



Stakeholder Assessment

Prepared for the
Devising Seminar on Arctic Fisheries

Hosted by the
Program on Negotiation at Harvard Law School

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Introduction

The Program on Negotiation (PON) at Harvard Law School is an inter-university consortium working to improve the theory and practice of negotiation and dispute resolution around the world. Devising Seminars are one way in which PON offers a neutral forum to the stakeholders involved in a range of multiparty negotiations.

Our approach to Devising Seminars begins with off-the-record interviews with key stakeholders. Next, we prepare a Stakeholder Assessment that summarizes the points of agreement and disagreement that emerge from our interviews. Then, we invite representatives of each category of stakeholders to participate in informal problem-solving or idea-generating sessions. If these are successful, possible solutions to current conflicts can be identified. Finally, we prepare a short written summary of the “good ideas” that emerge from the facilitated conversation. This written summary is provided to everyone we interviewed as well as to seminar participants to use as they see fit. We also distribute more widely a short summary of the Devising Seminar discussions without mentioning the individuals who participated.

In the case of Arctic Fisheries, our research team interviewed 45 participants from 12 countries. Interviewees were asked about: (1) new risks to various Arctic fisheries posed by retreating sea ice; (2) strategies for protecting fish stocks; (3) gaps in scientific knowledge; (4) the possible need for new monitoring systems; (5) concerns of indigenous communities; (6) ways of reducing the impact of oil spills that might occur; and (7) the possible need for new treaties or new institutional arrangements. We have grouped interviewee responses into seven stakeholder categories: national governments; fishing industry; oil and gas industry; indigenous peoples and human rights advocates; multilateral institutions; environmental interests; and independent scientists. The national governments stakeholder category is discussed in terms of Arctic five countries (Russia, U.S., Canada, Norway and Denmark, through Greenland and the Faroe Islands) and non-Arctic five countries (Iceland, Finland, and Sweden), as interviewees often referred to states according to these distinctions. Although some of our respondents were women, we have used the pronoun “he” for all interviewees in an effort to maintain anonymity. To avoid confusion, we have used the terms “central Arctic” and “peripheral Arctic” throughout the document to distinguish different regions of the Arctic, as compared to “high Arctic,” “low Arctic,” or other distinctions. We understand these terms mean different things to different people, and we hope our use of these terms accurately captures the intended meaning of our interviewees.

The PON team that prepared this Stakeholder Assessment included Lawrence Susskind, Ford Professor of Urban and Environmental Planning at the Massachusetts Institute of Technology (MIT) and a co-founder of PON; Todd Schenk, a doctoral candidate at MIT; Danya Rumore, a doctoral candidate at MIT; Alexandros Sarris, a doctoral fellow at PON; and Anita Parlow, Esq., an independent consultant. Any errors in interpreting interviewee responses are unintentional and are the sole responsibility of the authors.

The results of our interviews are presented below as responses to the specific questions we asked. While, as expected, there are many different perspectives on issues relating to Arctic fisheries, there was much more agreement on a number of key points than we anticipated.

1. New Risks to Arctic Fisheries

Q1: What risks do you think the Arctic fisheries now face because of retreating sea ice? Over the next decade or two will increased navigation and pressure for energy development in the various Arctic seas pose new threats to the fisheries?

Summary

Interviewees from all seven stakeholder groups generally agree that there is no immediate pressure to develop commercial fisheries in the central Arctic. Many see the emergence of a new fishery in this area as quite possible in the medium to longer-term as conditions continue to change, although others are more skeptical. All interviewees said there is considerable uncertainty about fisheries and the marine ecosystem in the central Arctic, necessitating a great deal more research. Most are supportive of some type of interim management agreement until the viability of a commercial fishery becomes clearer. The peripheral Arctic seas (i.e., those at the southern edges of the Arctic Ocean, where there are already many developed fisheries and mature management regimes) are a different story; many people noted that they are seeing conditions change, including where stocks are located. This could increase tensions and challenge existing agreements. Opinions vary on how well these fisheries are managed and what the response should be to environmental changes. Some respondents noted that further challenges might emerge as climatic (and other) conditions change. In general, there is variation in the extent to which stakeholder groups see various pressures—such as climate change, oil and gas development, and increased navigation—as posing new risks to Arctic fisheries.

National Governments

Many people from multiple states emphasized the importance of being clear about what region you are referring to when talking about the “Arctic”: the central Arctic or the peripheral Arctic.

A number of people said that most fisheries in the developed portion of the peripheral Arctic seas are already well managed, both within national waters, and in international waters under existing management regimes. Interviewees agreed there is no evidence of a viable commercial fishery in the central Arctic right now and that viable fisheries may not exist in this region for decades.

There was general agreement among people from all states that there is considerable uncertainty about fish stocks and the dynamics of the larger ecosystems in the broader Arctic, as well as about possible changes underway and what the implications of these changes might be. Interviewees identified a number of potential risks to fisheries throughout the Arctic region, including: pressure from longer fishing seasons and new technology that allows for more expansive fishing activities; invasive species moving in with changing conditions; impacts from increased navigation; ocean acidification; impacts from pollutants of various kinds, which could be magnified by melting ice; and risks to subsistence fishing and the way of life of indigenous communities. Many people from across the states said that energy development and increased navigation could put substantial pressure on Arctic ecosystems, but they did not see direct competition or near term conflicts with Arctic fisheries. One state expressed strong concern about risks to Arctic fisheries resulting from retreating sea ice, oil and gas development, and other related pressures.

People from a number of both Arctic five (A5) and non-A5 states expressed a strong need for a much more complete scientific understanding of the ecological dynamics of the central Arctic so that fisheries can be managed sustainably if and when they become viable, minimizing the challenges associated with illegal, unreported, and unregulated (IUU) fishing. To this end, the A5 nations have been meeting at both scientific and management levels to coordinate research and devise a collective approach. They seem collectively committed to sustainable resource development and careful management should a commercial fishery become viable. Many believe that countries beyond the A5 need to be brought on board, and interviewees reported that this has begun to happen. Many expressed support for a de facto “moratorium” on fisheries in the central Arctic until more is known. Others expressed concern that this is too strong a position even though they support a generally precautionary approach.

Related to this, many people from the A5 countries mentioned that a new regional fisheries management organization (RFMO) might become necessary for the central Arctic. Such an RFMO, they said, may be required to regulate fishing in the area and coordinate research. Interviewees from at least one A5 nation indicated no commercial fisheries should be started in Arctic areas that are not regulated by an RFMO, and that the groundwork should be laid now for the formulation of such an organization. Other interviewees said that it is premature to establish an RFMO for the central Arctic, given the uncertainty regarding if and when fisheries in the region might become commercially viable.

Fishing Industry

One interviewee said he thinks that if new species or marine areas emerge, the main concern will be effective management of these resources. He feels the Arctic states have generally shown a high degree of professionalism in the management of fisheries, but that there have been problems when new fisheries emerged in the past. He thinks the lack of monitoring is a key risk. Another interviewee said he is concerned about possible impacts on the ecosystem and food chain resulting from fishing and other activities in the Arctic. He noted that little is known about the Arctic ecosystem, particularly the plankton at the bottom of the food chain, and that we do not have a good understanding of what the effects of climate change will be. Finally, he is concerned about the potential impact of sonar from submarines on the behavior of fish stocks.

Indigenous/Human Rights

Interviewees in this stakeholder category expressed concern about the potential impacts of changing fisheries, particularly northward migration of fish, on subsistence fishers and indigenous communities. One person said that commercial fishing hasn't impacted subsistence fishing thus far, but expressed concern that if warming continues and fisheries move north, there could be more of a conflict. He feels that protection and sustainability of the Arctic marine ecosystem and food chain are important and interlinked. He would like to see more indigenous involvement in fisheries management. Another interviewee said that indigenous communities have faced, and continue to face, profound challenges to their traditional ways of life.

Oil and Gas Industry

Interviewees indicated that it is important for the oil industry to operate safely and sustainably. One interviewee said that fish are moving northward into yet unexploited parts of the Arctic, and that industrial fisheries' growing presence on many Arctic shelves will affect the local fish species as they end up as by-catch. He thinks that the largest threat to fish stocks is fishing. Other

anthropogenic activities can create impacts, he said, but he thinks that most if not all of these risks can be managed to minimize impacts on important spawning and feeding areas. Another interviewee said the industry thinks in terms of “coexistence” with fisheries and marine ecosystems, but what this means in practice is constantly evolving. It remains to be seen whether there will be conflicts between increased fishing in the Arctic and the future development of the oil industry. He is confident in the oil industry’s ability to operate in a safe, environmentally responsible, and operationally efficient way in the Arctic. His organization considers compliance with regulatory requirements to be critical. He noted that, in the U.S., there is a mix of federal and state agencies designated to referee disputes between fishers and the oil industry. Additionally, he said, there is an ongoing dialogue among companies and resource users to ensure that any issues that arise are addressed, including direct negotiations with indigenous peoples over conflicts related to whaling. Although he believes the oil industry can operate effectively in the Arctic, he said it remains to be seen whether oil and gas exploration is successful enough to justify large investments in setting up permanent facilities in the Arctic.

Multilaterals

Interviewees said there are not currently any commercial fisheries in the central Arctic. They said that much of the central Arctic Ocean is fairly deep and fisheries are generally only viable in waters up to 1 km deep. Therefore, they noted, it is unclear whether retreating sea ice will really create many fishable areas. They also said that the current cost of fuel makes exploratory fishing for low-value species unviable, unless there are other things at play, like government subsidies. While it is unclear whether commercial fisheries will be viable in the central Arctic any time soon, they said that fisheries in sub-Arctic seas are changing due to a variety of drivers, including climatic change and overfishing. Interviewees said they see positive trends in some areas and negative trends in others. They are hesitant to say that trends like declining shrimp and increasing ground stocks are the result of climate change since there are multiple factors involved, such as changing water temperatures and salinity, which may or may not have to do with climate change.

