

## Chapter 14

### Bioprospecting at the Poles

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#### 1. Introduction

The natural properties of many cold loving organisms, and their ability to survive and thrive in the cold and harsh environments of the Arctic and the Antarctic, has sparked interest in such life forms' potential for inspiring new developments in biotechnology. Products developed from the biodiversity of the Arctic and Antarctica have been successfully commercialized and are now on the market. This Chapter examines bioprospecting and the commercial exploitation of the Polar regions' biodiversity for the development of new biotechnology.

The Chapter begins by outlining the reasons why both the Arctic and Antarctica are of interest to the biotechnology industry. Debates surrounding regulation of bioprospecting in Antarctica and the Southern Ocean are examined and the key issues at stake are outlined. Debates on potential regulation of bioprospecting in Antarctica first occurred at Antarctic Treaty meetings in 2002, and since then its implications for Antarctica have been debated regularly within the various Antarctic Treaty forums. Some 18 years later no definitive resolution of the issue has been achieved. In contrast, in the Arctic, most bioprospecting has occurred within areas of national jurisdiction. The third part of this Chapter examines the emergence of bioprospecting regulation within national jurisdiction in the Arctic, primarily in Finland, Sweden, Norway and Greenland (Denmark). Examination of these jurisdictions highlights that domestic regimes are implemented consistently with the provisions of the 1992 United Nations Convention on Biological Diversity (1992 CBD)<sup>1</sup> and its associated 2010 Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity (Nagoya Protocol).<sup>2</sup> Finally, this Chapter examines the implications of the international instrument currently being developed in relation to biodiversity in areas beyond national jurisdiction (the BBNJ instrument) for the small part of the Arctic that lies beyond national jurisdiction, and for Antarctica and the Southern Ocean. The Chapter concludes with brief observations comparing and contrasting the three different approaches to bioprospecting.

#### 2. Why is Antarctica and the Arctic of Interest to the Biotechnology Industry?

Despite harsh conditions, an abundance of biodiversity flourishes in the Arctic, Antarctica, and in the surrounding ocean. In addition to biodiversity such as mammals, birds and other marine life, Polar environments are also host to a wide diversity of species of bacteria, fungi, algae, protozoa and metazoan.<sup>3</sup> The ways that biodiversity has adapted to grow and thrive in

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<sup>1</sup> Adopted 5 June 1992, entered into force 29 December 1993, 1760 UNTS 79.

<sup>2</sup> Adopted 29 October 2010, entered in force 12 October 2014, at <http://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf> (accessed 9 April 2019).

<sup>3</sup> Christopher Krembs, Hajo Eicken, Karen Junge et al, 'High Concentrations of Exopolymeric Substances in Arctic Winter Sea Ice: Implications for the Polar Ocean Carbon Cycle and Cryoprotection of Diatoms' (2002) 49 *Deep-Sea Research I* 2163, 2164.

these harsh environments offers insights for potential applications in biotechnology, which in turn is driving bioprospecting in both regions.<sup>4</sup>

There is no single agreed definition of bioprospecting. However, for the purposes of this Chapter one useful definition is that bioprospecting involves ‘the collection of small samples of biological materials for screening in the search for commercially exploitable biologically active compounds or attributes such as genetic information’.<sup>5</sup> Owing to the close relationship between scientific research and bioprospecting it is often difficult to distinguish between the two. This blurring of the distinction between scientific research and bioprospecting and its implications for regulation is a recurrent theme in nearly all international debates on bioprospecting.<sup>6</sup>

Despite no clear consensus on what constitutes bioprospecting, there is significant evidence of the activity in both Polar regions. Different companies are active in the Arctic compared to Antarctica. Companies active in the Arctic are largely based in the various Arctic jurisdictions. However, those active in commercialization of Antarctica’s biodiversity come from a diverse range of European, North American and Asian countries.

A series of policy reports and scholarly publications over the past decade have confirmed the important role biodiversity of the Polar regions is now playing in new developments in biotechnology.<sup>7</sup> In the Arctic, the focus is on five key areas: enzymes for use in a range of industrial processes; bioremediation and other pollution control technologies; anti-freeze proteins for use in food technology; dietary supplements with a particular focus on polyunsaturated fatty acids; and pharmaceuticals and other medical uses.<sup>8</sup> Significantly, this research and development has been heavily geared towards new developments in marine biotechnology, especially in Norway.<sup>9</sup>

The evidence of the extent of interest in Antarctica’s biodiversity is similarly compelling. In 2010, the Scientific Committee on Antarctic Research (SCAR) concluded that ‘bioprospecting research in the Antarctic region and/or involving Antarctic organisms is extensive and widespread’.<sup>10</sup> A series of reports to Antarctic Treaty Consultative Meetings (ATCM) show bioprospecting in Antarctica and the Southern Ocean is growing. Detailed data on the scale and key areas of research and development have been presented at and considered in numerous Information and Working Papers at such meetings, including

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<sup>4</sup> Donatella de Pascale, Concetta De Santi, Juan Fu et al, ‘The Microbial Diversity of Polar Environments is a Fertile Ground for Bioprospecting’ (2012) 8 *Marine Genomics* 15.

<sup>5</sup> David. Farrier and Linda Tucker, ‘Access to Marine Bioresources: Hitching the Conservation Cart to the Bioprospecting Horse’ (2001) 32(3) *Ocean Development & International Law* 213.

<sup>6</sup> See discussion in Salvatore Aricò and Charlotte Salpin, *Bioprospecting Genetic Resources in the Deep Seabed: Scientific, Legal and Policy Aspects*, UNU-IAS Report (Yokohama, United Nations University, 2005) at <http://collections.unu.edu/view/UNU:3101> (accessed 16 August 2019).

<sup>7</sup> See David Leary, *Bioprospecting in the Arctic*, UNU-IAS Report (Yokohama, United Nations University, 2008), 12.

<sup>8</sup> *Ibid.*

<sup>9</sup> *Ibid.*, 24.

<sup>10</sup> Scientific Committee on Antarctic Research (SCAR), *Biological prospecting in the Antarctic region: a conservative overview of current research*, ATCM XXXIII, WP 2 (2010), 5.

meetings held in 2003 through 2007,<sup>11</sup> 2009 and 2010,<sup>12</sup> 2013 through 2015,<sup>13</sup> and in 2017 and 2018.<sup>14</sup> In addition, individual countries, including Argentina,<sup>15</sup> Belgium,<sup>16</sup> Brazil,<sup>17</sup> Romania<sup>18</sup> and the Netherlands,<sup>19</sup> have all reported on their bioprospecting activities in Antarctica. A survey of patent data presented at ATCM XLI in May 2018 highlights three key areas of current research and development: (1) pharmaceuticals; (2) industrial applications such as enzymes; and (3) krill related oils and nutritional supplements.<sup>20</sup>

Two states dominate applications for patents in relation to Antarctic genetic resources: China and the United States.<sup>21</sup> However, companies from other countries have also applied for patents, including Novozymes (Denmark), BASF (Germany), Hoffmann La Roche (Switzerland) and Mitsubishi (Japan).<sup>22</sup> Data also shows that while the private sector may collaborate with universities and research institutes on research and development related to Antarctic genetic resources, patents in relation to such research predominately end up being held solely by the private sector.<sup>23</sup> Other studies confirm products are now being sold to consumers.<sup>24</sup>

### 3. Bioprospecting and the Antarctic Treaty System

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<sup>11</sup> See United Kingdom and Norway, *Bioprospecting*, ATCM XXVI, IP 75 (2003); United Nations Environment Programme (UNEP), *Industry involvement in Antarctic bioprospecting*, ATCM XXVII, IP 106 (2004); UNEP, *Recent developments in biological prospecting relevant to Antarctica*, ATCM XXVIII, IP 93 (2005); see also Spain, *Biological Prospecting in Antarctica*, ATCM XXVIII, IP 8 (2005); UNEP, *Recent trends in the [sic] biological prospecting*, ATCM XXX, IP 116 (2006); UNEP, *Biological prospecting in Antarctica: Review, update and proposed tool to support a way forward*, ATCM XXX IP 67 (2007); Netherlands, Belgium and France, *Biological prospecting in the Antarctic Treaty area: Scoping for a regulatory framework*, ATCM XXX, WP 36 (2007).

