The European Commission's science and knowledge service

Joint Research Centre

European Commission

Disaster Risk Management and Climate Change Adaptation in the EU

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European Commission - JRC – Disaster Risk Management Unit

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SUMMARY

1. **The Disaster Risk Management Knowledge Centre (DRMKC) and The Risk Data Hub**

2. **Climate Change Adaptation and The JRC PESETA III project -** *Projection of Economic impacts of climate change in sectors of the EU based on bottom-up analysis*

Disaster Risk Management Knowledge Centre:

Fostering Partnership, collective Knowledge and Innovative solutions

- Reinforcing and supporting **scientific partnerships**
  - Scientific WS
  - Trainings
  - Transfer of knowledge and technologies

- Contributing to the **science-policy interface**
  - **Cross-cutting topics** are addressed to facilitate an harmonized approach in support to policies:
    - MH-Early Warning Systems
    - Impact assessment: Damage and Loss Data collection (post-event)
    - Risk Assessment (pre-event)
    - Climate Adaptation
  - It allows an **enhanced coordination** across policies, increasing their effectiveness

- **Gaps identification**: new research programs

Because **T**ogether **E**veryone **A**chieves **M**ore

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Working together: Partnership

Some examples ….

13th Copernicus European Flood Awareness System (EFAS) Annual Meeting, March 2018

SERA Workshop on seismic hazard assessment in Europe, March 2018

Training in the Use of RAPID-N and ADAM RATools, Feb 2017 and Oct. 2017

1st DRMKC Risk Data Hub Workshop, June 2017

Seismic Risk Assessment Tools
Workshop, May 2017

1st Workshop on Risk Management Capability Assessment, Dec. 2017

1st European Drought Observatory (EDO) User Meeting, Nov. 2017

11th EU Loss Data Workshop, April 2018

Training activities in the domain of CI 2008/114/EC Directive, March 2017

Workshop with FP7 and H2020 projects on CIP, March 2017

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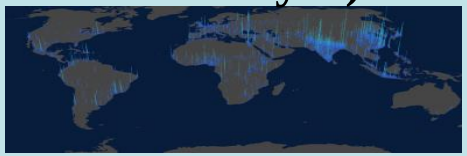
The Risk Data Hub

Risk Data Hub supports disaster risk management. How ?

Scientific partnership:

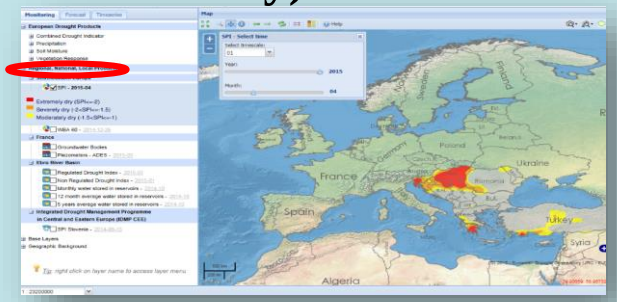
Copernicus

GHSL (Global Human Settlement Layer)

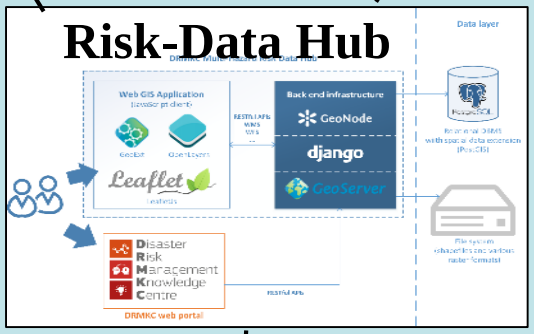


EFFAS (The European Flood Awareness System)

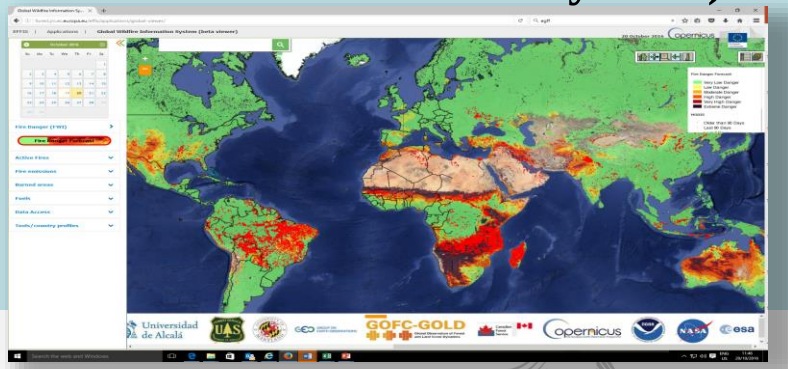
EDO (European Drought Observatory)



Risk-Data Hub



EFFIS (European Forest Fire Information System)



ESDAC (European soil Data Base)

GDACS

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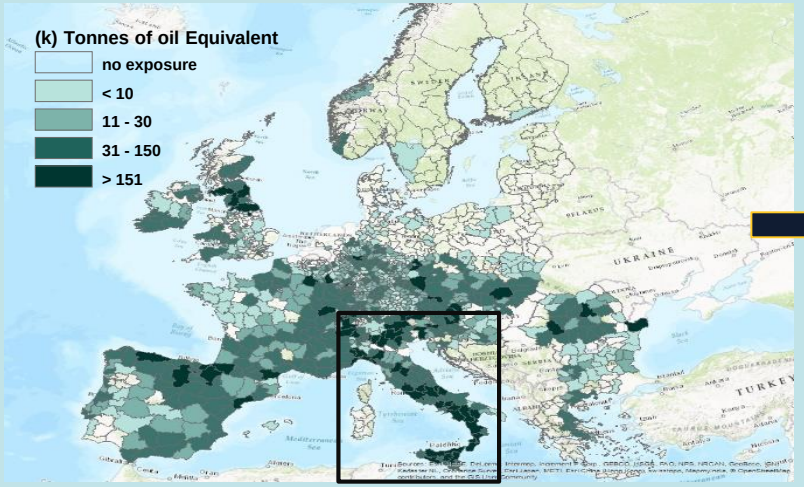
The Risk Data Hub

Across scales data visualization/access:

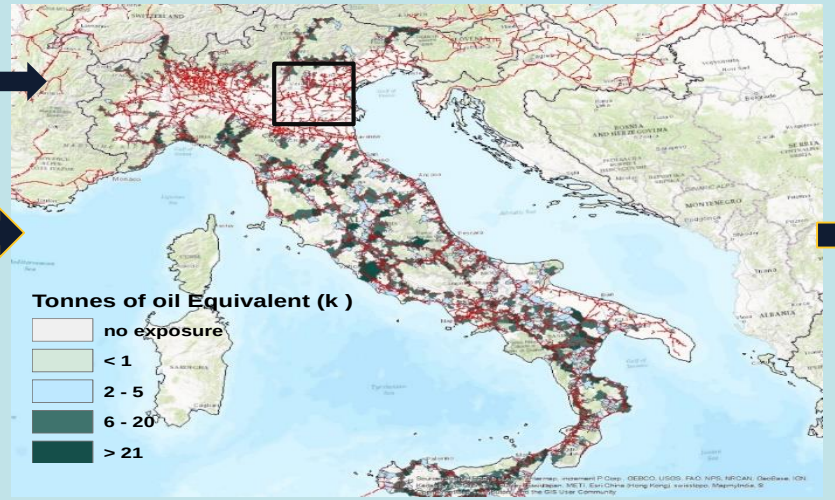
- For disaster risk assessment RiskDataHub is set on identifying the geographically located causal factors of disasters (exposure, vulnerability)

Implemented: Risk Data hub links across scale to aggregated assets/exposure (modeled data)= potential impact maps

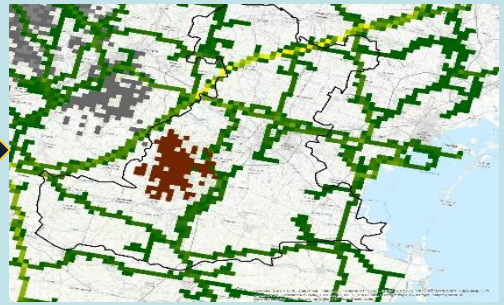
EU/REGIONAL



NATIONAL/TRANS-BORDER



LOCAL



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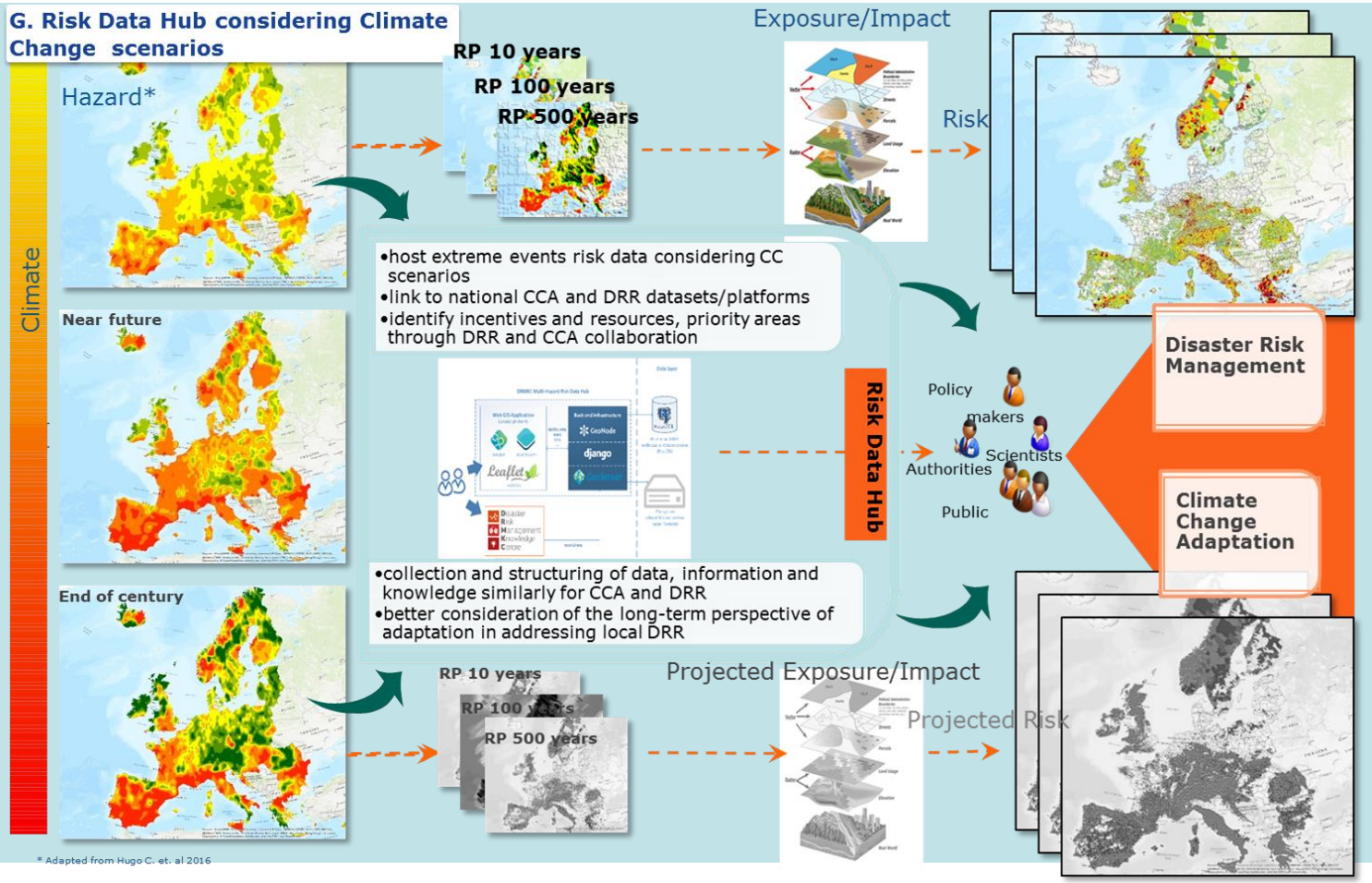
CCA and DRM

Risk Data Hub

Linking DRR and CC

Linking **Climate Change** Scenario for future losses to the past events

Bringing closer CCA strategies and DRR Actions –**RM Plans**



Local solutions for Global problems.

CCA local strategies – Covenant of Mayors for Adaptation.

Access to **good practices for CC Adaptation.**

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Innovation: the DMRKC Support Service

13 implemented over the last 2 years

to Develop a **Training on Drought Risk Assessment,** **Hungarian Met. Service** November 2018

Porting FRT App to Android

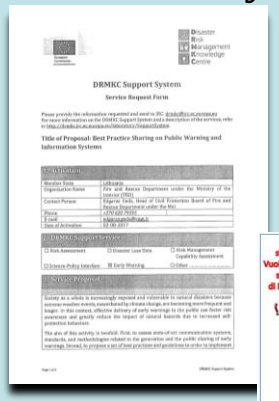
IT, MoI – Jan. – April 2018

Securing the European Drought Reference (EDR) and the Impact Report Inventory (EDII)

Dbs NO/DE – March – August 2018

Best practice sharing on Public warning and Information Systems

LT, MoI – May – Sept. 2018



@AlertPisa

4 Support Services are available to collect input from authorities willing to **test the DRMKC Risk Data Hub** at local or National level! Contact: EC-drmkc@ec.europa.eu

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Evaluation of the EU Climate Adaptation Strategy – main findings

