

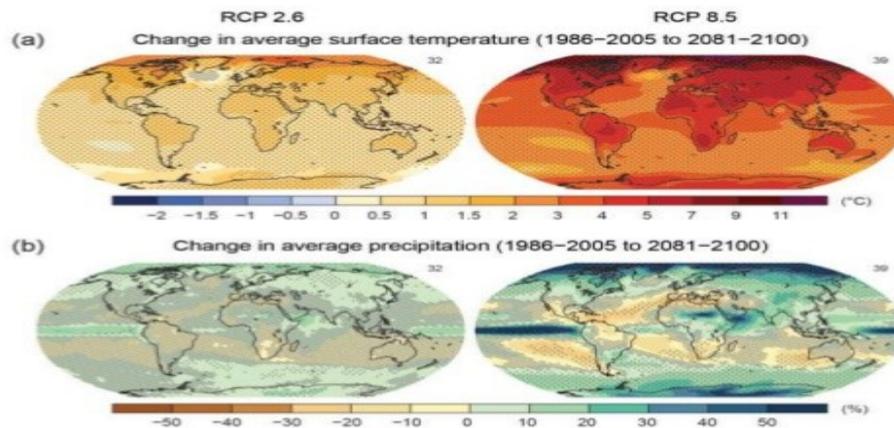
Clima, biodiversità, inquinamento: trappole globali da evitare

Luca Mercalli – Società Meteorologica Italiana - www.nimbus.it

Figure SPM.8a,b

Maps of CMIP5 multi-model mean results

All Figures © IPCC 2013



IPCC AR5 Working Group I
Climate Change 2013: The Physical Science Basis

ipcc
INTERGOVERNMENTAL PANEL ON climate change
WFP UNEP



ANTÓNIO GUTERRES

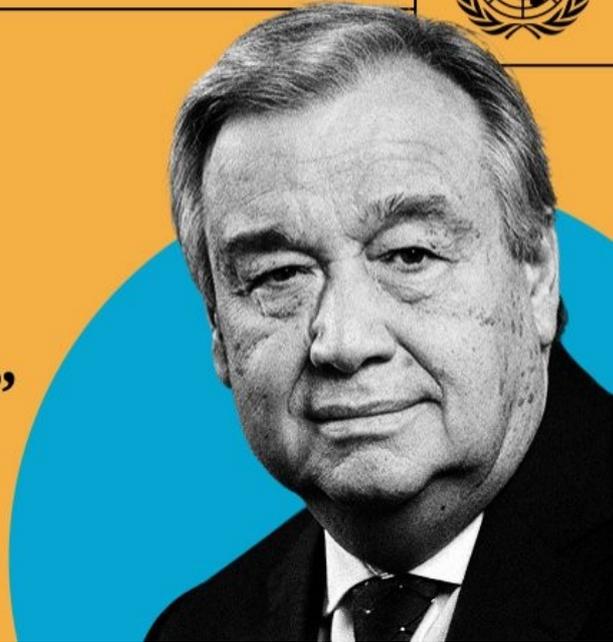
United Nations Secretary-General



“

Today's IPCC Working Group 1 Report is a **code red** for humanity.”

9 AUGUST 2021



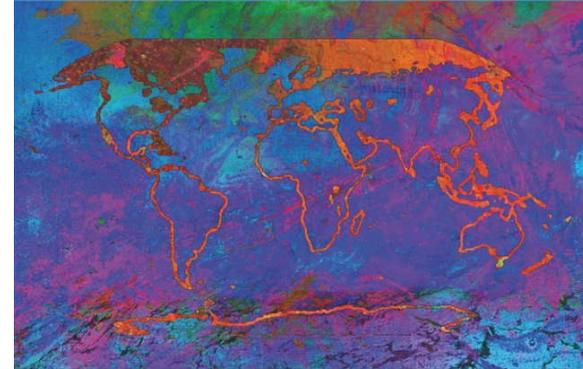
EMBARGOED - Do not publish, quote or distribute before 10 a.m. Central European Summer Time (08:00 ICT/GMT-4 a.m. EDT) on Monday 9 August 2021

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INTERGOVERNMENTAL PANEL ON climate change

Climate Change 2021

The Physical Science Basis

Summary for Policymakers



This Summary for Policymakers was formally approved at the 14th Session of Working Group I of the IPCC and accepted by the 54th Session of the IPCC, Virtual meeting, 6 August 2021. SUBJECT TO CORRECTION

