



## Discovery of Antarctica: 200th Anniversary

### Summary

The UK has had a long historical relationship with Antarctica. British naval officer Captain James Cook was the first to circumnavigate the Antarctic continent in the late 18th century, and a few decades later, British naval officer Edward Bransfield was one of the first to sight Antarctic land. This year marks 200 years since Bransfield's first sighting of Antarctic land on 30 January 1820, and the beginning of the UK's involvement in Antarctica.

After the discovery of the continent, British sealers and explorers established a presence in Antarctica and the UK became the first country to lay formal claim to Antarctic territory, in 1908. This claim was followed by territorial claims from six other countries, two of which laid claim to the same territory as the UK.

In 1957, for the duration of the International Geophysical Year (IGY), all claims to territory in Antarctica were put aside to allow for the establishment of scientific research stations across the continent for the collection of data as part of the worldwide programme of research. Following the success of the IGY, the twelve nations involved in Antarctic research negotiated the Antarctic Treaty, which set aside all claims to Antarctic territory indefinitely.

The UK is a signatory to the Antarctic Treaty. Since its ratification in 1961, the UK has upheld the principles of the treaty and protected the Antarctic continent through a series of Antarctic Treaty conventions.

Several UK institutions are active in Antarctic affairs. The UK has a dedicated office for the Polar Regions at the Foreign and Commonwealth Office, which represents the UK in matters of governance; the British Antarctic Survey, which represents the UK in leading Antarctic scientific ventures and collaborations; and the UK Antarctic Heritage Trust, which works to conserve the heritage sites on the continent that illustrate the long history of the UK's involvement in Antarctica.

The Antarctic continent faces several challenges, including those posed by climate change and the effects of increased tourism to the continent. The UK has dedicated to meeting these challenges and has undertaken initiatives to combat these issues.

Iqra Choudhry | 15 May 2020

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## 1. Introduction to Antarctica

Antarctica is the southernmost continent, located in the southern polar region. It is the only continent with no indigenous population.<sup>1</sup> The continent is surrounded by the Antarctic ocean, a body of water which partially freezes over during the Antarctic winter.<sup>2</sup>

Antarctica is covered in ice, which is, on average, 4.8km thick and holds 90 percent of the world's fresh water.<sup>3</sup> Antarctica is recognised as the coldest place on earth, having registered the lowest temperature on record, at  $-89^{\circ}\text{C}$ .<sup>4</sup> The Antarctic continent is also the world's largest desert, with the equivalent of 150mm rainfall a year, in the form of snow.<sup>5</sup>

## 2. Discovery of Antarctica

The exact date for the initial discovery of Antarctica is disputed. During British explorer Captain James Cook's second voyage from 1772–1775, the expedition travelled below  $60^{\circ}\text{S}$ , and into the Antarctic Circle pack ice, but did not report sighting land.<sup>6</sup> Although Cook was sure that there was a land mass beyond the expedition's capacity, it was several decades before it would be discovered.

The first sighting of the Antarctic continent has been attributed to two figures: the Russian explorer Fabian Gottlieb von Bellingshausen and British naval officer Edward Bransfield.<sup>7</sup> In 1819, von Bellingshausen set out to look for Antarctic land.<sup>8</sup> In the same year, British naval officer Captain William Smith of the *Williams* reported sightings of previously unmapped islands whilst sailing around Cape Horn.<sup>9</sup> In response to Captain Smith's reports, Edward Bransfield was given command of the ship and sent to investigate.<sup>10</sup> On 30 January 1820, the crew sighted part of the Antarctic peninsula and the event was recorded in the ship's logbook.<sup>11</sup> However, there was little interest in Bransfield's discovery, and his request for a second voyage to the Antarctic was denied.<sup>12</sup>

Upon his return, von Bellingshausen reported sighting the Antarctic continent on 27 January 1820, which led to controversy.<sup>13</sup> The two claims to discovery were criticised: a translation of von Bellingshausen's journal fostered doubt as to whether land was sighted;<sup>14</sup> and Bransfield's logbook with the record of the sighting was mislaid.<sup>15</sup>

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<sup>1</sup> British Antarctic Survey, '[Antarctic factsheet](#)', accessed 11 May 2020.

<sup>2</sup> *ibid.*

<sup>3</sup> *ibid.*

<sup>4</sup> *ibid.*

<sup>5</sup> *ibid.*

<sup>6</sup> Erin Blakemore, '[Who really discovered Antarctica? Depends who you ask](#)', *National Geographic*, 29 January 2020.

