
EU CAP
NETWORK
EU CAP Network workshop
'Enhancing food security under changing weather patterns: farm adaptation'
14 - 15 March 2023, Bologna | Italy
Funded by
the European Union

Workshop: 'Enhancing food security under changing weather patterns: farm adaptation' | 14-15 March 2023 | Bologna, Italy

Current and Future Climate Change Impacts on European Agricultural Production

Martin Claverie

European Commission
Joint Research Centre, Ispra

Funded by the European Union

Setting the scene

- **Current and Future Climate Change Impacts on European Agricultural Production**
  Martin Claverie, European Commission
  Joint Research Centre, Ispra

- **EU Climate Adaptation Strategy and key climate change adaptation objectives in the Common Agricultural Policy**
  Irene Bonvissuto, European Commission
  DG Climate Action

- **EIP-AGRI and EU CAP Network**
  Anikó Seregélyi, European Commission
  DG Agriculture and Rural Development

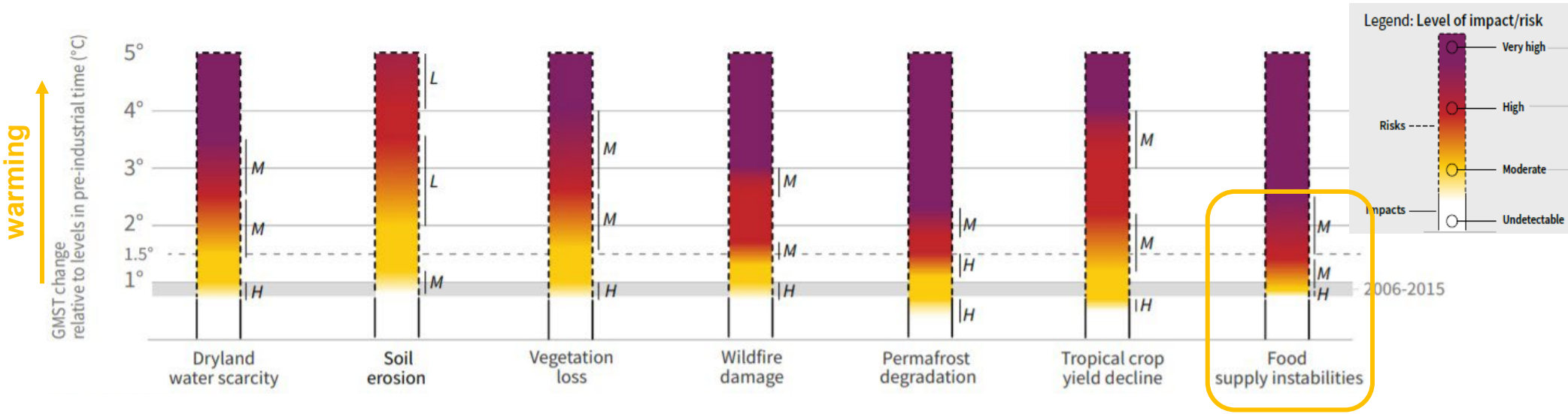
Current and Future Climate Change Impacts on European Agricultural Production

