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The Impact of Antarctic Treaty Challenges on the US Military

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ABSTRACT: The Antarctic Treaty of 1961 largely prevented conflicts on the continent, but growing pressure on the treaty system could affect the global community and the United States. This article utilizes historical documents and press reports to examine these challenges, which include ice deterioration, unreported and unregulated fishing, resource extraction preparation, and hostilities between treaty members. Given that these challenges involve China and Russia, it is in the United States' interest to understand them and the potential request for US military intervention to maintain global security and treaty interests.

Keywords: Antarctica, Antarctic Treaty, sea levels, unreported and unregulated fishing, global power competition

Despite being the fifth-largest continent, Antarctica remains somewhat unknown to the general population and is unlike any place in the world. In the winter, the average temperature is -67°F on the interior ice sheet and -13°F on the coast. In the summer, the average temperature rises to -17°F for the interior and 32°F for the coast, leading to the thaw of coastal ice between seasons.¹ Despite these constant changes in the temperature, inland Antarctica remains the coldest location in the world due to it being the continent with the highest elevation.² The high elevation leads to frigid air dropping to the coast, which creates the world's fastest constant wind speed of 200 miles per hour. For comparison, the sustained wind speed of a category 5 hurricane is 157 miles per hour.³

Due to the harsh conditions, the first officially recorded Antarctic exploration efforts began only 200 years ago. In 1773, British explorer James Cook crossed the Antarctic Circle at 66.5 degrees south latitude, the line of latitude marking the most northern point of the continent. After the crossing, Cook

1. *Encyclopedia Britannica*, s.v. "Antarctica," n.d., accessed August 24, 2022, <https://www.britannica.com/place/Antarctica/Climate>; and Australian Department of Climate Change, Energy, the Environment and Water (DCCEEW), "Ice Sheets," Australian Antarctic Program Antarctica (website), last updated September 9, 2021, <https://www.antarctica.gov.au/about-antarctica/ice-and-atmosphere/ice-sheet/>.

2. Michon Scott, "Antarctica Is Colder Than the Arctic, but It's Still Losing Ice," National Oceanic and Atmospheric Administration, Climate.gov (website), March 12, 2019, <https://www.climate.gov/news-features/features/antarctica-colder-arctic-it%E2%80%99s-still-losing-ice>.

3. "Saffir-Simpson Hurricane Wind Scale," National Hurricane Center and Central Pacific Hurricane Center (website), n.d., accessed August 27, 2022, <https://www.nhc.noaa.gov/aboutshws.php>.

chose not to look for land as he felt the region was too dangerous and offered few valuable resources.⁴ Over the next century, a handful of explorers braved the Antarctic and the imminent threat of starvation and exposure. By the 1950s, several countries had claimed territory and established outposts, and in 1952 tensions over Antarctica's Hope Bay nearly erupted into war. In response, the Antarctic Treaty was created, and for the duration of the Cold War, the treaty prevented violent conflict and nuclear testing while promoting scientific research.⁵

In recent decades, the threat of climate change and the rise of new world powers have created new challenges for the treaty, involving membership complications, protecting the continent's environment and resources, and growing adversarial relations between treaty members—all of which may affect US security interests. This article provides background on Antarctica as a continent, the actions leading to the creation of the Antarctic Treaty, the regulations established following the treaty's ratification, and the challenges that emerged from the treaty. Finally, it proposes how today's potential challenges may concern the United States and the US military's role in responding to them within the US *National Defense Strategy*.

The Antarctic Treaty

In the 1950s, Argentina, Australia, Chile, France, New Zealand, Norway, and the United Kingdom claimed various territories on the continent, some of which overlapped. After a war nearly erupted in 1952 between Argentina and the United Kingdom over Hope Bay, the global community unified over actions concerning the continent.⁶ In 1959, the seven countries that held continental territories, along with Belgium, Japan, South Africa, the Soviet Union, and the United States, signed the Antarctica Treaty.⁷ The treaty states:

4. Stephen Baines, "What Was Captain Cook Looking for When He Crossed the Antarctic Circle in 1773?" History Press (website), n.d., accessed August 27, 2022, <https://thehistorypress.co.uk/articles/what-was-captain-cook-looking-for-when-he-crossed-the-antarctic-circle-in-1773/>; and Erin Blakemore, "Who Really Discovered Antarctica? Depends on Who You Ask," *National Geographic* (website), January 27, 2020, <https://www.nationalgeographic.com/history/article/who-discovered-antarctica-depends-who-ask>.

5. Walter Sullivan, "1948 British-Argentine Clashes in Antarctic Ended Peacefully," *New York Times* (website), May 24, 1982, <https://www.nytimes.com/1982/05/24/world/1948-british-argentine-clashes-in-antarctic-ended-peacefully.html>.

6. Sullivan, "1948 British-Argentine Clashes."

7. "Conference on Antarctica – Final Act," December 1, 1959, in *Compilation of Key Documents of the Antarctic Treaty System*, 5th ed. (Buenos Aires, AR: Secretariat of the Antarctic Treaty, 2021), 9–20, http://documents.ats.aq/atcm43/ww/ATCM43_ww008_e.pdf.

The continent is to be used only for peaceful ambitions, such as scientific research. This use excludes military base construction, conventional and nuclear weapons testing, and radioactive waste storage.

All research information—to include personnel, tests, studies, and results—will be shared with other nations' research stations and the global community, to include the United Nations.

Each treaty member has the right to inspect the other members' facilities and equipment or explore any part of the continent, whenever it chooses—however, a member conducting an inspection must notify the other members beforehand.

Argentina, Australia, Chile, France, New Zealand, Norway, and the United Kingdom may maintain their original territorial claims, despite some of their claims overlapping.

Disputes between parties should be resolved through peaceful means. If a dispute is still unable to be resolved, the International Court of Justice may review the case.

The treaty may be revised at any time if there is unanimous agreement among its members.

Treaty membership may be offered to a state within the UN or to one that receives unanimous consent from treaty members.⁸

These regulations enabled the treaty's success in several respects. While the United States and the Soviet Union established research facilities after the treaty was enacted, the agreement prevented outright military activities from occurring and thus mitigated the spread of the Cold War. By focusing on advancing scientific studies, countries developed a mutual interest in maintaining a working relationship. This arrangement was enhanced by treaty members executing the right to inspect one another, instilling a sense

8. Secretariat of the Antarctic Treaty (ATS), "The Antarctic Treaty," December 1, 1959, in *Compilation of Key Documents of the Antarctic Treaty System*, 5th ed. (Buenos Aires, AR: ATS, 2021), 21–27, https://documents.ats.aq/keydocs/vol_1/vol1_2_AT_Antarctic_Treaty_e.pdf.

of openness and cooperation. The treaty was also written in broad enough terms that supported relatively easy updates. As a result, the treaty now holds 29 consultative members with voting rights and 26 non-consultative members who do not possess voting rights but may still participate in consultative conferences.⁹ There are also 1,100 to 5,000 people living on the continent, depending on the season.¹⁰ Although Antarctica has remained free of armed conflicts, the treaty faces substantial challenges due to treaty membership complications, efforts to protect the continent's environment and resources, and strife between countries.¹¹