One interviewee felt that interested states will want to exploit Arctic fisheries, oil and gas resources, and navigational resources as they open up. This could pose a variety of risks to fisheries. In addition, fisheries may be compromised by environmental changes or habitat disruption due to other activities such as oil and gas exploitation, which may increase the risk of overexploitation. He also said there is a risk that states will fail to agree on an appropriate management framework. His understanding of the science is that we still cannot fully explain all phenomena, so there might be other risks that are we are not able to predict. Another interviewee noted that fisheries tend to be highly contentious throughout the world. He feels that diplomats and policy makers tend to say that fisheries management regimes are in place and are working. But, the evidence suggests otherwise: the Norwegians and Russians seem to be doing a good job of management in their exclusive economic zones (EEZ), but overfishing is occurring throughout much of the rest of the world. He said that fisheries management organizations tend not to work—they rely on self-enforcement that cannot be depended upon. He thinks more effective enforcement mechanisms are needed. He advocates a precautionary approach to Arctic fisheries management and the recognition of the rights of indigenous communities in the Arctic. He feels there has been more sensitivity and respect for indigenous rights in Canada than in the United States. He also thinks that impacts of navigation and energy development will be more of an issue for marine mammals than for fish stocks. Another interviewee said that that there is

significant scientific uncertainty about whether and how fish stocks will move north, but that it is quite possible. He thinks it will be challenging for existing management regimes to keep up with climate change impacts and species migration. He noted that ocean acidification is another significant risk. The final interviewee in this category said that melting ice presents the following risks for Arctic fisheries: flow of fresh water into the CAO; flow of pollutants into the Russian Arctic; acidification, first in the cooler waters and then in the warmer waters; and the migration of the stocks toward to the poles due to warming water temperatures. He also thinks there could be impacts on indigenous people in terms of sustainability as well as challenges in terms of fairness or equity.

NGO/Environment

Interviewees agreed that, while it is not clear how much of a viable commercial fishery there is in the central Arctic, changing conditions present risks to existing Arctic fisheries and ecosystems. Additionally, they all said that the significant lack of knowledge about the region is problematic. Specific risks identified by interviewees included: general risk associated with warming waters and fisheries moving north into unmanaged waters; potential impacts on spawning grounds due to increased navigation and acoustic surveys for oil and gas exploration; risks associated with ocean acidification, which one interviewee in particular thinks should be more of a concern than it currently is; the threat of oil spills, which two interviewees said they are especially concerned about given the lack of tools for effectively cleaning up a spill in Arctic waters; and impacts associated with pollution from increased navigation. One interviewee said that while shipping seems to be developing slowly in the Arctic, he thinks this is an important issue, particularly in places like the Bering Strait where there is a confluence of migratory whales, a shipping bottleneck, and some of the world's worst weather. He said conflicts may eventually need to be managed by an international maritime organization (IMO), but expressed optimism that for now voluntary measures, such as regulations imposed by insurance companies on their customers, could be helpful. Regarding energy development, one interviewee indicated there is significant tension in Norway around the Svalbard Islands between fisheries and the oil and gas industry. He said there have also been conflicts in Russia, including in West Kamchatka.

Science

One interviewee said that the risks facing the Arctic are not yet known, and that it will take years to understand them. For example, he said, it is unclear whether it is possible for a sustainable fish population to establish itself in the central Arctic. This would require an underlying marine ecosystem, including the zooplankton that is at the base of the food chain. Another interviewee said that he thinks retreating ice could lead to commercial fishing in new areas, and that potential impacts on fish stocks and the ocean ecosystem must be considered. He believes that energy development could impact fisheries, and that fishing management should move in parallel with the exploration and exploitation of any natural resources in the Arctic, as they have elsewhere.

2. Protecting Fish Stocks

Q2: Are there fish stocks or locations in the Arctic that ought to be completely protected from commercial fishing? Permanently? Or, only while new management practices are put in place or more scientific research is undertaken?

If so, which are these? Why? How should such decisions be made and by whom?

Summary

All interviewees expressed support for the idea of protecting and taking a precautionary approach to Arctic fish stocks; however, exactly what this means, particularly with regard to the need for regulatory action, varied significantly within and across stakeholder groups. Many people—including those from most of the A5 states—support some sort of moratorium on fishing in the central Arctic until more research can be completed. Others, including some states, do not think that a moratorium on fishing is necessary until there is evidence that commercial fishing is viable in the central Arctic and/or serious problems begin to appear. Many people highlighted scientific uncertainty as the reason either for their support of some sort of moratorium or regulatory action to protect fisheries in the Arctic or for their belief that protections are not currently necessary. Among those who do support some sort of regulatory protection in the near term, most agreed that any moratorium or protective measures put in place should not be permanent. Rather, they should allow time for a deeper understanding of the Arctic environment and the changes underway to develop. Some people noted that particularly sensitive or ecologically important areas in the peripheral and central Arctic may require more permanent protection, as is already the case in other parts of the world with regard to marine-protected areas. Interviewees generally agreed that if and when new Arctic fisheries are identified, they should be effectively managed.

National Governments

Interviewees across states—and often within states—held differing views on whether and how to protect fisheries in the Arctic. One interviewee from an A5 nation said his country is participating in the negotiations over a temporary cessation of commercial fishing in the high seas of the central Arctic, but it remains to be seen what will come of these negotiations.

Two interviewees from another A5 country said there is currently no evidence or documentation of any fisheries problem in the Arctic. Therefore, in their view, there is no reason for a moratorium or any other form of protection for Arctic fisheries. They agreed that if a problem becomes evident, some form of protection might be needed, but opposed a moratorium at present. Another interviewee noted there are particularly sensitive areas, such as the sea ice edge and spawning grounds, where protective measures—but not necessarily a moratorium—should be put in place. All of these interviewees seemed to agree that existing management of sub-Arctic waters is relatively effective and that the near-term prospects of IUU fishing in the central Arctic are rather low. In terms of who should be coordinating scientific research, and how it should be vetted, one interviewee said he doesn't think this should be any different in the central Arctic than it is in oceans elsewhere: all interested countries should be involved, and there should be scientific organizations like the International Council for the Exploration of the Seas (ICES) and the North Pacific Marine Science Organization (PICES) that can coordinate and validate. The Arctic Council may be the most prominent organization in the Arctic, but it does not have purview over fisheries issues and many felt it should remain that way.

Interviewees from another A5 country generally expressed support for protection of fisheries in the Arctic. However, they disagreed on what this means. Several said there are not currently any fisheries in the Arctic that require protection. One person noted that the term “completely protected” is probably inappropriate, and that permanently protecting something might be an unreasonable or too strong an approach. However, he thinks that temporary protection measures might be necessary and he generally supports a precautionary approach to fisheries management in the Arctic until the marine ecosystem is better understood. Two interviewees said that fisheries in the Bering Sea should be and are protected, with one person saying that the Bering Strait is a good example of ecosystem-based management, surpassed perhaps by only the Barents Sea example. One person advocated for putting a moratorium in place to allow unimpeded data collection now, and leaving decisions about managing the central Arctic until later. This was supported by another interviewee, who said it would take at least 5-10 years to get enough data to understand Arctic habitats and ecosystems. Several people indicated that no commercial fishing should be allowed in the area until there is sufficient scientific understanding. In terms of how decisions about protection should be made and by whom, one interviewee said it will probably be necessary to generate an agreement that involves not only the A5 states but also other countries with interest in Arctic fisheries, such as the EU, Japan, Korea, and China. One interviewee said that existing research boards and national research services, universities, and other such bodies should be responsible for conducting research to inform Arctic fisheries decision-making.

One interviewee from another A5 nation said that sustainable commercial fisheries should be developed within countries’ EEZs, and that an RFMO is necessary to regulate beyond the EEZs. Such an RFMO, he thinks, should manage for all species and new RFMOs should be created for each new fishing area in the Arctic, whether as a single RFMO for the entire area, or as separate entities. He also thinks any new RFMO should be able to impose sanctions. A different interviewee from the same nation believes that fishing should not be allowed in new areas, and that there should be a complete ban on fishing in areas that emerge from ice in the coming years until reliable scientific data are available.

An interviewee from a non-A5 country said his country supports the precautionary principle as described in the Fish Stocks Agreement. He thinks there should be an absolute ban on fishing in the high seas of the central Arctic until relevant scientific data are collected and new management practices are developed. He thinks there should be no time limit on such a ban.

An interviewee from another non-A5 nation said marine protected areas should be established in areas where there are very valuable ecological systems. He said that, even if there are fish stocks in the Arctic, the bulk of these stocks will still be within EEZs; thus, decisions about fisheries protection are likely to be made by nation-states, given that UNCLOS and the Law of the Sea in general give states control over their EEZ. For highly migratory species going into the CAO, a straddling stocks convention to which all Arctic states are parties might make sense.

Fishing Industry

One interviewee said that he believes the fishing industry can develop responsibly, but that science should come first. He thinks that research needs to be directed at understanding Arctic fisheries and that, given the current underfunding of research, new financial support will be needed to enhance scientific understanding. Another industry interviewee said he does not think

there should be any sort of ban on fishing in the Arctic Ocean. However, he expressed concern about the potential impact of commercial fishing in the Arctic on red feed, a type of plankton that is integral to the ocean food chain. He worries that if there is commercial fishing of this species, it could disrupt the entire Arctic food chain. He also said he thinks the discussion on whaling should be opened up, as there are currently only two options for use of whales—either sell them to Japan or use them domestically within Norway. He believes there are a lot of whales and that the picture of whaling presented by conservation groups is not accurate.

Indigenous/Human Rights

One interviewee noted that the moratorium of the Northern Pacific Fisheries Group is in effect. He thinks it is appropriate to continue the moratorium. He noted that indigenous peoples need more information on fisheries. They are “behind the curve” with regard to the latest scientific information. He said that indigenous people in the Arctic want to be more informed about the science and more involved in fisheries management. Another interviewee said there are not currently any fish stocks or locations in the central Arctic that should be fully protected, but that indigenous communities in the Bering Strait do not support the development of a commercial fishery in the Strait.

