

# Arctic law in the face of climate change – a turning point?

## Anticipatory law-making and new modes of governance

Johanna Sophie Buerkert,<sup>a</sup> Kristian Sjøby Kristensen,<sup>b</sup> Frank Sejersen<sup>cd</sup>

### 1 Introduction

Temperature rise due to climate change is progressing twice as fast in the Arctic as on the rest of the planet,<sup>1</sup> and the changes that follow as a consequence will directly impact the environment<sup>2</sup> and the people that inhabit it, both in the Arctic and worldwide. Next to direct and indirect negative impacts on ecosystems and

livelihoods (such as e.g. effects on access to and composition of food,<sup>3</sup> community security,<sup>4</sup> and overall wellbeing more generally)<sup>5</sup> the effects of climate change on the Arctic also affect the rest of the globe, as the reduction of (sea) ice cover decreases the albedo effect, which

---

<sup>a</sup> PhD fellow, Centre for International Law and Governance (CILG), University of Copenhagen, corresponding author.

<sup>b</sup> Senior Researcher, Centre for Military Studies, Faculty of Social Sciences, University of Copenhagen.

<sup>c</sup> Associate Professor, Department of Cross-cultural and Regional Studies, Faculty of Humanities, University of Copenhagen.

<sup>d</sup> All authors are part of the interdisciplinary network on Climate Arctic Governance (CArGo) at Copenhagen University, which aims to create synergies between different scientific domains to address Arctic climate and sustainability challenges. More information: <https://jura.ku.dk/cilg/research/cargo/>.

<sup>1</sup> M. Meredith et al., "Polar Regions," in *IPCC Special Report on the Ocean and Cryosphere in a Changing Climate* ed. H.-O. Pörtner et al. (In press: Cambridge University press, 2019), 205; Rune Grand Graversen and Minghuai Wang, "Polar amplification in a coupled climate model with locked albedo," *Climate Dynamics* 33, no. 5 (2009/10/01 2009): 629, <https://doi.org/10.1007/s00382-009-0535-6>.

<sup>2</sup> Meredith et al., "Polar Regions," 205.

<sup>3</sup> Meredith et al., "Polar Regions," 205; R. Bezner Kerr et al., "Food, Fibre and Other Ecosystem Products," in *Climate Change 2022: Impacts, Adaptation, and Vulnerability*, ed. H.-O. Pörtner et al., Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (Cambridge: Cambridge University Press, 2022), 63.

<sup>4</sup> K. Kristensen & L. Mortensgaard, "Dangerous ice: Exploring the scales of climate change macrosecuritization through the Greenland Ice Sheet", in Jacobsen et.al. (eds.) *Greenland in Arctic security: (de)securitization dynamics under climatic thaw and geopolitical freeze*, (Ann Arbor: University of Michigan Press. Forthcoming 2023).

<sup>5</sup> Meredith et al., "Polar Regions," 259-60; Ashlee Cunsolo Willox et al., "Examining relationships between climate change and mental health in the Circumpolar North," *Regional Environmental Change* 15, no. 1 (2015/01/01 2015), <https://doi.org/10.1007/s10113-014-0630-z>; Frank Sejersen, "Mobility, climate change, and social dynamics in the Arctic: the creation of new horizons of expectation and the role of community," *Climate change and human mobility: global challenges to the social sciences*. Cambridge University Press, Cambridge, UK (2012).

reinforces global warming processes that affect other parts of the Earth.<sup>6</sup>

Despite the predominantly negative consequences of climate change, melting of (sea) ice and rising temperatures due to global warming may also give rise to certain opportunities, such as Arctic Shipping,<sup>7</sup> or increased access to resources. The possibility of ice-free summers in the Central Arctic Ocean (CAO), for example, may generate opportunities to exploit (yet unknown) fish-stocks, which may be economically attractive to states in the Arctic and beyond. This is especially relevant against the backdrop of a general decline in fish stocks in the rest of the globe,<sup>8</sup> considering the major role that blue foods play in the global economy.<sup>9</sup> Yet, an unregulated exploitation of these fisheries comes with dangers, such as stock collapse<sup>10</sup> and the possible irreversible

destruction of ecosystems that are yet unknown.

