

The World Meteorological Organization

Overview

01



What does WMO
do?



02

03



Questions &
Discussion



04

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Had you ever heard of WMO before today?

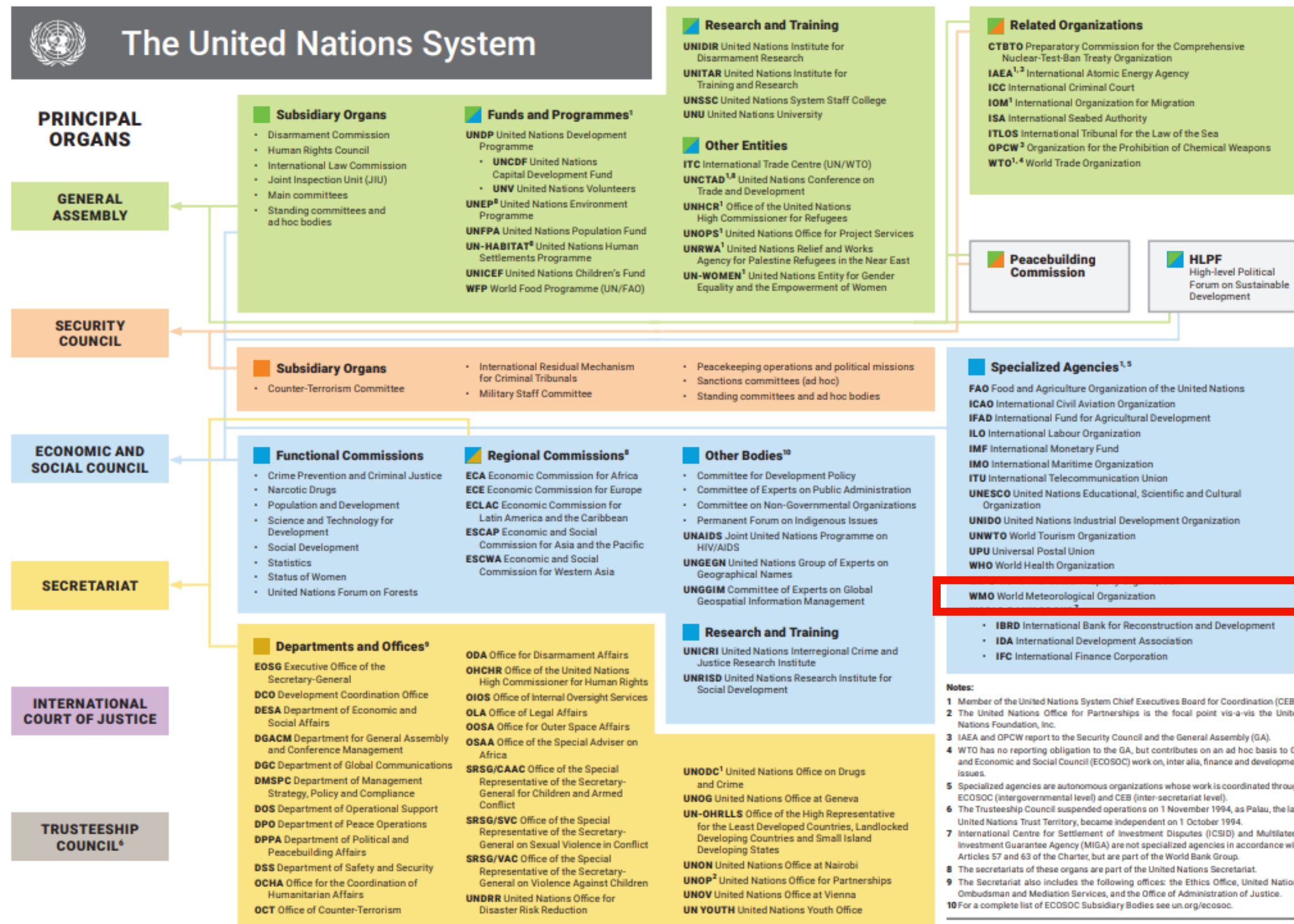
ⓘ Start presenting to display the poll results on this slide.

Weather

Climate

Water

WMO & the UN System



- The [International Meteorological Organization \(IMO\)](#) was founded in [1873](#).

- Welcomed into the UN Systems as a specialized agency of the Economic & Social Council in 1950.






