The Retrospective Analysis of Antarctic Tracking Data (RAATD): Areas of Ecological Significance in the Antarctic marine environment

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**Working Paper submitted by France, Australia,** **Belgium, Germany, the United Kingdom, the United States, and South Africa**

**Summary**

This paper draws attention to the publication in the scientific journal *Nature* of the results of the Retrospective Analysis of Antarctic Tracking Data (RAATD), a project of the Scientific Committee on Antarctic Research (SCAR) Expert Groups on Birds and Marine Mammals and Antarctic Biodiversity Informatics. Using assemblage-level tracking of marine predators, the analysis aimed to enhance understanding of fundamental ecosystem processes in the Southern Ocean by identifying ‘Areas of Ecological Significance’ (AESs) with high concentrations of multiple predator species. Integration of more than 4,000 tracks from 17 bird and mammal species revealed AESs around sub-Antarctic islands in the Atlantic and Indian Oceans and over the Antarctic continental shelf (see the related Information Paper “*The Retrospective Analysis of Antarctic Tracking Data identifies Areas of Ecological Significance in the Southern Ocean*” presented by SCAR).

The RAATD project is a good example of SCAR’s important role to assist in the coordination of large-scale data collation, processing and multi-national collaboration – notions at the core of the Antarctic Treaty. The co-authors of this paper consider that the AESs should be utilised by the CEP and ATCM as appropriate to support the objectives and environmental principles of the Protocol on Environmental Protection to the Antarctic Treaty.

France, Australia, Belgium, Germany, the United Kingdom, the United States, and South Africa recommend that the Committee endorses, and advises the ATCM to adopt, a Resolution to recognise the importance of the Areas of Ecological Significance (AESs) in the Antarctic marine environment as a further tool to inform management actions and assist Parties when planning and conducting activities in Antarctica, including to assist environmental impact assessments and to contribute to environmental monitoring as well as to provide further information in the elaboration or update of ASPAs and ASMAs management plans. Further, the AESs contribute to priority actions identified in the Climate Change Response Work Program to understand and monitor changes to the Antarctic environment and species.

**Background**

The Retrospective Analysis of Antarctic Tracking Data (RAATD) project began in 2009. This was a project initiated and led by the Scientific Committee on Antarctic Research (SCAR) Expert Groups on Birds and Marine Mammals and Antarctic Biodiversity Informatics. This analysis aimed to highlight ecologically significant areas for multiple top predator species in the Southern Ocean. To this end, spatial location data from on-board animal tracking devices collected between 1991 and 2006 on 17 different species with different ecological strategies and needs (seals, cetaceans, flying and diving birds) were collated to build one of the largest monitoring databases in the world with nearly 3,000,000 data points. These data were made freely available, as per Article III of the Treaty, and were introduced, together with the processing and analysing scripts in a data paper published in the scientific journal *Nature Scientific Data* (Ropert-Coudert et al. 2020) as a companion paper to the main article in *Nature*.

While the scale of the project, which involved more than 80 scientists from 42 polar programmes, is one of the characteristics of RAATD, it is above all the extreme attention paid to data cleaning, verification and editing before sharing that makes RAATD an extremely reliable source of information, especially in an era where Big Data projects cannot/do not always pay the same level of attention to the less glamourous data "cleaning" part, despite the importance this has for further analysis. The important and comprehensive data cleaning process took 9 years to complete. The monitoring data were then used to model the combined use of circumpolar habitat by the 17 species of marine predators (Hindell et al. 2020). By identifying, mapping and modelling areas of the Southern Ocean where several predator species congregate, a better understanding of the biodiversity of this area is gained. If predators that specialise in krill, fish and squid all visit the same place this is likely to signal high diversity, and probably abundance, of prey species at lower levels of the food chain.

**Recommendations**

France, Australia, Belgium, Germany, the United Kingdom, the United States, and South Africa recommend that the CEP endorses, and advises the ATCM to adopt the draft Resolution in Annex 1 to recognise the importance and utility of the Areas of Ecological Significance (AESs) in the Antarctic marine environment.

**References**

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**Annex 1. Draft Resolution on Areas of Ecological Significance identified in the Retrospective Analysis of Antarctic Tracking Data (RAATD) project**

Resolution XXX (2021)

Areas of Ecological Significance in Antarctica

The Representatives,

*Recognising* that, in some parts of Antarctica, a changing Antarctic climate is having an observable effect on native wildlife;

*Recalling* Article 3 of the Protocol on Environmental Protection to the Antarctic Treaty (“the Protocol”), which requires that activities in the Antarctic Treaty area shall be planned and conducted so as to limit adverse impacts on the Antarctic environment;

*Recalling* also the requirements of Annex II to the Protocol on the Conservation of Antarctic Fauna and Flora;

*Welcoming* the publication of the results of the Retrospective Analysis of Antarctic Tracking Data (RAATD) project of the Scientific Committee on Antarctic Research (SCAR) Expert Groups on Birds and Marine Mammals and Antarctic Biodiversity Informatics, which has identified Areas of Ecological Significance in the Antarctic marine environment;

*Aware of* the potential for harmful disturbance to marine predators in Antarctica from a range of human activities in the region;

*Aware* also that ongoing research is required to further improve the state of knowledge of the status and trends of Antarctic marine predator populations and their distribution at sea;

**Recommend** that their Governments:

1. welcome and acknowledge the RAATD project publication on identified Areas of Ecological Significance in the Antarctic marine environment, which are used by multiple predator species;

2. bring the report to the attention of the Secretariats of the Convention for the Conservation of Antarctic Marine Living Resources and the Agreement on the Conservation of Albatrosses and Petrels for their consideration;

3. take account of the identified Areas of Ecological Significance in the planning and conduct of their activities in Antarctica, including in the preparation of environmental impact assessments and in the development of new ASPAs with a marine component, or to review already agreed management plans of ASPAs/ASMAs;

4. consider how these Areas of Ecological Significance could serve as a basis to complement Antarctic marine spatial protection and management; and

5. continue to undertake appropriate on-land and at-sea monitoring of predator populations to inform future management actions that may be required.