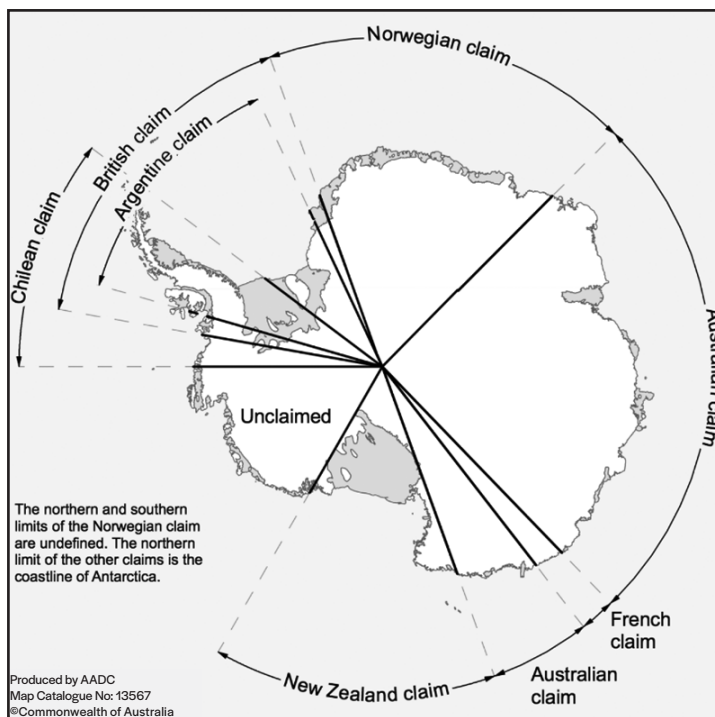


Figure 1. Antarctic territorial claims (Reprinted with permission of the Australian Antarctic Division. This work is licensed under a Creative Commons Attribution 4.0 International License. Source: Australian Antarctic Program [website], April 14, 2016, <https://www.antarctica.gov.au/about-antarctica/law-and-treaty/history/antarctic-territorial-claims/>).

Challenge 1: Rising Sea Levels and Treaty Membership

Earth's temperature derives from sunlight reaching its surface, with some sunlight reflected back to space. This process is offset by high concentrations of global emissions, such as carbon dioxide, that absorb reflected sunlight

9. "Parties," Secretariat of the Antarctic Treaty (ATS) (website), accessed September 16, 2022, <https://www.ats.aq/devAS/Parties?lang=e>.

10. "Antarctica," in *World Factbook* (Washington, DC: CIA, continuously updated), accessed August 2, 2022, last updated May 16, 2023, <https://www.cia.gov/the-world-factbook/countries/antarctica/>.

11. "The Future of the Antarctic Treaty," UK Antarctic Heritage Trust (website), January 31, 2022, YouTube video, 23:38–24:33, <https://www.youtube.com/watch?v=BWgVPCB76a4&t=649s>.

heat rather than allow it to escape the atmosphere. This leads to atmospheric warming and increases in ocean heat, which accounts for 90 percent of the world's surface heat accumulation.¹² The 2016–21 period marked the warmest global temperatures in recorded history, but scientists predict the temperature for the 2022–26 period will be warmer.¹³

These temperature changes severely impact Antarctica's landscape. According to NASA glaciologist Joseph A. MacGregor, Antarctica lost 250 gigatons of ice in 2019, which is roughly equal to the loss of 200 ice-filled Olympic-sized swimming pools per minute.¹⁴ Ice shelves, large ice platforms connected to land that prevent glaciers on land from falling into the ocean, are also disintegrating.¹⁵ Numerous examples demonstrate this disintegration, including an ice shelf the size of Rhode Island collapsing in 2002, an ice shelf developing a 110-mile crack in 2017, and an ice shelf nearly three-quarters of a mile in height dissolving in 2022.¹⁶ As ice shelves break down, the glaciers they once enclosed on land will accelerate toward the ocean.

The trend of significant amounts of Antarctic ice being lost to the ocean is not expected to change soon. As Secretary-General of the World Meteorological Organization Petteri Taalas stated, “The last time the Earth experienced a comparable concentration of [carbon dioxide] was 3–5 million years ago, when the temperature was 2–3°C warmer and sea level was 10–20 meters higher than now.”¹⁷ Today, the rise in current temperature appears likely, as the 2021 UN *Emissions Gap Report* warned that even if the countries who signed the Paris Agreement meet their current pledges on restricting emissions, global temperatures will still rise

12. “Basics of Climate Change,” United States Environmental Protection Agency (EPA) (website), last updated August 19, 2022, <https://www.epa.gov/climatechange-science/basics-climate-change>; “United in Science: We are Heading in the Wrong Direction,” United Nations Framework Convention on Climate Change (UNFCCC) (website), September 13, 2022, <https://unfccc.int/news/united-in-science-we-are-heading-in-the-wrong-direction>; and “Global Climate Indicators: Ocean Heat Content, Acidification, Deoxygenation, and Blue Carbon,” World Meteorological Organization (website), 2022, https://public.wmo.int/en/resources/bulletin/Ocean_Climate_Nexus/Climate%20Indicators.

13. “United in Science.”

14. “Antarctica Is Losing Ice at an Accelerating Rate. How Much Will Sea Levels Rise?,” *NewsHour*, PBS (website), April 10, 2019, YouTube video; 0:48–1:54, <https://www.youtube.com/watch?app=desktop&v=YReIymYR45k>.

15. California Institute of Technology, “Climate Change: NASA Studies Find Previously Unknown Loss of Antarctic Ice,” Jet Propulsion Laboratory, NASA (website), August 10, 2022, <https://www.jpl.nasa.gov/news/nasa-studies-find-previously-unknown-loss-of-antarctic-ice>.

16. “Antarctica Is Losing Ice,” 6:20–6:49; and Thomas Sumner, “Crack in Antarctica’s Larsen C Ice Shelf Forks,” *Science Ticker* (blog), Science News (website), May 2, 2017, <https://www.sciencenews.org/blog/science-ticker/crack-antarcticas-larsen-c-ice-shelf-splits-two>; and “Record Heat Sends Sea Ice into Retreat, Worrying Scientists,” UN Environment Programme (UNEP) (website), April 12, 2022, <https://www.unep.org/news-and-stories/story/record-heat-sends-sea-ice-retreat-worrying-scientists>.

17. “Rise in Greenhouse Gas Concentrations Jeopardizes Paris Agreement Temperature Targets,” UNFCCC (website), October 25, 2021, <https://unfccc.int/news/rise-in-greenhouse-gas-concentrations-jeopardizes-paris-agreement-temperature-targets>.

over 2.5°C by 2100.¹⁸ This temperature rise will likely continue melting Antarctica's ice into the ocean, escalating water levels and inflicting an upsurge of global humanitarian challenges.

