

Incheon, Marine@UGent, August 2024

Discovering the unknown blue potential: ocean research for man and planet.

Prof. Dr. Jan Mees, General Director VLIZ



Content presentation

Some words about VLIZ

The 'why' of ocean science

- The unknown sea
- Its significance for man and planet
- The major stressors

What will the future bring? A story of blue hope through collaboration...



VLIZ in Oostende, Belgium

VLIZ promotes marine knowledge creation and excellence through sound interdisciplinary research about the ocean, seas, coast and tidal estuaries.

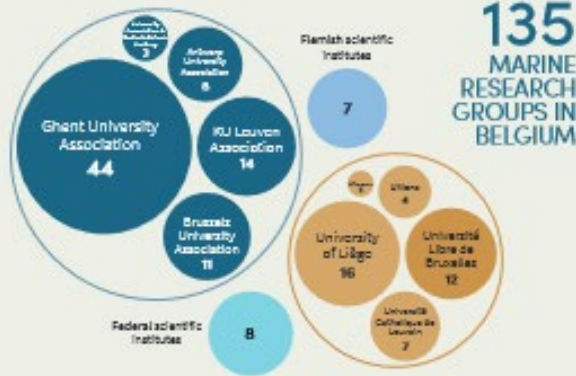
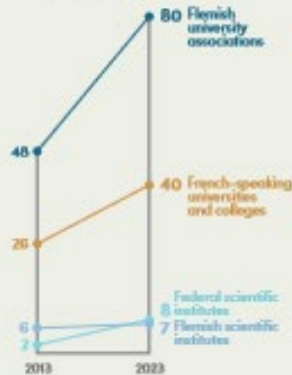
In close collaboration with other research groups, citizens, policy makers and industrial partners in Flanders, Belgium, and through international collaboration.



2023 MARINE RESEARCH AND INNOVATION

As the importance of seas and the ocean in sustainably addressing major societal challenges is growing, a similar boost in our marine knowledge and innovation capacity is urgently needed. The Belgian marine research landscape lives up to this challenge with a growing and multidisciplinary community, operating within a dynamic and par excellence international context.

CAPACITY

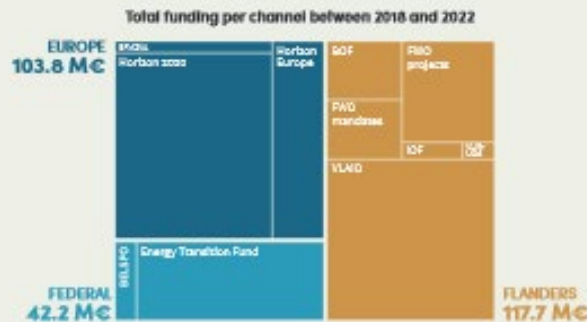
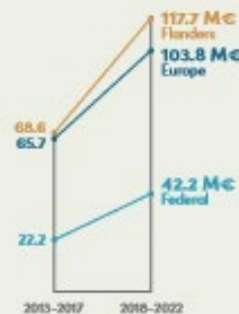


1,904 MARINE STAFF
39.6% WOMEN

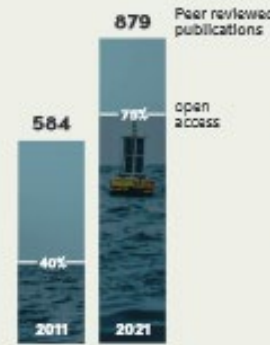
The increase in marine staff during the last decade places Belgium among the top five worldwide in terms of marine researchers per capita. For the first time, the Belgian percentage of women in marine sciences surpasses the global average, yet the representation of women in leading positions remains lower.



FINANCING



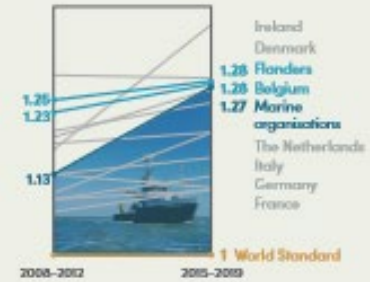
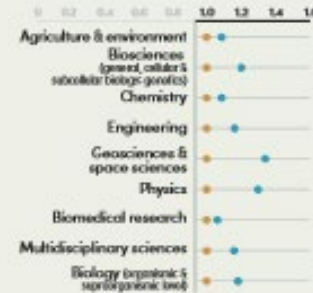
RESEARCH OUTPUT



Relative Citation Rate

The Belgian marine research community - covering various (sub)disciplines - has realized a notable surge in the citation impact over the past decade, currently ranking amongst the leading countries and holding a subtop position within Flemish research domains.

- World Standard
- Discipline



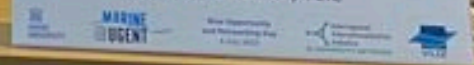


Instituut voor de Zee
Marine Institute

www.vliz.be

Mark Van de Walle
Ghent University

Prof. Jan Mees
General director, VLIZ



VLIZ as an Ocean Decade enabler and actor



2021
2030 United Nations Decade
of Ocean Science
for Sustainable Development

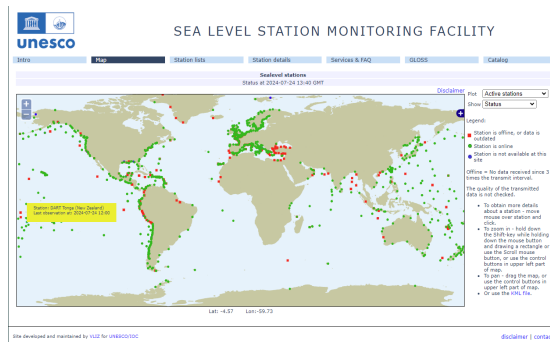


VLIZ Ocean Decade projects



Marineregions.org
a standard for georeferenced marine names

WORMS
World Register of Marine Species



INSPIRE
Innovative Solutions for
Plastic Free European Rivers



O-BIS
OCEAN BIODIVERSITY
INFORMATION SYSTEM

Sustainable Seabed Knowledge Initiative

THE NIPPON FOUNDATION-NEKTON
OCEAN CENSUS

THE NIPPON FOUNDATION
THE NIPPON FOUNDATION
For Social Innovation

THE NIPPON FOUNDATION-GEBCO
SEABED 2030

OCEAN TRACKING NETWORK

Our focus:

- Ocean data management and data sharing
- Ocean Observation
- Citizen engagement
- Innovative research for societal problems: Ocean-Climate-Biodiversity nexus

