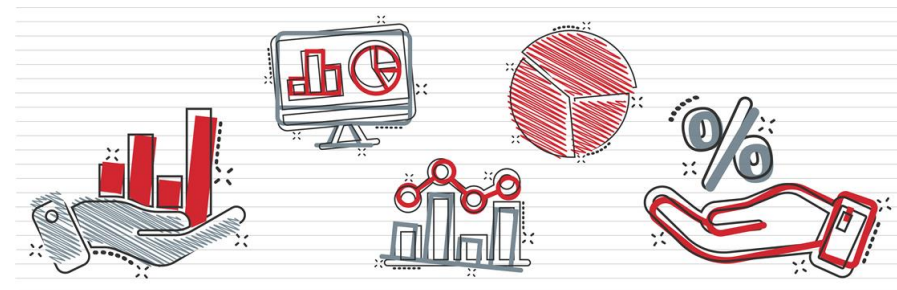


(London, 23-25 September)

Twelfth Meeting of the Expert Group on Environment and Climate Change Statistics (EG-ECCS)

# Overview of Water statistics in Italy: status and progress

*Main outcomes from the last three years*



**Simona Ramberti**

Istat – Italian National Institute of Statistics

Directorate for Environmental and Territorial statistics

Environmental and territorial networks Division

# Current status



## BACKGROUND

Lack of an adequate information system on water use in Italy. The available data are often produced by various agencies and institutions for administrative purposes, resulting in differing levels of quality and inconsistent archiving procedures.

## ISTAT'S ACTIVITIES



For more than 75 years, Istat has played a pivotal role in the availability and quality of national and subnational data on Water use through:



**SISTAN**  
SISTEMA STATISTICO  
NAZIONALE

la rete statistica  
per il paese



- ❖ Statistical surveys
- ❖ Integration of data sources
- ❖ Development of estimation models



- ❑ **Active collaboration** with local authorities, scientific institutions, international organizations, and other governmental agencies with the aim of making statistical information responsive to the country's informational needs.
- ❑ **Compliance** with European regulations
- ❑ **Comparability** and **harmonization** of the information produced

# Some Water-related repositories and frameworks



Benessere Equo e Sostenibile  
*Equitable and Sustainable Well-being*



In collaboration with all institutes belonging to the National Statistical System (NSS) and beyond, such as the ISPRA-Italian National Institute for Environmental Protection and Research, MASE, Ministry of Health



**AQUASTAT**



National Climate Change Adaptation Plan



National Recovery and Resilience Plan



strategianazionaleper  
losvilupposostenibile

# Advancing Istat's inter-institutional cooperation <sup>1/2</sup>



Water balance (at the national and subnational level)  
Hydrogeological map of Italy

ISPRA-Italian National Institute for Environmental Protection and Research



Member of the Italian national commission for the Forecasting and Prevention of Major Risks  
for the Sector 'Forest fire and Water deficit risks'

National Civil Protection



Italian National Institute of Health

Activities on databases and indicators related to water abstraction and use for public water supply  
GLAAS - Global Analysis and Assessment of Sanitation and Drinking-Water / WASH - Water, sanitation and hygiene



Evaluation of the assessment and performance of urban wastewater treatment plants

ENEA-Italian National Agency for New Technologies, Energy and Sustainable Economic Development

# Advancing Istat's inter-institutional cooperation 2/2



## 7 Permanent District Observatories for Water Uses

Development of methodologies for calculating indicators on water scarcity and drought, and production of related indicators.



MINISTERO DELL'AMBIENTE  
E DELLA SICUREZZA ENERGETICA

Ministry of Environment and Energy Security

Urban Wastewater Treatment Directive Expert Group



Collaboration with regional administrations to define agglomerations and quantify pollutant loads

# Istat's activities on Water

## Civil use

- **Urban water census** (main data source, from water withdrawal for public water supply to urban wastewater treatment)
- Urban environmental data (focus on provincial capital cities)

## Other uses

- Water use in agriculture: estimation models for volumes used in agriculture and livestock farming, based on the Agricultural Census, the SPA survey, and the survey on the population of cattle, buffalo, pigs, sheep, and goats)
- Water use in industry: estimation models for industrial water use based on the annual PRODCOM survey on industrial production and from corporate sustainability reports.
- Water and energy production: data integration based on annual records from TERNA
- Desalination: information collected through the Urban water census and the Survey on desalination plants for other uses.
- Survey “Anthropic Pressure and Natural Risks”: natural mineral waters withdrawals for production purposes
- Environmental protection investments: expenditures by industrial enterprises and resident units for environmental protection, particularly for wastewater management and soil and water (groundwater and surface water) protection and restoration.
- Bathing waters: percentage of coastline monitored for water quality levels (Bathing Water Directive).
- Meteo-climatic and hydrological survey: with a focus on provincial capital cities

