The impact of climate change on inland waterways

Connecting Europe Days, session on sustainable maintenance of inland waterways

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Adaptation policy at EU level

2021 European Climate Law

Union and Member States to ensure continuous **progress** in *enhancing adaptive capacity*, *strengthening resilience* and *reducing vulnerability to climate change.*

2021 EU Strategy on adaptation to climate change

- Smarter adaptation
- More systemic adaptation → *EU Climate Risk Assessment*
- Faster adaptation
- Stepping up international action

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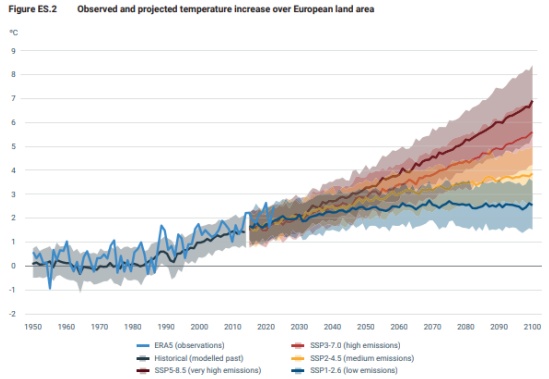
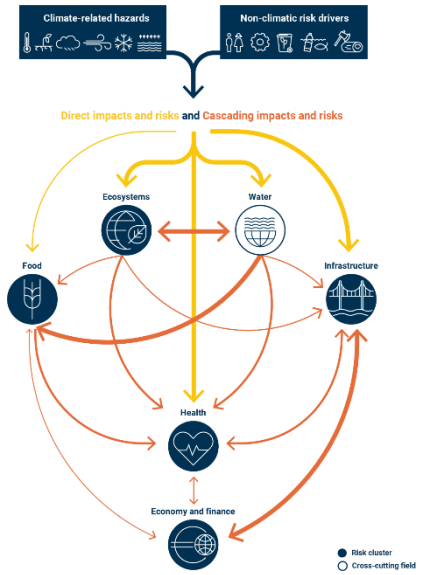
European Climate Risk Assessment

A scientific report of the European Environment Agency

- Europe’s climate is changing rapidly.
- Most climate hazards will further increase, magnitude and pace of change depends on global efforts to reduce greenhouse gas emissions
- Climate adaptation needs to consider a wide range of plausible scenarios, including:
  - **compounding hazards** occurring at the same time,
  - **Risk cascades** that stretch across national borders and sector boundaries and
  - plausible low probability events with high impacts (**wildcards**)





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Climate risk drivers are accelerating

- More frequent and more severe **heat waves**
- **Precipitation patterns** are changing:
  - overall precipitation: northern more, Wester & Central-Eastern mix, Southern Europe decline
  - whole Europe increase in frequency and severity of downpours / cloudbursts
- **Prolonged droughts** increasing in Europe, except NE
- **Sea level rise**

Land regions	Northern Europe			Western Europe			Central-Eastern Europe			Southern Europe		
	Past	Future		Past	Future		Past	Future		Past	Future	
		Low	High		Low	High		Low	High		Low	High
Mean temperature	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
Heatwave days	□(*)	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
Total precipitation	↗	↗	↗	↗	⟋	↘	↗	↗	⟋	↘	↘	↘
Heavy precipitation	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗	↗
Drought	↗	↘	↘	↗	⟋	↗	↗	⟋	↗	↗	↗	↗

European regional seas	Past	Future
Sea surface temperature	↗	↗
Sea level	↗	↗

Key risks in 5 sectors:

- Ecosystems
- Food
- Infrastructure
- Health
- Economy & Finance

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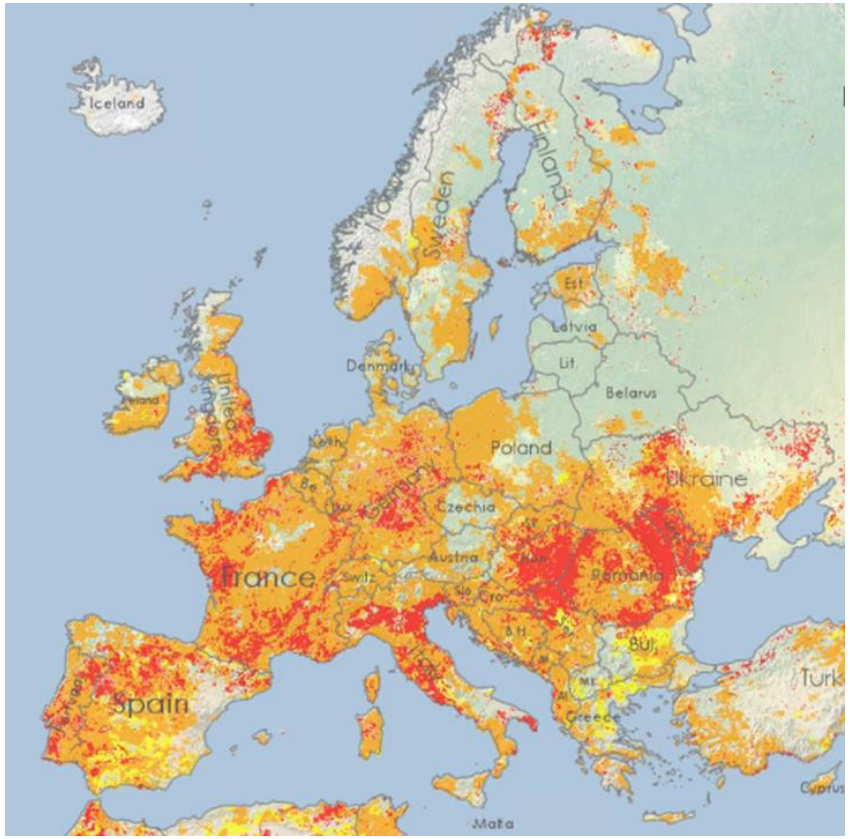
Recent extreme droughts & floods

