

European Pavilion
**Digital
Ocean**

Nice | France
2 - 13 JUNE 2025

Ocean and Climate Monitoring: a Copernicus Climate Change Service Perspective

12th June, 2025





Dr Samantha Burgess

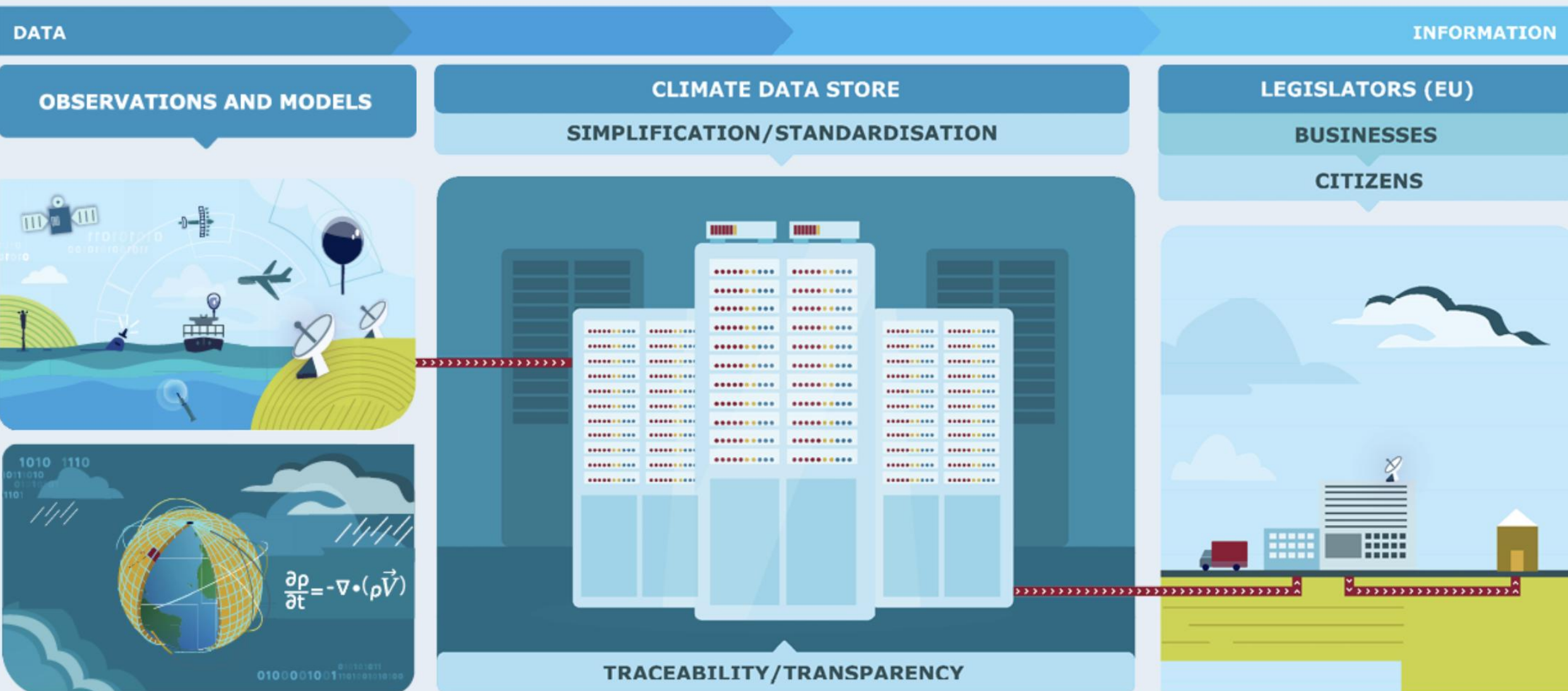
Copernicus Climate Change Service,
ECMWF

