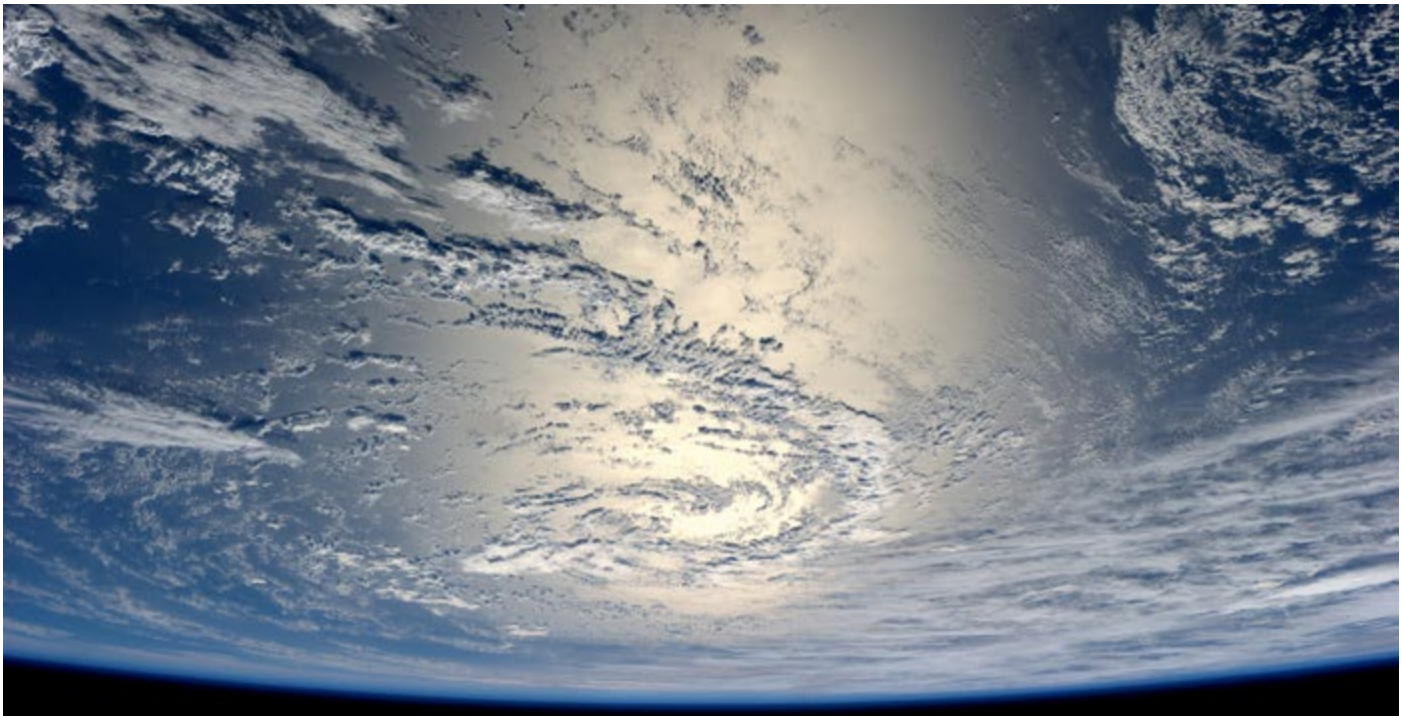


OUR OCEAN FROM SPACE

Coproduced by

unesco

2021 2030 United Nations Decade of Ocean Science for Sustainable Development

esa

With the support of

ASI Agenzia Spaziale Italiana

MERCATOR OCEAN INTERNATIONAL

In collaboration with

cnes CENTRE NATIONAL D'ÉTUDES SPATIALES

cmcc Centro Euro-Mediterraneo sui Cambiamenti Climatici

ICGC Institut Cartogràfic i Geològic de Catalunya

planetek italia

SHOM

msro

PROMÉTHÉE EARTH INTELLIGENCE

Discover the fragile beauty of our ocean as viewed from space and how scientists and local communities engage to protect this vital ecosystem against the consequences of climate change.

Using stunning Earth observation satellite images, augmented reality, and testimonials, “Our Ocean from Space” will visit a series of major international events and city centres to raise awareness about the main environmental issues affecting the Ocean.

“Our Ocean from Space”, an exhibition curated by Fiorella Coliolo and Benoit Delplanque, is coproduced by UNESCO and ESA, with the support of Mercator Ocean International and the Italian Space Agency, ASI, the French Space Agency (CNES), the Institut Cartogràfic i Geològic de Catalunya (ICGC), Planetek Italia, the Centro Euro-Mediterraneo sui Cambiamenti Climatici (CMCC), Shom, Prométhée Earth Intelligence, and the Maldives Space Research Organisation (MSRO).

The science we need for the ocean we want

Vidar Helgesen
Executive Secretary
Intergovernmental Oceanographic Commission of UNESCO

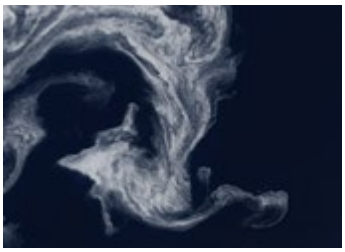
“The Ocean Decade is a global movement coordinated by UNESCO which aims to solve the main issues facing the ocean. Began in 2021, the movement brings scientists together with policymakers, governments, industry, and philanthropists to address some of the big questions, such as how to protect biodiversity against marine pollution, and how to generate more information about our oceans. Space allows for different perspectives on the way the ocean works. It allows us to capture the ocean’s big processes, such as heat conduction around the planet and the movements of water masses and ice floes.”

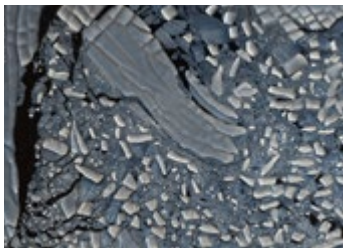
Josef Aschbacher
Director General
European Space Agency - ESA

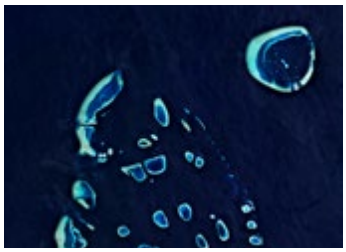
“Since 1975, ESA has developed the technical infrastructure needed to keep Europe at the forefront of global space activities, and has therefore played a crucial role in building strong and competitive local industry. In Earth observation, Europe is a world leader. The satellite data collected allows scientists to keep watch over the oceans to protect coastal residents and the environment. This data informs them about ocean behaviour in so many ways, supporting adaptation to any changes that might relate to temperature, wave height or phytoplankton, as well as to sea and salt levels.”