Faced with these unprecedented, yet pressing changes, a new approach to Arctic governance seems necessary. The term 'Anticipatory Governance' has gained traction in the discourse around planning for the effects of climate change and sustainability.<sup>11</sup> We argue that this way of thinking is also on the rise in Arctic governance, with the 2018 Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean (CAOF Agreement) being a recent example. Despite the advantages of and the need for the anticipatory approach, we argue that anticipation also calls for transformations of governance by including what can be conceptualized as 'thick governance' approaches in order to adequately cope with climate-change influenced futures in

---

<sup>6</sup> For an explanation of the albedo effect, see T. M. Lenton et al., "Tipping elements in the Earth's climate system," *Proceedings of the National Academy of Sciences of the United States of America* 105, no. 6 (2008): 1788, <https://doi.org/10.1073/pnas.0705414105>.

<sup>7</sup> Jackie Dawson, "Arctic shipping: Future prospects and ocean governance," in *The future of ocean governance and capacity development* (Brill Nijhoff, 2019).

<sup>8</sup> Erik J Molenaar, 'Participation in the central arctic ocean fisheries agreement', *Emerging Legal Orders in the Arctic* (Routledge 2019) 133; Beth Baker, 'Scientists Move to Protect Central Arctic Fisheries' (2012) 62 *BioScience* 852, 852; Elizabeth Mendenhall and others, 'Climate change increases the risk of fisheries conflict' (2020) 117 *Marine Policy* 103954, 2.

<sup>9</sup> Michelle Tigchelaar and others, 'The vital roles of blue foods in the global food system' (2022) 33 *Global Food Security* 100637, 2.

<sup>10</sup> Rosemary Rayfuse, "Regulating fisheries in the Central Arctic Ocean: much ado about nothing?," in *Arctic Marine Resource Governance and Development* (Springer, 2018), 38-39.

<sup>11</sup> Ray Quay, "Anticipatory governance: A tool for climate change adaptation," *Journal of the American Planning Association* 76, no. 4 (2010): 498; Karlijn Muiderman et al., "Four approaches to anticipatory climate governance: Different conceptions of the future and implications for the present," *Wiley Interdisciplinary Reviews: Climate Change* 11, no. 6 (2020).

an equitable and just manner and enhance legitimacy and effectiveness of measures.

## 2 Anticipation as a concept

The concept 'anticipation' is used differently in different bodies of literature (e.g. resilience, physics, psychology) but almost always contains some form of action, in view of future changes. "While anticipation and expectation are closely related",<sup>12</sup> anticipation is different from expectation in the sense that it includes present action to change the course of the future, instead of a mere contemplation of future events.<sup>13</sup> If undertaken by a group of people, the term collective anticipation refers to the joint effort of a community that is in realization that a change is about to happen, and tries to both prepare for future events, as well as change the course of events at the same time.<sup>14</sup> Anticipatory governance involves "changing short-term decision making to a longer-term policy vision, including the notion of foresight."<sup>15</sup> This can be done, by employing tactics of "precaution, preemption and

preparedness" in order to prepare for future disruptions.<sup>16</sup>

## 3 The CAOF Agreement as an example of anticipatory lawmaking and governance

The Central Arctic Ocean (CAO) is one of the areas that are currently ice-covered but likely free up more and more due to rising temperatures. This increases the likelihood of commercial fisheries in the future. Despite the fact that the ecosystem in the CAO is still largely unknown,<sup>17</sup> *the possibility of a northwards migration of species into the CAO following ocean warming, as well as the possible discovery of local fish stocks in the future posed the risk of an unregulated CAO fisheries with possibly disastrous consequences for local ecosystems.*<sup>18</sup>

In short, the Agreement prohibits unregulated commercial fishing in the High Seas portion of the Central Arctic Ocean,

---

<sup>12</sup> Rebecca Bryant and Daniel M Knight, *The anthropology of the future* (Cambridge University Press, 2019), 22.

