

REV Ocean and Seabed Mapping

Prof. Alex David Rogers

REV Ocean

October 9th, 2018

Goods and services provided by the ocean

- CO₂ sequestration & storage £
 - Food (fisheries) £
 - Oil & gas £
 - Minerals £?
 - Chemical compounds
 - Waste disposal
 - Gas & climate regulation
 - Waste adsorption and detoxification
 - Biological regulation
 - Nutrient cycling
 - Habitat
 - Resilience
 - Primary production
 - Biodiversity
 - Water circulation and exchange
 - Educational
 - Scientific
 - Aesthetic
 - Existence / bequest
- Provisioning**
- Regulatory**
- Supporting**
- Cultural**



Degradation to marine ecosystems

Overexploitation of marine living resources

e.g. Overfishing (largest footprint; most visible impact)

Habitat destruction

e.g. Coastal development

Pollution

e.g. Plastics and other debris

Invasive species

e.g. Lionfish

Climate change

e.g. Ocean warming



Life in the ocean reduced by 40 % in 40 years

- 36 % of life in the ocean has disappeared
- 90% of commercial fish stocks are either fully exploited or overfished
- $\frac{3}{4}$ of all world coral reefs are under threat
- **Why: climate change, ocean acidification, overfishing and bycatch, pollution and plastics**

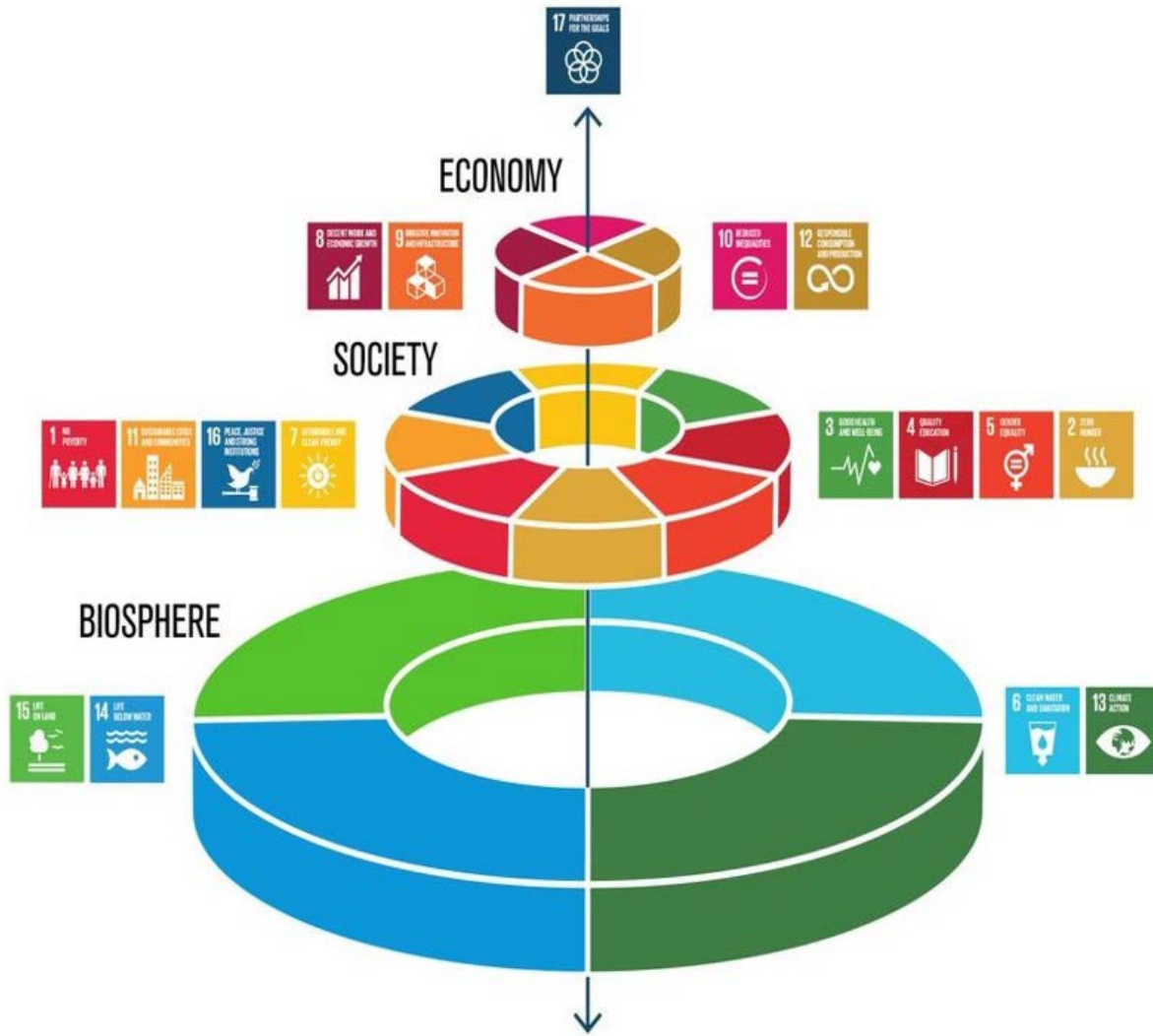
What if the ocean was
a *world economy*?

