

Development and Challenges of Antarctic Marine Protected Areas

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Abstract: Antarctic Marine Protected Areas (MPAs) have developed rapidly in the past decade and are the focus of ocean governance in the Antarctic, attracting much attention. This paper introduces the establishment process for and legal basis underlying Antarctic MPAs, discusses the challenges faced in the development process, and raises some policy proposals. Some disagreements and controversies remain among the Members of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) regarding legal regime, political issues, scientific basis, management, and monitoring, all of which are major challenges in the development of Antarctic MPAs. In order to implement the important “Maritime Community with a Shared Future” concept and to fulfill its obligations as a member of CCAMLR, China should actively participate in the affairs of Antarctic MPAs, improve domestic legal regimes in MPAs, and strengthen scientific research on the marine ecology and environment of Antarctica.

Keywords: Antarctic marine protected areas; Antarctic Ocean governance and conservation; scientific data

1 Introduction

The development of Antarctic Marine Protected Areas (MPAs) is a key issue in Antarctic Ocean governance. Since 2004, Antarctic MPAs have developed rapidly under the Commission for the Conservation of Antarctic Marine Living Resources (hereinafter referred to as the “CCAMLR”) system, becoming the fastest-growing and most widely discussed protected areas in the high seas. The South Orkney Islands South Shelf Marine Protected Area (SOISS MPA) established in 2009 is the first MPA that is completely beyond national jurisdiction, and the Ross Sea Region Marine Protected Area (RSRMPA) established in 2015 is the largest MPA in the world. According to the planning and development trends of CCAMLR, the MPA network will be spread over Antarctic waters within a decade.

China is majorly involved in conducting Antarctic activities and is an active supporter of the Antarctic Treaty System’s “peace, science, and protection” core value. China ratified the *Convention on the Conservation of Antarctic Marine Living Resources* (hereinafter referred to as the “CAMLR Convention”) in 2006 and became a member of CCAMLR the following year. When China has participated in CCAMLR meetings as a full member state, conclusions have been reached on the construction of Antarctic MPAs using the CCAMLR mechanism. China has carried out a lot of basic work on aspects of scientific research, diplomacy, and law, and has gradually reversed its passive status in Antarctic MPA affairs to become an active participant in the process. China is ready to make more contributions in terms of consolidating the legal basis for, scientific foundation of, and management and monitoring of the process.

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The *Antarctic Treaty* (signed on June 23, 1961) has temporarily frozen all claims to the Antarctic continent. Therefore, the waters around the Antarctic continent are generally regarded as the high seas, and the MPAs established in the Antarctic sea areas are regarded as High Seas Marine Protected Areas (HSMPAs). This paper only discusses the HSMPAs established by CCAMLR in the Southern Ocean under its jurisdiction, and does not consider the MPAs established by the United Kingdom, South Africa, and France in the seas around their respective sub-Antarctic islands. In terms of a definition, CCAMLR defines MPAs as sea areas where all or parts of the natural resources can be protected. In order to achieve the objectives of specific conservation measures, ecological environment protection, ecosystem monitoring, or fisheries management, some activities in these ocean areas are restricted or are completely prohibited.

2 The process of establishing Antarctic MPAs

In 2004, CCAMLR requested that its Scientific Committee treat MPAs as a priority [1], and began to promote the establishment of MPAs in the Antarctic seas. So far, two major MPAs have been established, accounting for half of the world's HSMPAs. Proposals for three other MPAs are now under consultation and discussion. According to the Antarctic MPA plan adopted by CCAMLR in October 2011, an MPA network will be gradually established across the entire Antarctic sea area [2].

2.1 Established Antarctic MPAs

Antarctic MPA affairs are carried out under the framework of the CAMLR Convention, and the Commission (CCAMLR) established under the CAMLR Convention controls the relevant work. CCAMLR currently has 26 members, including active Antarctic nations such as the United States, Australia, New Zealand, Russia, France, Japan, and China, as well as the European Union. In accordance with its goals for the conservation of living marine resources, CCAMLR has established the SOISS MPA, and the RSRMPA in the Southern Ocean.

2.1.1 South Orkney Islands Southern Shelf Marine Protected Area

In November 2009, the 28th CCAMLR meeting resulted in the decision to establish SOISS MPA, and special conservation measures were formulated to achieve this (CM 91-03). The protected area is located in a concave region to the east of the Antarctic Peninsula, and measures roughly 9.4×10^4 km² in area. The objective of establishing this MPA was to restrict excessive fishing activities in the area and to protect marine life such as albatrosses, petrels, penguins, and Antarctic fur seals. Fig. 1 shows the geographical location and boundary of the SOISS MPA.