<sup>13</sup> Bryant and Knight, *The anthropology of the future*, 22.

<sup>14</sup> Bryant and Knight, *The anthropology of the future*, 42, 43.

<sup>15</sup> Emily Boyd et al., "Anticipatory governance for social-ecological resilience," *Ambio* 44, no. 1 (2015): 153.

<sup>16</sup> Ben Anderson, "Preemption, precaution, preparedness: Anticipatory action and future geographies," *Progress in human geography* 34, no. 6 (2010): 791.

<sup>17</sup>Pauline Snoeijs-Leijonmalm et al., "Review of the research knowledge and gaps on fish populations, fisheries and linked ecosystems in the Central Arctic Ocean (CAO)," (2020): 45..

<sup>18</sup> Rosemary Rayfuse, "The role of law in the regulation of fishing activities in the Central Arctic Ocean," *Marine Policy* 110 (2019); Andrew J. Norris and Patrick McKinley, "The central Arctic Ocean-preventing another tragedy of the commons," *Polar Record* 53, no. 1 (2017).

through a precautionary approach,<sup>19</sup> while setting up a Joint Program of Scientific Research and Monitoring,<sup>20</sup> in order to make science-based decisions about a possible commercial fisheries in the future.<sup>21</sup> The parties to the Agreement also may only establish a commercial fisheries subject to (interim) conservation and management measures that are to be established under the terms of the Agreement as well as general applicable rules of international law.<sup>22</sup>

The Agreement has been hailed for its progressiveness in terms of adaptive governance, stewardship,<sup>23</sup> and its reliance on science in decision-making.<sup>24</sup> Due to its future-oriented approach,<sup>25</sup> the Agreement is also one of the first examples of anticipatory lawmaking in the oceans. *In the absence of* scientific certainty about the existence and properties of possible

ecosystems and fish stocks in the CAO, the state parties followed a call by the scientific community,<sup>26</sup> to address the problem of unregulated fishing in the CAO *before* it emerges in the first place.<sup>27</sup> While the Agreement's provisions are only temporary, it nevertheless sets the tone for future science-based management and stewardship. The Agreement aims to contribute to a "long-term strategy to safeguard healthy marine ecosystems",<sup>28</sup> establishing modes of cooperation that may contribute to prevent future disputes about resources that may arise in the Arctic following climate change impacts.<sup>29</sup> All these elements match the definition of anticipation, as well as anticipatory governance. It needs to be noted that the Agreement is not able to preclude all disputes, and is only a first step taken towards fisheries management subjected to management and conservation

---

<sup>19</sup> Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean (Ilulissat, Oct 3 2018, entered into force Jun 25 2021), Art. 2.

<sup>20</sup> Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean (Ilulissat, Oct 3 2018, entered into force Jun 25 2021), Art. 4.

<sup>21</sup> Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean (Ilulissat, Oct 3 2018, entered into force Jun 25 2021), Art.5 (1) (b) & Art. 5 (1) (c).

<sup>22</sup> Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean (Ilulissat, Oct 3 2018, entered into force Jun 25 2021), Art.3.

<sup>23</sup> Alexander N Vylegzhanin, Oran R Young, and Paul Arthur Berkman, "The Central Arctic Ocean Fisheries Agreement as an element in the evolving Arctic Ocean governance complex," *Marine Policy* 118 (2020): 9.

<sup>24</sup> Rayfuse, "The role of law in the regulation of fishing activities in the Central Arctic Ocean."

<sup>25</sup> Timo Koivurova, Pirjo Kleemola-Juntunen, and Stefan Kirchner, "Emergence of a New Ocean: How to React to the Massive Change?," in *The Palgrave Handbook of Arctic Policy and Politics* (Springer, 2020), 420.

