

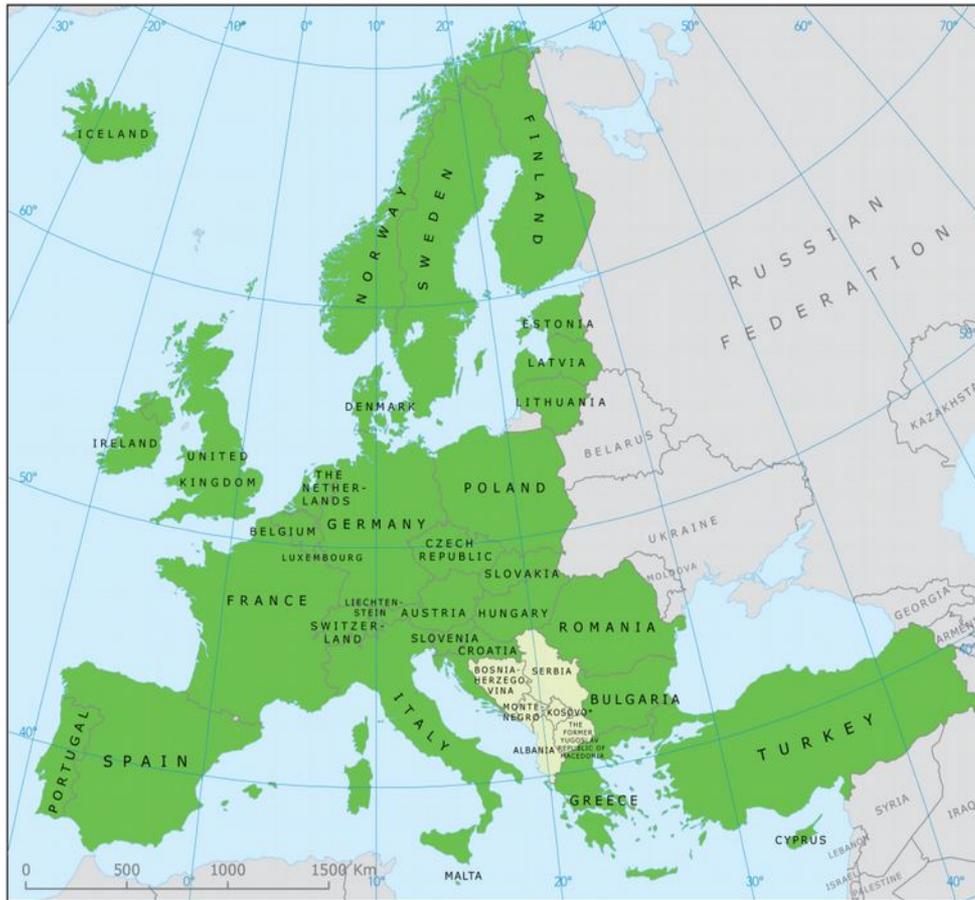
Use of climate data and information for EEA climate change assessments

Blaž Kurnik

**Climate change impacts and adaptation
European Environment Agency**



EEA networking with member countries (Eionet)



EEA coverage

 Member countries

 Cooperating countries

*Kosovo under UNSCR 1244/99

- **33 member** and six collaborating **countries** (ministries and **environment agencies**)
- Main target audience: **policymakers** at European and national levels
- Supporting and informing policy development and implementation by **data, indicators and assessments**
- **Networking:** annual Eionet workshop, expert meetings
- Supported by **European Topic Centres**, e.g. on adaptation see: <http://cca.eionet.europa.eu/>



2016-2020: EEA content priorities

- Circular economy and Natural Capital packages
- **EU Climate and Energy package**
- Sustainable Development Goals, Paris agreement, and Sendai Framework
- EU Copernicus programme (monitoring the environment)
 - land monitoring service (pan-European and local components) and in-situ coordination
 - climate change service (European user)
- **State of Environment Report (SOER 2020)**

Important global agreements

- **Sendai Framework on DRR 2015-2030**
 - Links between Disaster risk reduction and Climate Change Adaptation
- **Sustainable Development Goals (SDG)**
 - Strengthen resilience and adaptive capacity
 - Integrate climate change measures into national policies, strategies and planning
 - Implement the commitment of mobilising \$100 billion by 2020
- **Paris agreement**
 - in force since 4 November 2016
 - Global warming below 2 (1.5) °C target
 - Investment into adaptation to climate change and resiliency to extreme events



EU Strategy on Adaptation to Climate Change (2013)

Priority 1: Promoting action by Member States

Action 1. Encourage MS to adopt Adaptation Strategies and action plans

Action 2. LIFE funding, including adaptation priority areas

Action 3. Promoting adaptation action by cities along the Covenant of Mayors initiative

Priority 2: Better informed decision-making

Action 4. Knowledge-gap strategy

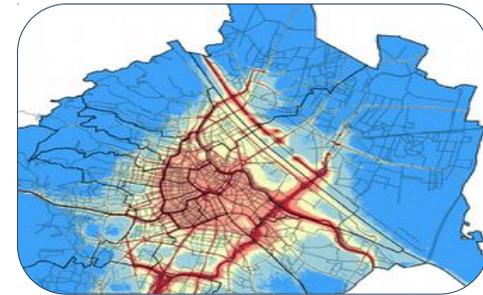
Action 5. Climate-ADAPT

Priority 3: Key vulnerable sectors

Action 6. Climate proofing the Common Agricultural Policy, Cohesion Policy, and the Common Fisheries Policy

Action 7. Making infrastructure more resilient

Action 8. Promote products & services by insurance and finance markets



.... “access to information for monitoring and predicting climate to support adaptation”

How is the climate changing?

- Observations
- Reanalyses

Will climate change continue, accelerate?

- Predictions
- Projections

What are the societal impacts?

- Climate indicators
- Sectoral information - including Agriculture

Climate change impacts and adaptation products in 2016

- *Climate change impacts indicators – Temperature, precipitations, storms, losses from disasters,*
- *Update of Climate – ADAPT*
- *Urban adaptation to climate change, 2016 report*



