H2OforAll

safe CREW

Preparing drinking water supply systems for climate change – case study insights

Thursday, 3 April 2025

Water quality monitoring in Ukraine

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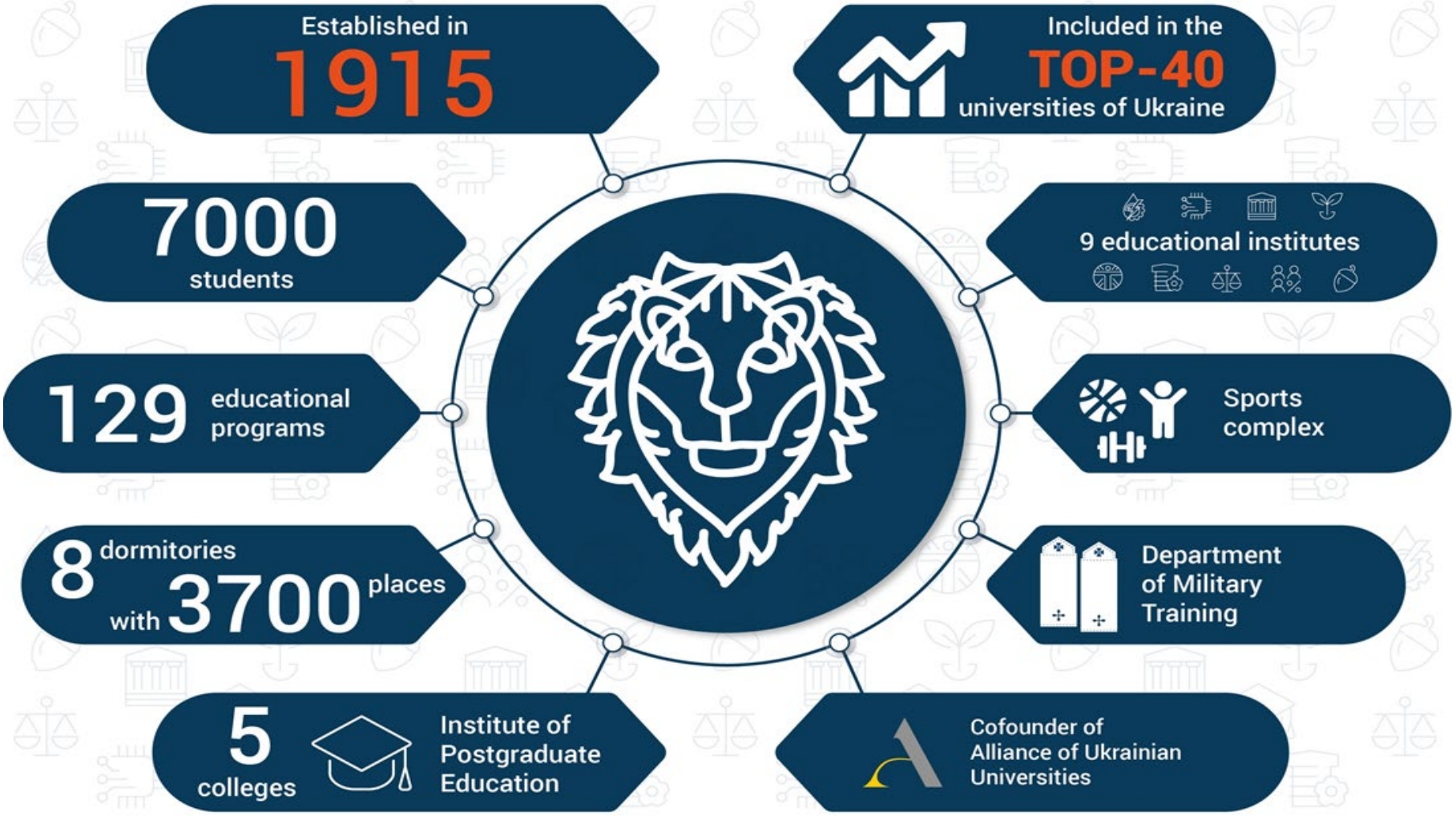

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CLIMATE-RESILIENT MANAGEMENT FOR SAFE DISINFECTED AND NON-DISINFECTED WATER SUPPLY SYSTEMS (SAFECREW) HOP ON

Call: HORIZON-WIDERA-2023-ACCESS-06
(Hop-on facility)
Proposal / 28.09.2023

On 15th April 2024 the EC approved and signed amendment. From 1st May 2024, NUWEE is the 12th SafeCREW project partner

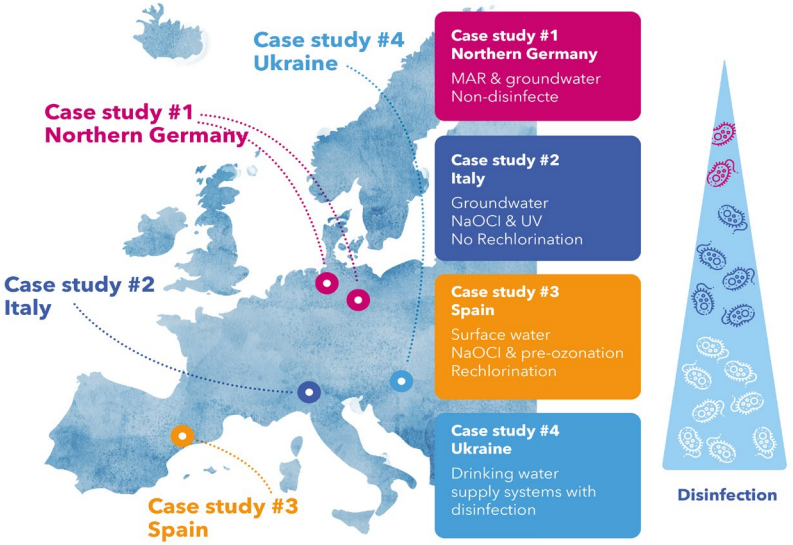
Duration: 01.05.2024 to 30.04.2026

WP7 - Transferring SafeCREW methods to western Ukrainian DWSS

WP7 Transferring SafeCREW methods to western Ukrainian DWSS

Objective of this WP is to transfer knowledge and methods of SafeCREW to Ukraine as a replication test case for less developed countries.

- Monitoring water quality in riverbank filtration (RBF) used for drinking water production → Adapting hydraulic models and establishing soft sensors for conditions with limited data availability
- Using monitoring results for risk-based planning of future interventions → Identifying regulatory and real-life gaps in Ukrainian and European drinking water quality guideline values
- Implementing risk-based management through the creation of Water Safety Plans → Providing a roadmap for the establishment of a Centre for Excellence in Water Management at NUWEE



The addition of NUWEE and activities proposed in WP7 are included in the new case study #4 in western Ukraine : 3 small scale DWSS.