## Households

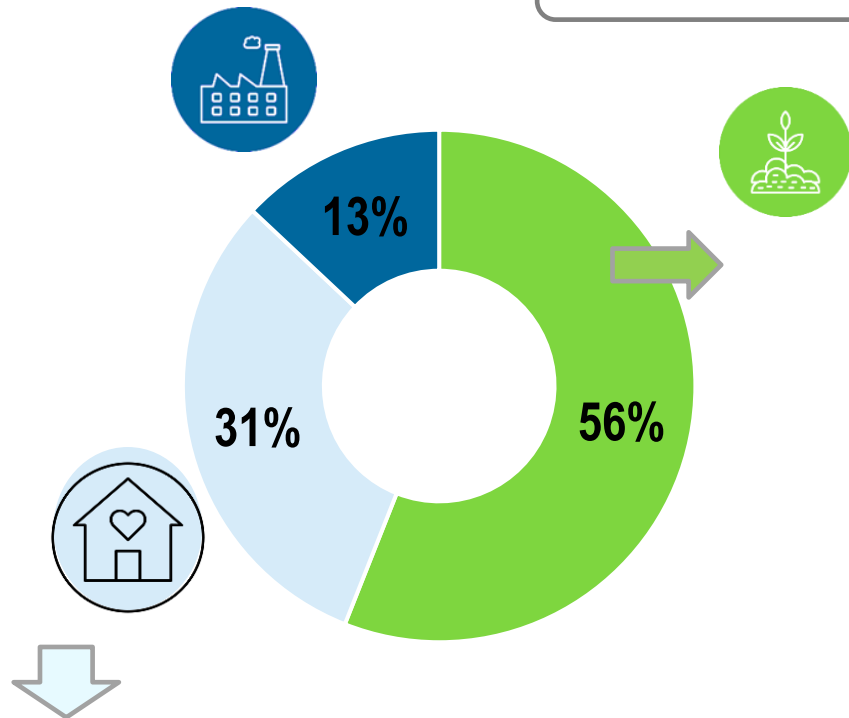
- Sample survey "Aspects of daily life": Evaluations and opinions of citizens towards water services
- Household Budget Survey: Household expenditures for water services and the purchase of bottled mineral water

# Freshwater withdrawal



Main uses.  
Mean 2015-2019

30.4 billion mc



Agriculture (irrigation) remains the most water-intensive sector at the national level.

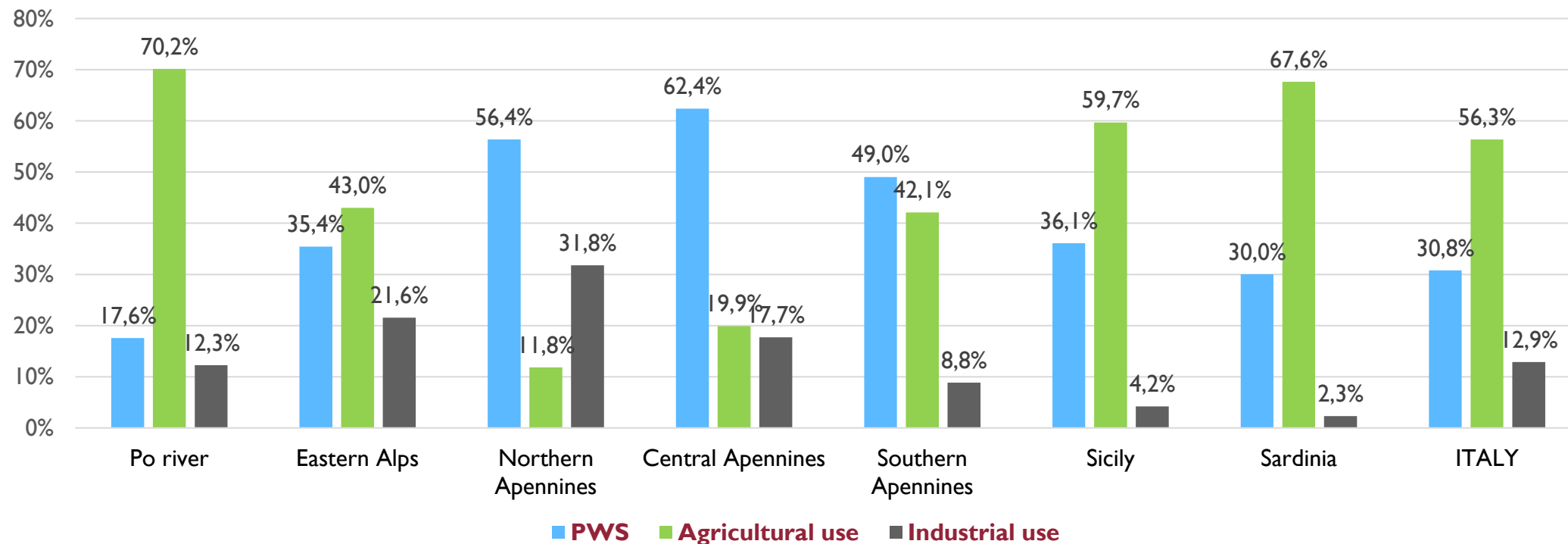
Water use for civil purposes is subject to special attention, as it directly affects citizen's wellbeing.

