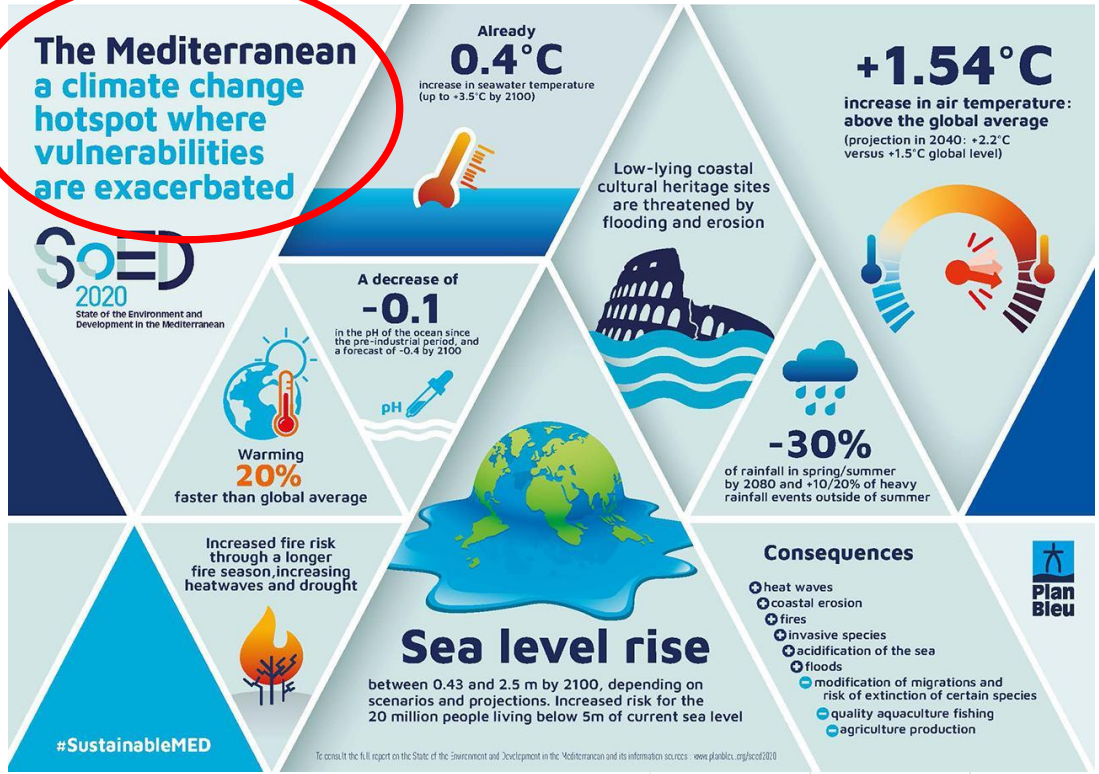
LIFE21-IPC-IT-LIFE CLIMAX PO-101069928

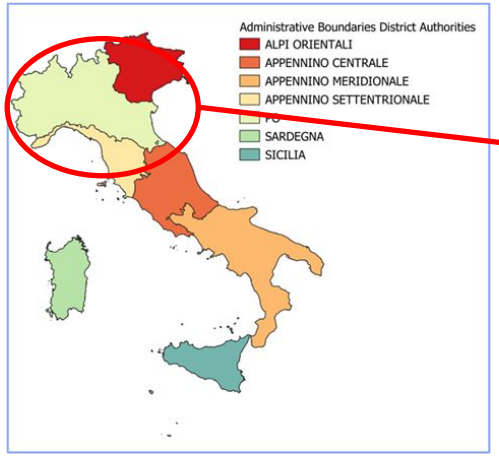
LIFE CLIMAX PO
The project on climate change adaptation

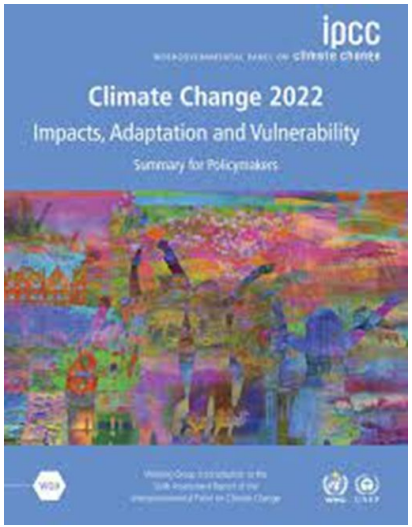
Francesco Tornatore - Autorità di Bacino Distrettuale del fiume Po

Parma, 19 May 2025

Climate Change in the Mediterranean area

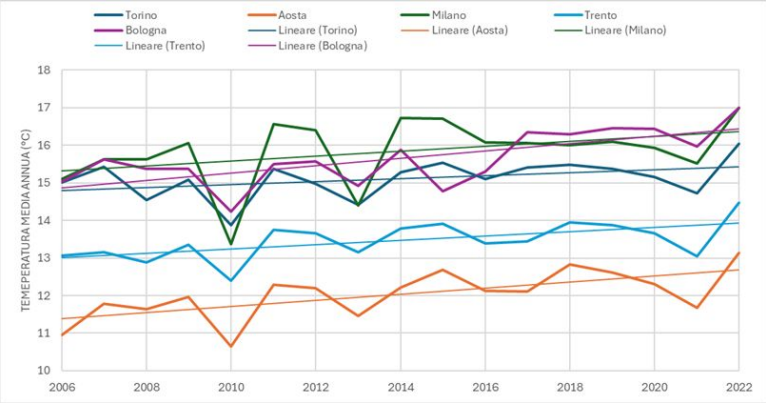






Based on global and regional climate prediction models, the **Po River District** is in the climate transition zone between the Mediterranean and Northern Europe, where uncertainty about future climate is higher than in other European areas.

