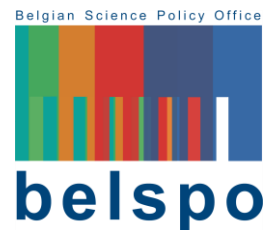


# The Antarctic Biodiversity Portal contributions to a marine virtual lab

Anton Van de Putte  
Biodiversity.aq  
RBINS  
HCMR, Crete



# Antarctic Treaty



« In order to promote international cooperation in scientific investigation in Antarctica, [...], Scientific observations and results from Antarctica shall be exchanged and made freely available. »

Our vision: Antarctic biodiversity data are open, linked, useful, interoperable and safe.



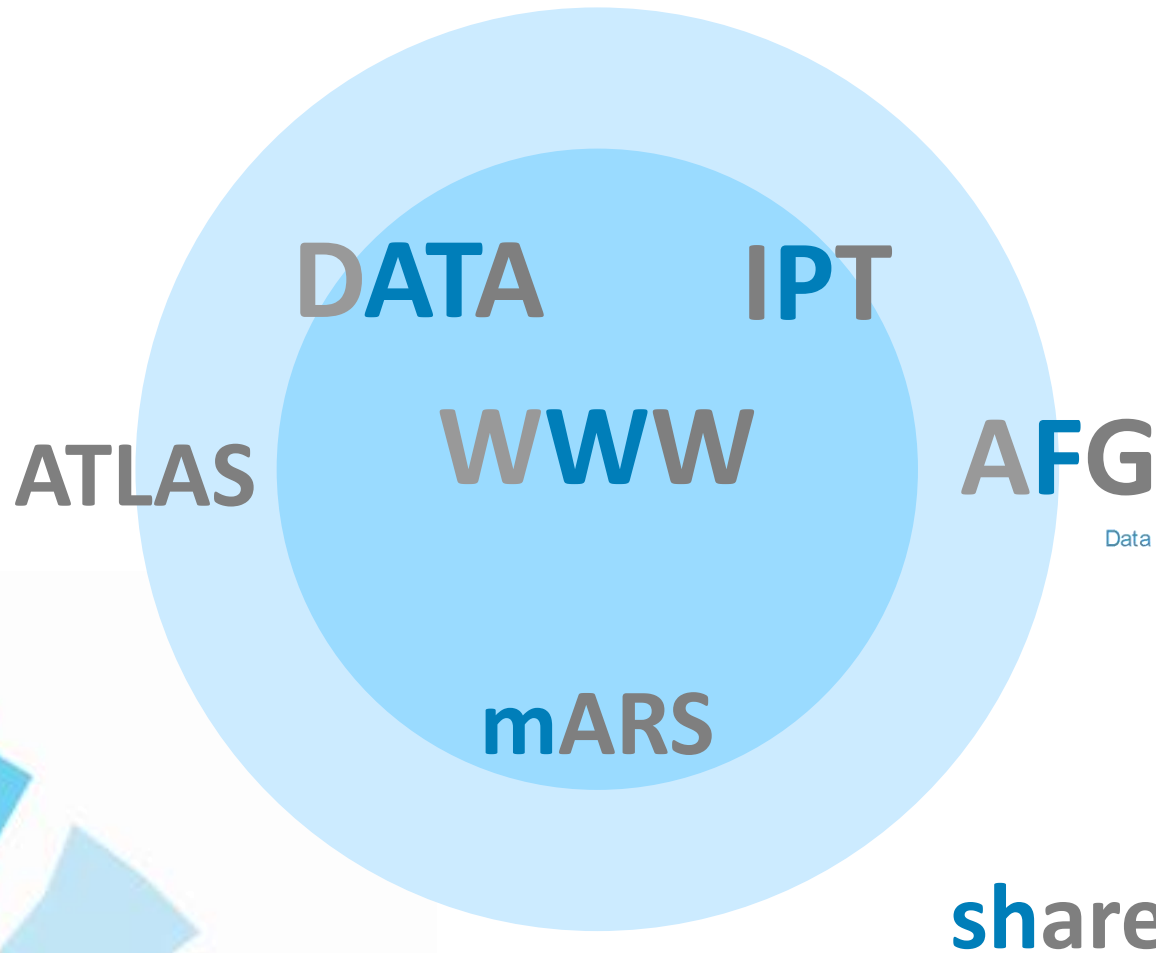
# Background



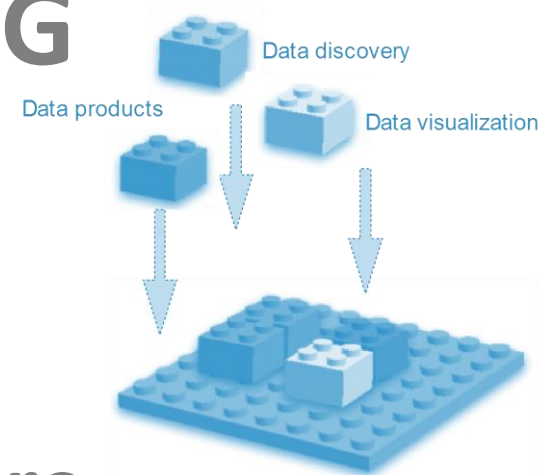
- Born during the IPY as Census of Antarctic Marine Life as the data, visualization and analysis component
- Free and open access to biodiversity data
- SCAR-MarBIN and ANTABIF projects
- Science, conservation and management
- Networked community developments



