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Antarctica: sovereignty, geopolitics, and climate change

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Executive summary

Brazil has been a polar country for over 40 years. Signatory of the Antarctic Treaty since 1975, Brazil has a consolidated presence in the region through a thriving scientific research program, PROANTAR, which also grants it the privileged status of “consultive member”. It means that Brazil is part of the select group of countries with the right to voice and vote in all decisions on the Antarctic territory. That corresponds to almost 8% of the planet, about 70% of all its freshwater and untouched mineral reserves.

The status of a consultive member is granted only to countries that conduct scientific research on the continent (Article IX of the Treaty). As the seventh country closest to Antarctica, the climate of the southern regions of Brazil is defined by this proximity. Thus, changes in Antarctica, especially in the Peninsula region, greatly influence Brazil, including our agriculture, fishing, and even tourism. Moreover, from a strategic point of view, Antarctica faces extensive international sea routes, such as the Drake Passage and the Cape of Good Hope, as well as an essential source of fish resources.

Despite the recognized relevance and success of PROANTAR as a continuous state policy, Brazil’s participation in the frozen continent can still be considered modest, with a geographical area of activity in the last 40 years limited to the region of the South Shetlands Archipelago and a single scientific station. The latest investments, such as Criosfera I and the inauguration of the new Comandante Ferraz Antarctica Station (EACF), may bring Brazil back to a more privileged position. However, it is necessary to ensure the regular maintenance of research through financial resources. It is crucial that Brazil is aware of the changes that may arise in redesigning the Antarctic Treaty, such as the possible — but not necessary — end of the moratorium on exploitation of mineral resources from 2048, which can impact the closer countries like Brazil.

Thus, the present scenario of the Brazilian presence in Antarctica reveals the need for a plan (road map) for our participation. Actions should include fostering a polar mentality, increasing investment in infrastructure and scientific research, and experts thinking about the Antarctic theme perennially, reducing the impact caused by the natural turnover of PROANTAR’s management positions.

KEYWORDS

Environment, International Relations, Brazilian Antarctic Program, Scientific Committee on Antarctic Research

Antarctica: sovereignty, geopolitics, and climate change

Paulo E. A. S. Câmara¹, Arthur R. C. Gianattasio² & Fernanda Quaglio³

1. Introduction

1.1 The Treaty

Even though it is not part of our culture, Brazil has been a polar country for over 40 years. In 1975, amid the Cold War, the countries negotiated resolutions for the oil crisis that affected the world due to the Arabic-Israeli conflict. In this geopolitical context, Brazil would become a signatory to a little-known treaty here: the Antarctic Treaty. As a previously forgotten and overlooked region, Antarctica started receiving attention from the great nations due to the agreement's negotiation, mainly because of its chimerical potential to provide the hydrocarbons that the world needed at the time. Once seen as a "desert and inhospitable region" (Silva, 1967), it gradually took a leading role — mainly with technological changes that showed different possibilities of economic, scientific, and military interests in the region (Dollot, 1949; Guyer, 1973; Mouton, 1962).

“Thus, a country’s accession to the Treaty will not give it the status of an implicit consultive member. For this purpose, the country must prove its commitment to scientific research by presenting results. It is a peculiar case in which science is the geopolitical tool par excellence.”

Antarctica is governed by the Antarctic Treaty, which was initially concluded by 12 countries in 1959 and entered into force in 1961. It is a unique and highly successful instrument of governance and currently has the participation of 53 signatory countries. The Treaty covers the entire area of the planet south of the parallel 60° S, covering an area of about 14 million km², therefore more extensive than South America — which amounts to about 8% of the planet. Among the signatory⁴ countries. There is the category of “consultive member”, countries with the right to voice, veto, and vote on all decisions about the Antarctic territory. This privileged status, currently achieved by only 29 countries, is not due to territorial occupation or base/station construction. Article IX of the Treaty states that the status of a consultative member is **“by promoting substantial scientific research activity”** (Câmara and Melo, 2018).

For example, in the case of Holland, a consultive member with no stations in Antarctica (only one laboratory inside a British station), neither has polar ships. Thus, a country’s accession to the Treaty will not give it the status of an implicit consultive member. For

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4. The Antarctic Treaty website has a constantly updated table with the signatory countries: <https://www.ats.aq/devAS/Parties?lang=e>.

this purpose, the country must prove its commitment to scientific research by presenting results. It is a peculiar case in which science is the geopolitical tool par excellence (Mattos and Câmara, 2020).