@OceanTerra.org

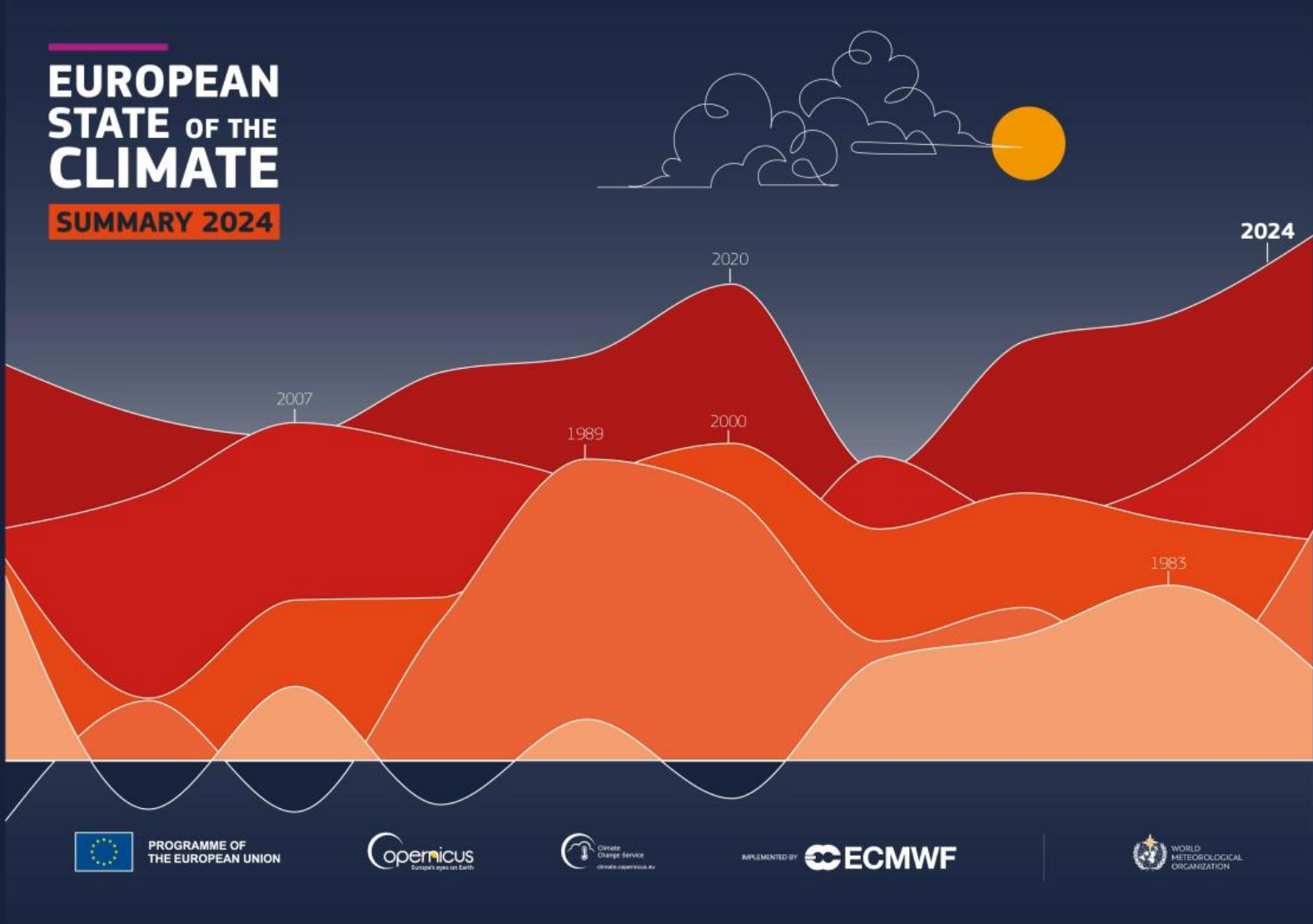




C3S – provision of climate data and services to society



Climate monitoring

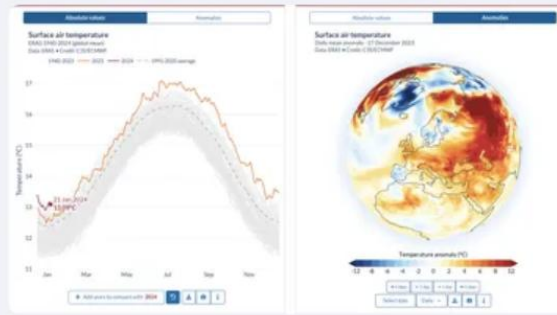


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Climate applications

- Accessible climate intelligence to inform policy
- Explore near real time updates of the global ocean
- Compare past trends and future changes with different scenarios