*Gross marine product
\$2.5 trillion per annum*

*Asset base of \$24
trillion*

*WWF (2015) Reviving
the Ocean Economy*





The ocean is now
an essential part of
the Sustainable
Development Goals

Norway billionaire Kjell Inge Roekke to give away 'lion's share'

2 May 2017

[f](#) [t](#) [d](#) [e](#) [Share](#)



A Norwegian billionaire has promised to give "the lion's share" of his money away.

Kjell Inge Roekke, a former fisherman who made his fortune in the oil industry, will begin by funding a research ship that will remove plastic from the ocean.

It will operate in partnership with the environmental organisation WWF.

He joins other billionaire philanthropists including Bill Gates, Warren Buffet and Mark Zuckerberg.

Source: BBC News

REV Ocean





THE GOAL:

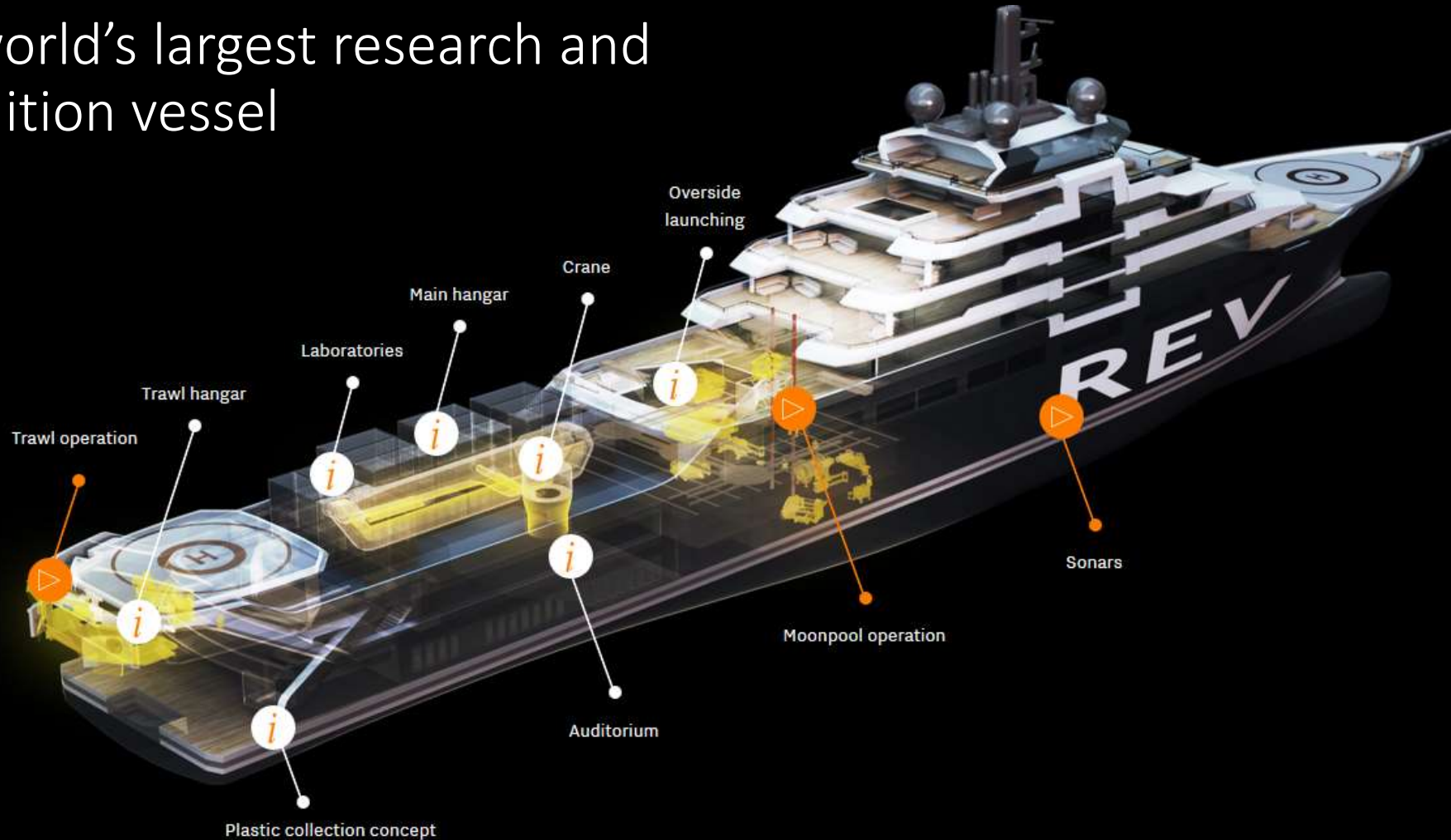
To reverse the negative environmental situation in the ocean by developing *concrete solutions*





