

ESA Space Technology for Climate Action

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→ THE EUROPEAN SPACE AGENCY

Global warming due to increased human-driven greenhouse gases in the atmosphere

If net zero emissions are achieved by 2050 (SSP1-1.9)

PARIS AGREEMENT GOAL

If net zero emissions are achieved in second half of 21st century (SSP1-2.6)

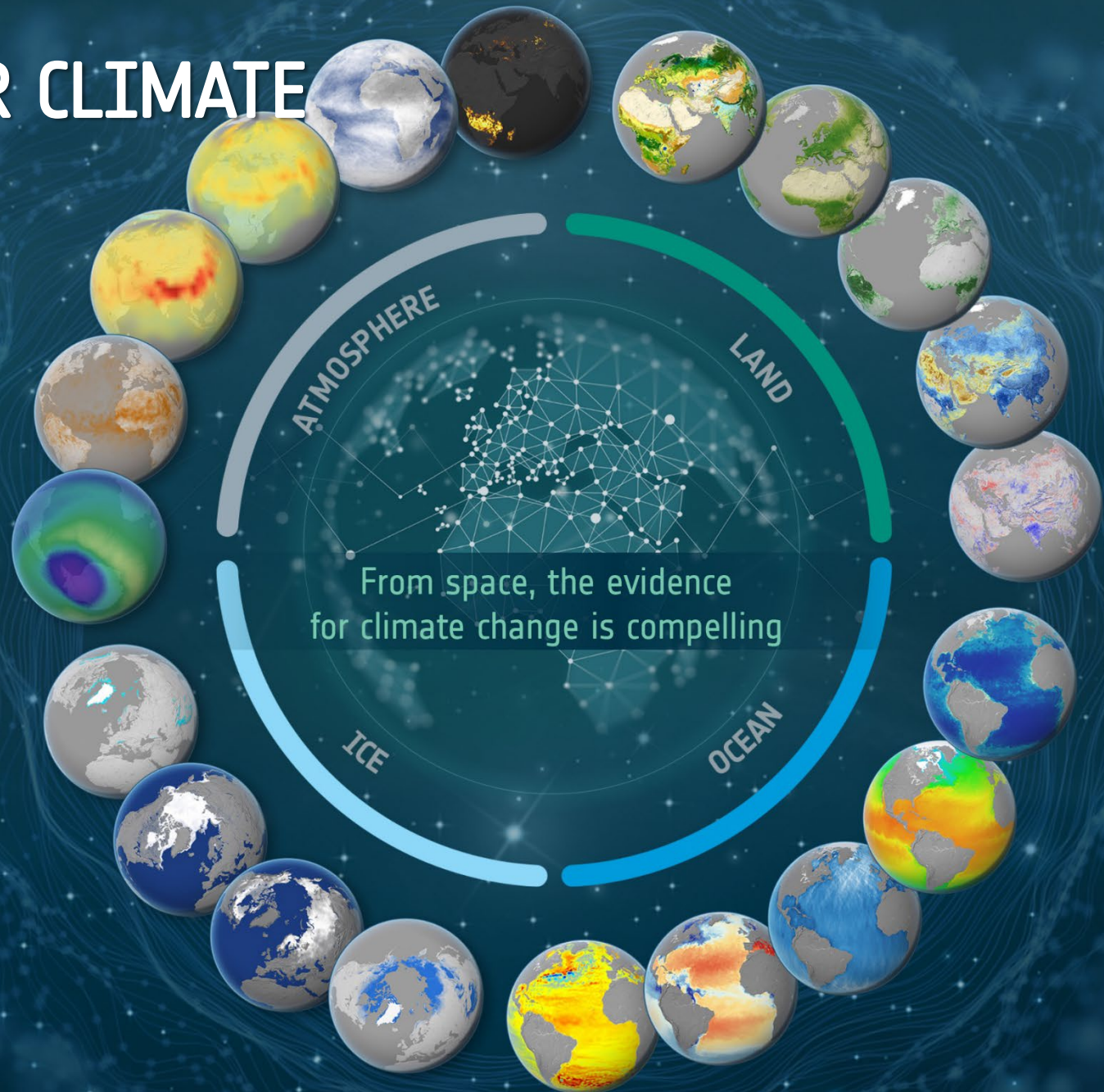
If current greenhouse gas emissions persist until mid-21st century (SSP2-4.5)