WGI

Working Group I contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change



Sixth Assessment Report
SYNTHESIS REPORT

ipcc
INTERGOVERNMENTAL PANEL ON climate change



Today's IPCC report is a **how-to guide to defuse the climate time-bomb**

#IPCC

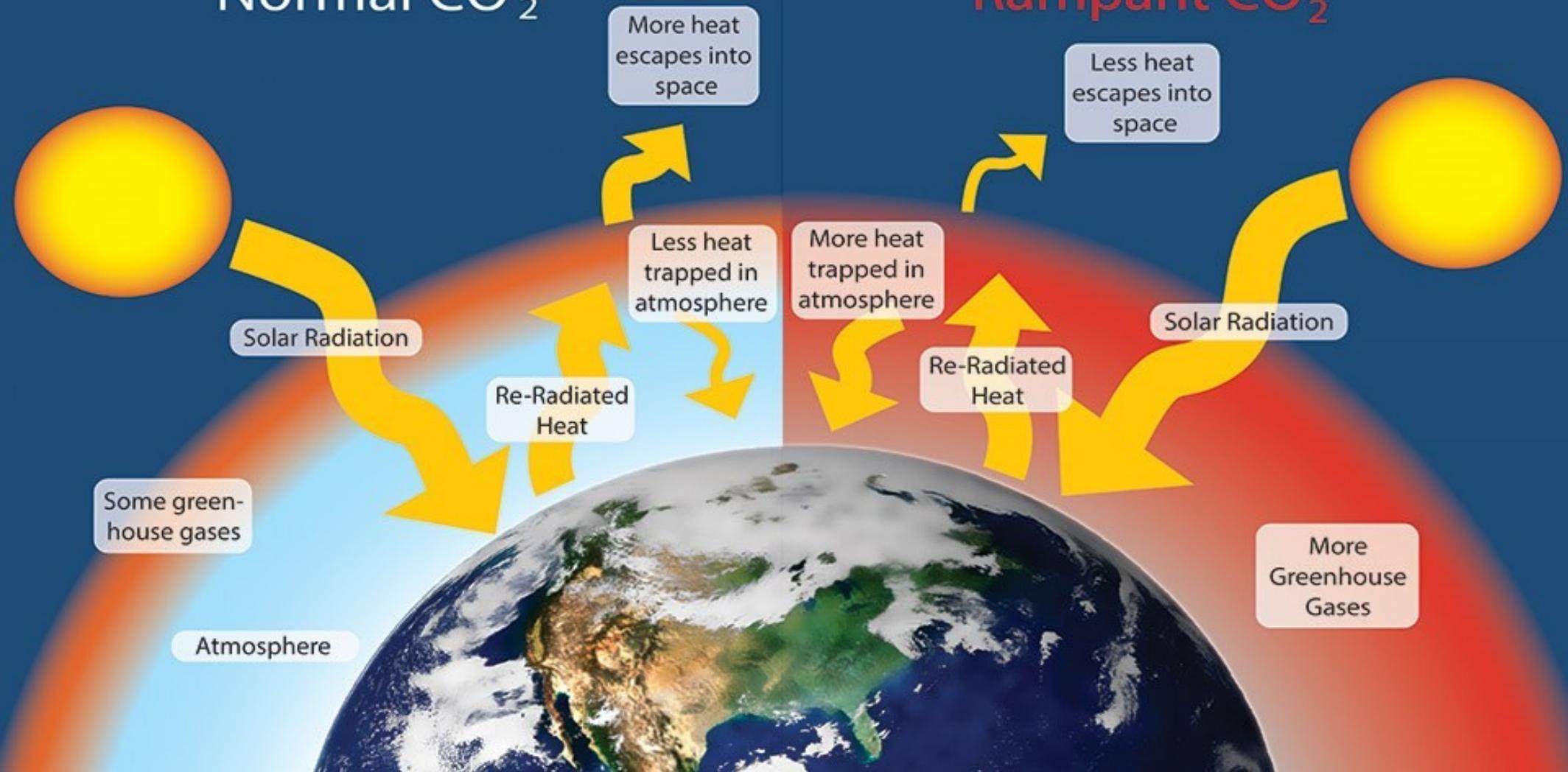
#ClimateReport

U.S. Mission Photo by Eric Bridiers

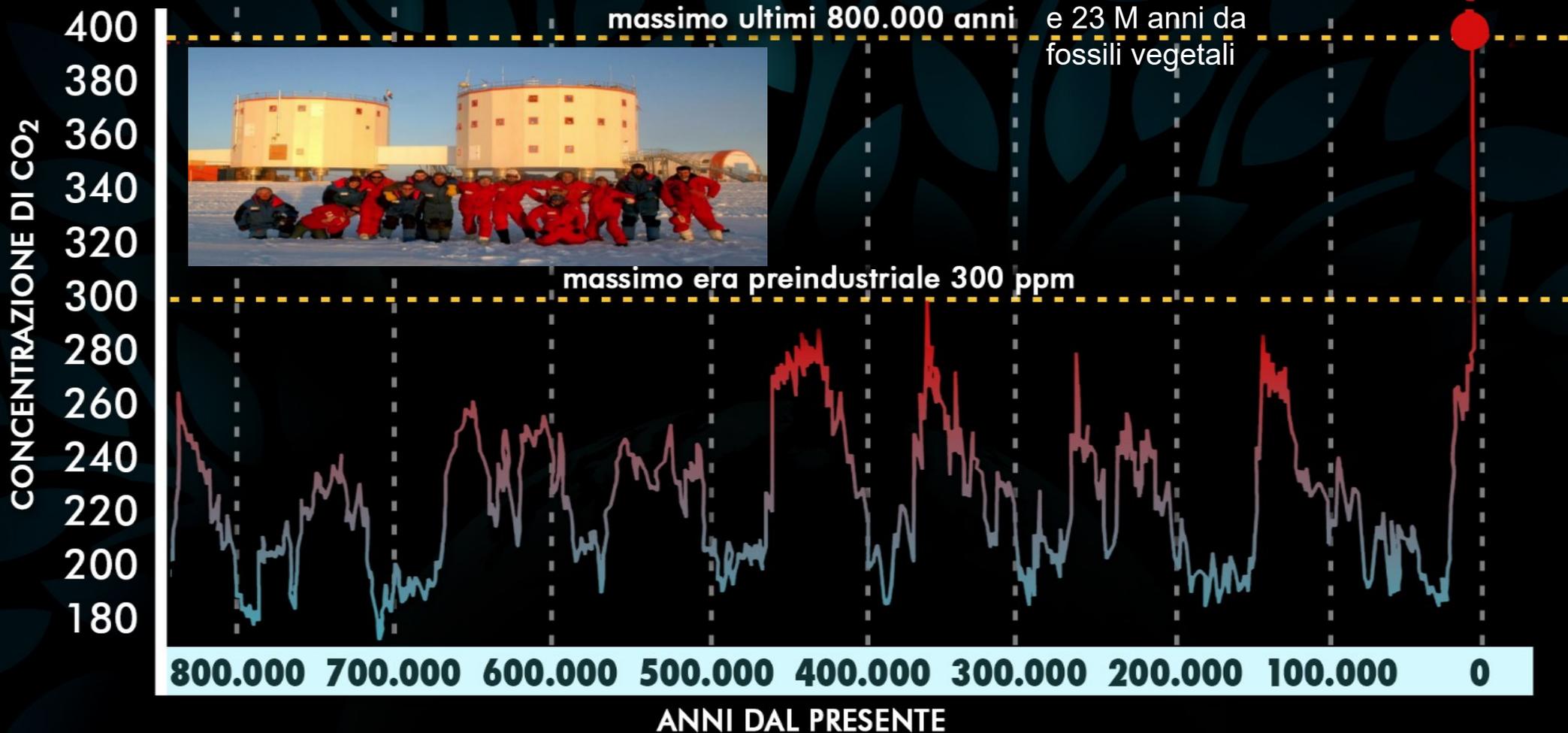


Greenhouse Effect Normal CO₂

Greenhouse Effect: Rampant CO₂

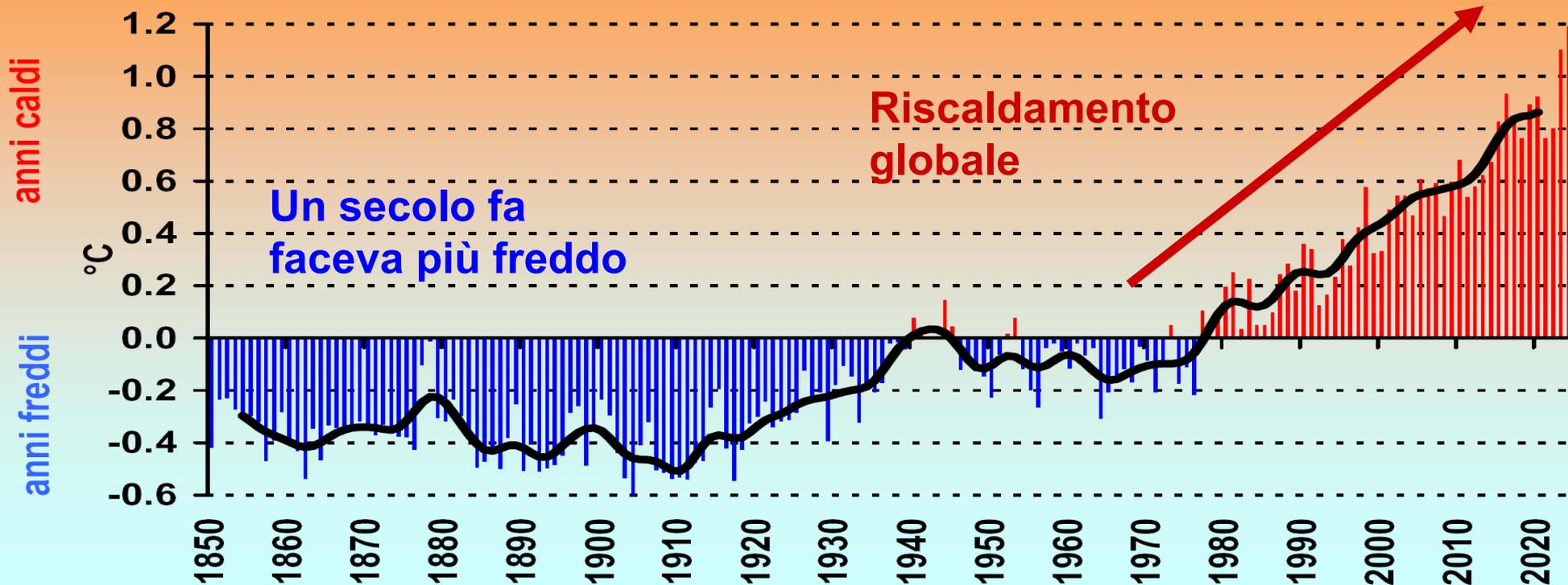


LIVELLO CO₂ NEL TEMPO



Temperatura in aumento su tutto il pianeta: **+1,3°C** nell'ultimo secolo

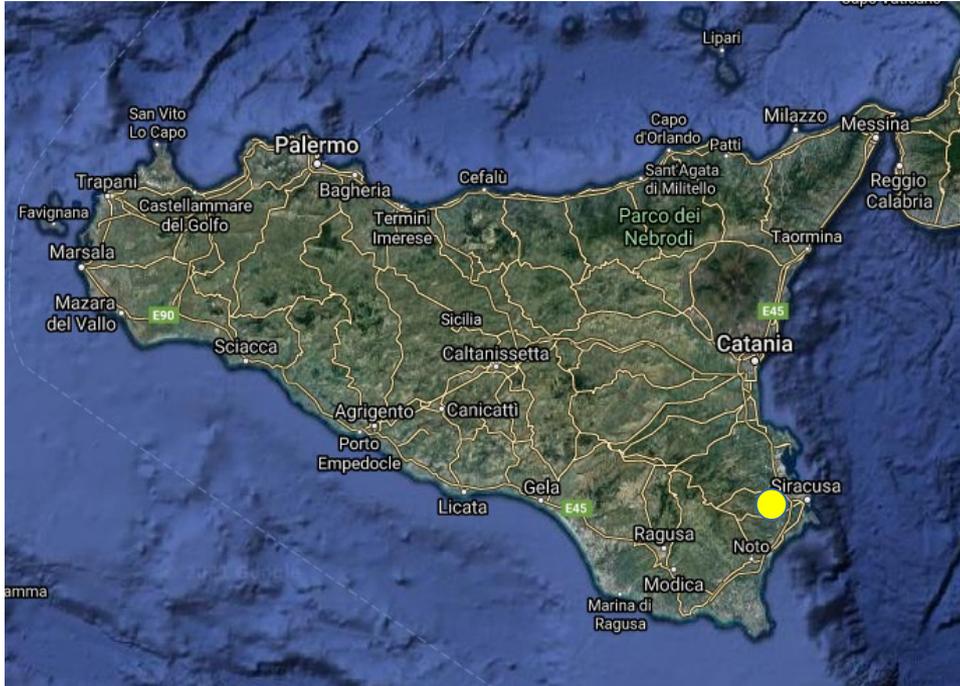
Anomalie termiche globali 1850-2024
(rispetto a media trentennio 1961-90)
serie MetOffice - Hadley Center



11 agosto 2021

48,8 °C a Florida, Siracusa

Temperatura massima record in Italia e in Europa in circa 200 anni di osservazioni



Stazione meteo rete SIAS

Stornoway

Met Office

40°C

has been provisionally recorded for the first time ever in the UK.