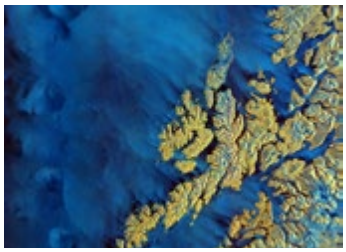
PUBLIC AWARENESS

With its breathtaking images and video-interviews, “Our Ocean from Space” showcases concrete examples of how innovation can help ecological transition while encouraging people to better understand the ocean, change their practices, and develop sustainable approaches.

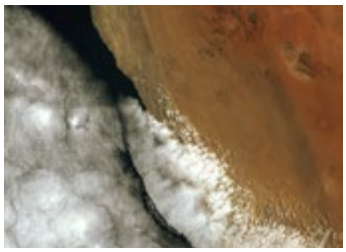

The Arctic Revealed

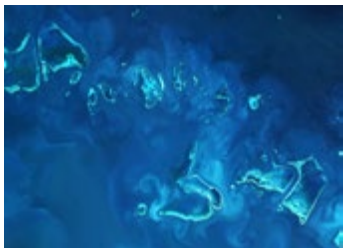

An Icy Farewell

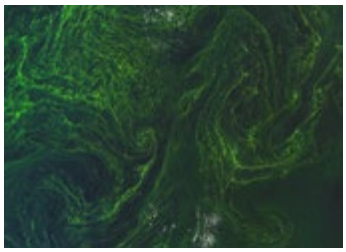

Islands Adrift

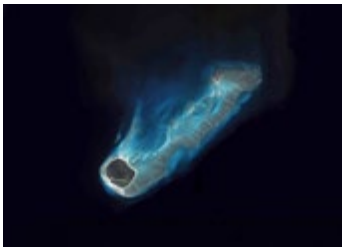

Literal Heat Waves


Sea Surface Salinity

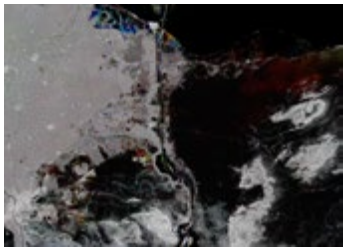

Nature’s Pathways


Marine Biodiversity Under Pressure

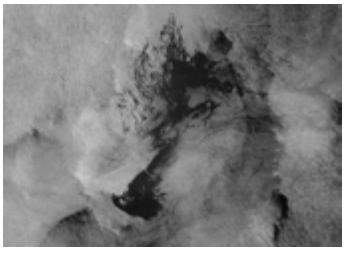

Revealing the Unseen


Safe Havens

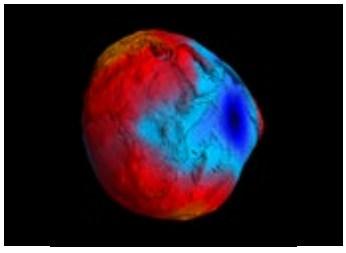

The Ocean’s Clean Power


The Ocean in Motion


Balancing Harvest


An Ocean in Distress


Defying Sea Level Rise


The Earth’s True Shape


Insights from the Deep

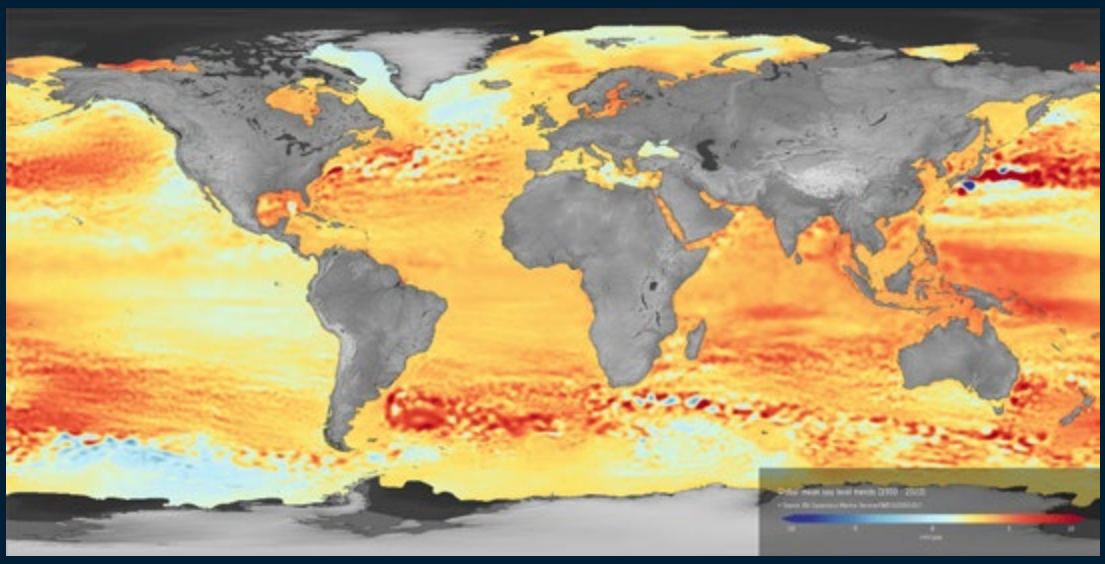

The Ocean’s Cultural legacy


Marine Heritage Sites

SCIENTIFIC-DRIVEN CONTENT

"Our Ocean from Space" covers a range of scientific topics including changes to arctic sea ice, ocean warming, rising sea levels, the role of sea salinity and ocean currents, and the consequences of climate change on coral reefs and biodiversity. During the exhibition, visitors will discover how Earth observation satellites monitor the way gravity influences ocean dynamics, maritime traffic, and marine protected areas.