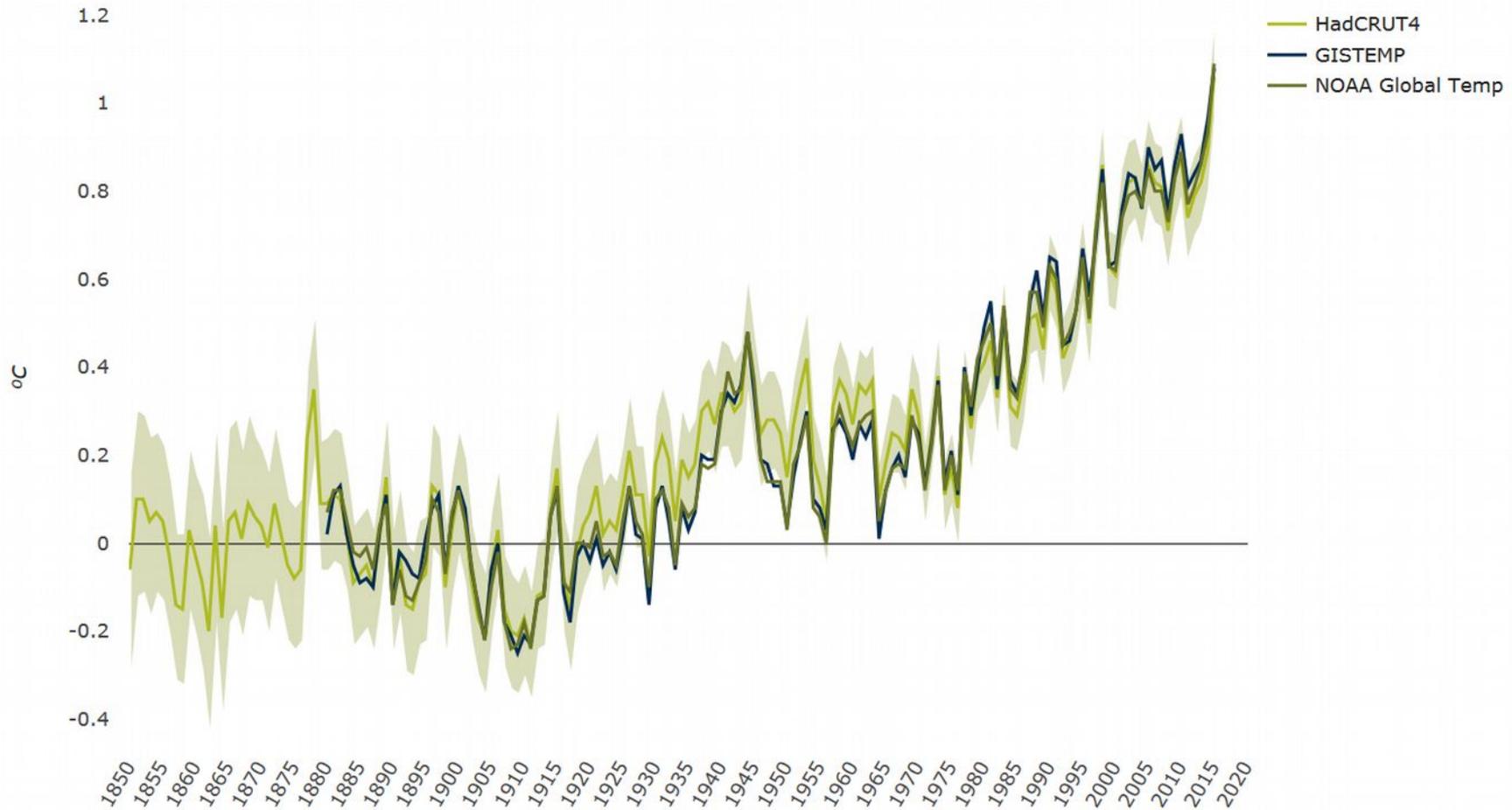
Forthcoming EEA reports on climate change

- Climate change, impacts, and vulnerability report 2016 – indicator report (finalised)
- Climate change adaptation and disaster risk reduction in Europe - Synergies for the knowledge base and policies – 2017 report (under review)
- Climate change impacts and adaptation in agriculture (end of 2017)



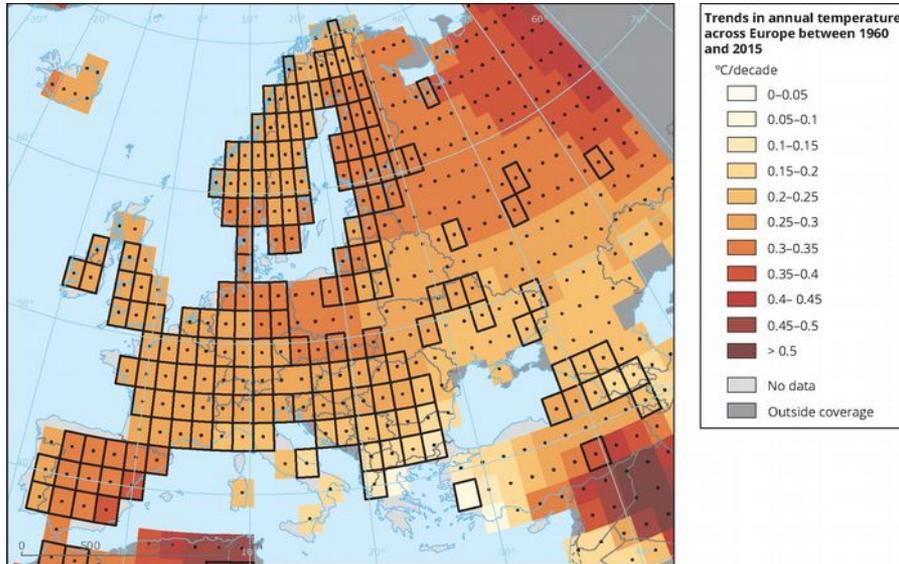
Global temperature - 2015 (2016) the warmest year

Annual average — Global average near surface temperatures relative to the pre-industrial period

