

Climate change impacts and adaptation Europe - What science and data tell us?

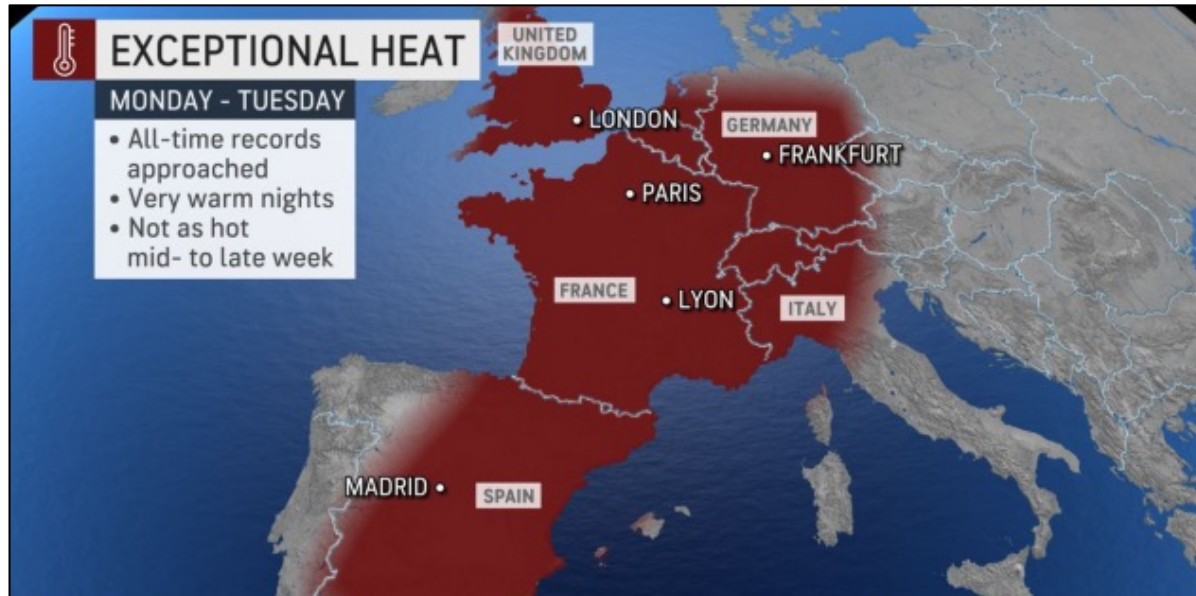
Dr. Blaz Kurnik

Climate law and litigation Annual Conference 24-25 October 2022

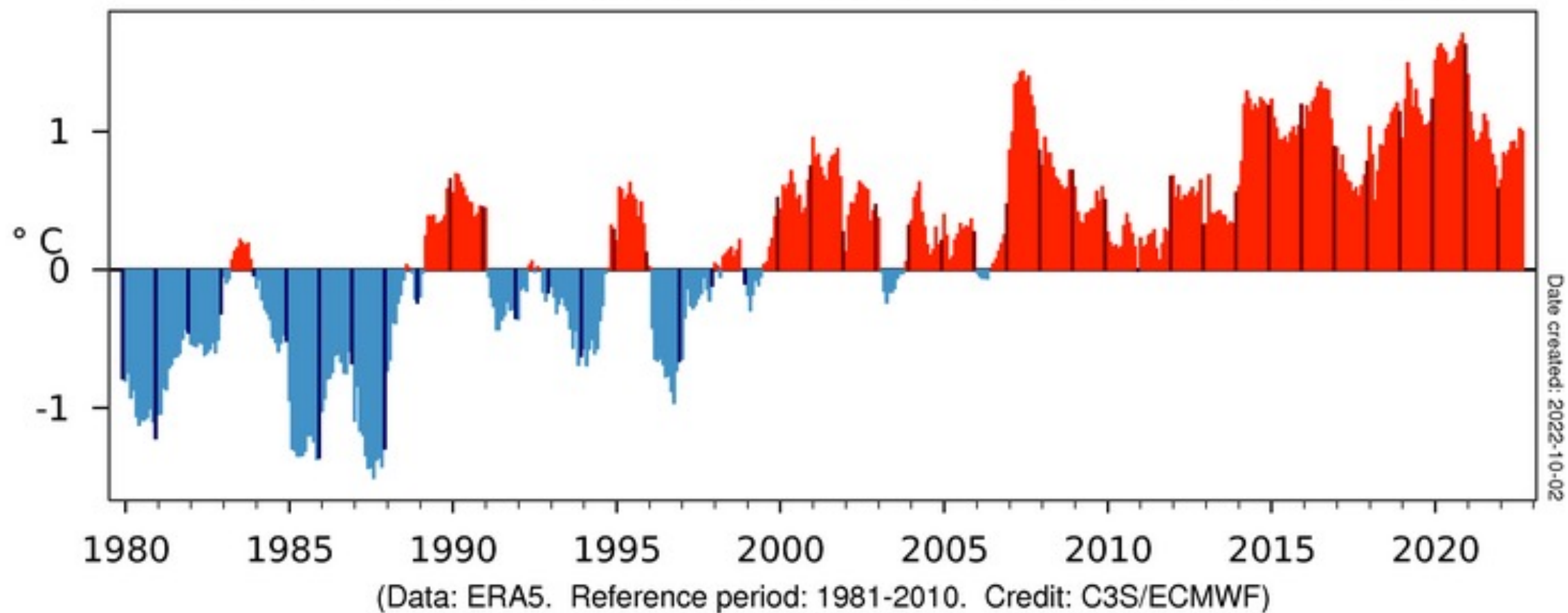
Conseil d'Etat – Paris – France



An (un)exceptional summer in Europe



Twelve-month European surface air temperature anomalies



Date created: 2022-10-02