<sup>7</sup> *ibid.*

<sup>8</sup> *ibid.*

<sup>9</sup> UK Antarctic Heritage Trust, '[Edward Bransfield: 200 years on](#)', 22 January 2020.

<sup>10</sup> *ibid.*

<sup>11</sup> *ibid.*

<sup>12</sup> *ibid.*

<sup>13</sup> Erin Blakemore, '[Who really discovered Antarctica? Depends who you ask](#)', *National Geographic*, 29 January 2020.

<sup>14</sup> *ibid.*

<sup>15</sup> UK Antarctic Heritage Trust, '[Edward Bransfield: 200 years on](#)', 22 January 2020.

An American sealer and explorer named Nathaniel Palmer challenged both claims. He reported his own sighting later that year on 18 November 1820.<sup>16</sup> This claim to discovery by an American was swiftly followed by reports that John Davis, an American sealer and explorer, had become the first person to set foot on Antarctic land in 1821.<sup>17</sup>

Celebrations of the 200th anniversary of the discovery of Antarctica were held in both the UK and Russia. The Government of the British Antarctic Territory marked the occasion by unveiling sets of commemorative stamps and announcing a competition for British schoolchildren to design their own Antarctic stamps to celebrate the occasion.<sup>18</sup> In Antarctica, ground was broken on a new building named *Discovery* at Rothera research station, to celebrate Edward Bransfield's sighting of Antarctica.<sup>19</sup>

### 3. Governing Antarctica

After the Antarctic continent was discovered, an age of exploration followed. During this period, explorers and adventurers travelled to Antarctica to lay claim to the continent on behalf of their respective countries. In 1908, the UK became the first country to lay a formal claim to the Antarctic through the Falkland Island Dependencies letters patent.<sup>20</sup>

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<sup>16</sup> Today in Connecticut History, '[November 18: Nathaniel Palmer discovers Antarctica](#)', 18 November 2018.

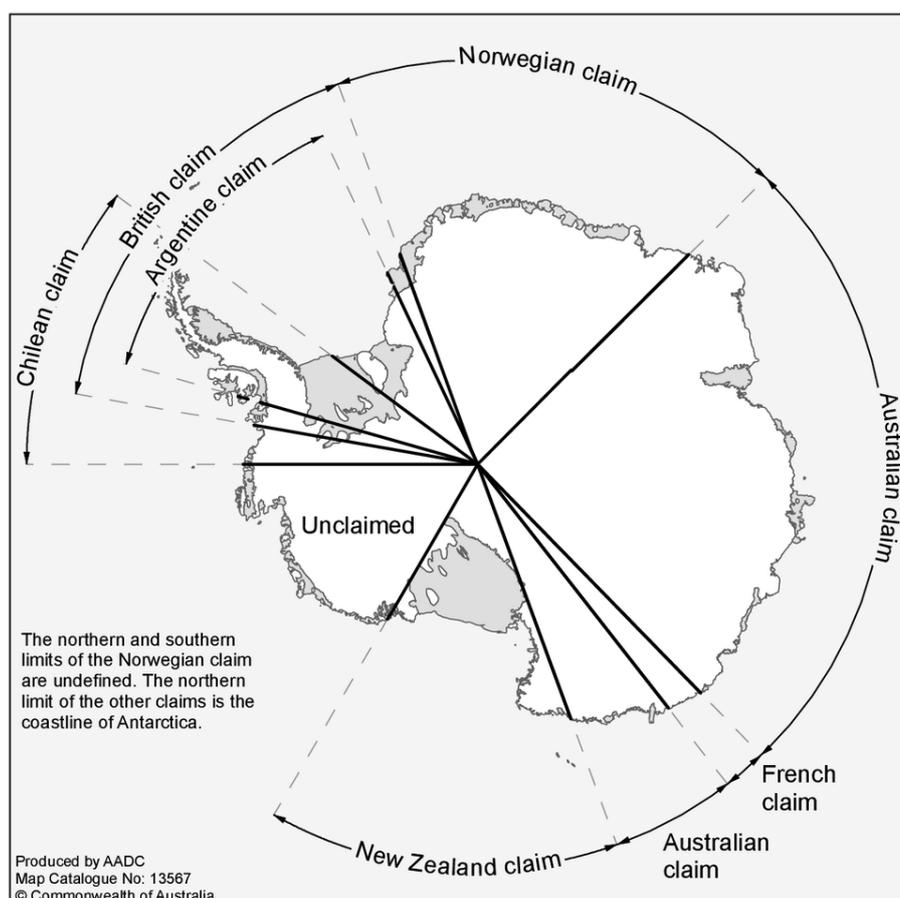
<sup>17</sup> Erin Blakemore, '[Who really discovered Antarctica? Depends who you ask](#)', *National Geographic*, 29 January 2020.