Brazil joined the Treaty in 1975 but was only allocated the status of a consultative member in 1983, the year of the Brazilian Antarctic Program's creation, PROANTAR, when it began to conduct scientific research. PROANTAR became an example of a successful Brazilian state policy that has existed uninterruptedly ever since.

Antarctica is currently the only area on the planet where sovereignty and territoriality issues have not been defined (Mattos and Câmara, 2020). These issues have not been subject to debate in the last six decades. That is because, according to the Treaty, Antarctica is currently considered a "Natural Reserve dedicated especially to peace and science", where mineral exploitation, territorial claims, military and nuclear activities, and waste dumping, among others, are prohibited. Therefore, all 53 signatory countries commit to following these rules. Additionally, any country that joins the Treaty after its entry waives its right to any territorial claims.

1.2 Environmental importance and its relation with geopolitics

Why did Brazil, even after overcoming the oil crisis of the 1970s, continue its intent to participate actively in discussions related to the scientific, peaceful, and environmentally responsible use of Antarctica?

From an international point of view, some characteristics of the region place Antarctica at the center of environmental discussion. The world's largest reserves of potable water, about 70%, occur there. The existence of large reserves of unexplored natural resources is also estimated. According to Thorp (2012), there are, in the waters of the Ross and Weddell seas alone, more than 50 million untouched barrels of oil, reserves comparable to those in Alaska and more than three times the estimated volume for the Brazilian reserves (BP, 2021). The enormous biotechnological potential can also be highlighted, such as the production of new drugs, probiotics, and other products and their respective patents. Under these aspects, Antarctica is potentially important for all countries because it represents one of the environments with the smallest direct anthropic impact on the planet.

However, the connection of Antarctica with all regions of the world occurs mainly due to the circulations of atmospheric and oceanic currents. The Antarctic Peninsula is the region of the planet that has suffered the most significant increase in the planet's temperature since the second half of the 20th century (Turner *et al.*, 2009, 2016). In fact, climate modeling studies predict that this increase will continue in the coming decades (Bracegirdle *et al.*, 2020). That shows that the impact on the region, although indirect, is worrying, which makes all countries, even the non-signatories, responsible for environmental changes that affect Antarctica, either through oceanic and atmospheric connections (Zhang, Haward and Mcgee, 2020) or for the anthropic action in situ. In this respect, it is worth pointing out that, as the Antarctic Treaty System proposed, the region cannot be intended for commercial environmental exploitation. This particular condition turns Antarctica into a piece in geopolitical negotiations, configuring itself as an element of interest for the future of nations.

From a more regional or even local point of view, other aspects of Antarctica are important for Brazil, including commercial interest. Brazil developed a tropical country culture with little or no relation to the poles. With the reinforcement from movies and tourism advertisements, we ended up valuing our beaches and carnival: the "Tropical Brazil" from our songs, with such a strong presence in our music and imagination. This view ignores that there are negative temperatures (and even snow) in parts of Brazil, which cause losses of harvests due to cold (frosts). The existence of low temperatures during winters in Brazil occurs precisely because Antarctica's atmospheric and oceanic circula-

“Therefore, Antarctica’s climate phenomena profoundly affect Brazil’s climate, such as rain, fishing, and other activities. Consequently, the changes that occur in the Antarctic climate will also significantly affect Brazil.”

tion influences the south of our country, with the arrival of an arm of the circum-antarctic current responsible for the definition of the climate of a part of the subtropical region.

In fact, the Southern Ocean surrounding Antarctica has a great influence on Brazil. According to Google Earth (2022), we are at a 3,600 km distance from Antarctica, about 10% less than the distance between Brazil’s most extreme north and south points. Cities of southern Brazil, like Pelotas and Rio Grande, are closer to Antarctica than other parts of Brazil, such as Macapá. Therefore, Antarctica’s climate phenomena profoundly affect Brazil’s climate, such as rain, fishing, and other activities. Consequently, the changes that occur in the Antarctic climate will also significantly affect Brazil. Likewise, due to this proximity, human activities that generate impacts, such as pollution, will quickly affect our country. In these terms, from a climate point of view, the Antarctic region influences a series of global processes, such as atmospheric and oceanic circulations, affecting the entire climate system of the planet (Simões *et al.*, 2011), including rainfall and frosts in the southern states of Brazil, with strong impacts to country’s agribusiness (Lagutina and Leksytina, 2019). That is recognized, for example, in the 2016 Defense White Paper:

The science developed in Antarctica has fundamental importance for Brazil. The continent, with 90% of the planet’s ice mass volume, plays an essential role in atmospheric and oceanic circulation. It is one of the most sensitive parts of climate variations on the global scale, interconnected with processes occurring in smaller latitudes, especially with the South American atmosphere and surrounding oceans. Cold air masses generated over the Southern Ocean and advancing over subtropical South America are responsible for producing low-temperature and frost events in the southern states of Brazil. In addition, sea currents bring living resources, nutrients, and oxygen to the waters off the coast of Brazil, which directly influences the southern coast of Brazil. Much of the fish available on the Brazilian coast is influenced by water masses from the southern ocean (Ministério da Defesa, 2016a, p. 41).

Moreover, from a strategic point of view, Antarctica faces extensive international sea routes, such as the Drake Passage and the Cape of Good Hope, besides being an essential source of fishing resources — within the framework of the Convention for the Conservation of Antarctic Marine Living Resources (Convenção, 1980) — not yet adequately explored by Brazil. In addition, Brazil’s 2013–2022 Plan of Action for Antarctica pointed out PROANTAR as a way of justifying the eventual country’s entry into the discussions of the Arctic Council as an observer member (Simões *et al.*, 2013). The creation of a Working Group for Arctic Activities (Arctic WG), in 2021, through the MB/MD Ordinance n. 167/2021, in the framework of the Interministerial Commission for Sea Resources (CIRM), followed by Resolution 04/022 of the Interministerial Commission for Sea Resources, which ratifies Brazil’s accession to the Svalbard Treaty, signals an institutional density of this plan, taking advantage of the scientific, diplomatic, environmental, and peaceful Brazilian experience acquired by decades of PROANTAR activity.

In these terms, Brazil’s effective participation in political decisions related to Antarctica is fundamental because they directly affect us. Moreover, considering the country’s traditional legalistic attitude in international relations, Brazil must remain aware of the current global legal parameters to position itself adequately in the face of Antarctic polar issues — and, as seen in the future, also perhaps the Arctic. In both cases, one must be aware that this insertion is only possible through scientific research — which makes environmentally responsible and peaceful science the great geopolitical tool in the current Antarctic scenario.

It is worth mentioning, however, that according to the Treaty, Antarctica is currently considered a “Natural Reserve dedicated especially to peace and science”, with mineral exploitation, territorial claims and military activities, nuclear, and dumping garbage, among others, prohibited. Therefore, all 53 signatory countries commit to following

these rules. Additionally, any country joining the Treaty after its entry waives any territorial claim, a situation that may change in 2048.

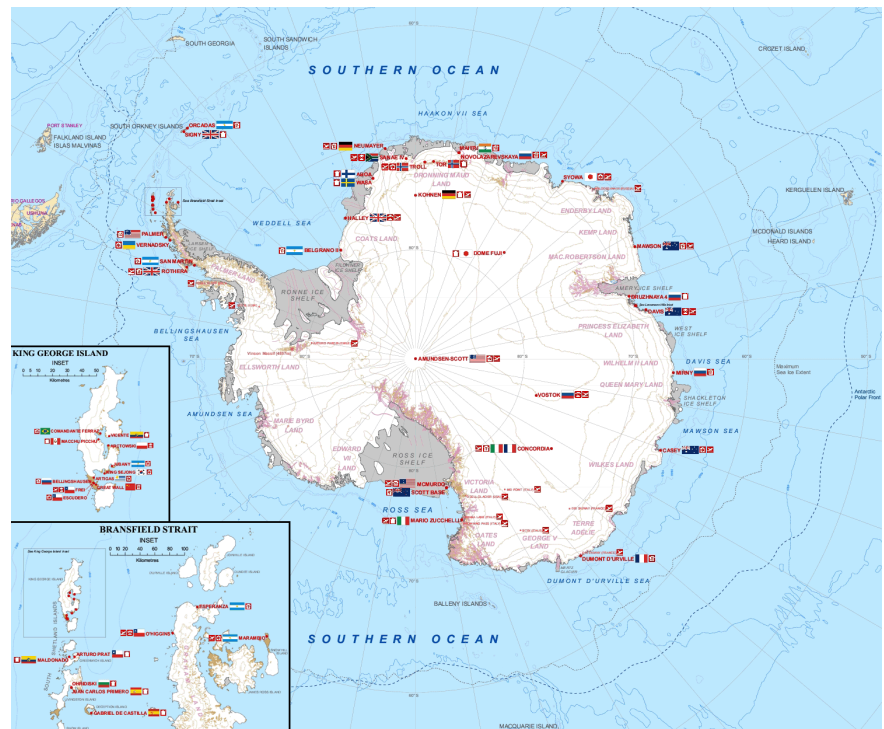
2. The best strategy after four decades of PROANTAR