Climate indicators for some of the main cities in the Po River District

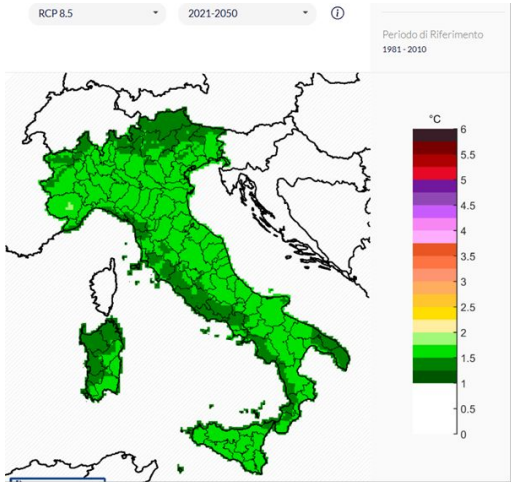


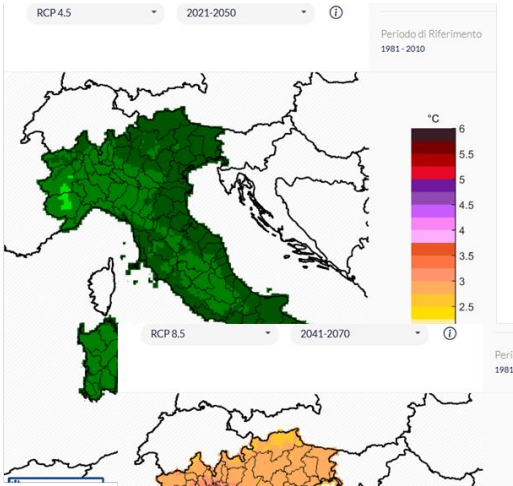
Minimum and maximum temperature

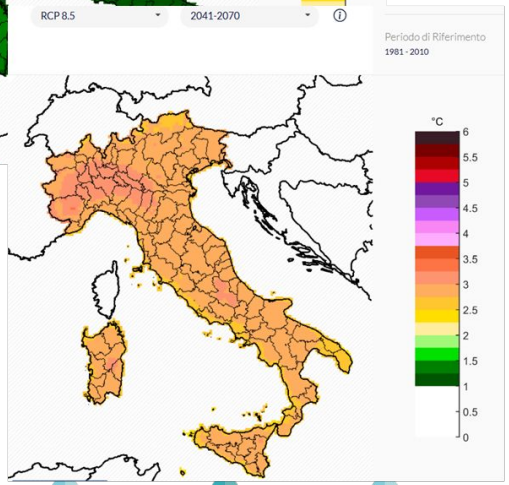
Number of summer days

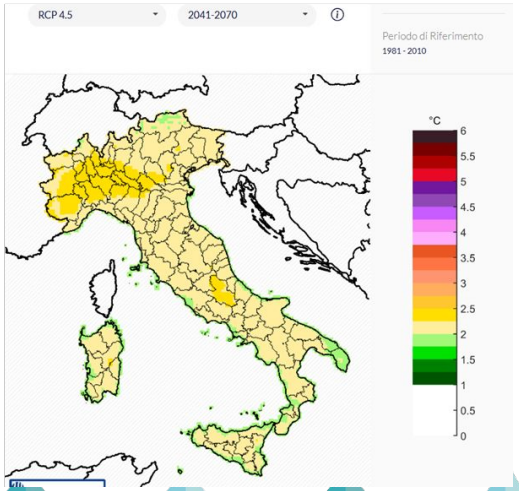
Number of tropical nights

COMUNI	Minimo delle temperature minime (°C)			Massimo delle temperature massime (°C)			Giorni estivi (T>25°C)			Notti tropicali (T>30°C)		
	2022	differenza 2022 dal valore medio 2006-2015	valore medio 2006-2015	2022	differenza 2022 dal valore medio 2006-2015	valore medio 2006-2015	2022	differenza 2022 dal valore medio 2006-2015	valore medio 2006-2015	2022	differenza 2022 dal valore medio 2006-2015	valore medio 2006-2015
Torino	- 2.7	+1.8	- 4,5	+36.9	+1.3	+35,6	124	+9.1	115	76	+35.2	41
Aosta	- 12.1	- 1.0	- 11,1	+36.8	+2.3	+34,5	121	+29.3	92	2	+0.6	1
Milano	- 0.7	+2.1	- 2,8	+37.1	+0.5	+36,6	131	+16.3	115	101	+43.5	58
Trento	- 4.8	+1.3	- 6,1	+37.4	+1.8	+35,6	121	+24.3	97	19	+7.7	11
Bologna	- 2.1	+2.5	- 4,6	+38.9	+1.7	+37,2	143	+27.8	115	95	+46.8	48



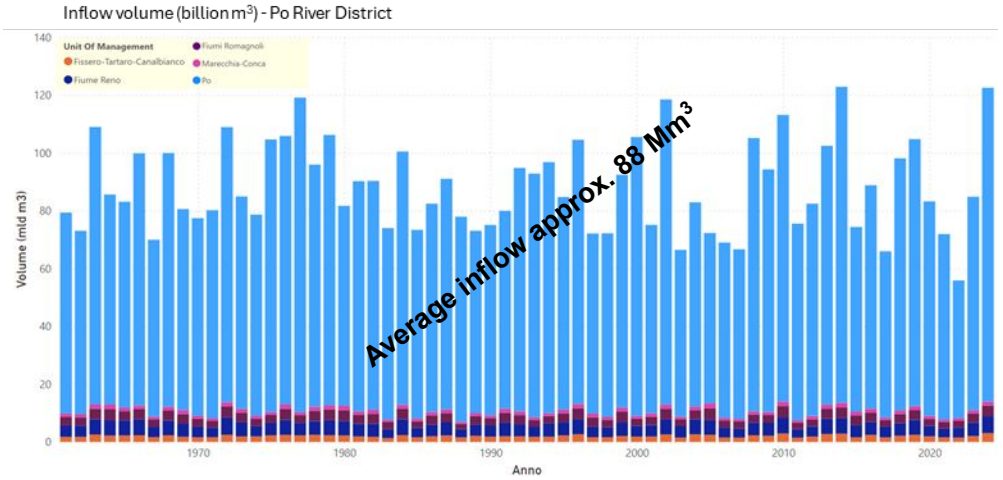


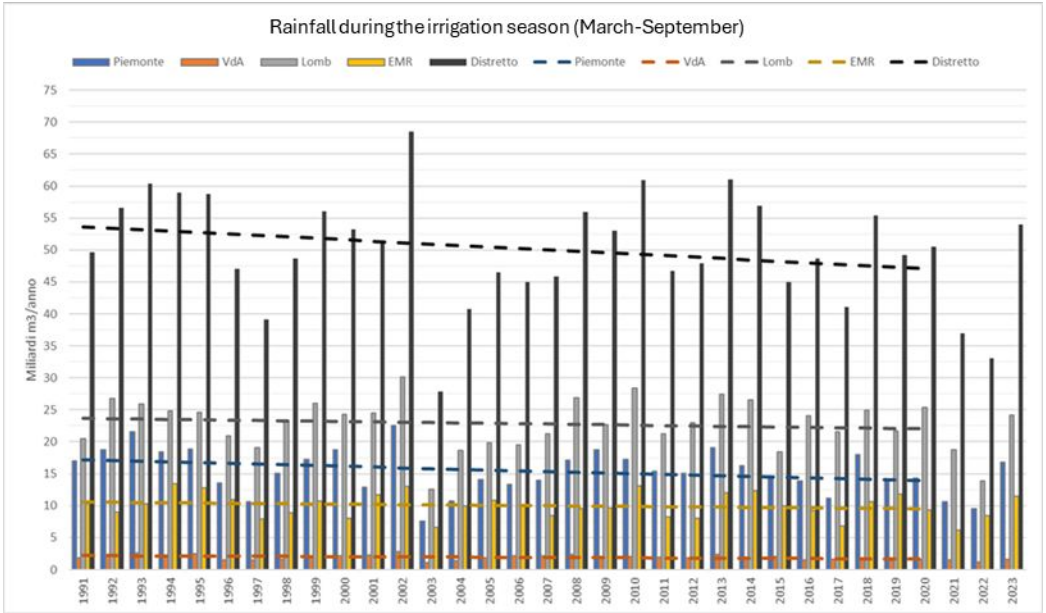




Expected daily average temperature based on RCP climate models 4.5 and 8.5

The Po River District has always been characterised by marked inter-annual meteorological and hydrological variability, but since 2000 there have been no less than 7 years in which the hydro-climatic balance was negative (i.e. the difference between rainfall and evapotranspiration) and 7 in which it was positive or very positive.





