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EU MISSIONS

ADAPTATION TO CLIMATE CHANGE

Drying landscapes: Embracing Water Resilience in a Changing Climate



#EUmissions #HorizonEU #MissionClimateAdaptation



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Drying landscapes: Embracing Water Resilience in a Changing Climate

September 17th, 14:00- 15:30 CET



Agenda

Duration (min)	Agenda item
5	Welcome
5	Warm-up quiz: 5 questions in 5 minutes!
10	Droughts – what to do?
20	Showcasing experiences and other relevant examples
10	Opportunities: Water4All ongoing projects and next calls
15	Q&A
5	Closing remarks

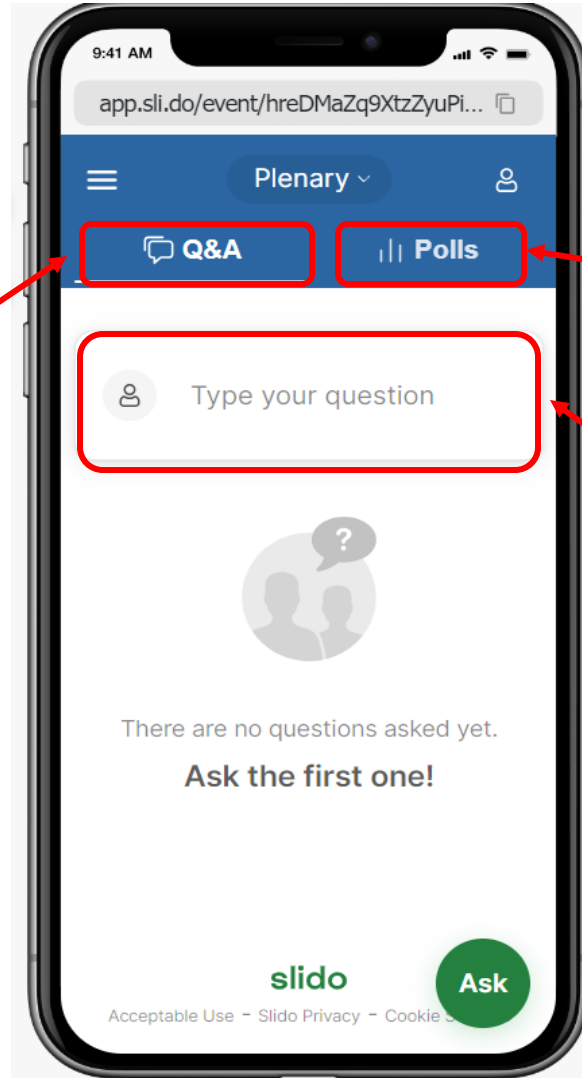


Housekeeping

- Please note that the **meeting is being recorded**.
- Please use slido for the Q&A to pose any questions to the speakers. Please don't unmute yourself, except for when your question is selected and you would like to ask directly.
- Select "Gallery view" in the top right corner so that you can see the presentation and the main speaker. For this to work, all other **cameras** and mics must be off, except for the speaker(s).



Slido

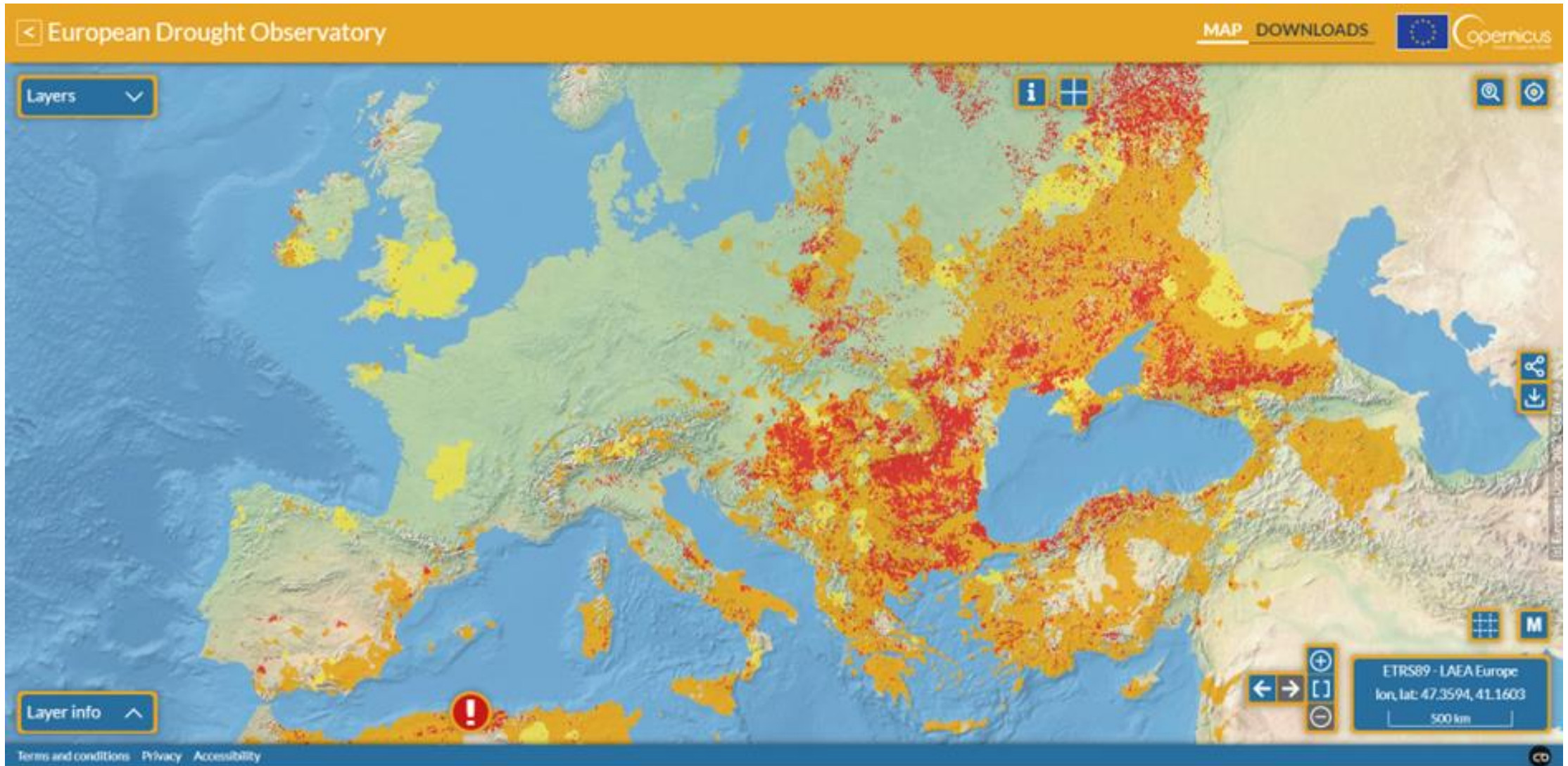


Click here to ask a question.

Click here for accessing the polls.

Type your questions here.







Slido Questions

Warm-up quiz: 5 questions
in 5 minutes!





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Lukas Repa

**European Commission
DG Environment**



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Jordi Molist

Catalan Water Agency

Location

Catalonian river basin district



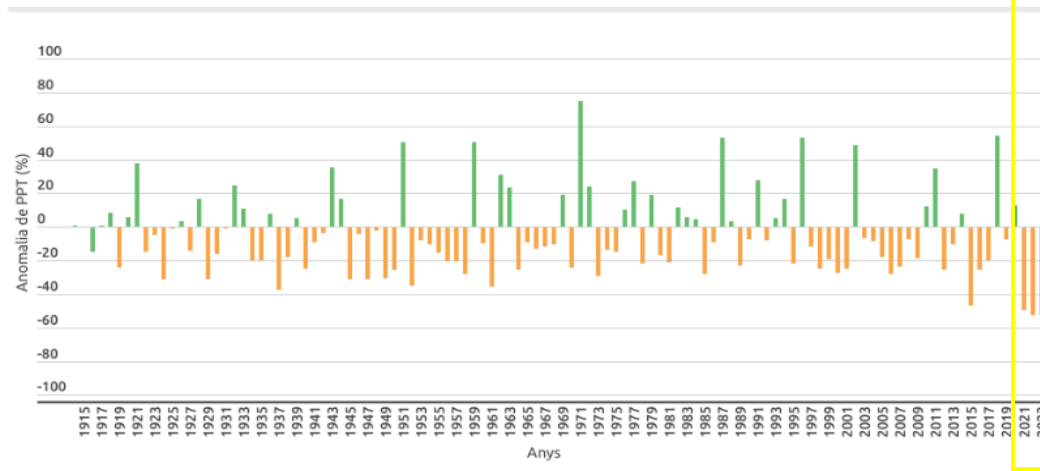
International and national river basin districts and sea regions