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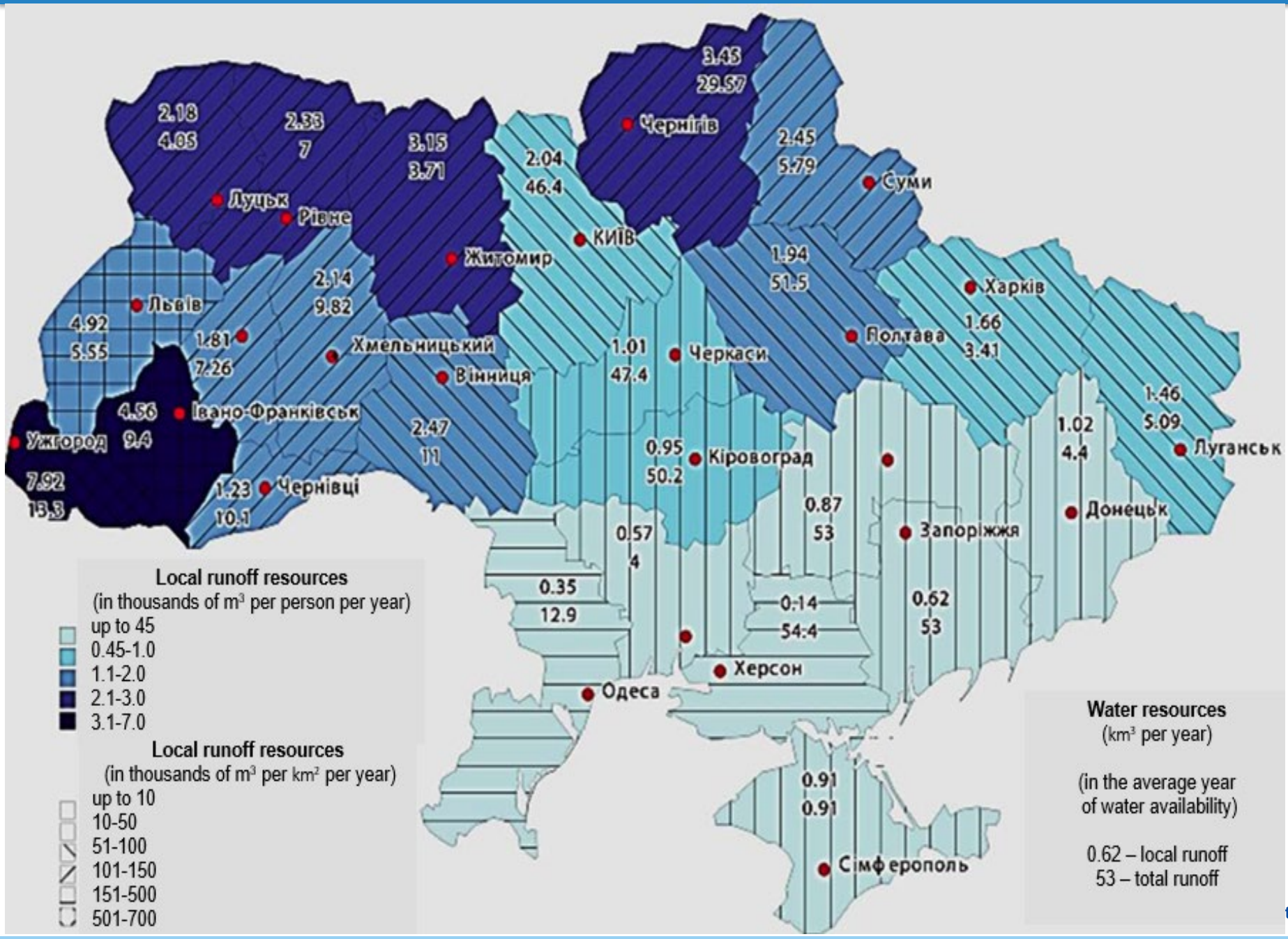
Water availability in Ukraine



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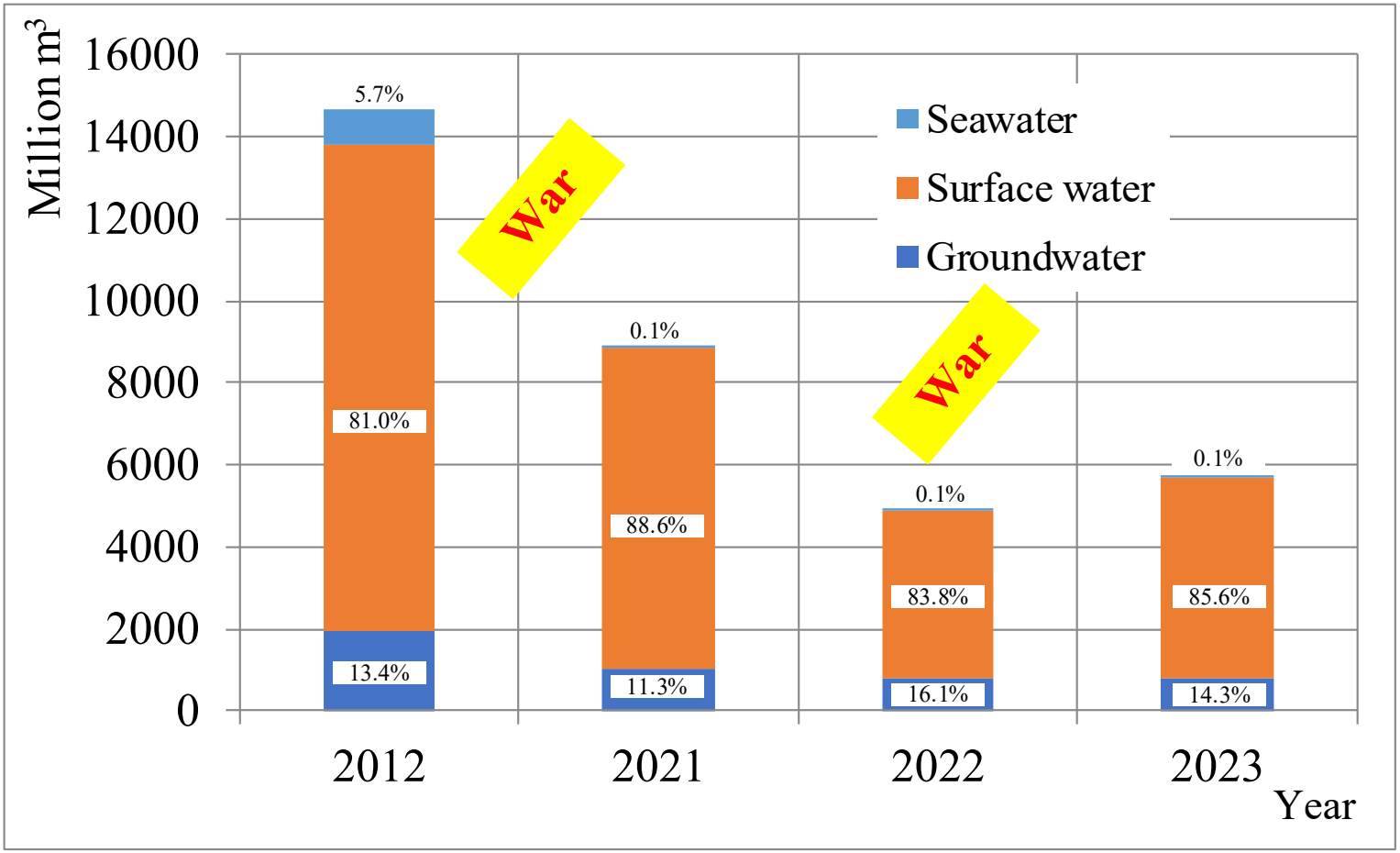
Water distribution by water intake sources in Ukraine