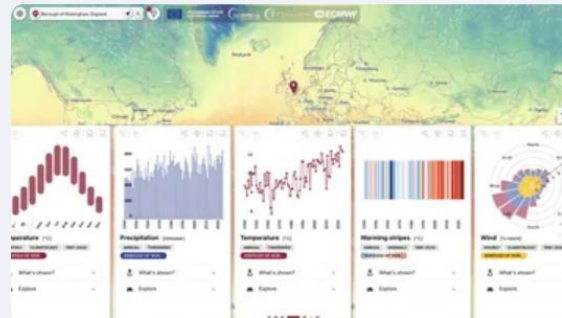
Climate Pulse [🔗](#)

Climate Pulse visualises near-real-time updates of global average air- and sea-surface temperatures from ECMWF's flagship ERA5 reanalysis



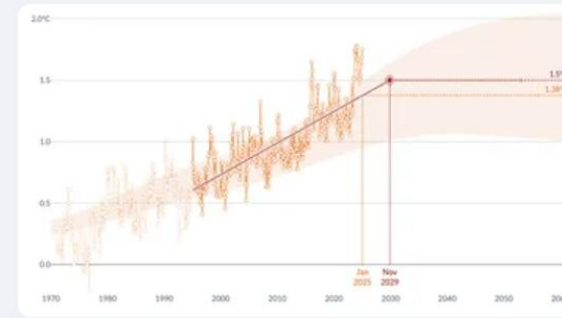
Copernicus Interactive Climate Atlas [🔗](#)

The Copernicus Interactive Climate Atlas provides graphical information about recent past trends and future changes (for different scenarios and global warming levels)



ERA Explorer [🔗](#)

Use the ERA Explorer to discover historical climate data from anywhere on earth, powered by the ERA5 reanalysis dataset.



Global temperature trend monitor [🔗](#)

The global temperature trend monitor keeps track of the rate at which we approach 1.5°C of global warming - a limit agreed under the Paris Climate Agreement.



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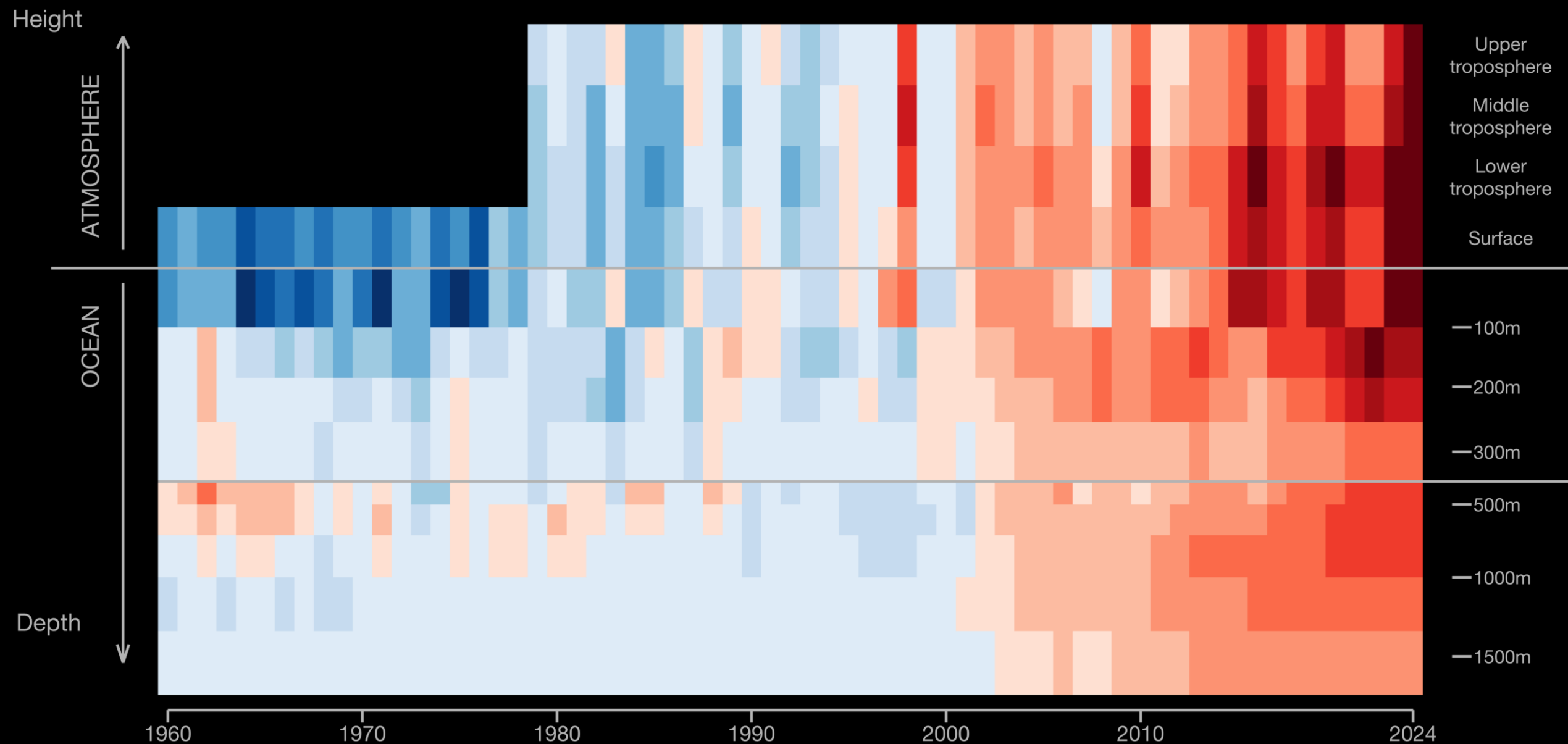