European Drought Observatory
Combined Drought Indicator



Beginning of August 2022

River Rhine, low water, Germany, 2022

© picture: Reuters

Summer flooding, Belgium, 2022

© picture: Globalcitizen.org

Sau reservoir, Spain, March 2023

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EUCRA full report

- Chapter 15 '**Major disruptions of critical infrastructure**'
- Inland navigation hindered due to extremely low water levels in the Rhine and the Danube for extended periods in recent years
- Inland waterways highly sensitive to **droughts** and **river and coastal floods**
- Infrastructure systems strongly interconnected → cascading impacts
- Pitfalls to avoid

Other studies

- ECCONET study on **climate change impacts on inland waterways**:
  - Up to 2050, no significant shift in modal shares away from inland waterway transportation
  - For the longer term (up to 2100) climate change could affect transport conditions more significantly, no assessment made
  - Adaptation measures: 1) technology and operational measures, 2) infrastructure and maintenance, 3) production and logistic processes, and 4) improved water level forecasting.
- PIANC-guidance '**Climate change adaptation planning for ports and inland waterways**'

→ *See Climate-ADAPT https://climate-adapt.eea.europa.eu/*

Communication “Managing climate risks – protecting people and prosperity”

COM (2024) 91 final
Adopted on 12 March 2024

- Demonstrates EU readiness to respond to the evolving reality → EUCRA
- Geographic focus within the EU
- Risk ownership a central concept - identifying responsibility for managing risks, notably between EU and MS level
- Calibrated to the end of mandate, mostly about good decision-making processes and tools.

1. **Introduction**:

2. **Analysis/climate science**:

3. **Solutions space**
- Improved governance
- Tools for empowering risk owners
- Harnessing structural policies
- Right preconditions for financing climate resilience

4. **Key actions in in main impact clusters**
- Natural ecosystems
- Water
- Health
- Food
- Infrastructure
- Economy

5. **Next steps**

Chapter 4: Actions in impact clusters

4.1. Natural ecosystems

- Implementation of legislation and better accounting of the value of natural systems
- Forest disturbances and carbon sinks
- Maritime ecosystems
- Climate-resilient landscapes

4.2. Water

- Safeguarding freshwater supplies
- Comprehensive stocktake of water issues

4.3. Health

- Occupational safety and health (linked to heat)
- European Climate and Health Observatory
- Monitoring on cross-border health threats
- Mobilisation of medical personnel and patient transfer
- Critical medical countermeasures

4.4. Food

- Food safety and affordability
- Future-proofing agriculture
- Fisheries policy

4.5. Infrastructure and built environment

- Infrastructure and building standards
- Transport infrastructure
- Energy infrastructure

4.6. Economy

- Resilience of firms, notably SMEs and supply chains
- Fiscal sustainability
- Financial markets stability

4.2 Water

- These risks can manifest in multiple forms, including droughts potentially affecting large areas for prolonged periods, with negative impacts on … usability of waterways …
- Protecting and restoring the water cycle, …. is crucial to ensure a water-resilient Europe.
- The Commission will take stock of water issues comprehensively …and on that basis consider the need for action.

4.5 Infrastructure

- All transport infrastructure is at risk from climate change. Yet, there is an EU knowledge gap with respect to the resilience of European transport infrastructure to the impacts of climate change in terms of risk exposure, adaptation needs and solutions, as well as investment needs to address them.
- The Commission will support climate risk assessments and climate proofing through its revised guidelines on the development of the Trans-European Transport Network (TEN-T).
- A study on climate resilience of the TEN-T will be published.

Thank you

Slide 4 – 7, 9-10:: source: European Environment Agency, 2024.

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