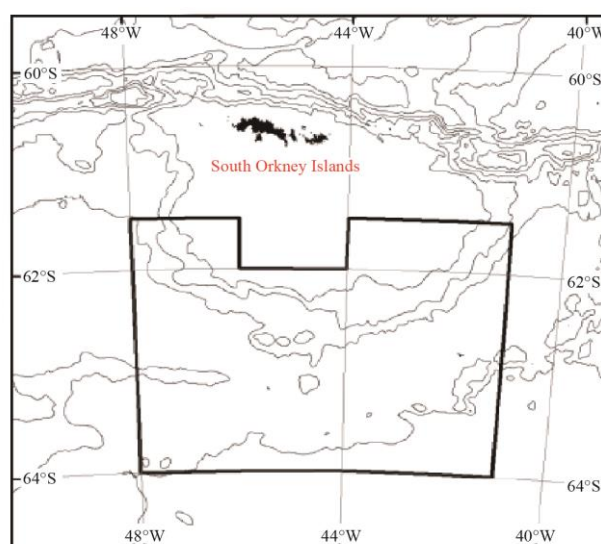


Fig. 1. The geographical location and boundary of the SOISS MPA.

Source: Commission for the Conservation of Antarctic Marine Living Resources. Protection of the South Orkney Islands Southern Shelf, Conservation Measure 91-03 (2009).

Conservation measures in the SOISS MPA include: (1) All fishing activities are prohibited. Scientific research activities conducted for monitoring or other purposes shall be approved by CCAMLR and shall comply with the

conservation measures in the protected area; (2) all fishery vessels (including fishing vessels, coopers, fish processing vessels, fishing transport vessels, etc.) are prohibited from carrying out any form of waste dumping or sewage discharge in the MPA or transshipment of fishing vessels; (3) in order to monitor traffic flow in the MPA, vessels are encouraged to inform the Secretariat of CCAMLR of their flag state, vessel size, International Maritime Organization number, route, and other necessary information before passing through the area. There are still some issues with the SOISS MPA 10 years after its establishment. The biggest problems are a serious lack of scientific monitoring data and an inability to evaluate the performance of the conservation measures [3].

2.1.2 Ross Sea Region Marine Protected Area (RSRMPA)

The proposals for the RSRMPA were presented separately by the United States and New Zealand in 2011 and were merged into a joint proposal in 2012. After the proposal was put forward, there were serious disagreements among CCAMLR Members on the proposed geographical coverage of, scientific basis for, necessity of, and duration of protection for the RSRMPA. The Western countries that took the lead in promoting the establishment of the protected area made comprehensive efforts to apply political, diplomatic, scientific, and public opinion to promote CCAMLR adopt the proposal in 2016. Since it was officially established, the RSRMPA has made slow progress in terms of management, and its scientific research and monitoring plans have not been completed up to now [4].

(1) The area of the RSRMPA

The Ross Sea is a large bay in the South Pacific Ocean penetrating deep into Antarctica, located to the north of the Ross Ice Shelf. The RSRMPA has a protected area of 1.55×10^6 km², of which 1.12×10^6 km² is under full protection, making it the largest HSMMPA in the world. The valid duration of protection for the RSRMPA is 35 years, lasting until 2052. The MPA is divided into three parts: 1) the General Protection Zone, in which commercial fishing is not allowed (about 72% of the protected area); 2) the Krill Research Zone (about 21% of the protected area), which allows regulated krill fishing; and 3) the Special Research Zone (about 7% of the protected area), in which limited fishing activities are allowed. The geographical location of the RSRMPA reflects a political compromise among the countries concerned. For example, the Special Research Zone was originally an important fishing ground for tooth fish (*Dissostichus mawsoni*) for New Zealand, and a certain amount of fishing activities are still permitted due regard for New Zealand's fishing interests. Moreover, the most productive fishing grounds, such as Isling Beach, are excluded from the Protected Area [2].

(2) Major protected objects and objectives of the RSRMPA

The main protected objects covered by the RSRMPA are the unique ecosystems of the Ross Sea, and the key protected species comprise tooth fish and krill. The main objectives of the protected area include: 1) to protect the biological structure and ecological functions of the Ross Sea region, and to protect local mammals, birds, fish, and invertebrates through the protection of habitats; 2) to provide research data on endangered fish populations, to better study the impacts of climate change on fish, and to provide better opportunities for research on Antarctic marine biological systems; 3) to provide special protection for the habitat of the Antarctic tooth fish; and 4) to protect krill species.