Oil and Gas Industry

Interviewees expressed general support for protecting fishing stocks and ensuring the oil and gas industry coexists with fisheries and marine ecosystems. One said that additional scientific research is needed to determine if there are high north fish stocks that should be given protected status. It is important, he said, to distinguish between ground fish fisheries and pelagic fisheries, since they have different environmental impacts. One option would be to subdivide the UN FAO ocean areas so that “true Arctic species” receive protection from fisheries targeting boreal species, as their habitats expand northward. No other interviewees in this stakeholder category expressed an opinion about whether there should be permanent protection of any fisheries or locations in the Arctic, nor did they suggest specific approaches to fisheries management. One interviewee did note that, absent existing commercial fishing, his organization focuses on understanding sensitive marine and benthic habitats as well as marine shore habitats. These are the key considerations with respect to project location and timing.

Multilaterals

One interviewee said that he does not believe there should be any bans on fishing in the Arctic. Another interviewee said this topic is not his area of expertise, but that in light of the fact that fish stocks in the north Atlantic and elsewhere have suffered historically and continue to fluctuate, some stocks should probably be protected. Management decisions should be made by states that have jurisdiction over fishing in the Arctic or participate in fishing on the high seas. However, he said, states should draw on the advice of scientific bodies such as ICES when making these decisions, and decisions should be made in the context of FMOs and other multilateral forums. They should also be made in accordance with state obligations under treaties such as UNCLOS and the Straddling Fish Stocks Agreement. Another interviewee noted that every fish stock has its own ecosystem. He thinks that shifting ice patterns are changing everything in the Arctic. For example, he said, cod are very sensitive to temperature and thus are migrating due to melting ice. He thinks that the best management is being done by Russia. However, he said he is not certain whether this is due to their unique ecosystems or their unique management system. Still another interviewee in this stakeholder category said protections should be put in place, particularly until

Arctic ecosystems are better understood. He feels this is being pursued through the U.S. precautionary moratorium in the Beaufort Sea. He said it was obvious the A5 countries did not want to pursue a moratorium on fishing through the Arctic Council, probably to avoid the politics of the involved non-A5 countries. He said the Arctic Council has not really taken on fisheries in a major way. He noted that the moratorium in the Beaufort Sea was relatively easy to get support for since there was no developed commercial fishery there to push back.

NGO/Environment

One interviewee said that existing fleets, including those operating in the Barents Sea, are moving further northward, putting pressure on fisheries further north. Given how lucrative some fish species are, he is concerned that some fishers might be prepared to go into risky waters to get them. He thinks we need to prepare for southerly fish moving north due to climatic changes, and that protection ought to be put in place now before the Arctic seas are decimated like other areas in the world. He would like to see a moratorium on fishing in the central Arctic put in place until the science becomes clearer. He also thinks we need to think about putting in place longer-term management plans. Another interviewee noted that a complete long-term ban might not be necessary, but that essential habitats and sensitive areas (spawning areas, migration routes, etc.) have already been identified. While they need to be further understood, they should be protected now. He agreed that a moratorium on fishing in the central Arctic should be put in place until we have better data. However, he does not support a limitless moratorium, as has been proposed by some NGOs. Putting a moratorium in place forever, he said, would alienate fishermen, who have important roles to play in preventing oil and gas development in the Arctic, which they see as a larger threat. Another interviewee said his organization does not use the word “moratorium” because people do not like it. Instead, they use the phrase “an agreement to prevent the development of an unregulated fishery.”

Science

Two interviewees expressed general support for protecting compromised fisheries and valuable ecological systems. One said that a moratorium makes sense until we know more about what is going on under the ice, what is happening with fish stocks, and what changes are underway. The other argued that bans are rarely effective and complete protection may not be the best approach.

3. Gaps in Scientific Knowledge

Q3: Are there specific gaps in scientific knowledge about fisheries and marine ecosystems that need to be filled in order to protect the Arctic? If so, can you describe them?

Summary

Among people from all stakeholder groups, there was general agreement that significant scientific gaps exist. All groups agreed that much more research is needed to understand fisheries and marine ecosystems in the central Arctic, and they identified a number of specific research gaps that deserve attention. A couple interviewees from across stakeholder groups noted that many years of research will be needed to begin to understand the Arctic ecosystem and the changes underway, and that such an endeavor will be very expensive. Interviewees held mixed opinions about which organization should be in charge of coordinating Arctic research, but many agreed

that research will need to be better coordinated and that it is in the interest of Arctic states to support more research in the region.

National Governments

Among interviewees from all states, there was general agreement that there are major scientific gaps about Arctic fisheries and marine ecosystems, and that much more research is needed. Research on the central Arctic is currently being conducted by numerous agencies and organizations, with some ad hoc coordination under the A5 process. Interviewees were unsure of whether or not a dedicated scientific organization should be created to coordinate and vet science, or if an existing organization such as ICES should assume these responsibilities.

Interviewees from one A5 nation agreed that little is known about the central Arctic, and that much more research needs to be completed. These interviewees identified the following research gaps and concerns: the need for baseline data (i.e., what fish are in the region, how many, and what are their reproductive cycles are); the need to understand what the impacts of climate change are likely to be on the Arctic; the need to develop capacity to monitor ocean conditions, since current capacity is limited; and the need to standardize and improve monitoring domestically and internationally. Related to this, several interviewees noted that domestically and internationally there are many monitoring efforts underway. They are not well linked and they tend to be precarious, and limited in scope, depth, and duration.

Interviewees from another A5 nation said that basic stock assessments are needed in the central Arctic and international waters, and that we really have no idea what is under the ice. One interviewee from the same country said understanding the character of sea ice, its thickness, and its changing nature should be a top research priority. For example: if we are moving to longer seasonal warming and more open waters, how will this affect various components of the ecosystems, from phytoplankton to carnivores? He said there are lots of scientific gaps, not only in our understanding of fisheries, but also in our knowledge of mammals, birds, and other species, particularly in the context of climate change. Another interviewee reinforced the fact that we know very little about ecosystems in the areas outside of the 200-mile EEZs, saying the central Arctic has been very difficult to study for a number of reasons, including: some remote sensing tools are not able to penetrate the ice; it is an expensive place to send vessels; and it is very difficult to allocate ship time and other resources to studying an area in which there is very little activity and not likely to be much in the near future. Another interviewee said that, in the central Arctic, we need a better understanding of the toxicity of oil spills and their effects on Arctic cod and other lynchpin species. He noted that oil spills in the Arctic are very different from oil spills in warmer environments; the toxicity may persist longer and be more disruptive to ecosystems, even at relatively low levels of exposure. Additionally, he said that if an oil spill were to happen in Arctic conditions of more than 50 percent ice coverage, any response would have to wait until spring to be cleaned up. Hence, he feels that really understanding the risks and potential impacts of oil and gas development in the Arctic region is vital. With regard to who should coordinate research, one interviewee said that will likely be the responsibility of either be a new, freestanding scientific body created for this purpose, or of a combination of existing groups (such as ICES and PICES). He said that ICES and PICES have already had joint meetings to consider Arctic marine science, and that a broader diplomatic structure is being set up, in part because the EU and major Asian players must be included on an equal footing. The Arctic Council is not setup to

accomplish this. He thinks it would be desirable to have an entity apart from the Arctic Council, but that this entity should have some relationship to the Council.

Interviewees from another A5 country also said that more research is needed, and noted that this is both important and very costly. One of these interviewees believes it is in the interest of all Arctic states to contribute resources to a coordinated research effort and that all neighboring states should share responsibility for monitoring the environmental changes underway. Another interviewee said that effectively monitoring the central Arctic will be extremely expensive, and that it will be difficult to convince people to do this until there is a commercial fishery established in the area. He thinks research and science could be coordinated by ICES, or potentially through a cooperative program (along the lines of what was proposed at the Nuuk meeting). Finally, this same interviewee thinks that existing institutions can do the research required and manage the Arctic, and that new institutions are not needed.

Interviewees from another A5 state generally agreed that there is little knowledge about the areas covered with ice, that data for the central Arctic are sparse, and that much more intensive scientific research is required. One of these interviewees said that his country tried to use seismic research to find out what exists below the ice, but that this was not effective. He noted a significant amount of funding will be required to undertake the necessary research. Another interviewee from the same country said he believes that more data should be collected before any decisions are made about allowing fishing in new areas. Still another person thinks there should be a period of “scientific fishing” to collect data. He does not think the Arctic Council is the appropriate organization to oversee this.

An interviewee from another A5 country said he feels that much more research needs to be completed before we will understand how climate change is affecting fish movement. He said fisheries appear to be moving northward, and this raises questions about the sustainability of fish stocks.

An interviewee from a non-A5 country said that his understanding is that there is a lot of scientific uncertainty, and this is why the A5 nations want to establish a moratorium until they are able to collect more scientific data.

An interviewee from another non-A5 country said he thinks that collecting data to inform management is crucial, explaining that there is so little scientific data on the central Arctic because it is very difficult and expensive to access.

Fishing Industry

One interviewee said there are scientific gaps, but this is not his area of expertise. Another said he is concerned about the potential impacts of commercial fishing on red feed and the Arctic food chain. He thinks the best way to collect data is for scientists to go out with fishermen on fishing vessels to conduct field research. He thinks the results are better when there is cooperation between industry and scientists.

Indigenous/Human Rights

One interviewee said that there are a number of gaps in our knowledge of the Arctic, particularly in our understanding of ice movement. He suggests that changes in the ice are quite dramatic.

Additionally, he believes that more research and data are needed on the interactions between commercial fisheries and subsistence fishing. Related to this, he feels that more anecdotal evidence of the implication for coastal subsistence fisheries is needed, noting that subsistence fisheries are managed differently from commercial fisheries. Broadly, he believes that the delivery of science and research information to indigenous communities needs to be significantly improved. Another interviewee said that the Inuit Circumpolar Council-Alaska has a large food security project underway that is identifying gaps in science that would support Inuit food security—this will identify research gaps from an Inuit perspective. He said there have been huge fish wars in Alaska, with a main source of tension being how to count fish. Given that the state and federal government are not counting fish in the rivers, he thinks these conflicts are, at their core, battles caused by inadequate data.

Oil and Gas Industry

One interviewee said that scientific gaps do exist. In particular, he said the Arctic continental shelves and deep ocean areas need more research. There is a need for temporal and spatial data to enable trend analyses. He also said that it is important to identify where the key spawning areas are, the duration of different life stages of species, and the probability of survival for each life stage. The other interviewees in this stakeholder category did not speak to gaps in science related to fisheries or marine habitats in the Arctic. However, one said that—from the oil and gas industry’s perspective—more engineering studies are needed. He also said that questions remain about whether oil and gas resources in the Arctic are sufficient to merit major investments in extraction infrastructure and how infrastructure might be designed to avoid destruction by moving ice.

