Blue Economy

Final Review Meeting

INIDEP and CONAE activities

Dr. Mara Braverman
Dr. Rosana Di Mauro
Dr. Guillermina Ruiz

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INIDEP SOSTENIBLE Initiative
Environmental and Social Management

Mission

"To develop an action plan that attends to an institutional policy focused on people and on the sustainable development of ecosystems"

- **Environment**
- **Social**
- **Comunication/education**

VIDEP SOSTENIBLE Initiative

FIRST recycling actions

Internal campaign to separate our trash
PAPER – PLASTIC
BATTERIES – METALS/GLASS

All materials for disposal from the laboratories, ships, offices.

- **Environment**
- Social
- Comunication/education

Coordination social actions

Recycling our garbage

Coordination with a **Citizen Recycling Organization (RUM)** to take and recycle our garbage.

Circular economy

Others needs the materials we through away

- **Environment**
- **Social**
- Comunication/education

Environmental and social actions

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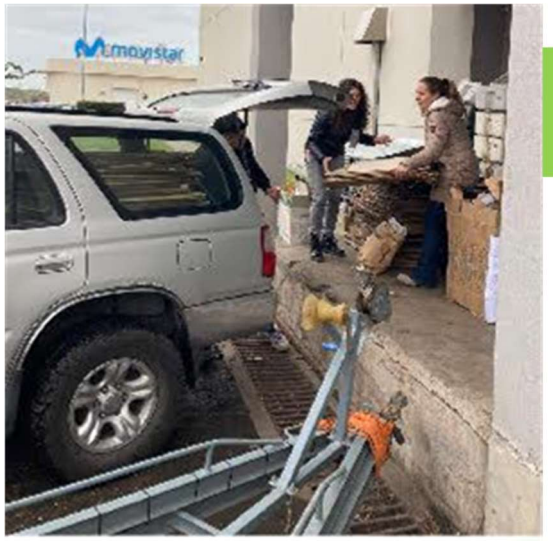
Others needs the materials we through away

Circular economy



Culture education for INIDEP workers

Advices to improve the awareness in our daily actions

- **Environment**
- **Social**
- **Comunication/education**

To use both sides of a paper-sheet

Culture education for INIDEP workers

Advices to improve the awareness in our daily actions

To use take the stairs instead of the elevator

To re-used paper sheets, the other side

- **Environment**
- **Social**
- **Comunication/education**

Culture education for INIDEP workers

Advices to improve the awareness in our daily actions

How to build an **eco-bottle?**

What to do with **one-use plastic?**

CONAE contributions to INIDEP Activities

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CONAE

Library of Spectral Signatures - spectroradiometer surveys

Microplastics - Pilot measurements

Ocean color - Chlorophyll, Sediments, Organic matter

Coastal and marine water characterization
through oceanographic surveys and/or coastal measurements for ***SABIAMar Mission*** (Ocean Color Mission for 2024)

Oil Spill detection/monitoring - complement with SAOCOM data (SAR L band)

Monitoring of algae blooms - Modis, VIIRS, Sentinel 2, Landsat 8/9, Spot 6/7
development of new indexes for algae groups

Monitoring/detection of vessels jigger fleet (squid,.*Illex argentinus*)

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HARMFUL ALGAL BLOOM STUDIES AT INIDEP

