

WMO State of the Global Climate 2023

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WORLD
METEOROLOGICAL
ORGANIZATION



What is the State of the Climate report?

Annual report on the State of the Global Climate covering:

- Key climate indicators
- High-impact weather and climate events
- Socioeconomic impacts

Wide range of inputs:

- WMO Members provide detailed summaries of weather and climate events
- Scientific experts providing specific information on key indicators
- UN agencies provide information on broader socioeconomic impacts
 - UNHCR, IOM, FAO, WFP, UNEP, UNDRR, IOC/UNESCO

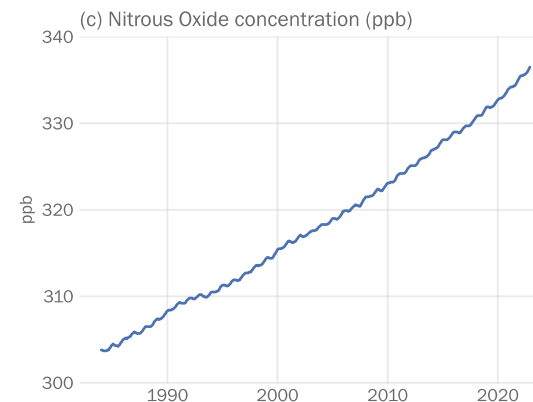
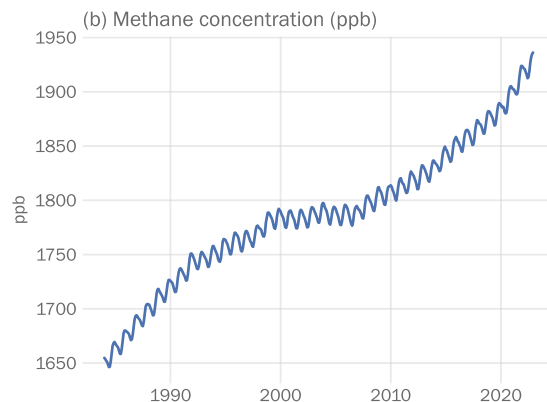
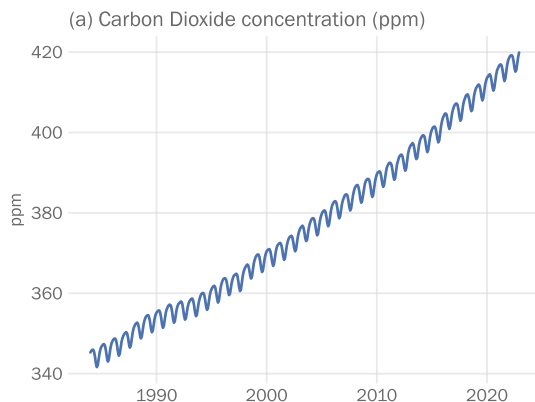
Regional State of the Climate reports produced for Africa, Asia, Latin America and the Caribbean, Southwest Pacific and Europe

Decadal report (to be released 5th December 13:15-14:15)