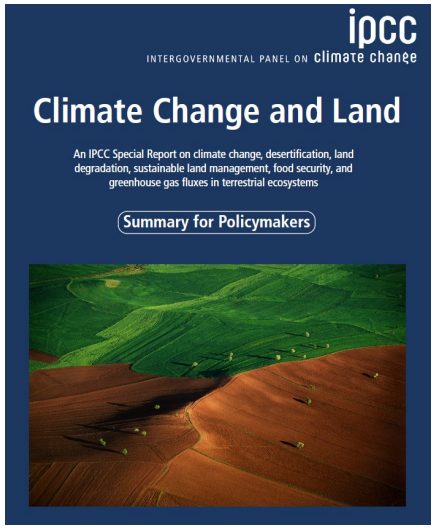
Martin Claverie, JRC Food Security Unit

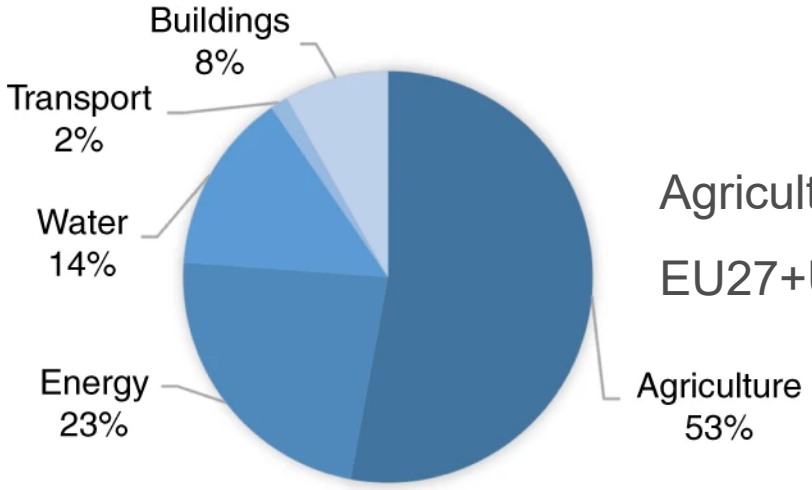
Climate Change and food production

1. Global food production is highly vulnerable in the coming decades (IPCC). Water availability is a key risk for Europe.
2. Two severe drought events in Europe 2022 and 2018: can become normal in the 2040s.
3. Production of specific crops becomes unfeasible by 2050.
4. Agro-climatic zones have changed and keep changing with implications for crop growth feasibility.
5. Monitoring of the resilience of crop production points to the importance of crop diversification and the importance of European common market but we cannot count on compensation mechanism for the future.

