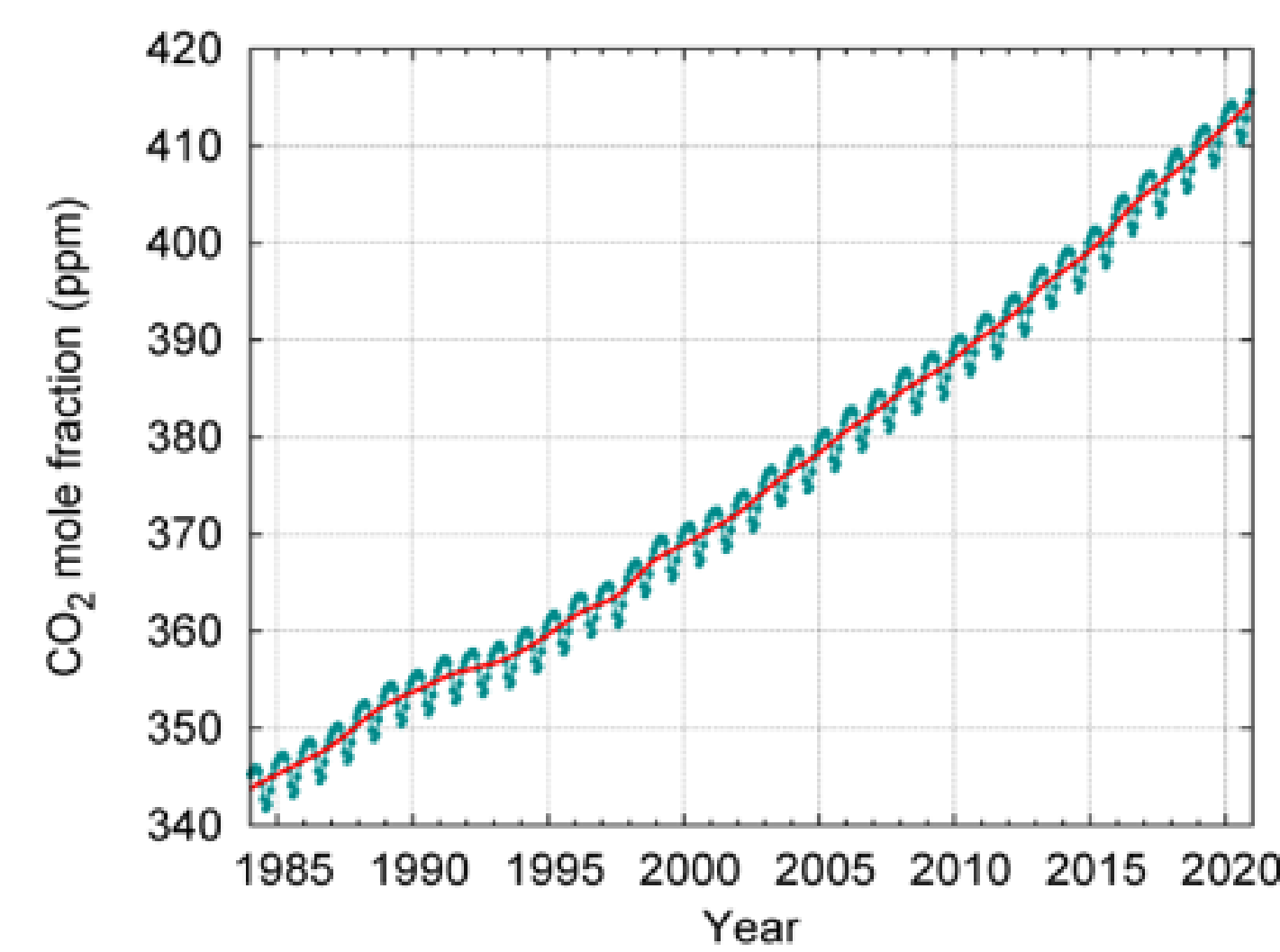


# WMO State of the Global Climate 2021

## Key Climate Indicators