(3) Operation of and protection measures in the RSRMPA

The protection approaches employed in the RSRMPA mainly include: 1) dividing the MPA area into three zones, and implementing different management measures in different zones; 2) prohibiting or restricting fishing; and 3) managing fishing vessels, requiring reports of fishing vessels entering and leaving the RSRMPA, and restricting the transshipment of fishing vessels in the protected area. The RSRMPA requires more detailed reporting of movements, and Members shall submit a report on activities related to the scientific research and monitoring plan of the MPA to the Secretariat of CCAMLR every five years, which is then reviewed by the Scientific Committee. The management methods for the RSRMPA also include encouraging the Members of CCAMLR to undertake corresponding monitoring and supervision measures on all activities [5].

(4) Management methods for the RSRMPA

Decision-making regarding the RSRMPA mainly depends on cooperation among CCAMLR, the Scientific Committee, the Secretariat, and Members, in which CCAMLR has the decision-making authority to establish the RSRMPA, as well as to formulate and issue relevant management measures. The mandates of the Scientific Committee are mainly to consider the scientific basis of proposals for protected areas and to provide suggestions to CCAMLR, as well as to review and evaluate relevant research plans and activities. The Secretariat is responsible for administrative matters, and Members report to CCAMLR on their performance on their obligations with regards to carrying out activities in MPAs. Fig. 2 shows the geographical location and boundary of the RSRMPA.

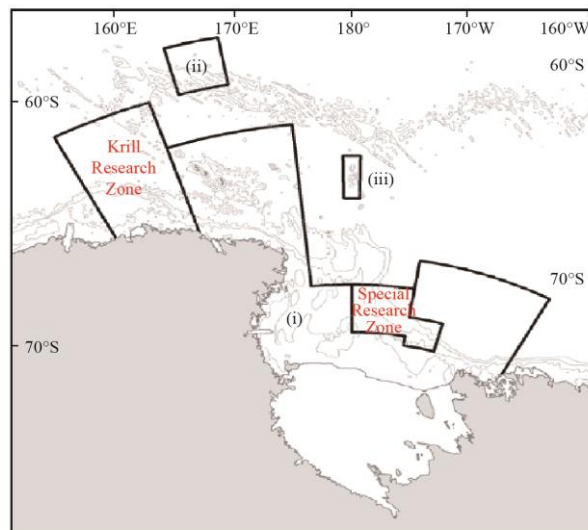


Fig. 2. The geographical location and boundaries of the RSRMPA.

Source: Commission for the Conservation of Antarctic Marine Living Resources. Ross Sea Region Marine Protected Area, Conservation Measure 91-05 (2016).

2.2 Development trends in Antarctic MPA affairs

In October 2011, the 13th meeting of the Scientific Committee of CCAMLR adopted a regional plan for the Antarctic MPAs, which comprises the planning basis and blueprint for designating Antarctic MPAs (Fig. 3). The plan divides all Antarctic waters into nine domains. In the future, the aim is that Antarctic MPAs will be established in all of these nine sub-regions of the Antarctic seas.

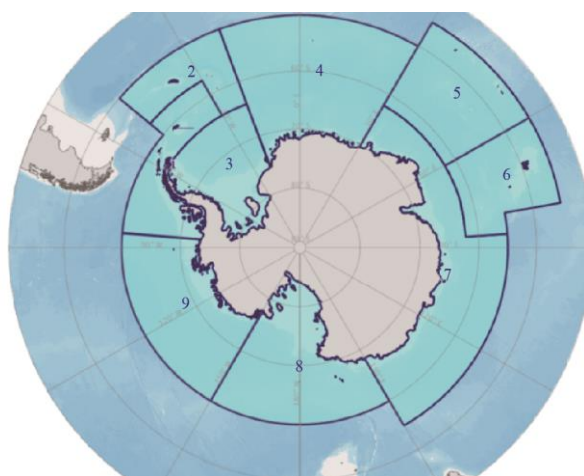


Fig. 3. Planning domains for Antarctic MPAs.

Source: Commission for the Conservation of Antarctic Marine Living Resources. MPA Planning Domains.