Impoverished and congested countries with ocean shores will potentially be the hardest struck by rising water levels and, in turn, may request humanitarian support. Bangladesh, the eighth-most populous country, with approximately 170 million citizens inhabiting an area the size of Iowa, possesses a long ocean coastline. Many Bangladeshis live in river basins susceptible to ocean sea rise.¹⁹ Should sea levels continue to rise, the United Nations expects that 17 percent of the country's citizens will be displaced. This displacement could cause a mass migration of Bangladeshis to overpopulated urban areas or countries like India, which are experiencing a large influx of undocumented immigrants.²⁰

Another country likely to be challenged by increasing sea levels is Nigeria. Nigeria, the most populous country in Africa, is expected to become the third most populous country in the world before 2050.²¹ Lagos, the country's most populous city, is next to the Atlantic Ocean, and 14 million people reside in its slums. The slums are located on plains prone to flooding, and Eko Atlantic, the city's flood-preventing construction project, may further damage residents' homes. The project plans to build an elevated complex with modern amenities such as sterile water, individual power generation, and wide roads with tree lines. A barrier built to shield the complex from rising water was successful for its residents, but it deflected water into neighboring slums, exacerbating erosion and flooding issues for poor communities.²²

The challenges faced by Bangladesh and Nigeria allude to the possibility that if water levels rise, many governments may not be prepared or may enact plans that leave many citizens unprotected or endangered. This situation could then offer insurgency groups such as ISIS–West Africa and Boko Haram

18. "Record Heat Sends Sea Ice into Retreat, Worrying Scientists," UNEP (website), April 17, 2023, <https://www.unep.org/news-and-stories/story/record-heat-sends-sea-ice-retreat-worrying-scientists>; and UNEP, *Emissions Gap Report 2021: The Heat is On – A World of Climate Promises Not Yet Delivered* (Nairobi, KE: UNEP, 2021), xvi, 36, <https://www.unep.org/resources/emissions-gap-report-2021>.

19. "Bangladesh Population 2022," World Population Review (website), accessed September 12, 2022, <https://worldpopulationreview.com/countries/bangladesh-population/>; "Bangladesh," in *World Factbook* (Washington, DC: CIA, continuously updated), accessed July 26, 2023, last updated July 18, 2023, <https://www.cia.gov/the-world-factbook/countries/bangladesh/#geography>.

20. Wing Ka Ho, "The Looming Threat of Sea Level Rise in Bangladesh," Earth.Org (website), July 14, 2022, <https://earth.org/sea-level-rise-in-bangladesh/>; and Sanjeev Tripathi, "Illegal Immigration from Bangladesh to India: Toward a Comprehensive Solution," Carnegie India (website), June 29, 2016, <https://carnegieindia.org/2016/06/29/illegal-immigration-from-bangladesh-to-india-toward-comprehensive-solution-pub-63931>.

21. "Nigeria Population 2022," World Population Review (website), accessed September 15, 2022, <https://worldpopulationreview.com/countries/nigeria-population/>.

22. Kimberley Anh Thomas and Benjamin P. Warner, "Weaponizing Vulnerability to Climate Change," *Global Environmental Change* 57 (July 2019): 2–4, <https://doi.org/10.1016/j.gloenvcha.2019.101928>.

an even greater opportunity to challenge domestic security measures.²³ Should countries receive security threats or economic and infrastructural damage from the rising water created by Antarctica's melting ice, the Antarctic Treaty could receive more interest as a forum to shape international solutions, address rising sea levels, and provide other forums for dealing with domestic issues stemming from climate changes tied to the continent.

The second paragraph of the Antarctic Treaty states, “[It] is in the interest of all mankind that Antarctica shall continue for ever to be used exclusively for peaceful purposes and shall not become the scene or object of international discord.”²⁴ The original issues addressed in the treaty were contemporary Cold War-era concerns, including sovereign claims, military bases, and the nuclear waste disposal.²⁵ While the melting of ice caps was not included within the original text, it was likely not envisioned that future international tensions arising from the environmental impact of rising sea levels would make Antarctica the origin of international discord. Notably, greater participation of smaller and previously nonaligned countries in international security forums provides a critical modern context for potentially updating the security issues and the signatories of the Antarctic Treaty.

A treaty seeks to address security issues of a particular time, and treaties that persist have a forum for participants to gather and address emerging issues. The Antarctic Treaty brings together the Consultative Parties (signatories) within a recurring meeting framework known as the Antarctic Treaty Consultative Meeting (ATCM).²⁶ According to Article IX of the treaty, the Consultative Parties meet “for the purpose of exchanging information, consulting together on matters of common interest pertaining to Antarctica, and formulating and considering, and recommending to their Governments, measures in furtherance of the principles and objectives of the Treaty”²⁷ Concurrent to the ATCM are the Committee of Environmental Protection (CEP) meetings, which address climate change issues concerning Antarctica.²⁸ While the treaty specifies that the Antarctic region is south of 60 degrees south latitude, it indirectly speaks to associated global ecosystems.²⁹

23. Thomas and Warner, “Weaponizing Vulnerability,” 8; and “Boko Haram, Including JAS and ISIS-WA,” *European Union Agency for Asylum* (website), February 2019, <https://euaa.europa.eu/country-guidance-nigeria/121-boko-haram-including-jas-and-isis-wa>.

24. ATS, “Antarctic Treaty,” 21–25.

25. ATS, “Antarctic Treaty,” 21–27.

26. “ATCM and Other Meetings,” ATS (website), accessed May 29, 2023, <https://www.ats.aq/e/atcm.html>.

27. ATS, “Antarctic Treaty,” 24.

28. “The Committee for Environmental Protection,” ATS (website), accessed June 8, 2023, <https://www.ats.aq/e/committee.html>.

29. ATS, “Antarctic Treaty,” 23.

The combination of the ATCM and the CEP provides governance for new issues, specifically climate change, to be addressed by participants of the Antarctic Treaty.³⁰

The melting of the ice caps is observable, and its impacts are associated with climate changes worldwide.³¹ This fact provides less developed countries a pathway to seek participation in formats such as the Antarctic Treaty, as evidenced by the recent implementation of global environmental protection agreements such as the Paris Agreement and Kyoto Protocol.³² As such, the treaty system may also consider asking its most affluent members, including the United States, for support in addressing systemic issues tied to climate change. This request would be an opportunity for American embassies to deepen relations with foreign governments and create pathways for humanitarian and security support from US combatant commands.³³ While providing combatant command support would incur a cost in military personnel and funds for the United States, it would offer an opportunity for increased access, basing, and overflight through mutual defense agreements (MDAs) with countries in Africa and South Asia by way of collaboration and extending goodwill.³⁴

If the treaty places less emphasis on contributing to scientific studies and more emphasis on addressing flood concerns tied to Antarctica's melting ice, there could be ramifications that affect the US military. A melting Antarctica may force the Treaty Secretariat to decide whether or not to extend membership to affected nations. If the decision is made to stop adding members, the treaty risks receiving condemnation from the global community. Of the 54 African countries, 38 have coastlines, but South Africa is the only country with consultative or non-consultative membership.³⁵ Of the 11 southeastern Asia countries, only Malaysia is a member, despite the other 10 countries having ocean coastlines or being islands.³⁶

30. "ATCM and Other Meetings," ATS (website), accessed May 29, 2023, <https://www.ats.aq/e/atcm.html>; and "Committee for Environmental Protection."

