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CLIMATE CHANGE IN THE MEDITERRANEAN BASIN:

Italy's case and the impact of climate change on
road and motorway infrastructures

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Majority Shareholder – Ecogest SpA
Founder of the CCSC

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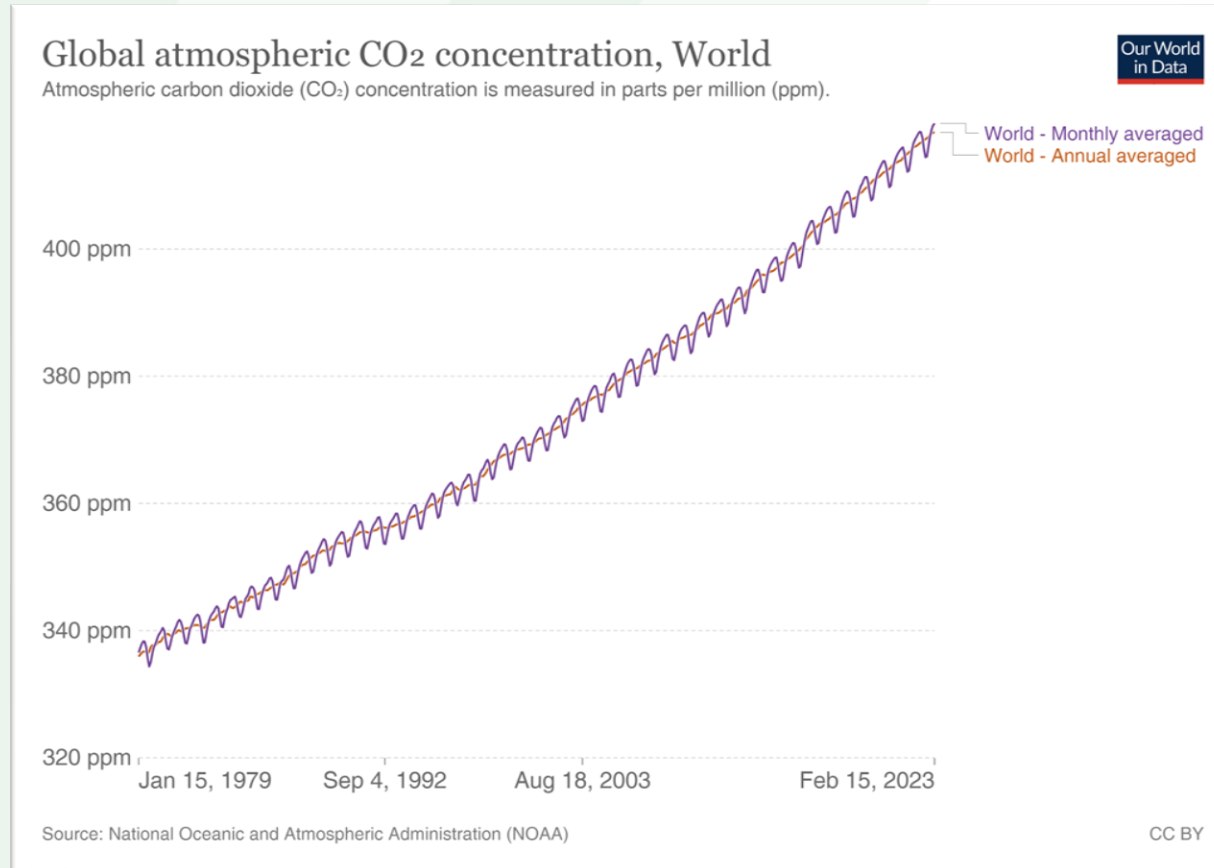
Scientific Research at CCSC

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Global atmospheric CO₂ concentration. Source: National Oceanic and Atmospheric Administration (NOAA)