Multilaterals

One interviewee did not provide a response. Two interviewees said there is little or no knowledge about the marine ecosystems in the central Arctic, and it will take a number of years to begin to understand these systems, because the research is more or less starting from scratch. This is particularly true because there has not been any commercial fishing in the area. These interviewees noted that ICES can contract out for whatever research is required, and that there is fairly good cooperation between organizations involved in Arctic fisheries. Another said that we do not know what climate change is doing to the migration of fish stocks, and that is a source of controversy. He said there is some evidence that shrimp and halibut are moving farther north, but also some counterarguments that they are not (because there is nothing for them to feed on). He also said that one of the core issues the Arctic Council has been struggling with is the amount of emphasis that should be put on western science vs. traditional knowledge. From a Canadian perspective, traditional knowledge is knowledge, he said. He feels that at the Arctic Council, indigenous groups are given real rights to participate, their voices are heard, and they are able to influence the process. While he thinks some people write this off as “political correctness,” he believes that scientists value the knowledge indigenous people bring. He indicated that there is some tension between environmental groups and indigenous knowledge, saying indigenous people do not feel environmentalists understand their way of life, but overall, he seemed to think indigenous knowledge is generally well respected within the Council and its partner organizations. In terms of who should do research, this interviewee believes it will be driven in part by national bodies, such as NOAA in the U.S., and will require some combination of individual countries doing research along with countries collaborating with each other. The collaboration around the International Polar Year was a good model of how this kind of research

collaboration can work. He questioned whether “pure science” will be overridden by economics, saying that the goal of a moratorium is to cut off debate before a fight erupts over economics. He believes that when the Chinese, Japanese, Koreans, and other countries get involved in Arctic fisheries management discussions, things are going to become very challenging. Another interviewee said that the biggest gap in our knowledge of the Arctic is in our knowledge of the central Arctic, pointing out that the A5 countries have produced a statement calling for more research to study the CAO. He said that studying this area is challenging and costly given that, even when there is melting ice, the central Arctic is not completely ice-free. He also said there is a lot of uncertainty around areas outside of the central Arctic; for example, very little is known about the Beaufort Sea. Another interviewee emphasized the importance of taking an ecosystem approach to research and management.

NGO/Environment

All interviewees in this stakeholder group generally agreed that there are many gaps in the science of the Arctic; that we need to understand the dynamics of particular fish species and whether there will be any fish stocks in areas that emerge due to ice melt; and that we need to understand potential threats to the fisheries. They also said we need to get a better understanding of the entire Arctic food web, interdependencies within the food web, and how things are likely to change due to climate change. Related to this, one interviewee expressed concern that the invasion, introduction, and migration of species caused by changing conditions could affect the food web, saying this should be studied. Another said it is important to think about whether we should look at these scientific gaps just as fisheries gaps, or also as ecosystem gaps. He said the Arctic ecosystem is literally restructuring itself, and it is a lot to ask of science to understand this. He feels that fisheries scientists do not want to talk about anything other than stock assessments. This is too limited in his view, although he recognizes that taking a more comprehensive approach to understanding the Arctic will be very expensive and hard to do. So, at this point, he feels we should focus on defining the gaps at a very general level and using any agreement as an impetus to doing a lot of joint research. In terms of who should do the research, one interviewee indicated that countries tend to focus on their EEZs, and said we need to be mindful that ecosystems span beyond these zones. Therefore, he feels the Arctic Council could be more active in facilitating cooperation leading to a more complete understanding of the relevant ecosystems. He also mentioned that, in his country, fisheries scientists and scientists working on other species/ecosystems tend to not talk to each other. Cross-disciplinary collaboration is needed, and his organization is working to foster it.

Science

One interviewee did not respond to this question. One said there are many research gaps surrounding the Arctic zooplankton community, such as how much the planktons eat, where they reproduce, and how climate change will affect them and the food chain. He noted that there are significant differences among established fisheries, such as those in the Bering and Barents Seas, and that it is important to investigate the physical environments of fisheries and how they function under different conditions. He also noted that there is significant speculation about how zooplankton and fish transported into new areas, such as from the Bering Sea to the Chukchi Sea, function and reproduce, if at all. Another interviewee said there are huge gaps in our knowledge of marine ecosystems, both in the quality of the scientific data available and the governance activities required. He believes that an ecosystem approach should be central to the management of Arctic fisheries.

4. Need for New Monitoring Systems

Q4: What new monitoring systems might be put in place in the Arctic to detect ecosystem and socio-ecological changes at the earliest possible time? Who should coordinate such monitoring activities, if you think they are important?

Summary

As with science and research in general, people across stakeholder groups agreed that better monitoring of the Arctic is needed. Many people mentioned countries and organizations currently monitor parts of the Arctic region, but said these efforts are not well coordinated or connected. A number of people across stakeholder groups think that monitoring could be greatly improved if there were better collaboration among different stakeholders (including states, industry, and indigenous peoples). Many people from different stakeholder groups agreed that better use of satellite technology could improve monitoring.

National Governments

Interviewees from all states generally agreed that more monitoring is needed. Even within EEZs, monitoring is often not comprehensive, although some countries, like Russia and the United States, have more extensive systems than others; the extensiveness is, in part, a product of how developed their respective economic zones are.

An interviewee from an A5 country said that satellite systems are commonly used by the European Union and other states for Arctic monitoring. He said that the vessel monitoring system (VMS) is the most reliable system at this time. According to this interviewee, RFMOs do not allow scientists to access data due to reasons of confidentiality; the RFMOs, he said, worry that scientists may leak data to people operating illegally. He believes that industry should contribute to monitoring efforts, for example, by bringing scientists on board fishing vessels. He does not think that the fishing industry currently provides reliable monitoring data. He suggested that states should impose a new fee for every new fishing area that becomes accessible to help pay for monitoring. Another interviewee from this country said that satellite systems should be used more often and more efficiently. He thinks there should be a period of five years of test fishing before total allowable catches are set for new species, and that there should be more funding of scientific research both by government and industry. In addition, he noted that Arctic Monitoring and Assessment Program (AMAP), a working group of the Arctic Council, does scientific research on living and non-living resources but that it does not have a mandate to coordinate governmental authorities. Another interviewee from the same country said new monitoring systems are required not only for fisheries but also for oil and gas exploration and mining.

One interviewee from another A5 country said that, apart from Norway, Russia and maybe Iceland, none of the Arctic countries are equipped to carry out their commitments under existing search and rescue services agreements. For example, the U.S. and Canada only have icebreakers in the region in the summer. He said there are some good examples of cooperation in seabed mapping and that, in the lead up to UNCLOS, there was amazing cooperation, such as the shared use of Russian vessels. He expressed some concern that tension around Ukraine could compromise the potential for this kind of monitoring and research cooperation at present. Another interviewee said that the question is whether it is possible to achieve greater

coordination and greater action on monitoring at no additional costs. In terms of what kind of monitoring should be done, he thinks the best approach is to start with a proactive plan, and then prioritize among monitoring needs and attract resources to achieve those needs. For example, he said, if we are going to open up a certain part of the Beaufort for resource extraction, we should ask “What do we need to know first?” In that instance, doing a study to get a consistent snapshot over several years would be helpful. This would provide a common interdisciplinary understanding of the region that would inform better decisions about where to explore and where not to explore. Another interviewee said he thinks the focus should be on doing very “straightforward, good oceanography” and letting the ocean “tell us when the conditions are changing and what we might expect.” Then, he thinks, we should locate comprehensive research technology in a few places to provide high-quality understanding that can then be applied elsewhere. He said that the sociological side of monitoring is often not talked about, but is important. Canada, he said, has a well-developed series of wildlife management boards with indigenous representatives and a co-management process. These boards are the first line in understanding ecological change. One interviewee from this A5 country noted the A5 have a vested interest in taking the lead on research and monitoring. Others said they believe innovative approaches will be needed to address the significant monitoring needs and knowledge gaps; they suggested collaboration involving a wider range of stakeholders, such as the fishing industry, NGOs, and many more countries. One respondent noted the need to ensure incorporation of indigenous and traditional knowledge.

One interviewee from another A5 country said there appears to be a hodgepodge of disjointed monitoring efforts going on in the Arctic. He believes that a central Arctic agency that can better coordinate the disparate initiatives going on is needed. He did not have a prescription for a specific coordination or monitoring system, but he does feel strongly that efforts need to be synchronized. Another interviewee noted that monitoring is important, but emphasized how expensive it is. Another interviewee emphasized the importance of good monitoring in the Arctic, as well as the need to coordinate monitoring efforts. There is an international program called Sustaining Arctic Observing Networks (SAON) supported diplomatically and politically by the Arctic Council to coordinate the international research community. He said it has had a hard time getting going, but that the organization is trying to harness scientific expertise from all of the states (Arctic and otherwise) that monitor the Arctic. The question, he said, is how to pull all of the available money together. He thinks that coordination is critical but complicated given the various entities and the politics involved. He believes that states beyond the A5 need to be involved in monitoring and funding monitoring efforts, since the A5 do not own the central Arctic. In terms of how monitoring should be done, he said that satellites can play a big role in Arctic monitoring, particularly if we effectively integrate this data with other sources. One interviewee emphasized that monitoring needs to be broad in scope: the impacts of oil and gas seismic activity as well as shipping and the military activity need to be monitored. He also said ocean acidification needs to be monitored, noting that oil and gas companies can partner with communities in monitoring efforts.

One interviewee from a non-A5 country said that, currently, monitoring is done by the A5 states. His view is that it is difficult to say at what point monitoring should involve other states because there are currently no fisheries in the high seas of the Arctic Ocean.

Fishing Industry

One interviewee thinks that many existing fisheries management systems involve strong cooperation. He said the Alaska fisheries industry puts two scientists on every fishing vessel. These scientists, who are paid for by the operator, collect fisheries data. He thinks this is a good model for monitoring and data collection. Another interviewee believes that most seas need better monitoring, in part to inform efficient responses to threats. He thinks there should be cooperation with oil monitoring systems and sees potential for better use of satellite technology for monitoring purposes.