31. "Climate Change Indicators: Snow and Ice," United States Environmental Protection Agency (website), August 1, 2022, <https://www.epa.gov/climate-indicators/snow-ice>.

32. Lindsay Maizland, "Global Climate Agreements: Successes and Failures," Council on Foreign Relations (website), November 4, 2022, <https://www.cfr.org/backgrounder/paris-global-climate-change-agreements>.

33. Department of Defense (DoD), *Foreign Humanitarian Assistance*, Joint Publication (JP) 3-29 (Washington, DC: DoD, 2019): II-6, II-9, II-19, https://www.jcs.mil/Portals/36/Documents/Doctrine/pubs/jp3_29.pdf.

34. Renanah M. Joyce and Brian Blankenship, "Access Denied? The Future of U.S. Basing in a Contested World," War on the Rocks (website), February 1, 2021, <https://warontherocks.com/2021/02/access-denied-the-future-of-u-s-basing-in-a-contested-world/>; and DoD, *Joint Planning*, JP 5-0 (Washington, DC: DoD, 2020), I-6, I-24, I-25, III-29, IV-44, https://irp.fas.org/doddir/dod/jp5_0.pdf.

35. Jason Shvili, "How Many Countries Are There in Africa?," World Atlas (website), March 15, 2021, <https://www.worldatlas.com/articles/how-many-countries-are-in-africa.html>; and "Coastal Countries of Africa," Maps of World (website), n.d., accessed September 16, 2022, <https://www.mapsofworld.com/africa/thematic/coastal-countries.html>; and "Parties."

36. Barbara Watson Andaya, "Introduction to Southeast Asia: History, Geography, and Livelihood," Asia Society (website), n.d., accessed September 18, 2022, <https://asiasociety.org/education/introduction-southeast-asia>; and "Parties."

Treaty membership in the past was usually based on the scientific offerings a country could offer with regard to Antarctica. Countries that can provide significant scientific support are likely more affluent and able to instill more protection mechanisms against rising sea levels.³⁷ If membership is not extended to the countries most affected by Antarctica's environmental changes, the treaty members may be labeled dismissive of impoverished countries in considerable danger from rising sea levels. Yet, if more members are invited, the Treaty Secretariat will be forced to consider more diverging interests. If membership is offered to flood-threatened countries, the number of members could significantly increase. An interest in flood threats would complicate current signatories' interests, as the treaty may ask its members to support other countries' flood-tied security, economic, and humanitarian issues. This request could serve as a transition from diplomatic to military activity for the United States. If the State Department received a request to support flood-tied issues, it could, in turn, request support from the Department of Defense and its combatant commands to provide security or humanitarian assistance to other countries in exchange for access, basing, and overflight. This type of activity would change the global power competition landscape.

Challenge 2: Environmental and Resource Conservation

The treaty's original members understood Antarctica contained territorial claims to natural resources but refrained from discussing them in-depth so they could focus on collaboration.³⁸ This approach mostly worked, but some treaty members have exploited this ambiguity. In particular, the treaty faces challenges with illegal, unreported, and unregulated (IUU) fishing and potential mineral resources extraction preparations.

Illegal, unreported, and unregulated fishing threatens ecosystems as it depletes maritime areas of biodiversity and can often be conducted in areas belonging to impoverished countries, which have few surveillance capabilities.³⁹ Further, IUU fishing, often transnational and sponsored by state governments or organized crime groups, can create economic and food insecurity.⁴⁰ This type of fishing applies to locations below the 60th parallel south and the Antarctic Convergence, a line connecting multiple points of latitude and longitude in which

37. "Future of the Antarctic Treaty," 16:38–17:23, 41:41–42:04.

38. "Future of the Antarctic Treaty," 5:45–6:06, 7:00–7:09, 14:14–14:41.

39. Food and Agriculture Organization (FAO) of the United Nations, *International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing* (Rome: FAO, 2001), 1, 3, <https://www.fao.org/3/Y1224E/y1224e.pdf>

40. United Nations Office on Drugs and Crime (UNODC), *Fisheries Crime* (Vienna: UNODC, 2015), 3-5, https://www.unodc.org/documents/about-unodc/Campaigns/Fisheries/focus_sheet_PRINT.pdf.

cold Antarctic waters flow and sink under warmer waters from the north.⁴¹ Within this area are many types of “marine living resources,” which the Conservation of Antarctic Marine Living Resources (CAMLR) Commission defines as “the population of fin fish, molluscs, crustaceans and all other species of living organisms, including birds”⁴²

The commission has 27 members and 10 acceding members and is responsible for preserving Antarctic aquatic life on behalf of the Antarctic Treaty.⁴³ To fulfill this obligation, the commission researches marine species and instills fishing catch limits. It has also established marine protected areas tied to the South Orkney Islands and the Ross Sea to preserve sea life.⁴⁴ The CAMLR Commission articulates a desire for cohesion among its members who execute marine protected area inspections and surveillance.⁴⁵ It is aware, however, that IUU fishing undermines its effectiveness, and at the 41st Meeting of the Commission, US representation stated, “[Collaboration] is now holding back progress. Countries that have prioritised their individual needs have weakened our ability to meet the shared conservation objectives on which this body [the CMALR Commission] was founded.”⁴⁶ Other members echoed this view in 2022, and should dissension grow, the commission may unintentionally permit more opportunities for IUU fishing activities.⁴⁷

Illegal fishing increased significantly in the Southern Ocean in the 1980s, generating \$150 billion of global revenue yearly.⁴⁸ One type of fish targeted in the Southern Ocean is the Patagonian toothfish, also known as Chilean sea bass, for which fishermen receive high payments and a minimum of 22,000 tons are caught

41. “Convention on the Conservation of Antarctic Marine Living Resources,” in *Compilation of Key Documents of the Antarctic Treaty System*, 5th ed. (Buenos Aires, AR: ATS, 2021), 121, https://documents.ats.aq/atcm43/ww/ATCM43_ww008_e.pdf; and *Encyclopedia Britannica*, s.v. “Antarctic Convergence,” accessed April 22, 2023, <https://www.britannica.com/place/Antarctic-Convergence>.

42. “Antarctic Marine Living Resources,” 121.

43. “About CCAMLR,” Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) (website), last updated October 20, 2022, <https://www.ccamlr.org/en/organisation>; and “Membership,” CCALMR (website), last updated October 20, 2022, <https://www.ccamlr.org/en/organisation/who-involved-ccamlr>.

44. “Fisheries,” CCAMLR (website), last updated May 31, 2017, <https://www.ccamlr.org/en/fisheries/fisheries>; and “Marine Protected Areas,” CCAMLR (website), last updated July 3, 2020, <https://www.ccamlr.org/en/science/marine-protected-areas-mpas>.

45. Conservation Measure 91-05 (2016): Ross Sea Region Protected Area, CCAMLR (2016), 6, 7, <https://cm.ccamlr.org/measure-91-05-2016>.