- | | |
|---|--|
| International river basin district | Regional sea coastline |
| National river basin district | Black Sea |
| International river basin district outside EU-27 | Mediterranean Sea |
| National river basin district outside EU-27 | Celtic Sea, Bay of Biscay and the Iberian Coast |
| International river basin district boundary | Greater North Sea |
| Country boundary | Baltic Sea |
| EU-27 boundary | Outside EU-27 |



An unprecedented four-year drought (still ongoing)

Observatori Fabra - Anomalia de la precipitació acumulada anual



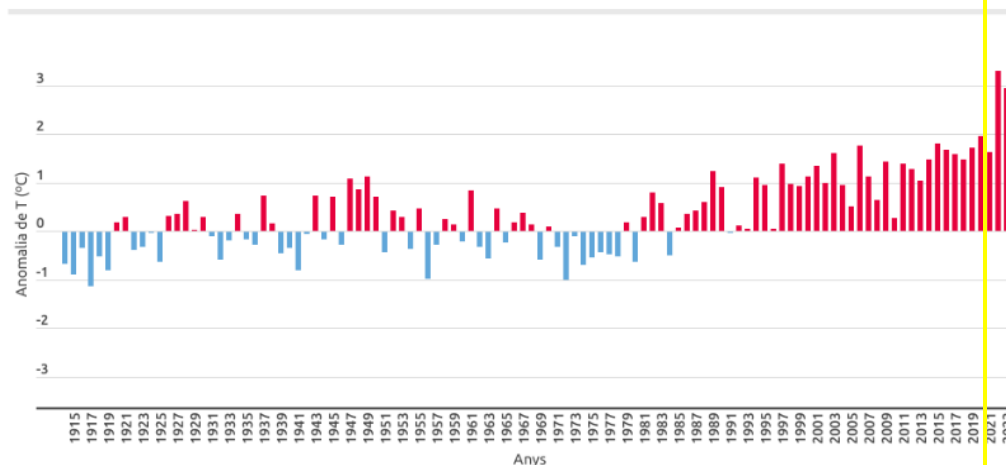
Sustained rainfall deficit of 50%

On the graph:
Annual precipitation anomalies (%)



Sept. 21

Observatori Fabra - Anomalia de la temperatura mitjana anual



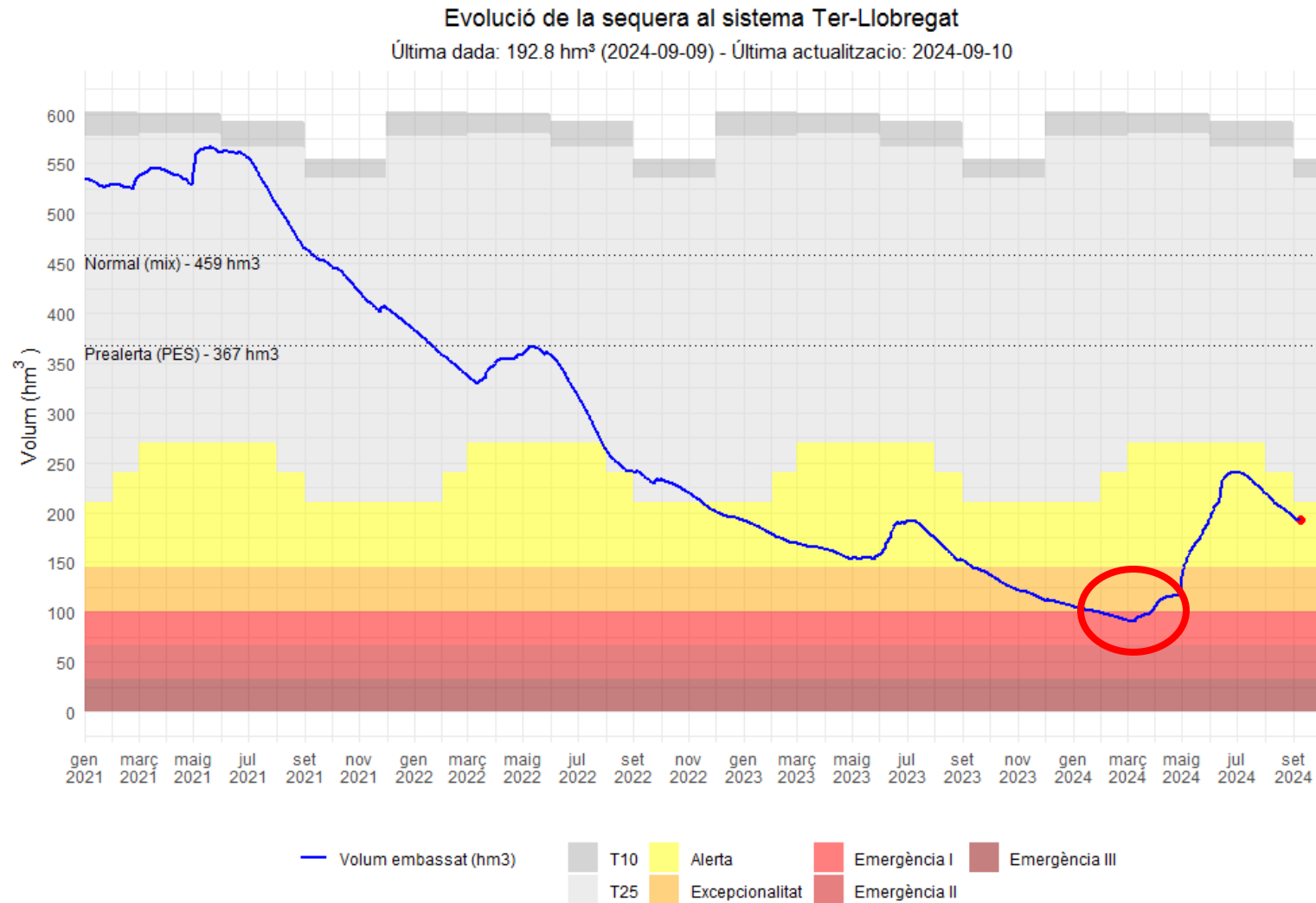
Record temperatures

On the graph:
Annual average temperature anomalies (°C)