Source: National report on the quality of drinking water and the state of drinking water supply in Ukraine

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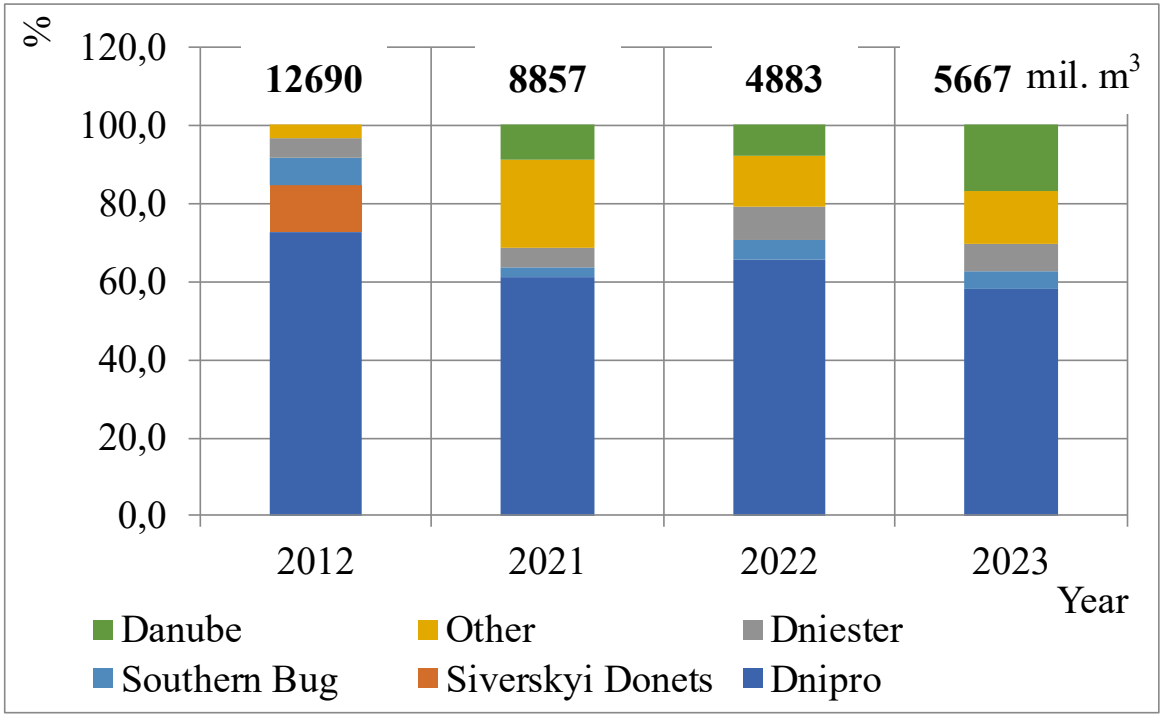
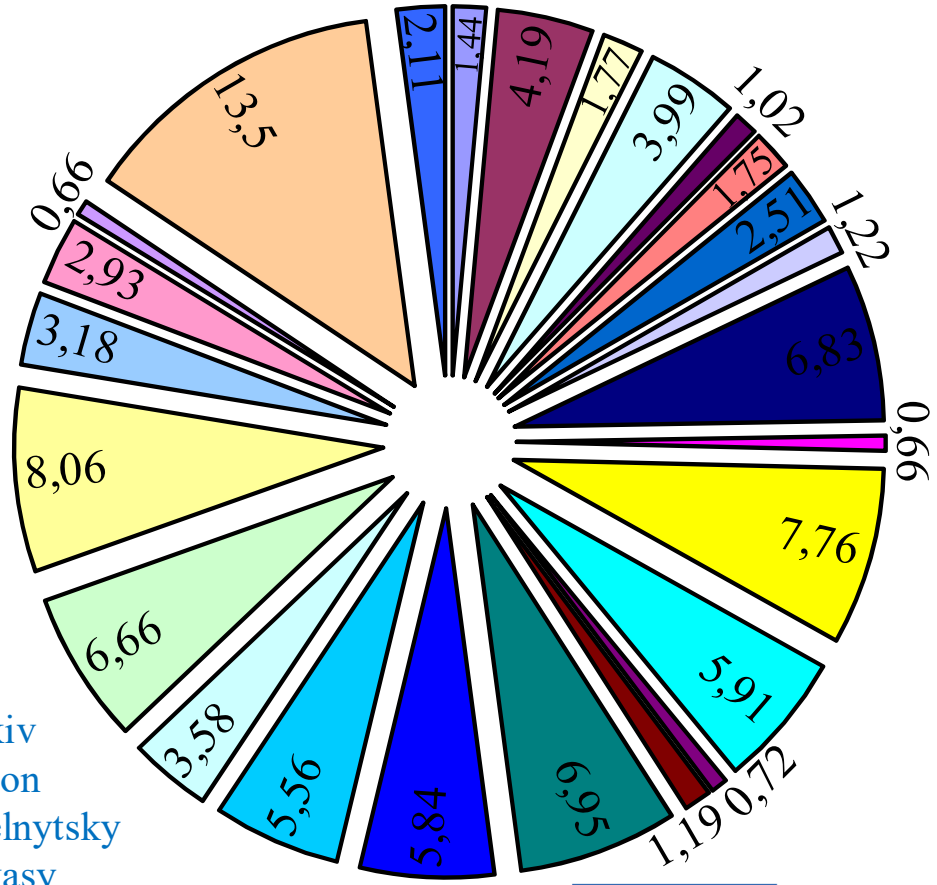
Water distribution by water intake sources in Ukraine

Surface water



Projected groundwater resources by regions of Ukraine, %



Regions of Ukraine:

- Vinnytsia
- Volyn
- Dnipropetrovska
- Donetsk
- Zhytomyr
- Zakarpattia
- Zaporizhzhya
- Ivano-Frankivsk
- Kyiv
- Kirovograd
- Luhansk
- Lviv
- Mykolaiv
- Odesa
- Poltava
- Rivne
- Sumy
- Ternopil
- Kharkiv
- Kherson
- Khmelnytsky
- Cherkasy
- Chernivtsi
- Chernihiv
- Republic of Crimea

