

NOTE

GIVE THE PENGUINS THEIR FREEDOM: THE CASE FOR ANTARCTIC INDEPENDENCE

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I. INTRODUCTION

Antarctica: home to the emperor penguin, the leopard seal, and the occasional researcher. The continent is the largest unclaimed landmass in the world—yet still has a system of governance. Most of the land on the planet has been inhabited by humanity for millennia.¹ As a result, most systems of governance have developed slowly over time to reach their present iteration. Antarctica, however, is unlike any other land on earth. It does not have, nor has it ever had, permanent inhabitants, and the history of human activity on the continent stretches back a mere 200 years. Accordingly, Antarctic governance is unlike any other on earth. The Antarctic Treaty System (ATS) was established in 1961 at the height of the Cold War: it froze all territorial claims and created a framework through which several countries jointly administer the continent.² The ATS was a masterful creation—it ushered in a period of peace, mutual cooperation, and scientific enlightenment that has safeguarded the continent for over half a century.³ Were it not for its protective embrace, Antarctica likely would have been strip-mined long ago, with the emperor penguin and leopard seal relegated to myth.

Unfortunately, a rapidly changing world has left the ATS behind—its framework reinforces historic inequities, it has no capacity to regulate criminal activity on the continent, and it is unable to defend the continent against the environmental threats of our age. Climate change is the greatest peril facing humanity today; though it may appear futile to fixate on Antarctica instead of the planet as a whole, it seems a shame for us to have protected the Antarctic continent for over half a century only to turn our backs on it now. Nations seeking access to natural resources circle the continent like vultures, and climate change has begun its inexorable assault on the Antarctic ecosystem—failure to act now will send Antarctica down a path from which there is no return. We cannot abandon our seventh continent to such an ignominious fate.

1. See, e.g., Elizabeth Howell, *How Long Have Humans Been on Earth?*, UNIVERSE TODAY (Jan. 19, 2015), <https://www.universetoday.com/articles/how-long-have-humans-been-on-earth> [https://perma.cc/ED5R-NQML].

2. The Antarctic Treaty art. IV(2), IX, Dec. 1, 1959, 12 U.S.T. 794, 402 U.N.T.S. 71 [hereinafter Antarctic Treaty].

3. See *id.*

Proposals exist that seek to reform the ATS,⁴ but they will continue to be rejected by the countries that govern Antarctica. The ATS encourages countries to pursue their individual geopolitical interests at the cost of Antarctic preservation.⁵ Consequently, countries have zero incentive to surrender control and every incentive to block reform. This note therefore entertains a bold proposal—one that would simultaneously resolve existing issues and transform Antarctic governance into a lithe and reactive system capable of meeting the problems of tomorrow. It proposes definitively closing the door on territorial claims and competing interests by turning Antarctica into an independent nation state.

Section II provides a brief history of the continent, an overview of Antarctica's natural resources, and explains how the system of governance works. It then discusses the effects of climate change and the current state of Antarctic environmental protections. Section III explores the three primary limitations of the current system of governance. Firstly, the ATS is an outdated and structurally unjust system that slows regulatory development. Secondly, the ATS does not have a set framework for criminal enforcement, which, with the ever-increasing number of visitors to Antarctica, is problematic. Lastly, environmental protections on the continent are not sufficient to protect against climate change or unfettered resource extraction. Section IV explores existing proposals to remedy these three limitations and finds that none are likely to be implemented, as the current framework rewards preservation of the status quo. Accordingly, Section V proposes a path to reform Antarctic governance by turning it into an independent nation state. Not only would this resolve the issues identified in section III, but recent developments in environmental law create a path to state recognition that would avoid the pitfalls of the solutions explored in section IV.

4. See, e.g., Yelena Yermakova, *Legitimacy of the Antarctic Treaty System: Is It Time for a Reform?*, 11 POLAR J. 342 (2021) [hereinafter Yermakova, *Legitimacy of the Antarctic Treaty System*]; Todd F. Chatham, *Criminal Jurisdiction in Antarctica: A Proposal For Dealing With Jurisdictional Uncertainty and Lack of Effective Enforcement*, 24 EMORY INT'L L. REV. 331 (2010); Elizabeth K. Hook, *Criminal Jurisdiction in Antarctica*, 33 U. MIAMI L. REV. 489 (1978).

5. See generally Yermakova, *Legitimacy of the Antarctic Treaty System*, *supra* note 4.

II. ANTARCTICA, THE TREATY, AND CLIMATE CHANGE

The current limitations of Antarctic governance are rooted in its history, its resources, and the growing threat posed by climate change. Early Antarctic exploration and human activity on the continent led to the original implementation of the ATS. The nature of human activity on the continent has changed since then, with exploration giving way to scientific research and tourism. Due to the increase in human activity, the world has learned of the vast amount of natural resources on the continent, with both governments and private parties turning their gaze south as a result. Today, various treaties and actors work together under the ATS to govern the continent and regulate extraction of its resources. Though Antarctic environmental protections under the ATS are wide-ranging, climate change remains unaddressed and poses an existential risk to both the continent and the planet as a whole.

A. Creation of the ATS

Antarctica is the coldest and driest continent on earth—98% of the surface is covered in ice.⁶ Antarctica was first sighted in the early nineteenth century, though the existence of a landmass in that part of the globe had been theorized for millennia.⁷ Political and strategic aims in the early twentieth century led to regular expeditions to the continent; as the last remaining unclaimed landmass in the world, Antarctica was of great interest to the world's imperial powers.⁸ In the subsequent decades, colonial era explorers surveyed, explored, and hunted in the Antarctic—despite the continent's remote location and inhospitable conditions leading to several failed expeditions and deaths.⁹

6. See, e.g., *Antarctica*, CIA WORLD FACTBOOK (Feb. 10, 2005), <https://user.iiasa.ac.at/~marek/fbook/04/geos/ay.html> [https://perma.cc/NW4N-FLSM].

7. See Yelena Yermakova, *Governing Antarctica: Assessing the Legitimacy and Justice of the Antarctic Treaty System* 15 (2021) (Ph.D. dissertation, University of Oslo) [hereinafter Yermakova, *Governing Antarctica*].

8. See *id.* at 15–16.

9. See *History of Scott's Expedition: British Antarctic (Terra Nova) Expedition 1910–1913*, ANTARCTIC HERITAGE TRUST, <https://nzaht.org/conserv/explorer-bases/scotts-hut-cape-evans/history-of-scotts-expedition/> [https://perma.cc/4EYT-RQH5] (last visited Dec. 18, 2025).

The first territorial claim in Antarctica was made by the United Kingdom in 1908, and seven other countries followed suit in the following decades.¹⁰ An illustration of these claims is shown below. Antarctic territorial claims were the last major imperial venture before the world moved on from land-grab colonialism.¹¹ Much like colonial claims in Africa or the Americas, Antarctic territorial claims asserted ownership and control over their given sectors. These claims were the first step in establishing sovereignty over the territory. Successfully establishing sovereignty would grant the right to build, inhabit, and—crucially—extract resources.

10. See Yermakova, *Governing Antarctica*, *supra* note 7, at 16.

11. See Alejandra Mancilla & Peder Roberts, *Introduction: What Colonialism Tells Us About Antarctica, and What Antarctica Tells Us About Colonialism*, in *COLONIALISM AND ANTARCTICA: ATTITUDES, LOGICS, AND PRACTICES* 4 (Peder Roberts & Alejandra Mancilla eds., 2024) (“the European imperial wave that took place roughly from 1830 to 1914, when the last bits and pieces of what was considered global terra nullius (including Antarctica) were sought after and claimed.”).



*Map of Antarctic Territorial Claims*¹²

Antarctic territorial claims are based on a variety of factors—the United Kingdom claims its territory on the basis of whaling activity they conducted in the Southern Ocean, whereas the Norwegian claim relies on Roald Amundsen's expedition to the South Pole.¹³ The Chilean and Argentine claims are based on the

12. *Antarctic Governance*, ANTARCTIC AND SOUTHERN OCEAN COALITION, <https://www.asoc.org/learn/antarctic-governance/> [https://perma.cc/5VCH-M3FP] (last visited Dec. 15, 2025).

13. See Yermakova, *Governing Antarctica*, *supra* note 7, at 17.

Treaty of Tordesillas—an agreement made by Portugal and Spain during the age of discovery (early sixteenth century), in which they partitioned the known world between themselves.¹⁴ Because Chile and Argentina consider themselves successor states to the Spanish colonies in the New World, they assert claims to Antarctic territory on the basis that the Treaty of Tordesillas allocated this land to them.¹⁵ All nations other than Norway applied the sector principle: the geographic area in which activity was conducted (whether it be whaling, seal hunting, or exploration) was extended all the way to the South Pole.¹⁶ After the Second World War, Cold War tensions led to increased interest in Antarctica, culminating in the signing of the Antarctic Treaty (AT).¹⁷ Research at the time indicated little economic value in Antarctic mineral resources.¹⁸ Accordingly, claimant states were more interested in avoiding military confrontation over the question of Antarctic sovereignty than they were in pressing their territorial ambitions. They agreed to freeze all territorial claims under the Treaty until 2048, with the United States and the Soviet Union reserving the right to make territorial claims in the future.¹⁹

B. Human Activity in Antarctica

The pursuit of scientific knowledge was enshrined in the Treaty and has driven human activity in the Antarctic since the first expeditions set out to explore the continent.²⁰ During the race to the South Pole in the early twentieth century, both the Norwegian and British expeditions constructed temporary shelters on the continent.²¹ These were used as bases from which they conducted scientific research—this included geological surveys, specimen

14. See *id.*

15. See *id.*

16. See *id.* at 17 n.17 (the Norwegian claim was not originally extended to the South Pole: Canadian claims in the Arctic at the time applied the sector principle by extending territorial claims from Canada's northern islands all the way to the North Pole. Norway's opposition to Canada's arctic claims was legitimized by its rejection of the sector principle in Antarctica—though Norway appears to have recently reversed its position and now claims the entire sector).

17. See Yermakova, *Governing Antarctica*, *supra* note 7, at 18.

18. See *id.* at 19.

19. See *id.* at 17–20.

20. See *History of Scott's Expedition*, *supra* note 9; see also Antarctic Treaty, *supra* note 2.

21. See *History of Scott's Expedition*, *supra* note 9.

collection, and astronomical observations. Though this gave countries a physical presence, which they used to justify territorial claims, they were also among the first scientific research bases in the Antarctic.²² After the suspension of territorial claims under the ATS, countries were free to build research bases across the continent—with some being built on land claimed by other countries.²³ Today, over seventy permanent research stations exist on the Antarctic continent, resulting in a summer population of around 4,500 researchers and a winter population of around 1,000.²⁴ The largest research station on the continent is run by the US National Science Foundation. Named McMurdo station, it has a harbor, two airfields, utility lines, and over 140 buildings.²⁵ Research conducted on the continent is varied: studies of ice cores, ecosystems, and glaciers are evident from the nature of Antarctica.²⁶ Other areas include astrophysics and chemistry—one recent project studied the accumulation of rare earth elements in brine pools, with potential applications in space exploration.²⁷

The importance of Antarctic research cannot be understated. Research conducted in Antarctica comes from “almost all scientific disciplines.”²⁸ The continent is home to a myriad of organisms, the study of which has deepened our understanding of evolution, habitat change, and how local species have adapted to the cold.²⁹ The study of Antarctic geology offers insight into the planet’s past, revealing data on how Earth and its environments have changed over the ages.³⁰ The continent is also ideal for exploration beyond

22. *See id.*

23. *See NSF McMurdo Station*, US NAT’L SCI. FOUND., <https://www.nsf.gov/geo/opp/ail/mcmurdo-station#location-a29> [https://perma.cc/T4NN-NFUQ] (last visited Dec. 18, 2025); *Antarctic Governance*, *supra* note 12.

24. *10 Research Stations in Antarctica You Should Know About*, SWOOP ANTARCTICA BLOG (Sept. 8, 2025), <https://www.swoop-antarctica.com/blog/10-research-stations-in-antarctica-you-should-know-about/> [https://perma.cc/N9XS-8K3J].

25. *See NSF McMurdo Station*, *supra* note 23.

26. *See id.*

27. *See generally* Zachary F.M. Burton et al., *Controls on Cold-Climate Critical Minerals: Regolith-Hosted REE at Three Polar Desert Salt Ponds (McMurdo Dry Valleys, Antarctica)*, 239 COLD REGIONS SCI. AND TECH. 1 (Nov. 2025).