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Global temperature change in the atmosphere and ocean (1960-2024)



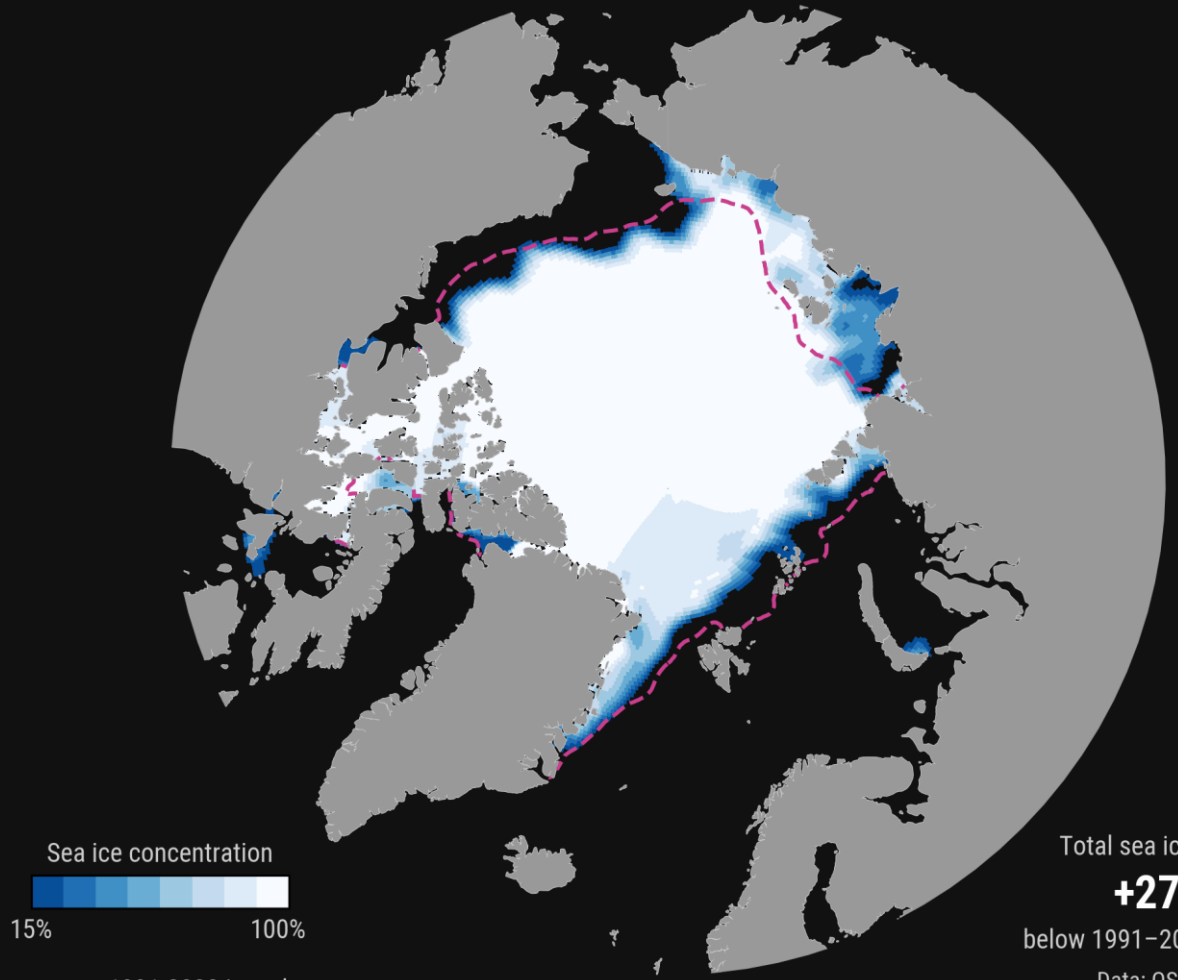


The Arctic is the fastest warming place on our planet



Arctic sea ice • September 1979

Data: ERA5 & OSI SAF Sea Ice Index v2.2 • Credit C3S/ECMWF/EUMETSAT