The global food system is highly vulnerable







Agriculture has the largest share in EU27+UK wide drought damages

Naumann et al. 2021. Nature Climate Change volume 11, pages485–491

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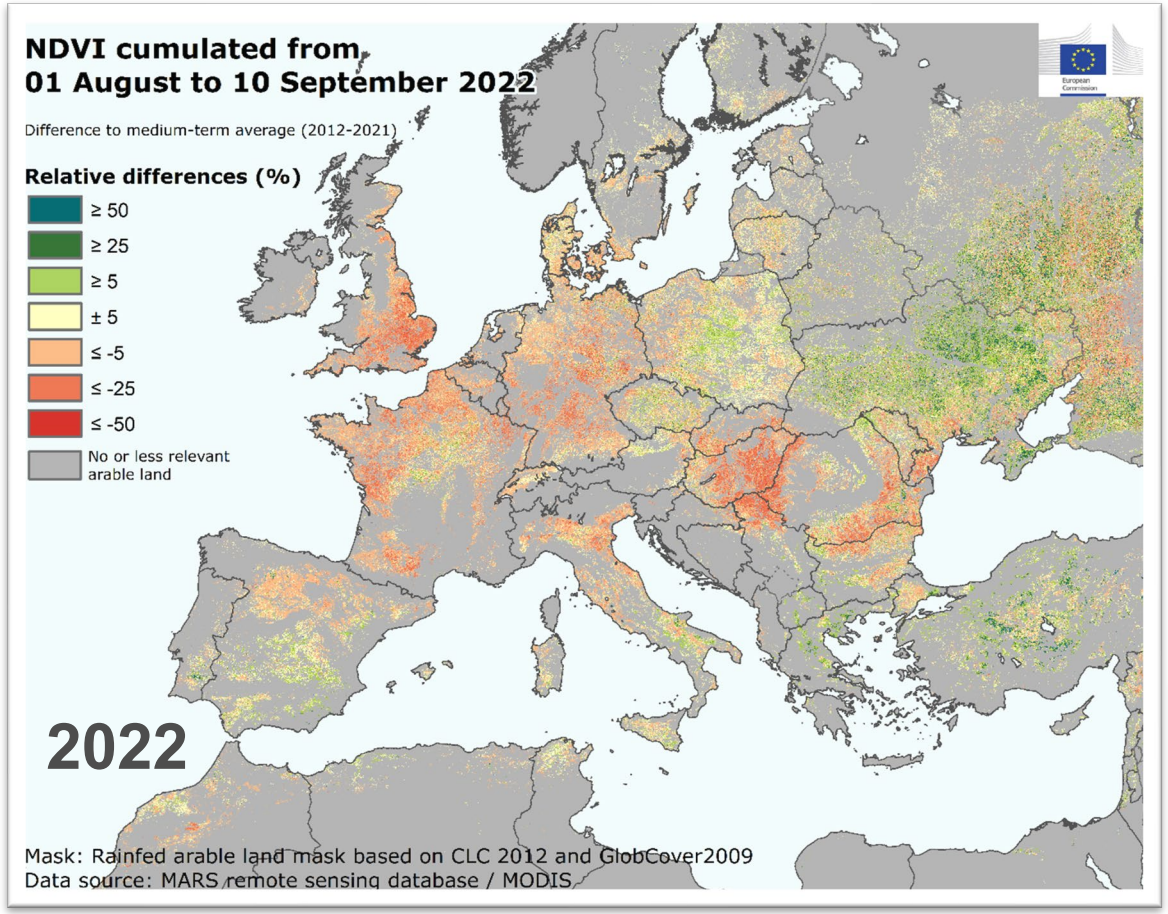
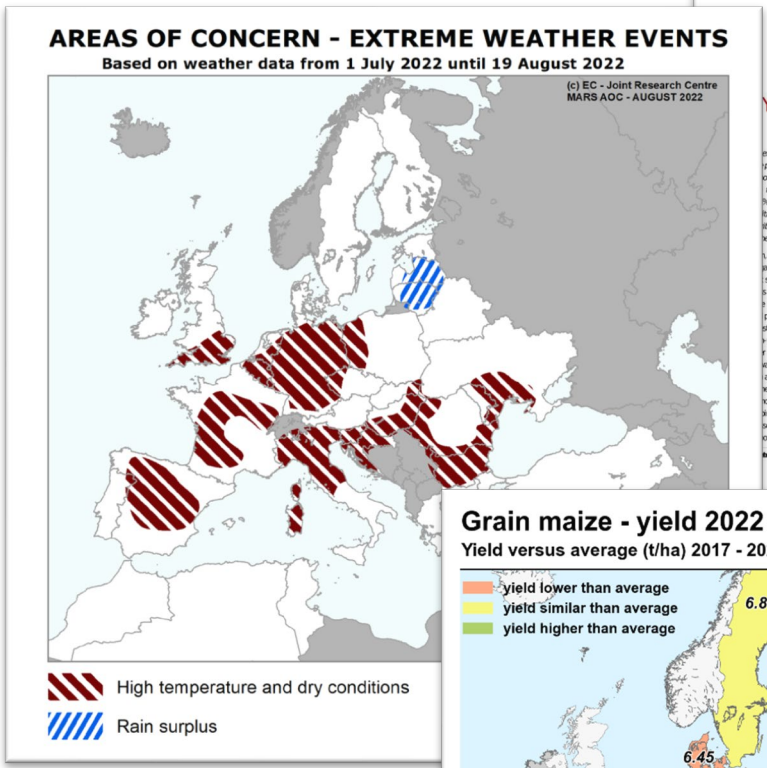
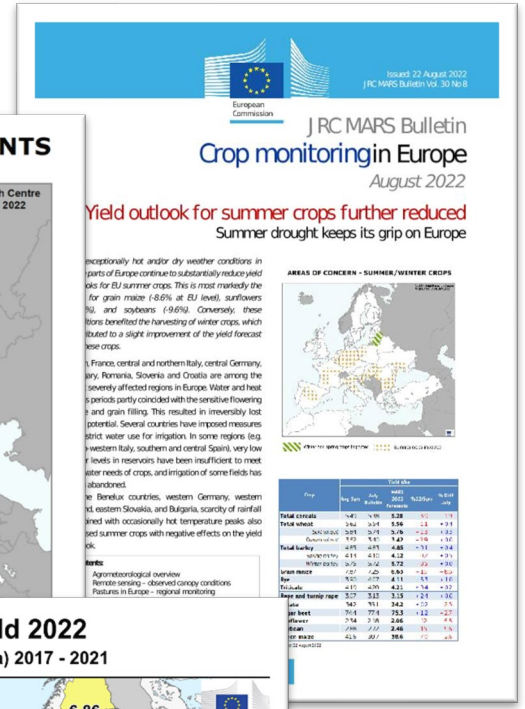
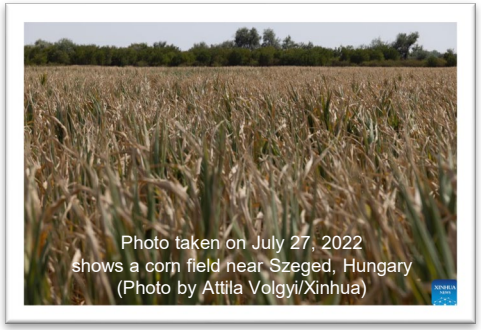
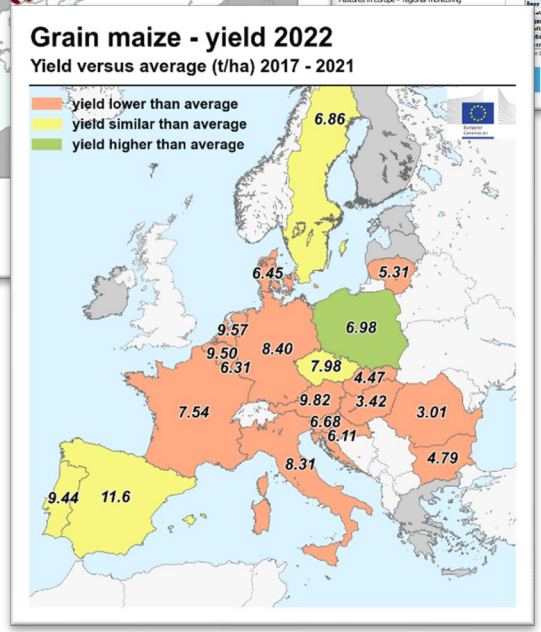
The summer 2022 drought severely affected summer crop production in Europe