PROGRAMME OF
THE EUROPEAN UNION

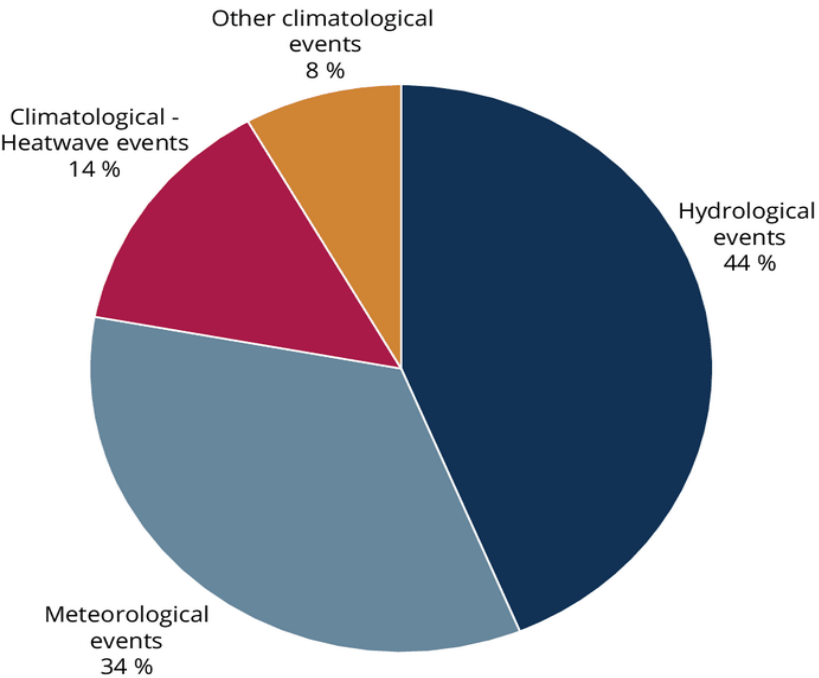


European Environment Agency

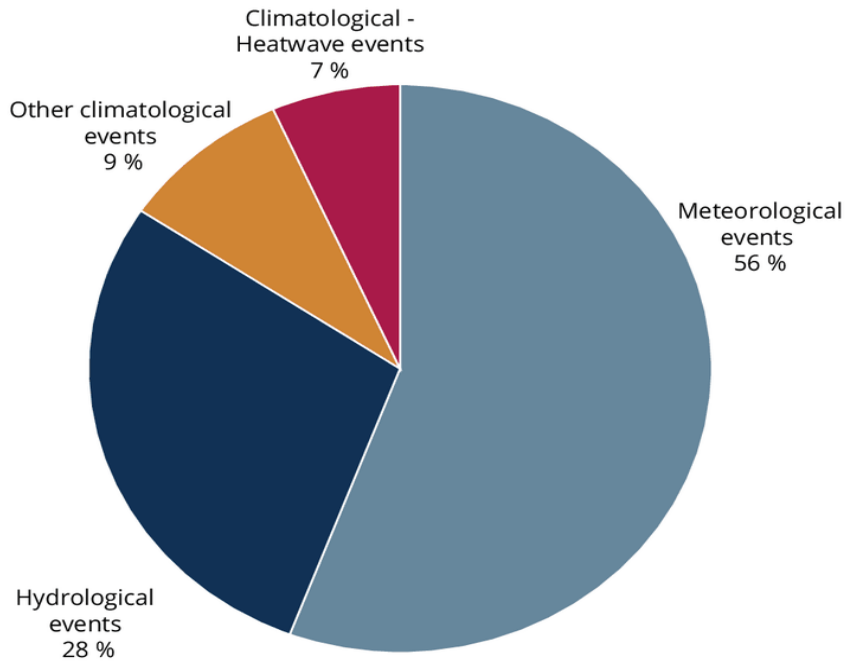


Economic losses from weather and climate extremes 1980-2020

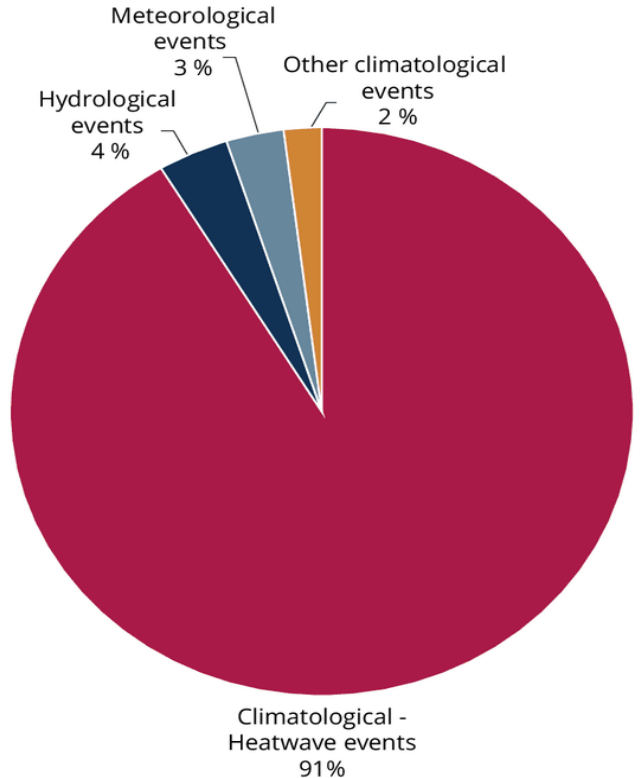
Economic losses
EUR 509 437 million



Insured economic losses
EUR 116 395 million

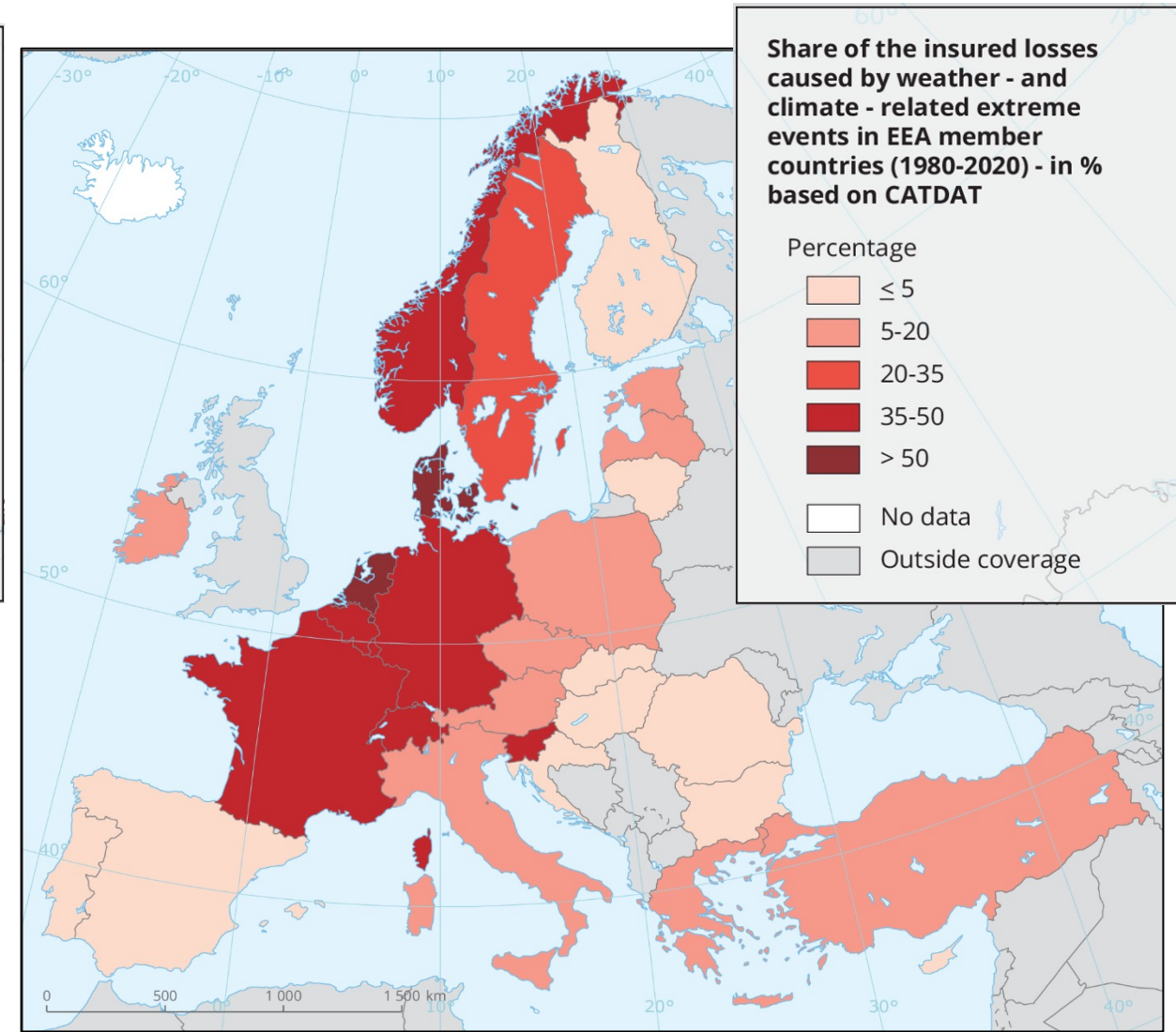
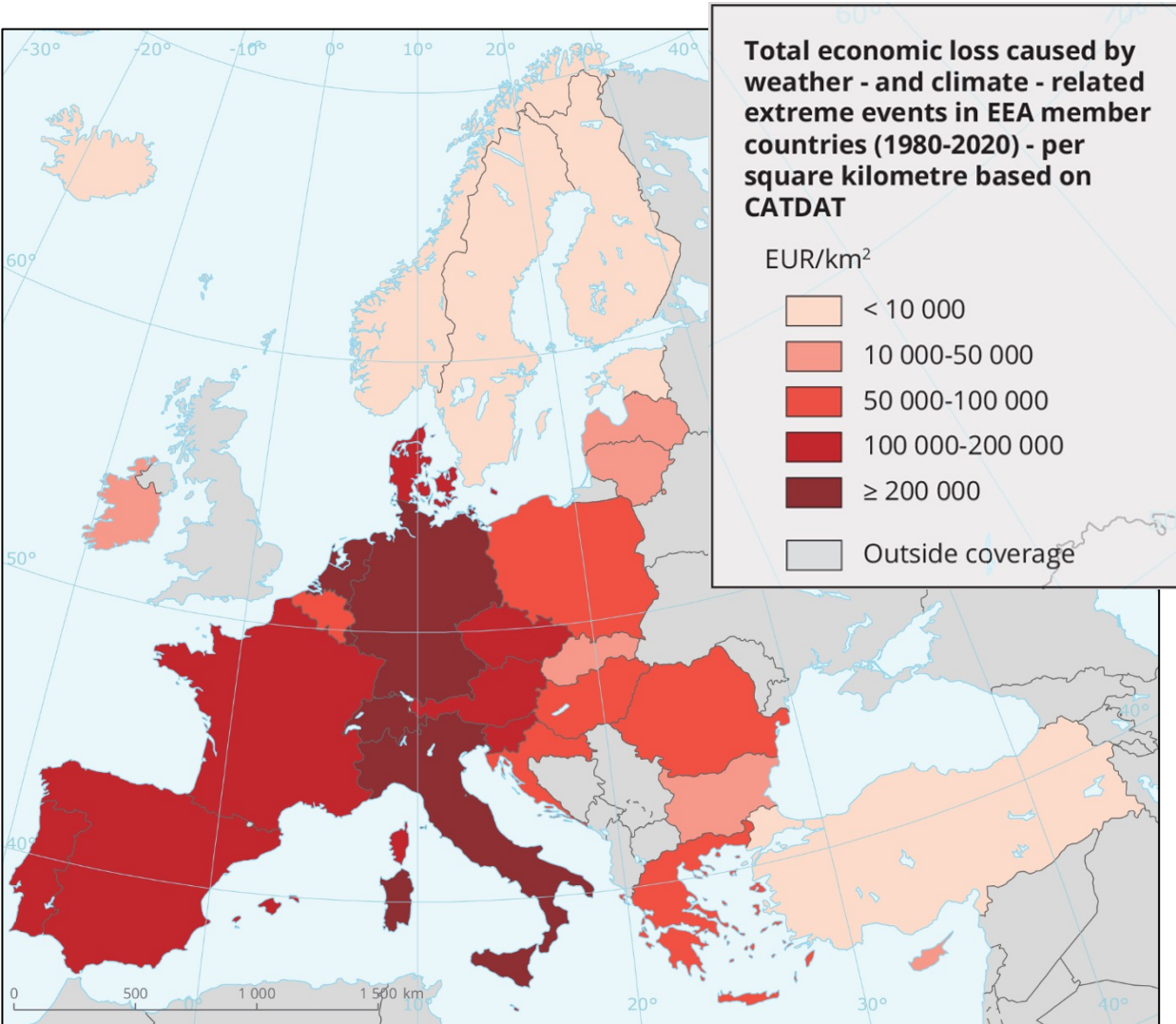