Marine Chemistry and Red Tide Program

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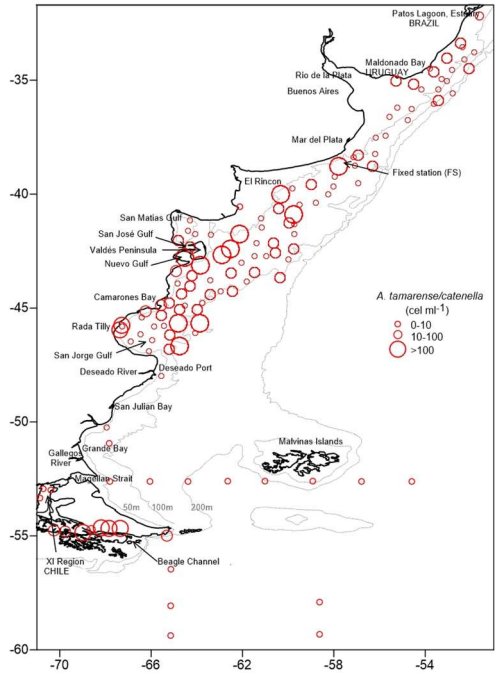
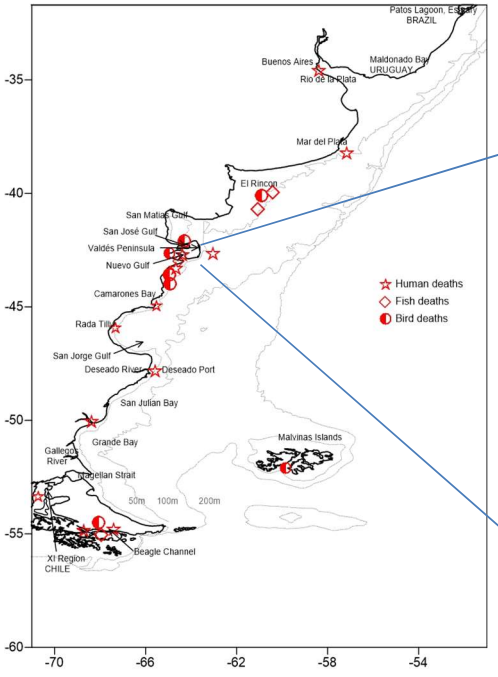
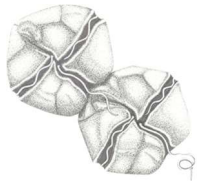
Alexandrium catenella /tamarense complex dinoflagellate produces lethal paralytic shellfish toxins.





1980: first human intoxication and death



2022: southern right whale mortality

We characterized the biological succesion from diatoms to dinoflagellates of Bloom using an index based on Rrs variability among groups (BI index, Shang et al. 2014).

Journal of Marine Systems 178 (2018) 15–28

Contents lists available at ScienceDirect

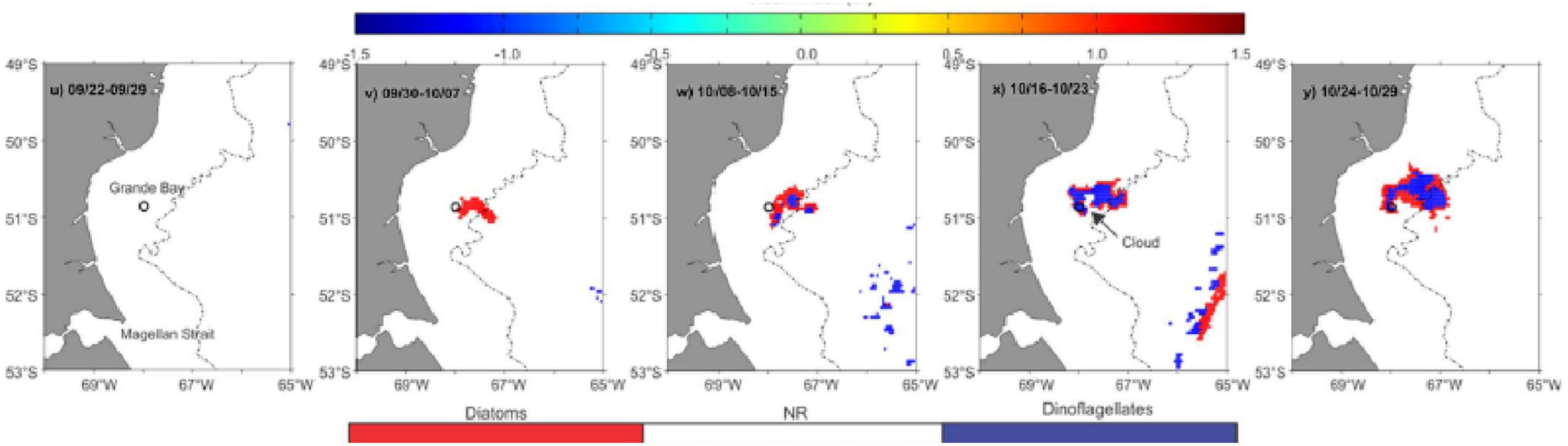
Journal of Marine Systems

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

Mycosporine-like amino acids and xanthophyll-cycle pigments favour a massive spring bloom development of the dinoflagellate *Prorocentrum minimum* in Grande Bay (Argentina), an ozone hole affected area