28. Mahlon Kennicutt II, *New Frontiers and Future Directions in Antarctic Science*, in SCIENCE DIPLOMACY: ANTARCTICA, SCIENCE, AND THE GOVERNANCE OF INTERNATIONAL SPACES 153–54 (Berkman et al. eds., 2011).

29. *See id.*

30. *See id.*

Earth: its location over the south pole presents a “unique place for astronomical and solar-terrestrial observations,” with telescopes in Antarctica sweeping the cosmos for clues as to how the universe came to be.³¹ Antarctica and its surrounding ocean allow for both terrestrial and celestial research that could not be conducted or observed anywhere else on the planet—the continent’s continued potential for scientific discovery is vast.³²

In the present day however, scientific research is not the main industry in Antarctica. The largest industry currently operating on the Antarctic continent is tourism.³³ The annual number of visitors has been increasing over time: in 1991, over 7,000 tourists visited the Antarctic Peninsula; today, that number is closer to 35,000.³⁴ Antarctica is an appealing destination—despite an abundance of natural resources, it remains largely untouched by humanity and offers a unique experience for those willing to pay the often exorbitant prices charged by tourist companies.

C. Antarctic Resources

Given Antarctica’s remote location and recent discovery, little resource extraction has taken place. The continent has extensive natural resources, ranging from frozen water in the ice sheet to fossil fuels buried in the seafloor. Data further suggests the presence of substantial metal deposits, in addition to diverse flora and fauna that have both scientific and economic value.

Antarctica has vast freshwater reserves—though humans consume little of it. The Antarctic continent is covered by the largest glacier on earth: the Antarctic ice sheet.³⁵ The ice sheet is

31. *Id.* at 154–55, 158–59.

32. *See id.* at 159.

33. *See* Juan Francisco Salazar et al., *Reimagining Antarctic ‘Gateway’ Cities*, CIRCLES OF SUSTAINABILITY, <https://www.circlesofsustainability.com/projects/antarctic-cities/> [https://perma.cc/9LAU-VCVX] (last visited Dec. 11, 2025); Klaus Dodds, *In 30 Years the Antarctic Treaty Becomes Modifiable, and the Fate of a Continent Could Hang in the Balance*, THE CONVERSATION (July 12, 2018), <https://theconversation.com/in-30-years-the-antarctic-treaty-becomes-modifiable-and-the-fate-of-a-continent-could-hang-in-the-balance-98654> [https://perma.cc/S65D-3JPD].

34. *See* Salazar et al., *supra* note 33, at 4.

35. *See* N. A. Wright & P. L. Williams, Mineral resources of Antarctica: Geological Survey Circular 705, at 1, 15 (1974) (explaining ninety-eight percent of the continent is covered by the ice sheet, which holds “as much as 90 percent of the world’s store of fresh water”).

estimated to contain as much as 90% of the planet's frozen fresh water.³⁶ Frozen fresh water—commonly known as ice—is a key source of potable water for much of the global population, with water from melting glaciers hidden high in mountain ranges supplying many of the planet's rivers.³⁷ Most of Antarctica's annual precipitation is compacted into the ice sheet—and as with any glacier, the ice sheet is constantly moving down toward sea level.³⁸ As a result, most Antarctic freshwater ends up melting in the sea and becoming saltwater, rendering it undrinkable. Growing concerns about global water scarcity suggest Antarctic water reserves may be of increasing interest.³⁹

Deposits of fossil fuels including oil and gas exist on the continent, though the exact quantities are uncertain. The Polar Research Institute of China calculated that deposits located both on the Antarctic seafloor and under the ice sheet contain 500 billion tons of petroleum and between 300 billion and 500 billion tons of natural gas.⁴⁰ It is estimated that the Ross Sea shelf in Antarctica has similar resources to the Gippsland Basin in Australia, due to both areas having been originally joined in a supercontinent, and both having developed continental shelves composed of Tertiary sedimentary rocks.⁴¹ Considering the Gippsland Basin contains reserves of 2.5 billion barrels of petroleum and 220 billion cubic meters of natural gas, it is likely the Ross Sea shelf alone contains substantial fossil fuel deposits.⁴² Fossil fuels, with uses ranging from international shipping to stovetop cooking, are a finite resource.⁴³ Discovery of large

36. *Id.*

37. See Anne Helmenstine, *River – Definition, Formation, Facts*, SCIENCE NOTES (Apr. 8, 2026), <https://sciencenotes.org/river-definition-formation-facts/> [<https://perma.cc/9LK4-FZH3>].

38. *Id.*

39. See, e.g., Somini Sengupta, *Water Crises Threaten the World's Ability to Eat*, *Studies Show*, N.Y. TIMES (Oct. 16, 2024), <https://www.nytimes.com/2024/10/16/climate/water-shortages-global-food-supply.html> [<https://perma.cc/M5F4-N786>].

40. Yermakova, *Governing Antarctica*, *supra* note 7, at 24.

41. See WRIGHT & WILLIAMS, *supra* note 35, at 16.

42. See *id.* (discussing how conversion of natural gas tons to cubic meters is impossible without more data).

43. See Christina Nunez, *Fossil Fuels, Explained*, NAT'L GEOGRAPHIC (April 2, 2019), <https://www.nationalgeographic.com/environment/article/fossil-fuels> [<https://perma.cc/X5YC-4DAC>].

Antarctic reserves would be a tantalizing prospect to countries around the world.⁴⁴

Other mineral deposits are difficult to quantify with accuracy. A study by the United States Department of the Interior conducted a statistical analysis based on a reconstruction of the supercontinent that Antarctica, Australia, Africa, India, and South America broke off from during the Mesozoic era in an effort to predict the mineral potential of Antarctica.⁴⁵ The results suggest Antarctica is rich in minerals, though most of them would likely be under the ice sheet.⁴⁶ These minerals include iron, copper, gold, and platinum—gold in particular is frequently the subject of reporting and interest.⁴⁷

Rare earth elements (REEs) are used in most modern technology; indeed, the current fascination with AI, and the advanced computing power it requires makes REEs indispensable. Evidence points to several Antarctic deposits: geological surveys conducted on the continent have found mineral deposits containing thorium, uranium, and rare earth elements in the Transantarctic Mountains.⁴⁸ Furthermore, surveys of Queen Maud Land in East Antarctica revealed deposits of lanthanum, another REE.⁴⁹ A scientific study on the behavior of REE accumulation in Antarctica revealed scientific data applicable to our understanding of the world, but also revealed accumulations of REEs in Antarctic brine pools.⁵⁰

Antarctica and its surrounding ocean are host to marine mammals, birds, and other marine life—and they are exploited for

44. See *Norway Opens New Arctic Oil Fields – Named After Sea Ice Phenomenon That the Very Same Oil Will Contribute to Melting* (April 24, 2025), BELLONA, <https://bellona.org/news/arctic/2025-04-norway-opens-new-arctic-oil-fields-named-after-sea-ice-phenomenon-that-the-very-same-oil-will-contribute-to-melting> [<https://perma.cc/RK5T-EDAU>] (highlighting how Norway is already drilling for oil in Arctic Sea ice).

45. See WRIGHT & WILLIAMS, *supra* note 35, at 16, 24.

46. See *id.* at 21.

47. See, e.g., *Antarctic Volcano Emits \$6,000 Worth of Gold Daily*, MINING.COM (Apr. 30, 2024), <https://www.mining.com/antarctic-volcano-erupts-6000-worth-of-gold-daily/> [<https://perma.cc/EGH9-G7TJ>].

48. See US CONG. OFF. OF TECH. ASSESSMENT, *POLAR PROSPECTS: A MINERALS TREATY FOR ANTARCTICA, POTENTIAL MINERAL RESOURCES IN ANTARCTICA* 91, 120 (1989).

49. See *id.*

50. See generally Burton et al., *supra* note 27 (noting that extraction is not economically viable now but may become so as technology advances).

both economic and scientific purposes.⁵¹ Though hunting penguins, seals, and whales has been banned,⁵² fish and krill remain subject to fishing activity.⁵³ Penguins are a frequent subject of scientific study. Some species, such as the emperor penguin, are found only in Antarctica. The continent is also a prime location for the study of seals—a recent study of seal cell samples revealed unique attributes that further humanity’s understanding of oxygenation in blood flow.⁵⁴ Of more interest to industry, however, is the presence of varied bacteria, algae, protozoa, and metazoa, all of which are subject to bioprospecting.⁵⁵ Bioprospecting consists of harvesting organic material from the continent. The harsh and unforgiving Antarctic climate has led to the evolution of unique organisms, and their genetic information can lead to lucrative products for parties that harvest and develop them.⁵⁶

D. Governance

The ATS is the framework through which the continent is governed and encompasses the AT (with its subsequent amendments, protocols, and annexes), in addition to other treaties and agreements.⁵⁷ The AT provides the basic framework under which the original claimants agreed to suspend their territorial claims.⁵⁸ The Madrid Protocol was added to the AT in 1991 and created an environmental protection regime for the continent. The oceans surrounding the continent are regulated by the Convention for the Conservation of Antarctic Marine Living Resources

51. See David Leary, *Bioprospecting at the Poles*, in RESEARCH HANDBOOK ON POLAR LAW 272 (Karen N. Scott & David L. VanderZwaag eds., 2020).

52. See, e.g., Lauren Bash, *Is Hunting Allowed in Antarctica?*, EWASH (July 2025) <https://www.ewash.org/is-hunting-allowed-in-antarctica/> [https://perma.cc/Y26K-3VF5].

53. Jessica F. Green, *Hierarchy in Regime Complexes: Understanding Authority in Antarctic Governance*, 66 INT’L STUD. Q. 1, 6 (2022).

54. See generally Kaitlin N. Allen et al., *Low Guanylyl Cyclase Activity in Weddell Seals: Implications for Peripheral Vasoconstriction and Perfusion of the Brain During Diving*, 316 AM. J. PHYSIOLOGY-REGUL., INTEGRATIVE AND COMPAR. PHYSIOLOGY 704 (2019).

55. See Leary, *supra* note 51, at 272–73.

56. See *id.* at 274 (a survey of patent data shows the three main areas in which Antarctic genetic material is used: pharmaceuticals, industrial applications, and nutritional supplements).

57. Antarctic Treaty, *supra* note 2.

58. See *id.* (explaining claims have been frozen, and the *status quo* has been maintained ever since).

(CCAMLR). In addition to these formal international agreements, various other state and non-state actors also play an important regulatory role.

The ATS was established with the signing of the AT, which entered into force on June 23, 1961.⁵⁹ It recognized that “it is in the interest of all mankind” that Antarctica remain peaceful and acknowledged the value of scientific research on the continent.⁶⁰ Science remains the foundation of the ATS—that science continues to play a prominent role in Antarctic governance has never been challenged.⁶¹ Article I of the AT states that “Antarctica shall be used for peaceful purposes only.”⁶² It further prohibits any actions of a military nature, but allows use of “military equipment or personnel for scientific research or any other peaceful purpose.”⁶³ Article IV froze all territorial claims on the continent; considering it was implemented during the Cold War, the successful imposition of a moratorium on territorial claims, military activity, and political saber-rattling is seen by many as the greatest achievement of the ATS.⁶⁴

Decision making in the ATS is done by Antarctic Treaty Consultative Parties (ATCPs). The original twelve signatories are referred to as the claimants, and are accorded permanent ATCP status.⁶⁵ Since its inception, the treaty has expanded to forty-eight signatories—only twenty-eight of which are ATCPs.⁶⁶ Any country may join the ATS as a non-consultative party, but a country must demonstrate an interest in Antarctica by conducting substantial research on the continent to become an ATCP.⁶⁷ Annual meetings are held in accordance with the treaty to make decisions about the continent. Both ATCPs and non-consultative parties can attend and

59. *Id.*

60. *Id.*

61. Zia Madani, *Unpacking Inclusivity of the Antarctic Treaty System Amidst Contemporary Challenges*, 43 POLAR SCI. 1, 4 (2025).

62. Antarctic Treaty, *supra* note 2, art. I (1).

63. *Id.* art. I (2).

64. See Yermakova, *Governing Antarctica*, *supra* note 7, at 18.

65. See Madani, *supra* note 61, at 7; see also Yermakova, *Legitimacy of the Antarctic Treaty System*, *supra* note 4, at 344.

66. See Tony Press, *Explainer: Keeping Conflict on Ice With the Antarctic Treaty*, THE CONVERSATION, (July 17, 2011) <https://theconversation.com/explainer-keeping-conflict-on-ice-with-the-antarctic-treaty-2197> [<https://perma.cc/E258-UDT9>].