1. The **current strategy is still relevant** and the Commission will be guided by its objectives
2. Knowledge, adaptation modelling and region-specific intelligence has been generated by the EU's **Horizon 2020 research programme** and projects and by the Commission's own internal scientific services (**JRC**)
3. Major **infrastructure projects** financed by the EU budget have become **climate-proof** and will withstand sea level rise, flooding or intense heat
4. An effort must be made to ensure **most or all EU cities** count on a thorough adaptation plan to protect citizens from both extreme and slow-onset climate hazards
5. Adaptation must support and be supported by the protection of the EU's biodiversity (**nature-based solutions**)
6. The **contribution of the private sector** to enhance society's resilience must be encouraged: the Commission's efforts will continue to be channelled through its Action Plan on Financing Sustainable Growth and the subsequent legislative proposals adopted in 2018
7. **Climate services for specific adaptation needs** should develop into business opportunities, based on reliable and standardised data and the incentives provided by **Copernicus** and other European Earth observation initiatives

Evaluation of the EU Climate Adaptation Strategy – main findings

Read more:

- Report on the implementation of the EU Strategy on adaptation to climate change - COM(2018)738

https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2018:738:FIN

- Evaluation of the EU Strategy on adaptation to climate change - SWD(2018)461

https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=SWD:2018:461:FIN

- Adaptation preparedness scoreboard **Country fiches** - SWD(2018)460

https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=SWD:2018:460:FIN

PESETA III findings
Background

Which are the most important climate impacts in Europe?

Is there a regional pattern in impacts?

How much climate impacts are avoided at 2ºC warming vs high-emissions?

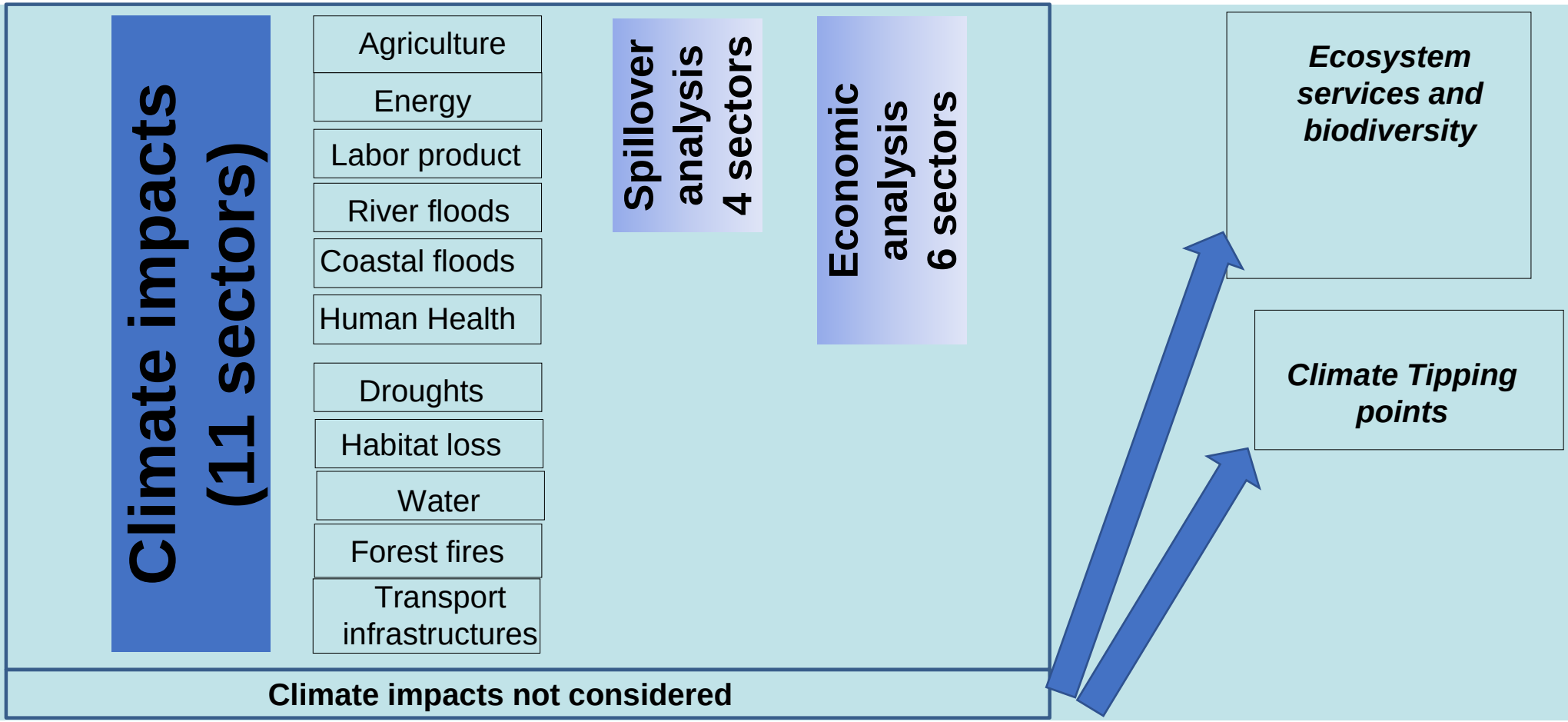
Policy context and Purpose

- International context Paris Agreement and Sendai Framework
- EU Adaptation Strategy and evaluation;
- Better understanding of possible consequences of climate change for Europe at all governance levels

The PESETA approach

- Consistency (common climate scenarios)
- Coupling with sectoral economic modelling for agriculture, coastal floods, river floods, heat mortality and labour productivityPESETA
- https://ec.europa.eu/jrc/en/news/climate-change-human-and-economic-outlook-europeans

