



# Fostering European water resilience: lessons to learn from the Po droughts and floods

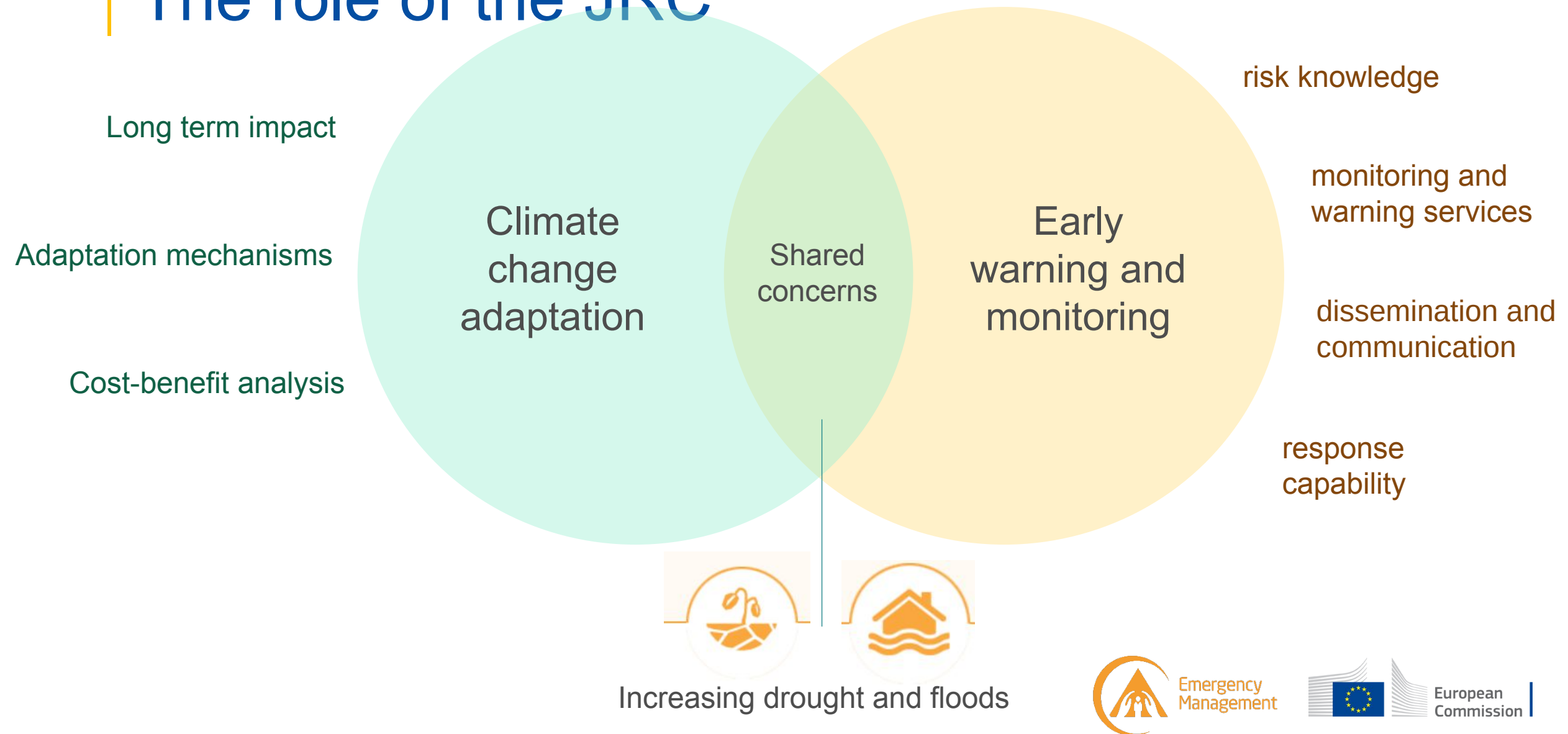
## **WHO NEEDS WATER?**

**Managing drought in Alps. Climate change and Alpine water resource  
to be preserved**

**Planet Week del G7 Clima, Energia e Ambiente Climate, Energy and Environment, TORINO, 