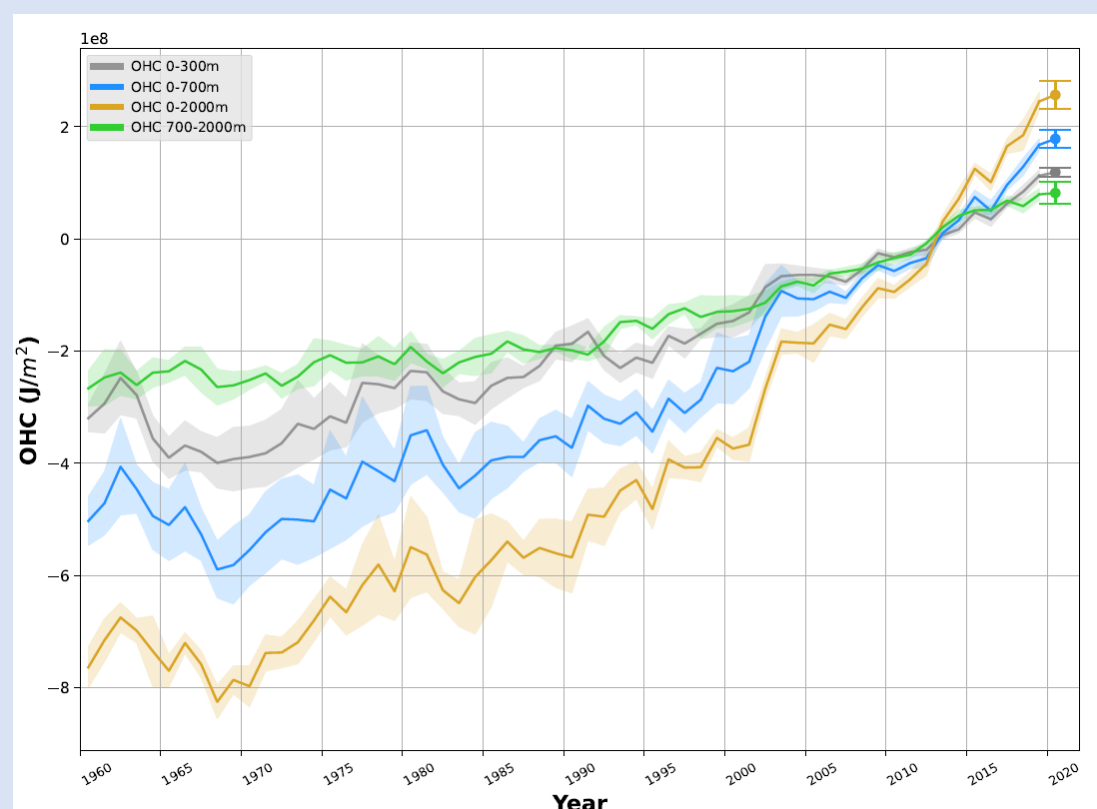
HEAT

Greenhouse gases reached record highs in 2020, 2021

