Cambiamenti climatici ed eventi estremi

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European Commission Joint Research Centre

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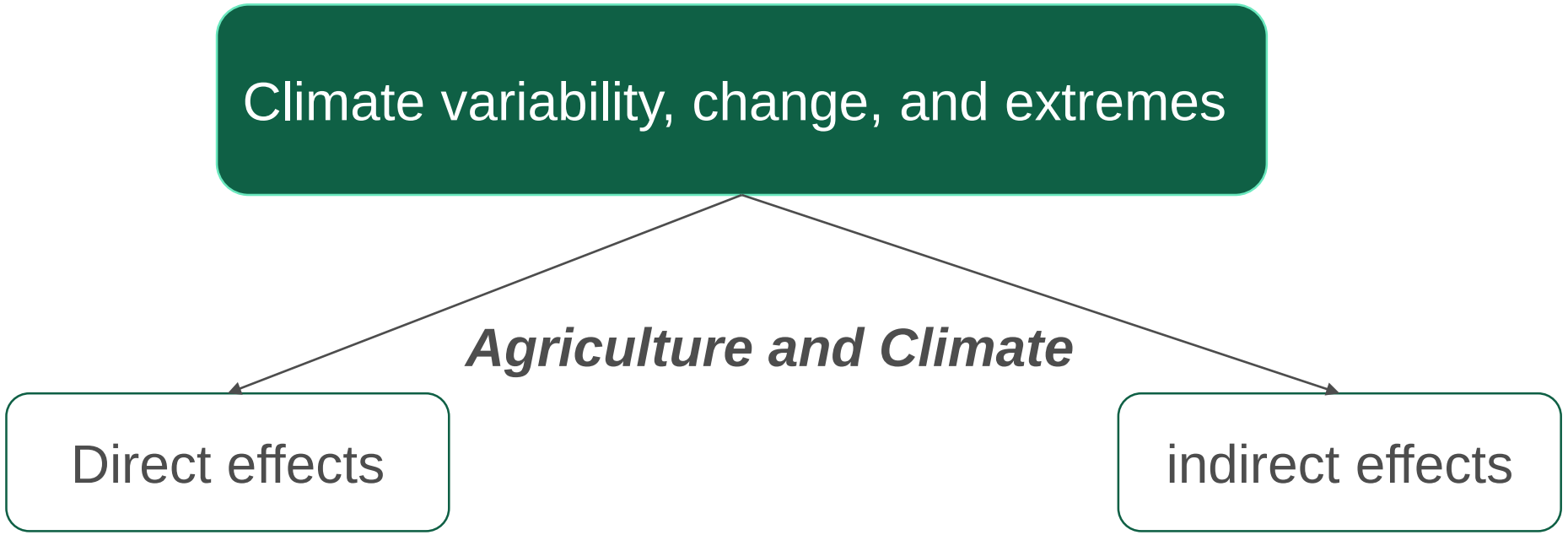
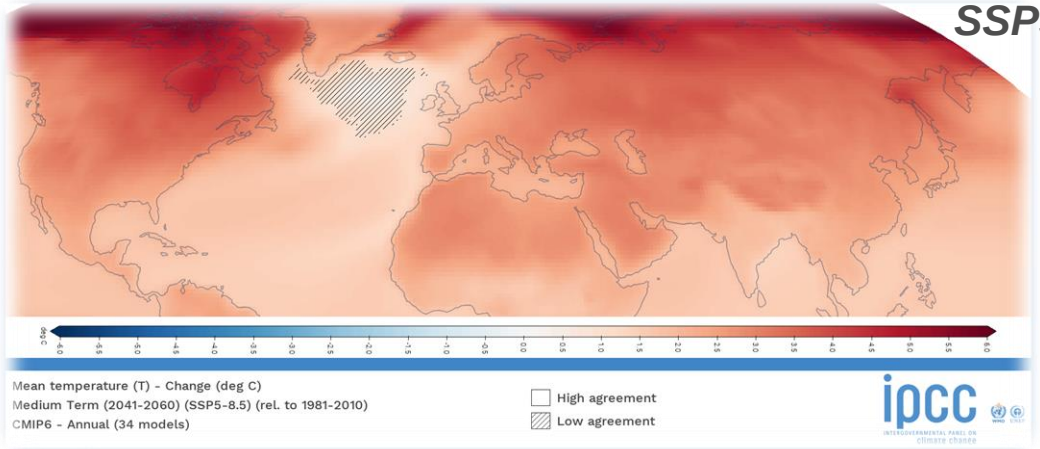
Introduzione

