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Youth Participation in Creating Resilient Cities

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“Seminar in Italy of Youngsters”

Quali sono le proiezioni future per i cambiamenti climatici?
Come comunicare le cause e gli effetti del cambiamento climatico?

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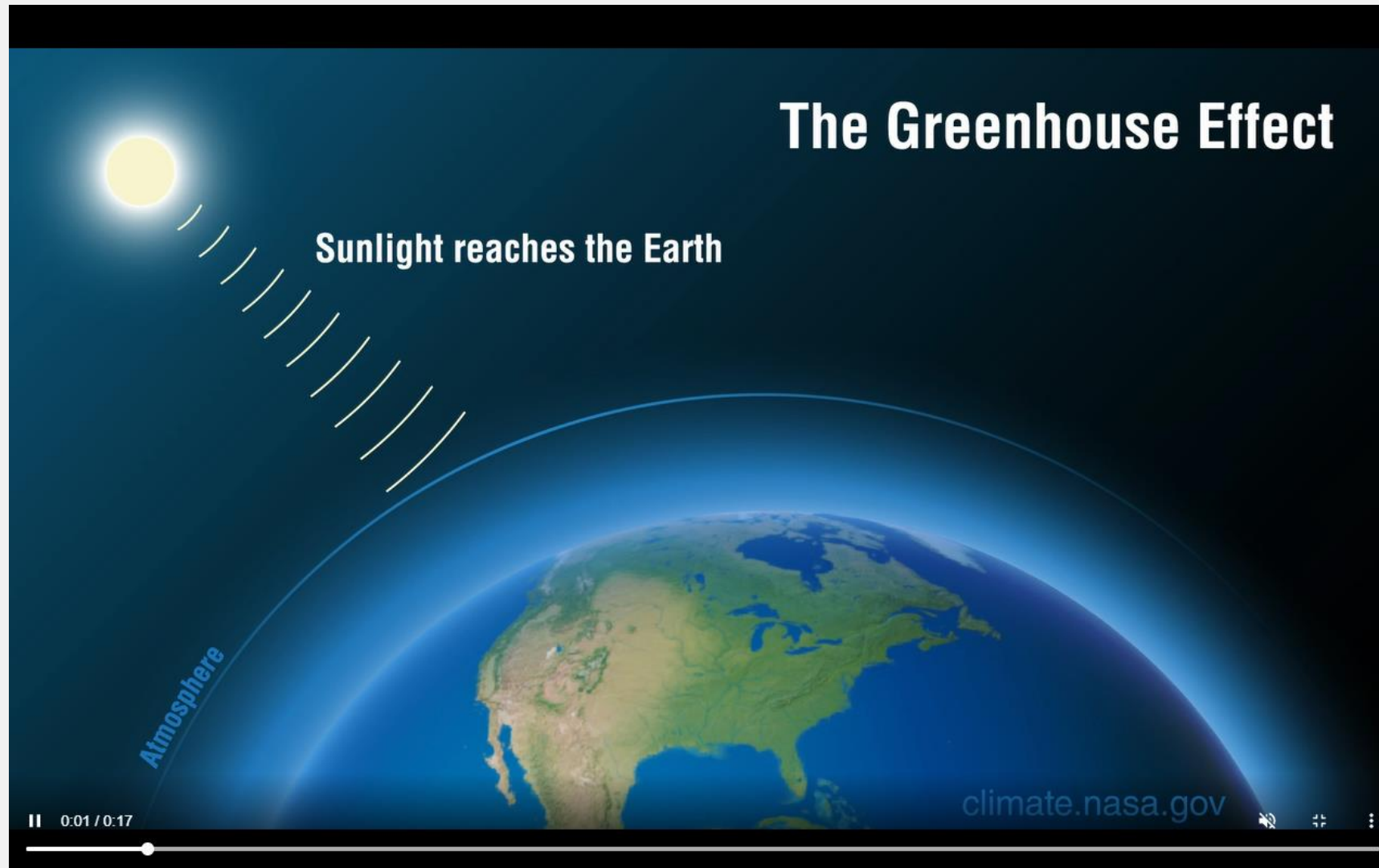
8 maggio 2024