67. See *id.*

share views, but only ATCPs can vote.⁶⁸ Decisions are made by consensus—*i.e.*, unanimous vote.⁶⁹ ATCPs can lose their consultative status if they fail to maintain a significant research commitment on the continent, with the exception of the original twelve signatory countries: their ATCP status is irrevocable.⁷⁰

The Madrid Protocol was adopted in 1991 under the ATS and lays out a comprehensive environmental regime for the continent.⁷¹ It did not enter into force until 1998; for an agreement to have effect under the ATS, it must be adopted by ATCPs and then ratified by the national legislature of each ATCP.⁷² The Madrid Protocol is notable for imposing a complete prohibition on any mineral resource activities outside of scientific research.⁷³ This functions as a mining ban, and it cannot be overturned unless “there is ‘in force a legally binding regime on Antarctic mineral resource activities.’”⁷⁴ The Madrid Protocol established the Committee for Environmental Protection, which advises ATCPs on implementation and management of the environmental protection clauses.⁷⁵ The Madrid Protocol further mandates that the ATCPs work on drawing up a liability regime for “damage arising from activities taking place in the Antarctic Treaty area.”⁷⁶ In 2005, Annex VI was adopted: it creates a framework for “liability arising from environmental emergencies.”⁷⁷ Unfortunately, Annex VI has not entered into force as several ATCPs have yet to ratify it—despite two decades having passed since its adoption by consensus.⁷⁸

The Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) was signed in 1980 and entered into

68. See Madani, *supra* note 61, at 8.

69. See Yermakova, *Legitimacy of the Antarctic Treaty System*, *supra* note 4, at 344.

70. See *id.*

71. See generally Protocol on Environmental Protection to the Antarctic Treaty, Oct. 4, 1991, 2941 U.N.T.S. 3 [hereinafter Madrid Protocol].

72. See Madani, *supra* note 61, at 8,9.

73. Madrid Protocol, *supra* note 71, art. 7.

74. Donald R. Rothwell & Alan D. Hemmings, *Evolution of a Polar Law*, in RESEARCH HANDBOOK ON POLAR LAW 471 (Karen N. Scott & David L. VanderZwaag eds., 2020).

75. Madrid Protocol, *supra* note 71, art. 11–12.

76. *Id.* art. 16.

77. Annex VI to the Protocol on Environmental Protection to the Antarctic Treaty: Liability Arising from Environmental Emergencies, Measure 1 (2005), ATCM XXVIII, Stockholm (June 17, 2005).

78. See Madani, *supra* note 61, at 6.

force in 1982.⁷⁹ Membership is open to all states in addition to some international organizations. Though considered part of the broader ATS, it is separate from the AT and membership does not require ATP status.⁸⁰ CCAMLR regulates the oceans within the Antarctic convergence, a natural boundary demarcated by the meeting of northerly flowing Antarctic waters with the warmer waters of the Atlantic, Pacific, and Indian oceans.⁸¹ It has two main responsibilities: conservation of marine life and regulation of fisheries in the Antarctic Ocean.⁸² CCAMLR mirrors the AT in many ways, with decisions made by consensus, and “substantial interest” being required for a state to become a voting party.⁸³ CCAMLR has seen success in adopting regulation and enforcement mechanisms regarding fishing in the Antarctic Ocean, in addition to expanding protections for seabirds in the area.⁸⁴

Since the inception of the ATS, Antarctica has also seen an increase in non-state actors participating in Antarctic governance.⁸⁵ One example is the International Association of Antarctica Tour Operators (IAATO), which implements various environmental guidelines for both tourists and tour operators.⁸⁶ IAATO, despite being an industry group, is given “considerable deference” with regard to tourism by other regulatory parties in Antarctica—such that IAATO’s guidelines may evolve into regulatory schemes in the future.⁸⁷ Another organization involved in Antarctic governance is the Scientific Committee on Antarctic Research (SCAR). SCAR has implemented guidelines covering scientific research on the continent in addition to advising the Antarctic Treaty on scientific matters.⁸⁸ Despite being a non-state

79. See Christopher C. Joyner, *The Exclusive Economic Zone and Antarctica: The Dilemmas of Non-Sovereign Jurisdiction*, 19 OCEAN DEV. AND INT’L L. 469, 482 (1988).

80. See Madani, *supra* note 61, at 8–9.

81. See Emily S. Nocito & Cassandra M. Brooks, *The Influence of Antarctic Governance on Marine Protected Areas in the Biodiversity Beyond National Jurisdiction Agreement Negotiations*, 2 NPJ OCEAN SUSTAINABILITY 1, 6 (2023); Antarctic Convergence, BRITANNICA <https://www.britannica.com/place/Antarctic-Convergence> [https://perma.cc/M5LQ-7GKX].

82. Madani, *supra* note 61, at 8.

83. Yermakova, *Legitimacy of the Antarctic Treaty System*, *supra* note 4, at 345.

84. See Rothwell & Hemmings, *supra* note 74, at 470.

85. See Green, *supra* note 53, at 3.

86. See *id.* at 18.

87. *Id.* at 35.

88. See *id.* at 18.

actor (and accordingly not a treaty signatory), SCAR is seen as the “‘authoritative voice’ of the scientific community”—such that “there are few Consultative Parties who will contradict or dispute SCAR information.”⁸⁹ Several other parties are present on the continent and occupy niche areas of Antarctic governance.⁹⁰

E. Environmental Protections and Climate Change

Current environmental protections in Antarctica are derived primarily from the Madrid Protocol and CCAMLR; some areas are highly regulated, but others—like tourism—operate under a disjointed framework. The Madrid Protocol imposes stringent pollution controls in the Antarctic that regulate environmental protection schemes, pollution, and environmental impact of human activity.⁹¹ Bioprospecting is not explicitly regulated under the ATS, but the Madrid Protocol requires a permit granted by a state party in order to take biological samples from the continent for scientific study.⁹² To create protected areas, CCAMLR designates marine protected areas (MPAs)—geographical zones in which excessive fishing and other environmentally detrimental activities are heavily restricted.⁹³ MPAs are meant to ensure long-term biodiversity conservation and “have [provided] . . . biological, ecological and sociocultural benefits . . . [including] restoring biodiversity and increasing ecological resilienc[e].”⁹⁴ The Ross Sea MPA was designated in 2016, and will remain in effect until 2051 unless CCAMLR agrees by consensus to terminate it.⁹⁵ MPAs do little to regulate tourist activity; indeed, despite being the largest industry on the continent, the ATS lacks a unified regulatory framework for tourism.⁹⁶ Guidelines for tourist expeditions are convoluted and work under a combination of Madrid Protocol requirements, ATS resolutions, protected areas, and IAATO.⁹⁷

89. *Id.* at 24.

90. *See generally* Green, *supra* note 53 (examples include the Convention for the Conservation of Antarctic Seals, the Institute for Marine and Antarctic Studies, and the Antarctic Research Centre, Wellington).

91. Madrid Protocol, *supra* note 71, art. 8.

92. *Id.* annex II, art. 3.

93. *See* Nocito & Brooks, *supra* note 81, at 2.

94. *Id.*

95. *See id.*

96. *See* Yermakova, *Governing Antarctica*, *supra* note 7, at 56.

97. *See id.* at 57.

Participation in IAATO is voluntary—although it “promotes environmentally responsible tourism in Antarctica,” it lacks both a monitoring system and an enforcement system.⁹⁸ Though environmental protections do help on a local level, they cannot protect against the global threat that is climate change.

In today’s political climate, the fact that the planet is warming is often treated as an opinion. The unfortunate reality is that human activity has released over 1.6 trillion tonnes of greenhouse gases into the atmosphere since the Industrial Revolution.⁹⁹ The Paris Agreement, signed in 2015, was a commitment to limit global warming to well below two degrees above pre-industrial levels.¹⁰⁰ The state of global warming as of 2025 has likely already surpassed 1.5 degrees globally, with warming above 2 degrees certain by 2100 should we continue on the current trajectory.¹⁰¹ Furthermore, emission statistics show that between 1994 and 2024 (30 years), more greenhouse gases were released into the atmosphere than between the Industrial Revolution and 1994 (approximately 250 years).¹⁰² Though some facts remain contested,¹⁰³ the scientific consensus holds that the evidence is incontrovertible and the outlook is bleak.¹⁰⁴

A warming planet is not the only concern: carbon dioxide reacts with seawater to form carbonic acid.¹⁰⁵ The oceans of earth

98. *Id.* at 6.

99. Bruno Venditti, *Here’s How CO2 Emissions Have Changed Since 1900*, WORLD ECON. F. (Nov. 22, 2022), <https://www.weforum.org/stories/2022/11/visualizing-changes-carbon-dioxide-emissions-since-1900/> [<https://perma.cc/2T7J-SGSJ>].

100. Paris Agreement, Apr. 22, 2016, 3156 U.N.T.S. 79.

101. See Kirsty McCabe, *World exceeds 1.5°C threshold for entire year for the first time*, ROYAL METEOROLOGICAL SOC’Y (Jan. 10, 2025) <https://www.rmets.org/metmatters/world-exceeds-15degc-threshold-entire-year-first-time> [<https://perma.cc/6YGN-8ZZG>].

102. See Hannah Ritchie, et al., *Greenhouse gas emissions*, OUR WORLD IN DATA (Jan. 2024) <https://ourworldindata.org/greenhouse-gas-emissions> [<https://perma.cc/TZM4-EXLQ>].

103. See Somini Sengupta & Lisa Friedman, *Trump to World: Green Energy Is a Scam and Climate Science Is From ‘Stupid People’*, N.Y. TIMES (Sept. 23, 2025) <https://www.nytimes.com/2025/09/23/climate/trump-climate-energy-united-nations-unga.html> [<https://perma.cc/32SA-SA4C>] (“President Trump went on a rant against climate change at the United Nations General Assembly on Tuesday, calling it the ‘greatest con job ever perpetrated on the world’ and saying that the scientific consensus on global warming was created by ‘stupid people.’”).

104. See generally *Obligations of States in Respect of Climate Change*, Advisory Opinion, 2025 I.C.J. 187 (July 23).

105. Tim Stephens, *Ocean Acidification at the Poles: Regional Responses to Marine Environmental Change in the Anthropocene*, in RESEARCH HANDBOOK ON POLAR LAW 434

are alkaline: the pH was around 8.2 prior to the Industrial Revolution.¹⁰⁶ The release of carbonic acid into the oceans results in a phenomenon termed “ocean acidification”—the pH of the oceans has declined by about 0.1 so far, and is predicted to further decline by 0.2–0.3 by 2100.¹⁰⁷ While this may seem like a negligible figure, the 0.1 decline in pH equates to a 30% increase in ocean acidity.¹⁰⁸ The ocean is more acidic today than it has been at any point in the last half-million years.¹⁰⁹ Continued ocean acidification threatens the existence of most marine life: the oceans are acidifying faster than many species can adapt.¹¹⁰

The effects of climate change are detrimental to all life on the planet. We can expect dwindling water supplies, devastation of ecosystems around the world, and vast swathes of the globe becoming uninhabitable for humans and wildlife alike. Human induced climate change is the greatest environmental threat Antarctica faces, and it has already had a significant effect on the continent.¹¹¹ Global warming is occurring three times faster in the Antarctic than it is anywhere else on the planet.¹¹² Prior to 2012, annual ice loss in the Antarctic was around 76 billion tons; by 2018, it was around 219 billion tons.¹¹³ The effects of climate change are compounded by the introduction of pollutants into the delicate Antarctic ecosystem. Plastic has been found both in Antarctic ice fields and in Antarctic Ocean fish catches.¹¹⁴ Studies show that “contaminants of emerging concern,” in addition to microplastics, are increasingly prevalent in Antarctica.¹¹⁵

(Karen N. Scott & David L. VanderZwaag eds., 2020) (explaining that carbonic acid lowers the natural pH of the oceans).

106. *Id.* at 435. Alkaline refers to a substance with a pH higher than 7.

107. *Id.*

108. *See id.*

109. *See id.*

110. *See id.* (Considering the earliest species of humans first evolved 300,000 years ago, we are venturing into uncharted territory.).

111. *See* Sabaa A. Khan & Seita Romppanen, *Global Trajectories of Chemical Pollution: Legal Gaps and Complexities in the Polar Context*, in RESEARCH HANDBOOK ON POLAR LAW 394 (Karen N. Scott & David L. VanderZwaag eds., 2020).

112. Kyle R. Clem et al., *Record Warming at the South Pole During the Past Three Decades*, 10 NATURE CLIMATE CHANGE 762, 762 (2020).