*Istat, Use of water resources*

# Water withdrawal by RBD and month



Mean 2015-2019



RBD	Q1	Q2	Q3	Q4
Alpi Orientali	15,9%	22,8%	41,4%	20,0%
Fiume Po	11,2%	21,4%	50,0%	17,4%
Appennino Settentrionale	22,3%	24,6%	31,1%	22,0%
Appennino Centrale	21,1%	24,0%	32,9%	22,1%
Appennino Meridionale	16,7%	22,8%	40,7%	19,8%
Sardegna	11,6%	21,7%	49,0%	17,7%
Sicilia	13,6%	22,1%	45,4%	18,9%
ITALIA	14,0%	22,1%	45,2%	18,7%

Istat, Use of water resources



# Istat Urban water census: main indicators

## Water withdrawal and transmission

- ✓ Identification code
- ✓ Annual water withdrawal for drinkable use
- ✓ Water withdrawal by month
- ✓ Type of source
- ✓ Geographical coordinates
- ✓ Wise codes
- ✓ Water withdrawal by treatment
- ✓ Water delivered to municipalities
- ✓ Water tradings between water operators
- ✓ Water delivered for not civil uses (agriculture, industry, oilers, supply ship)

## Public water supply network

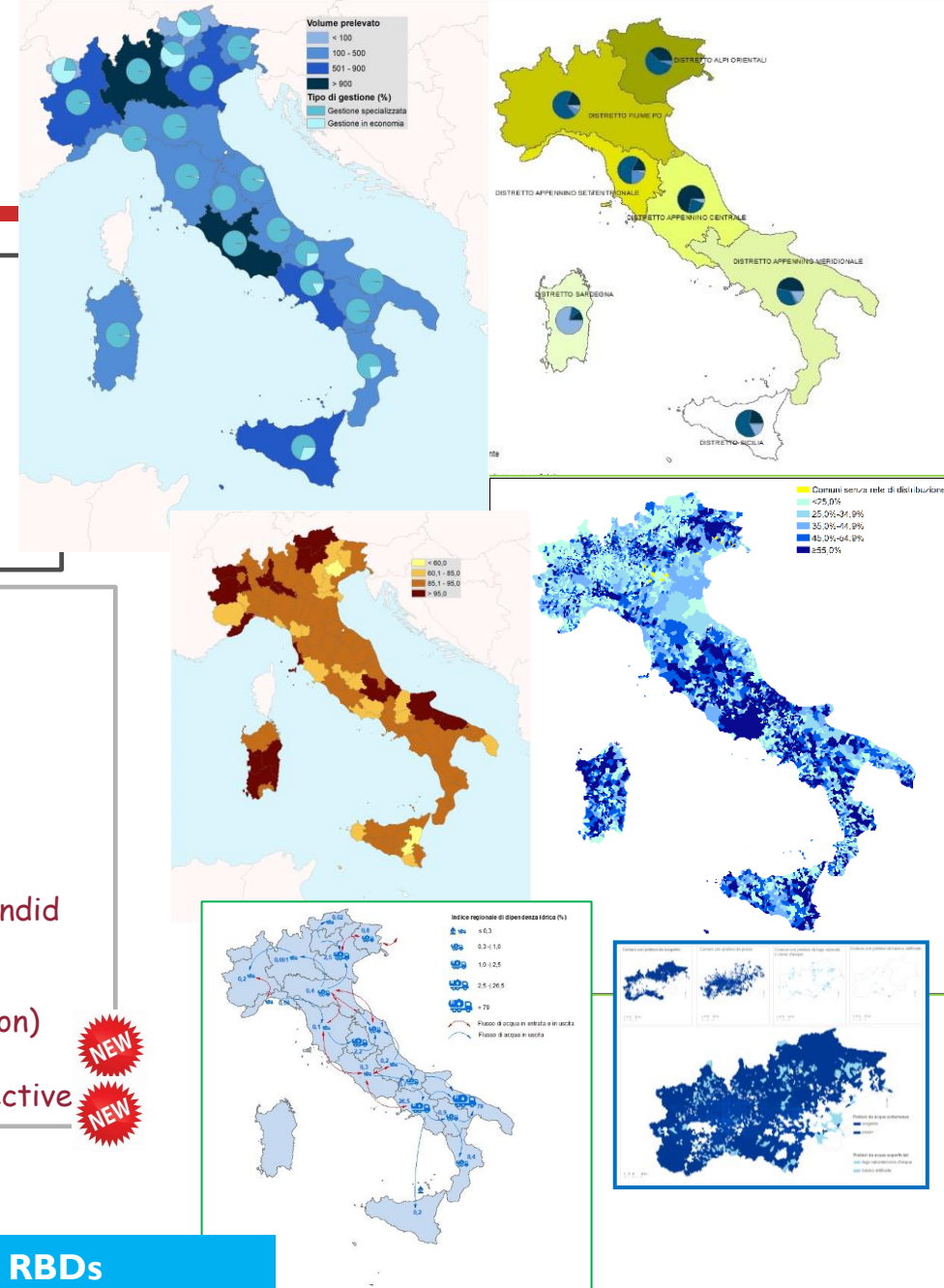
- ✓ Water input into the network
- ✓ Water supplied
- ✓ Water invoiced and users by use: civil, public, agricultural and zootechnical, industrial, ...
- ✓ Network length
- ✓ Number and length of connections
- ✓ % resident population connected to PWS
- ✓ Water safety plan
- ✓ Remediation activities
- ✓ Interruptions in the supply (days and users involved) **NEW**
- by motivation