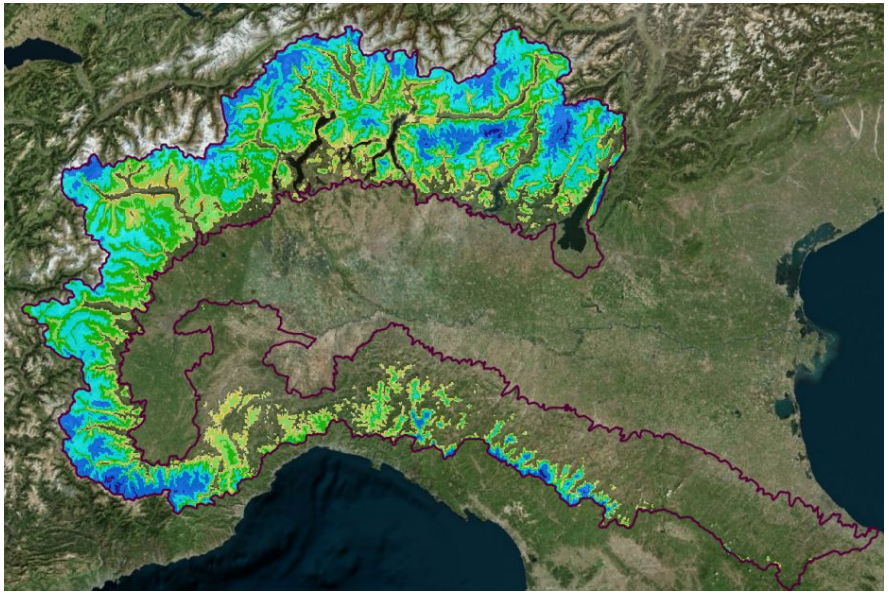
Over the period 1991-2022, no statistically significant changes in the average volume of rainfall are observed, but if we refer to the irrigation season alone, then the downward trend in rainfall is much more evident.

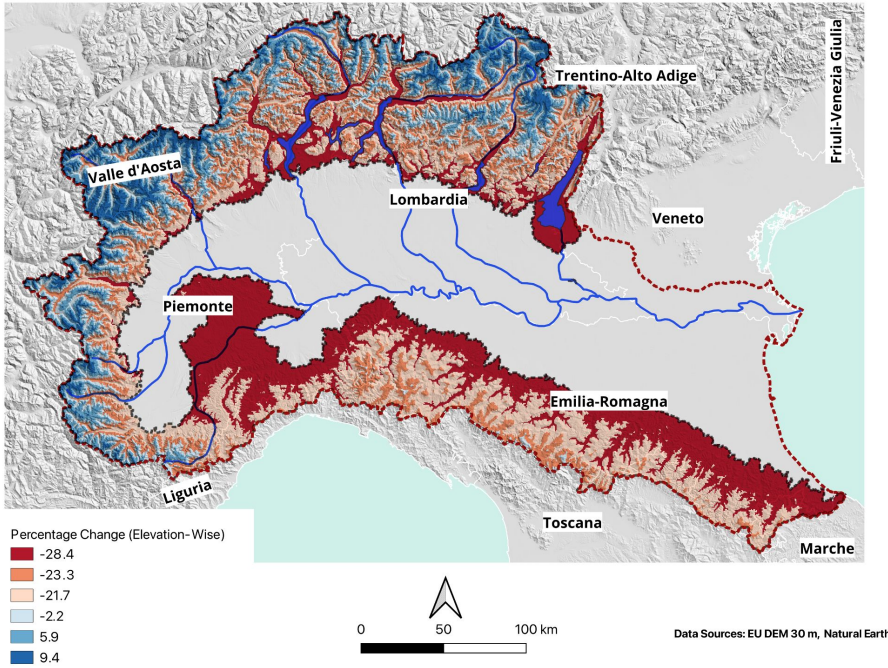
Overall reduction in the number of total events and increase in the intensity of individual rainfall events!

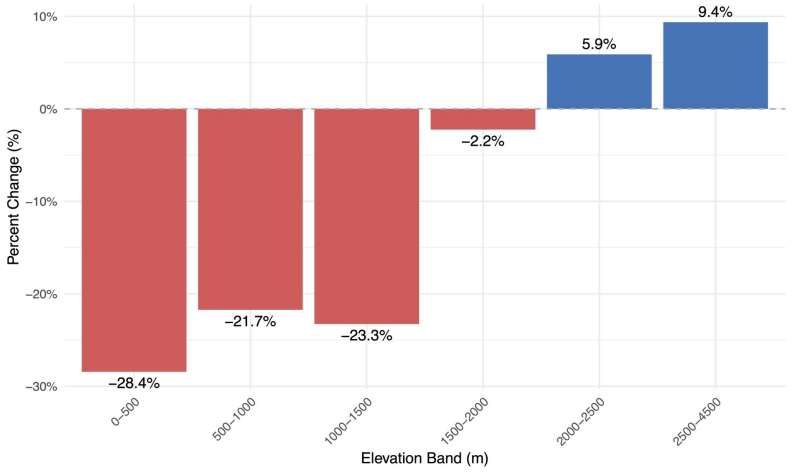
ADBPO recently conducted a study on the spatial distribution of the Snow Water Equivalent (SWE) calculated on a daily scale for the years 1991 to 2021.

An initial analysis of the data shows that the trend towards **winters with little snow** seems to be consolidating mainly in the areas of the District located **below 1300 meters above sea level**.

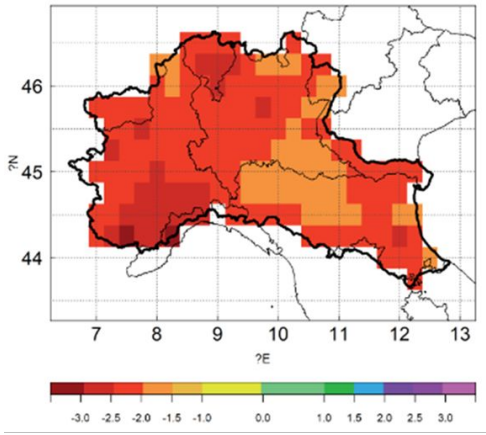
Above 2,000 metres, on the other hand, snow depths in the middle of winter (December to February) do not show a clear trend, although most of the measuring stations show a **clear decrease in the number of days with snow on the ground**, which is attributable to an earlier snowmelt in spring and the late appearance of snow in autumn, especially at the stations located at lower altitudes.