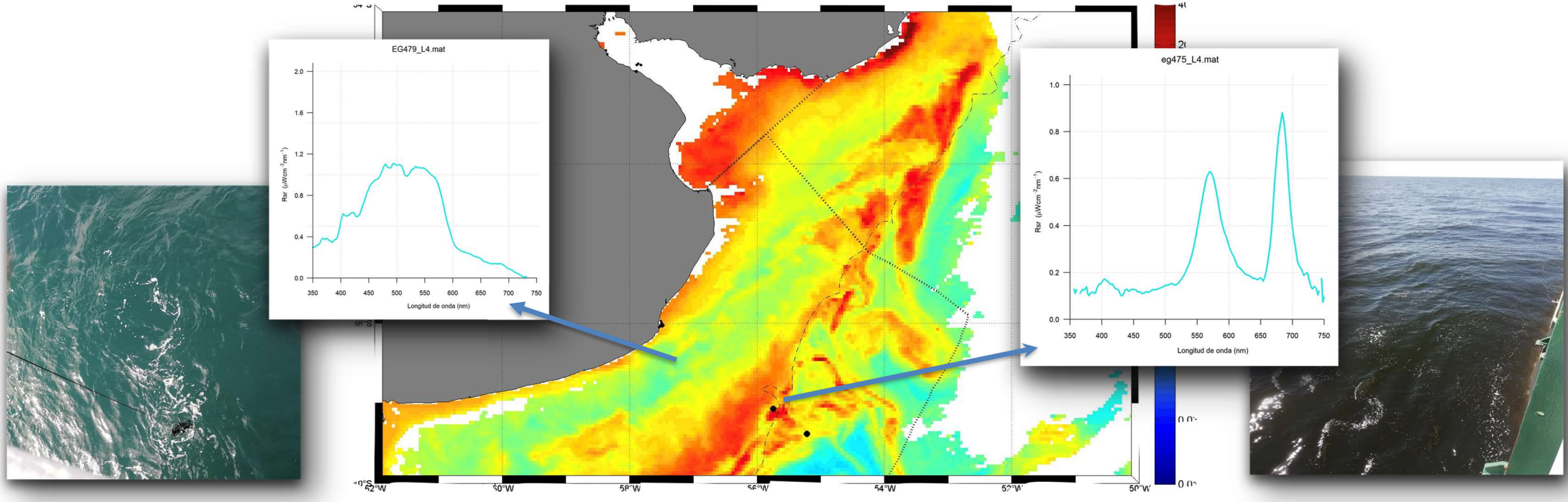
José I. Carreto*, Mario O. Carignan, Nora G. Montoya, Ezequiel Cozzolino, Rut Akselman

Instituto Nacional de Investigación y Desarrollo Pesquero (INIDEP), V. Ocampo 1, B7602HSA Mar del Plata, Argentina



2022

In situ remote sensing reflectance signals of phytoplankton blooms are being retrieved on board INIDEP vessels.



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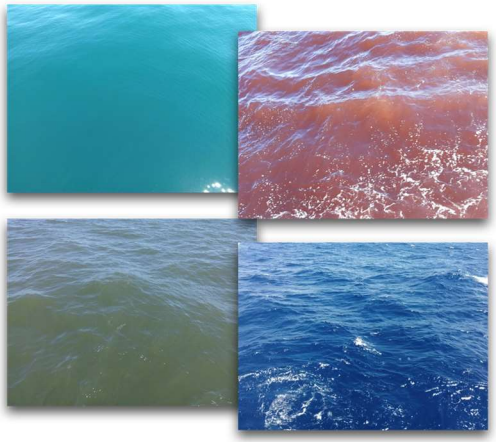
Biogeography can be studied by remote sensing, but the toxic potential of a bloom can only be determined from *in situ* samples.



Non toxic bloom of the peridinine containign dinoflagellate *Gimnodinium sp*.

The “Red tide fishing project” is aimed at studying the biogeography of HABs from samples obtained on board fishing vessels.