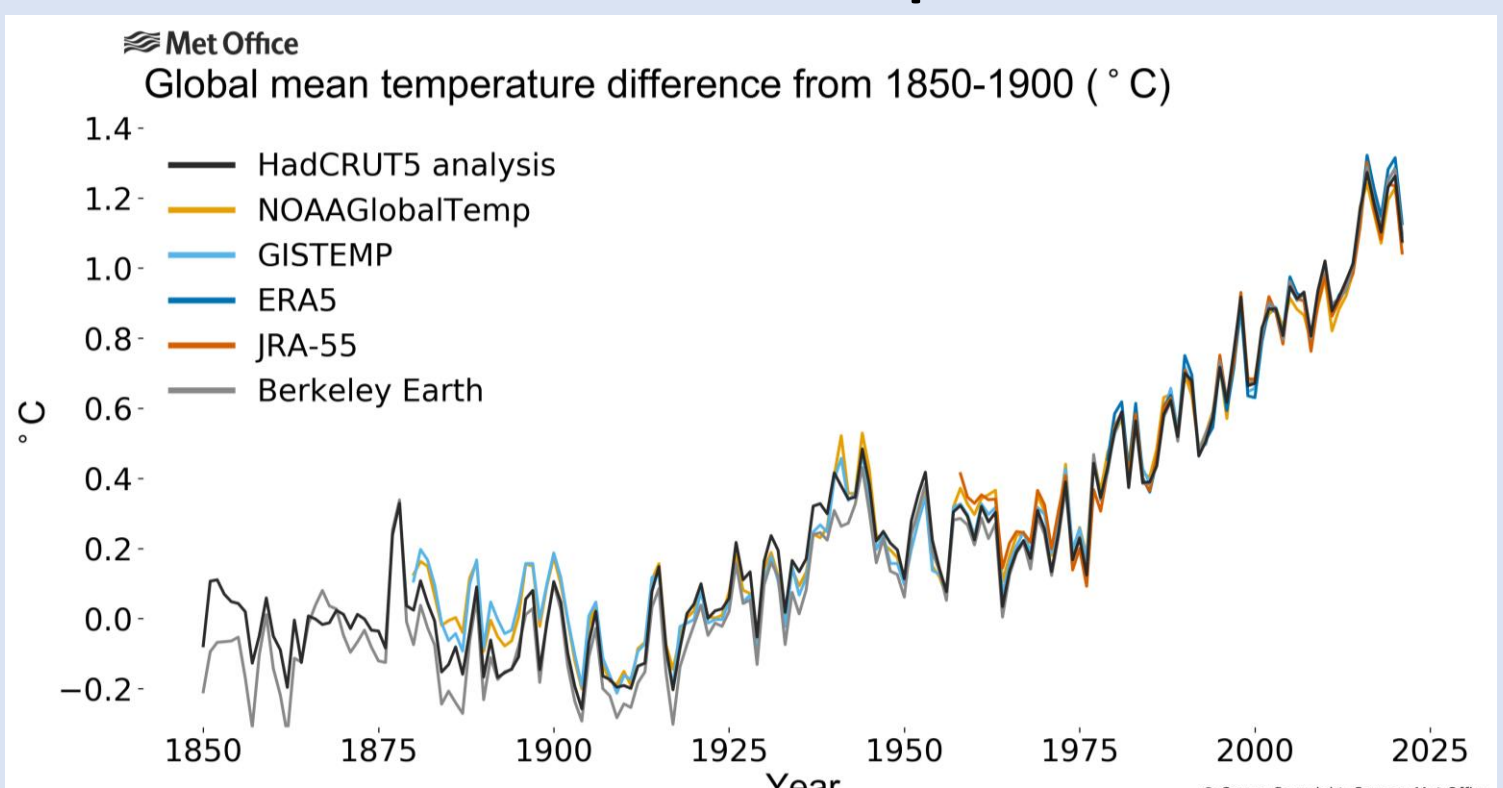


CO<sub>2</sub>

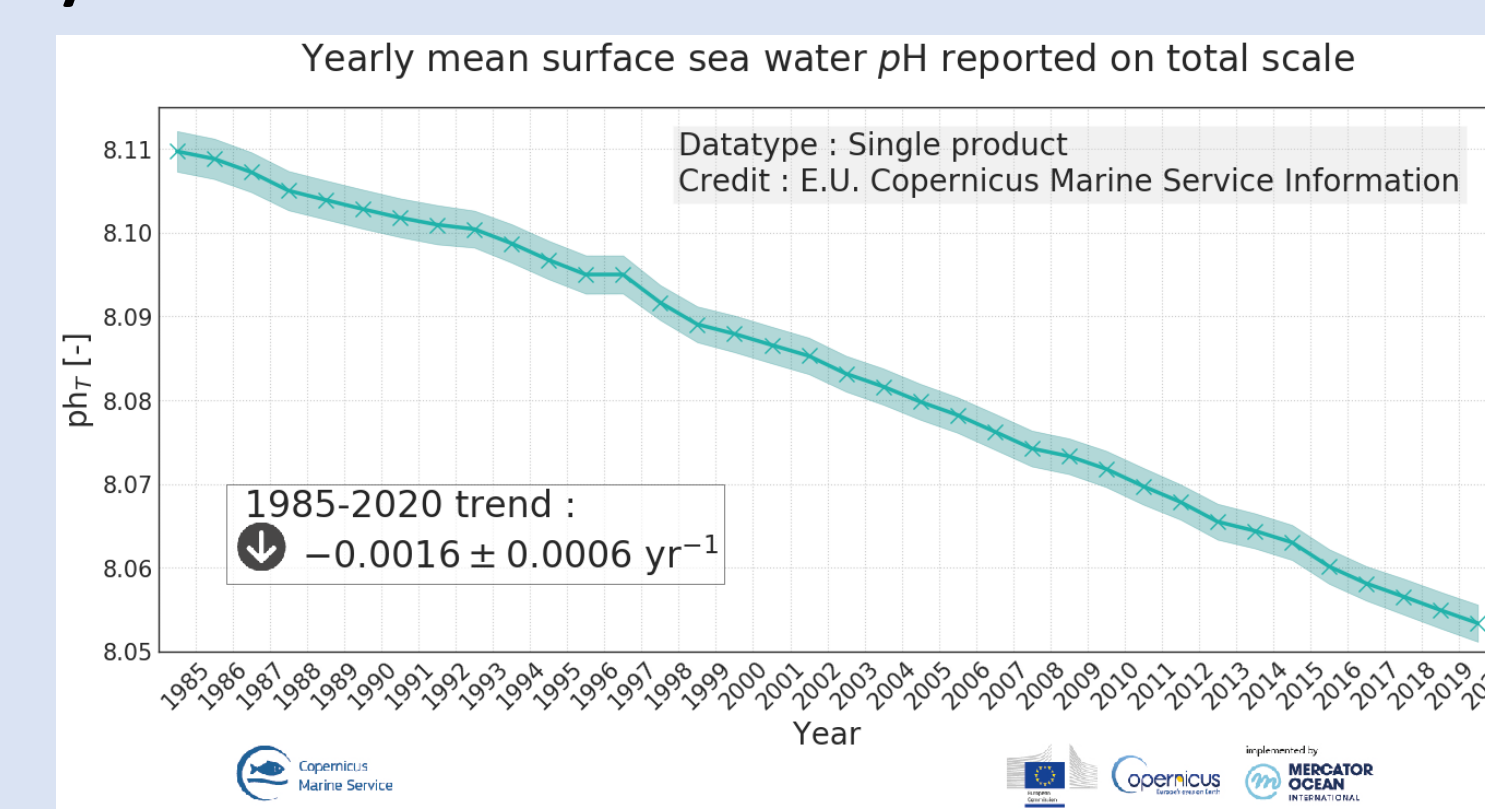
Ocean heat content record high in 2020