<sup>18</sup> Government of British Antarctic Territory, '[2019 stamp set: 200 year anniversary](#)', 21 November 2019 and '[Design a stamp competition: discovering Antarctica](#)', 30 January 2020

<sup>19</sup> Dave Grove, '[British Antarctic Survey's new Discovery Building at Rothera Research Station breaks ground](#)', Ramboll, 30 January 2020.

<sup>20</sup> Government of British Antarctic Territory, '[History of the Territory](#)', accessed 7 May 2020.

Image 1: Map of Claims to Antarctic Territory<sup>21</sup>



Further formal claims to Antarctic territory were made by six other nations: New Zealand (1923); France (1924); Norway (1929); Australia (1933); Chile (1940) and Argentina (1942).<sup>22</sup> Most of the claims adhered to the 'sector' principle, which means that territorial claims resembled slices of cake, claiming a region of the Antarctic continent that extended from the South Pole with a defined southern limit at 90°S, and defined northern limits. This approach was adopted by all countries claiming territory, except for Norway, which does not define northern or southern limits.<sup>23</sup>

Both the USA and Russia have not made claim to Antarctic territory but reserve the right to make a claim in the future.<sup>24</sup>

<sup>21</sup> Australian Antarctic Division, '[Who owns Antarctica?](#)', accessed 12 May 2020. Reproduced in accordance with the Australian Antarctic Division's usage policy.

<sup>22</sup> Leslie Hook and Benedict Mander, '[The fight to own Antarctica](#)', *Financial Times* (£), 24 May 2018.

<sup>23</sup> *ibid.*

<sup>24</sup> Ashley Coates, '[Geopolitics threatens Antarctica's future as a peaceful hub for science](#)', *Independent*, 29 March 2017.

## **Overlapping Claims to Territory**

Argentina, Chile and the UK have made overlapping claims to parts of the Antarctic Peninsula.<sup>25</sup> The UK claims the area between 20°W–80°W; Argentina claims the area between 25°W–74°W, and Chile claims the area between 53°W–90°W.

This issue of conflicting claims to the Antarctic Peninsula region initially prevented international agreement on the validity of territorial claims to the Antarctic.

## **International Geophysical Year 1957–1958**

The International Geophysical Year (IGY) was the first activity in Antarctica that laid aside territorial claims to the continent.<sup>26</sup> The IGY was a comprehensive global study of geophysical phenomena, which aimed to coordinate simultaneous data collection across the world.<sup>27</sup> During this year, twelve nations established research stations on the continent, after agreeing to set aside territorial claims for the duration of the IGY so as not to interfere with the research.<sup>28</sup> In doing so, the foundation was laid for the Antarctic Treaty.

## **Antarctic Treaty**

The Antarctic Treaty was negotiated after the end of the IGY and is still in force today. The treaty sets out several unique provisions, including the suspension of all territorial claims whilst the treaty is in force; the demilitarisation of the Antarctic continent, and the use of the continent for peaceful and scientific purposes.<sup>29</sup>

The treaty was signed by the twelve nations that had carried out research on the continent during the IGY: Australia; Argentina; Belgium; Chile; France; Japan; New Zealand; Norway; South Africa; the UK; the United States and the USSR.<sup>30</sup>

The treaty was signed in Washington, USA on 1 December 1959. It entered into force in 1961 after being ratified by signatories.<sup>31</sup> To date, 54 countries have acceded to the Antarctic Treaty.<sup>32</sup> Of these countries, 28 have consultative status, meaning that they are involved in the decision-making process at the annual Antarctic Treaty Consultative Meetings (ATCMs).<sup>33</sup>

<sup>25</sup> Leslie Hook and Benedict Mander, '[The fight to own Antarctica](#)', *Financial Times* (£), 24 May 2018.