“With bold architecture, the new EACF has solar panels and wind turbines energy generation, significantly reducing the impact caused by pollutants resulting from Diesel generators traditionally used in Antarctic stations.”

Despite the suspension of territorial disputes advocated by the Treaty, Brazil began considering Antarctica as part of our strategic surroundings in September 2013. With the approval of the National Defense Policy (Política Nacional de Defesa – PND) new version, the Antarctic continent officially became part of the region of the planet where Brazil “wants to radiate its diplomatic, economic and military influence and leadership” (Fiori, 2013).

In this context, two events should be highlighted as potential “game changers”, the first was the inauguration of the Criosfera I module in 2012, the Latin American module located further south of the Earth. In addition to its scientific merits, Criosfera I led Brazil’s participation into the continent’s interior, more than 2,000 km from Brazil’s traditional area of operation. The installation of this scientific module changed the map of Brazilian participation in Antarctica over the last forty years, previously restricted to the South Shetlands Islands region, and expanded Brazil’s presence on the continent and toward the southern pole. In 2023, a second module, the Criosfera II, is expected to enter into operation.

Comandante Ferraz Antarctic Station



Brazilian Navy website – <https://www.marinha.mil.br/secirm/pt-br/proantar/eacf>.

Another important event was the inauguration of the new Brazilian scientific station to replace the one destroyed in 2012. The new Comandante Ferraz Antarctic Station (EACF) is a potential “game changer” because it is the largest Antarctic research station in Brazil’s area of action. As the largest of the entire Antarctic Peninsula, it has seventeen research laboratories and an area of 4,500m². With bold architecture, the new EACF has solar panels and wind turbines energy generation, significantly reducing the impact caused by pollutants resulting from Diesel generators traditionally used in Antarctic stations.

Despite PROANTAR's recognized importance and success as a continuous state policy, Brazil's participation in the frozen continent is still modest, with a geographical area of activity practically limited to the South Shetlands Archipelago region for about forty years and with only one scientific station. The world watches the growth of other countries in Antarctica, such as China and South Korea, that joined the Treaty after Brazil. Other countries increased their participation with a more significant number of bases (although smaller ones) and better distributed their stations along the quadrants to be present in more than one Antarctic sector. Even countries with minor geopolitical expression than Brazil seem to have greater participation and influence in Treaty meetings. Among those with the most significant presence in the continent, China, the USA, Russia, the United Kingdom, Chile, and Argentina have icebreaker ships (and continue investing in the construction of more vessels of this kind), allowing the exploration of areas outside PROANTAR's reach and logistical and scientific operations for a more extended period in Antarctica. Another critical point is the existence of airfields from countries like Chile and Argentina, on which we depend, since we do not have one of our own in the region.

The latest investments, such as Criosfera I and the new EACF, put Brazil again in a more privileged position. However, they will only be viable in the medium and long term with the regular maintenance of the research's financial resources, without which the scientific advance cannot occur, which can cause our position as a consultive member to be questioned. In addition, the definition of the research lines to be developed is strategic. In the case of Brazil, the financial contribution for research comes from the Ministry of Science, Technology, and Innovation (Ministério da Ciência, Tecnologia e Inovação – MCTI). At the same time, logistics depend on resources from the Ministry of Defense (Ministério da Defesa – MD). This partnership makes possible the research existence and maintenance: the Navy provides logistics (transport, food, and accommodation), and the MCTI, capital resources, funding, and scholarships for the execution of research (Câmara *et al.*, 2020). This way, resources must be constantly ensured for both arms.