OCEAN WARMING



Regional mean sea-level trends between 1993 and 2022: the red shows where sea levels have risen and the blue where sea levels have fallen. In the last 30 years, sea levels have been rising at a rate of 3 mm per year, a rate that is increasing. Half of this rate is accounted for by increased sea surface temperatures, while the other half comes from melting ice sheets and glaciers.

Angélique Melet
Oceanographer
Mercator Ocean International

"Global warming is essentially ocean warming. The ocean has absorbed 90% of the Earth's extra heat caused by global warming and increased greenhouse gases in our atmosphere. As deep ocean layers heat up, the consequences will become more numerous and widespread: rise in sea-levels, more destructive cyclones, and acidification. The impact on marine life will be disastrous..."

Tania Casal
Campaign scientist
European Space Agency - ESA

"Rising sea levels are a serious issue because 40% of the global population lives in coastal areas. Rising levels are due partly to the melting of the polar caps and also to mountain glaciers. But most people are not aware of the role of thermal expansion. As the ocean warms up, it also expands, which is one of the major contributors to rising sea levels right now."

SOCIAL ENGAGEMENT

The exhibition will visit a series of major international events to raise awareness about the main environmental issues affecting the ocean. In the United Nations Decade of Ocean Science for Sustainable Development, the exhibition aims to engage the public, key actors in space technology, decision-makers, and students and young professionals working in the domain.