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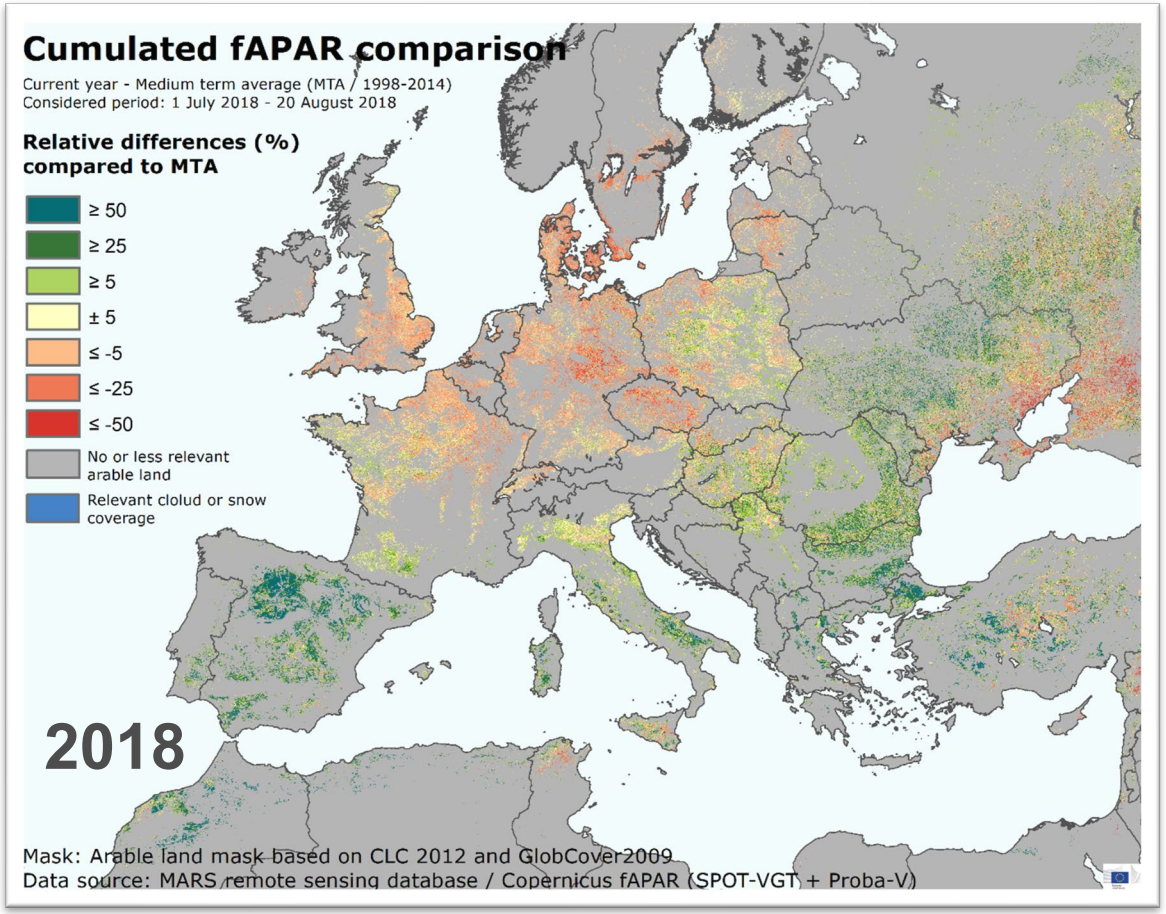
The summer 2018 drought impacted a large part of northern Europe