113. Rosemary Rayfuse, *Climate Change and the Poles*, in RESEARCH HANDBOOK ON POLAR LAW 413–14 (Karen N. Scott & David L. VanderZwaag eds., 2020).

114. Khan & Romppanen, *supra* note 111, at 397

115. *Id.*

Both pollution and climate change are the result of human activities conducted outside of Antarctica, but the long-term implications for the Antarctic are considerable.¹¹⁶ Ocean acidification and continued pollution will decimate the krill population, which is the cornerstone of the Antarctic food web.¹¹⁷ Widespread biodiversity loss will occur, with the destruction and potential extinction of native species such as the emperor penguin, the albatross, and the leopard seal. Glacial retreat and ice loss due to warmer temperatures will destroy vulnerable native vegetation and may lead to the proliferation of alien species and bacteria, leading to a complete collapse of the local ecosystem.¹¹⁸

The idea of a vast extinction event like the one described should be enough to mobilize the international community to prevent such an outcome. This seems an unlikely outcome, however, considering retreating ice cover in the Arctic Ocean has led to the use of terms such as “bonanza” and “boom” to describe new shipping lanes and resource extraction opportunities.¹¹⁹ Accordingly, it is worth mentioning the economic perils posed by climate change in Antarctica. The Antarctic ice sheet is the largest on the planet, making it a major contributor to global sea-level rise—a concerning prospect when the economic cost of climate change on the global economy is considered.¹²⁰ Aside from pure economic harm, conservative estimates of sea-level rise as a result of climate change predict that by 2100, sea-level rise will displace 190 million people globally.¹²¹ More pessimistic estimates of sea level rise suggest the number to be closer to 630 million people—almost twice the population of the United States, or approximately

116. *Id.*

117. See Rayfuse, *supra* note 113, at 416.

118. *Id.* at 417.

119. See Yelena Yermakova, *Future Governance of the Arctic: Press, Policy and the Arctic Council*, 4 (May 2017) (MPA thesis, Cornell University) (on file with the Cornell University Library).

120. See Yermakova, *Governing Antarctica*, *supra* note 7, at 55; see also Seene Aerts et al., *Economic Losses From Climate Change Are Probably Larger Than You Think: New NGFS scenarios*, CEPR (Oct. 22, 2024), <https://cepr.org/voxeu/columns/economic-losses-climate-change-are-probably-larger-you-think-new-ngfs-scenarios> [<https://perma.cc/PJ9X-ZZR2>] (explaining the GDP loss to the global economy as a result of climate change could be as high as 45% - climate change poses serious economic danger to the planet even without considering its effect on Antarctica).

121. Yermakova, *Governing Antarctica*, *supra* note 7, at 55.

eight percent of the world population.¹²² Immigration is a contested issue, and countries are resorting to morally dubious actions and human rights violations in their efforts to address it.¹²³ This situation would not be improved by the physical displacement of over 8% of the global population (without even accounting for people migrating due to crop failure or lack of water access). Accordingly, even should the environmental effects of climate change on the continent be deemed trivial, the global economic cost of a melting Antarctic ice sheet would be astronomical.

III. LIMITATIONS OF THE ATS

The current Antarctic system is inadequate for the growing demands of the twenty-first century. Governance of the continent—meaning the framework for making binding decisions affecting Antarctica and its surrounding waters—suffers from institutionalized inequality and procedural complications that ossify the regulatory process. Criminal jurisdiction and enforcement were barely touched upon in the original treaty, and no clear process exists—the number of research stations and their many personnel have exposed the dangers of such an approach. Lastly, despite environmental protection being the stated purpose of the Madrid Protocol, significant gaps remain such that the continued protection of the Antarctic environment is in doubt.

A. Structural Injustice

The ATS has been criticized for institutionalizing its colonial origins and benefiting only the original signatories.¹²⁴ The ATS was established in the context of competing territorial claims in Antarctica.¹²⁵ Accordingly, the original signatories represented those countries that had asserted sovereignty over parts of the continent, in addition to countries that were influential at the time.¹²⁶ The decision to freeze territorial claims instead of

122. *Id.*

123. See, e.g., Mattathias Schwartz & Chris Cameron, *U.N. Human Rights Office Asks Ghana to Halt Deportations of Migrants Sent From U.S.*, N.Y. TIMES (Sept. 26, 2025) <https://www.nytimes.com/2025/09/26/us/politics/migrants-ghana-deportations.html> [https://perma.cc/N7HS-TSTJ].

124. See Yermakova, *Governing Antarctica*, *supra* note 7, at 69–70.

125. *Id.* at 18.

126. See *id.* at 19 (referring to Belgium, Japan, South Africa, United States, and USSR).

extinguishing them, and the declaration that nothing in the ATS should be construed as strengthening or weakening any existing claims, were for the benefit of those original signatories.¹²⁷ The onerous process to become an ATCP prevents these benefits from being diluted by new signatories. Even decisions made by ATCPs can be undermined by the consensus requirement: it gives every ATCP the right to veto any proposal it disagrees with, ensuring that party's individual interests are not compromised. Failure to reform the ATS risks rendering the entire system irrelevant, as countries frustrated by the inflexible framework may choose to bypass the ATS by simply ignoring it.

Prospective ATCPs have a high bar to clear before they can participate in Antarctic governance.¹²⁸ Countries must adopt ATS provisions into their national legislation, which requires accounting for environmental protection and scientific research guidelines.¹²⁹ The continued failure of countries to ratify Annex VI two decades after its inception shows that integrating the ATS into a national legislative framework is no easy task. Many countries are unable to clear the required legislative hurdles to become an ATCP.¹³⁰

The financial cost to meet the scientific research requirement to become an ATCP not only exacerbates the high barrier to access to governance, but also erodes the usefulness of the research conducted. Conducting scientific research in the Antarctic is an expensive endeavor; the logistical challenge of transporting people, supplies, and equipment vast distances across the Southern Ocean is considerable.¹³¹ Ships traverse some of the most dangerous and turbulent waters on the planet to reach the continent. The only alternative is a flight, which comes with its own complications and exorbitant cost. In the mid 2000s, the Antarctic Division of the Australian federal government faced a funding

127. *See id.*

128. *See id.* at 96.

129. *See* Madani, *supra* note 61, at 7.

130. *See id.*; *see also* Madrid Protocol, *supra* note 71, art. 16.

131. *See Logistics and Support*, INT'L POLAR FOUND. (last visited Aug. 2, 2026), http://www.antarcticstation.org/science/logistics_support/ [<https://perma.cc/UD7G-J6QF>]. For a party to receive Consultative Party status, it must conduct activities physically on the continent—general research from afar is not sufficient. *See generally* Antarctic Treaty System, *Guidelines on the Procedure to Be Followed with Respect to Consultative Party Status*, Decision 2 (2017), ATCM XL, CEP XX, Beijing (June 1, 2017).

shortfall. The country's budget could barely cover the cost of maintaining existing bases, let alone support any meaningful scientific activity.¹³² Accordingly, the budget was increased from AU\$88 million in 2005 to AU\$95 million in 2006.¹³³ Australia's government expenditure on Antarctic research in 2006 alone was higher than the GDP of some countries;¹³⁴ indeed, meeting the scientific research requirement through Antarctic research is so costly that many countries cannot afford it. Furthermore, because conducting scientific research is a requirement to become an ATCP, many national programs are conducted primarily to gain entry to the ATS.¹³⁵ Many scientific research projects are therefore "far less than optimal from a scientific point of view."¹³⁶ That the scientific research requirement prevents scientists from conducting meaningful research defeats the purpose of having it to begin with. Therefore, the requirement not only reinforces historic inequities in Antarctic governance through its high financial cost, but also undermines the very scientific research it aims to promote.¹³⁷

The inherent unfairness of the ATS drew criticism even before the Treaty was signed; failure to develop a more inclusive regime could cause the current one to fade into irrelevancy. In 1956, India proposed opening Antarctic governance to the UN General Assembly.¹³⁸ Developing countries, led by Malaysia, criticized the exclusive nature of the ATS throughout the 1980s and 1990s, stating at the United Nations General Assembly (UNGA) that "[t]he days when the rich nations of the world can take for themselves whatever territory and resources that they have access to are over."¹³⁹ Attempts by the UNGA to involve itself in Antarctic

132. See Neil T. M. Hamilton, *Poles Apart: Australia's Policy and Responsibilities in Antarctica*, THE CONVERSATION (July 18, 2011), <https://theconversation.com/poles-apart-australias-policy-and-responsibilities-in-antarctica-2118> [https://perma.cc/98KV-4U3U].

133. *Id.*

134. See GDP – Gross Domestic Product, 2006, COUNTRY ECONOMY, <https://countryeconomy.com/gdp?year=2006> [https://perma.cc/56EK-QA9X] (last visited Dec. 17, 2025) (showing both Tuvalu and Nauru had a total GDP of under US\$30 million).

135. See Yermakova, *Legitimacy of the Antarctic Treaty System*, *supra* note 4, at 349.

136. *Id.*; see also Yermakova, *Governing Antarctica*, *supra* note 7, at 54 ("according to a 2012 assessment of Antarctic research, New Zealand was one of the top producers of Antarctic scientific papers while having only one base.").

137. See Yermakova, *Legitimacy of the Antarctic Treaty System*, *supra* note 4, at 349.

138. Yermakova, *Governing Antarctica*, *supra* note 7, at 3.

139. *Id.* at 63.

governance ceased after the adoption of the Madrid Protocol and its mining ban, suggesting criticism of the ATS was motivated less by ideological concerns and more by a desire to extract economic value from the continent at a time where mining had not yet been banned.¹⁴⁰ Recent increases in Antarctic tourism, alongside increased awareness of mineral deposits on the continent, suggest that the economic potential of Antarctica is higher now than when the Madrid Protocol was adopted.¹⁴¹ Accordingly, due to the recent increase in potential economic value, interest in Antarctic participation is likely to increase despite the present mining ban.¹⁴² Should the ATS fail to encourage wider participation from non-consultative parties, countries unable to become ATCPs may choose to extract economic value from Antarctica of their own accord and ignore the ATS, resulting in the regulatory framework being bypassed and thus rendered irrelevant.¹⁴³

Even existing ATCPs may choose to bypass the ATS in the future as a result of the consensus requirement. CCAMLR and ATS proposals are only ratified if they reach consensus among participating states; that every state have absolute veto power over any proposal is considered the “Achilles’ heel” of informed decision-making in Antarctic treaties.¹⁴⁴ Disagreement among countries over different “scientific perspectives” on climate change compromised CCAMLR negotiations on MPAs, with the consensus requirement being wielded as a tool to “kill” a resolution.¹⁴⁵ Russian and Chinese opposition to MPAs has resulted in a failure to reach consensus on proposed MPAs off of the coast of the East Antarctic, the Weddell Sea, and the Antarctic Peninsula.¹⁴⁶ The Ross Sea MPA only reached consensus among ATCPs because it is time limited, setting an unfavorable precedent for future protected areas.¹⁴⁷ The benefit of requiring consensus is that each party is forced to participate in decision-making. Considering current participation from some parties consists solely of rejecting any proposal that would check resource extraction or otherwise

140. *See id.* at 65.

141. *See id.*

142. *See id.*

143. *See id.* at 66.

144. *See* Nocito & Brooks, *supra* note 81, at 4.

145. *Id.*

146. Rothwell & Hemmings, *supra* note 74, at 467.

147. *See* Nocito & Brooks, *supra* note 81, at 4.

constrain activity on the continent, the merits of such participation are questionable. Currently, parties “[struggle] to reach consensus on just about anything,” leaving one CCAMLR delegate to conclude that “consensus is a killer.”¹⁴⁸

Even with decisions that do reach consensus, failure to define terms and vague language lead to gray areas ripe for abuse. The clearest example of this is bioprospecting. Bioprospecting consists of the commercialization of scientific research and has resulted in Antarctic biological material being used to develop a variety of lucrative products.¹⁴⁹ Under current interpretations, bioprospecting falls under the Madrid Protocol Annex II, which regulates the taking of biodiversity from the continent for scientific purposes.¹⁵⁰ Whether bioprospecting can be classed as “scientific study” is disputed. Were it instead to be classed as for-profit sequestration of Antarctic biodiversity, bioprospecting would be prohibited.¹⁵¹ Scientific research can also be used to justify mineral prospecting. In early 2020, Russia conducted a survey to assess offshore oil and gas potential in Antarctica—ostensibly in the name of scientific research.¹⁵² Even the foundation of the ATS is ambiguous. The AT states that Antarctica shall be used for “peaceful purposes” and bans any military use of the continent.¹⁵³ Military personnel and equipment, however, could in theory be used for any purpose that is not military in nature.¹⁵⁴ A country could conduct scientific research for military purposes while complying with the ATS.¹⁵⁵ Equally, military action for “peaceful purposes” would also be permissible under certain interpretations of the ATS.¹⁵⁶ Though no country has attempted to circumvent the prohibition on military use of the continent thus far, this ambiguity

148. *Id.*

149. Leary, *supra* note 51, at 274; *see also supra* note 55 and accompanying text.

150. *See id.* at 277.