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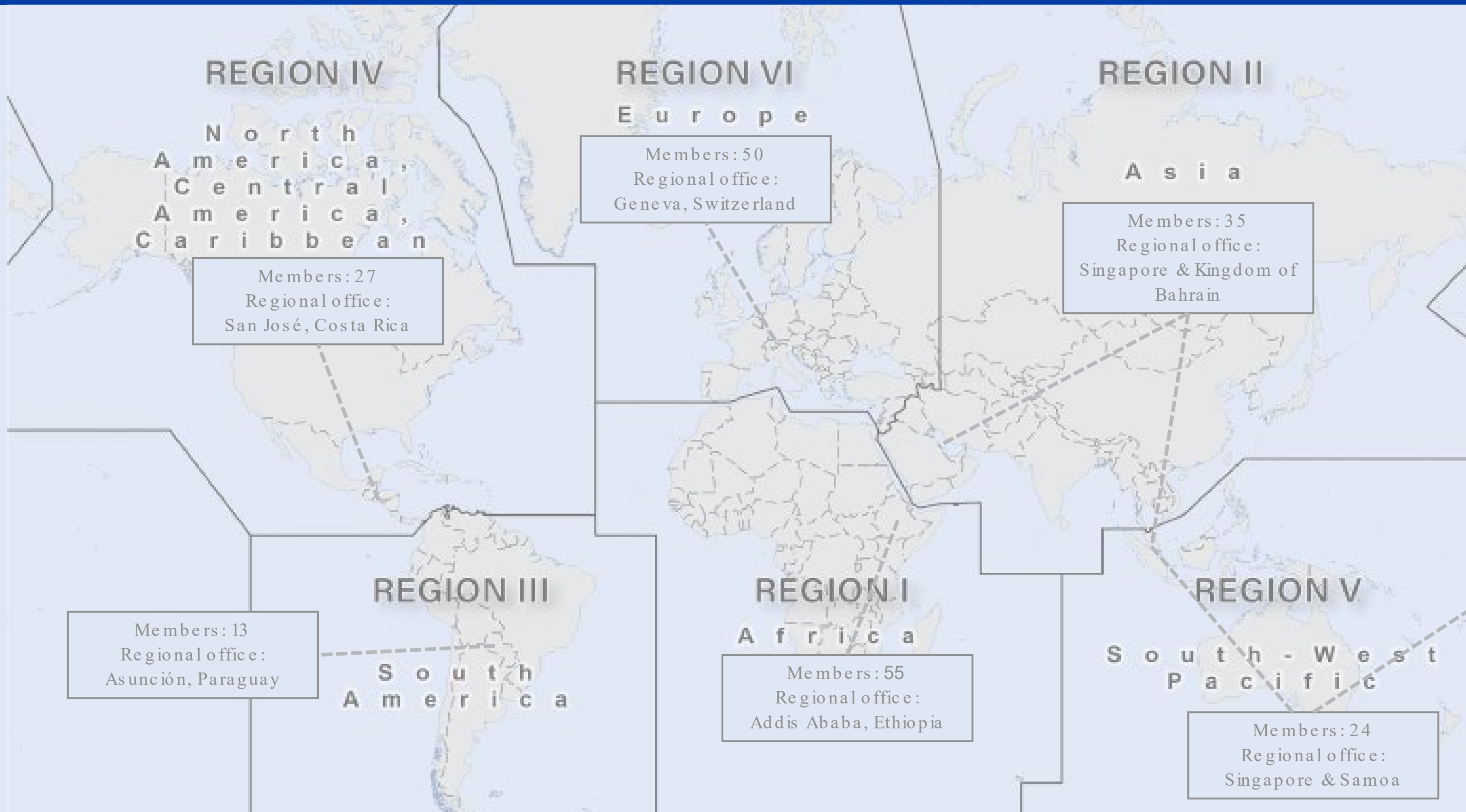
Who governs WMO? (Who are our "Members"?)

What does WMO do?