In promoting Antarctic MPAs, CCAMLR has exceeded the objectives and functions stipulated in the CAMLR Convention, and is increasingly becoming more similar to environmental protection organizations promoting biodiversity and ecosystem conservation; thus, it has changed its primary purpose of fishery management organization. Article II of the CAMLR Convention makes it clear that the objective of the CAMLR Convention is to conserve Antarctic marine living resources. Article IX relates to the specific implementation of Article II, which stipulates the function of CCAMLR in the conservation and management of Antarctic marine living resources. It can be seen from the contents of Article II and Article IX that the CAMLR Convention is, in essence, still a traditional treaty focusing on the utilization of living resources, reflecting the spirit of the international law of the sea in balancing conservation and the sustainable use of living resources in the high seas. The only difference is that the CAMLR Convention emphasizes ecosystem protection and precautionary principles [2]. However, the

objectives and conservation measures relating to Antarctic MPAs have been extended to the conservation of ecosystems and biodiversity. The main proponents of this extension made a statement at the 2014 CCAMLR meeting and it was agreed that regional management measures for the conservation of fishery resources are not those expected by CCAMLR for the protected areas, instead, they should be able to achieve the objective of conservation of marine biodiversity.

2.3 Proposals for MPAs under discussion

In addition to the abovementioned established MPAs, there are currently three proposals for protected areas under discussion in CCAMLR. These proposals are to establish the East Antarctic MPA (EAMPA; submitted jointly by France, Australia, and European Union in 2012, the order of proponents changed to European Union and Australia in 2019), the Weddell Sea Marine Protected Area (WSMPA; submitted by the European Union in 2015), and the Antarctic Peninsula MPA (submitted jointly by Argentina and Chile in 2018).

2.3.1 Proposal to establish the East Antarctic MPA (EAMPA)

The proposal to establish an MPA in the East Antarctic was jointly put forward by France and Australia at the 30th CCAMLR meeting in 2011, and has been discussed and modified in subsequent meetings. The sea area around East Antarctica covered by the proposal is rich in living and mineral resources. According to the preliminary investigation, there exist abundant oil stocks, gas resources, and manganese nodules in the oceanic areas of the East Antarctica. The ice shelves in sea bay areas contain rich fresh water resources. In terms of living resources, the seas of the East Antarctica provide a habitat for a large number of seals and seabirds. After several revisions, the planning scope and management systems in the proposal have changed. At the 34th CCAMLR meeting in 2015, the proponents reduced the number of planned subareas from seven to three, but indicated that the other four subareas would not be abandoned. At the 38th CCAMLR meeting in 2019, the proposal was not adopted due to disagreement among CCAMLR Members relating to the scientific basis, boundaries, and objectives of the protected area, and further discussions and revisions are needed. Fig. 4 shows the proposed plan for the East Antarctic MPA.

2.3.2 Proposal for the Weddell Sea Marine Protected Area (WSMPA)

The proposal for establishing an MPA in the Weddell Sea region was put forward by the European Union and its member states in 2016. According to the proposal, the WSMPA will be composed of two unconnected sea areas, the first of which roughly extends to the east along the northeast coast of the Antarctic Peninsula in a concave shape; the second of which roughly extends to the north along the Antarctic continent and includes some ice shelves and islands.

The main objectives of the WSMPA are to protect biodiversity and habitats, to establish a scientific reference area to monitor the impacts of climate change, fishing, and other human activities, to study marine ecosystems and representative, rare, and unique biodiversity and habitats, and to enhance the adaptability of these ecosystems to the impacts of climate change. To achieve the above objectives, three types of protected zones are designated in the WSMPA proposal: a General Protected Zone (GPZ), Special Protected Zones (SPZ), and a Fishery Research Zone (FRZ). The GPZ is the largest in area, and the SPZs are spread across the GPZ, while the FRZ is located along the coast of the Antarctic continent. The proposal particularly highlights that the area and duration of establishment for the WSMPA need to be decided through discussion in CCAMLR meetings. The WSMPA proposal covers a vast area which includes the Antarctic peninsula, where most human activities in the Antarctic region are concentrated. The potential impact of this MPA on Antarctic activities deserves further close attention.

2.3.3 Antarctic Peninsula MPA Proposal

At the 2018 CCAMLR meeting, Argentina and Chile proposed to establish the Antarctic Peninsula MPA in Planning Domain 1 (D1MPA). The proposed area is located near the Antarctic Peninsula to the northwest of the Antarctic continent. The protection objects outlined in the proposal include representative habitats, ecosystem processes, important areas of species life cycles, rare and vulnerable ecosystems, etc.