Fatalities
142 101



Based on CATDAT database for EEA-32

Large variation across Europe in insured losses



European Environment Agency

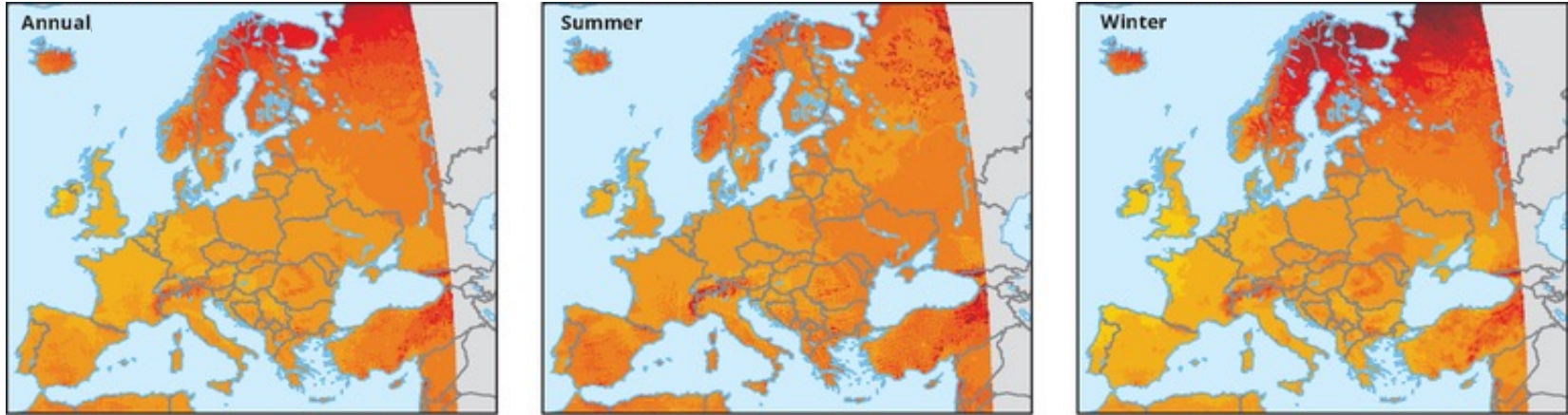


source: <https://www.eea.europa.eu/ims/economic-losses-from-climate-related>

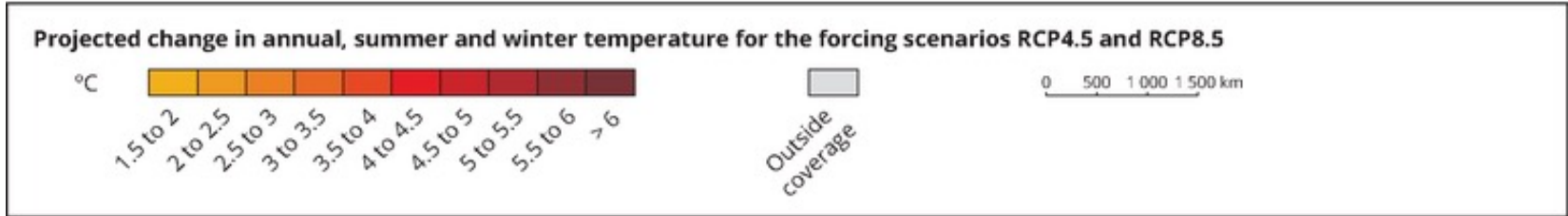
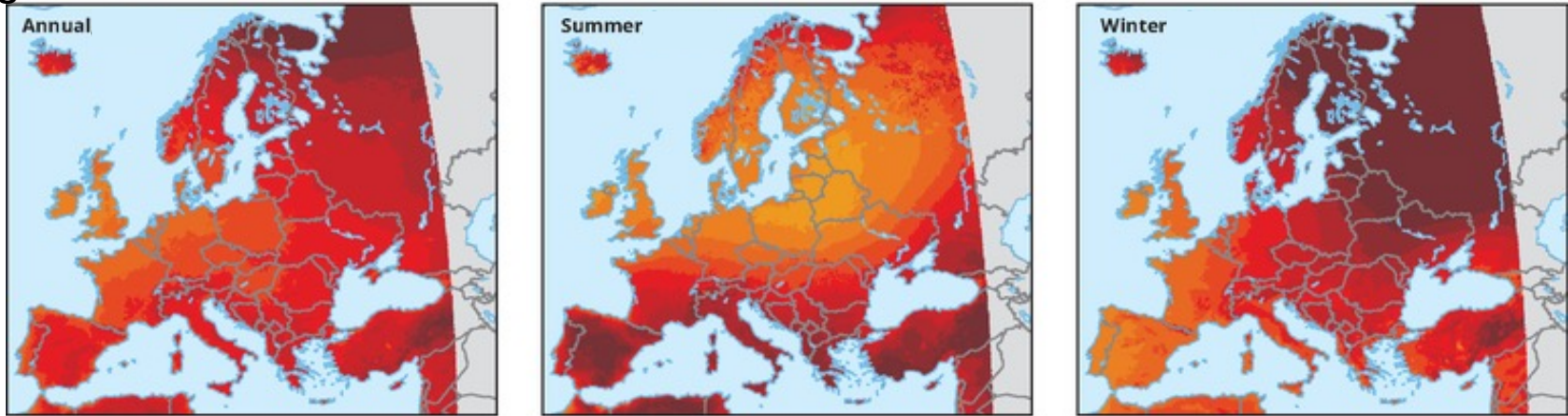
Data from Risk Layer

Europe will get even warmer...

Low-medium emissions scenario



High emissions scenario

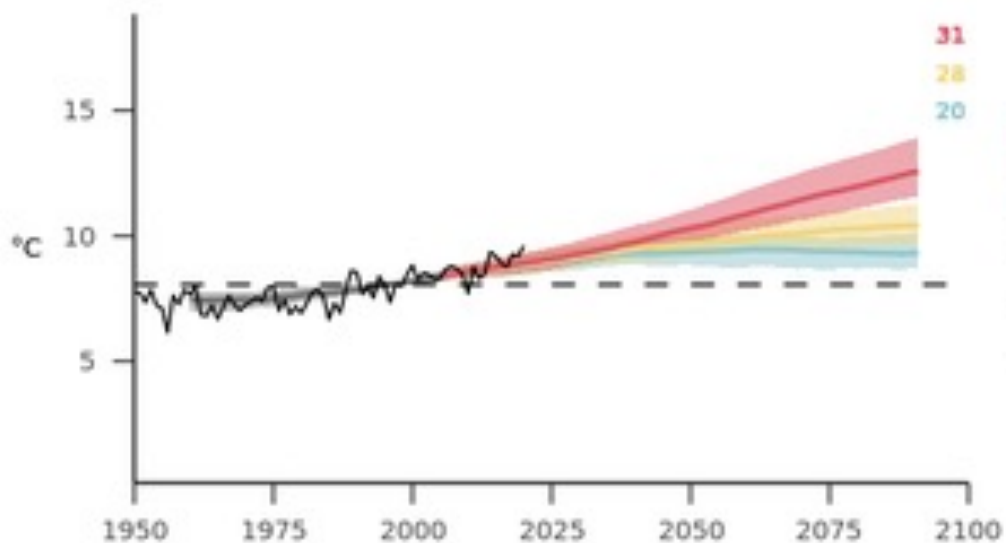


Temperature change:
annual, summer, winter
(projected change for 2080s,
two scenarios)

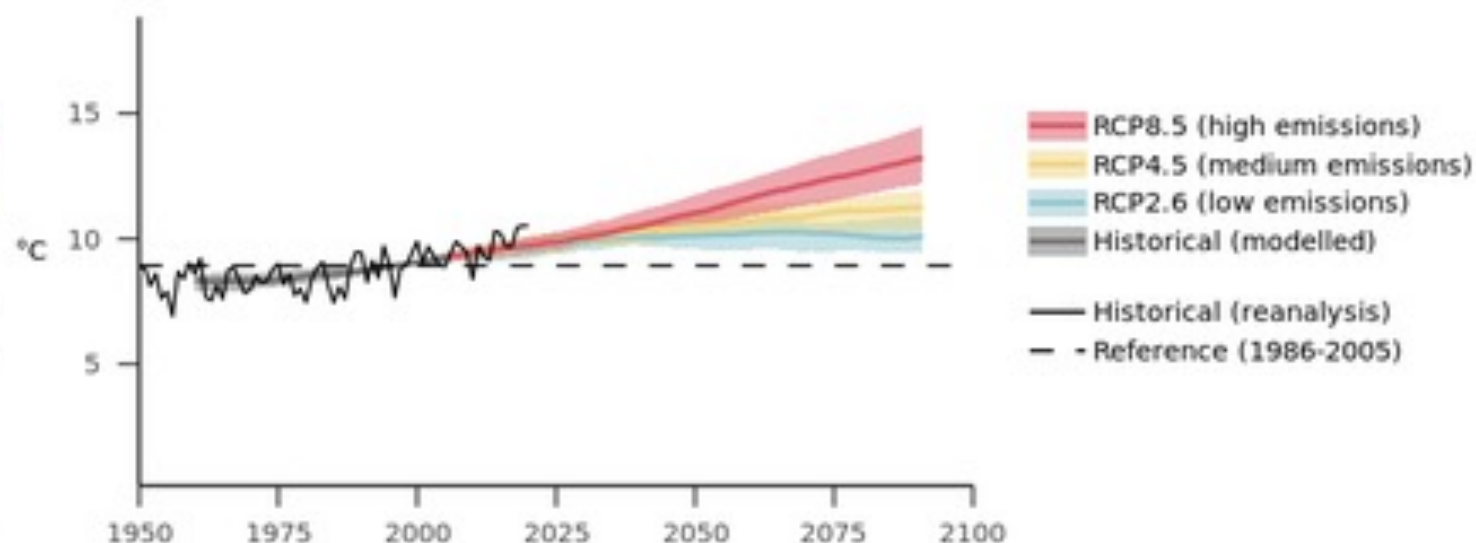
Source: EURO-CORDEX (Jacob et al., 2014)

Warming is accelerating

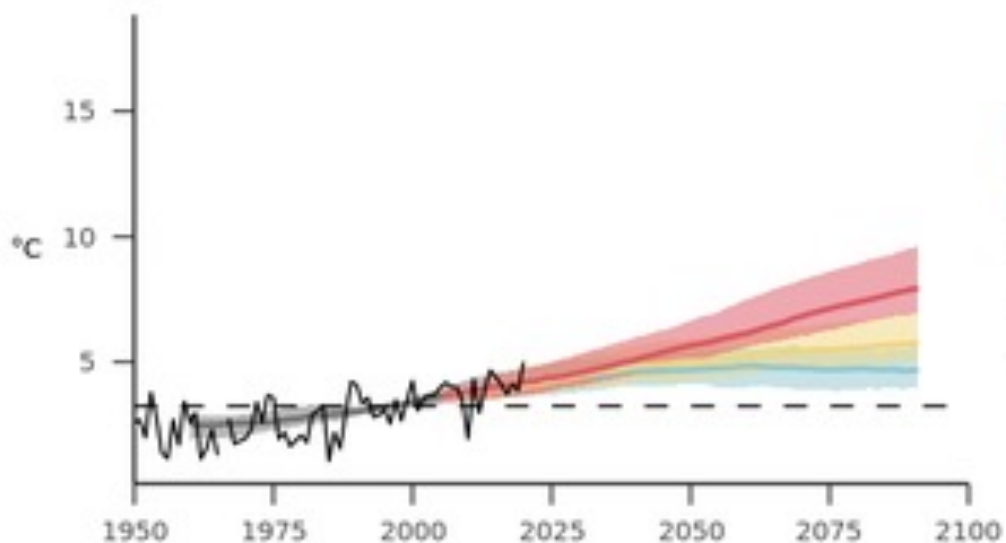
Europe (EEA38)