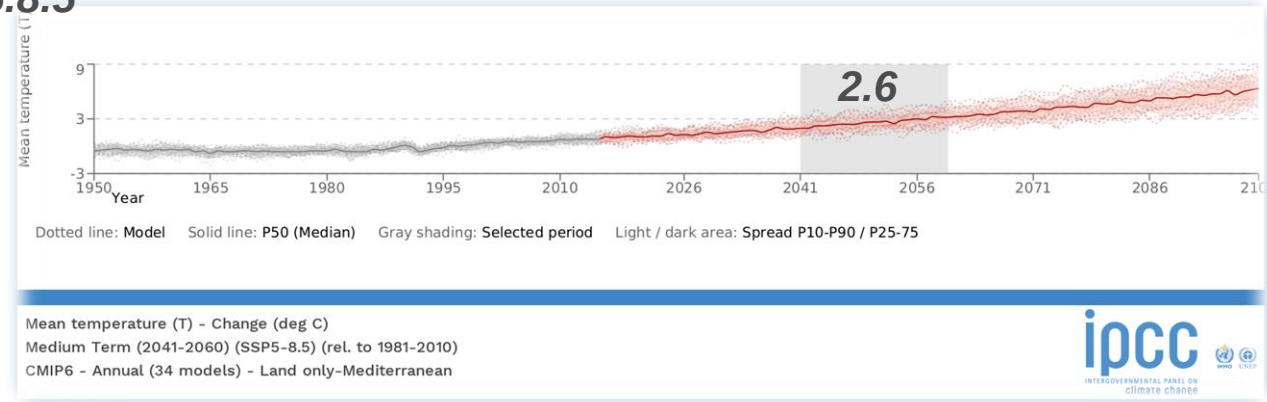


Cambiamenti climatici

SSP5.8.5

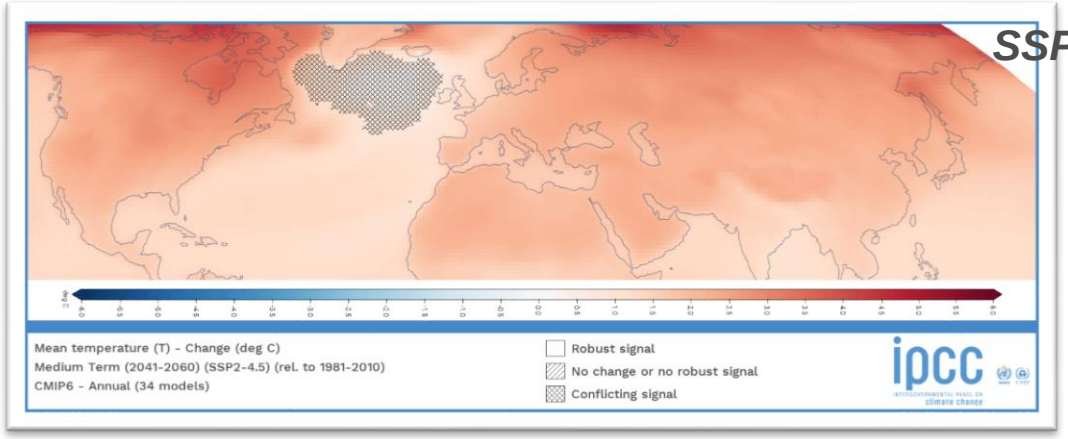


Mediterranean region

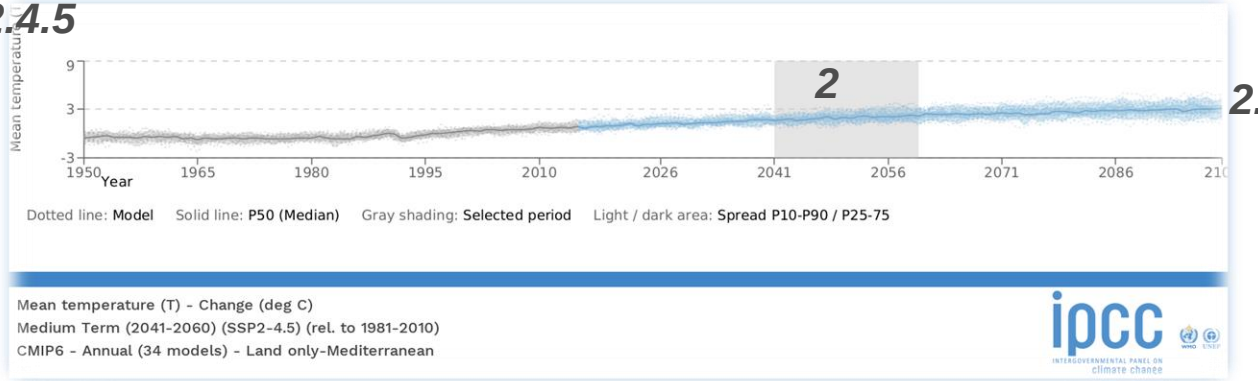


5.4

SSP2.4.5



Mediterranean region



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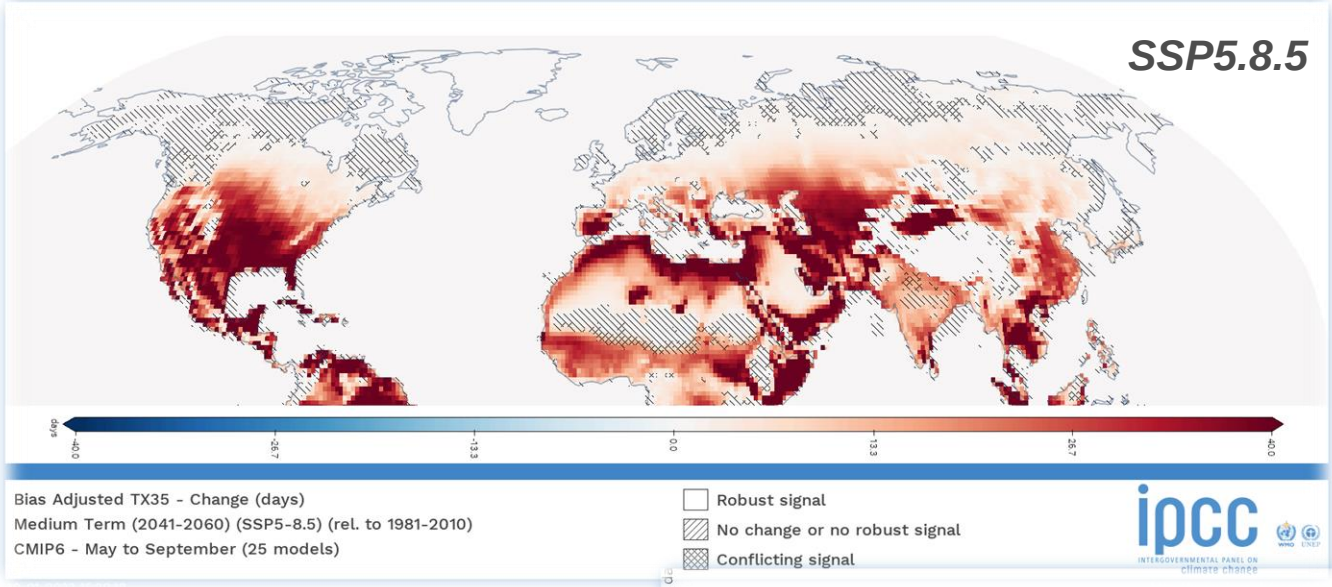
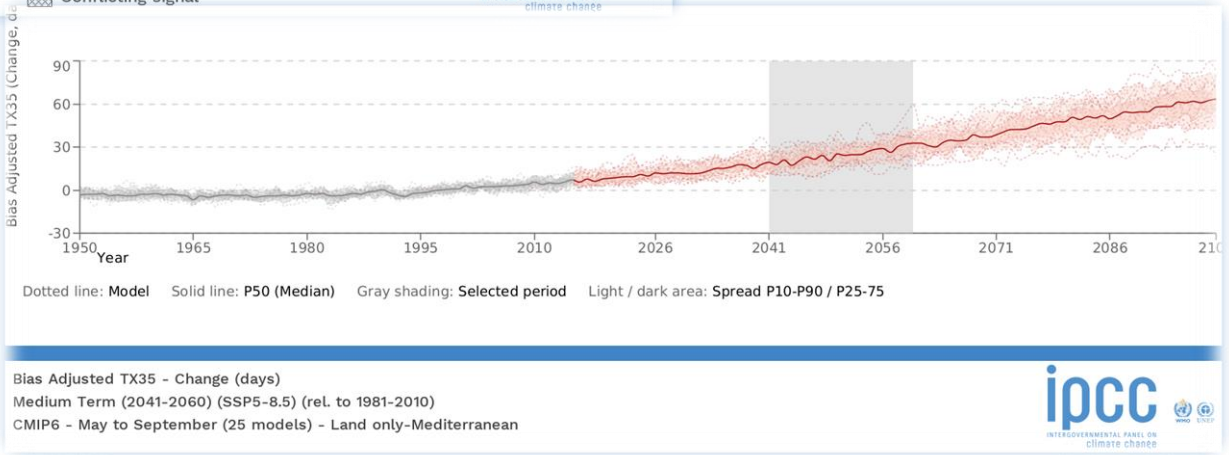
Cambiamenti climatici



May-September



Mediterranean region

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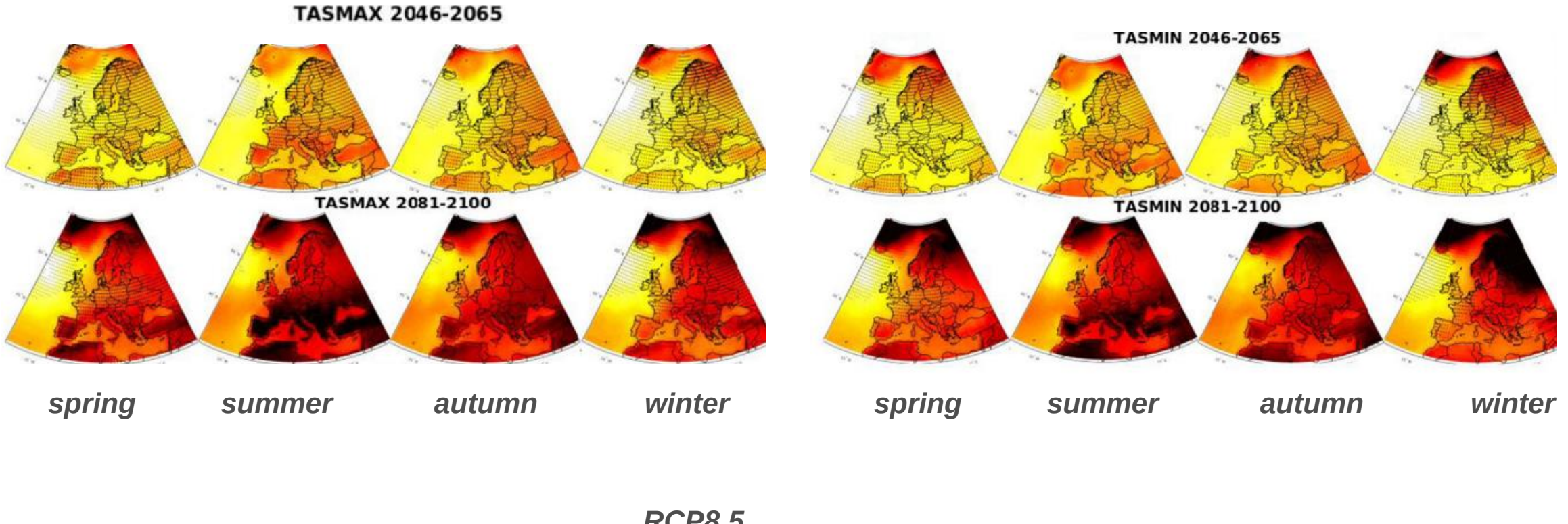
Cambiamenti climatici



RCP8.5

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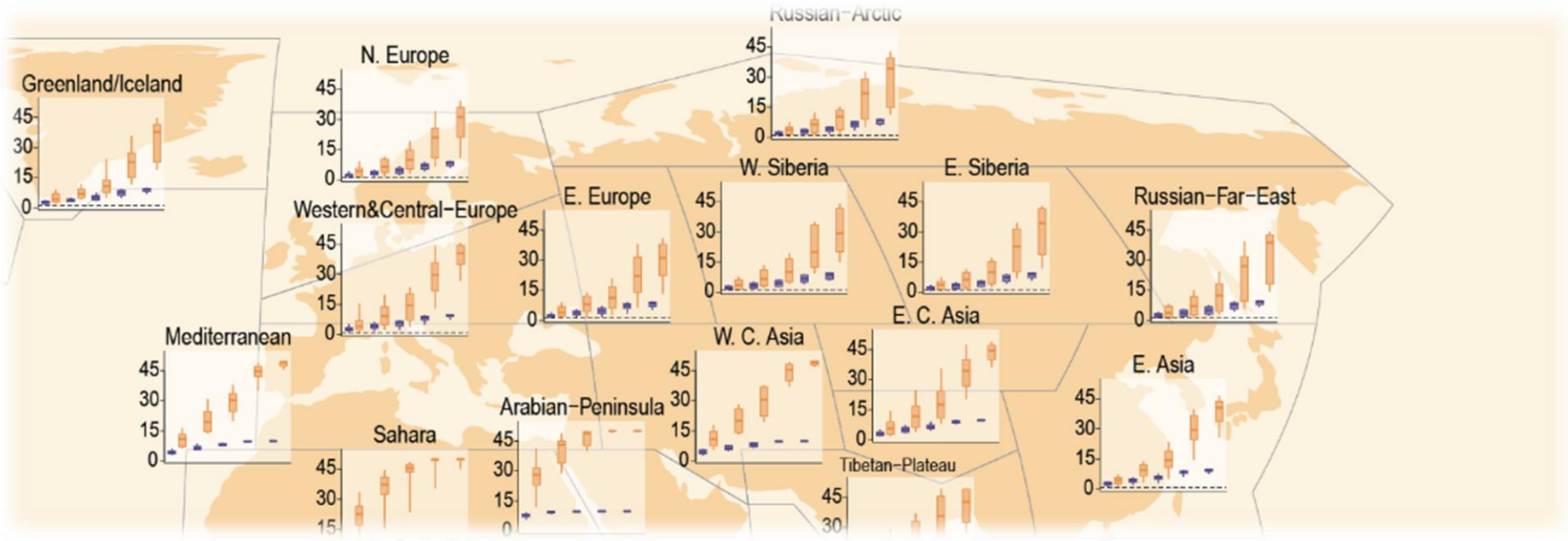
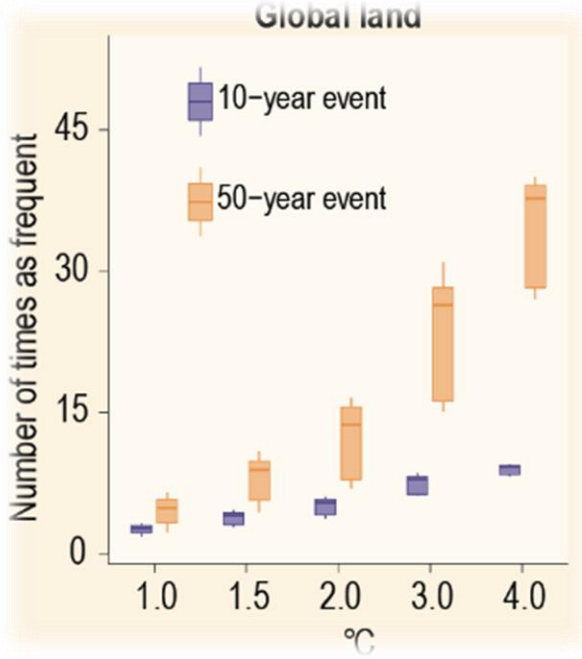
Cambiamenti climatici





Projected changes in the frequency of temperature extremes (1850-1900 baseline)