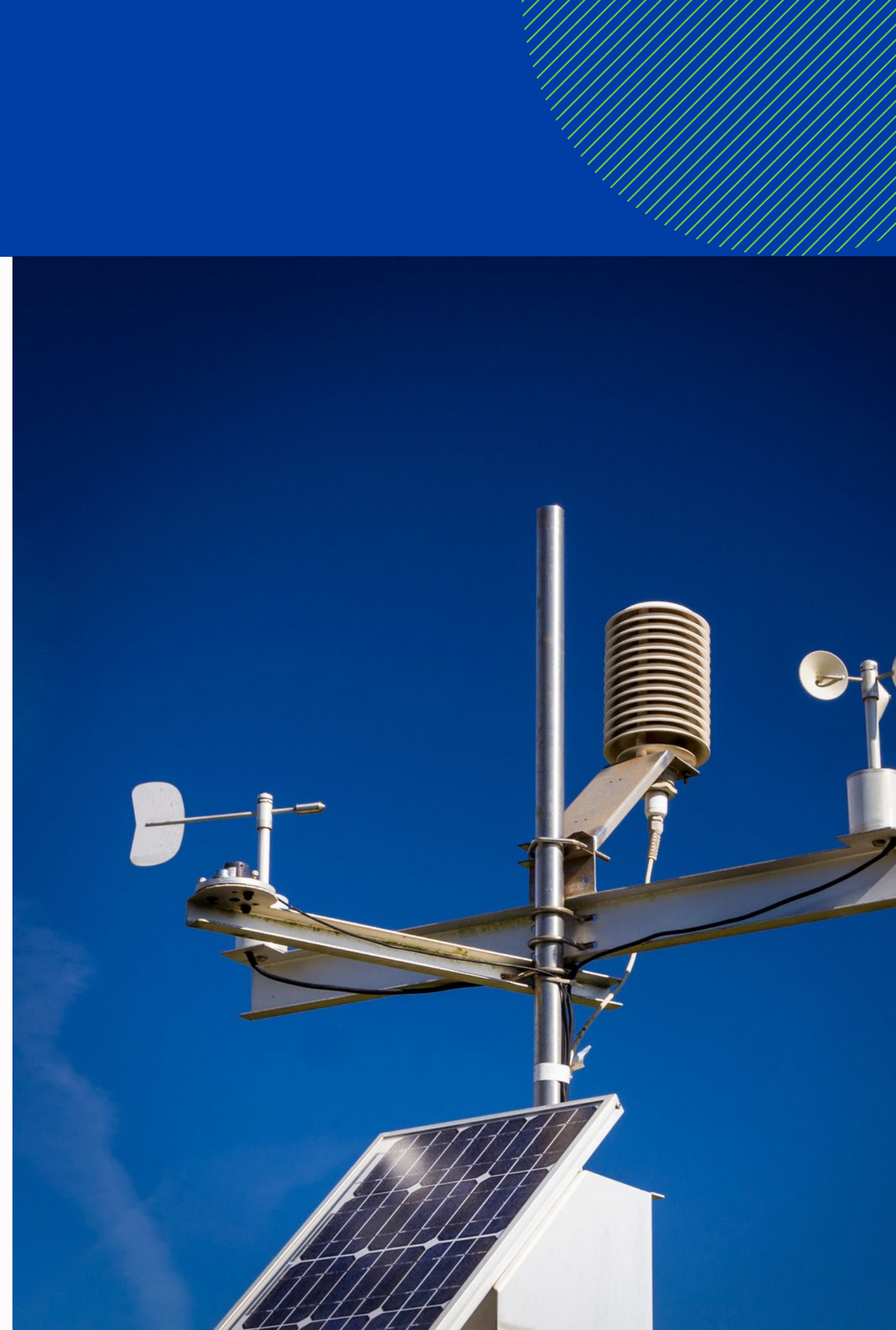
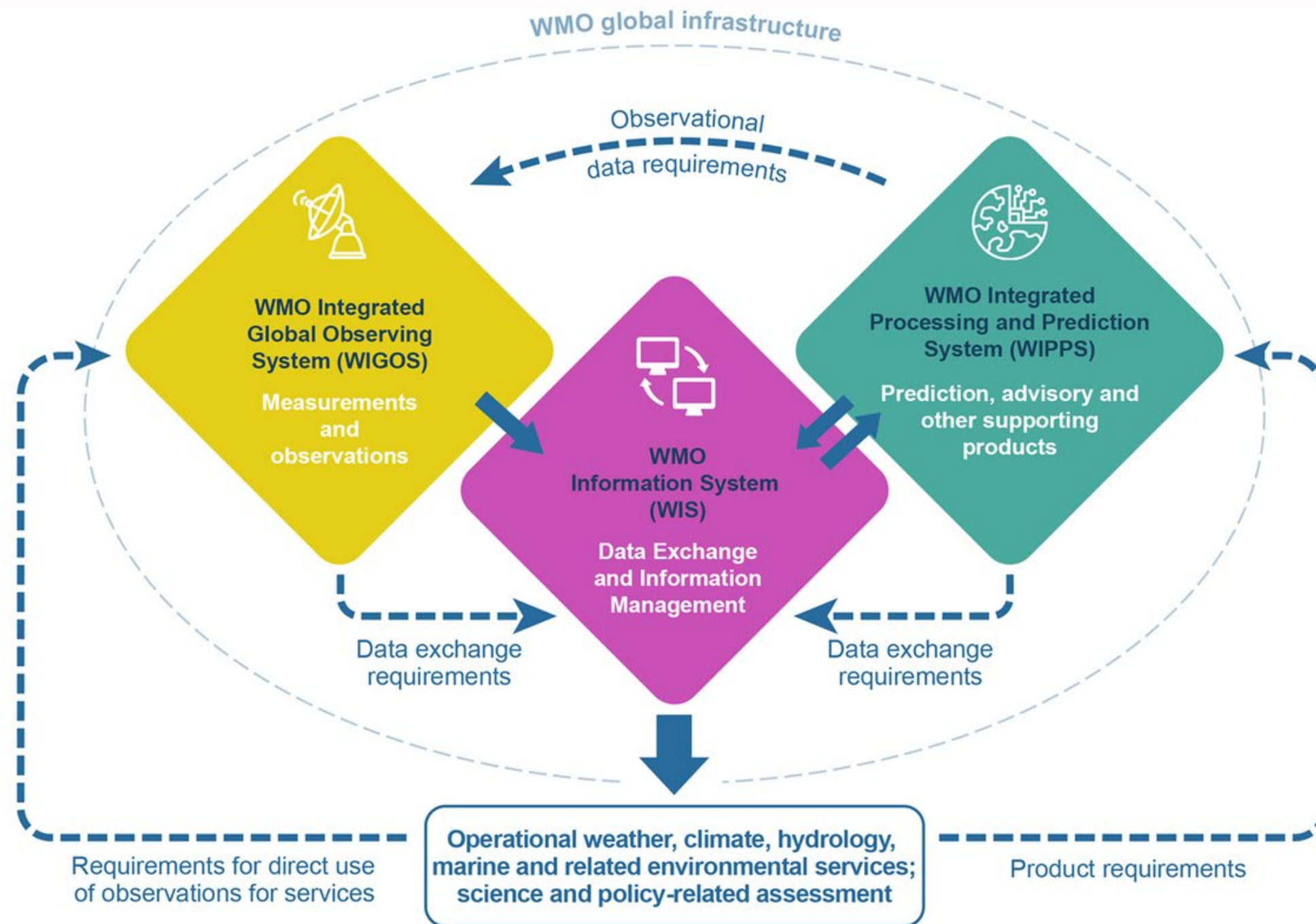
WMO Strategic Plan at a Glance

VISION	A world where all nations , especially the most vulnerable , are more resilient to the socioeconomic impact of extreme weather, climate, water and other environmental events , and empowered to boost their sustainable development through the best possible weather, climate and water services				
OVERARCHING PRIORITIES	Preparedness for, and reducing loss of life, infrastructure and livelihood from hydrometeorological extremes	Climate-smart decision-making to build resilience and adaptation to climate risk	Socioeconomic value of weather, climate, hydrological and related environmental services		
CORE VALUES	Accountability for results and transparency		Collaboration and partnership	Inclusiveness and diversity	
LONG-TERM GOALS	1 Services  Better serve societal needs	2 Infrastructures  Enhance Earth system observations and predictions	3 Science and Innovations  Advance targeted research	4 Member Services  Close the capacity gap	5 Smart Organization  Strategic realignment of WMO structure & programmes
STRATEGIC OBJECTIVES	<ol style="list-style-type: none"> National multi-hazard early warning/alert systems Policy- and decision-supporting climate information & services Hydrological services Decision-supporting weather information & services Changes in the cryosphere and downstream impacts 	<ol style="list-style-type: none"> Acquisition of Earth system observation data (WIGOS) Access to, exchange and management of Earth system observation data and products (WIS) Access to and use of numerical analysis and Earth system prediction products 	<ol style="list-style-type: none"> Advance scientific knowledge of the Earth system Enhance science-for-service value chain to improve predictive capabilities and analysis Advance policy-relevant science 	<ol style="list-style-type: none"> Enable developing countries to provide and utilize essential services Develop and sustain core competencies and expertise Scale up partnerships for investment in sustainable cost-efficient infrastructure and service delivery 	<ol style="list-style-type: none"> Optimize WMO constituent body structure Strategic partnerships Advance equal, effective and inclusive participation Environmental sustainability