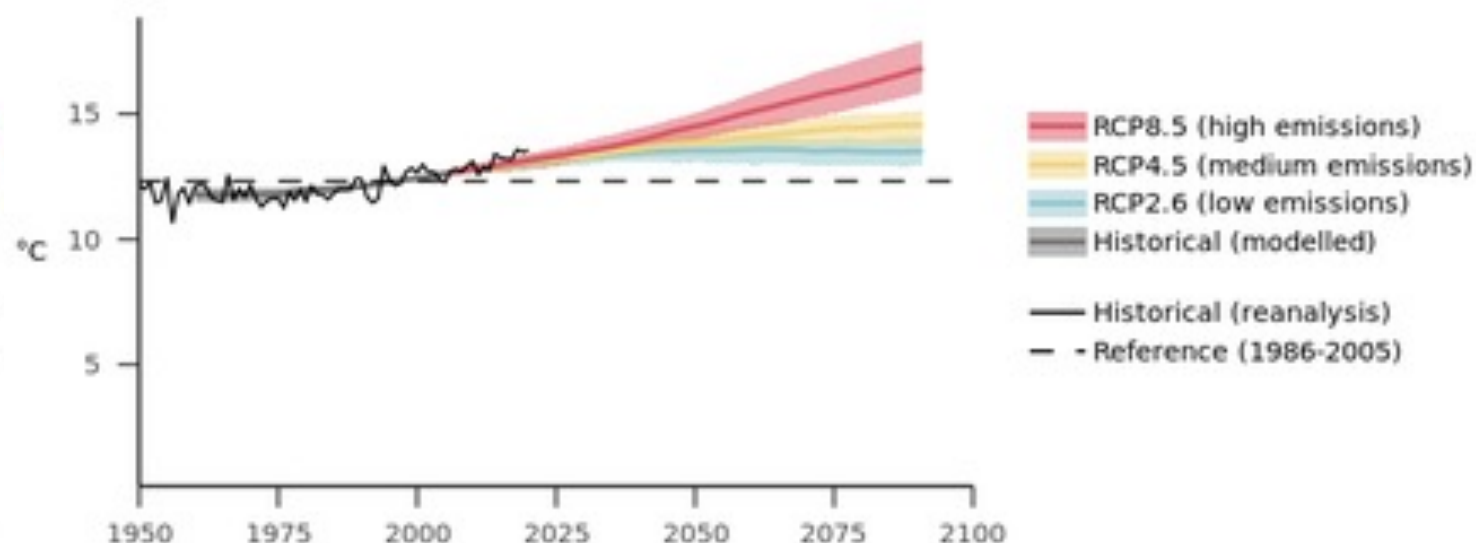
Central Europe



Northern Europe

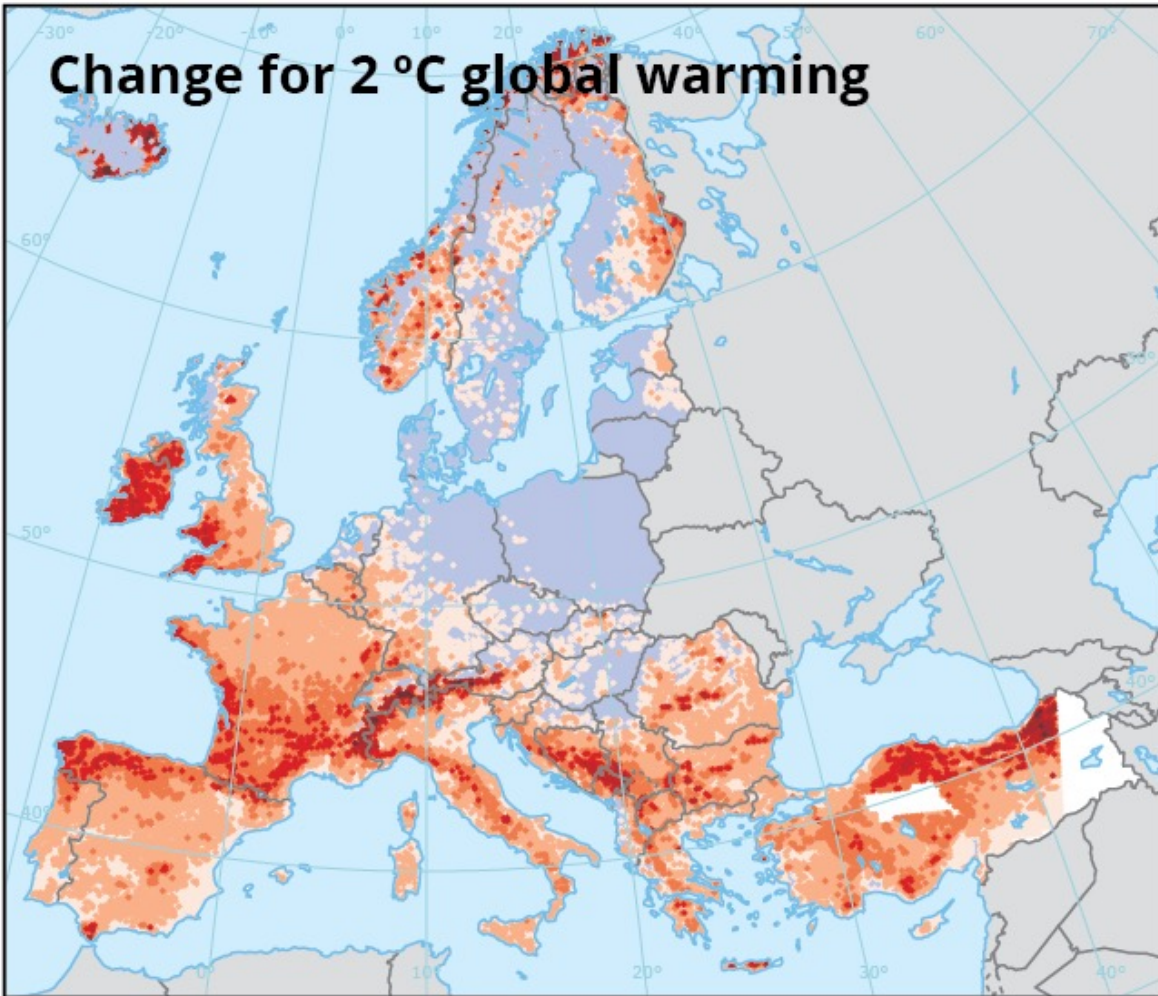


Southern Europe

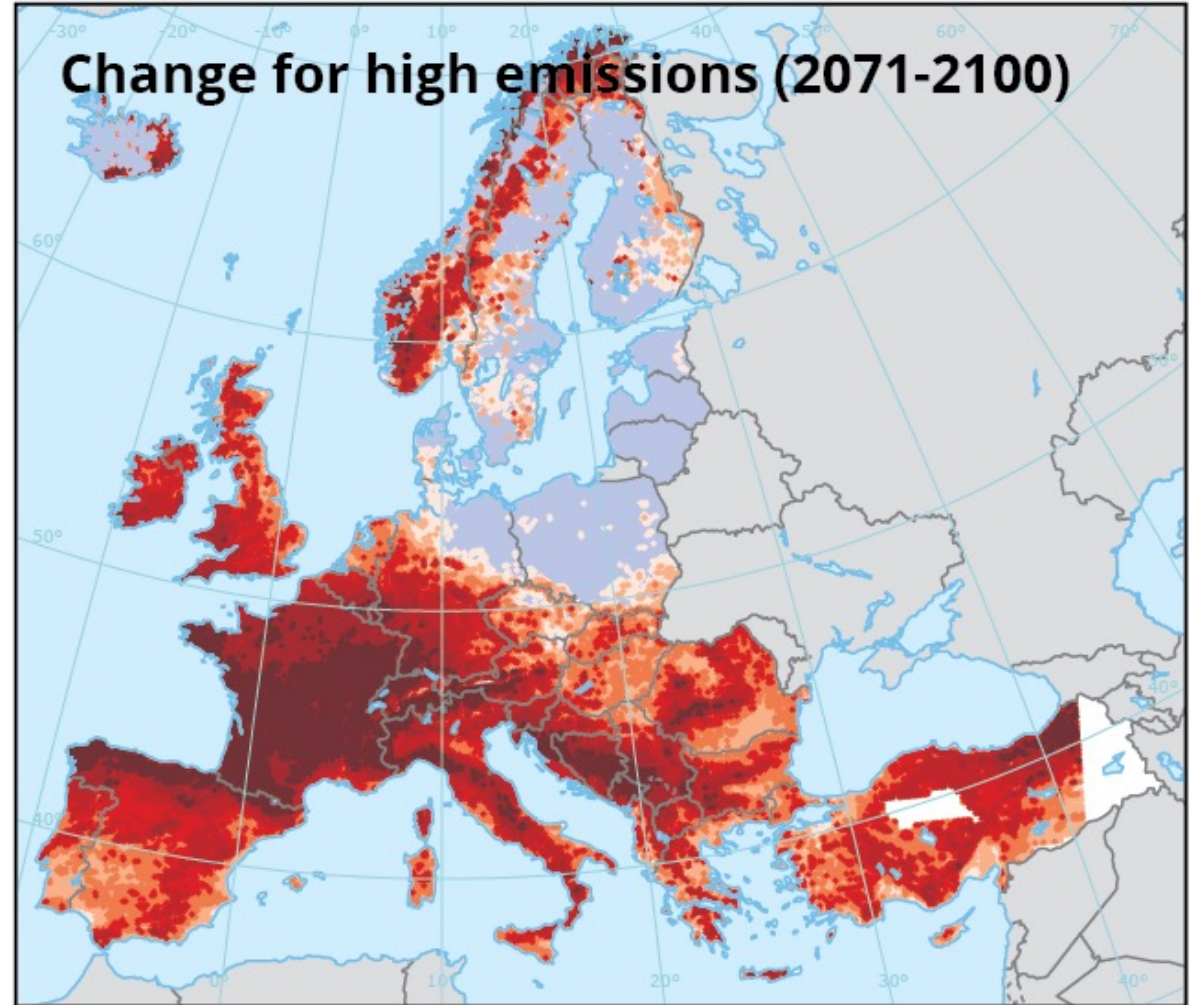


Nature under threat: increase of climate extremes – forest fires

Change for 2 °C global warming



Change for high emissions (2071-2100)