27

Aberdeen

29

Glasgow

19 luglio 2022

32

Newcastle

26

Belfast

38

Hull

36

Manchester

38

Norwich

37

Birmingham

40

London

33

Cardiff

27

Southampton

Plymouth

State of the Climate in Europe 2022



WEATHER CLIMATE WATER



WORLD METEOROLOGICAL ORGANIZATION

WMO-No. 1320

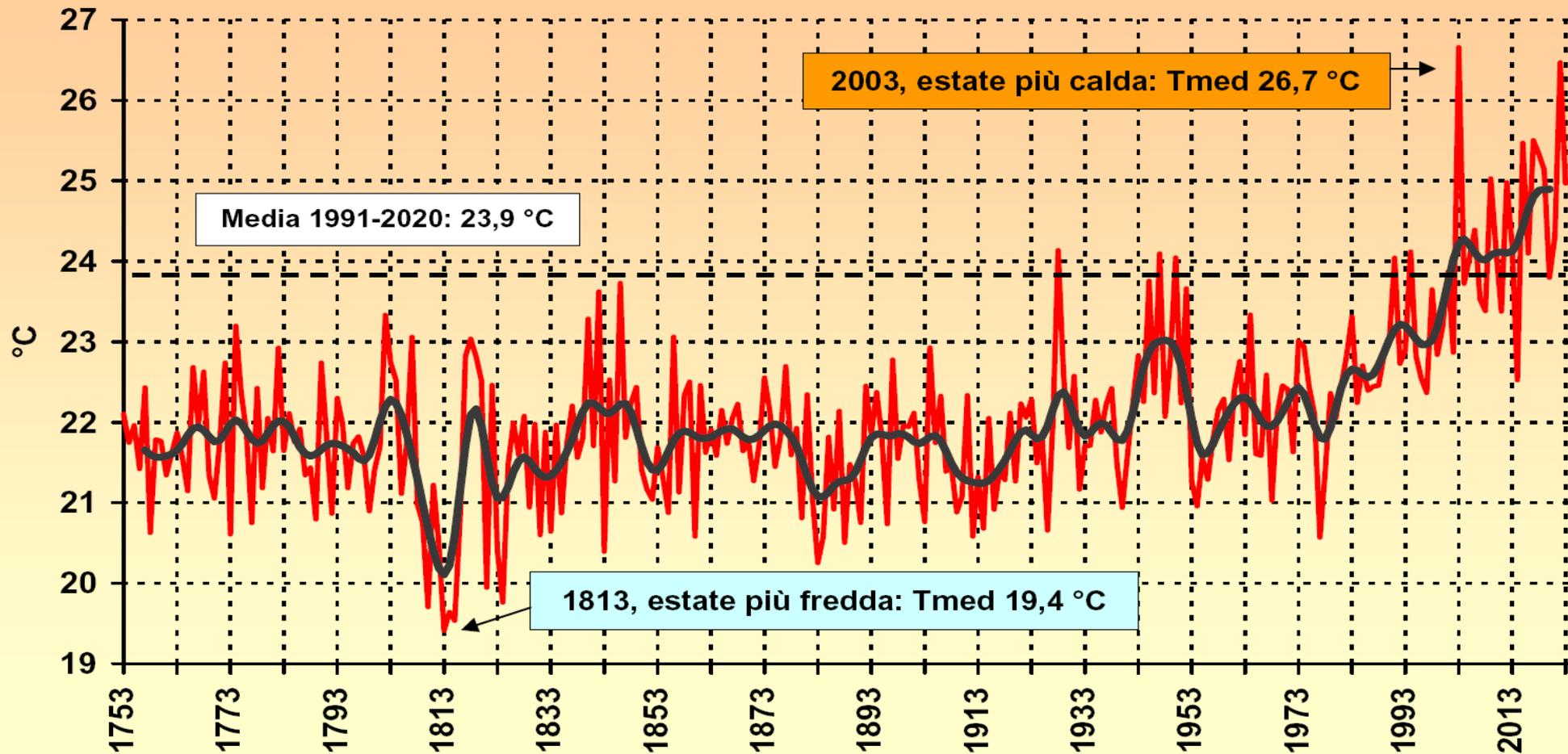


PROGRAMME OF THE EUROPEAN UNION



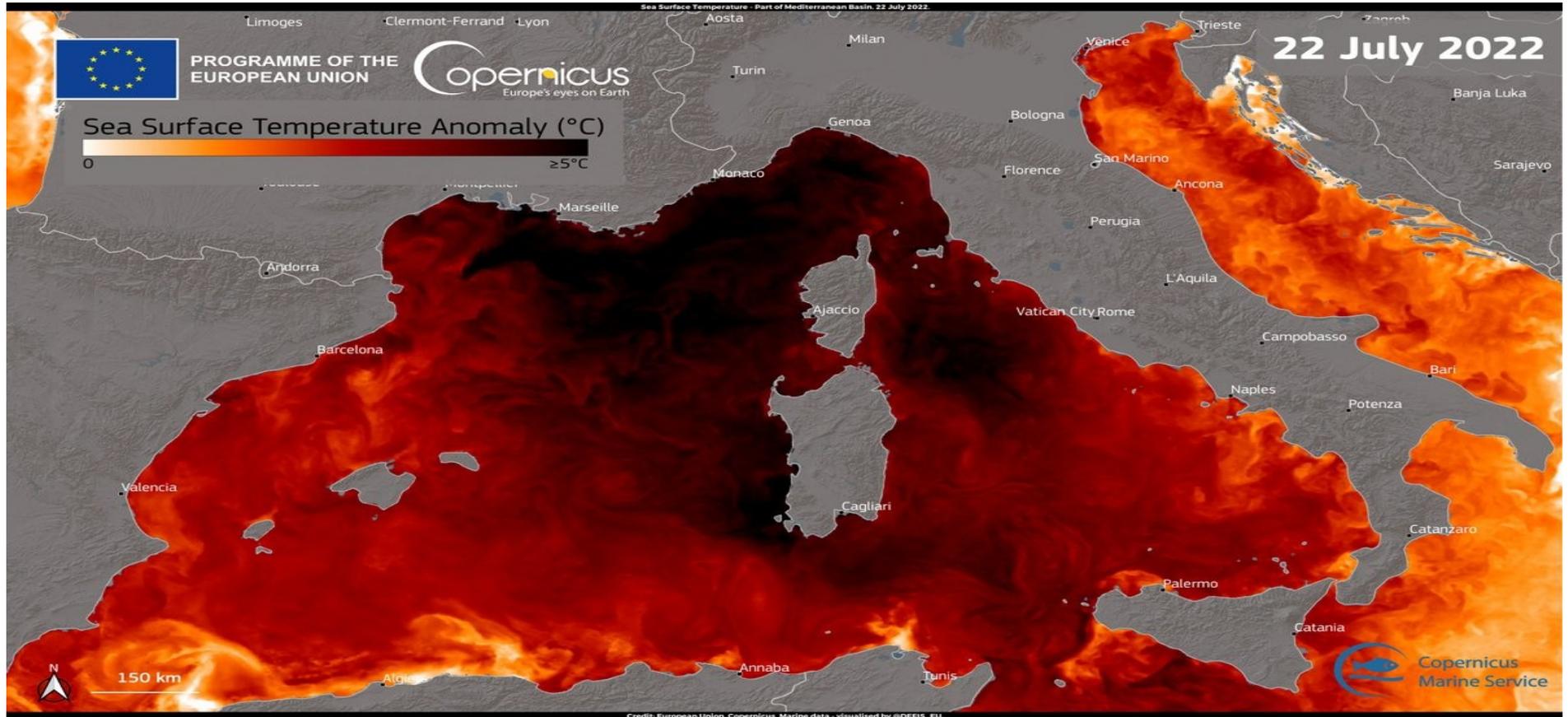
Torino - Temperature medie estive (°C) dal 1753 al 2024

(dati attuali: Arpa Piemonte; analisi storica: SMI / Nimbus)



2022, straordinaria ondata di calore “marina” nel Mediterraneo, fino a 5 °C sopra media!

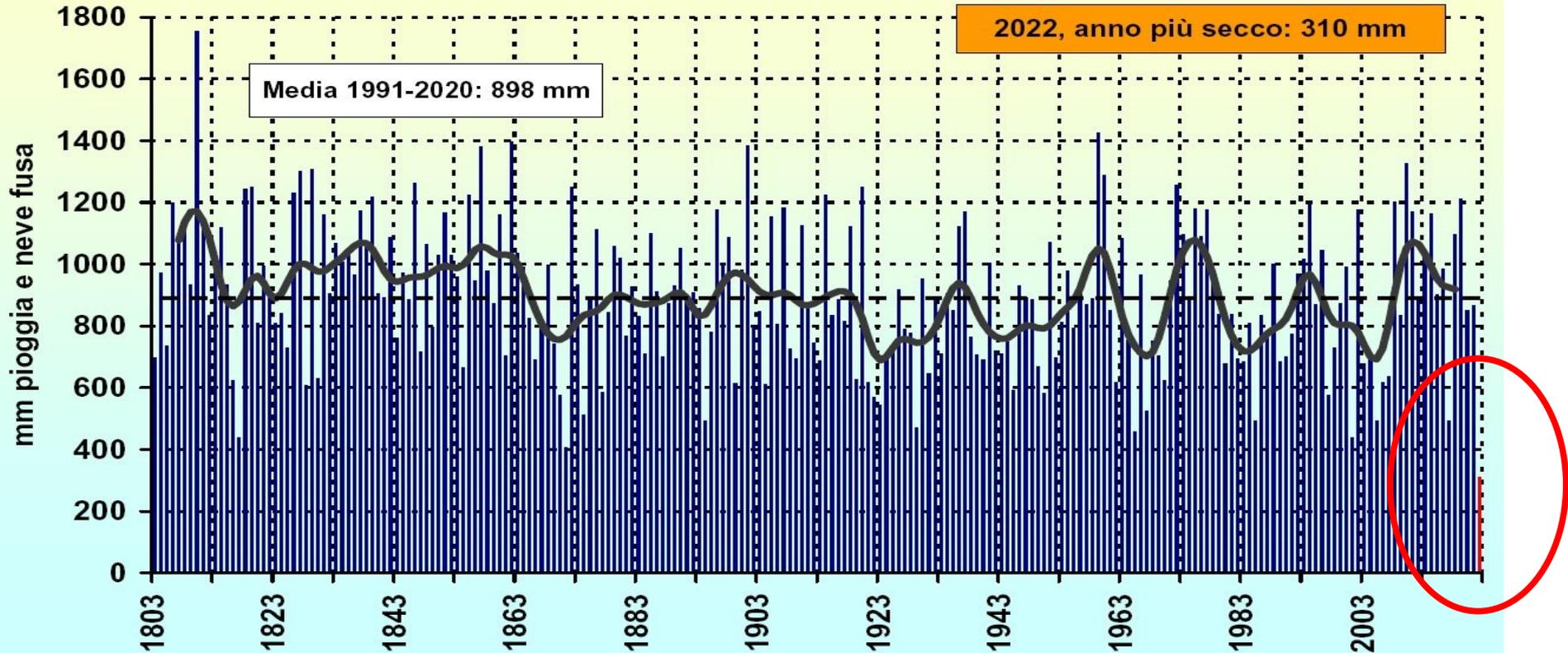
Credit: European Union, Copernicus Sentinel-3 imagery



2022: anno più asciutto in oltre due secoli a Torino



Torino centro - Precipitazioni totali annue (mm) dal 1803 al 2022
(dati attuali: Arpa Piemonte; analisi storica: SMI / Nimbus)