<sup>26</sup> Vanessa Heggie, '[Blood, sweat and ice? During the 60th anniversary of the IGY let's celebrate Antarctic physiology too](#)', *Guardian*, 1 July 2017.

<sup>27</sup> Australian Antarctic Division, '[International Geophysical Year \(IGY\) and International Polar Year \(IPY\)](#)', accessed 5 May 2020.

<sup>28</sup> British Antarctic Survey, '[The Antarctic Treaty explained](#)', accessed 5 May 2020.

<sup>29</sup> Secretariat of the Antarctic Treaty, '[The Antarctic Treaty](#)', accessed 5 May 2020.

<sup>30</sup> British Antarctic Survey, '[The Antarctic Treaty explained](#)', accessed 5 May 2020.

<sup>31</sup> Secretariat of the Antarctic Treaty, '[The Antarctic Treaty](#)', accessed 5 May 2020.

<sup>32</sup> *ibid.*

<sup>33</sup> Secretariat of the Antarctic Treaty, '[Parties](#)', accessed 5 May 2020.

#### 4. UK in Antarctica

The UK is represented on the Antarctic continent and in Antarctic politics by several bodies. The British Antarctic Survey (BAS) is the body responsible for coordinating and conducting UK-led science in Antarctica.<sup>34</sup> BAS works alongside international bodies, such as the Scientific Committee on Antarctic Research (SCAR) and the Council of Managers of National Antarctic Programmes (COMNAP) to shape international research in Antarctica.<sup>35</sup>

The Foreign and Commonwealth Office's (FCO) Polar Regions Department addresses the UK's political interests in both the Arctic and the Antarctic.<sup>36</sup> FCO representatives attend Antarctic Treaty Consultative Meetings (ATCMs) as part of the delegation of a Consultative Party to the Antarctic Treaty.<sup>37</sup>

The UK Antarctic Heritage Trust (UKAHT) is the body entrusted with preserving the legacy of the UK's activities in Antarctica.<sup>38</sup> The work of the UKAHT involves conserving heritage sites on the Antarctic continent and educating the British public about the history of British endeavours in the Antarctic.<sup>39</sup>

The All-Party Parliamentary Group (APPG) on the Polar Regions is a cross-party group in Parliament that aims to inform members of the House of Commons and the House of Lords about issues affecting both the Arctic and Antarctic.<sup>40</sup> In December 2019, the APPG hosted the first Antarctic parliamentarians assembly, chaired by James Gray, Conservative MP for North Wiltshire.<sup>41</sup> The event was inspired by the Conference of Arctic Parliamentarians. It aimed to create a similar forum for parliamentarians from around the world to raise awareness of the issues affecting the Antarctic.<sup>42</sup>

#### 4. UK and Antarctic Conservation

As a Consultative Party to the Antarctic Treaty, the UK is active in the consensus-based decision-making process of the Antarctic Treaty system.<sup>43</sup> The UK has been active in supporting and implementing conservation efforts through the Antarctic Treaty System.

##### ***Protecting Marine Life***

One of the focuses of the UK in the Antarctic Treaty System has been the creation of conventions for the conservation of marine life. An example of this is the 1972 Convention for the Conservation of Antarctic Seals (CCAS), which regulates sealing activity in the Antarctic and prohibits the killing of both Ross and Antarctic fur seals.<sup>44</sup> The UK Government acts as the depository for this convention,

<sup>34</sup> British Antarctic Survey, '[Science in Antarctica](#)', accessed 6 May 2020.

<sup>35</sup> HM Government, '[UK Science in Antarctica 2014–2020](#)', 2014.

<sup>36</sup> *ibid.*

<sup>37</sup> HM Government, '[UK Science in Antarctica 2014–2020](#)', 2014.

<sup>38</sup> UK Antarctic Heritage Trust, '[Britain's Antarctic Heritage](#)', accessed 7 May 2020.

<sup>39</sup> *ibid.*

<sup>40</sup> APPG Polar Regions, '[About](#)', accessed 10 May 2020.

<sup>41</sup> *ibid.*

<sup>42</sup> *ibid.*

<sup>43</sup> HM Government, '[UK Science in Antarctica 2014–2020](#)', 2014.

