Climate change impacts on European wheat and maize yields

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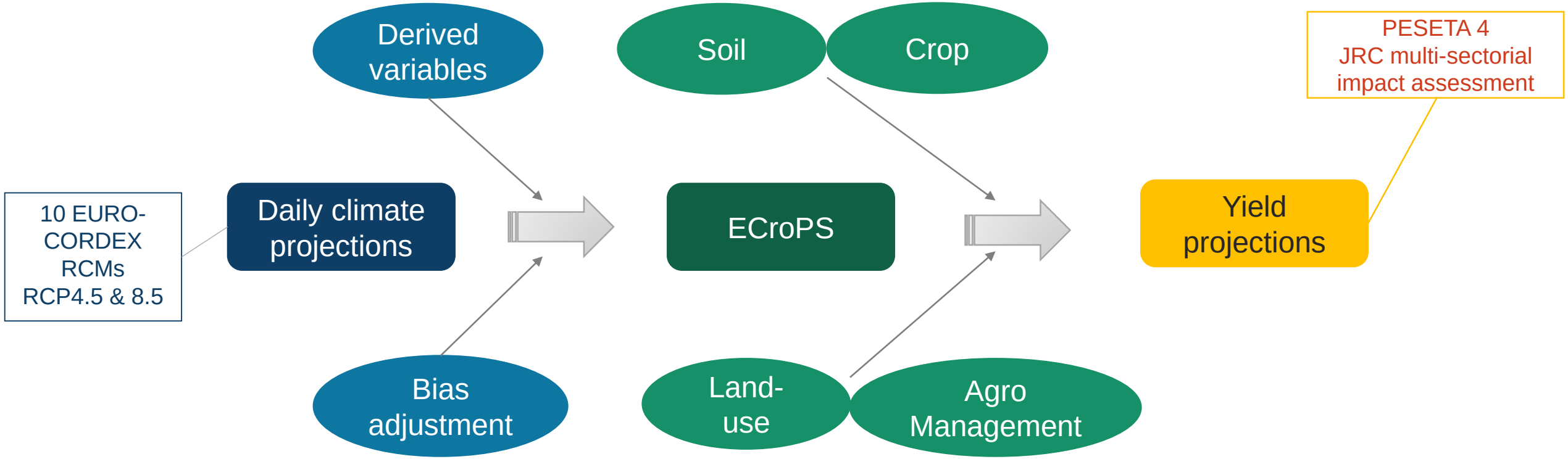
Assessing the impacts of climate change

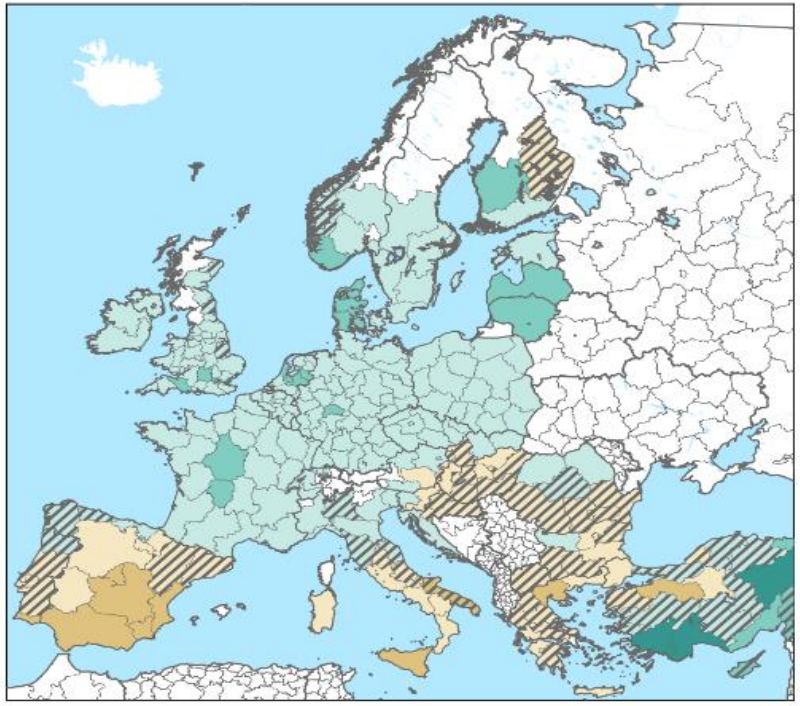
ECroPS a new modelling environment based on improved WOFOST crop growth model
designed for massive simulations and high-res climate change impact assessments



