



Climate Justice
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INTERNATIONAL CONFERENCE ON CLIMATE JUSTICE – 1st June

Climate change and adaptation on ecosystems and societies

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Fossil fuels and concrete emissions

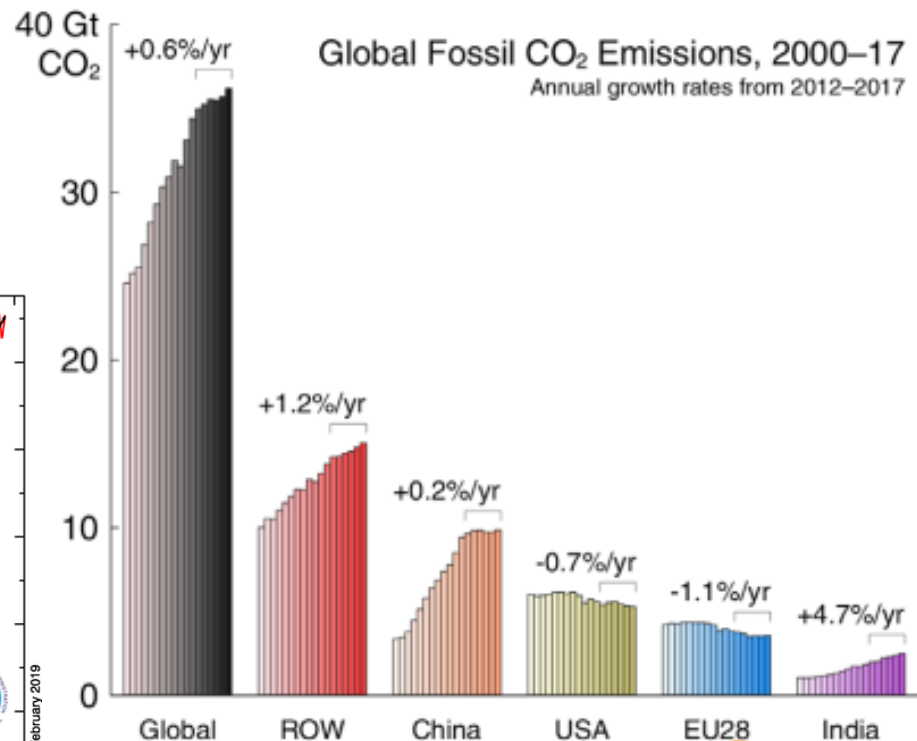
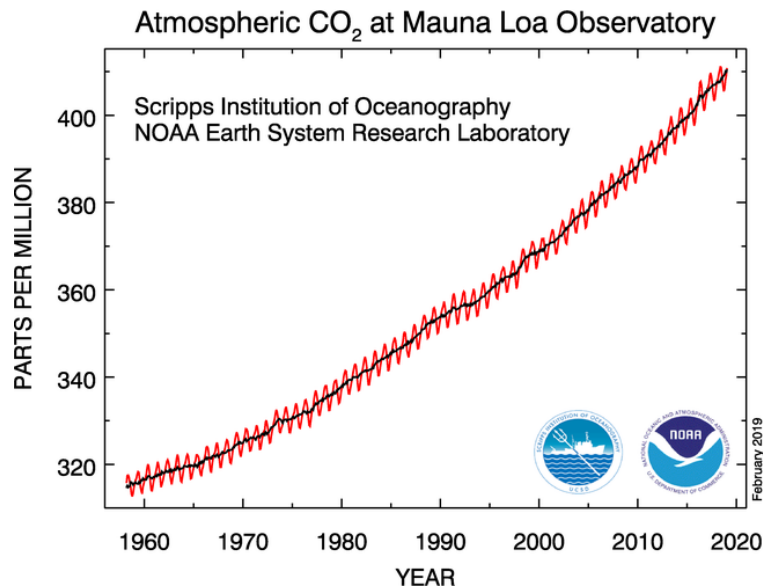
2018 CO₂ from fossils + concrete

