

Micro-Plastic in Antarctica

Session 6 : Circular Economy,
Future Global Environment and S&T Response
Jeju Plus Intl Environment Forum 2023

Dongmin JIN

Overwintering Leader, Antarctic King Sejong Research Station

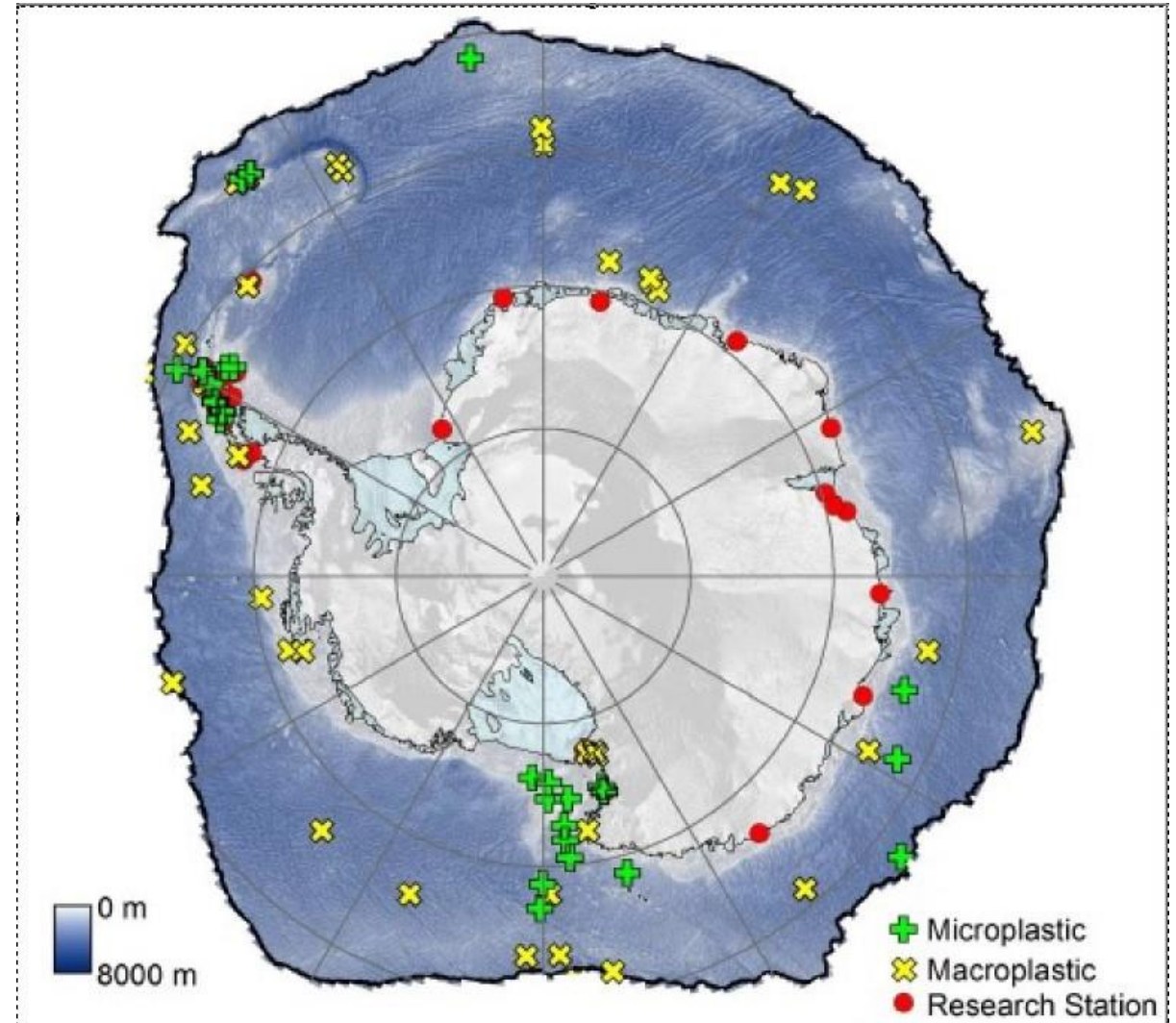
2023. 09. 08

Micro and Macro Plastic in Antarctica

Remote wilderness
Natural Reservoir for
Science

Micro and Macro Plastic
in Surface waters, on
beaches and in Sediments
south of Polar Front:
Antarctic Environments
Portal