24 aprile 2024**

*Francesca Moschini – Joint Research Centre*

# The role of the JRC

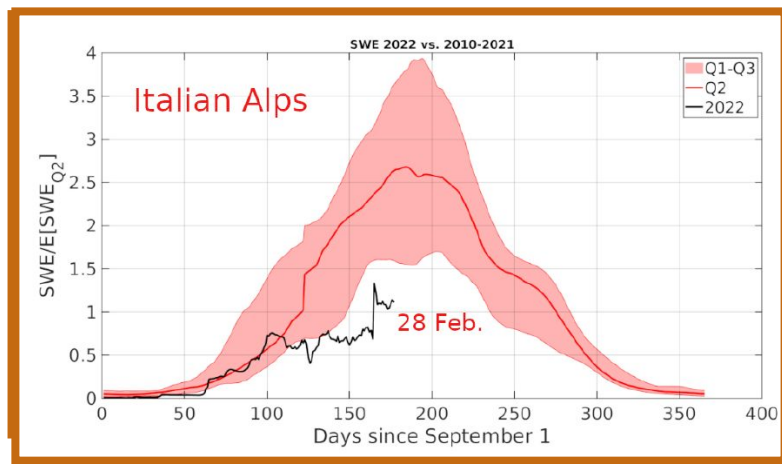


# Drought 2022-2023

Low Flow Index

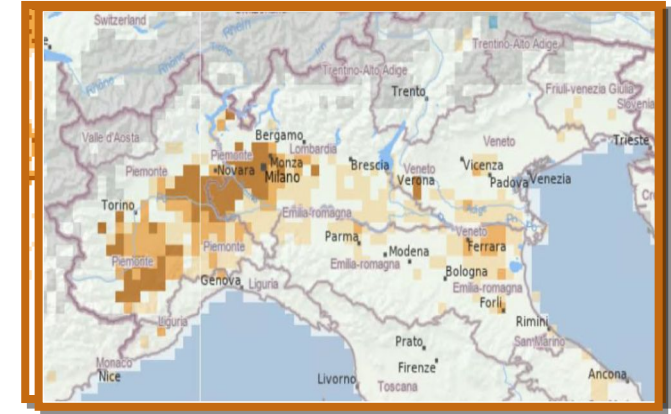


Snow Water Equivalent

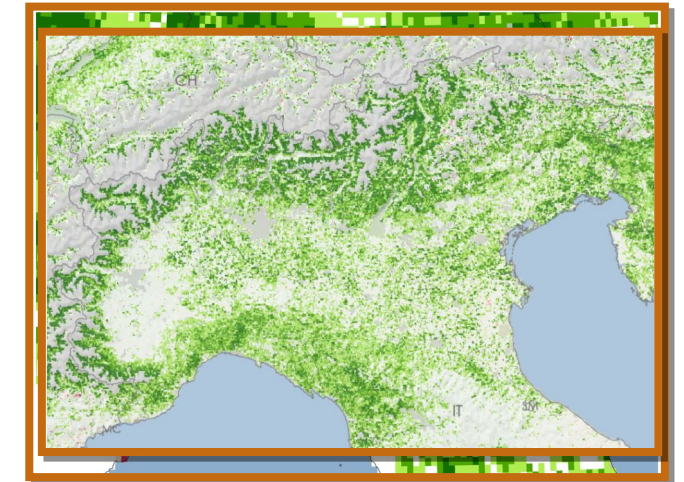


Monitored  
variables

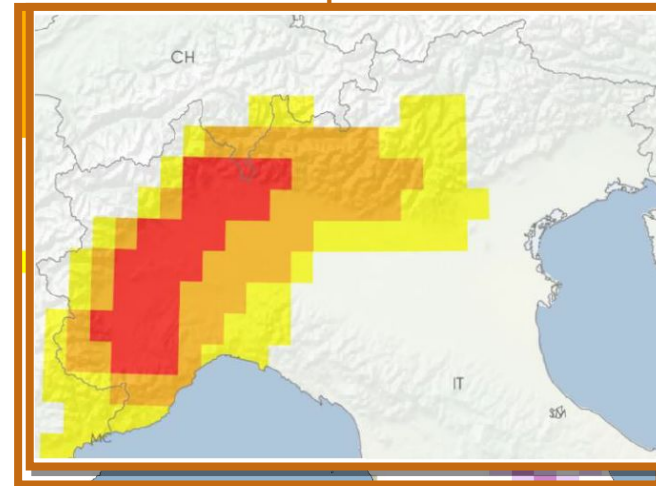