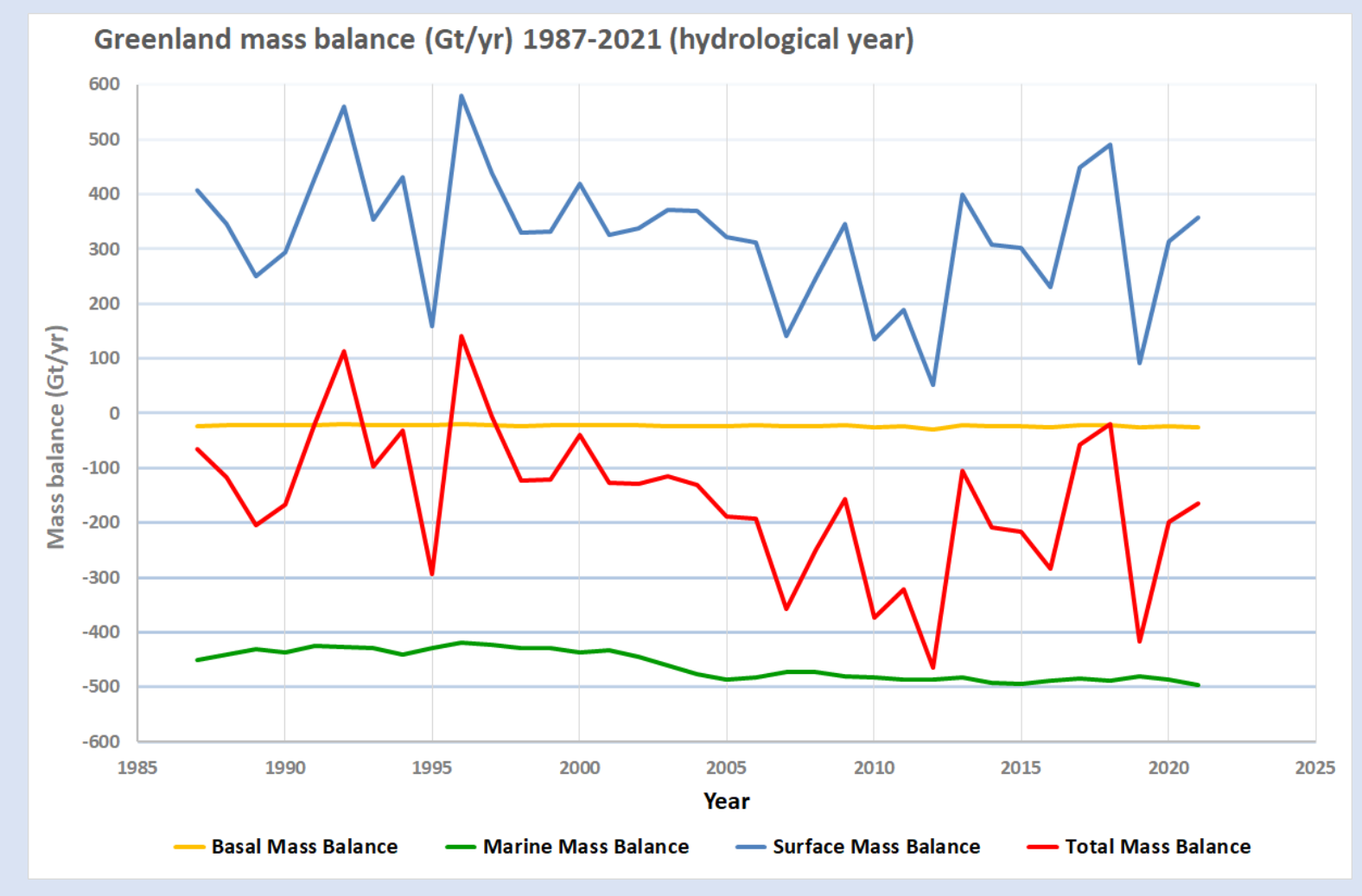
Global mean temperature 2021 1.08±0.13 °C above pre-industrial