UNIVERSITÀ
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DI MILANO

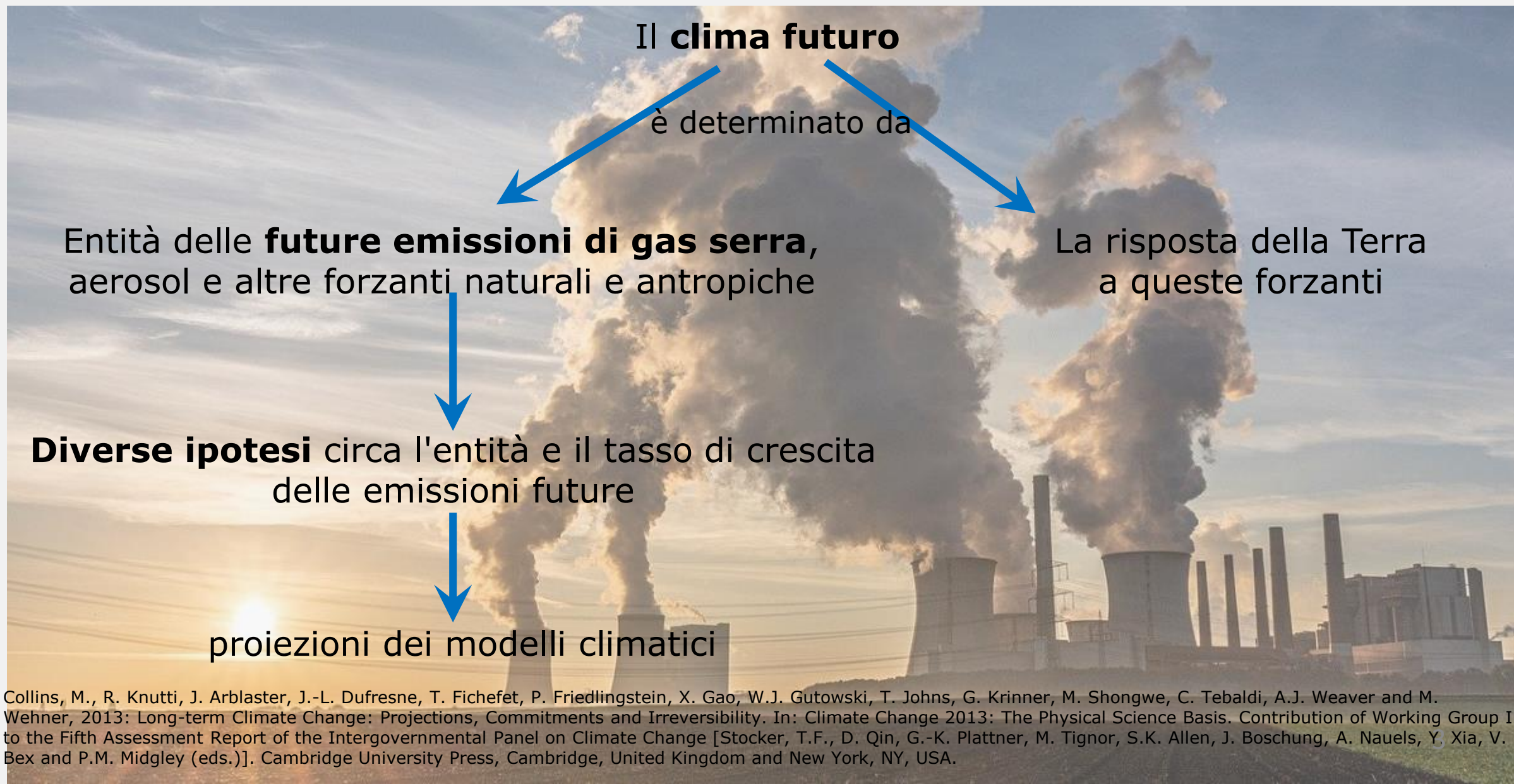
EFFETTO SERRA E TEMPERATURA

<https://climate.nasa.gov/causes/>

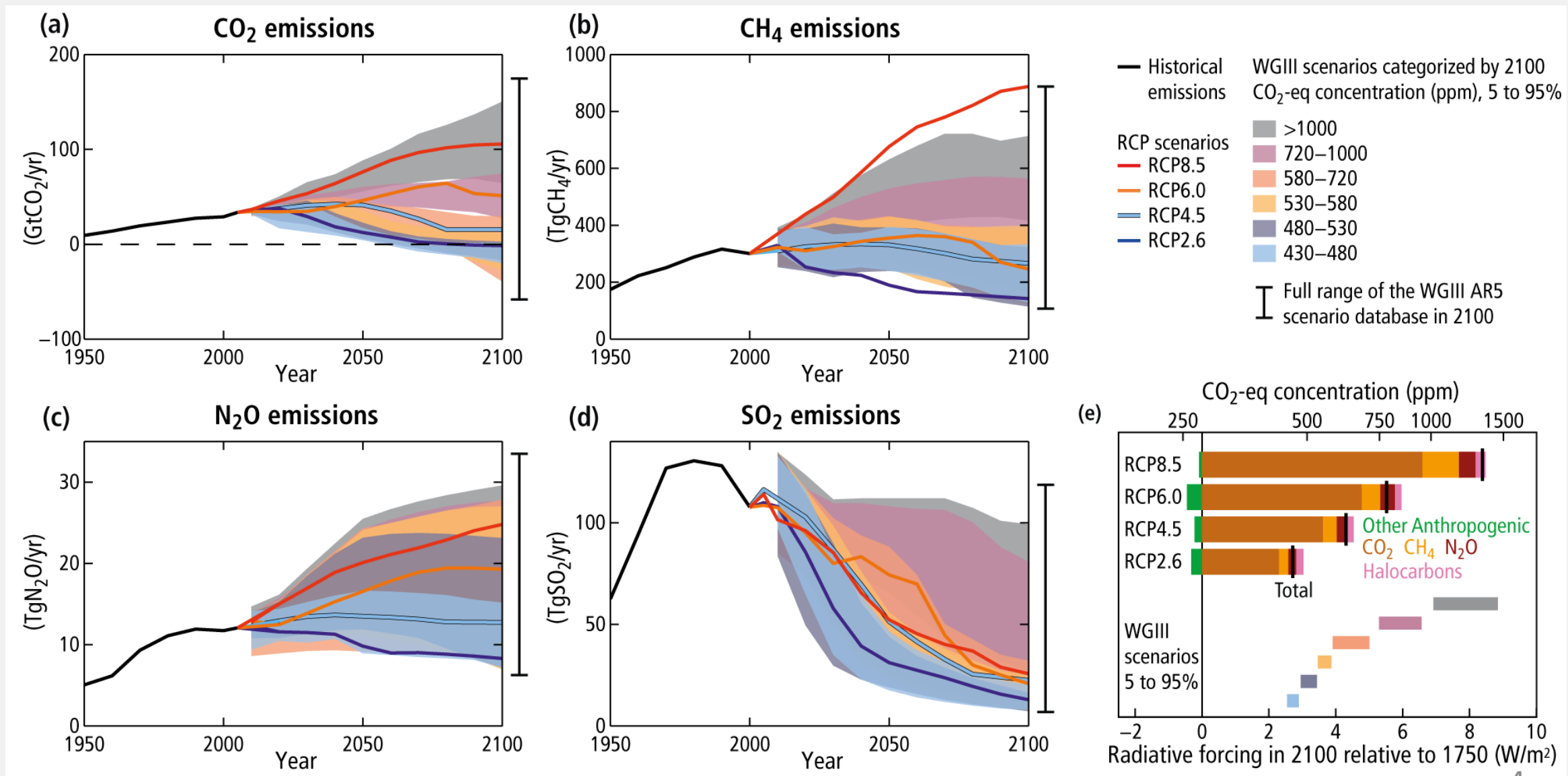