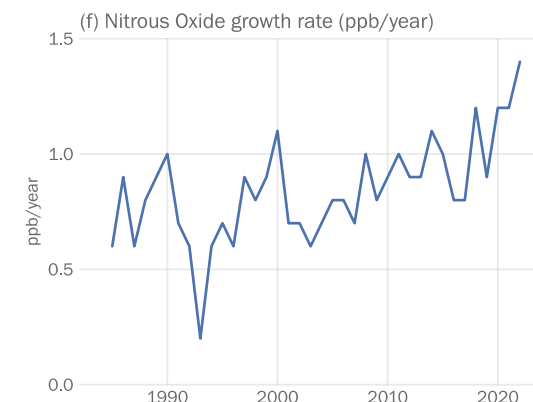
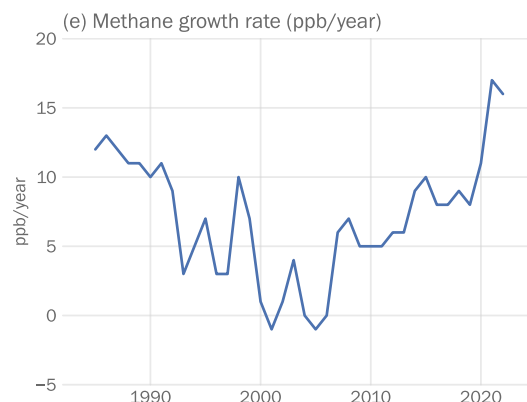
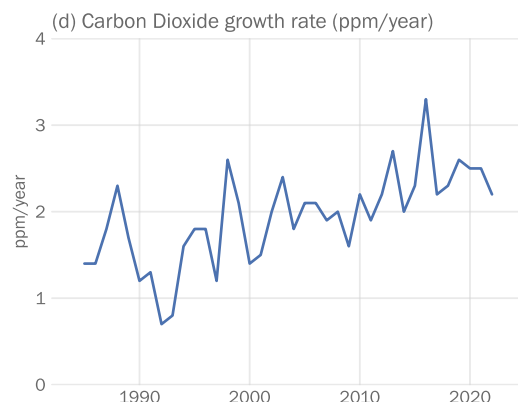


Greenhouse gas concentrations reached record global levels in 2022

Atmospheric concentration



Growth rate



Carbon dioxide
417.9 ± 0.2 ppm
150% of pre-industrial

Methane
1923 ± 2 ppb
266% of pre-industrial

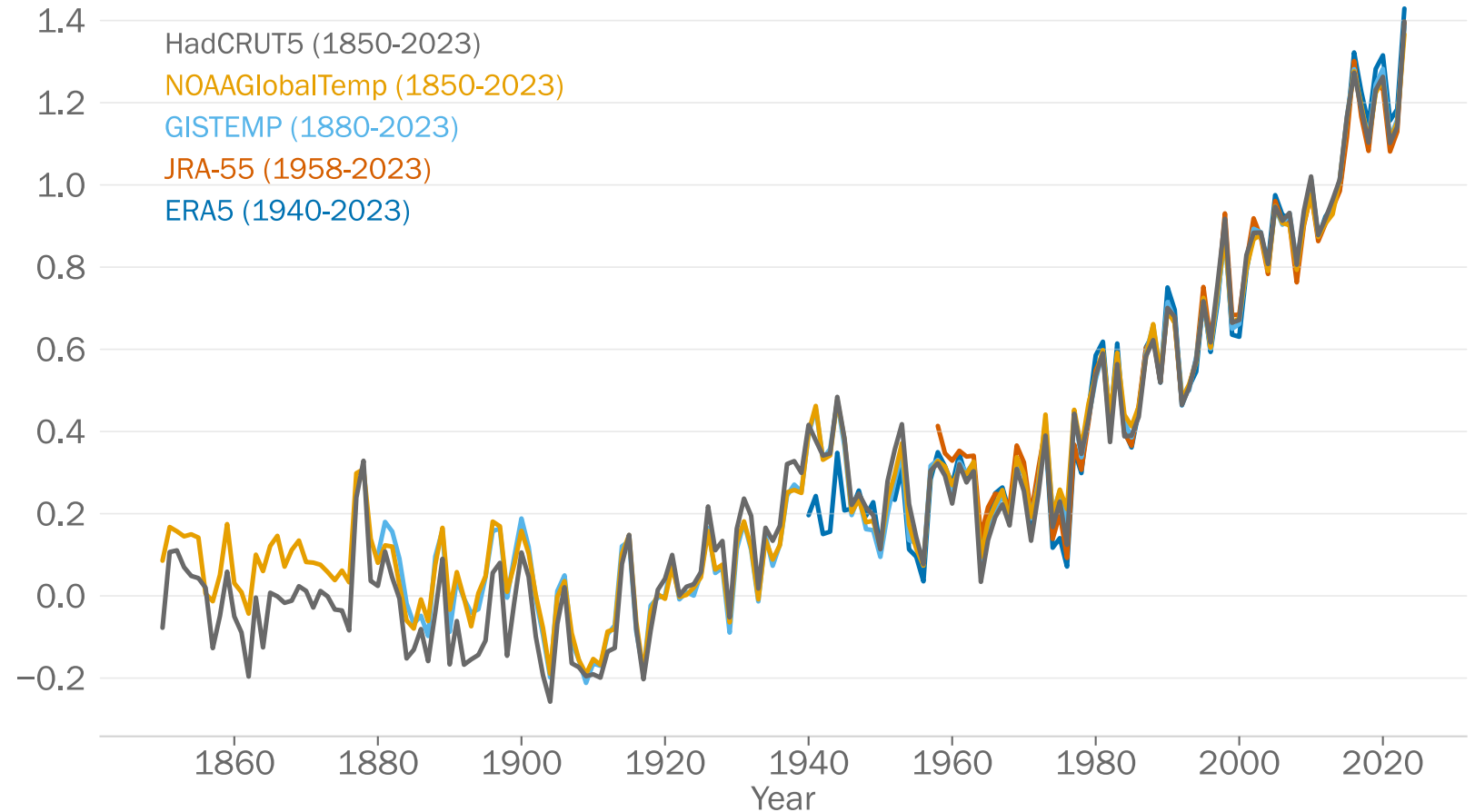
Nitrous oxide
335.8 ± 0.1 ppb
124% of pre-industrial