Indigenous/Human Rights

One interviewee said better monitoring is needed, including monitoring of catch, such as whether porpoises are being released when caught or not. However, he does not know how this is going to happen. Another interviewee said he believes that marine mammal hunters and indigenous people have kept data on how the ice has changed over time and should be key players in Arctic monitoring.

Oil and Gas Industry

One interviewee said that some key species—such as polar cod and some mollusks—can be used as sentinel species for monitoring ecosystem health. He also said that satellite imagery and remote sensing technologies can be used to monitor a range of physical, chemical, and biological oceanographic parameters as proxies for overall ecosystem health. In this respondent's view, responsibility for monitoring activities should remain with the Arctic nations, and cross-border issues should be negotiated by affected nations. The other interviewees did not provide a response to this question.

Multilaterals

Interviewees said that a fairly regular research and monitoring approach to fisheries is needed to understand changes at the ecosystem level, and that this kind of sustained research is not happening in the Arctic right now. Research needs to be done in each area on a yearly basis to produce consistent time series data. In the Arctic, they said, it is unclear how integrated and coordinated the limited scientific work is at the international level. They noted that some countries are probably doing more or less, but there is little coordination. One interviewee said he does not know much about monitoring in the Arctic, but his understanding is that there are many gaps in our knowledge and in monitoring efforts. Another said he believes it is important to monitor a number of areas to detect ecosystem changes and socio-ecological changes. He believes there is a high potential for collaboration among organizations like the Arctic Monitoring Observatory to get and share information. The more cooperation in monitoring, the better, he said. Another interviewee noted that there are existing agreements, such as the bilateral agreement between Norway and Russia. He feels that it will probably be left to each country to make sure that principles are being met in their own waters. In terms of the central Arctic, he said it is not clear how to proceed. One option, he thought, could be to set up a RFMO, or perhaps even more than one given the different fisheries involved. When asked who can be trusted and looked to for data, this interviewee said that there are numerous organizations, such as the Arctic Science Working Group, Conservation of Arctic Flora and Fauna, and the Arctic Council Task Force on Scientific Cooperation. But he thinks the question of how data and monitoring should be coordinated is “a moving target.” He mentioned that scientists in different countries say different things: some are more optimistic while others are

pessimistic about the potential for a fishery in the central Arctic anytime soon. When asked whether the scientists providing data are generally trusted, he said yes and no. Trust is generally not a problem when it comes to what we do and do not know about Arctic fisheries. It is more of a problem when allocating quotas. In these instances, there is a lot of debate around how good projections are. He thinks that climate science is also a source of political tension. He thinks the A5 need some sort of an agreement around the sharing of scientific information. There are many scientific “loose ends” and no one has started to coordinate research and monitoring. A final interviewee said the A5 are conducting monitoring by themselves and they should consider greater cooperation with ICES.

NGO/Environment

All interviewees said that better monitoring is needed and that there are major information gaps that must be filled. One said his organization is working to protect areas in the Arctic so we can increase our understanding of the region and its ecosystems. He thinks that the Antarctic treaty is reasonably strong because it creates space for research to be done and for research to influence decisions. Another interviewee said a fishing vessel monitoring system exists throughout Arctic zones, but there are reporting problems that need to be addressed. He also said Arctic law needs to be coordinated to control “pirate” and “flag of convenience” fisheries. This will have to be addressed in terms of monitoring, he thinks. Another interviewee agreed that more research and monitoring are important. He indicated that this could be done either by a new research group or one like AMAP. He noted that whatever science organization gets picked or created, it cannot avoid being political, although he thinks there is an opportunity to focus on the science for now and to keep politics out as much as possible.

Science

All interviewees indicated that more systematic data collection is important. One interviewee said that monitoring, data collection, and coordination among the states and the Industry should be a key focus.

5. Concerns of Indigenous Communities

Q5: Which fisheries protection issues are most important from the standpoint of indigenous communities in the Arctic? Should indigenous knowledge be incorporated into early warning systems, i.e., such as efforts to monitor changes in sea ice?

Summary

People from all stakeholder groups expressed respect for indigenous peoples’ rights and their unique knowledge. There was variation among stakeholder groups—and to some extent within stakeholder groups—regarding the extent to which indigenous knowledge can contribute to Arctic fisheries management. There was also disagreement about the role indigenous peoples should play in Arctic decision-making. People within most stakeholder groups said that indigenous knowledge can help inform and enhance western scientific knowledge. Many people think that indigenous communities should have a central role in monitoring the Arctic. However, a number of people from different groups said there are limitations to indigenous knowledge, that the usefulness of traditional knowledge is changing as the climate changes, and that indigenous people do not have knowledge of the central Arctic, given that it is far beyond their historical

lands. Interviewees from the fishing industry in particular were skeptical that indigenous knowledge could contribute to Arctic fisheries management, particularly regarding commercial fishing. Many people expressed support for meaningful inclusion of indigenous people in Arctic decision-making, but there was disagreement regarding how much say they should have and in which forums.

National Governments

Most interviewees across states indicated that indigenous interests are important and that indigenous knowledge can be useful. However, responses varied within and among states.

One interviewee from an A5 state said that indigenous knowledge is very important. He thinks that Greenland does the best at incorporating indigenous knowledge into national policy. Another interviewee from the same state said that indigenous knowledge can be helpful and should be used, but that people should also be aware of the limitations of this kind of knowledge. Indigenous people have cooperated with scientists, he said, but local people tend to lack the wider perspective that science brings, and this can create conflicts. Another person from the same state does not think indigenous people have anything to do with Arctic fisheries, as they are not involved with commercial fishing.

An interviewee from another A5 state said that coastal communities and non-commercial fisheries are part of the Arctic equation and need to be considered in fisheries discussions. He said that it is possible that indigenous knowledge could improve understanding of how to manage fisheries and ecosystems.

Interviewees from another A5 state held somewhat differing perspectives on the topic of indigenous peoples and indigenous knowledge. One interviewee noted that people living in the Arctic live there all year long and thus see things that others—such as seasonal researchers—do not. For example, he said, the discovery of Pacific salmon in the Beaufort was by indigenous peoples. However, he said, with global change, traditional knowledge is becoming less reliable. Nevertheless, he thinks that indigenous communities are still very helpful observers in the Arctic. He said the Arctic Council is generally good at incorporating indigenous perspectives, but that it can be hard to have a fruitful dialogue between indigenous people and scientists. One interviewee thinks there is a capacity concern that needs to be addressed by the Council: indigenous groups do not have the money, resources, and training to engage in Council forums. Another interviewee expressed some concern about indigenous knowledge and management capabilities, giving the example of depleted fishing stocks in British Columbia, Canada. In British Columbia, he said indigenous people have been claiming rights not only over subsistence fisheries, but also commercial rights, and indigenous fisheries are very low now, because the stocks have been depleted. Another interviewee from this same country said he thinks that western-based scientific knowledge is increasingly being informed by indigenous knowledge. He also noted that, while valuable, indigenous knowledge is not keeping up with emerging issues like climate change. In his country, he said, indigenous voices hold equal sway in discussions around species protection.

One interviewee from a different A5 state feels that indigenous knowledge should definitely be incorporated into decision-making and early warning systems. He believes there are technical reasons to draw on this knowledge, as well as political reasons to engage indigenous people in

discussions of resource use in the Arctic. He thinks that indigenous knowledge is particularly helpful for ecological understanding, such as observations around behavior, responses to different conditions, and general ecology. He also thinks it is very important in monitoring. However, he thinks it is less valuable in evaluating abundance and determining sustainable quotas. Trying to bring indigenous knowledge in after data have already been collected and analyzed is not effective. Instead, he suggests that scientists should ask “what is it about this question that this kind of knowledge and understanding might be really powerful in answering?” and then go out and seek indigenous input when designing research and trying to answer questions. He gave the example of studying narwhales—scientists needed to know what they should see when flying over fjords half covered in ice: narwhales on the ice, in open water, or underwater? He believes that indigenous knowledge can help answer questions like this and inform good research by contributing a deeper understanding of ecological relationships. His country is working hard to include indigenous people in decision making, including the A5 process, and to ensure their knowledge and information does get incorporated. Like others, he noted it is important to recognize both the contributions and limitations of indigenous knowledge. He does not believe there is traditional knowledge about the central Arctic. Another interviewee from the same A5 country noted that indigenous communities are calling for a place at the table, and are often there now. They are very in tune with the links between each component of the ecosystem. They want to be sure that they are part of the process and make sure that their livelihoods and the ecosystems they depend upon are protected.

An interviewee from another A5 country said that indigenous people have depended on the Arctic Ocean for centuries and that advanced technologies and development—such as shipping, oil and gas exploitation, and tourism—impact their local fishing and hunting practices. This, he said, is why indigenous people and their organizations should be part of negotiations whenever issues of resource use in the region are discussed. He thinks that, in many respects, indigenous people have higher status and greater participation in the Council than permanent observer states. However, he noted, indigenous people would like to have even more say than they do. Another interviewee shared a slightly different perspective, saying there are no questions of indigenous peoples’ rights when talking about the management of fisheries in the higher Arctic since indigenous people are not present in these places. His organization does not use indigenous knowledge when making decisions about stocks, allocations, and quotas; they rely solely on modern science. However, they do draw on indigenous knowledge when it comes to questions of how to regulate, such as establishing net sizes. Another interviewee from the same A5 country agreed that indigenous knowledge should be incorporated into management monitoring at the local level and on the coasts, but not in the central Arctic or at a larger scale, where local knowledge is not as relevant. He thinks that “traditional” knowledge is a more appropriate term, since long established fishing communities also have important local knowledge to contribute, such as knowing where fish spawning grounds are.

One person from a non-A5 state said he believes indigenous populations should have some sort of participation in Arctic governance. He does not think, however, that their standing should be equal to states since their interests can be represented by their home nations. Moreover, he believes that since they don’t conduct fishing in the high seas, their knowledge will not be as important for questions about the central Arctic.