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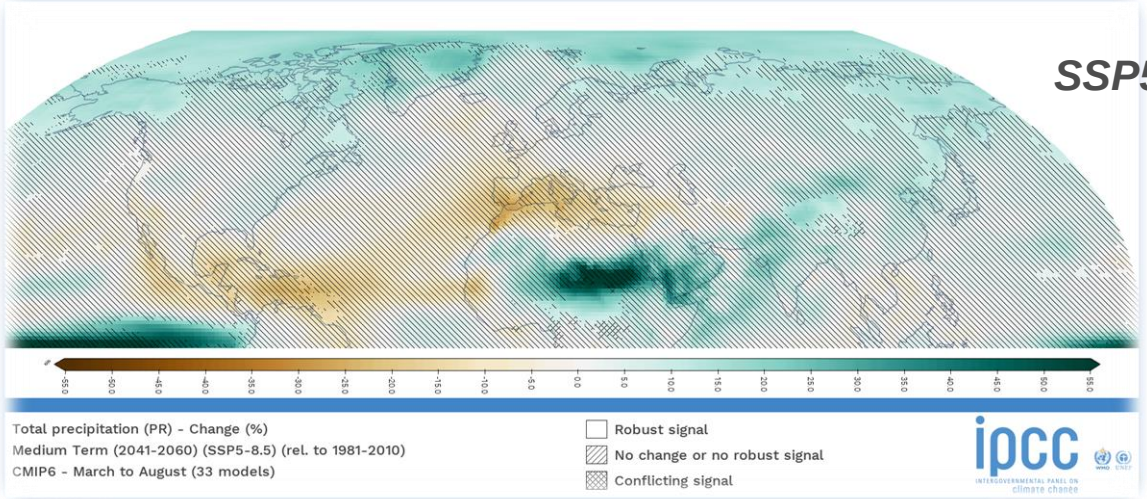
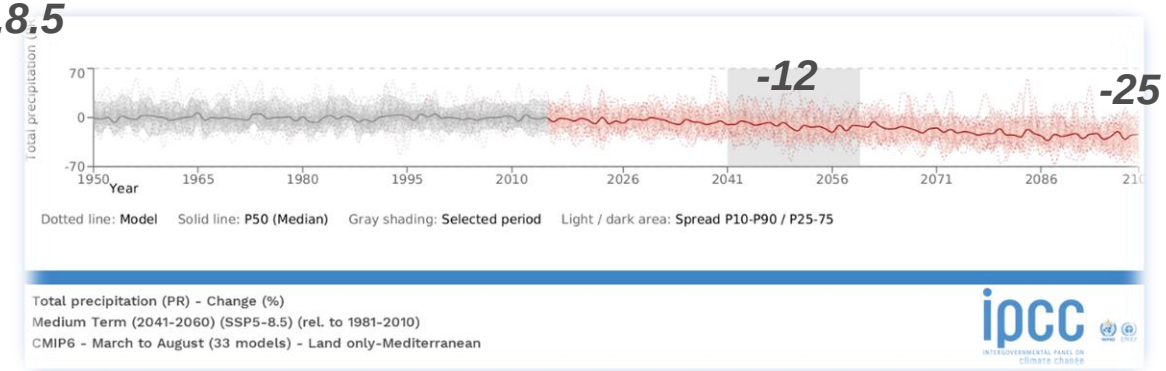
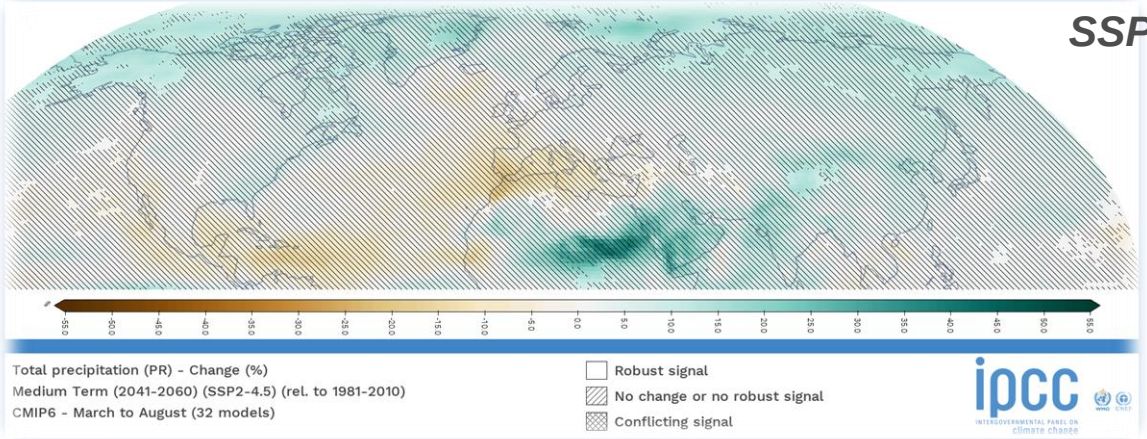
Cambiamenti climatici



SSP5.8.5

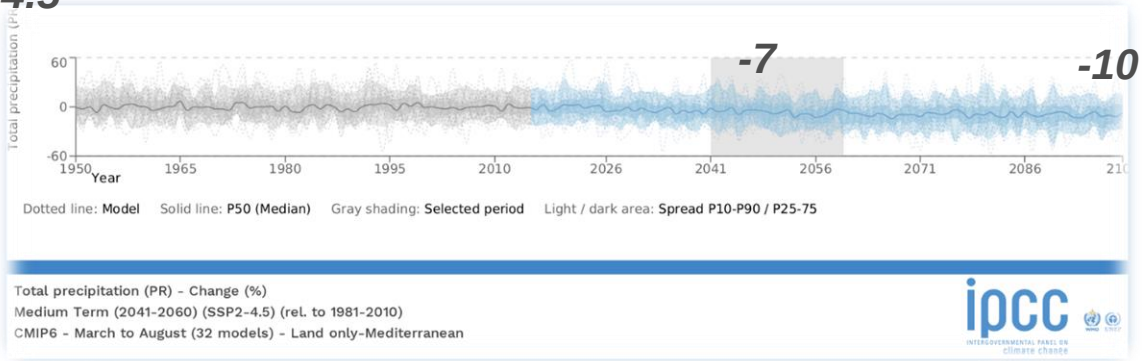
Mediterranean region





SSP2.4.5

Mediterranean region



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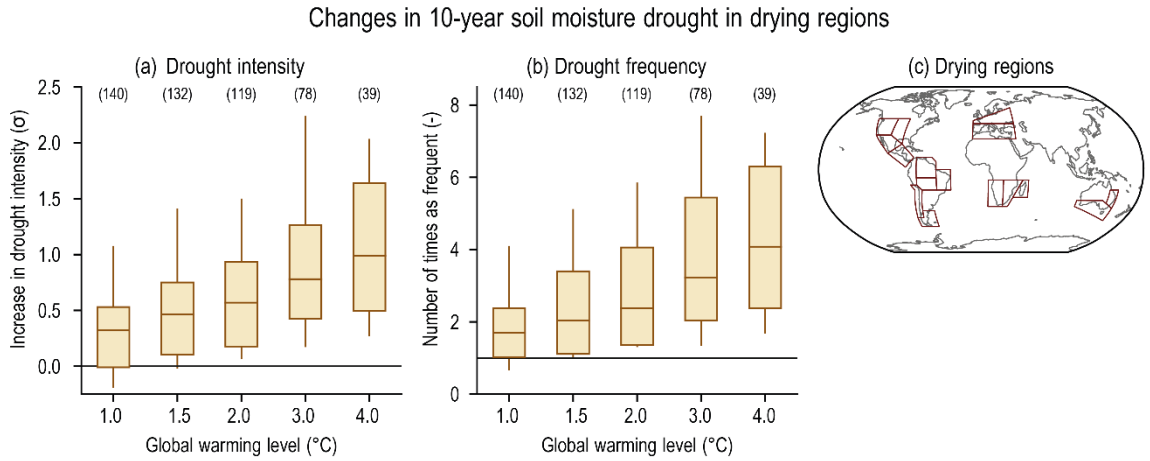
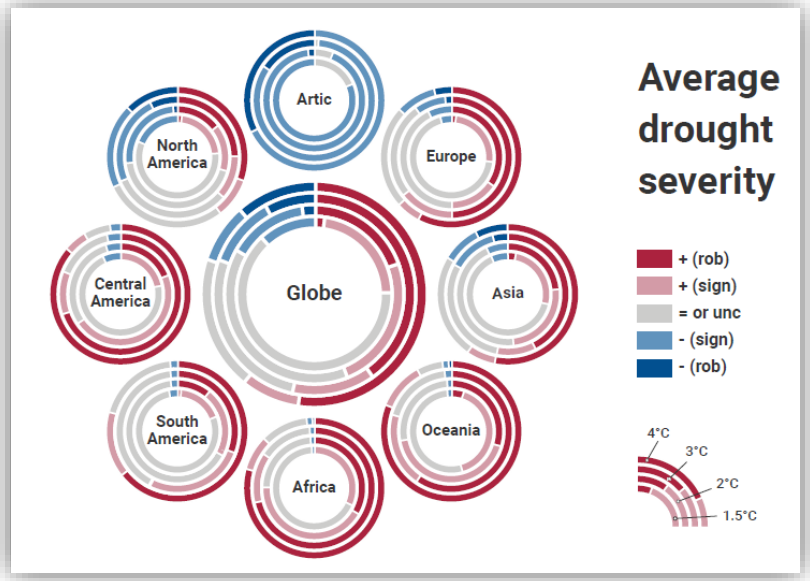
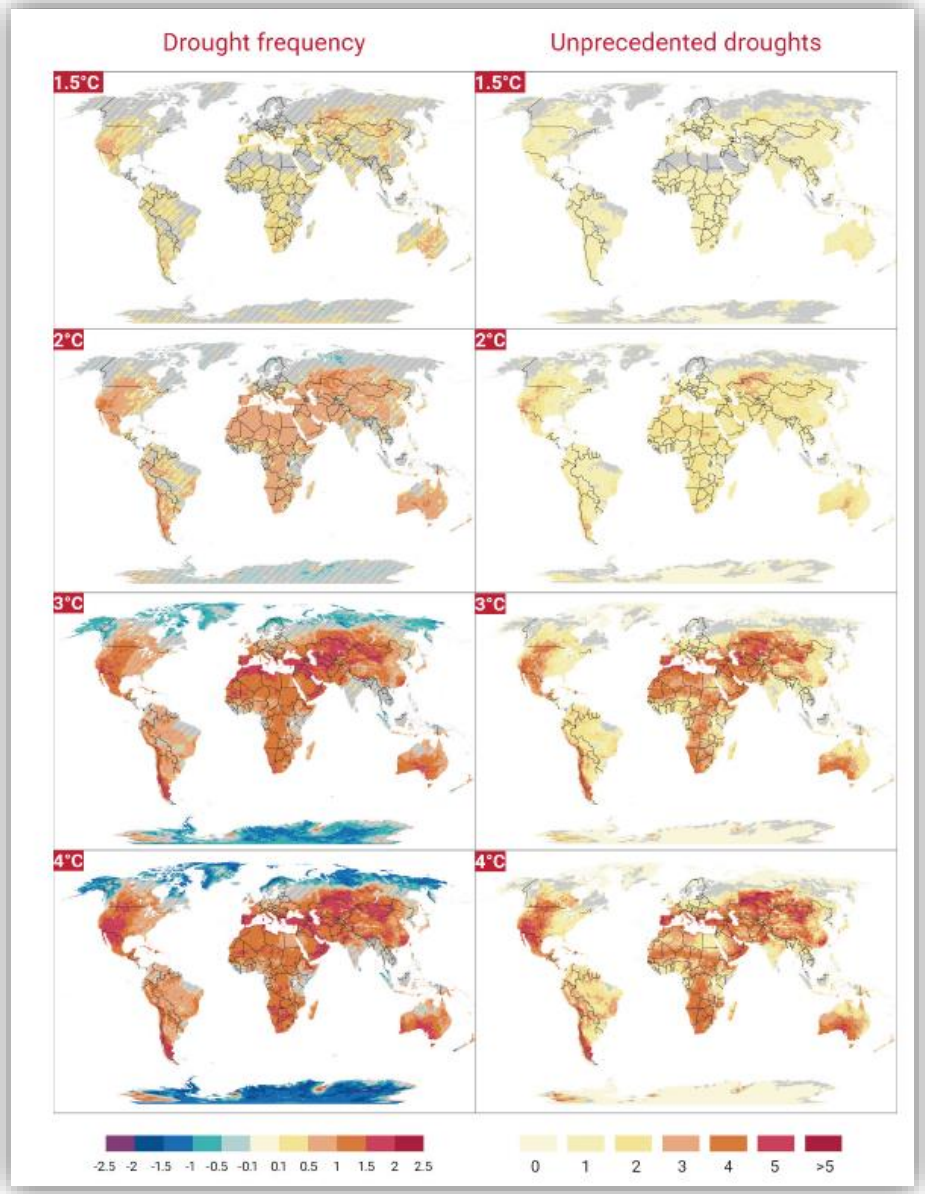
Cambiamenti climatici