2023 on track to be warmest year on record

- Based on data to October 2023
- 2023 $1.40 \pm 0.12^\circ\text{C}$ above the 1850-1900 average.
- 2023 virtually certain to be the warmest year on record
- Nine years, 2015-2023, will be the nine warmest years on record.
- The ten-year average 2014-2023 is the warmest 10-year period on record.

Global Mean Temperature Difference ($^\circ\text{C}$)
Compared to 1850-1900 average

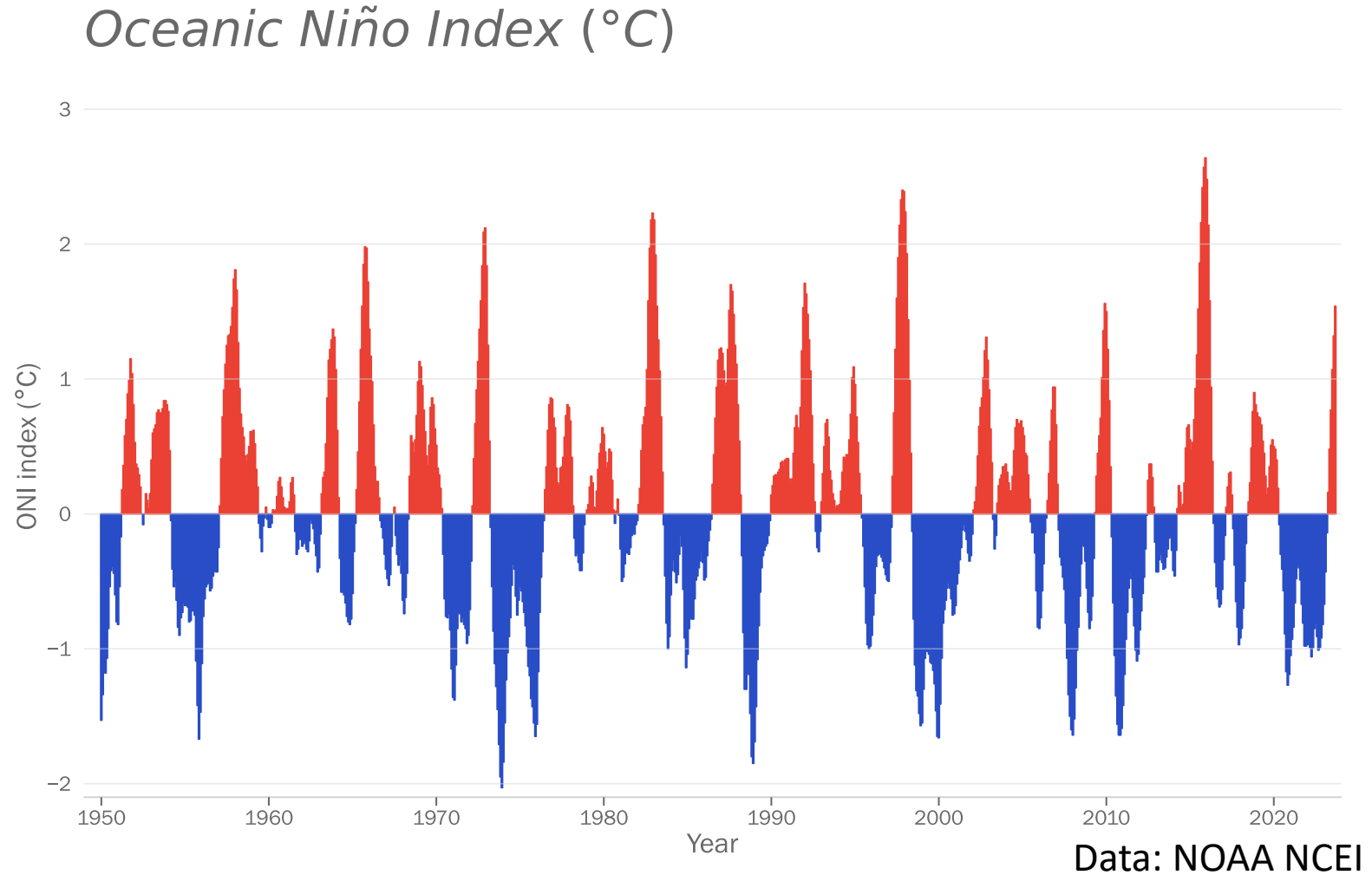


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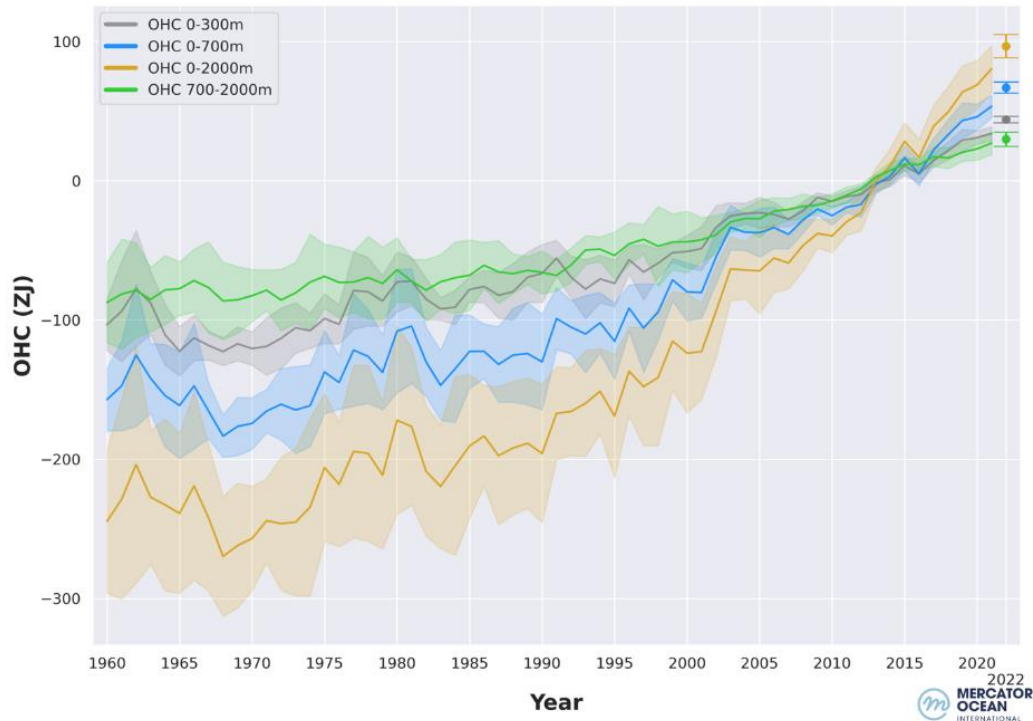