March 24

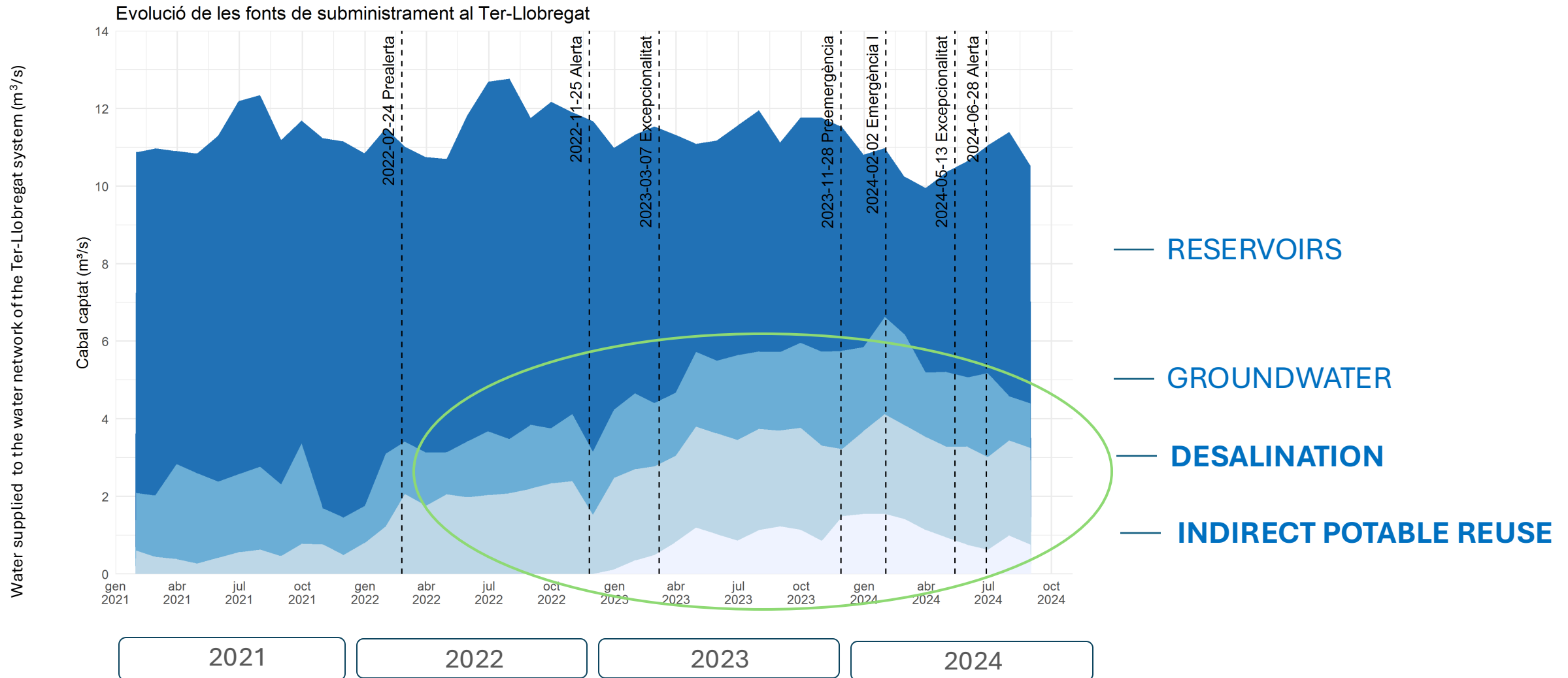
Evolution of water reserves in the reservoirs (2021-2024)



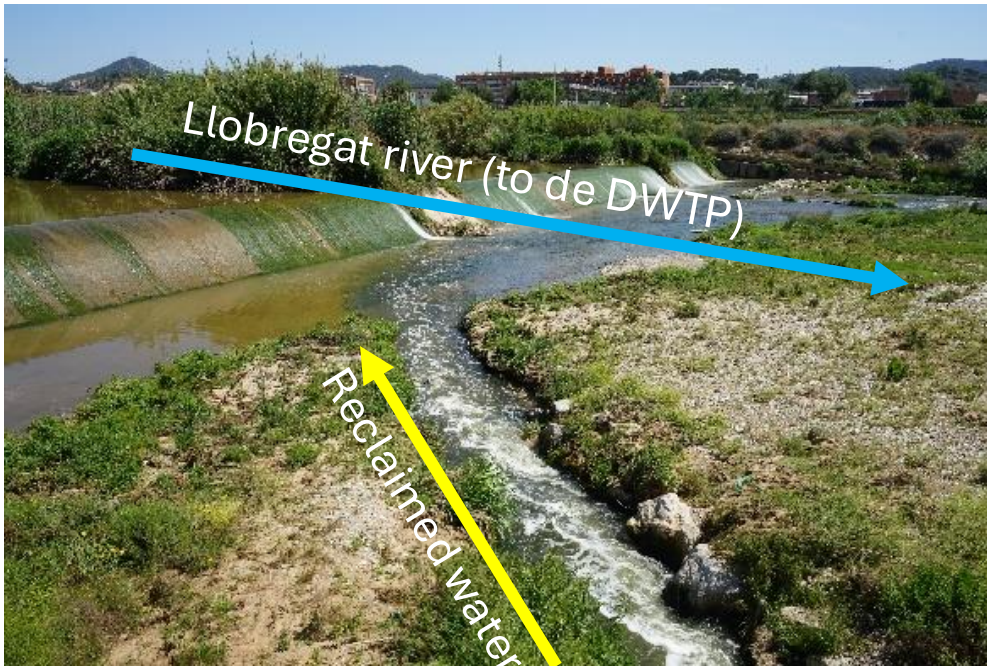
DGRH - ACA

On the supply side

Origin of the bulk water supplied to the Greater Barcelona Area during the last three years



Indirect Potable Reuse in Barcelona



- ❑ Included in the [Drought Plan](#)
- ❑ Reclaimed water has been introduced into the river [8 km upstream from Barcelona's Drinking Water Treatment Plant](#).
- ❑ This practice has been ongoing for the last [22 months](#).
- ❑ IPR has saved [48 hm³](#) in reservoirs.
- ❑ This contribution has been crucial in preventing [water shortages](#) in Barcelona.

On the demand side

1 All **water rights holders** have been affected

Reductions apply to normal consumption for each type of use, depending on the drought stage

Water use	Alert	Excepcionalidad	Emergency
Farm irrigation	25%	40%	80%
Livestock	10%	30%	50%
Industrial	5%	15%	25%
Recreational with irrigation	30%	50%	100%
Other recreational	5%	15%	25%

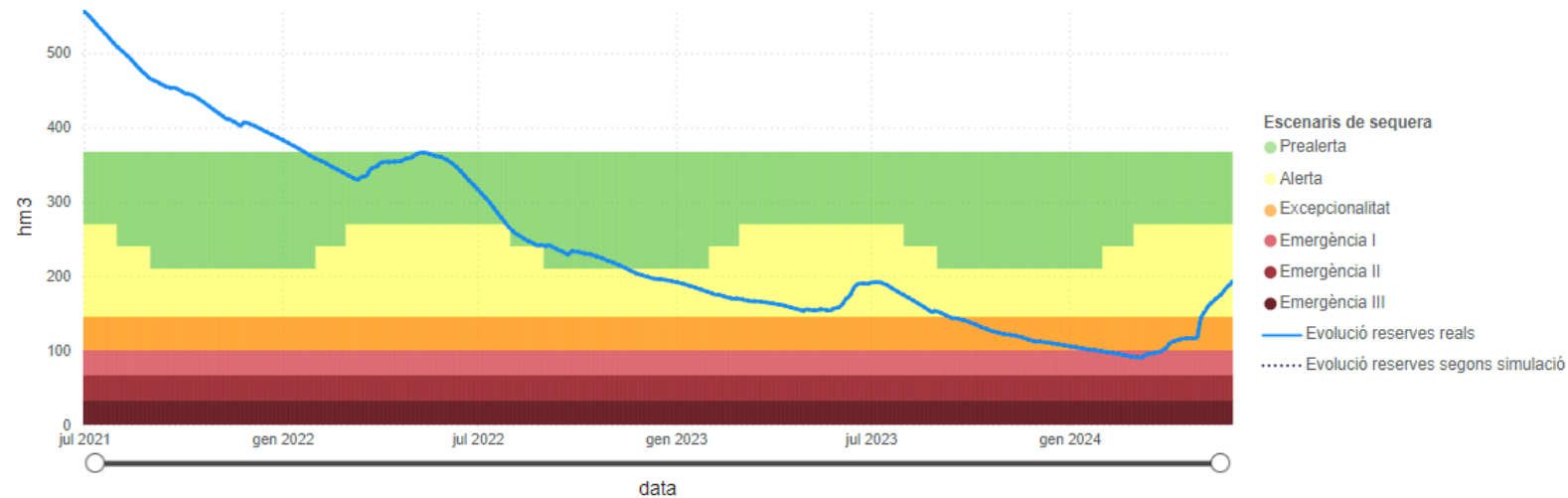
However, users can request a relaxation in certain cases (e.g., exceptional efficiency under normal conditions, no interference with municipal wells, etc.)