Soil Moisture anomaly



Vegetation



Standard Precipitation Index



Emergency  
Management

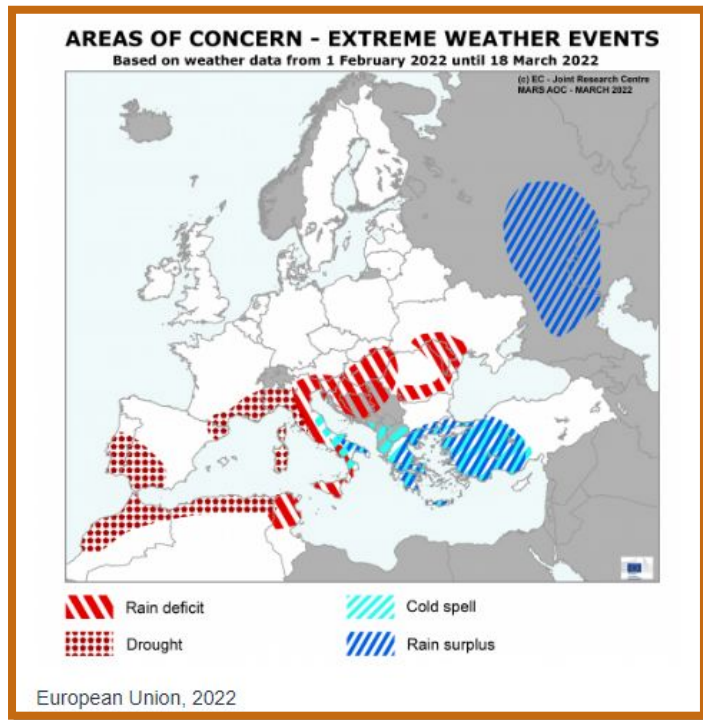


European  
Commission

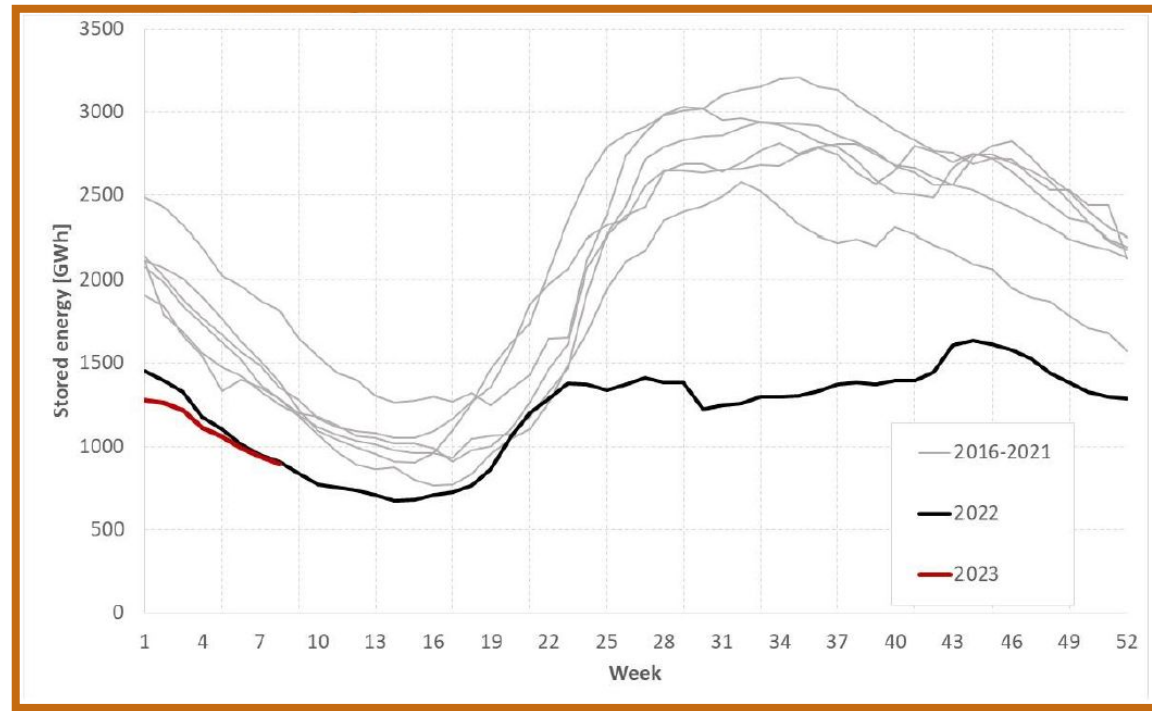
# Drought 2022-2023

## Impacts 2022

### Agriculture



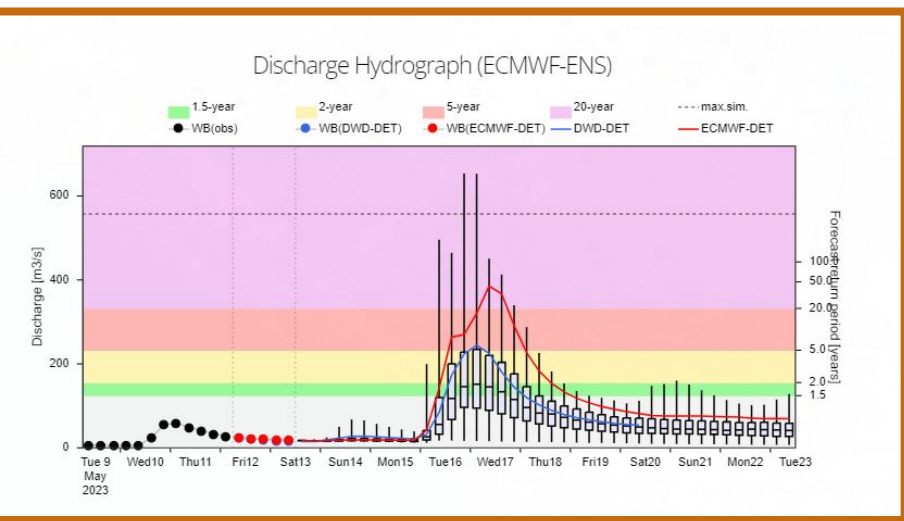