Transition from La Niña to El Niño

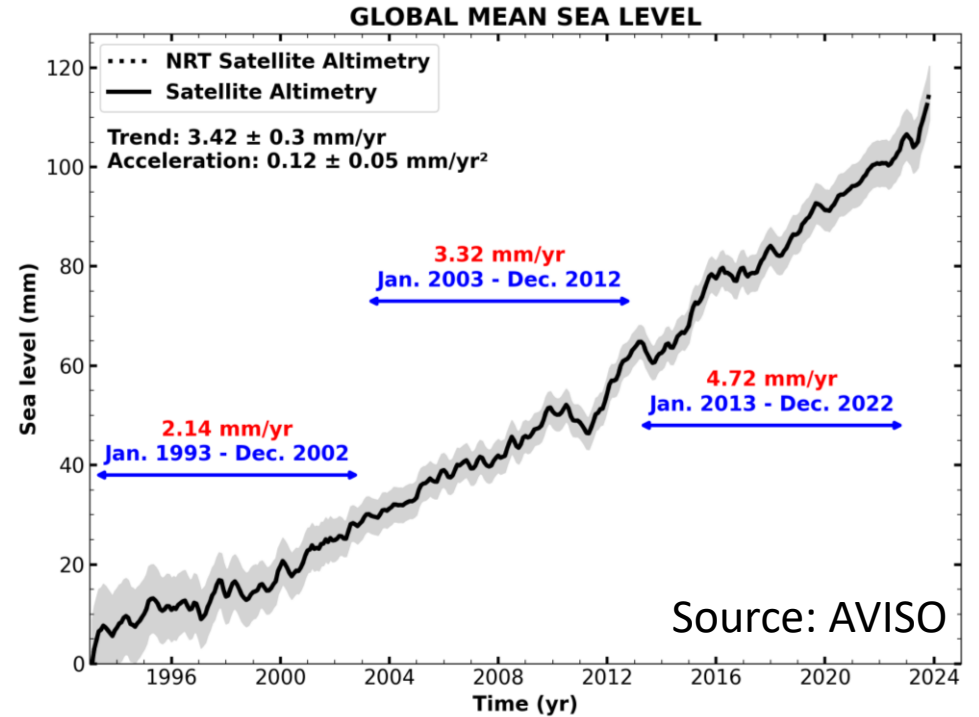
- Past three years La Niña, typically associated with lower global temperatures
- This year transition from La Niña at the start of the year to El Niño.
- Likely to continue through the end of the year
- Effects on temperature and precipitation



The ocean continues to warm and sea levels to rise



- Around 90% of the energy that accumulates in the Earth system is taken up by the ocean.
- Ocean heat content reached its highest level in 2022
- Ocean warming rates show a particularly strong increase in the past two decades