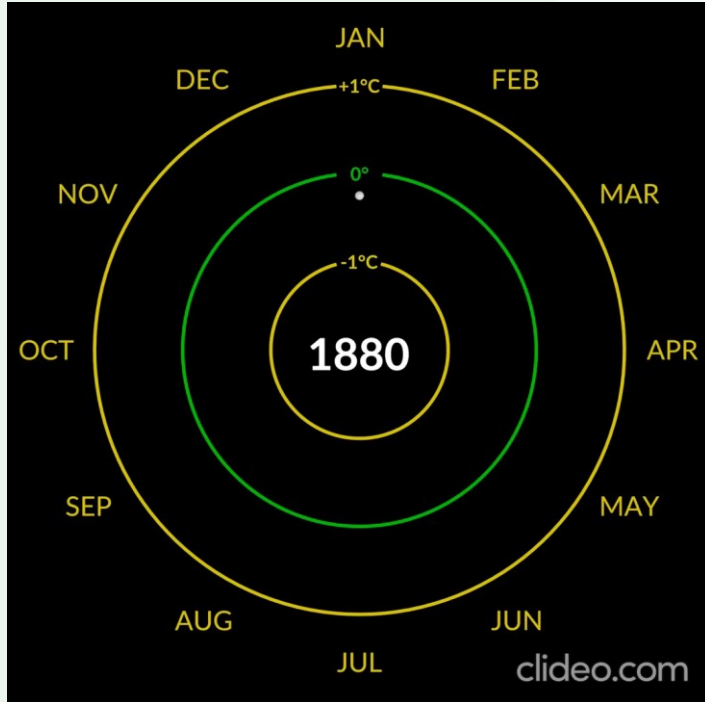
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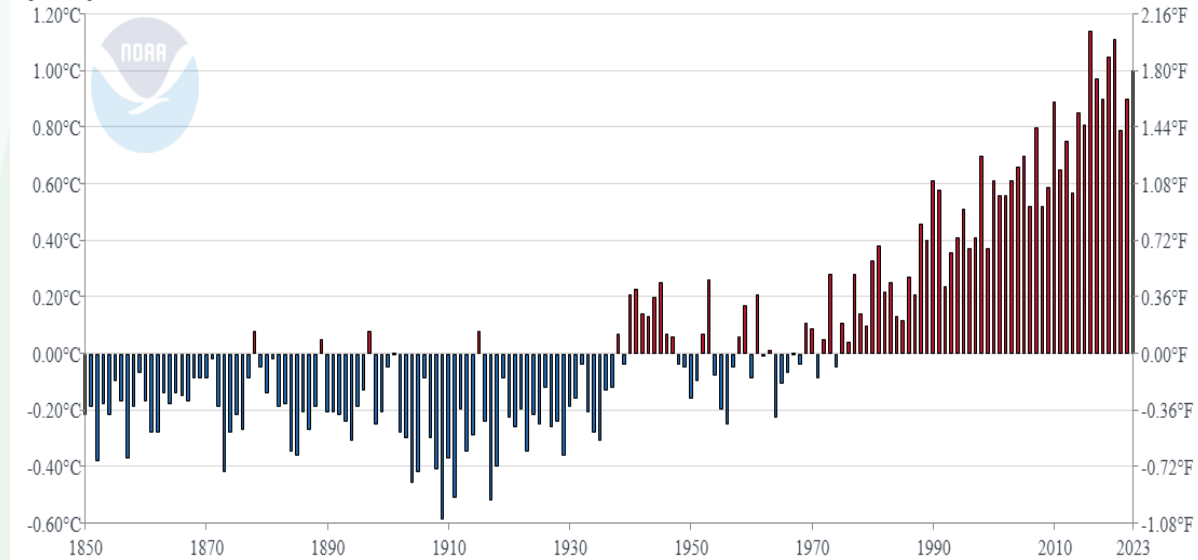
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Video: Climate Spiral (1880-2022). Source: NASA's Scientific Visualization Studio

Global Land and Ocean

April Temperature Anomalies



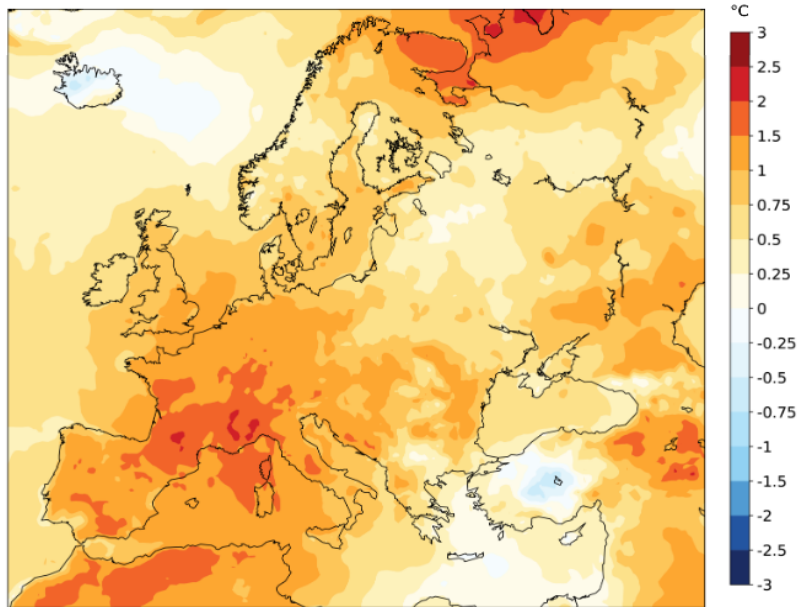
Global Land and Ocean – April Temperature Anomalies. Source: NOAA



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2022 mean temperature anomaly

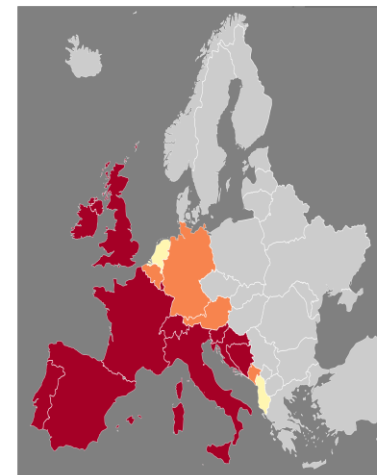


Reference period: 1991-2020, Data source: ERA5, Credit: C3S/ECMWF



Average surface air temperature anomaly for 2022, relative to the 1991–2020 reference period. Data source: ERA5. Credit: C3S/ECMWF.

