climatic conditions. The peculiarities of the climate, the remoteness of the supply bases, the limited accessibility and dispersion of the farms over a large area as well as the constantly increasing costs of fuel and energy resources, transportation, and feed have had a negative impact on the

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<sup>1</sup> Gosudarstvennaya Duma Rossiyskoy Federacii [State Duma of the Federal Assembly of the Russian Federation], 1994. (1994 g. N 51-FZ) [*The Civil Code of the Russian Federation (part one of November 30, 1994 N 51-FZ)*] *Grazhdanskiy Kodeks Rossiyskoy Federacii (chast' pervaya ot 30 noyabrya)*.

<sup>2</sup> Federal Law 104-FL. 2000. Ob obshchikh printsipakh organizatsii obshchin korennykh malochislennykh narodov Severa, Sibiri i Dal'nego Vostoka Rossiiskoi Federatsii (On General Principles on the Organization of Clan Communities among Indigenous Small-numbered Peoples of the North, Siberia and the Far East of the Russian Federation), dated July 20, 2000, No. 104-FZ. President of the Russian Federation, Moscow, <http://base.garant.ru/182356> (accessed April 2, 2024).

economy of the reindeer husbandry complex. Despite the stabilization of the economic situation in the region, reindeer husbandry remains unprofitable.

Salmon fishing is one of the largest sectors of Kamchatka's economy. The health, status, and availability of salmonids are at the core of the region's social and economic fabric. Almost every citizen of the region is involved in some aspect of the salmon industry. Sport fishing is an important cultural activity. Many residents, particularly members of Indigenous communities, depend on salmon for their subsistence, including nearly 13,000 members of the Itelmen, Koryak, Kamchadal, Aleut, and Even communities.

Throughout the existence of Indigenous peoples, hunting has been one of the leading components of the traditional economy. The sustainable use of natural resources and the transmission of knowledge from generation to generation have created a special culture of commercial hunting among Indigenous peoples. For them, hunting is not just an economic activity; it is a traditional way of life that has evolved over time.

Currently, marine mammals are slaughtered primarily for the needs of Indigenous people in the Aleutsky district. Small-scale individual aboriginal fisheries are conducted in the northern regions of Kamchatka. There are no official reports, but only a few seals of each species are harvested.

A significant economic problem limiting the exploitation of commercial resources of sea mammals is the lack of production capacity for full development of the total allowable catch, along with the lack of financial resources for the introduction of resource-saving technologies for processing and the expansion of the range of commercial products. Nevertheless, sea mammal harvesting has the potential to improve the socioeconomic situation of Indigenous peoples.

Sled dogs were important in the Indigenous economy. The dogs were used to transport cargo, hay, and firewood. A team usually consisted of five pairs; twelve to fourteen animals were harnessed for long journeys. In the national settlements, mushing was a common occupation. Now, the main direction of sled dog breeding is for sled dog tourism. There are about twenty kennels in Kamchatka.

Gathering includes processing valuable medicinal plants as well as harvesting timber and non-timber forest resources for their own needs. Practically all *rodovye obshchiny* engage in gathering wild herbs, such as mushrooms, berries, and medicinal herbs, for personal use or sale. Specifically, they harvest ramson, fern, honeysuckle, cowberry, and cloudberry.

The Indigenous Peoples of Kamchatka have a long-standing tradition of creating various household items, ethnographic and ritual items, arts and crafts made of reindeer fur, seal, walrus, leather, and beads. They also carve and engrave bone, walrus tusk, and wood in a traditional manner.

Among the key challenges for the traditional economic activities of the Indigenous Peoples of Kamchatka are: (1) imprecise laws and uncertain implementation, (2) lack of capacity among Indigenous *obshchiny*, and (3) limited access to resources.

## 8. SEAN ASIKŁUK TOPKOK: CLIMATE CHANGE AND INDIGENOUS COMMUNITIES IN ALASKA

If I'm going to go into a community, I encourage people, including myself, to learn their heritage through language. That helps build relationships with communities. It shows that you are investing in Indigenous co-production of knowledge. In Alaska, we have at least twenty-one unique cultural groups. I have been a Native educator since 1987. I have been in places throughout my career where there were hundreds of participants and I was the only Indigenous person. In this section, I want to share some things I have heard others talk about and some things I have seen personally.