Member Services



Infrastructure



Climate Services

State of the Climate in the South-West Pacific

State of the Climate in Africa

The Global Climate 2011-2020

A decade of accelerating climate change

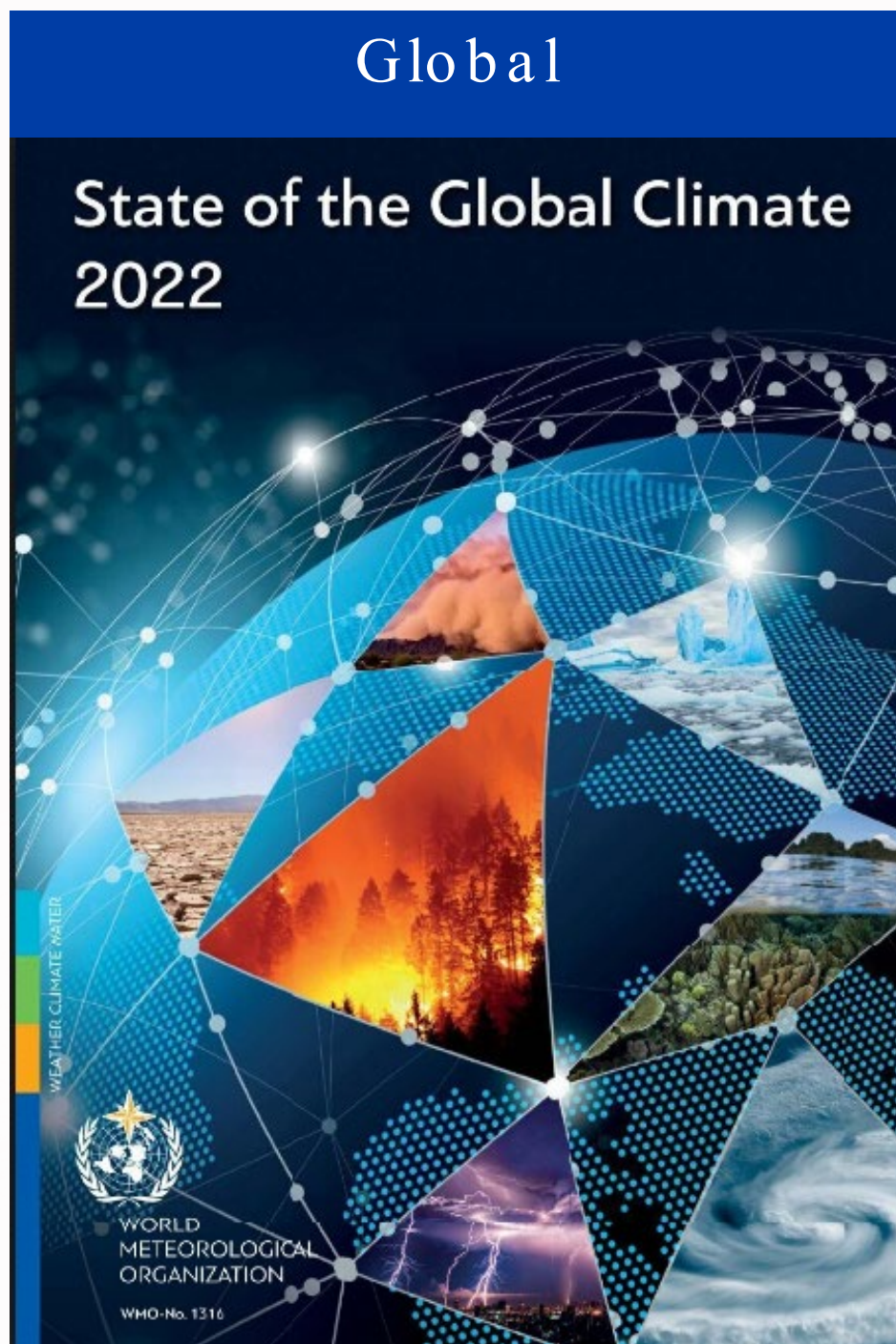
State of the Global Climate 2023



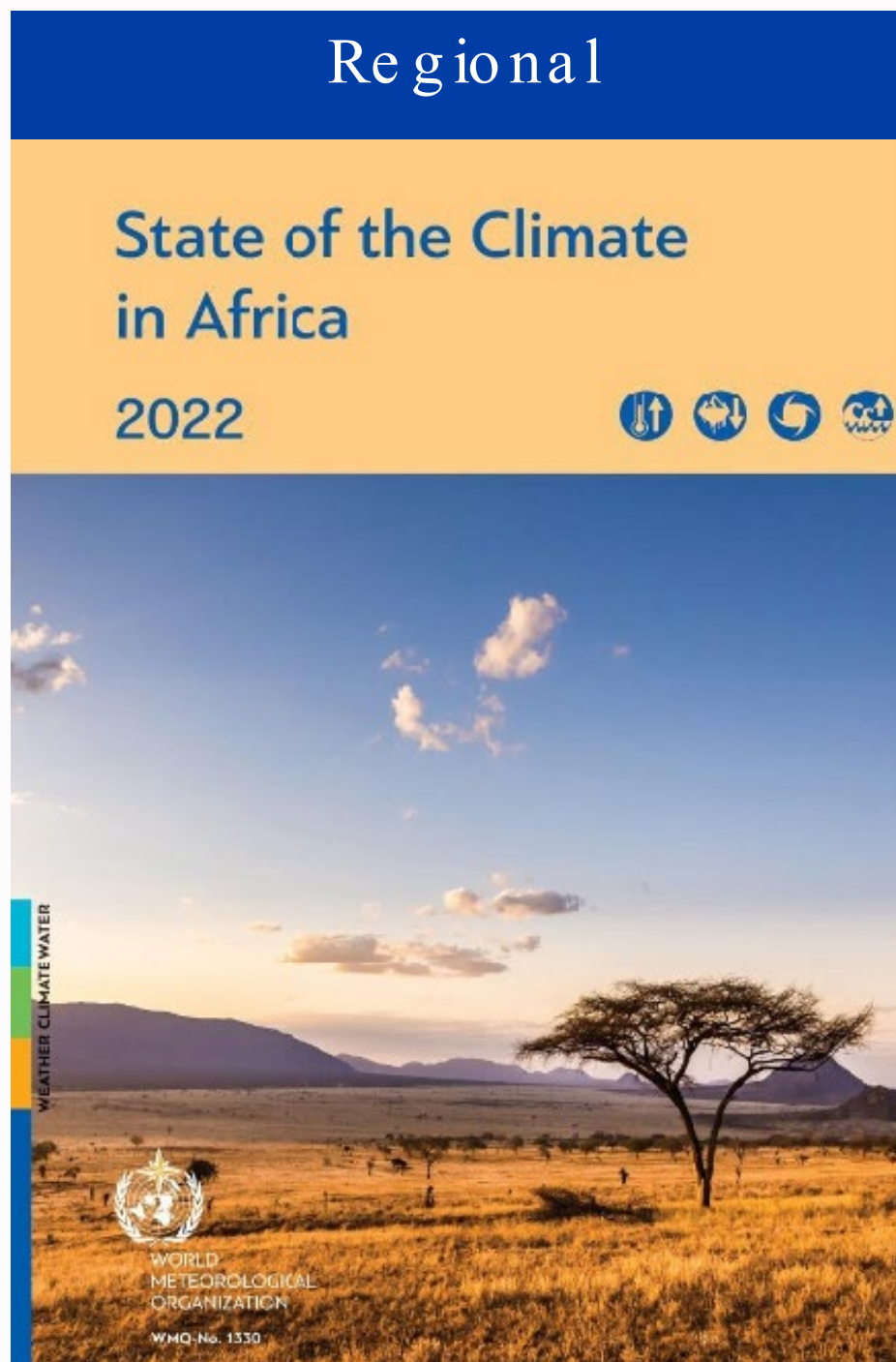
Early Warnings for All

State of the Climate

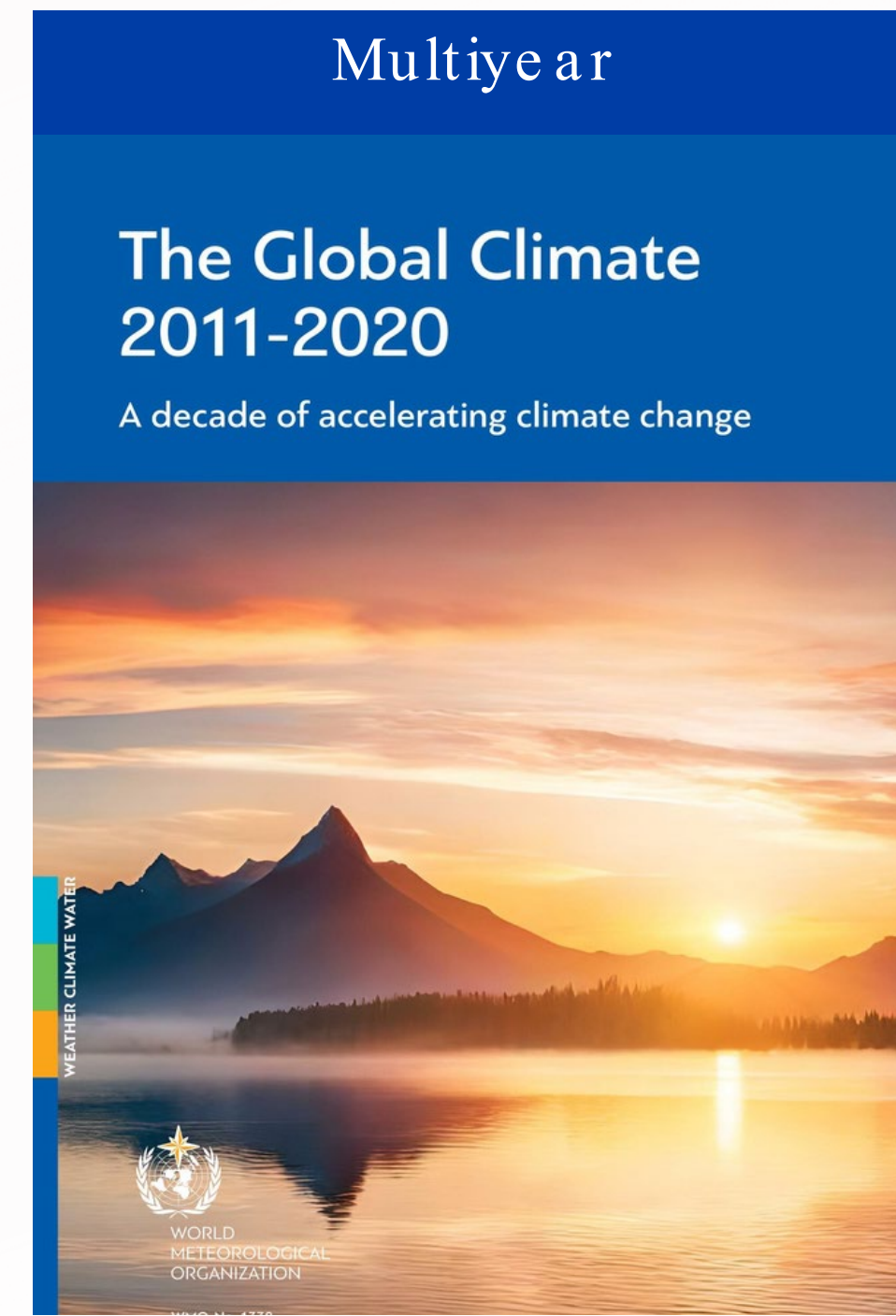
Global



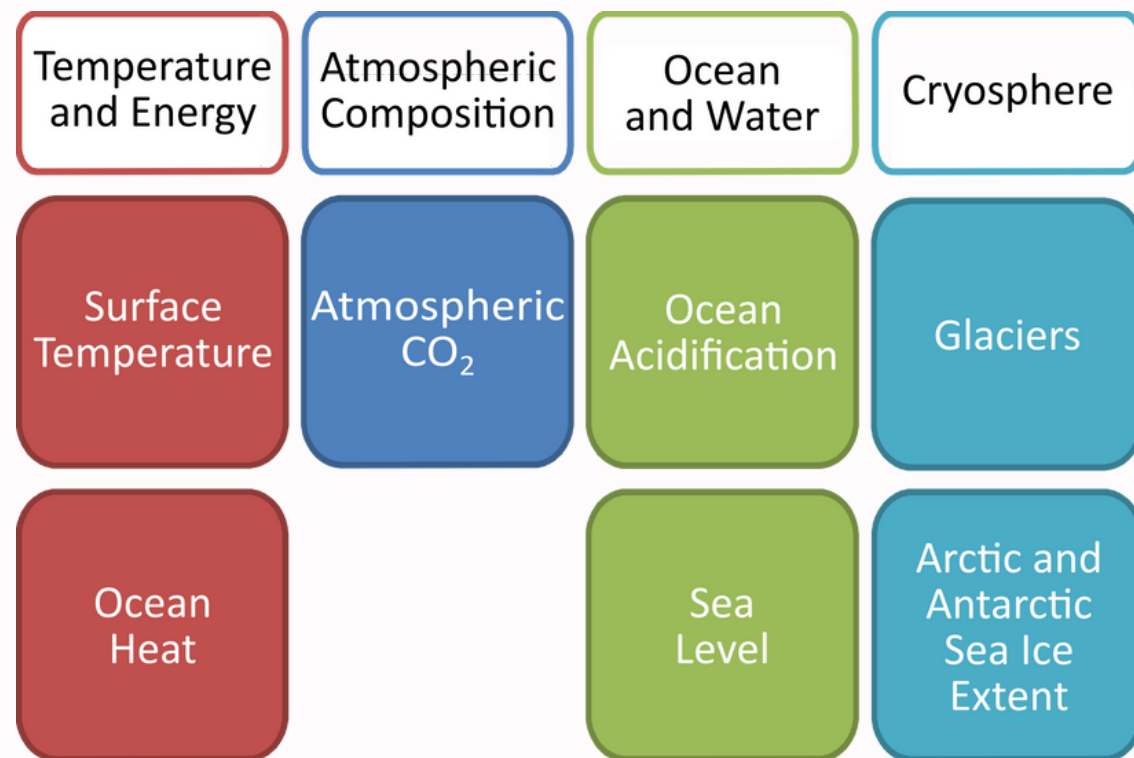
Regional



Multiyear



Report Structure



Key climate indicators



Extreme Events



Impacts & Policy

Report Structure

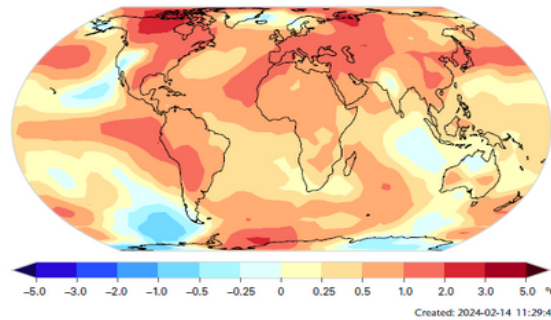


Figure 3. Mean near-surface temperature anomalies (difference from the 1991–2020 average) for 2023. Source: Data are the median of the six datasets indicated in the legend. See [Data set and methods](#) for more details.

likely explains some of the rise in temperature from 2022 to 2023. However, some areas of unusual warming, such as the North-East Atlantic (see Figure 3) do not correspond to typical patterns of warming or cooling associated with El Niño. Other factors, which are still being investigated, may also have contributed to the exceptional warming from 2022 to 2023, which is unlikely to be due to internal variability alone.⁹

The average global temperature over the past 10 years, from 2014 to 2023, was 1.20 ± 0.12 °C above the 1850–1900 average, making the past 10 years the warmest among all 10-year periods on record in all six datasets.

Between late spring in the northern hemisphere and the end of 2023, global average sea-surface temperatures (SSTs) were also at a record observed high. The records for July, August and September were each broken by a large margin (between 0.21 °C and 0.27 °C). Exceptional warmth relative to the 1991–2020 baseline was recorded in the eastern North Atlantic, the Gulf of Mexico and the Caribbean, the North Pacific extending eastward from the Sea of Japan, the Arabian Sea and large areas of the Southern Ocean (see Figure 3; see also [Marine heatwaves and cold spells](#)).