Source: National report on the quality of drinking water and the state of drinking water supply in Ukraine

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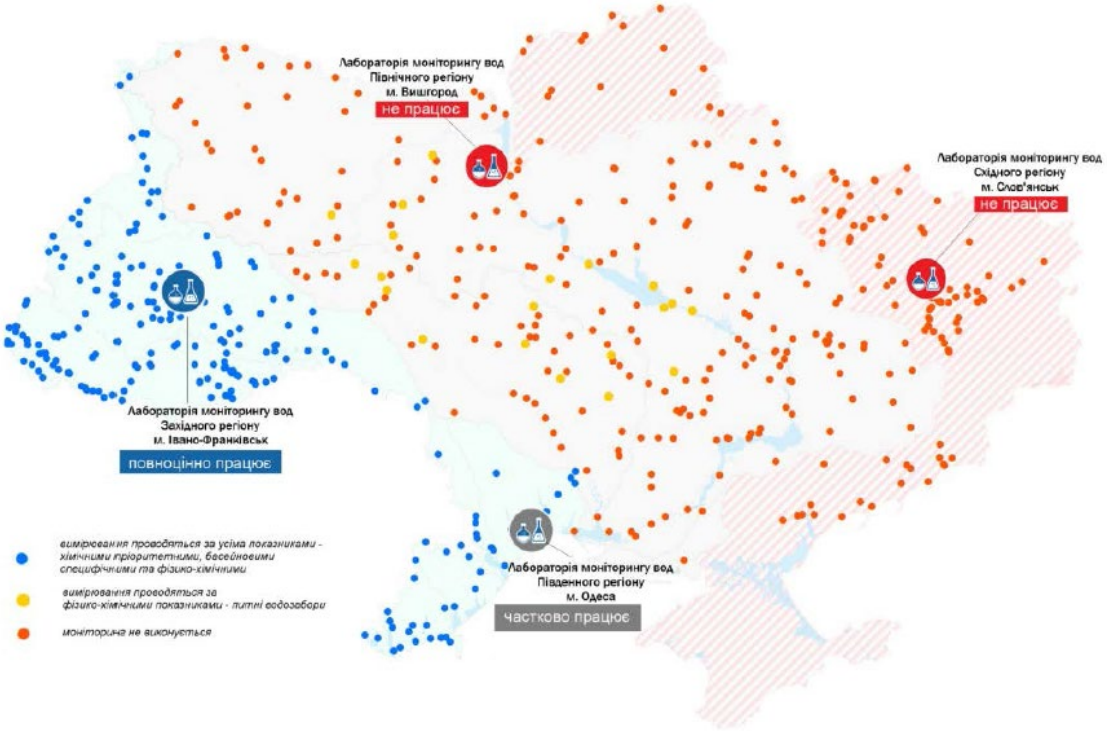
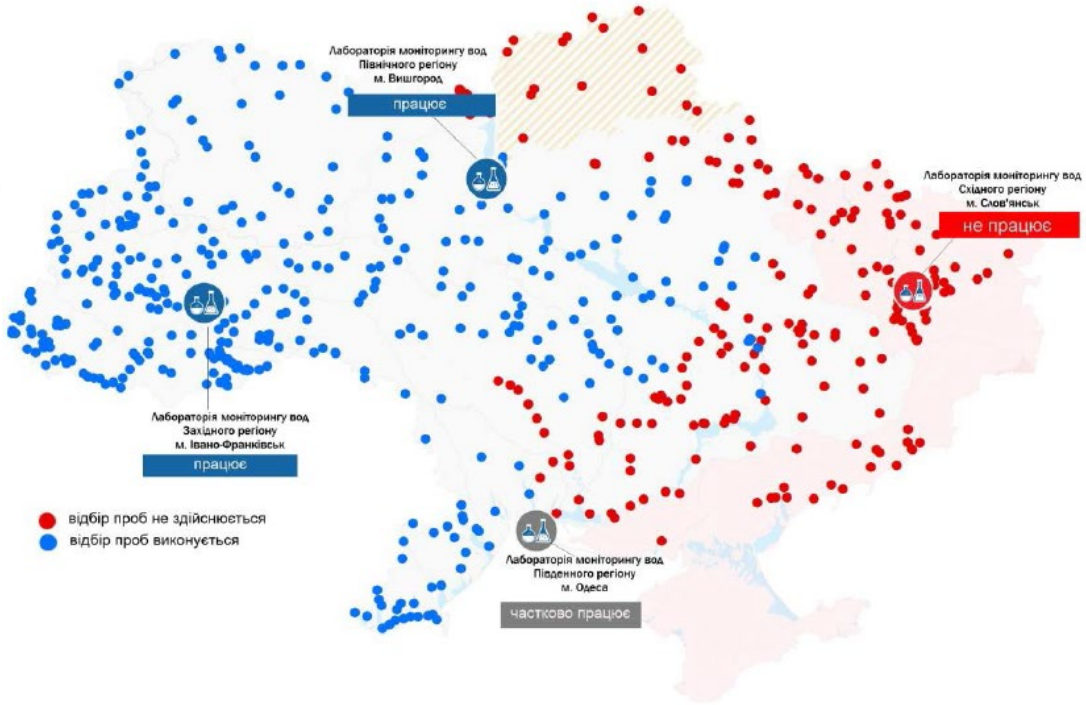
Monitoring status of drinking water supply sources in Ukraine



Map of water sampling and measurements in March 2022



Map of water sampling and measurements in May 2022

Source: National report on the quality of drinking water and the state of drinking water supply in Ukraine