Ranking of annual mean temperature for 2022 by country



- Warmest
- 2nd warmest
- 3rd warmest
- Other rankings

Rankings based on ERA5 data for 1950-2022
Credit: C3S/ECMWF



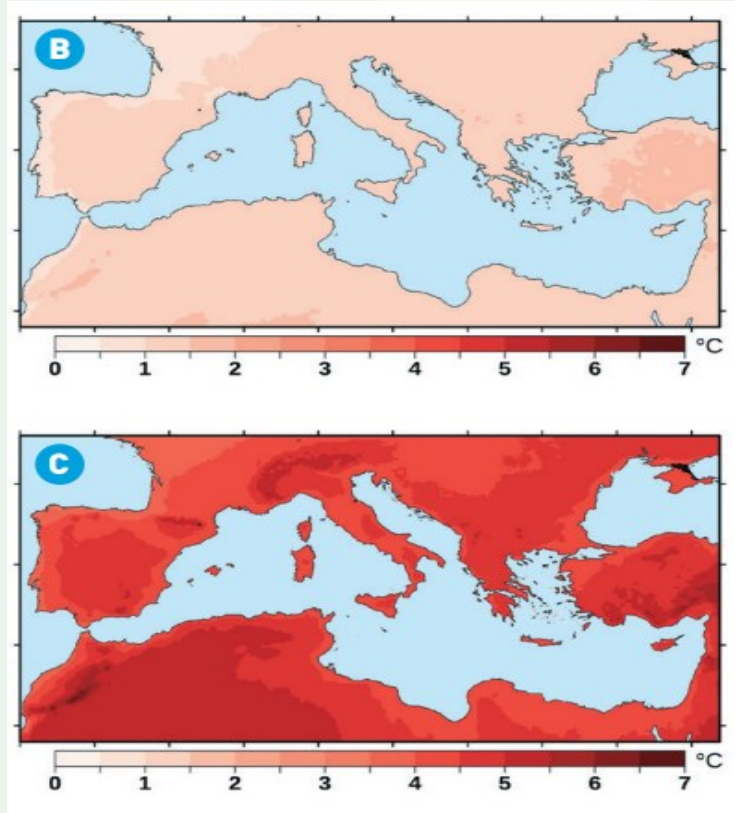
Ranking of 2022 surface air temperatures by country over the period since 1950. Data source: ERA5. Credit: Copernicus Climate Change Service/ECMWF.



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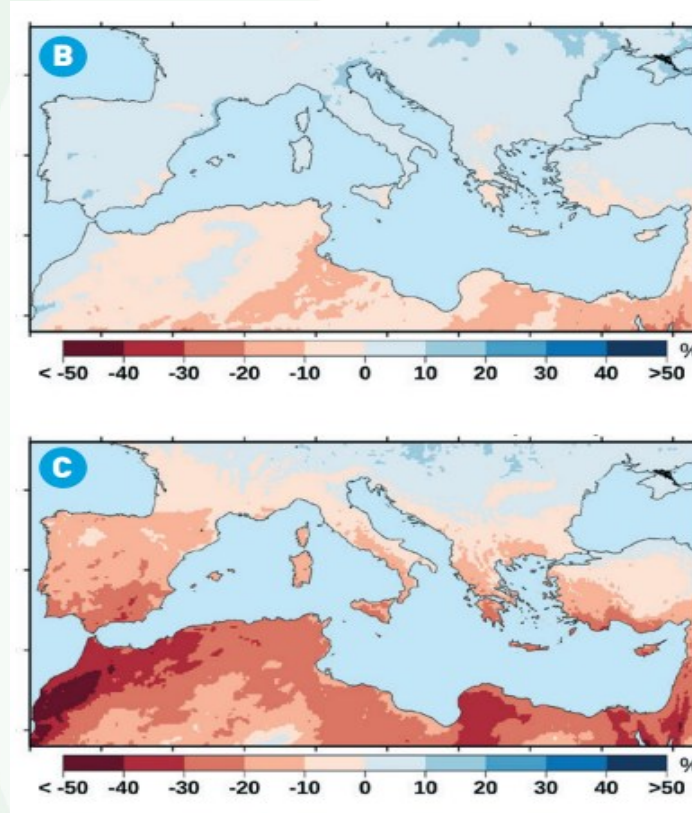


Spatial distribution of warming at the end of the 21st century under RCP 2.6 scenario



Spatial distribution of warming at the end of the 21st century under RCP 8.5 scenario

Spatial distribution of precipitation anomalies at the end of the 21st century under RCP 2.6 scenario