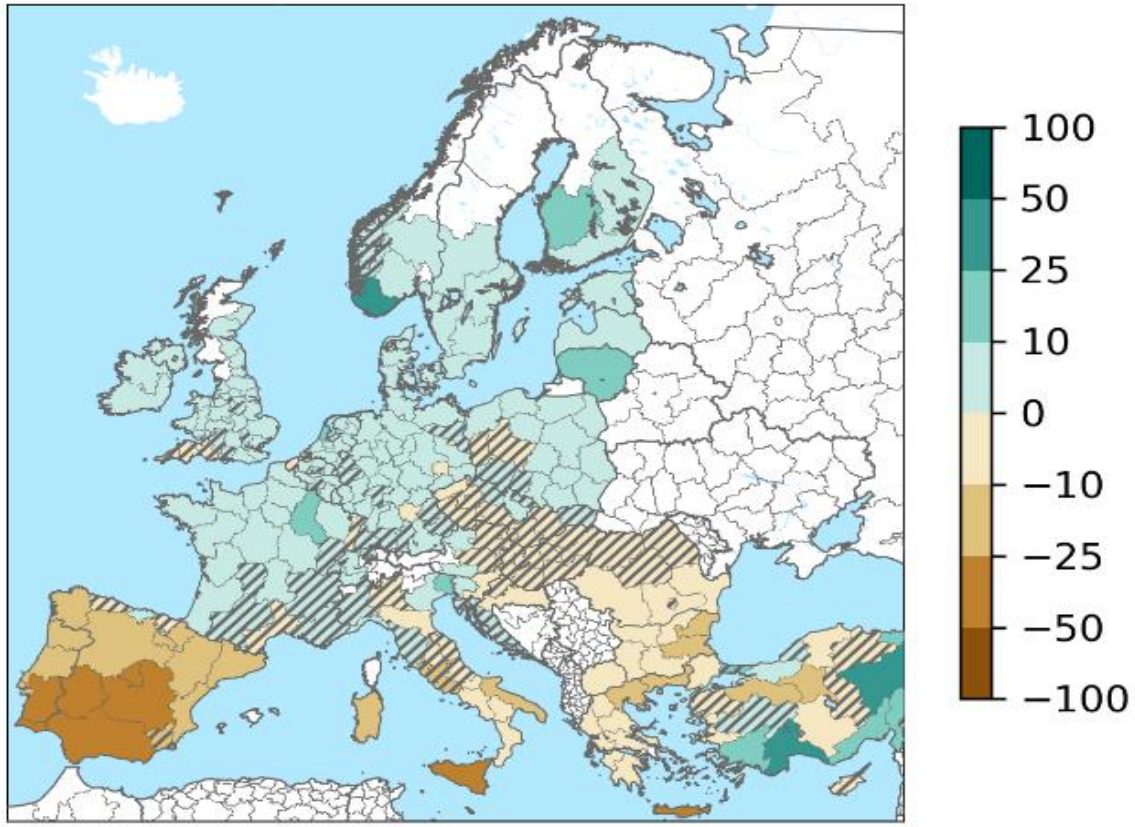
European Commission

Projected wheat yield

*RCP8.5, Euro-Cordex, two global warming levels**



*1.5 °C, Ensemble median changes (% w.r.t. the baseline)***



*2 °C, Ensemble median changes (% w.r.t. the baseline)***

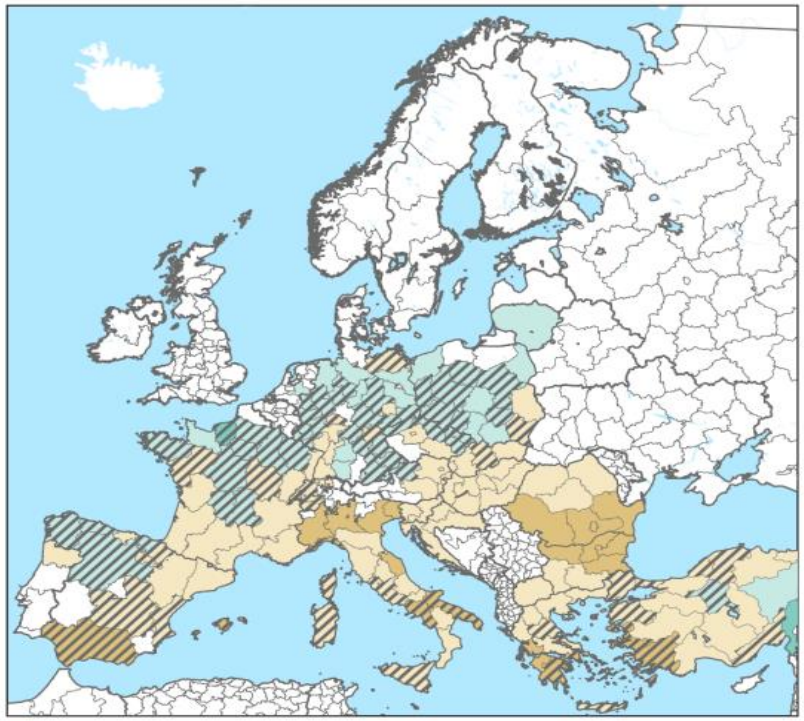
** 20-year period when the mean global temperature increase reaches 1.5 °C and 2 °C.