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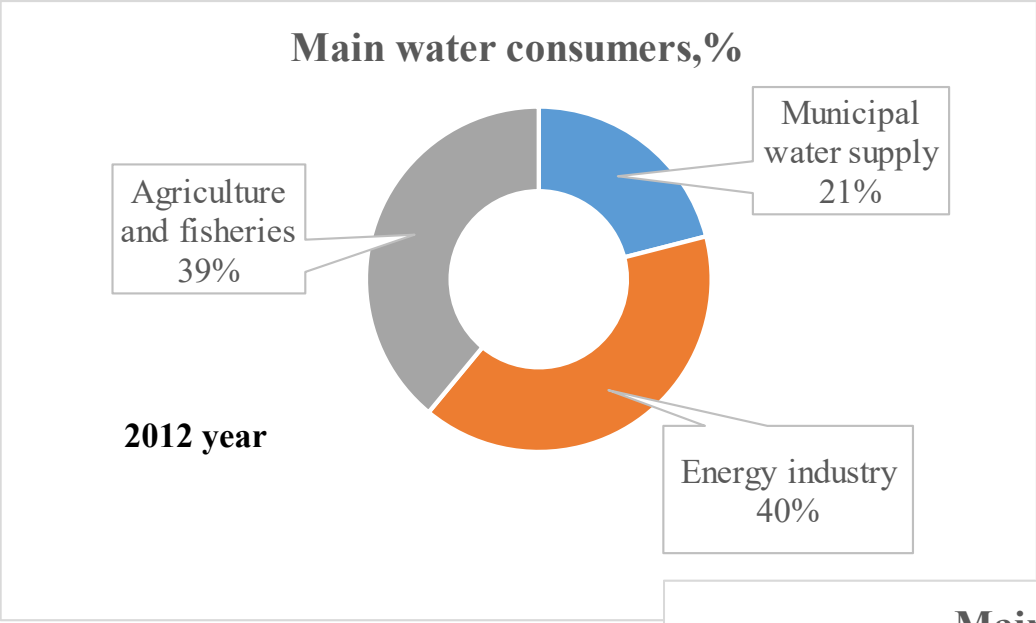
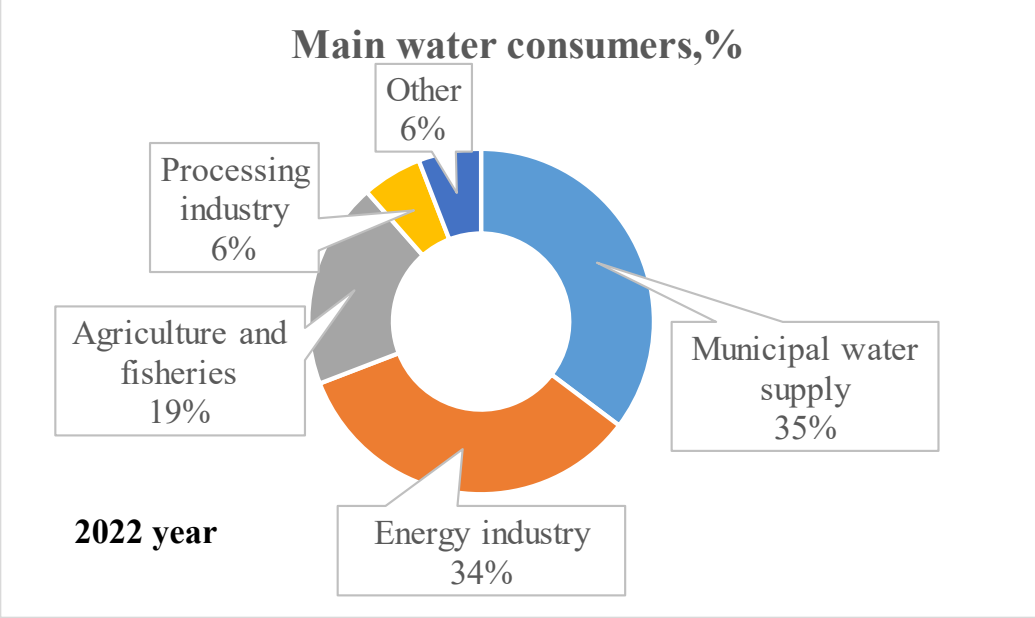
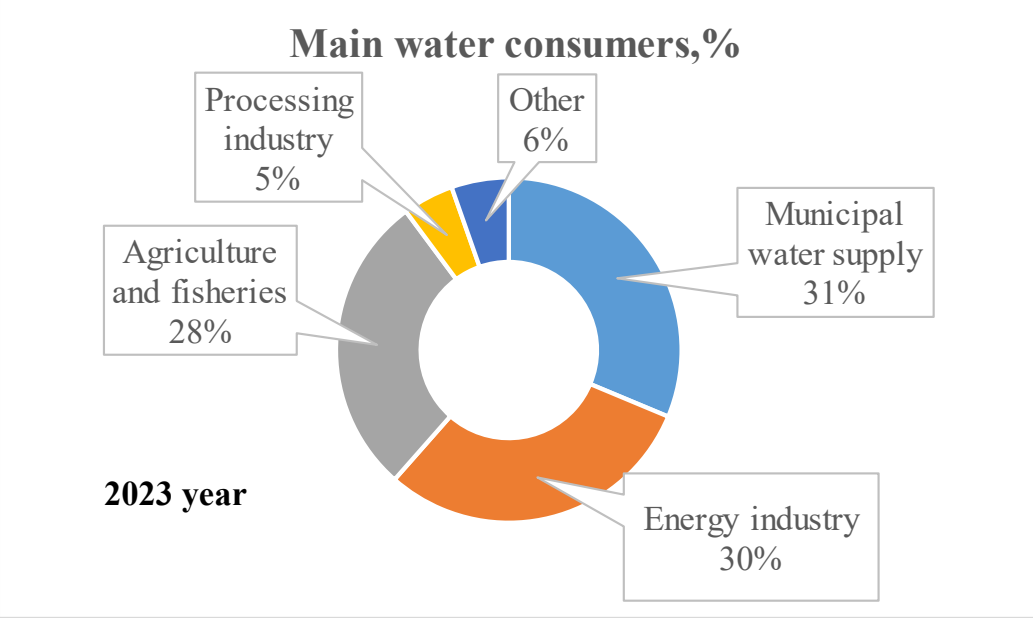
Main water consumers







Source: National report on the quality of drinking water and the state of drinking water supply in Ukraine

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Access to centralized water supply and sewage

Indicator	Water supply in urban area	Water supply in rural area	Sewage in urban area	Sewage in rural area
Number of settlements, total	928	24,447	928	24,447
Number of settlements provided with systems	855	6,399	720	429
Number of settlements provided with systems, %	92.1%	26.2%	77.6%	1.8%

Source: National report on the quality of drinking water and the state of drinking water supply in Ukraine

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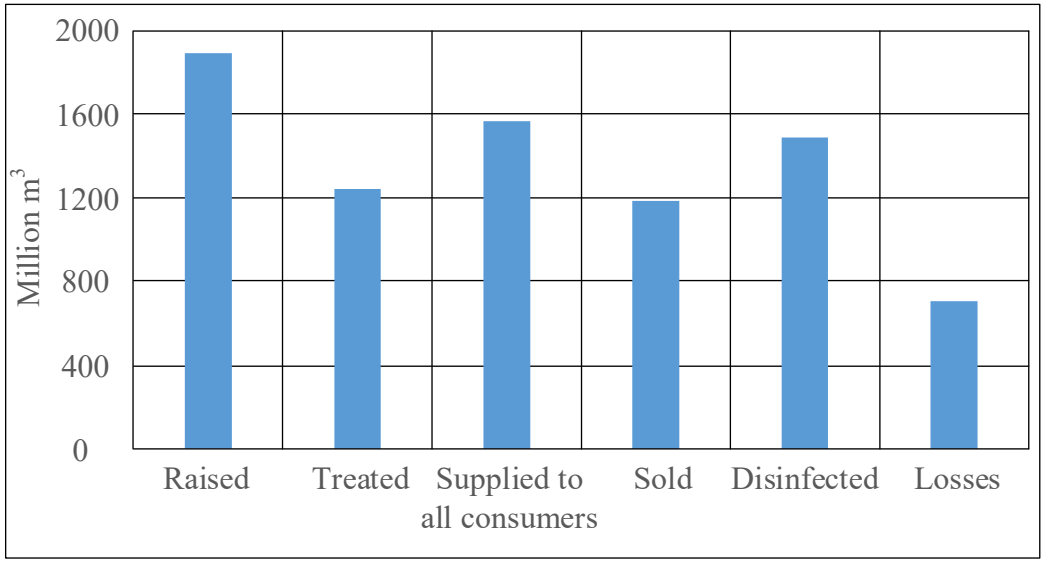
Water supply indicators in Ukraine

The water supply indicators were as follows - data excluding information for Luhansk region and the Autonomous Republic of Crimea.