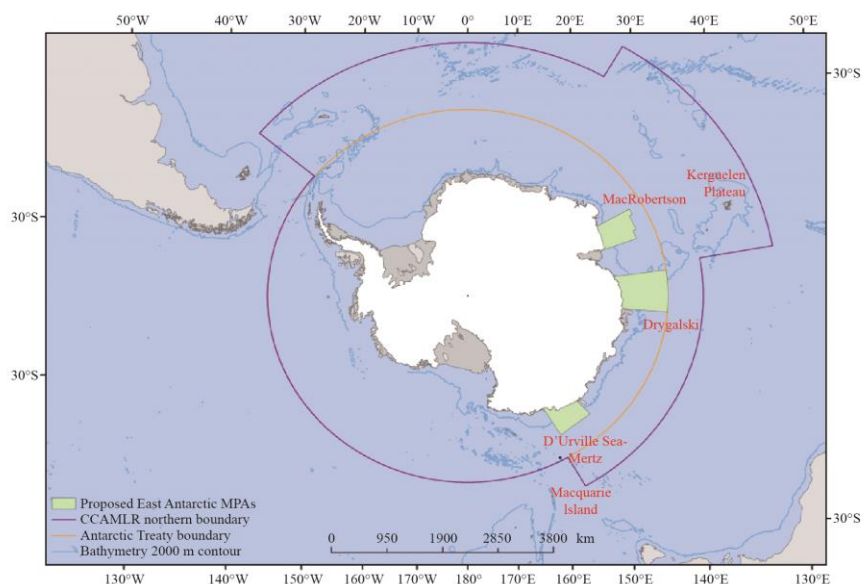


Fig. 4. The proposed plan for the East Antarctic MPA.

Source: Australian Government. Marine Protected Area for the East Antarctica.

3 Challenges in implementing Antarctic MPAs

On the whole, although important progress has been made in establishing Antarctic MPAs, there are still major disagreements among Members regarding legal systems, political support, scientific basis, management, and monitoring, which are all main challenges for the further development of Antarctic MPAs. CCAMLR and its Members should pay attention to the legal, scientific, and management problems that currently exist in constructing MPAs, should actively reflect on and address political concerns, and should promote justice, transparency, science, and pragmatism in the course of the Antarctic MPA development, so as to facilitate the long-term and effective conservation of Antarctic marine life and ecology.

3.1 Ambiguous legislation

At present, a unified legal framework to regulate the establishment and management of protected areas in the high seas does not exist at the global level. There are a number of international treaties and normative documents related to the issues of protected areas in the high seas [6], but generally these lack pertinence and applicability. At present, regional treaties provide the most important and direct legal basis for the establishment and management of protected areas in the high seas.

The regulations and measures formulated by CCAMLR established under the 1980 CAMLR Convention form the direct legal basis of Antarctic MPAs. Article IX of the CAMLR Convention details the basis for CCAMLR to designate MPAs and to take corresponding measures to manage living resources. This article stipulates that CCAMLR has the authority to formulate, adopt, and revise conservation measures on the basis of the best scientific evidence available. In 2011, CCAMLR formulated and passed the *General Framework for the Establishment of CCAMLR MPAs* (hereinafter referred to as the “General Framework”), which supplements and improves the provisions of Article IX in terms of zoning for protection [7].

The General Framework briefly describes the legal sources, institutional background, and scientific theoretical basis for the establishment of MPAs in the area covered by the CAMLR Convention, and formulates the objectives, elements, procedures, applicable objects, review processes, and evaluation systems for the establishment of MPAs. Due to the short time for discussion and lack of experience, the General Framework still has some room for improvements. At the time of its adoption, the CCAMLR Members still had differing opinions on the positioning, objectives, and scientific basis of MPAs; and key components of MPAs such as baseline data, management plans, scientific research, and monitoring plans, had not been fully discussed. The General Framework failed to provide details about the scientific approach, scientific indicators, standardized systems, data collection, data analysis, and treatment systems needed to establish MPAs. In addition, the General Framework lacked reasonable definitions and overall ideas of major substantive issues such as the concept of an MPA, the meaning and scope of rational use, and the relationship between the specific objectives of the protected areas and Article II of the CAMLR Convention. These are the main issues causing disagreements among the CAMLR parties on MPA issues [8].