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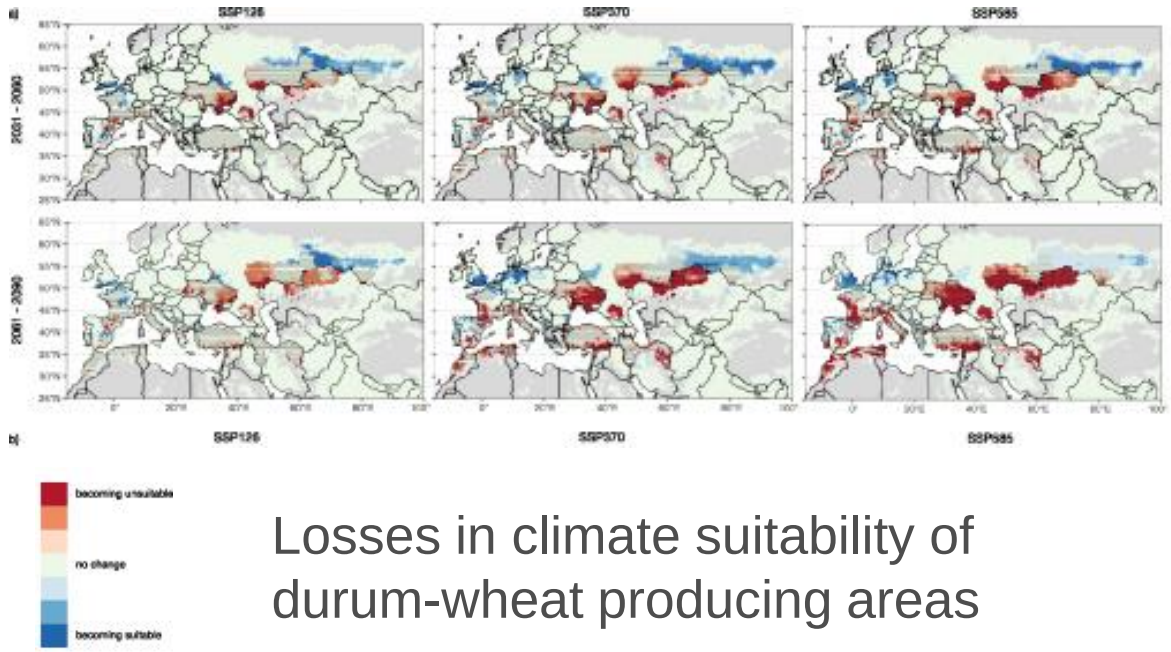
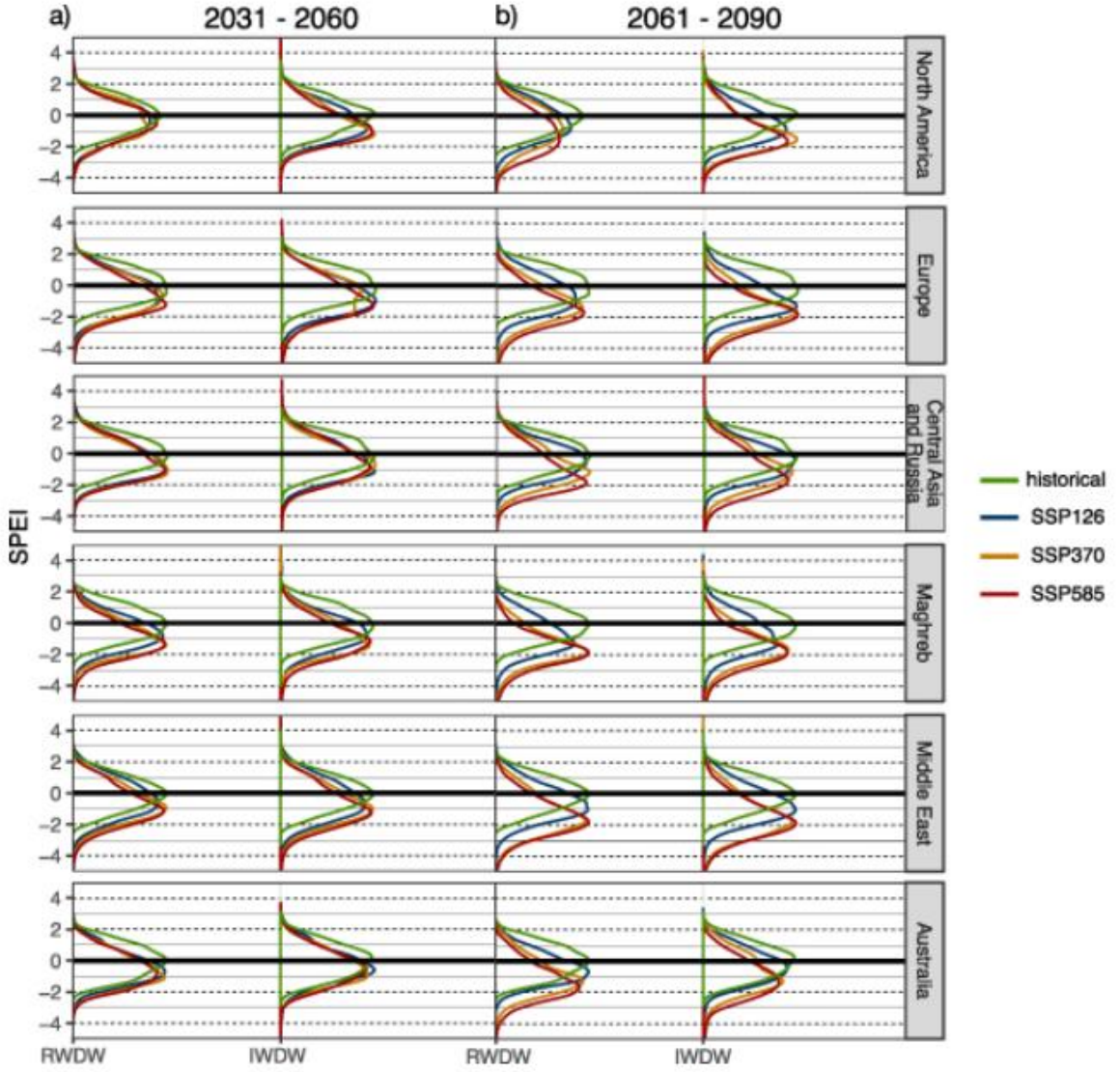
Rischi per l’agricoltura