Projected change in fire weather index



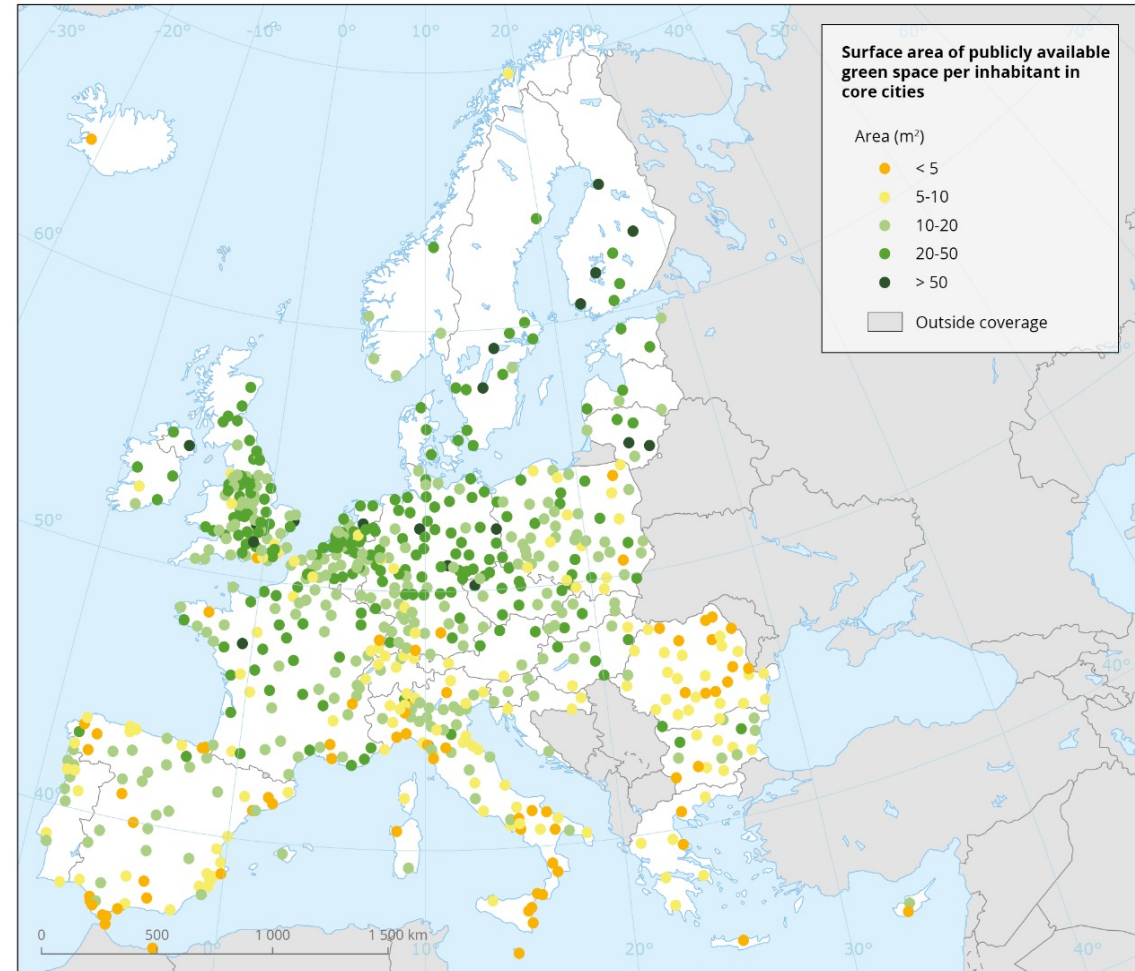
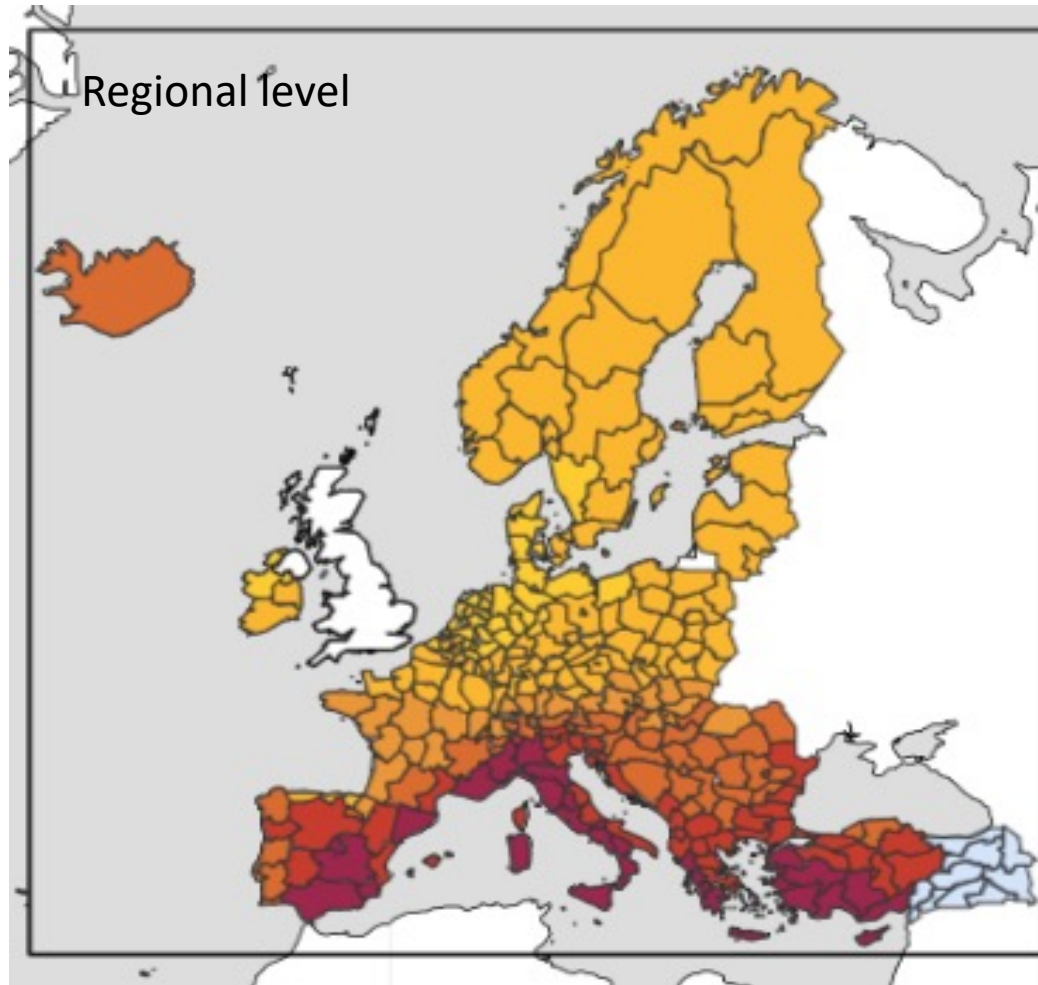
European Environment Agency



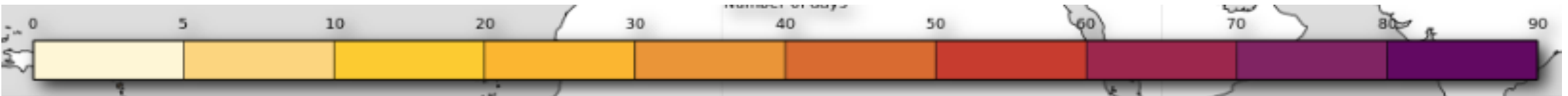
source: <https://www.eea.europa.eu/ims/forest-fires-in-europe>

Data from JRC EFFIS

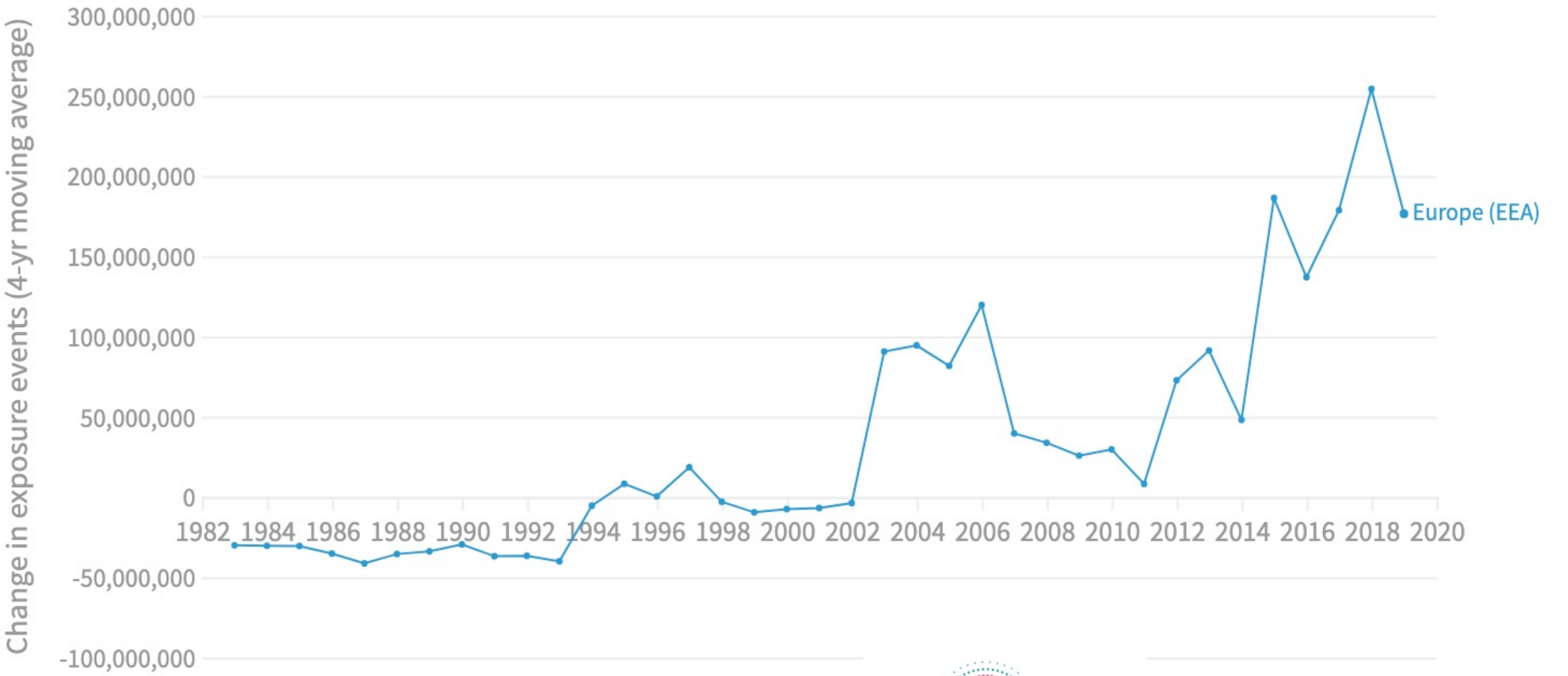
Humans under threat: increase of climate extremes – heat waves