PESETA III findings
Climate impact sectors



Climate scenarios

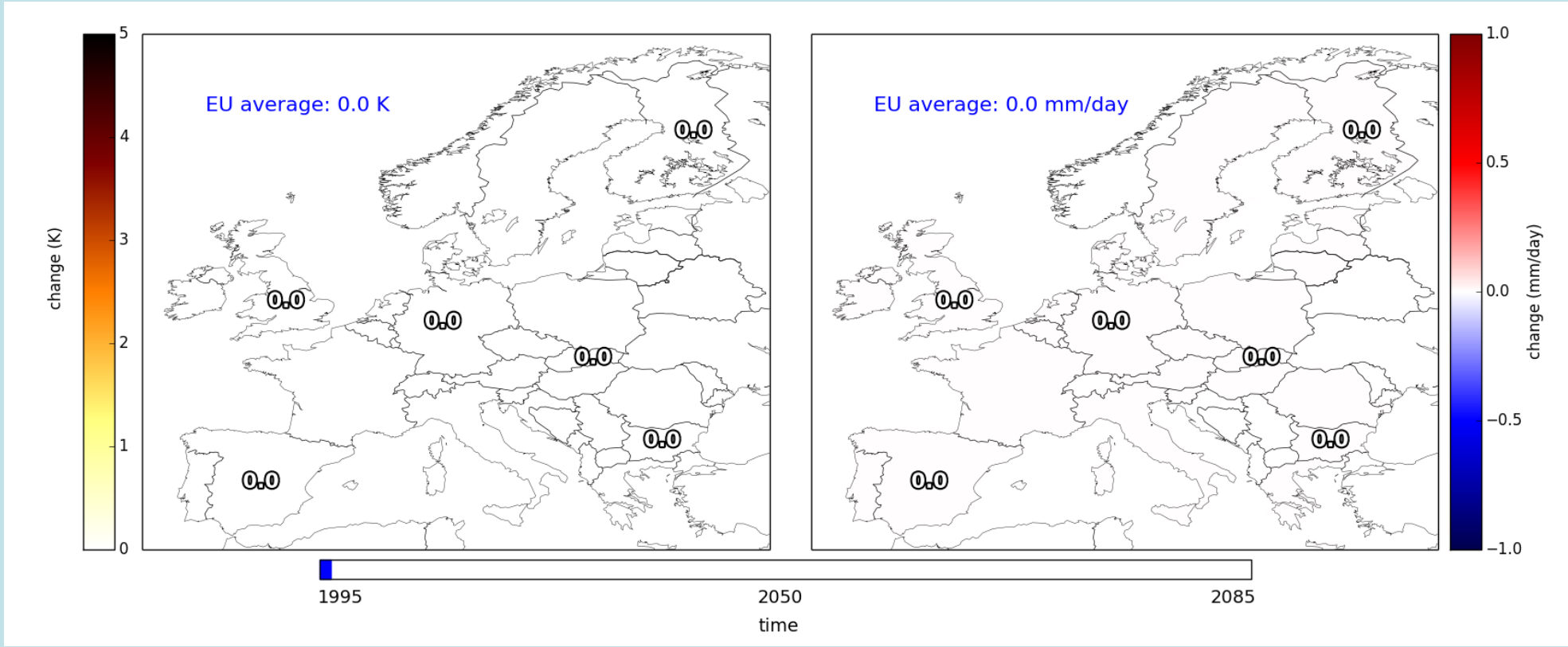
RCP8.5, EUROCORDEX climate runs (5 to 11 regional climate runs)

Two warming scenarios (relative to pre-industrial temperature)

- **High warming scenario** (or reference scenario), end of the century
- **2ºC scenario**

Future climate heterogeneity in the EU

Temperature *Precipitation*



Derived from regional climate projections based on Reference Concentration Pathway RCP8.5

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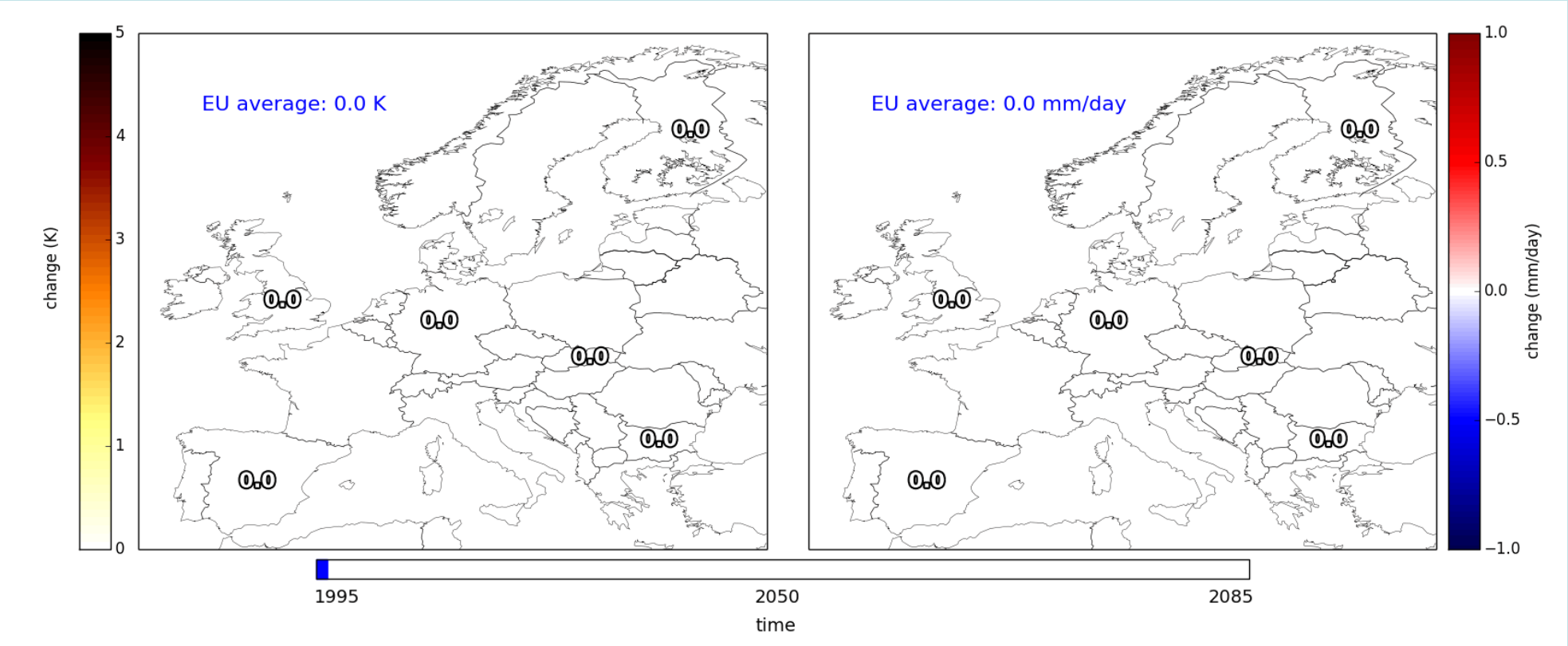
Future climate heterogeneity in the EU

Temperature *Precipitation*



Derived from regional climate projections based on Reference Concentration Pathway RCP8.5