151. *See id.*

152. *See* Madani, *supra* note 61, at 5 (describing the Karpinskiy's suspected minerals prospecting in the Antarctic Treaty area despite its prohibition under the Madrid Protocol).

153. Antarctic Treaty, *supra* note 2, art. I.

154. *See* Alan D. Hemmings, Challenges to Substantive Demilitarisation in the Antarctic Treaty Area, 12 Y.B. POLAR L. ONLINE 172, 186 (2020).

155. *Id.* (explaining how some countries use scientific equipment in Antarctica (such as oil tankers) to bolster military projection and military deterrence).

156. *See* Madani, *supra* note 61, at 3.

nonetheless illustrates a gray area in the treaty that could be exploited in the future.

B. Lack of Criminal Enforcement

Since the formation of the ATS, the number of people on the Antarctic continent at any one time has multiplied—with a resultant increase in criminal activity.¹⁵⁷ Support personnel, family members of scientists, civilian staff, and tourists were not envisioned when the AT was first ratified, and, as a result, are not covered by the ATS.¹⁵⁸ Such an ill-defined approach to criminal enforcement sufficed in the mid twentieth century when a negligible number of people were present on the continent at any one time. With current annual visitors to Antarctica numbering in the tens of thousands, however, a clear framework is needed.

The ATS cannot support a framework for criminal enforcement in its current form. A court's jurisdiction over criminal matters is usually tied to sovereignty.¹⁵⁹ Because the ATS resolved the sovereignty dispute in Antarctica by sidestepping the issue, criminal jurisdiction was given only a fleeting mention.¹⁶⁰ The ATS holds that countries shall retain jurisdiction over their own nationals if they are observers or scientific personnel.¹⁶¹ Any disputes not involving these groups of people are to be resolved by "consultation among the concerned states."¹⁶² Each of the claimant states has adopted either Antarctic-specific legislation or held that its domestic legislation applies to Antarctica.¹⁶³ The rules of McMurdo station illustrate how this works in practice. McMurdo is a research station run and owned by the US that, due to its port and airstrip, serves as the main access point to the continent.¹⁶⁴ Tourists who visit McMurdo are allowed to walk around the base

157. See *Antarctica*, *supra* note 6; US NAT'L SCI. FOUND., SEXUAL ASSAULT AND HARASSMENT PREVENTION AND RESPONSE (SAHPR) FINAL REPORT, NSF SAHPR 30 n.25 (2022) [hereinafter SAHPR FINAL REPORT].

158. See Hook, *supra* note 4, at 492.

159. See *id.* at 496.

160. See *id.* at 492.

161. Antarctic Treaty, *supra* note 2, art. VIII (1).

162. *Id.* art. XI (1); art. VIII (2).

163. See Hook, *supra* note 4, at 494.

164. Zoom Interview with Kaitlin Allen, Ph.D., Postdoctoral Scholar, Woods Hole Oceanographic Institution (Dec. 12, 2025).

but are not allowed to enter the buildings.¹⁶⁵ The buildings are US property, but the physical land is part of the Ross Dependency—to which New Zealand asserts a claim.¹⁶⁶ This creates both jurisdictional and logistical issues, neither of which has a straightforward solution.

Though international law addresses areas beyond national jurisdiction, it cannot be reliably applied in Antarctica.¹⁶⁷ International law determines jurisdiction on the basis of territoriality and nationality, with territoriality being paramount.¹⁶⁸ Accordingly, because the assertion of criminal jurisdiction over any party in Antarctica is tied to territorial claims, applying international jurisdictional principles to Antarctica is not practicable.¹⁶⁹ Claimant countries are unlikely to surrender jurisdiction to any other country as it would diminish the strength of their own territorial claims.¹⁷⁰ Non-claimant countries are unlikely to surrender jurisdiction of their nationals to another country, as it would serve to bolster the other country's influence over the continent.¹⁷¹

Criminal enforcement in Antarctica is further constrained by logistical realities. Antarctica has no police force, no investigative force, and no court system.¹⁷² Any state prosecuting criminal behavior has to transport the offending individual to a courtroom to face trial.¹⁷³ Such trials are compromised by difficulties in preserving evidence and securing witnesses: these tend to be other researchers in Antarctica, often of a different nationality than the accused.¹⁷⁴ Of course, this assumes that the perpetrator of a crime can be identified in the first place—an assumption that the unresolved death of Dr. Rodney Marks undermines.

Dr. Marks was an Australian researcher who died in 2000 during his stay at the Amundsen-Scott South Pole Station—a US

165. *Id.*

166. *See* Chatham, *supra* note 4, at 333.

167. *See* Hook, *supra* note 4, at 495.

168. *See id.* at 496 (explaining different theories of determining jurisdiction).

169. *See id.* at 497.

170. *See id.* at 493.

171. *See id.* at 497.

172. *Id.* at 498.

173. *See id.*

174. *See id.* at 498.

research station.¹⁷⁵ When his body reached New Zealand six months later, the police found that he died from “a heavy dose of methanol in his system”—for which there was no apparent explanation.¹⁷⁶ According to the New Zealand authorities, they could not rule out “that this was as the direct result of the act of another person.”¹⁷⁷ Both the United States and New Zealand had an interest in the case: it occurred on a US base, but New Zealand claims the land on which the base is located. As a result of conflicting interests, neither country cooperated with the other.¹⁷⁸ The circumstances surrounding Dr. Marks’ death remain a mystery more than two decades later.¹⁷⁹

Rising occurrences of sexual assault on Antarctic research bases further highlight failures in investigation and enforcement of criminal activity. The US National Science Foundation published a report in 2022 showing that 40% of respondents said they had personally experienced or witnessed sexual harassment or sexual assault on the continent.¹⁸⁰ Awareness of this issue is increasing: McMurdo has a US marshal, and has instituted a strict alcohol policy.¹⁸¹ Nevertheless, much of the research on the continent is conducted at field sites—these are remote locations located far from bases, and with limited radio contact.¹⁸² A single US marshal at McMurdo is hardly sufficient to adequately police the entire continent. As a result, reports of harassment and assault are often made to superiors instead of a designated police force.¹⁸³ These reports are frequently ignored, or the women who file them are fired, which leaves female researchers forced to choose between continued employment and continued sexual assault.¹⁸⁴ In one

175. See Chatham, *supra* note 4, at 331.

176. See *id.* at 332 (explaining the six-month delay was the result of flights having been paused over the winter months).

177. *Id.* at 332–33.

178. See *id.* at 333.

179. See *id.*

180. SAHPR FINAL REPORT, *supra* note 157, at 30 n.25.

181. Interview with Kaitlin Allen, *supra* note 164.

182. *Id.*

183. See Nick Perry, *Women Working in Antarctica Say They Were Left to Fend for Themselves Against Sexual Harassers*, AP NEWS (Aug. 27, 2023), <https://apnews.com/article/women-working-antarctica-sexual-harassment-assault-mcmurdo-ba0e550fddf1ab0afd031ff4d25143cb> [https://perma.cc/8GKR-3YU8] (noting several prominent female researchers have been fired for reporting sexual harassment or refusing to work alongside their harassers after having reported them).

184. See *id.*

instance, zero action was taken in response to a report of repeated and concerning instances of unwanted sexual advances, leading the scientist in question to carry a hammer at all times for protection.¹⁸⁵

C. Environmental Concerns

Significant gaps in Antarctic environmental preservation are a troubling prospect considering Antarctica's vulnerability to environmental damage.¹⁸⁶ Preservation of the natural environment is one of the highest priorities for individual researchers, who, aware of the effect their actions can have on the environment, act accordingly.¹⁸⁷ As a result, Antarctic environmental protection on a local scale is comprehensive.¹⁸⁸ Broader protections are lacking, however. The current ban on mining is neither sufficient to cover all of Antarctica's resources nor authoritative enough to prevent resource extraction in the near future—especially considering today's geopolitical climate. Implementation of protected areas on both sea and land has stalled, and the environmental protections they provide are questionable at best. The environment is regularly and negatively affected by tourism, and, despite being the continent's largest industry, a regulatory framework for it does not exist. Environmental preservation frameworks that do exist and seek to safeguard the Antarctic environment are negated by countries' behavior outside of Antarctica. Lastly, despite the Madrid Protocol having mandated the creation of a liability regime for the Antarctic continent, no such regime exists because some countries have failed to "elaborate rules and procedures relating to liability . . . covered by [the Madrid] Protocol."¹⁸⁹

The current framework restricting resource exploitation in Antarctica mirrors a broader issue: Antarctic governance is "not

185. *Id.*

186. See Clem et al., *supra* note 112.

187. Interview with Kaitlin Allen, *supra* note 164.

188. *Id.* Dr. Allen further explained that the United States Antarctic Program, through which all US activity on the continent is regulated, has stringent regulations governing local environmental protection. She gave two examples of local environmental conservation: the duty to report environmental contamination should something fall off a sled, and the treatment of refuse on bases—people always pick up trash, and there is a concerted effort to separate and sort items for transport back to the United States. *Id.*

189. Madrid Protocol, *supra* note 71, art. 16.

designed to limit or restrict emerging activities . . . but rather to encourage, and ultimately facilitate, their conduct.”¹⁹⁰ The current mining ban is only supported because ATCPs’ mineral needs can be met elsewhere.¹⁹¹ The Madrid Protocol imposed a complete prohibition on any mineral resource activities apart from scientific research.¹⁹² It cannot be rescinded unless “there is ‘in force a legally binding regime on Antarctic mineral resource activities.’”¹⁹³ This, in essence, means that mining in Antarctica is banned until a legal framework for mining exists. A further regulatory gap that may be exploited in future stems from the applicability of the ATS: non-signatory countries are not bound by it and accordingly have no obligation to follow the provisions regulating resource and mineral extraction.¹⁹⁴

Although ice is a mineral, it is exempted from the minerals regime outlined by the Madrid Protocol.¹⁹⁵ This was a conscious decision—during the negotiations, states agreed that, should ice harvesting in Antarctica become a reality, it would be permissible and governed by the protocol’s “generic environmental obligations.”¹⁹⁶ Access to glacial meltwater is a common cause of friction between nation states.¹⁹⁷ In an age where the climate is changing around the world—leaving many nations facing water scarcity—the immense store of freshwater on the Antarctic continent is a valuable resource.¹⁹⁸ The idea that icebergs could be broken off and transported to countries facing water shortages sounds far-fetched, but the US Department of the Interior noted it as a possibility as early as 1974.¹⁹⁹ Such a practice would doubtlessly ravage local ecosystems, making the lack of stringent regulation problematic.

Securing access to natural resources is a key aspect of today’s geopolitical climate, and the Antarctic continent stands out as an

190. Rayfuse, *supra* note 113, at 433.

191. See Dodds, *supra* note 33.

192. Madrid Protocol, *supra* note 71, art. 7.

193. Rothwell & Hemmings, *supra* note 74, at 471.

194. See Madani, *supra* note 61, at 5.

195. See U.S. CONG. OFF. OF TECH. ASSESSMENT, *supra* note 48, at 121.

196. Rothwell & Hemmings, *supra* note 74, at 472.

197. See Tessa Wong, *China Begins Building World’s Largest Dam, Fuelling Fears in India*, BBC (July 21, 2025), <https://www.bbc.com/news/articles/c4gk1251w14o> [<https://perma.cc/NF7W-BGV4>].