2022: portata media del Po ai minimi storici, 22 luglio = 108 m³/s

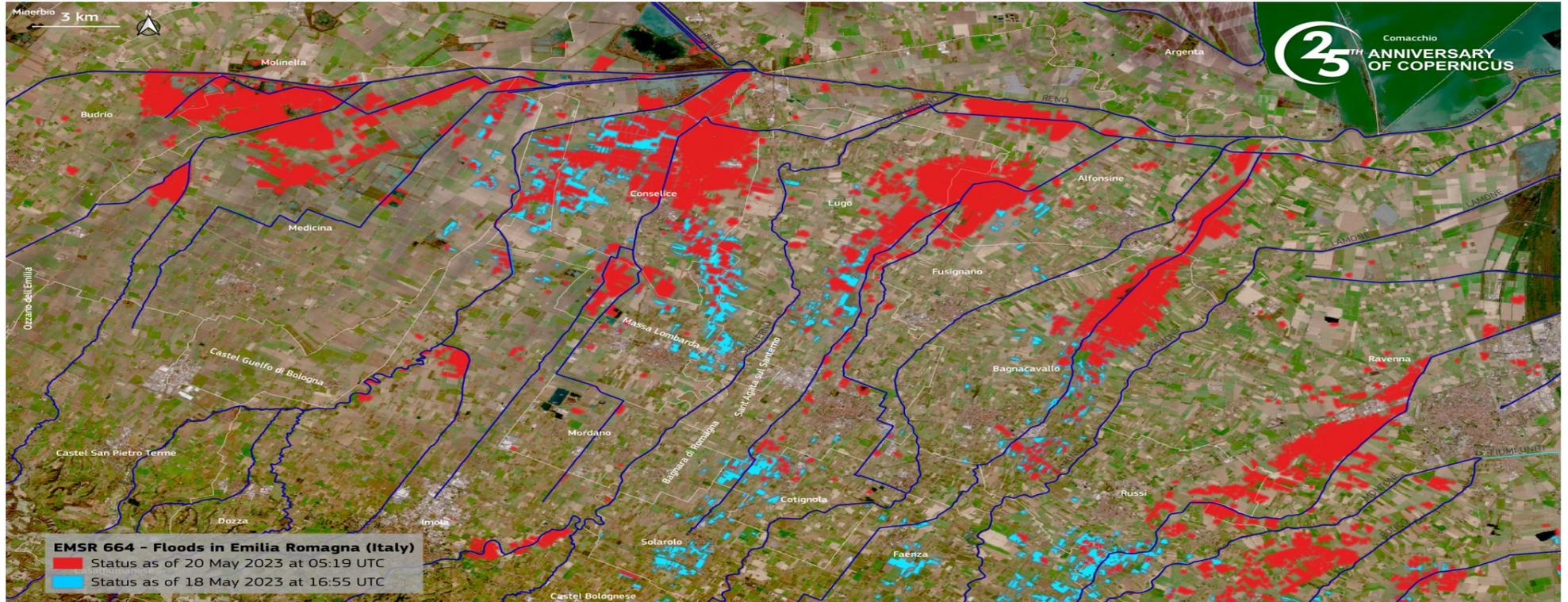


T. Orco in magra primaverile straordinaria nel Torinese (9 aprile 2022)

Portata del fiume Po a Pontelagoscuro



Maggio 2023, improvvisa fine della siccità al Nord Italia, gravi alluvioni in Romagna. Due eventi da 150-250 mm (simili solo a caso del maggio 1939), effetti aggravati dall'interferenza con le crescenti infrastrutture umane. + Alluvione 19 settembre e 20 ottobre 2024



PROGRAMME OF THE
EUROPEAN UNION



Emergency
Management

**Alluvioni Germania-
Belgio luglio 2021:
243 vittime;
Marche 15 Settembre
2022, 13 vittime;
Ischia, 26 novembre
2022, 12 vittime**

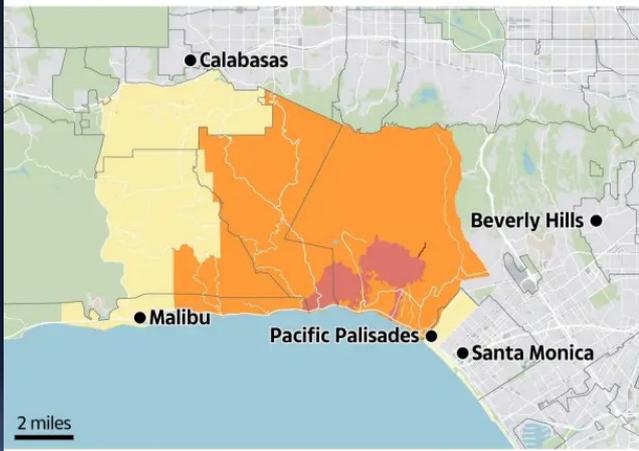




Estate 2021 e 2022: incendi in California, Grecia, Turchia, Algeria, Siberia, Francia...
Estate 2023: 6000 incendi in Canada, 170.000 km2 bruciati
Gennaio 2025: incendi Los Angeles

LA INFERNO

Fires erupt in Los Angeles with thousands forced to leave homes as city burns



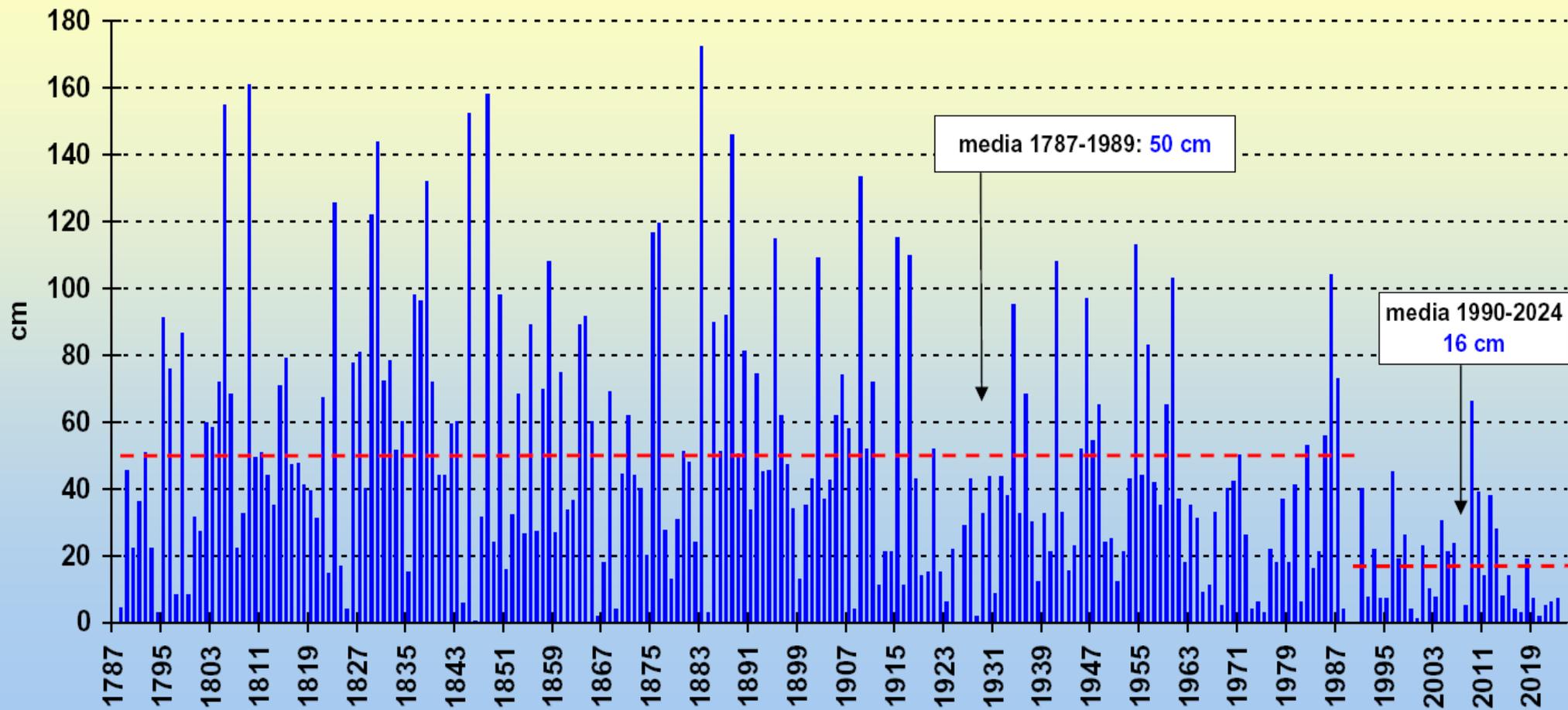
● Calabasas ● Beverly Hills ● Malibu ● Pacific Palisades ● Santa Monica

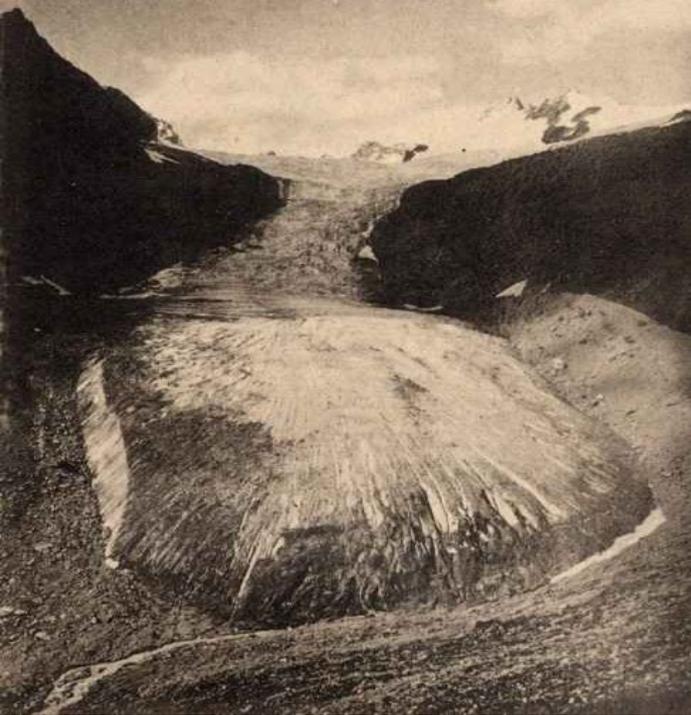
2 miles

 Fire	 Evacuation order	 Evacuation order
--	--	--

Torino, quantità stagionale di neve fresca (anno idrologico) dal 1787-88 al 2023-24

(fonte: SMI / www.nimbus.it)





1897
(f. Druetti)



2005
(f. L. Mercalli)



2015
(f. S. Jobard)

Ghiacciaio Pré de Bar (Monte Bianco):

ritiro della fronte di oltre 800 m dal 1897 al 2015

I ghiacciai alpini si sono ridotti di oltre il 60% in un secolo

3 luglio 2022: ghiacciaio Marmolada, collasso glaciale causato da massiccio e anomalo afflusso di acqua di fusione all'interno del ghiacciaio, 11 vittime