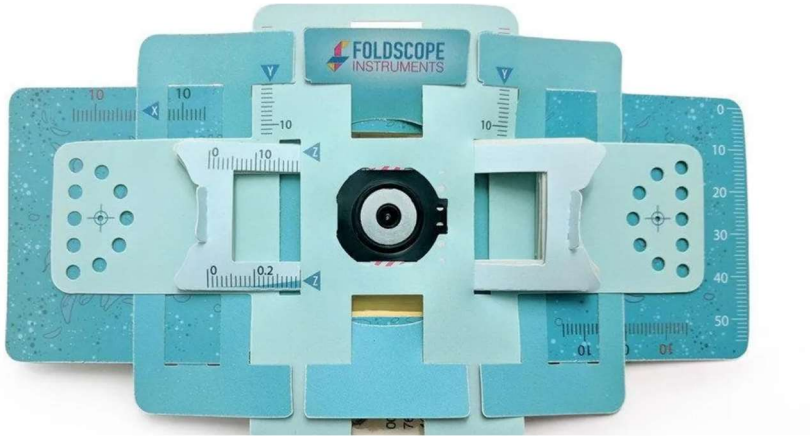
- ✓ Training of captains and fishing staff
- ✓ Logistic instruction for sample preservation
- ✓ Sample recovery and observations
- ✓ Taxonomic identification and toxic potential
- ✓ Characterization of HABs using remote sensing

The “Red tide fishing project” has started with training activities

Training of future captains at National School of Fisheries

Work agreement with the Association of Artisanal Fishermen of Puerto Madryn

The “Red tide fishing project” will deliver foldscopes instruments to local fishermen to help detecting dinoflagellate blooms.



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Future perspectives: to generate *in situ* observations with validated remote sensing products (e.g. “dinoflagellate images”) at least for shelfish extraction areas.

PLASTICS AND MICROPLASTICS

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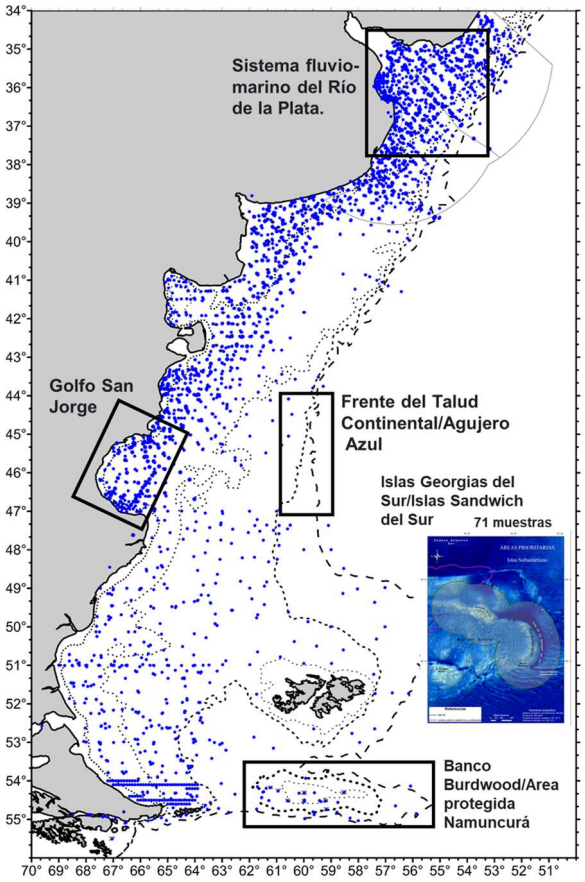
Plastics and microplastics in the Southwestern Atlantic ocean



This is the sampling power that our fisheries research institution has. This picture shows the historical sampling with plankton nets since 1991 to 2021.

We use this capacity to study plastics and microplastics using Niskin bottles, plankton nets, underway filtration systems, and fishing trawls. Basically, everything that is done in the fisheries assessment programs