### Energy production





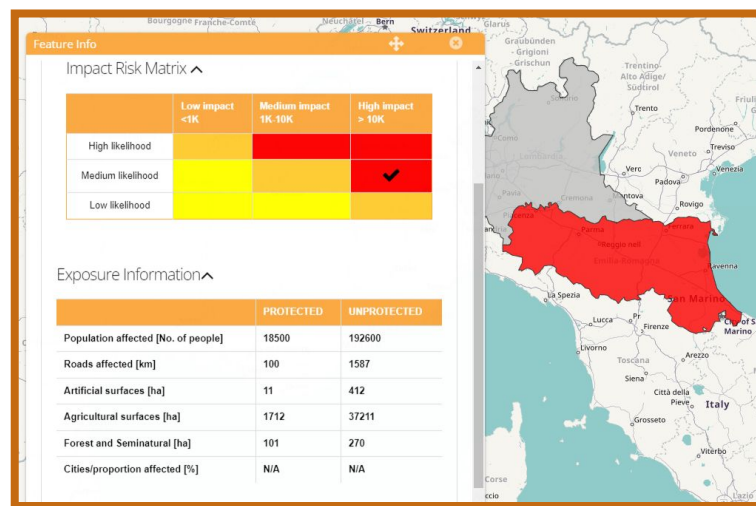
# Floods 2023 – Emilia Romagna

## Early warning

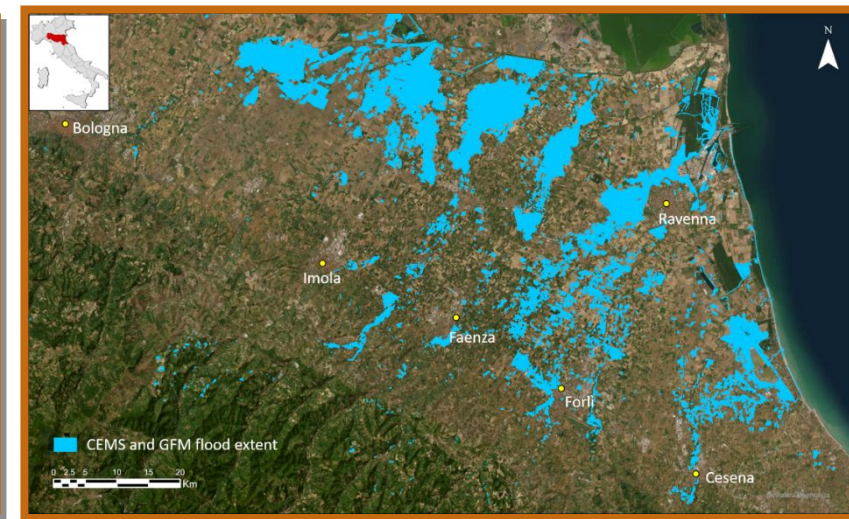


Before the event

## Impact assessment



## Delineation of affected areas



After the event

Sources: <https://european-flood.emergency.copernicus.eu/en>  
CEMS On-Demand Mapping and Global Flood Monitoring