Ocean Prediction
UN DECADE COLLABORATIVE CENTRE

Ocean Data Sharing
Decade Coordination Office

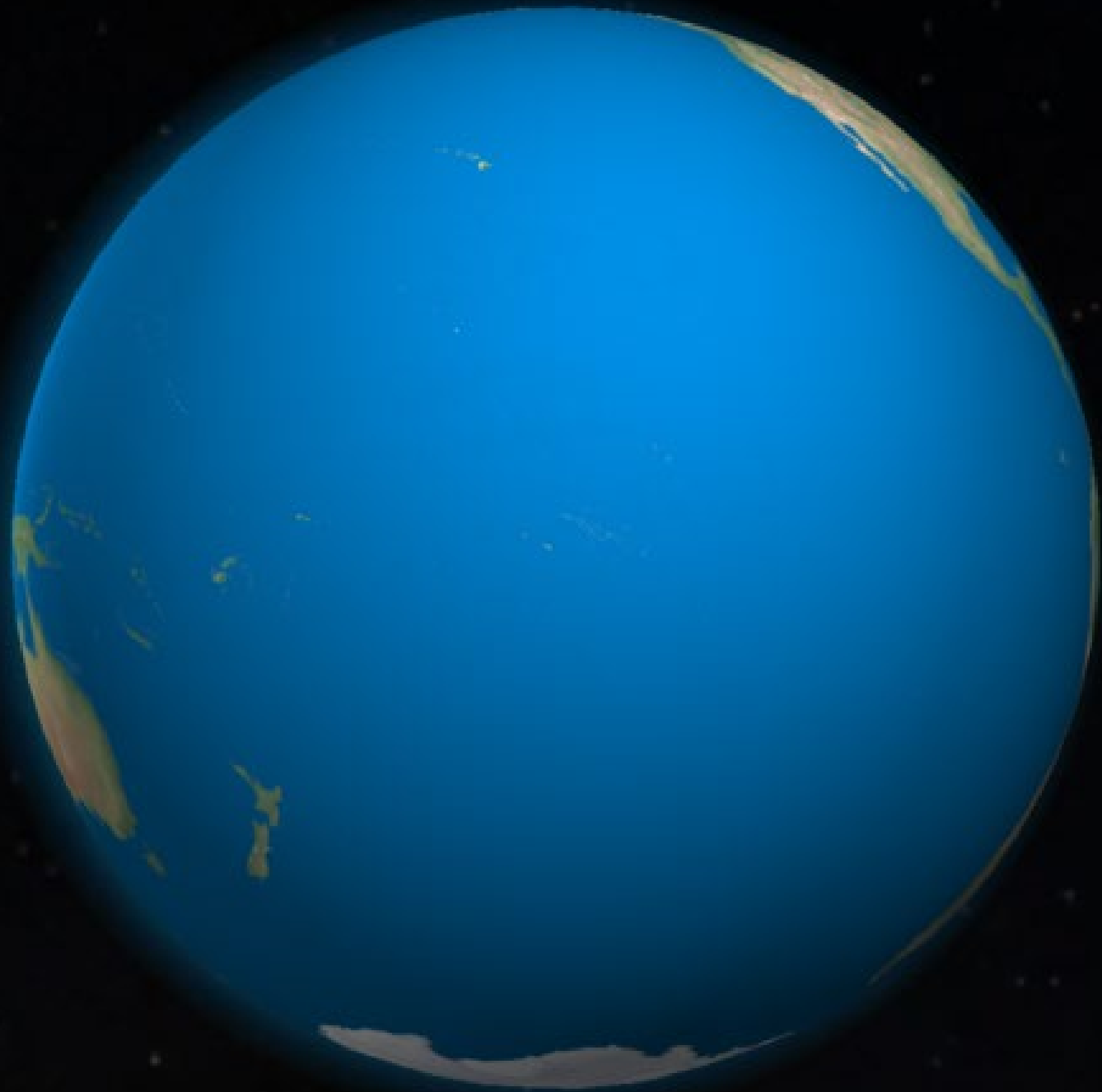
Why study the ocean?

- It is too big to ignore
- Provides many goods and services
- Huge potential for new discoveries
- System under pressure: it is not too big to fail; it is not too big to fix
- Timely: the blue acceleration is in full swing