An energy and resource intensive scenario for the 21st century (SSP5-8.5)

IPCC AR6 2021

GLOBAL MEAN TEMPERATURE INCREASE BY 2100 (RELATIVE TO 1850-1900)
Source: IPCC Assessment report Working Group 1, Table SPM.1

SPACE FOR OUR CLIMATE



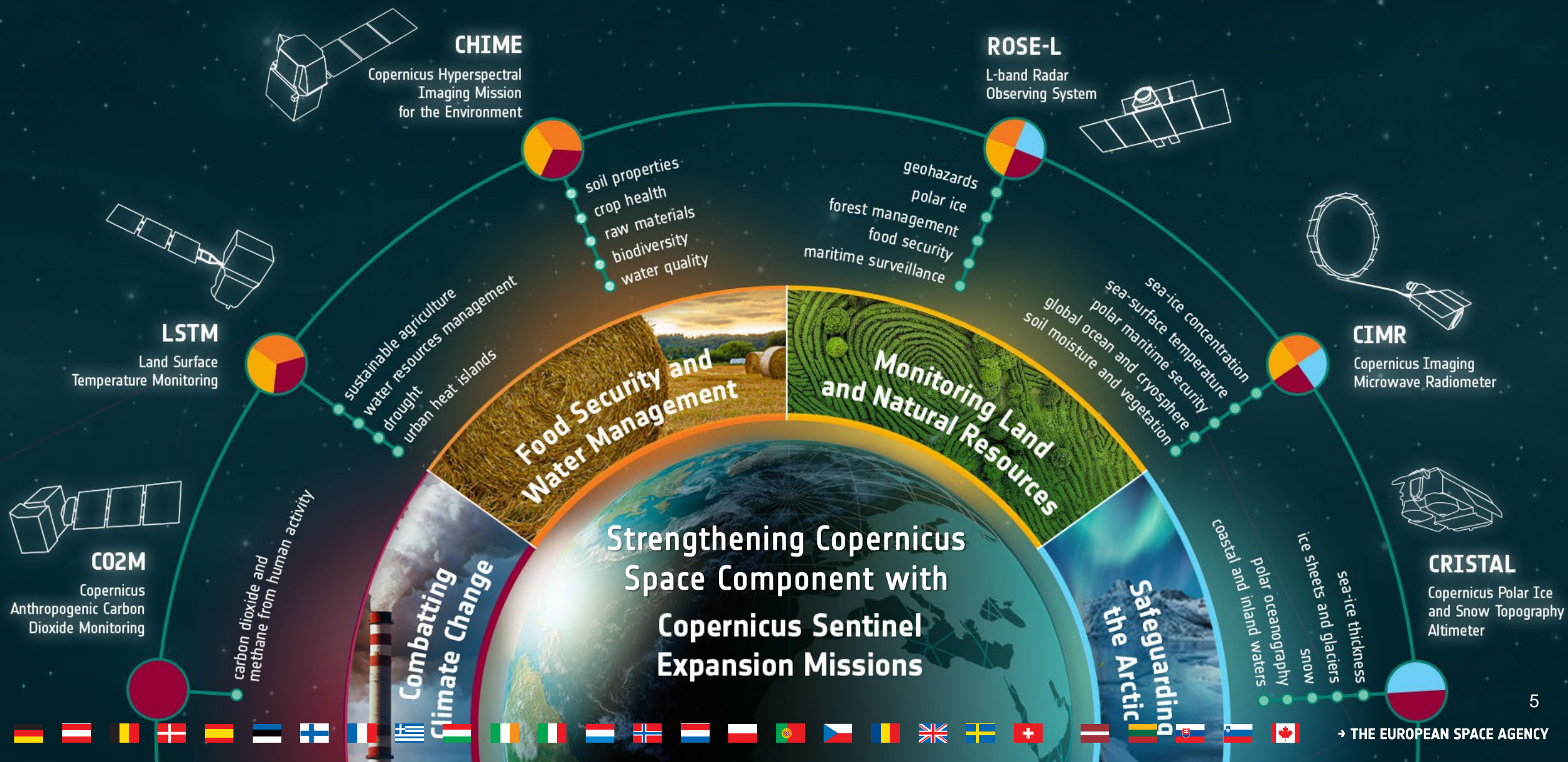


Continued and Enhanced Observations

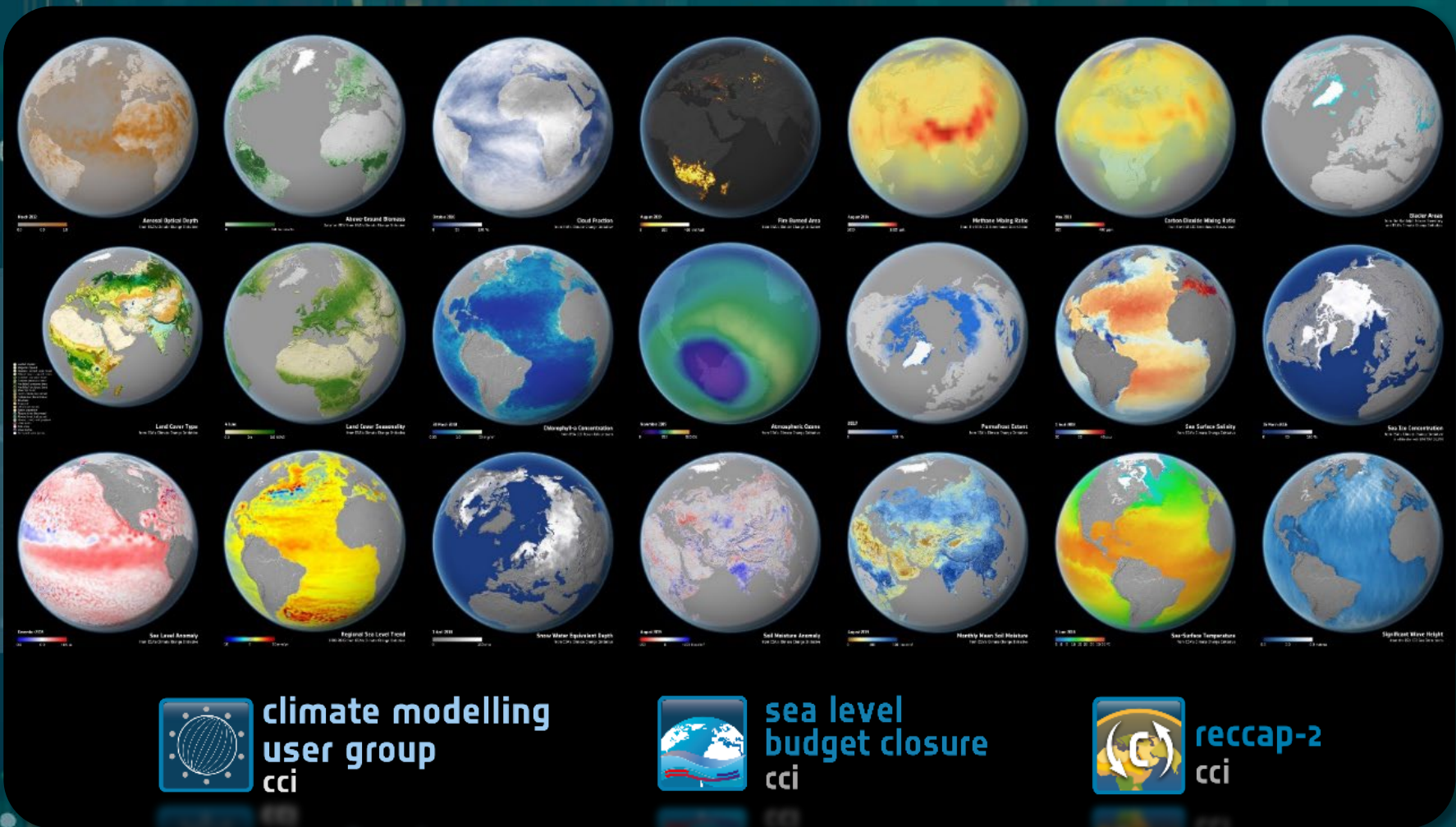