2.7% (range: 1.8%–3.7%)

record 37.1±2 Gt

Global energy growth is outpacing

Decarbonization Jackson et al., 2018





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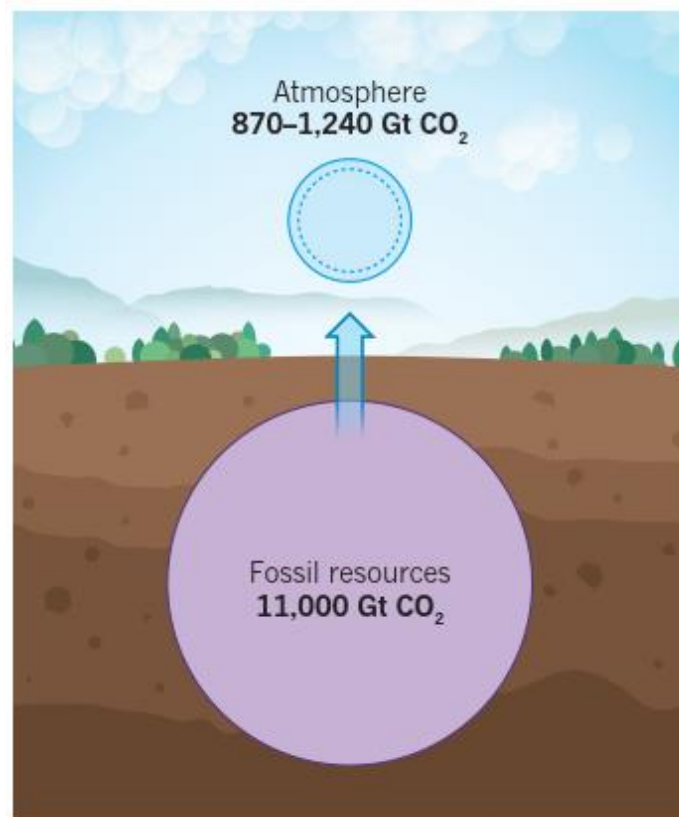


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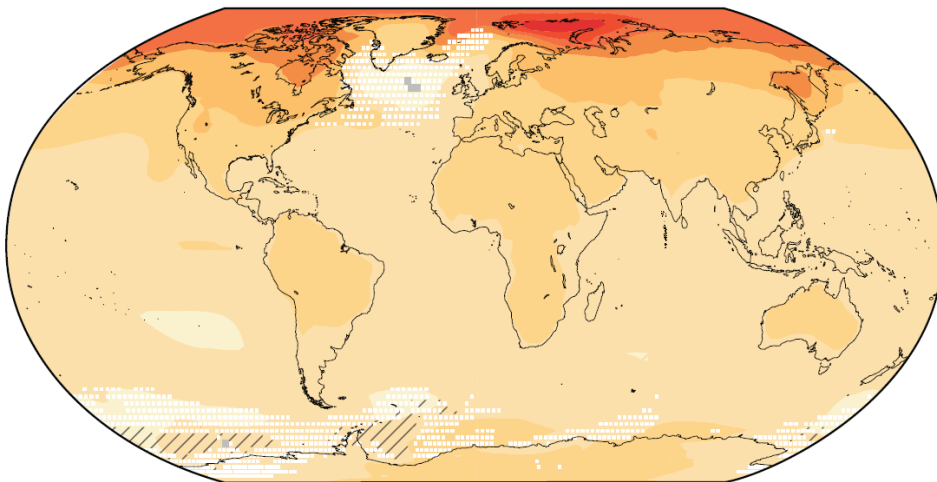
Jakob, Hilaire, 2015
Nature