198. Yermakova, *Governing Antarctica*, *supra* note 7, at 48.

199. See WRIGHT & WILLIAMS, *supra* note 35, at 15.

untapped and untouched source. Access to oil, gas, and REEs is vital, and countries are resorting to increasingly erratic measures to ensure continued access.²⁰⁰ One need only look to recent US developments for an illustration: threats to invade Greenland (which has considerable REE reserves) by force because “we need Greenland very badly”;²⁰¹ continued calls to incorporate Canada (which has considerable oil reserves) as the fifty-first US state;²⁰² and a military incursion into Venezuela (which has 17% of the world’s proven oil reserves).²⁰³ Antarctic reserves present a tantalizing alternative route to secure access to such minerals.²⁰⁴ As a result, ATCPs have begun exploring the extraction of Antarctic resources. One such exploratory expedition sparked protests in Cape Town when the Russian research vessel Karpinskiy returned.²⁰⁵ Ostensibly owned by a Russian geological exploration company, the Karpinskiy was suspected of minerals prospecting in the Antarctic Sea.²⁰⁶ Prospecting is an Antarctic mineral resource

200. Jessie Yeung & Piper H. Blackburn, *Trump Renews Threat of Military Force to Annex Greenland*, CNN (May 4, 2025), <https://www.cnn.com/2025/05/04/world/greenland-annexation-threat-trump-nbc-interview-intl-hnk> [<https://perma.cc/DFQ7-EZ9V>].

201. *Id.*

202. Garth Friesen, *Why Trump Wants Greenland and Canada: Strategic and Economic Goals*, FORBES (Jan. 29, 2025), <https://www.forbes.com/sites/garthfriesen/2025/01/26/why-trump-wants-greenland-and-canada-strategic-and-economic-goals/> [<https://perma.cc/XLV8-6PQD>].

203. See Edward Wong & Julian E. Barnes, *Venezuela’s Oil Is a Focus of Trump’s Campaign Against Maduro*, N.Y. TIMES (Dec. 17, 2025), <https://www.nytimes.com/2025/12/16/us/politics/trump-maduro-venezuela-oil-tanker.html> [<https://perma.cc/U6SL-B43R>]; see also Farnaz Fassihi, *At the U.N., Even Allies Condemn U.S. Action in Venezuela*, N.Y. TIMES (Jan. 7, 2026), <https://www.nytimes.com/2026/01/05/world/americas/un-security-council.html> [<https://perma.cc/D5XD-Z4EW>].

204. See U.S. CONG. OFF. OF TECH. ASSESSMENT, *supra* note 48, at 120.

205. See Madani, *supra* note 61, at 5.

206. See *id.* (A report from Russia’s largest oil, gas, and minerals conglomerate stated that the purpose of its work in the Antarctic “was to ensure the geopolitical interests of Russia in the Antarctic in the form of systematic regional geological and geophysical studies of the subsoil of Antarctica and the adjacent continental shelf, which represent a potential reserve for the extraction of mineral raw materials by future generations of mankind.”); see also Jeffrey Lin & P. W. Singer, *These Are China’s New Underwater Drones*, POPULAR SCI. (June 4, 2021), <https://www.popsoci.com/finding-qianlong-iii-chinas-new-underwater-drones/> [<https://perma.cc/6LFN-4PVQ>] (China has invested heavily in underwater surveying—the Qianlong III is a submarine capable of diving to 14,800 feet and the PRC has been using it to scour the seabed for natural gas and metallic nodules in the South China Sea).

activity banned under the Madrid Protocol.²⁰⁷ Furthermore, a report prepared for the US government in 1989 concluded that, should gold deposits be found in Antarctica, there would likely be economic interest in extracting it if gold prices remained stable.²⁰⁸ In 1989, the price of gold was US\$403 per ounce—accounting for inflation, this would amount to US\$1,046 per ounce in 2025.²⁰⁹ The market price of gold on December 15, 2025 was US\$4,302 per ounce—more than four times the inflation-adjusted 1989 price.²¹⁰ Not only are countries making exploratory moves toward Antarctic mining, but current economic and geopolitical conditions make Antarctic resource extraction a practical endeavor. Changed global circumstances render the ATS's ability to conserve Antarctic resources uncertain and suggest the mining ban may be reconsidered in 2048.²¹¹

Despite attempts to the contrary, Antarctic ecosystems on both sea and land remain ill-protected.²¹² Traditionally, regulation of the sea is done through the use of Exclusive Economic Zones (EEZs).²¹³ As Antarctica lacks a sovereign, any attempt by an ATCP to impose an EEZ would be legally suspect and opposed by other ATCPs.²¹⁴ Accordingly, the current regulation of Antarctic seas by ATCPs is through the creation of an international fisheries zone for ATS parties.²¹⁵ The limitations of this are clear: non-parties to the ATS fish in the area regardless, subject neither to Antarctic regulation nor enforcement action.²¹⁶

CCAMLR, despite implementing the Ross Sea MPA after five years of negotiation, has failed to implement other proposed MPAs

207. See Madani, *supra* note 61, at 5 (noting Russia suffered no consequences for this purported violation of the treaty).

208. US CONG. OFF. OF TECH. ASSESSMENT, *supra* note 48, at 118.

209. US Inflation Calculator, *Inflation Calculator*, <https://www.usinflationcalculator.com/> [https://perma.cc/6YJ8-NG86] (last visited Aug. 6, 2026).

210. XAU to USD Chart, XE, <https://www.xe.com/currencycharts/?from=XAU&to=USD&view=1W> [https://perma.cc/69V3-HKJ2] (last visited Aug. 6, 2026).

211. See Yermakova, *Governing Antarctica*, *supra* note 7, at 4.

212. See Nocito & Brooks, *supra* note 81, at 1.

213. See Joyner, *supra* note 79, at 470.

214. See *id.* at 476.

215. See *id.* at 484.

216. See *id.*

in the area.²¹⁷ Consensus was only reached on the Ross Sea MPA because it was time limited. The first of its kind, it will expire in thirty-five years unless all CCAMLR members agree to extend it.²¹⁸ Both the Russian Federation and China see MPAs as an intrusive and restrictive management method, and as such demanded a temporary measure.²¹⁹ Despite assertions to the contrary, the Ross Sea MPA has set a precedent for time-limited MPAs worldwide, with negative implications for environmentally protected areas globally.²²⁰ In the ten years since implementing the Ross Sea MPA, CCAMLR has failed to reach consensus on any other MPAs.²²¹ Given China's aims to expand its fishing practices to krill fisheries in the Southern Ocean, they remain opposed to further implementation of MPAs.²²² The East Antarctic MPA has been in discussion since 2011, the Weddell Sea since 2016, and the Western Antarctic Peninsula since 2018. CCAMLR convened a special meeting in Chile in 2023 to advance MPAs in the Antarctic Ocean, which failed to make any progress.²²³ This failure to expand protection also applies to Antarctica's specially protected areas (ASPAs)—similar to an MPA, they apply to land areas.²²⁴ Since 1980, there has been a decline in the creation of ASPAs, with just one designated in the last decade.²²⁵ Even the protection afforded by existing ASPAs is lacking, as 60% of Antarctic protected land areas are covered by ASPAs of less than a square kilometer in size.²²⁶ As a result, less than 30% of the continent is free from human interference.²²⁷

217. See Madani, *supra* note 61, at 8; see also Rothwell & Hemmings, *supra* note 74 at 467 (“[N]oted marine management specialists conclude, ‘[a]doption of the Ross Sea MPA was a diplomatic success, but its conservation value remains to be seen.’”).

218. See Nocito & Brooks, *supra* note 81, at 2.

219. See *id.* at 4.

220. See *id.* (“the Ross Sea region MPA has set a precedent through its designation of a time-bound, high seas MPA.”)

221. See Madani, *supra* note 61, at 8 (“three proposals for new marine protected areas (MPAs) made no progress”); see also Rothwell & Hemmings, *supra* note 74, at 467 (“[N]oted marine management specialists concludes, ‘[a]doption of the Ross Sea MPA was a diplomatic success, but its conservation value remains to be seen.’”).

222. See Nengye Liu, *Emerging and Non-Traditional Actors at the Poles*, in RESEARCH HANDBOOK ON POLAR LAW 171 (Karen N. Scott & David L. VanderZwaag eds., 2020).

223. See Madani, *supra* note 61, at 8.

224. See Yermakova, *Governing Antarctica*, *supra* note 7, at 59.

225. *Id.*

226. *Id.*

227. *Id.*

Another troubling regulatory gap—considering the extent of human activity on the continent—is the lack of a comprehensive framework for tourism. Although signatory countries have binding obligations to ensure their nationals abide by environmental regulations, the 2011 Berserk expedition led by Norwegian national Jarle Andhøy demonstrated how readily these obligations are ignored.²²⁸ Furthermore, the weak environmental regulations for nationals of signatory countries do not apply to every tourist visiting the continent, as visitors from a country that is not a party to the ATS have no obligations whatsoever.²²⁹ Considering tourism is the largest industry in Antarctica and is responsible for the majority of people travelling to the continent, the lack of regulation raises serious concerns.

Global pollution and climate change pose the greatest threat to the stability of the Antarctic ecosystem—and they remain unaddressed by the ATS.²³⁰ The activities that most contribute to climate change and pollution occur outside the area governed by the ATS.²³¹ The Madrid Protocol's obligations in the Antarctic are negated by lack of progress in restricting both pollution and carbon emissions globally.²³² ATCPs are among the countries with the highest pollution and global emission rates.²³³ The countries that govern Antarctica through the ATS have thus implemented environmental protections for the continent, while simultaneously emitting sufficient pollutants to render such protections moot.²³⁴

Existing environmental protections in the ATS are further undermined by the failure to implement a liability regime for environmental damage—despite the Madrid Protocol mandating its creation.²³⁵ Annex VI creates a liability regime for environmental emergencies arising from research programs,

228. *Id.* at 57–58 (“The expedition did not obtain a permit, did not comply with the environmental impact assessment requirements, and tragically resulted in the loss of three lives . . . [despite being fined by Norway] . . . he went to Antarctica again in 2012 without getting the required permits or filing an environmental impact assessment.”).

229. *See id.* at 58.

230. *See* Khan & Romppanen, *supra* note 111, at 394.

231. *See id.* at 412.

232. *See id.* at 409.

233. *Id.*

234. *See* Carbon Dioxide Emissions, CIA WORLD FACTBOOK, <https://worldfactbookarchive.org/archive/field/XX/Carbon%20dioxide%20emissions> [<https://perma.cc/M3JW-Q93C>] (last visited Dec. 18, 2025).

235. Madrid Protocol, *supra* note 71, art. 16.

tourism, and all other activities covered by the ATS.²³⁶ Though comprehensive, as of 2025, nine ATCPs have still not ratified it, including the United States.²³⁷ Annex VI would be a positive step for the Antarctic continent, and would address significant gaps in environmental protection—if it were in force. Until the nine remaining countries ratify Annex VI, its potential will remain unrealized, much like the proposed MPAs.²³⁸

IV. PROPOSED REMEDIES FOR THE ATS

There are three primary issues with Antarctic governance and regulation. First, the system of governance is structurally flawed: the high barrier to entry consolidates the decision-making power of wealthier countries, while the consensus requirement creates a system that can be abused to further geopolitical interests. Second, in light of the ever-increasing number of people on the continent at any one time, the lack of adequate criminal enforcement mechanisms can no longer be ignored. Finally, current Antarctic governance fails to address significant environmental concerns: the mining restrictions are flimsy in an era where access to resources is critical, tourism and its effects remain unregulated, and the broader effects of climate change are ignored. Several proposals seek to remedy these issues, but ATCPs are likely to reject them. The current system preserves their influence over the continent and allows them to further their national interests—ATCPs have no incentive to set such a system aside.

A. Addressing Structural Injustice

Greater UNGA involvement in Antarctic governance would rectify the structural injustice of the ATS; removing the science requirement to become an ATCP would have a similar result. By allowing every country to have a say, the future of the “interest of all mankind”²³⁹ would no longer be determined by a closed circle of twenty-eight countries.²⁴⁰ Integrating the ATS into the broader UN framework would legitimize the ATS on the global stage and

236. *Id.* at annex VI; *see also* Madani, *supra* note 61, at 6.

237. *See id.*

238. *See id.*

239. Antarctic Treaty, *supra* note 2.

240. *See* Yermakova, *Legitimacy of the Antarctic Treaty System*, *supra* note 4, at 351.

would result in a unified system of Antarctic governance subject to majority vote.²⁴¹ Removing the science requirement to become an ATCP would have a similar effect and lead to more productive scientific research overall.²⁴²

Neither of these proposals is likely to be implemented. Considering claimant parties avoid taking any action that would weaken their territorial claims or in any way enhance another country's territorial claims, ATCPs are reluctant to surrender any control to the UN.²⁴³ Removal of the science requirement is also unlikely for similar reasons: an influx of new ATCPs would dilute the power of claimant parties and therefore diminish their influence over the continent.²⁴⁴

B. Addressing Lack of Criminal Enforcement

Proposals to rectify the current lack of criminal enforcement on the continent suggest creating a uniform system of enforcement. One suggestion is the creation of an International Tribunal with exclusive jurisdiction over any criminal acts that occur on the Antarctic continent, alongside a uniform criminal code.²⁴⁵ Such a tribunal would apply the Antarctic penal code impartially, avoiding criminal jurisdictional disputes among ATCPs.²⁴⁶ The tribunal would be housed within the ATS framework, such that it would not jeopardize the existing territorial claims to the continent (though claimant parties would likely still consider this a challenge to their claims).²⁴⁷ A variation of this proposal suggests forming a condominium, in which ATCPs would create a sovereign capable of establishing courts, enforcement mechanisms, and criminal codes on the continent.²⁴⁸ Unfortunately, existing ATCPs have explicitly opposed a condominium, as it would undermine territorial claims.²⁴⁹

241. *See id.*

242. *See id.* at 356.