<sup>44</sup> British Antarctic Survey, '[International agreements for conservation of fauna and flora](#)', accessed 5 May 2020.

holding the official copies in its archives, and bearing responsibility for notifying signatories of any changes in regards to CCAS.<sup>45</sup>

The UK is also a member of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR).<sup>46</sup> CCAMLR regulates fishing activity in the Antarctic region to ensure that marine life is protected, and that harvesting of Antarctic marine life is done sustainably.<sup>47</sup>

Marine protected areas (MPAs) are defined as geographical areas of water for which protective measures are implemented, to conserve the species and ecosystems within them.<sup>48</sup> There is a wide spectrum of variability around the differing levels of protection afforded to these areas, from total closure to a range of permitted uses.<sup>49</sup> CCAMLR is the body through which MPAs are designated in the Antarctic.<sup>50</sup> The UK advocates for the creation of new MPAs, and contributed to the creation of the first MPA, which was established by CCAMLR in 2009.<sup>51</sup>

### ***Discovery of Hole in the Ozone Layer***

In May 1985, three BAS scientists published a paper in the journal *Nature*, on the discovery of a hole in the ozone layer over a part of the Antarctic continent.<sup>52</sup> Further research showed that the hole in the ozone layer stretched across the Antarctic continent, and that it could be attributed to the release of chemicals called chlorofluorocarbons (CFCs) into the atmosphere.<sup>53</sup>

A coordinated response by scientists and politicians to the discovery of the hole in the ozone layer resulted in the 1987 Montreal Protocol.<sup>54</sup> The protocol aimed to ban CFCs and other ozone-depleting substances by phasing out their use.<sup>55</sup> The 1987 Montreal Protocol was adopted on 15 September 1987 and remains the only international treaty to be ratified by all 197 UN member states. To date, over 98 percent of ozone-depleting substances have been removed from the atmosphere in comparison to 1990 levels.<sup>56</sup>

### ***Regulation of Mining***

During the 1980s, a Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA) was negotiated.<sup>57</sup> The UK was an active proponent of CRAMRA, which aimed to regulate prospecting, exploration and development activities regarding minerals in Antarctica, agreeing that mining would only be permitted if all Parties agreed that there was no risk to the environment.<sup>58</sup>

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<sup>45</sup> British Antarctic Survey, '[Convention for the Conservation of Antarctic Seals \(1972\)](#)', accessed 12 May 2020.

<sup>46</sup> CCAMLR, '[Members](#)', accessed 7 May 2020.

<sup>47</sup> CCAMLR, '[About](#)', accessed 7 May 2020.

<sup>48</sup> British Antarctic Survey, '[Marine Protected Areas](#)', 29 June 2018.

<sup>49</sup> *ibid.*

<sup>50</sup> *ibid.*

<sup>51</sup> *ibid.*

<sup>52</sup> British Antarctic Survey, '[The ozone hole](#)', 1 April 2017.

<sup>53</sup> *ibid.*

<sup>54</sup> *ibid.*

<sup>55</sup> UNEP, '[About Montreal Protocol](#)', accessed 6 May 2020.

<sup>56</sup> *ibid.*

<sup>57</sup> British Antarctic Survey, '[Mining](#)', accessed 5 May 2020.

<sup>58</sup> *ibid.*

However, although CRAMRA was adopted by Antarctic Treaty System Consultative Parties in 1988, two Consultative Parties, France and Australia, declined to sign the Convention due to environmental concerns.<sup>59</sup> During the negotiations, international campaigns run by environmental groups such as Greenpeace had called for a ban on all mining activities in Antarctica and such campaigns may have influenced the decision not to sign.<sup>60</sup>

After CRAMRA failed to enter into force, Australia, France and some other Antarctic Consultative Parties began negotiating an alternative which would ban all mining activities.<sup>61</sup> The UK was one of the countries which opposed a permanent ban on mining activity, and a mining moratorium of 50 years was agreed upon.<sup>62</sup>

The negotiations led to the creation of the 1991 Madrid Protocol, which was signed in Madrid on 4 October 1991, and came into force in 1998.<sup>63</sup> The Madrid Protocol designated the Antarctic continent a “natural reserve, devoted to peace and science”.<sup>64</sup> The Protocol has six Annexes, the first four of which were adopted in 1991 together with the Protocol and entered into force in 1998.<sup>65</sup> The Antarctic Act 1994 enshrined the first four annexes of the protocol into UK legislation.<sup>66</sup>