Observed global land temperature anomalies reached record levels in July and August, somewhat later than for SSTs, but the September average was also a record by a large margin of 0.53 °C–0.71 °C. The second-widest margin by which a record has been broken in the past 60 years was 0.22 °C–0.27 °C in September 2002. In 2023, most land areas were warmer than the 1991–2020 average (see Figure 3). Unusual warmth was reported across large areas of northern Canada, the southern United States of America, Mexico and Central America, as well as large areas of South America. Large areas from Central Asia to western Europe, including parts of North Africa and the Arabian Peninsula, were also unusually warm, as were South-East Asia and Japan.

OCEAN

Increasing human emissions of carbon dioxide (CO₂) and other greenhouse gases cause a positive radiative imbalance at the top of the atmosphere. This imbalance leads to the accumulation of energy in the Earth system in the form of heat, which is driving global warming.^{10,11} The ocean, which covers about 70% of the Earth's surface, absorbs heat and CO₂, which can act to slow the rate of warming in the atmosphere. However, the heat absorbed by the ocean leads to ocean warming, which, together with the melting of ice on land, raises sea levels, while the absorption of CO₂ leads to ocean acidification. Warming waters, sea-level rise and ocean acidification all have significant effects on the ocean, as well as on the plants and animals that live in it and the people who rely upon it for their livelihoods.

OCEAN HEAT CONTENT

In 2023, ocean heat content reached its highest level in the 65-year observational record.

About 90% of the energy that has accumulated in the Earth system since 1971 is stored in the ocean. As energy has accumulated in the ocean, it has warmed, and global ocean heat content has increased (see Figure 4).

According to a consolidated analysis based on several individual datasets, the upper 2 000 m of the ocean continued to warm in 2023.¹² It is expected that warming will continue – a change that is irreversible on centennial to millennial timescales.^{13,14} Ocean heat content in 2023 was the highest on record, exceeding the 2022 value by 13 ± 9 ZJ (see Figure 4)¹⁵ consistent with estimates published in early 2024.¹⁶

All datasets agree that ocean warming rates show a particularly strong increase in the past two decades. The rate of ocean warming for the 0–2 000 m layer was 0.7 ± 0.1 W m⁻² from 1971 to 2023 on average, but 1.0 ± 0.1 W m⁻² from 2005 to 2023 (the period covered by the Argo programme). The steady increase in ocean warming rates^{17,18} is seen consistently in direct estimates from in situ observations, indirect estimates from remote sensing and direct estimates of the net flux at the top of the atmosphere as measured by satellites.¹⁹ Different drivers of this change are discussed in literature, including a change in anthropogenic climate forcing²⁰ and natural variability.²¹ Deep-ocean global warming below 2 000 m depth is estimated to be 0.07 ± 0.03 W m⁻² from 1992 to 2022.²²

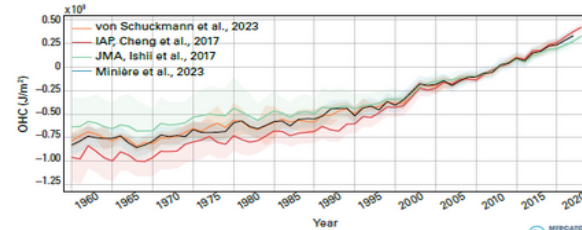
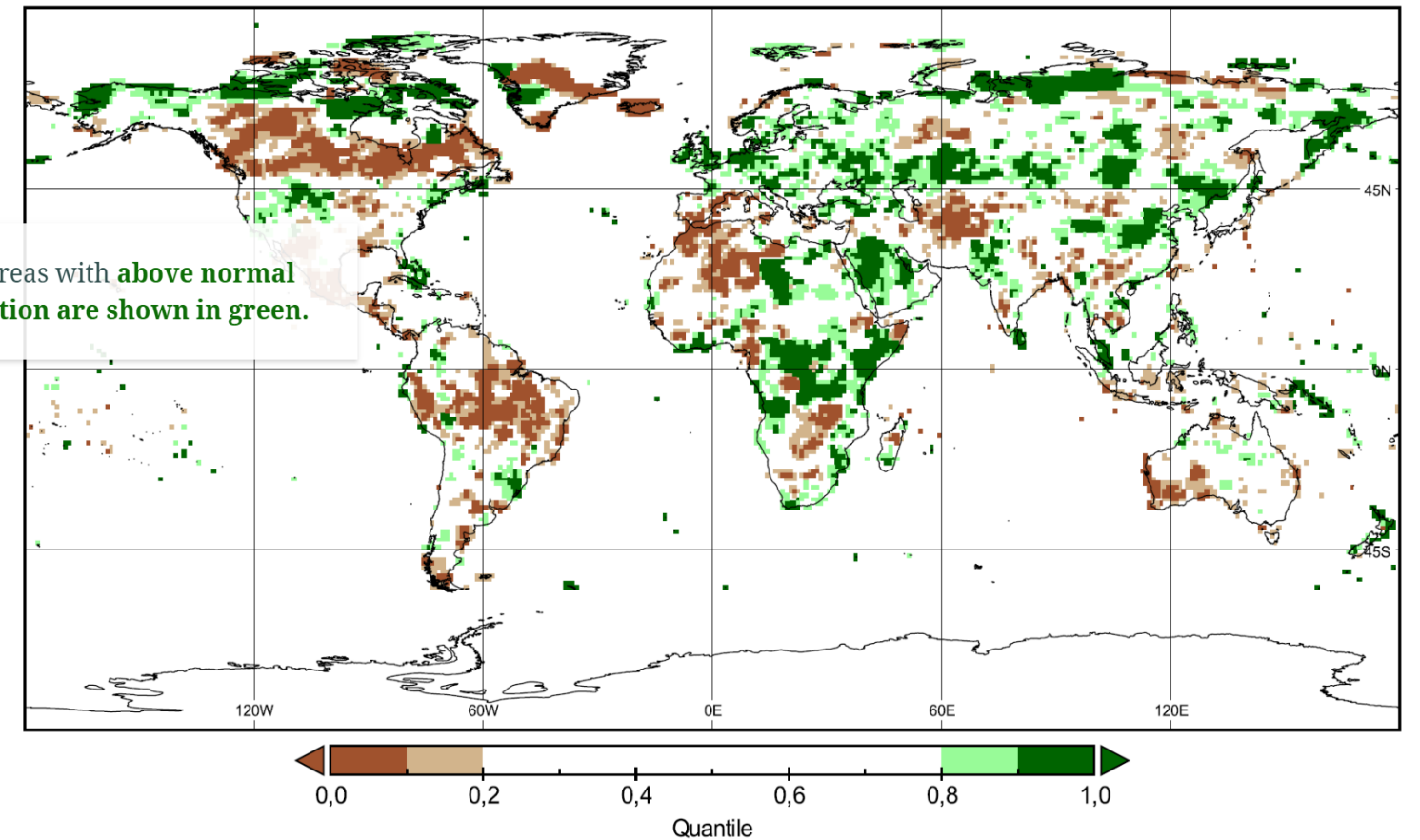