Foto CNSAS

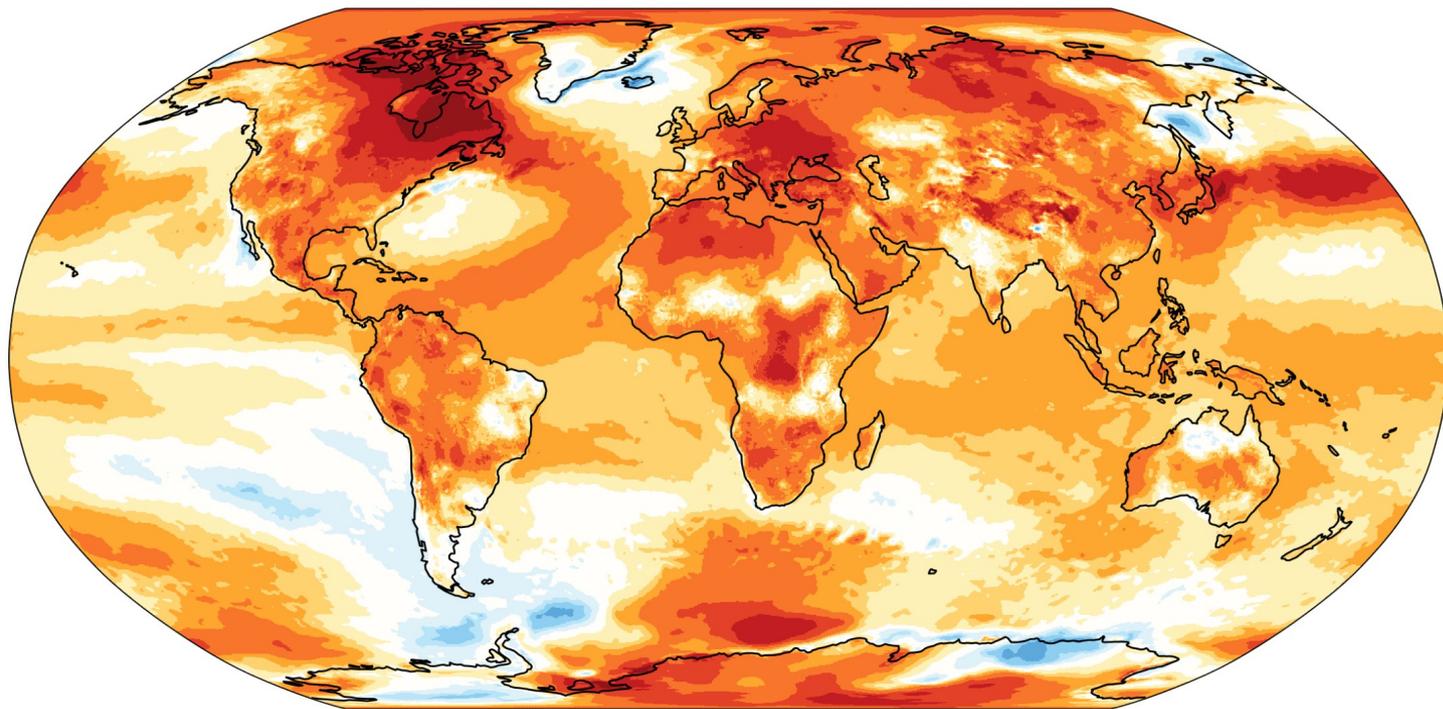


**2024, anno più
caldo da inizio
misurazioni,
>1,5 °C
preindustriale**

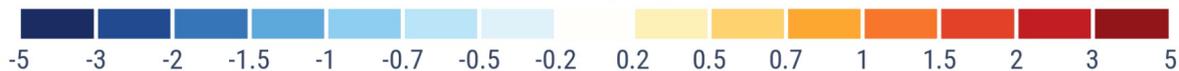


Surface air temperature anomalies in 2024

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

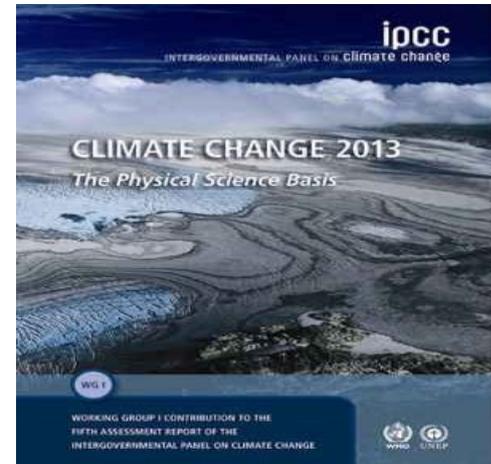


Anomaly (°C)



PROGRAMME OF
THE EUROPEAN UNION



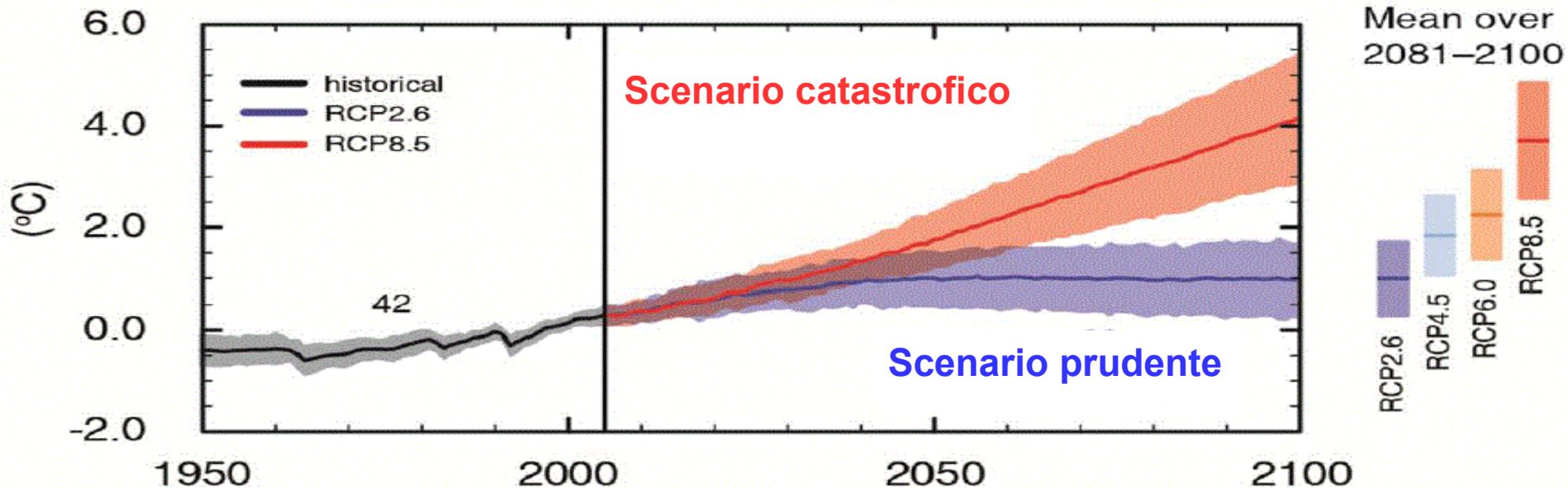


Scenari 5° rapporto IPCC (AR5 2013):

+2°C al 2100 se si applica **Accordo Parigi 2015** (linea azzurra), o fino a **+5°C** in più con business-as-usual (linea rossa)

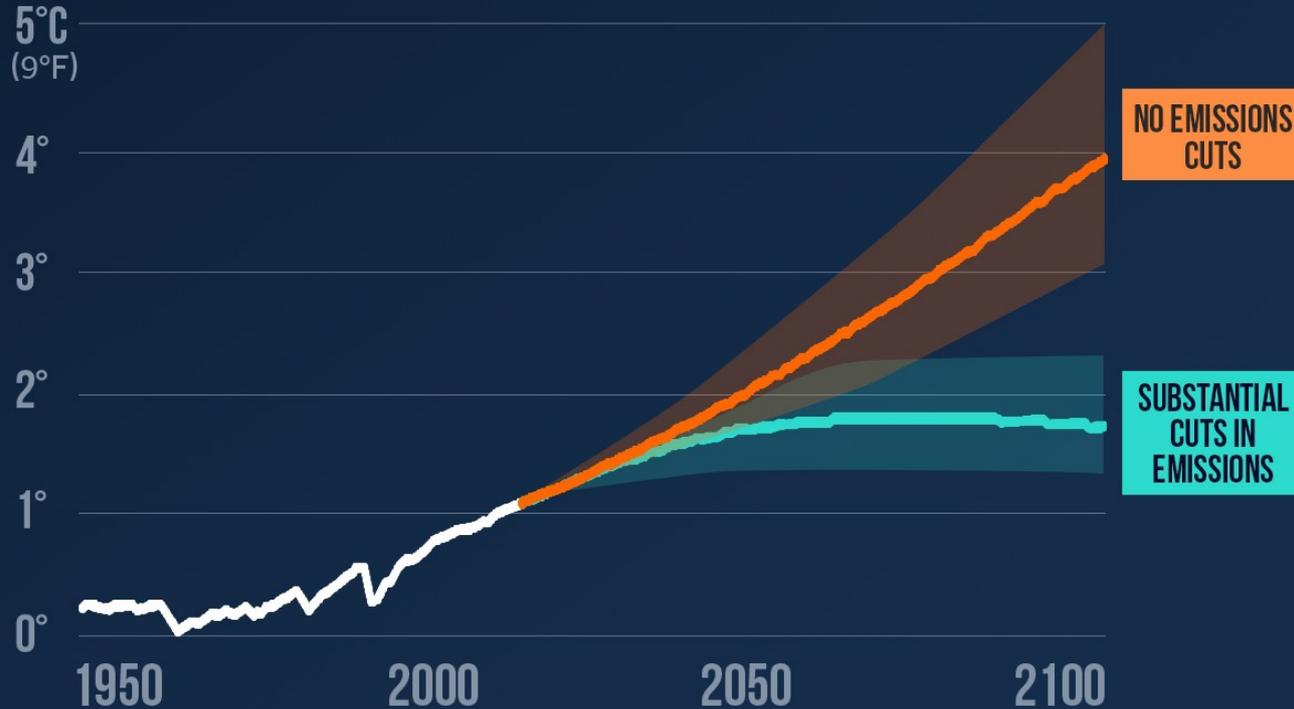
(a)