2 There are also limitations on **urban water use**:

- some applications of water are limited or prohibited
- each town has a cap on its total water consumption

3 And finally, the **environmental flows** in the rivers have also been reduced.

Contribution of the drought measures



Aigua aportada de nous recursos



Supply side measures

Estalvi d'aigua generat per les mesures (PES)



Demand side measures

Dies sense aigua

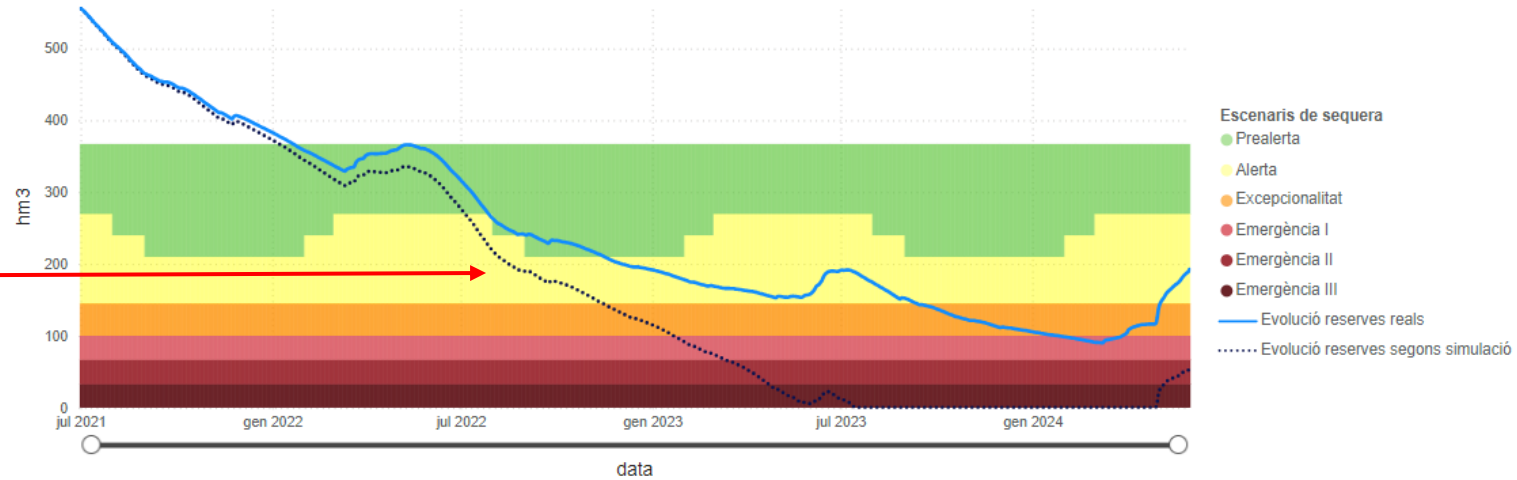


Volumes contributed



Contribution of the drought measures

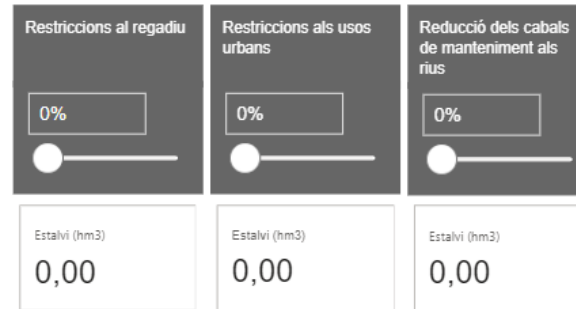
Without any measure



Aigua aportada de nous recursos



Estalvi d'aigua generat per les mesures (PES)



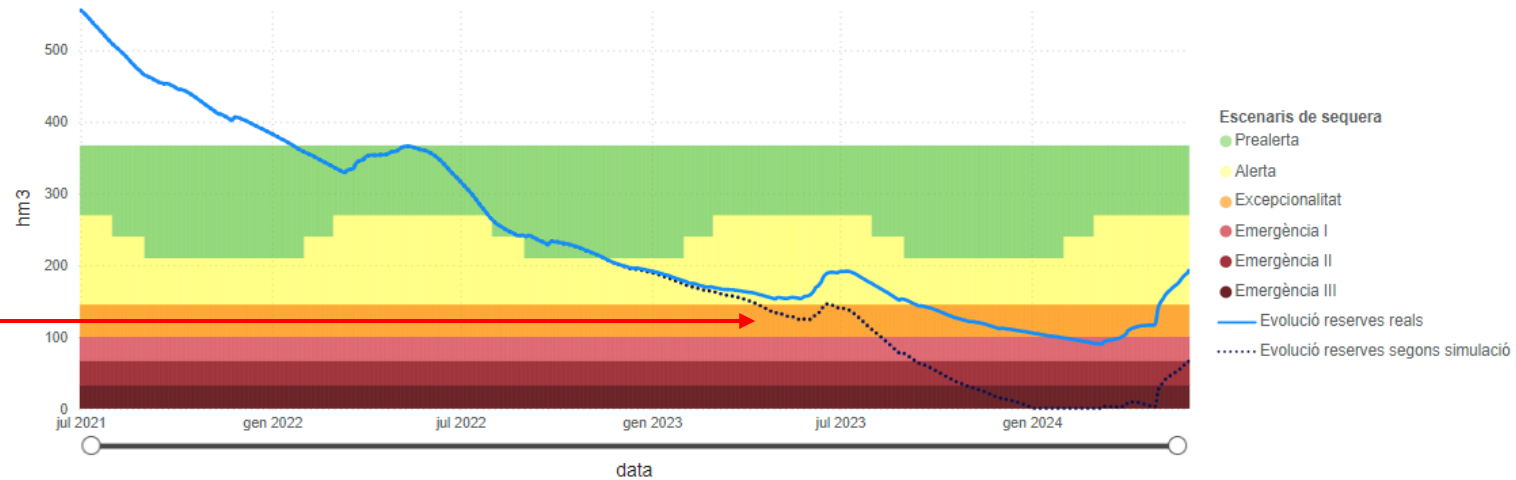
Dies sense aigua



Number of days with empty reservoirs

Contribution of the drought measures

Only "supply side"
(without restrictions)



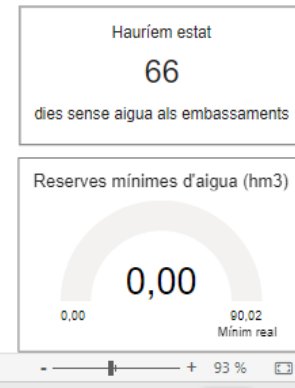
Aigua aportada de nous recursos



Estalvi d'aigua generat per les mesures (PES)

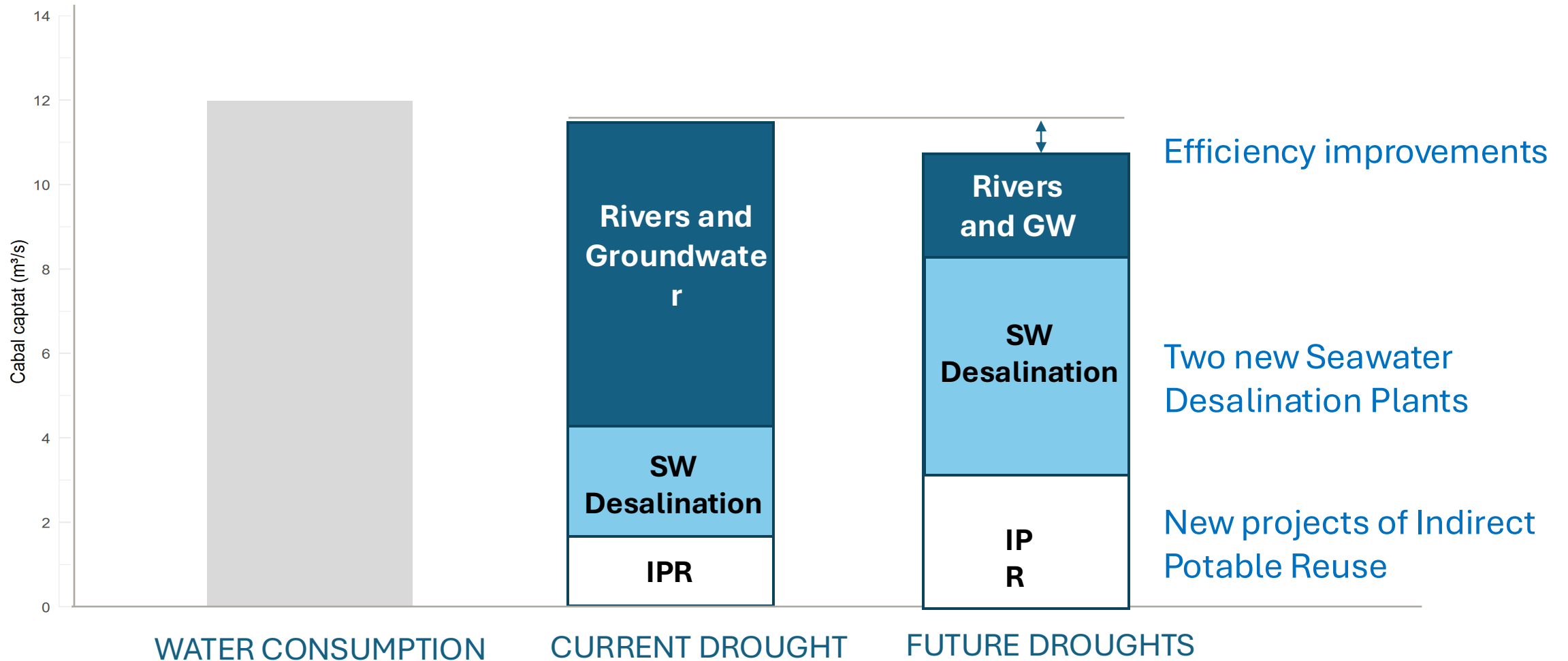


Dies sense aigua



Towards water security

Planned components of the bulk water supplied to the Greater Barcelona Area during droughts