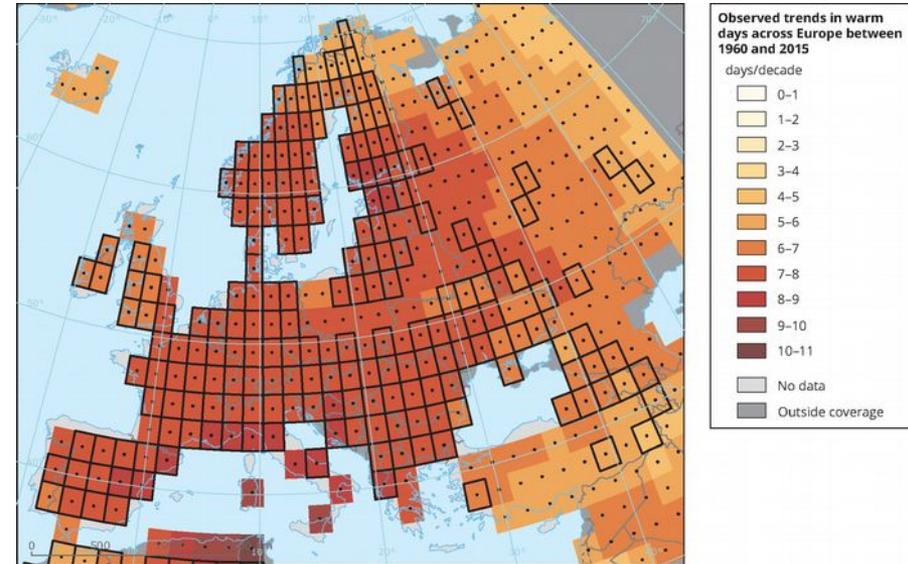


Trends in European temperature

Trends in annual temperature

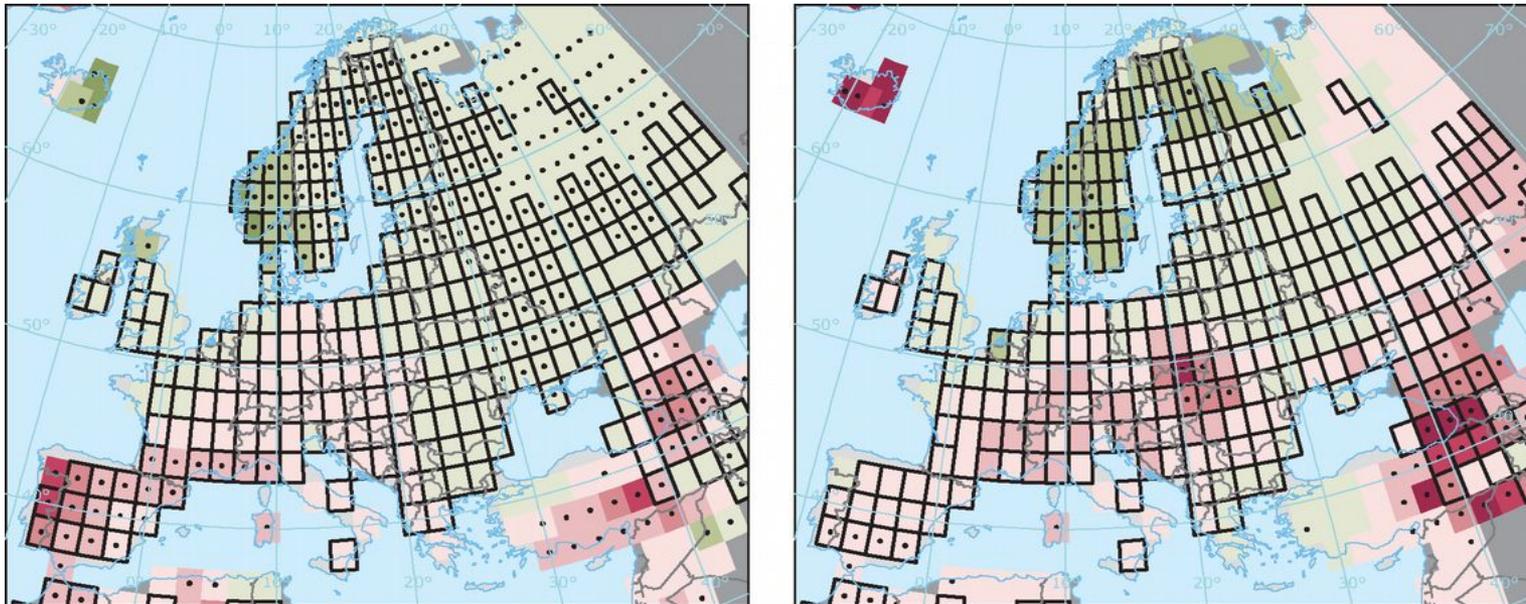


Trends in number extreme warm days

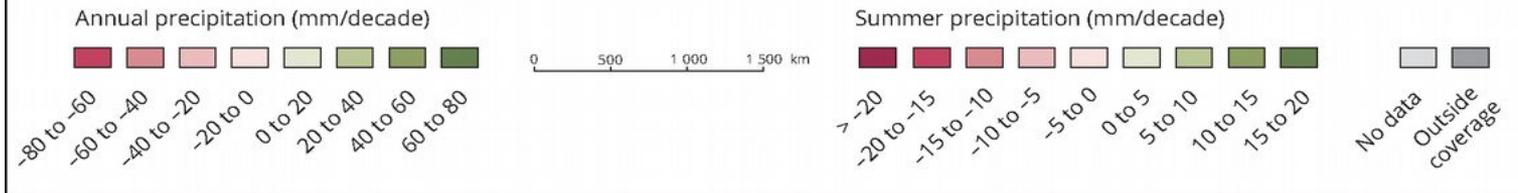


Trends for 1961-2015 based on E-OBS and HadEX

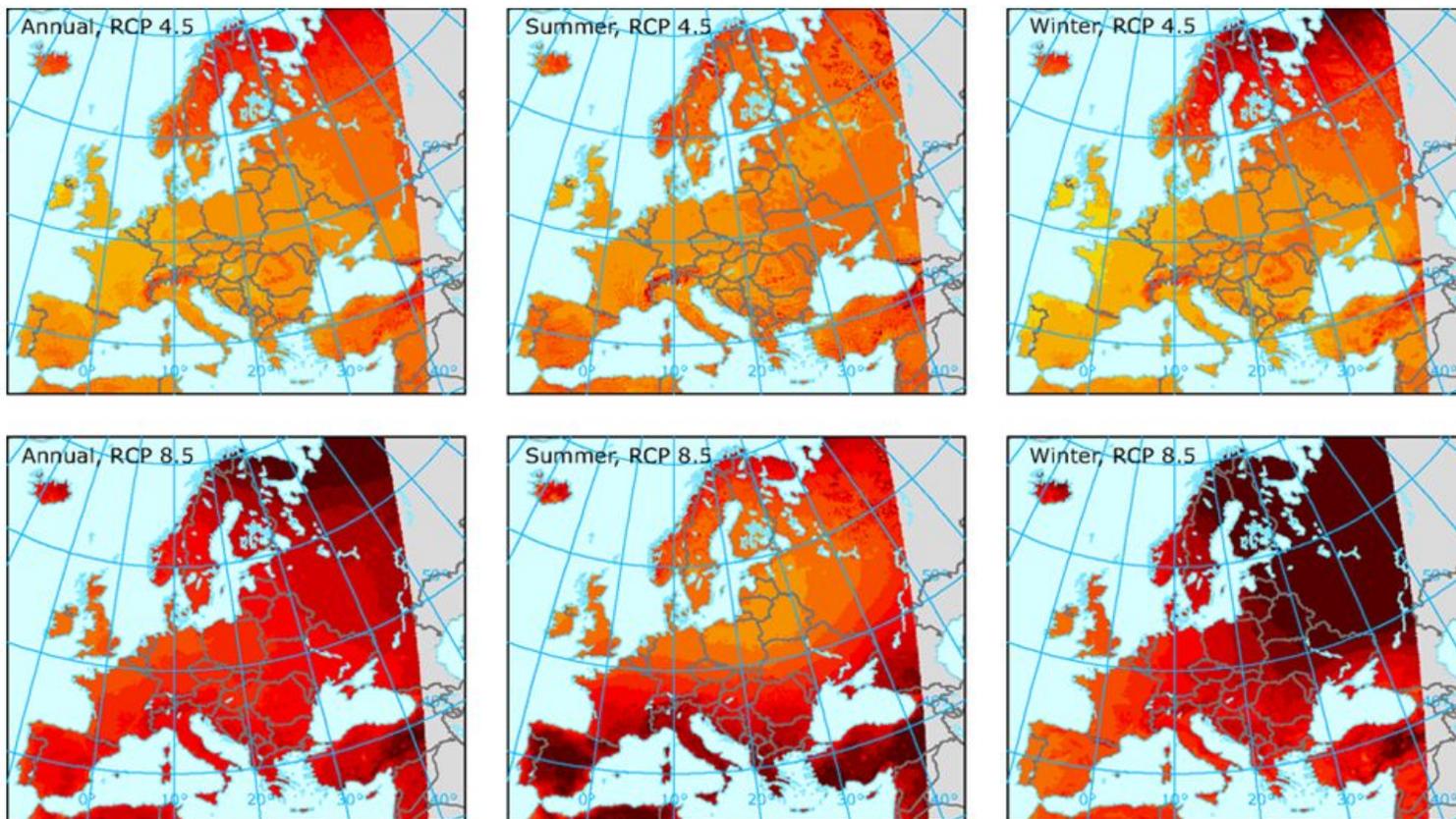
Trends in European precipitation