Global average surface temperature change



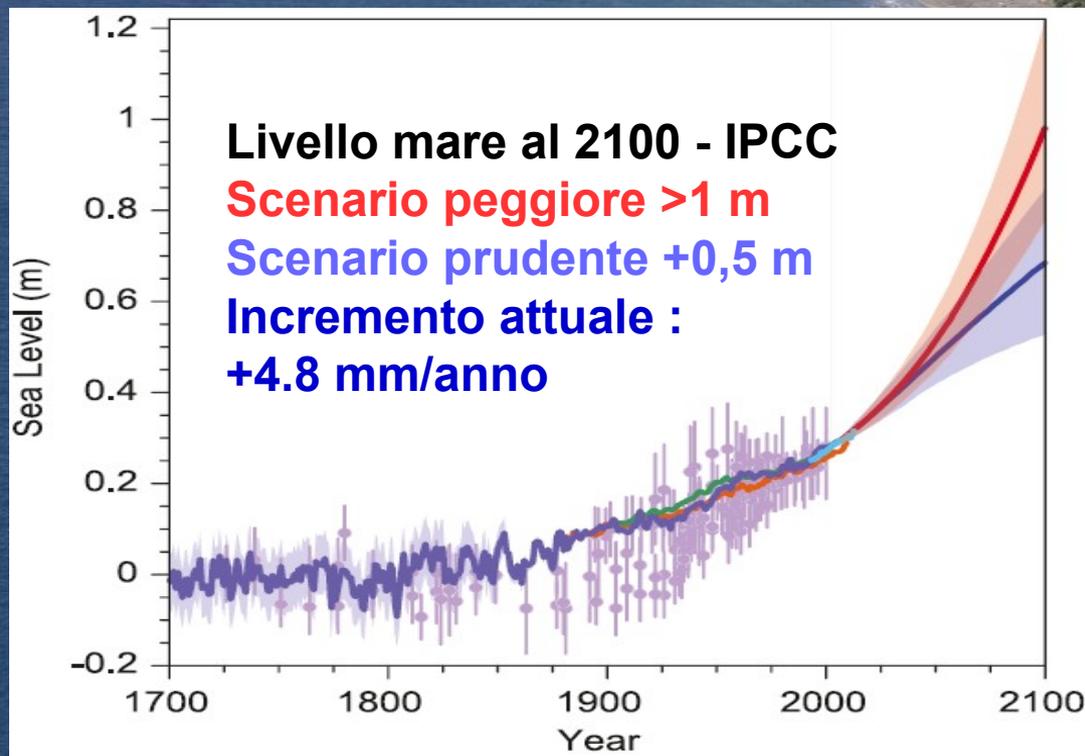
FUTURE TEMPERATURES

WARMING DEPENDS ON CHOICES TODAY



Global surface temperature (°C) anomaly relative to 1850-1900
High warming scenario: SSP3-7, Low warming scenario from SSP1-2.6.
Source: IPCC AR6 WG1

Le zone costiere risentiranno dell'aumento del livello marino, e dovranno essere adeguatamente protette (es: Venezia, delta del Po)



Cambiamento clima e perdita biodiversità

ipcc

INTERGOVERNMENTAL PANEL ON climate change

Climate Change and Land

An IPCC Special Report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems

Summary for Policymakers



WG I WG II WG III





**L'inquinamento
di aria, acqua e
suolo minaccia
la nostra salute
e quella delle
generazioni
future**

**POP Persistent
Organic
Pollutants +
Heavy Metals
Toxicity**

Top 10 Global Risks by Severity

Over the next 10 years



■ Economic ■ Environmental ■ Geopolitical ■ Societal ■ Technological

Source: World Economic Forum Global Risks Report 2022



I primi tre rischi globali più importanti secondo il World Economic Forum 2022 sono :

- cambiamenti climatici
- eventi meteorologici estremi
- perdita di biodiversità.

Possiamo ancora agire per evitare di peggiorarli, **ma dobbiamo farlo subito! Non c'è più tempo...**

FIGURE 16 Severity ranking by stakeholder over the long term (10 years)



Risk categories | Economic | Environmental | Geopolitical | Societal | Technological

Source

World Economic Forum Global Risks
Perception Survey YYYY



Biodiversity Strategy for 2030

A new Circular Economy Action Plan

- Strategy on the sustainable use of chemicals
- Clean Air and Water Action Plans

Preserving Europe's natural capital

Transition to a Circular Economy

A zero pollution Europe

- TBD with the commissioner-designate

Sustainable Transport

Farm to Fork

Farm to Fork Strategy

- Revising 2030 Climate targets
- Extending ETS
- Climate Pact
- Climate Law
- Carbon Border Tax

Achieving Climate Neutrality

The transformation of agriculture and rural areas

- Vision for Inclusive Rural Areas
- Africa Europe agenda

- Review Energy Legislation
- European Framework for gas
- Review Energy Taxation directive

Clean, Reliable and Affordable energy

Towards a modernised and simplified CAP

CAP reform proposal

Financing the transition

Leave no one behind (Just Transition)

- European Investment Bank as European Climate Bank
- Sustainable Europe Investment Plan
- Green Financing Strategy
- Mainstreaming climate transition and sustainability in the MFF

- Just Transition Instrument, including the Just Transition Fund
- Mainstreaming the Just Transition in the MFF





Più energie rinnovabili ed efficienza energetica edifici. Da risolvere il problema dello stoccaggio stagionale dell'energia!

Favorire mobilità elettrica a condizione che sia alimentata da elettricità rinnovabile e che sia obbligatorio il riciclo delle batterie



Meno viaggi aerei, meno trasporti in genere, più telelavoro



Telework can save ...



time



money

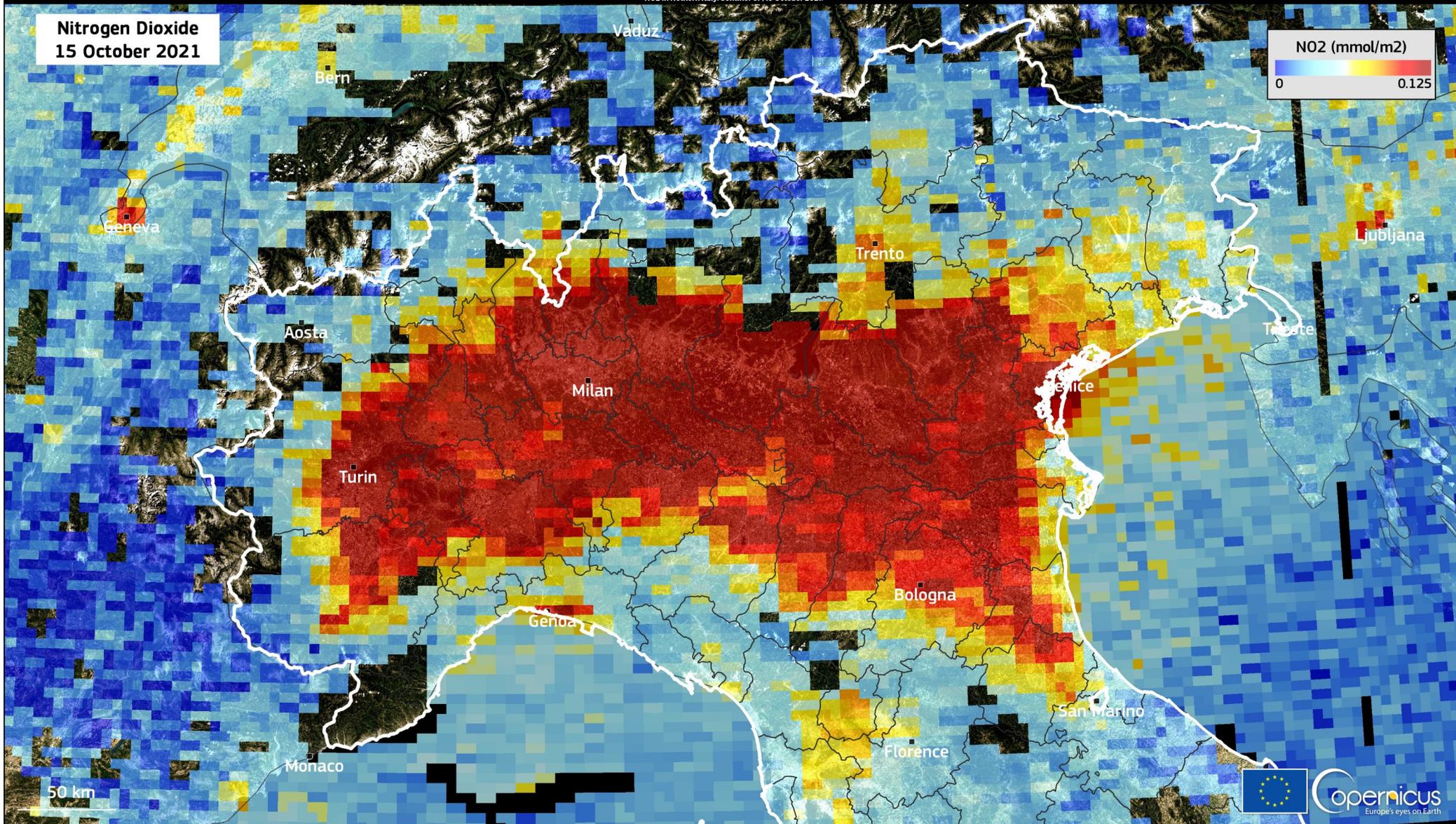
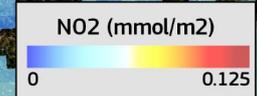


environment

**Allevamento: vale 15% delle emissioni globali (metano)
Ridurre la quota di carne rossa nella dieta e sostenere
agricoltura biologica e a filiera corta locale**



Nitrogen Dioxide
15 October 2021



Fermare la cementificazione, il suolo non è infinito!