1

The world's largest research and expedition vessel





REV

Research Expedition Vessel

⋮



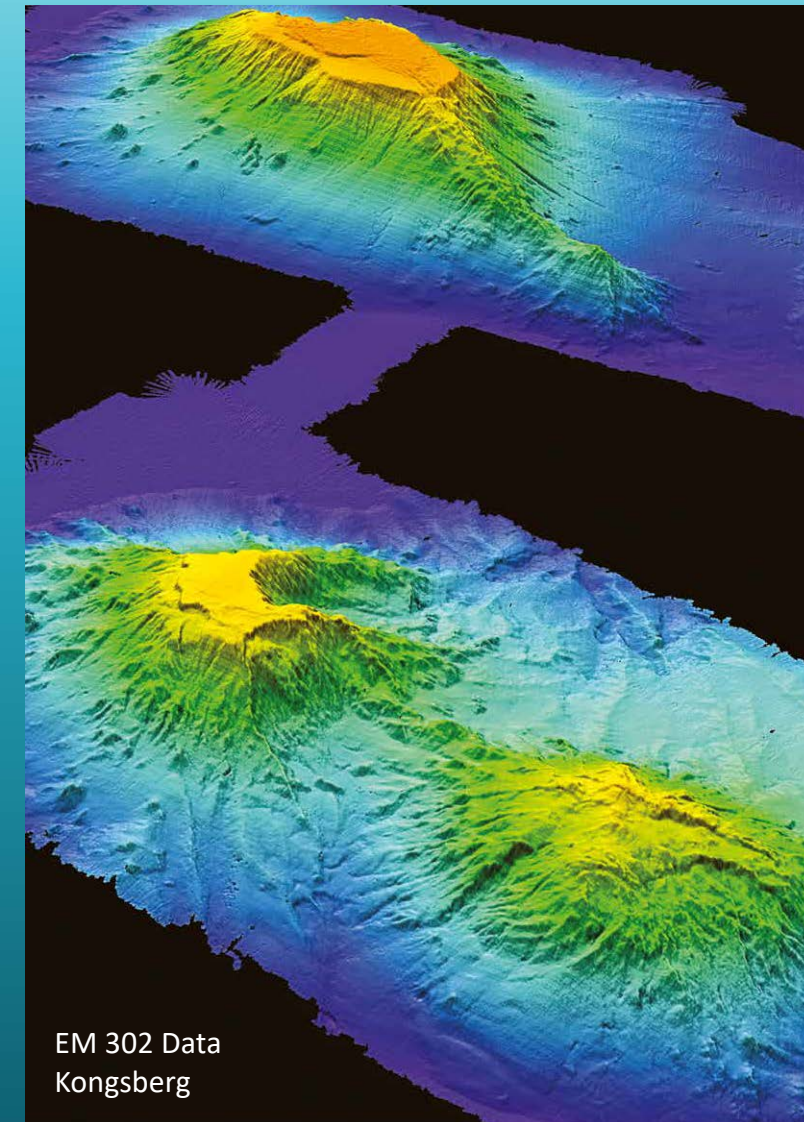
Click and drag your mouse around to view the ship from different angles.