PROGRAMME OF THE
EUROPEAN UNION

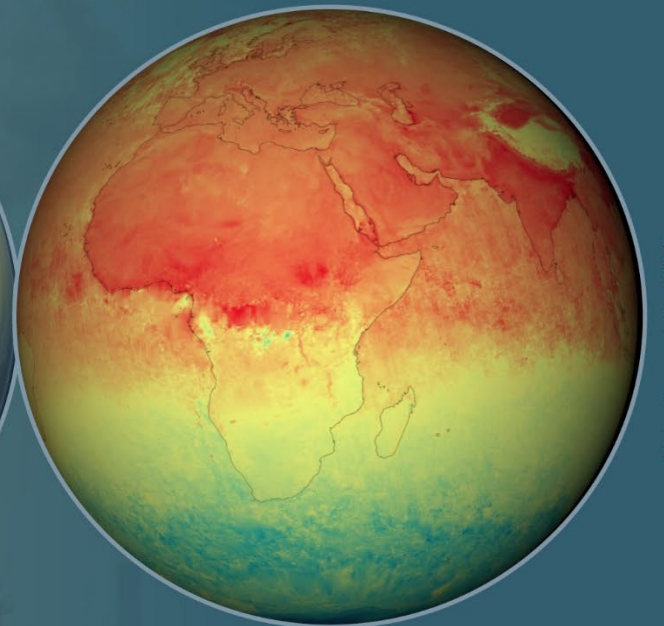
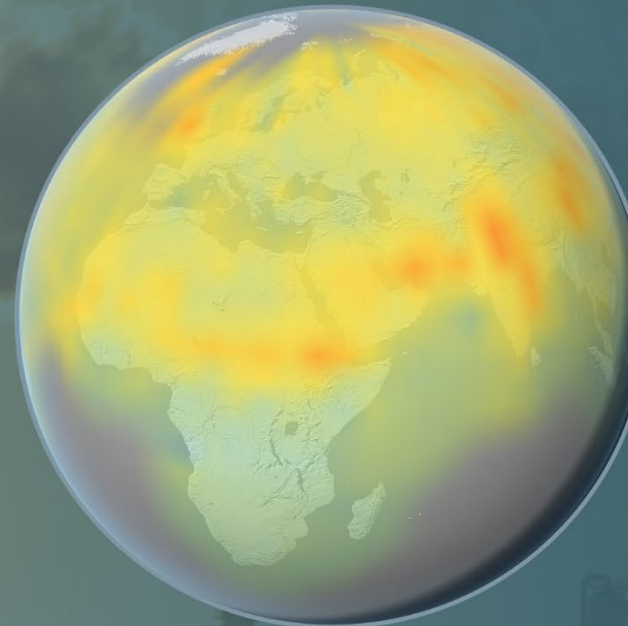
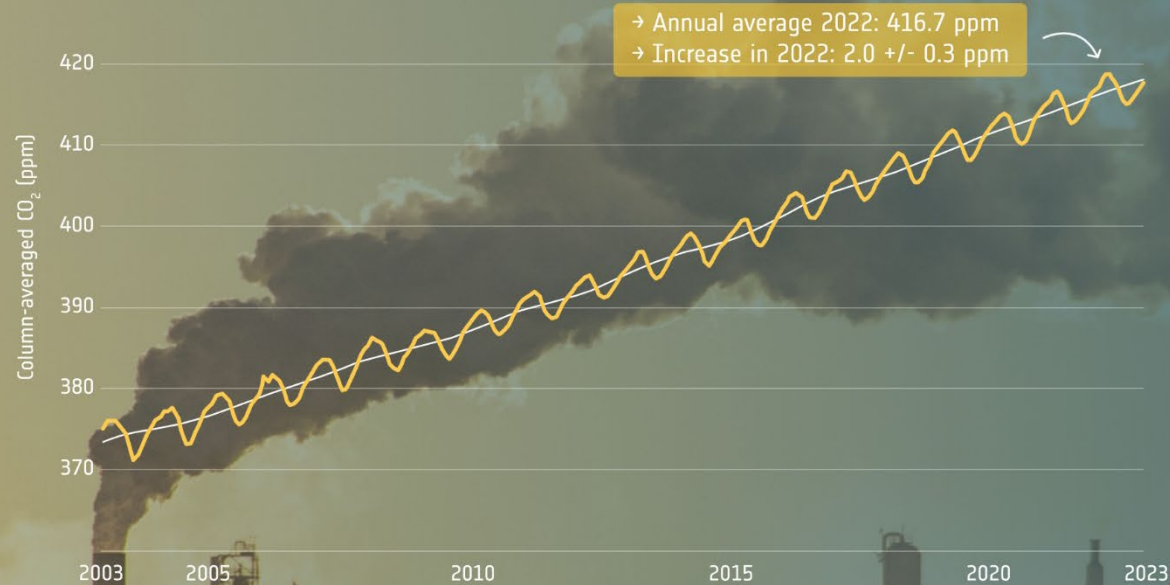
co-funded with