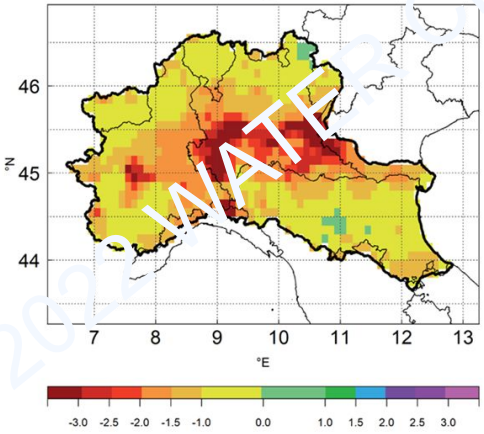

Trentino-Alto Adige
Friuli-Venezia Giulia
Valle d'Aosta
Lombardia
Veneto
Piemonte
Emilia-Romagna
Liguria
Toscana
Marche
Percentage Change (Elevation-Wise)
-28.4
-23.3
-21.7
-2.2
5.9
9.4
0
50
100 km
Data Sources: EU DEM 30 m, Natural Earth


10%
0%
−10%
−20%
−30%
Percent Change (%)
9.4%
5.9%
−2.2%
−21.7%
−23.3%
−28.4%
0–500
500–1000
1000–1500
1500–2000
2000–2500
2500–4500
Elevation Band (m)

STI – July 2022

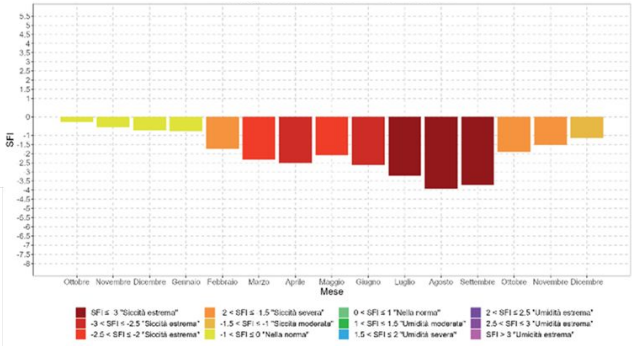


SPI – June 2022

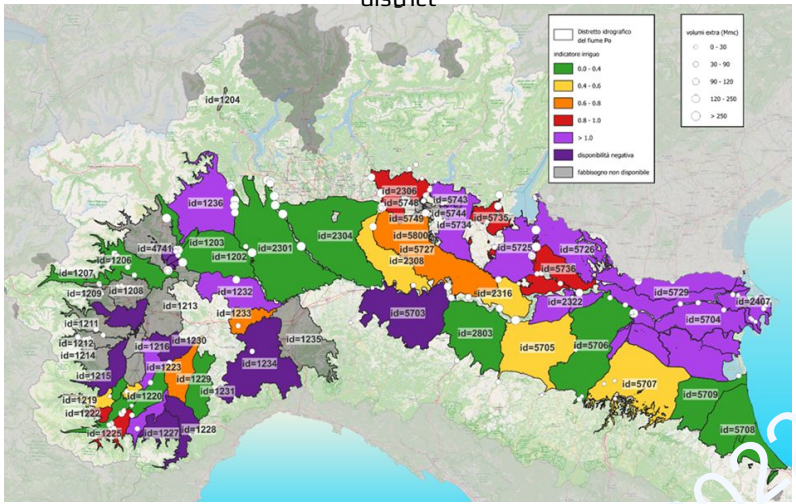


2022
-35% inflows compared to the long-term average

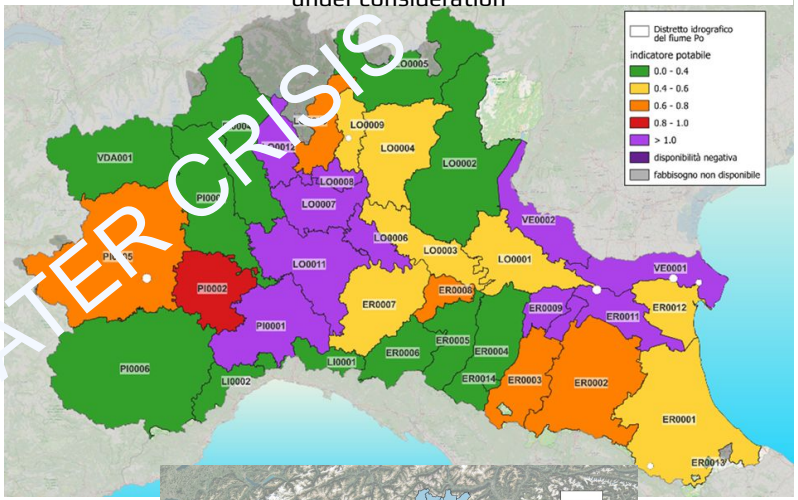
Pontelagoscuro Oct. 2021 – Dic. 2022

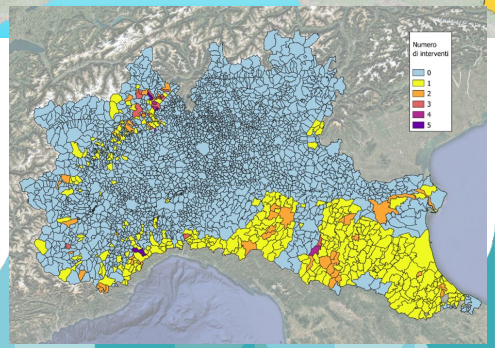


Ratio of irrigation use to water availability in 2022 for each irrigation district

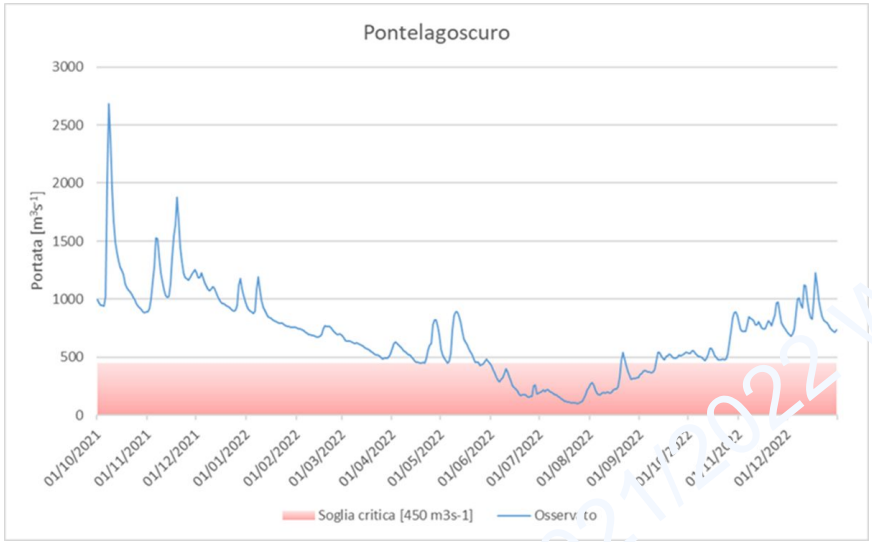


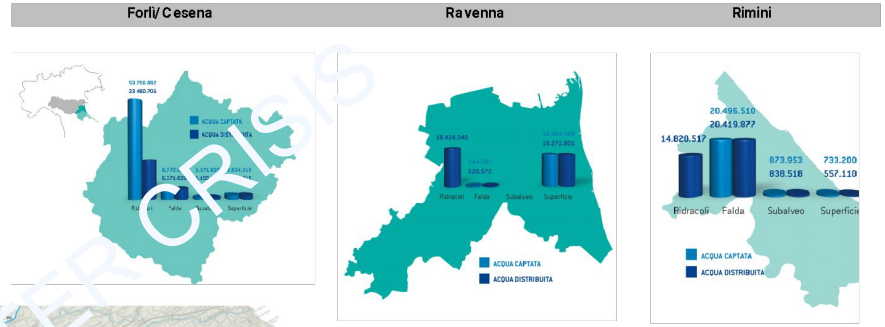
Ratio of drinking water use to water availability in 2022 for each EGATO/GSII without the contribution of volumes outside the area under consideration