# Architectural design & developments



## MODULAR ARCHITECTURE



# WWW.BIODIVERSITY.A

# Q

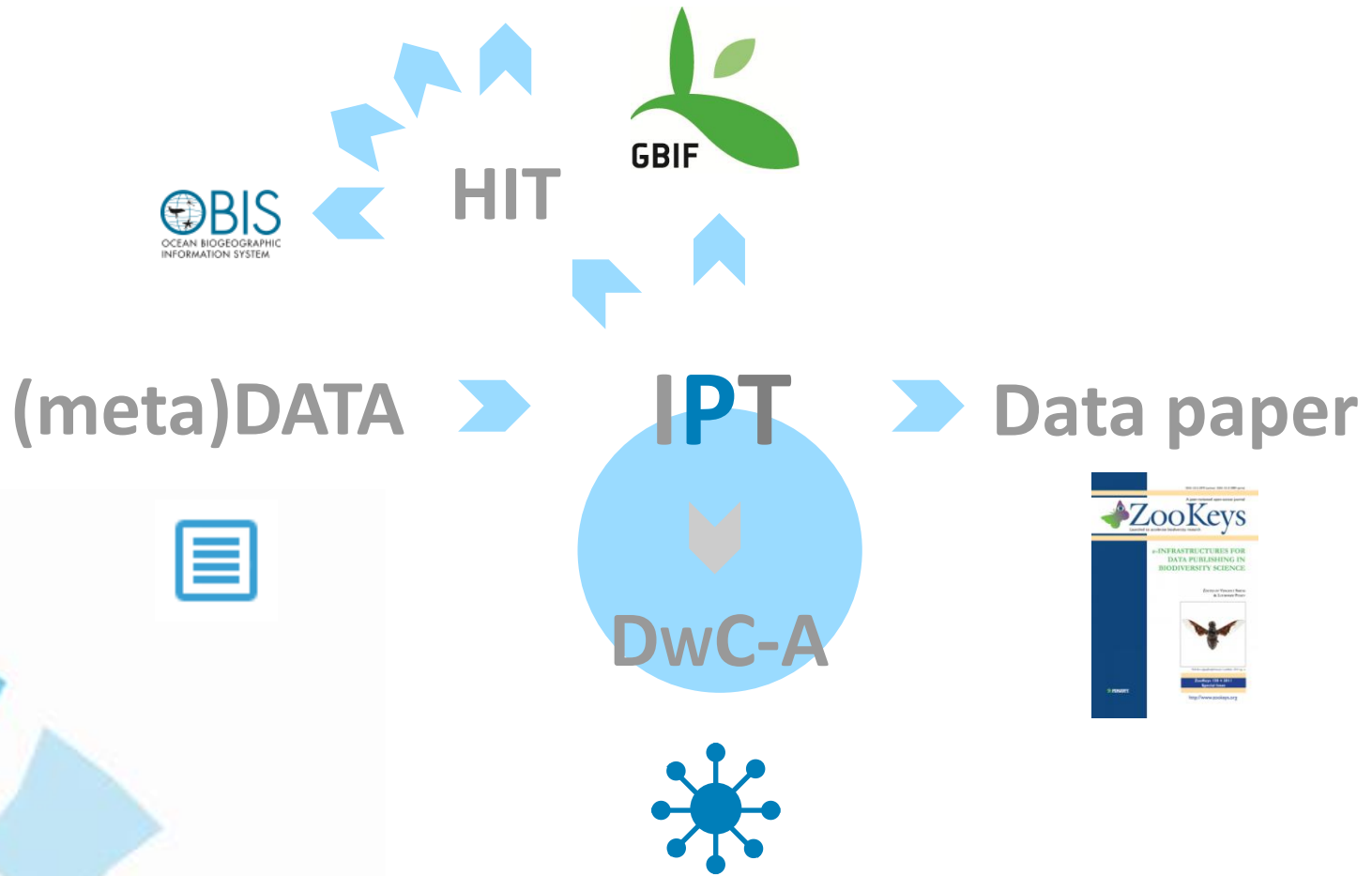


- General website
- latest news
- contact
- sponsors
- governance
- resources
- projects

A screenshot of the Biodiversity.AQ website homepage. The header is blue with the text "BIODIVERSITY.AQ" and navigation links: "WWW", "AFG", "IPT", "DATA", "ATLAS", "MARS". Below the header is the "WWW | ANTARCTIC BIODIVERSITY" logo and a navigation menu: "HOME", "NEWS", "CONTACT", "DATA", "RESOURCES", "PROJECTS", "SPONSORS". The main content area has a heading "About biodiversity.aq" followed by a paragraph: "Funded by the Belgian Science Policy Office, biodiversity.aq is building an innovative Antarctic biodiversity information system, giving access to a distributed network of contributing database, according to the principles of the Global Biodiversity Information Facility. It is building a new data discovery tool using two complementary networks and will expand these by using an advanced technical architecture, capable of linking with many potential data resources." Below this is another paragraph: "biodiversity.aq integrates SCAR-MarBIN (Scientific Committee on Antarctic Research - Marine Biodiversity Information Network), with the biodiversity databases managed by the Australian Antarctic Division, bringing together data from marine and terrestrial realms." A third paragraph states: "biodiversity.aq is the data management tool and repository for the biodiversity-related research conducted at the Princess Elisabeth Station." A fourth paragraph says: "biodiversity.aq will use the best available technology to integrate, share and disseminate all available information on Antarctic Biodiversity. Its implementation by the Belgian Biodiversity Platform ascertains that biodiversity.aq can take advantage of the relevant experience of the Belgian GBIF node." The final paragraph mentions: "biodiversity.aq is steered by an International Steering Committee composed of selected experts in the field of Polar biodiversity." At the bottom of the main content area is a "CONTACT US" link. On the right side of the screenshot, there is a blue sidebar with the heading "DATA" and the URL "www.biodiversity.aq". It contains two sections: "Find data (beta)" with a download icon and the text "Use data.biodiversity to search for data", and "Publish data" with an upload icon and the text "Use ipt.biodiversity.aq to publish your data".

## History

# IPT.BIODIVERSITY.AQ



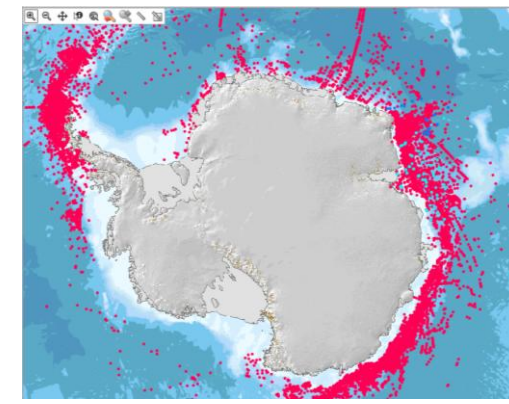
# DATA.BIODIVERSITY.AQ



OCCURRENCE (INTERNAL WEB SERVICE)

HIT

DATA



Taxonomy

RAMS

Environmental

TAXONOMY (INTERNAL WEB SERVICE)



Encyclopedia of Life

AADC

# AFG.BIODIVERSITY.AQ



Expert Provided Content  
(text & images)

DATA



AFG



Occurrence  
Taxonomy

**Lobodon carinophaga** (Hombrøt & Jacquinot, 1842)

provided by CC-BY-NC-SA, Mark Whelan

**Description**  
Crabeater seals have a circumpolar distribution, and are largely restricted to Antarctic pack-ice which makes them difficult to access for scientific study. Adults are 2.0-2.8 m in length, with females slightly larger than males. Males can vary considerably throughout the year, but are typically in the range of 1.50-2.50 kg.