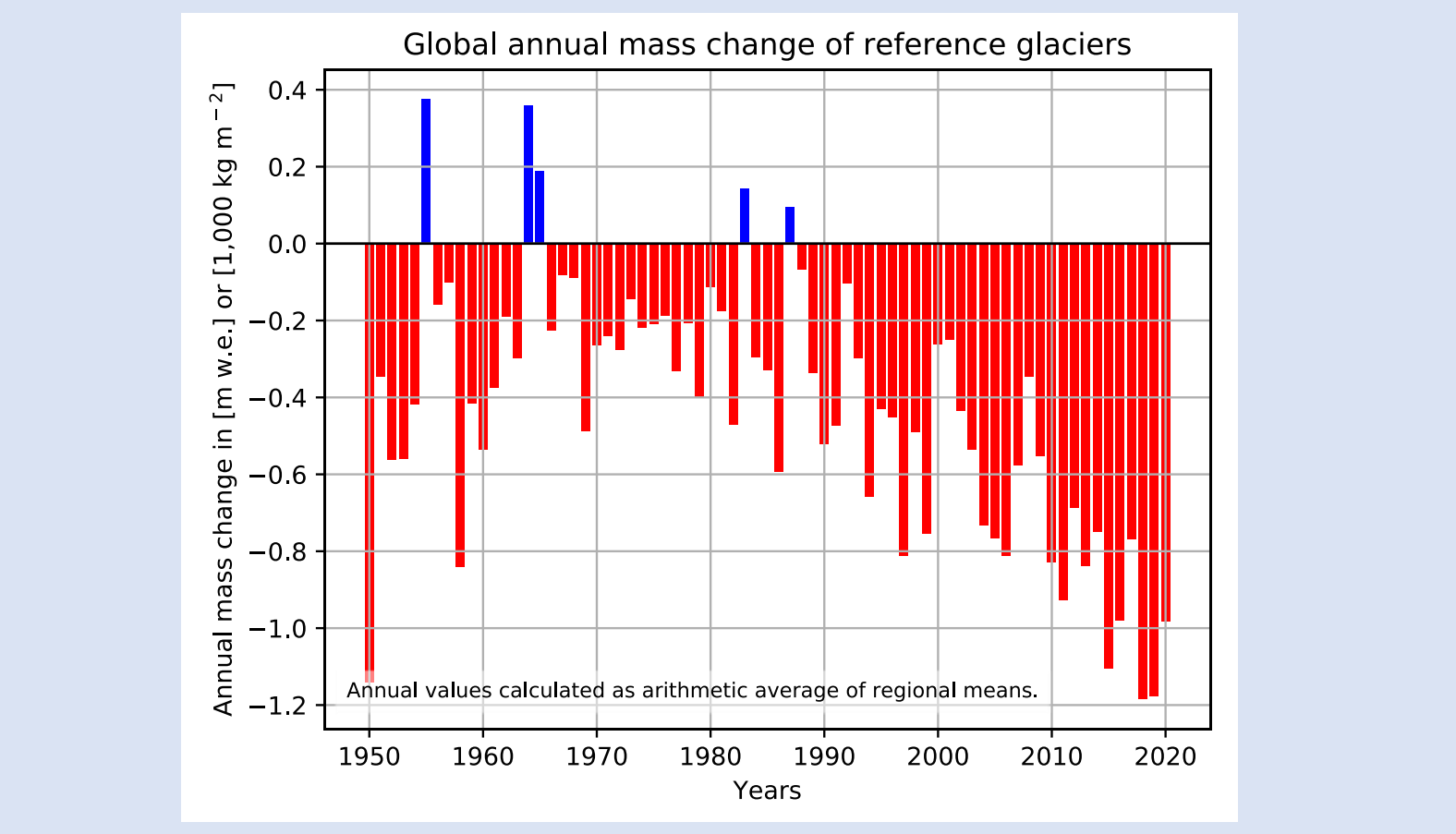
Ocean acidification fastest in 26k years