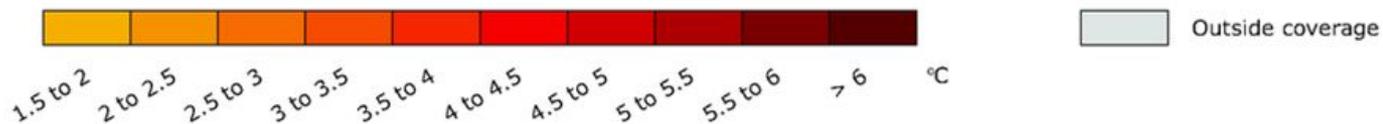
Trends in annual (left) and summer (right) precipitation across Europe between 1960 and 2015



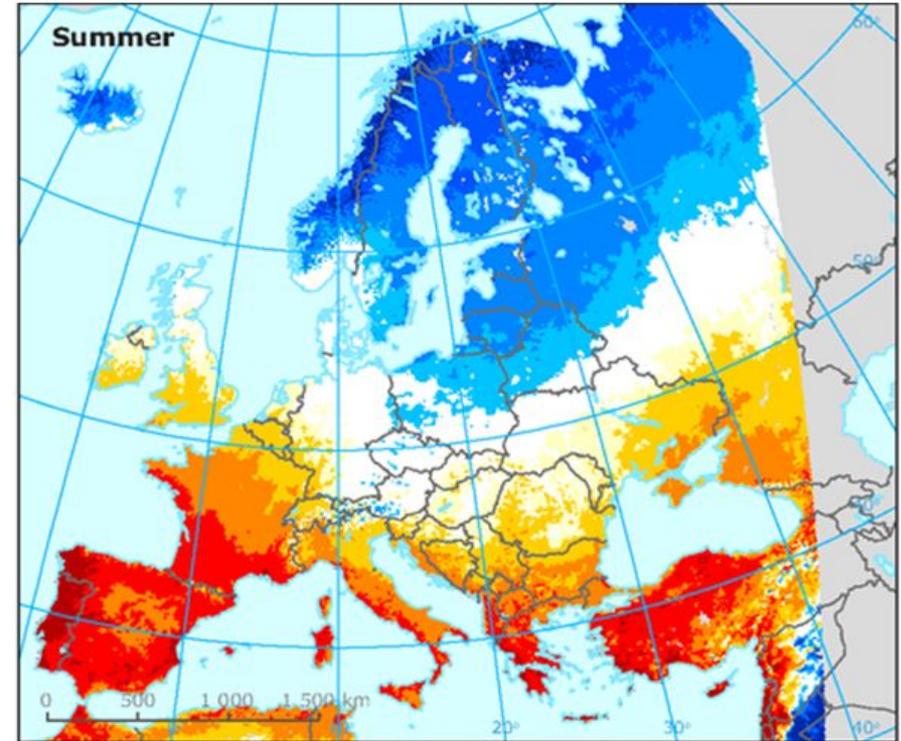
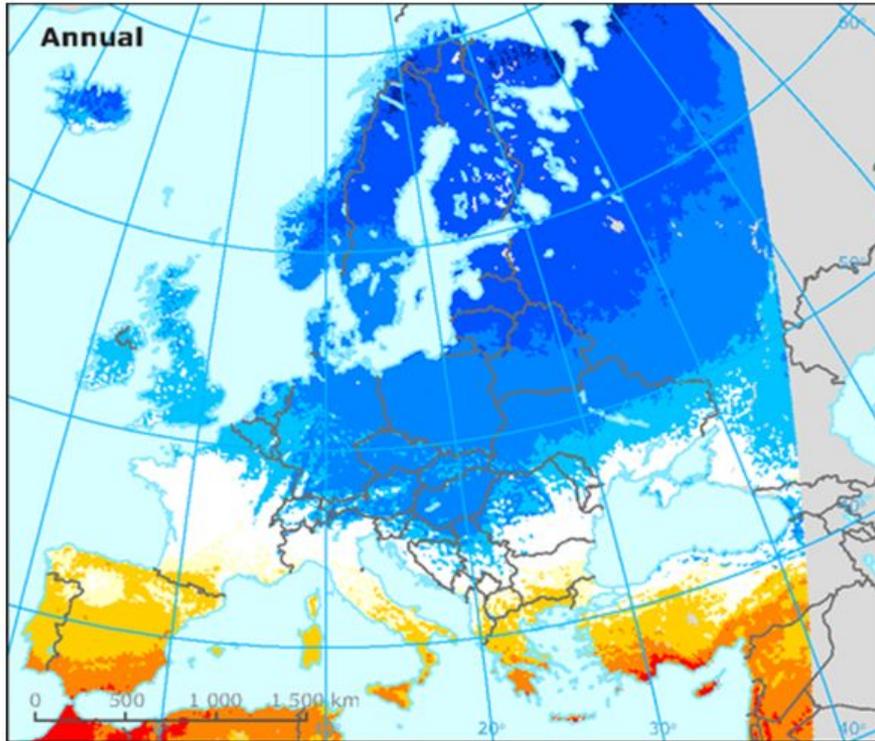
Projected temperature



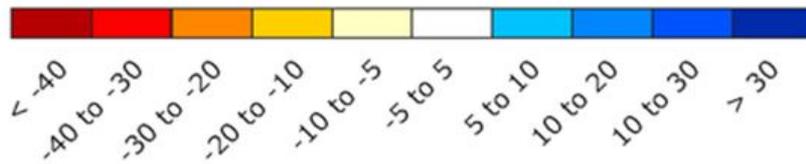
Projected change in annual, summer and winter temperature for the forcing scenarios RCP 4.5 and RCP 8.5