<https://environments.aq>



29 states 82 stations(year round 41, seasonal 41)

Plastics in sea surface waters around the AP (2019)

Lacerda, Nature

Stranded pellets in Fildes Peninsula, King George Is. (2022)

Lozoya, Science of the Total Environment

First evidence of MP in the Antarctic snow(2022)

Aves, The Cryosphere

www.nature.com/scientificreports

SCIENTIFIC REPORTS

OPEN **Plastics in sea surface waters around the Antarctic Peninsula**

Ana L. d. F. Lacerda^{1,2}, Lucas dos S. Rodrigues³, Erik van Sebille⁴, Fábio L. Rodrigues⁵, Lourenço Ribeiro^{6,7}, Eduardo R. Secchi⁸, Felipe Kesder⁹ & Maira C. Proietti²

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Accepted: 4 February 2019
Published online: 08 March 2019

Although marine plastic pollution has been the focus of several studies, there are still many gaps in our understanding of the concentrations, characteristics and impacts of plastics in the oceans. This study aimed to quantify and characterize plastic debris in oceanic surface waters of the Antarctic Peninsula. Sampling was done through surface trawls and mean debris concentration was estimated at 1.794



Contents lists available at ScienceDirect

Science of the Total Environment

journal homepage: www.elsevier.com/locate/scitotenv



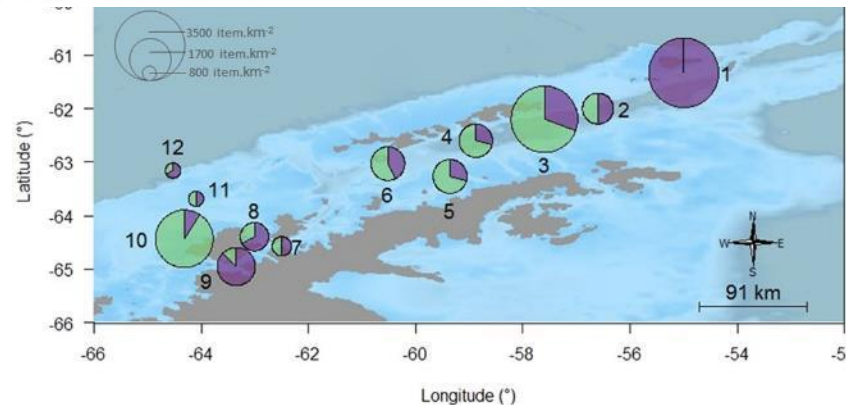
Stranded pellets in Fildes Peninsula (King George Island, Antarctica): New evidence of Southern Ocean connectivity

J.P. Lozoya^{a,*}, M. Rodríguez^b, G. Azcune^b, G. Lacerot^a, A. Pérez-Parada^b, J. Lenzi^c, F. Rossi^a, F. Teixeira de Mello^a

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<https://doi.org/10.5194/tc-16-2127-2022>
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First evidence of microplastics in Antarctic snow

Alex R. Aves^{1,2}, Laura E. Revell¹, Sally Gaw¹, Helena Ruffell¹, Alex Schuddeboom¹, Ngairé E. Wotherspoon¹, Michelle LaRue², and Adrian J. McDonald^{1,2}

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Revised: 19 April 2022 – Accepted: 6 May 2022 – Published: 7 June 2022