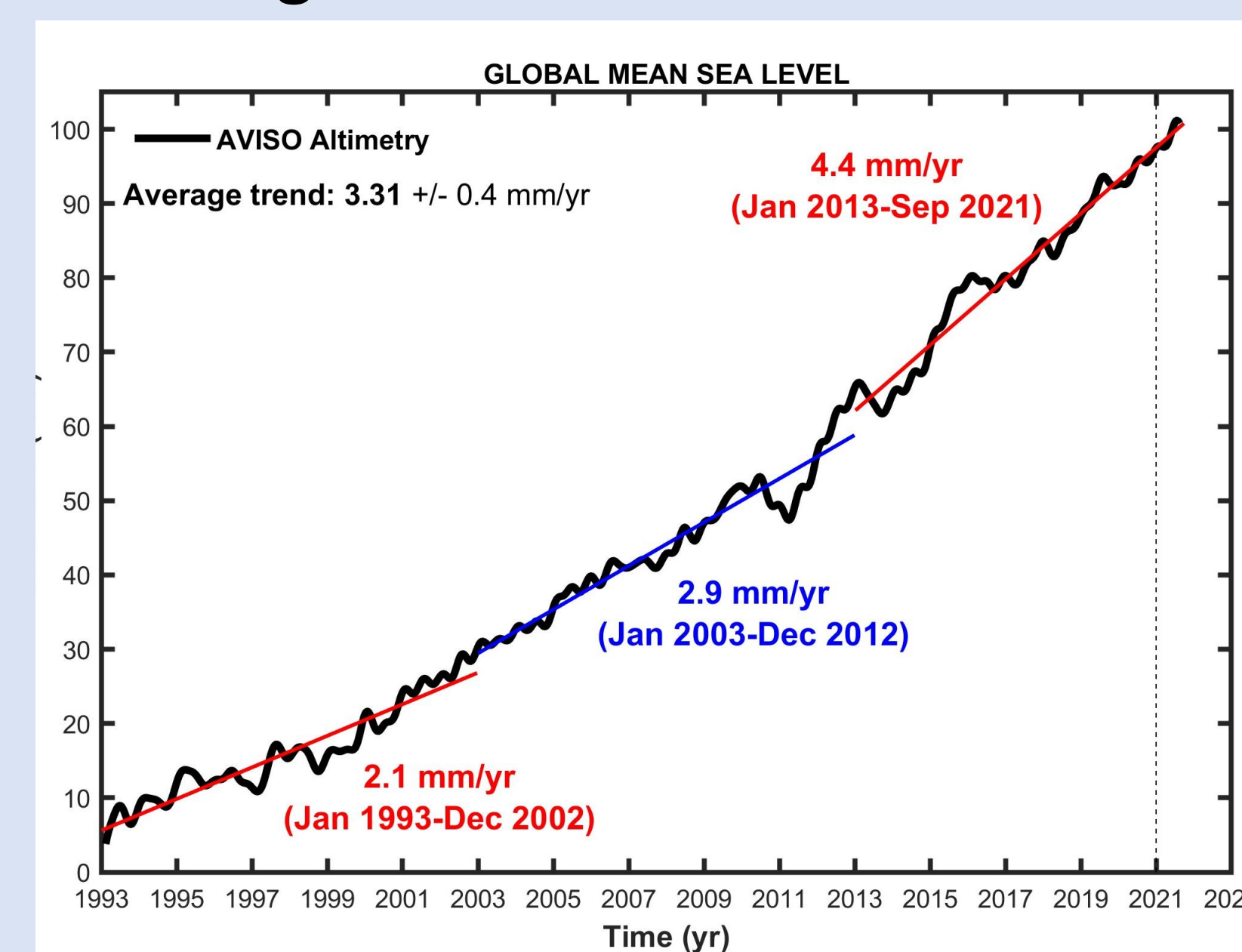
Greenland continues to lose ice



Mountain glaciers continue to lose ice



Record global mean sea level

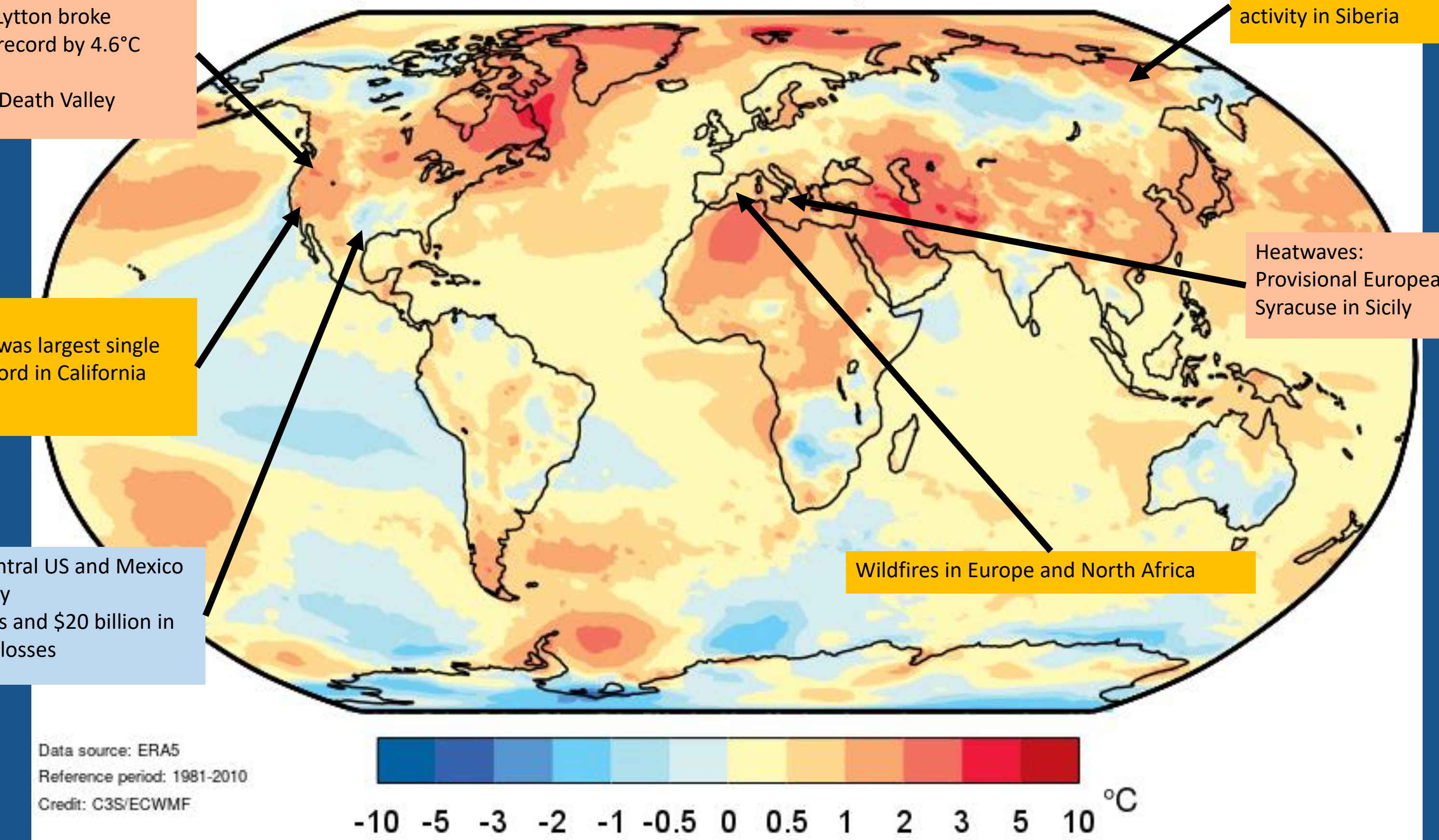


WATER

80 WMO Members  
70 Scientific experts  
40 Institutions  
6 UN agencies

## High Impact Events

Temperature difference between Jan-Sept 2021 and 1981-2010



Heatwaves:  
49.6°C at Lytton broke Canadian record by 4.6°C  
54.4 °C in Death Valley

3<sup>rd</sup> year of significant wildfire activity in Siberia

Wildfire:  
Dixie fire, was largest single fire on record in California

Heatwaves:  
Provisional European record 48.8°C Syracuse in Sicily

Cold in central US and Mexico in February  
172 deaths and \$20 billion in economic losses