**Distinguishing Characters**  
The key distinguishing characteristics of crabeater seals is their relatively uniform colour, as they lack the prominent dorsal and ventral stripes characteristic of most other seals. They are generally smaller, more slender, and colour than other seal species which may also be found in the pack-ice. They have a blunt, square shaped snout in comparison to other seals, and very distinct mottled patches.

[Add to your guide](#)

2023 times added

**Species details**

Colour is also variable with old, pre-molt coats being a tawny white and post-molt coats light to medium brown. The snout is often black with darker brown, and tend to be darker on the dorsal surface. They are commonly heavily scarred from encounters with leopard seals, a common predator of young crabeater seals, as from other specific interactions as adults during the breeding season. Crabeater seals have highly specialised and distal (on multi-layered) and some teeth which can interlock to form a saw when their feeding on amphipods.

**Size**  
The global population size of crabeater seals and its long-term trends are unclear. This is primarily due to the extreme difficulty of conducting a circumpolar survey in the pack ice regions used by the seals. Estimates from the 1970 and 1980s put the global population at around 10 million seals, but these were revised down to 2.2 million as data improved in the 1990s. It has also been suggested the population and genetic diversity throughout the 20th century as a consequence of increased ice availability during 1960s from the decline in whale numbers. Despite some demographic data supporting this idea, there are no systematic survey data from before adding to test the hypothesis. ICAZ coordinated an international pack ice seal survey in 1999-2001 which estimated the population of eastern Antarctica (20-110°E) one quarter of the southern-ice quadrant to be 314,200 using 398 confidence levels, 188,600-1,421,000. Differences in the distribution between 60s and earlier surveys in the region, presented an overestimate of trends, and there is still no revised global estimate for population size for this species.

**Reference**  
Bunn, J.M., Costa DP, Peabody KA, Hindle MM, Bradburn CJ, Calvert M, McDonald S, Trumble S, Croxall JB (2014) Winter habitat use and foraging behavior of crabeater seals along the Western Antarctic Peninsula. Deep-Sea Research Part II 111: 2279-2303. Bunn, JM, Whelan MA, Bradburn CJ, Costa DP (2008) Fine-scale habitat selection of crabeater seals as determined by otolith analysis. Deep-Sea Research Part II 55: 100-114. Calvo N, Fraser MB, Costa DP, Southwell C (2020) Do crabeater seals 'forage cooperatively'? Deep-Sea Research Part II 191: 2403-2412. Harkness LA, Bunn JM, Guin PL, McDonald B, Croxall JB, Costa DP (2022) Use of a sentinel in a changing environment: the crabeater seal along the western Antarctic Peninsula. Marine Ecology - Progress Series 653: 287-302. Lam AM, Bunn A, Blythe MM (2013) Breeding behavior and embryonic diapause in crabeater seals (Lobodon carinophaga). Reproduction 136: 183-193. Lam AM, Bunn A, Blythe MM (2011) Sex and growth of the crabeater seal Lobodon carinophaga. Mammalia 75(4): 697-704. Trumble S, Croxall JB, Southwell C (2007) Optimizing the timing of visual surveys of crabeater seal abundance. Public Library of Science 2(6): 1000166. Whelan MA, Bradburn CJ, Costa DP, Peabody KA, Hindle MM, Bradburn CJ, Bunn JM, De la Haza W (2014) Taking account of seasonal species in management of the Southern Ocean seal: Trends estimating crabeater seal abundance off west Antarctica. Journal of Applied Ecology 41: 822-832. Whelan MA, Bradburn CJ, Southwell C, Calvo N, Hindle MM (2011) Crabeater seal foraging behaviour in eastern Antarctica. Marine Ecology - Progress Series 317: 261-272.