3.2 Political arguments

In the process of developing Antarctic MPAs, political controversy and doubts arose about the connection between MPAs and Antarctic sovereignty claims. Russia submitted a working paper to CCAMLR in 2014, questioning the Antarctic territory claimants' use of MPAs to establish geopolitical control in their claim areas [2]. Territorial claimants such as Australia, France, and New Zealand denied this. However, it is undeniable that the sectors of Antarctic land claimed by the proponents of Antarctic MPAs greatly overlap with the corresponding sea areas covered by the proposal. The sea areas covered by the MPAs proposed by New Zealand, Australia, Chile, and Argentina are all located in sea areas corresponding to their respective Antarctic land claims (Fig. 5 and Fig. 6). The WSMPA proposal submitted by the European Union overlaps with sea areas corresponding to Norway's claim of land territory in Antarctica, and Norway raised an objection to the proposal. Although the Antarctic Treaty temporarily froze territorial claims to the Antarctic continent, it did not deny these claims, nor did the claimant countries abandon their claims. Australia is one of the closest countries to Antarctica and has territorial claims to the largest area among the seven claimants of Antarctica. In 2004, Australia's application for the outer continental shelf beyond the 200 nautical miles (1 nautical mile = 1.852 km) submitted to the United Nations Commission on the limits of the continental shelf included the outer continental shelf of Australia's "Antarctic territory" [9].

In this sensitive situation, the relationship between Antarctic MPAs, territorial claims, and geopolitical control has led to political suspicion and controversy [10].

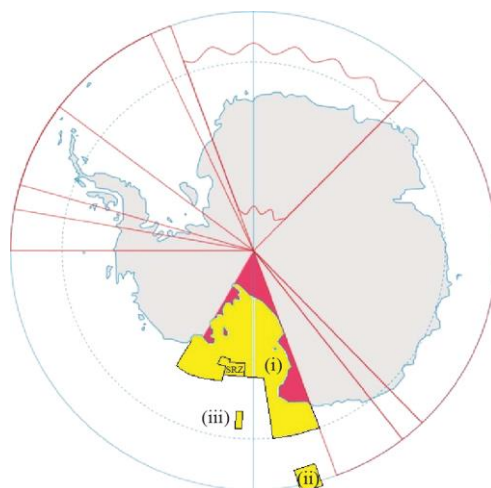


Fig. 5. New Zealand's territorial claims correspond to the location of the RSRMPA.

Note: The pink area is the area of Antarctic land claimed by New Zealand, and the yellow area is the RSRMPA, established with New Zealand as the proponent (cartographer Feng Chong).

3.3 Insufficient scientific data

Scientific data lay the foundation for the conservation and management of Antarctic living resources in the Antarctic Treaty System, as well as for the construction of MPAs. The 1980 CAMLR Convention further emphasized the importance of science and used precautionary and ecosystem approaches to manage fishing activities that impact Antarctic marine living resources [11]. The General Framework stipulates that Antarctic MPAs should be based on the best scientific evidence available and requires CCAMLR to give full consideration to the advice given by the Scientific Committee.

The interpretation and application of the phrase "best scientific evidence available", and whether the scientific basis of the MPA is sufficient to support its establishment, conservation, and management, are always issues during MPA consultations in CCAMLR. In 2011, the United States and New Zealand submitted proposals to the Scientific Committee supporting the establishment of the MPA in the Ross Sea region, while Australia and France jointly submitted a proposal to the Scientific Committee supporting the establishment of an MPA system in the East Antarctic region. When the Scientific Committee discussed the scientific basis underlying these proposals, serious disagreements arose among the Members (including the proponents) in establishing the scientific facts and policy objectives of the MPAs.

In October 2019, at the 38th CCAMLR meeting, no agreement was reached regarding the scientific research and monitoring plan for the RSRMPA, though two years had passed since the MPA was established. China

submitted a working paper on the research and monitoring plan for the RSRMPA, emphasizing that the plan is of great importance for collecting, sorting, and analyzing the data from the protected area and for promoting the management and evaluation of the protected area. China suggested that when making scientific research and monitoring plans, attention should be paid to the baseline data, and that the conservation objectives and general provisions should be converted into specific, measurable, and implementable management objectives. As there are still objections to the scientific data presented in the proposal for the EAMPA, mainly concerning the suitability of the baseline data, protection objectives, parameters, etc., the EAMPA proposal has not been adopted, and needs to be discussed in future Commission meetings [4].