Losses in climate suitability of durum-wheat producing areas



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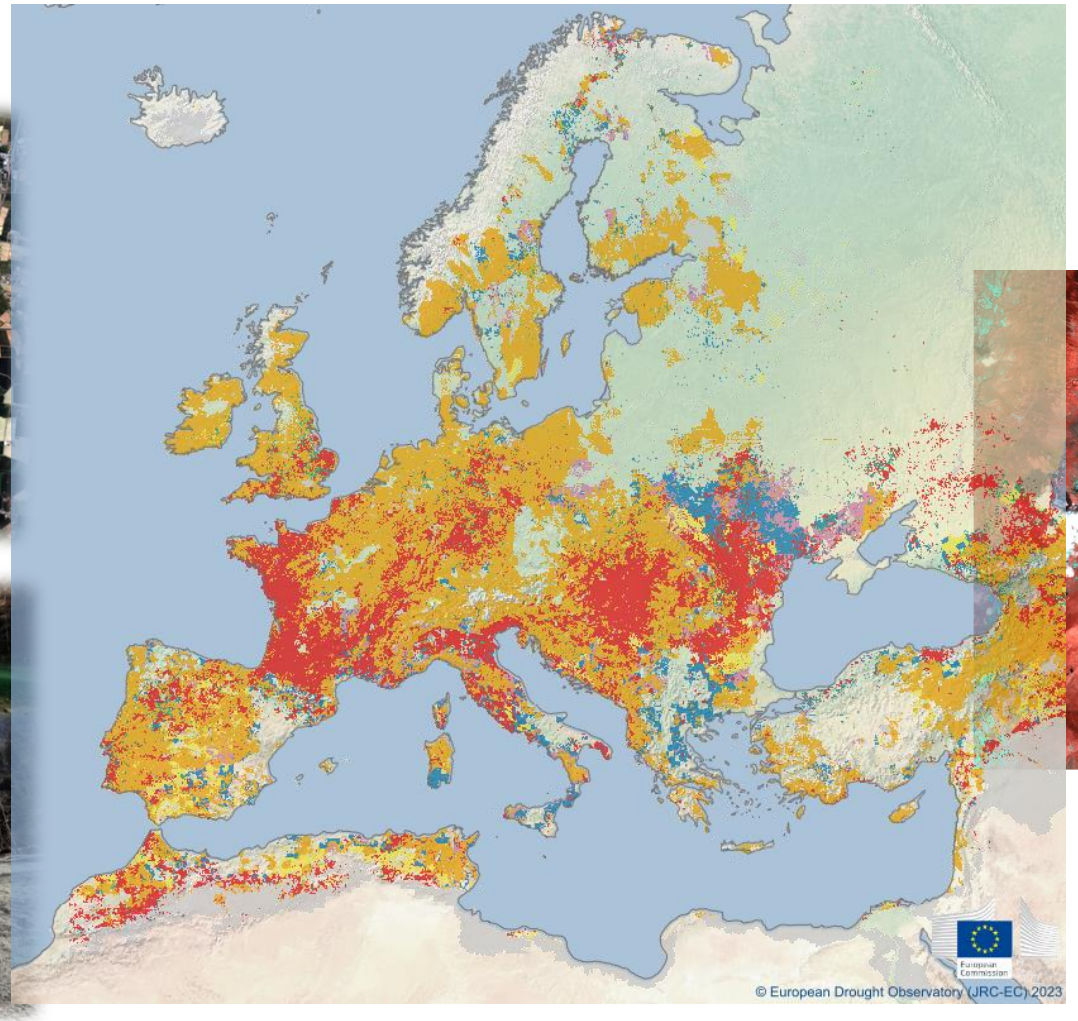
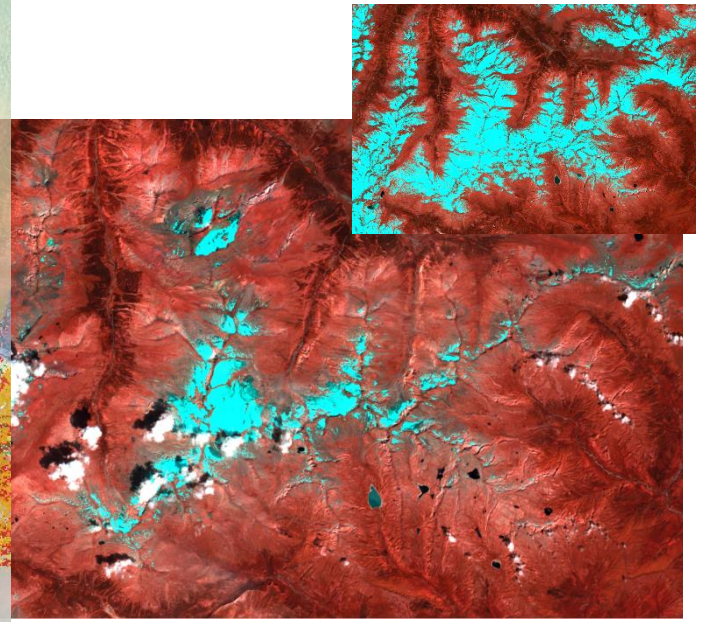
Eventi estremi





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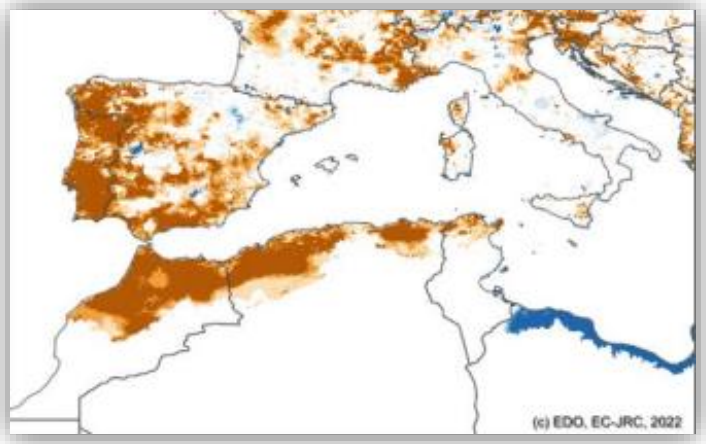
2022 siccità – heatwaves



Soil Moisture Anomaly - end of January 2022

Sea-water intrusion

Water supply issues

Dike stability

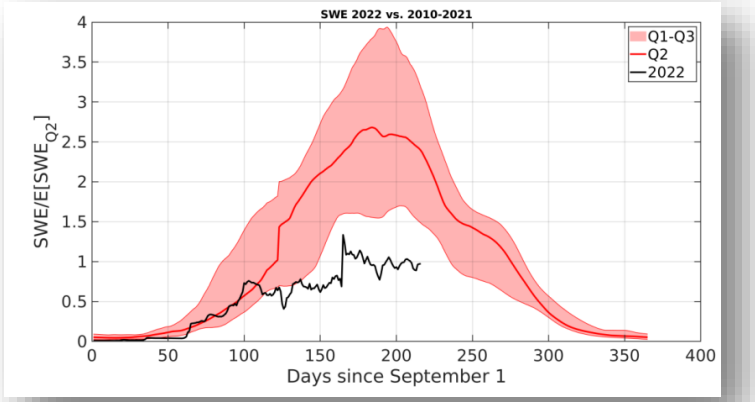
River transport

Energy

…

Agriculture

Grain maize Soybean Sunflower Rice …



Normalised snow water equivalent

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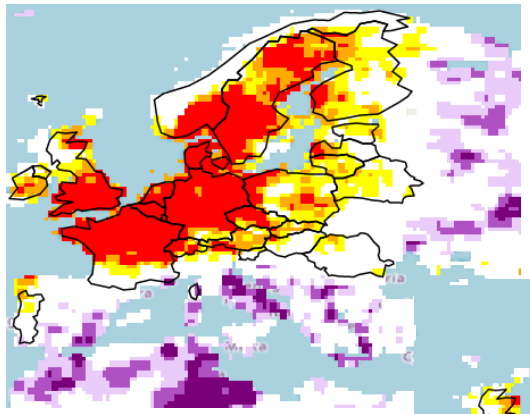
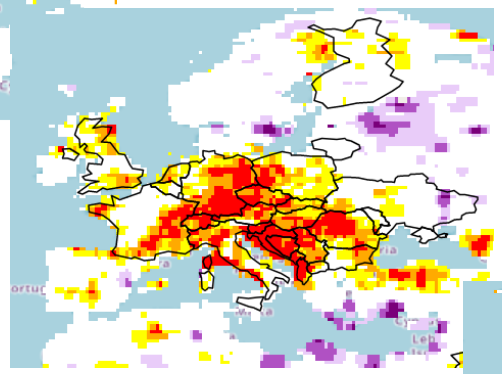
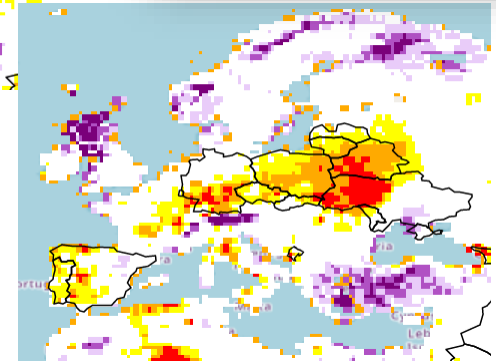
Eventi di siccità degli ultimi decenni