46. Conservation Measure 10-05 (2022): Catch Documentation Scheme for *Dissostichus* spp., CCAMLR (2022), 1, <https://cm.ccamlr.org/en/measure-10-05-2022>; and CCAMLR, *Report of the Forty-First Meeting of the Commission* (Hobart, AU: CCAMLR, November 4, 2022), 5, <https://meetings.ccamlr.org/system/files/meeting-reports/e-cc-41-rep.pdf>.

47. CCAMLR, *Report of the Forty-First Meeting of the Commission*, 2–4.

48. Huw Thomas, “To Fight Illegal Fishing, Follow the Money,” Pew (website), June 19, 2018, <https://www.pewtrusts.org/en/research-and-analysis/articles/2018/06/19/to-fight-illegal-fishing-follow-the-money>.

annually.⁴⁹ The toothfish is caught from an elongated fishing line with numerous subsidiary lines that often entangle and kill birds, turtles, and other marine wildlife.⁵⁰ The catching of the toothfish presents a unique challenge to the Antarctic Treaty. While the treaty aims to preserve wildlife, it also requires unanimous consent from its members to enact a ruling. In 2021, Russia vetoed a proposal to limit toothfish catches, and in 2022, the United Kingdom distributed its domestic license for catching toothfish without international approval.⁵¹ If the treaty cannot establish diplomatic consent among official foreign governments toward illegal fishing, it will be difficult to thwart illegal fishing operations.

Illegal fishers can operate for several reasons. They often receive financial and logistical assistance from governments or organized crime groups with a planning system that supports laundering and fraudulent activities.⁵² Many IUU vessels fish in international waters where state navies and coast guards have limited or no authority, and some of the groups most active in pursuing IUU vessels are nongovernmental organizations (NGOs), such as Sea Shepherd.⁵³ Sea Shepherd demonstrated its importance in 2015 when its crews discovered the *Thunder*, the world's most wanted illegal fishing vessel. After receiving the radio request to turn itself in, the *Thunder* fled and abandoned 44 miles of illegal netting containing 1,400 fish.⁵⁴ While trying to avoid capture, it burned potential evidence, flew a Nigerian flag from its mast, and radioed to the Sea Shepherd ships that it was registered with the Nigerian

49. *Patagonian Toothfish* (report), Monterey Bay Aquarium Seafood Watch (Monterey, CA: Monterey Bay Aquarium, September 4, 2019), 7, https://www.seafoodwatch.org/globalassets/sfw-data-blocks/reports/S/MBA_SeafoodWatch_ChileanSeabassReport.pdf.

50. "Overfishing," Discovering Antarctica (website), accessed October 9, 2022, <https://discoveringantarctica.org.uk/challenges/sustainability/overfishing/>; International Southern Oceans Longline Fisheries Information Clearing House (ISOFISH), *The Involvement of Mauritius in the Trade in Patagonian Toothfish from Illegal and Unregulated Longline Fishing in the Southern Ocean and What Might Be Done about It*, ISOFISH, Information Clearing House Occasional Report no. 1, 3rd ed. (Hobart, AU: ISOFISH, August 1998), 10, <https://www.colto.org/wp-content/uploads/2013/03/Report-No.-1-Mauritius.pdf>; and US Department of Commerce and US Department of State, "Chilean Sea Bass Frequently Asked Questions" (fact sheet), NOAA (website), accessed October 17, 2022, https://media.fisheries.noaa.gov/dam-migration/chilean_sea_bass_fact_sheet.pdf.

51. Nick Perry, "Russia May Again Block Antarctic Marine Protections," AP News (website), October 27, 2022, <https://apnews.com/article/science-health-china-new-zealand-europe-5658031102973723c1a035b66dfd6aa3>; and Karen McVeigh, "US Accuses UK of Exploiting Russia Tensions to Fish Highly Prized Species," *Guardian* (website), June 24, 2022, <https://www.theguardian.com/environment/2022/jun/24/us-accuses-uk-of-exploiting-russia-tensions-to-fish-highly-prized-species>.

52. Teale N. Phelps Bondaroff, Wietse van der Werf, and Tuesday Reitano, *The Illegal Fishing and Organized Crime Nexus: Illegal Fishing as Transnational Organized Crime* (Geneva, CH: Global Initiative against Transnational Organized Crime and The Black Fish, April 2015), 24, 39, https://www.unodc.org/documents/congress/background-information/NGO/GIATOC-Blackfish/Fishing_Crime.pdf.

53. "Front Lines: Sea Shepherd Is Taking the Fight to Illegal Fishing," Sea Shepherd (website), accessed July 29, 2023, <https://seashepherd.org/iuu/>; and United States International Trade Commission (USITC), *Seafood Obtained via Illegal, Unreported, and Unregulated Fishing: U.S. Imports and Economic Impact on U.S. Commercial Fisheries*, publication no. 5168, investigation no. 332-575 (Washington, DC: USITC, February 2021), 51, <https://www.usitc.gov/publications/332/pub5168.pdf>.

54. "Poaching Vessel, *Thunder*, Sinks in Suspicious Circumstances," Sea Shepherd Global (website), April 6, 2015, https://www.seashepherdglobal.org/latest-news/thunder_sinks_in_suspicious_circumstances/; and "Interpol Takes Custody of Evidence against *Thunder* from Sea Shepherd," Sea Shepherd Global (website), March 5, 2015, https://www.seashepherdglobal.org/latest-news/interpol_takes_custody_of_evidence_against_thunder/.

government to fish. Upon notification of the *Thunder's* activities, the Nigerian government withdrew the ship's registry, as the Sea Shepherd's ships pursued and gathered evidence from the *Thunder* for three months and 10,000 miles until it surrendered.⁵⁵ Nongovernmental organizations like Sea Shepherd enforce international laws protecting the high seas, and the capture of the *Thunder* was impressive.⁵⁶ However, there are thousands of illegal fishing vessels across the globe, including the Southern Ocean, which far outnumber the NGO ships conducting patrols. Further, an illegal fishing vessel can create a new identity by arriving in a port, switching crews and captains, and changing its name, numbers, and state flag.⁵⁷ With limited patrols provided by the treaty system and the CAMLR Commission in this expansive area, the number of illegal fishing expeditions sponsored by crime organizations and governments will likely grow if they are not further addressed.

A separate maritime activity that is not experiencing illegalities but is increasing at a rate that may cause issues is krill fishing. Krill are shrimp-like crustaceans that number in the hundreds of trillions in the Southern Ocean and are critical to the Antarctic ecosystem, serving as a food source for whales, fish, seals, and birds.⁵⁸ Humans also use them as a food source for cultivated aquatic animals, such as salmon and sea bass, and they emit an oil used in wound ointments and pet food products.⁵⁹ The treaty authorizes krill fishing so long as it is conducted within four designated zones near the Antarctic Peninsula and caps vessels at 620,000 combined tons of krill per year. While fishers did not reach the limit in 2020, vessels from Chile, China, South Korea, and Ukraine caught 450,000 tons—the largest catch in decades. China's particularly noteworthy 2020 catch doubled from 2019.⁶⁰ With room offered for more annual catches, the estimated weight of Antarctica's krill being roughly 400 million tons (the same weight as the world's cattle), and China needing

55. Ian Urbina, "The Dark Fleet," in *The Outlaw Ocean*, October 3, 2022, produced by the Outlaw Ocean Project and Ryan French, podcast, 9:27–9:52, 19:58–20:12, 23:05–23:55, 29:05–29:12, <https://www.cbc.ca/listen/cbc-podcasts/1068-the-outlaw-ocean/episode/15939947-episode-2-the-dark-fleet>.