Water volumes in water supply systems:

- raised - 1,895.07 million m^3
- treated - 1,245.66 million m^3 or 65.6% of the volume of water raised;
- supplied to all consumers - 1,572.75 million m^3 or 83.0%;
- sold - 1,187.31 million m^3 or 62.7%;
- disinfected - 1,490.56 million m^3 or 78.7%;
- losses - 707.76 million m^3 or 37.3%

Water supply networks, km	
Total	108801
Replacement required	39674
Centralised sewerage networks, km	
Total	35279
Replacement required	14628

Source: National report on the quality of drinking water and the state of drinking water supply in Ukraine

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Impact of war on water supply

As 2023, 327 km of sewerage networks and over 1,046 km of water supply networks were damaged, with 70 pumping stations and 12 water treatment facilities partially or completely destroyed.

According to World Bank experts, by December 2024, the water supply and sewerage sector in Ukraine have suffered losses amounting to $4.6 billion since the start of the full-scale invasion.

Around 8.5 million Ukrainians are facing challenges in accessing safe water supply.

To restore the sector, $11.3 billion will be needed over the next 10 years.

The priority is reconstruction, modernization, and compliance with EU standards. This must be done with the transfer of advanced European experience to the Ukrainian side.

Source: https://ukrvodokanal.in.ua/wp-content/uploads/2023/09/vv-4-2023.pdf
Ukraine - Fourth Rapid Damage and Needs Assessment (RDNA4) : February 2022 - December 2024

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Monitoring objects

Monitoring objects:

- site #1 - Rivne region
- site #2 - Rivne region
- site #3 - Ivano-Frankivsk region

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List of analyses

Chemicals	1	Free chlorine
	2	Bound chlorine
	3	Chlorites
	4	Iron
	5	Manganese
	6	Calcium
	7	Magnesium
	8	Ammonium
	9	Chlorides
	10	Sulfates
	11	Nitrates
	12	Phosphates
	13	Silicates
	14	pH
	15	Alkalinity
	16	Permanganate oxidation ($KMnO_4$)
	17	Conductivity
	18	UV Absorbance 254 nm
	19	Trihalomethanes
	20	Temperature
	21	Potassium
	22	Sodium

Microbial	1	Total coliforms
	2	E.coli
	3	Enterococci
	4	Coliphages
	5	Salmonella
	6	Pseudomonas aeruginosa
	7	Eggs, larvae of helminths
	8	Oocysts of intestinal pathogenic protozoa
	9	Cysts of intestinal pathogenic protozoa

	Trihalomethanes
1	Chloroform
2	1.2 Dichloroethane
3	Tetrachloromethane
4	Trichloroethylene
5	Tetrachloroethylene
6	Bromoform
7	Bromodichloromethane
8	Dibromochloromethane
9	1,1,1-Trichloroethane

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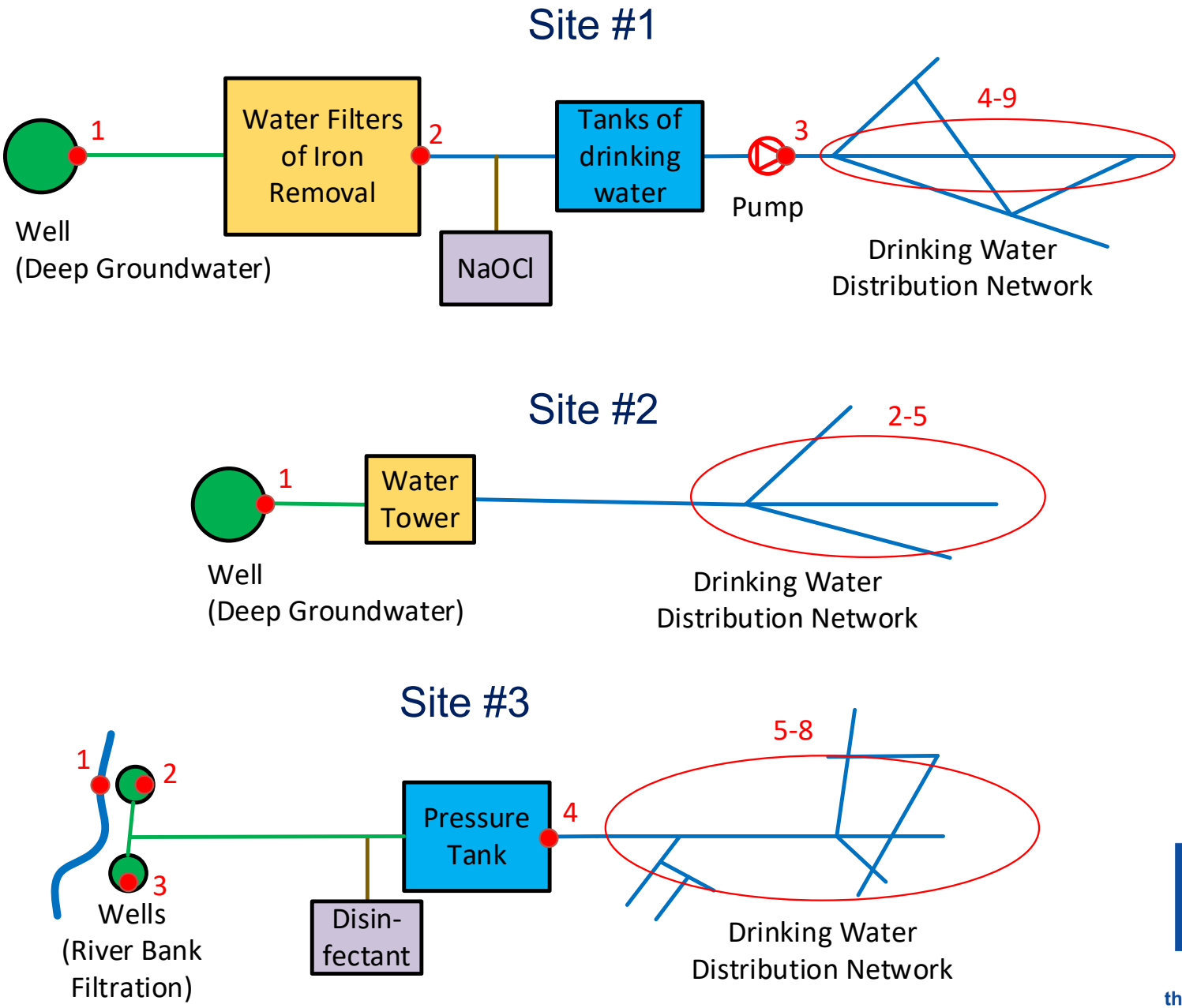
Monitoring objects