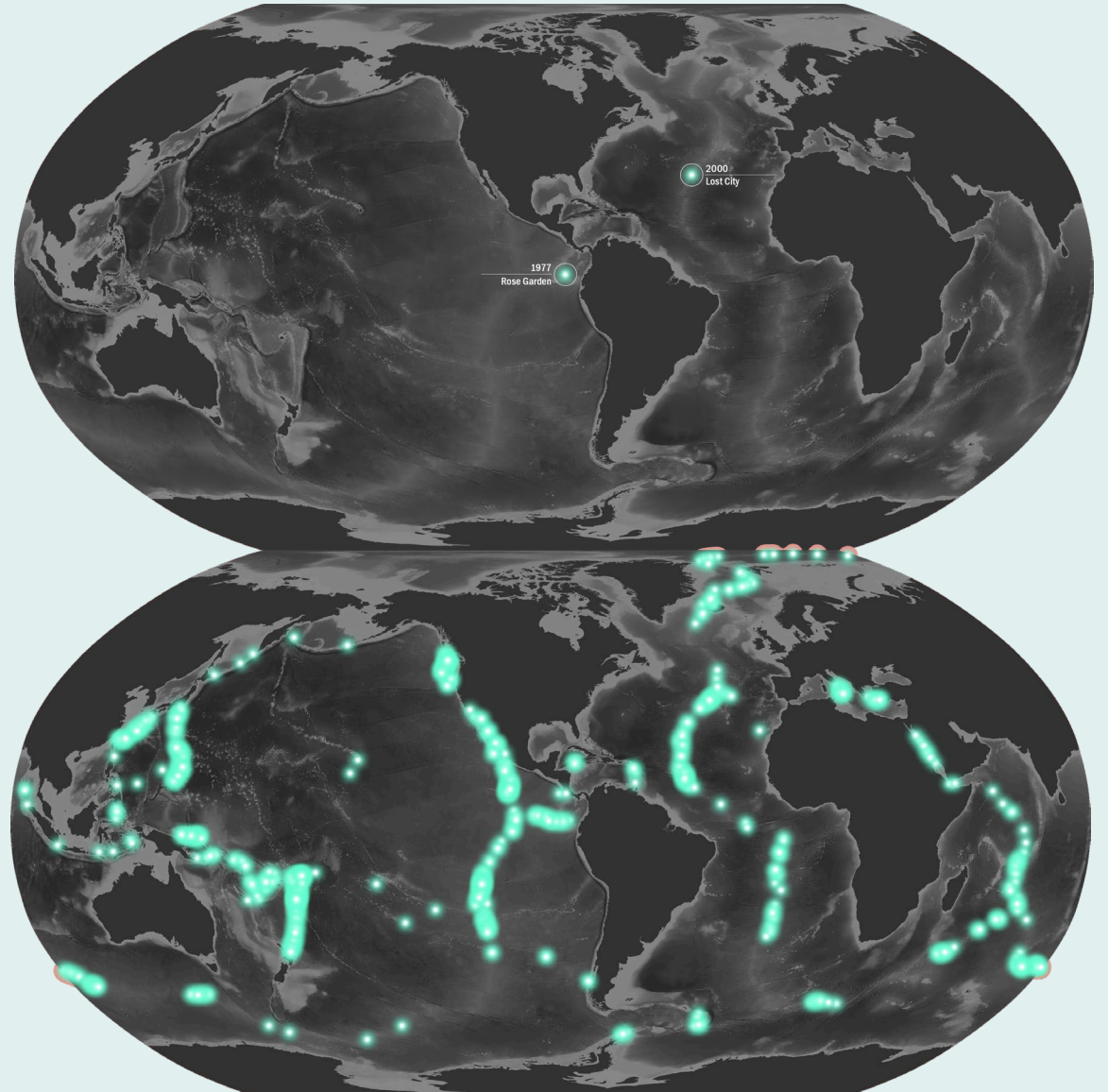
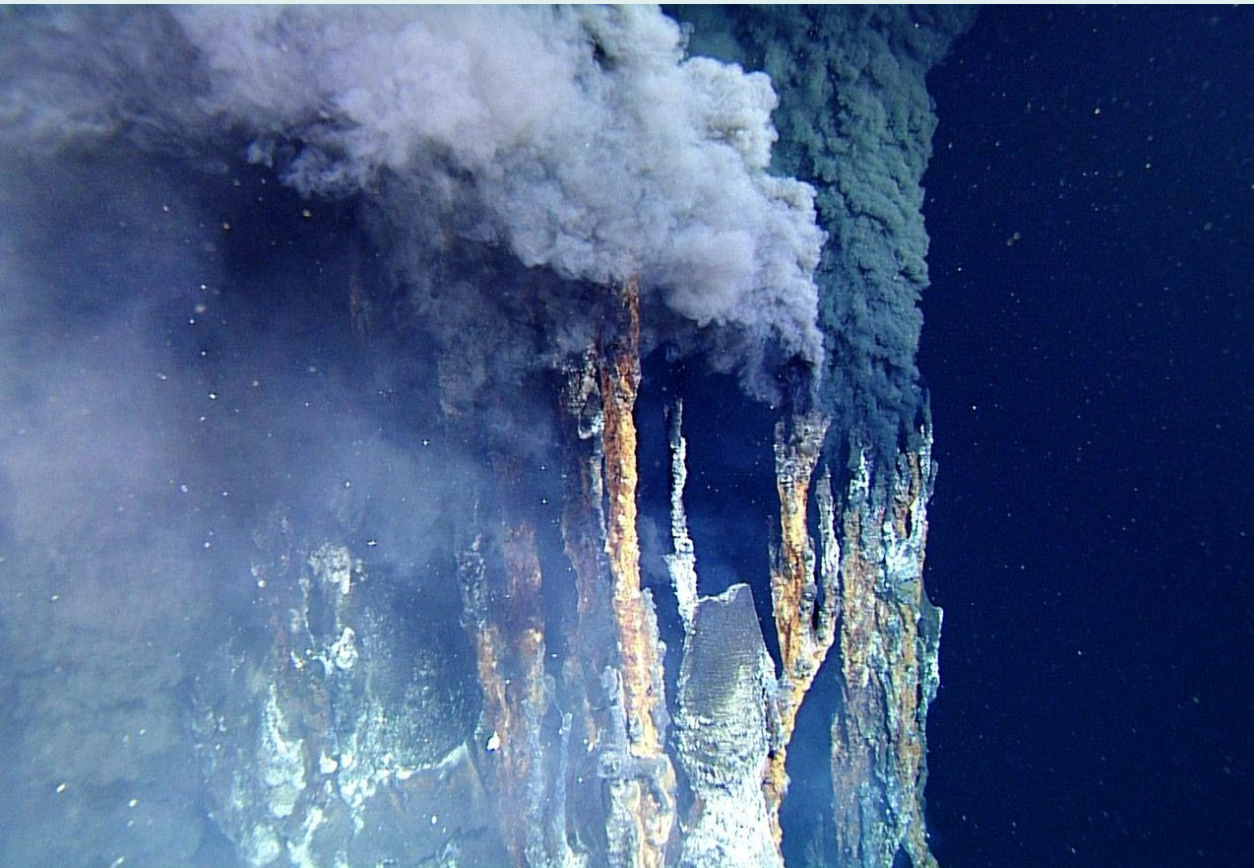
“The Blue Marble” as seen
by the Apollo 17 mission,
7 December 1972



*71% surface = ocean
7% of habitable space*



... 'the last frontier' for major discoveries



Discoveries in the deep...

- A gigantic seamount (1600 m high)
- Heat waves near the deep seafloor
- A mysterious golden orb
- A volcano covered with eggs
- A huge methane leak in the Baltic Sea
- The deepest fish at 8336 m
- Deepsea coral reefs down to 300 m
- 5000 new species in the Clarion-Clipperton zone
- A hidden ecosystem beneath mini-HTVs
- 19.000 (!) new underwater volcanos



Discoveries in the deep...

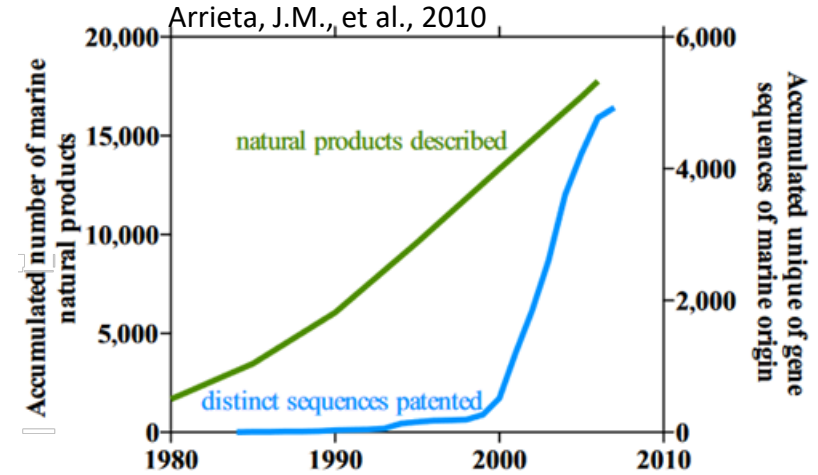
all in 2023!