An interviewee from another non-A5 state said he thinks that indigenous knowledge is important and that the rights of indigenous people have been addressed in international and domestic law. Issues of indigenous rights are generally dealt with at the nation-state level and indigenous people have to be very strategic in advocating for their interests. He believes they do not find much support in the world of the law of the sea, but that they have had some successes in the world of international human rights.

Fishing Industry

One interviewee said he thinks it is important to protect indigenous interests and that their well-being has to be considered. None of the interviewees in this stakeholder category believes that indigenous knowledge can contribute much to Arctic fisheries management, particularly as regards commercial fishing.

Indigenous/Human Rights

Interviewees expressed strong support for using indigenous knowledge in making management decisions. One feels that indigenous people generally do not have enough say in ocean management and that there has not been appropriate inclusion of indigenous voices and information relevant to their interests in UNCLOS. He thinks that there is a tendency not to fully inform indigenous people about fisheries issues. Studies tend to look at commercial fisheries without considering subsistence fishing, which he thinks is problematic. He feels strongly that information on what is happening in terms of changes in water temperature, microorganisms, the food chain, and other Arctic Ocean concerns needs to be communicated to indigenous people in a timely and effective way, since such changes affect their livelihoods and sustenance. He would also like to see a modified quota system that allocates a certain percentage to fishing in coastal areas. Another interviewee in this category expressed support for integrating indigenous knowledge into fisheries management decisions, but said that, to accurately answer this question, indigenous people themselves must have a chance to express their views.

Oil and Gas Industry

One interviewee said that competition from industrial scale fishing fleets is a key concern for indigenous peoples who rely on fishing. He thinks that the knowledge held by indigenous people should be respected, as should its value in many aspects of ecosystem analysis. The other interviewees in this stakeholder category did not speak specifically to this topic, although one said that when there are potential conflicts between whaling and oil development, the industry negotiates directly with indigenous groups.

Multilaterals

One interviewee noted that fishing by indigenous communities raises different questions from those facing commercial fishing interests. Fishing by indigenous communities is generally on a smaller scale and often supports communities that might not otherwise be sustainable economically or culturally. He noted that some indigenous communities might suffer more seriously or more directly than others from overfishing, and thus have a stronger interest in fisheries protection. Another person said that there tends to be tension between conservation groups and indigenous groups. Conservation groups are generally concerned about protecting fishing stocks for moral or ethical reasons. In contrast, indigenous people want to understand and protect fisheries, but they generally more concerned about their livelihoods. A third interviewee said that ensuring indigenous fishing rights are respected, including rights to new fisheries as they

emerge, is a big issue in Canada. He indicated that tension between indigenous people and commercial fishing has become an issue on the east coast of Canada. There are currently no commercial fisheries in the Beaufort and, thus, no current conflicts; however, there is the looming issue of who will have first rights of access to fisheries in this area if they emerge. He feels that lip service is paid to the notion of traditional ecological knowledge, but that it is really hard to document where this kind of knowledge is having an effect in practice. Decisions are still driven largely by western science, although he noted that indigenous knowledge is being employed in tracking halibut in Greenland. The final interviewee in this stakeholder category said he does not think that indigenous people have anything to do with commercial fisheries and that new fishing opportunities should not affect their existing interests.

NGO/Environment

One interviewee did not provide comment on this topic. The others explicitly said their organizations respect indigenous peoples' rights and are generally working well with indigenous people on issues related to the Arctic. They see indigenous people as key stakeholders in the Arctic region. One said he thinks inclusion of indigenous people in the Arctic Council is one of the better features of the Council. Another interviewee said that his organization is working directly with indigenous people to prevent poaching and protect indigenous fisheries from being exploited. He said that coastal communities, not just indigenous people, are important and should have a say in local fisheries management. Another interviewee noted that his organization has had some differences with indigenous people historically. However, since then, his organization has worked to build bridges with indigenous communities, and he believes it is important to ensure that their subsistence needs are met as commercial fisheries move farther north.

Science

One interviewee did not provide a response. Another said it is not possible to entirely separate commercial fisheries from coastal, indigenous fishing, since both are part of an interrelated system. He indicated that there are a number of scientific questions that are relevant to indigenous people, such as how changing environmental conditions will impact trophic levels of ecosystems and thus upper trophic levels. Another interviewee thinks that indigenous peoples should play a very significant role in the decision making process in the Arctic. He said they are major stakeholders and, despite their jurisdictional dependency on their home states, they should be treated as separate entities with cultural rights over fishing. Moreover, he said, scientists should take into account indigenous peoples' knowledge on specific species that they have been fishing for centuries.

6. Oil Spills

Q6: How should oil spill response and prevention capacities factor into protection of fisheries and the eco-systems that sustain them in the Arctic? What are some of the key engineering considerations? Can existing spill response technologies protect Arctic fisheries in Arctic conditions?

Summary

Respondents from all stakeholder groups agreed that an oil spill in the Arctic would be problematic and that effective oil spill prevention and management systems should be in place. They varied, however, in their estimates of how problematic a spill would be, the likelihood of a spill occurring, and the ability of existing oil response systems to manage a spill. People from some states and the oil industry expressed confidence in industry's ability to prevent and manage spills. In contrast, interviewees from other states and stakeholder groups said a spill in the Arctic could be catastrophic, there is currently no effective technology to clean up a spill in ice infested waters, and that there is no effective spill response systems in place for the Arctic. A number of interviewees from different stakeholder groups indicated, in contrast to the perspective of the oil industry, that science is not clear about what will happen if an oil spill does occur in Arctic waters. For instance, they said, we don't know how the oil would behave, what its effect on the marine ecosystem would be, and how clean up mechanisms (such as dispersants) would work. Interviewees generally agreed that there is not an urgent risk of a major oil spill occurring in the Arctic, but a number of interviewees did note that vessels traveling in the Arctic can generate spills. Thus, this risk needs to be addressed.

National Governments

One interviewee from an A5 state said that ice packs limit opportunities for petroleum development in Arctic waters. He noted that the Arctic Council is developing a protocol for cooperation on oil spills and that there are transboundary exercises underway. He said that dealing with oil spills in the Arctic is a technological challenge. Sea ice absorbs oil, making the oil difficult to extract, and if the ice melts in the Barents, it deposits oil and kills fish.

An interviewee from a different A5 state said that Greenland, Iceland, and Norway cooperate on oil-related issues. They try to apply best practices and follow the Norwegian paradigm, but they currently do not have the necessary means to effectively respond to oil spills. Another interviewee from this state believes there should be higher standards for oil and gas exploration and exploitation, agreeing that Norway provides a good example of what these should be. He supports the Arctic Council's adoption of treaties addressing oil spills, especially the Oil Spills Response of 2013. He said that sustainable fisheries are a major consideration for his country when it comes to oil and gas development on its continental shelf. His country will not make any deal with the oil industry if they do not uphold high standards of ecosystem protection.

All interviewees from another A5 state acknowledged that oil spills present a risk to the Arctic. However, one interviewee said that, while the risks are bigger in ice-infested areas, he is not particularly concerned, since he does not think oil exploration will occur in the central Arctic any time soon, especially given oil prices. One interviewee expressed concern about seismic testing disturbing fisheries and marine mammals. His country demands oil operations employ the most modern technology to prevent oil spills and that they have oil spill preparedness in place. The

size and location of an oil spill would affect the exact type and magnitude of issues the spill would cause. For example, effects on spawning during April and May would present a serious problem. He seemed optimistic that oil spills could be handled. Another interviewee from this same country expressed a more pessimistic view, saying that when exploiting oil and gas, accidents are always possible and we need to be prepared. He indicated that shipping also presents risks—as shipping routes move away from coastlines there will be a need for rescues. None of the states neighboring the Arctic have sufficient capacity on their own to rescue a ship in trouble in the far north, he said. This is even more of a problem for cruise ships, which have more passengers and crewmembers. A tanker running aground and leaking oil or an extensive blowout would create major threats to Arctic ecosystems, and it would take a lot of time to clean up such a spill. He noted that when it comes to shipping and cruise ships, we are talking about human lives, and therefore he is very concerned about preparing for and increasing our capacity to address these worries.

One interviewee from another A5 country said a lot of work needs to be done to figure out how to respond to an oil spill that occurs in ice filled waters or on top of ice, as well as to figure out what the impacts on fisheries and the rest of the ecosystem might be. Similarly, another interviewee said there are some very important scientific questions that need to be considered, such as what happens if oil spills in much colder water—how does it behave and what is its fate? Another interviewee said that, in addition to big spills, smaller spills from passing vessels (such as coast guard) have to be considered. Since Arctic communities get annual resupplies from such vessels, oil spill response is necessary in every community. According to this interviewee, there are some trained responders in each coastal Arctic community in his country, but they do not have the capacity to manage large spills from exploratory wells. At this time, he said, the debate is mostly around things such as management of relief wells, and there is currently not the infrastructure or protection to manage a big spill. In terms of whether existing technology can protect fisheries in Arctic conditions, one interviewee said the answer is a straight forward no. Not only does he think that the technology for dealing with oil in icy waters currently does not exist, but he also questions the emergency response capabilities in the Arctic. Even if necessary equipment is available, there are big challenges associated with getting it deployed.

One interviewee from another A5 country said he knows the U.S. Coast Guard is spending a lot of time trying to figure out what is needed to protect marine ecosystems. He thinks that species health should definitely be factored in when assessing oil spill prevention and management capabilities. Another interviewee said that the Arctic Council has an international mechanism in place to get nations to cooperate and prepare for a spill. He also said there are some bilateral agreements in place. However, the Arctic Council and involved countries are not ready to deal with something like Deepwater Horizon. It would be very difficult to contain and clean up a big spill in cold, icy Arctic waters. He thinks that one reason Shell hasn't started to drill in the Arctic is because of the requirement that they have their own containment and management system in place, which is a large and expensive proposition. Another interviewee noted there is not any marine maritime infrastructure, like icebreakers, in the Arctic today, outside of parts of Greenland and northern Norway. This lack of infrastructure is particularly true for oil spill response. He thinks that while there is now an agreement about oil spill response and the sharing of resources, there is nothing in place in terms of practice. New technologies will likely be needed to manage and protect against oil spills in the Arctic. In cold water, oil will not evaporate and it is harder to disperse with dispersants. Therefore, a spill in the Arctic today would likely shut

everything down; it would definitely impact fisheries, but it would have even more—potentially devastating—impact on coastal communities dependent on marine mammals, as well as birds. In light of this, he thinks significant resources should be devoted to prevention. He mentioned there is a new comprehensive study published by the National Academies in the United States about Arctic oil spills that should be helpful.