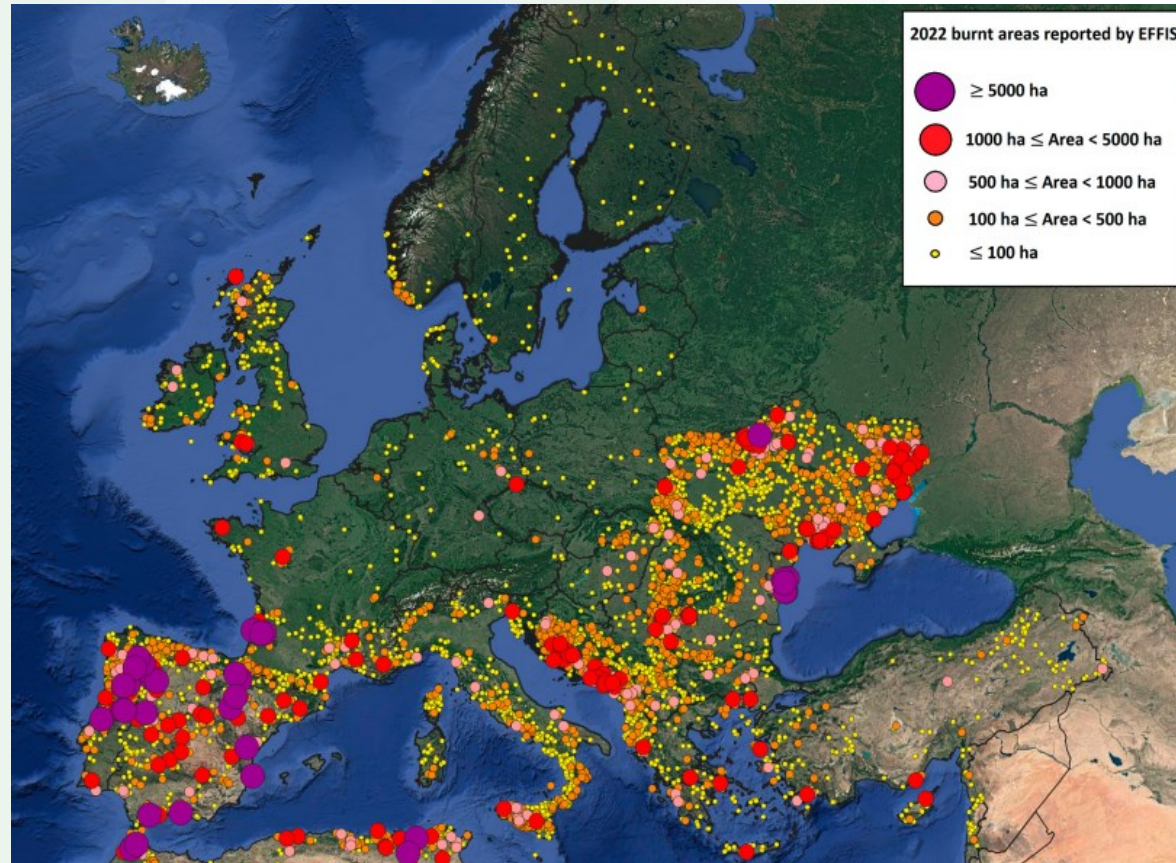


Spatial distribution of precipitation anomalies at the end of the 21st century under RCP 8.5 scenario

Source: Cramer et al., (2020)



2022 burnt areas reported by EFFIS



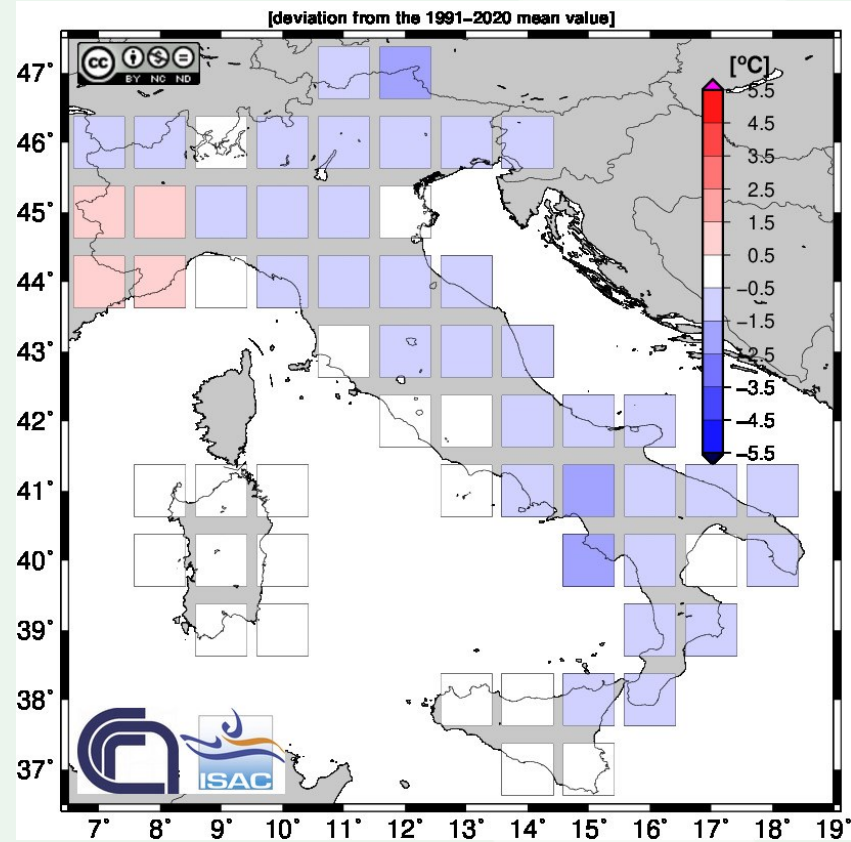
Distribution and extent of burnt areas across Europe and the Mediterranean in 2022. Data source: European Forest Fire Information System (EFFIS). Credit: EFFIS/Copernicus EMS.