IPR: Indirect Potable Reuse



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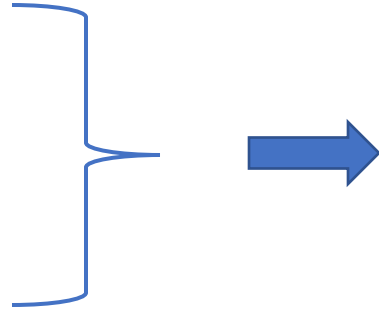
Klio Monokrousou
NTUA, Climate-IMPETUS

Drought & Water scarcity in Mediterranean cities

Climate change

Population growth

Mismanagement



Reduction in water availability

Deterioration of water quality



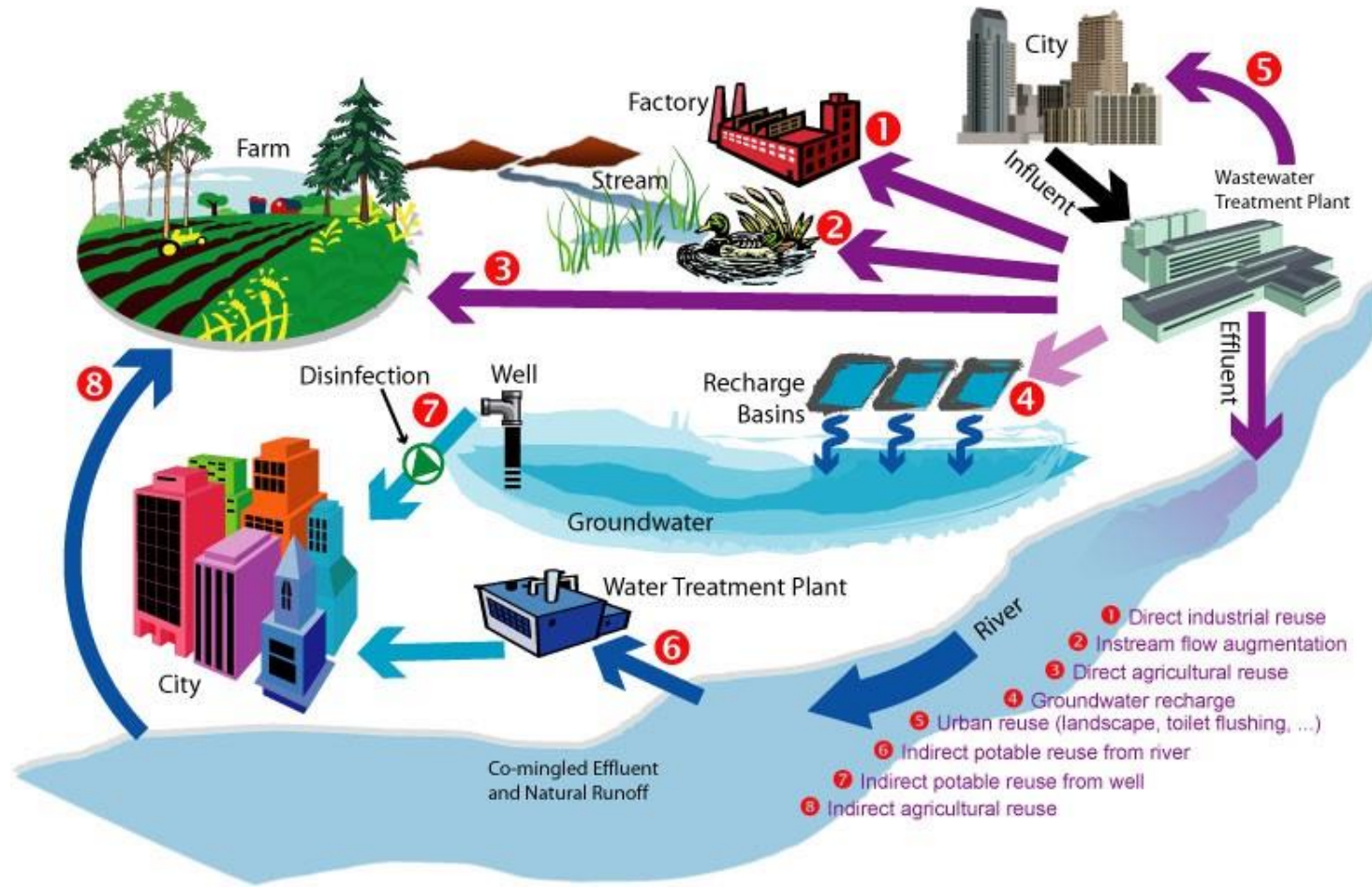
These challenges demand urgently sustainable innovative practices and technological solutions

How we can tackle water scarcity

Water reuse has become an **attractive option** for keeping resources within social or industrial systems for as long as possible while extracting additional value from them.

Preferred solutions

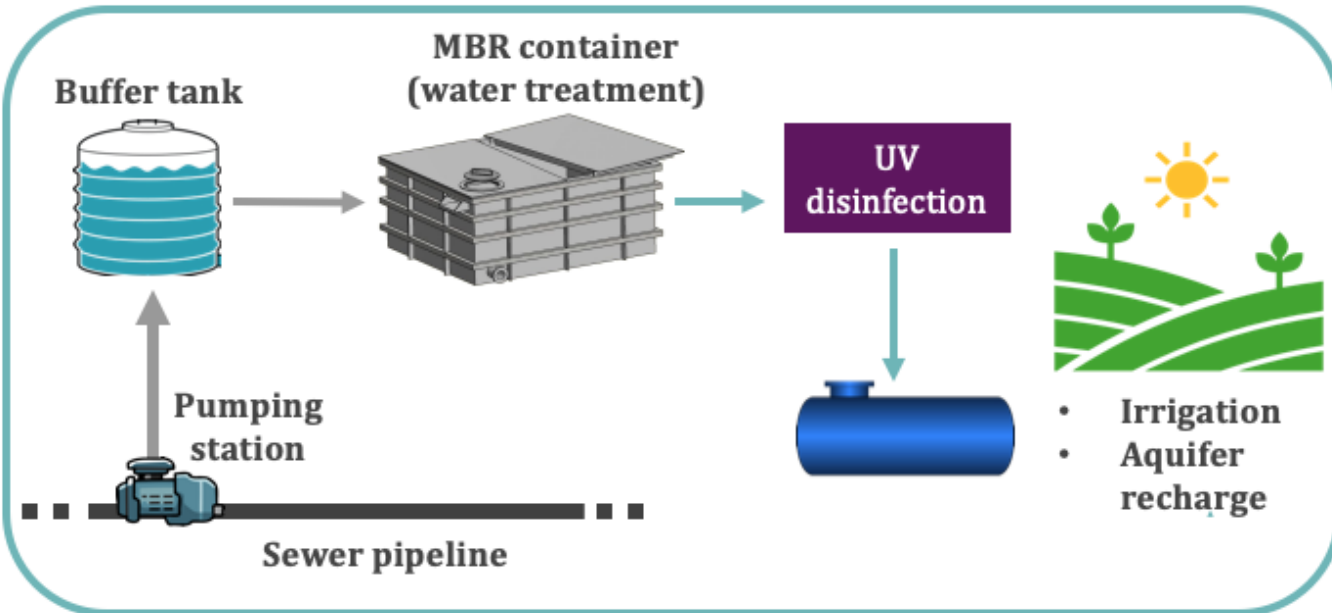
- Distributed & autonomous
- Flexible & adaptable
- Replicable