<sup>26</sup> Norris and McKinley, "The central Arctic Ocean-preventing another tragedy of the commons," 47.

<sup>27</sup> Koivurova, Kleemola-Juntunen, and Kirchner, "Emergence of a New Ocean: How to React to the Massive Change?," 420.

<sup>28</sup> Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean (Ilulissat, Oct 3 2018, entered into force Jun 25 2021), Art. 2.

<sup>29</sup> Jessica Spijkers et al., "Exploring the future of fishery conflict through narrative scenarios," *One Earth* 4, no. 3 (2021).

measures. Nevertheless, the Agreement moves *away from a tradition of regulating after the damage to ecosystems has already materialized*,<sup>30</sup> towards a new anticipatory approach to manage Arctic resources.

#### **4 Towards new governance modes in anticipation of coming changes**

Despite the anticipatory approach in terms of the regulation of state actors in fishing in the CAO, comprehensive collective anticipation requires the inclusion of all actors that may be impacted by commercial fisheries in the future. Considering the fact that the impacts of climate change will disproportionately impact Arctic indigenous peoples,<sup>31</sup> measures for equitable and just mechanisms are necessary.<sup>32</sup> Thick values in governance, as well as thick governance

may be a possible solution to bring about more equity and justice.

Thick governance values “incorporate a rich portfolio of ethical values”<sup>33</sup> into governance approaches such as inclusiveness, accountability, capacity building, stakeholder accountability and transparency.<sup>34</sup> The implementation of these values in governance is key for “effective problem-solving and durable behavioral change within an institution”<sup>35</sup> and can enhance the respective institution’s legitimacy.<sup>36</sup> Thick governance means that governing institutions have to nourish a ground for public participation and the inclusion of a variety of voices that have the space to unfold their interpretations of potential impact and change elaborately. If thick governance is pursued, it entails an engagement in different understandings of data, action, contexts and interpretations, and elaborate

---

<sup>30</sup> Rayfuse, “The role of law in the regulation of fishing activities in the Central Arctic Ocean,” 4.

<sup>31</sup> Elizabeth Kronk Warner and Randall Abate, “International and domestic law dimensions of climate justice for Arctic indigenous peoples,” *Revue générale de droit* 43 (2013): 118; Yuko Osakada, “From Victims to Contributors: A Human Rights Approach to Climate Change for the Indigenous Peoples of the Arctic,” *The Yearbook of Polar Law Online* 13, no. 1 (2022): 21; See also H.-O Pörtner et al., “Summary for Policymakers,” in *Climate Change 2022: Impacts, Adaptation, and Vulnerability*, ed. H.-O Pörtner et al., Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (Cambridge: Cambridge University Press, 2022), 12 stressing the severity of the impacts of ecosystem loss especially on indigenous peoples as a whole.

<sup>32</sup> Even considering the argument that the possible impact of a high seas fishery on coastal Arctic Indigenous peoples and other residents is unclear.

<sup>33</sup> Tim Cadman, Charles Sampford, and Rowena Maguire, “Introduction: Governing the climate regime,” in *Governing the Climate Change Regime* (Routledge, 2016), 16.

<sup>34</sup> Hugh Breakey, Tim Cadman, and Charles Sampford, “Governance values and institutional integrity,” in *Governing the Climate Change Regime* (Routledge, 2016), 30.

<sup>35</sup> Bridget Lewis, “Enhancing good governance within the international climate regime through human rights principles,” in *Governing the Climate Change Regime* (Routledge, 2016), 181.