Our Elders have been talking about climate change for decades. I am glad that we are now at a place where we involve more remote people in these meetings. It has been stated that we should involve Indigenous People even before applying for funding. We talk about utilizing all types of knowledge systems. There is the theory of Two-Eyed Seeing, bringing western and Indigenous knowledge systems together. There is co-production of knowledge, also acknowledging both knowledge systems equally and in an authentic manner.

I remember when I was growing up, playing on the frozen lake near Portage Glacier by the parking area. Now the glacier is rapidly disappearing, and you cannot even see the glacier from the parking area. You must take a charter plane to see Portage Glacier. It is evidence of dramatic climate change in the Arctic, even within my lifetime.

There are other communities who have observed a lot of rapid changes. There is the late Sadie Neakok, an Iñupiaq Elder from Utqiagvik, who spoke about sea ice on the shore year-round. Then she explained that the ice is no longer safe for travel due to climate change. Sadie Neakok said, "We used to store all our meat in this underground dugouts, what we call, 'Ice Cellars'. And we would bring in all the catch we wanted saved: fish, seal, whale meat – if whaling was prosperous. And we would store it in the cellar. And it would keep indefinite (Neakok, ND)."

Two students in high school conducted research near Kotzebue in 2010 and submitted their research to the statewide science fair. They looked at archived aerial photos of Silver Dollar Lake, witnessing the lake disappearing over time due to the permafrost melting underneath. Their poster was entered into an oceans conference alongside those of institutional researchers and graduate

students. The high school students' poster earned the grand prize (Dublin et al. 2014).

My family is from Teller, a community of about 200 people. Salmon is 80–90 percent of our diet. The taste of salmon is unique to the place where it is caught. Salmon from the Pacific Ocean tastes different to farmed salmon from the Atlantic Ocean. Ocean-caught salmon tastes different to salmon traveling in Interior Alaska. In the past few years, the Department of Fish and Game has limited subsistence fishing throughout Alaska, even going as far as cutting nets. Many communities depend on salmon as a main staple food throughout the year, including the winter. There continue to be debates with government agencies limiting Indigenous communities' subsistence fishing while allowing commercial fishing to continue to export Alaskan salmon.

A research project I recently learned about involves Robe Lake near Valdez, Alaska. In the past, this lake was cool in temperature, ideal for salmon to return to for several generations. Due to climate change, the lake started warming up, and new vegetation grew in abundance, cutting off some of the tributaries that the salmon utilized. Dredging and reducing the vegetation is now occurring in an attempt to make room for the salmon. But this is like treating a symptom rather than finding a cure. One of the things community members are suggesting is to reroute the nearby snow-capped mountain runoffs to cool the lake again.

## 9. VERA METCALF: INDIGENIZING ENVIRONMENTAL GOVERNANCE – CO-MANAGEMENT OF WALRUS IN ALASKA

I was born and raised in Savoonga on Saint Lawrence Island. I now live in Nome and have worked for the Eskimo Walrus Commission (EWC), a co-management organization, since 2002. My office is located at Kawerak, a regional nonprofit consortium representing about twenty-two tribes. Our Walrus Commission represents nineteen coastal communities, covering a large region. EWC has an agreement with the US Fish and Wildlife Service to manage the Pacific walrus population (Metcalf and Robards 2008).

I would like to begin my discussion of environmental change and community response by describing our relationship with our environment. The land and the waters of my home on Saint Lawrence Island have been the most wondrous, special, and sacred place on earth for thousands of years. My ancestors are right there on the island. The variety and quantity of natural resources sustain our lifestyle that continues today. Alaska Native people cannot be separated from our environment and natural resources. We are, and always have been, absolutely dependent on this intimate relationship with our environment and the gifts that are offered to us. To be grounded in this dependent

relationship is a cultural strength for us as we are with our land, the waters, and the air with the Pacific walrus, the bowhead and beluga whales, ice seals, migratory birds, sea birds, fish, and the greens, and so much more. I always say, if they are healthy, so are we.