*

***Hatching denotes areas with low models' agreement (i.e. less than 66% of models agree in the sign of estimated changes).*

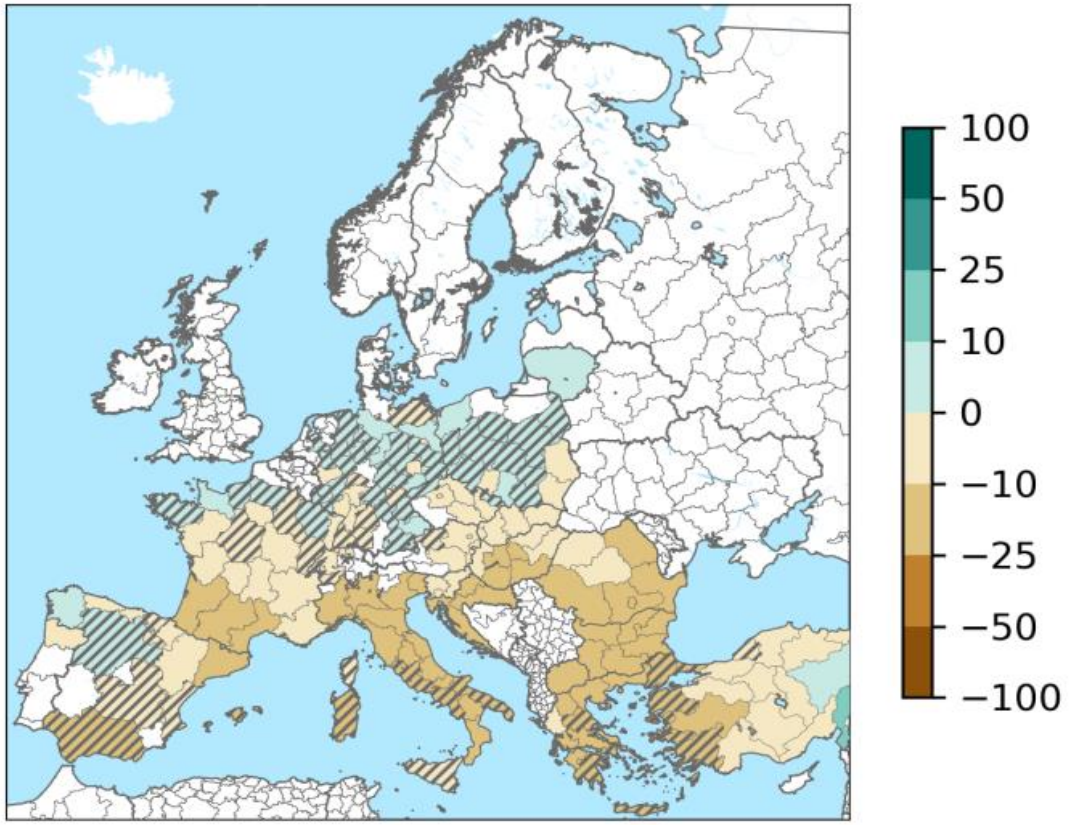
European Commission

Projected grain maize yield

*RCP8.5, Euro-Cordex, two global warming levels**



*1.5 °C, Ensemble median changes (% w.r.t. the baseline). Full irrigation conditions***