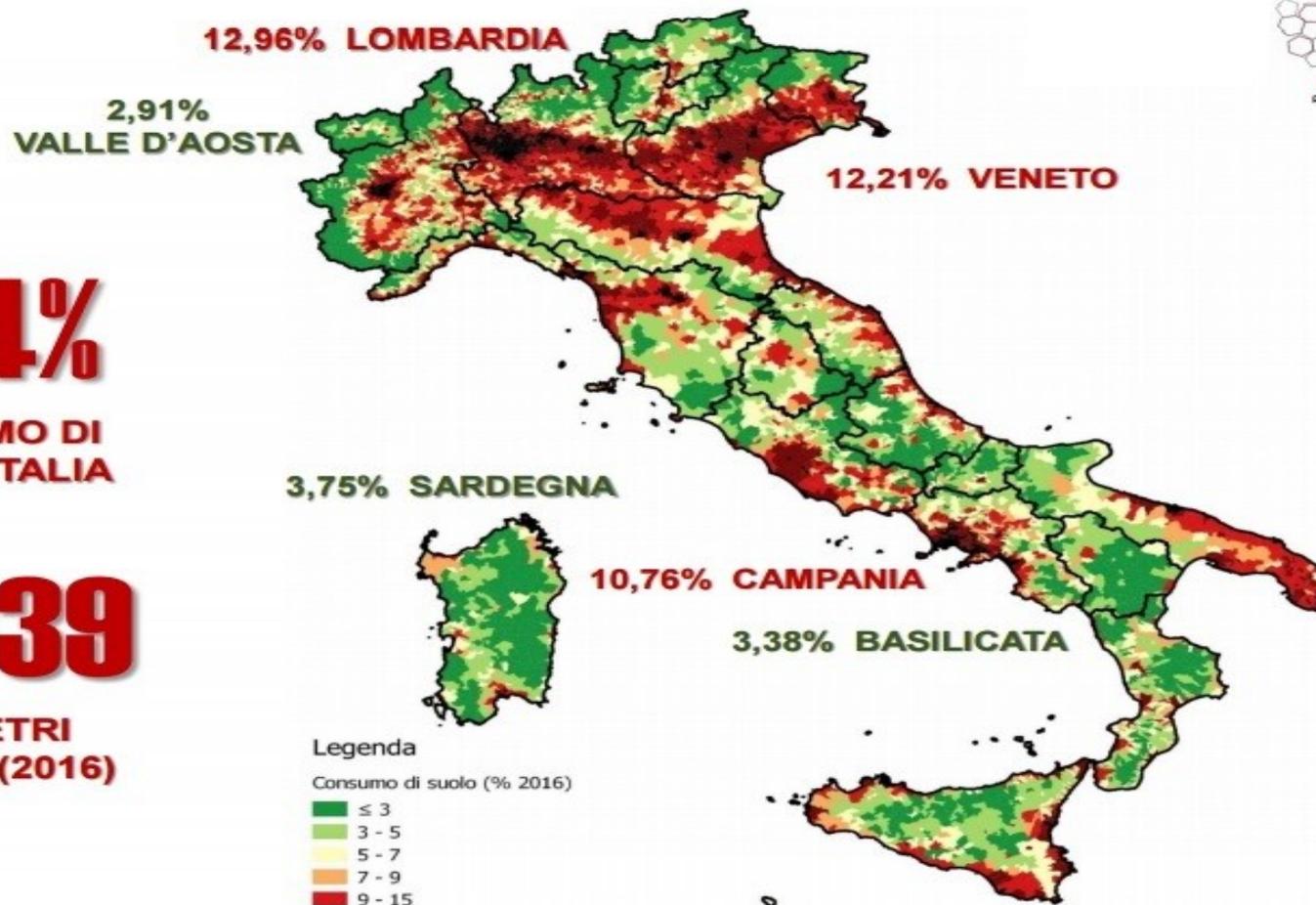


7,64%

**IL CONSUMO DI
SUOLO IN ITALIA**

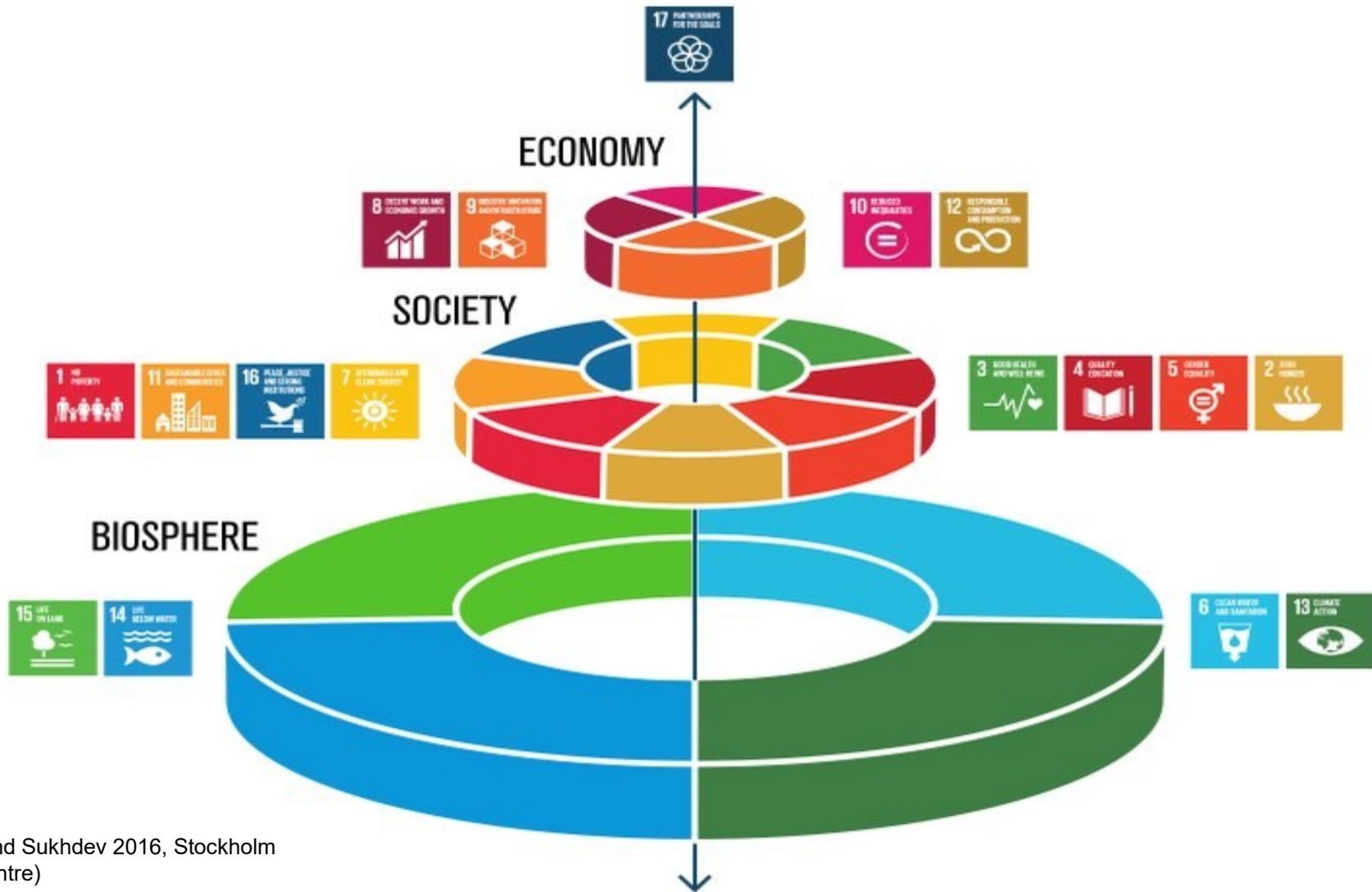
23.039

**CHILOMETRI
QUADRATI (2016)**



Al lavoro! Gli obiettivi UN dell'Agenda 2030





(Rockström and Sukhdev 2016, Stockholm Resilience Centre)

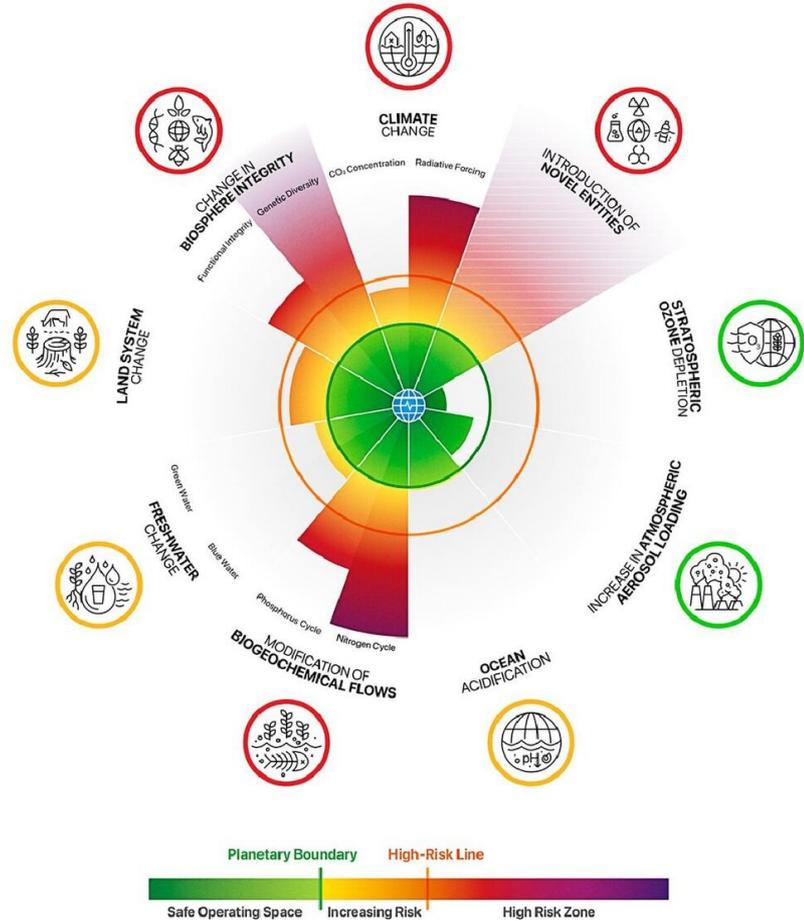
Planetary Health Check 2025

A Scientific Assessment of the State of the Planet



Planetary Health Check

Our planet's vital signs are flashing **red**.
7 out of 9 Planetary Boundaries are breached.
We have to act now.