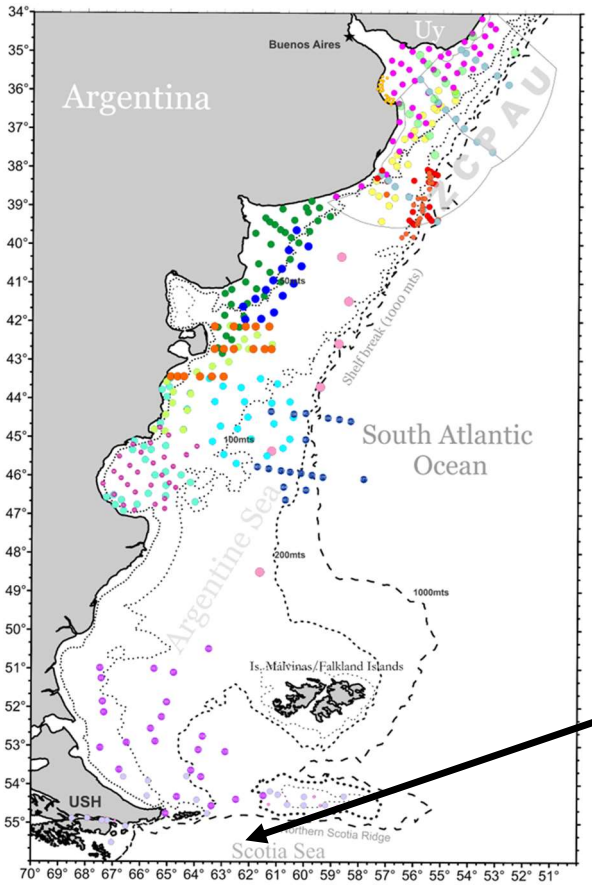
Fibers

Fragments

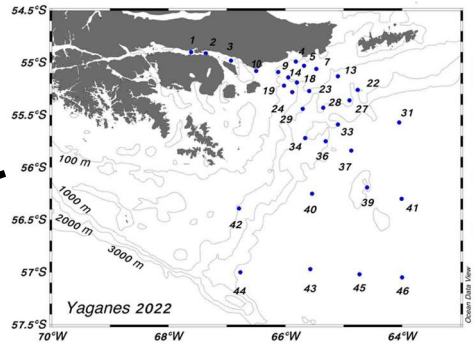
Biofilms

Macroplastics

Plastics and microplastics in the Southwestern Atlantic ocean



This is the microplastics sampling with Niskin bottles until from April 2018 until November 2022. In general, every Niskin bottle is linked to a plankton net, and to a fishing trawl. Also, we try to use the underway system when possible. This sampling design facilitates the interaction with fisheries assessment programs.



Our perspective:

Monitoring marine plastic pollution through remote sensing …

Challenging… but

Because many studies show that most of the plastic in the ocean is actually under the surface

Although everything might float at the beginning, we don't know for how long plastic remains on the surface

In can be a useful tool to locate macroplastics "hot spots" in the oceans

Assess about the source.

Plastics and microplastics in the Southwestern Atlantic ocean

Environmental Pollution 306 (2022) 119364

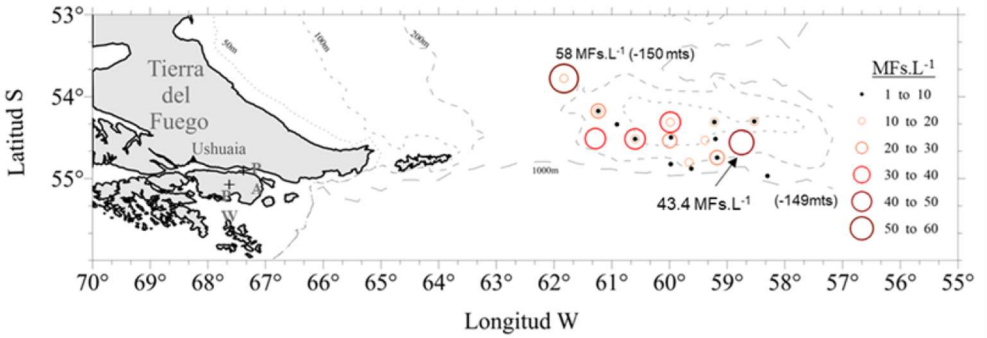
Contents lists available at ScienceDirect

Environmental Pollution

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

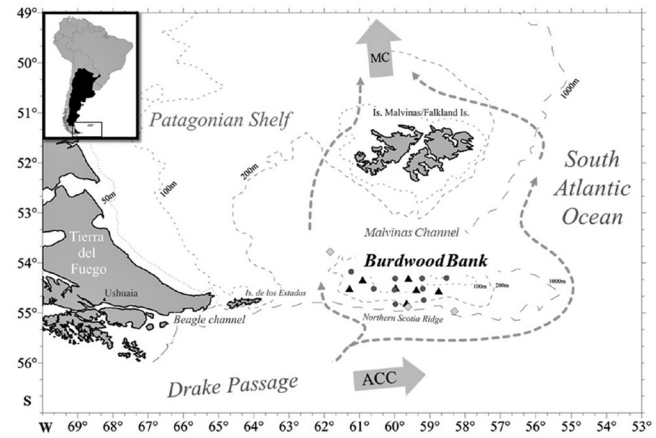
Anthropogenic microfibers are highly abundant at the Burdwood Bank seamount, a protected sub-Antarctic environment in the Southwestern Atlantic Ocean☆