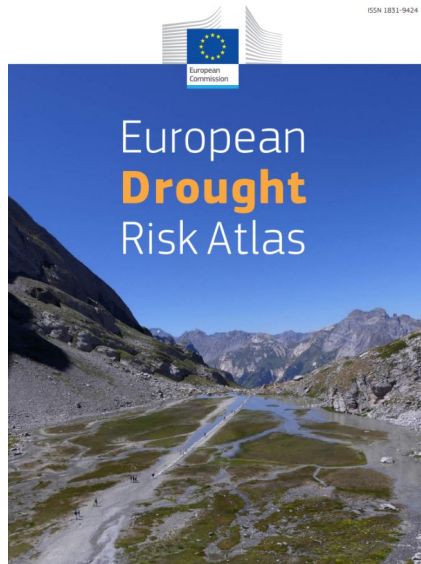


# Disaster risk assessment

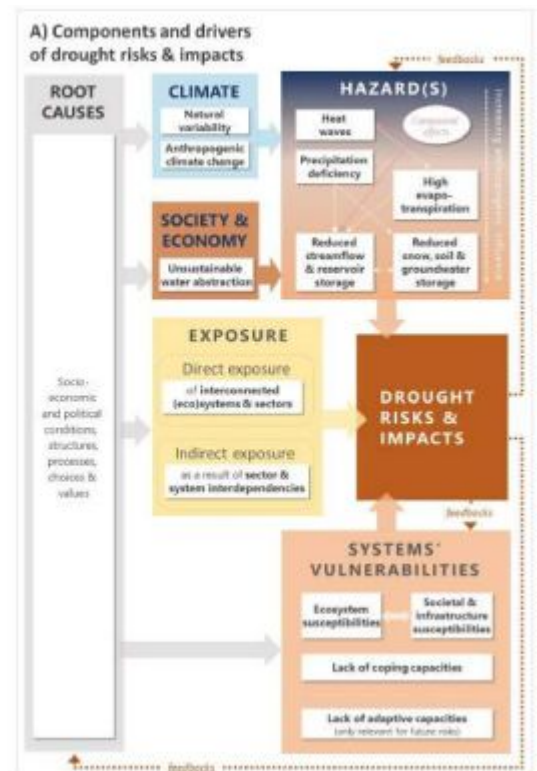
## Drought risk atlas (2023)



- Impact-based drought assessment
- Supports drought management and adaptation plans



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## Flood directive (2007)

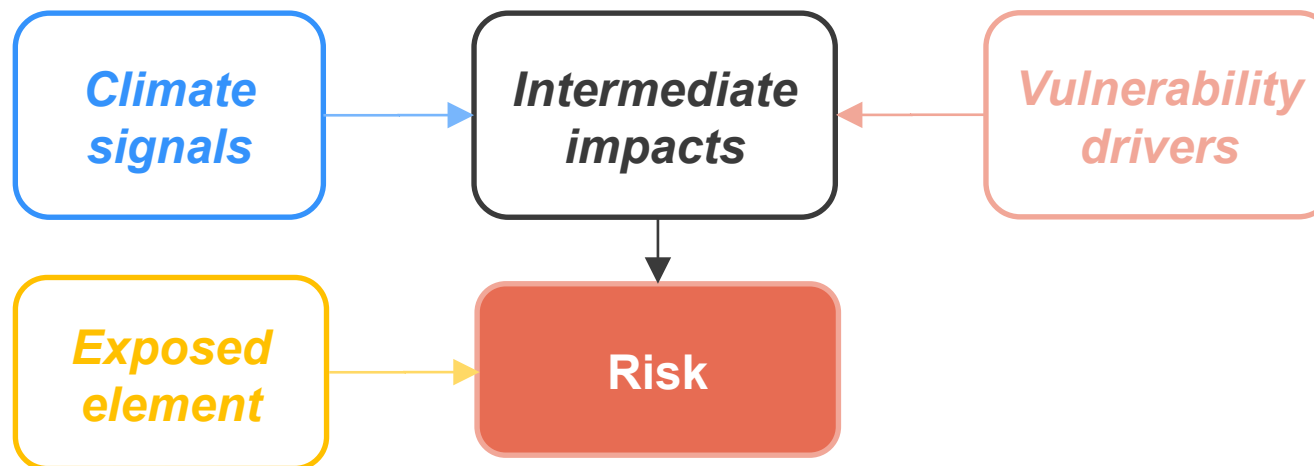


- Flood risk quantification and management
- Collects flood risk maps produced by Member States

