Topic Summary: CEP Discussions on Ship Biofouling and Ballast Water Management

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**Information Paper presented by Australia, New Zealand and the United Kingdom**

Summary

The potential for ships to transport species to Antarctic waters has been the subject of CEP discussions since the first meeting in 1998, as a component of broader efforts to understand and address the environmental risks associated with the introduction of non-native species to the Antarctic region. To support the CEP’s work on related actions in the Five-Year Work Plan and Climate Change Response Work Program (CCRWP), this paper presents a summary of CEP discussions on ship biofouling and ballast water management, with references to meeting reports and papers. It supports Working Paper 14 *Review of International Maritime Organization (IMO) and Antarctic Treaty system (ATS) guidelines and agreements concerning ship biofouling and ballast water management*.

Summary of CEP discussions related to ship biofouling and ballast water management

CEP I / ATCM XXII (Tromsø, 1998)

*See CEP Report paragraph 34.*

In discussion of non-native species issues, the International Maritime Organization (IMO) informed the Committee about its work regarding proposed international restrictions on the discharge of ballast water at sea to prevent the accidental introduction of non-native species.

CEP VII / ATCM XXVII (Cape Town, 2004)

*See CEP Report paragraphs 126-128.*

COMNAP submitted [ATCM XXVII/WP009.Rev A](https://documents.ats.aq/ATCM27/wp/ATCM27_wp009_e.doc) on *Applicability to the Antarctic of the IMO “Guidelines for ships Operating in Arctic Ice-Covered Waters* to CEP VII and ATCM XXVII.

Norway suggested environmental issues related to ballast water management may be of concern to the Committee, especially with respect to the potential to introduce non-native species of marine life.

*See ATCM Report paragraph 134.*

ATCM XXVII also discussed the possible introduction of non-native organisms into Antarctic water through the discharge of ballast water, and noted the use of the same ships operating in both the Arctic and Antarctic and therefore encountering the organisms that could potentially thrive in both areas, could be a particular reason to look further into this issue. It was noted that the International Convention for the Control and Management of Ship’s Ballast Water and Sediment (Ballast Water Management Convention) agreed to in February 2004, should be considered in this regard. The ATCM agreed the issue warranted further consideration and requested SCAR, with the support of other appropriate organisations, to investigate the environmental and technical issues associated with the question of ballast water and to report to the ATCM.

CEP VIII / ATCM XXVIII (Stockholm, 2005)

*See CEP Report paragraphs 133-144.*

COMNAP and IAATO submitted [ATCM XXVIII/IP121](https://documents.ats.aq/ATCM28/ip/ATCM28_ip121_e.doc) *The use of Ballast Water in Antarctica*, which noted that 35 of the 70 vessels operated or chartered by COMNAP and IAATO members did not discharge any ballast water in the Antarctic Treaty area, 3 vessels did not discharge any ballast water brought from outside the Treaty area, and 2 vessels only exchanged ballast water in the open ocean. The paper also provided background on the risk of introducing non-native marine species through ballast water, and the development by IMO of related guidelines and the Ballast Water Management Convention.

In CEP discussion, there was general agreement among Members to a proposal from Norway that consideration should be given to voluntary application of the Ballast Water Management Convention within the Antarctic Treaty area, because the implementation of the Convention in general may take some time. The United Kingdom noted the Convention provided for additional measures for certain areas and offered to develop practical guidelines for ballast water exchange in the Antarctic Treaty area, in consultation with other interested Parties and appropriate experts, for consideration at the next meeting. New Zealand noted that hull fouling may also be a significant factor in the transfer of foreign organisms to Antarctica. Members agreed there were several matters of concern with regard to the broad issues of quarantine and the introduction of non-native species, which warranted further detailed consideration by the Committee, based on expert scientific advice, such as from SCAR. SCAR advised that it had programs studying relevant questions, such as the potential pathways for alien arrivals, and that it had new information indicating that hull fouling is probably a bigger problem than ballast water in Antarctic waters. SCAR offered to provide further expert advice on the issue and indicated that it would bring a paper to the next meeting

CEP IX / ATCM XXIX (Edinburgh, 2006)

*See CEP Report paragraphs 125-133.*

The Committee considered [ATCM XXIX/WP005(rev.1)](https://documents.ats.aq/ATCM29/wp/ATCM29_wp005_rev1_e.doc) *Practical Guidelines for Ballast Water Exchange in the Antarctic Treaty Area*, submitted by the United Kingdom, which set out practical guidelines that aimed to support early implementation of the IMO Ballast Water Management Convention, and reduce the risk of introducing non-native marine species into Antarctica through ballast water. The draft guidelines had been circulated to COMNAP members, and all comments were taken on board, and had also received significant support at the 54th session of the IMO Marine Environment Protection Committee (MEPC).