Sea ice concentration
15% 100%

--- 1991-2020 ice edge

Total sea ice extent
+27%
below 1991-2020 average
Data: OSI SAF



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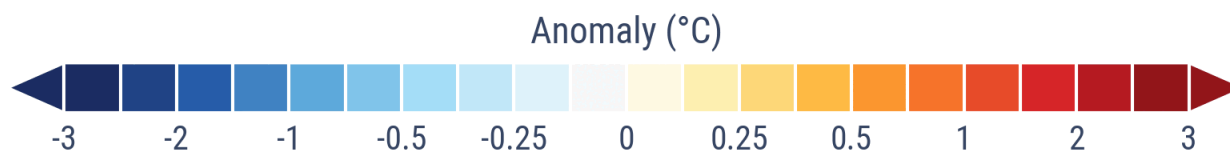
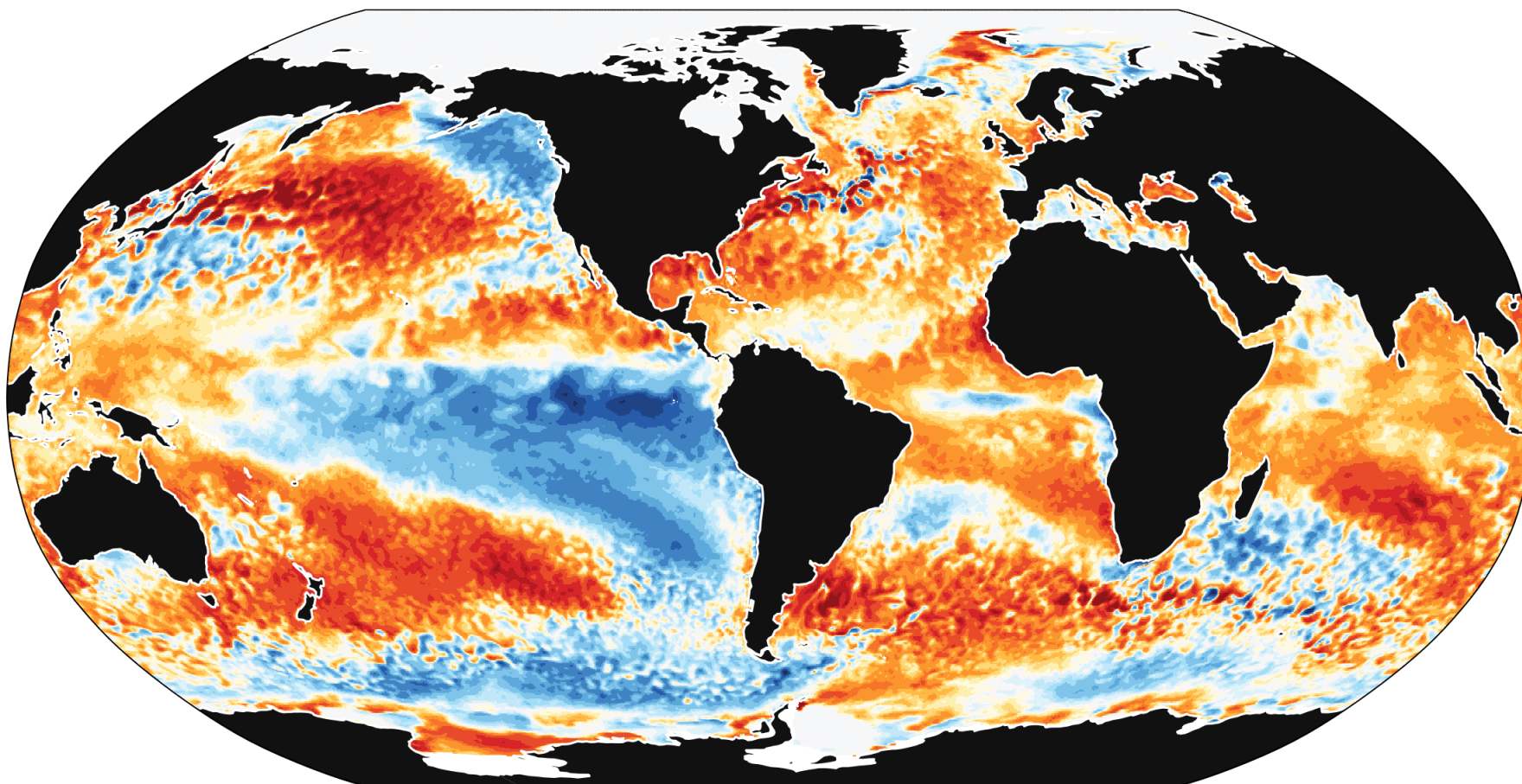
IMPLEMENTED BY **ECMWF**