<sup>12</sup> See Belgium, *An update on biological prospecting in Antarctica, including the development of the Antarctic Biological Prospecting Database*, ATCM XVII, WP 11 (2009); Belgium, Brazil, Bulgaria, Finland, France, Germany, Netherlands and Sweden, *The Antarctic Biological Prospecting Database*, ATCM XXXII, WP 1, (2009); SCAR, *Biological prospecting in the Antarctic region: A conservative overview of current research*, ATCM XXXIII, WP 2 (2010); Belgium and UNEP, *The role of ex-situ collections in Antarctic bioprospecting*, ATCM XXXIII, IP 96 (2010).

<sup>13</sup> Belgium, Netherlands and Sweden, *Biological prospecting in Antarctic: The need for improved information*, ATCM XXXVI, WP 48 (2013); Belgium and Netherlands, *An update on status and trends biological prospecting in Antarctica and recent policy developments at the international level*, ATCM XXXVI, IP 22 (2013); Netherlands, *An update on status and trends biological prospecting in Antarctica and recent policy developments at the international level*, ATCM XVII, IP 133 (2015).

<sup>14</sup> Netherlands, *An update on status and trends biological prospecting in Antarctica and recent policy developments at the international level*, ATCM XL, IP 168 (2017); Netherlands, *Biological prospecting in the Antarctic Treaty area*, ATCM XLI, IP 29 (2018).

<sup>15</sup> Argentina, *Argentine activities of bioprospecting and bioremediation in Antarctica*, ATCM XXIX, IP 112 (2006); see also Argentina, *Report on the recent bioprospecting activities carried out by Argentina during the period 2010–2011*, ATCM XXXIV, IP 16 (2011).

<sup>16</sup> Belgium, *Report on the bioprospecting activities carried out by Belgian scientists since 1998*, ATCM XXXV, IP 22 (2012).

<sup>17</sup> Brazil, *Bioprospecting activities of Brazil in Antarctica: A short report*, ATCM XXXII, IP 115 (2009).

<sup>18</sup> Romania, *Management plan for Romanian biological prospecting activities in Antarctica*, ATCM XXXV, IP 84 (2012).

<sup>19</sup> Netherlands, *A case of biological prospecting*, ATCM XXXIV, IP 62 (2011).

<sup>20</sup> Netherlands, IP 29, note 14, 4.

<sup>21</sup> *Ibid.*

<sup>22</sup> *Ibid.*, 6.

<sup>23</sup> *Ibid.*

<sup>24</sup> See, for example, studies such as Leary, note 7; Belgium et al, WP 1, note 12, 11. See also individual company websites such as Lipotec, ‘Antracticine® marine ingredient’ at <https://www.lipotec.com/en/products/antarcticine-reg-marine-ingredient/> (accessed 4 May 2019); MicroGEM, ‘Gong to Extremes for Nucleic Acid Extraction Solutions’ at <https://microgembio.com/about/culture-collection/> (accessed 4/5/19); and Aker Biomarine, ‘QRILL Pet’ at <https://www.qrillpet.com> (accessed 5 May 2019).

Bioprospecting in Antarctica has been controversial because it challenges key pillars of governance that underlie the Antarctic Treaty System (ATS). These challenges include the way the ATS manages competing territorial claims to Antarctica, scientific research and environmental protection.

Article IV (2) of the 1959 Antarctic Treaty<sup>25</sup> provides:

No acts or activities taking place while the present Treaty is in force shall constitute a basis for asserting, supporting or denying a claim to territorial sovereignty in Antarctica or create any rights of sovereignty in Antarctica. No new claim, or enlargement of an existing claim to territorial sovereignty in Antarctica shall be asserted while the present Treaty is in force.

While Article IV(2) has successfully diffused the potential for conflict over territory in Antarctica for over five decades, it has been suggested that bioprospecting has the potential to re-open debates on the legitimacy of territorial claims in Antarctica, especially in marine areas.<sup>26</sup> Could a unilateral attempt by an individual state to go it alone and regulate bioprospecting, for example, have the potential to re-open long frozen territorial disputes?<sup>27</sup> In a related theme, others have noted the close connection between resolution of the bioprospecting question in Antarctica to resolution of questions surrounding Antarctica's global purported status as either a global commons or the common heritage of mankind.<sup>28</sup>

Mirroring debates elsewhere in the world, ethical issues have been at the centre of debates in relation to bioprospecting in Antarctica, including who has the right to benefit from the utilization of Antarctic biodiversity.<sup>29</sup> However, in Antarctica there is an added dimension to these questions. Article II of the Antarctic Treaty guarantees 'freedom of scientific investigation in Antarctica'.<sup>30</sup> To that end, Article III provides for exchange of plans for scientific programmes, exchange of research personnel, and the free exchange of scientific observations and results<sup>31</sup>

However, questions have arisen as to whether bioprospecting poses a moral hazard for science and the unique role that science plays in governance under the ATS.<sup>32</sup> Hemmings has argued that bioprospecting in Antarctica is closely tied to scientific research in Antarctica, raising questions as to the ability to distinguish between science as a core advisor of Antarctic governance, from science as an active participant in bioprospecting.<sup>33</sup> In related arguments, others maintain that bioprospecting in Antarctica may hold other ethical implications with

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<sup>25</sup> Adopted 1 December 1959, entered into force 23 June 1961, 402 UNTS 71.

<sup>26</sup> Michelle Rogan-Finnemore, 'What bioprospecting means for Antarctica and the Southern Ocean' in Geoff Leane and Barbara Von Tigerstrom, *International Law Issues in the South Pacific* (Ashgate, Farnham 2005), 199.

<sup>27</sup> David Leary, 'Bi-polar Disorder? Is Bioprospecting an Emerging Issue for the Arctic as well as for Antarctica?' (2008) *Review of European Community and International Environmental Law* 41, 42.

<sup>28</sup> Julia Jabour, 'Biological Prospecting: The Ethics of Exclusive Reward from Antarctic Activity' (2010) *10 Ethics in Science and Environmental Politics* 19.

<sup>29</sup> Michelle Rogan-Finnemore, 'Setting the scene' in Alan Hemmings and Michelle Rogan-Finnemore, *Antarctic Bioprospecting* (Gateway Antarctica Special Publication Series, Christchurch, 2005), 6. See also Alistair Graham, 'Environmental, ethical and equity issues' in Hemmings and Rogan-Finnemore, *ibid*, 41–68.

<sup>30</sup> Antarctic Treaty, Art II.

<sup>31</sup> *Ibid*, Art III(1).

<sup>32</sup> Alan Hemmings, 'Does Bioprospecting Risk Moral Hazard for Science in the Antarctic Treaty System?' (2010) *10 Ethics in Science and Environmental Politics* 5.

<sup>33</sup> *Ibid*.

regard to science funding, personal gain, international scientific collaboration and interactions with industrial partners.<sup>34</sup>

Emphasis on the confidentiality of commercial research and development in relation to Antarctic genetic resources challenges the traditions of free and open exchange of scientific information that have characterized Antarctic scientific research.<sup>35</sup> Given the difficulty of distinguishing ‘pure’ scientific research from the more commercially focused bioprospecting, the regulation of bioprospecting could result in more regulation of scientific research, contrary to the norm of freedom of scientific research that prevails under the Antarctic Treaty. Similarly, the close association of bioprospecting with intellectual property rights may restrict the free and open exchange of scientific research that has characterized nearly all scientific research in Antarctica. Contrary to this, some have suggested that there is no inherent conflict between commercialization and free exchange of scientific information, because patenting only delays the sharing of this information.<sup>36</sup>

A final concern is the potential environmental impact.<sup>37</sup> However, it is not clear if the environmental impacts of bioprospecting in Antarctica are any greater than that of scientific research.<sup>38</sup> A comprehensive regime for managing environmental impact assessment is provided by the 1991 Madrid Protocol<sup>39</sup> to the Antarctic Treaty. Article 3(2) of the Madrid Protocol requires that activities in the Antarctic Treaty area (ATA) must be planned and conducted so as to limit adverse impacts on the Antarctic environment and dependent and associated ecosystems.<sup>40</sup> Article 3(2)(c) mandates that all activities in the ATA must be ‘planned and conducted on the basis of information sufficient to allow prior assessments of, and informed judgements about their possible impacts on the Antarctic environment’.<sup>41</sup>

In addition, the Madrid Protocol contains detailed provisions relating to environmental impact assessment, which would be triggered in the event that bioprospecting had more than a minor or transitory impact.<sup>42</sup> However, there are no cases where bioprospecting has reached that threshold. For example, in 2018, an initial environmental evaluation of a Brazilian project concluded that the proposed bioprospecting would have a less than minor or transitory impact and therefore did not require further environmental impact assessment.<sup>43</sup> Given that most bioprospecting in Antarctica is associated with microorganisms, it is unlikely environmental impact assessment will ever be required under the provisions of the Madrid Protocol<sup>44</sup>

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<sup>34</sup> Kevin Hughes and Paul Bridge, ‘Potential Impacts of Antarctic Bioprospecting and Associate Commercial Activities upon Antarctic Science and Scientists’ (2010) 10 *Ethics in Science and Environmental Politics* 13.