Most now know that the environmental changes in the Arctic are significant and apparent. I speak from my experience in Indigenous resource management and food security that I've been involved in at the EWC. The most basic climate threat is warming air and water, which is decreasing the quantity and quality of sea ice. The traditional rhythms of our coastal communities are food security seasons. While spring normally determines a community's sense of food security, seasons are now dissolving and blending together, with hunter safety becoming an increasing concern for us. We are traveling farther with less sea ice, and with what seems like more disruptive weather. During our hunting trips, we are becoming more reliant on fall hunting when migrations south occur and the sea ice returns. Marine mammal hunting is a communal effort on Saint Lawrence Island, with families and clans combining resources and manpower to effectively, properly, and safely send boats, often for many hours and many miles, to harvest whales, walrus, seals, and seabirds.

In adapting to these changes, it is absolutely necessary that our Indigenous knowledge and our point of view are involved, especially at the local community level. Communities are adapting their harvest activities to changing conditions, while also using traditional management practices to protect terrestrial haulout sites from disturbances. They are advocating for and participating in the monitoring of our waters for pollution and harmful algal blooms. Today, walruses are hauling out in large numbers in Point Lay, which is one of our coastal member communities. The Pacific walrus is adapting to less sea ice by relying more on terrestrial haulouts. We are informing commercial airlines and marine traffic that comes up along the waterways that this haulout event is happening. The Native Village of Point Lay really takes an active stewardship role in protecting the walrus when they do haulout. We must support and allow walrus to adapt by protecting not only their haulout sites but their open water activities, which can involve tens of thousands of animals swimming and feeding. This makes walruses vulnerable to shipping and, of course, other human activities.

Arctic Indigenous communities are increasingly engaged in scientific research and environmental monitoring projects, which I also consider an adaptive strategy. For generations, we've been largely ignored in research. Some of you may not understand that. But we are now realizing that becoming active participants in research and governance is necessary for our communities to thrive. As the Inuit Circumpolar Council puts it: "Nothing about us without us."



I have experienced many frustrations, disagreements, and misunderstandings regarding the co-management relationship with our partner, the US Fish and Wildlife Service, during my more than twenty years of working with the EWC. I have always felt that unequal power and authority dynamics have prevented Alaskan Native communities from being seated at the table during hours of management and research discussions.

Recently, we were approached by the Fish and Wildlife Service with a long list of questions about the Pacific walrus and our relationship with the walrus to use in developing a harvest risk assessment computer model. It was a one-sided and extractive process, fairly typical of the usual way of doing business with us and the way scientific research in general has been conducted here in the Arctic.

There is a different approach that could offer much more successful results for the goals of Pacific walrus conservation and management. We recommended creating a new initiative that would involve Alaska Native communities and our Indigenous knowledge experts from the beginning in specifying the assumptions and questions that are necessary to consider in any modeling effort. We suggested that even the phrase “harvest risk assessment” negatively characterizes our protected, Indigenous right to harvest walrus for our food security. I was glad when the Fish and Wildlife Service, Alaska Region Marine Mammal Management Division accepted and provided funding for what is now called the walrus sustainability assessment model workshop. The workshop brought together six Indigenous experts from Saint Lawrence Island.

So, while co-management of marine mammals through marine mammal protection remains a work in progress, it does provide a way for Alaskan Native communities to influence policy. Besides the obvious work on walrus, the EWC also regularly comments on federal policy that impacts Alaskan Native communities. For example, the Fish and Wildlife Service is drafting an Alaskan Native relations policy that will direct how they should work with and incorporate the contributions of Alaskan Native communities, including Indigenous knowledge and points of view in their resource management planning. Although the final policy hasn’t been released yet, as of September 30, 2024 (US Fish and Wildlife Service 2022), we are expecting recommendations regarding the definition of Indigenous knowledge, how it goes beyond observations, and how Alaskan Native communities should be properly engaged. We suggest following the recommendations developed in the Inuit Circumpolar Council’s protocols for equitable and ethical engagement (*ICC Ethical and Equitable Engagement Synthesis Report*, Inuit Circumpolar Council Canada 2021).