Projected precipitation



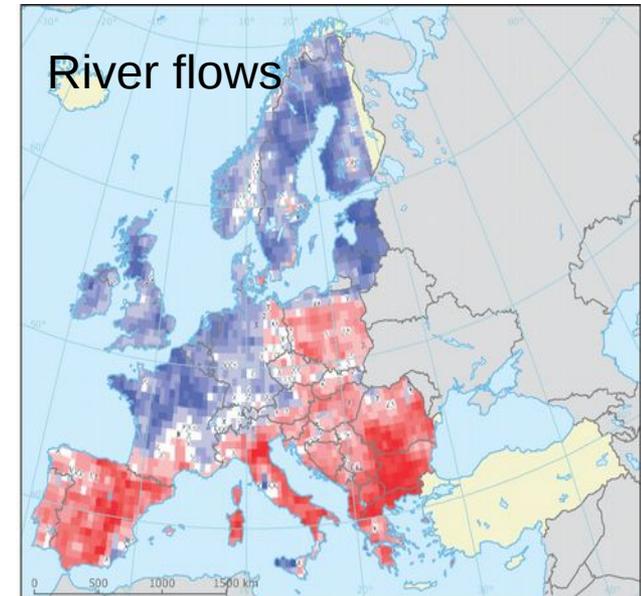
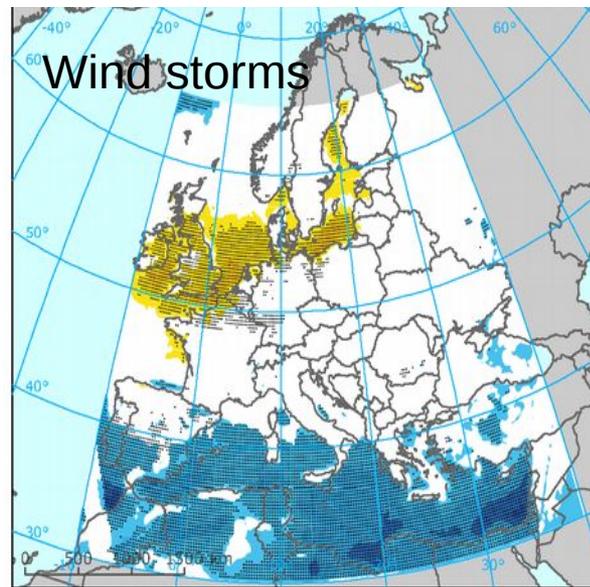
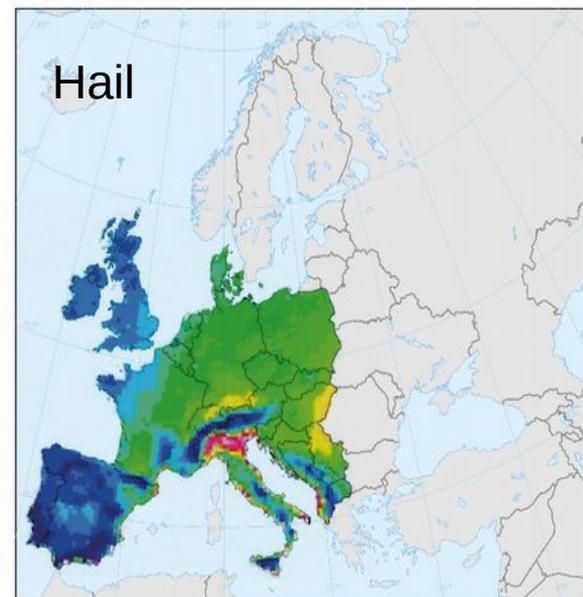
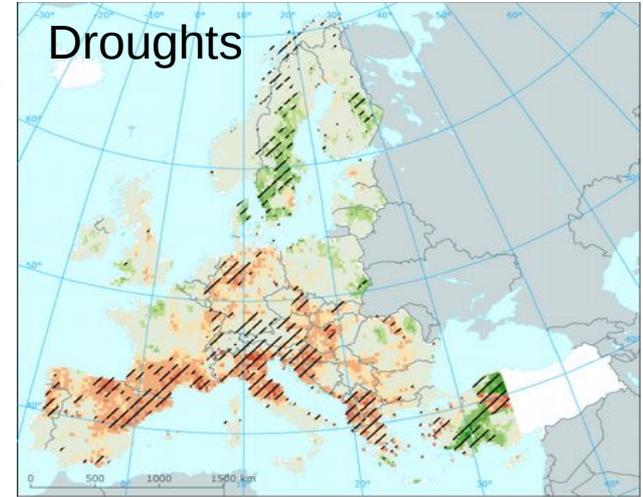
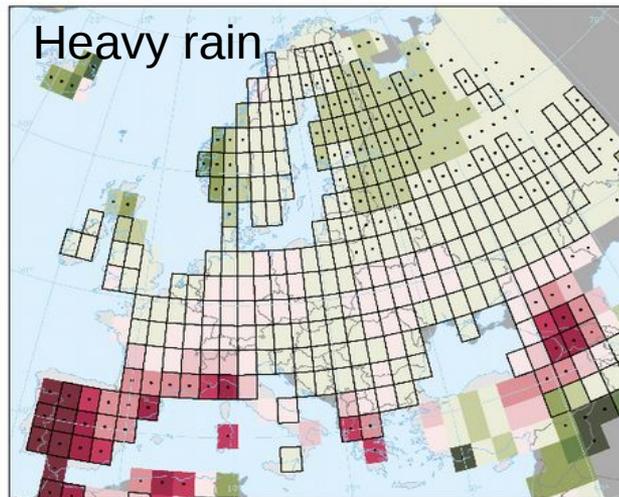
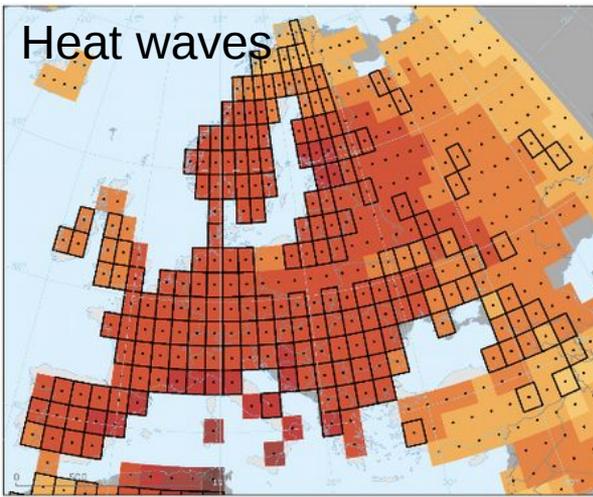
Projected change in annual and summer precipitation (%)