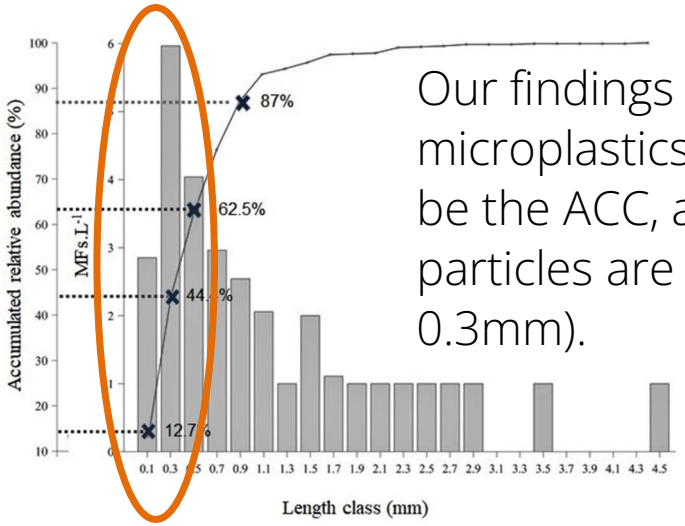
Rosana Di Mauro [a,b], Santiago Castillo [c,d], Analía Pérez [b,e], Clara M. Iachetti [f], Leonel Silva [b,g], Juan P. Tomba [b,g], Ignacio L. Chiesa [b,h,*]



Spatial distribution of microfibers concentrations in the Burdwood Bank.

We used fibers as an index of microplastics pollution.





Our findings suggest microplastics source could be the ACC, and these particles are small (< 0.3mm).

Other ideas…

Can we use it to prove that plastic is trapped within the ACC?

Environment International 136 (2020) 105494

Contents lists available at ScienceDirect

Environment International

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

Floating macro- and microplastics around the Southern Ocean: Results from the Antarctic Circumnavigation Expedition

Giuseppe Suaria[a,b,1,*], Vonica Perold[c], Jasmine R. Lee[d], Fabrice Lebouard[e,f], Stefano Aliani[a], Peter G. Ryan[c,1]

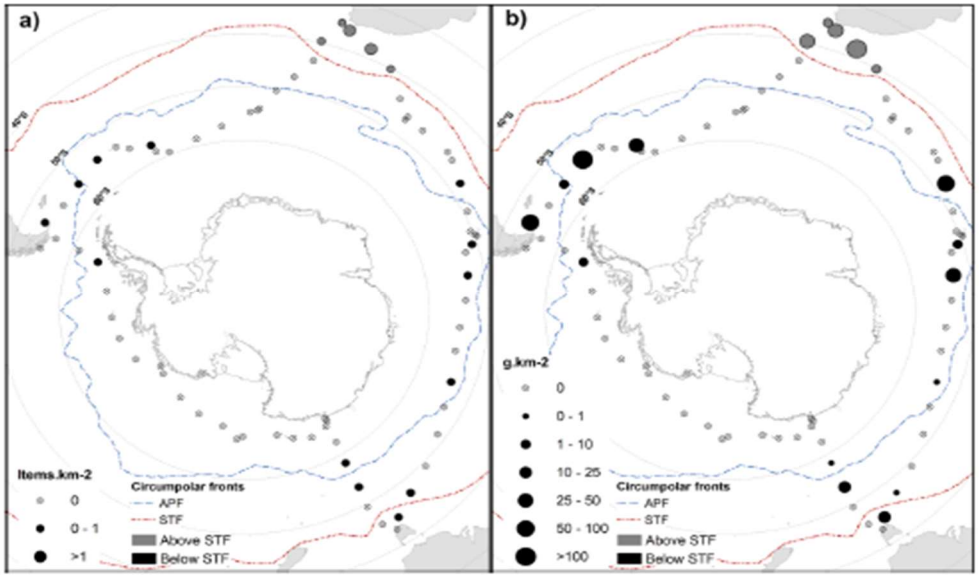


Fig. 3. The concentration of floating macroplastics sighted around the Southern Ocean expressed in (a) items·km^{-2} and (b) g·km^{-2} (n = 15,417 km of transects). The mean positions of major fronts (APF and STF) are also shown (after Orsi et al., 1995).