Therefore, it seems clear that achieving the PND and the National Defense Strategy (Estratégia Nacional de Defesa – END) purposes in Brazil's strategic surroundings can only come through intense scientific research activity. However, the maintenance of the EACF, the two polar ships, and the entire scientific research have a high cost, which is responsible for other vital elements of the state budget plan, such as education, health and safety, and the fight against hunger and poverty. In addition to our lack of territorial claims in Antarctica and the impossibility of exploring mineral resources, these have left the theme of our presence on the continent as a secondary and often neglected agenda. On the other hand, the possible lack of resources for Antarctic research may threaten our privileged position as consultive member (Câmara *et al.*, 2020; Mattos and Câmara, 2020; Câmara and Melo, 2018).

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3. Education and science as instruments for Brazil's sovereignty in Antarctica

Many of the listed problems originate from **Brazil's lack of a polar mentality**. The lack of knowledge or understanding on the subject reaches equally from young people to our ruling class, entrepreneurs, civil servants, and the governing sectors, including a large part of the executive, the legislature, and almost the entire judiciary. The subject is rarely addressed in schools or covered in college entrance and secondary national exams. Similarly, the subject is not part of the regular curricula of undergraduate courses in Law, International Law, International Relations, or diplomats and military formation. This scenario may result from the low sensibility to the different themes and issues that the Antarctic continent suggests, or this territory is only perceived under a security and nationalist logic.

The close environmental and climate link between Brazil and Antarctica justifies the subject's inclusion in general education and scientific dissemination initiatives for basic and higher

education communities and the general public. Incorporating the subject in Brazil's education curriculum (primary, secondary or higher) represents the main incentive for developing a polar mentality for the next generations, as in many other countries (e.g., Chile and Argentina). Concerning the present generations, including servants and the general public from university communities, publicity on Brazil's presence in Antarctica could help in a more diffuse form than education initiatives in creating this Antarctic culture in Brazil. However, differently from other countries, the creation of this polar mentality must follow the internationality parameters established by the Antarctic Treaty, to which Brazil is a signatory. In the Treaty, explanations or approaches that see the possibility of territorial annexation or use of resources present for exclusive national interests in the Antarctic continent must be avoided, as in other countries.

Another critical point is guaranteeing resources for science because, as a geopolitical tool par excellence in the Antarctic Treaty system, the drop in financial incentives for Antarctic science would bring drastic consequences to the country. Brazilian researchers have faced decades of irregularity in calls for proposals. That may also be a result of the fact that public managers seem to be unaware of the topic.

Just like science, logistics also demands resources to ensure the feasibility of the research itself. However, there are sensitive differences when the MCTI (Ministry of Science, Technology, and Innovations) and the MD (Ministry of Defense) budgets are reduced, as logistics have expanded with the acquisition of new aircraft for use in Antarctica, the new EACF and, more recently, the construction of the new Polar ship. On the other hand, in general, there used to be uncertainty in the launching of calls for proposals, in addition to the reduction in the number of scholarships. Thus, only the military logistics activities for research seem to be safeguarded, while research does not have the same planning guarantee. The cause, whether only the MD seems to understand the geopolitical importance of PROANTAR or there is no clear interest in Brazilian scientific research, is a topic for future discussion. Regardless of the cause, **Brazilian Antarctic science is generally under budget insecurity**, which could negatively affect our scientists' careers and Brazil's very presence in Antarctica.

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4. For a Brazilian strategy in Antarctica

In 2048, i.e., in less than 30 years, the moratorium on exploitation of Antarctic non-renewable economic resources may be revised as it stands in the Treaty. That is not a necessity but a possibility. Regardless of which items will or will not be subject to revision, Brazil may have a relevant role in these decisions as one of the few countries with the right to vote and veto any motion within this and other themes. Therefore, it will have, as well as the other 28 countries, the power to decide the destiny of this immense area (about 8% of the planet), and that will have great potential in a few decades to be in a geopolitically strategic position for decision making.