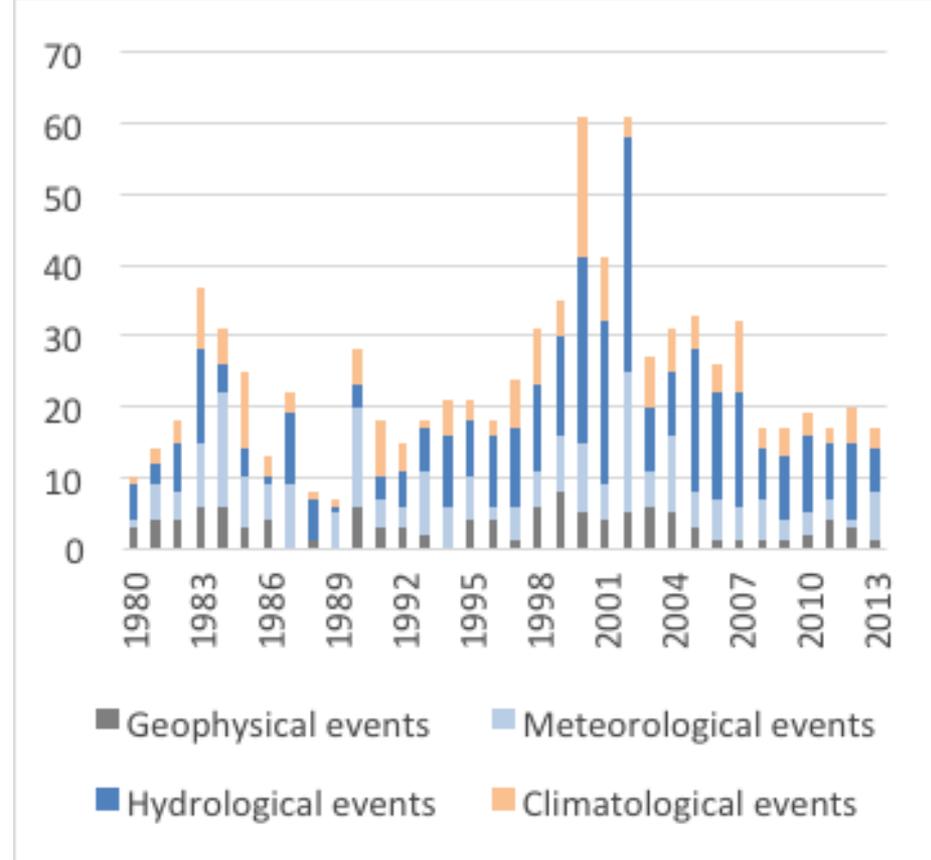
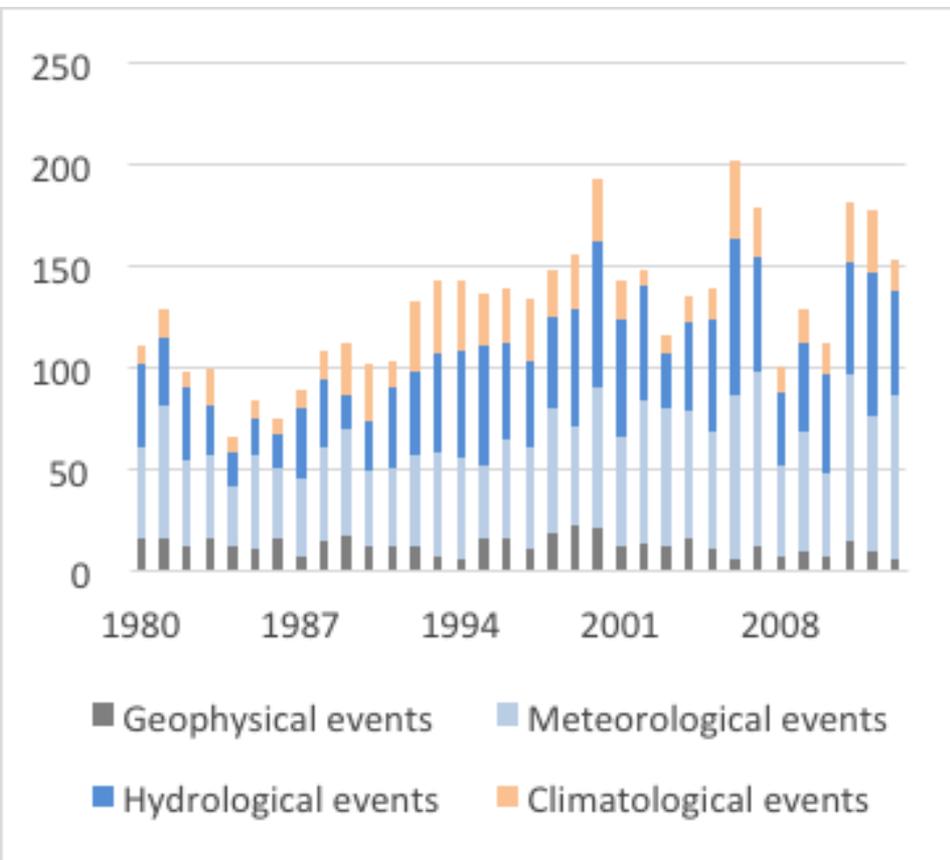
Outside coverage

Source: Euro-CORDEX Jacob et al. 2014, RCP8.5

Changes in weather and climate related natural hazards



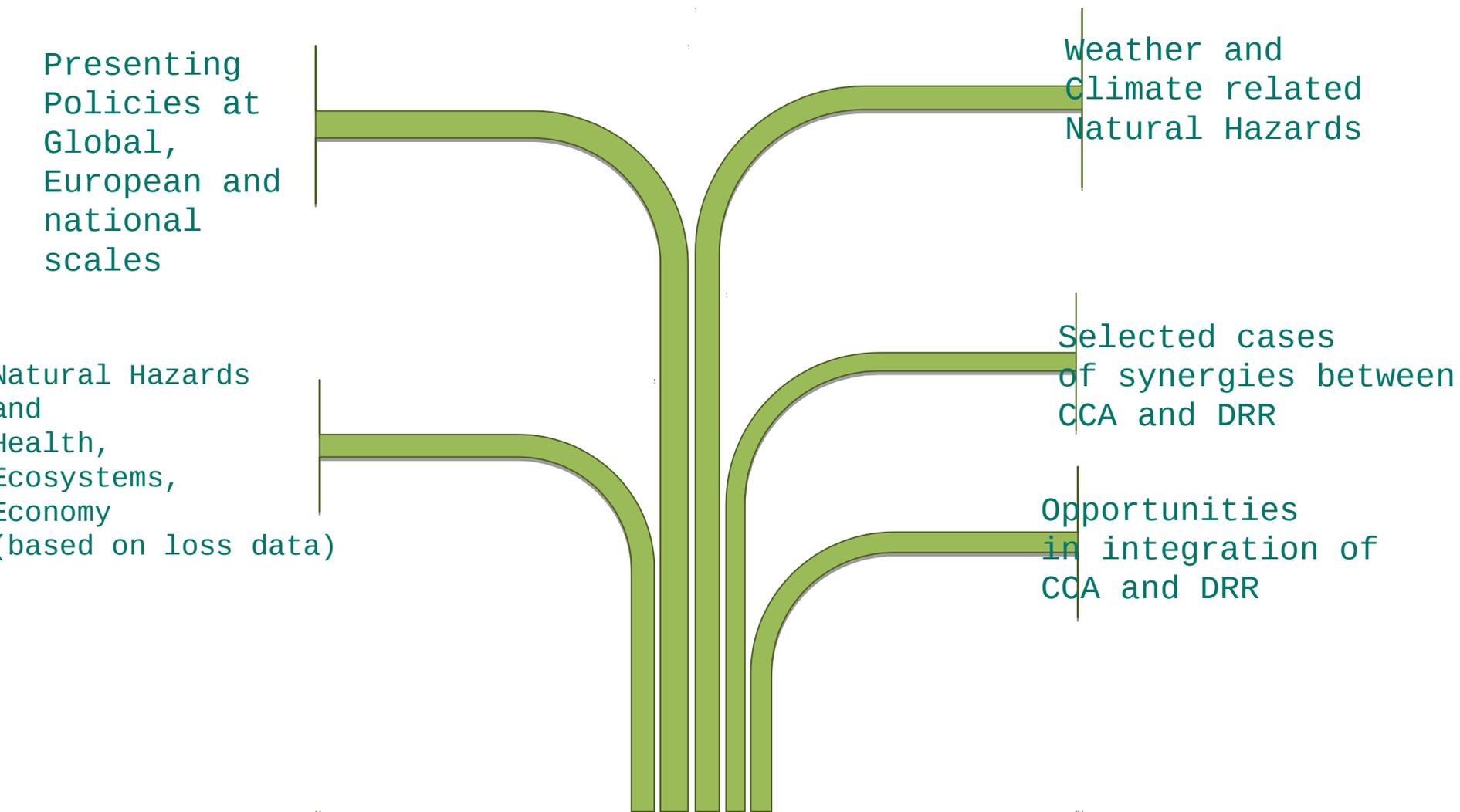
Number of recorded extreme events



Left: Munich RE NatCatSERVICE (data received under institutional agreement)

Right: CRED EM-DAT (data received based on a Letter of Understanding).