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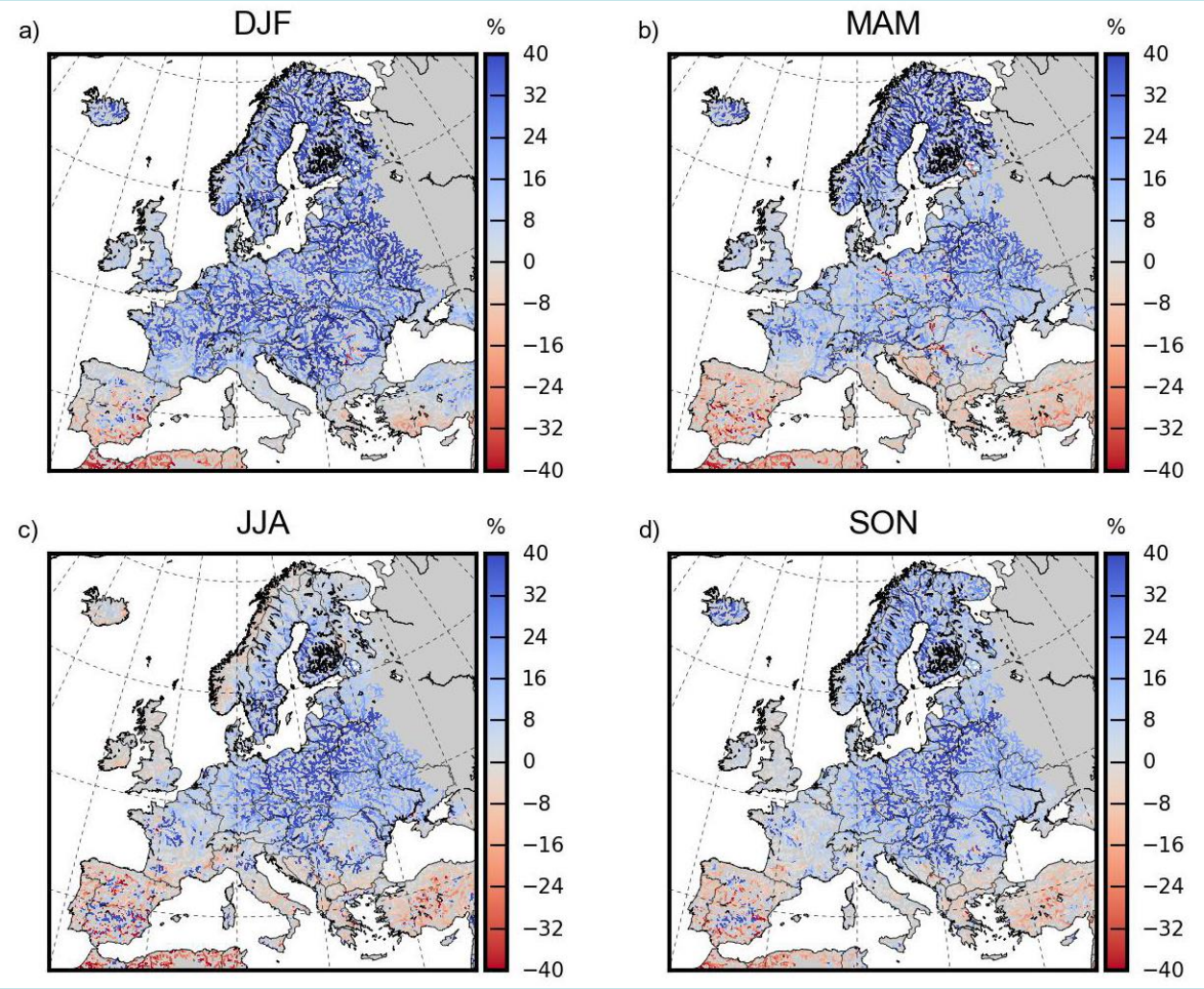
Impact on the hydrological cycle

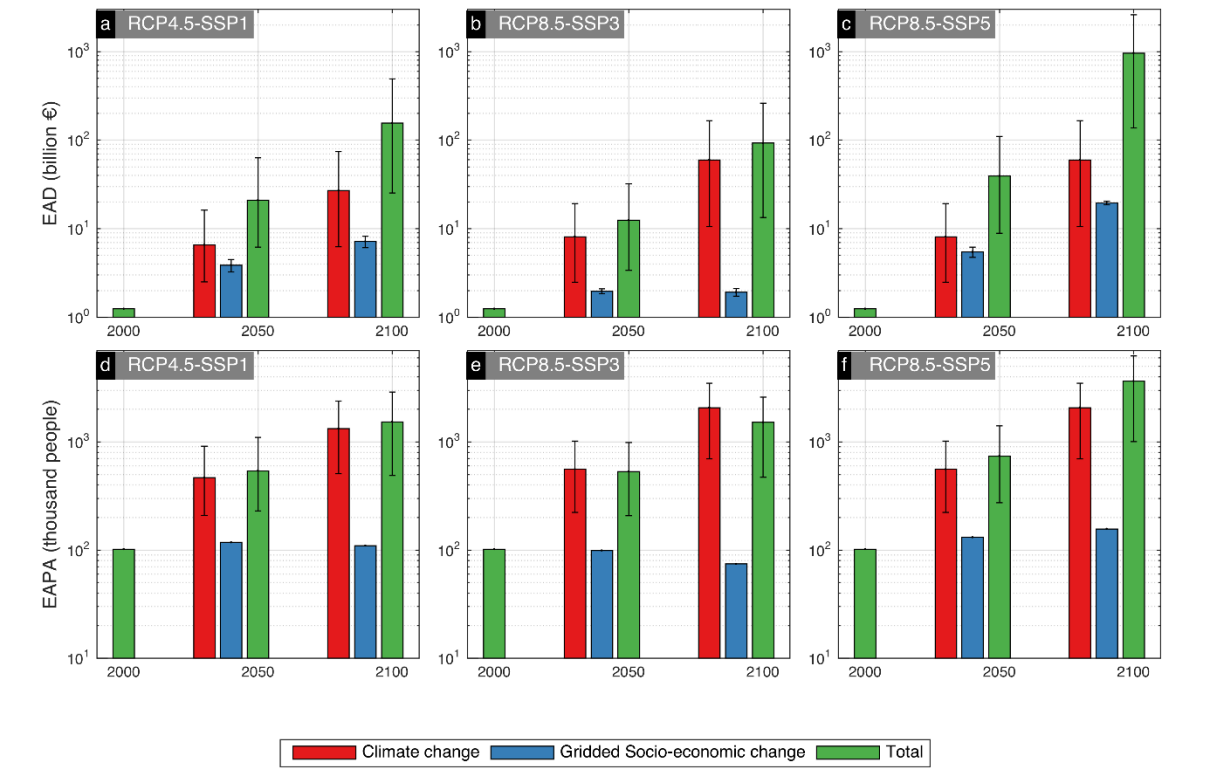


Change (%) in median river flow between 2ºC warming period and present climate (ensemble average) for the seasons a) DJF (winter), b) MAM spring), c) JJA (summer) and d) SON (autumn)

2°C warming

- **Reduced river flows in Southern Europe**
- **Increased river flows in Northern Europe**