**Species distribution**

**Distribution info**  
Crabeater seals are found almost entirely in the Antarctic pack-ice, with only occasional sightings being seen in sub-Antarctic islands north of the pack-ice front, or even more rarely on the coasts of Australia, New Zealand, Africa and South America. Within the pack-ice, their distribution centres to its largely date north by that of the primary prey, Antarctic krill. Feeding studies have shown that in the West Antarctic Peninsula they occur on the continental shelf, while in Eastern Antarctica highest densities are associated with the continental shelf break or the marginal ice zone.

**Depth:**  
Crabeater seals typically dive deeper during the day than at night as they follow the

**Photos**

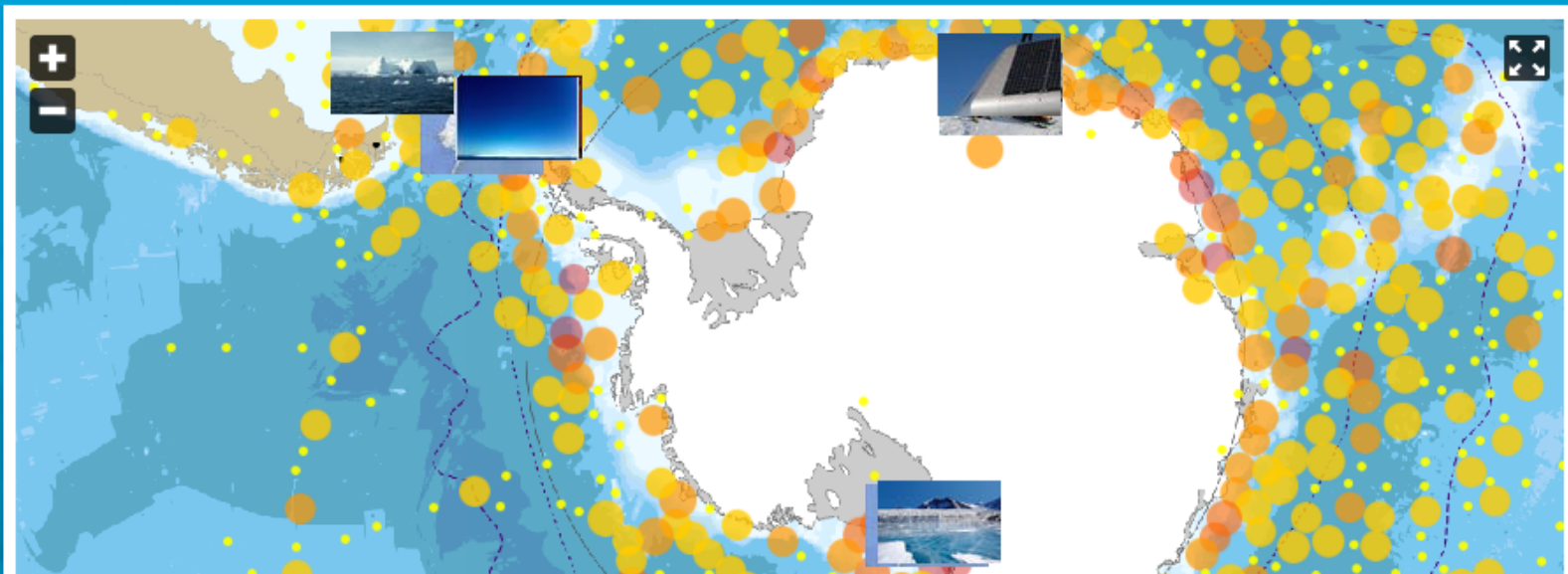
**Occurrences map**





## 11 places available for your Guide

Do you have any recommendation? [Send it to us](#)