The Arctic is our home, eternal and sacred to many of us. We aren’t going anywhere. We will continue to adapt. Indigenous knowledge reminds us that our health and well-being depend on the health and well-being of others living

with us – the whales, the walrus, the seals, fish, greens, and berries. If we don't treat them with proper respect and care, then we are not deserving of them, and we will suffer. I simply ask others to do the same and support our Arctic Indigenous communities.

## 10. LIZA MACK: INDIGENIZING GOVERNANCE AND DECISION-MAKING TO ADDRESS CLIMATE CHANGE AND COMMUNITY NEEDS

For my home community of King Cove, Alaska, fish is very important. Even though we fish commercially, we are still participating in the subsistence economy, and that has been the case for many years. That is unique, especially within Alaska, and particularly important given that we are dealing with so many issues with fisheries, which are rapidly changing.

One of the key questions is: What can we do to adapt? What are the main adaptation strategies that we have as Indigenous Peoples? From a political ecology perspective, we can look at Alaska and how many layers of government exist there. Alaska has various forms of land ownership, including Federal lands, State lands, Native Settlement Act lands, and private holdings. There are different language groups, business groups, tribes, Native corporations, and village corporations. All these institutions have multiple jurisdictions within Alaska and within communities. Under the Alaska Native Claims Settlement Act, a lot of land was transferred. However, with that there was also the creation of land ownership outside our communities, and no longer tribal. Along with the state, boroughs, and cities, there are now corporations, and there are also different levels of ownership in federal and state lands. The Indigenous Peoples have to be enrolled in a corporation in order to be part of the land ownership. That's something we have to deal with because our tribes do not own land unless it's been gifted to them or transferred by a corporation.

As an example, the King Cove community faces a major challenge related to the Isabelle Wildlife Refuge. The refuge was established in 1980, and the Indigenous Peoples can no longer access these lands. However, throughout the Arctic, we are still on Native land. There isn't an Arctic ecosystem that doesn't have Indigenous people. At the same time, some federal agencies, including the National Park Service, tend to romanticize nature, claiming that it is pristine, meaning that there has not been any human impact there. Our communities experienced that after the passage of the Alaska National Interest Lands Conservation Act (ANILCA) in 1980 and the establishment of the refuge, when the government banned all hunting in an area where Indigenous people had hunted for thousands of years. These are issues where we need to be involved, not only to illustrate the complexities but to engage our deep knowledge. Indigenous knowledge comes from being on the land. Through being on

the land, we are able to adapt and participate within our culture regardless of the government rules we are expected to accept.

Another big issue for Arctic Indigenous communities is infrastructure. When we talk about Arctic infrastructure, we need to change the dialogue regarding what we mean by infrastructure. We normally think of roads, airports, and buildings. But we need a paradigm shift in how we're approaching infrastructure. We also need to include components that are built to sustain Indigenous cultures and communities. The science used to manage infrastructure and make other decisions often does not incorporate hundreds of years of Indigenous knowledge to enhance understanding of the weather, fish migration, and the migration of the animals. Indigenous Peoples learn about all these things in order to bring home food. We need to understand all parts of this landscape in order to continue to be successful here.

The White House Office of Science and Technology Policy (OSTP) and Council of Environmental Quality (CEQ) (2022) recently issued a statement about the recognition and acceptance of Indigenous knowledge at the federal government level. The White House statement acknowledges the body of observations, oral and written knowledge, innovations, practices, and beliefs of tribes and Indigenous people derived from their interaction and experience with the environment. This statement allows federal agencies within the United States not only to acknowledge Indigenous knowledge but also to build on it and bring forward that knowledge to help in advocating for our people. This process is well-aligned with what was done in the Arctic Council to establish an international forum for engagement and important dialogue with multiple actors. Through Indigenous Permanent Participants, the Arctic Council has acknowledged the wisdom that the Indigenous peoples have and recognized its application to current issues.