- A gigantic seamount (1600 m high)
- Heat waves near de deep seafloor
- A mysterious golden orb
- A volcano covered with eggs
- A huge methane leak in the Baltic Sea
- The deepest fish at 8336 m
- Deepsea coral reefs down to 300 m
- 5000 new species in the Clarion-Clipperton zone
- A hidden ecosystem beneath mini-HTVs
- 19.000 (!) new underwater vulcanos

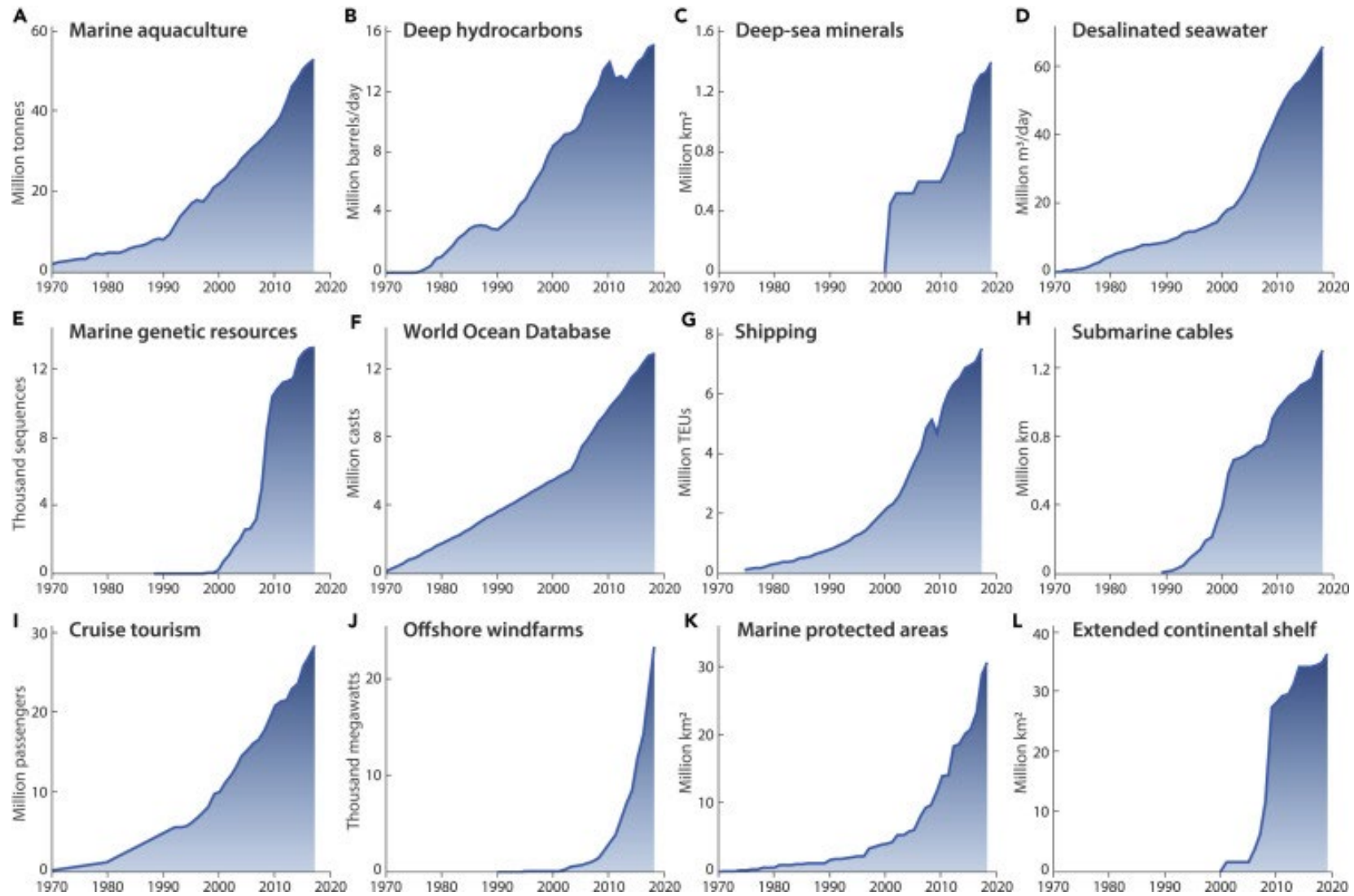


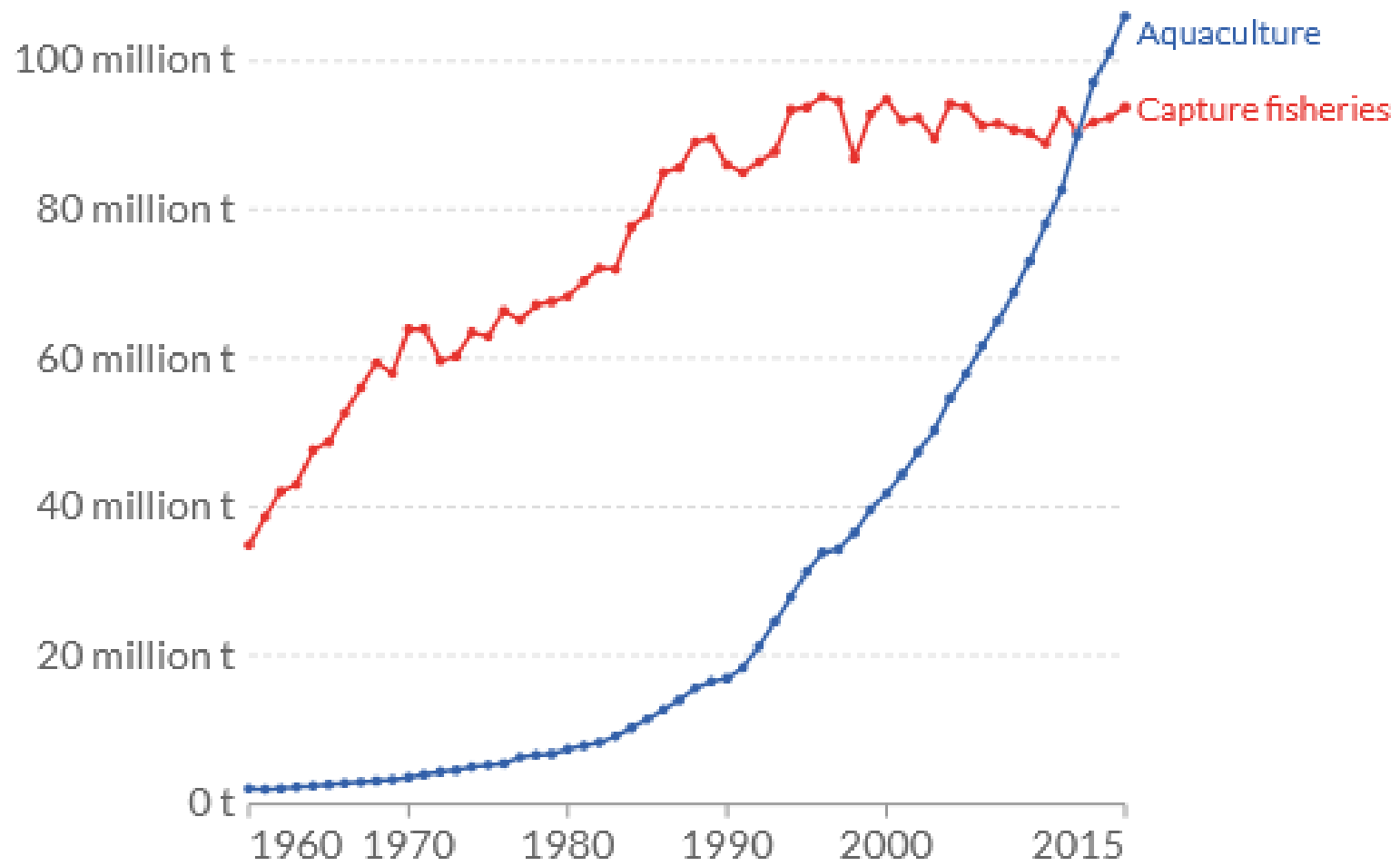
BIOPROSPECTING:

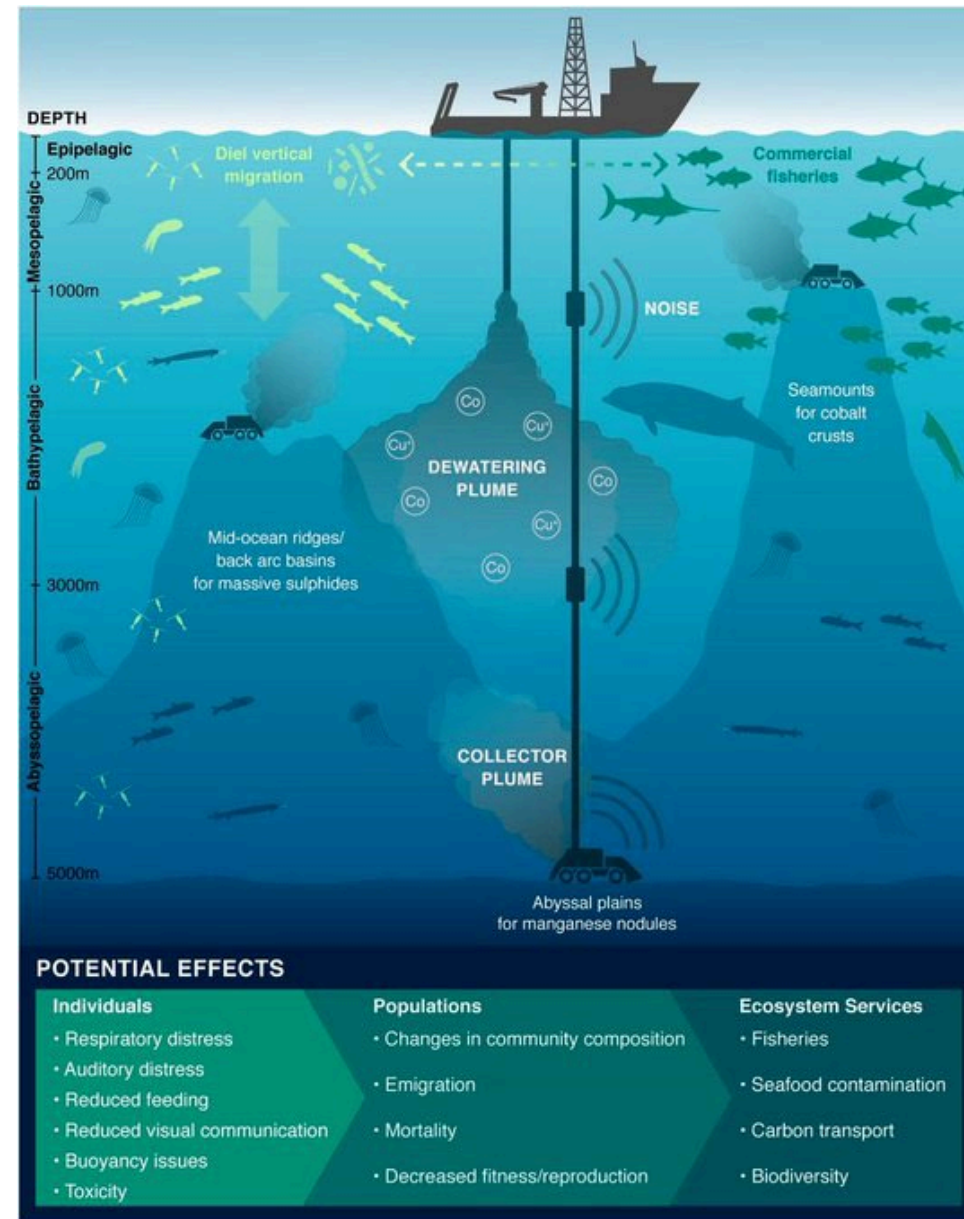
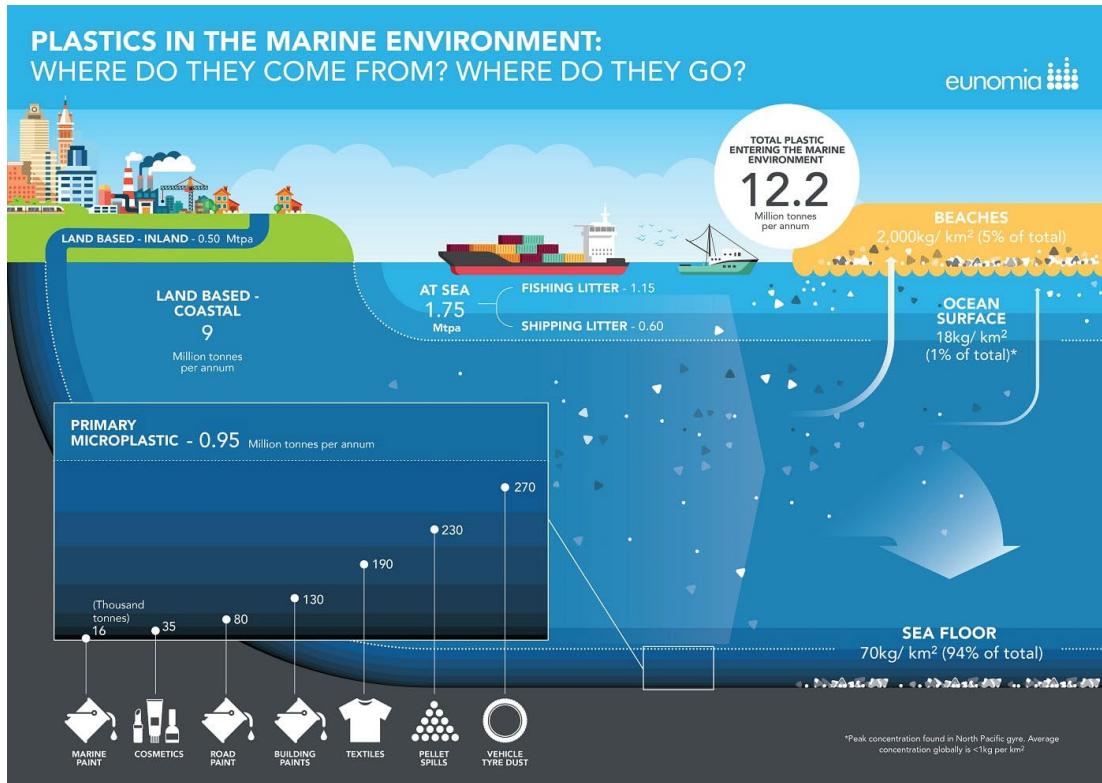
- > 20,000 new compounds in the last 20y
- > 5000 patented applications
 - Superglues
 - Antifouling agents
 - Cosmetics
 - Painkillers (e.g. Prialt)
 - Antibiotics
 - Anticoagulants
 - Chemotherapy (e.g. Yondelis)
 - Anti-HIV agents
 - Chemical warfare
- Global market value: 8.6 billion \$ (2016)
- 90%-93% left undiscovered
- Estimated potential: 563 billion \$ to 5.7 trillion \$