Sea surface temperature anomaly • Jan 2022

Data: ERA5 • Reference period: 1991–2020 • Credit: C3S/ECMWF



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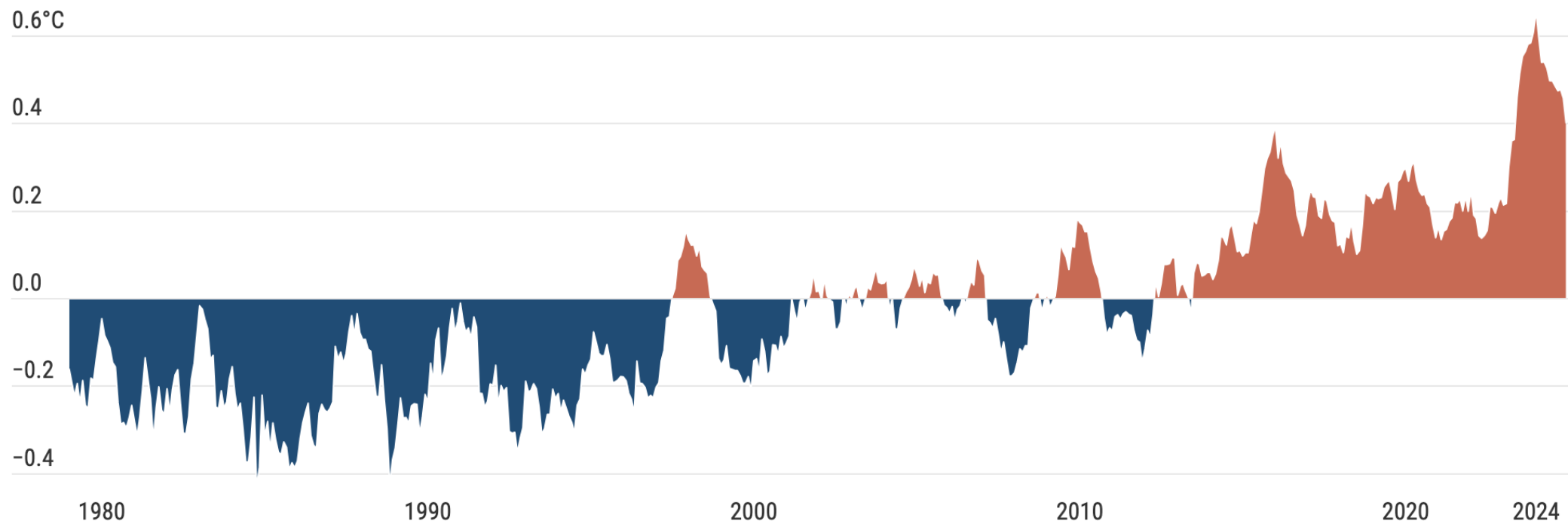
A rapidly warming ocean