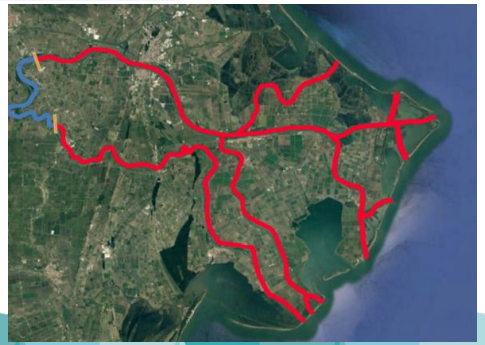
On 24 July 2022, the lowest flow rate ever recorded was 114 m^3/s at Pontelagoscuro!





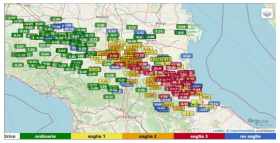
270.000 inhabitants served

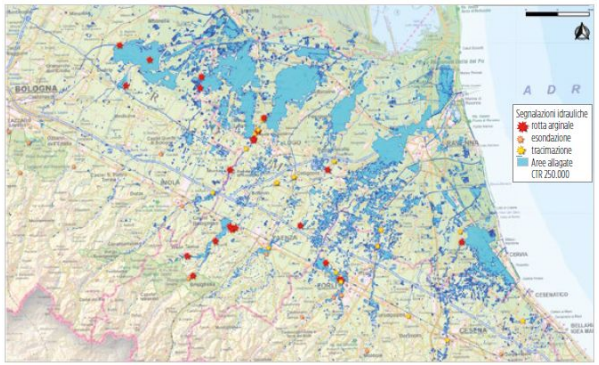
25.000 non-irrigable hectares



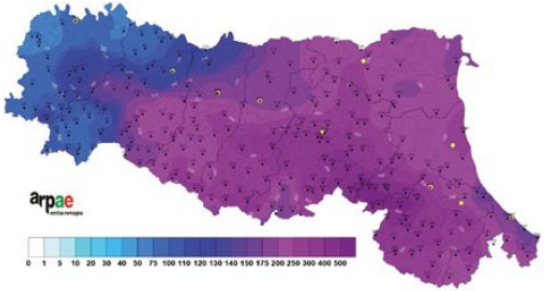
The rainfall events of 1-3 May and 16-17 May together accounted for 50 per cent of the average annual precipitation in the Emilia-Romagna region.

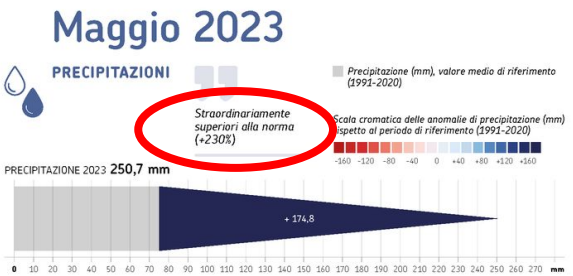
The rainfall event affected the entire hydrographic district, both natural and artificial, causing the flooding of 19 rivers. Flooding was recorded throughout the territory between Bologna and Rimini, bank breaches and widespread slope landslides throughout the hill-mountainous