- ✓ Emergency water supply arrangements **NEW**
- ✓ Water houses **NEW**

## Public sewerage

- ✓ Type of public sewerage network
- ✓ % Population connected to public sewerage
- ✓ Discharge destination

## Urban wastewater treatment plants

- ✓ Identification code
- ✓ Geographical coordinates
- ✓ Treatment level
- ✓ Municipalities connected to WWTP
- ✓ Capacity (in p.e.)
- ✓ Total urban population equivalent
- ✓ Total industrial population equivalent
- ✓ Water parameters (BOD, COD, suspended solid, ...)
- ✓ Sludge production and disposal
- ✓ Reuse of WW (quantity and destination)
- ✓ Energy consumption
- ✓ Activities for new Eu wastewater directive **NEW**



~80,000 questionnaires  
~300 variables

7 RBDs  
21 Regions (NUTS2)  
~7,900 municipalities

# Non-civil water uses



## PREMISE

- **Water use in agriculture:** estimation models for volumes used in agriculture and livestock farming, based on the Agricultural Census, the SPA survey, and the survey on the livestock population
- **Water use in industry:** estimation models for industrial water use based on the annual PRODCOM survey on industrial production and from corporate sustainability reports.

## UPDATE

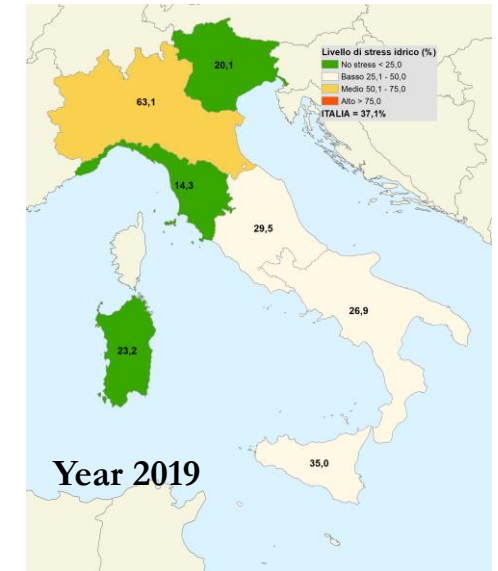
- Istat updated the volumes of water withdrawn for non-civil uses during 2015–2019 at both national and river basin district levels, including quarterly breakdowns.