<sup>35</sup> See Dagmar Lohan and Sam Johnston, *Bioprospecting in Antarctica*, UNU-IAS Report (Yokohama, United Nations University, 2005); Leary, note 27.

<sup>36</sup> Kim Connolly-Stone, ‘Patents, property rights and benefit sharing issues’ in Hemmings and Rogan-Finnemore, note 29, 69.

<sup>37</sup> Julia Jabour and Dianne Nicol, ‘Bioprospecting in Areas Outside National Jurisdiction: Antarctica and the Southern Ocean’ (2003) 76(4) *Melbourne Journal of International Law* 76.

<sup>38</sup> Alan Hemmings and Michelle Rogan-Finnemore, ‘Environment, ethics and equity issues’ in Hemmings and Rogan-Finnemore, note 29, 255.

<sup>39</sup> Protocol on Environmental Protection to the Antarctic Treaty, adopted 4 October 1991, entered into force 14 January 1998, 2941 UNTS 3 [Madrid Protocol].

<sup>40</sup> *Ibid.*, Art 2(a).

<sup>41</sup> *Ibid.*, Art 3(2)(c).

<sup>42</sup> *Ibid.*, Art 8 and Annex 1, Art 1(2).

<sup>43</sup> Brazil, ‘Initial Environmental Evaluation of the project entitled “Biodiversity, monitoring, survival strategies and bioprospection of extremophilous seaweeds along Maritime Antarctica”’ at <https://www.ats.aq/devAS/EP/EIAItemDetail/1982> (accessed 9 January August 2020).

<sup>44</sup> David Leary, ‘Bioprospecting in Antarctica and the Arctic. Common Challenges?’ (2009) 1 *Yearbook of Polar Law* 145.

The taking of biological samples requires a permit issued by an authority of a state party to the Madrid Protocol.<sup>45</sup> A permit can only be granted where sampling is to provide specimens for scientific study or scientific information; museums, herbaria and botanical gardens, or other educational institutions or uses; or for zoological gardens. Sampling of mammals or birds will only be allowed if such specimens cannot be obtained from existing captive collections, or if there is a compelling conservation requirement.<sup>46</sup> If bioprospecting can be regarded as scientific study, then samples may be taken under a permit. If not, then bioprospecting could arguably be prohibited. Regardless of whether or not access to samples is regulated, there are no provisions contained within the Madrid Protocol dealing with benefit sharing.

There has been extensive debate within the ATS on the need for regulation. The issue has been discussed at every ATCM since 2002, several meetings of SCAR, one CCAMLR meeting and two separate intersessional contact group processes,<sup>47</sup> and by a meeting of the Committee on Environmental Protection.<sup>48</sup> Despite extensive deliberations only two resolutions have formally been adopted and neither establishes any new regulation. Resolution 7 adopted at ATCM XXVIII in 2005 recommended that governments

1. ... draw to the attention of their national Antarctic programmes and other research institutes engaged in Antarctic biological prospecting activities the provisions of Article III(1) of the Antarctic Treaty; [and]
2. ... continue to keep under review the question of biological prospecting in the Antarctic Treaty Area, and exchange on an annual basis information and views relating to that question as appropriate.<sup>49</sup>

In 2009, at ATCM XXXII, parties adopted Resolution 9, which recommended that governments

1. reaffirm that the Antarctic Treaty System is the appropriate framework for managing the collection of biological material in the Antarctic Treaty area and for considering its use;
2. emphasize that existing Antarctic Treaty system arrangements under the Protocol on Environmental Protection and the Convention on the Conservation of Antarctic Marine Living Resources address the environmental aspects of scientific research and the collection of biological material in the Antarctic region; and
3. keep matters raised under Antarctic Treaty Consultative Meeting Agenda Item 17 *Biological Prospecting in Antarctica* under active consideration within the Antarctic Treaty system, including in relation to obligations under Article III(1)(c) of the Treaty.<sup>50</sup>

Beyond this, state parties have been unable to agree on the need for any further regulation.

#### **4. Regulation of Bioprospecting in the Arctic**

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<sup>45</sup> Madrid Protocol, Annex II, Art 3(1).

<sup>46</sup> Ibid, Annex II, Art 3(2).

<sup>47</sup> Netherlands, IP 29, note 14.

<sup>48</sup> See Leary, note 27.

<sup>49</sup> ATCM Resolution 7 (2005) *Biological Prospecting*.

<sup>50</sup> ATCM Resolution 9 (2009) *Collection and Use of Antarctic Biological Material*.

The 1992 CBD confirms the sovereign right of nation states over their genetic resources.<sup>51</sup> It also recognizes that the authority to determine access to genetic resources<sup>52</sup> rests with national governments, subject to national legislation.<sup>53</sup> Countries are obliged to endeavour to create conditions to facilitate access to genetic resources.<sup>54</sup> However, access to genetic resources is subject to prior informed consent on mutually agreed terms.<sup>55</sup>

Subsequent to entry into force of the 1992 CBD, the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising out of their Utilization (the Bonn Guidelines) were adopted.<sup>56</sup> The Bonn Guidelines provided non-legally binding guidelines on how countries may develop legislative, administrative or policy measures on access and benefit sharing in relation to genetic resources under their jurisdiction.<sup>57</sup> Building on the Bonn Guidelines in 2010, parties to the 1992 CBD concluded negotiations on the 2010 Nagoya Protocol<sup>58</sup> to comprehensively address issues relating to access and benefit sharing of genetic resources. Pursuant to Article 3, the Protocol applies to genetic resources within the scope of Article 15 of the Convention and to the benefits arising from the utilization of such resources. It also applies to ‘traditional knowledge associated with genetic resources within the scope of the Convention and to the benefits arising from the utilization of such knowledge’.<sup>59</sup>

Under Article 3(1) of the Protocol, benefits arising from the utilization of genetic resources, as well as subsequent applications and commercialization, must be shared in a fair and equitable way with the party providing such resources.<sup>60</sup> Benefit sharing must be upon mutually agreed terms.<sup>61</sup> Benefit sharing can take many forms, both monetary and non-monetary, and Article 5(4) provides for a wide definition of benefits, including, but not limited to, those contained in the Annex to the Nagoya Protocol.

Benefit sharing is granted in exchange for access to genetic resources by the country of origin. The Nagoya Protocol recognizes sovereign rights over natural resources and provides that access can be granted subject to domestic access and benefit-sharing legislation or regulatory requirements.<sup>62</sup> Each party, in accordance with domestic law, shall take measures to ensure that the prior informed consent or approval and involvement of Indigenous and local communities is obtained for access to genetic resources where they have the established right to grant access to such resources.<sup>63</sup>

Prior informed consent is specifically required for all access to traditional knowledge associated with genetic resources.<sup>64</sup> States are obliged to take into consideration Indigenous and local communities’ customary laws, community protocols and procedures with respect to traditional knowledge associated with genetic resources.<sup>65</sup>

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<sup>51</sup> 1992 CBD, Art 3.

<sup>52</sup> Article 2 of the 1992 CBD defines genetic resources as ‘any material of plant, animal, microbial or other origin containing functional units of heredity’.

<sup>53</sup> *Ibid.*, Art 15(1).

<sup>54</sup> *Ibid.*, Art 15(2).

<sup>55</sup> *Ibid.*, Art 15(4).

<sup>56</sup> CBD, COP 6, Decision VI/24, ‘Access and Benefit-Sharing as related to genetic resources: Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of the Benefits Arising Out of their Utilization’ at <https://www.cbd.int/decision/cop/default.shtml?id=7198> (accessed 30 April 2019).