The current scenario of the Brazilian presence in Antarctica reveals **the need for a long-term strategic plan** (road map) for our participation, where it is necessary to study our geopolitical position for 2048. How do we want to get there? What is our intention? That is, what are we really doing in Antarctica? Remember in this regard that there is no obligation for the ban on the economic exploitation of mineral resources to be reviewed in 2048, despite the broad political commotion surrounding this round of possible reviews. Nevertheless, this is a real possibility that we should be aware of. As the seventh closest country to Antarctica, any such decision has the potential to affect us very directly. It is essential to maintain the attention of public opinion and government agents around potential national interests in Antarctica.

The traditional legalistic approach of Brazilian foreign policy should, in this sense, hereafter in the different national and international forums, academic or not, precisely remember that a geopolitical posture that perceives Antarctica as a future continent to have its non-renewable resources exploited is averse to the very purposes of the Treaty and the entire Antarctic

Treaty System (Casella, Lagutina and Giannattasio, 2020), including Article 19(c) of the Vienna Convention on the Law of Treaties (Convenção, 1969).

In this regard, it should be noted that the Protocol on Environmental Protection to the Antarctic Treaty (Protocolo, 1991), which entered into force on January 14, 1998, established in article 7 the prohibition of this economic activity and determined, in its art. 25, that only after 50 years of the beginning of its validity (i.e., January 14, 1998) may a request be presented to amend any part of the Protocol. This review may or may not include the possible removal of the mineral exploitation ban. However, under the same art. 25, any such request can only be submitted after 50 years, and after that, a conference must be held to discuss this Protocol's proposed revisions.

Only after this collective discussion will the proposals be open for voting. They will only be adopted if the majority of the states agree and 3/4 of the states that were consultative members of the Treaty in 1991 also agree. Moreover, the ban on economic exploitation can only be reviewed under the same art. 25, if the States have agreed to a new international legal regime that expressly authorizes this, provided that it disregards the Antarctic Treaty's fourfold foundation established in arts. I to IV (preserving the local environment, combating climate change, scientific use of Antarctica for peaceful purposes).

Despite this, it is essential to be aware of the possibility, though currently unlikely, that the Treaty may be abandoned unilaterally by some countries in the face of economic or political interests. We emphasize that the spirit and purpose of the Treaty are, in short, to implement the presence in Antarctica within an international approach focused on science, peace, and the protection of the global and local environment. In this sense, it would be necessary to think more deeply about the Brazilian geopolitical integration in Antarctica through an enhanced scientific presence. That would imply, among other initiatives, seeking to build more than one station, for example, in addition to increasing the financial resources for human training and resources and research development.

Thinking through, where should the new station be located? It took us seven years to build the new EACF. Do we want to reduce our dependence on other countries by building our own airfield? Do we want to have an actual icebreaker ship? How can we ensure that these human resources remain developing research in Antarctica to the point that Brazil is recognized in a given topic about the region? These are themes that we need to focus on in the coming years.

Here is highlighted the need to define the more apparent objectives of the participation strategy in the frozen continent. The instability of budget allocation for the development of scientific activities in Antarctica seems to have been the keynote of Brazil's action since the beginning of regular activities within the Antarctic Treaty. Despite all the merits, advances, and contributions developed by Brazil to date, it should be noted that the geopolitical positioning of the country through Antarctic science can be viewed as incipient compared to other countries (Sampaio, Cardone and Abdenur, 2017, pp. 303-306).

At the same time, the Brazilian scientific approach to Antarctica, managed in the interior of PROANTAR, may be able to gradually approach an even more scientific perspective that has guided contemporary international relations — including concerning the **intersection between** science and diplomacy promoted by the Sustainable Development Goals and the Decade of Ocean Science (Polejack and Coelho, 2021). In this respect, the interface of scientific decisions with areas of knowledge that perceive international relations outside of a key of national interest could promote a less extractive awareness of Antarctica and highlight other ways of understanding the also aesthetic, historical, artistic, and biological importance of Antarctica, as well as the local, regional and global impacts of this continent and the living and nonliving forces that compose it.

Thus, not only is greater openness or even greater encouragement for scientific presence on the country's continent important, but it also fosters the dialogue among life sciences, earth sciences, and humanities that reinforces the purposes of the Treaty. Internationally conceived and managed, this Treaty points out that the scientific approach should allow the

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development and rooting of geopolitical positions around Antarctica as well as a key to national security or search for territories and correlated scarce resources for exploration and exploitation (Casella, Lagutina and Giannattasio, 2021).