Reference data: ©ESRI



Social vulnerabilities and exposure to heatwaves

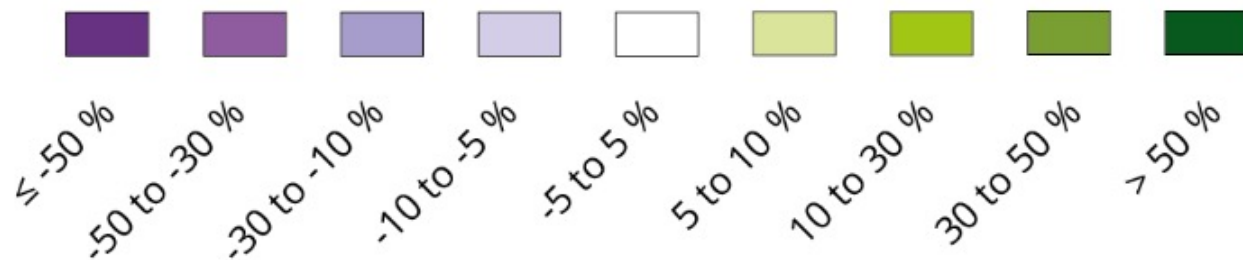
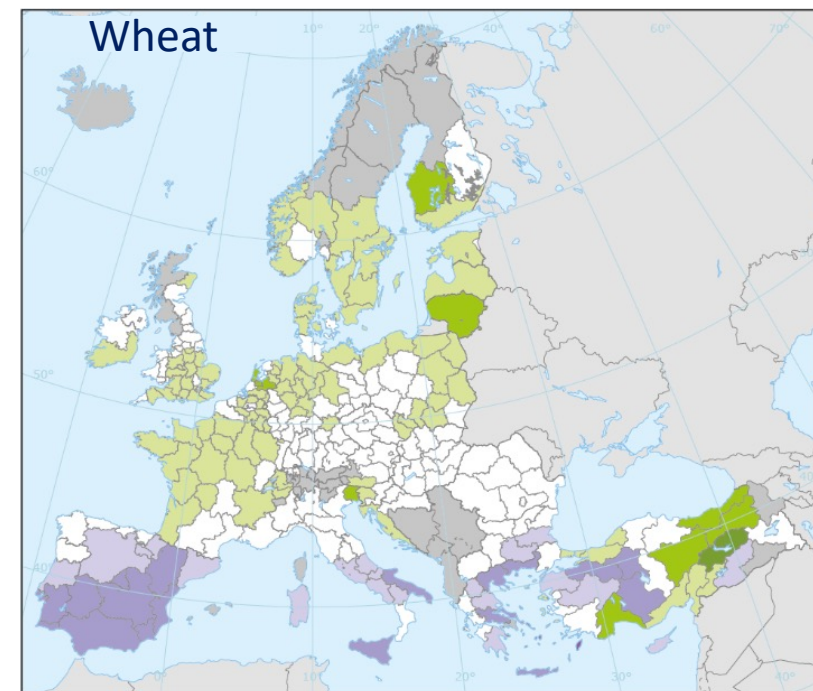
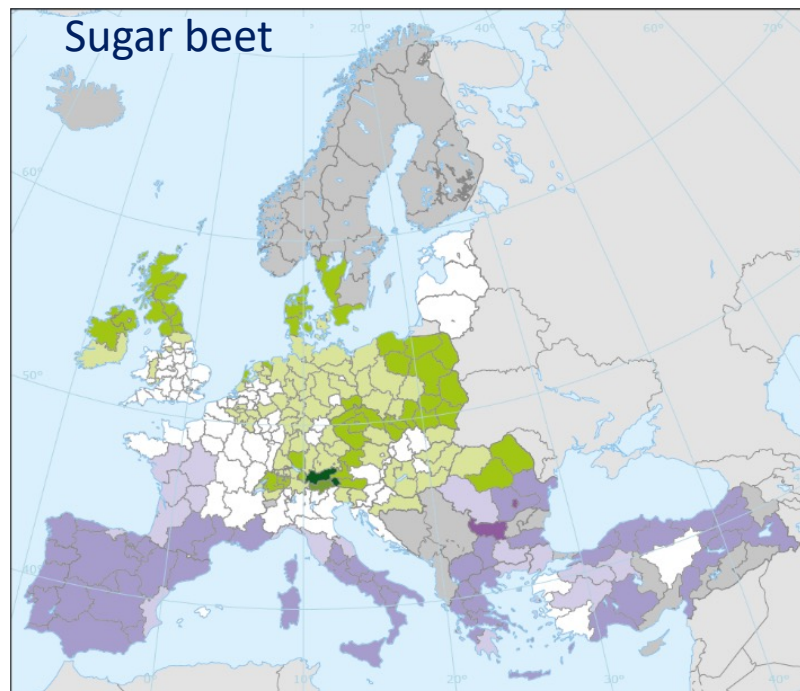
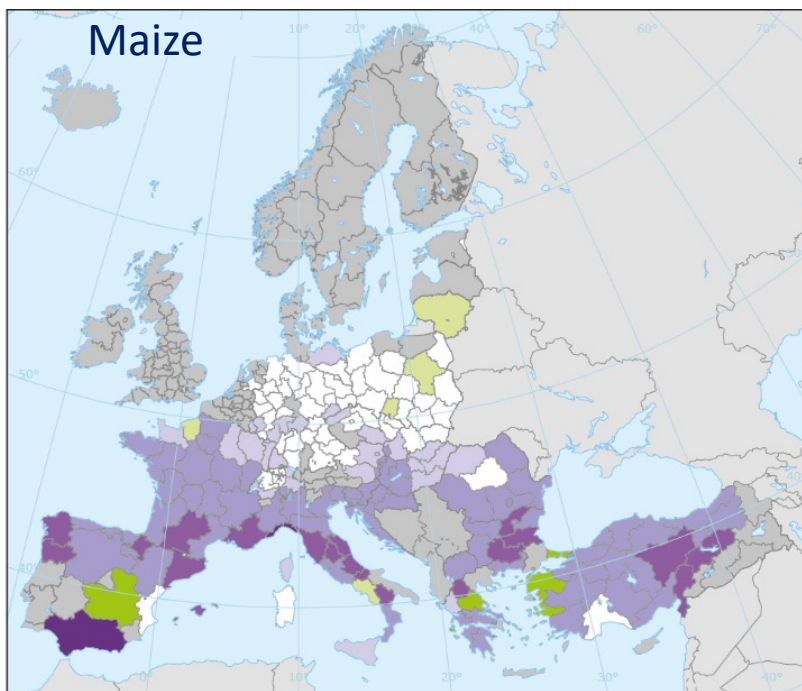


Source: Lancet Countdown, 2020



Climate change impacts influence yields

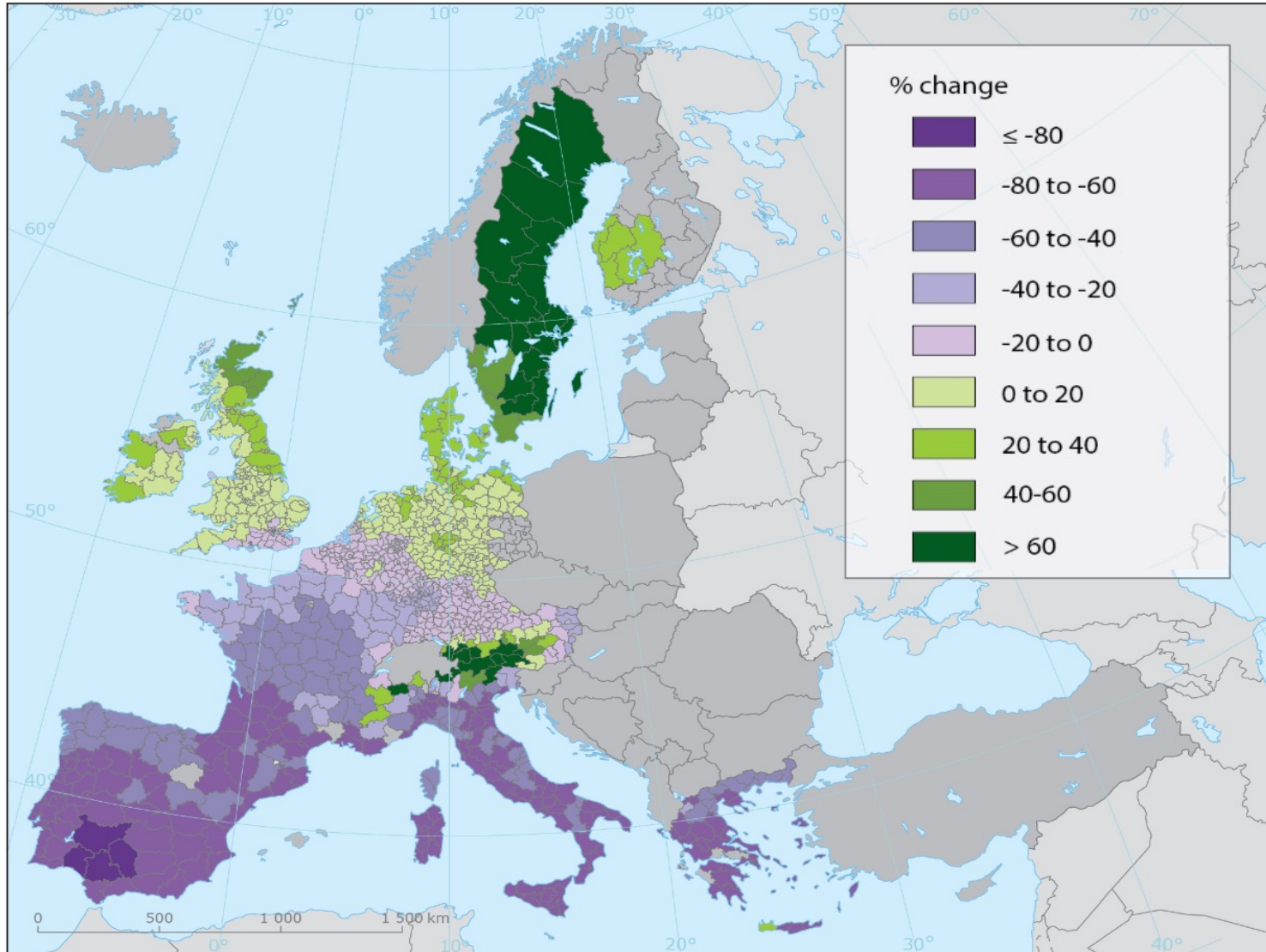
Projected percentage change in yields 2021-2050 compared to 1981-2010



Source: DG JRC (PESETA III project)

Climate change will affect the economy of farmers

Projected change in farmland value by 2100

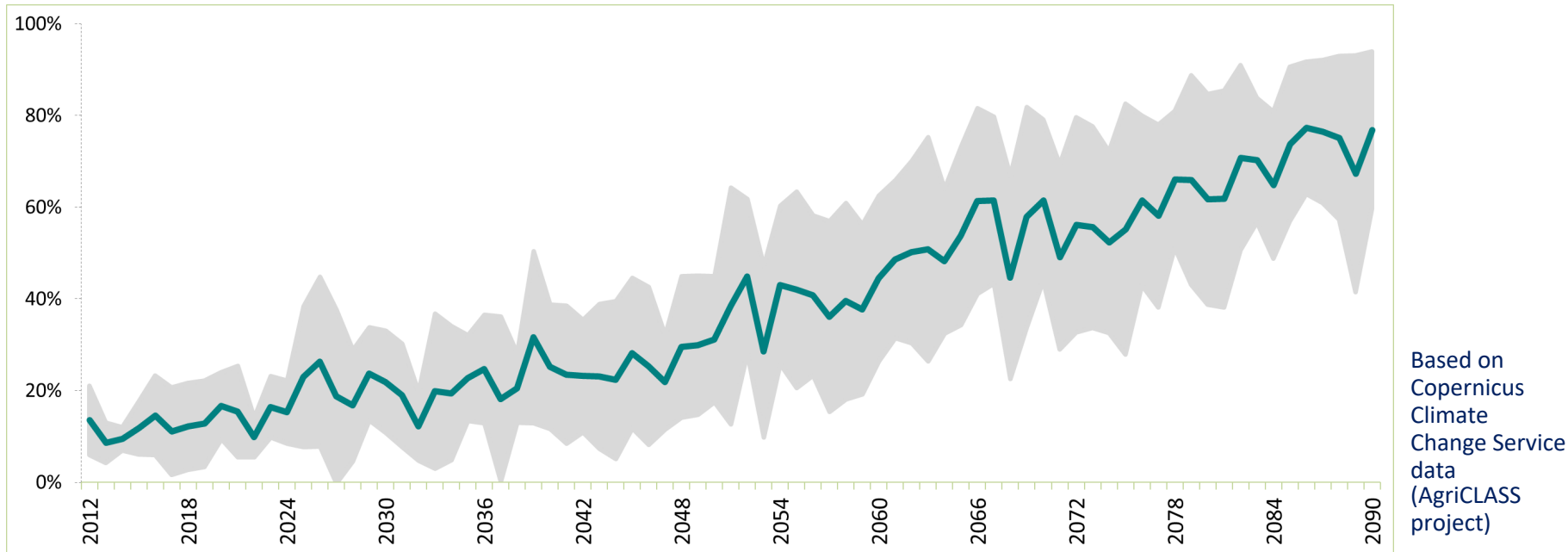


- Agricultural income in Europe is projected to decrease
- Farmland values projected to decrease the most in southern Europe (figure)
- Some farmland might be abandoned due to climate change if no adaptation is introduced