Photograph shows stressed grassland in Southern England 17th July 2018

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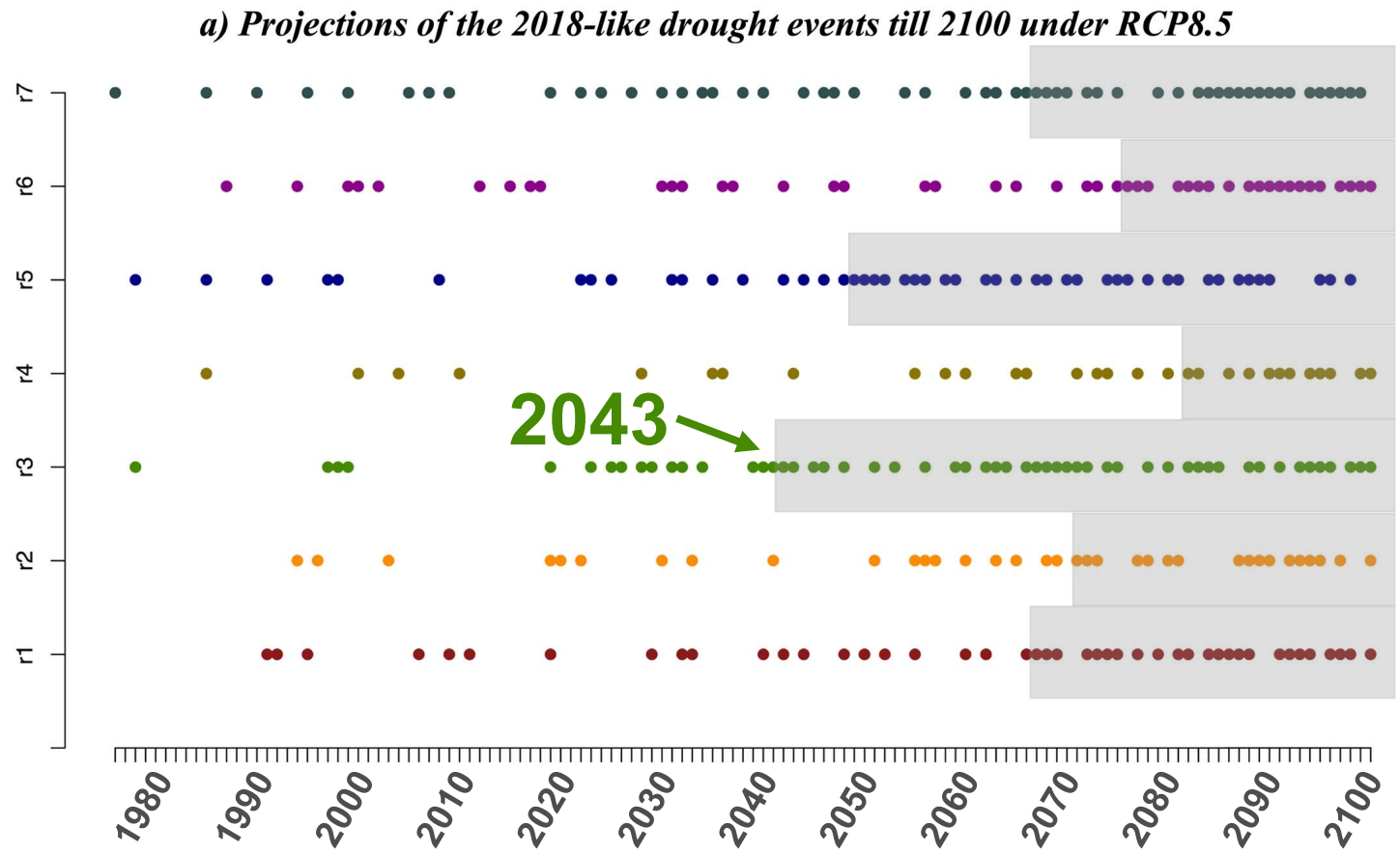
Extreme drought events similar to the one of 2018 could become normal as early as 2043



- Occurrence of 2018-like drought events using 7 high-resolution climate projections (RCP8.5)
- 2018-like droughts could become "normal" in the early 2040s (grey areas). Two CAPs ahead of us.
- Climate change adaptation strategies for agriculture in Europe cannot count on recurrent water “seesaws” - i.e. compensation between Northern-Central-Southern Europe.

Toreti et al. 2019. Earth's Future, 7, 652– 663.