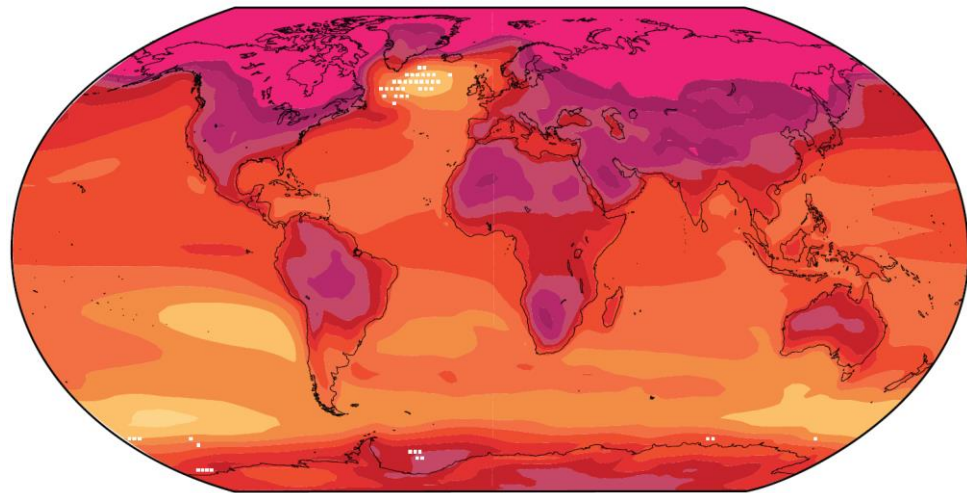


Global warming scenario

RCP2.6 2081–2100



RCP8.5 2081–2100



Projected Temperature Change



Difference from
1986–2005 mean (°C)

Solid Color

Very strong
agreement

White Dots

Strong
agreement

Gray

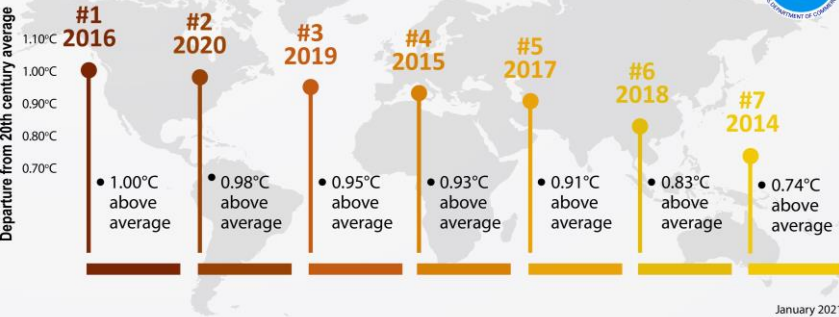
Divergent
changes

Diagonal Lines

Little or
no change

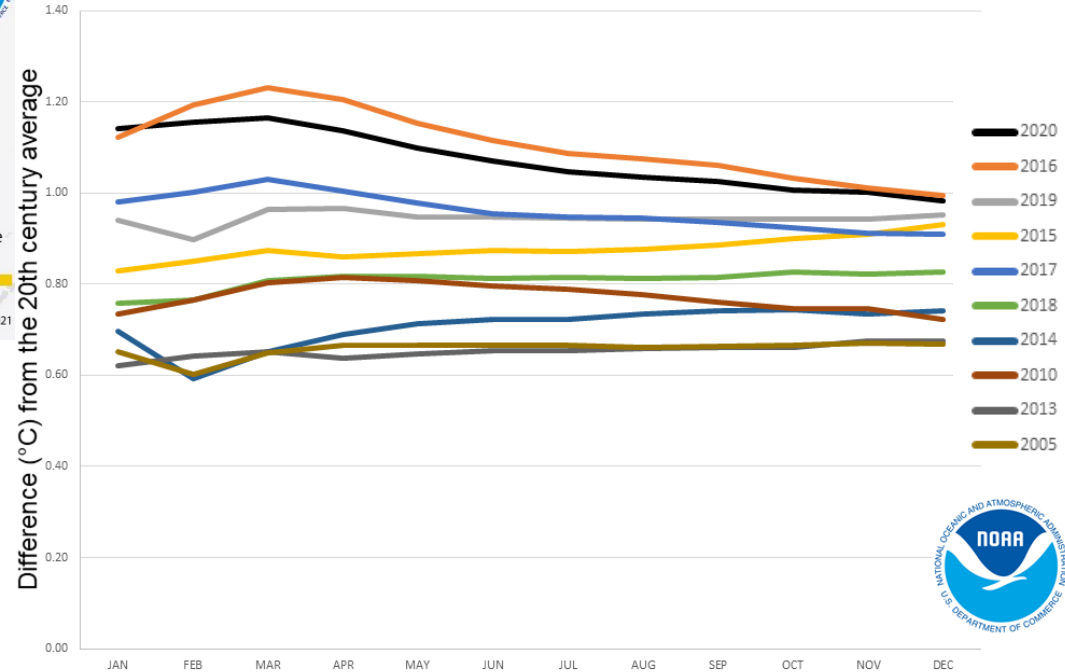


LAST 7 YEARS RANK AS TOP 7 HOTTEST



Year-to-Date Global Temperatures

The ten warmest years on record



Should We Expect Each Year in the Next Decade (2019–28) to Be Ranked among the Top 10 Warmest Years Globally? (Arguez et al. 2020)