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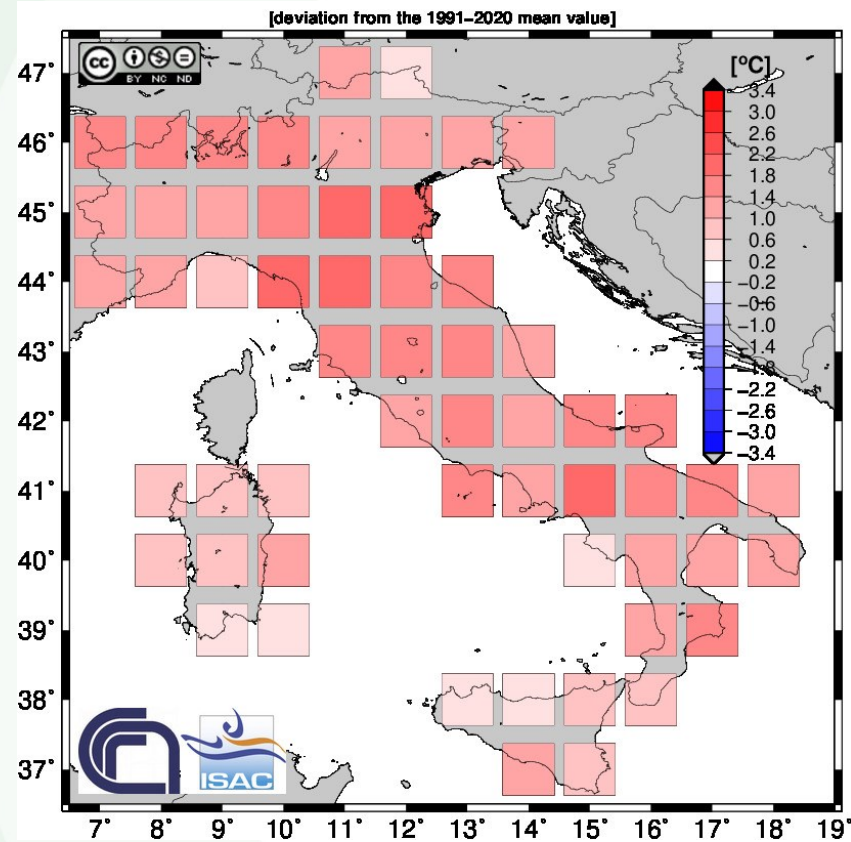
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Temperature anomaly in Italy April 2023 (mean value)



Source: Isac-Cnr

Temperature anomaly in the winter season (DJF) in Italy 2023



Source: Isac-Cnr



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Flood events Emilia Romagna (Italy) May 2023