The Blue Acceleration



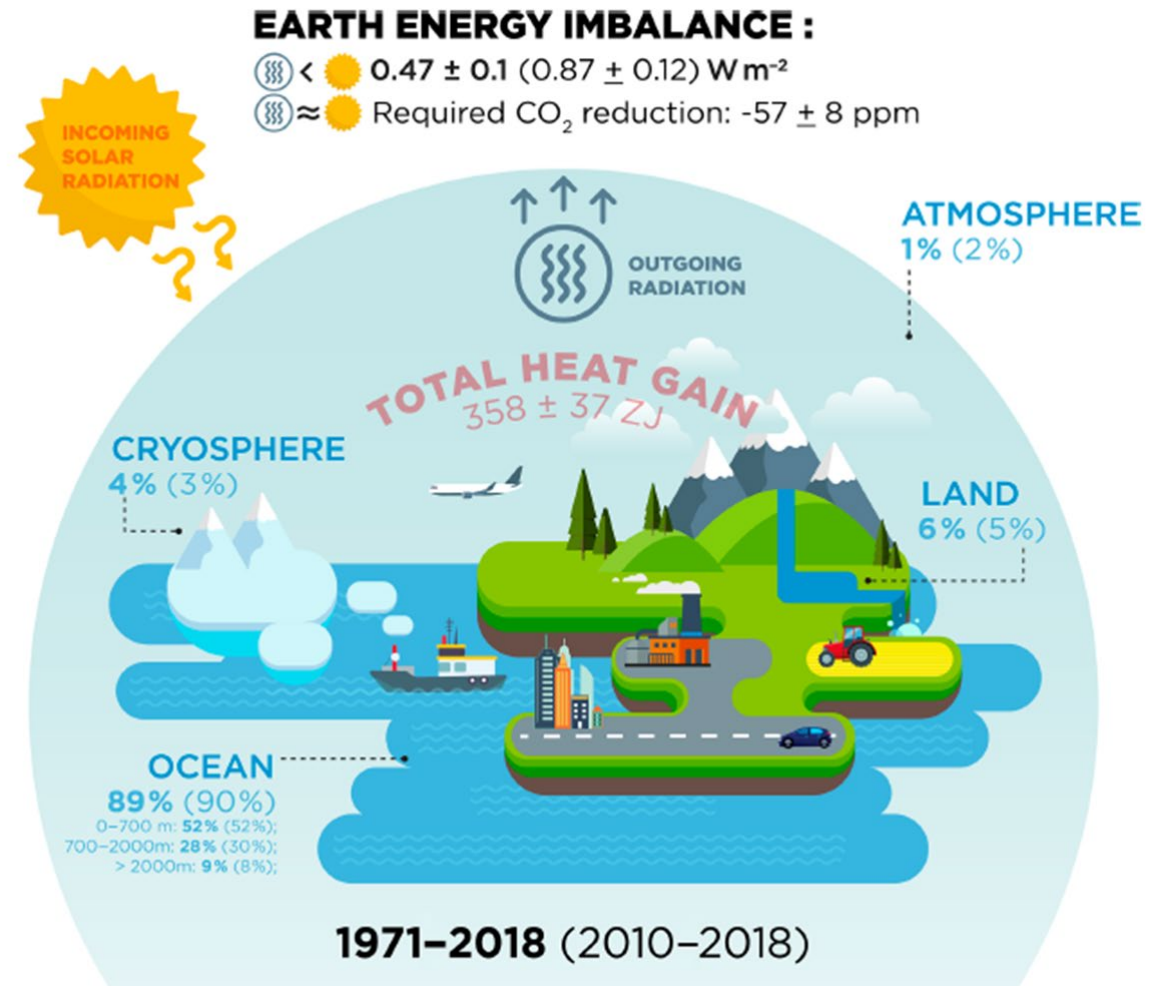




What the ocean does for the climate
absorbs heat
removes carbon dioxide
buries carbon (ocean carbon pump)