START EXPLORING



Acoustic systems

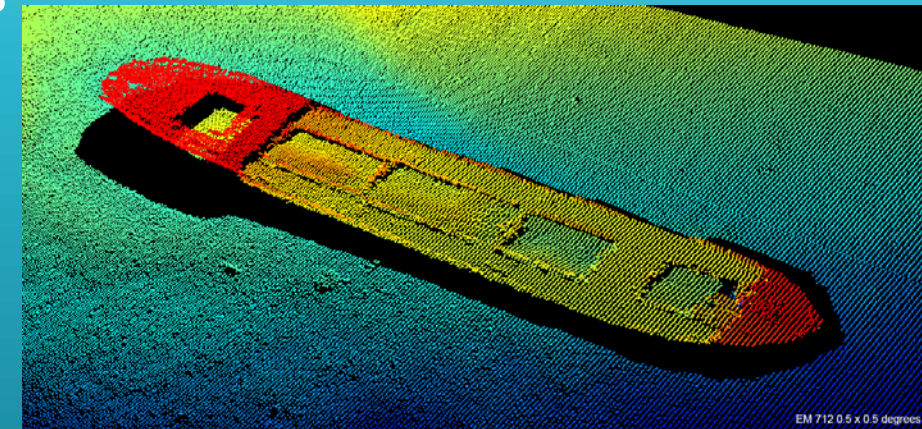
- Kongsberg EM 712
 - Multibeam echosounder
- Kongsberg EM 304
 - Multibeam echosounder
- Kongsberg EA640
 - Single beam echosounder
- Sub-Bottom Profiler Kongsberg SBP 300 – 6 degrees
 - Full ocean depth system
- Kongsberg TOPAS PS40 Sub-Bottom Profiler
 - 5m to 1,000m operation
- Kongsberg Seapath 330 positioning system