Sea surface temperature anomalies

Data source: ERA5 • Reference period: 1991–2020 • Credit: C3S/ECMWF

Global (60°S–60°N)



Annual sea surface temperatures reached record highs in 2023/2024

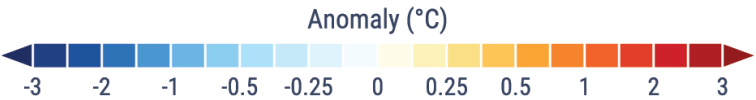
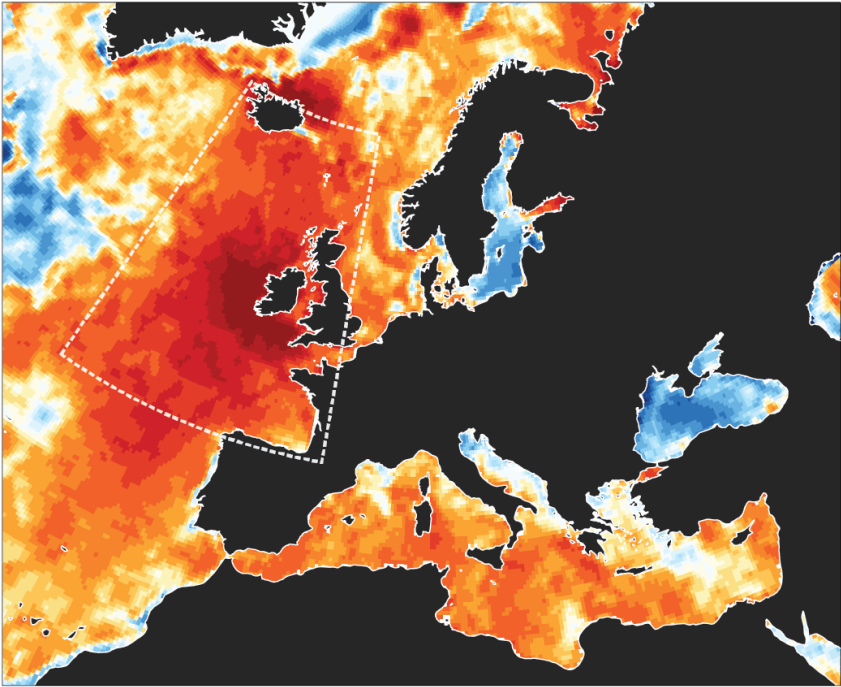
Marine heatwaves are increasing in intensity and frequency



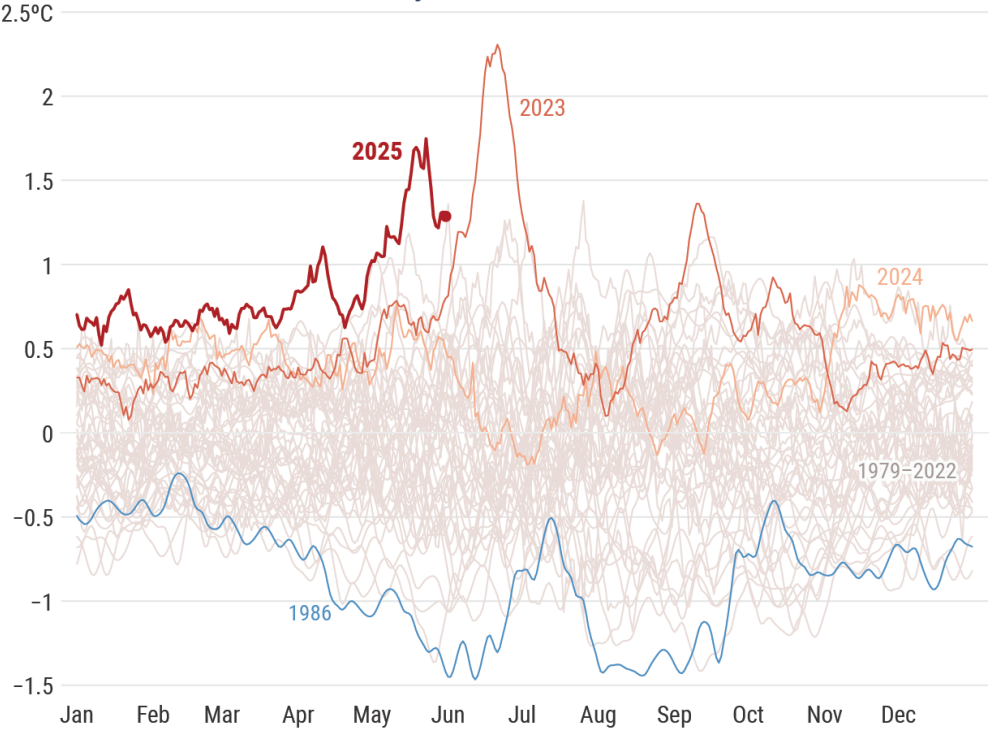
Sea surface temperature (SST) anomalies in northeastern North Atlantic