THE POWER OF GREENHOUSE GASES: Cosa ci preoccupa per i prossimi decenni

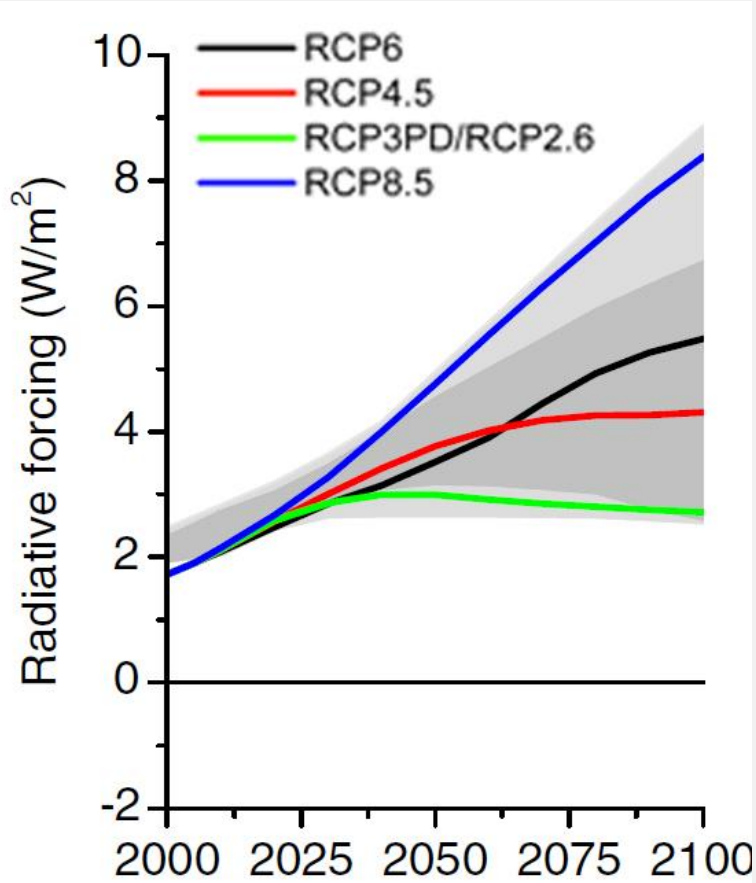


1. Proiezioni delle emissioni future: Representative Concentration Pathways (RCP)

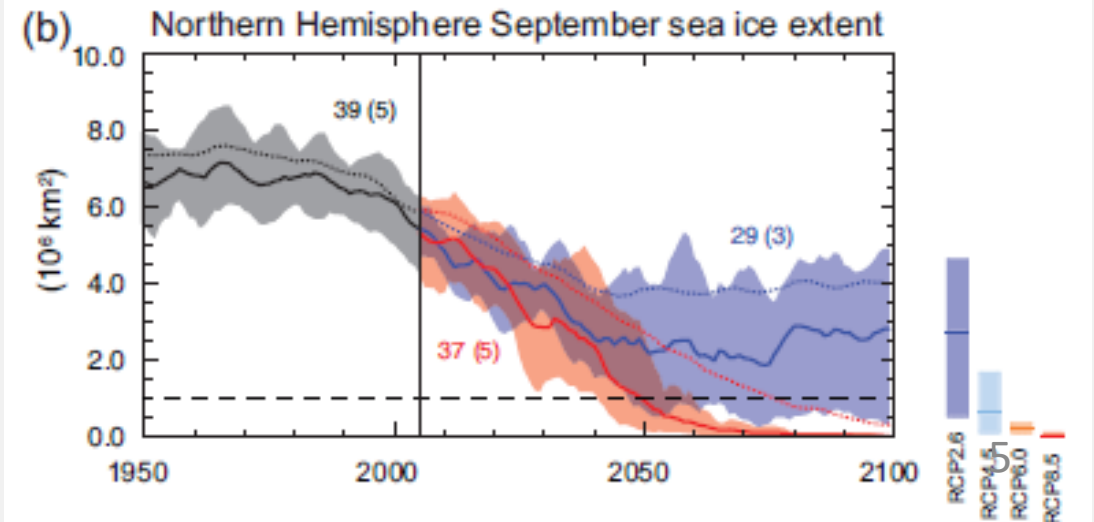
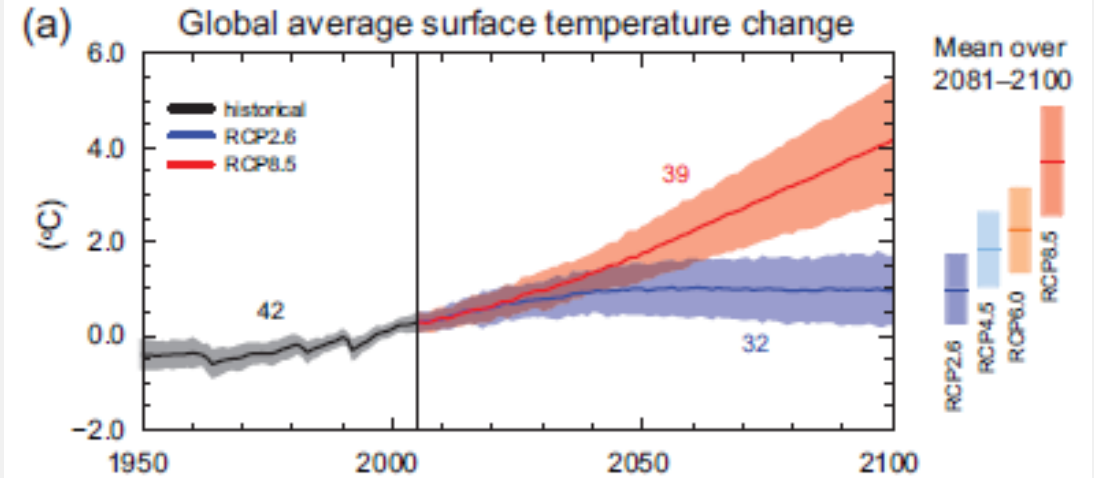