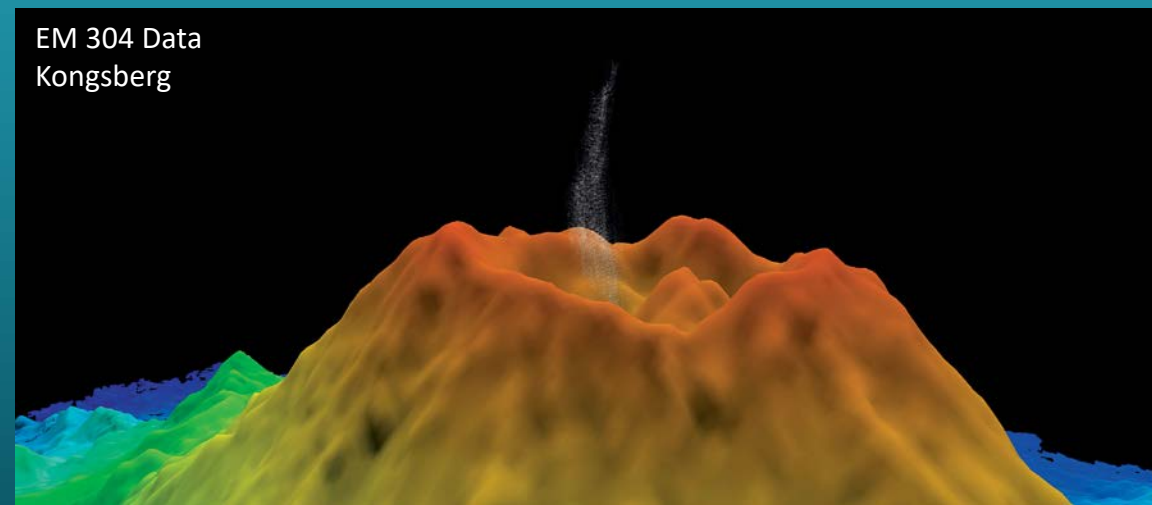


Acoustic systems

- Kongsberg EM 712
 - High to very high resolution seabed mapping
 - 3m depth to 3,500m
 - SWATH width 5.5x water depth
 - Frequency 40-100 KHz
- Kongsberg EM 304
 - High resolution seabed mapping
 - 10m to 8,000m depth
 - 5.5x depth or >9km
 - Frequency 26-34 KHz



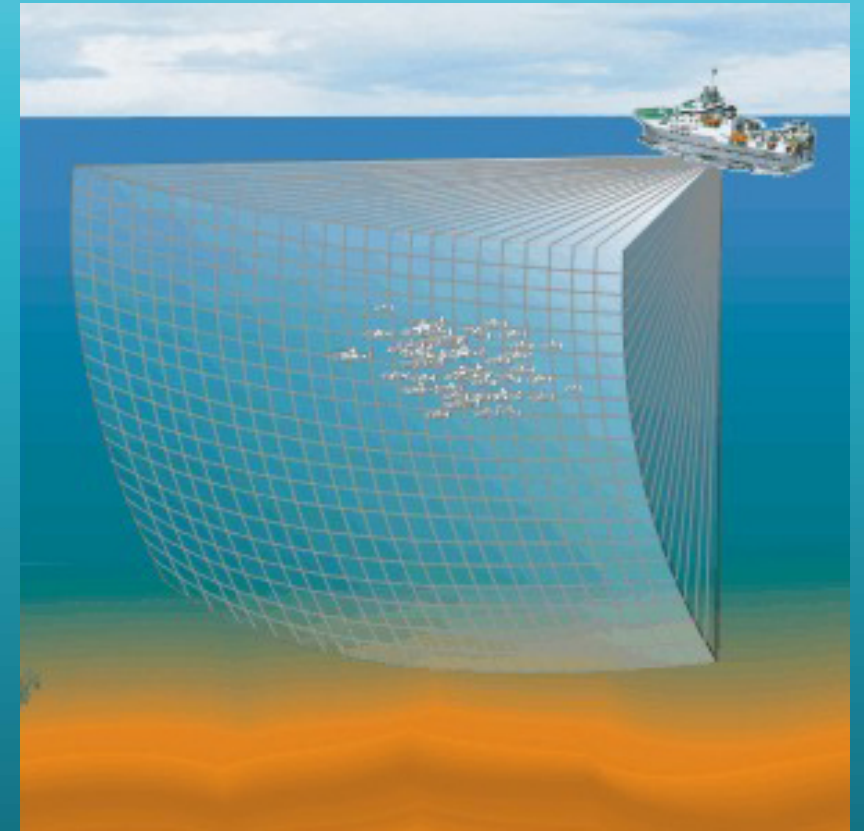
EM 304 Data
Kongsberg





Other acoustic systems

- SIMRAD EK80
 - Scientific echosounder
- SIMRAD SU94
 - Fish finding sonar
- SIMRAD SC94
 - Fish finding sonar
- SIMRAD ME70
 - Multibeam sonar for science research
- SIMRAD MS70
 - Multibeam sonar for fisheries research
- Hydrophones
- ADCPs