OUR OCEAN FROM SPACE

1 Sea ice off the east coast of Greenland

2 The Pine Island Glacier in Antarctica

3 Maldives

4 Lofoten archipelago

5 Mouth of the Amazon

6 Namib desert

7 Great barrier reef

8 Plankton bloom in the Baltic sea

9 Glorioso Islands Marine Natural Park

10 Rotterdam and the North Sea

11 The Suez Canal

12 Seaweed farms in the South Jeolla Province, South Korea

13 Grande America oil spill off the French Atlantic coast

14 Ebro delta in Spain

15 The Earth's True Shape

16 Bahrain

17 North Frisian Islands, Germany-Denmark

18 The Bijagos Archipelago in Guinea Bissau

ICE

OCEAN WARMING

MOTION

ECOSYSTEMS

FUTURE

TRAFFIC

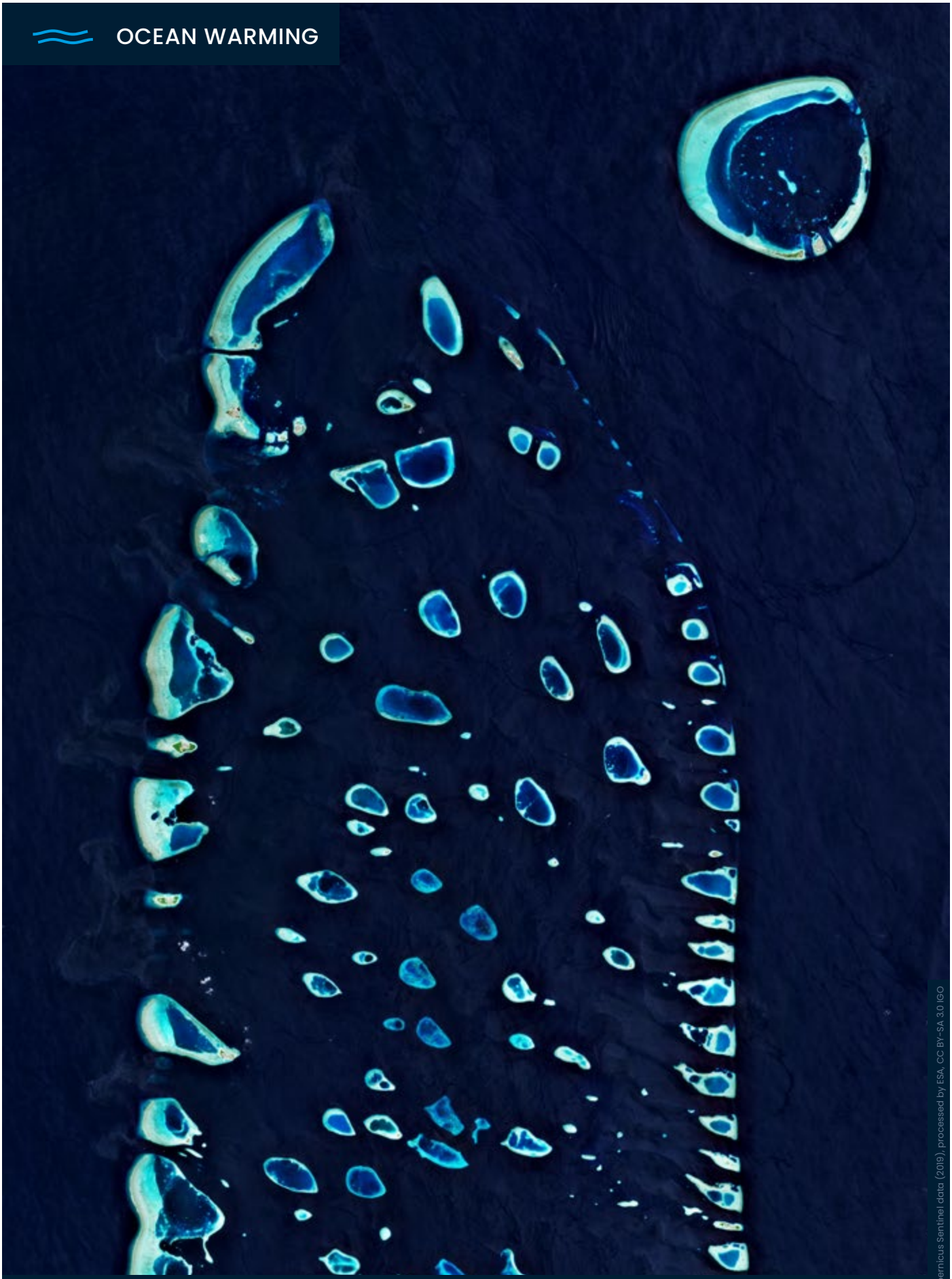
THREATS

SHAPE

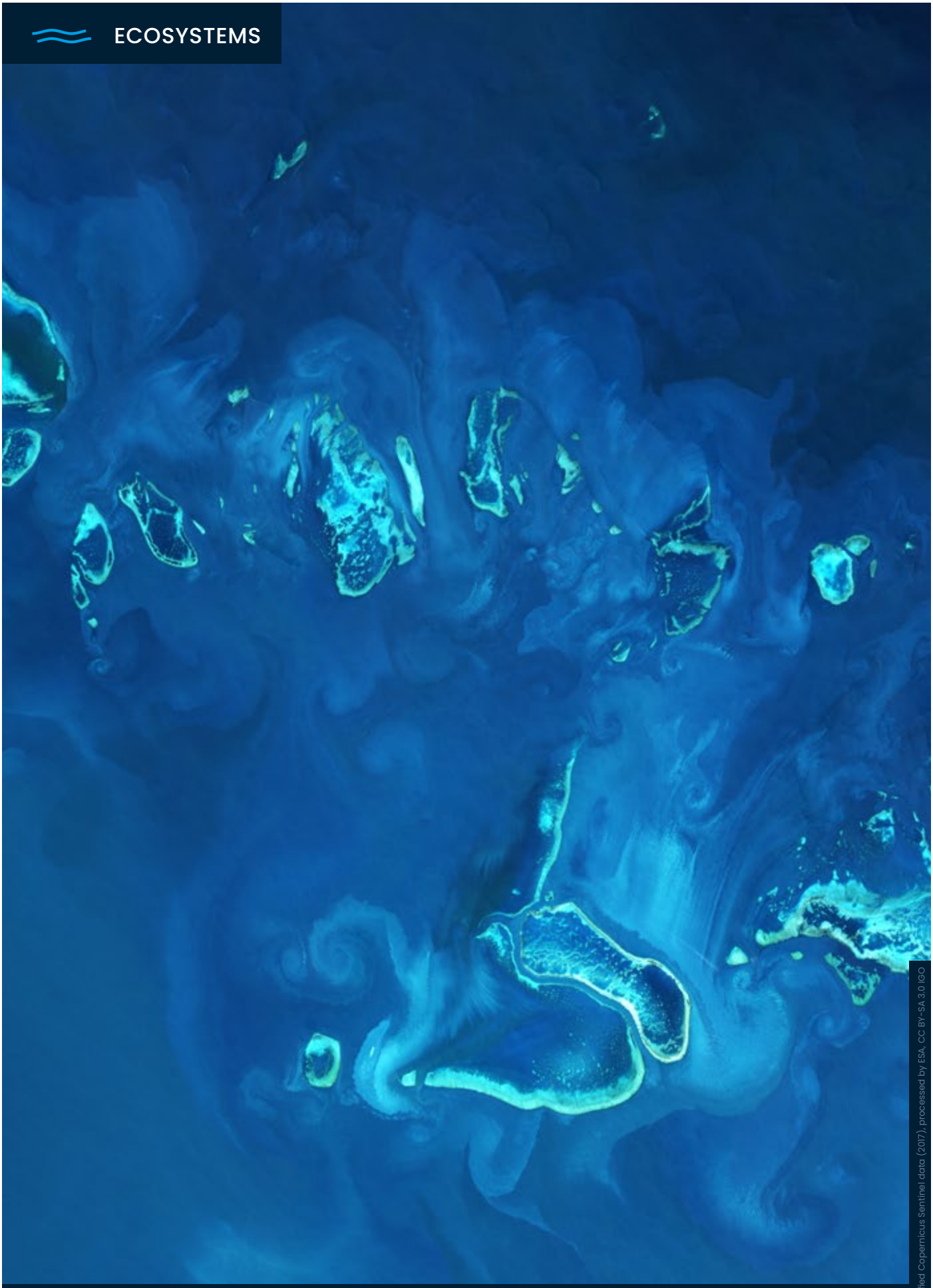
HERITAGE

The Pine Island Glacier in Antarctica as seen by the COSMO-SkyMed satellite from ASI, which clearly shows icebergs breaking away from the ice shelf formed by the flow of ice into the sea.