Warmer temperatures in winter lead to more pests and diseases

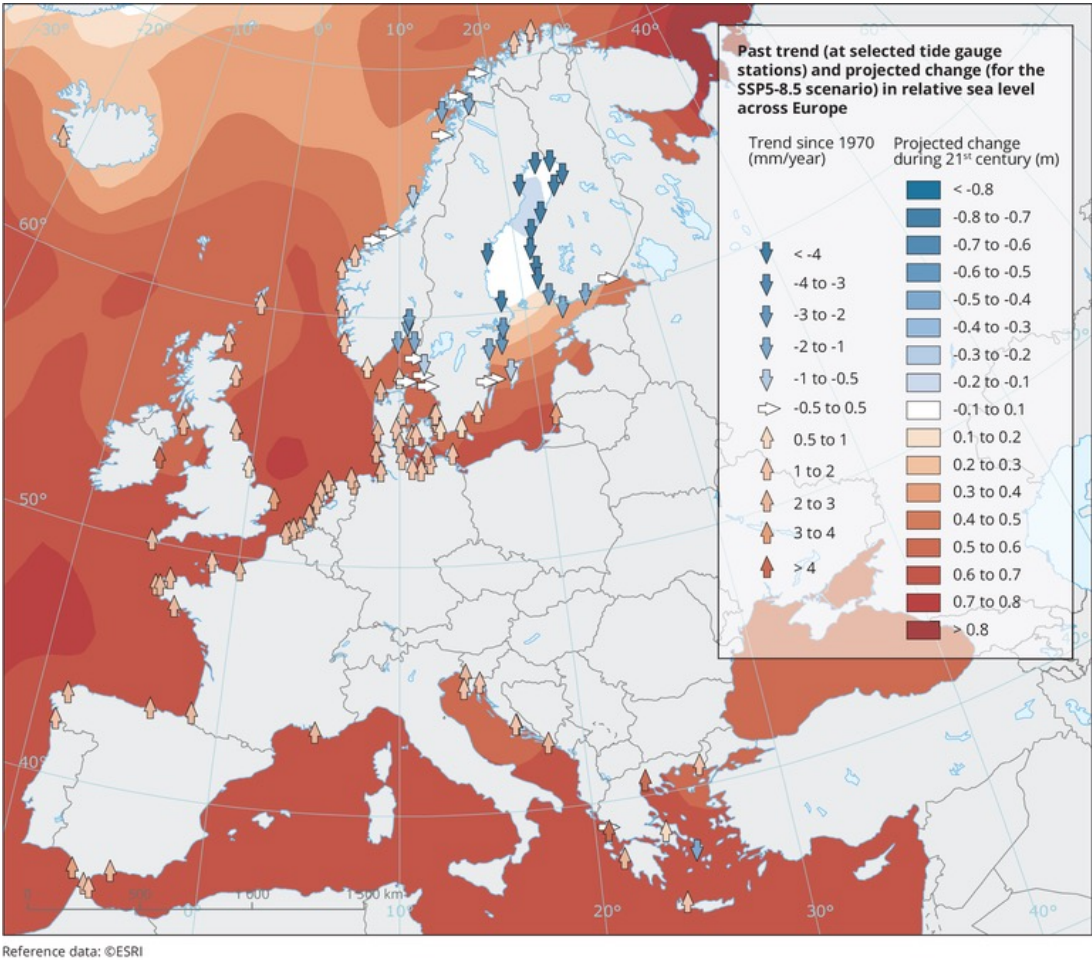
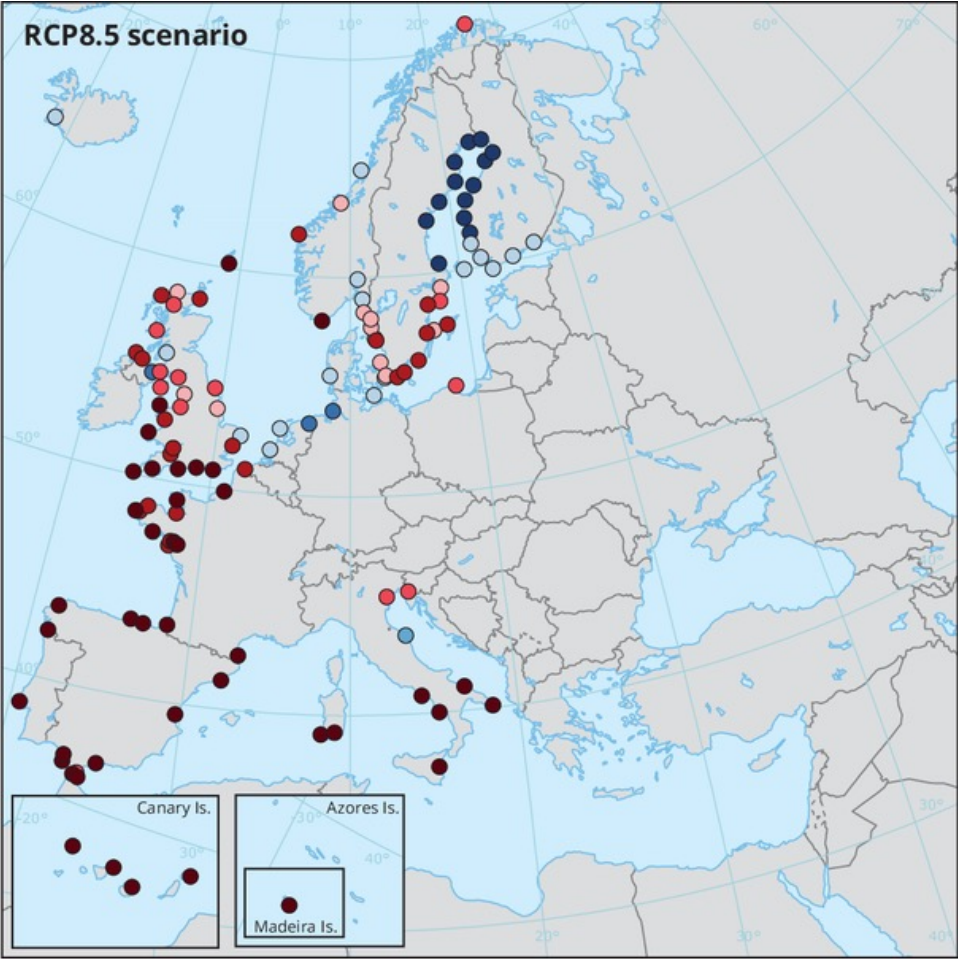
Development of pest infestation for olive trees in Italy based on high-end scenario

Projected share of infested olive trees



- 75 % of global olive oil production is in Europe – an important agriculture commodity for exports
- By end of century 60-80 % of olive trees might be affected by pests due to the warmer conditions mostly because of warmer winters (currently around 10 %)
- Adaptation options include early warning, spraying and planting resilient trees

Increase in mean and extreme sea level by 2100



Projected change in the frequency of historical 1-in-100 year coastal flooding events by 2100

Frequency amplification factor



Sea level rise and coastal population

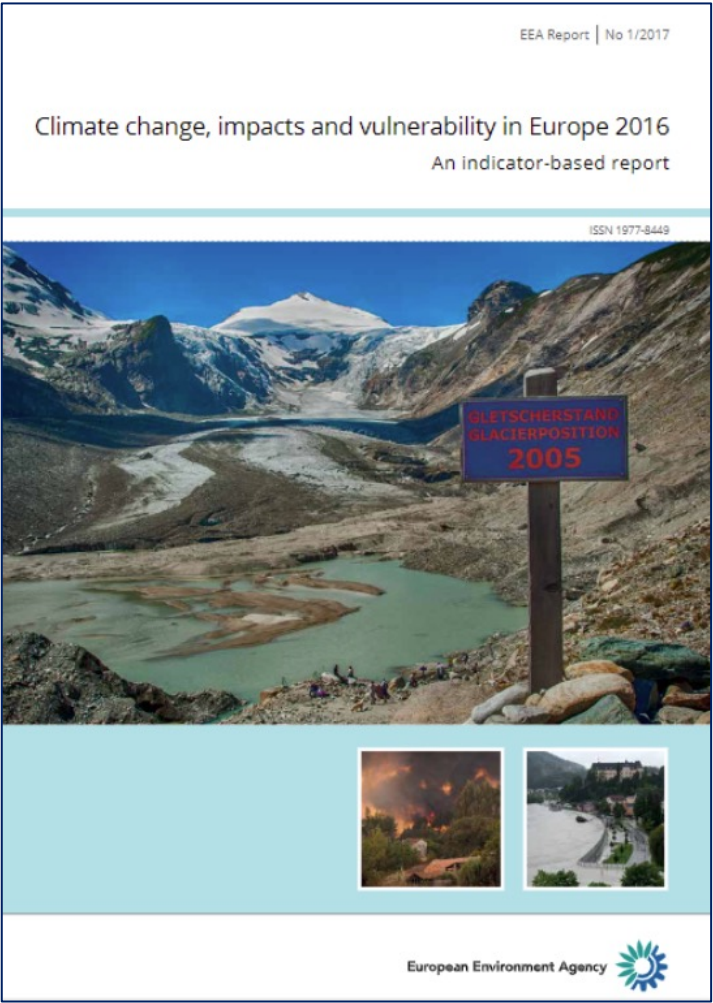


Population living within the respective height above mean sea level (in metres):