Sources of Plastic/Microplastics and its Effects

- **Direct Sources**

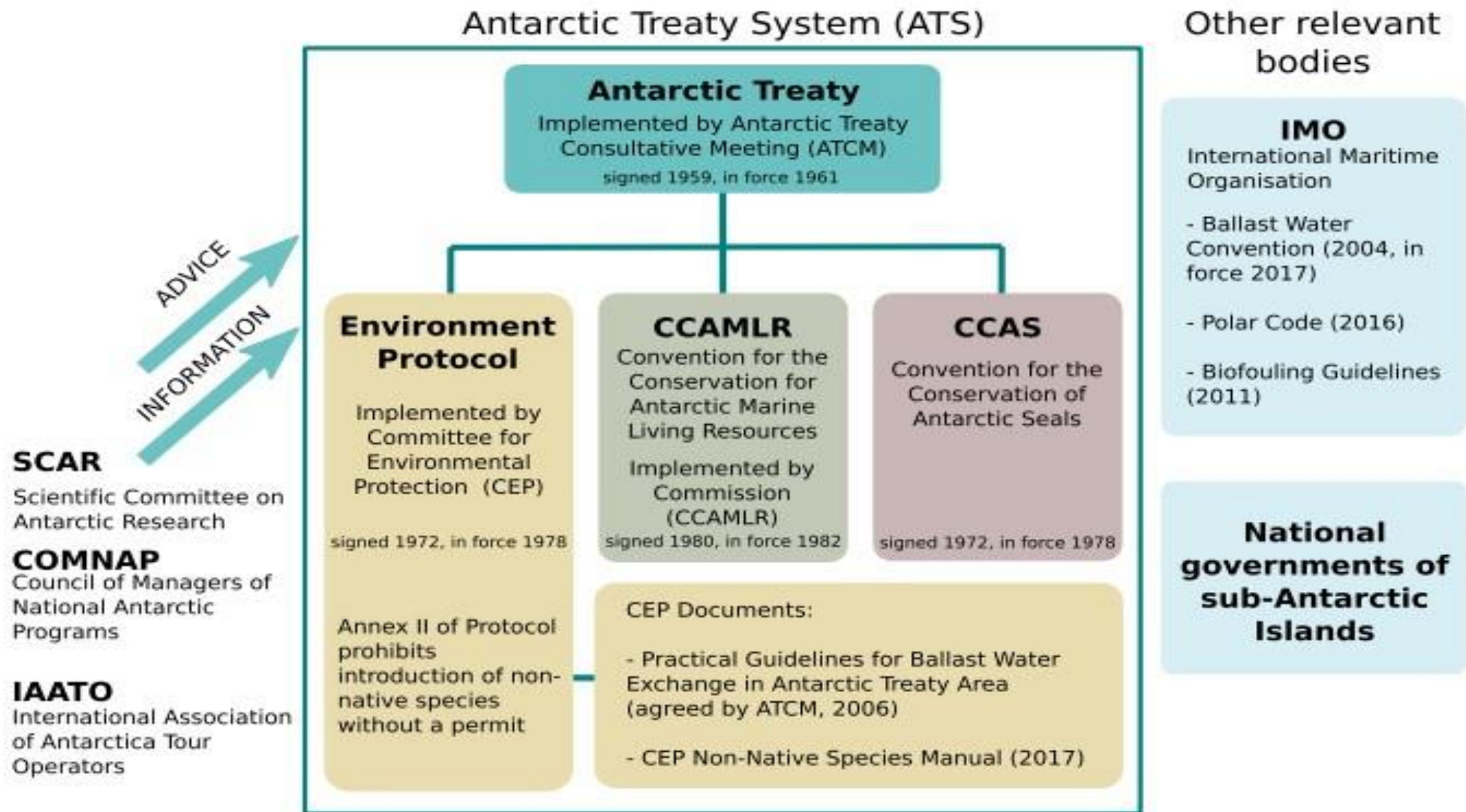
- Fisheries
- Tourism
- Research Activities

- **Indirect Sources**

- Transport by Ocean Currents from Low Latitudes

- **Effects**

- Marine Ecosystems : ingestion or entanglement with trash
- Food Chain
- Krill may change micro to nano



Antarctica: The final frontier for marine biological invasions, Arlie McCarthy

Measures of International Organizations(1)

- **2019 ATCM (42nd, Prague)**
 - **Resolution 5, Reducing Plastic Pollution in Antarctica and SO**
- **CCAMLR General Environmental Protection measure During Fishing in 2006 (CM 26-01)**
 - **prohibit disposal of plastics from fishing vessels in AT Area**
- **SCAR Polar Plastics Action Group (PLASTIC-AG) in 2018**
 - **analyze and quantify the distribution, sources, destination and biological effects of plastics**
 - **propose solutions to reduce the impact of the polar ecosystem**