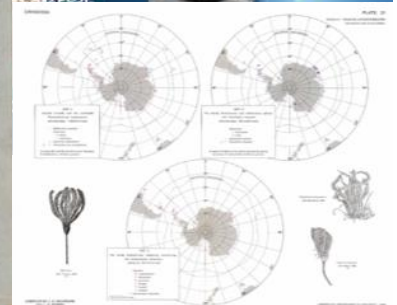
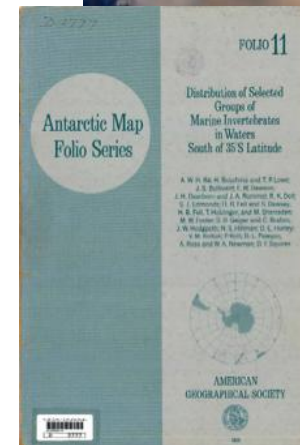
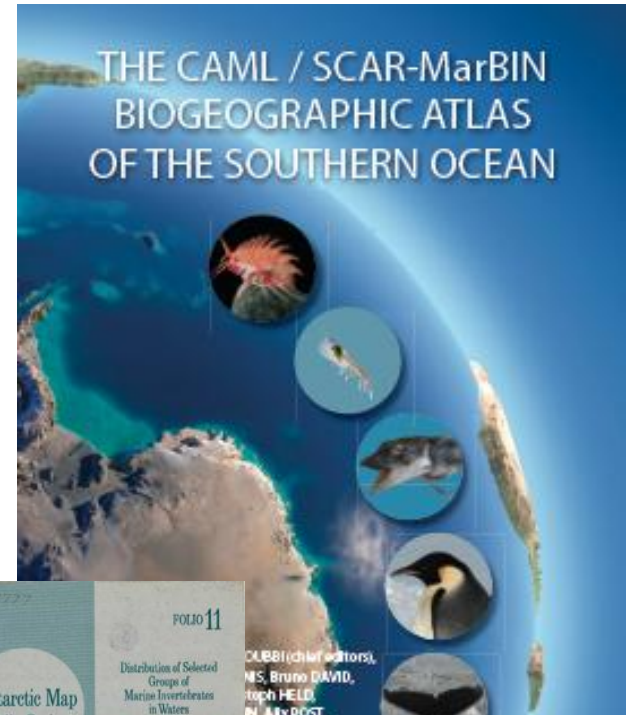