<sup>57</sup> *Ibid.*, Guideline 1.

<sup>58</sup> See note 2.

<sup>59</sup> Nagoya Protocol, Art 3.

<sup>60</sup> *Ibid.*, Art 3(1).

<sup>61</sup> *Ibid.*

<sup>62</sup> *Ibid.*, Art 6.

<sup>63</sup> *Ibid.*, Art 6(2).

<sup>64</sup> *Ibid.*, Art 7; see also Art 12.

<sup>65</sup> *Ibid.*, Art 12(1).

## 4.1 Access and Benefit Sharing in the European Union

More than 57 countries, plus the European Union (EU), have formulated domestic access and benefit sharing measures.<sup>66</sup> Of the Arctic jurisdictions, Canada, the Russian Federation, Finland, Denmark, Iceland, Sweden and Norway have all signed and ratified the 1992 CBD.<sup>67</sup> The United States has signed but not yet ratified the 1992 CBD and it looks unlikely to do so for the foreseeable future. However, only Finland, Denmark, Norway and Sweden have ratified the Nagoya Protocol.<sup>68</sup> The EU has been a party to the Nagoya Protocol since 5 March 2018. Three Arctic states (Sweden, Denmark and Finland) are members of the EU and, as such, measures adopted by the EU on access and benefit sharing apply in these jurisdictions, as well as any laws adopted domestically.

The EU has adopted an extensive regulatory regime to implement obligations under the Nagoya Protocol, primarily under (1) the EU ABS Regulation (EU)<sup>69</sup> and (2) the Commission Implementing Regulation.<sup>70</sup> In addition, the European Commission has also issued a non-legally binding guidance document on the scope of application and core obligations of the EU ABS Regulation (the EU ABS Guidance Document).<sup>71</sup>

The EU ABS Regulation establishes the rules governing compliance with access and benefit sharing for genetic resources and traditional knowledge in accordance with the provisions of the Nagoya Protocol.<sup>72</sup> The mechanisms for implementation of Articles 5, 7 and 8 of the EU ABS Regulation, dealing with the register of collections, the monitoring of user compliance and best practices, are further clarified in the EU Implementing Regulation.

Article 4 of the EU ABS Regulation imposes an obligation on all users of genetic resources to exercise due diligence to ascertain that genetic resources and traditional knowledge associated with genetic resources have been accessed in accordance with applicable access and benefit sharing registration or other regulatory requirements. This includes confirming that benefits are fairly and equitably shared upon mutually agreed terms.<sup>73</sup> To verify compliance, the EU ABS Regulation contains detailed obligations relating to record keeping, internationally recognized certificates of compliance and information provided on mutually agreed terms.<sup>74</sup> This latter obligation extends to include an obligation to pass such documentation on to any subsequent user of the genetic resources.<sup>75</sup>

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<sup>66</sup> Christian Prip, Kristin Rosendal, Steinar Andressen and Morton Walløe Tvedt, *The Australian ABS Framework. A Model Case for Bioprospecting?*, FNI Report 1/2014 (Oslo, Fridtjof Nansen Institutt, 2014), 6.

<sup>67</sup> See Convention on Biological Diversity, 'List of Parties' at <https://www.cbd.int/information/parties.shtml> (accessed 1 May 2019).

<sup>68</sup> Convention on Biological Diversity, 'Parties to the Nagoya Protocol' at <https://www.cbd.int/abs/nagoya-protocol/signatories/default.shtml> (accessed 1 May 2019).

<sup>69</sup> Regulation (EU) No 511/2014 of the European Parliament and of the Council of 16 April 2014 on compliance measures for users from the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from the Utilization in the Union, OJ L150/59 (16 April 2014) [EU ABS Regulation].

<sup>70</sup> Commission Implementing Regulation (EU) 2015/1866 of 13 October 2015 laying down detailed rules for the implementation of Regulation (EU) No 511/2014 of the European Parliament and of the Council as regards the register of collections, monitoring user compliance and best practices, OJ L275/4 (13 October 2015).

<sup>71</sup> Commission Notice: Guidance document on the scope of application and core obligations of Regulation (EU) No 511/2014 of the European Parliament and of the Council on the compliance measures for users from the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilisation in the Union, C/2016/5337, OJ C 313/1 (27 August 2016) [EU ABS Guidance Document].

<sup>72</sup> EU ABS Regulation, note 69, Art 1.

<sup>73</sup> *Ibid*, Art 4.

<sup>74</sup> *Ibid*, Art 4(3).

<sup>75</sup> *Ibid*.



The due diligence obligations aim to ensure that the necessary information related to the genetic resources is available throughout the value chain of the utilization of genetic resources.<sup>76</sup> This is to ensure all users know of, and respect rights and obligations attached to, genetic resources and all associated traditional knowledge.<sup>77</sup>

The EU ABS Regulation also addresses a range of other topics, including the creation of a register of collections,<sup>78</sup> provisions for competent authorities and focal points,<sup>79</sup> monitoring and checks on compliance,<sup>80</sup> and a process for the establishment of best practices.<sup>81</sup> It applies to genetic resources over which states exercise sovereign rights, and to traditional knowledge associated with genetic resources that are accessed after the entry into force of the Nagoya Protocol for the EU.<sup>82</sup> The EU ABS Regulation also applies to the benefits arising from the utilization of such genetic resources and associated traditional knowledge.<sup>83</sup> The EU ABS Regulation only applies to genetic resources and associated traditional knowledge from provider countries that have ratified the Nagoya Protocol and which have access and benefit sharing legislation or other requirements in place consistent with the provisions of the Protocol.<sup>84</sup>

The EU ABS Guidance Document clarifies that the EU ABS Regulation does ‘not apply to the genetic resources obtained from areas beyond national jurisdiction (for example, from the high seas), and from areas covered by the [ATS]’.<sup>85</sup> In addition, the temporal scope of the EU ABS Regulation limits its application to genetic resources accessed and utilized after the Nagoya Protocol entered into force for the EU.<sup>86</sup> The material scope of the EU ABS Regulation is also limited. It does not apply to the genetic resources governed by specialized international instruments and other agreements,<sup>87</sup> to genetic material covered by the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRA),<sup>88</sup> and the World Health Organization’s Pandemic Influenza Preparedness (PIP) Framework.<sup>89</sup> Human genetic resources are likewise outside the scope of the EU ABS Regulation, as are trade and exchange of genetic resources as commodities (such as agricultural, fisheries or forest products). However, this can change if such a commodity is subsequently used for research and development for biotechnology purposes.<sup>90</sup> Whether genetic resources are held privately or publicly is not relevant in defining whether or not the EU ABS Regulations apply.<sup>91</sup>

Definitions used in the EU ABS Regulation match those contained in the 1992 CBD and the Nagoya Protocol, but with some notable exceptions. Firstly, because there is no internationally accepted definition of ‘traditional knowledge’ and no such definition is provided in the Nagoya Protocol, the EU ABS Regulation provides a definition explicitly linked to the contractual provisions of mutually agreed terms mandated by the Protocol. Thus Article 3(7) of the EU ABS Regulation defines ‘traditional knowledge’ as meaning

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<sup>76</sup> EU ABS Guidance Document, note 71, 11.

<sup>77</sup> Ibid.

<sup>78</sup> EU ABS Regulation, note 69, Art 5.

<sup>79</sup> Ibid, Art 6.

<sup>80</sup> Ibid, Arts 7, 9.

<sup>81</sup> Ibid, Art 8.

<sup>82</sup> Ibid, Art 2(1).

<sup>83</sup> Ibid.

<sup>84</sup> Ibid, Article 2(4); see Also EU ABS Guidance Document, note 71, [2.1.2].

<sup>85</sup> EU ABS Guidance Document, *ibid*, [2.1.1].

<sup>86</sup> Ibid, [2.2].

<sup>87</sup> EU ABS Regulation, note 69, Art 2(2).

<sup>88</sup> EU ABS Guidance Document, note 71, [2.3.1].

<sup>89</sup> Ibid, [2.3.1].

<sup>90</sup> Ibid.