Impact on coastal flooding



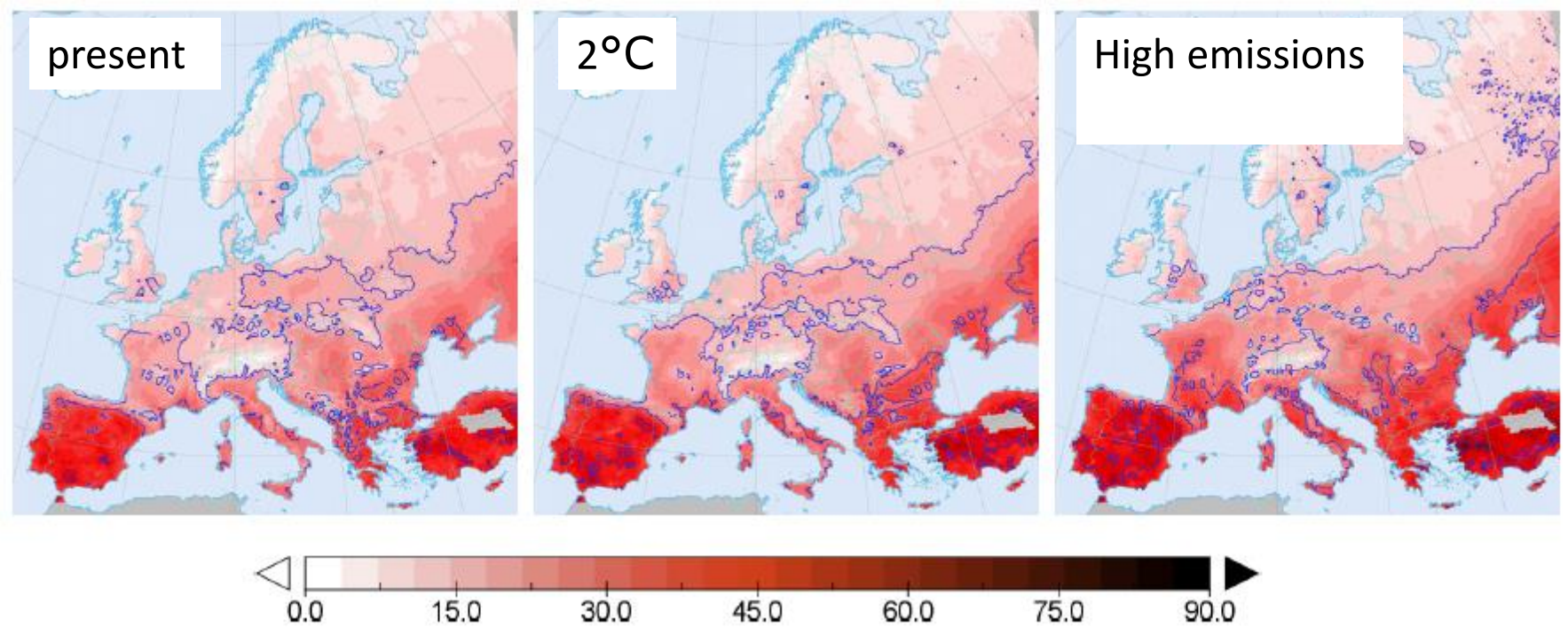
Expected annual damage from
coastal flooding

Expected annual people exposed to
coastal flooding

- **Strong rise in coastal flood risk**
- **Coastal flood risk will dominate future flood risk: 961 billion EUR – 2100, SSP5/RCP 8.5**
- **Sea level rise delayed effects**

Impact on forest fires

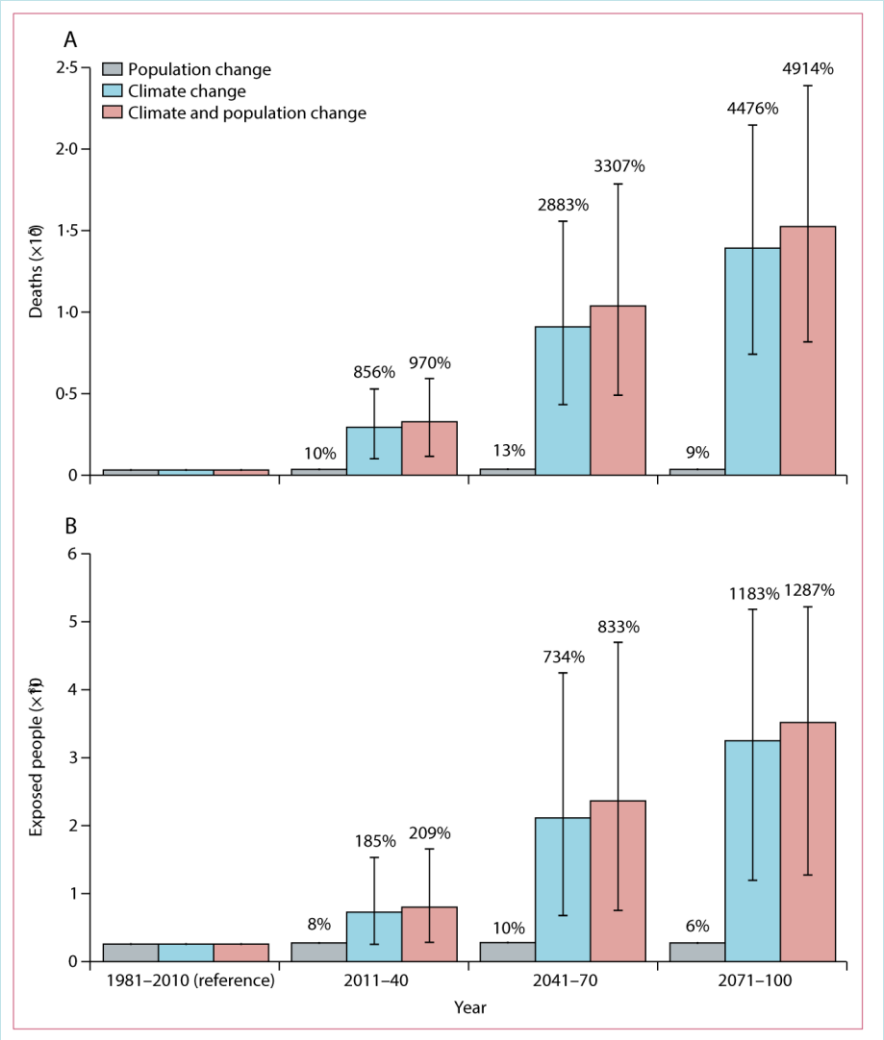
Overall weather-driven forest fire danger in present, 2°C and high emissions scenarios



- **Mainly increase in southern Europe**
- **Fire danger increases with level of warming**

Impact on human health (heat waves)

Projected relative changes in fatalities from and people exposed to heat waves assuming no adaptation (SRES A1B scenario, middle between RCP8.5 and RCP4.5)