2. Proiezioni delle variazioni della temperatura

Scenari emissivi + Modelli climatici = Scenari Clima Futuro

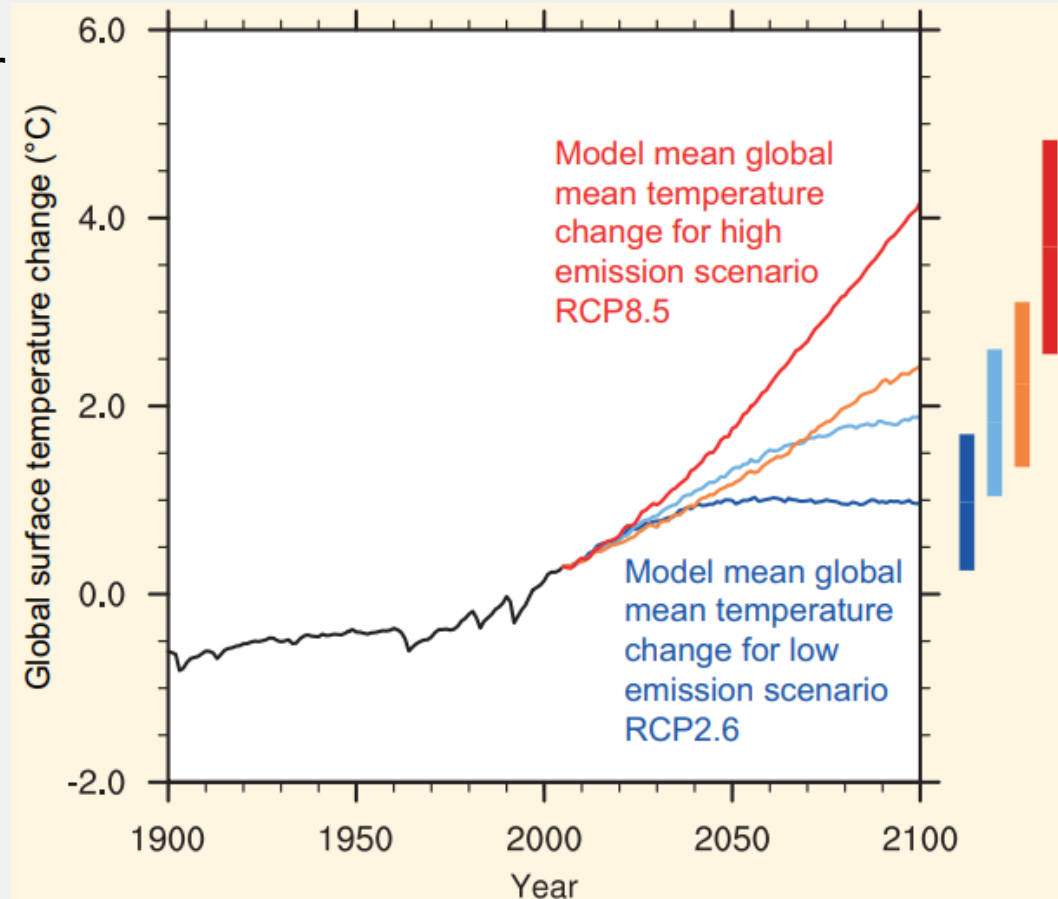


Radiative Forcing of the Representative Concentration Pathways. From van Vuuren et al (2011) The Representative Concentration Pathways: An Overview. Climatic Change, 109 (1-2), 5-31. The light grey area captures 98% of the range in previous IAM scenarios, and dark grey represents 90% of the range.



2. Proiezioni delle variazioni della temperatura

Global mean surface temperature increase for 2081–2100, relative to 1986–2005



Representative Concentration Pathways (RCP) scenarios

RCP8.5 -> 2.6-4.8°C

RCP6.0 -> 1.4-3.1°C

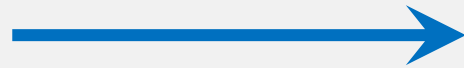
RCP4.5 -> 1.1-2.6°C

RCP2.6 -> 0.3-1.7°C

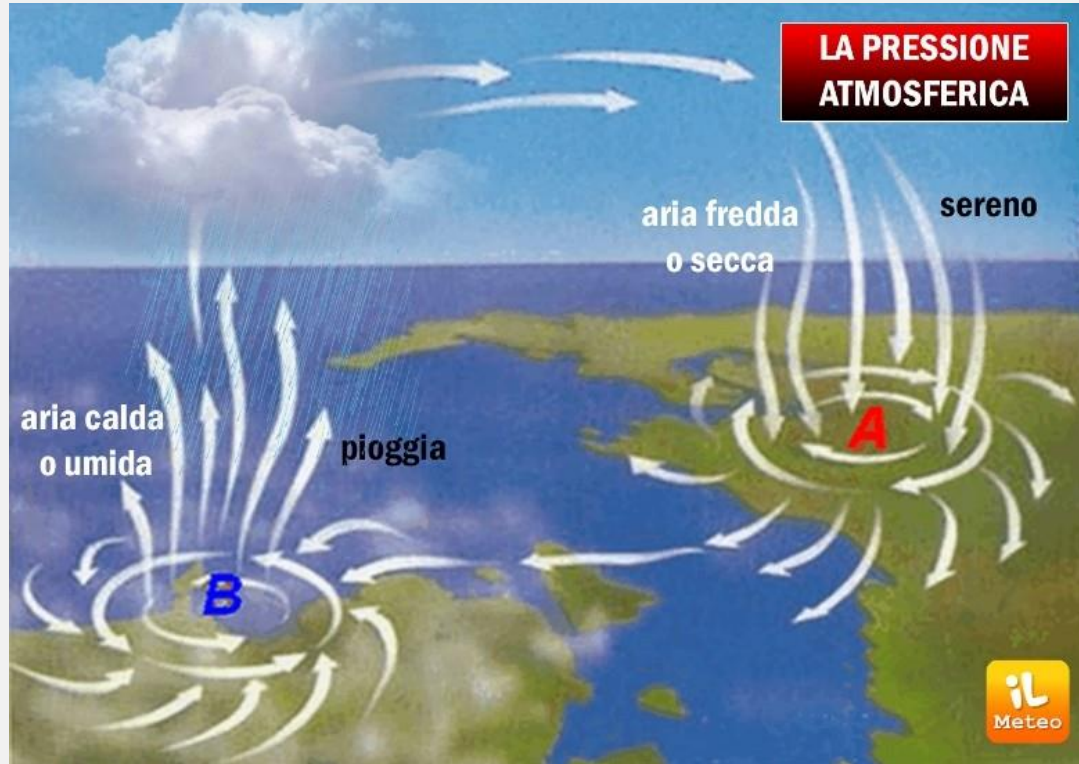
This temperature change will not be regionally uniform. There is very high confidence that globally averaged changes over land will exceed changes over the ocean at the end of the 21st century by a factor that is likely in the range 1.4 to 1.7. In addition, in most places, there will be more hot and fewer cold temperature extremes as global mean temperatures increase. These changes are expected for events defined as extremes on both daily and seasonal time scales. Increases in the frequency, duration and magnitude of hot extremes along with heat stress are expected; however, occasional cold winter extremes will continue to occur.