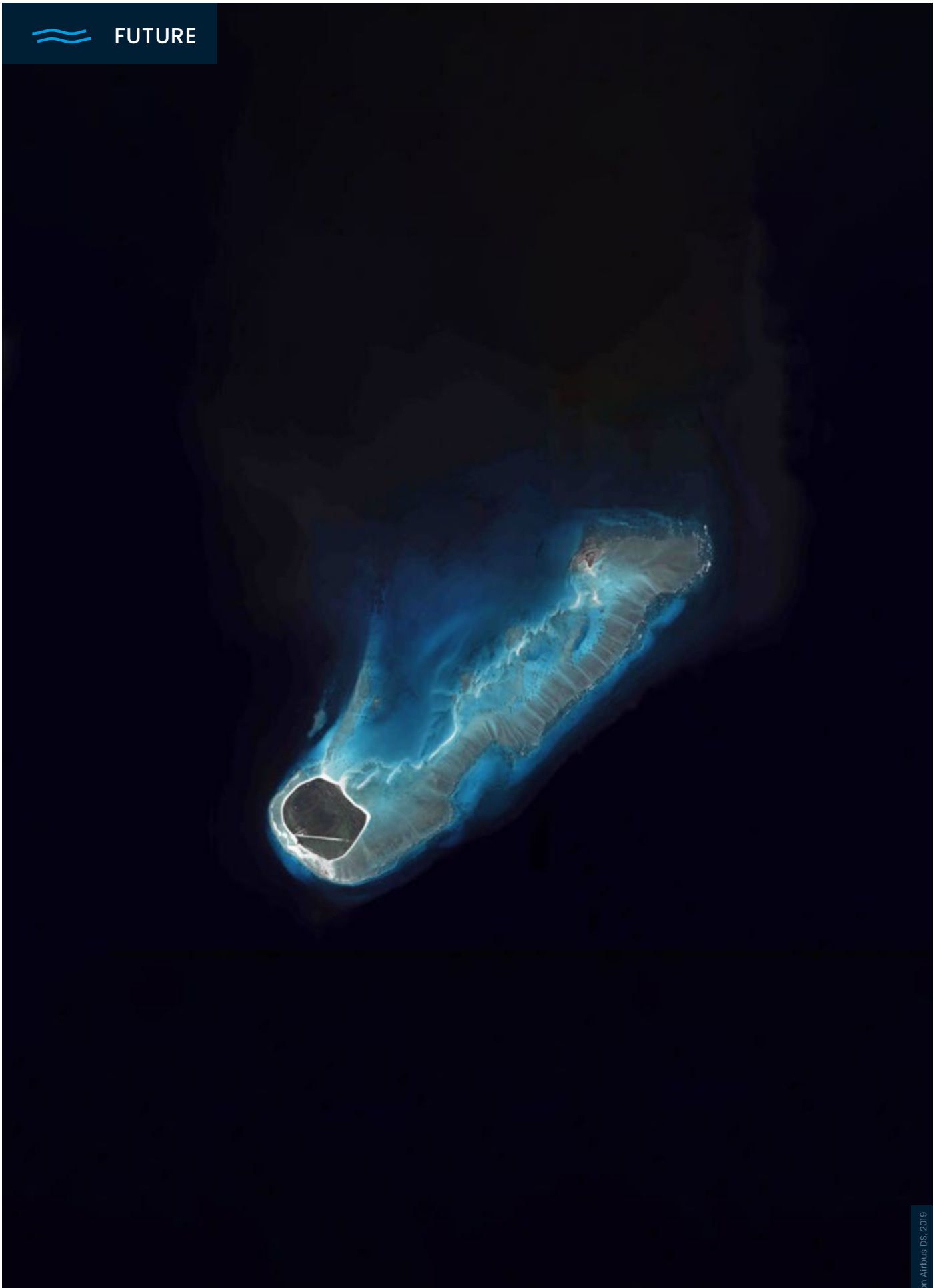
OCEAN WARMING



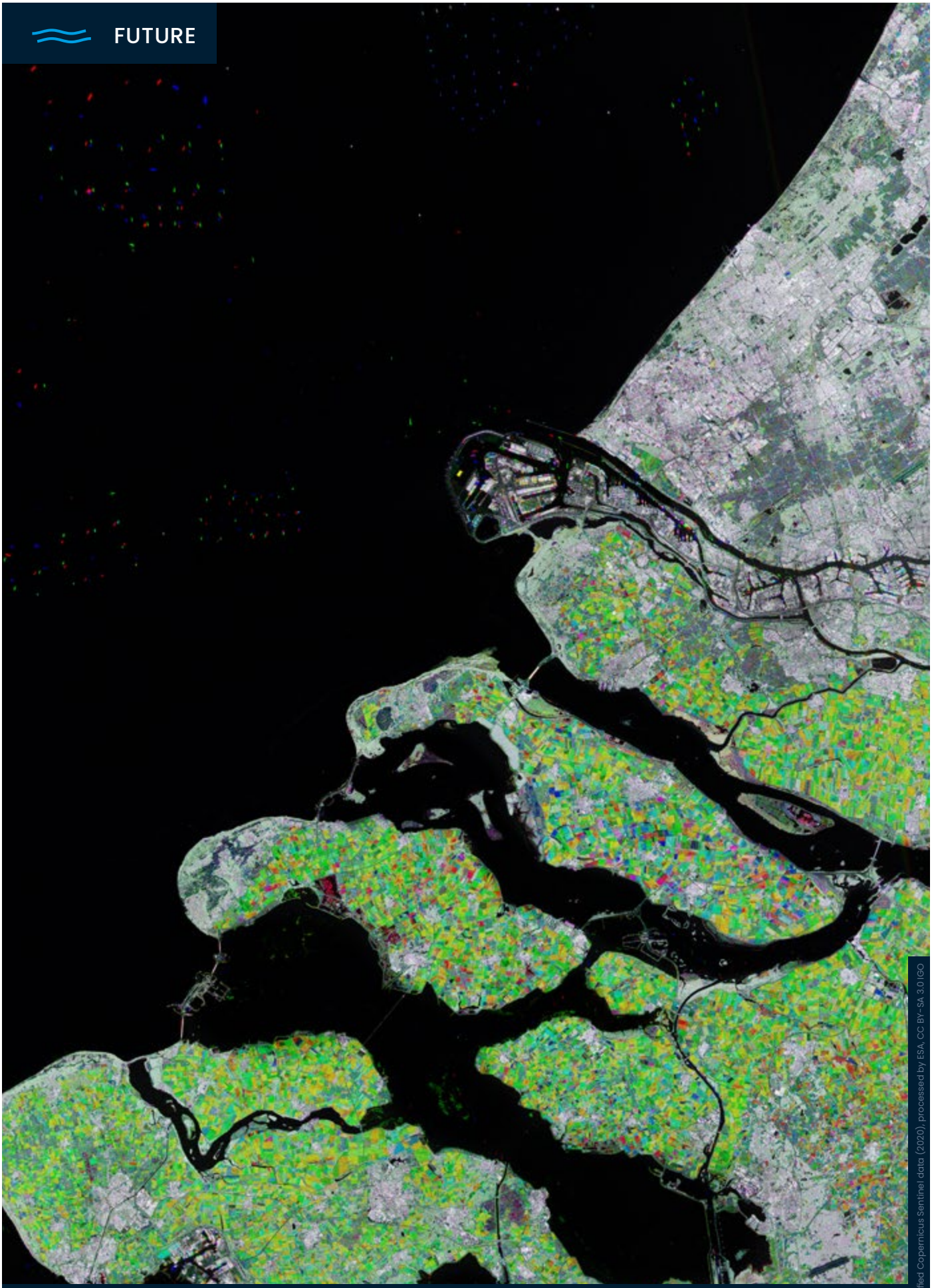
More than 80% of the Maldives' land is less than one metre above average sea level. This extremely low elevation makes the country, and its inhabitants, particularly vulnerable to rising sea levels. Satellite data has shown that, globally, the ocean has risen an average of 3 mm a year over the last 25 years. But more alarmingly, satellite data shows the rate has accelerated over the last few years to around 5 mm per year. Warming ocean waters, melting glaciers, and diminishing ice sheets are making rising sea levels a real threat to low-lying islands such as the Maldives.



Stretching more than 2,000 km and covering more than 350,000 sq km, the Great Barrier Reef is the planet's largest single structure made by living organisms known as coral polyps. In recognition of its significance, the reef was made a UNESCO World Heritage Site in 1981. Image taken by Copernicus Sentinel-2A satellite.