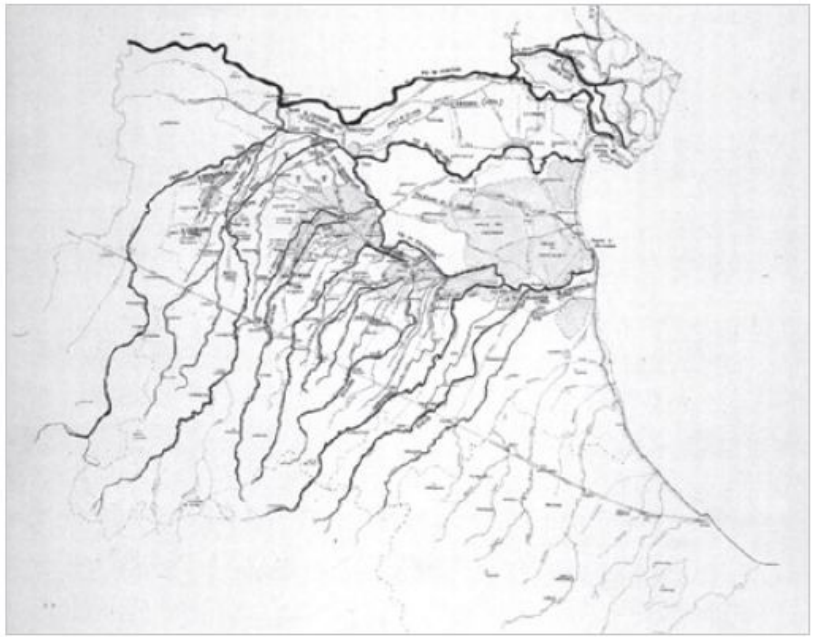


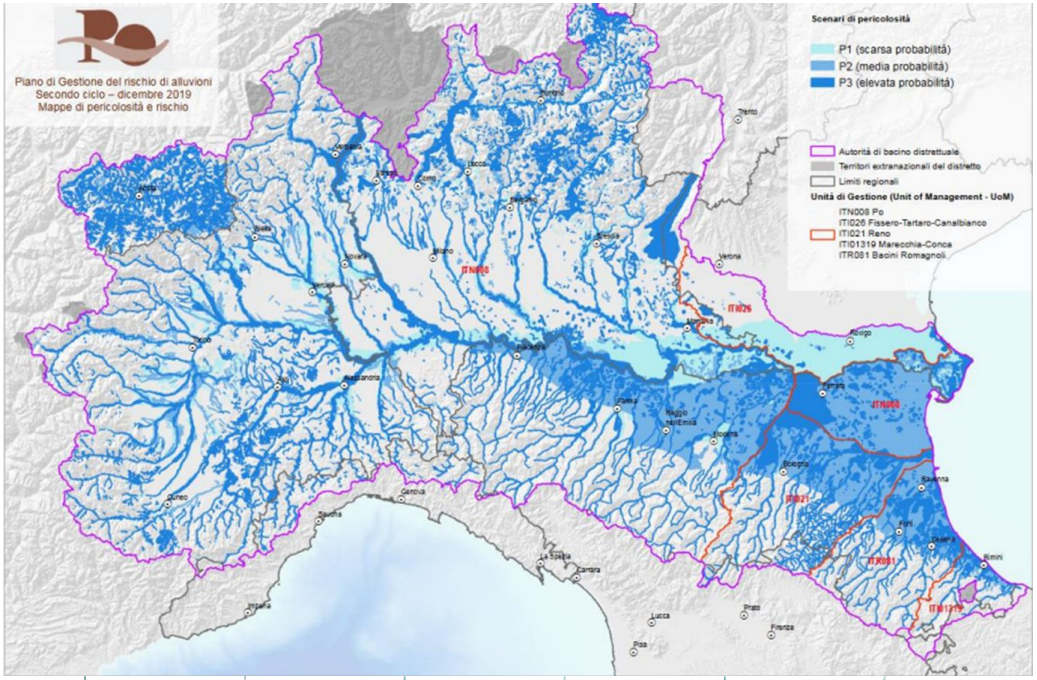
FLOODS 2023



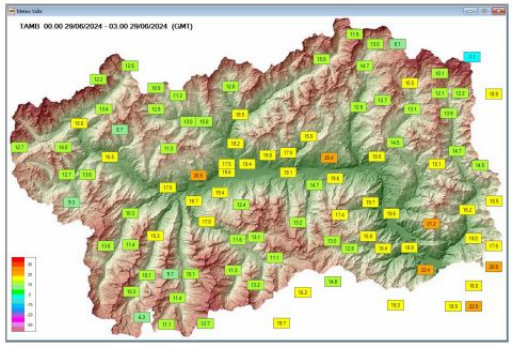


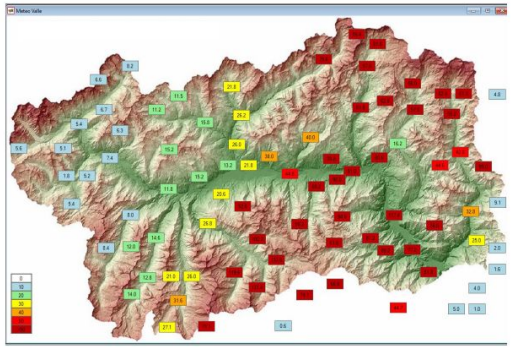
FLOODS 2023





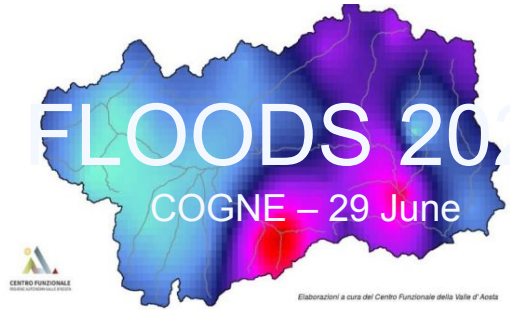
Po Valley of Bologna, Ravenna and Forlì between the 15th and 17th centuries

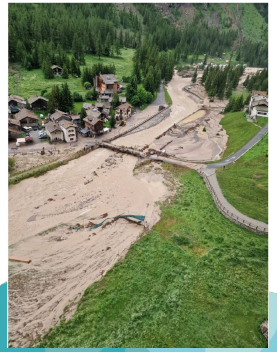


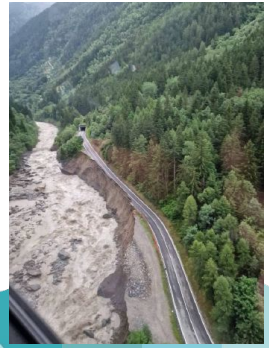


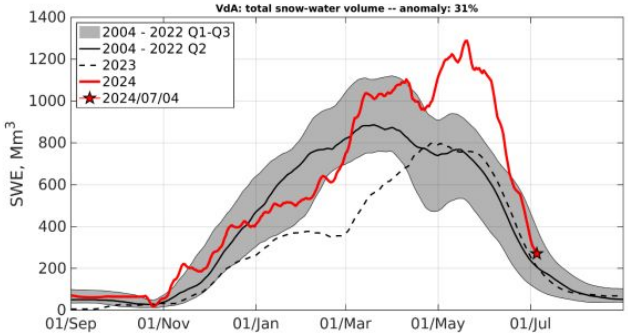
27/06 - 4.455 m^3/s in Pontelagoscuro

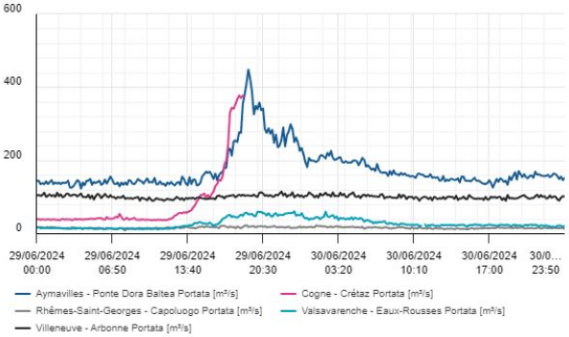
At the beginning of the event, about 700M³ of water had already changed from the solid state (snow) to the liquid state (about 200 mm of average equivalent precipitation over the Aosta Valley in the month preceding the event, resulting from the melt).