<sup>91</sup> Ibid.

traditional knowledge held by an indigenous or local community that is relevant for the utilisation of genetic resources and that is as such described in the mutually agreed terms that apply to the utilisation of genetic resources.<sup>92</sup>

Secondly, ambiguity surrounds the meaning of the terms ‘research’ and ‘development’, which are used in both the EU ABS Regulation and the Nagoya Protocol but are not defined. The EU ABS Guidance Document acknowledges this ambiguity providing a detailed discussion of the meaning of ‘research and development’, especially in the context of upstream activities.<sup>93</sup> While non-legally binding, this aspect of the EU ABS Guidance Document will be useful for researchers to determine whether or not the EU ABS Regulation applies to their activities.

Derivatives are covered by the EU ABS Regulation where they are derived from genetic resources accessed under the Nagoya Protocol, covered by the required prior informed consent related to genetic resources from which they were derived, and are addressed in mutually agreed terms.<sup>94</sup> While some derivatives fall under the EU ABS Regulation, digital information relating to genetic resources does not.<sup>95</sup>

## 4.2 Sweden

The Nagoya Protocol entered into force for Sweden on 7 December 2016. Sweden does not currently have specific domestic legislation in force regulating access to Swedish genetic resources.<sup>96</sup> However, the EU ABS Regulation applies in Sweden by virtue of Sweden’s membership of the EU, and aspects of the EU ABS Regulation are supplemented by Ordinance 2016:858 on the use of genetic resources and traditional knowledge of such resources.<sup>97</sup> The Ordinance deals with administrative matters relating to the implementation of the Nagoya Protocol and the EU ABS Regulation in Sweden, and vests responsibility for administration and oversight in the Swedish Environmental Protection Agency.

## 4.3 Finland

Finland implements aspects of the Nagoya Protocol and the EU ABS Regulation through an Act adopted by the Finnish parliament on 1 March 2016.<sup>98</sup> Beyond measures contained in the EU ABS Regulation, the scope of the Finnish legislation is limited to imported genetic resources and traditional knowledge of Indigenous communities associated with them.<sup>99</sup> The

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<sup>92</sup> EU ABS Regulation, note 69, Art 3(7).

<sup>93</sup> See EU ABS Guidance Document, note 71, [2.3.3].

<sup>94</sup> Ibid, 9.

<sup>95</sup> Ibid, 10.

<sup>96</sup> CBD, Access and Benefit Sharing Clearing House, ‘Legislative, Administrative or Policy Measures on Access and Benefit Sharing: Sweden’ at <https://absch.cbd.int/database/record/ABSCH-MSR-SE-208288> (accessed 1 May 2019).

<sup>97</sup> Förordning (2016:858) om användning av genetiska resurser och traditionell kunskap om sådana resurser. The Ordinance can be accessed in Swedish at [https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/forordning-2016858-om-anvandning-av-genetiska\\_sfs-2016-858](https://www.riksdagen.se/sv/dokument-lagar/dokument/svensk-forfattningssamling/forordning-2016858-om-anvandning-av-genetiska_sfs-2016-858) (accessed 1 May 2019). This brief summary of the Swedish Ordinance is based on an unofficial translation prepared by the author using Google translate.

<sup>98</sup> The following discussion is based on an unofficial English translation of the Act on the Implementation of the Nagoya Protocol to the Convention on Biological Diversity provided by the Finnish Ministry of the Environment at <https://absch.cbd.int/database/record/ABSCH-MSR-FI-207673> (accessed 1 May 2019). Only Finnish or Swedish versions of this legislation is authoritative.

<sup>99</sup> Ibid, section 2.

Act imposes an obligation on users of imported genetic resources or traditional knowledge of Indigenous communities to provide notification to the relevant competent authority.<sup>100</sup> It also regulates access to knowledge contained in a database managed by the Saami Parliament.<sup>101</sup> Traditional knowledge contained in this database must not be used in a way that weakens the opportunities of the Saami people to use their rights as an Indigenous people and to maintain and develop their culture and to engage in their traditional livelihoods.<sup>102</sup> The Act also contains provisions on enforcement of the provisions of the legislation and the EU ABS Regulation, including penalties for non-compliance.<sup>103</sup>

#### 4.4 Denmark

The Nagoya Protocol entered into force for Denmark on 12 October 2014.<sup>104</sup> The EU ABS Regulation applies in Denmark by virtue of Denmark's membership of the EU. Denmark has also enacted an Act on sharing benefits arising from the utilization of genetic resources (the Danish Benefit Sharing Act).<sup>105</sup> The Danish Benefit Sharing Act provides that genetic resources sourced from overseas must not be used in Denmark if they have been acquired in violation of access legislation in the source country (i.e., in a manner inconsistent with the Nagoya Protocol).<sup>106</sup> This prohibition on use extends to traditional knowledge.<sup>107</sup> The Act also grants power to the Danish minister for the environment to adopt regulations requiring reporting of the collection of genetic resources from wild organisms in Denmark, including information on intended utilization.<sup>108</sup> These regulations have not yet been enacted.

#### 4.5 Greenland

Denmark's approval of the Nagoya Protocol does not apply to Greenland or the Faroe Islands.<sup>109</sup> As such, the Protocol and the EU ABS Regulation do not apply to these two Danish territories. However, access and benefit sharing of genetic resources in Greenland is regulated under legislation enacted by the Home Rule Parliament. Greenland was the first Arctic jurisdiction to enact legislation in relation to access and benefit sharing in the Arctic, in 2006.<sup>110</sup> This legislation was repealed with the enactment by the Home Rule Parliament of

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<sup>100</sup> Ibid, section 5.

<sup>101</sup> Ibid, sections 6, 7.

<sup>102</sup> Ibid, section 8.

<sup>103</sup> Ibid, sections 13, 15, 17.

<sup>104</sup> CBD, Access and Benefit-Sharing Clearing House, 'Denmark' at <https://absch.cbd.int/countries/DK> (accessed 1 May 2019).

<sup>105</sup> Act on Sharing Benefits Arising from the Utilisation of Genetic Resources (Denmark), Act no. 1375 23/12/2012. Official English translation at <https://absch.cbd.int/api/v2013/documents/8C9F1ADB-89DF-B6E2-DF7D-F3F0802AE59B/attachments/Act%20on%20sharing%20benefits%20arising%20from%20the%20utilisation%20of%20genetic%20resources.pdf> (accessed 1 May 2019).

<sup>106</sup> Ibid, section 3.

<sup>107</sup> Ibid, section 4.

<sup>108</sup> Ibid, section 6.

<sup>109</sup> CBD, 'Denmark', note 104.

<sup>110</sup> David Leary, 'Greenland's New Legislation on Commercial and Research-related Use of Biological Resources: Implications for the International Polar Year and Later' (2008) 44 (229) *Polar Record* 97.

the Act on Utilization of Genetic Resources and Activities in Connection Therewith (Greenland ABS legislation), which came into force on 1 June 2016.<sup>111</sup>

The aim of the Greenland ABS legislation is to preserve biodiversity, provide for the sustainable use of genetic resources, provide for reasonable and fair distribution of benefits from exploitation of genetic resources, and to provide for reasonable and fair distribution of dividends resulting from exploitation of traditional knowledge relating to genetic resources owned by Indigenous peoples and local communities.<sup>112</sup> It also asserts the sovereign right of the Greenland Self-Government to own and control utilization of Greenland's genetic resources.<sup>113</sup> The utilization of genetic resources is very widely defined and includes carrying out

research or development on . . . genetic or biochemical composition of genetic resources, including through use of biotechnology. The utilisation of genetic resources also means subsequent uses and commercialisation, including the development, marketing and sales of products based on genetic engineering [sic] resources. Exploitation includes any activity related to research, development, application, commercialisation, marketing and sales . . . including collection, examination, registration, storage, transfer, acquisition, receipt, use and export of genetic resources.<sup>114</sup>

More than any other legislation adopted by Arctic states, the Greenland ABS legislation has wide application. It purports to apply to

- any access to, and exploitation of, genetic resources in Greenland and abroad;
- any access in Greenland to genetic resources from another country other than Greenland and anyone utilizing in Greenland of genetic resources from another country;
- publication of research findings on Greenland's genetic resources;
- patents and other intellectual property rights relating to such genetic resources; and
- products extracted from or produced from Greenland's genetic resources.<sup>115</sup>

The legislation also applies to traditional knowledge relating to genetic resources held by Indigenous peoples and local communities. A licence holder under the legislation performing activities relating to utilization of genetic resources is obliged to examine and assess whether relevant traditional knowledge exists, and whether and how any traditional knowledge can be used with the exploitation of this genetic resource.<sup>116</sup> More detailed regulations on traditional knowledge may be adopted.<sup>117</sup>

The Greenland ABS legislation establishes a licensing system for the exploitation of Greenland's genetic resources. A licence is required for any exploitation of Greenland's

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<sup>111</sup> Inatsisartutlov nr. 3 af 3. juni 2016 om udnyttelse af genetiske ressourcer og aktiviteter i forbindelse dermed. The Act can be accessed in Danish at <http://lovgivning.gl/lov?rid=%7b9FD12C4B-DB13-4545-B38E-F617738BD35F%7d> (accessed 2 May 2019). The following discussion is based on English translation of this version of the legislation by Google translate and is not an official English translation. A further brief summary in English is also available at Business Greenland, 'Collection and research of genetic resources' at <https://www.businessingreenland.gl/en/Erhverv/Genetiske-ressourcer>.