In Alaska, the Denali Commission, an independent federal agency established by the US Congress in 1998 to provide utilities, infrastructure, and economic development throughout the state, supports building infrastructure in rural areas. Much of Alaska is not connected by roads. There are still places that don't have running water, and there are other needs as well. In the last couple of years, the Commission has had an influx of funding to focus on several areas. The main mission is economic development with an emphasis on critical infrastructure and workforce training.

The Commission has invested USD 1.4 billion in 230 Alaska communities over twenty years. The projects are needs based and complement, but do not duplicate, efforts that are already underway. The Commission also builds partnerships with state actors and local communities. Some projects are helping communities with designing subdivisions, mapping, and planning. The Denali Commission staff partners with communities to ensure that infrastructure development is done in a holistic way. The aim is to support community

goals for infrastructure improvement: roads, sewers, landfills, housing, and so forth in a way that makes sense to communities. The Commission provides an opportunity to address basic infrastructure needs and also ensures food security, access to medical care, and transportation. The investments are made to ensure that our community members throughout Alaska can access what they need.

The Village Infrastructure Protection program focuses on investments targeting technologies that can help communities stay in current locations rather than move. Community relocation is an important item in the Commission's portfolio. Many settlements are threatened by floods caused by the accelerating changing climate. One of the Commission's contributions is support for the revised statewide assessment of risk based on new data. It is being developed using scientific research and modern technologies. The Commission works with its partners to assess the utility of past iterations of such assessments, how people have been able to use them, and what they should look like in the future. This process is centered around the notion that infrastructure has meaning in a cultural context. It means being able to practice subsistence and practice culture, and to protect whales, seals, and ice cellars. It is also critical that we reflect on how infrastructure can be defined in a given place and across the Arctic.

The ability to respond to the impacts of climate change and infrastructure needs in Alaska's rural communities is embedded in Indigenous knowledge and language. Unless you actually have Indigenous knowledge and the language component that builds the story that connects you to your culture and your worldview, you will not succeed in addressing key challenges.

## 11. DISCUSSION AND CONCLUSION

This multi-authored chapter brings together diverse voices from Arctic communities to share key perspectives on challenges, impacts, and responses to climate and economic change in the context of well-being and governance. The voices provide testimonials regarding the three major challenges faced by Arctic communities: climate change, economic development, and well-being. However, more importantly, they emphasize community responses that make them resilient and adaptive to complex natural and social transformations. Indigenous communities themselves, with their knowledge, cultures, traditions, and capacities, serve as a source of resilience. The most effective way to capitalize on these capacities is to open the path for Indigenizing climate change response, governance, economy, and sustainable development to enable resilient futures.

Multi-level governance is an integral part of this resilience. It is realized through a multitude of relationships and interactions at the global, national,

regional, and local levels, with a core emphasis on realizing sovereignty through co-management, co-governance, and Indigenous self-determination. Co-management is multi-level and requires communication, advocacy, and ongoing dialogue with agencies. The Eskimo Walrus Commission is one regional example. Supranational bodies, such as the Inuit Circumpolar Council, are also connected to this work. Equitable engagement of Indigenous Peoples and Indigenous knowledges in multi-level climate change responses through knowledge co-production is a central pillar of sustainability. It is embedded in equity and reciprocity between knowledge systems, in thriving Indigenous languages, and vibrant Indigenous cultures. It is impossible without the recognition and respect for Indigenous self-determination, including the ability of Indigenous communities to define their own sustainable futures. Such a future could be attained through Indigenizing local economies, gaining political power, ensuring the vitality of Indigenous languages and cultures, and equitably engaging with western science and governance institutions across the global-to-local continuum.

The Arctic's strategic importance, due to its natural resources and shipping routes, has led to increased geopolitical competition among nations with interests in the region. Decisions related to sovereignty, security, and resource allocation may affect Indigenous communities. Traditional knowledge, culture, and practices may be influenced or displaced by omnipresent capitalist economies, westernized cultures and education, and foreign-instituted value systems. Indigenous communities must navigate economic fluctuations, geopolitical conflicts, culture wars, and social transformations. These processes can limit communities' resilience, particularly if coupled with restricted self-determination and sovereignty.