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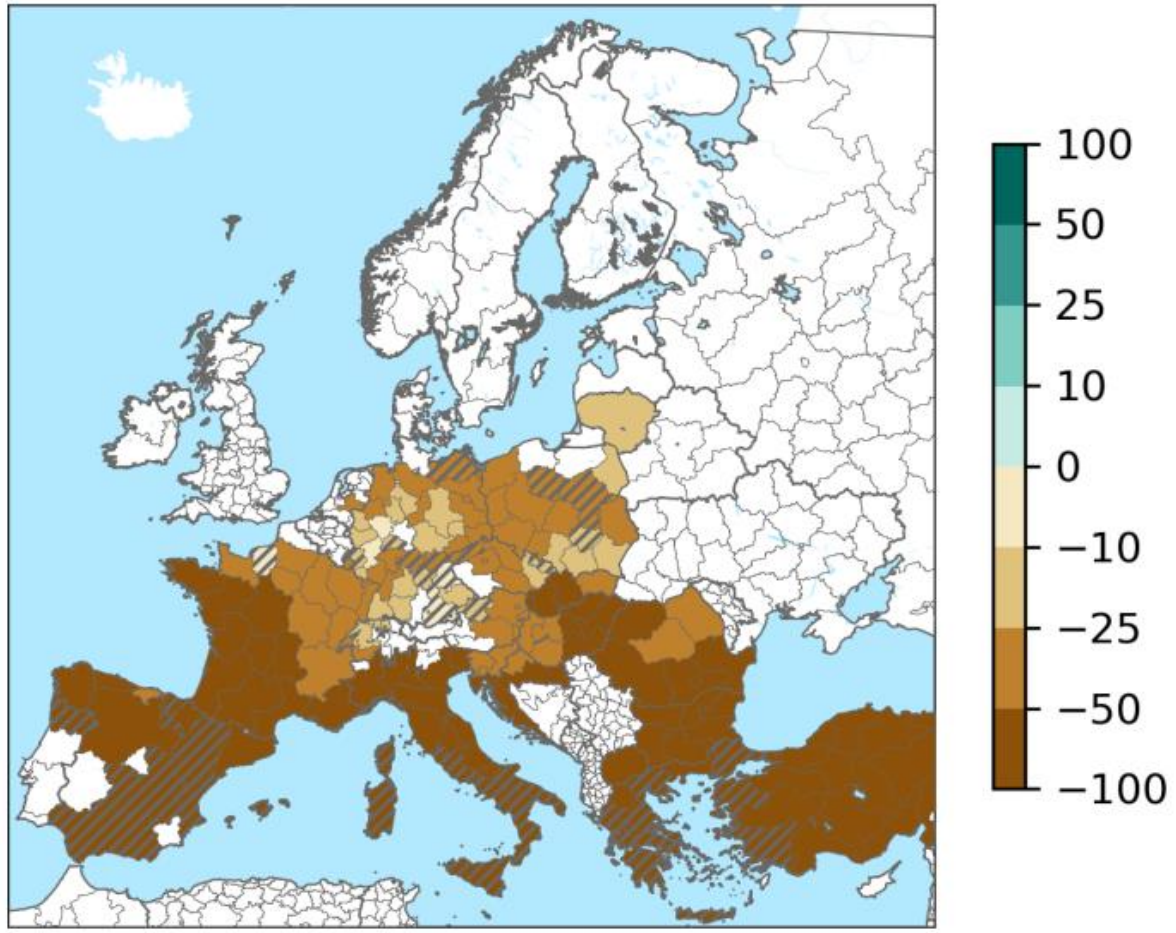
European Commission

Projected grain maize yield

RCP8.5, Euro-Cordex

What if…

water for irrigation will not be available?



*2 °C, Ensemble median changes (% w.r.t. the baseline). No irrigation**

**Hatching denotes areas with low models' agreement (i.e. less than 66% of models agree in the sign of estimated changes).*

CONCLUSIONS

- Grain maize is projected to be the most affected crop by climate change in Europe, with extreme losses if water for irrigation will not be available.
- Tested adaptation strategies* are not so effective to reduce the negative impacts of climate change on maize yield.
- North-South dipole is projected for wheat yield. Reductions in southern Europe points to the limited CO_2 positive effect under limited water conditions.
- Tested adaptation strategies* seem to be effective to reduce the impacts of climate change on wheat yield.
- The impacts of more intense and more frequent climate extremes may induce severe losses and shocks even in regions where positive changes are projected.

* Adapted sowing and simple variety improvement