<https://www.ncei.noaa.gov/news/projected-ranks>



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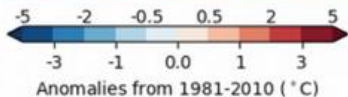
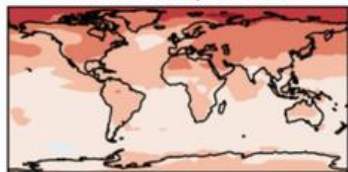


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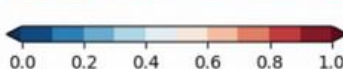
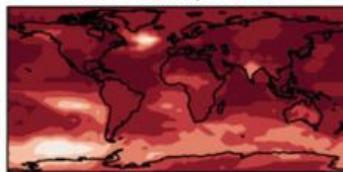


WMO Lead Centre for Annual-to-Decadal Climate Prediction

Ensemble mean forecast for 2021-2025
surface temperature



Probability of above average
surface temperature



New climate predictions increase likelihood
of temporarily reaching 1.5 °C in next 5 years

Tags: [Climate](#)

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WORLD
METEOROLOGICAL
ORGANIZATION

https://hadleyserver.metoffice.gov.uk/wmolc/WMO_GADCU_2020.pdf





Climate change: global issue, effects felt on a local scale

Rural areas in the “global south”
Urban areas, cities and municipalities





Climate change on ecosystems

- Climate change impacts through changes in mean conditions and climate variability, coupled with other associated changes

(ocean acidification, atmospheric CO₂ concentrations, water and nutrient cycle)

- Climate change interacts with other pressures on ecosystems:
 - Degradation (land use/land cover changes)
 - Reduction of biological diversity
 - Habitat fragmentation



Climate change on ecosystems

Water

Alteration of hydrological systems, affecting water resources in terms of quantity and quality

Biodiversity

Shift of terrestrial, freshwater and marine species from their geographical range

Energy

Trophic webs

Energy and material flux

Ecosystems responses are diverse



Climate change on societies

- Crop yields (corn and wheat decrease)
- Extreme weather dynamics: heatwaves, droughts, floods, cyclones
- Differential risks related to multi-dimension inequalities
- Exacerbation of other stressors with negative outcome for livelihood
- Areas of conflicts increase vulnerability