<sup>112</sup> Ibid, section 1.

<sup>113</sup> Ibid, section 2.

<sup>114</sup> Ibid, section 6(11).

<sup>115</sup> Ibid, section 4.

<sup>116</sup> Ibid, section 5.

<sup>117</sup> Ibid, section 5(2).

genetic resources either in Greenland or overseas.<sup>118</sup> Such a license is nonexclusive.<sup>119</sup> It may include conditions on benefit sharing (in the legislation called a ‘dividend sharing agreement’) and can include financial and non-economic benefits arising from the exploitation of Greenland’s genetic resources.<sup>120</sup> This is in addition to payment of remuneration to the government of Greenland in relation to the license.<sup>121</sup>

The Greenland ABS legislation also imposes obligations in relation to publications arising from research and exploitation of Greenland’s genetic resources.<sup>122</sup> This includes an obligation to provide copies of all such publications to the Greenland Self-Government and an explicit obligation to cite the permit number of the exploitation license granted for the research.<sup>123</sup> However, these obligations only need to be complied with to the extent that they do not conflict with regulations relating to intellectual property and publication.<sup>124</sup> The legislation also contains an obligation to notify the Greenland Self-Government before applications for patents are lodged.<sup>125</sup>

The Greenland ABS legislation also imposes obligations on the use of genetic resources sourced from outside Greenland requiring compliance with regulation and access and benefit sharing agreements that may be in place with the provider country.<sup>126</sup> These obligations extend to the use of associated traditional knowledge.<sup>127</sup>

#### 4.6 Norway

Norway is a party to both the 1992 CBD and the Nagoya Protocol. Access and benefit sharing in Norway is regulated by (1) the Marine Resources Act,<sup>128</sup> (2) the Nature Diversity Act,<sup>129</sup> and (3) the Regulation on Traditional Knowledge Associated with Genetic Material.<sup>130</sup> Given that the majority of bioprospecting in Norway focusses on the marine environment, the following discussion confines its examination to the Marine Resources Act.

The aim of the Marine Resources Act is ‘to ensure sustainable and economically profitable management of wild living marine resources and genetic material derived from them, and to promote employment and settlement in coastal communities’.<sup>131</sup> Pursuant to section 2 of the Act, ‘wild living resources’ belong to Norwegian society as a whole.

The provisions of the Act apply to all harvesting and other utilization of wild living marine resources and genetic material derived from them.<sup>132</sup> Wild living marine resources are defined as including fish, marine mammals that spend part or all of their life cycle in the sea,

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<sup>118</sup> Ibid, section 9.

<sup>119</sup> Ibid, section 9(3).

<sup>120</sup> Ibid, section 11.

<sup>121</sup> Ibid, section 9(5).

<sup>122</sup> Ibid, section 18.

<sup>123</sup> Ibid, section 18(3).

<sup>124</sup> Ibid, section 18(4).

<sup>125</sup> Ibid, section 19.

<sup>126</sup> Ibid, section 7(3), 24.

<sup>127</sup> Ibid, section 5.

<sup>128</sup> Lov nr. 37 of 6 June 2008 om forvaltning av viltlevande marine ressursar (Marine Resources Act) (Norway), unofficial English translation, at <http://extwprlegs1.fao.org/docs/pdf/nor82017E.pdf>? (accessed 27 August 2019).

<sup>129</sup> Lov nr. 100 of 19 June 2009 om forvaltning av naturens mangfold (Nature Diversity Act) (Norway), in Norwegian, at <http://www.fao.org/faolex/results/details/en/c/LEX-FAOC098830> (accessed 27 August 2019).

<sup>130</sup> Regulation nr. 1367 of 25 November 2016 relating to the protection of traditional knowledge associated with genetic material (Norway), unofficial English translation, at <https://lovdata.no/dokument/SFE/forskrift/2016-11-25-1367> (accessed 27 August 2019).

<sup>131</sup> Marine Resources Act (Norway), note 128, section 1.

<sup>132</sup> Ibid, section 3.

and plants and other marine organisms that live in the sea or on or under the seabed and that are not privately owned.<sup>133</sup> However, anadromous salmonids are specifically excluded.<sup>134</sup> The Act also applies to other activities in connection with harvesting and other utilization of catches, such as transshipment, delivery, landing, receipt, storage, production and placing on the market.<sup>135</sup>

The Marine Resources Act applies

- on board Norwegian vessels;
- within Norwegian land territory with the exception of Jan Mayen and Svalbard (although regulations can be issued under the Act extending its operation to land territory on Jan Mayen, Svalbard, Bouvet Island, Peter's Island and Dronning Maud Land);<sup>136</sup>
- in the Norwegian territorial sea and internal waters; and
- on the Norwegian continental shelf, and in the Norwegian exclusive economic zone.<sup>137</sup>

Outside the areas mentioned above, the Act applies to Norwegian legal persons in so far as this is not in conflict with the jurisdiction of another state.<sup>138</sup> Provisions also recognise the possibility of the jurisdictional scope of the legislation extending to foreign natural and legal persons within Norway's exclusive economic zone (EEZ) and outside the jurisdiction of any state, if that follows from an international agreement.<sup>139</sup>

Chapter 2 of the Marine Resources Act deals specifically with marine bioprospecting. Section 9, which regulates the conduct of marine bioprospecting, provides that the 'King may prescribe that harvesting and investigations in the sea in connection with marine bioprospecting require a permit from the Ministry'.<sup>140</sup> Section 9 also provides that the King may adopt regulations on marine bioprospecting, covering such things as exemptions under the Act, information that must be provided for a permit under the Act, and any further rules on the types of conditions that may be imposed.

Section 10 of the Act deals with benefits arising out of the use of marine genetic material, and provides that permits issued for bioprospecting under Section 9 can include conditions on sharing of a proportion of the benefits arising out of the use of Norwegian marine genetic material with the Norwegian state. Permits can also require that the results of bioprospecting not be sold or communicated to others without the consent of and, if required, payment to the Norwegian state.<sup>141</sup> Where marine bioprospecting or the use of genetic material has taken place without a permit being issued under Section 9, a proportion of the benefits may still accrue to the Norwegian state.<sup>142</sup>

#### 4.7 Other Arctic Jurisdictions

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<sup>133</sup> Ibid.

<sup>134</sup> Ibid.

<sup>135</sup> Ibid.

<sup>136</sup> Thus potentially extending to Norwegian activities in Antarctica.

<sup>137</sup> Marine Resources Act (Norway), note 128, section 4.

<sup>138</sup> Ibid.

<sup>139</sup> Ibid, section 5.

<sup>140</sup> Ibid, section 9.

<sup>141</sup> Ibid, section 10.

<sup>142</sup> Ibid.

Canada, Iceland, the Russian Federation and the United States are not parties to the Nagoya Protocol. Therefore they have not legislated specifically to implement obligations under the Protocol.