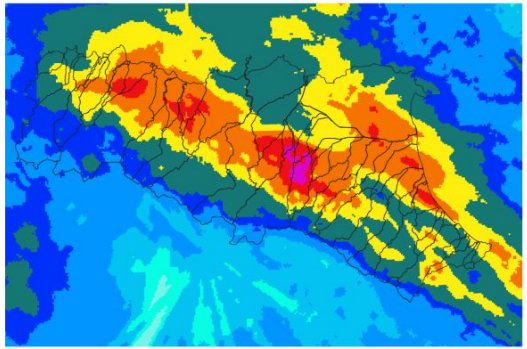


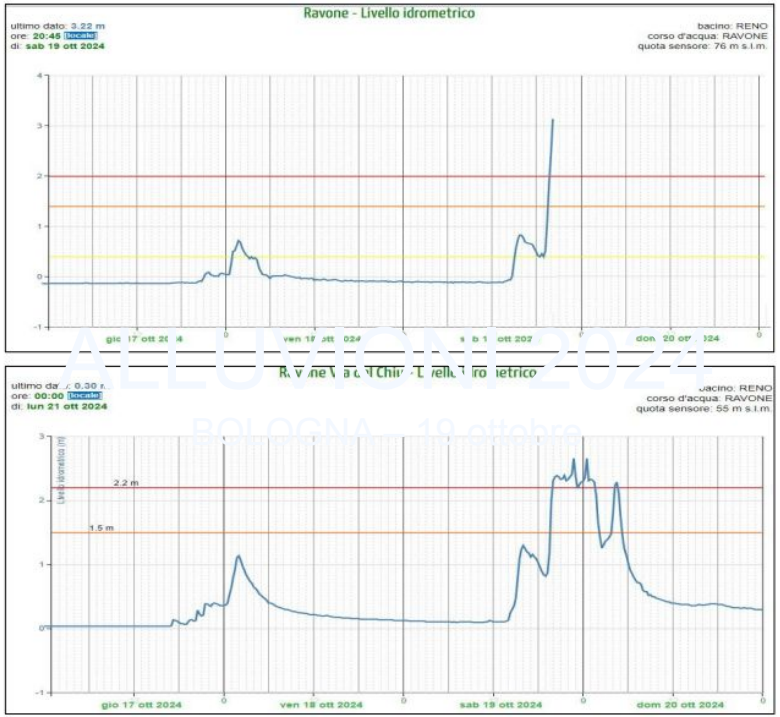




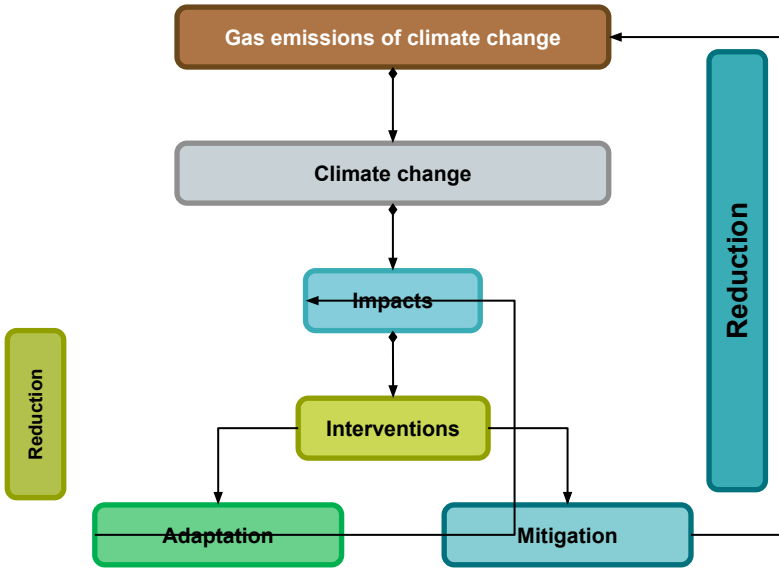


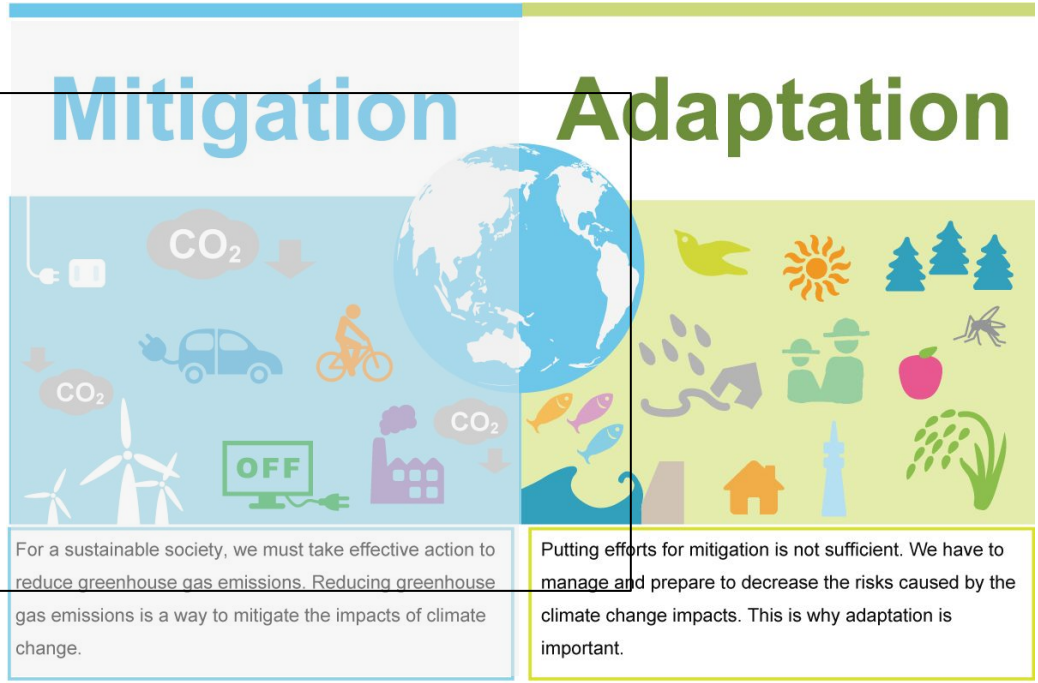
Applying flow regionalisation, the estimated flood discharge of the Dora Baltea carried out at Cogne - Cretaz was estimated to have a **return time a is 1000 years!**





The average rainfall over the Bologna municipality on 19 October 2024 (> 150 mm) represents the absolute **record for daily rainfall since 1961!**

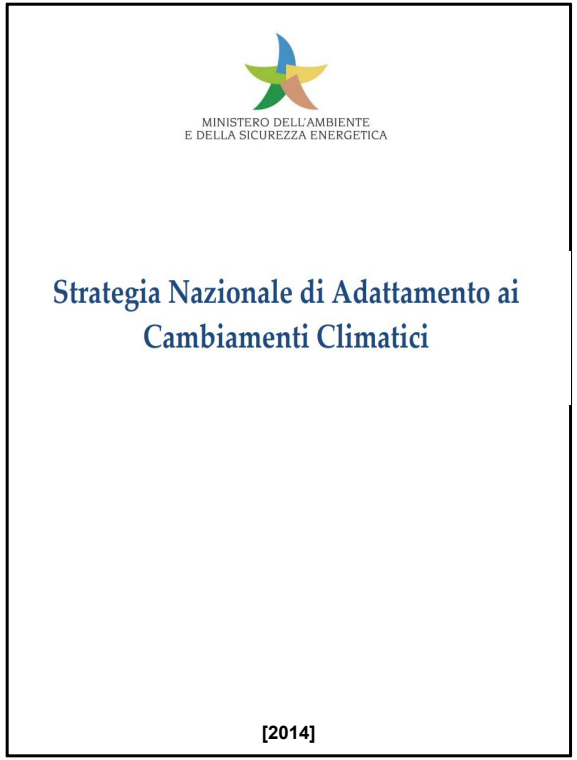




For a sustainable society, we must take effective action to reduce greenhouse gas emissions. Reducing greenhouse gas emissions is a way to mitigate the impacts of climate change.

Putting efforts for mitigation is not sufficient. We have to manage and prepare to decrease the risks caused by the climate change impacts. This is why adaptation is important.

Reference 18 A-PLAT (climate change adaptation platform) portal site, National Institute for Environmental Studies



MASE approved the National Climate Change Adaptation Plan (NACC, Decree No. 434 of 21 December 2023) to NAS implementation.

Co-funded by the European Union

LIFE CLIMAX PO
Make the Change

CLIMate Adaptation for the PO river basin district

General aim

Promote adaptation to climate change through smart water management.