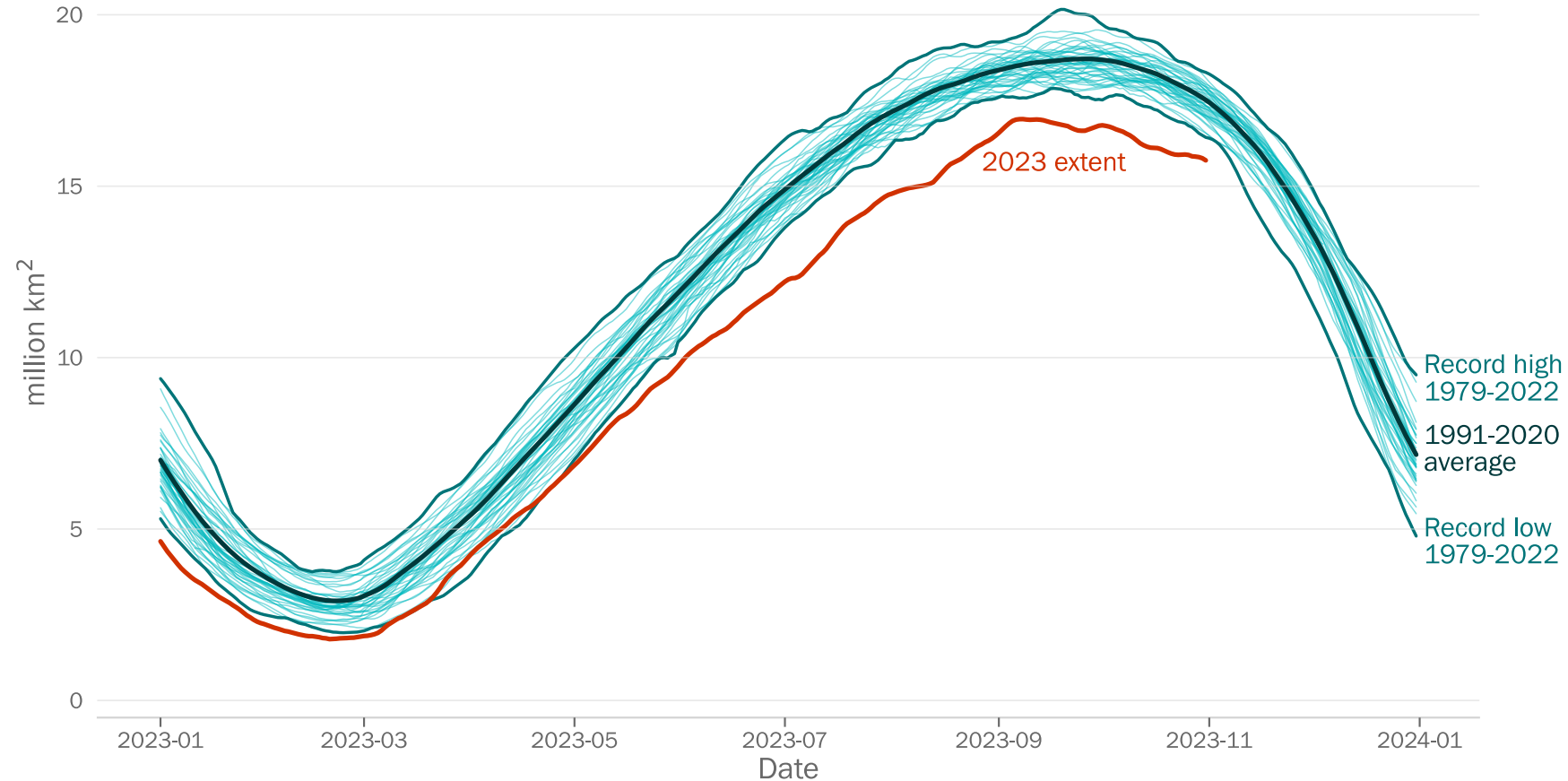


- In 2023, global mean sea level reached record high in the satellite record
- Rate of global mean sea level in rise in the past ten years is more than twice the rate of sea level rise in the first decade of the satellite record

Sea ice

- Exceptional low Antarctic sea-ice extent in 2023
- Lowest recorded minimum and maximum extents
- Arctic sea ice remained below the long-term average
- Annual minimum was 6th lowest on record