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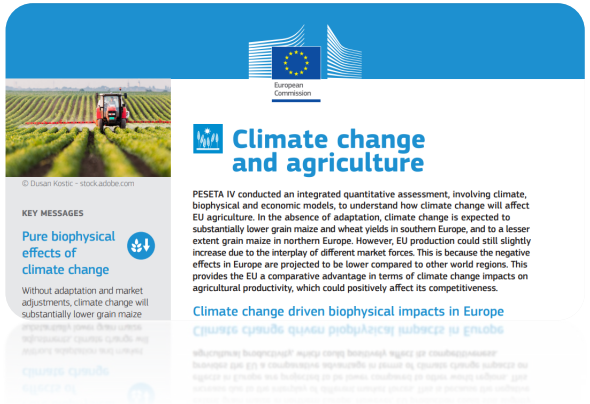
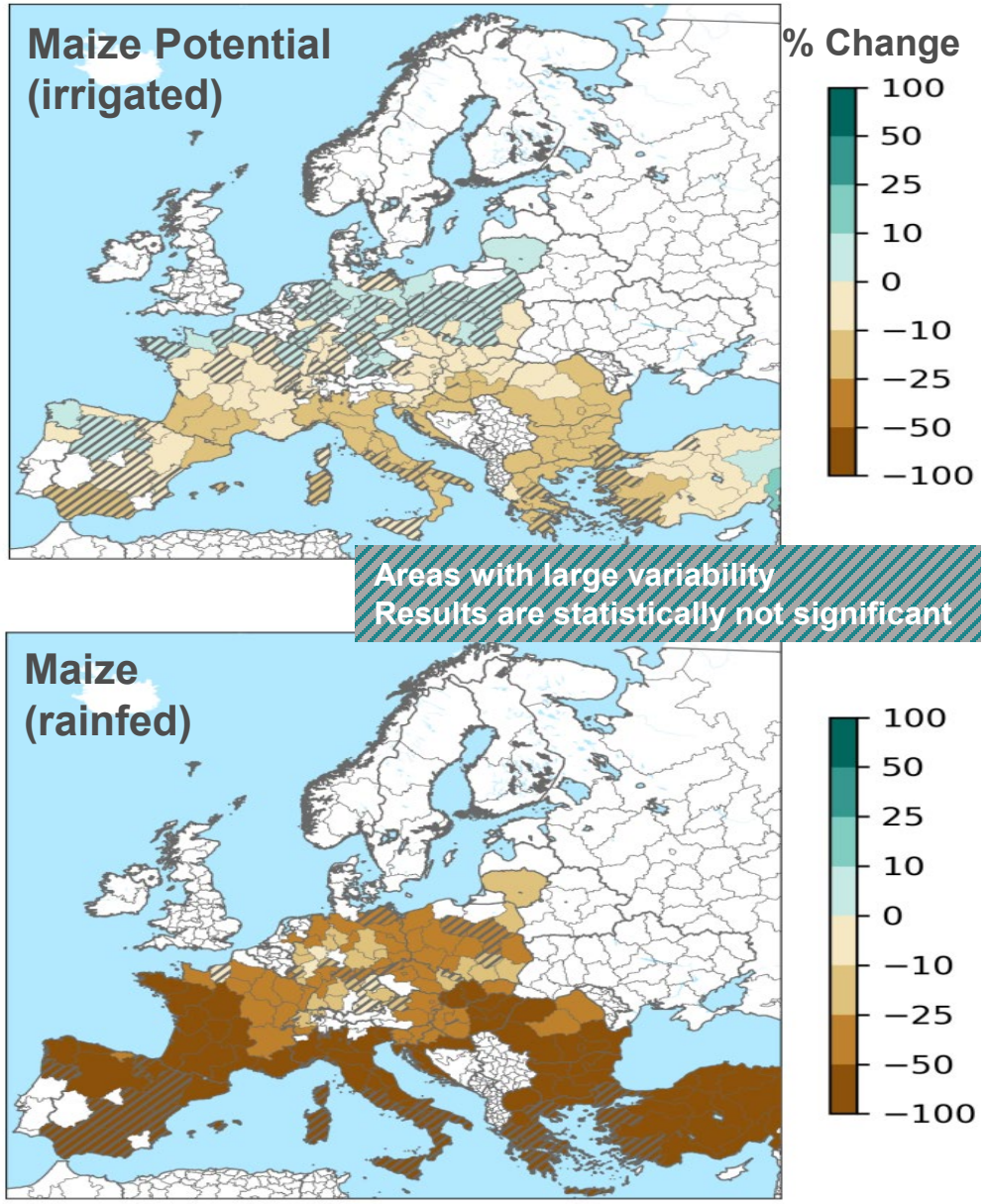
PESETA-IV: Climate change impact assessment

- PESETA4 is a cross-sectoral climate risk assessment performed at the JRC.
- Without adaptation, climate change will substantially lower grain maize and wheat yields in Southern Europe, and to a lesser extent grain maize in northern Europe
- Grain maize 2050 irrigated yield change: Losses up to 25 % in Southern Europe, moderate gains in Northern Europe.
- Climate change could further restrict the water available for irrigation- de-facto making the production of certain summer crops impossible in Southern Europe