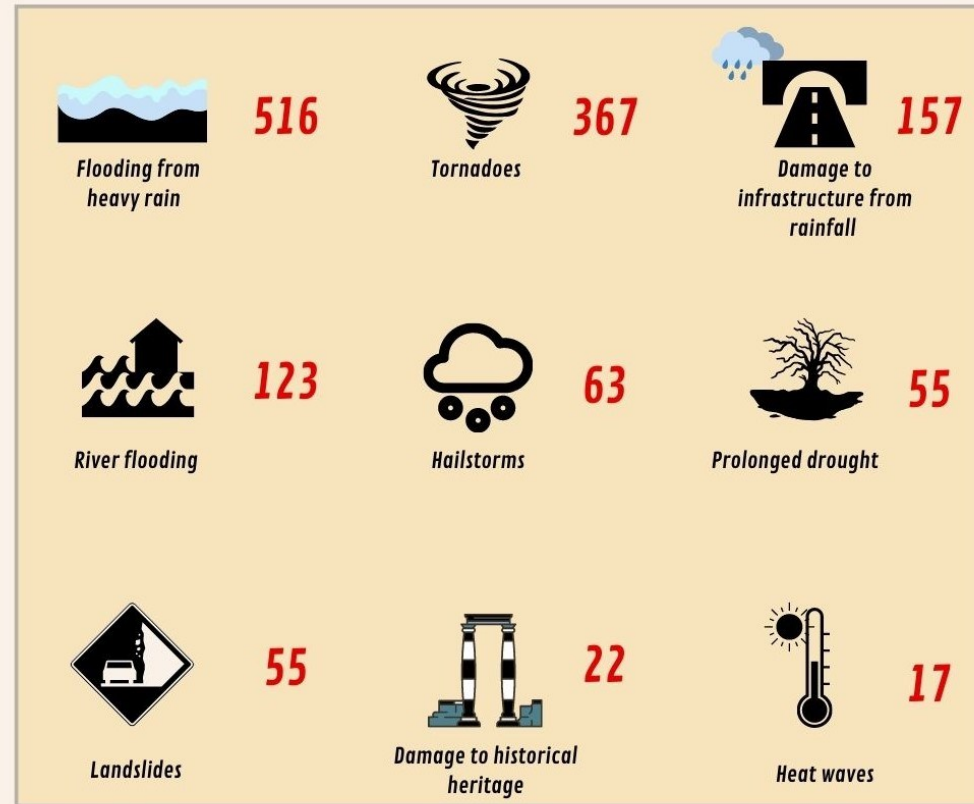
Source: World is Dangerous

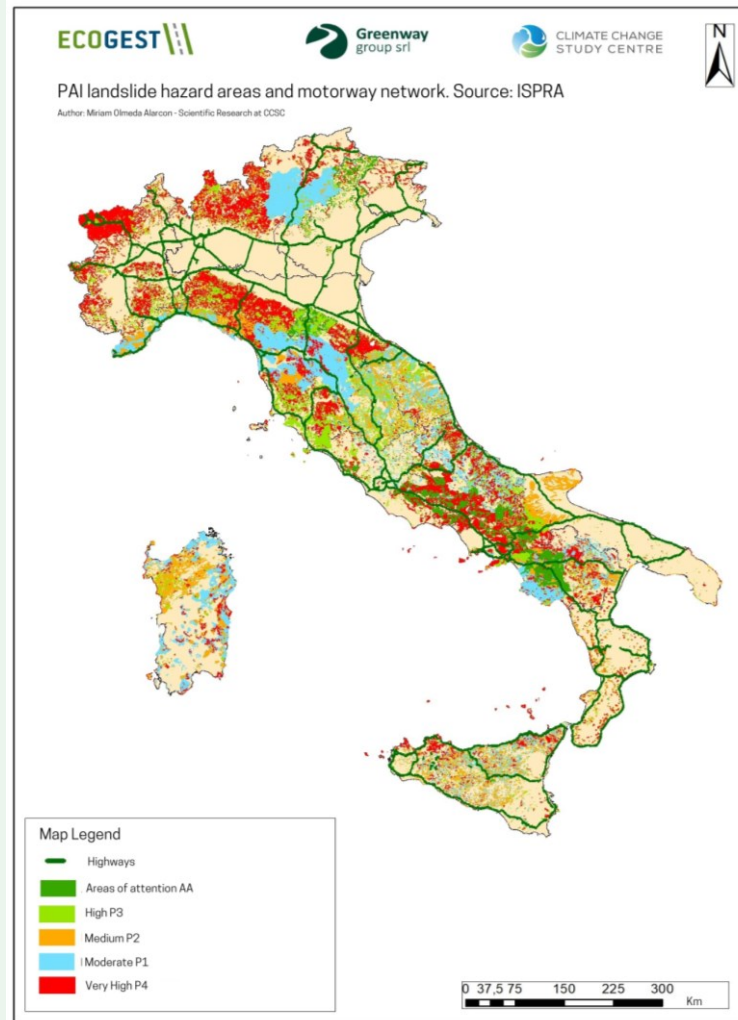


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Extreme events in Italy





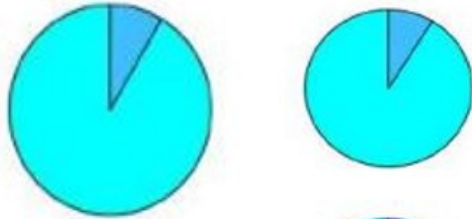
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Distribution of impacts of climatic extremes on infrastructure types by sector, calculated in the period 2041-2070 (2050s)