ESA's Climate Change Initiative



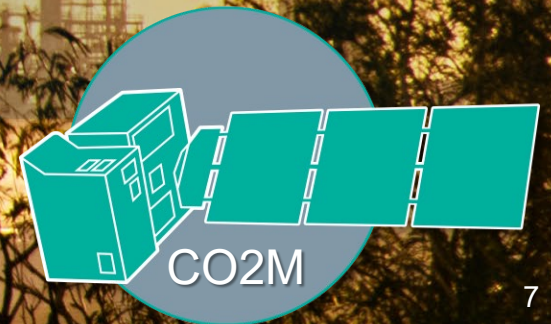
GREENHOUSE GASES



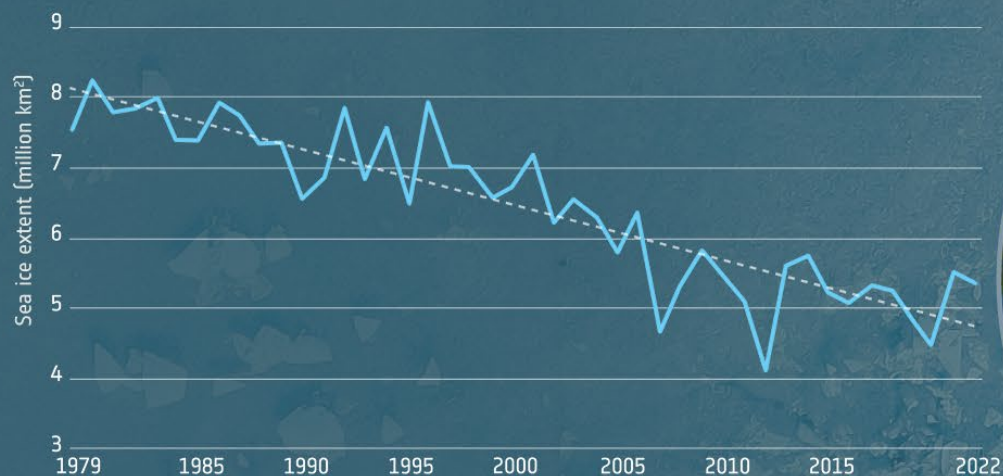
Atmospheric Carbon Dioxide (CO₂) from satellites

Copernicus Climate Change Service dataset 2003–2022 (December) using algorithms and brokered products from CCI with data from Copernicus Atmosphere Monitoring Service