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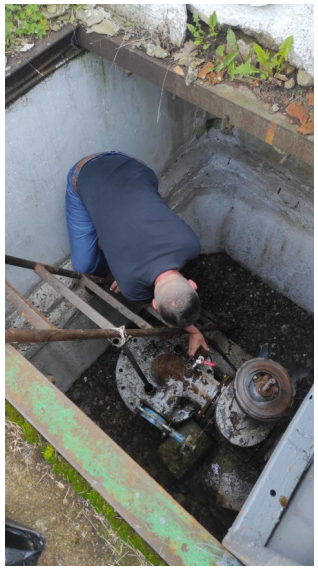
Water sampling for analysis

Site #1





Site #2



Site #3



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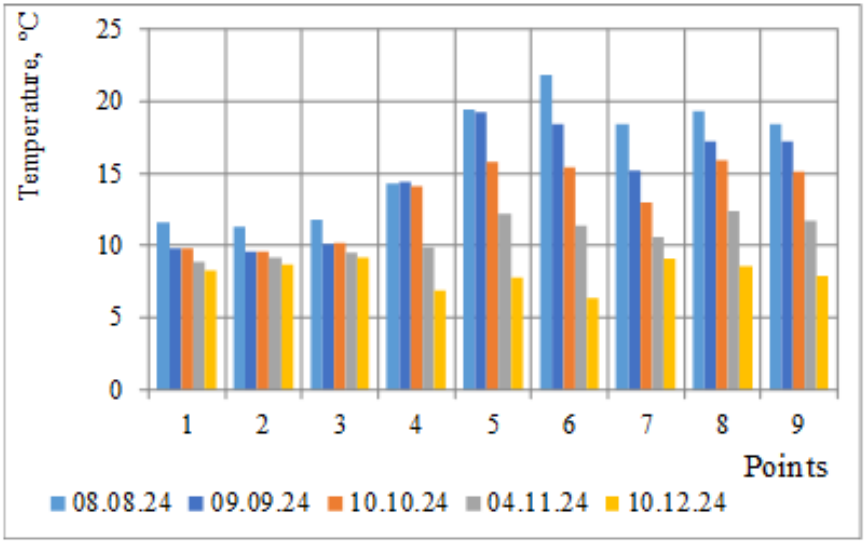
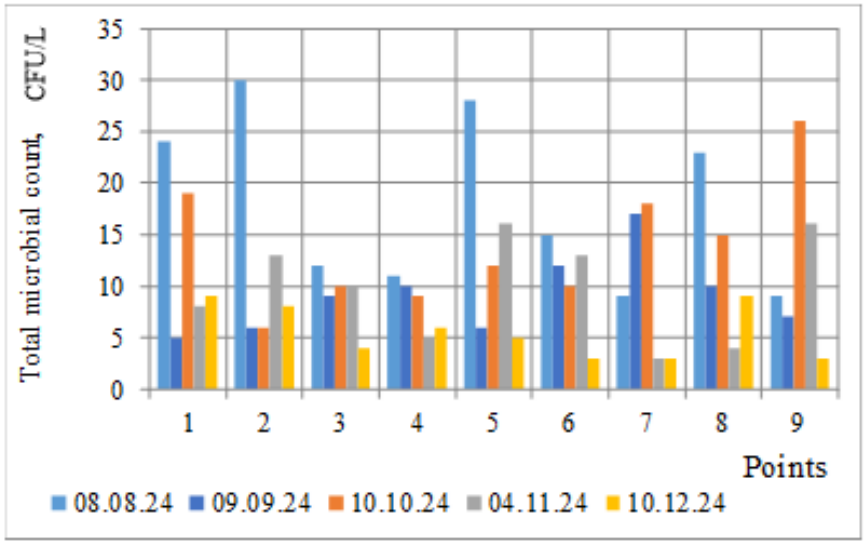
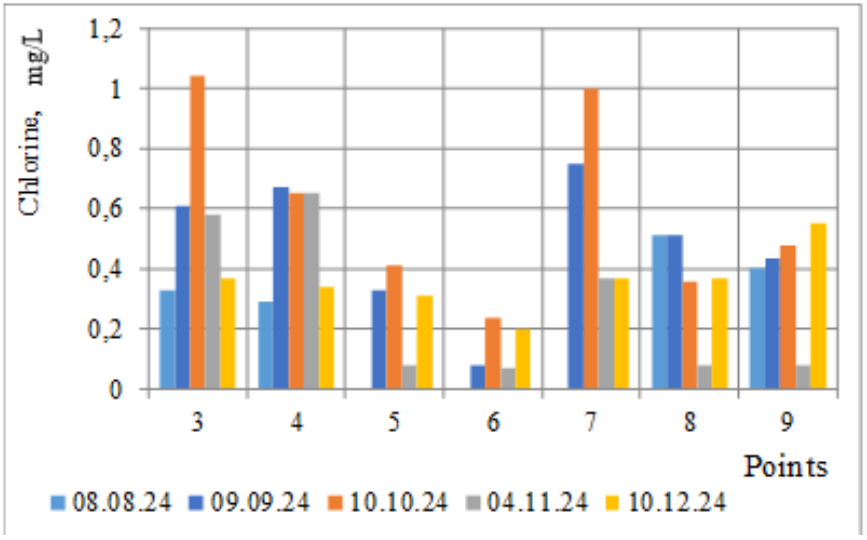
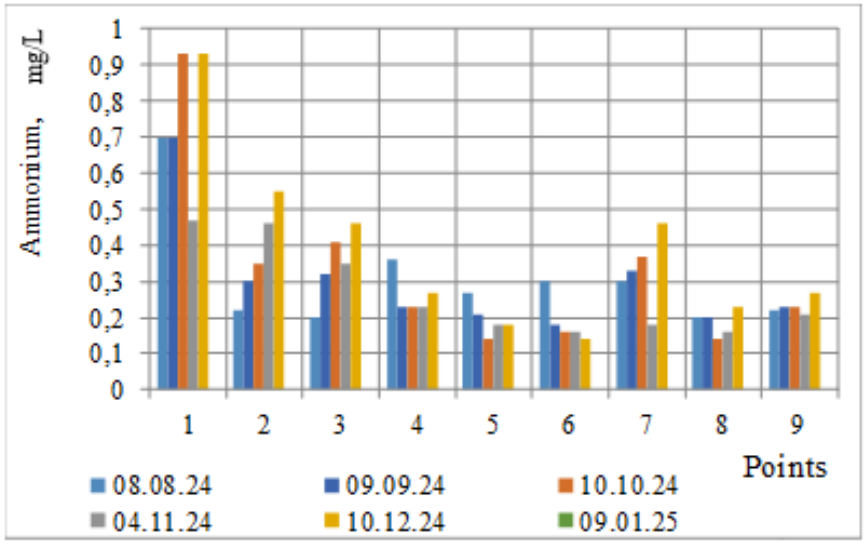
Results of analyzes: site#1