European Climate Risk Assessment

2016: Climate change impacts and vulnerability report

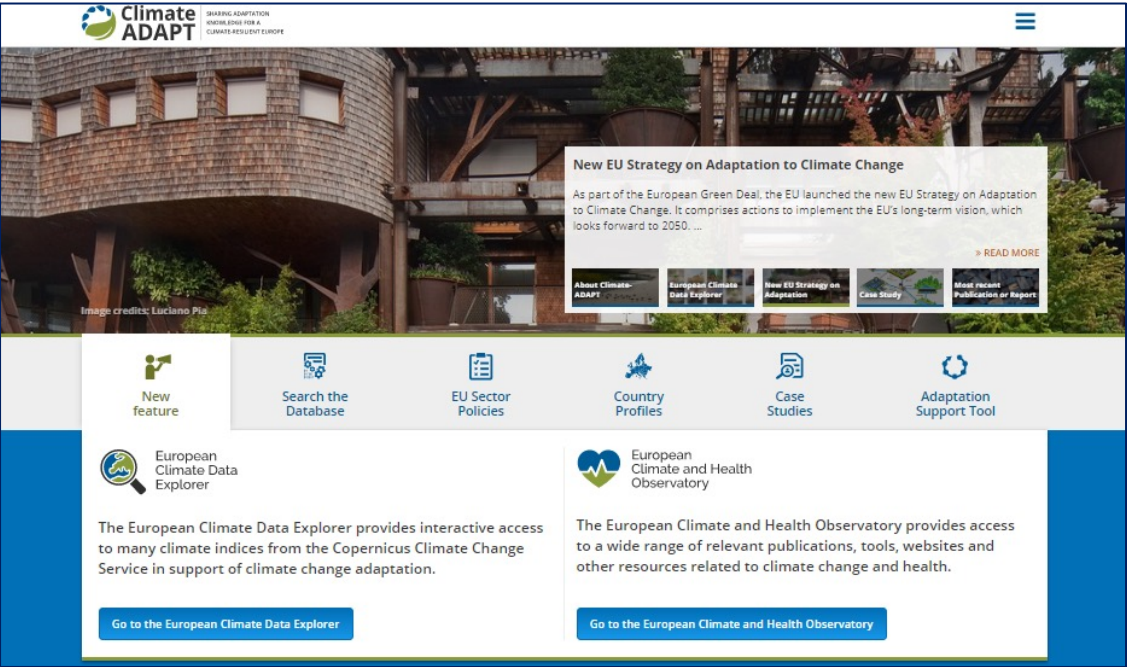


2021: Climate change hazards interactive report



2024:
European
Climate Risk
assessment
and priorities
for actions

Providing data and information on climate adaptation solutions



Policy and programmes drive adaptation



Global level

Policies:

UNFCCC Paris Agreement

Sendai Framework for Disaster Risk Reduction

Sustainable Development Goals



European level

Policies:

EU Climate Adaptation Strategy

EU Regulation on governance of the Energy Union and Climate action and the Climate Law

EU Water Framework Directive and Floods Directive

EU Biodiversity strategy

EU Common Agricultural Policy

EU Action plan on sustainable finance

Programmes:

LIFE+, Copernicus, Horizon 2020/Europe



EEA member countries	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Austria													*				
Belgium																	
Bulgaria																	
Croatia																	
Cyprus																	
Czechia																	
Denmark																	
Estonia																	
Finland																	
France																	
Germany																	
Greece																	
Hungary																	
Ireland																	
Italy																	
Latvia																	
Lithuania																	
Luxembourg																	
Malta																	
Netherlands																	
Poland																	
Portugal																	
Romania																	
Slovakia																	
Slovenia																	
Spain																	
Sweden																	
Iceland																	
Liechtenstein																	
Norway																	
Switzerland																	
Turkey																	

Actions on adaptation in EU Member States

- All EU Member States (MSs) have a dedicated adaptation policy in place
- All EU MSs have prepared climate change impacts assessments
- Few countries with climate risk assessments
- Some MSs have started evaluation of the strategies and identifying adaptation measures

Legend:	
	No adaptation policy adopted
	National Adaptation Strategy (NAS) adopted
	National Adaptation Plan (NAP) adopted
	NAS and NAP adopted
*	NAS revision adopted
	Min. 1 Sectoral Adaptation Plan (SAP) adopted and reported (2021)
	Min. 1 Regional Adaptation Plan (RAP) adopted and reported (2021)
	SAP and NAP reported (2021)

<https://climate-adapt.eea.europa.eu/#t-countries>

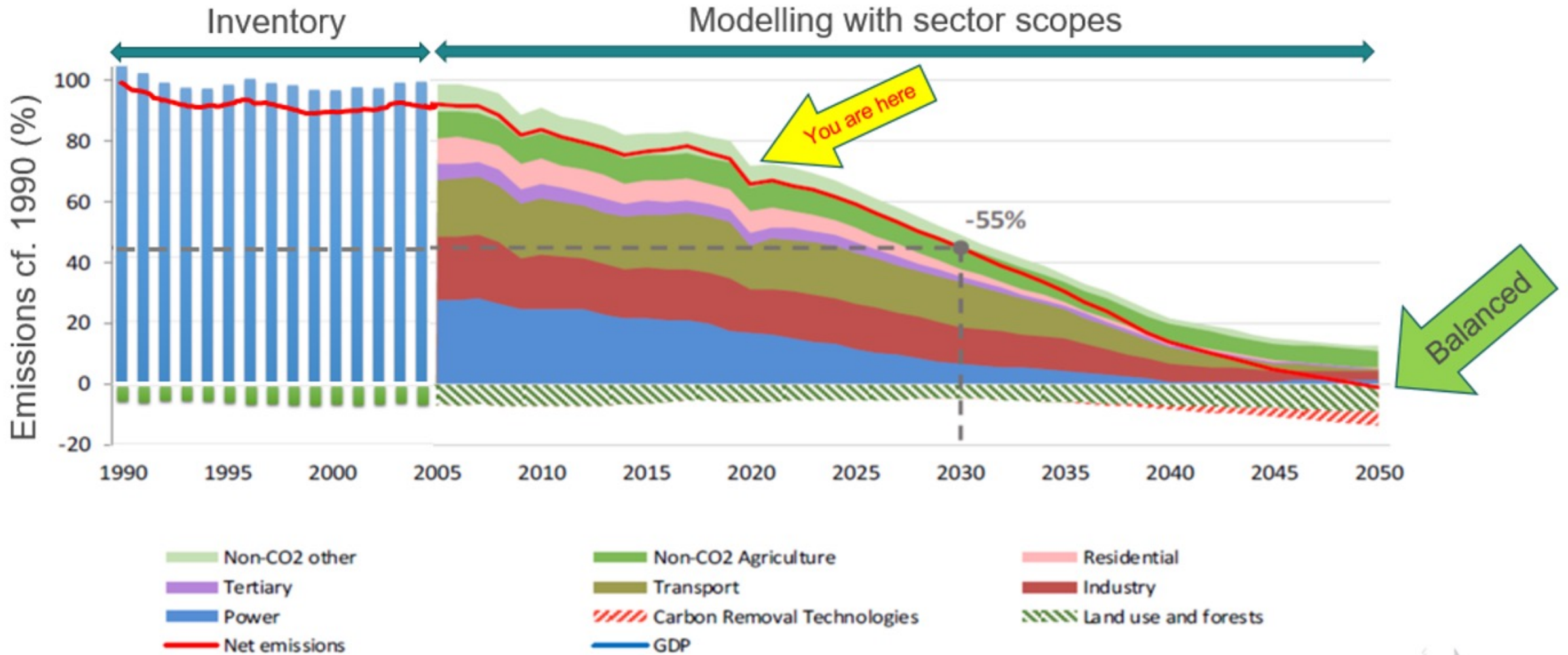


Investing into adaptation at subnational level

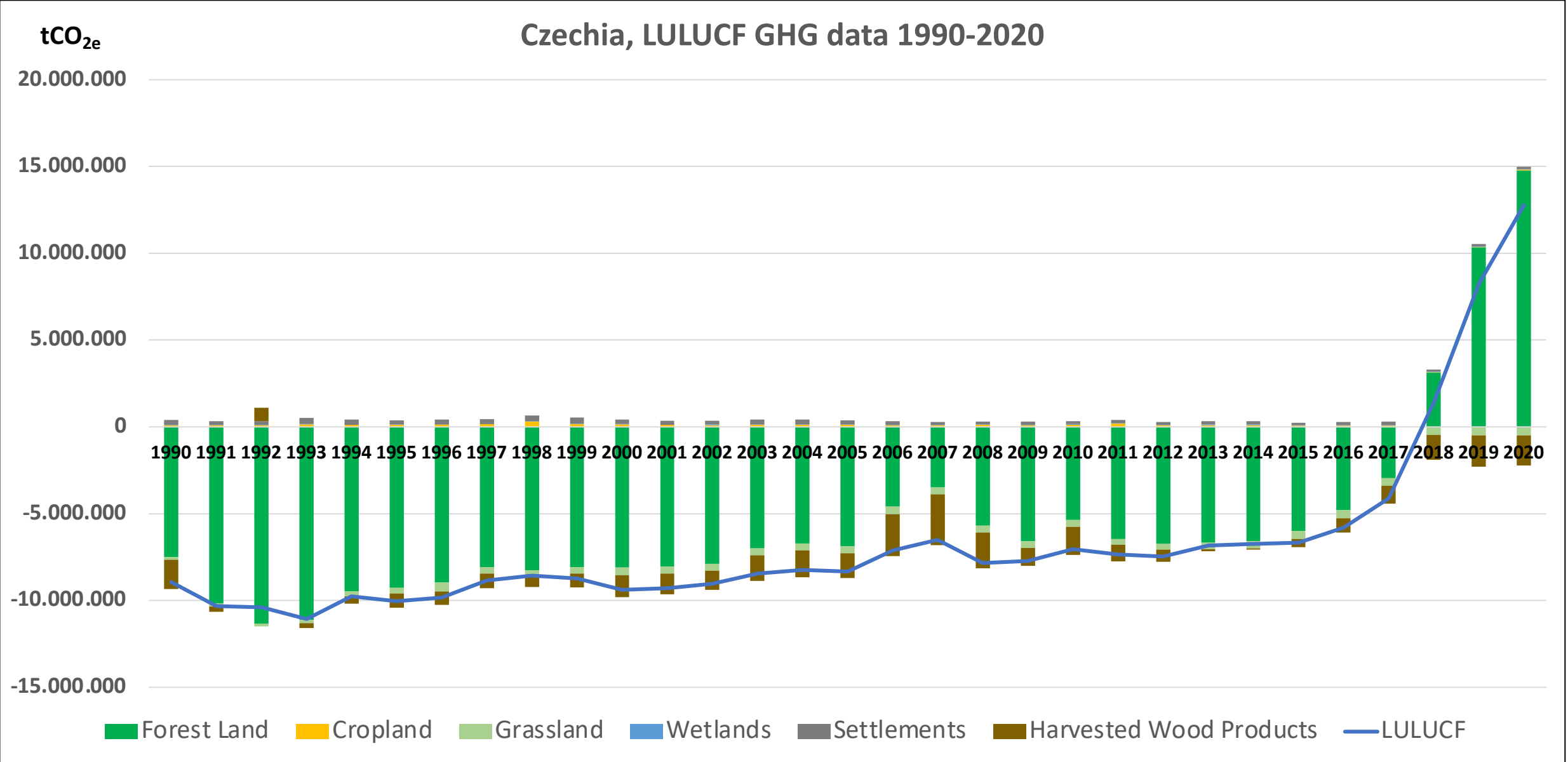


- ☐ Demonstrating systemic transformations to climate resilience
- ☐ Accelerating transformations to climate resilience
- ☐ Preparing and planning for climate resilience

Climate ambitions: towards climate neutrality



Forests becoming net source of emissions (example in Czechia)





Thank you