3. Cambiamenti nella circolazione atmosferica

Incremento globale della temperatura



Pressione media (sul livello del mare)



Riduzione alle alte latitudini

Incremento alle medie latitudini

Spostamenti verso il polo nella circolazione delle medie latitudini di circa 1 o 2 gradi di latitudine

In the tropics, the Hadley and Walker Circulations are likely to slow down. Poleward shifts in the mid-latitude jets of about 1 to 2 degrees latitude are likely at the end of the 21st century under RCP8.5 in both hemispheres (with a medium confidence), with weaker shifts in the North Hemisphere. In austral summer, the additional influence of stratospheric ozone recovery in the Southern Hemisphere opposes changes due to Greenhouse Gasses there, although the net response varies strongly across models and scenarios. Substantial uncertainty and thus low confidence remains in projecting changes in the North Hemisphere storm tracks, especially for the North Atlantic basin.

4. Cambiamenti nel ciclo dell'acqua

Incremento globale della temperatura

→ **aumento globale delle precipitazioni** alla fine del 21° secolo

Da 0.5 a 4%/°C
(RCP2.6)

Da 1 a 3%/°C
(RCP4.5, RCP6.0, RCP8.5)

↓
Crescente contrasto tra regioni e stagioni umide e secche

Changes in average precipitation in a warmer world will exhibit substantial spatial variation. Some regions will experience increases, other regions will experience decreases and yet others will not experience significant changes at all. Annual surface evaporation is projected to increase as global temperatures rise over most of the ocean and is projected to change over land following a similar pattern as precipitation. In addition, decreases in annual runoff are likely in parts of southern Europe, the Middle East, and southern Africa by the end of the 21st century under the RCP8.5 scenario. Increases in annual runoff are likely in the high northern latitudes corresponding to large increases in winter and spring precipitation by the end of the 21st century under the RCP8.5 scenario. Finally, regional to global-scale projected decreases in soil moisture and increased risk of agricultural drought are likely in presently dry regions and are projected with medium confidence by the end of the 21st century under the RCP8.5 scenario.

5. Cambiamenti nella criosfera

Incremento globale della temperatura

Riduzione in area e spessore della copertura del ghiaccio marino artico

per il periodo 2081-2100 rispetto al periodo 1986-2005: dall'8% per RCP2.6 al 34% per RCP8.5 a febbraio dal 43% per RCP2.6 al 94% per RCP8.5 a settembre

Diminuzione dell'estensione e del volume del ghiaccio marino antartico

Diminuzione dell'intervallo dal 16% per RCP2.6 al 67% per RCP8.5 a febbraio e dall'8% per RCP2.6 al 30% per RCP8.5 a settembre per il periodo 2081-2100 rispetto al periodo 1986-2005

Riduzione del manto nevoso nell'emisfero nord del 7% (RCP2.6) - 25% (RCP8.5)

Ritiro dell'estensione del permafrost del 37% (RCP2.6) - 81% (RCP8.5)