Heat waves



Wildfires



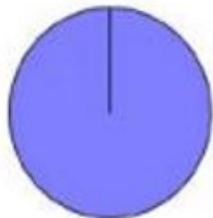
Cold waves



River floods



Droughts



Coastal floods

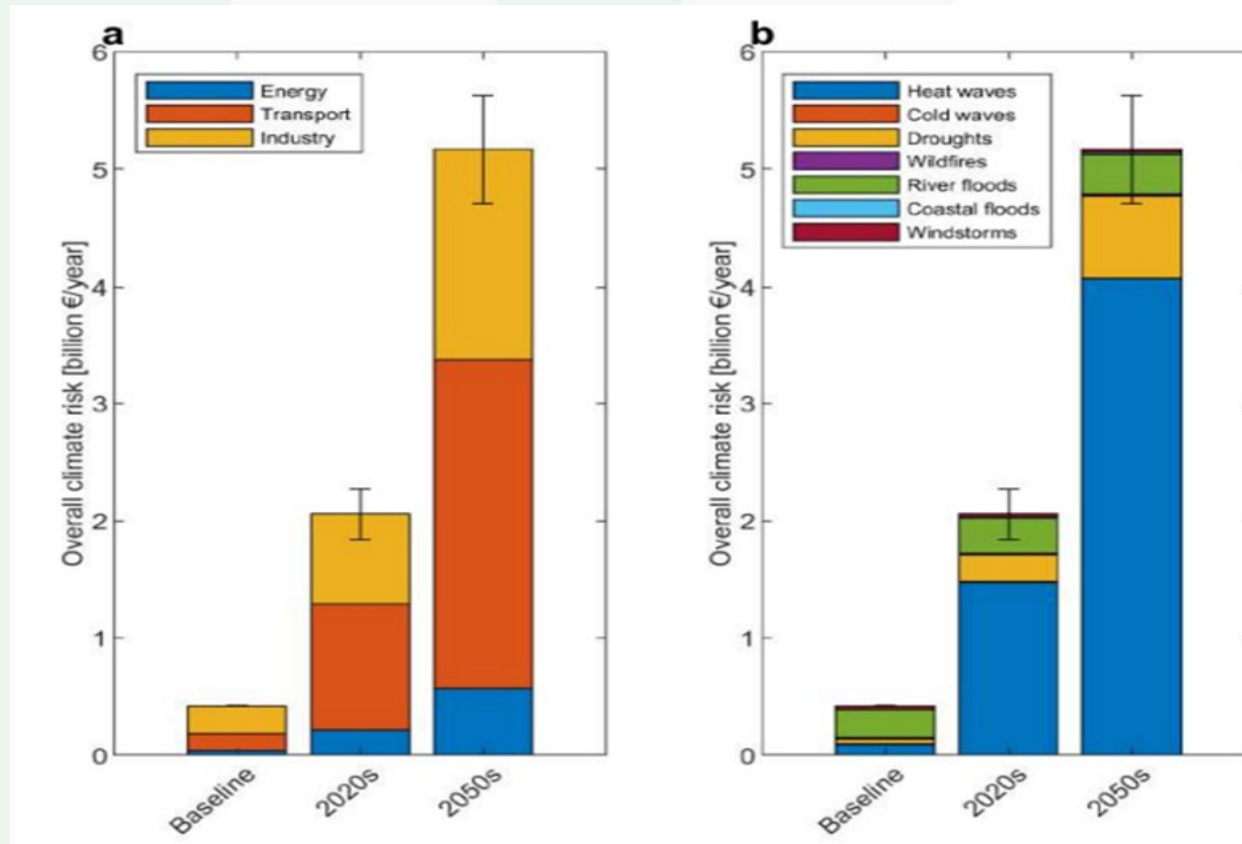


Windstorms



Simulations produced in Forzieri et al., 2018 cited in Accetturo et al., 2022.

Overall climate risk for critical infrastructure aggregated at national level for each time period



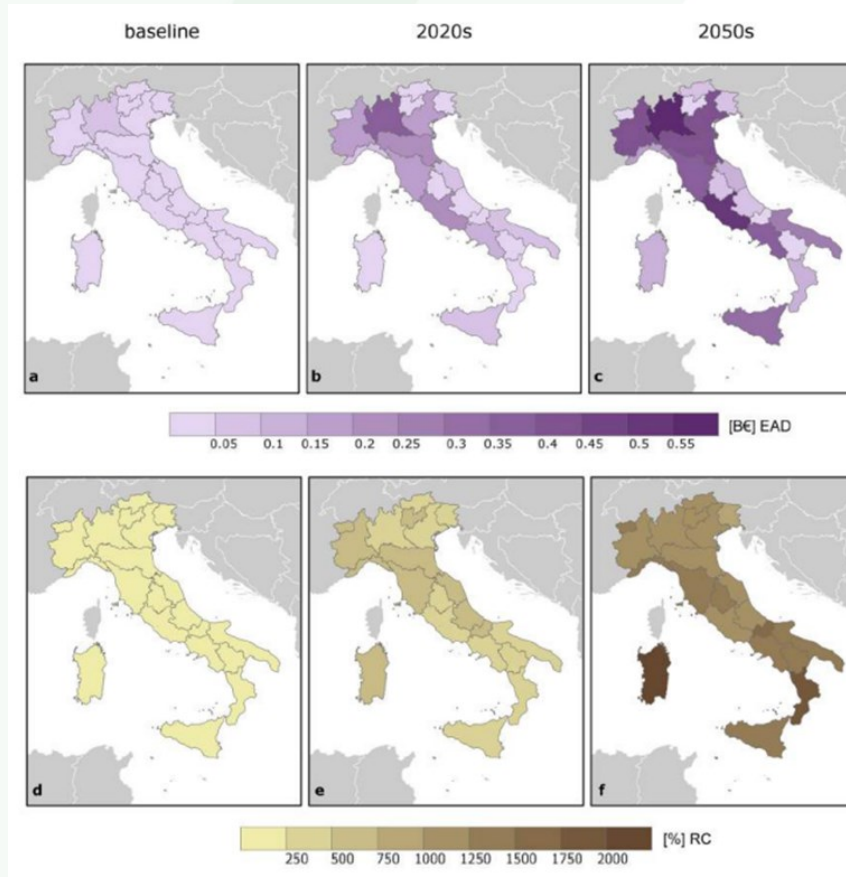
Simulations produced in Forzieri et al., 2018 cited in Accetturo et al., 2022.