<sup>36</sup> Breakey, Cadman, and Sampford, “Governance values and institutional integrity,” 30.

and detailed inquiries are means to add thickness. Because such an open and inclusive engagement often entails epistemological and ontological discussions (i.e. Indigenous knowledge vs. scientific knowledge)<sup>37</sup> governmental practices become more surprising, difficult and time consuming. Thick governance approaches in anticipatory governing and lawmaking in an era of rapid environmental change is more than expanding the portfolio of ethical values; it is creating a space for committed exploration, newness and transformation.<sup>38</sup>

In the Arctic, there is a long tradition of the integration of different voices and the setting up of hybrid government (co-management, trans-national institutions etc).<sup>39</sup> In some cases, the Indigenous voices have been not only integrated into but also driven policy-making.<sup>40</sup> This legacy of

bringing thickness into governance opens up the potential of pushing anticipatory governance into a more robust and flexible position. The CAOFA Agreement recognizes "the interests of Arctic residents, including indigenous peoples" in the preamble, and expressly stipulate the taking into account of Indigenous and local knowledge in the Joint Program of Scientific Research and Monitoring.<sup>41</sup> However, Indigenous peoples and their representatives are not given their own vote or voice in the decision-making procedure of Article 6, and are only given the opportunity ("may") to participate in "committees or similar bodies" that can be established to further the Agreement's implementation.<sup>42</sup> Thus, while some elements of participation are available, the Agreement presents more of what Breakey et al. call "thickish" governance values.<sup>43</sup> They are a step up from thin values that describe the "limited

---

<sup>37</sup> Frank Sejersen, *Rethinking Greenland and the Arctic in the Era of Climate Change: New Northern Horizons* (Routledge, 2015).

<sup>38</sup> Frank Sejersen, "Resilience, human agency and climate change adaptation strategies in the Arctic," in *The Question of Resilience. Social Responses to Climate Change* ed. Kirsten Hastrup (The Royal Danish Academy of Sciences and Letters, 2009).

<sup>39</sup> Henry P Huntington, *Wildlife Management and Subsistence Hunting in Alaska* (Belhaven Press, 1992); Fikret Berkes and Derek Armitage, "Co-management institutions, knowledge, and learning: Adapting to change in the Arctic," *Etudes/Inuit/Studies* 34, no. 1 (2010); Derek Armitage et al., "Co-management and the co-production of knowledge: Learning to adapt in Canada's Arctic," *Global Environmental Change* 21, no. 3 (2011); Paul Nadasdy, "Reevaluating the co-management success story," *Arctic* (2003): 368.

<sup>40</sup> See e.g. Annika E Nilsson, "Arctic climate change: North American actors in circumpolar knowledge production and policy making," *Changing Climates in North American Politics: Institutions, Policymaking, and Multilevel Governance* (2009): 209.

<sup>41</sup> Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean (Ilulissat, Oct 3 2018, entered into force Jun 25 2021), Art. 4 (4) & Art. 5 (1) (b).

<sup>42</sup> Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean (Ilulissat, Oct 3 2018, entered into force Jun 25 2021), Art. 4 (4) & Art. 5 (2).

<sup>43</sup> Breakey, Cadman, and Sampford, "Governance values and institutional integrity," 30.

and basic" element of governance values,<sup>44</sup> but not sufficient to depict thick values that are "the full gamut of social and moral qualities that can be demanded of an institution's mechanisms".<sup>45</sup> The lack of appropriate thick governance mechanisms within the Agreement, as well as a lack of space for thick governance approaches is problematic in the climate change context, as it leaves out an important group of individuals affected by the consequences of climate change, which, in the end, may hinder comprehensive anticipation and thus effective problem solving.

Due to its anticipatory approach, the CAOF Agreement is a good example for a (hopefully) new trend in Arctic governance, taking action now to positively impact the future, while preparing for adverse events. However, an anticipatory standpoint requires also further investigating new modes of governance and diverting from old pathways in order to ensure a just and equitable progression into Arctic futures determined by global warming.

## 5 References

Anderson, Ben. "Preemption, Precaution, Preparedness: Anticipatory Action and Future Geographies." *Progress in human geography* 34, no. 6 (2010): 777-98.

Armitage, Derek, Fikret Berkes, Aaron Dale, Erik Kocho-Schellenberg, and Eva Patton. "Co-Management and the Co-Production of Knowledge: Learning to Adapt in Canada's Arctic." *Global environmental change* 21, no. 3 (2011): 995-1004.