In developing practical guidelines for ballast water exchange, the United Kingdom had considered the following key principles of the IMO Ballast Water Management Convention:

* ballast water exchange is to be used as an interim measure, until such a time as ballast water treatment technologies have been developed, as set out in the Convention;
* Parties with common interests bordering enclosed and semi-enclosed seas shall endeavour to seek co-operation with neighbouring Parties through regional agreements to develop harmonised procedures (Article 13(3) of IMO Convention); and,
* a Party or Parties can put in place additional measures to those in Section B of the Convention, such as regional management strategies based on ballast water exchange, which will require ships to meet a specified standard or requirement (Regulation C-1).

The Committee agreed to submit the guidelines to the ATCM for adoption, and subsequent submission to the 55th session of the MEPC to consider extending them to all shipping activities.

CEP IX also considered [ATCM XXIX/WP013](https://documents.ats.aq/ATCM29/wp/ATCM29_wp013_e.doc) *Non-native Species in the Antarctic. Report of a Workshop* and [ATCM XXIX/IP046](https://documents.ats.aq/ATCM29/ip/ATCM29_ip046_e.doc) *“Non-native Species in the Antarctic” A Workshop*, which reported on a workshop held in New Zealand from 10 to 12 April 2006. Among other things, the workshop had concluded that while hull fouling was considered to be the most significant pathway for marine introductions to the Antarctic, ballast water, debris, and waste water (ships or facilities) also have to be considered. In addition, it is likely there are significant risks of introduction associated with IUU fishing activities. None of the marine pathways were adequately addressed, with the state of knowledge on marine native as well as non-native biodiversity, as well as management options, several decades ‘behind’ the terrestrial environments.

Other related papers submitted to CEP VIII included:

* [ATCM XXVIII/IP082](https://documents.ats.aq/ATCM29/ip/ATCM29_ip082_e.doc) The use of Anti-fouling Biocide Paints by National Antarctic Program Vessels (COMNAP). COMNAP noted that the IMO International Convention on the Control of Harmful Anti-fouling Systems on Ships would prohibit the use of harmful organotins (such as tributlyltin (TBT)) in anti-fouling paints and establish a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems. The paper reported on a survey of the anti-fouling practices of 25 National Antarctic Program vessels, none of which used TBT-based paint and all already complied with the Convention. The majority of vessels used anti-fouling paints with the majority of biocides used being copper-based. Controlled Depletion Polymer (CDP) was the most common technology used for the control of biocide release by the paint. A number of vessels did not use anti-fouling paint with some of these equipped with electric cathodic methods of protection. These results were considered representative of the anti-fouling practices for the fleet of 39 ships operated by COMNAP members in the Antarctic Treaty area.
* [ATCM XXVIII/IP083](https://documents.ats.aq/ATCM29/ip/ATCM29_ip083_e.doc) *The Use of Ballast Water in Antarctica* (COMNAP), which provided an update to the earlier results presented in ATCM XXVII/IP121. A more detailed survey conducted in 2005-2006, which captured 25 National Antarctic Program vessels, found that no vessels discharged ballast water in the Area: 16% had isolated (sealed) ballast water tanks so never take on or discharge ballast water, 60% did not take on or discharge ballast water at all while in the Treaty Area, and the remaining 24% took on but did not discharge ballast water in the Treaty Area. COMNAP noted the surveys indicate the potential for environmental damage from ballast water discharge is already low as few, if not none, of the ships operating in the Antarctic Treaty area have an operational requirement for discharging ballast water in the Area under normal circumstances, that compliance with the IMO Ballast Water Management Convention should not pose any significant problem, and that COMNAP supported efforts to put the principles of the Convention into practice within the Antarctic Treaty area, whenever practicable, before the Convention comes into force.