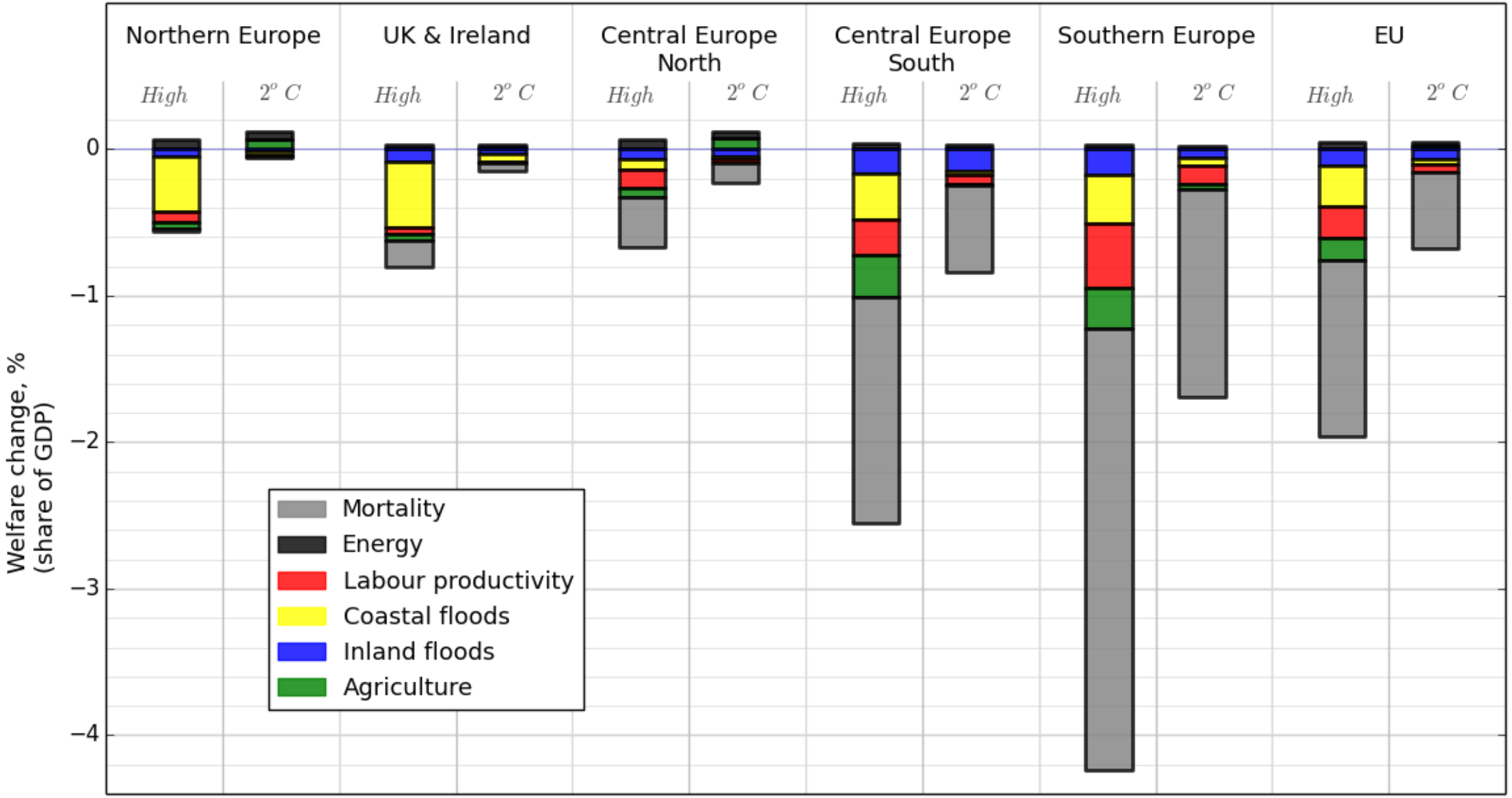
Increase in human mortality

- 2˚C warming – 20 fold
- High emissions – 50 fold
- Strongest increase southern parts of Europe

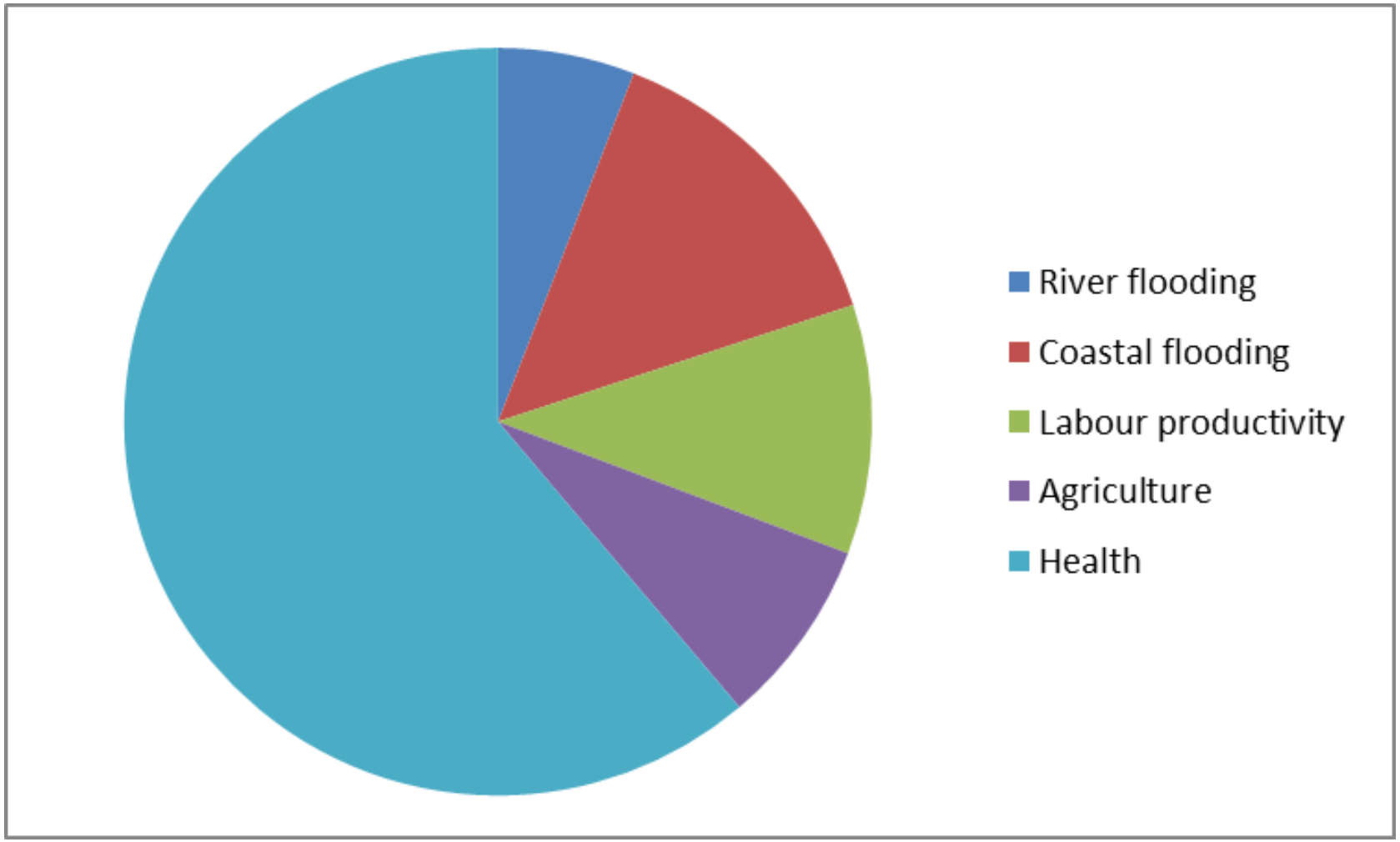
People annually exposed

- Present – 1%
- 2˚C warming – 15%
- High emissions – 40%

Economic integration (welfare losses)