Berkes, Fikret, and Derek Armitage. "Co-Management Institutions, Knowledge, and Learning: Adapting to Change in the Arctic." *Etudes/Inuit/Studies* 34, no. 1 (2010): 109-31.

Bezner Kerr, R., T. Hasegawa, R. Lasco, I. Bhatt, D. Deryng, A. Farrell, H. Gurney-Smith, *et al.* "Food, Fibre and Other Ecosystem Products." In *Climate Change 2022: Impacts, Adaptation, and Vulnerability*, edited by H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, *et al.* Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, 1-63. Cambridge: Cambridge University Press, 2022.

Boyd, Emily, Björn Nykvist, Sara Borgström, and Izabela A Stacewicz. "Anticipatory Governance for Social-Ecological Resilience." *Ambio* 44, no. 1 (2015): 149-61.

Breakey, Hugh, Tim Cadman, and Charles Sampford. "Governance Values and Institutional Integrity." In *Governing the*

---

<sup>44</sup> Breakey, Cadman, and Sampford, "Governance values and institutional integrity," 26.

<sup>45</sup> Breakey, Cadman, and Sampford, "Governance values and institutional integrity," 28.

- Climate Change Regime*, 34-62: Routledge, 2016.
- Bryant, Rebecca, and Daniel M Knight. *The Anthropology of the Future*. Cambridge University Press, 2019.
- Cadman, Tim, Charles Sampford, and Rowena Maguire. "Introduction: Governing the Climate Regime." In *Governing the Climate Change Regime*, 21-33: Routledge, 2016.
- Cunsolo Willox, Ashlee, Eleanor Stephenson, Jim Allen, François Bourque, Alexander Drossos, Sigmund Elgarøy, Michael J. Kral, *et al.* "Examining Relationships between Climate Change and Mental Health in the Circumpolar North." *Regional Environmental Change* 15, no. 1 (2015/01/01 2015): 169-82. <https://doi.org/10.1007/s10113-014-0630-z>.
- Dawson, Jackie. "Arctic Shipping: Future Prospects and Ocean Governance." In *The Future of Ocean Governance and Capacity Development*, 484-89: Brill Nijhoff, 2019.
- Graversen, Rune Grand, and Minghuai Wang. "Polar Amplification in a Coupled Climate Model with Locked Albedo." *Climate Dynamics* 33, no. 5 (2009/10/01 2009): 629-43. <https://doi.org/10.1007/s00382-009-0535-6>.
- Huntington, Henry P. *Wildlife Management and Subsistence Hunting in Alaska*. Belhaven Press, 1992.
- Koivurova, Timo, Pirjo Kleemola-Juntunen, and Stefan Kirchner. "Emergence of a New Ocean: How to React to the Massive Change?". In *The Palgrave Handbook of Arctic Policy and Politics*, 409-25: Springer, 2020.
- Kronk Warner, Elizabeth, and Randall Abate. "International and Domestic Law Dimensions of Climate Justice for Arctic Indigenous Peoples." *Revue générale de droit* 43 (2013): 113-50.
- Lenton, T. M., H. Held, E. Kriegler, J. W. Hall, W. Lucht, S. Rahmstorf, and H. J. Schellnhuber. "Tipping Elements in the Earth's Climate System." *Proceedings of the National Academy of Sciences of the United States of America* 105, no. 6 (2008): 1786-93. <https://doi.org/10.1073/pnas.0705414105>.
- Lewis, Bridget. "Enhancing Good Governance within the International Climate Regime through Human Rights Principles." In *Governing the Climate Change Regime*, 195-214: Routledge, 2016.
- Meredith, M., M. Sommerkorn, S. Cassotta, C. Derksen, A. Ekaykin, A. Hollowed, G. Kofinas, *et al.* "Polar Regions." In *Ipcc Special Report on the Ocean and Cryosphere in a Changing Climate* edited by H.-O- Pörtner, D.C. Roberts, V. Masson-Delmotte, P. Zhai, M. Tignor, E.S. Poloczanska, K. Mintenbeck, *et al.* In press: Cambridge University press, 2019.
- Muiderman, Karlijn, Aarti Gupta, Joost Vervoort, and Frank Biermann. "Four Approaches to Anticipatory Climate Governance: Different Conceptions of the Future and Implications for the