*See ATCM Report paragraph 83.*

The ATCM adopted [Resolution 3 (2006)](https://www.ats.aq/devAS/Meetings/Measure/365?s=1&from=1/1/1958&to=1/1/2158&cat=0&top=0&type=0&stat=0&txt=ballast&curr=0&page=1) on Ballast Water Exchange in the Antarctic Treaty Area, which recommended that [The Practical Guidelines for Ballast Water Exchange in the Antarctic Treaty area](https://documents.ats.aq/recatt/att345_e.pdf) be used by all ships in the Antarctic Treaty area, except those referred to in Article 3, paragraph 2, of the IMO Ballast Water Management Convention. The Resolution stated the Parties’ recognition that the IMO Ballast Water Management Convention had yet to enter into force, their awareness of the key principles including that ballast water exchange be used as an interim measure until such time as ballast water treatment technologies have been developed, and their desire to put in place a Ballast Water Regional Management Plan for Antarctica.

The ATCM also adopted [Decision 2 (2006)](https://www.ats.aq/devAS/Meetings/Measure/362?s=1&from=1/1/1958&to=1/1/2158&cat=0&top=0&type=0&stat=0&txt=ballast&curr=0&page=1), stating the Parties’ desire to promote the implementation of an interim Ballast Water Regional Management Plan for Antarctica by all vessels entering the Antarctic Treaty area, and requesting the Host Government of ATCM XXIX to forward the *Practical Guidelines for Ballast Water Exchange in the Antarctic Treaty Area* to the 55th session of the Marine Environment Protection Committee (MEPC) of the International Maritime Organisation, with a request that they be considered for appropriate action by the IMO.

CEP X / ATCM XXX (New Delhi, 2007)

*See CEP Report paragraph 223-234.*

SCAR submitted [ATCM XXX/IP037](https://documents.ats.aq/ATCM30/ip/ATCM30_ip037_e.doc) *Hull fouling as a source of marine invasion in the Antarctic*, which indicated that hull fouling is an important route for the transport of marine non-native species to the Antarctic region. The paper summarised information about risks associated with fouling communities that have been reported from vessels operating in the Antarctic Treaty area. It noted that:

* fouling is much reduced by anti-fouling treatments, but those areas of the hull resting on supports in dry dock, that typically go untreated, have much denser fouling assemblages than treated areas
* recorded fouling assemblages can be large and diverse, including as many as 18 species, at least some of which are known invasive species elsewhere in the world
* although hull fouling assemblages are reduced during transit at sea, the speed of many vessels entering the Antarctic is thought to be too slow to remove much of the assemblage
* ice-scouring is known to remove hull fouling assemblages and anti-fouling treatments, however the relationship between ice thickness, extent, encounter rate, and the extent of removal of fouling is unknown and ice-scour is unable to remove fouling from sea chests
* smaller vessels and craft, typically transported on board larger research vessels and deployed for use on arrival at a given destination, may also harbour considerable fouling assemblages.

SCAR drew attention to research required to fully understand the sources of and species contributing to hull fouling and the extent to which hull fouling could be reduced as a risk of introducing non-native species. This included research on: the extent to which hull fouling assemblages are found on all vessels entering the Antarctic Treaty area; the relationships between ice characteristics and cover, and removal of hull fouling assemblages and anti-fouling treatments; the significance of hull fouling assemblages in sea chests; the extent of fouling and organisms found on smaller vessels and craft used for operations; the physiology of typical fouling organisms from various parts of the world to identify species that can tolerate the conditions of the Antarctic marine environment; and Antarctic marine diversity.

Sweden also encouraged all Parties to ratify the IMO’s Ballast Water Convention at the earliest opportunity, and the United Kingdom noted that the Ballast Water Guidelines adopted by the ATCM under Resolution 3 (2006) would be considered by the IMO in July 2008.