What is the Sewer Mining technology

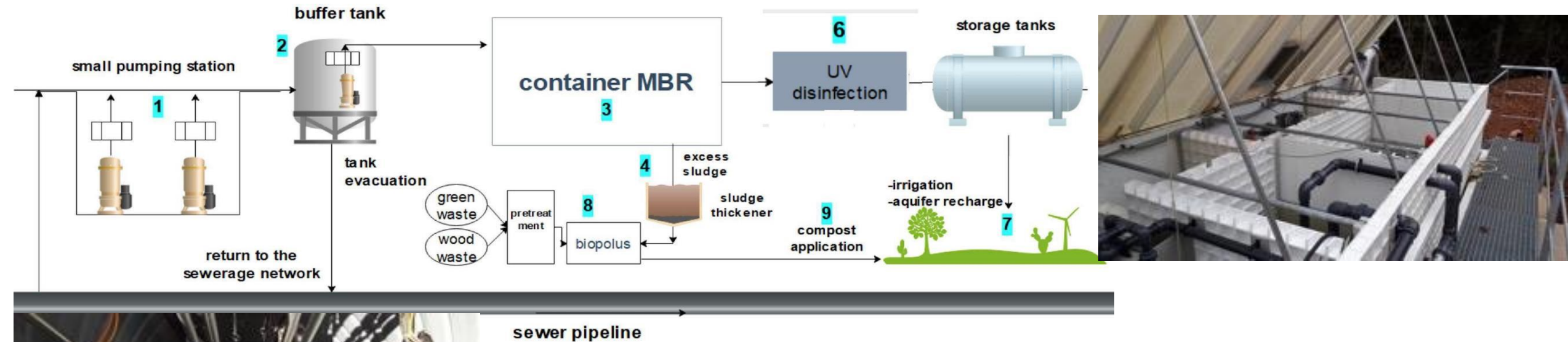
The SM technology is a water reuse solution that:

- Extracts wastewater from local sewers
- Treats wastewater in a mobile system that fits in containers
- Produces high quality water



The process of the SM solution

- Two pumps extract wastewater from the network at a depth of about 4m
- Raw sewage is treated with MBR technology, additional biological treatment and UV disinfection
- The water is now ready for irrigation



Sewer Mining technology is a flexible and autonomous circular economy solution which converts a waste into a resource

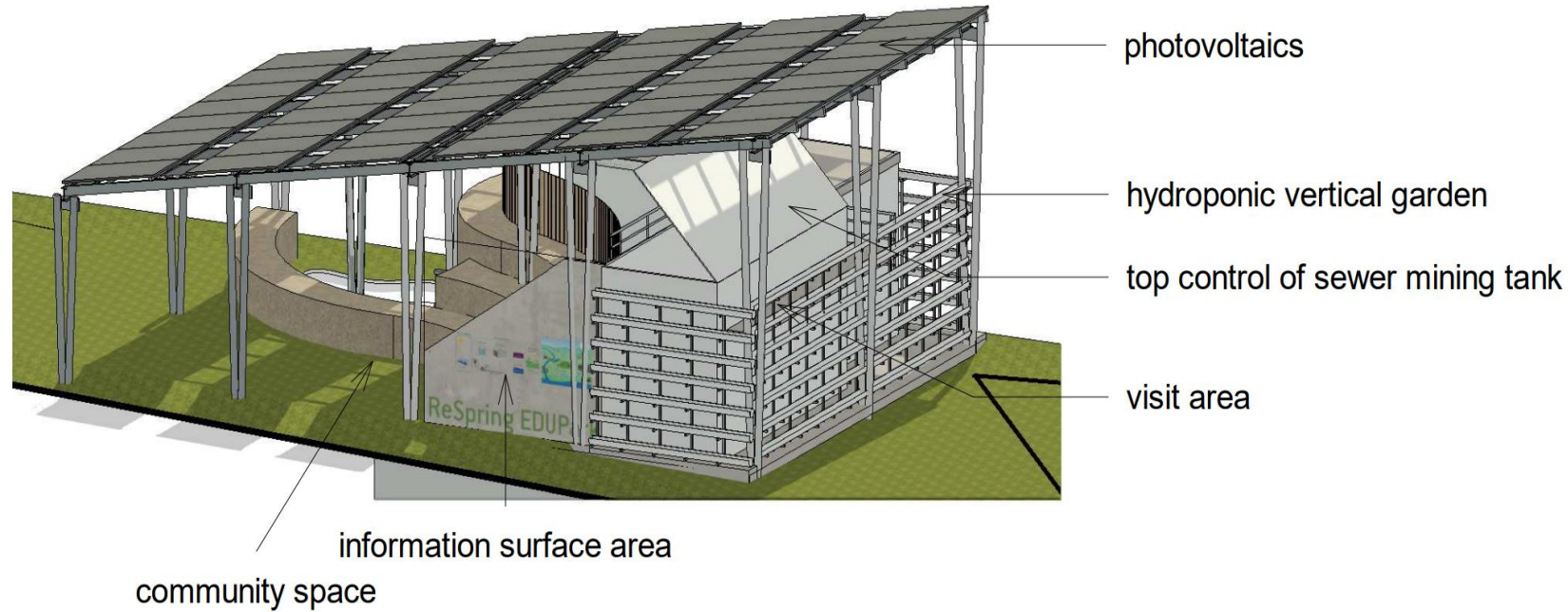
Irrigating the gardens with Sewer Mining reclaimed water

This solutions allows for creating a series of gardens around the Sewer Mining technology by using the recycled water for irrigation



Energy autonomous Sewer Mining configuration

Markopoulo, Eastern Attica

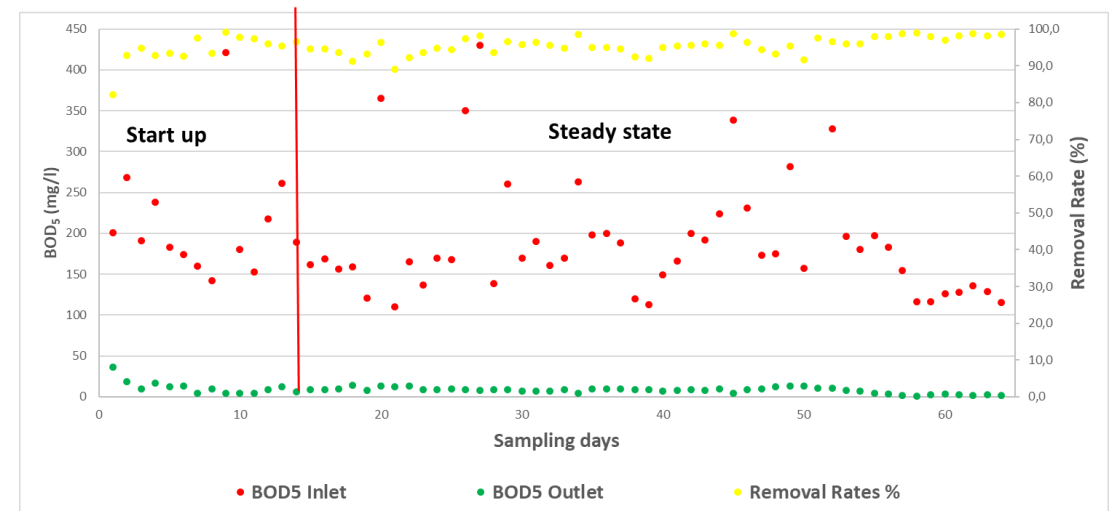
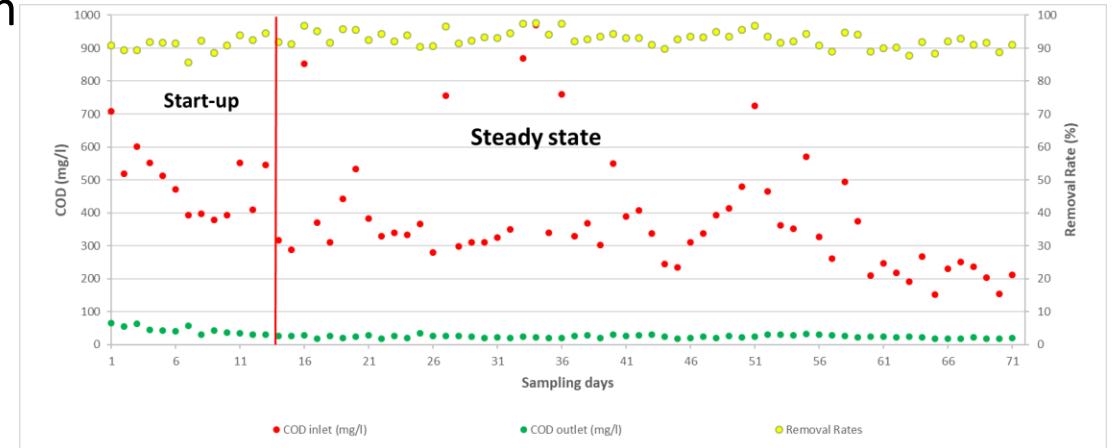