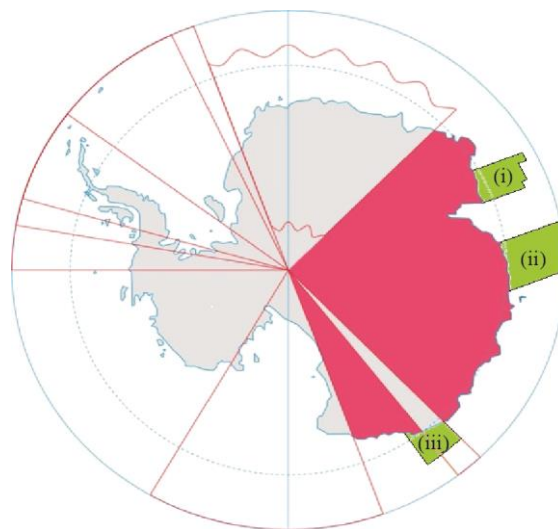


Fig. 6. The proposed area for the East Antarctic MPA corresponds to Australia's territorial claim.

Note: The pink area is the Antarctic land claimed by Australia, and the green areas are the oceanic locations of the East Antarctic MPA proposed by Australia (cartographer Feng Chong).

3.4 Absence of effective management

Due to the vastness of Antarctic sea areas, its harsh climate, relatively little human activity, and the lack of CCAMLR's monitoring and law enforcement capabilities, it is a challenge to achieve effective management and monitoring in the MPAs. Alarmingly, there are still some problems in the SOISS MPA 10 years after its establishment, including that the reporting system has not been well implemented, the conservation measures are limited to a ban on fishing, and the conservation efficiency remains to be evaluated. In addition, law enforcement capabilities in the protected areas are limited. In terms implementing the system, according to the CAMLR Convention, observers and inspectors are entitled to carry out inspections. However, even if a ship is found to be engaging in illegal activities upon inspection, observers and inspectors cannot directly enforce consequences themselves, but can only report to the flag state. This greatly reduces the effectiveness of law enforcement.

3.5 Controversy over conservation and rational use

In the process of setting up Antarctic MPAs, the trade-off between conservation and rational use, which is related to objectives and concepts of MPAs, is one of the focuses of debate. Article II of the CAMLR Convention clearly states that the objective of the Convention is "the conservation of Antarctic marine living resources", and the term "conservation" includes rational use [1]. The General Framework (2011) formulated by CCAMLR also makes it clear that "the provision of Article II of the CAMLR Convention on MPA conservation includes rational use should be fully taken into account" for Antarctic MPAs. China and Russia attach great importance to the balance between the conservation and rational use of marine living resources, and believe that MPA proposals should have sufficient evidence for restricting fishery activities. New Zealand, as a proponent of the RSRMPA, believes that the Ross Sea proposal has adjusted the border to minimize the impact on fisheries, and that the Special Research Zone in the proposal constitutes rational use. New Zealand emphasizes that the word "conservation" stipulated in Article II of the CAMLR Convention includes rational use, rather than meaning that "conservation is rational use" [3]. For this argument, as the Chinese scholar Tang Jianye pointed out, the purpose

of the Article II of the CAMLR Convention is to achieve a balance between conservation and use. The sustainable use of Antarctic living resources should not be prohibited when constructing Antarctic MPAs [2].

4 Suggestions for China to enhance its participation in Antarctic MPA affairs

Antarctic MPAs are greatly important in studying and coping with the impacts of global climate change, and in conserving the marine biodiversity and ecological environment in Antarctica. However, if CCAMLR hastily promotes the establishment of MPAs with extremely large areas, long durations of protection, and strict control measures before reaching a consensus on relevant scientific, legal, and political issues, it is bound to raise doubts and concerns. These doubts include: in the context of the *Antarctic Treaty*'s temporary freezing of Antarctic sovereignty claims, the Western developed countries have invested a lot of political and diplomatic resources to promote the establishment of Antarctic MPAs. Are they strengthening the dominance of their power over Antarctic Ocean governance, competing for management powers over Antarctic affairs, and implementing "soft control" over Antarctic waters with the MPAs as the starting point? Will the establishment of MPAs strengthen the control of relevant sea areas, raise the threshold of participation, and restrict the activities of some countries in Antarctica? The United Nations is in the process of negotiating an international agreement on biological diversity conservation and sustainable utilization in waters beyond national jurisdiction (BBNJ). Area-based management tools, including MPAs, are an important part of the agreement. In order to promote the smooth development of the Antarctic MPA process and to ensure the conservation performance of the MPAs, all Members of CCAMLR should strengthen communication and exchange of science, law, politics, and other fields, build a more solid legal and scientific basis for the establishment of MPAs, and enhance the transparency of various procedures.