Related papers to ATCM XXX included:

* [ATCM XXX/IP001](https://documents.ats.aq/ATCM30/ip/ATCM30_ip001_e.doc) *Report by the CCAMLR Observer at the Thirtieth Antarctic Treaty Consultative Meeting* (CCAMLR), which noted that a number of points from ATCM XXIX were directly relevant to CCAMLR’s work, including ATCM Decision 2 (2006) and Resolution 3 (2006) regarding ballast water exchange in the Treaty Area as relating to fishing vessels.
* [ATCM XXX/IP134](https://documents.ats.aq/ATCM30/ip/ATCM30_ip134_e.doc) *Report of the International Association of Antarctica Tour Operators 2006-2007* (IAATO), which noted that the agenda of the IAATO 2006 General Meeting had included discussions on ballast water.
* [ATCM XXX/IP125](https://documents.ats.aq/ATCM30/ip/ATCM30_ip125_e.doc) *Report Submitted to the XXX ATCM by IUCN The World Conservation Union* (IUCN), which noted that with the increase in the number of ships visiting Antarctica, and the predicted impact of climate change which may increase the chance of survival and reproduction of non-native species in the Southern Ocean, it was urgent for Parties to take effective measures to reduce such risks by effectively managing the main introduction vectors and pathways including fouling of vessel hulls, and ballast water, including from fishing activities. It noted that smaller vessels may pose a greater threat of introduction of non-native species through biofouling due to less stringent hull maintenance regimes, and that Parties may wish to support work within the IMO MEPC to develop measures for minimising the translocation of invasive aquatic species through biofouling of ships, including investigation of measures with respect to niche areas on vessels.

The CEP Provisional Five-Year Work Plan (CEP X Report, Appendix 1) included an issue related to ‘Ballast Water Guidelines’, and a related action ‘Review status of guidelines within IMO’.

CEP XI / ATCM XXXI (Kyiv, 2008)

Related papers included:

* [ATCM XXXI/IP033](https://documents.ats.aq/ATCM31/ip/ATCM31_ip033_s.doc) *Preventive measures to avoid the introduction of alien species in Antarctica, in compliance with Annex II of the Protocol* (Uruguay), which described operational procedures implemented to minimise the unintentional introduction of alien species prior to departure for Antarctica, including cleaning the ship's hull every 2 years during maintenance repairs.
* [ATCM XXXI/IP089](https://documents.ats.aq/ATCM31/ip/ATCM31_ip089_e.doc) *Report Submitted to the XXXI ATCM by IUCN The International Union for Conservation of Nature* (IUCN), which noted that several recent studies had documented species introductions into Antarctic and Southern Ocean waters, with marine debris and shipping (mainly through hull fouling) representing the two major vectors for marine species introductions. It suggested that a thorough consideration of the issue is urgently needed within the framework of the Treaty to prevent species introductions, particularly in the marine environment, and that to conserve the integrity of the unique Antarctic system Parties needed to take effective measures to reduce such risks by effectively managing the main introduction vectors and pathways: fouling of vessel hulls, and ballast water, including from fishing activities. It noted that the IMO MEPC had adopted guidelines providing common guidance for vessels undertaking ballast water exchange in Antarctic waters, suggested Parties apply the guidelines as soon as possible as an interim measure for all ships entering the Antarctic Treaty area before the Ballast Water Management Convention comes into force, and encouraged Parties to exchange information on introduced and invasive marine species and consider undertaking risk assessment of species introductions through ballast water and hull fouling into the Treaty area.

The CEP Five-Year Work Plan (CEP XI Report, Appendix 1) included a task to review the status of IMO Ballast Water Guidelines.

CEP XII / ATCM XXXII (Baltimore, 2009)

The CEP Five-Year Work Plan (CEP XII Report, Appendix 1) included a task to review the status of IMO Ballast Water Guidelines.

CEP XIII / ATCM XXXIII (Punta del Este, 2010)

*CEP Report paragraph 306.*

In discussion of ongoing intersessional work to update the CEP Non-Native Species Manual, the United Kingdom reminded the Committee of existing guidelines applicable to the issue of non-native species that the ICG could draw on to include in a manual including, for example, the Ballast Water Guidelines.