243. *See id.*

244. *See id.* at 354.

245. *See* Chatham, *supra* note 4, at 352.

246. *See id.*

247. *See id.*

248. *See* Hook, *supra* note 4, at 501.

249. *See id.*

Accordingly, it is unlikely that the creation of an International Tribunal would be accepted.²⁵⁰

Another proposal suggests an Antarctic Criminal Code (ACC).²⁵¹ The ACC would set a uniform standard of conduct for Antarctic life, ensuring everyone on the continent would be on notice as to what constitutes acceptable behavior.²⁵² The code would be integrated into the ATS and ratified by ATCPs.²⁵³ Despite being framed as an “interim step” that would not advance or diminish any territorial claims, this is unlikely to be approved by the ATCPs due to its perceived effect on existing territorial claims.²⁵⁴

American activity on the continent could further explain the reticence of ATCPs to implement criminal reform in the Antarctic. The United States has the highest number of researchers on the continent; of the approximately 5,000 people living in Antarctica during the summer months, over 1,200 of them work on United States stations.²⁵⁵ Furthermore, the largest station and main access point to the continent, McMurdo Base, is run by the United States.²⁵⁶ It is therefore statistically likely that a uniform system of Antarctic criminal enforcement would be disproportionately applied to US citizens and researchers. In addition, most criminal enforcement personnel would be reliant on the United States to even reach Antarctica. There may well be concerns among non-US ATCPs that any system of criminal reform could be leveraged by the United States to bolster its influence over the continent.

250. See Chatham, *supra* note 4, at 353.

251. See generally Hook, *supra* note 4.

252. See *id.* at 500.

253. See *id.* at 501–03.

254. See *id.*

255. See, e.g., *Antarctic Stations – Bases – Currently Occupied*, COOL ANTARCTICA (last visited Aug. 6, 2026) https://www.coolantarctica.com/Community/antarctic_bases.php [<https://perma.cc/2Q26-UB8V>]; Alexander J, *Research Stations of Antarctica*, STORYMAPS (Apr. 27, 2024) <https://storymaps.arcgis.com/stories/ebe493b816e64fa0b72b749041f94362> [<https://perma.cc/TC37-7U4N>]; *Research Stations of Antarctica*, CONTINENTS (last visited Aug. 6, 2026) <https://continenten.com/en/antarctica/research-stations/> [<https://perma.cc/JF7W-P3RZ>].

256. *NSF McMurdo Station*, *supra* note 23.

C. Addressing Environmental Concerns

Proposals to remedy the lack of sufficient environmental regulation in Antarctic governance range from adding an emissions requirement to ATCPs to creating an entirely new system of governance. The International Seabed Authority and the Svalbard Treaty are two separate frameworks that have been proposed as models for future Antarctic governance.²⁵⁷ As with proposed resolutions to structural justice and criminal reform however, few of these resolutions are likely to be accepted by ATCPs. Though ATCPs might be amenable to a system modeled on the Svalbard Treaty, such a system would encourage substantial Antarctic resource extraction and is unlikely to resolve the structural injustice of the current system.

The political philosopher Yelena Yermakova proposes the addition of a global emissions requirement to the ATS.²⁵⁸ The signatories of the ATS would be held to some objective standard, such as the Paris Agreement.²⁵⁹ Should they fail to reduce their global emissions accordingly, their ATCP status would be temporarily suspended.²⁶⁰ This approach would address the damage done to the Antarctic environment by actions taking place outside the continent. Though it might not prevent further damage, it would at least provide an incentive to curtail such actions.²⁶¹ Considering this would void the ATCP status of most signatories to the ATS, however, such a requirement is unlikely to be implemented.²⁶²

The International Seabed Authority (ISA) was established in 1982 by the UN Convention on the Law of the Sea and has also been considered a model for improving Antarctic environmental regulations.²⁶³ ISA designates all sea beds outside of EEZs as “the common heritage of humankind”—this area covers about 54% of

257. United Nations Convention on the Law of the Sea, Dec. 12, 1982, U.N.T.S. v. 1833; The Svalbard Treaty, Nov. 2, 1920, LoN-41.

258. See Yermakova, *Legitimacy of the Antarctic Treaty System*, *supra* note 4, at 350–51.

259. See *id.* at 355.

260. See *id.*

261. See *id.*

262. See *id.* (explaining “this might prove difficult in practice and the proposal is rather an ideal goal to aim for”).

263. About ISA, INT’L SEABED AUTH., <https://isa.org.jm/about-isa/> [https://perma.cc/HAT5-F59Z] (last visited Aug. 6, 2026).

the oceans on the planet.²⁶⁴ The common heritage of humankind (CHM) designates *humanity as a whole* as sovereign over such areas.²⁶⁵ Accordingly, there are five guiding principles:

1. Neither public nor private actors have a right to appropriate the area and its resources.
2. All nations must be involved in management of such resources.
3. All nations must share the benefit of any exploitation of the common area.
4. No military installations or activity is allowed.
5. The common area should be preserved such that future generations of humanity may also share the benefit.²⁶⁶

ISA has 171 member states and retains legislative and enforcement authority over the area: it grants mining licenses, determines access rights, and develops benefit-sharing regulations.²⁶⁷ The ISA's authority to punish violations includes imposing sanctions and monetary fines.²⁶⁸ Should future Antarctic governance follow the ISA, decisions would be made by majority vote, all nations would have a say, and the ATS would cease to be an archaic, closed-off system.²⁶⁹ As with all proposed solutions, however, the issue of ATCPs voluntarily giving up their influence over the continent remains unresolved. Furthermore, applying the CHM to the Antarctic would likely result in ATS signatories immediately reasserting their national territorial claims in Antarctica to protect their interests—an action which would upset the fragile balance provided by the current system.²⁷⁰

The Svalbard Treaty governs Svalbard, and creates a unique framework that Yermakova believes could be modified to address environmental concerns in the Antarctic.²⁷¹ Svalbard is an archipelago off the northern coast of Norway whose sovereignty

264. *Id.*

265. See Yermakova, *Governing Antarctica*, *supra* note 7, at 110.

266. *Id.* at 110–11.

267. See *id.* at 111; *About ISA*, *supra* note 263 (“ISA has 172 members, including 171 Member States”)

268. *Id.*

269. See *id.* at 112 (suggesting majority vote for all decisions not passed unanimously).

270. See Joyner, *supra* note 79, at 479.

271. Yermakova, *Governing Antarctica*, *supra* note 7, at 105–07.

was contested prior to the signing of the treaty in 1925.²⁷² Norwegian sovereignty over the archipelago is recognized, and the Norwegian government retains the right to pass and enforce laws on all residents.²⁷³ All other signatory countries, however, retain equal fishing, hunting, access, and mineral rights over the archipelago—rights that are extended to any national of a signatory country.²⁷⁴ This system arose out of a dispute over resource extraction rights and has resulted in nations retaining freedom to mine for resources in Svalbard, with Norway retaining rights to enforce environmental regulations and collect taxes for the upkeep of the archipelago.²⁷⁵

Were it to be applied in Antarctica, the Svalbard model would entail the seven claimant states having their territorial claims recognized.²⁷⁶ These sovereigns would then oversee their sector of Antarctica, regulating resource extraction and enforcing their law.²⁷⁷ All other non-claimant states would retain the right to extract Antarctic resources and profit from them, but would have to comply with any restrictions or taxes imposed by the newly recognized sovereigns.²⁷⁸ Dr. Abdel-Motaal suggests that this system would prevent an unregulated scramble for Antarctica's resources, while also "permitting the rest of the international community to share the benefits of the continent's riches."²⁷⁹

Yermakova highlights the flaws in this argument. First, the imposition of the Svalbard model assumes that an unregulated scramble for Antarctic resources is an inevitability (one would hope conservation remains an option), and second, the notion that all countries will share the benefit of Antarctic resources is an illusion: most countries cannot afford to conduct scientific research in Antarctica—let alone finance a mining operation.²⁸⁰ Furthermore, recognizing all existing territorial claims would present the considerable logistical issue of resolving overlapping

272. *Id.* at 105–06.

273. *Id.* at 106–07.

274. *Id.*

275. *See id.* at 108.

276. *See id.* at 115.

277. *See id.*

278. *See id.*

279. *Id.* at 116–17 (citing DOAA ABDEL-MOTAAL, *ANTARCTICA: THE BATTLE FOR THE SEVENTH CONTINENT* 263 (2016)) (emphasis removed).

280. *See id.* at 117–18.

claims; that several ATCPs lack territorial claims altogether and would thus lose all influence over the continent overnight would doubtlessly also prove a sticking point. A new Antarctic regime modeled on the Svalbard Treaty would therefore not resolve all the issues with the ATS and would likely still be defeated by the consensus requirement if proposed.

V. ANTARCTICA AS A NATION STATE

Transforming Antarctica into a nation state—complete with a constitution, criminal enforcement, and a seat at the UN—would go a long way toward addressing issues with the current system. The drawbacks of the proposals outlined above highlight the unwillingness of ATCPs to ever accept a solution that diminishes their influence over the Antarctic continent. One could argue that ATCPs are zealously guarding their power over the continent to avoid losing their territorial claims to other nations. Should the Antarctic continent transition into an independent nation state, all existing territorial claims would be voided, and no country would be left worse off relative to the other claimant countries. In a geopolitical climate where nations compromise their own prosperity to check rivals' influence, ATCPs might cede Antarctic control to an independent state, because no existing nation would benefit from another's loss of its Antarctic claim.²⁸¹ Though conceivable, expecting some of the most powerful countries in the world to abdicate their position of dominance over the Antarctic is far-fetched. Accordingly, for Antarctica to be established as an independent state, the transition would have to originate from outside the ATS. Recent developments in environmental law around the world present a potential avenue for non-signatories to force such a transition.

281. See, e.g., Erica York & Alex Durante, *Tracking the Impact of the Trump Tariffs & Trade War*, TAX FOUND. (July 27, 2026), <https://taxfoundation.org/research/all/federal/trump-tariffs-trade-war/> [https://perma.cc/M8CN-9L9N] (estimating the Trump tariffs "amounted to an average tax increase of \$1,000 per US household" in 2025 and will reduce long-run US GDP, incomes, and employment).

A. Benefits of an Antarctic State

An independent Antarctic state would function in much the same way as other nation states. A constitution would create the basic legal framework, with environmental protections being of paramount importance. The state would be responsible for legislation and criminal enforcement within its borders, which would solve current criminal enforcement issues. Governance would consist of a representative democracy, with the UN appointing a High Representative for Antarctica to oversee the transition period.²⁸² Existing research bases would lease their land from the Antarctic state, in addition to following any other Antarctic tax laws—this would provide funding for the government. As an independent state, military activity on the continent conducted by other nations would be deemed a violation of Antarctic sovereignty. All members of the UNGA would thus need to commit to defending Antarctic sovereignty in the event of such a violation.

The Antarctic Constitution would create the basic legal framework for the fledgling nation. The Constitution ought to both grant the Antarctic environment legal recognition and impose an obligation to combat climate change at a global level. Recent advances in environmental law have recognized legal rights for nature.²⁸³ The Ecuadorian Constitution grants nature “the right to integral respect for its existence and for the maintenance and regeneration of its life cycles, structure, functions and evolutionary processes.”²⁸⁴ It further allows any individual or party to seek judicial intervention on behalf of the environment.²⁸⁵ This constitutional provision was used to revoke mining permits in the Los Cedros forest. The court held that “the rights of nature . . . are neither rhetorical nor ideals, but are legally binding . . . [and that]

282. The Office of the High Representative was instituted in Bosnia and Herzegovina after the signing of the Dayton Accords. Though highly controversial in Bosnia and Herzegovina, a similar appointment in Antarctica would prove less of an issue given the lack of a permanent population. *See generally* Off. of the High Rep., *PIC Bonn Conclusions: Bosnia and Herzegovina 1998: Self-Sustaining Structures* (Dec. 10, 1997).