- Present." *Wiley Interdisciplinary Reviews: Climate Change* 11, no. 6 (2020): e673.
- Nadasdy, Paul. "Reevaluating the Co-Management Success Story." *Arctic* (2003): 367-80.
- Nilsson, Annika E. "Arctic Climate Change: North American Actors in Circumpolar Knowledge Production and Policy Making." *Changing Climates in North American Politics: Institutions, Policymaking, and Multilevel Governance* (2009): 199.
- Norris, Andrew J., and Patrick McKinley. "The Central Arctic Ocean-Preventing Another Tragedy of the Commons." *Polar Record* 53, no. 1 (2017): 43-51.
- Osakada, Yuko. "From Victims to Contributors: A Human Rights Approach to Climate Change for the Indigenous Peoples of the Arctic." *The Yearbook of Polar Law Online* 13, no. 1 (2022): 16-38.
- Pörtner, H.-O, D.C Roberts, E.S Poloczanska, K Mintenbeck, M Tignor, A Alegría, M Craig, *et al.* "Summary for Policymakers." In *Climate Change 2022: Impacts, Adaptation, and Vulnerability*, edited by H.-O Pörtner, D.C Roberts, E S Poloczanska, K Mintenbeck, M Tignor, A Alegría, M Craig, *et al.* Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, 1-35. Cambridge: Cambridge University Press, 2022.
- Quay, Ray. "Anticipatory Governance: A Tool for Climate Change Adaptation." *Journal of the American Planning Association* 76, no. 4 (2010): 496-511.
- Rayfuse, Rosemary. "Regulating Fisheries in the Central Arctic Ocean: Much Ado About Nothing?". In *Arctic Marine Resource Governance and Development*, 35-51: Springer, 2018.
- . "The Role of Law in the Regulation of Fishing Activities in the Central Arctic Ocean." *Marine Policy* 110 (2019): 103562.
- Sejersen, Frank. "Mobility, Climate Change, and Social Dynamics in the Arctic: The Creation of New Horizons of Expectation and the Role of Community." *Climate change and human mobility: global challenges to the social sciences*. Cambridge University Press, Cambridge, UK (2012): 190-213.
- . "Resilience, Human Agency and Climate Change Adaptation Strategies in the Arctic." In *The Question of Resilience. Social Responses to Climate Change* edited by Kirsten Hastrup: The Royal Danish Academy of Sciences and Letters, 2009.
- . *Rethinking Greenland and the Arctic in the Era of Climate Change: New Northern Horizons*. Routledge, 2015.
- Snoeijls-Leijonmalm, Pauline, Hauke Flores, Filip Volckaert, Barbara Niehoff, Fokje Schaafsma, J Hjelm, J Hentati-Sundberg, *et al.* "Review of the Research Knowledge and Gaps on Fish Populations, Fisheries and Linked Ecosystems in the Central Arctic Ocean (Cao)." (2020).
- Spijkers, Jessica, Andrew Merrie, Colette CC Wabnitz, Matthew Osborne, Malin

Mobjörk, Örjan Bodin, Elizabeth R Selig, *et al.* "Exploring the Future of Fishery Conflict through Narrative Scenarios." *One Earth* 4, no. 3 (2021): 386-96.

Vylegzhanin, Alexander N, Oran R Young, and Paul Arthur Berkman. "The Central

Arctic Ocean Fisheries Agreement as an Element in the Evolving Arctic Ocean Governance Complex." *Marine Policy* 118 (2020): 104001.