Climate change adaptation and disaster risk reduction



Synergies and integration of CCA and DRR
an 2017 EEA report

(complement to the JRC Science report on Disaster risk management)

European Environment Agency

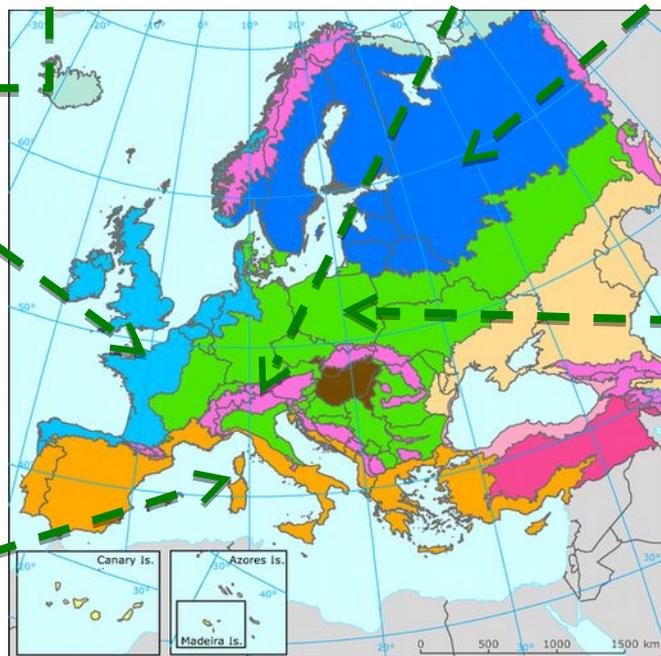


Changes in climate related natural hazards in bio-geographical regions

Changes in avalanches
Increase in flash floods

Increase in wind storms
and heavy precipitation
Increase storm surges in
coastal zones

Increase in heavy precipitation
Increase in forest fires

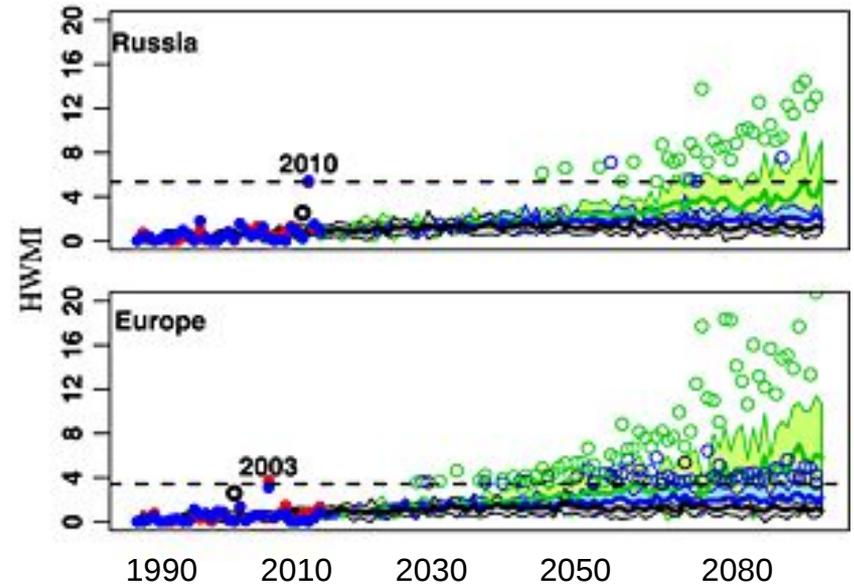
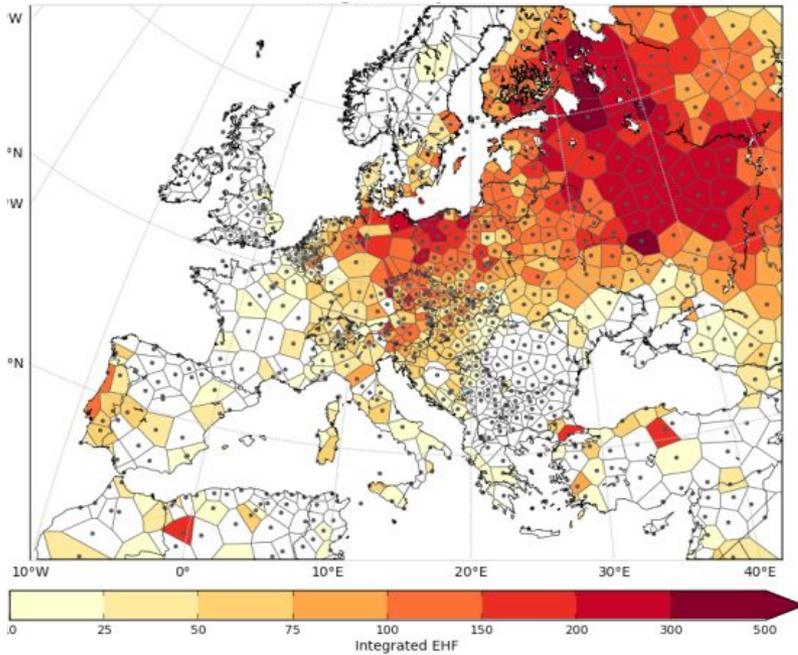


Increase in heat waves
Increase in drought extremes
Increase in risk of floods
and landslides
Increase in risk of hail events

Increase in drought extremes
Increase in forest fires
Increase in Mediterranean storms (Medicanes)