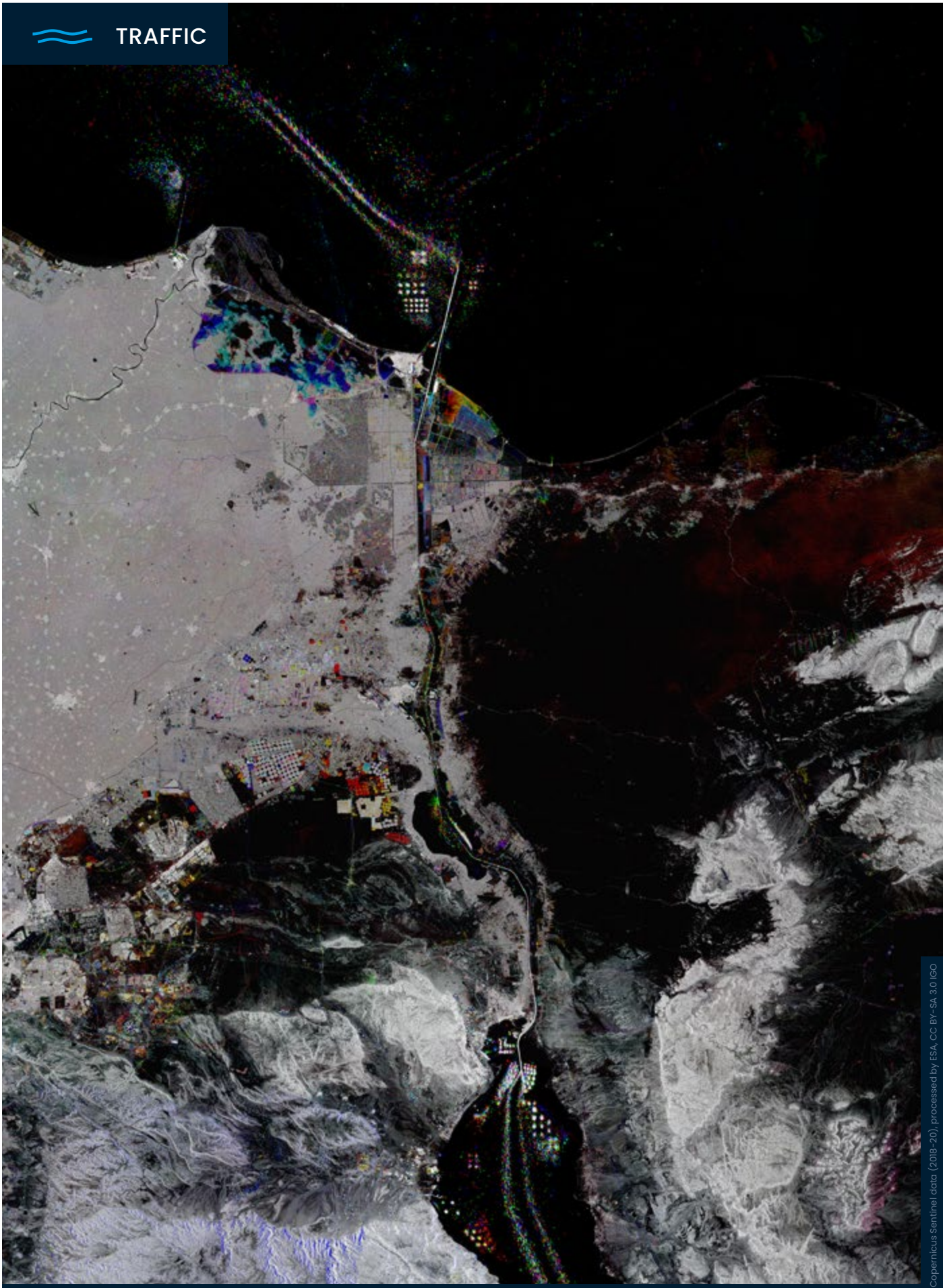


The Glorioso Archipelago National Nature Reserve is in the French Southern and Antarctic Lands, to the southwest of the Indian Ocean, at the northern entrance to the Mozambique Channel. The Glorioso are notably a favoured breeding site for green and hawksbill turtles, humpback whales, and seabirds.



Rotterdam and part of the Zeeland province in southwest Netherlands are featured in this radar image acquired by Copernicus Sentinel-1. The coloured dots in the North Sea are ships. Their colours indicate when they were captured by the satellite. The white dots on the left are offshore wind farms.