# ATLAS.BIODIVERSITY.A

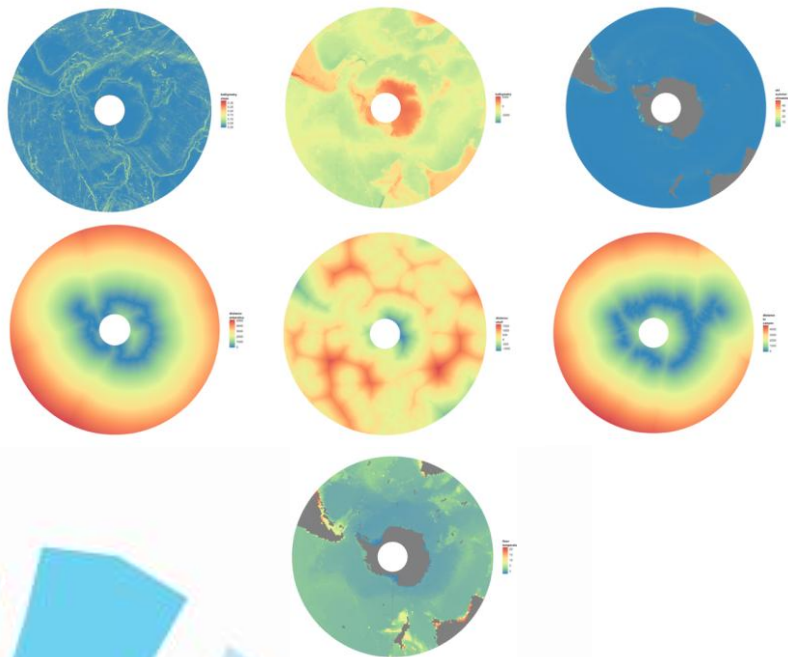


## Q

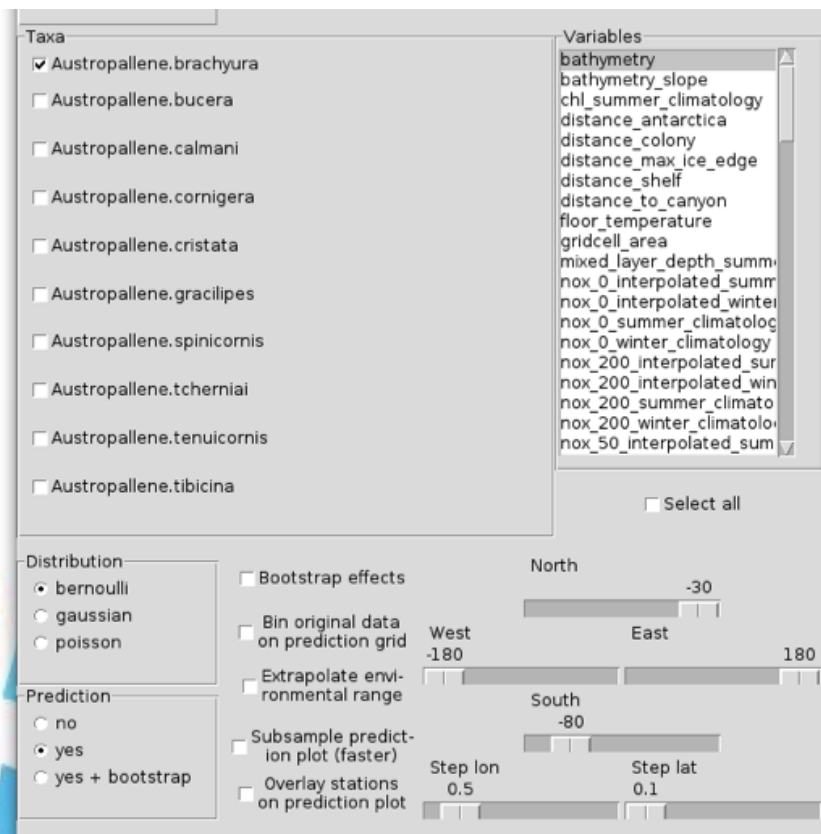
- Biogeographic Atlas of the Southern Ocean
- Editors: De Broyer & Koubbi
- Redo of Hedgepeth 1969 Folio
- Predictive approach
