

European Pavilion  
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Ocean**  
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# Starfish & the Copernicus Ocean State Report

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The Ocean sustains life on Earth, regulating climate, nurturing biodiversity, supporting livelihoods, and inspiring cultures. Yet, growing human pressures threaten its health and our future. The Starfish Barometer, launched on World Ocean Day 2025, offers an accessible, science-based annual snapshot of the Ocean's state and its vital connection with humanity.

# THE STARFISH BAROMETER<sup>2025</sup>



We Shape  
the Ocean's Future.  
It Shapes Ours.

The Ocean is essential to life on Earth: it regulates the climate, supports rich biodiversity, sustains livelihoods, and shapes cultures. Yet, information about its current state remains fragmented across disciplines, reports, and institutions, often inaccessible to the general public.

- The Starfish Barometer bridges this gap by providing an annual, science-based overview of the Ocean's condition and its interdependence with humanity.
- What sets the Starfish Barometer apart is its holistic perspective.
- By making robust, evidence-based information accessible to all, the Barometer empowers informed decisions and commitments for Ocean sustainability.



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## OCEAN STATE IN 2025



The **sea is rising**. Its level has **increased globally by 23 cm** since 1901



The ocean reached its **highest recorded temperatures**



The **4th major coral bleaching record event** hit the ocean



**1,677 marine species** are **threatened with extinction**

## HUMAN PRESSURES IN 2025



Fossil fuel **CO<sub>2</sub> emissions**  
**are rising** including a **2.7%**  
**increase from shipping**



**Unsustainable fishing**  
**hits 37.7%** while **75%** of  
**large vessels go untracked**



**Rising human and**  
**climate pressures threaten**  
**ocean habitats globally**



**Plastic pollution is rising**  
but still no global system  
to monitor and assess it

## SOCIETAL HARMS IN 2025



Global **losses from tropical storms and floods** hit **US\$ 102 billion**



**Insurance premium costs** incurred by maritime activities **grew by 5.9%**



**9,002 migrants** lost their lives at sea



**US\$ 250 billion health cost** and **1,200 species** affected by marine plastic pollution



**Global protected areas  
hits 8.34%** but efforts  
are still needed



**Multilateral  
ocean governance  
advances**



**Equity rises** as  
a driving force in  
**global ocean conservation**



**Ocean literacy  
is gaining  
global momentum**



## OPPORTUNITIES FOR HUMANITY IN 2025



**Marine animal food  
production** reached a  
**record 115 million tonnes**



The **marine-derived  
health market** is growing  
amid high inequality



**US\$ 2.6 trillion ocean  
economy** powers  
**134 million jobs**



**Small-scale fisheries** support  
**88% of marine harvest jobs**  
and **US\$ 51.8 billion**



The sea is rising – its level has increased by 23 cm since 1901



1,677 marine species are currently at risk of extinction



37.7% of fish stocks are overexploited



Global losses from tropical storms and floods hit US\$102 billion



Marine food production is at a record high of 115 million tonnes



We have set policies to protect 8.34% of the ocean

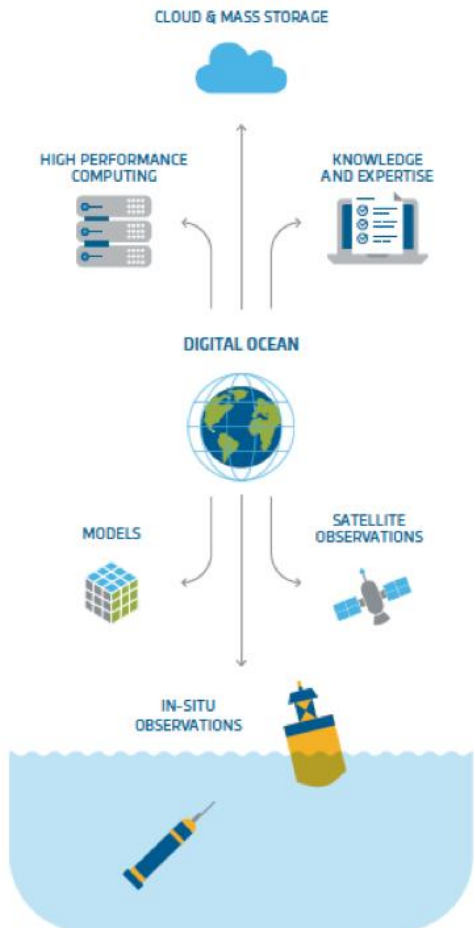


## Karina von Schuckmann

Mercator Ocean international



## Copernicus Service



## Scientific expertise



## Copernicus Ocean State Report



Combining evidence and knowledge to inform...



- **ISSUE 9:** accepted/under review
- **ISSUE 10:** in preparation



- Annual publication of Copernicus Marine Service, implemented by Mercator Ocean International.
- Provides a state-of-the-art reference for the variability, changes, and state of the ocean, incl. new methods & tools, relevant scientific knowledge, and recent unusual events
- Provides key inputs that support major EU and international policies & initiatives
- Collaboration of more than 150 scientific experts from more than 25 European institutions



# THE COPERNICUS OCEAN STATE REPORT: CONTENT

## CHAPTER 1



Synopsis of the ocean state & marine environment over the past decades

## CHAPTER 2



Indicator reviews and new science pathways and updates

## CHAPTER 3



Science-based ocean knowledge for policy & society

## CHAPTER 4



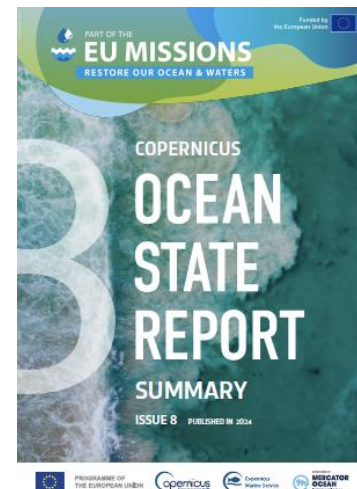
Science-based ocean knowledge for recent events



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# THE REPORT AT A GLANCE



## Unprecedented Marine Heatwaves

Strong and extreme marine heatwaves have grown in frequency, duration, intensity and geographical spread over the past four decades.