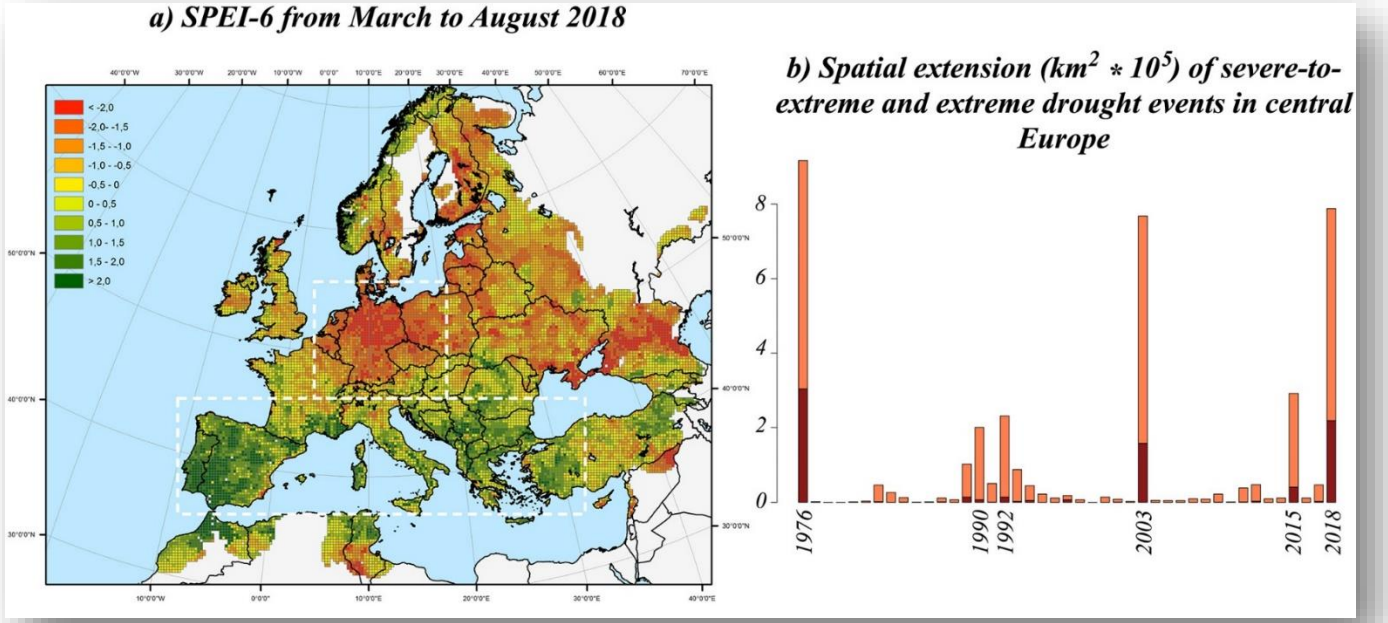
1976 SPI-6 August



2003 SPI-6 August



2015 SPI-6 August



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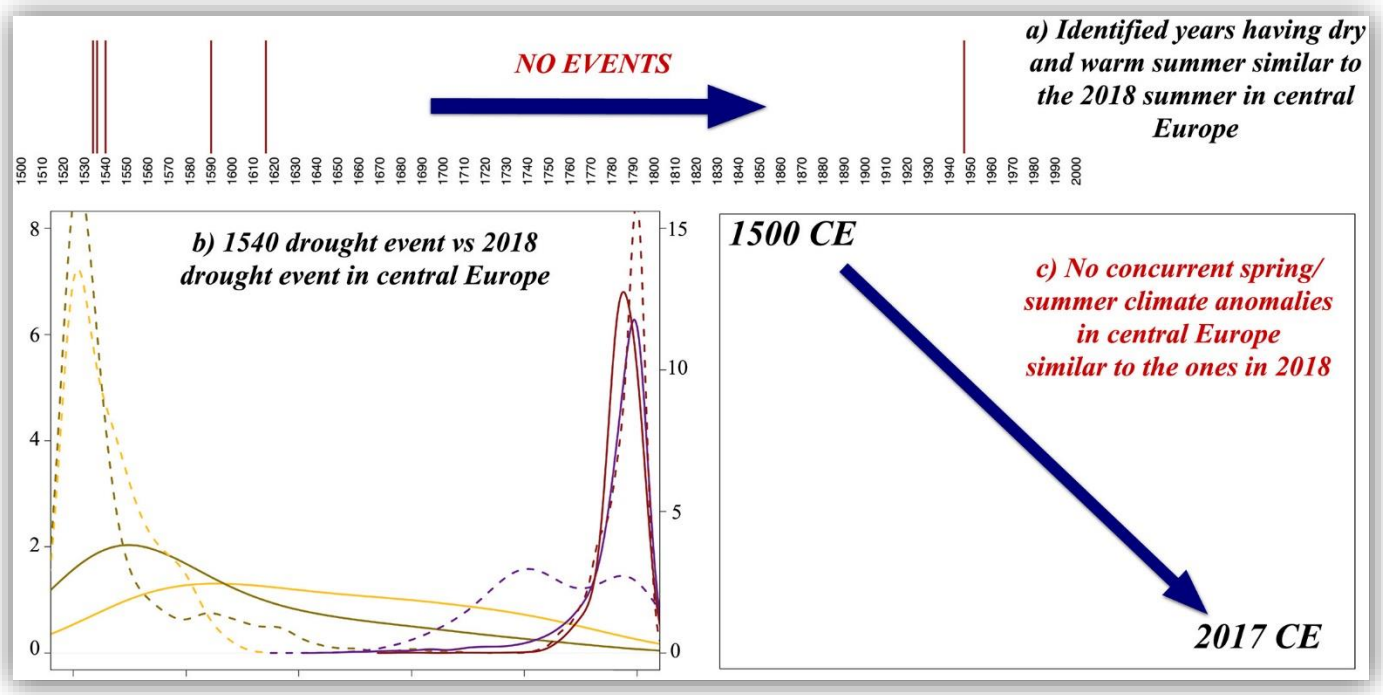
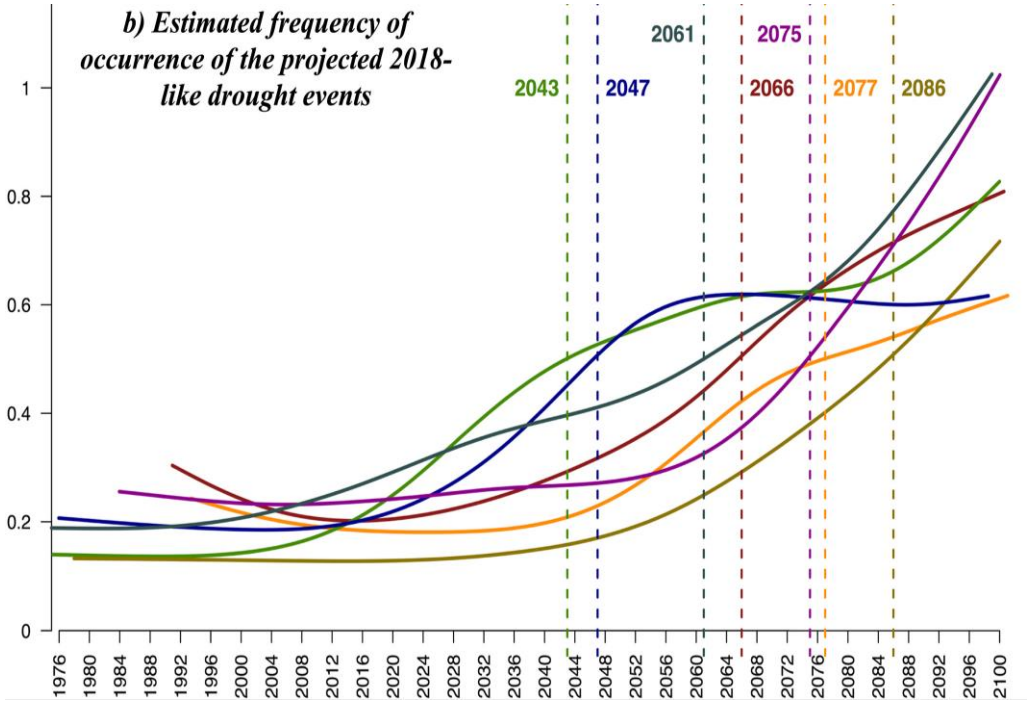
Eventi estremi

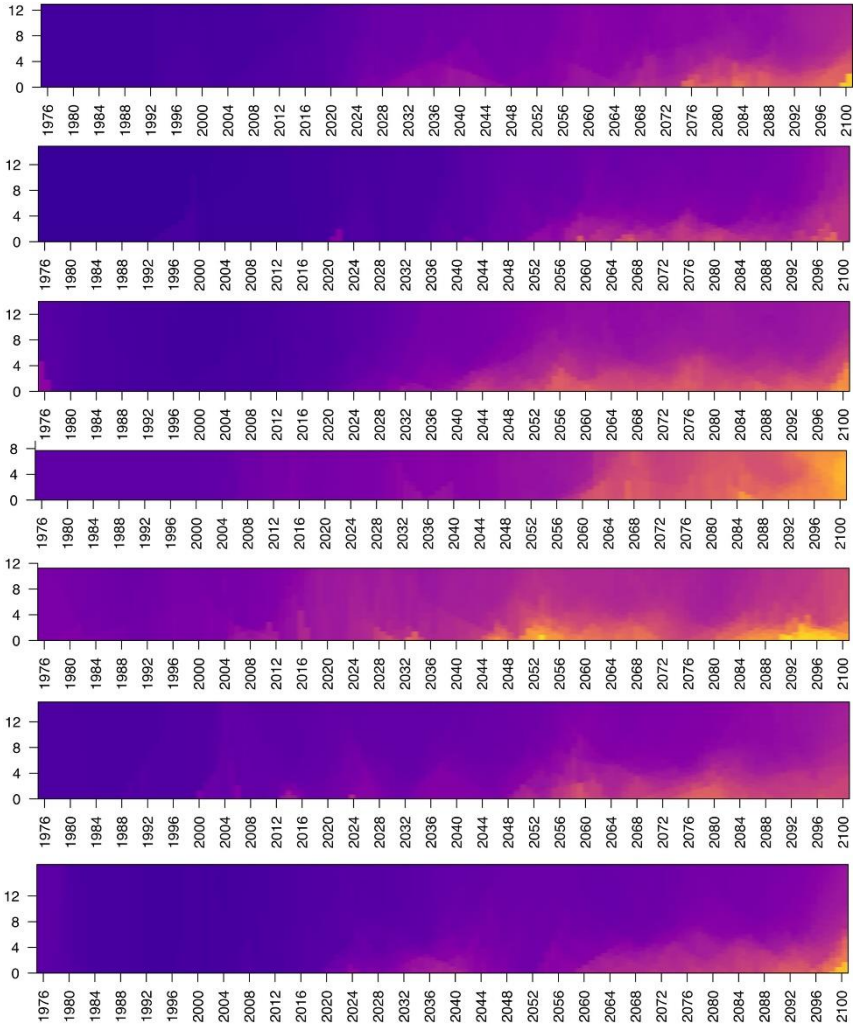


In early August, the rivers Elbe, Saale, and Eger in Saxony could be crossed in the dry by stepping from one stone to the next. The Rhine had become a runnel […] most rivers in France could be waded […] the grapes were like roasted and the leaves of the vines had fallen […] Cattle all over Europe died of thirst and hunger.

Source: Pfister, 2017

Eventi estremi - recurrent





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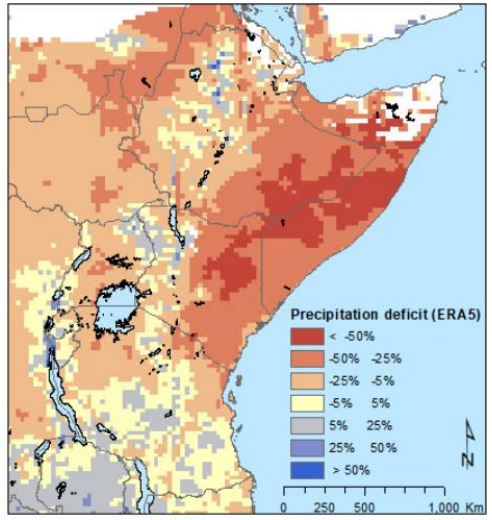
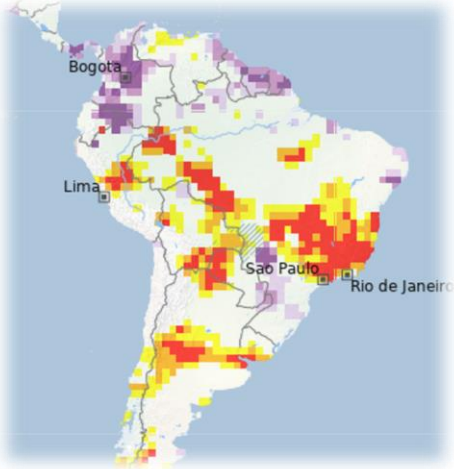
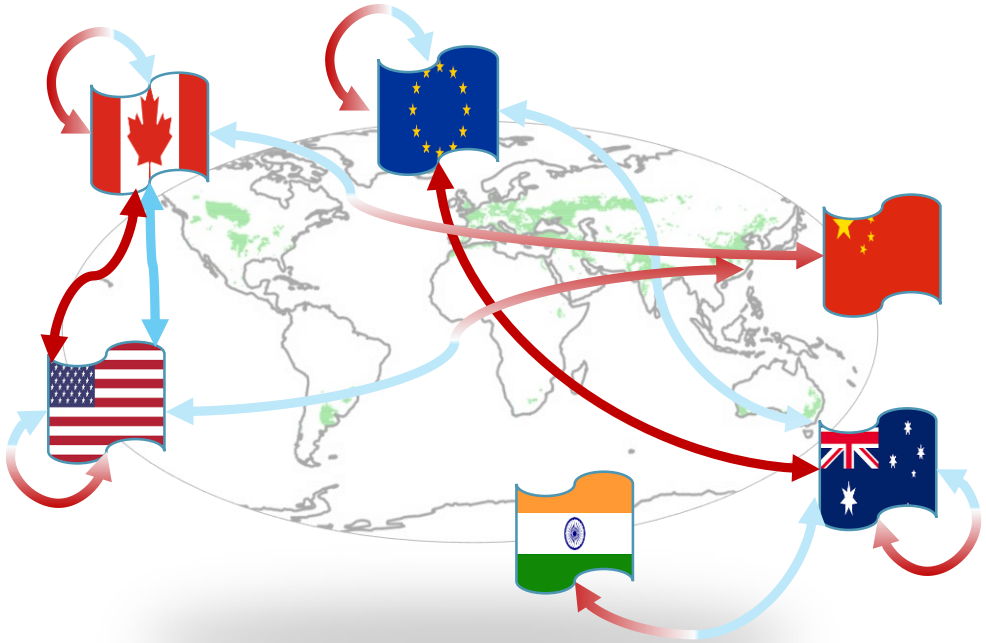
Eventi estremi – recurrent & concurrent