REVOcean

2

World Ocean Headquarters
at Fornebu, Norway



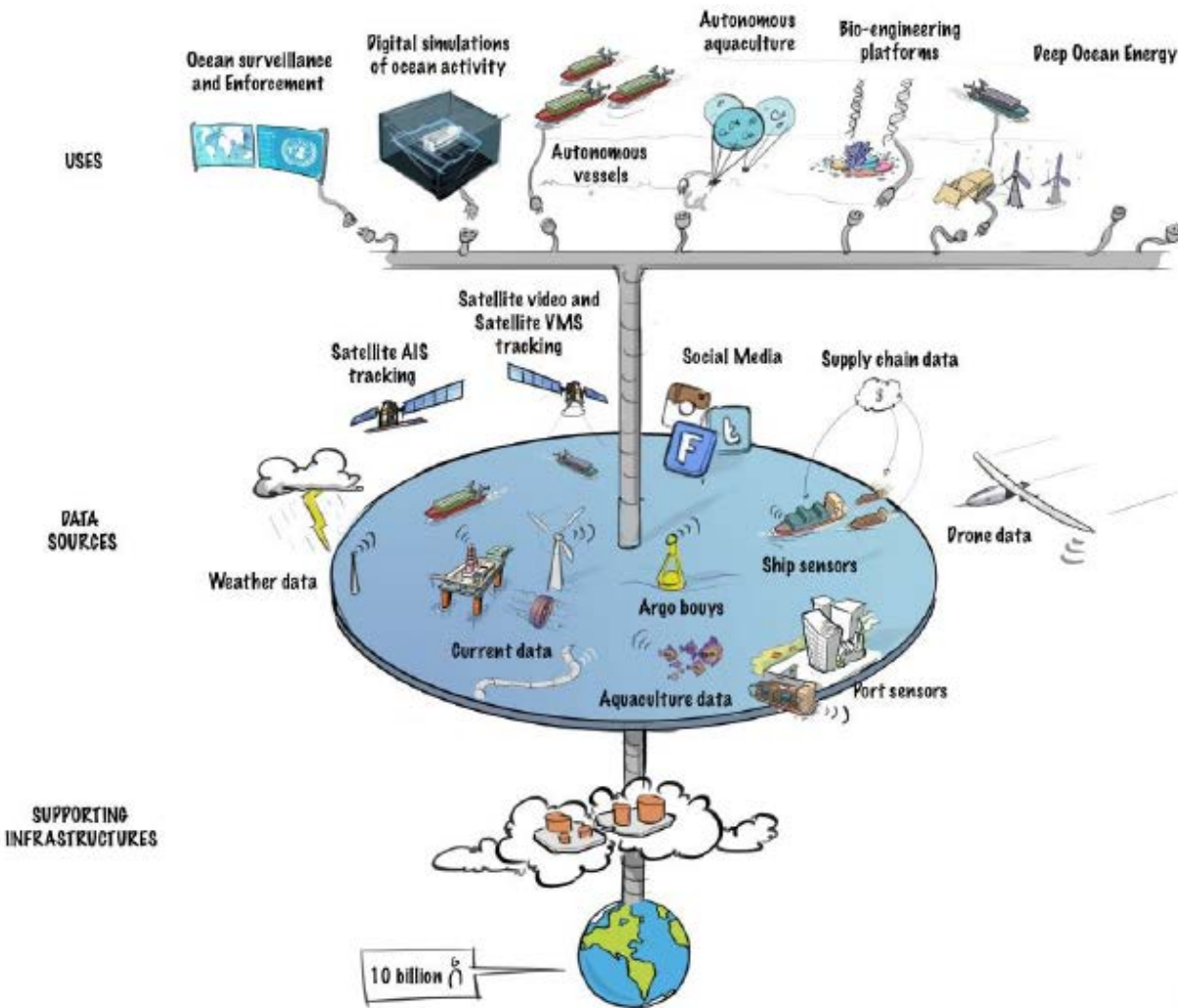
- Connect the right people to create new ocean solutions
- Bring business, NGOs, science, institutions, decision-makers and relevant stakeholders together to create sustainable business concepts
- Interactive knowledge- and information sharing center
- Showroom for technology and solutions
- Ocean co-working space
- Exhibits and conference centre
- Laboratories and research facilities