One non-A5 country interviewee said there are technologies in development for cleaning up oil even in icy sea conditions, but they are not ready yet. He also said there is currently not sufficient infrastructure in place to deal with oil pollution in the Arctic, although he hopes such infrastructure will be developed in the context of the new treaty negotiated under the auspices of the Arctic Council.

An interviewee from another non-A5 country said his nation thinks the Arctic should be considered holistically, taking into account environmental and pollution issues. He believes that the oil spills treaty signed last year under the auspices of the Arctic Council should be blended with a new RFMO, which he thinks will be required for management of the Arctic. In his view, oil companies will be highly interested in the Arctic Ocean, meaning there could be considerable interactions between the oil and gas industry and fisheries.

Fishing Industry

One fishing industry representative said that new technologies for protecting against and managing oil spills in the Arctic are needed. He also thinks that international rules and regulations for better coordination and faster response are needed to prevent a major catastrophe. Fishing vessels should be deployed with monitoring systems and the capacity to give warnings and conduct oil field inspections. He feels strongly that the fishing industry needs to cooperate with the oil industry. Another interviewee from the fishing industry said that, although a potential oil spill is a considerable risk, this should not prevent oil drilling.

Indigenous/Human Rights

One interviewee said we do not know what the implications of a spill would be, but that this has been a significant issue with Shell offshore. Another said that communities are being trained to respond to oil spills, and that having people trained and prepared on-site is important. There has been mysterious oil that has washed up on shore in Alaska, but they are unsure where it is coming from. Having people equipped and trained to clean it up is important.

Oil and Gas Industry

Two interviewees expressed confidence in the ability of the oil industry to manage spills, indicating there has been considerable attention paid to spill-response planning. Another said there have been major oil spill exercises in the Prince William Sound and Cook Inlet. Industry has considered the presence of fisheries and impending seasons from the standpoint of potential risks, flow of oil, interference with fishing and of potential space use that could conflict with harbors and ports. He believes that industry has already demonstrated its ability to operate in the Arctic and to do so in safe, environmentally responsible, and operationally efficient ways. He noted, however, that icebreakers remain a big concern, saying that industry can provide the capability but there are questions about port accessibility. The history of oil and gas exploration, he argued, shows the ability of the industry to move the frontier forward in terms of risk analysis, assumption of risk, initiatives to improve spill response and prevention technologies. Another

interviewee in this stakeholder category said that, for the oil industry, safety and environmental responsibility “go hand in hand.” Another interviewee said oil spill prevention should be a core value of any company working in the Arctic. This means it must be an integral part of disciplined and structured work decisions and work processes. He mentioned a Net Environmental Benefit Analysis decision-making tool that has been used widely by industry and governments to guide oil spill response. He said dispersants can reduce the impacts on ecosystems, in part by minimizing the residence time of crude oil in the environment. Additionally, he said, ice containment can be beneficial, as oil contained in ice is immobile, allowing more time for effective response. Responders need flexibility and, ideally, access to “all of the tools in the toolbox.” Therefore, he said, effective recovery mechanisms should be pre-permitted and readily available for use in case a spill occurs. Also, natural oil seeps are one of the largest sources of oil entering the world’s oceans, he said, contributing between 4 and 14 billion barrels annually.

Multilaterals

Two interviewees said their organization recently made a submission to the Canada-Newfoundland Offshore Petroleum Board on a draft report of a strategic environmental assessment for the waters off Newfoundland. They wanted to highlight the extent of fishing going on beyond the 200-mile limit. They do fisheries research that could be of use in assessing various project proposals. They have defined vulnerable marine environments. Another interviewee said that if there is a spill in the north, he does not think it will be possible to clean up. He questioned whether the spill in the Gulf of Mexico was truly cleaned up, or whether the dispersants just made it look better. He said that, given the success rate in removing oil from the Gulf of Mexico, where conditions are much better, was only about 10 percent, he thinks there would be an absolute failure in cleaning up an Arctic spill. He is very pessimistic about the prospects for fish stocks if a spill occurs. Another interviewee in this stakeholder category said that a major concern related to oil and gas is the risk of displacing traditional fisheries and decimating livelihoods. One potential solution is to create safety zones where oil and gas development are not allowed. In terms of shipping, he said, the Arctic Council's Arctic Marine Shipping Assessment was completed and approved in 2009. The Assessment's recommendations continue to be implemented and many of its recommendations relate to Arctic peoples. An important aspect of the Assessment was the identification and protection of cultural areas as well as sensitive marine habitats. He indicated that countries have struggled to identify, not to mention protect, such areas. The final interviewee in this category said that oil spills are not very relevant to Arctic fisheries at this time, although he agreed that an oil spill could be very damaging to the Arctic ecosystem.

NGO/Environment

All interviewees expressed significant concern about the potential risks of an oil spill in the Arctic. One said he believes an oil spill in the Arctic would be catastrophic. Another indicated that he thinks drilling in the Arctic is a bad idea because of both the risks it creates and the implications of expanded fossil fuel exploitation. His organization is trying to prevent oil development from happening in the region. He thinks that, if a spill the size of the Deepwater Horizon spill were to occur in the Arctic, there would be no way to clean it up. There are many studies that question the effectiveness of existing technologies to manage spills in the Arctic, he said. Another interviewee agreed that current technology is not sufficient for responding to oil spills, especially given ice and tough weather conditions. However, his organization is trying to negotiate around this concern with countries like Russia rather than taking a more adversarial position the way

some other environmental organizations have. He thinks that there should not be any drilling in the Arctic until there is effective technology for managing spills.

Science

One interviewee said that an oil spill would be destructive for the Arctic ecosystem and that ocean currents could transport spills to other sensitive areas. An important scientific question is what happens across all trophic levels of the ecosystem over time after an oil spill in the Arctic. He also mentioned the impacts of noise from seismic activity, development, and shipping should be considered. Another interviewee said that his organization develops spill trajectory models for corporate, government, and NGO clients. Modeling is most effective when done in conjunction with worst-case scenarios and probable trajectories of unwanted discharges of petroleum in the Arctic offshore. He said that their modeling explores the range of applicable technologies and costs. From the data developed, they can determine whether potential response plans meet needs. Results can then be taken one step further to translate the scenarios into government regulatory systems, corporate practices, and insurance strategies, he said. Another interviewee said that an oil spill, whatever its source, would have a huge impact on the environment, potentially leading to the complete elimination of species within a specific area. Oil companies in cooperation with states and the fishing community should learn from the mistakes of the past and work together to develop a more effective and sufficient mechanism for protecting Arctic ecosystems. A second Exxon-Valdez oil spill would be inexcusable, he said.

7. Are New Treaty Arrangements Necessary?

Q7: Do we need new treaty arrangements of any kind to protect Arctic fisheries?

Summary

Perspectives on whether a new treaty or additional formal agreements are needed to protect Arctic fisheries, as well as what form these might take, varied somewhat within and across stakeholder categories. Most people agree that no new agreements are needed for the peripheral Arctic. People from many states and some stakeholder groups support the creation of a new RFMO for the central Arctic, although some think a new RFMO should only be put in place if and when new fisheries emerge. Some respondents think discussions about a possible new agreement should wait until there is greater scientific knowledge about the Arctic and/or it is clear that there are new Arctic fisheries that must be managed. Several interviewees see potential to build on existing treaties and agreements. Others would like to see an agreement similar to the Antarctic Treaty put in place, although they recognize this is unlikely. Many people advocated for a regional approach, but some think fisheries or Arctic management should be undertaken on a sectoral basis. People generally agreed that geopolitics make the creation of a new agreement difficult and will be the primary constraint on what is done. A number of respondents from across stakeholder groups believe that non-Arctic countries must be included in any negotiations or management strategies that are put in place.

National Governments

Perspectives on whether a new treaty arrangement is needed and what kind of agreement would be most effective varied across and within states.

One interviewee from an A5 country said he thinks more knowledge is needed before an agreement can be considered.

An interviewee from another A5 country thinks that the path forward involves building on agreements that are already in place to manage existing fisheries. He thinks that future agreements and collaboration will be driven by consumer pressure, as fishing fleets around the world continue to chase fish (particularly in the regions of Iceland, Norway, and Greenland) and regulations follow them. As new knowledge and pressures develop, there will be incremental growth of the regulatory framework based on new information. In the meantime, there are some good reasons why people are not fishing in the Arctic. As conditions change, the international community needs to get ahead of the curve in taking a precautionary approach. He noted that, in the end, there might not be as much of a threat if new commercial species are not identified in the Arctic. At this time, though, we just do not know. Another interviewee from the same country suggested we might want to think about creating as a treaty based on science, not a treaty based on commercial fisheries. It should be a treaty, he suggested, like those underlying ICES or PICES. These organizations could link up well with another organization that is treaty-based and focused on doing research in the Arctic to reduce scientific knowledge gaps. This new organization, he said, could also draw in non-Arctic nations with an interest in the Arctic, such as China and Japan. One interviewee said that the Arctic Council does not have a mandate to deal with fisheries issues, nor does it seem to be the appropriate forum to take up fisheries management. If a new fishery starts to emerge, a new RFMO would have to be established. The final interviewee from this stakeholder group believes the A5 process is solid, but that it will need to be expanded to include other countries if it is going to be successful. He said the Nuuk statement decided that there is no need to establish an RFMO right now, but as conditions change a need might arise.