Warming causes
sealevel rise
extreme weather
changing circulation

The deadly trio for marine life
heat (coral bleaching, migrations,...)
oxygen (marine heat waves)
acidification (the 'other' CO₂ problem)





Ocean is high on the political agenda

- UN Decade of Ocean Science for Sustainable Development (2021-2030)
- Blue Growth Strategy (2012) → Sustainable Blue Economy (2021)
- EU Mission Ocean: Restore our Ocean and Waters by 2023



Role of science in reaching the goals

- An essential link in the marine innovation landscape:
 1. providing actionable research results and data to underpin decisions
 2. being at the forefront of new solutions & support their valorization
 3. provide access to research infrastructure (incl. data)
 4. de-risking solutions
- A lively and well-organized community

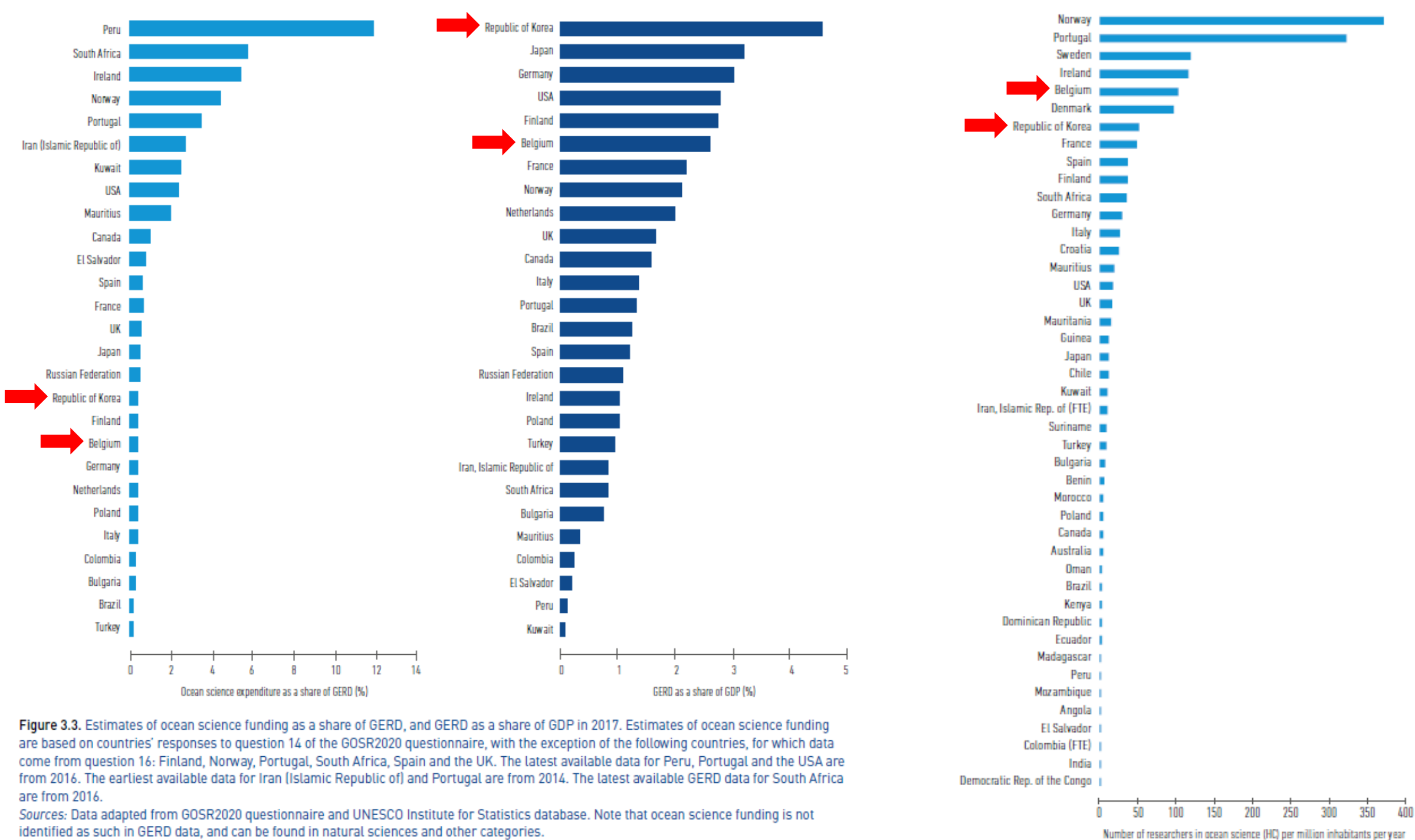
60th Anniversary of the Intergovernmental Oceanographic
Commission of UNESCO and the launch of the Global Ocean
Science Report 2020