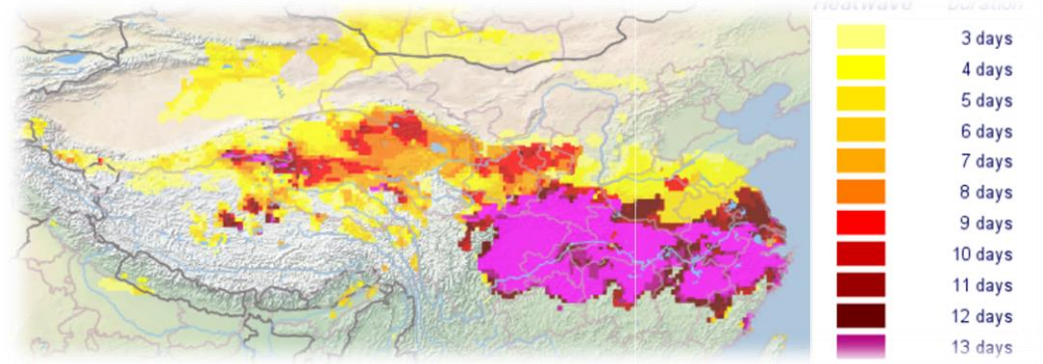


Precipitation deficit (1981-2020) July 2020 – June 2022

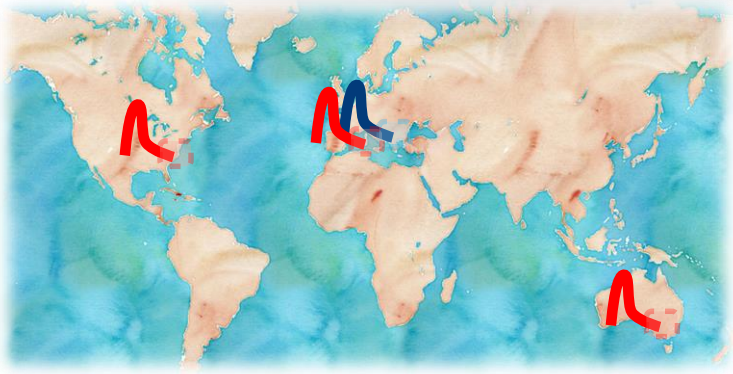


Drought in the La Plata – SPI-3 August 2022





Heatwave in China. Data up to the 12th of August,



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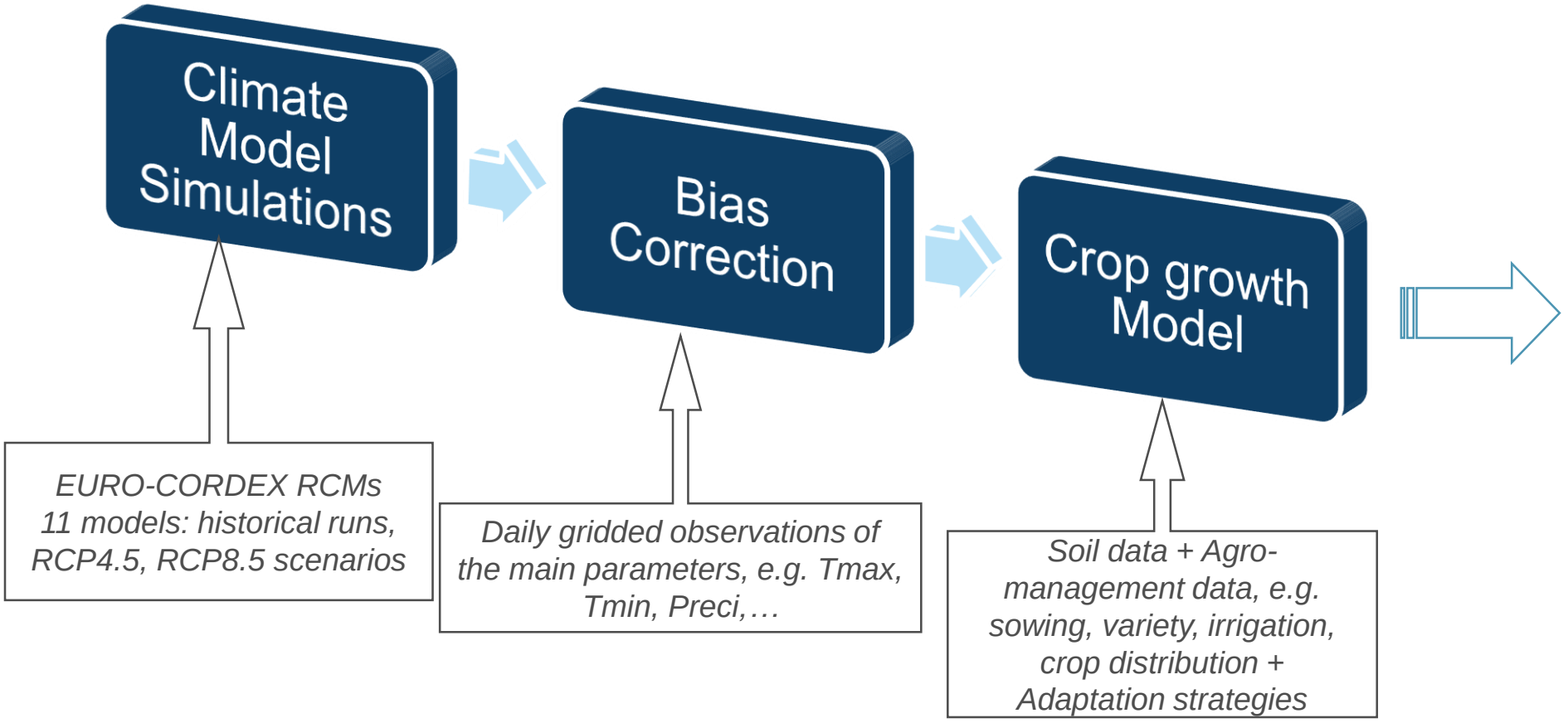
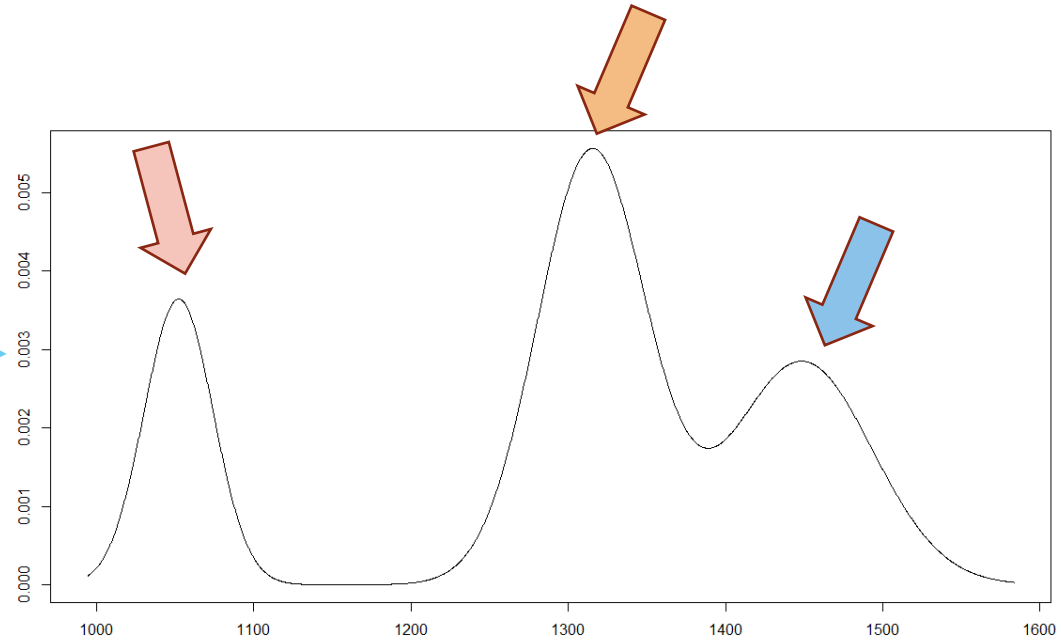
Adattamento



Six crops (wheat, maize, barley, …)
Ensemble of yield projections at ~12km, regional and national level under 2 scenarios, different agro-management and adaptation strategies