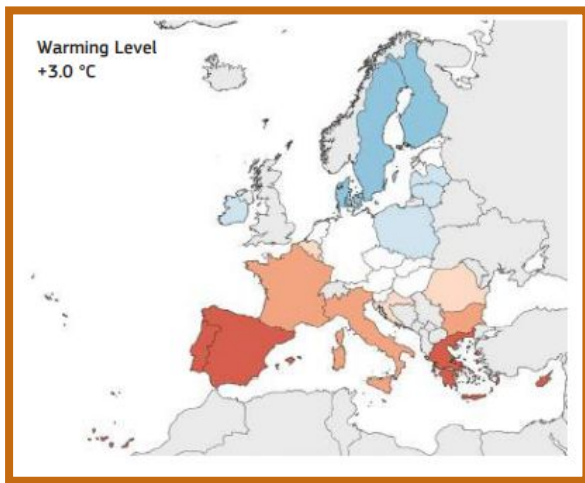


# Disaster risk assessment - Drought

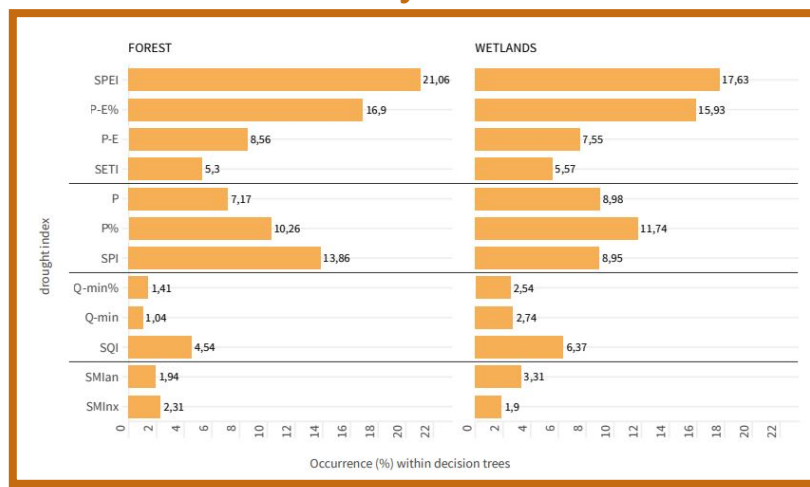
- Agriculture
- Public water supply
- Energy production
- Ecosystem
- River transportation



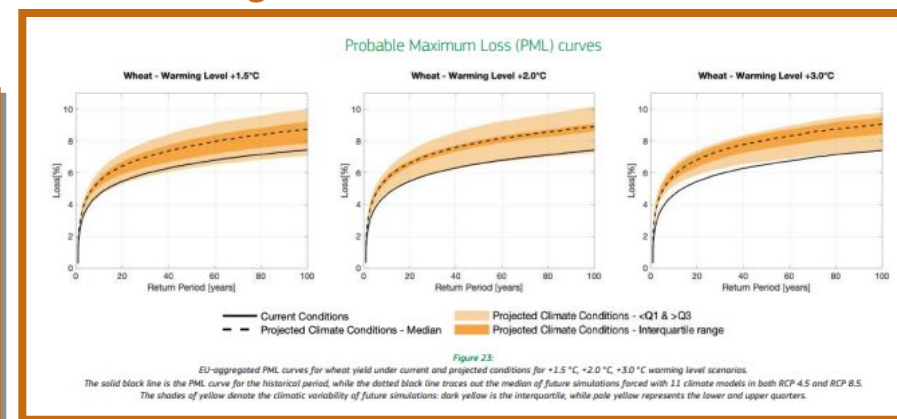
## Hydropower



## Ecosystems



## Agriculture - wheat



Emergency  
Management



European  
Commission



# Disaster risk assessment - floods



- 6 years cycle
- Effective in assessing risk
- Flood prevention still weak



[https://environment.ec.europa.eu/news/commission-publishes-new-flood-risk-areas-viewer-raise-awareness-about-significant-flood-risks-2023-10-13\\_en](https://environment.ec.europa.eu/news/commission-publishes-new-flood-risk-areas-viewer-raise-awareness-about-significant-flood-risks-2023-10-13_en)  
<https://op.europa.eu/webpub/eca/special-reports/floods-directive-25-2018/en/#:~:text=We%20found%20that%20the%20Floods,Plans%2C%20but%20improvements%20are%20needed.>