Extreme events and agriculture

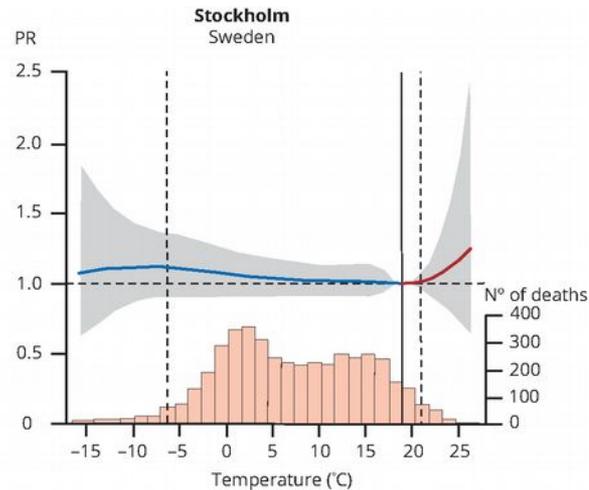
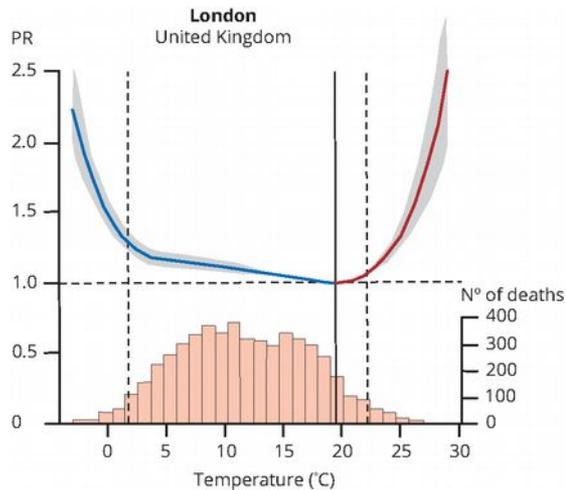


Russo et al., 2014

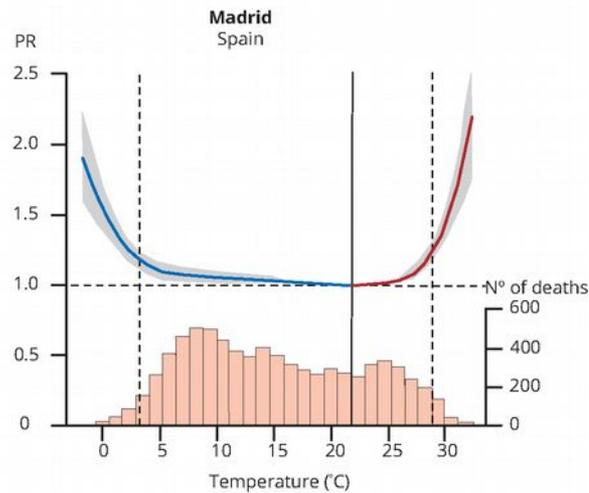
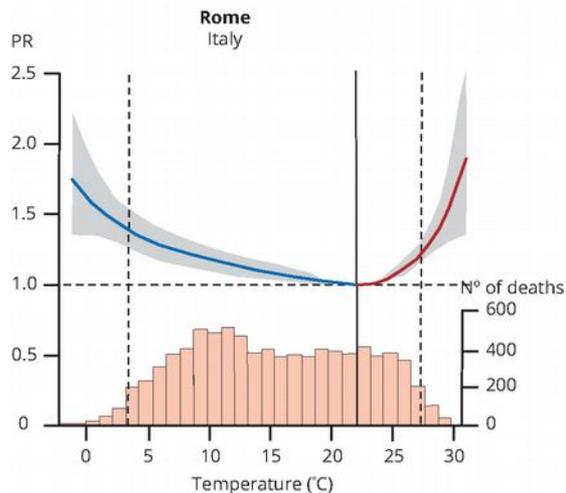
Russian heat wave in 2010, have had negative economic consequences for Europe.



Risks of mortality due to extreme temperatures

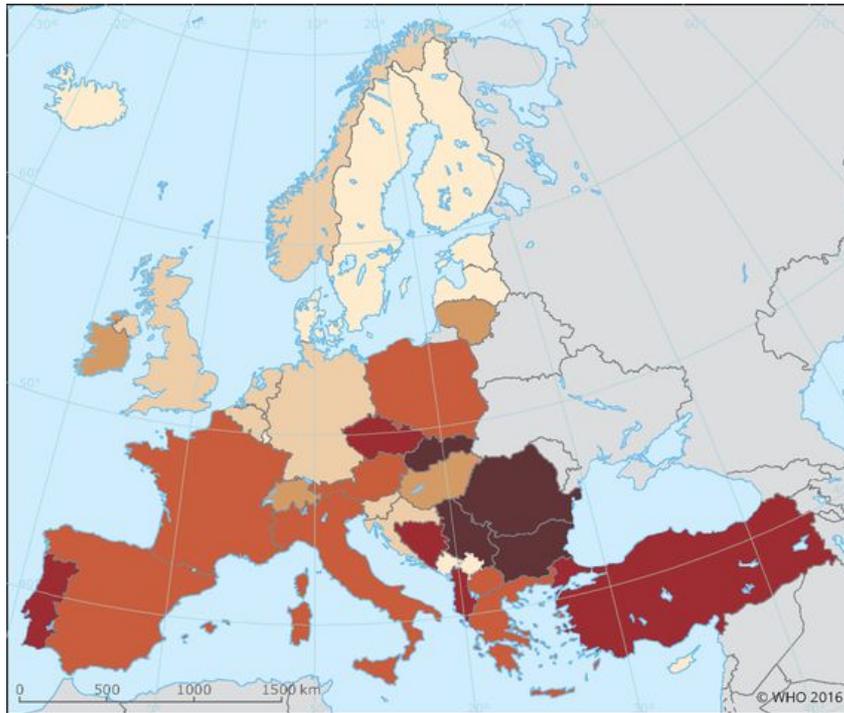


Changes in relative mortality due to extreme temperatures in four different cities



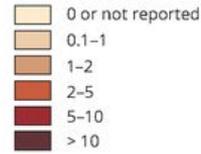
Adapted from Gasparrini et al. (2015).

Deaths due to flooding



Deaths per million inhabitants related to flooding in Europe for the period 1991-2015

Rate per 1 000 000 inhabitant



Grey box

The designations employed and the presentation of this material do not imply the expression of any opinion whatsoever on the part of the Secretariat of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers and boundaries. Dotted and dashed lines on maps represent approximate borders for which there may not be full agreement.

Cumulative number of deaths due to river floods in Europe

Data on number of deaths received from WHO, population data by EUROSTAT

Climate change impacts report – data driven

- Since 2003 Europe has experienced several extreme summer heatwaves (2003, 2006, 2007, 2010, 2014 and 2015). ***Heat waves are projected to become the norm in the second half of the 21st century under a high forcing scenario (RCP8.5).***
- The length of wet spells as well as the intensity of heavy precipitation events have decreased in southwestern Europe but increased in northern and northeastern Europe since 1960s. ***High resolution precipitation dataset not available.***
- Since 1951 increasing hail trends have been noted in southern France parts of Spain and Austria, and decreasing (but not significant) trends in parts of eastern Europe. ***Missing reliable data***





- Presents **terminologies** used by CCA and DRR communities.
- Presents **trends and projections** of natural hazards and selected events.
- Presents **mainstreaming** of CCA in DRR into different policies.
- Presents **synergies** by describing **case studies** on integration of CCA and DRR in practice.
- **Complements** to the JRC DRMKC Science report



Thank you

See for more information:

<http://www.eea.europa.eu/themes/climate>

<http://climate-adapt.eea.europa.eu/>

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