TRAFFIC

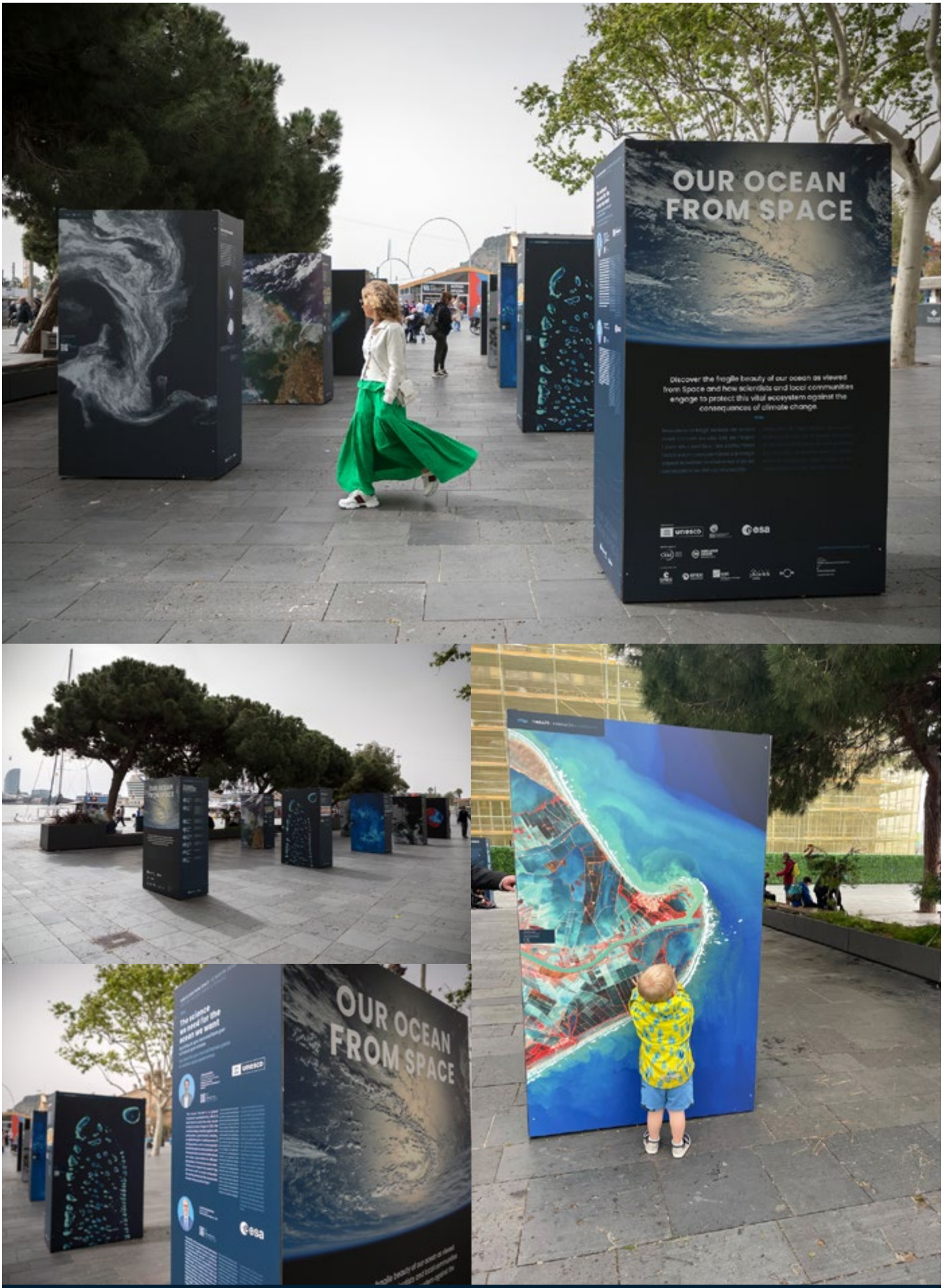


Satellites are used to monitor shipping on one of the world's most important waterways, the Suez Canal, which connects the Mediterranean Sea and Indian Ocean. The sea surface reflects the radar signal away from the satellite, which makes the water appear darker in the image. The dark waters contrast with metal objects, in this case the ships, which appear as bright dots in the somber expanse.

This image, acquired on 28 December 2020 by one of the Copernicus Sentinel-2 satellites, shows numerous seaweed farms in the South Jeolla Province, Korea. Seaweed aquaculture is common along the coast of South Jeolla Province: it produces more than 80 per cent of the seaweed farmed in Korea. In comparison to other types of food production, seaweed farming has a light environmental footprint because it does not require freshwater or fertiliser.

Captured by the Copernicus Sentinel-1 mission, this image shows the oil spill from the Grande America vessel about 300 km off the French coast on 12 March 2019. Copernicus Sentinel-1 acquired this radar image of the oil slick, the large, dark patch visible in the centre of the image, stretching about 50 km. Marine vessels are identifiable as smaller white points, which could be those assisting in the clean-up process. Satellite radar is particularly useful for monitoring the progression of oil spills because the presence of oil on the sea surface dampens down wave motion. Since radar basically measures surface texture, oil slicks show up well – as black smears on a grey background.

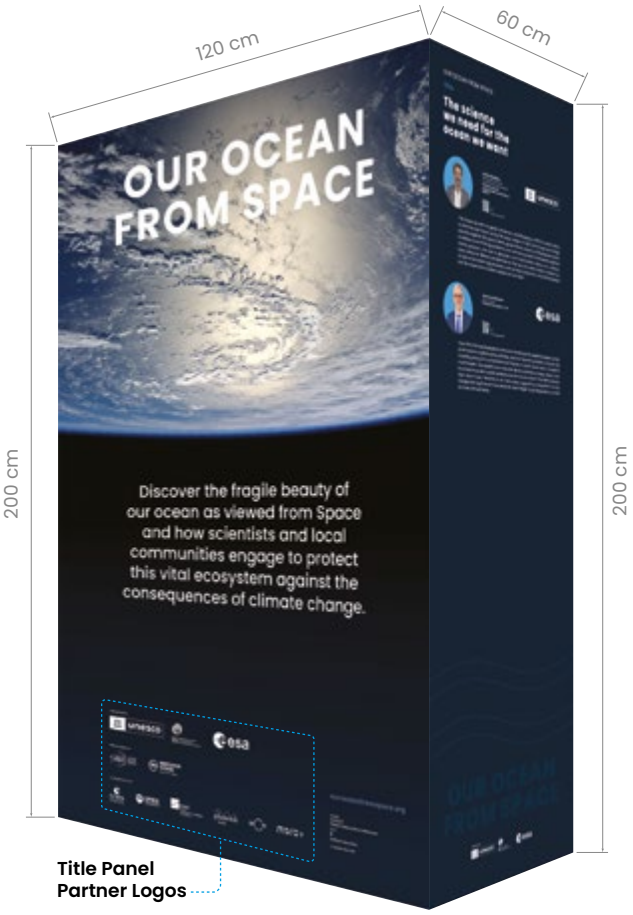
A UNESCO World Heritage site, the Wadden Sea is the largest unbroken system of intertidal sand and mud flats in the world. The site covers the Dutch Wadden Sea Conservation Area, the German Wadden Sea National Parks of Lower Saxony and Schleswig-Holstein, and most of the Danish Wadden Sea maritime conservation area. In the top-left of the image, a large algal bloom is visible in emerald-green. Harmful algal blooms caused by excessive growth of marine algae have occurred in the North Sea in recent years, with satellite data being used to track their growth and spread. These data can then be used to help develop alert systems to mitigate the damage to the tourism and fishing industries.