6. Cambiamenti negli oceani

Riscaldamento globale degli oceani

Da 0.6°C (RCP2.6) a 2.0°C (RCP8.5) in superficie

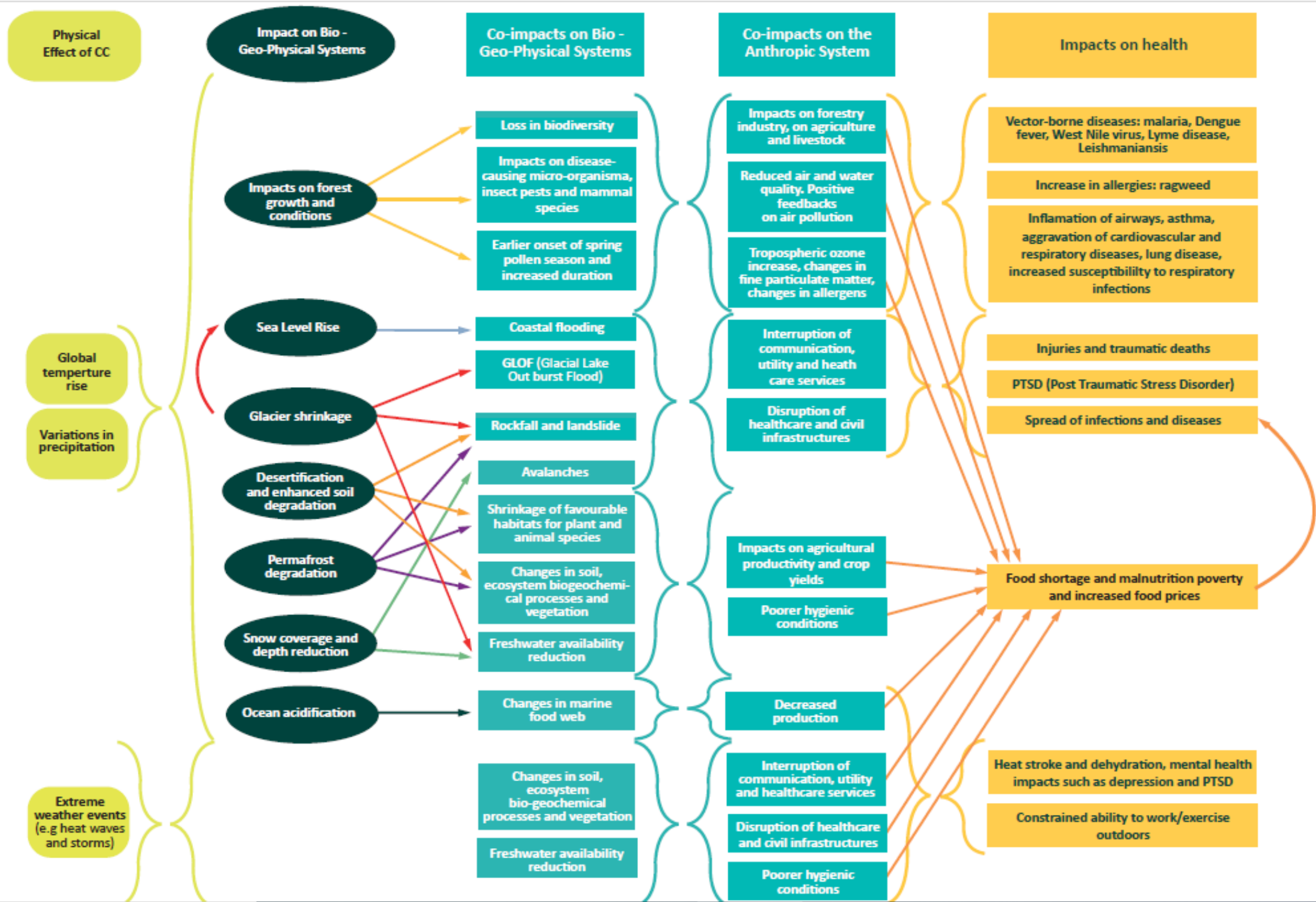
Da 0.3°C (RCP2.6) a 0.6°C (RCP8.5) ad una profondità di circa 1 km

**il riscaldamento degli oceani continuerà per secoli,
anche se le emissioni di gas serra verranno ridotte o le concentrazioni mantenute costanti**

The strongest ocean warming is projected for the surface in subtropical and tropical regions. At greater depth the warming is projected to be most pronounced in the Southern Ocean. For RCP4.5 by the end of the 21st century, half of the energy taken up by the ocean is in the uppermost 700 m and 85% is in the uppermost 2000 m. Due to the long time scales of this heat transfer from the surface to depth, ocean warming will continue for centuries, even if GHG emissions are decreased or concentrations kept constant.