Sectoral distribution, high warming (welfare losses)



PESETA III findings Summaery

JRC PESETA III Science for Policy Summary Series

This infographic summarises the key impacts of climate change for the EU, assessed by the JRC PESETA III project. The largest impacts across all member states/regions are highlighted in bold blue text.

UK and Ireland

Key impacts: coastal & river flooding, flooding of airports & seaports

- River floods (UK): €2 bn/yr for high warming (€0.5 bn/yr for 2°C).
- Coastal floods (UK): €11 bn/yr for high warming (€1.5 bn/yr for 2°C).
- **Transport (UK): 85 seaports & 19 airports at risk of coastal flooding >1m.**

Central Europe North

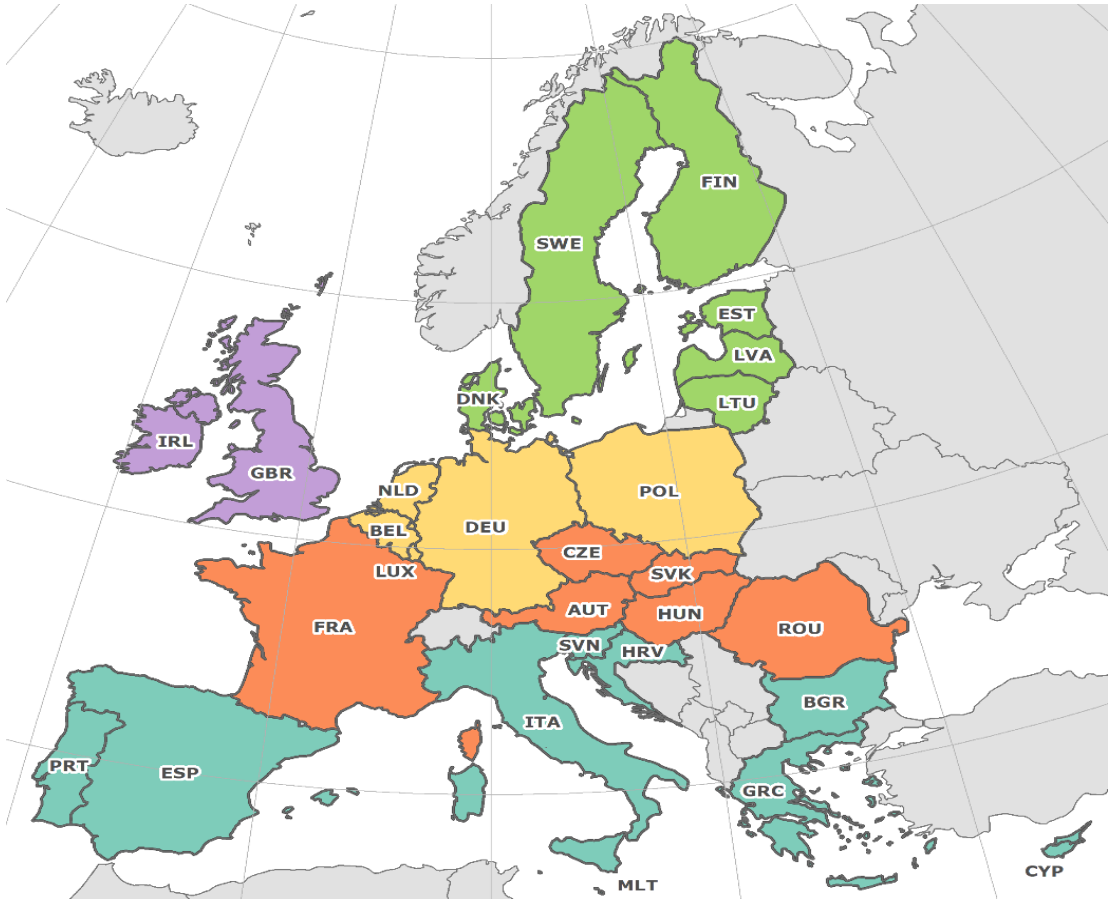
Key impacts: coastal & river flooding, flooding of airports

- River floods (Germany): €2 bn/yr for high warming (€1.7 bn/yr for 2°C).
- Transport (Germany): 5 airports at risk of coastal flooding >1m.
- **30% increase in rain-fed wheat and maize yields.**

Central Europe South

Key impacts: labour productivity decline, welfare losses, coastal & river flooding

- River floods (France): >€2 bn/yr for high warming (€1.5 bn/yr for 2°C).
- **Coastal floods (France): €11.5 bn/yr for high warming (€0.9 bn/yr at 2°C).**
- Outdoor labour productivity decline: 3% (high warming) and 1% (2°C).



Northern Europe

Key impacts: flooding of seaports

- Transport (Denmark & Finland): 46 & 19 seaports respectively at risk of coastal flooding >1m.
- **29% decline in heating & cooling demand under the high warming scenario.**

Southern Europe

Key impacts: coastal & river flooding, flooding of seaports, labour productivity decline, drought, forest fires, water shortages, loss of habitat, welfare losses

- **River floods (Italy): €4.5 bn/yr for high warming (€1.8 bn/yr for 2°C).**
- Coastal floods (**Italy**): €5.7 bn/yr for high warming (€0.6 bn/yr for 2°C).
- Transport (Croatia): 51 seaports at risk of coastal flooding >1m.
- **Outdoor labour productivity decline: 7% (high warming) and 2% (2°C).**
- **Increased water shortages (particularly Spain, Cyprus & Italy).**
- Mediterranean habitats contract by 16% (high warming).
- **Risk of droughts and forest fires (particularly Spain & Portugal)**
- **Welfare loss is 4.2% of GDP for high warming (1.7% for 2°C).**

The JRC PESETA III project assessed the impacts of climate change for several sectors relevant to society and the natural environment, including: freshwater, agriculture, transportation, ecosystems, labour productivity and coasts. Impacts were assessed under a high warming scenario at the end of the century and a 2°C warming scenario. The economic consequences of the projected impacts were also assessed. Read more at https://ec.europa.eu/jrc/en/peseta

Grazie!

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