CEP XIX / ATCM XXXIX (Santiago, 2016)

*CEP Report paragraph 239-240.*

The United Kingdom presented [ATCM XXXIX/IP27](https://documents.ats.aq/ATCM39/ip/ATCM39_ip027_e.doc) *Introduction of biofouling organisms to Antarctica on vessel hulls*, which provided a summary of [recent research](https://documents.ats.aq/ATCM39/att/ATCM39_att041_e.pdf) on the levels of hull fouling on the British Antarctic Survey’s RRS James Clark Ross between 2007 and 2014 at Rothera Research Station. It noted that better quantification of the risk of marine non-native species introductions posed by vessel hulls to Antarctic environments may inform the development of appropriate management responses. Further hull surveys, on a wider variety of vessels, throughout Antarctica may yield valuable information on the likelihood of marine species introductions. The Committee noted the information presented would be relevant to work scheduled in its updated Five-Year Work Plan to address the risk of marine non-native species introductions.

The CEP Five-Year Work Plan (CEP XIX Report, Appendix 1) included a task to review a report on IMO biofouling guidelines.

The CEP adopted the [Climate Change Response Work Programme](https://documents.ats.aq/ATCM39/att/atcm39_att072_e.doc) (CEP XIX Report, Appendix 2), including the action ‘Review of IMO biofouling guidelines to check adequacy for Southern Ocean and vessels moving from region to region’.

CEP XX / ATCM XL (Beijing, 2017)

The CEP Five-Year Work Plan (CEP XX Report, Appendix 1) included a task to review a report on IMO biofouling guidelines.

CEP XXI / ATCM XLI (Buenos Aires, 2018)

The CEP Five-Year Work Plan (CEP XXI Report, Appendix 1) included a task to review a report on IMO biofouling guidelines.

CEP XXII / ATCM XLII (Prague, 2019)

Related papers included:

* [ATCM XLII/IP027](https://documents.ats.aq/ATCM42/ip/ATCM42_ip027_e.doc) *Marine non-native species in the Antarctic Treaty area* (United Kingdom). This paper presented [recent knowledge](https://documents.ats.aq/ATCM42/att/ATCM42_att086_e.pdf) regarding the introduction pathways/vectors, risk, known status and potential impacts of marine non-native species in the Antarctic Treaty area. It noted that quantitative research on the vectors and pathways that transport non-native marine species and hot-spots of invasion in Antarctica is scarce. Nonetheless, current estimates suggested there may be 180 vessels and 500+ voyages in Antarctic waters each year across tourism, fishing and research, representing a 5 to 10-fold increase since the 1960s. Different types of activity appear to vary temporally and spatially, representing a different kind of introduction risk. The Antarctic Peninsula may be particularly at risk as it receives most ship-based traffic and is showing rapid climate change. Due to a combination of vessel activity and recent international agreements (e.g. IMO Polar Code and Ballast Water Convention), biofouling on ships is likely to be a greater concern than ballast water and other vectors.

The CEP Five-Year Work Plan (CEP XXII Report, Appendix 1) included a task to review a report on IMO biofouling guidelines.

CEP XXIV / ATCM XLIV (Berlin, 2022)

Related papers included:

* [ATCM XLIV/IP024](https://documents.ats.aq/ATCM44/ip/ATCM44_ip024_e.docx) *Ship traffic connects Antarctica to worldwide locations, with implications for non-native marine species introduction risk* (United Kingdom). This paper presented the results of a quantitative analysis of ship movements into Antarctic waters, and a spatially-explicit assessment of introduction risk for non-native marine species in all Antarctic waters by fishing, tourism and national Antarctic operator vessels. It concluded that increasing ship activities in the region increase the opportunities for non-native species introductions, while climate change makes non-native species establishment more likely. Development and implementation of methods to reduce species transfer on vessels may go some way to reducing this risk marine non-native species present to Antarctic marine habitats.
* [ATCM XLIV/IP049](https://documents.ats.aq/ATCM44/ip/ATCM44_ip049_e.docx) *Work to review International Maritime Organization and Antarctic Treaty system guidelines and agreements concerning ship biofouling and ballast water management* (Australia, New Zealand, United Kingdom). This paper set out progress with ongoing work initiated by the CEP Subsidiary Group on Climate Change Response (SGCCR) to review IMO and ATS agreements of the concerning ship biofouling and ballast water management, to check adequacy for the Southern Ocean and vessels moving from region to region.

The CEP Five-Year Work Plan (CEP XXIV Report, Appendix 1) included a task to review a report on IMO biofouling guidelines.