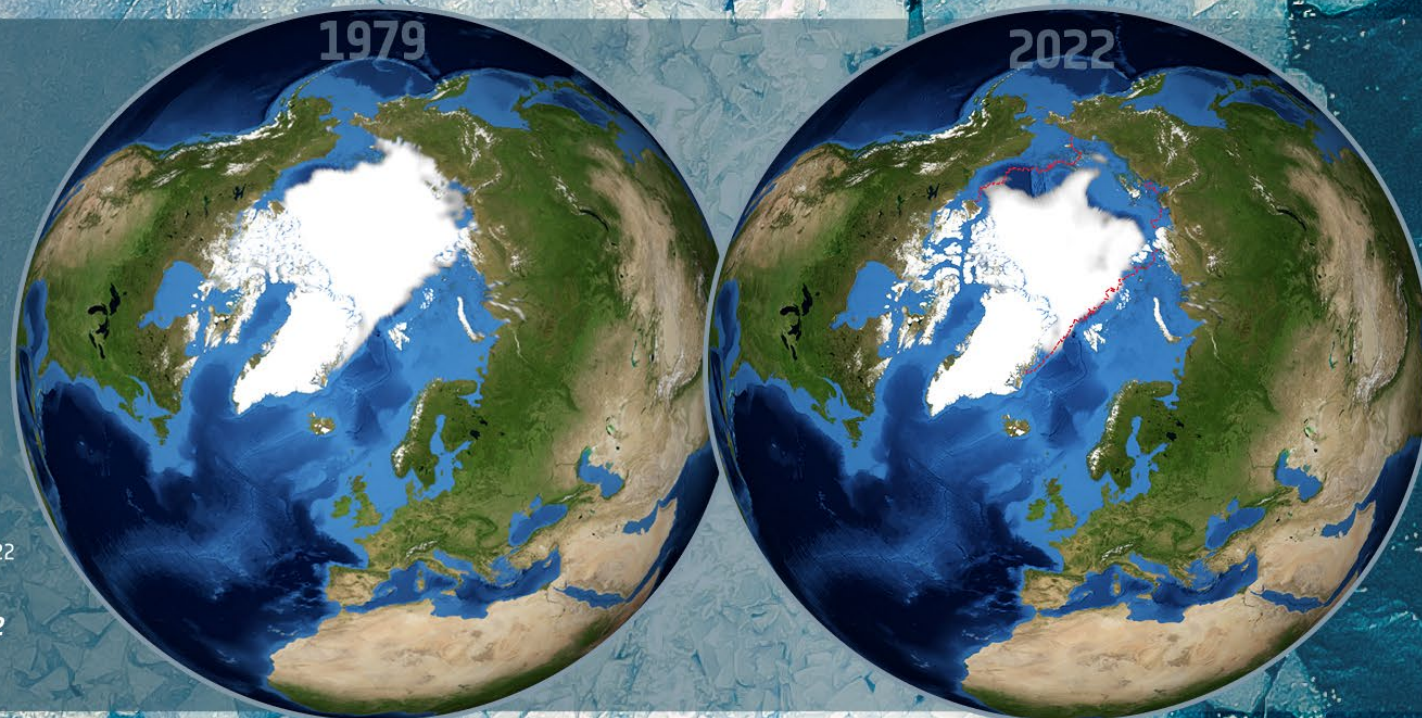
While carbon dioxide is more abundant in the atmosphere and therefore more commonly associated with global warming, methane is around 30 times more potent as a heat-trapping gas, albeit more short-lived.



SEA ICE



Late summer (September) sea-ice extent in the Arctic as measured by satellites 1979–2022
 © EUMETSAT OSI SAF data, with R&D input from ESA CCI



Arctic sea ice extent (September 1979 - September 2022)
 Source: OSI SAF data redistributed by CMEMS. © [2022] EUMETSAT

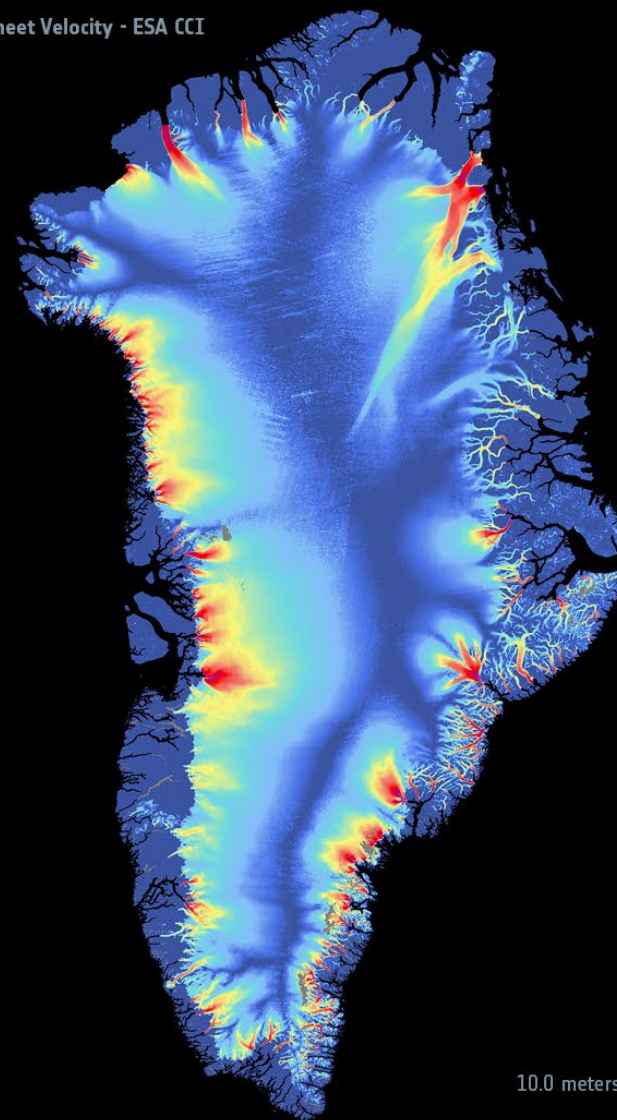
Climate projections, informed by satellite data, show that the Arctic Ocean is likely to experience 'ice free' summers before 2050.