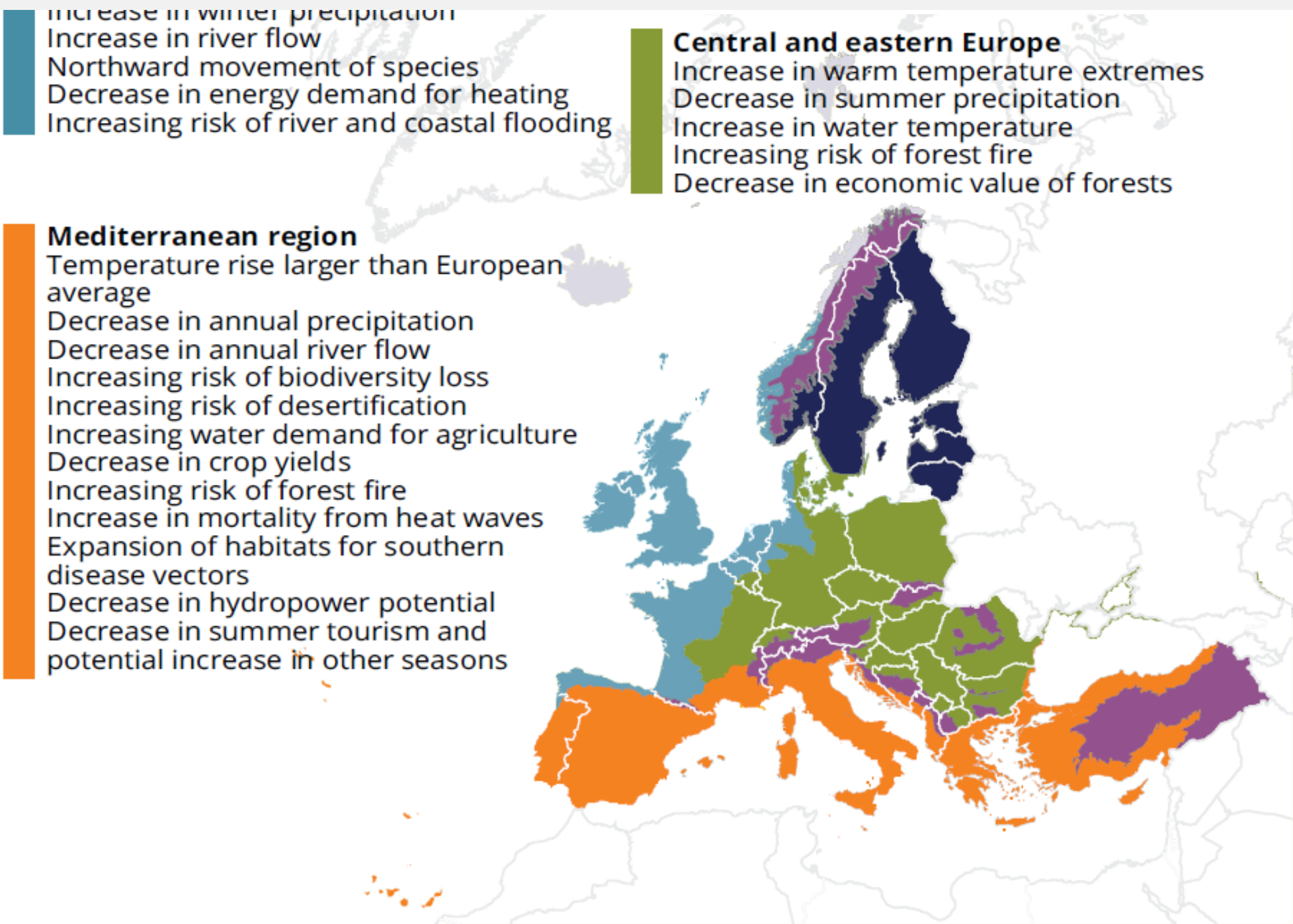


Overview of the links between different impacts of climate change: from physical effects to impacts on bio-geophysical and anthropic systems and on health

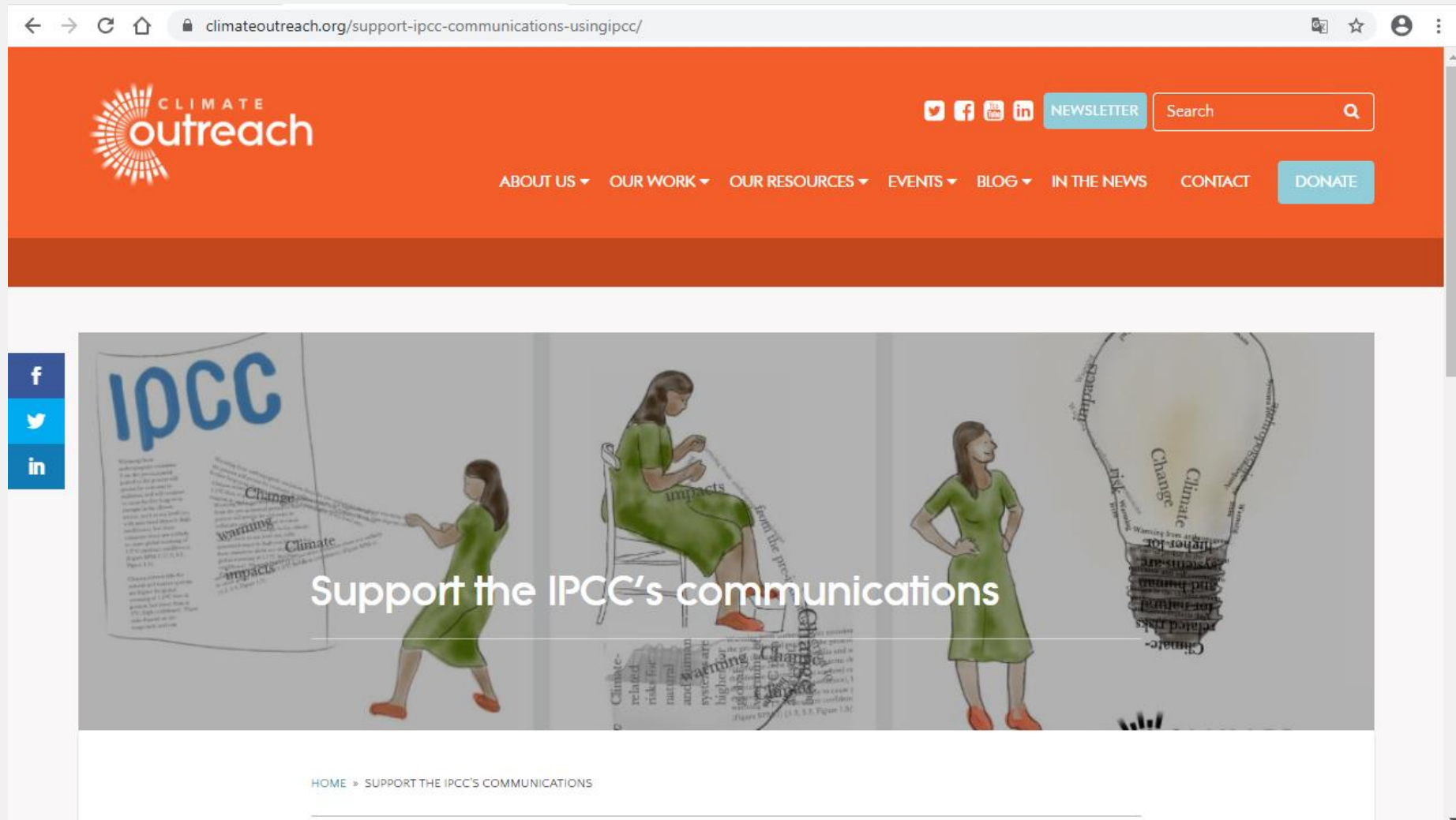




Key observed and projected impacts from climate change for the main regions in Europe



How to communicate?



For example Climate Outreach is a company founded in 2004 to increase public understanding and awareness of climate change.

How to communicate

The Working Group I Technical Support Unit of the Intergovernmental Panel on Climate Change (IPCC) commissioned Climate Outreach to produce an evidence-based, practical communications handbook tailored for IPCC authors