Engagement activities increase resilience and improve adaptation of societies to climate change

Results & conclusions on implementing the SM solution

- ✓ The SM plant is a **marketable solution** that produces quality irrigation water on-site meeting all national and international criteria for unlimited irrigation and urban use
- ✓ Efficient system in treatment and stable in operation

Parameters	Influent ¹	Effluent after UV Disinfection	Legislation Limits ²
TSS	138 (average)	≤ 2 for 80% of samples	≤2 for 80% of samples ⁵ ≤10 for 80% of samples ⁴
BOD ₅	196,45 ± 77 ³	7,83 ± 3,3 ³ ≤10 for 81,3% of samples	≤10 for 80% of samples ^{4,5}
COD	399 ± 170 ³	23,9 ± 4,2 ³	-
TN	105 ± 67 ³	5,4 ± 1,5 ³	≤ 15 ^{4,5}
NH ₄ -N	49 ± 10 ³	0,34 ± 0,19 ³	≤ 2 ^{4,5}
TP	15,8 (average)	1,57 (average)	-
Turbidity	-	0 (median)	≤ 2 (median) ^{4,5}
Conductivity	1.055 ± 85 ³	660 ± 49 ³	-
pH	6,9 ± 0,2 ³	6,91 ± 0,3 ³	-
TC	>10 ⁶	≤20 for 89% of samples	≤2 for 80% of samples ⁵ ≤20 for 95% of samples ⁵
FC	>10 ⁶	1,2 (average)	-
EC	>10 ⁶	≤5 for 91,6% of samples	≤5 for 80% of samples ⁴ ≤50 for 95% of samples ⁴



- ✓ Small footprint configuration
- ✓ High replication potential
- ✓ Enhances resilience of cities to climate change especially for drought prone areas – such as cities in the Med

How much does this solution cost?

CAPEX / unit		OPEX per year / unit	
Unit capital cost	150,000.00 €	Maintenance equipment	2,000.00 €
Pumping station	50,000.00 €	Personnel cost* + Analyses	4,200.00 €
Pipes & tanks	4,000.00 €	Lab consumables	840.00 €
Fence + protective shell in construction	60,000.00 €	Electricity cost (0.112 €/kWh)	277.20 €
Solar Panel	16,000.00 €		
TOTAL	280,000.00 €	TOTAL	7,317.2 €

Costs for a distributed autonomous SM unit (for a capacity of 25 m³/d)



FIWARE4WATER



Thank you for your attention

Klio Monokrousou

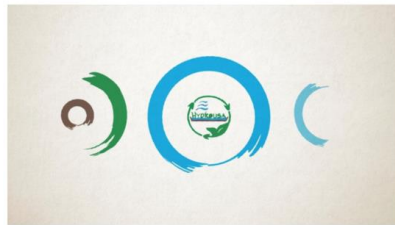
Senior Researcher NTUA
Department of Water Resources & Environmental Engineering
School of Civil Engineering
National Technical University of Athens

kmonokrousou@gmail.com

<https://mp.watereurope.eu/d/technology/1219>



IMPETUS



HYDROUSA

B-WATER SMART

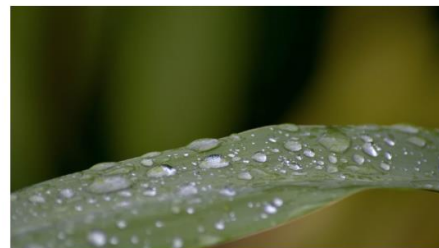


TODRINO



UWOT

NEXTGEN



HYDROUSA SERIOUS GAME



DIGITAL TWIN



Opportunities Water4All ongoing projects and next calls

Ariane Blum

Water4All, ARN

WATER4ALL
PARTNERSHIP

Water4All

Water security for the Planet

Ariane BLUM (Water4All Coordinator, French National Research Agency)



Drying landscapes: embracing water resilience
in a changing climate

17 September 2024

#WaterWiseEU



Co-funded by the European Union

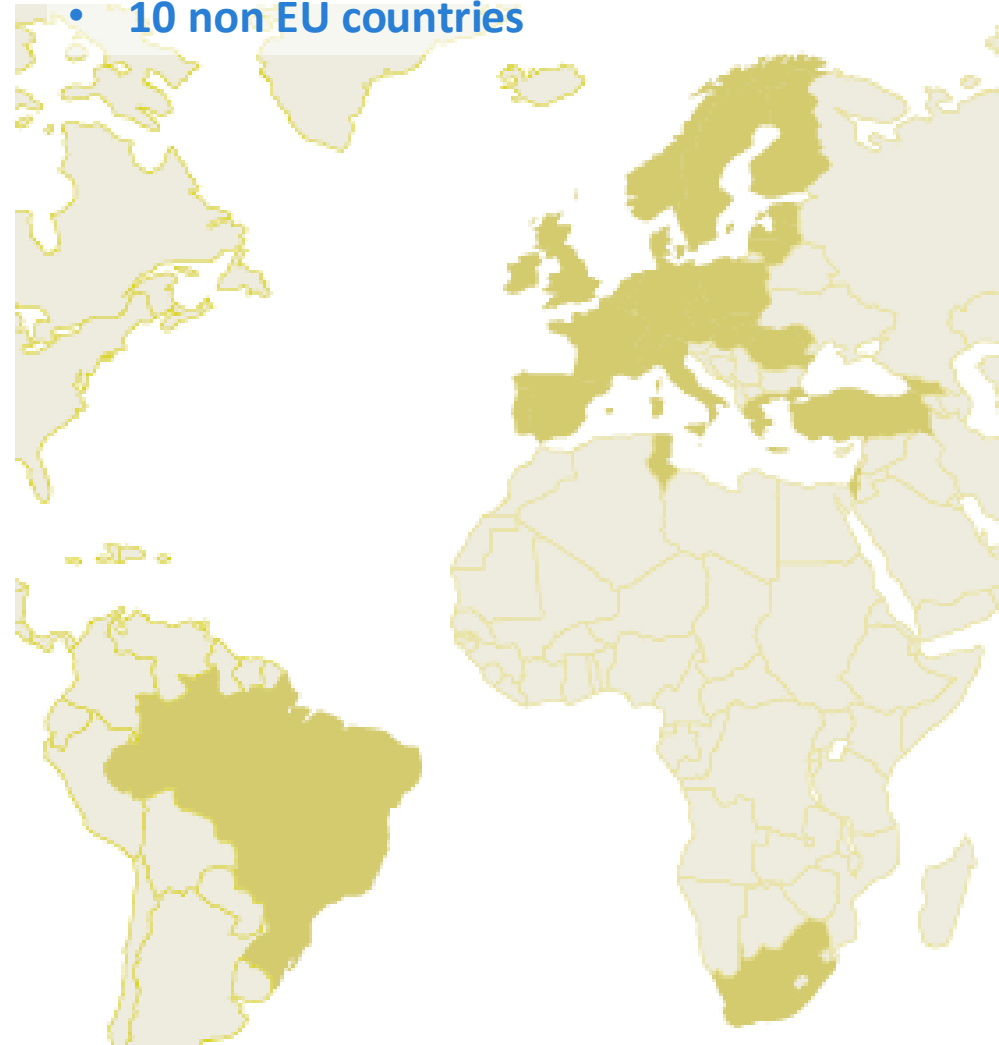


Partners



33 countries

- 23 EU Member States
- 10 non EU countries



Budget

Phase 1: 86M€, 26M€ from the EC
 Phase 2 : from June 2024: 103 M€, 31M€ from the EC

For the decade : 420 M€ expected (126 M€ from EU)



JTC1 “Management of water resources: resilience, adaptation and mitigation to hydroclimatic extreme events and management tools”