On the other hand, global connections can present opportunities for collaboration and partnership between Arctic Indigenous peoples and international entities. Fair trade, sustainable resource management, benefit sharing, and recognition of Indigenous self-determination can provide avenues for building a sustainable future in the Arctic that align with Indigenous peoples' aspirations and cultural values. After years of advocacy and resistance by communities, there has been an increased recognition of the rights and voices of Indigenous peoples in shaping decisions that affect their lands and livelihoods. Still, balancing the advantages of global engagement with continued cultural practices, traditional lifestyles, and environmental sustainability remains both a significant challenge and an opportunity made possible by Indigenizing governance.

## REFERENCES

- Berkes, Fikret. and Dyanna Jolly (2002) Adapting to Climate Change: Social-ecological Resilience in a Canadian Western Arctic Community. *Conservation Ecology*, 5(2): 18.
- Breton-Honeyman, Kaitlin, Henry P. Huntington, Mark Basterfield, Kiyo Campbell, Jason Dicker, Tom Gray, Alfred E.R. Jakobsen, Frankie Jean-Gagnon, David Lee, Rodd Laing, Lisa Loseto, Paul McCarney, John Noksana, Jr., Tommy Palliser, Lawrence Ruben, Clayton Tartak, Joseph Townley, and Eduard Zdor (2021) Beluga Whale Stewardship and Collaborative Research Practices among Indigenous Peoples in the Arctic. *Polar Research*, 40: (S1).
- Bronen, Robin, Denise Pollock, Jacquelyn Overbeck, DeAnne Stevens, Susan Natali, and Chris Maio (2020) Usteq: Integrating Indigenous Knowledge and Social and Physical Sciences to Coproduce Knowledge and Support Community-based Adaptation. *Polar Geography*, 43(2–3), 188–205, <https://doi.org/10.1080/1088937X.2019.1679271>.
- Curry, Dion (2018) Multi-level Governance in British Columbia: Local Perspectives on Shifting Relations and Structures. *BC Studies: The British Columbian Quarterly*, 198, Summer, 103–124.
- Degai, Tatiana S. and Andrey N. Petrov (2021) Rethinking Arctic Sustainable Development Agenda through Indigenizing UN Sustainable Development Goals. *International Journal of Sustainable Development & World Ecology*, 28(6), 518–523.
- Dublin, Robin, Marilyn Sigman, Andrea Anderson, Ray Barnhardt, and Sean A. Topkok (2014) COSEE-AK Ocean Science Fairs: A Science Fair Model that Grounds Student Projects in Both Western Science and Traditional Native Knowledge. *Journal of Geoscience Education*, 62(2), 166–176.
- Gladun, Elena, Soili Nystén-Haarala, and Svetlana Tulaeva (2021) Indigenous Economies in the Arctic: To Thrive or To Survive? *Elementa: Science of the Anthropocene*, 9(1), 00088.
- Graybill, Jessica K. and Andrey N. Petrov (2020) *Arctic Sustainability, Key Methodologies and Knowledge Domains*. London: Routledge.
- Huntington, Henry P., Alpina Begossi, Sherry F. Gearheard, Beth Kersey, Philip A. Loring, Tero Mustonen, Prakash K. Paudel, Renato A. Silvano, and Ron Vave (2017) How Small Communities Respond to Environmental Change: Patterns from Tropical to Polar Ecosystems. *Ecology and Society*, 22(3), 9.
- Huntington, Henry P., Julie Raymond-Yakoubian, Gerge Noongwook, Noah Naylor, Cyrus Harris, Qaiyaan Harcharek, and Billy Adams (2021) We Never Get Stuck. *Arctic*, 74(2), 113–126.
- ICC Ethical and Equitable Engagement Synthesis Report, Inuit Circumpolar Council Canada (2021, September 22), <https://www.inuitcircumpolar.com/project/icc-ethical-and-equitable-engagement-synthesis-report/>. Accessed on October 1, 2024.
- IPCC (2018) *Global Warming of 1.5°C – An IPCC Special Report on the Impacts of Global Warming of 1.5°C above Pre-industrial levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty*, <https://www.ipcc.ch/sr15/>. Accessed on October 1, 2024.
- Kimmel, Mara (2014) Fate Control and Human Rights: The Policies and Practices of Local Governance in America's Arctic. *Alaska Law Review*, 31, December 179–210.