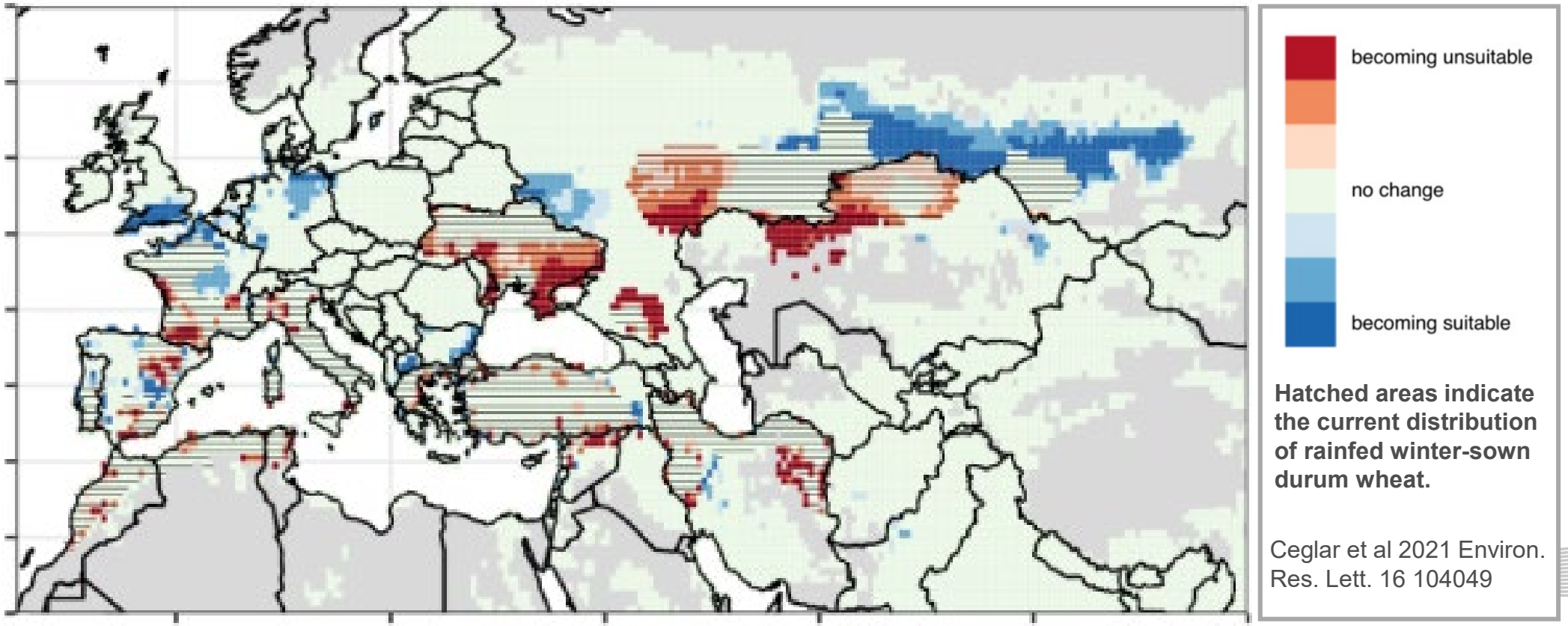
Simulated Grain maize yield change by 2050



https://joint-research-centre.ec.europa.eu/peseta-projects/jrc-peseta-iv_en

Agro-climatic zones in Europe will look different

- Estimated impacts of climate change on rainfed winter-sown durum wheat suitability for SSP370 scenarios and 2061-2090
- Northward migration of climate zones between 50-150 km per decade is already being detected.... and even stronger northward migrations are expected