283. *See* Yaffa Epstein et al., *Science and the Legal Rights of Nature*, 380 *SCIENCE* 1, 1 (2023) (“Rights-of-nature laws have been enacted in Ecuador, Bolivia, New Zealand, Uganda, Panama, Spain and US and Canadian localities, among others.”).

284. CONSTITUCIÓN DE LA REPÚBLICA DEL ECUADOR [CONSTITUTION], Oct. 20, 2008, ch. 7, art. 71 (Ecuador) (translated from Spanish).

285. *Id.*

the basis for rights of nature lie in the intrinsic value of nature—these rights must be recognized independently of any utility the nature in question may have for human beings.”²⁸⁶ A similar provision in the Antarctic Constitution would grant the Antarctic environment a fundamental and inviolable right to exist and prosper, thereby safeguarding the Antarctic continent. To address external influences, the constitution ought to internalize the obligations of states in respect of climate change issued by the International Court of Justice.²⁸⁷ The effects of climate change are keenly felt on the Antarctic continent—a constitutional requirement to combat climate change would not only encourage protection of the continent itself, but would create a nation state with international influence committed to curtailing global emissions. Each nation at the UN has its own geopolitical aims—many of which are incompatible with the reduction of carbon emissions. An Antarctic state with a constitutional duty to combat climate change would create a UN member state with the principal geopolitical aim of reducing global climate emissions. This would be a powerful voice advocating for the good of the planet—a voice missing in our current geopolitical arena.

An independent Antarctic state would resolve current problems with criminal enforcement on the continent. The state would create a penal code, putting all parties on notice as to what behavior would and would not be allowed on the continent. The state would create courts—a single courthouse at the McMurdo base would likely suffice for the current annual population. The state would further create a system of law enforcement, including regulation of tourism and a liability regime for environmental damage or other violations of conservation laws.

The Antarctic government would be a representative democracy, and would receive funding from land leasing, taxes, and potentially mining permits. To ensure both adherence to the Antarctic Constitution and a successful transition period into an independent state, the UNGA would appoint a High Representative. The High Representative would reserve the right to veto any legislation proposed by the Antarctic legislature that would violate

286. Corte Constitucional de Ecuador [Constitutional Court of Ecuador], Sentencia No. 1149-19-JP/20, §§ 35, 42 (Nov. 10, 2021) (translated from Spanish).

287. Obligations of States in Respect of Climate Change, *supra* note 104.

the Antarctic Constitution, and further reserve the right to remove from office any Antarctic official found to violate the Constitution.²⁸⁸ The UNGA would set objective standards to be met for the dissolution of the Office of High Representative: these would include comprehensive environmental protections to be codified by the Antarctic legislature and clear adherence to the Antarctic Constitution for a probationary period. Several sources of funding could provide for a functioning government. All countries with Antarctic bases would lease the land their bases are on from the Antarctic government. The Antarctic state could further provide licenses to tourist vessels, in addition to imposing a visitor's fee for each tourist traveling to the continent. Such a fee is in line with conservation fees levied on visitors to national parks around the world and would serve the dual purpose of collecting funds and stressing the importance of environmental protection to any visiting tourists. In the unfortunate event that Antarctic resource extraction becomes a reality, an independent nation state would be best suited to regulate it to minimize its environmental impact. According to the Antarctic Constitution outlined above, any mining permits or approvals of other resource extraction projects would be granted only if they were to respect the legal rights of nature. Accordingly, the Antarctic state would have to regulate resource extraction along environmentally friendly lines while levying taxes, fines, and sanctions—all of which would provide additional government funding.

The Antarctic state would not require a formal military; international acceptance of a state dedicated to conserving the priceless Antarctic environment should ideally ensure its territorial integrity for the foreseeable future. Realistically, the expansionist tendencies of avaricious states make this a naïve suggestion. A practical solution would be for all nations in the UNGA to commit to defending Antarctic sovereignty should the necessity arise. Failing that, a defense pact with a sufficiently wealthy country would suffice. Many countries around the world have no standing military and rely on other countries for defense; this would not be a novel state of affairs.²⁸⁹

288. See Off. of the High Rep., *supra* note 282, and accompanying text.

289. See, e.g., Tratado de Buena Vecindad, Amistad y Cooperación entre España, Francia y Andorra [Treaty of Good Neighbourliness, Friendship and Cooperation between Spain, France and Andorra] art. 3, June 30, 1993, BOE n° 155 (assigns responsibility for

B. Establishing an Antarctic State

Given that ATCPs would likely be unwilling to void their claims to the continent and establish an independent Antarctic state, such a state would have to be established outside the ATS framework. An Antarctic state would require a recognized government with sovereignty over the physical landmass. As territorial control is not a necessary requirement of state recognition theory, this could be achieved by first creating an Antarctic state, and then merging this recognized state with the continent itself. The Sovereign Military Order of Malta offers a blueprint for creating a state with no territory. If an Antarctic state were created along similar lines, recent developments in rights-of-nature law could allow it to serve as the legal representative of the physical continent, thus merging the state with the landmass.

Theories of state recognition are not reliant on territorial control. State recognition theory transforms political problems into legal problems: the lack of a globally accepted political system means no standardized legal framework for state recognition exists.²⁹⁰ Accordingly, there are two competing theories. The constitutive theory holds that a state only becomes a state when it is recognized by other states.²⁹¹ Recognition by other states requires some degree of independence. The declaratory theory holds that a state becomes a state when it meets certain objective criteria, one of which is independence;²⁹² global recognition is “merely acknowledgement of the existing statehood status.”²⁹³ Independence from sovereign control is thus a requirement for indisputable state recognition under both theories. Accordingly, should a state be free of external control, this requirement would be met.²⁹⁴ Given that territorial control is not needed for an absence of external control, it follows that state recognition does not require territorial control.

Andorra's military defense to Spain and France); *Andorra Military Forces*, GLOBAL MILITARY (2026) <https://www.globalmilitary.net/countries/and/> [https://perma.cc/7SUB-GVRH].

290. See William Thomas Worster, *Law, Politics, and the Conception of the State in State Recognition Theory*, 27 B.U. INT'L L. J. 115, 116 (2009).

291. *Id.* at 118.

292. *Id.* at 118–19.

293. *Id.* at 118.

294. See Catherine J. Iorns, *Indigenous Peoples and Self Determination: Challenging State Sovereignty*, 24 CASE WESTERN RES. J. INT'L L. 199, 225 (1992).

An internationally recognized state with no territory exists: The Sovereign Military Order of Malta. It has a fully functioning government—complete with a legislature, an executive, and a judiciary.²⁹⁵ It retains a mission at the UN, and issues internationally recognized passports to its functionaries—all without physical territory.²⁹⁶ Members of the state are accepted after a probationary period, satisfactory completion of which gives them lifelong membership.²⁹⁷ Creation and recognition of an Antarctic state could thus be achieved without territorial control over the continent. As with the Order of Malta, Antarctic scientists and researchers could be invited to join a fledgling Antarctic state and create a government. Once established in a similar manner to the Order of Malta, the Antarctic state would then have to be merged with the continent itself.

The initial formation of such a state could come from a variety of parties. Researchers and academics could begin the process of forming a government; equally, it could come from an international coalition of interested nations. The ATS is a complex system of international treaties among various nations, but operations in Antarctica—be they research, base maintenance, or tourism—are run by individuals who care about the future of the continent. It is these people, who have experience both living in Antarctica and managing its current governance, who would be best suited to lead the formation of an Antarctic state.

Merging a recognized Antarctic state with the physical territory of Antarctica could be achieved by recognizing a legal right to self-determination for the Antarctic environment. Ecuador

295. See, e.g., *About the Order of Malta*, SOVEREIGN MILITARY HOSPITALLER ORDER OF ST JOHN OF JERUSALEM OF RHODES AND OF MALTA, <https://www.orderofmalta.int/about-the-order-of-malta/faq/> [https://perma.cc/77UK-HA8A] (last visited Dec. 18, 2025); *Government Bodies*, ORDER OF MALTA <https://www.orderofmalta.org.uk/about/government/government-bodies/> [https://perma.cc/9V5Q-ZV8E].

296. See *Permanent Observer Mission of the Sovereign Order of Malta to the United Nations*, UNITED NATIONS <https://www.un.int/orderofmalta/content/permanent-observer-mission-order-malta-united-nations> [https://perma.cc/Z3PY-R6HB]; *Passports*, ORDER OF MALTA <https://www.orderofmalta.int/government/passports/> [https://perma.cc/CSQ2-R53W].

297. See *The Life Commitment and Membership Criteria of the Knights and Dames of the Order of Malta*, ORDER OF MALTA WESTERN ASSOCIATION, U.S.A. (June 21, 2023) <https://orderofmaltawestern.us/the-life-commitment-and-membership-criteria-of-knights-and-dames-of-the-order-of-malta/> [https://perma.cc/W95J-Z2FH].

is not the only country to have recognized the inherent rights of nature. Several countries around the world have recognized that nature has a legal right to exist, thrive, and evolve free of human interference.²⁹⁸ Developments in indigenous peoples' rights have led to the idea that self-determination is not only the right to determine one's future, but also the right to be free of external influence and control.²⁹⁹ The recognition of nature's right to evolve free of interference parallels the recognition of indigenous peoples' rights to be free of external influence and control. Should the Antarctic environment's intrinsic rights to exist and endure free of human influence be legally recognized, it follows that the environment would have a right to be free of external influence and control, allowing a claim for self-determination. The newly formed Antarctic state would thus act as the legal representative of the Antarctic environment and make a claim for self-determination on its behalf. With international recognition, the physical landmass could then merge with the already recognized independent state.

Considering the vast mineral wealth of Antarctica and the lack of meaningful reform so far, international recognition would seem unlikely. That ATCPs comprise the strongest military powers on the planet—and would not be thrilled at the potential dissolution of their claims—does not improve matters. Despite this, the existence of both the ATS and the ISA proves that international acceptance of systems that benefit the global collective is possible. Both the ATS and the ISA have aspects contrary to some individual national interests, but as they apply to all member states, no individual state loses out to any other. International recognition of Antarctic sovereignty would benefit the entire global community, and any downsides would apply to all.

Should enough countries recognize the rights of Antarctica and its new government, and should the Antarctic government be granted a seat at the UN, acceptance of the new regime by ATCPs might be possible. The ATS signatories are a small subset of the global community; should enough countries recognize the Antarctic state, ATCPs would be under immense pressure to accept the new state of affairs. Furthermore, the antagonistic and obstructive nature of ATCPs—exemplified by the constant use of

298. See, e.g., Epstein, *supra* note 283.

299. See Iorns, *supra* note 294, at 225.

the consensus requirement to block new proposals³⁰⁰—might work in favor of Antarctica for once. As mentioned earlier, one characteristic of the current geopolitical climate is that countries are willing to compromise their own positions for the sake of contradicting or otherwise harming their supposed adversaries.³⁰¹ Some ATCPs may therefore see value in supporting the new Antarctic state, as it would void the territorial claims asserted by their rivals.

VI. CONCLUSION

The ATS has been instrumental in protecting the Antarctic continent from its inception to the present day. The drafters of the Antarctic Treaty reacted to the problems the continent faced at the time, and created a system that has successfully—though not perfectly—safeguarded Antarctica for the past sixty years. That said, the ATS is no longer capable of shielding the continent from opportunistic resource extraction or climate change. The ATS further acts as a barrier to comprehensive criminal reform on the continent—the extent to which violent crime has proliferated in the Antarctic is quite sadly astonishing. Existing proposals to remedy the flaws in the ATS are superficial in scope and fail to address the underlying issue: a system in which everybody has an incentive to maximize their influence over the continent will inevitably fail—countries will prioritize their own national advancement over the good of Antarctica. If we truly want to preserve this continent for future generations and ensure its continued survival, we should entertain bold proposals. Countries around the world are waking to the idea that the natural environment has the right to exist free of human destruction. By recognizing that right in Antarctica, the global community could create a new system of Antarctic governance—one that prioritizes the protection of the Antarctic environment, protects the people on the continent from odious crimes, and safeguards the seventh continent for centuries to come.

300. See, e.g., Nocito & Brooks, *supra* note 81, at 4 (discussing continued failure of CCAMLR to implement MPAs).

301. See, e.g., York & Durante, *supra* note 281 (illustrating how the US accepted domestic economic harm from tariffs to pressure trade rivals).