Plastics and microplastics in the Southwestern Atlantic ocean

Why is it important?

Contents lists available at ScienceDirect

Deep-Sea Research Part I

journal homepage: http://www.elsevier.com/locate/dsri

Zooplankton in the Southern Ocean from the continuous plankton recorder: Distributions and long-term change

Matthew H. Pinkerton [a,*], Moira Décima [a], John A. Kitchener [b], Kunio T. Takahashi [c], Karen V. Robinson [d], Robert Stewart [a], Graham W. Hosie [e]

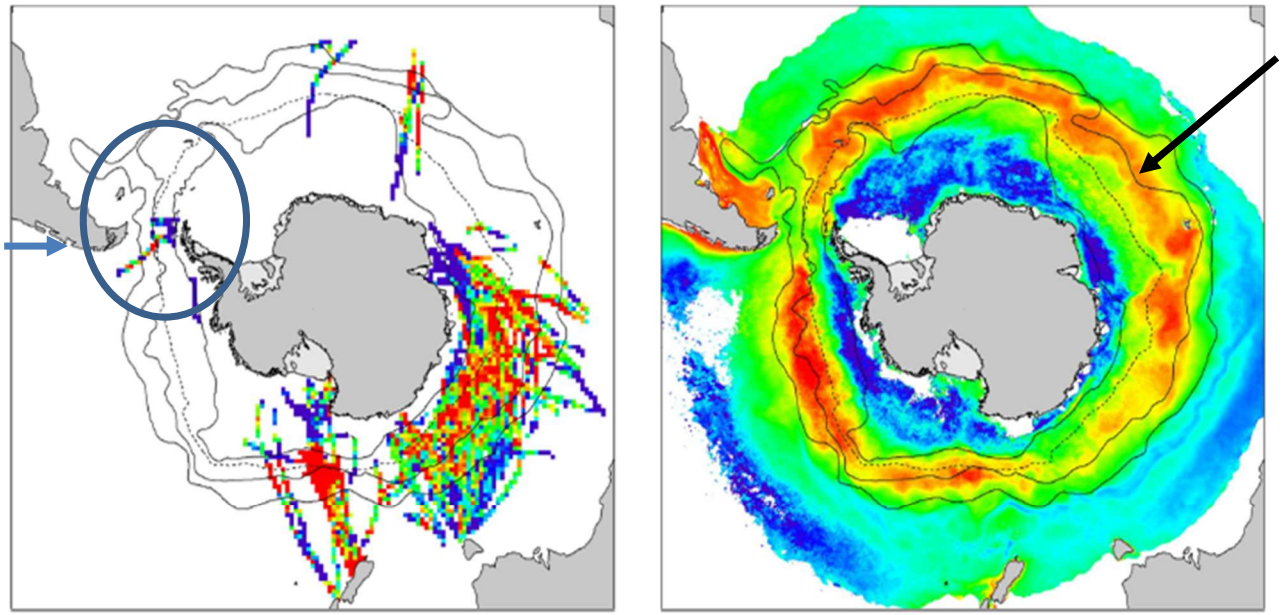


Figure 2. a: Log-averaged CPR measurements of total zooplankton abundance (counts per 5 n. mile CPR segment) in 81 km × 81 km spatial areas, using all data between October and March inclusive over the whole CPR time series (1991–2018). b: Modelled total zooplankton environmental suitability ('modelled abundance') from the *combined* BRT model, averaged for three times of day, 6 months (October to March) and years 1998–2018. Areas shown white either have no data, or no predictions were made, including because environmental conditions were outside the training data. Fronts as Fig. 1.

Southern Ocean ecosystems are globally important

Zooplankton abundance in the Southern Ocean

Krill is one of the key components of the Antarctic marine trophic web.

An experimental study shows that they can eat and break microplastics into even smaller pieces

We should focus observations on this area

Because is the area affected by anthropogenic activities all year round.

Our needs...

Human resources

Technological equipment and training for the chemical identification of particles which is fundamental step to validate satellite imaging.

Capacity building, Outreach communication and education

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