Ceglar et al 2021 Environ. Res. Lett. 16 104049

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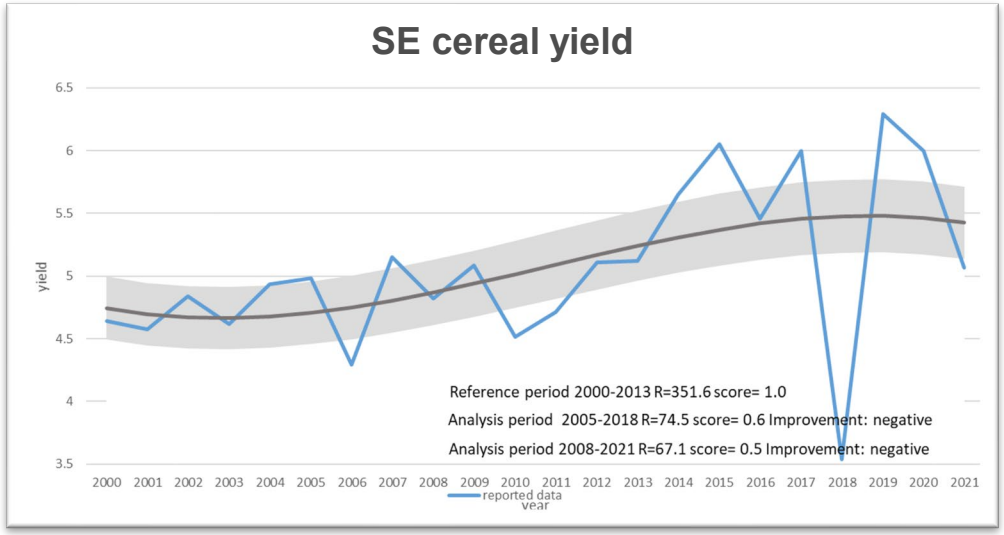
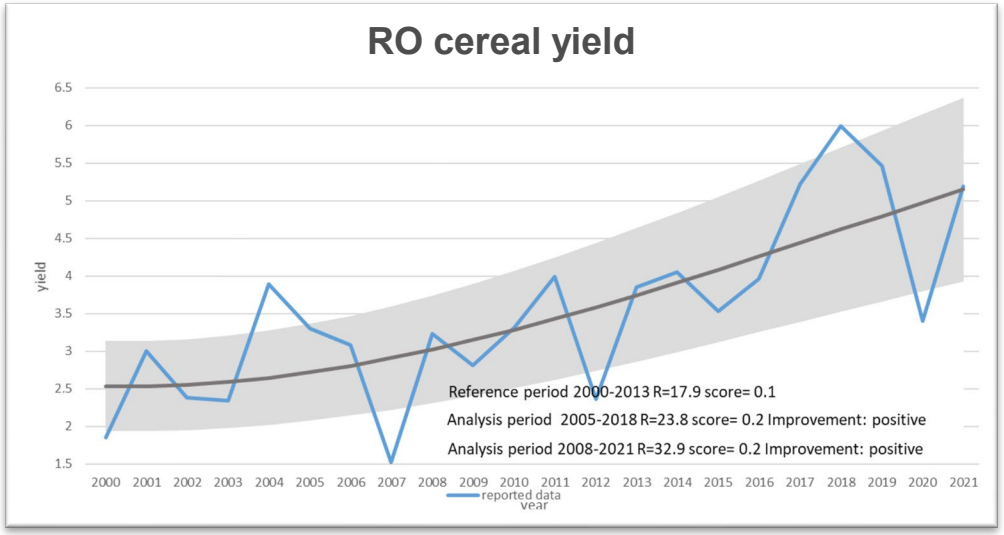
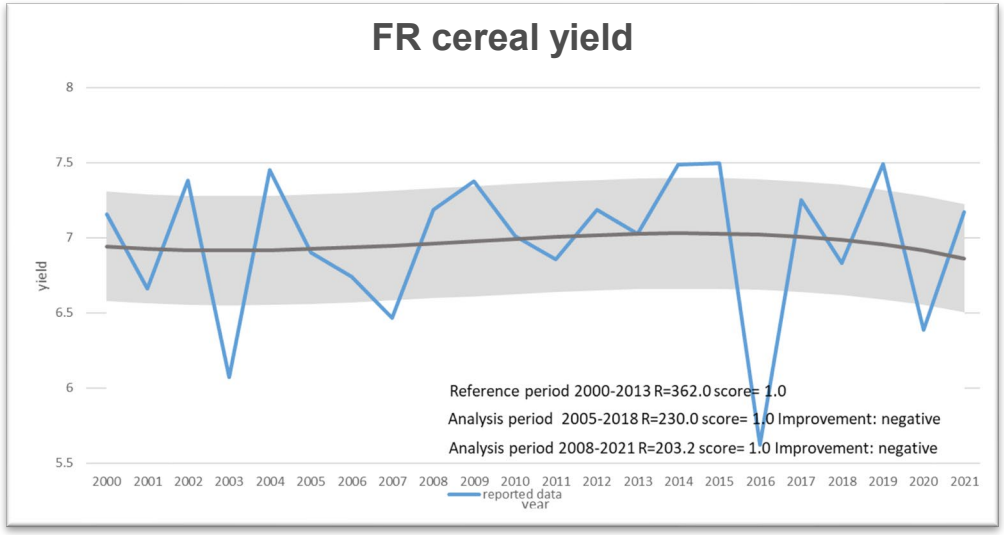
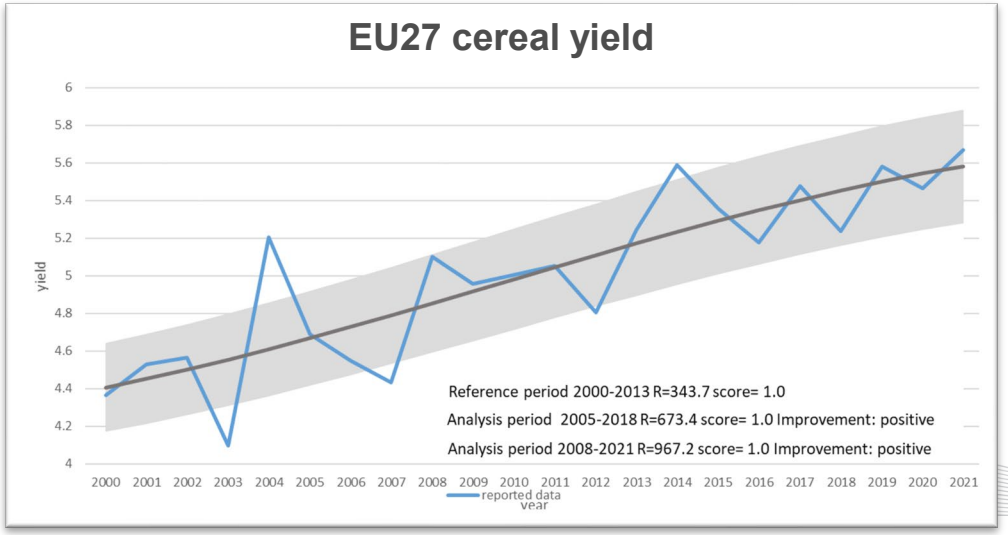
Resilience of the agricultural production system









See more in Zampieri et al. 2020. Science of The Total Environment

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All information on the workshop is available on the **EU CAP Network website**

On the event webpage: https://eu-cap-network.ec.europa.eu/events/eu-cap-network-workshop-enhancing-food-security-under-changing-weather-patterns-farm_en