TOPICS



Resilience, adaptation and mitigation to hydroclimatic extreme events



Tools for water management - in the context of hydroclimatic extreme events



Improved water governance in the context of hydroclimatic extreme events and international contexts

- 27 funded project funded in JTC1 (2022): “Management of water resources for increased resilience, adaptation and mitigation to hydroclimatic extreme events”
- Budget 27M€
- Project period: 2024-2027

FOR DOWNLOAD



Project sites map



2nd Joint Transnational Call “Aquatic Ecosystem Services”

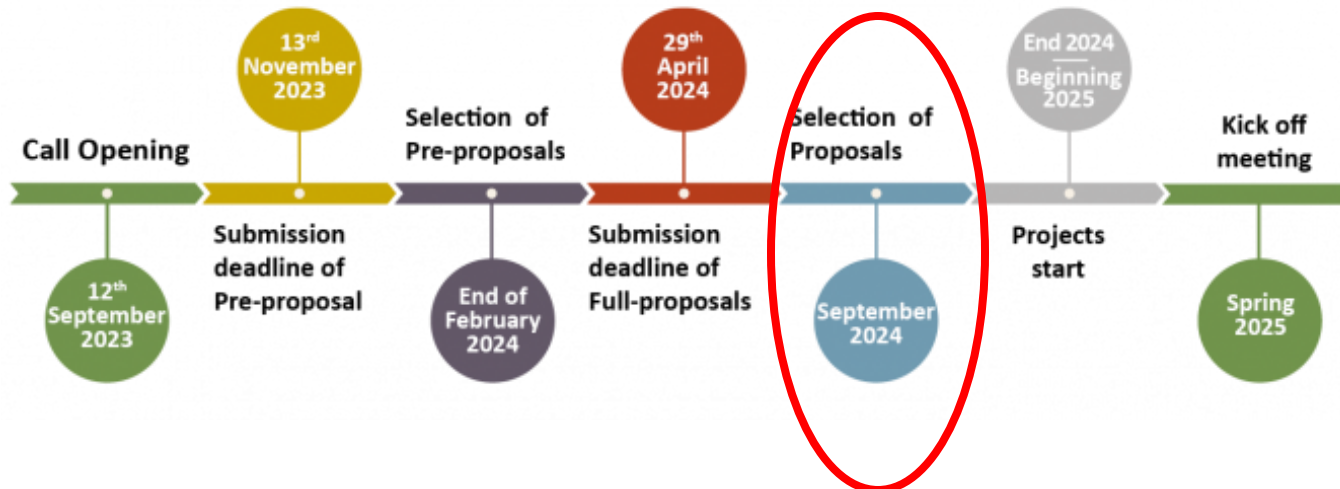
TOPICS

- 1** Mapping, monitoring, & assessment for a better understanding of ecosystem services in a context of changes, from local to global change.
- 2** Understanding & predicting multiple pressures (including anthropogenic pressures) - impact – response relationships in ecosystem services through advanced methods & techniques.
- 3** New tools & solutions for better integration of ecosystem services into the management of water resources.

- 36 funding partners, 30 countries
- Expected budget: ~ 36 M€
- Call secretariat: ANR
- 2 additional modalities
 - Early Career Researchers (PhD <10 years)
 - Knowledge Hub



- 118 pre-proposals received (step 1)
- 59 invited in step 2



3rd and 4th Joint Transnational Calls

12 September 2024

Call secretariat:
PTKA (GE)



Webinar: 2nd of October

The 4 topics are

- **Topic 1:** Enhancement of water circularity in industries.
- **Topic 2:** Urban water circularity.
- **Topic 3:** Resource recovery and valorization.
- **Topic 4:** Economic, environmental and social implications of water reuse and recovered products



Up coming themes :

- 4th Joint Transnational Call (32M€), September 2025, “**Water and Health**” theme from the SRIA

Main modalities

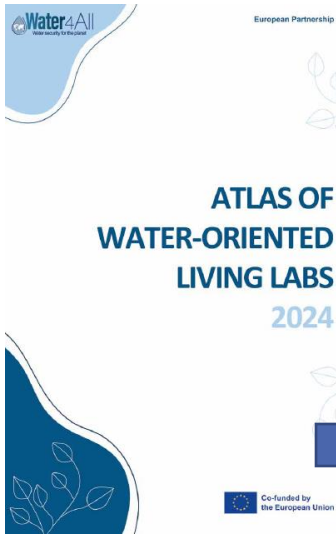
- 36 months projects
- Minimum of 3 eligible partner from participating countries
- Minimum of 2 independent legal entities for 2 different EU Member States or Horizon Europe associated countries
- Maximum of 7 partners
- Coordinator from an eligible country
- No partner with more than 50% of the person-months

Other Water4All activities: some examples

25 WOLL and soon more!



Water Oriented Living Lab



LISBON WATER SMART LIVING LAB
Lisbon, Portugal

Geographical scale: Municipal
WOLL Type: Urban
Year of establishment: 2020

WOLL Introduction
The Lisbon Water Smart Living Lab represents an innovative approach to addressing the quality of life in cities in the face of climate change, technological change, demographic and social trends, and the need to ensure water security and the development of blue space with water as a resource for citizens. The objective is to improve the resilience of the city's water services, achieved by capturing water management opportunities for non-potable uses, including administrative processes, irrigation, and other uses.

WOLL Representative
"Water reuse can help reduce pressure on strategic freshwater resources, support the transition to increased water security, and manage water-related risks through strong, long-lasting partnerships between researchers, technology developers and users."

WATERCLIMATEHUB
Geographical scale: Regional
WOLL Type: Mixed
Year of establishment: 2021

WOLL Introduction
WaterClimateHub is a regional living lab that focuses on the development of water-oriented living labs in the region of Flanders and Brussels in Belgium. The hub is a platform for water-oriented living labs, providing a space for water-oriented living labs to share their experiences and knowledge. The hub is a platform for water-oriented living labs, providing a space for water-oriented living labs to share their experiences and knowledge.

WOLL Representative
"Trust between stakeholders is key when establishing a WOLL and takes time to build up. Together in cooperations where each money is managed to win-win-win for all the partners."

C.1. Science Policy governance interface (INBO)

Knowledge Hubs (FORMAS)

Policy Support Group (INBO, VMM)

C2. Accelerating the uptake of R&I results by the economic sector (KIT-PTKA)

Supporting the creation of start-ups (Water Alliance)



EU Incubator strategy (Water Alliance)

Priority: Water Framework Directive, Drinking water Directive, Urban Waste-water treatment directive



THANK YOU



Follow us!

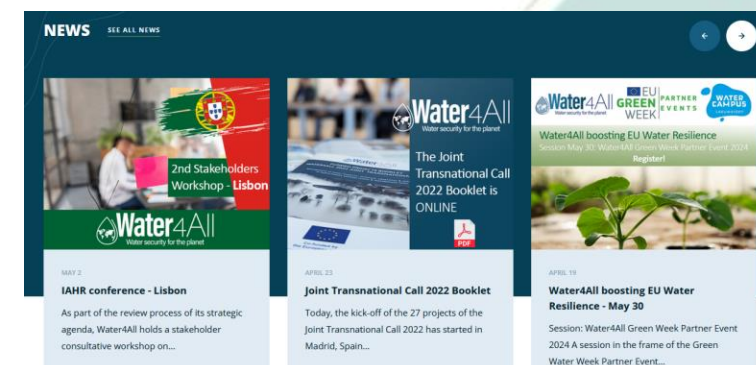
Ariane.BLUM@agencerecherche.fr

Water4All@agencerecherche.fr

www.water4all-partnership.eu



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Q&A session

Moderated by **Martina Alvarez**
and **Guido Schmidt**, MIP4Adapt



Closing remarks

Martina Alvarez

MIP4Adapt



Satisfaction Survey

Moderated by **Martina Alvarez**, MIP4Adapt



Closing remarks

- Recording, presentation and a summary report of the event will be shared on the online community site.
- Upcoming September events:
 - **Flood Resilience: Strategies and Solutions for a Safer Future (26.09)**
 - **Joint Workshop Mission Adaptation and Mission Ocean and Waters: “Integrated Approaches to Build Coastal Resilience” (30.09)**
- Calling all Charter Signatories, **the second cycle of the Peer Learning Programme is now open for registration. [Secure your spot now!](#)**
- We are moving our Community and associated services from CIRCABC to Futurium!



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Thank you !

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