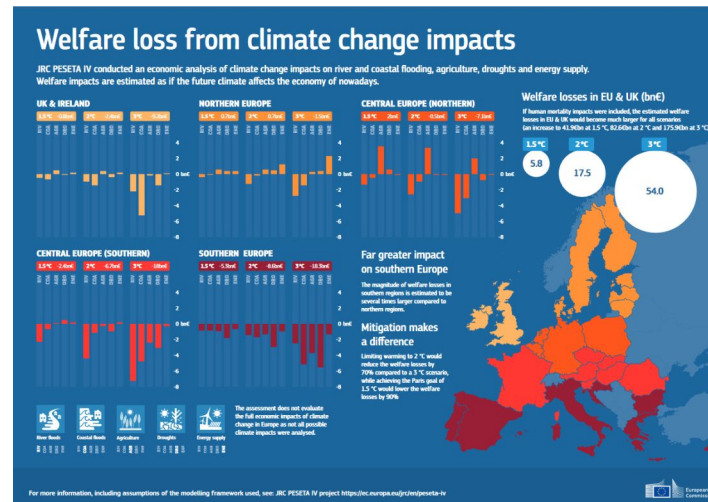
# Integrated assessment of CC impacts

## Estimates of current economic losses for Italy

- 1.4 billion/year loss due to drought (39-60% from agriculture) (22 -48% energy sector)

2022 drought: 6 billion damages from agriculture (source: Coldiretti)

Losses are expected to increase in all scenarios



## Water scarcity is already an issue in the EU

There are currently around 52 million people in the EU+UK living in water scarce regions. This is equivalent to 11% of the population. Most of the people exposed to water stress live in countries in southern Europe. In the Mediterranean, the period of water stress can exceed 5 months (Figure 1).



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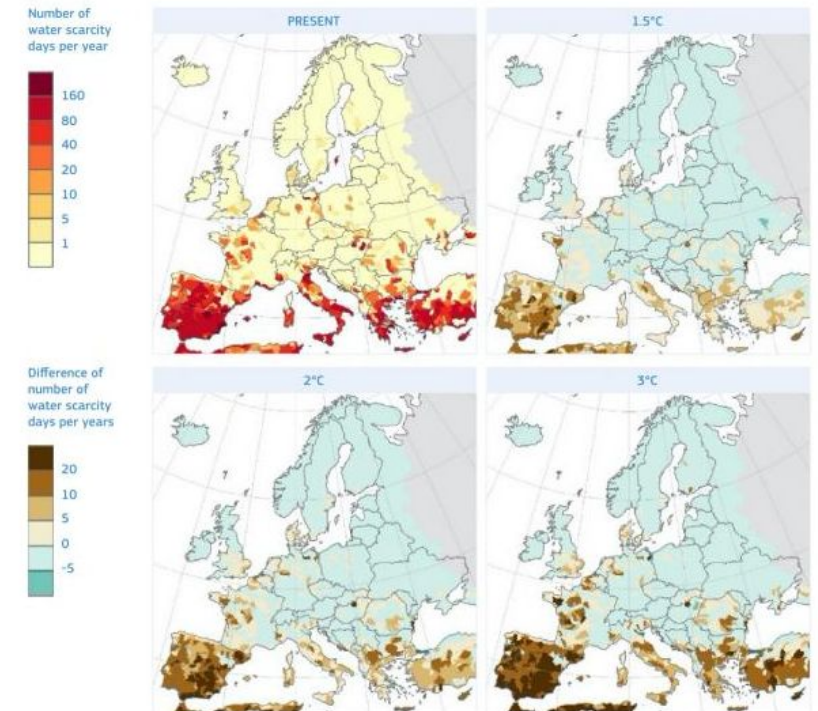
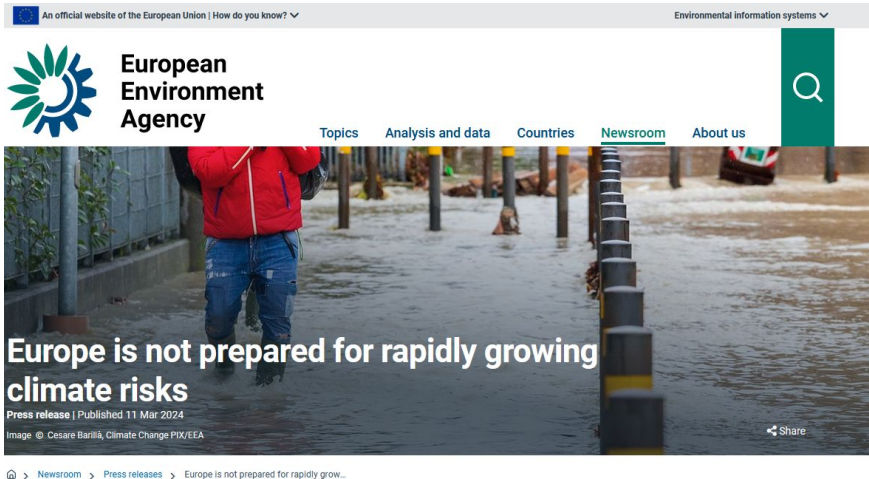