56. "Our Mission," Sea Shepherd Global (website), accessed May 11, 2023, <https://www.seashepherdglobal.org/who-we-are/our-mission/>.

57. "Sea Shepherd Shuts Down Operations of the *Thunder* and Confiscates Illegal Gear," Sea Shepherd Global (website), February 7, 2015, https://www.seashepherdglobal.org/latest-news/sea_shepherd_shuts_down_operations_of_thunder/; and Urbina, "Dark Fleet," 17:20–18:07.

58. Association of Responsible Krill Harvesting Companies (ARK), "ARK Commits to Voluntary Restrictions in the Antarctic Peninsula to Ensure Long-Term Sustainability of Krill Fisheries," ARK (website), July 13, 2018, <https://www.ark-krill.org/news/ark-commits-to-voluntary-measures/>; and Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI), "Protecting Ecologically Important Krill in the Southern Ocean from Overfishing," ScienceDaily (website), October 16, 2020, www.sciencedaily.com/releases/2020/10/201016100916.htm.

59. AWI, "Protecting Ecologically Important Krill."

60. Gloria Dickie, "Insight: In Antarctica, Does a Burgeoning Krill Fishery Threaten Wildlife?," Reuters (website), February 24, 2022, <https://www.reuters.com/business/cop/antarctica-does-burgeoning-krill-fishery-threaten-wildlife-2022-02-24/>.

to feed its 1.4 billion population, krill fishing will also likely increase.⁶¹ Adherence to krill fishing regulations, not currently an issue for the treaty, could become one in the near future.

Countries are seeing the prospects of fishing in remote areas with large reserves. Some actors may first test krill fishing treaty regulations by fishing in undesignated areas or by hauling more than allowed. Countries possessing veto power within the treaty or countries who feel potential treaty reprisal is worth the risk of acquiring a greater food supply will more likely undertake this activity. China exemplified this behavior in 2018. It utilized 700 illegal fishing vessels to catch squid in North Korean waters and appears at least partially responsible for the 80 percent decline of squid in South Korean and Japanese waters since 2003.⁶² While China may not deploy 700 vessels to Antarctica, it has demonstrated a willingness to disregard other regional countries' boundaries. Thus, it may be inclined to do the same in Antarctica, which is remote and not owned by any country. In return, the treaty system may desire more enforcement of its regulations and may consider requesting maritime and aerial patrols from its members, including the United States. Such measures could require personnel, equipment, and training support from the US Navy and Air Force and offer the United States an opportunity to align more closely with South American countries affected by Antarctic IUU fishing. This event would provide the United States with an opportunity to pursue its *2022 National Defense Strategy* priority of “detering aggression” through “resilience” of supporting partners and resisting adversaries across multiple domains.⁶³ It would also enable the United States to utilize aerial and naval assets to address another *National Defense Strategy* priority, deterring perceived adversarial “aggression.”⁶⁴

While krill fishing may offer a challenge for the treaty in the next few years, potential resource extraction is an issue that will need to be addressed in the long term. The Convention on the Regulation of Antarctic Mineral Resource Activities, a convention of the Antarctic Treaty, defines “mineral resources” as “non-living natural non-renewable resources, including fossil fuels, metallic and non-metallic minerals.”⁶⁵ Enacted in 1988,

61. Dickie, “Insight”; and “Population, Total – China,” World Bank (website), accessed December 2, 2022, <https://data.worldbank.org/indicator/SP.POP.TOTL?locations=CN>.

62. Jaeyoon Park et al., “Illuminating Dark Fleets,” Indo-Pacific Defense Forum (website), September 22, 2021, <https://ipdefenseforum.com/2021/09/illuminating-dark-fleets/>.

63. DoD, *2022 National Defense Strategy of the United States of America* (Washington, DC: DoD, 2022), 7–8, <https://media.defense.gov/2022/Oct/27/2003103845/-1/-1/1/2022-national-defense-strategy-npr-mdr.pdf>.

64. DoD, *2022 National Defense Strategy*, 1, 9–10.

65. Convention on the Regulation of Antarctic Mineral Resource Activities (1988), 3, https://documents.atl.aq/recatt/att311_e.pdf.

the treaty's Protocol on Environmental Protection states in Article 7, "Any activity relating to mineral resources, other than scientific research, shall be prohibited."⁶⁶ Yet, in the same treaty, Article 27 provides, "If, after the expiration of 50 years from the date of entry into force of this Protocol, any of the Antarctic Treaty Consultative Parties so requests by a communication addressed to the Depositary, a conference shall be held . . . to review the operation of this Protocol."⁶⁷ In short, the treaty prohibits the removal of mineral resources until 2048. While this prohibition stops activities like mining and drilling, there are ways within treaty limits that countries can position themselves to extract minerals after 2048.

In 2020, Russia employed a state-owned company to conduct seismic surveys 2,700 miles in length off the eastern Antarctic coast and announced it did so to learn about the available quantity of gas and oil. From these activities, Russia determined there may be 70 billion tons of hydrocarbons in the surveyed areas.⁶⁸ Even if Russia does not remove natural resources from the continent before 2048, it is still positioning itself to understand the most advantageous drilling and extraction sites. Further, the US Department of State announced that "exploration for hydrocarbons on the continental margins around Antarctica is foreseeable, and commercial exploitation is a possibility in the longer term."⁶⁹

Environmental and resource conservation presents various issues for the Antarctic Treaty to address in the present, near term, and long term. The treaty may need to consider deterrents to thwart illegal fishing, as there are far more illegal fishing vessels than maritime and aerial patrol vehicles provided by state governments and NGOs. Further, as fishing in the Southern Ocean becomes more lucrative, the treaty may encounter more instances of countries refusing to follow its international policies. To address this problem, the treaty system may feel compelled to establish more pronounced deterrents and could consider requesting naval and aerial patrols from the United States. This possibility could offer the United States opportunities to engage in diplomacy and utilize its military to protect other

66. ATS, The Protocol on Environmental Protection to the Antarctic Treaty (Madrid, ES: ATS, October 4, 1991), 5, <https://www.ats.aq/e/protocol.html>.

67. ATS, Protocol on Environmental Protection, 5.

68. Mateusz Kubiak, "Russian Drilling in the Antarctic," Warsaw Institute (website), June 1, 2020, <https://warsawinstitute.org/russian-drilling-antarctic/>.