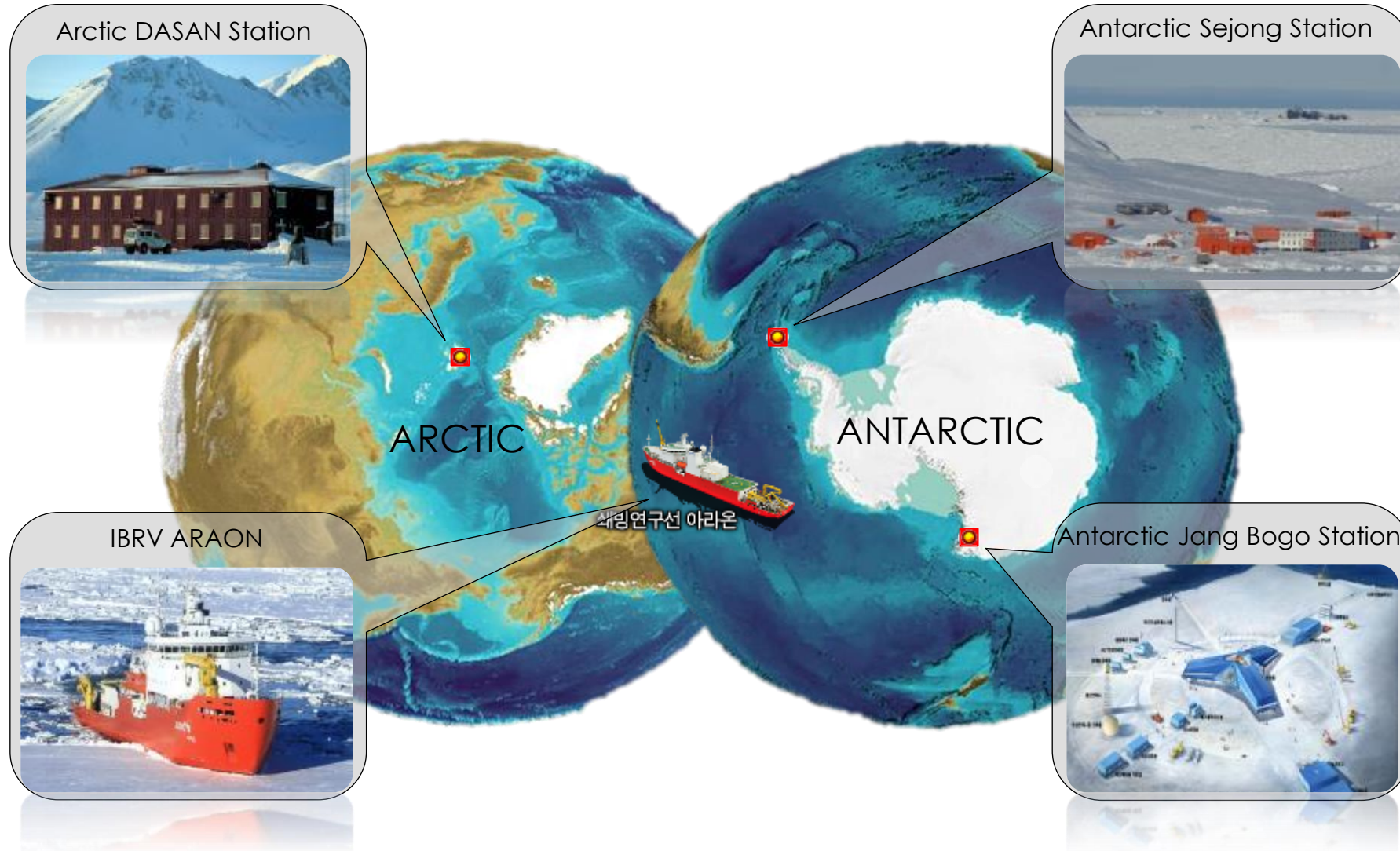


Measures of International Organizations(2)

- **COMNAP Recommendation to NAP (2019)**
 - support the research of MP and cooperate with suppliers to reduce the use of plastics
- **New visitor guidelines on reducing waste (2019)**
 - to avoid using disposable cups, straws and other items when travelling to Antarctica
 - to avoid using skincare products and cosmetics containing plastic microbeads, and clothing made of synthetic fibers



Korean Polar Research Infrastructure



Korean Activities to reduce plastics in the Antarctica

- Active Engagement in the international organizations**
- Importance of seasonal sea ice in the western Arctic ocean to the Arctic and global microplastic budgets in Journal of Hazardous Materials, 2021**
- Pilot study to monitor the microplastic in the Marian cove, KGI in 2021**
- Project, Monitoring microplastic in Korean King Sejong Station in 2023**
- Install the filter to the washing machines**
- Prohibit using personal care products containing microbeads, etc**

- **Monitoring microplastics in King Sejong Station**

- Year round data collection from melted and waste water, surface water in the pier, soil, sediment in the shore, snow, and atmosphere



THANK YOU