REV Ocean

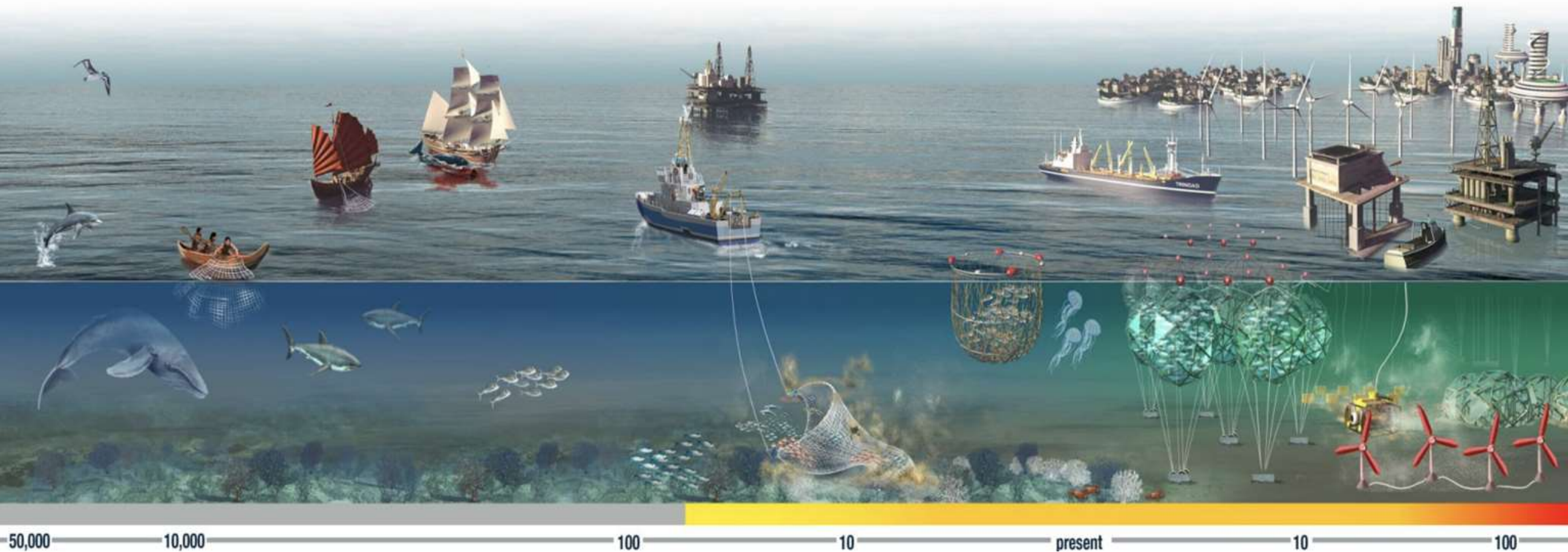
3

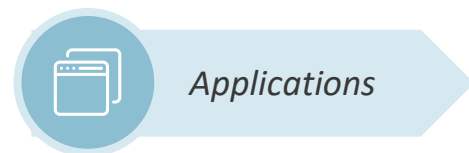
A Global Ocean Data Platform



- Build an open source platform to integrate ocean data
- Unify already existing data sources and harmonize the datapoints
- Provide ocean insights/foresights to drive investments, policies and regulations
- Adopt standards, contribute to the creation of missing ones
- Foster the creation of an Artificial Intelligence community for oceans

A global ocean data platform is needed to simplify free data access, enabling unbiased research and facilitate a data-driven debate