- Koivurova, Timo, Else G. Broderstad, Dorothée Cambou, Dalee Dorrough, and Florian Stammer (2021) *Routledge Handbook of Indigenous Peoples in the Arctic*. New York, New York: Routledge Taylor & Francis.
- Krupa, Joel, Lindsay Galbraith, and Sarah Burch (2015) Participatory and Multi-level Governance: Applications to Aboriginal Renewable Energy Projects. *Local Environment*, 20(1), 81–101.
- Larsen, Joan N. and Andrey Petrov (2015) “Human Development in the New Arctic.” 133–146 In Evengård, Birgitta, Nyman Larsen, Joan, Paasche, Øyvind. (eds) *The New Arctic*. Cham, Switzerland: Springer International Publishing, [https://doi.org/10.1007/978-3-319-17602-4\\_10](https://doi.org/10.1007/978-3-319-17602-4_10).
- Latta, Alex (2018) Indigenous Rights and Multilevel Governance: Learning from the Northwest Territories Water Stewardship Strategy. *The International Indigenous Policy Journal*, 9(2): 4.
- Lezak, Stephen. and Genevieve Rock (2024) On Micropolitics: Climate adaptation and Indigenous governance in Western Alaska. *Climatic Change* 177, 135
- Metcalf, Vera and Martin Robards (2008) Sustaining a Healthy Human–Walrus Relationship in a Dynamic Environment: Challenges for Comanagement. *Ecological Applications*, 18(sp2), S148–S156.
- Moon, Twila A., Matthew L. Druckenmiller and Richard L. Thoman (2021) *NOAA Arctic Report Card 2021 Executive Summary*, <https://doi.org/10.25923/5S0F-5163>.
- Neakok, Sadie (ND) Background Essay: Sadie Neakok, Iñupiaq Elder. Alaska Native Knowledge Network. <http://ankn.uaf.edu/IARC/course/view.php?id=5>. Accessed October 1, 2024
- Nuttall, Mark (2018) “Self-determination and Indigenous Governance in the Arctic.” 67–80. In Nuttall, Mark, Christensen, Torben R. and Martin Siegert (eds) *The Routledge Handbook of the Polar Regions*. London, Routledge <https://www.taylorfrancis.com/reader/read-online/c1cfe05d-2410-4f8d-842f-b2b12545e356/chapter/pdf?context=ubx>.
- Overbeck, Jacquelyn R., Richard M. Buzard, Mark M. Turner, Katie Y. Miller, and Roberta J. Glenn (2020) *Shoreline Change at Alaska Coastal Communities* (RI 2020–10; p. RI 2020–10). Alaska Division of Geological & Geophysical Surveys, <https://doi.org/10.14509/30552>.
- Pahl, Julia and Brooks A. Kaiser (2018) “Arctic Port Development,” 139–184 in N. Vestergaard, B.A. Kaiser, L. Fernandez, and J. Nyman Larsen, eds., *Arctic Marine Resource Governance and Development*. Cham, Switzerland: Springer International Publishing, [https://link.springer.com/chapter/10.1007/978-3-319-67365-3\\_8](https://link.springer.com/chapter/10.1007/978-3-319-67365-3_8).
- Parlee, Brenda and Chris Furgal (2012) Well-being and Environmental Change in the Arctic: A Synthesis of Selected Research from Canada’s International Polar Year Program. *Climatic Change*, 115 13–34.
- Petrov, Andrey N., Shauna BurnSilver, F. Stuart Chapin III, Gail Fondahl, Jessica Graybill, Kathrin Keil, Annika E. Nilsson, Ruldoph Riedlsperger, and Peter Schweitzer (2016) Arctic Sustainability Research: Toward a New Agenda. *Polar Geography*, 39(3), 165–178.
- Parlee, B., Furgal, C. (2012) Well-being and environmental change in the arctic: a synthesis of selected research from Canada’s International Polar Year program. *Climatic Change* 115, 13–34, <https://doi.org/10.1007/s10584-012-0588-0>.
- Shadian, Jessica M. (2013) Of Whales and Oil: Inuit Resource Governance and the Arctic Council. *Polar Record*, 49(4), 392–405.