Figure 4. Global ocean heat content anomalies relative to the 2005–2021 average for the 0–2 000 m depth layer 1960–2023 (orange). Ensemble mean time series and ensemble standard deviation (2-standard deviations, shaded) updated from Schuckmann et al., 2023 (red); Cheng et al., 2017 (green); Mimière et al., 2023 (light blue); and Ishii et al., 2017 (dark blue). Source: [Marcaton Ocean International](#).

GPCC Quantile, Reference 1991-2020, 2023



In 2023, areas with above normal precipitation are shown in green.

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Approximately how much warming does the ocean absorb?

Ocean Heat Content

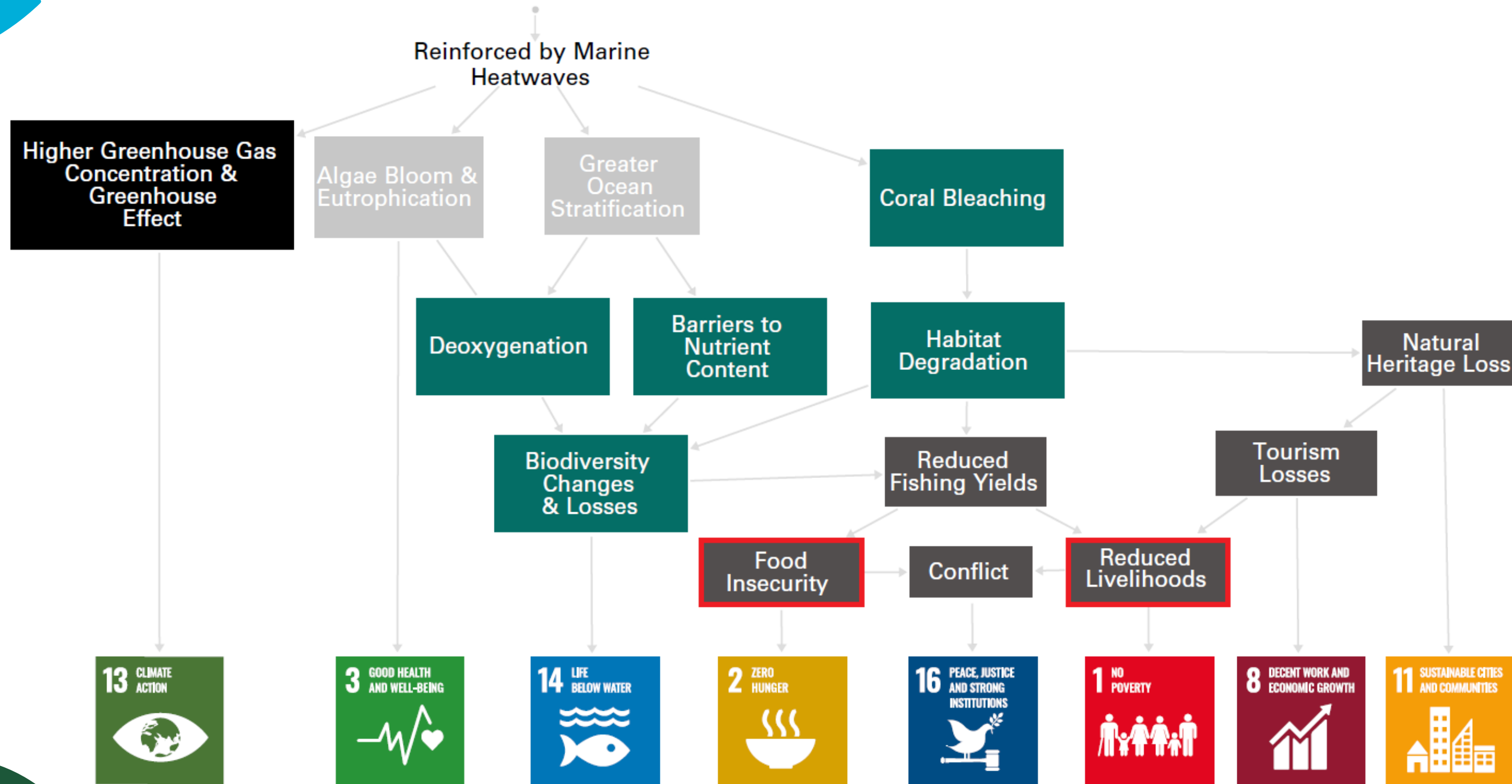


Figure 14. Associated risks of increased OHC and the SDGs

Legend

- Change in the Climate System
- Ecosystem Services Degradation
- Impact on Human Societies
- Feedback Loop
- Gender Implications

THANK YOU

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🌐 [Datasets](#)

🌐 [State of the Global Climate](#)

🌐 [Regional & Decadal SoC](#)