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Absolute risk expressed in terms of billions of euros of damage expected each year (EAD); (d-f) relative risk expressed in terms of relative changes (RC) with respect to the reference period (baseline)

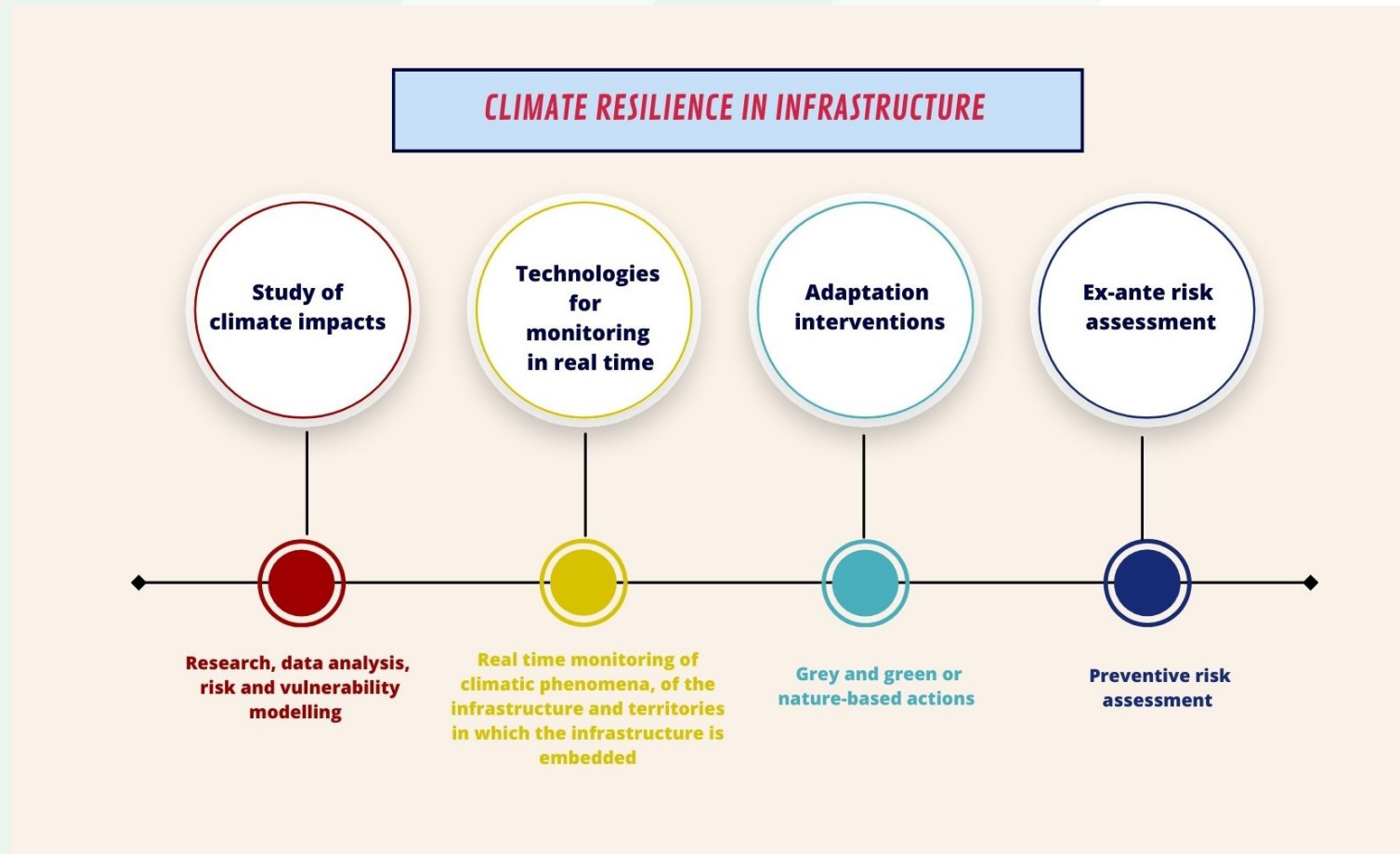


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Source: MINISTRY OF SUSTAINABLE INFRASTRUCTURE AND MOBILITY

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“Vegetation adaptation strategies are essential in a climate change context”



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THANK YOU FOR YOUR ATTENTION

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