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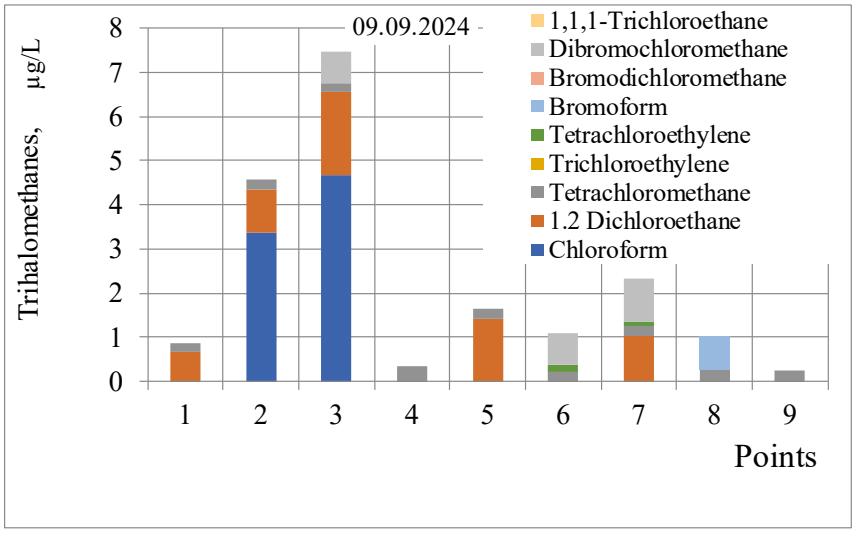
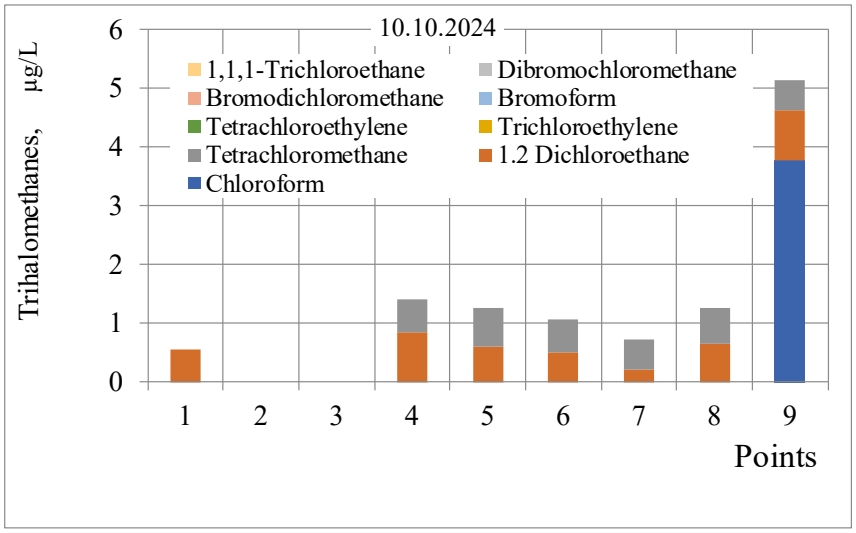
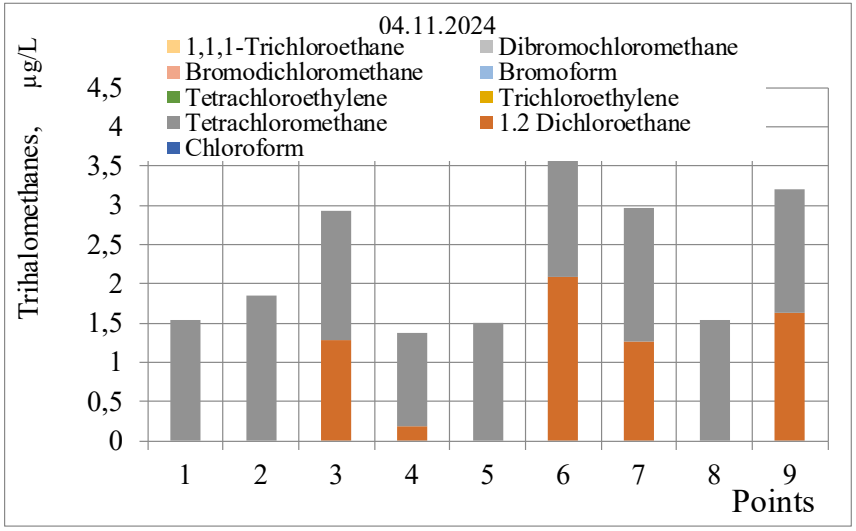
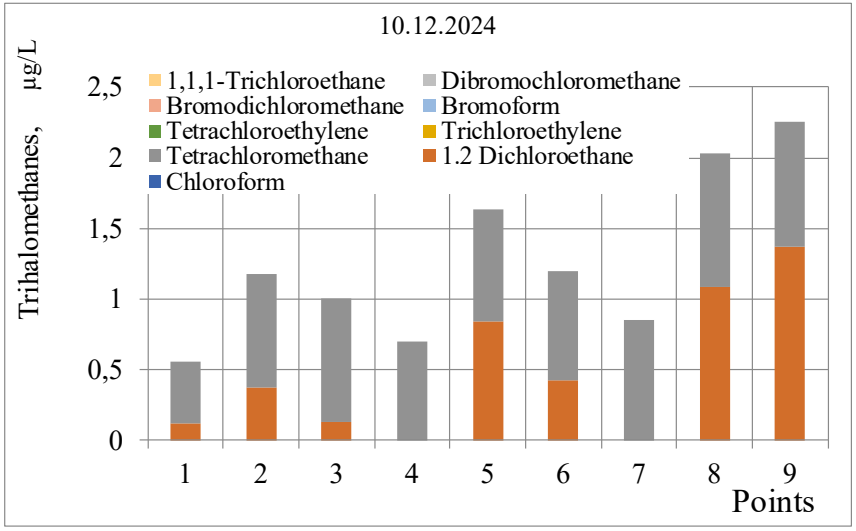
Results of analyzes: site#1









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Next steps

- Continued monitoring of water quality
- Risk assessment for risk-based planning of future interventions
- Implementation of risk-based management via new WSPs
- Adapting the hydraulic models for modelling of alternative disinfection methods
- Adapting supporting tools for routine DWSS management

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Thank you!