- Static and dynamic versions
- Modelization loops are



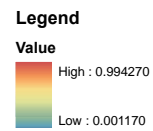
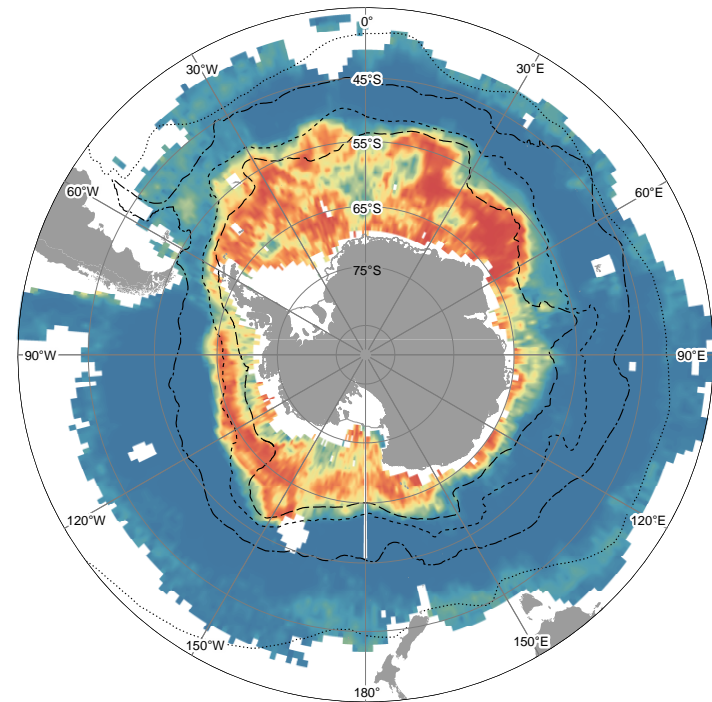
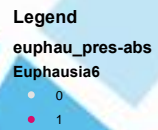
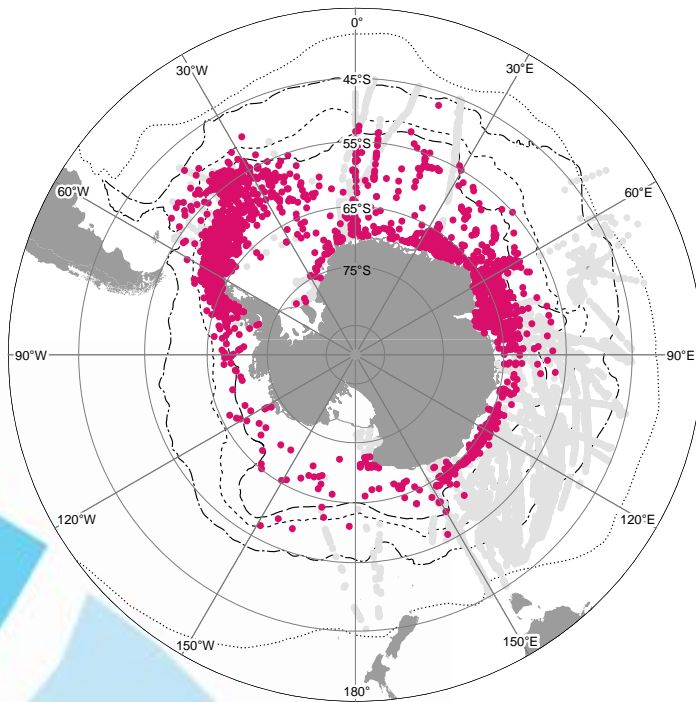
# Environmental layers