CRISTAL





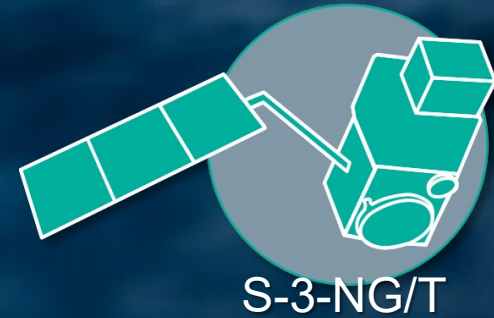
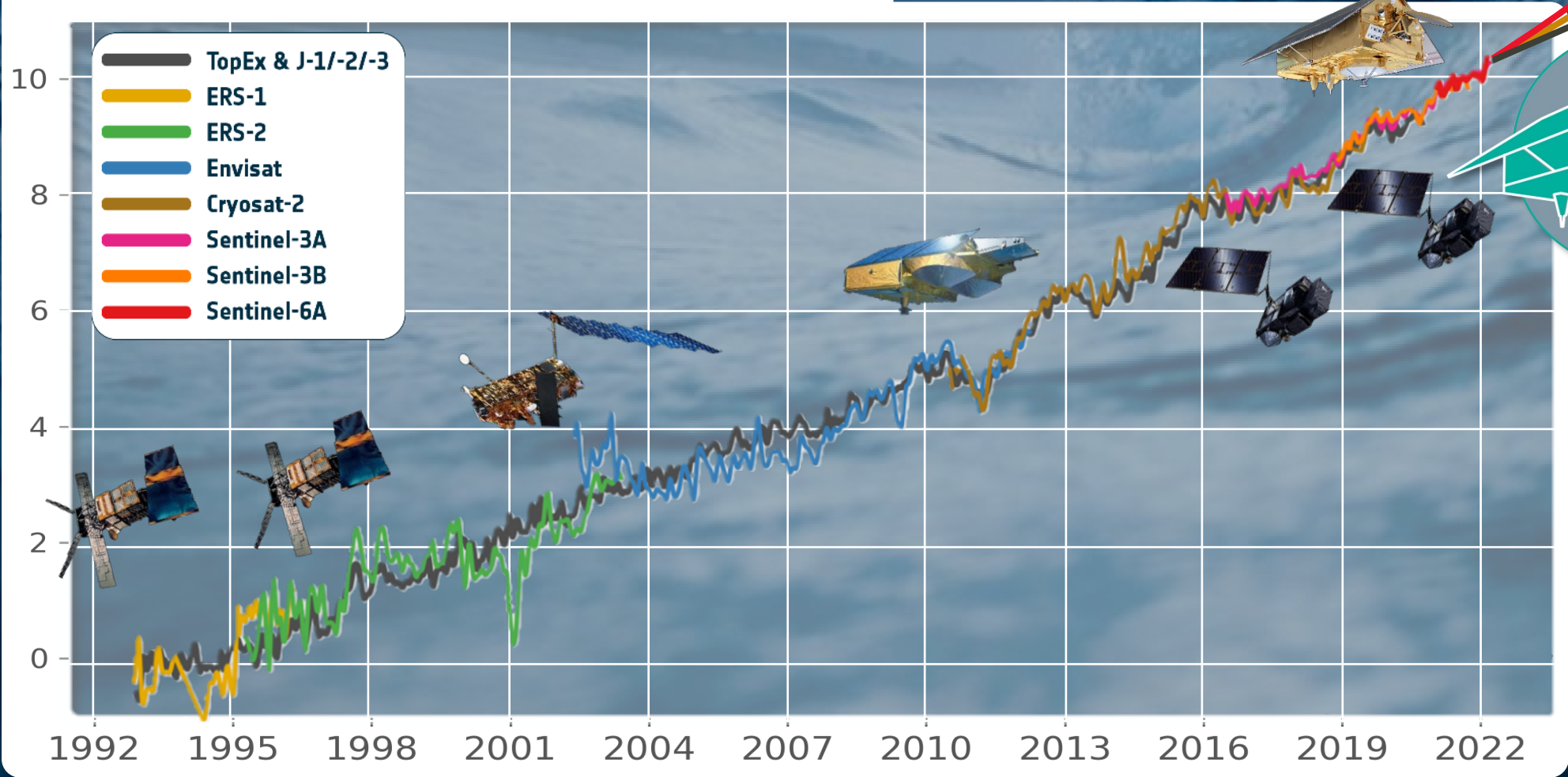
Ice Sheet Velocity - ESA CCI