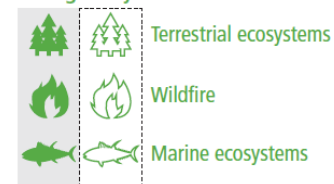


Observed impacts attributed to climate change

Physical systems



Biological systems



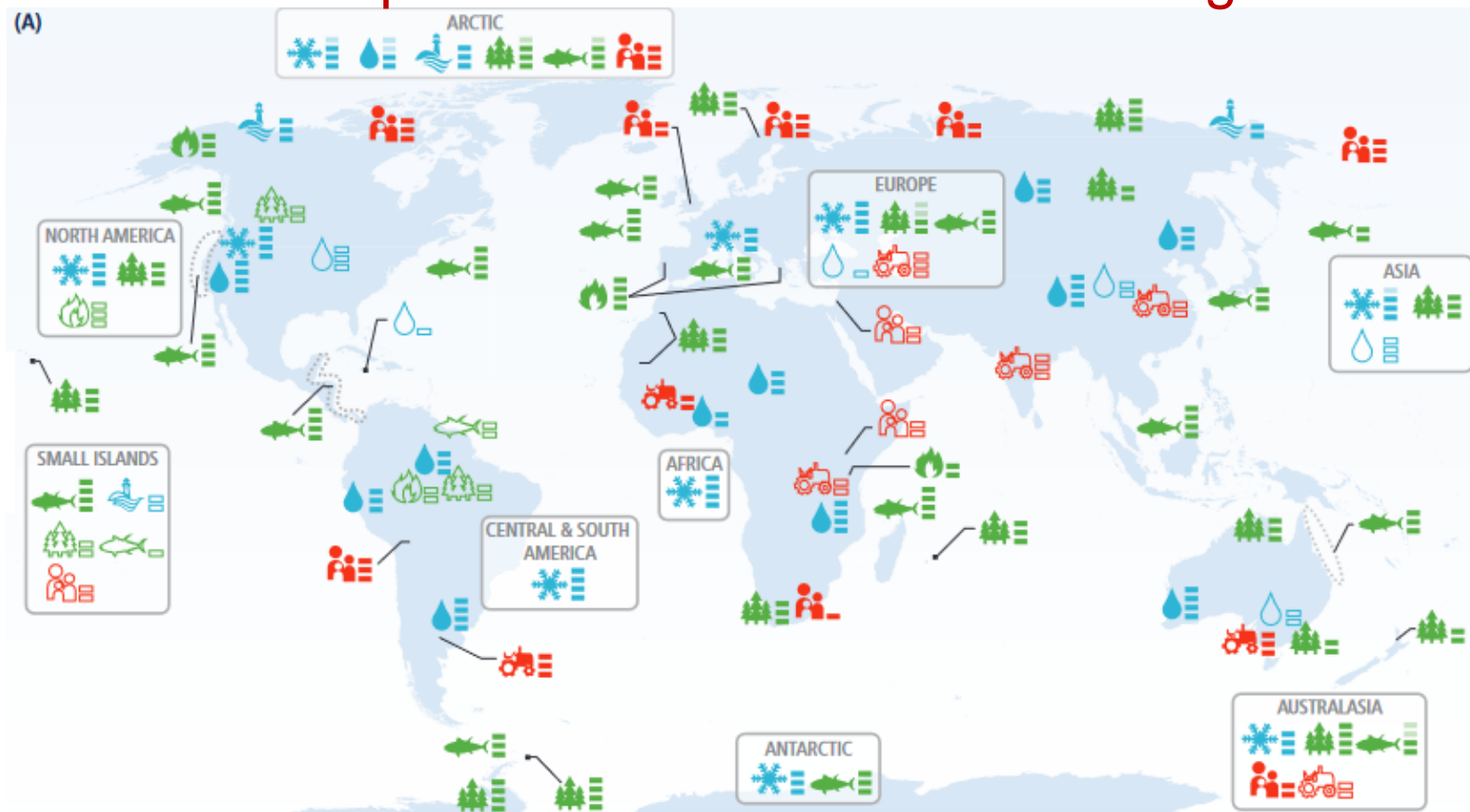
Human and managed systems



Confidence in attribution to climate change



indicates confidence range





Climate change mitigation

Reducing the flow of heat-trapping greenhouse gases into the atmosphere

- Drastic decrease of GHG
- Enhancing the 'sinks' that accumulate and store GHG

Goals

- avoid significant human interference with climate system
- " [...] stabilize greenhouse gas levels in a timeframe sufficient to allow ecosystems to adapt naturally to climate change, ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner" (IPCC, 2014)



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Climate change mitigation

Reducing GHG source

Burning fossil fuels
(transportation, electricity and heat)



Enhancing the GHG sinks
oceans, forests, soils



<https://www.frontiersin.org/articles/10.3389/fpsyg.2019.01840/full>



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Climate change adaptation

Human system

The process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities.

Natural systems

the process of adjustment to actual climate and its effects;
human intervention may facilitate adjustment to expected climate and its effects





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Climate change adaptation

Adaptation involves reducing risk and vulnerability; seeking opportunities; and building the capacity of nations, regions, cities, the private sector, communities, individuals, and natural systems to cope with climate impacts, as well as mobilizing that capacity by implementing decisions and actions (Tompkins et al., 2010).





Ecosystem-based Climate change adaptation

A wide range of ecosystem management activities to increase the resilience and reduce the vulnerability of people and the environment to climate change

Ecosystem-based adaptation is the use of biodiversity and ecosystem services as part of an overall adaptation strategy to help people to adapt to the adverse effects of climate change. (CBD, 2009)



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Ecosystem-based climate change adaptation





Climate-resilient farming



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