- Slope
- Bathymetry
- Chlorophyll
- Distance to the continent
- Distance to bird colonies
- Distance to ice
- Distance to shelf
- Distance to canyon
- Floor temperature
- ...
- +
- ANTABIF Occurrence records



- R-functions GUI for BRT and GDM
- <https://github.com/jiho/atlasr>

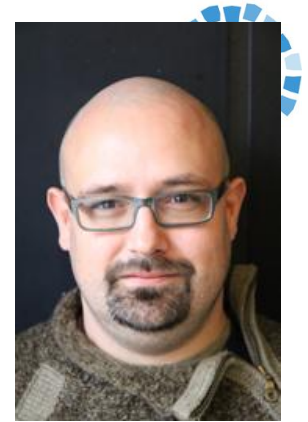


# Continued efforts



- Application of [informatics](#) techniques to [biodiversity information](#)
- Improved integration, presentation, discovery, exploration and analysis.
- Yields new ways to view and analyse existing information, as well as predictive models for information that does not yet exist.
- Allows data-intensive biodiversity research and applications (e.g. in conservation)

- **Anton Van de Putte**
- Science Officer AntaBIF
- PhD Biology
- Promotor at RBINS: CCAMBIO (Belspo) vERSO (Belspo, positive review )



**Nabil Youdjou**

Project developer for AntaBIF





## Privileged partners



ALFRED P. SLOAN  
FOUNDATION

## Partners

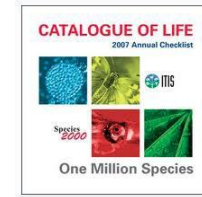


## Associate partners





Friends



# mARS.BIODIVERSITY.AQ

## Q



**BIODIVERSITY.AQ**

WWW AFG IPT DATA ATLAS **MARS**

**mARS** | MICROBIAL ANTARCTIC  
RESOURCE SYSTEM



[HOME](#) [BLOG](#) [USER GROUPS](#) [WHITE PAPER](#) [TEMPLATES](#) [JOIN US](#)

## Microbial Antarctic Resource System



### THE PATH TO ANTARCTIC MICROBIAL DIVERSITY INFORMATION

mARS is envisioned as an information system dedicated to facilitate the discovery, access and analysis of molecular microbial diversity (meta)data generated by Antarctic researchers.

mARS will allow the discovery and integration of these microbial resources using the Antarctic Biodiversity Information Facility ([ANTABIE](#)) infrastructure.

By harboring this information directly at [ANTABIE](#), Antarctic scientists will have the information archived and accessible through common language queries.

## Resources

[mars.biodiversity.aq](http://mars.biodiversity.aq)



### White Paper

Provide input on our white paper



### (polar)MiMarks template

Create your own Antarctic field guides...



### mARS sequence set template

Template for sequence data

# mARS.BIODIVERSITY.AQ

Sequence set summary



# mARS white paper



- ***Step 1: Data description and discovery***
- ***Step 2: Habitat and Microbial Sequence Metadata Entry***
  - *(MiMARKS Data Standard; Microbial\_Sequence\_Set\_Template)*
- ***Step 3: Georeferenced-molecular sequence database integration***
- ***Step 4: Processing batch sequence data – Circum-Antarctic microbial diversity***