Given that Canada hosts the CBD Secretariat, it is surprising that there is no national regulation governing access to and benefit sharing of Canadian genetic resources. While there have been various government initiatives over the past decade to examine the policy implications of access and benefit sharing in Canada, currently there is no national scheme in place. There are, however, some sub-national access and benefit sharing schemes in parts of Canada, such as the Scientists and Explorers Act 2002 (Yukon), which applies in the Yukon, and the Scientists Act 1988 (Northwest Territories), which applies in Nunavut.<sup>143</sup> Similarly, in national parks and conservation areas, the Parks Canada Research and Collection Permit System applies.<sup>144</sup>

Currently, in Iceland, there is no clear framework relating to access and benefit sharing. However, access to Iceland's geothermal areas is regulated under Law No 57/1998 on Research and Exploration of Natural Resources in the Ground, and arguably this legislation applies to the harvesting of microorganisms in geothermal areas.<sup>145</sup>

The situation in Russia is far more complicated. A recent study of the law in the Russian Federation noted that there is currently 'no consolidated Law on ABS'.<sup>146</sup> However, it is reported to be developing access and benefit sharing legislation in preparation for its likely ratification of the Nagoya Protocol.<sup>147</sup> Development of ABS policy is being undertaken by the Russian Department of Environment and Environmental Security of the Ministry of Natural Resources and the Department of Science, Ministry of Economic Development and Trade.<sup>148</sup> Currently, individual access requests are dealt with on an ad hoc basis under various laws<sup>149</sup> administered by a range of ministries and authorities.<sup>150</sup> However, it has been suggested that these laws have been implemented with little regard for the rights and interests of Indigenous and local communities.<sup>151</sup>

While the United States is a signatory, it has not ratified the 1992 CBD or any of its protocols. There is no federal ABS legislation relating to bioprospecting in its Arctic territory, although specific legislation dealing with management of national parks may restrict some activities associated with bioprospecting in national parks. Only two state jurisdictions,

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<sup>143</sup> Freedom Kai-Phillips, 'Access and benefit-sharing in Canada: Glimpses from the national experiences of Brazil, Namibia and Australia to inform indigenous-sensitive policy' in Chidi Oguamanam, *Genetic Resources, Justice and Reconciliation* (Cambridge University Press, Cambridge, 2018), 157. See also Chidi Oguamanam and Jain Vipal, 'Access and Benefit Sharing, Canadian and Aboriginal Research after the Nagoya Protocol: Digital DNA and Transformations in Biotechnology' (2017) 3 *Journal Environmental Law and Practice* 79.

<sup>144</sup> Kai-Phillips, *ibid.* This system operates under Canadian federal legislation such as the Canada National Parks Act (SC 2000, c 32), the Canada National Marine Conservation Areas Act (SC 2002, c 18), the Saguenay-St. Lawrence Marine Park Act (SC 1997, c 37), and the Species at Risk Act (SC 2002, c 29).

<sup>145</sup> Leary, note 27, 51.

<sup>146</sup> Hasrat Arjjumend, Sabiha, Alam, Nikolay Shishatskiy and Timo Koivurova, 'Analysis of Evolving Domestic Access and Benefit Sharing Legislation in Russia from the Perspective of Indigenous People and Local Communities' (2016) 2 *Journal of Global Resources* 109, 114.

<sup>147</sup> *Ibid.*, 112.

<sup>148</sup> *Ibid.*, 111.

<sup>149</sup> According to Arjjumend et al, note 146, these laws are the Patents Act, 1993; Law on Veterinary Medicine, 1993; Law on Selection Achievements, 1994; Law on Copyright and Related Rights, 1994; Law on State Regulation of Foreign Trade, 1994; Law on Wildlife, 1995; Law on Science and State Science and Technology Policy, 1996; Law on Participation in the International Exchange of Information 1996; and Law on State Regulation in the Field of Genetic Engineering, 1996.

<sup>150</sup> *Ibid.*, 114.

<sup>151</sup> *Ibid.*, 115.

namely, Hawaii and Utah, have enacted legislation regulating bioprospecting.<sup>152</sup> Alaska, the only Arctic state, has no such legislation.

## 5. The Polar Regions and the BBNJ Process

Parallel to debates on bioprospecting in the Arctic and Antarctic, there has also been debate in relation to the status of marine biodiversity in areas beyond national jurisdiction within the United Nations system. Pursuant to United Nations General Assembly (UNGA) Resolution 69/292,<sup>153</sup> adopted in 2015, states have agreed to negotiate an international legally binding instrument under the 1982 United Nations Convention on the Law of the Sea (UNCLOS)<sup>154</sup> on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction. A key feature of Resolution 69/292 is the requirement for the international legally binding instrument to be a ‘package deal’ addressing

the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction, in particular, together and as a whole, marine genetic resources, including questions on the sharing of benefits, measures such as area-based management tools, including marine protected areas, environmental impact assessments and capacity-building and the transfer of marine technology.<sup>155</sup>

In 2017, the UNGA established a Preparatory Committee to make substantive recommendations on the elements of a draft text of an international legally binding instrument under UNCLOS. The Preparatory Committee met in 2016 and 2017. In response to the report of the final session of the Preparatory Committee, the UNGA passed Resolution 72/249 to convene an intergovernmental conference under the auspices of the United Nations to negotiate the text of the proposed instrument.<sup>156</sup>

These negotiations are ongoing, so it is still too early to determine what will be in the instrument and its implications for the Polar regions. The current draft of the negotiating text proposes several models for regulating access to genetic resources in areas beyond national jurisdiction, ranging from requiring those accessing such resources to hold a licence or permit<sup>157</sup> to free and open access.<sup>158</sup> Other proposed options include a requirement for notification to a new secretariat<sup>159</sup> or, alternately, an as yet unspecified role for coastal states.<sup>160</sup>

Proposed alternative provisions for benefit sharing include a staged sharing of monetary benefits under an approval mechanism to be determined by a proposed conference

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<sup>152</sup> Emily Stolfer, ‘Bioprospecting Legislation in the United States: What Are We Doing, and What Should We Do Next’ (2017) 65 *Cleveland State Law Review* 101, 111.

<sup>153</sup> United Nations General Assembly (UNGA), *Resolution 69/292: Development of an international legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction*, UN Doc A/RES/69/292 (6 July 2015), [1].

<sup>154</sup> Adopted 10 December 1982, entered into force 16 November 1994, 1833 UNTS 397.

<sup>155</sup> UNGA Res 69/292, note 153, [2].

<sup>156</sup> UNGA, *Resolution 72/249: International legally binding instrument under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction*, UN Doc A/RES/72/249 (24 December 2017), [1].

<sup>157</sup> UNGA, *Draft text on an agreement under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction*, UN Doc A/CONF.232/2019/6 (17 May 2019), draft article 10(1) [Alt 2].

<sup>158</sup> *Ibid*, draft article 10[3].

<sup>159</sup> *Ibid*, draft article 10[1]

<sup>160</sup> *Ibid*, draft article 10[5].



of parties.<sup>161</sup> Under this proposal, non-monetary benefits (such as samples and information) would be shared under an open access mechanism.<sup>162</sup> An alternative model includes using benefits to contribute to conservation and sustainable use of marine biological diversity, promoting and facilitating scientific research, capacity building and transfer of marine technology.<sup>163</sup>

The draft text also contains conflicting approaches to intellectual property rights. One approach requires consistency with relevant obligations under various agreements concluded under the auspices of the World Intellectual Property Organization.<sup>164</sup> An alternative proposal seeks to prohibit the patenting of inventions based on access or utilization of marine genetic resources in certain circumstances.<sup>165</sup> Another model proposes a role for consultation with a scientific and technical body or network in relation to patent applications and how they might be linked to access and benefit sharing agreements.<sup>166</sup> The draft text also contains a range of different mechanisms for monitoring the utilization of marine genetic resources of areas beyond national jurisdiction.

While the final form of the proposed agreement depends on the outcome of negotiations, it is clear that the instrument is to apply only to areas beyond national jurisdiction. It has been accepted by all parties to the negotiations that the existing rights and jurisdiction of coastal states over all areas under national jurisdiction will remain unchanged. In the case of the Arctic, there is approximately 2.8 million km<sup>2</sup> of high seas adjacent to the EEZs of Arctic coastal states.<sup>167</sup> To the extent that this vast ocean space is beyond national jurisdiction, the proposed agreement would apply to bioprospecting occurring in those waters. By contrast, nearly all of the seafloor of the Arctic Ocean (including the North Pole), is located within the continental margins of one or more of the five Arctic states.<sup>168</sup> Of these five Arctic states, four (the Russian Federation, Norway and Denmark and, in 2019, Canada) have submitted data on their continental shelf claims in the Arctic to the Commission on the Limits of the Continental Shelf as envisaged by Article 76(8) of UNCLOS.<sup>169</sup> Ambiguity surrounds the status of species associated with hydrothermal vents (such as some molluscs,

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<sup>161</sup> Ibid, draft article 11[3.[a]].