22 %

of the global ocean surface experienced at least one severe to extreme marine heatwave event in 2023



## Marine Heatwaves in Europe/Northeast Atlantic and Adjacent Seas

In the northeast Atlantic Ocean and nearby seas, marine heatwaves grew stronger, more frequent, larger and longer over the past few decades. Areas of this region suffering marine heatwaves in any given year grew from around 20 % to over 90 % between 1982 and 2023.



## Rising Ocean Heat Content

A new method to measure Earth's energy budget shows a significant positive trend of  $0.75 \text{ W m}^2$  over the period 1993-2022, indicating continued warming of the ocean.



## Unexpected Bloom

An extreme phytoplankton bloom was detected southeast of Crete in 2022, caused by a strong and unusual cold spell across the eastern Mediterranean Sea. The event led to a 35 % rise in annual primary productivity in the area, which may have impacted marine life across food chains.

↑ 35 %

rise in annual primary productivity



## Sea Ice

2023 saw the lowest sea ice on record in the world's polar regions. The Arctic region lost 4 % of sea ice per decade during the period 1979-2023, followed by an increase in surface water temperature in the region. Meanwhile, the Antarctic region reached the lowest ever sea ice value since the beginning of satellite observations.

↓ 4 %

mean annual sea ice lost in the Arctic per decade since 1979



## Deep Marine Heatwaves

A marine heatwave in the Mediterranean Sea reached up to 1,500 m below the surface. While heatwaves were more frequent at the surface, temperatures rose further and for longer beyond 150 m.



## Record-Breaking Wave Events

The tallest 5 % of global ocean waves have grown much higher in recent years. A violent storm that struck Melilla, Spain in April 2022 broke several records at once, with towering, enduring waves sweeping over the port and disrupting maritime operations.

## Key Ocean Innovations

New tools and technologies are helping to monitor the ocean and support our society. This includes safeguarding marine life to bolster aquaculture, state-of-the-art wave analysis which could improve coastal protection, and a pioneering technique to power heat pumps with thermal energy from the ocean.



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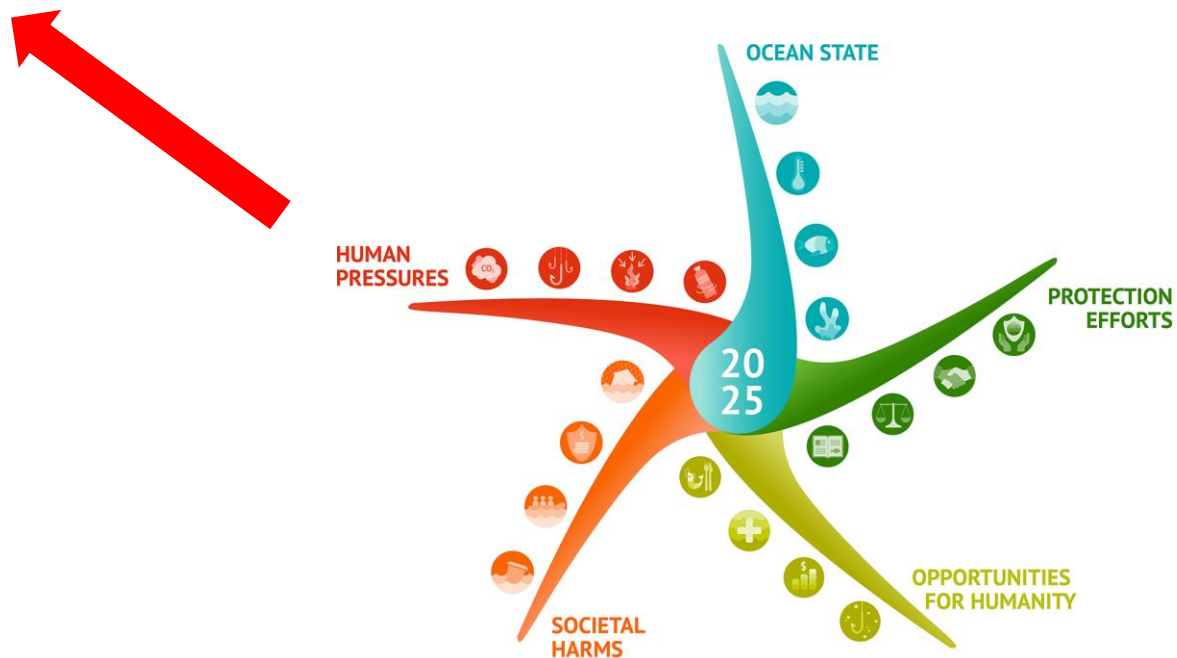








Science-based ocean knowledge for policy & society

## CHAPTER 4



Science-based ocean knowledge for recent events



-  The sea is rising – its level has increased by 23 cm since 1901
-  Global losses from tropical storms and floods hit US\$ 102 billion
-  We have set policies to protect 8.34% of the ocean
-  1,677 marine species are currently at risk of extinction
-  Marine animal food production reached a record of 115 million tonnes
-  37.7% of fish stocks are overexploited



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## WRAP-UP