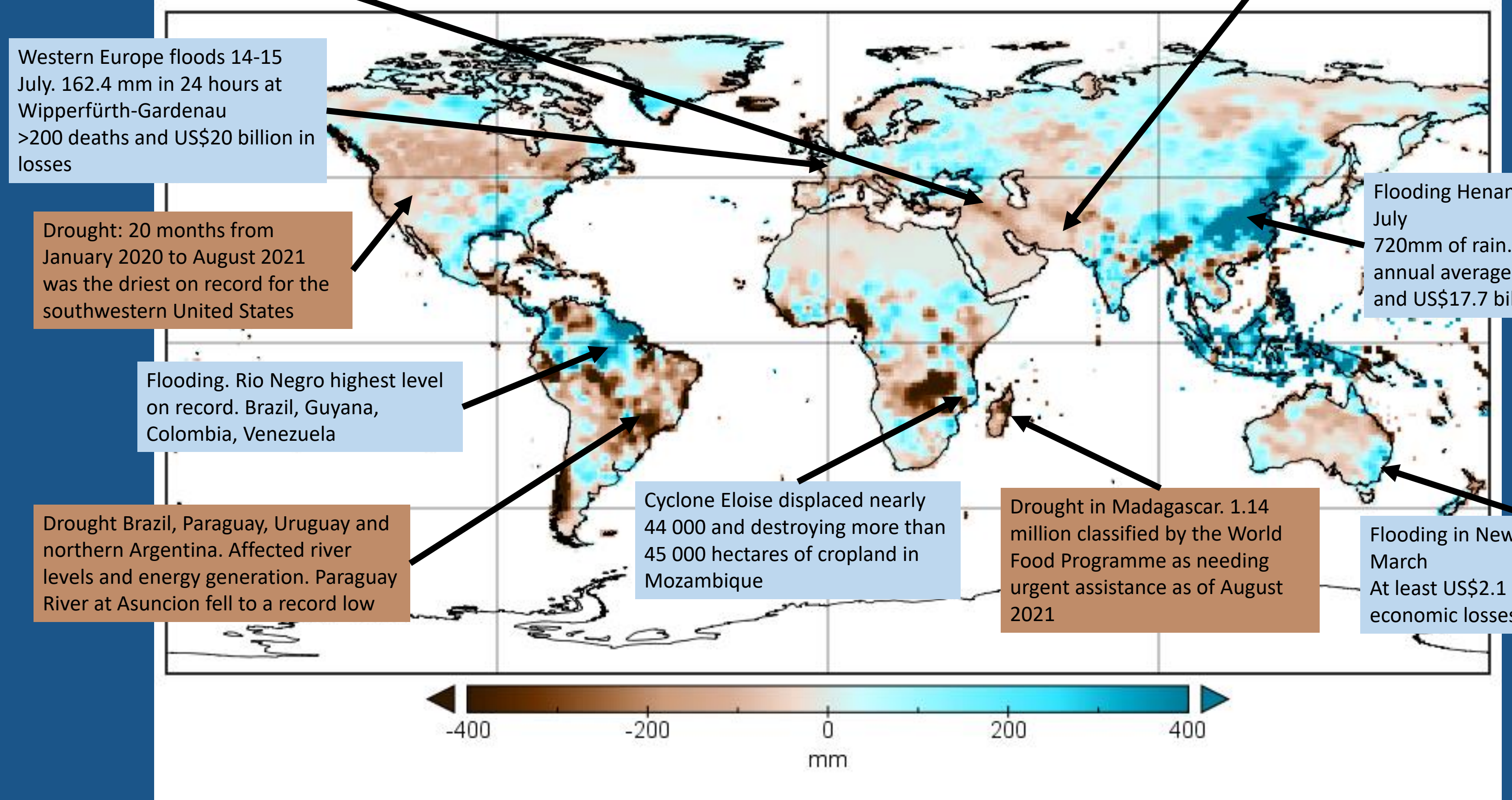
Wildfires in Europe and North Africa

Data source: ERA5  
Reference period: 1981-2010  
Credit: C3S/ECWMF

Drought Iran, Afghanistan, Pakistan, southeast Turkey, and Turkmenistan. Pakistan had its third-driest February on record.

Afghanistan flash flooding in May and July. Over 170 dead

Precipitation Anomaly, 2021, Jan-Sep



Western Europe floods 14-15 July. 162.4 mm in 24 hours at Wipperfurth-Gardenau >200 deaths and US\$20 billion in losses

Flooding Henan Province, 17-21 July. 720mm of rain. Greater than the annual average. Over 300 deaths and US\$17.7 billion in losses

Drought: 20 months from January 2020 to August 2021 was the driest on record for the southwestern United States

Flooding. Rio Negro highest level on record. Brazil, Guyana, Colombia, Venezuela

Drought Brazil, Paraguay, Uruguay and northern Argentina. Affected river levels and energy generation. Paraguay River at Asuncion fell to a record low

Cyclone Eloise displaced nearly 44 000 and destroying more than 45 000 hectares of cropland in Mozambique

Drought in Madagascar. 1.14 million classified by the World Food Programme as needing urgent assistance as of August 2021

Flooding in New South Wales in March. At least US\$2.1 billion in economic losses

The provisional WMO State of the Global Climate 2021 is a summary of key climate indicators and the weather and climate events of the year. It draws on inputs from over 80 WMO Members and 60 domain experts to provide an authoritative review of the year. The report is split into three parts. The first presents updates of key global climate indicators – including greenhouse gas concentrations, global mean temperature, ocean heat content, global mean sea level, ocean pH, sea-ice extent, glacier mass change and ice sheet mass change – and summarizes key drivers of short-term variability. The second part details high-impact events that occurred during the year informed by contributions from WMO Members. These include heatwaves and wildfires, cold spells and snow, floods, droughts, tropical cyclones and severe storms. The third part, supported by other UN agencies, highlights the socioeconomic risks and impacts of weather and climate events