<sup>162</sup> Ibid, draft article 11.[3.[(b)].

<sup>163</sup> Ibid, draft article [4].

<sup>164</sup> Ibid, draft article 12[1].

<sup>165</sup> Ibid, draft article 12[3].

<sup>166</sup> Ibid, draft article 12 [4].

<sup>167</sup> Timo Koivurova and Richard Caddell, ‘Symposium on Governing High Seas Biodiversity: Managing Biodiversity Beyond National Jurisdiction in the Changing Arctic’ (2018) 112 *American Journal of International Law Unbound* 134.

<sup>168</sup> Tim Stephens, ‘Polar continental shelves: Australian and Canadian challenges and opportunities’ in Tim Stephens and David VanderZwaag, *Polar Oceans Governance in an Era of Environmental Change* (Edward Elgar, Cheltenham, 2014), 156.

<sup>169</sup> The Russian Federation filed a revised submission in relation to the Arctic Ocean in 2015. Norway’s initial submission in 2006 related to the North East Atlantic and the Arctic. Denmark has made a number of submissions, including in 2012 on the southern continental shelf of Greenland and in 2014 in relation to the Northern Continental shelf of Greenland. See United Nations Division for Oceans and Law of the Sea, ‘Submissions through the Secretary-General of the United Nations to the Commission on the Limits of the Continental Shelf, pursuant to article 76, paragraph 8, of the United Nations Convention on the Law of the Sea of 10 December 1982’ at [https://www.un.org/Depts/los/clcs\\_new/commission\\_submissions.htm](https://www.un.org/Depts/los/clcs_new/commission_submissions.htm) (accessed 6 May 2019). On Canada’s submission in 2019 see Canada, Canada’s Continental Shelf Submission at <https://www.canada.ca/en/global-affairs/news/2019/05/canadas-arctic-ocean-continental-shelf-submission.html> (accessed 9 January 2020) and ‘Commission on the Limits of the Continental Shelf (CLCS), Outer Limits of the continental shelf beyond 200 nautical miles from the baselines: Submissions to the Commission: Partial Submission by Canada’ at [https://www.un.org/Depts/los/clcs\\_new/submissions\\_files/submission\\_can1\\_84\\_2019.html](https://www.un.org/Depts/los/clcs_new/submissions_files/submission_can1_84_2019.html) (accessed 9 January 2020).

gastropods and certain species of microbes) on the continental shelf beyond the EEZ in the Arctic. Rights to such species depends on whether or not they fall within the definition of sedentary species under Article 77(4) of UNCLOS.<sup>170</sup> This is also complicated by the fact that some areas of the continental shelf in the Arctic (such as the Gakkel Ridge) may straddle the continental shelf of a claimant state and areas beyond national jurisdiction.<sup>171</sup>

The situation in Antarctica and the Southern Ocean is far more complex. Here the status of the genetic resources is tied closely to territorial claims with all ‘seven claimant states . . . maintaining they have rights to continental shelves appurtenant to the Antarctic coast in the Southern Ocean’.<sup>172</sup> If the claimant states are entitled to rights in relation to continental shelf areas in the Southern Ocean then (as in the Arctic) the status of sedentary species is unclear. Of course, if continental shelf claims are admissible, similar claims to a territorial sea and an EEZ may also be supportable. However, as highlighted above, this is unlikely to occur while Article IV of the Antarctic Treaty remains in force.

Throughout the current negotiations it has been clear that the proposed instrument is not intended to prejudice the rights, jurisdiction and duties of states under UNCLOS, and that it should be interpreted in the context of, and in a manner consistent with, UNCLOS. As such, the negotiations for the proposed instrument aim to promote greater coherence with and complement existing relevant global, regional and sectoral bodies. Many states have made explicit declarations that the instrument should be interpreted and applied in manner which would not undermine these instruments, frameworks and bodies. This has also been the tenor of all of the key resolutions passed by the UNGA throughout the BBNJ process.

In the Antarctic context this raises several questions. Would an access and benefit sharing regime under the proposed international instrument apply to waters in the Southern Ocean and off the coast of Antarctica? How would that sit with the freedom of scientific research recognized by the Antarctic Treaty? If Antarctic science was indistinguishable from bioprospecting, would science be regulated under the international instrument?

In the Arctic, given that regulation of bioprospecting in many Arctic states is driven by obligations under the 1992 CBD and the Nagoya Protocol, what will the interrelationship of the new instrument be with the provisions of the Convention and the Protocol? Will this interrelationship change the substantive obligations of states that developed biotechnology in areas of national jurisdiction based on biodiversity obtained from areas beyond national jurisdiction?

Another potential area for conflict is how the international instrument deals with fishing and fish stocks.<sup>173</sup> In recent negotiations states such as the United States, Canada, Argentina and the European Union have argued that there is a clear distinction between ‘fish as a commodity’ and ‘fish valued for their genetic properties’. They have been firmly of the view that ‘fish as a commodity’ should not be regulated under the proposed access and benefit sharing regime.<sup>174</sup> However, there are many examples of biotechnology that have involved the production of novel products from marine raw materials such as omega 3 and

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<sup>170</sup> See David Leary, *International Law and the Genetic Resources of the Deep Sea* (Martinus Nijhoff, Leiden, 2007); Craig Allen, ‘Protecting the Oceanic Gardens of Eden: International Law Issues in Deep Sea Vent Resources Conservation and Management’ (2001) 13 *Georgetown International Environmental Law Review* 563; Joanna Mossop, ‘Protecting Marine Biodiversity on the Continental Shelf Beyond 200 Nautical Miles’ (2007) 38 *Ocean Development & International Law* 283.

<sup>171</sup> Kamrul Hossain and Miriam Czarski, ‘Regulating Marine Biodiversity in Arctic Areas Beyond National Jurisdiction’ (2018) 48(5) *Environmental Policy and Law* 299, 300.

<sup>172</sup> Stephens, note 168, 147.

<sup>173</sup> David Leary, ‘Agreeing to Disagree On What We Have or Have Not Agreed On: The Current State of Play of the BBNJ Negotiations on the Status of Marine Genetic Resources in Areas Beyond National Jurisdiction’ (2019) 99 *Marine Policy* 21, 26.

<sup>174</sup> *Ibid.*

other fatty acids from fish oils. Each have required harvesting of fish on a large scale, essentially on a commodity basis. By-products of fishing have also been widely utilized in marine biotechnology in countries such as Norway. How would regulation of fish or failure to regulate fish or specific fish stocks under the proposed international instrument fit with allowable catches issued under CCAMLR and relevant fishery treaties that apply in the Arctic? Some clear definitions will be required and, in particular, the instrument will need to define 'when and why fish are not considered as fish; and when and why fish are not considered as part of marine biodiversity'.<sup>175</sup>

## **6. Conclusion: Poles Apart**

This Chapter has highlighted how the regulation of bioprospecting in both the Arctic and Antarctica is literally 'Poles apart'. While bioprospecting has many common features in both Polar regions, the regulatory response is different in both. In many of the Arctic states (but not all), comprehensive access and benefit sharing regimes have emerged consistent with the obligations of states under the 1992 CBD and the Nagoya Protocol. On the other hand, despite extensive debate and examination of bioprospecting by Antarctic policy-makers, a comprehensive resolution of the issue has been elusive. In part, that is perhaps owing to the fact that many states active in Antarctica are engaged in bioprospecting, and to some these activities are indistinguishable from Antarctic science.

Up until quite recently there have been only two legal regimes relating to bioprospecting in the Polar regions: domestic regulation within areas of national jurisdiction in the Arctic and unregulated free access in the Antarctic and Southern Ocean. However, recent negotiations surrounding the status of marine genetic resources in areas beyond national jurisdiction have added further complexity to these debates. It is therefore reasonable to say that there is no Polar Law per se which applies to bioprospecting in the Polar regions, but there are three Polar legal regimes: an Arctic regime; an Antarctic regime; and a third emerging regime whose relationship with the other two is as yet unclear.

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<sup>175</sup> Ibid.