- Southcott, Chris, Frances Abele, David Natcher, and Brenda Parlee (2022) *Extractive Industry and the Sustainability of Canada's Arctic Communities*. Montreal, PG: McGill-Queen's University Press.
- Terenzi, John, Craig, R. Ely, and M. Torre Jorgenson (2014) Storm-Surge Flooding on the Yukon-Kuskokwim Delta, Alaska. *Arctic*, 67(3), 360–374.
- Thoman, R. (2022, September 19). “Typhoon Merbok, Fueled by Unusually Warm Pacific Ocean, Pounded Alaska’s Vulnerable Coastal Communities at a Critical Time. *The Conversation*, <http://theconversation.com/typhoon-merbok-fueled-by-unusually-warm-pacific-ocean-pounded-alaskas-vulnerable-coastal-communities-at-a-critical-time-190898>. Accessed on October 1, 2024.
- Tysiachniouk, Maria S., Laura A. Henry, Machiel Lamers, and Jan P.M. van Tatenhove (2018) Oil Extraction and Benefit Sharing in an Illiberal Context: The Nenets and Komi-Izhemtsi Indigenous Peoples in the Russian Arctic. *Society & Natural Resources*, 31(5), 556–579, <https://doi.org/10.1080/08941920.2017.1403666>.
- Tysiachniouk, Maria S., Laura A. Henry, Svetlana A. Tulaeva, and Leah S. Horowitz (2020) Who Benefits? How Interest-Convergence Shapes Benefit-sharing and Indigenous Rights to Sustainable Livelihoods in Russia. *Sustainability*, 12(21), 9025.
- US Fish and Wildlife Service (2021). USFWS Draft Alaska Native Relations Policy for Consultation. <https://www.fws.gov/media/usfws-draft-alaska-native-relations-policy-consultationpdf>. Accessed on October 1, 2024.
- The White House Office of Science and Technology Policy (OSTP) and Council of Environmental Quality (CEQ) (2022) Memorandum for Heads of Federal Departments and Agencies: Guidance for Federal Departments and Agencies on Indigenous Knowledge. [https://www.bia.gov/sites/default/files/dup/inline-files/ik\\_guidance\\_implementation\\_memo.pdf](https://www.bia.gov/sites/default/files/dup/inline-files/ik_guidance_implementation_memo.pdf) Accessed on September 30, 2024.
- Yamin-Pasternak, Sveta, Andrew Kliskey, Lilian Alessa, Igor Pasternak, and Peter Schweitzer (2014) The Rotten Renaissance in the Bering Strait: Loving, Loathing, and Washing the Smell of Foods with a (Re) Acquired Taste. *Current Anthropology*, 55(5), 619–646.
- York, Abigail M., Eduard Zdor, Shauna BurnSilver, Tatiana Degai, Maria Monakhova, Svetlana Isakova, Andrey N. Petrov, and Morgan Kempf (2022) Institutional Navigation of Oceans Governance: Lessons from Russia and the United States Indigenous Multi-level Whaling Governance in the Arctic. *Earth System Governance*, 14, December, 100154.
- Zellen, Barry S. (2020) “Multinational Corporations in the Arctic: From Colonial-era Chartered Companies to Contemporary Co-management and Collaborative Governance,” 157–173 in Coates, Ken S. and Carin Holroyd, eds., *The Palgrave Handbook of Arctic Policy and Politics*. Cham, Switzerland: Springer.