CIMR

CRISTAL

Sea Level



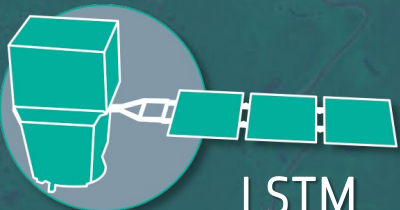
BIOMASS AND LAND COVER



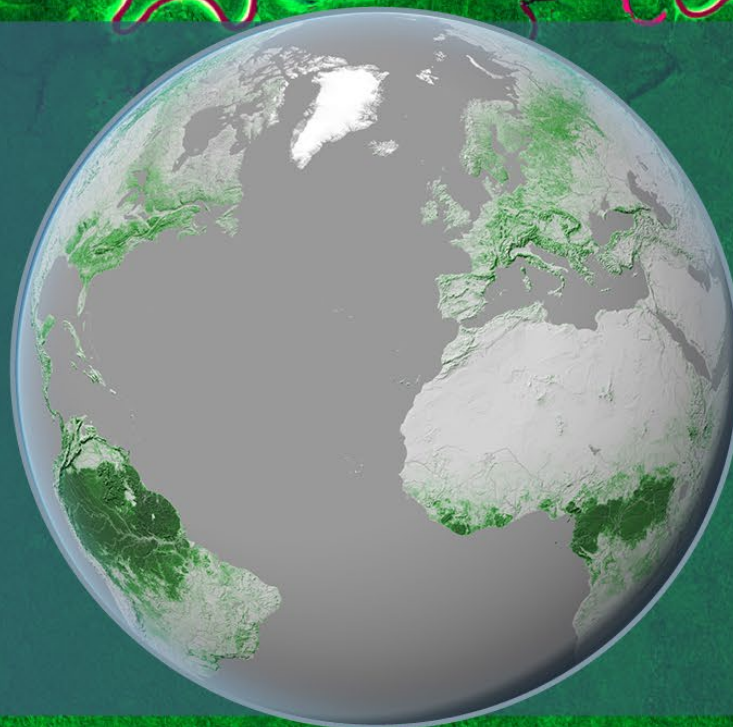
BIOMASS



CHIME



LSTM



Land Cover Type - ESA CCI

Contains modified Copernicus Sentinel data (2019), processed by ESA

New and more robust global forest biomass data in the stocktake will help to establish – and quantify – with greater certainty, the net gains and losses of carbon associated with forest growth, loss and degradation.

SPACE FOR A GREEN FUTURE

“Space offers a vast untapped potential to ramp up the fight for a green future and tackle global climate change”

ESA Director General
Josef Aschbacher



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