An interviewee from another A5 country said that coordination is key and that some type of international treaty is needed to implement agreements regarding the central Arctic waters. He thinks it is necessary to convince the Russians to join the agreement, and then to consider who else to open it up to—every country in the world, just the countries that are considered important, such as the EU, China, Japan, and Korea. Another interviewee from the same country said that he thinks a new binding treaty would be useful, but he questions who would sign it given that the Arctic is a global commons. He thinks that a treaty should put in place a moratorium to give time for monitoring the Arctic and doing research, but that it should not shut down the Arctic indefinitely. The question of how to put together such an agreement is challenging. He suggested that starting with the science might be a less politically charged approach. He noted that geopolitics are a significant concern, particularly given the current tension between the U.S. and Russia. On a related matter, he noted that if the Arctic Marine Shipping Assessment could be redone, an agreement might emerge around using ecosystems-based management in one area. This could lead to a holistic approach as a global community. Another interviewee from the same country said that, when it comes to the central Arctic, some sort of agreement is probably needed.

Interviewees from another A5 nation generally agreed that a new treaty might be needed, although one said there are many arrangements in place that might suffice. Two others feel more strongly that a new agreement is necessary. One said there is agreement among the neighboring states that UNCLOS applies to the Arctic, but the Arctic is only mentioned in one article (234).

This gives Arctic states more power in their 200-mile EEZ. He does not think that issues pertaining to the Arctic Ocean are well addressed in treaties developed for “blue oceans.” He does not think an entirely new treaty is needed or realistic, but that supplementary treaties might do the trick. For instance, if fish stocks move into international waters in huge amounts, then an international fisheries treaty supplementing UNCLOS and taking particularities into account might be necessary. Another interviewee said that a new agreement always seems to be needed when no agreement is in place. He seemed a little skeptical, though, saying that the people who are most eager address uncertainty in the Arctic are scientists who want to increase their research budgets.

An interviewee from another A5 state said there should be some form of treaty arrangement, but at this time, he is not sure what its content would look like. Another respondent from the same state feels that a new RFMO is crucial for the Arctic Ocean. However, he noted, negotiations over such and RFMO are very difficult due to on-going geopolitical tensions. Regardless, he said, his country supports both bilateral and multilateral cooperation in the Arctic on fisheries. Another interviewee from the same A5 state also feels there is a need for a new RFMO. He underlined that the Law of the Sea Convention is the basis for all discussions and that there should be dialogue about a new RFMO. In terms of who should be involved, he believes there should be an interpretation of the term “real interest” (included in the Straddling Stocks Agreement) in deciding who will participate in a new RFMO. It should not be limited to Arctic coastal states.

An interviewee from a non-A5 state said, in the future, a new agreement will likely be needed, but that very much depends on further scientific understanding of whether the central Arctic Ocean can sustain fish stocks. If it cannot, bilateral and trilateral treaties will probably be all that is necessary.

An interviewee from another non-A5 state said his country is unhappy with the lack of cooperation among the major Arctic states on the issue of Arctic management. His country supports a sectorial approach rather than a holistic approach to Arctic governance and, therefore, does not support the transformation of the Arctic Council into a regional organization to deal with the management of natural (living and non-living) resources. Broadly, he believes that fisheries in the Arctic should be treated like fisheries everywhere else in the world. He thinks a new RFMO should be developed for the central Arctic Ocean to address the areas not covered by NAFO and NEAFC. This RFMO should not be considered, however, until relevant fisheries at this area are possible and viable. This RFMO should be introduced by a new treaty that will be adaptive and flexible so that it can take account of new research. He said it should be based on the rules that govern NAFO and NEAFC, since these organizations work well. Participation in this RFMO should also be based upon a broad interpretation of the term “real interest” in the Fish Stocks Agreement. This interpretation, he says, would include not only Arctic states but also other fishing states. This is the source of some disagreement, he said, since if this interpretation prevails, it will result the participation of states such as China, South Korea, and Japan.

Fishing Industry

One interviewee said that if and when new fishing areas emerge, they will need to be well managed. There will need to be a new agreement or treaty among interested states, which should be international and flexible, and include a self-executing mechanism to ensure adaptation to

future changes. Another interviewee said that every fishing area that opens up due to melting of the ice should be sectorally regulated. He agrees that some form of agreement should be put in place and that it should be adaptive. Sanctions should be imposed on parties who do not adhere to international standards, he said. All the respondents in this stakeholder category stressed the importance of international cooperation.

Indigenous/Human Rights

One respondent in this category indicated that a new agreement should at least be considered. Meaningful indigenous input must be included in whatever arrangements emerge, he said, including those that pertain to the central Arctic Ocean.

Oil and Gas Industry

One stakeholder representative in this category noted that oil development in the Arctic will require international agreement, whether formal or informal. Others indicated that compliance with regulations is important to the industry. One interviewee said he thinks this question should first be addressed by indigenous groups. It is important to distinguish between indigenous peoples' fisheries and industry-scale fleets from the south. He thinks that some regulation appears to be needed to avoid overfishing by industrial fleets from non-Arctic nations. Such policies, he thinks, must be created within and among Arctic nations, ensuring full participation by indigenous groups. He noted that present day industrial fisheries in the Arctic Ocean and adjacent seas are boreal, not Arctic.

Multilaterals

Two interviewees said that NEAFO reaches up into the Arctic, but only covers a small wedge in the Arctic area. They think it might make the most sense to establish a new RFMO with all of the interested parties. This, they said, could be done through the Arctic Council. Another interviewee said that if retreating ice opens up new Arctic fisheries, new management agreements will be needed, although not necessarily treaties. He feels that the approach of encouraging states to agree on fishing quotas and other matters in the context of fisheries management organizations and multilateral negotiations has worked well elsewhere. He thinks that a strict treaty regime such as that applicable in the Antarctic would be infeasible in the Arctic. If, however, conditions in the Arctic create the risk of overexploitation, states should consider entering into binding agreements on fishing and environmental protection. Another interviewee thinks there should be a new agreement, and that it should be much more robust than existing treaties or agreements. A third said that "time will tell" whether a new agreement is needed. He pointed out that at the recent meeting in Nuuk, Greenland, they left the window open for a new agreement. He does not think that a new treaty is absolutely necessary, saying one option would be to have a UN resolution passed every year supporting a moratorium. Or, he said, there could be a broader declaration concerning Arctic issues supported by relevant countries, or some other sort of "soft agreement." He noted that UNCLOS provides a framework for cooperation, but does not provide details regarding this cooperation. He can envision a new implementation agreement that creates a global process for managing high seas and protected areas, with the Arctic being at the top of the list in terms of protected marine areas. The final interviewee said hard law is not necessarily more effective than soft law and that the lack of clear definitions of the Arctic makes any sort of binding hard law agreements difficult. Nevertheless, in his view, in the CAO, at least one new instrument for managing fisheries (such as an RFMO) is required. He noted the Arctic states are in negotiations about this, and a declaration is expected before the end

of this year. He believes they are going to invite selected players—such as Iceland, the EU, Korea, China, and Japan—to be part of the agreement.

NGO/Environment

One interviewee said his organization is calling for a sanctuary in the Arctic. He also said there are multiple paths by which management of the Arctic might be achieved, including through UNCLOS and the potential evolution of the Arctic Council. Some people have called for the equivalent of the Antarctic Treaty, but he thinks that may not be realistic. Arctic countries need to come together and look at how they can best manage fisheries in the Arctic. He also thinks we need to create marine-protected areas in country EEZs, and support collective management of fisheries in areas between protected areas or in international waters. A second interviewee agreed there should be a new agreement, and that it needs to be effective. While he notes that there is a large difference between the Antarctic and the Arctic, he thinks several things can be learned from the Antarctic treaty experience. One is that the Arctic Council should be stronger. A third interviewee said the general rule is that you can fish in the high seas unless there is an agreement in place. Therefore, he said, in order to manage fishing in the Arctic, it is critical that countries reach some sort of agreement. In the past, he said, the creation of RFMOs has typically resulted from chaotic fisheries and unsustainable fishing. He would like to see a management regime put in place before commercial fishing begins, particularly as chaos and misuse would be extremely damaging to the fragile Arctic ecosystem. The challenge is how to do this before a commercial fishery is established. Creating an RFMO will require a comprehensive agreement among countries and that the U.S. is on board, but that it won't work unless other countries (particularly the remaining A4) concur. He noted that it is difficult to outline who needs to be part of an agreement in the Arctic. He also noted that the tension between Russia, the U.S., and Canada may lead to delay. One interviewee said he thinks it is in the self-interest of all involved nations to prevent fishing just beyond their EEZs, and therefore they will eventually support management of the high seas. He noted that Russia wants to develop oil and gas and to keep others away, and the best way to do that is to protect fisheries right now. Additionally, he said Russia has other, more certain fisheries, and its main concern in the central Arctic is keeping away tourism and fishers from other countries (such as China) to avoid potential major impacts, such as ecosystem disruption. He is moderately hopeful that the non-Arctic countries will become party to an agreement when invited to do so, because there are currently no jobs at stake and no domestic industries lobbying hard for the right to fish in this area. Instead, he said, countries are likely to see this as an opportunity to advance diplomacy. If China, for example, wants to be part of the 'Arctic club', this is a valuable opportunity.

One interviewee noted that RFMOs have varying levels of effectiveness and said ICES is a better model than PICES. Another said he does not think a simple RFMO or an extension of an existing entity is sufficient. Rather, he thinks the Arctic needs a management organization that is about more than fisheries, considers all different species in concert, puts marine protected areas in place, and generally takes a broad perspective. He thinks the Arctic Council would have to go through some considerable changes to become this organization. He said it could be something like CCAMLR (the Commission for Conservation of Antarctic Marine Living Resources) that manages Antarctica. It has the instruments to create marine protected areas as well as other powers. Given that the Arctic has extensive international waters, his organization would like to see integrated management involving many countries and, ultimately, a sort of global sanctuary around the North Pole.

Science

One interviewee in this stakeholder category said that new treaty arrangements are necessary because there is a lack of regulation in the areas that were previously covered by the ice. He said an RFMO should be immediately negotiated for the emerging areas and put in place as soon as the ice allows exploration and exploitation of new regions. He noted, though, that it is difficult to negotiate new treaties in an area with so many conflicting claims on the sea and natural resources. Related to this, he said, it is not useful to look for a new international body to conduct governance activities since current political and geostrategic realities would make that impossible. Instead, he said, we should use the expertise that existing intergovernmental panels have to strengthen the authority of the Arctic Council. The Council has proven to be a useful forum for cooperation among Arctic states, he said.