Principles for effective communication and public engagement on climate change

A Handbook for IPCC authors

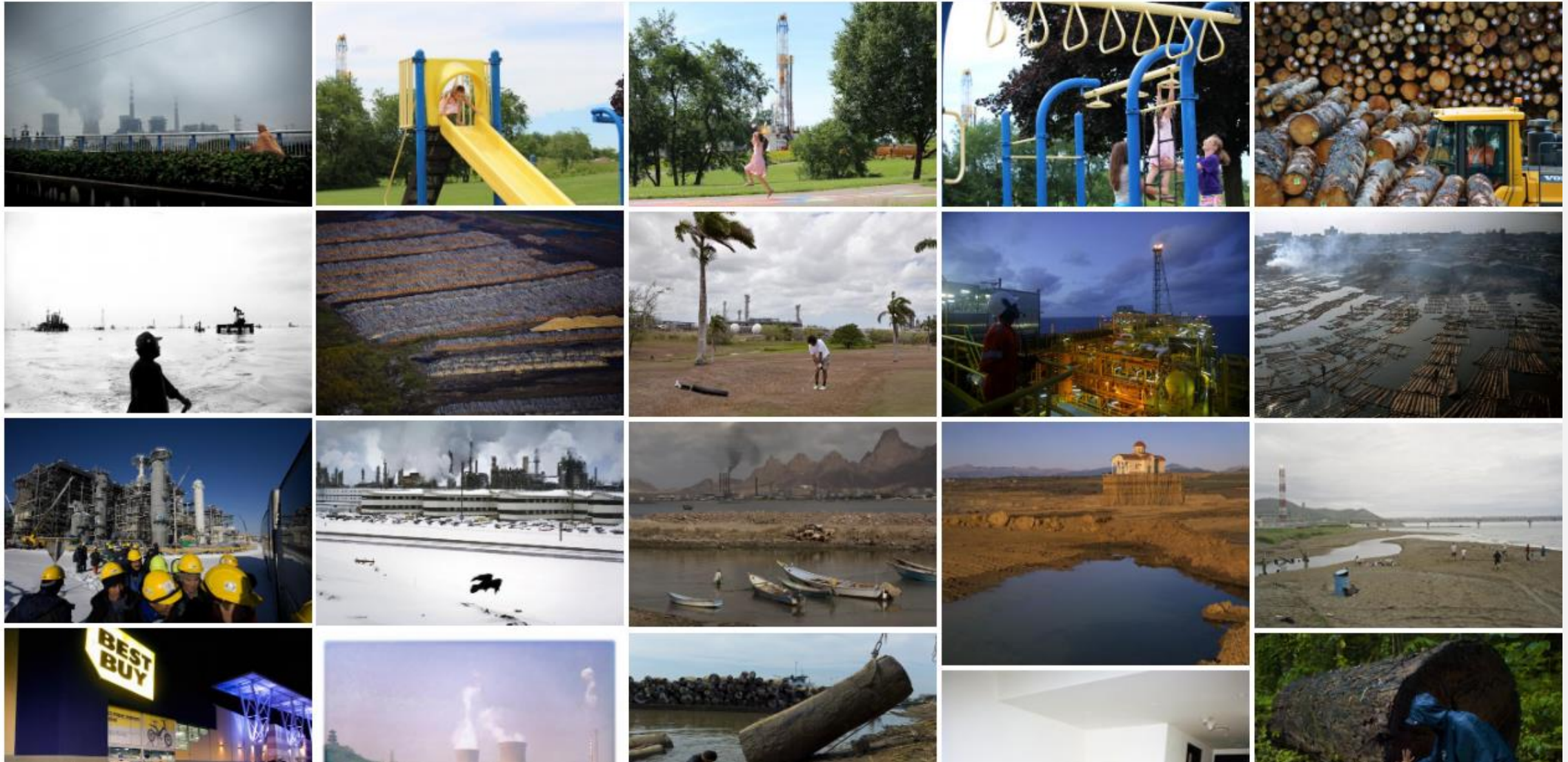


How to communicate?

6 principles for IPCC authors to use in public engagement

1. Be a confident communicator
2. Talk about the real world, not abstract ideas
3. Connect with what matters to your audience
4. Tell a human story
5. Lead with what you know
6. Use the most effective visual communication

Visual communication: Climate Causes



Visual communication: Climate Impacts



Visual communication: Climate Solutions



Visual communication: Climate Solutions

Questo è un esempio di una delle immagini precedenti. Questa immagine mostra "persone reali" che svolgono un "lavoro reale" e questo può aiutare a generare un senso di soluzioni climatiche integrate nella vita quotidiana.



Medellín as a renaissance city: GREEN CORRIDORS PROJECT

Temperatures have fallen by two or three degrees with bigger reductions expected in the future



<https://www.youtube.com/watch?v=Kv0m2MSlo2s&feature=youtu.be>

Award for Clean Air in Towns and Cities: Waltham Forest (London)



Enjoy Waltham Forest

<https://youtu.be/h7-sqmJjPY4>

Link utile

<http://www.metlink.org/resource/ipcc-updates-for-science-teachers/#1>

The screenshot shows a web browser displaying the MetLink website. The browser's address bar shows the URL <http://www.metlink.org/resource/ipcc-updates-for-science-teachers/#7>. The website header includes the MetLink logo (Royal Meteorological Society) and navigation links for Teaching Resources, Experiments, Careers, Fieldwork, MetMark, CPD, and Blog. A search icon is also present.

The main content area is titled "Report for Science Teachers" and features a "List of Figures" section with the following links:

- [The Earth's Energy Balance](#)
- [The Carbon Cycle](#)
- [Sources of Anthropogenic Carbon Dioxide](#)
- [Changing Carbon Dioxide and Oxygen Concentrations in the Atmosphere](#)
- [Are People Causing Climate Change?](#)
- [Quantifying the Causes of Recent Climate Change](#)
- [Projected Effects of Increased Levels of Greenhouse Gases](#)
- [The Effect of Rising Carbon Dioxide on Plants and Ecosystems](#)
- [The Methane Cycle](#)
- [Could Geoengineering Counteract Climate Change?](#)

Below the list of figures is a "Glossary" section. On the right side of the page, there are two dropdown menus labeled "All Topics" and "All ages", and a purple "SEARCH" button. Below these is a "Latest from blog" section with two entries:

- [Weather, Climate and Chaos Theory](#)
- [Borrow a 3D printer to 3D Print the Central England Temperature Record](#)

At the bottom of the page, there is a cookie consent banner that reads: "We use cookies on this site to enhance your user experience. By clicking any link on this page you are giving your consent for us to set cookies. [More Info](#)". There are two buttons: "OK, I agree" and "No, thanks".