69. Department of State (DoS), "Regulation of Antarctic Mineral Resource Activities," in *Antarctic Treaty Handbook: Regulations of Antarctic Mineral Resources* (Washington, DC: DoS, 2017), 448, <https://2009-2017.state.gov/documents/organization/15282.pdf>.

states' economic and security interests, all while strengthening its international influence and possibly decreasing adversarial influence.

Challenge 3: Hostilities and Military Activities

Hostilities are growing between treaty members, especially as most countries choose not to accept the original territorial claims articulated by the treaty.⁷⁰ With these disagreements, several countries are enacting aggressive measures that potentially skirt the lines of Antarctic Treaty regulations or outright disobey them, thereby creating hostilities between states.

In the past few years, Russia executed actions that can be viewed as creating dissension within the treaty members.⁷¹ In 2020, a New Zealand plane patrolling the continent's protected Ross Sea identified a Russian vessel fishing when fishing was not authorized by the treaty's CAMLR Commission.⁷² The United States asked Russia to allow the CAMLR Commission to release its fishing vessel's positional data during the accused fishing timeframe, while New Zealand provided evidence of the vessel's activities.⁷³ Following the incident, New Zealand asserted that the vessel should be listed as illegal.⁷⁴ Instead, the vessel received no retribution because Russia threatened to veto the action before it could be presented.⁷⁵ Should diplomacy like this become more common, affronted treaty members may feel the need to assert themselves more aggressively.⁷⁶

On October 10, 2022, Russian forces launched a major missile offensive against Ukraine, a fellow Antarctic Treaty member, and demolished part

70. "Antarctic Region," DoS (website), accessed June 26, 2023, <https://www.state.gov/key-topics-office-of-ocean-and-polar-affairs/antarctic/>.

71. "No Warmth for Russia at Diplomatic Conference on Antarctica," AP News (website), May 26, 2022, <https://apnews.com/article/russia-ukraine-germany-antarctica-government-and-politics-df4e24da3b1391769dc4747c50236827>; Elizabeth Sidiropoulos and Tom Wheeler, *To the Ends of the Earth: Antarctica, the Antarctic Treaty, and the South Africa*, South African Institute of International Affairs [SAIIA] Research Report 23 (Johannesburg, SA: SAIIA, March 2016), 23–24, 48–49, <https://saiia.org.za/wp-content/uploads/2016/04/To-the-Ends-of-the-Earth.pdf>; and CCAMLR, *Report of the Thirty-Ninth Meeting of the Commission* (North Hobart, AU: CCAMLR, November 2020), 3–5, <https://meetings.ccamlr.org/system/files/e-cc-39-rep.pdf>.

72. Department of Commerce (DoC) and NOAA, *Improving International Fisheries Management: 2021 Report to Congress* (Washington, DC: DoC and NOAA, August 2021), 27, <https://media.fisheries.noaa.gov/2021-08/2021ReporttoCongressonImprovingInternationalFisheriesManagement.pdf>.

73. Mathieu Boulègue, *The Militarization of Russian Polar Politics* (London: Russia and Eurasia Programme, Chatham House, June 2022), https://www.chathamhouse.org/sites/default/files/2022-06/2022-06-06-militarization-russian-polar-politics-boulegue_0.pdf; and NOAA, *Improving International Fisheries Management*, 27.

74. CCAMLR, *Report of the Thirty-Ninth Meeting of the Commission*, 3–4.

75. Boulègue, *Russian Polar Politics*; and Liz Allen, "Russian Vessel Suspected of Illegal Fishing in Antarctic Waters Will Face No Consequences," *Forbes* (website), October 31, 2020, <https://www.forbes.com/sites/allenelizabeth/2020/10/31/russian-vessel-suspected-of-illegal-fishing-in-antarctic-waters-will-face-no-consequences/amp/>.

76. Boulègue, *Russian Polar Politics*.

of the Antarctic research facility in Kyiv.⁷⁷ On October 24, 2022, during a global in-person CAMLR Commission meeting held in Tasmania, Australia, a mass walkout of international delegates occurred when Russian representatives began speaking.⁷⁸ Ukraine's delegate expressed appreciation for the walkout's participants and stated, "A state that kills the civilian population, destroys the air and ground civilian infrastructure of another country and defiantly violates the basic provisions of international law should definitely be limited in its right to participate in international organizations such as CCAMLR."⁷⁹ Commission representatives from Australia, the EU, Italy, Japan, New Zealand, the United Kingdom, and the United States also offered official statements of support for Ukraine during the meeting.⁸⁰ With Russia's refusal to comply with a treaty inspection, invasion of a fellow treaty member, and subsequent retaliation from other treaty members, the treaty system may feel compelled to review the rules concerning deterrence or enforcement. Otherwise, there may be additional cavalier actions, and the treaty could receive condemnation from members who feel slighted for adhering to policies disregarded by other members.

Likewise, China is the focal point of current issues tied to the treaty.⁸¹ In 2021, China established an Antarctic research base on Inexpressible Island, Australian-claimed territory.⁸² This action lends credibility to the Office of the Secretary of Defense's assertion that China is "increasing its presence in the Antarctic through scientific projects, commercial ventures, and infrastructure and capability investments, likely intended to strengthen its position for future claims to natural resources and maritime access."⁸³ When China established the research base, Australia responded by approving AUD\$800 million to purchase ships, helicopters, and unmanned

77. Heiner Kubny, "Ukrainian Antarctic Office Partially Destroyed by Missile Attack," *Polar Journal* (website), October 17, 2022, <https://polarjournal.ch/en/2022/10/17/ukrainian-antarctic-office-partially-destroyed-by-missile-attack/>; and Perry, "Russia May Again Block."

78. Perry, "Russia May Again Block."

79. Nick Perry, "Russia, China Block Plans for Antarctic Marine Protections," *AP News* (website), November 4, 2022, <https://apnews.com/article/europe-china-new-zealand-united-states-oceans-857b3438cbeec35b68a4b125fbc9373a>; and "Russia, Ukraine among Countries Meeting in Tasmania over Future of Antarctic Waters," *Australian Broadcasting Company* (website), October 27, 2023, <https://www.abc.net.au/news/2022-10-27/russia-may-again-block-antarctic-marine-protections/101585316>.

80. *CCCAMLR Report of the Forty-First Meeting of the Commission*, 2–4.

81. *CCCAMLR Report of the Forty-First Meeting of the Commission*, 31, 35–36.

82. Matthew Cranston and Michael Smith, "US Rings Alarm on China's Antarctic Interests," *Australian Financial Review (AFR)* (website), October 27, 2022, <https://www.afr.com/world/north-america/us-rings-alarm-on-china-s-antarctic-interests-20221027-p5btb6>.