Our Ocean From Space Exhibition

2024 Ocean Decade Conference, Barcelona Harbour, Spain

Specifications

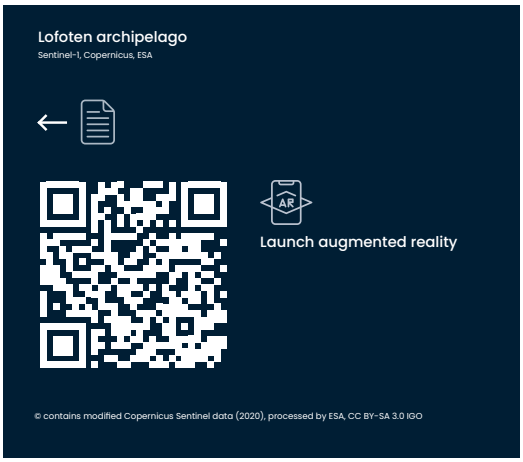


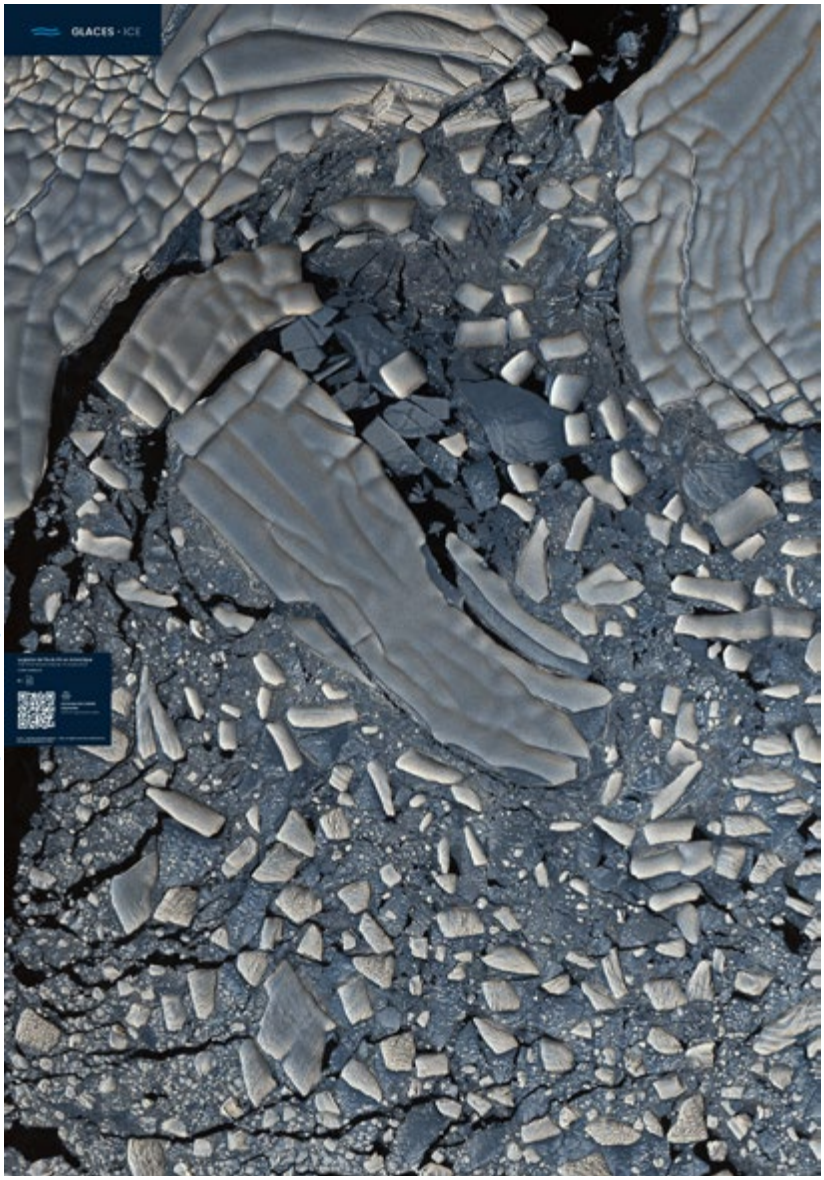
Module Specifications

- 10 modules measuring : 200x120x60 cm
- Each module is made of 4 panels : 2 panels (200x120) – 2 panels (200x60)
- Each panel is printed directly on Dibon – TIMKAT provides the print files
- A total of 40 panels will be printed : 20 panels (200x120), 20 panels (200x60)
- The host needs to hire a local provider to print, produce, and install the modules

Augmented Reality Content

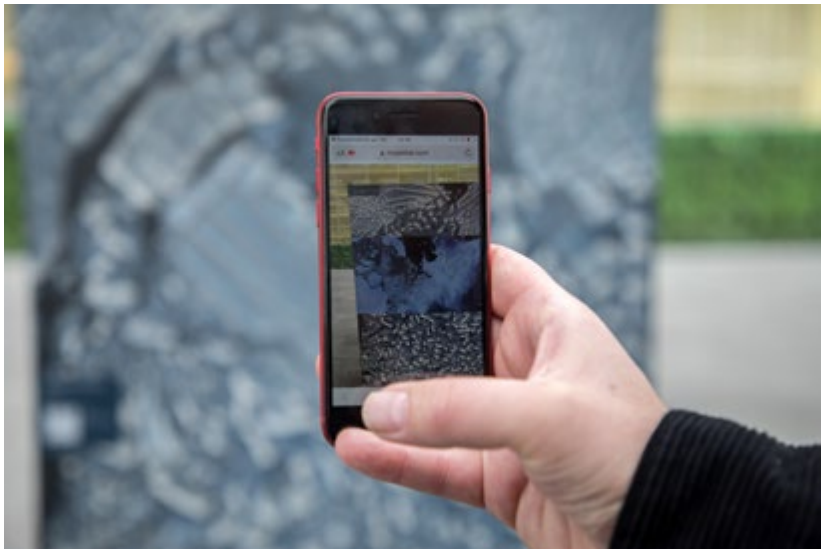
How to open AR content using a smartphone





Procedure

- Open phone camera
- Scan QR code
- Tap the notification
- Launch MyWebAR
- Allow browser to access camera
- Point smartphone at QR code on panel



Augmented Reality Testimonials

How to open AR testimonials using a smartphone

Procedure

- Open phone camera
- Scan QR code
- Tap the notification
- Launch MyWebAR
- Allow browser to access camera
- Point smartphone at QR code beside portrait

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