For this reason, it is necessary having people permanently thinking about the Antarctic theme, reducing the effects of the natural turnover of management positions on PROANTAR. The stability of these human resources allocated to think about and manage PROANTAR is fundamental so that there is not, as happens every 2-3 years, an unavoidable and recurring “restart” in certain parts of our program.

It is understood that such an opening of PROANTAR regarding the processes of construction, making, and implementing decisions would also be crucial to continue allowing the country to meet the international requirements of building an Antarctic mentality within international, legal, scientific, environmental, and peaceful paradigms. These keywords are equally relevant in the case of the country intending to pursue its project of greater participation in another polar domain: that located within the Arctic Council.

5. Conclusions and recommendations: how to achieve sovereignty in Antarctica and beyond

Brazil entered the Treaty in 1975 and consolidated its presence on the white continent in less than five years. In a record time, it acquired a polar ship and built a station in one of the world's most remote areas, operating during the winter. However, this “momentum” seems to have slowed down, and our presence over the last decades has weakened. We are approaching a possible inflection point when, in 2048, changes may occur in the Antarctic Treaty system. As consultive members and South America's largest economic power, we cannot fail to play an essential role in decision-making in the Antarctic Treaty. Even though we do not have territorial claims, Antarctica is part of our strategic surroundings, as the PND defines it.

It is worth mentioning that, due to its mineral wealth, potable water, biotechnological potential, importance in climate regulation, and geographical location, Antarctica is vital for Brazil and the world. Not coincidentally, all countries with a permanent seat on the United Nations Security Council are signatory and consultive members of the Treaty.

The elaboration of a “road map” that clearly defines Brazilian priorities and actions is fundamental for the coming years. Without neglecting the political game on the world's largest reserve of natural resources, of which only about 14% of the world's countries have decisive power, **Brazil must ensure the protection of the antarctic environment.** We are a polar country with a broad capacity to operate in the environment; we master the logistical aspects, inaugurate the largest station of the entire Antarctic Peninsula (the third largest in the world), are the largest economy in Latin America, and **we must assume the leading role that befits us in the polar geopolitical scenario.** Not only Antarctic but polar.

Thinking further, the Antarctic theme can be associated with the geopolitical advantage that Brazil has in having in its territory the largest part of the Amazon forest. By adding the Amazon to the possible strategy for Antarctica and the Arctic, Brazil is moving towards a possible future when it may have essential tools for the central debate and international negotiations in the coming decades: **the environment as a sustainer of humanity's very existence.** If it is attentive to science for creating a committed polar strategy, Brazil, as a State, will undoubtedly have better tools for geopolitical negotiations in the future.

“By adding the Amazon to the possible strategy for Antarctica and the Arctic, Brazil is moving towards a possible future when it may have essential tools for the central debate and international negotiations in the coming decades: the environment as a sustainer of humanity's very existence.”

References

1. Bracegirdle, T. J. *et al.* (2020) 'Twenty-first century changes in Antarctic and Southern Ocean surface climate in CMIP6', *Atmospheric Science Letters*, 21(9), pp. 1-14. Available at: <https://doi.org/10.1002/asl.984> (Accessed: 10 June 2022).
2. BP. (2021) 'BP Statistical Review of World Energy 2015', BP Statistical Review of World Energy. Available at: <http://www.bp.com/statisticalreview> (Accessed: 24 April 2022).
3. Câmara, P. E. A. S. and Melo, R. B. (2018) 'Brasil na Antártica, os próximos 30 anos', *Revista da Escola Superior de Guerra*, 33(68), pp. 64-81.
4. Câmara, P. E. A. S. *et al.* (2020) 'Brazil in Antarctica: 40 years of science', *Antarctic Science*, 33(1), pp. 30-38.
5. Casella, P. B., Lagutina, M. and Giannattasio, A. R. C. (2020) 'BRICS in polar regions: Brazil's interests and prospects', *Vestnik of Saint Petersburg University. International relations*, 13(3), pp. 326-340.
6. Casella, P. B., Lagutina, M. and Giannattasio, A. R. C. (2021) 'Dealing with the sorcerer's apprentice dilemma in polar international public authorities: BRICS interests and Brazilian prospects for mixed governance structures in the Arctic and in Antarctica', in Casella, P. B., Bueno, E. P. and Künzli, W. S. (eds.) *Challenges and development prospects within BRICS countries*. Belo Horizonte/São Paulo: D'Plácido, pp. 43-76.
7. *Convenção sobre a Conservação dos Recursos Vivos Marinhos Antárticos (The Convention on the Conservation of Antarctic Marine Living Resources)*. (1980). Available at: http://www.planalto.gov.br/ccivil_03/decreto/1980-1989/1985-1987/D93935.htm (Accessed: 8 September 2022).
8. *Convenção de Viena sobre o Direito dos Tratados (Vienna Convention on the Law of Treaties)*. (1969). Available at: http://www.planalto.gov.br/ccivil_03/_ato2007-2010/2009/decreto/d7030.htm (Accessed: 8 September 2022).
9. Dollo, R. (1949) 'Le Droit International des Espaces Polaires', *Recueil des Cours de l'Académie de Droit International*, 75, pp. 115-200.
10. Google Earth website. (2022). Available at: <http://earth.google.com/> (Accessed: 18 May 2022).
11. Fiori, J. L. (2013) 'O Brasil e seu 'entorno estratégico' na primeira década do século XXI', in Sader, E. (ed.) *10 anos de governos pós-neoliberais: Lula e Dilma*. São Paulo: Boitempo.
12. Guyer, R. (1973) 'The Antarctic System', *Recueil des Cours de l'Académie de Droit International* 139, pp. 149-226.