China is an important force in strengthening Antarctic Ocean governance and conservation of its ecological environment. China is not a territorial sovereignty claimant of Antarctica and has a relatively detached political status. China attaches great importance to the role of Antarctica as a new strategic frontier in the maritime community with a shared future. China should play a role in addressing the impacts of global climate change, in the conservation of marine biodiversity, and in the protection of the Antarctic ecological environment. Since 2014, China's position on Antarctic MPA affairs has changed from "relative" to "active participation" [12].

4.1 In-depth participation in Antarctic MPA affairs

The governance of the Antarctic is linked to the common well-being of mankind, is a new frontier for global governance strategies, and is highly valued by China. General Secretary Xi Jinping pointed out that China is willing to work with the international community to better understand Antarctica, protect Antarctica, and make use of Antarctica. In April 2019, General Secretary Xi Jinping put forward the important concept of "building a maritime community with a shared future," highlighting the fact that China attaches great importance to the protection of marine ecological communities and to the conservation of marine biodiversity. Antarctica is an important part of this maritime community with a shared future. The world's oceans are inextricably linked in terms of their ecology. Human society needs to work together to build marine ecological security. As the world version of marine ecological civilization, the maritime community with a shared future calls on the international community to work together to build marine ecological communities, strengthen the governance of ecological environments in the sea areas under the jurisdiction of all countries, actively participate in global ocean governance, and strengthen international cooperation in sea areas beyond national jurisdiction such as the polar regions, the international seabed areas, and the high seas.

China's in-depth participation in Antarctic MPA affairs is an important embodiment of this concept and is an important opportunity for China to discuss its discourse power and institutional rights in Antarctic Ocean governance. China is a member of CCAMLR. It is China's right and obligation to participate in the development of Antarctic MPAs in accordance with the CAMLR Convention. Underlying the rapid development of Antarctic MPAs, there are still many problems and challenges, such as further enhancing trust and clearing up political doubts, strengthening the foundation of scientific research, strengthening the construction of the protected area institution, scientific monitoring and performance evaluation of the established MPAs, consolidating the establishment criteria for new MPAs, the geographical location and duration of protection, the suitability of protection measures, etc., all of which CCAMLR Members need to address jointly. China's in-depth participation in Antarctic MPA affairs is not only needed practically, but it is also an embodiment of the concept of a maritime community with a shared future.

4.2 Improving the domestic legal system for Antarctic activities

China is a consultative party for both the Antarctic Treaty and the CAMLR Convention, and it plays an important role in Antarctic affairs. With the continuous and in-depth development of China's Antarctic involvement, China has the responsibility to transfer the principles and requirements of the Antarctic Treaty System to domestic laws and regulations, clarify the responsibilities of competent departments, regulate the activities of its relevant subjects, and improve the capacity-building of Antarctic activities, so as to promote the further development of China's Antarctic activities. Therefore, in March 2019, the Standing Committee of the 13th National People's Congress included the "Antarctic Activities and Environmental Protection Act" in the legislative plan, which represents an important step forward in improving the Chinese domestic legal system with regards to Antarctic activities. To participate in Antarctic MPA affairs more effectively and to provide a necessary legal guarantee for China to carry out activities in Antarctic MPAs, the domestic legislation should include relevant information on the Antarctic MPAs, reflect China's position and principle on Antarctic MPAs, and the statement that Chinese enterprises and individuals will abide by the relevant management measures in Antarctic MPAs. On one hand, the connection between domestic laws and the systems of protected areas in the high seas, such as Antarctic MPAs, should be strengthened, and on the other hand, compliance with the regulations of the Antarctic Treaty System should also be promoted.

4.3 Strengthening scientific research on the Antarctic marine ecological environment

A scientific basis is necessary for the construction of protected areas in the high seas. A large amount of accurate information and data are needed to underpin decision-making in the design planning, operation management, monitoring, and evaluation of HSMPAs. Following the Great Wall, Zhongshan, Kunlun, and Taishan stations, China's fifth Antarctic scientific research station will be situated in the Ross Sea region, Antarctica. China should continue to strengthen scientific research in the Antarctic marine ecological environment in order to accurately understand the ecological environment and the number of important populations of marine life in the Ross Sea and wider Antarctic waters, analyze the future development trends of Antarctic MPAs, lay a foundation for scientific research for China to strive for more contribution, and provide public products and services to improve the conservation performance of Antarctic MPAs.

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