83. DoD, *Military and Security Developments Involving the People's Republic of China 2022: Annual Report to Congress* (Washington, DC: DoD, 2022), 142, <https://media.defense.gov/2022/Nov/29/2003122279/-1/-1/1/2022-military-and-security-developments-involving-the-peoples-republic-of-china.pdf>.

aerial vehicles for employment on the continent.⁸⁴ While Australia will use these vehicles for conservation and scientific activities, it appears intent on deterring potential adversaries from encroaching on its claimed territory. This conclusion is based on Australian Prime Minister Scott Morrison's 2022 statements, "We need to keep eyes in Antarctica because there are others who have different objectives to us" and "for Australia's defense interests . . . you need the capabilities that enable you to keep potential adversaries as far away from Australia as you possibly can. And that obviously meant an increased focus on our naval and our aerial capabilities."⁸⁵ The countries' resistance toward each other signals a potential inclination of some countries to exert a greater presence, whether by creating a new installation or by enhancing the presence of military vehicles. Should these inclinations continue, there is a greater chance of an increased military presence or a military incident in which antagonism between countries could heighten.

Although it does not engage in activities that would violate the treaty, the United States displays a considerable commitment to the continent. The National Science Foundation's US Antarctic Program researches the continent while using different aerial vehicles to ferry equipment and personnel between the continent to Chile and New Zealand.⁸⁶ The New York Air National Guard's 109th Airlift Wing has deployed to Antarctica at least once a year since 1988. From 2020–21, it flew six missions to the continent for medevac support and to transport researchers and equipment. During this time, rather than redeploy to their home station as usual between missions, the unit's forward personnel remained in Antarctica for three months, providing logistical support to personnel on the continent.⁸⁷ The 109th Airlift Wing representatives also met with Brazilian Air Force

84. Cranston and Smith, "US Rings Alarm"; and Phillip Coorey, "PM Pledges \$804m to Fight Cold War in Antarctica," *AFR* (website), February 21, 2022, <https://www.afr.com/politics/federal/pm-pledges-804m-to-fight-cold-war-in-antarctica-20220221-p59yax>.

85. Kirsty Needham, "Australia Says Plane Had 'Right' to Watch China Navy Vessel in Its Waters," Reuters (website), February 22, 2022, <https://www.reuters.com/world/asia-pacific/australia-plane-had-right-watch-china-navy-vessel-its-waters-pm-morrison-2022-02-22/>; and Scott Morrison and Miles Yu, "Australia's Role in the China Struggle: A Conversation with Scott Morrison," China Center, Hudson Institute (website), December 6, 2022, YouTube video, 44:38–45:08, <https://m.youtube.com/watch?v=QGcabczrUNCg&pp=ygUfaHVkc29uIGluc3RpdHV0ZSBzY290dCBtb3JyaXNvbg%3D%3D>.

86. "About NSF," National Science Foundation (NSF) (website), accessed April 30, 2023, <https://new.nsf.gov/about>; "Antarctic Sciences," NSF (website), accessed April 30, 2023, <https://www.nsf.gov/geo/opp/ant/index.jsp>; and "United States Antarctic Program (USAP) Aircraft," NSF (website), accessed April 30, 2023, <https://www.nsf.gov/geo/opp/support/usapairc.jsp>.

87. Raymond F. Shields Jr., New York State Division of Military and Naval Affairs (DMNA), *2021 Annual Report* (Latham, NY: New York DMNA, February 2022), 48–49, http://dmna.ny.gov/annual/NYNG_annual_report_2021.pdf.

counterparts in Rio de Janeiro in 2019 to discuss their Antarctic-tied missions and flight operations.⁸⁸

The United States holds considerable influence on the continent through its military-supported operations and international relations. It runs the only research station at the actual geographic South Pole at the center of the continent, the Amundsen-Scott South Pole Station, where it conducts astrophysics, meteorology, and aeronomy testing. The US Palmer Station operates in territory claimed by the United Kingdom. The US McMurdo Station is in Antarctic territory claimed by New Zealand and works closely with the nearby New Zealand Scott Base. In addition, the United States and Australia built an astronomical observatory on the Antarctic Plateau's highest point, and both countries signed a joint statement backing the establishment of marine protected areas around the continent.⁸⁹ While these partnerships align with the treaty, they may cause Russia and China to feel the United States is challenging their influence, especially with the United States already backing other security alliances that resist Russia's and China's foreign military endeavors.⁹⁰ Both countries, therefore, may be more willing to undermine the treaty as long as they advance their domestic and global interests.

When boundaries are violated and foreign interests are challenged, state governments are more likely to consider military options. The treaty was designed to promote international cooperation. Today, however, clear hostilities challenge the treaty's framework and the signatories' relationships with each other. If this situation continues, treaty members may feel the need to enact measures more drastic than diplomacy.⁹¹ The treaty system might become more willing to ask members to provide military support capable of convincing other members to comply with regulations. The United States and its military may be an attractive option for treaty officials, especially if this option can neutralize the actions of powerful members who defy regulations.

88. Shields, *2019 Annual Report*, 53; and Jaclyn Lyons, "NY Air Guard, Brazil Partner on Antarctic Flying," Air National Guard (website), October 2, 2019, <https://www.ang.af.mil/Media/Article-Display/Article/1977915/ny-air-guard-brazil-partner-on-antarctic-flying/>.

89. Tim Stephens, "Australia and the United States in Antarctica: Warm Partners on the Coldest Continent," United States Studies Centre (website), December 6, 2016, <https://www.ussc.edu/au/analysis/australia-and-the-united-states-in-antarctica-warm-partners-on-the-coldest-continent/>; and Nick Routley, "Slices of the Pie: Mapping Territorial Claims in Antarctica," Visual Capitalist (website), February 20, 2021, <https://www.visualcapitalist.com/mapping-territorial-claims-in-antarctica/>.

90. DoD, *Military and Security Developments*, 8, 14; and Joseph R. Biden Jr., *National Security Strategy* (Washington, DC: White House, 2022), 24, 26, 41, <https://www.whitehouse.gov/wp-content/uploads/2022/11/8-November-Combined-PDF-for-Upload.pdf>.

91. Morrison and Yu, "Australia's Role in the China Struggle," 12:30-16:28; and Biden, *National Security Strategy*, 16-17.

Conclusion

The Antarctic Treaty was created to foster peaceful international research activities, limit military expansion, and ensure Antarctica did not become a theater for nuclear weapons testing or waste disposal.⁹² These Cold War security concerns were largely addressed. Since then, the treaty's membership has quadrupled in size, with more members possessing diverging and conflicting interests, including those tied to the impacts of climate change.⁹³ There is no indication that this trend will stop, and if unaddressed, international compliance with the treaty may continue to face challenges. This situation could lead to treaty members reexamining which issues to manage and a potential request from the Antarctic Treaty Consultative Meeting for a more pronounced emphasis on security issues to ensure treaty compliance. This reappraisal could include implementing humanitarian and security support to address the rise of ocean levels from Antarctica's melting ice or establishing naval and aerial patrols to deter IUU fishing, mineral extraction, and other aggressive military activities. In turn, such developments could offer the United States opportunities to engage with nations in Africa, South America, and South Asia and generate approaches for improving deterrence against potential adversarial activities tied to Antarctica. These are potential scenarios. American policymakers and military leadership should monitor the issues tied to Antarctica and the Antarctic Treaty to understand the support the United States may be asked to provide and any potential risks or opportunities.

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92. ATS, "Antarctic Treaty," 21–27.

93. ATS, "Antarctic Treaty," 1; and "Parties."

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