Figure 1. Number of water scarce days (WEI+ greater than 0.2) in present (refer to top colourbar) and projected changes relative to present for three different levels of global warming (refer to bottom colourbar).

Source: [https://joint-research-centre.ec.europa.eu/peseta-projects/jrc-peseta-iv\\_en](https://joint-research-centre.ec.europa.eu/peseta-projects/jrc-peseta-iv_en)  
[https://joint-research-centre.ec.europa.eu/document/download/eccf4612-9ebe-4861-97f4-d491d4?filename=pesetaiv\\_task\\_10\\_water\\_final\\_report.pdf](https://joint-research-centre.ec.europa.eu/document/download/eccf4612-9ebe-4861-97f4-d491d4?filename=pesetaiv_task_10_water_final_report.pdf)

# A new normality for the Po basin?

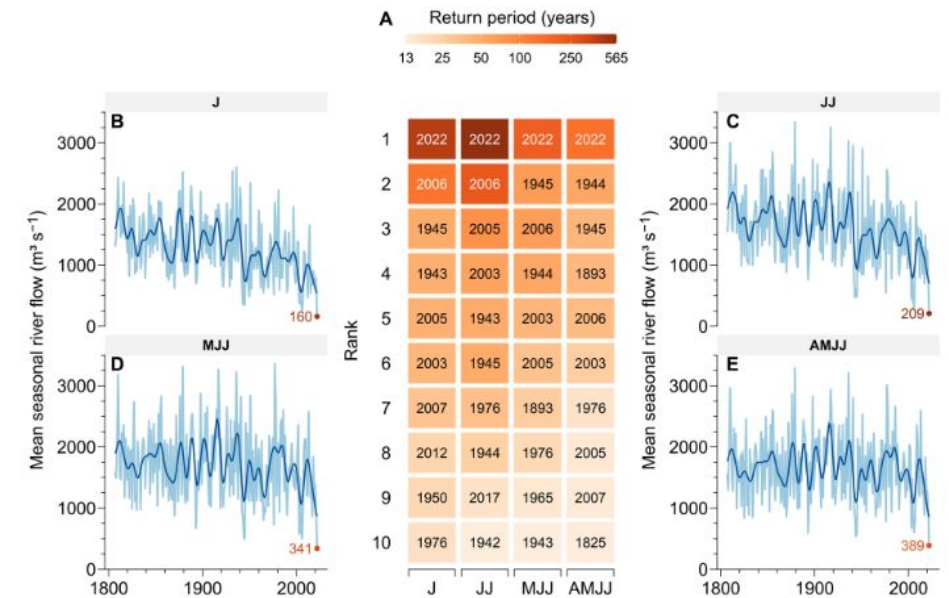
A preview for Europe?



Europe is the fastest warming continent in the world, and climate risks are threatening its energy and food security, ecosystems, infrastructure, water resources, financial stability, and people's health. According to the European Environment Agency's (EEA) assessment, published today, many of these risks have already reached critical levels and could become catastrophic without urgent and decisive action.

Which adaptation actions?

- Win-Win
- No/Zero regret
- Red tape
- Adaptation as opportunity for new sectors



Source: Montanari et al. 2023

# Po basin a pilot case for Europe



# Keep in touch



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# Thank you



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