Annex V of the Protocol, on Area Protection and Management, was adopted separately at the ATCM in 1991 and entered into force in 2002.<sup>67</sup> Annex VI on Liability Arising from Environmental Emergencies was adopted at the ATCM in Stockholm in 2005 and has yet to enter into force, as it has not been ratified by all Consultative Parties.<sup>68</sup> The Antarctic Act 2013 ratified Annex VI of the Protocol in the UK.<sup>69</sup>

The 1991 Madrid Protocol led to the subsequent creation of the Committee for Environmental Protection (CEP).<sup>70</sup> The CEP is a body which meets annually to discuss the best practice for protecting the Antarctic, and to provide the Antarctic Treaty Consultative Meeting’s Consultative Parties with advice for the policymaking process.<sup>71</sup>

## 6. Challenges

There are challenges facing the Antarctic continent. Two of the most pressing challenges are tourism and the effects of climate change.

<sup>59</sup> British Antarctic Survey, ‘[Mining](#)’, accessed 5 May 2020.

<sup>60</sup> Greenpeace, ‘[Protect the Antarctic](#)’, accessed May 5 2020.

<sup>61</sup> British Antarctic Survey, ‘[Mining](#)’, accessed 5 May 2020.

<sup>62</sup> *ibid.*

<sup>63</sup> Secretariat of the Antarctic Treaty, ‘[The Protocol on Environmental Protection to the Antarctic Treaty](#)’, accessed 5 May 2020.

<sup>64</sup> *ibid.*

<sup>65</sup> *ibid.*

<sup>66</sup> [Antarctic Act 1994](#), accessed 5 May 2020.

<sup>67</sup> Secretariat of the Antarctic Treaty, ‘[The Protocol on Environmental Protection to the Antarctic Treaty](#)’, accessed 5 May 2020.

<sup>68</sup> *ibid.*

<sup>69</sup> [Antarctic Act 2013](#), accessed 7 May 2020.

<sup>70</sup> Secretariat of the Antarctic Treaty, ‘[The Protocol on Environmental Protection to the Antarctic Treaty](#)’, accessed 5 May 2020.

<sup>71</sup> *ibid.*

## Tourism

Tourism to Antarctica began in the 1950s as an exclusive and expensive adventure marketed to the well-off, before becoming increasingly popular during the 1980s and 1990s.<sup>72</sup> In 1991, seven tour operators formed the International Association of Antarctic Tour Operators (IAATO)<sup>73</sup>, an organisation which now consists of over 100 tour operators.<sup>74</sup> The number of visitors to the Antarctic continent has steadily increased over the past few decades, from 6,700 visitors in 1992–1993 to 56,000 visitors in the 2018–2019 season.<sup>75</sup>

The main concern with Antarctic tourism is the disturbance it poses to the Antarctic environment and to Antarctic wildlife.<sup>76</sup> Tourists are expected to comply with strict guidelines concerning the wildlife sites they visit.<sup>77</sup> However, as Antarctic tourism becomes more popular, countries are calling for stricter regulation.<sup>78</sup> The environmental footprint of tourist activities is also of concern, as increased tourist activity means an increase in fossil fuels burnt, which negatively affects the continent, where glaciers are rapidly melting.<sup>79</sup>

Concerns about Antarctic tourism often centre around how best to regulate tourism in the future, with discussions on the subject taking place every year during Antarctic Treaty Consultative Meetings.<sup>80</sup> IAATO operators are asked to adhere to strict visitor guidelines for landing sites<sup>81</sup> but unregulated operators do not have to follow these rules, and unregulated activity is also becoming a pressing issue.<sup>82</sup>

Another issue is safety at sea. With increased traffic in Antarctic waters, there is an increased risk of accidents.<sup>83</sup> In response to the increased likelihood of accidents in Antarctic waters, the International Maritime Organisation (IMO) created the International Code for Ships Operating in Polar Waters, or the 'Polar Code', which came into force on 1 January 2017.<sup>84</sup> It was adopted quickly by the UK.<sup>85</sup>

## Climate Change

Another pressing issue is climate change. The Antarctic continent is covered in an ice sheet up to a mile thick and represents a window into how the planet is changing.<sup>86</sup> The Special Report of the

<sup>72</sup> Paige McClanahan, '[Tourism in Antarctica: edging towards the \(risky\) mainstream](#)', *New York Times*, 26 February 2020.

<sup>73</sup> *ibid.*

<sup>74</sup> IAATO, '[Who is IAATO?](#)', accessed 11 May 2020.