<https://www.planetaryhealthcheck.org/>

Earth beyond six of nine planetary boundaries

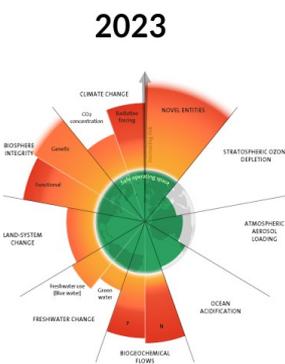
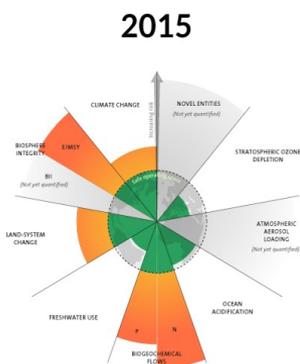
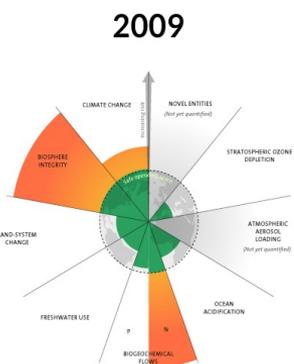
KATHERINE RICHARDSON, WILL STEFFEN, WOLFGANG LUCHT, JÖRGEN BENDTSEN, SARAH E. CORNELL, JONATHAN F. DONGES, MARCO INGO FETZER, GOVINDASAMY BALA, [...] AND JOHAN ROCKSTRÖM +19 authors [Authors Info & Affiliations](#)

SCIENCE ADVANCES · 13 Sep 2023 · Vol 9, Issue 37 · DOI: 10.1126/sciadv.adh2458

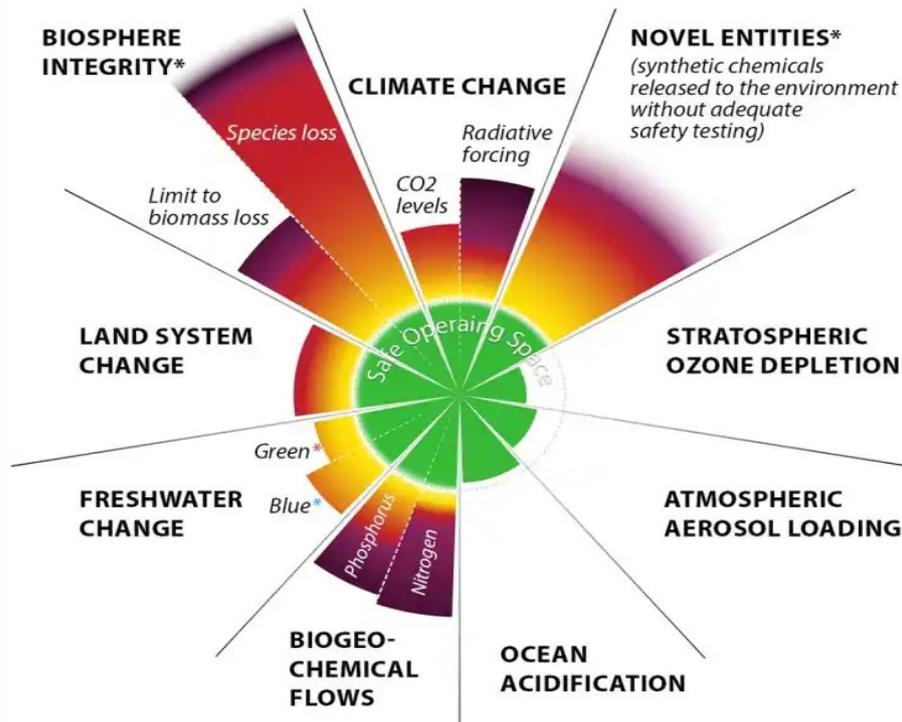
234.323

Abstract

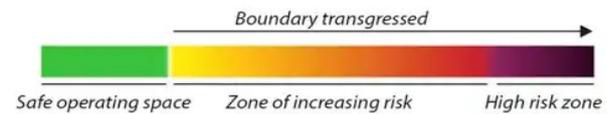
This planetary boundaries framework update finds that six of the nine boundaries are transgressed, suggesting that Earth is now well outside of the safe operating space for humanity. Ocean acidification is close to being breached, while aerosol loading regionally exceeds the boundary. Stratospheric ozone levels have slightly recovered. The transgression level has increased for all boundaries earlier identified as overstepped. As primary production drives Earth system biosphere functions, human appropriation of net primary production is proposed as a control variable for functional biosphere integrity. This boundary is also transgressed. Earth system modeling of different levels of the transgression of the climate and land system change boundaries illustrates that these anthropogenic impacts on Earth system must be considered in a systemic context.



SIX OUT OF NINE PLANETARY BOUNDARIES BREACHED



*Blurred upper edges because either the increasing risk has not yet been quantitatively defined or the current value is uncertain
 *Blue water is found in lakes, rivers, and reservoirs
 *Green water is available in the soil for plants and soil microorganisms



The 2023 state of the climate report: Entering uncharted territory

William J. Ripple, Christopher Wolf , Jillian W. Gregg, Johan Rockström, Thomas M. Newsome, Beverly E. Law, Luiz Marques, Timothy M. Lenton, Chi Xu, Saleemul Huq, Leon Simons and Sir David Anthony King

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Life on planet Earth is under siege. We are now in an uncharted territory. For several decades, scientists have consistently warned of a future marked by extreme climatic conditions because of escalating global temperatures caused by ongoing human activities that release harmful greenhouse gasses into the atmosphere. Unfortunately, time is up. We are seeing the manifestation of those predictions as an alarming and unprecedented succession of climate records are broken, causing profoundly distressing scenes of suffering to unfold. We are entering an unfamiliar domain regarding our climate crisis, a situation no one has ever witnessed firsthand in the history of humanity.

exceptional heat waves have swept across the world, leading to record high temperatures. The oceans have been historically warm, with global and North Atlantic sea surface temperatures both breaking records and unprecedented low levels of sea ice surrounding Antarctica (figure 1a–1d). In addition, June through August of this year was the warmest period ever recorded, and in early July, we witnessed Earth's highest global daily average surface temperature ever measured, possibly the warmest temperature on Earth over the past 100,000 years (figure 1e). It is a sign that we are pushing our planetary systems into dangerous instability.



APOSTOLIC EXHORTATION LAUDATE DEUM

Of the Holy Father Francis

To all people of good will on the climate crisis

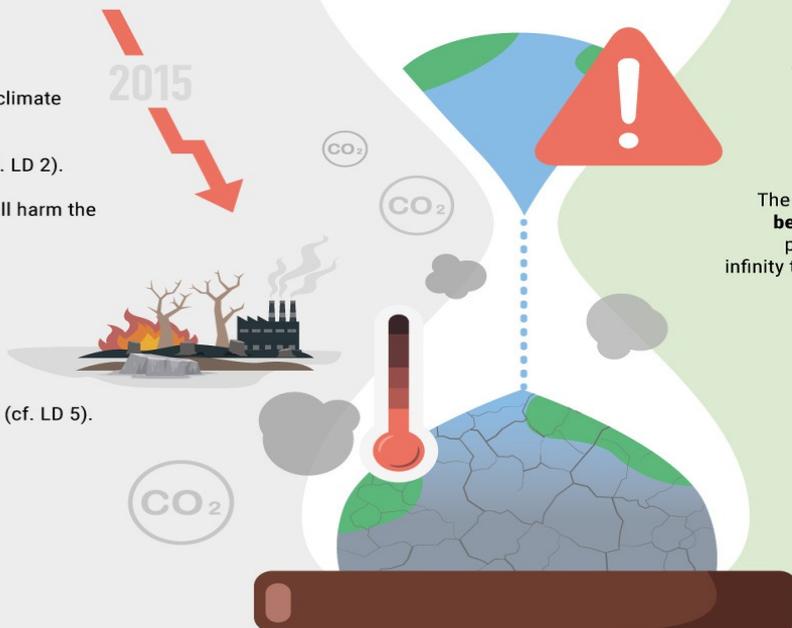
October 4, 2023

SINCE THE PUBLICATION OF LAUDATO SI' IN 2015...

- We have not reacted strongly enough to the climate crisis (cf. LD 2).
- The world that welcomes us is crumbling (cf. LD 2).
- We see how the impact of climate change will harm the lives and families of many people (cf. LD 2).

THE SIGNS OF CLIMATE CHANGE ARE:

- Extreme phenomena, unusual heat, droughts (cf. LD 5).
- Heavy rainfall, floods (cf. LD 5).
- Unusual acceleration of warming (cf. LD 6).
- Acceleration of the increase of greenhouse gases (cf. LD 11).



HOW DID WE GET TO THIS POINT?



Neither the **human causes** of climate change (cf. LD 11) nor its position in the **technocratic paradigm** can be doubted.

LACK OF EFFICIENCY, OPPORTUNITIES, AND LASTING PROGRESS IN MULTILATERAL AGREEMENTS BETWEEN STATES (cf. LD 34).

The **human being believes himself to be limitless**, "whose capacities and possibilities could be expanded to infinity thanks to technology" (cf. LD 21).

There are no organizations with real authority to ensure non-renounceable objectives (cf. LD 35).

We believe that the world around us is an object of exploitation, of unbridled use, of **unlimited ambition** (cf. LD 25).

Previous effective decision-making procedures were not sufficient (cf. LD 43).

Prior Climate Conferences have had a low level of implementation (personal interests are privileged over the common good) (cf. LD 52).

What is the point of preserving a power that will be remembered for its inability to intervene (cf. LD 60)?



“ ”

The whole of the universe shows the inexhaustible richness of God (cf. LD 63). Let us join this path of reconciliation with the world that shelters us (cf. LD 69). "There are no cultural changes without changes in people" (cf. LD 70). "Praise God": a human being who pretends to take his place becomes the worst danger to himself (cf. LD 73).

POPE FRANCIS



COP28
UAE

UN Dubai COP28

NOV 30, 2023 - DEC 12, 2023

- It should be a turning point to react and show that what has been done was worthwhile (cf. LD 54).
- It should help us to make a better energy transition (cf. LD 59).
- It should help us to get out of the logic of patchwork solutions in order to seek the common good and ensure the future of coming generations (cf. LD 58, 60).

DICASTERY FOR PROMOTING
INTEGRAL
HUMAN
DEVELOPMENT

Contact the Laudato Si' Movement and the
Laudato Si' Action Platform at
www.LaudateDeum.org
info@humandevlopment.va



“

We have a choice. Collective action or collective suicide. It is in our hands.

**UN SECRETARY-GENERAL ANTÓNIO GUTERRES
JULY 18, 2022**

“ The Guardian Pacific Press / LightRocket via Getty Images