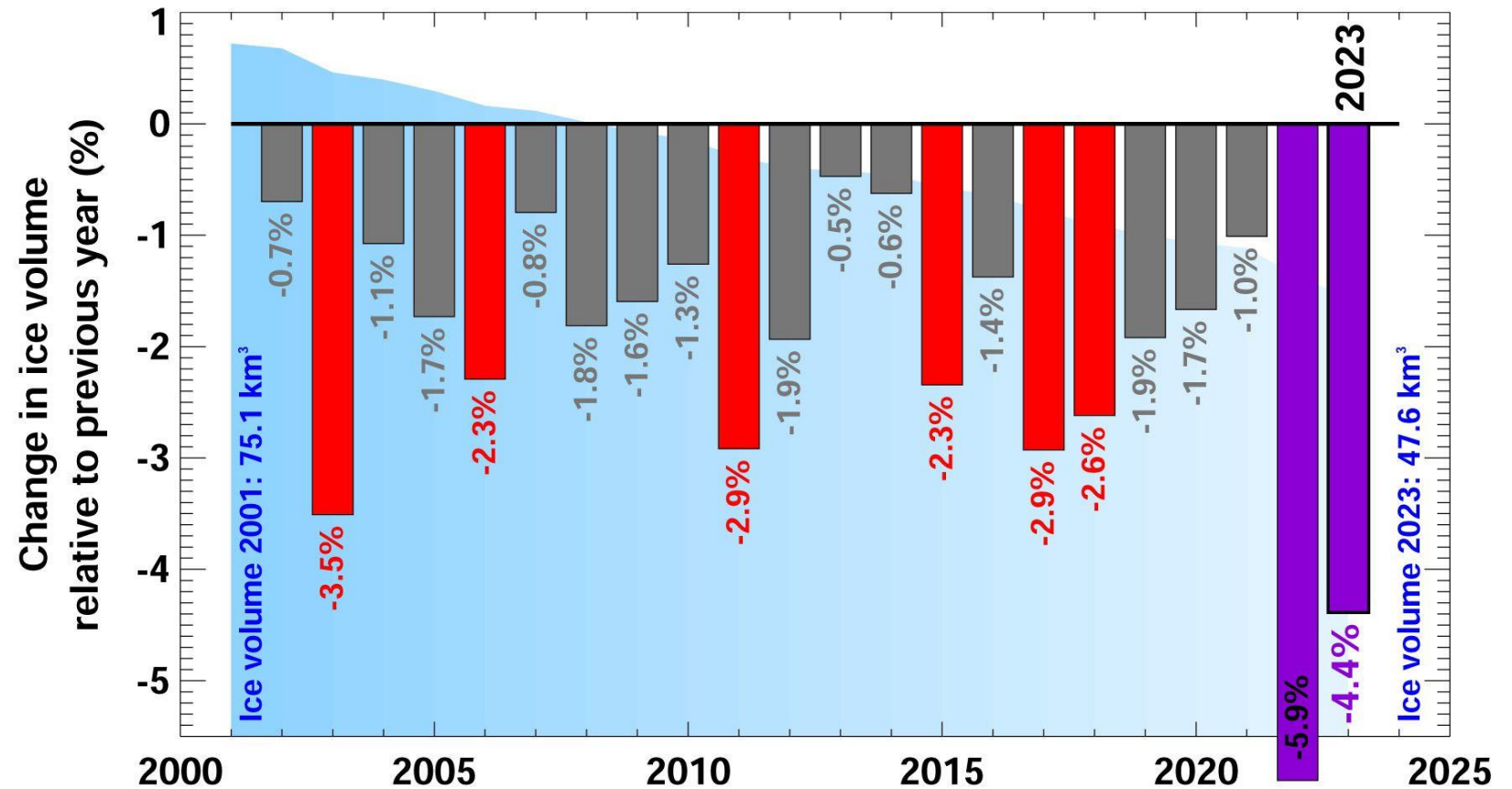
Daily Antarctic Sea-ice Extent 1979-2023 (million km²)



Data: U.S. National Snow and Ice Data Center

Glaciers

- Glaciers in western North America and the European Alps experienced an extreme melt season.
- Swiss glaciers lost around 10% of their remaining volume in the past two years



Source: Glacier Monitoring Switzerland

High-Quality Global Data Management Framework for Climate

International collaborative initiative that enables effective development and exchange of high-quality climate data based on reliable information systems and standards at global, regional and national levels by:

1. Promoting data management standards and best practices for ensuring high quality datasets for use in climate science, policy and services.
2. Evaluating maturity of climate data, identifying gaps and improving stewardship.
3. Enabling quick discovery and access to relevant high-quality datasets.



<https://community.wmo.int/en/high-quality-global-data-management-framework-climate-hq-gdmfc>

Thank you

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