- Governance
- Shared climatic knowledge
- Cooperation and integration
- Water security and climate resilience
- Climate Adaptation for the Po River District

Co-funded by the European Union

LIFE CLIMAX PO Make the Change

CLIMate Adaptation for the PO river basin district

Programme: LIFE SIP

Study area: Po River District

Time: 9 years

Budget: 17,890,937 €

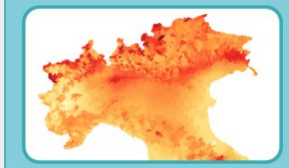
UE Co-funding: 10,734,562 € (60%)

Partner: 21 + 4 associated

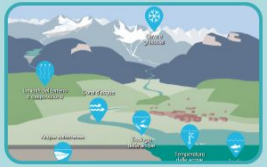
Co-funded by the European Union

LIFE CLIMAX PO Make the Change

CLIMATE CHANGE



WATER MANAGEMENT



NATURE-BASED SOLUTIONS

EXTREME EVENTS AND EARLY WARNING SYSTEM

AGROSISTEMS ADAPTATION

COMMUNICATION

More than 200 Stakeholder
also from organisations and institutions operating abroad and in territories not belonging to the Po River District

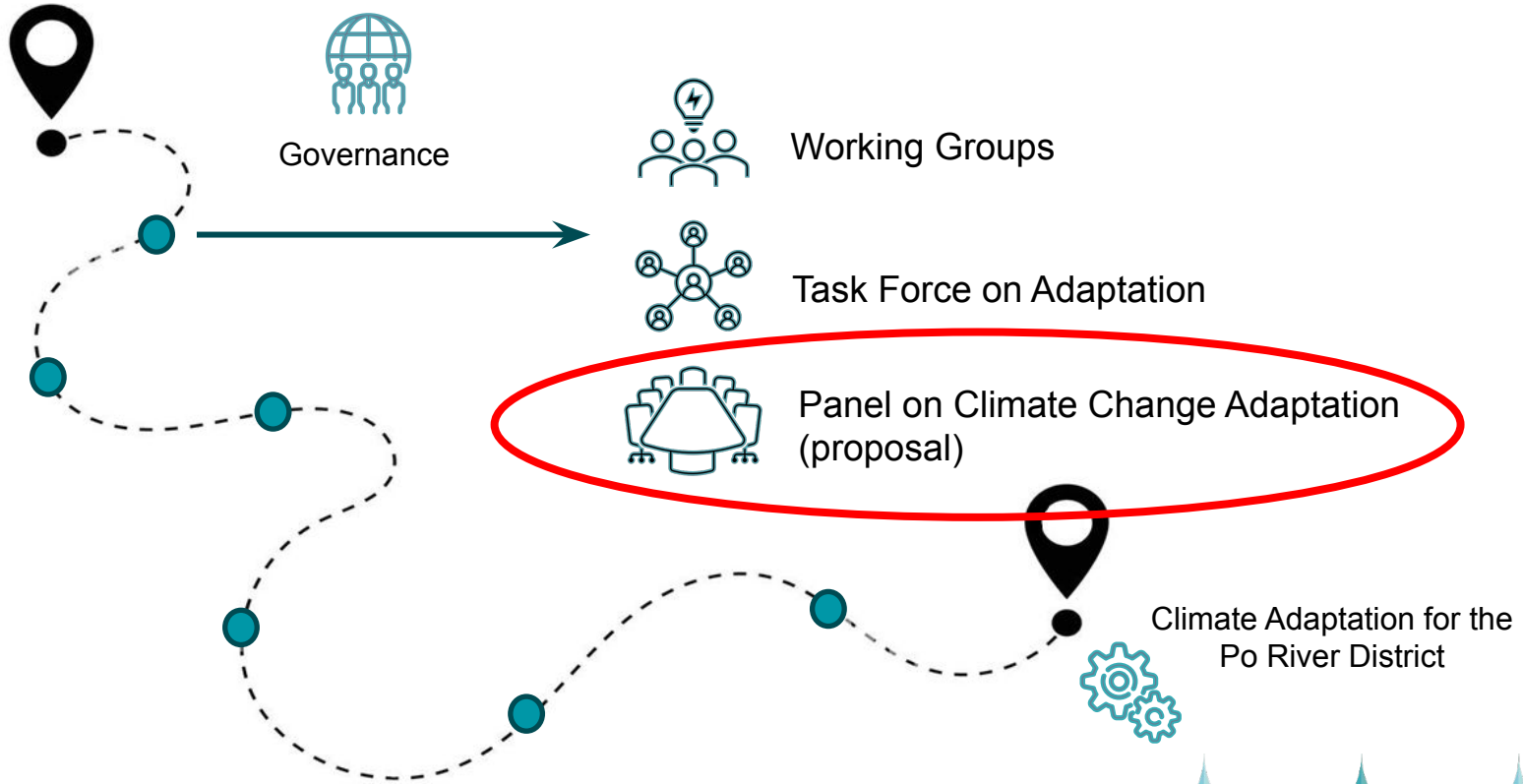
River café (e.g. Casalmaggiore photo of 7 September 2024)

PA training (e.g. 26 March in Pavia and 3 April in Comacchio)

Po River Blue Fest

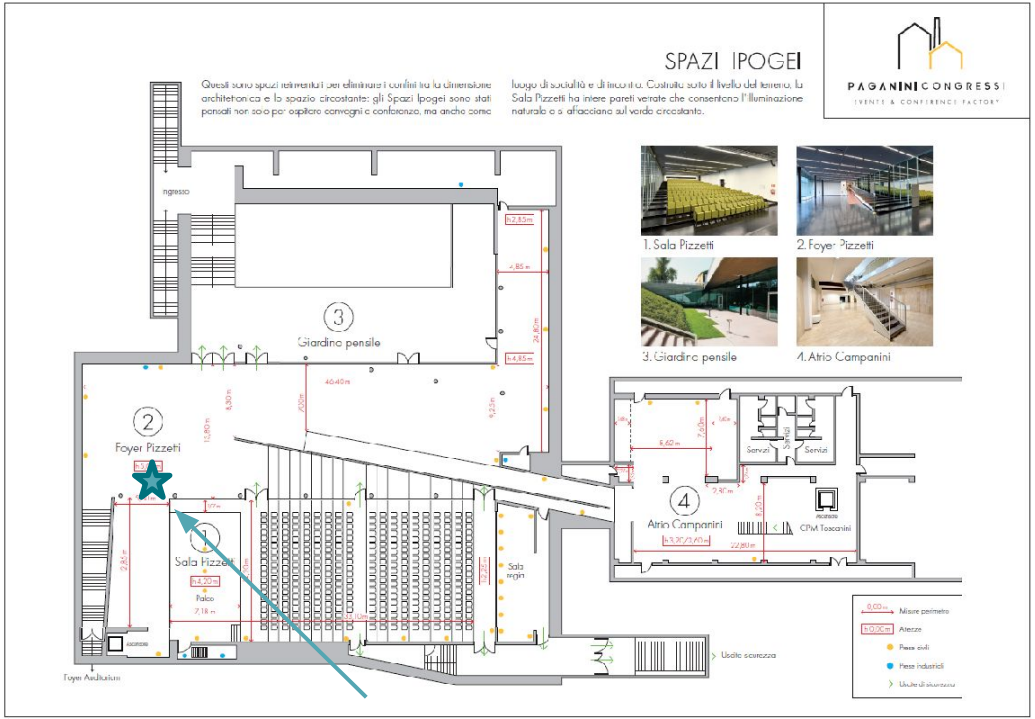
16 e 17 May in Bologna and Ravenna

Thematic, Regional and District Board


Governance
Working Groups
Task Force on Adaptation
Panel on Climate Change Adaptation (proposal)
Climate Adaptation for the Po River District

Visit us for more information about the project!

LIFE CLIMAX PO project - Let's keep in touch!



You can find us here

"It is not the strongest or the most intelligent species that survives, but the one that adapts best to change."

«*Lessons from Europe for American Business*»
Leon C. Megginson, US university professor and essayist.
(1963)

https://www.lifeclimaxpo.adbpo.it/ | climaxpo@adbpo.it

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