Adattamento

Experimental data: 189 durum wheat varieties tested in 8 sites in the Med



Representative sample of 18 ideotypes

ECroPS

2021-2040 RCP8.5 scenario

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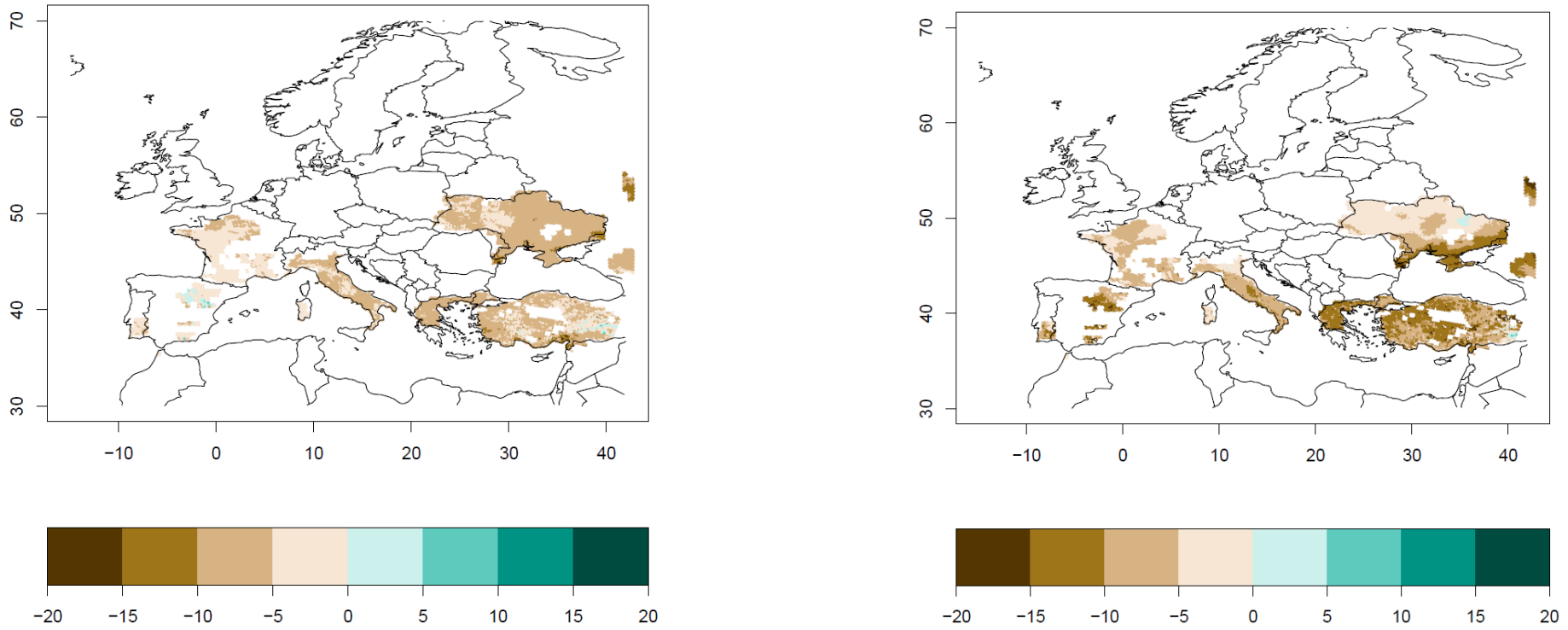
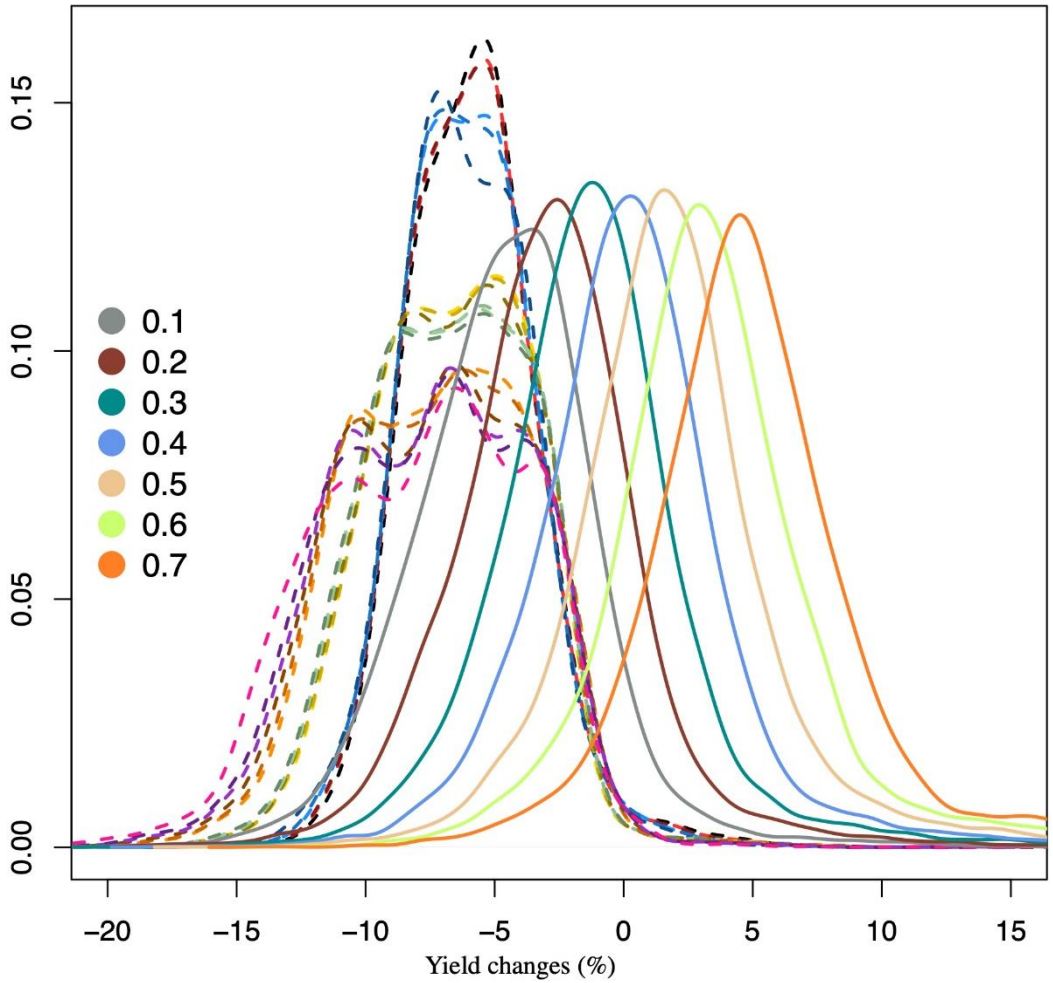
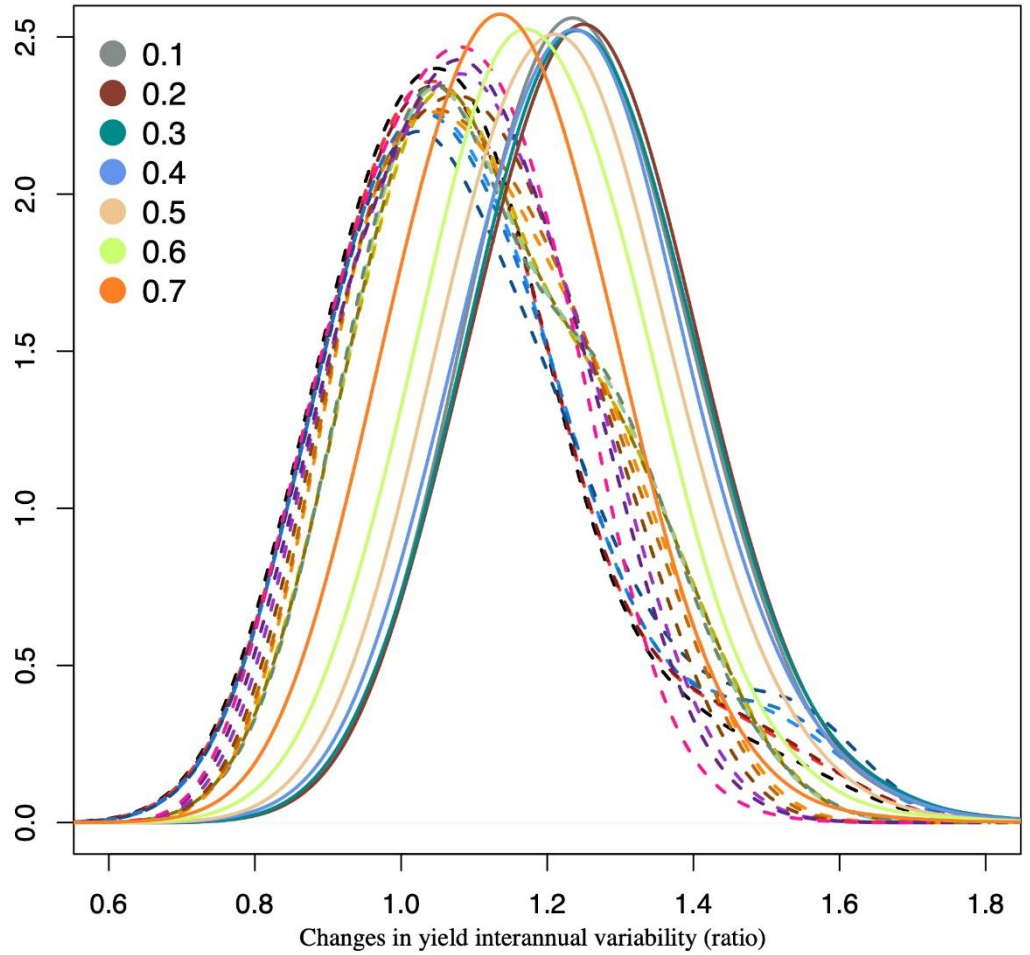
Adattamento



Ensemble yield changes in %

Adattamento





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Conclusioni

- La regione Euro-Mediterranea è un *hot-spot* del cambiamento climatico
- Gli eventi climatici estremi diventeranno più frequenti ed intensi
- Rischi derivanti da eventi *concurrent-recurrent*
- L'adattamento sostenibile, combinato a delle strategie efficaci di mitigazione, può ridurre gli effetti negativi del cambiamento climatico ed in alcuni casi creare delle opportunità

Thank you

Slide 5, source: Carvalho et al. Climatic Change, 167, 2021. Slide 6 and 9, source: IPCC AR6 WGI. Slide 9, source UN GAR report 2021. Slide 11, source: Ceglar et al. ERL 16, 2021. Slide 12 (2018 Figure)-13-14, source: Toreti et al. Earth's Future 7, 2019. Slide 15, flag figure, adapted from Toreti et al. Sci. Rep. 9, 2019. Slide 18,19, source: Toreti et al. Comms. Bio 5, 2022.

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