<sup>75</sup> Paige McClanahan, '[Tourism in Antarctica: edging towards the \(risky\) mainstream](#)', *New York Times*, 26 February 2020.

<sup>76</sup> Australian Antarctic Division, '[Minimising disturbance to Antarctic wildlife](#)', accessed 12 May 2020.

<sup>77</sup> British Antarctic Survey, '[Antarctic tourism: frequently asked questions](#)', accessed 12 May 2020.

<sup>78</sup> Alex Marshall, '[Antarctica's tourism industry is designed to prevent damage, but can it last?](#)', *Guardian*, 26 June 2016.

<sup>79</sup> James Draven, '[Tourism in Antarctica: what does it mean for the world's last great wilderness?](#)', *National Geographic*, 9 April 2019.

<sup>80</sup> Paige McClanahan, '[Tourism in Antarctica: edging towards the \(risky\) mainstream](#)', *New York Times*, 26 February 2020.

<sup>81</sup> *ibid.*

<sup>82</sup> Leslie Hook and Benedict Mander, '[The fight to own Antarctica](#)', *Financial Times* (£), 24 May 2018.

<sup>83</sup> Paige McClanahan, '[Tourism in Antarctica: edging towards the \(risky\) mainstream](#)', *The New York Times*, 26 February 2020.

<sup>84</sup> International Maritime Organization, '[Shipping in polar waters: International Code for Ships Operating in Polar Waters \(Polar Code\)](#)', accessed 11 May 2020.

<sup>85</sup> UK P&I Club, '[The Polar Code enters into force on 1 January 2017](#)', 13 December 2016.

<sup>86</sup> Leslie Hook and Benedict Mander, '[The fight to own Antarctica](#)', *Financial Times* (£), 24 May 2018.

Intergovernmental Panel on Climate Change (IPCC) noted that a 1.5°C increase in global temperature would lead to marine ice sheet instability in Antarctica and could result in multi-metre rise in sea level.<sup>87</sup> Temperatures in some parts of Antarctica are rising much faster than the global average, and the pace of glacial melting there will help determine how quickly global sea levels rise in future.<sup>88</sup>

Another concern about the effects of climate change is the ways in which global temperature increase could affect the continent's wildlife.<sup>89</sup> At the current rate of temperature increase, changes are already being observed, as Antarctic penguin distributions and abundances are changing,<sup>90</sup> and the establishment of non-native species is beginning to push out native species.<sup>91</sup>

The UK has said it is committed to taking action to tackle climate change.<sup>92</sup> Having made a commitment in legislation to achieving net zero carbon emissions by 2050, carbon cuts have been implemented by successive UK governments, leading to a 29 percent reduction in carbon emissions over the past decade.<sup>93</sup>

An independent review of the UK's actions to combat climate change found that the net-zero policy was implemented across all levels and departments of government, and that the UK strongly leads international action on climate change.<sup>94</sup> However, it has been noted that even with the reduction in carbon emissions, the UK is not on target to reach net-zero emissions by 2050, and would have to introduce new policy measures to meet the target.<sup>95</sup>

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<sup>87</sup> IPCC, '[Special Report: Global Warming of 1.5°C—Summary for Policymakers](#)', IPCC, November 2018.

<sup>88</sup> Leslie Hook and Benedict Mander, '[The fight to own Antarctica](#)', *Financial Times* (£), 24 May 2018.

<sup>89</sup> Antonia Filmer, '[If Antarctica ice melts global sea level will rise by 50 metres](#)', *Sunday Guardian Live*, 7 December 2019.

<sup>90</sup> Craig Welch, '[The big meltdown](#)', *National Geographic*, accessed 11 May 2020.

<sup>91</sup> Antonia Filmer, '[If Antarctica ice melts global sea level will rise by 50 metres](#)', *Sunday Guardian Live*, 7 December 2019.

<sup>92</sup> Samuel Fankhauser et al, '[The UK's carbon targets for 2020 and the role of the Committee on Climate Change](#)', accessed 12 May 2020.

<sup>93</sup> Simon Evans, '[Analysis: UK's CO2 emissions have fallen 29 percent over the past decade](#)', 3 March 2020.

<sup>94</sup> Committee on Climate Change, '[Reducing UK emissions—2019 Progress Report to Parliament](#)', accessed 12 May 2020.

<sup>95</sup> Laura Singleton, '[Climate change policies need to improve for UK to reduce carbon emissions](#)', Imperial College London, 5 December 2019.