The Global Ocean Science Report 2020

Charting Capacity for
Ocean Sustainability

Jacqueline Uku and Jan Mees
Co-Chairs of the GOSR2020 Editorial Board





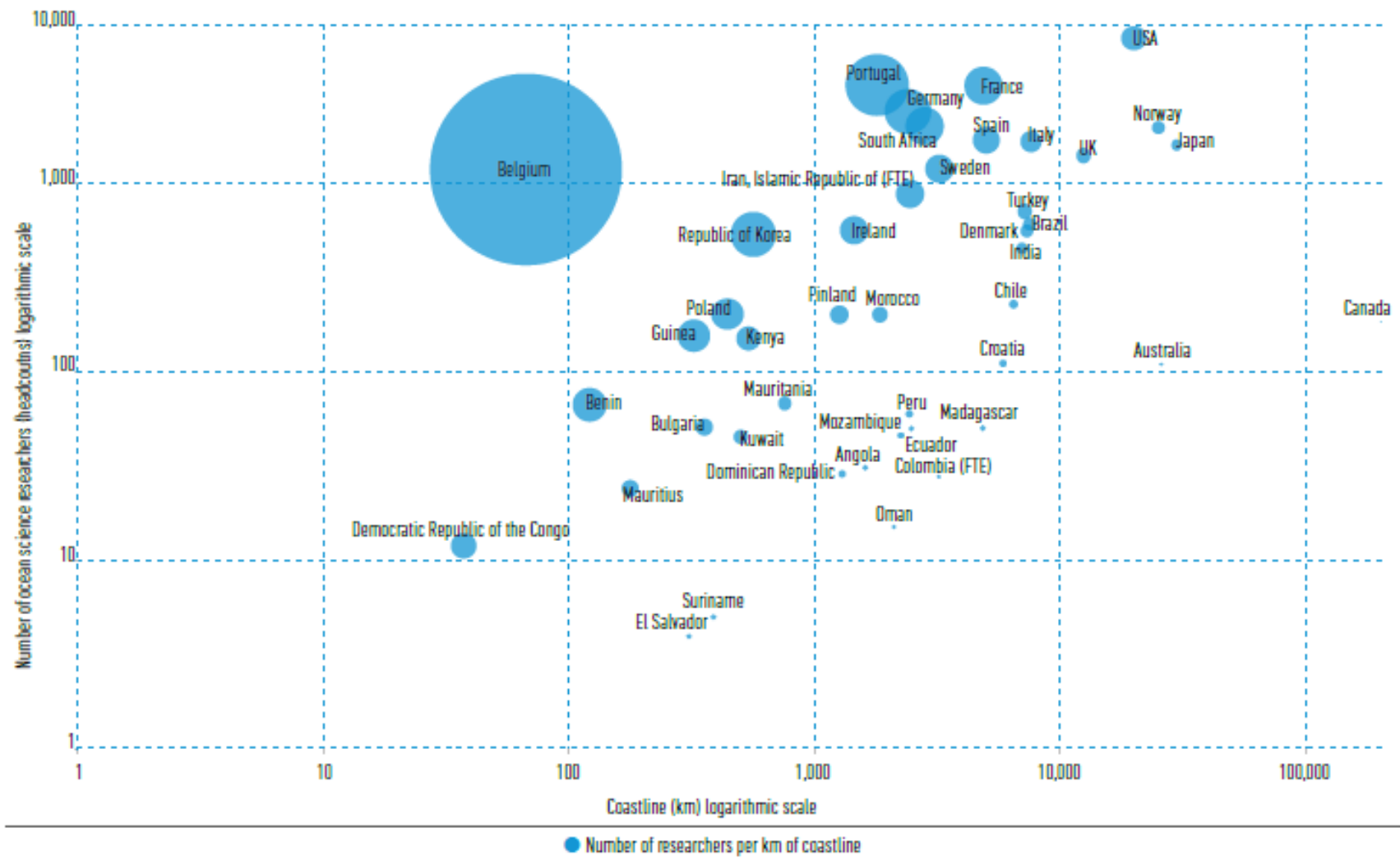


Figure 4.3. Number of national ocean science researchers (HC) per km of coastline. The size of the bubble is proportional to the number of researchers per km of coastline for each country (Belgium reported 18 ocean science researchers per km). Based on the subset of data presented in Table 4.1, researchers employed in ocean science.

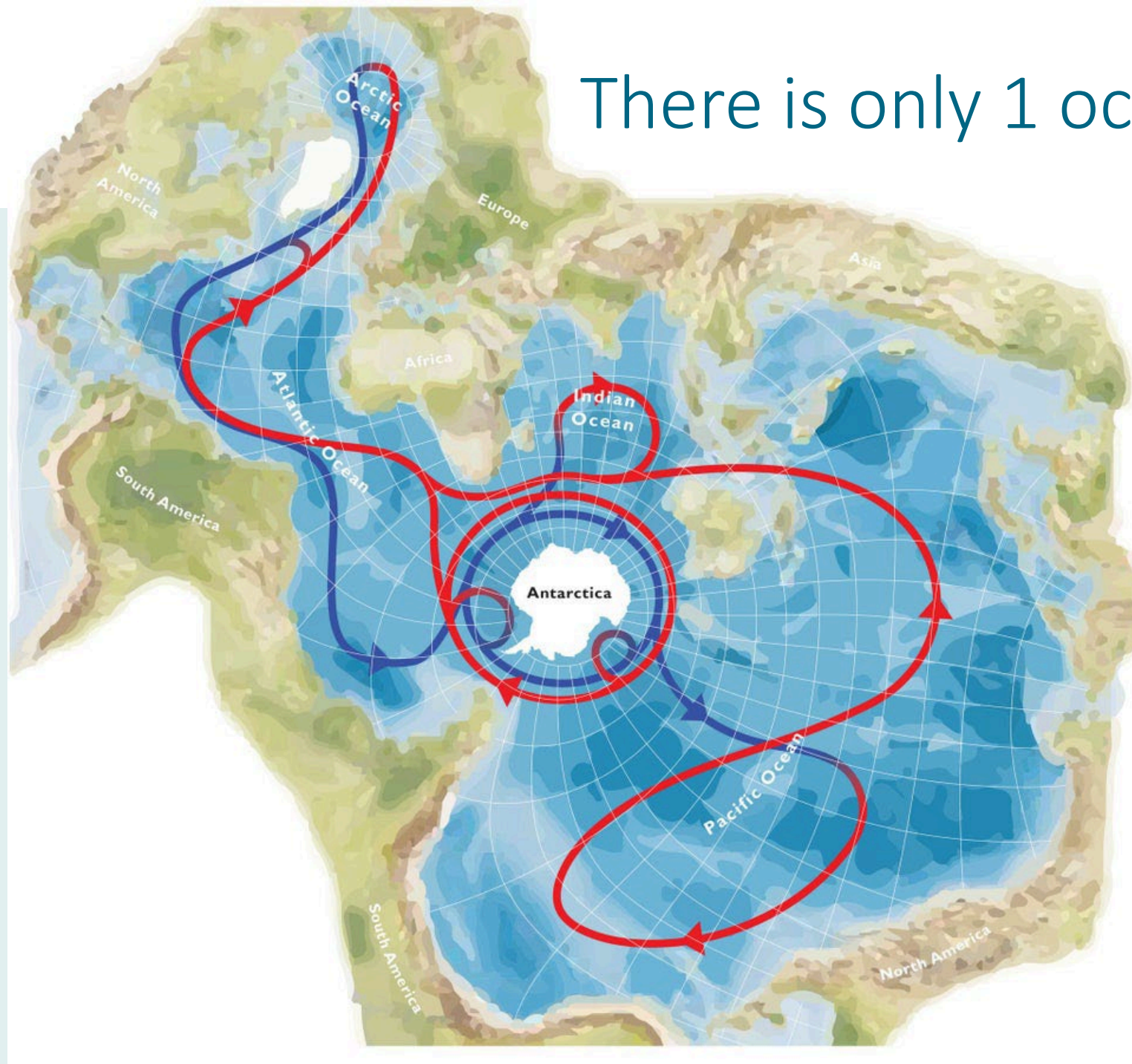
Sources: Data based on the GOSR2017 and GOSR2020 questionnaires (researchers) and the CIA World Factbook.⁸



Collaboration is key

1. Quadruple helix collaboration
 - science-policy interface
 - researchers and industry
 - engaging citizens and developing blue skills
2. International collaboration

There is only 1 ocean...



Thank you for your attention!