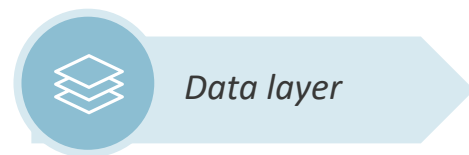
Predictive
Maintenance

Production
Optimization

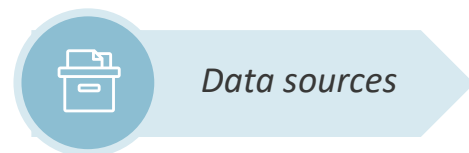
Remote
monitoring

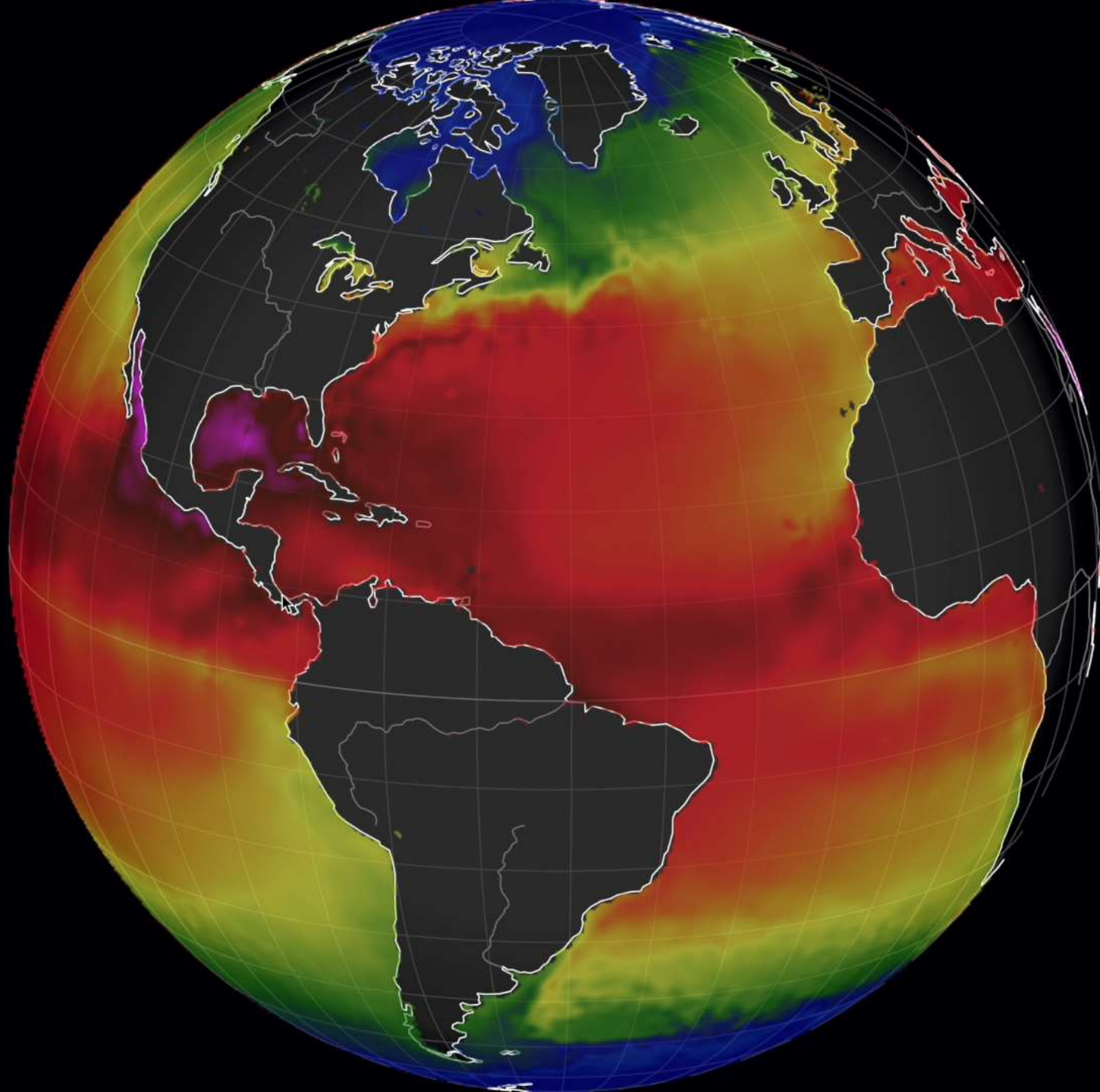
Simulations and
visualization

Alliance
Partners



HORIZONTAL DATA PLATFORM







Thank you for your attention!



Visit us at revocean.org

Contact me at: alex.rogers@zoo.ox.ac.uk (until November 30th)

Alex.rogers@revocean.org (from December 1st)