Data: ERA5 • Reference period: 1991–2020 • Credit: C3S/ECMWF

SST anomaly on 23 May 2025



Daily SST anomalies



Northeastern North Atlantic defined as 25W–0E, 43N–66N



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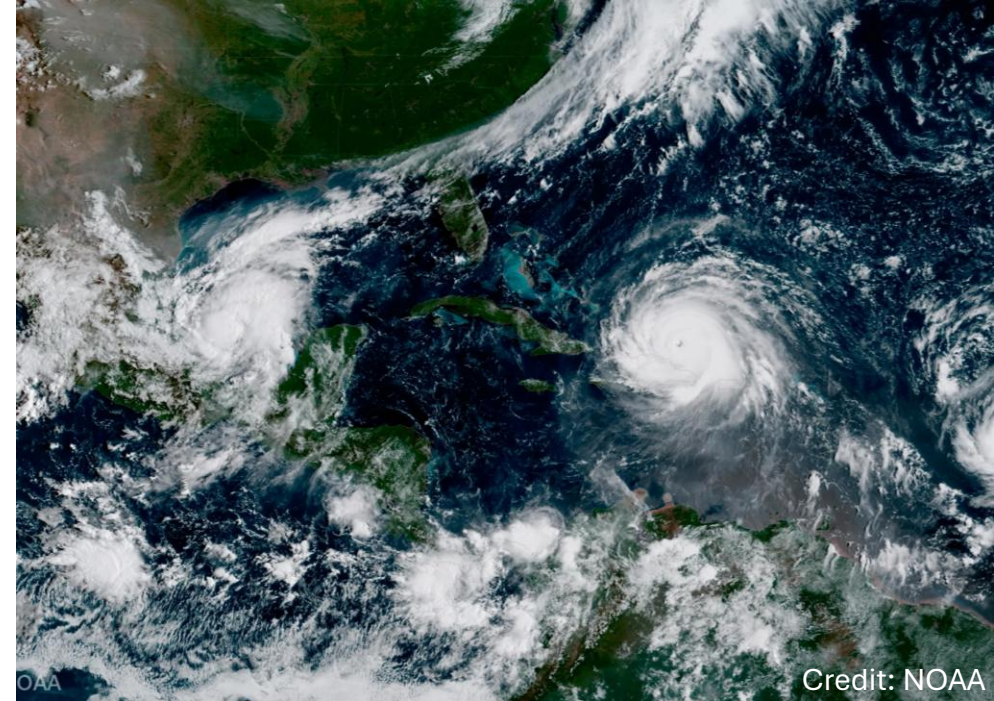


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Credit: Brook Pyke



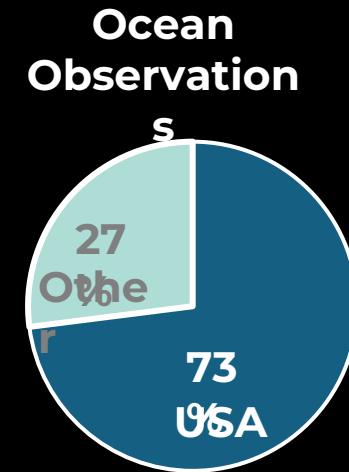
Credit: NOAA



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Ocean observations are more critical than ever

- The ocean is changing rapidly
- Monitoring has never been more important
- Any satellite or in situ observational gaps impair our knowledge and ability to mitigate and adapt to current and future changes
- Achieving SDG14 and other international policy instruments rely on observations and new science



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