13. Lagutina, M. and Leksytina, Y. (2019) 'BRICS countries' strategies in the Arctic and the Prospects for consolidated BRICS agenda in the Arctic', *The Polar Journal*, 9(1), pp. 45-63.
14. Mattos, L. F. and Câmara, P. E. A. S. (2020) 'A ciência antártica como ferramenta geopolítica para o Brasil', *Revista Marítima Brasileira*, 140, pp. 15-23.
15. Ministério da Defesa. (2016a) Livro Branco de Defesa Nacional, Brasília.
16. Ministério da Defesa. (2016b) Política Nacional de Defesa e Estratégia Nacional de Defesa, Brasília.
17. Mouton, M. W. (1962) 'The International Regime of the Polar Regions', *Recueil des Cours de l'Académie de Droit International*, 107, pp. 169-286.
18. Polejack, A. and Coelho, L. F. (2021) 'Ocean Science Diplomacy can Be a Game Changer to Promote the Access to Marine Technology in Latin America and the Caribbean', *Frontiers in Research Metrics and Analytics*, 6, pp. 1-11.
19. Protocolo ao Tratado da Antártida sobre Proteção ao Meio Ambiente. (1991). Available at: http://www.planalto.gov.br/ccivil_03/decreto/d2742.htm (Accessed: 8 September 2022).
20. Sampaio, D., Cardone, I. and Abdenur, A. (2017) 'A modest but intensifying power? Brazil, the Antarctic Treaty System, and Antarctica', in Dodds, K., Hemmings, A. D. and Roberts, P. (eds.) *Handbook on the Politics of Antarctica*. Cheltenham/Northampton: Edward Elgar, pp. 301-317.
21. Simões, J. C. *et al.* (2011) *Antártica e as Mudanças Globais: Um Desafio para a Humanidade*. São Paulo: Editora Blucher.
22. Simões, J. C. *et al.* (2013) *Ciência Antártica Para O Brasil: Um Plano de Ação Para o Período 2013-2022*. Brasília: Ministério da Ciência, Tecnologia e Inovação.
23. Silva, G. do C. e. (1967) *Geopolítica do Brasil*. Rio de Janeiro: Livraria José Olympio.
24. Thorp, A. (2012) 'Antarctica: the treaty system and territorial claims', House of Commons: International Affairs and Defense Section, London, pp. 1-15. Available at: <https://researchbriefings.files.parliament.uk/documents/SN05040/SN05040.pdf> (Accessed: 3 May 2015).
25. Turner, J. *et al.* (eds.). (2009) 'Antarctic climate change and the environment', Scientific Committee on Antarctic Research, Cambridge.
26. Turner, J. *et al.* (2016) 'Absence of 21st-century warming on Antarctic Peninsula consistent with natural variability', *Nature* 535, pp. 411-415.
27. Zhang, M., Haward, M. and Mcgee, J. (2020) 'Marine Plastic Pollution in the Polar South: Responses from Antarctic Treaty System', *Polar Record*, 56(36), pp. 1-9.