# SDG 6.4.2 Level of water stress



In 2023, for the first time, ISPRA, FAO, and Istat calculated the UN-SDG 6.4.2 indicator at both national and river basin district levels, covering the years 2015 to 2019.

- **Five-Year Period 2015–2019:** Italy’s average annual water stress level was 38.3%, classified as “low.” The highest value was recorded in 2017, reaching 40.8%, a year marked by significant drought conditions. Approximately 30% of the national territory experienced severe to extreme drought on an annual scale, with the Central and Northern regions being most affected in terms of water scarcity severity.
- Freshwater withdrawals play a decisive role, as they can lead to seasonal and local water stress even in years without drought, when water availability exceeds climatic value.
- Despite a low overall water stress level at the national scale, certain Italian river basins exceed the 60% threshold—most notably the RBD Fiume Po.



UN 2023 WATER CONFERENCE

Food and Agriculture Organization of the United Nations

GOALS

SDG 6.4.2

A disaggregation of indicator 6.4.2 "Level of water stress: freshwater withdrawal as a proportion of available freshwater resources" at river basin district level in Italy

ISPRA

Istat

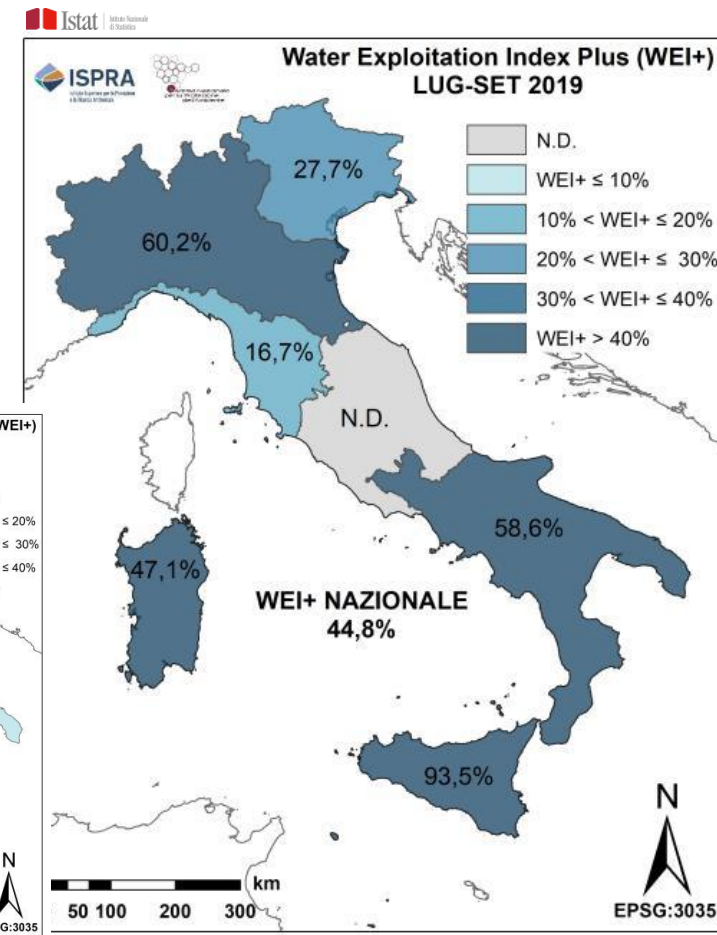
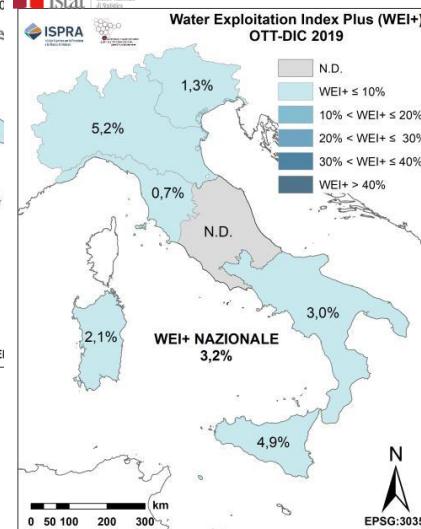
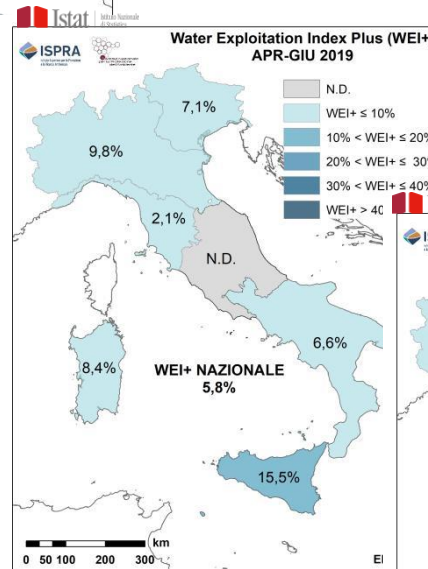
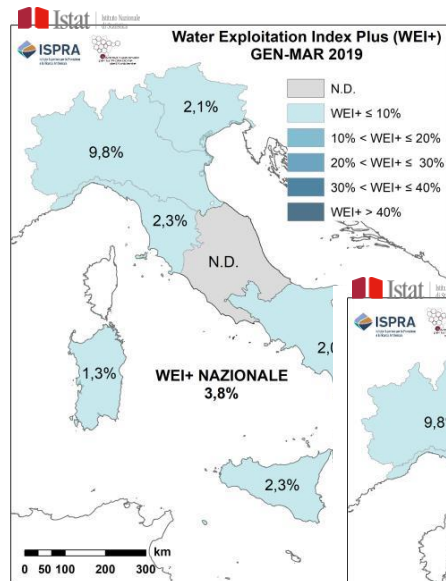
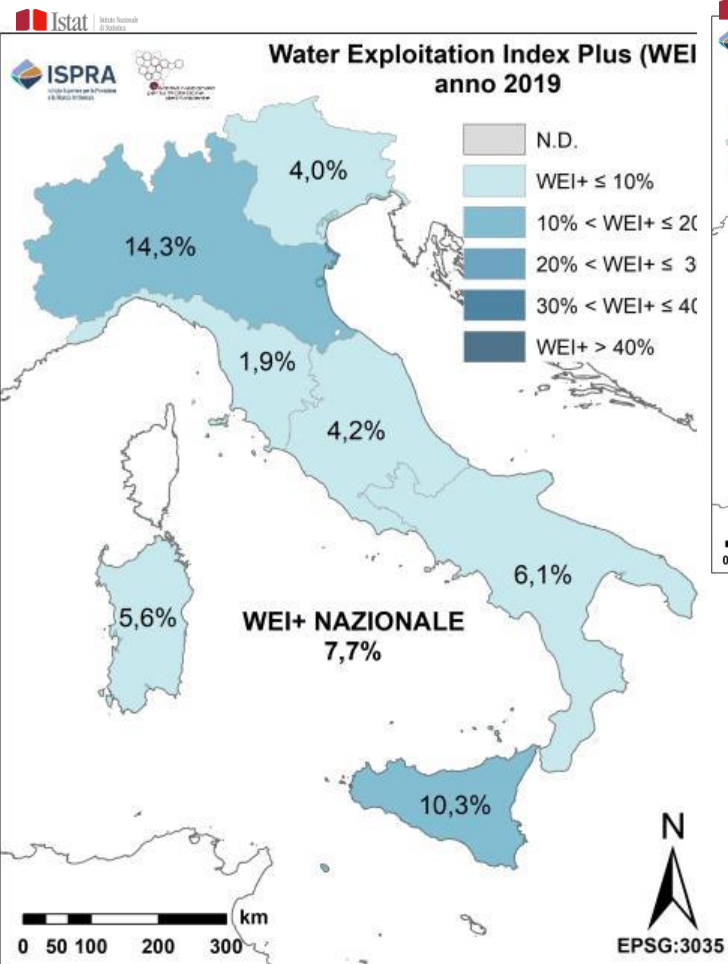
<https://openknowledge.fao.org/items/44b8ff33-cccc-4661-a1d9-ac5c94d0eede>

*\*Calculated by relating the total annual volume of freshwater withdrawn by the main economic sectors (domestic, industrial, agricultural) to the average annual water availability, based on the 1991–2020 climatological thirty-year period, net of environmental water requirements*

# Water Exploitation Index Plus



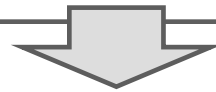
As part of the WISE 2022 reporting process for the third cycle of the River Basin Management Plan under the EU Water Framework Directive (Directive 2000/60/EC), Italy submitted to the European Commission the assessment carried out by ISPRA and Istat of WEI+ for the **period 2015–2019**. *Annual and quarterly level analysis.*



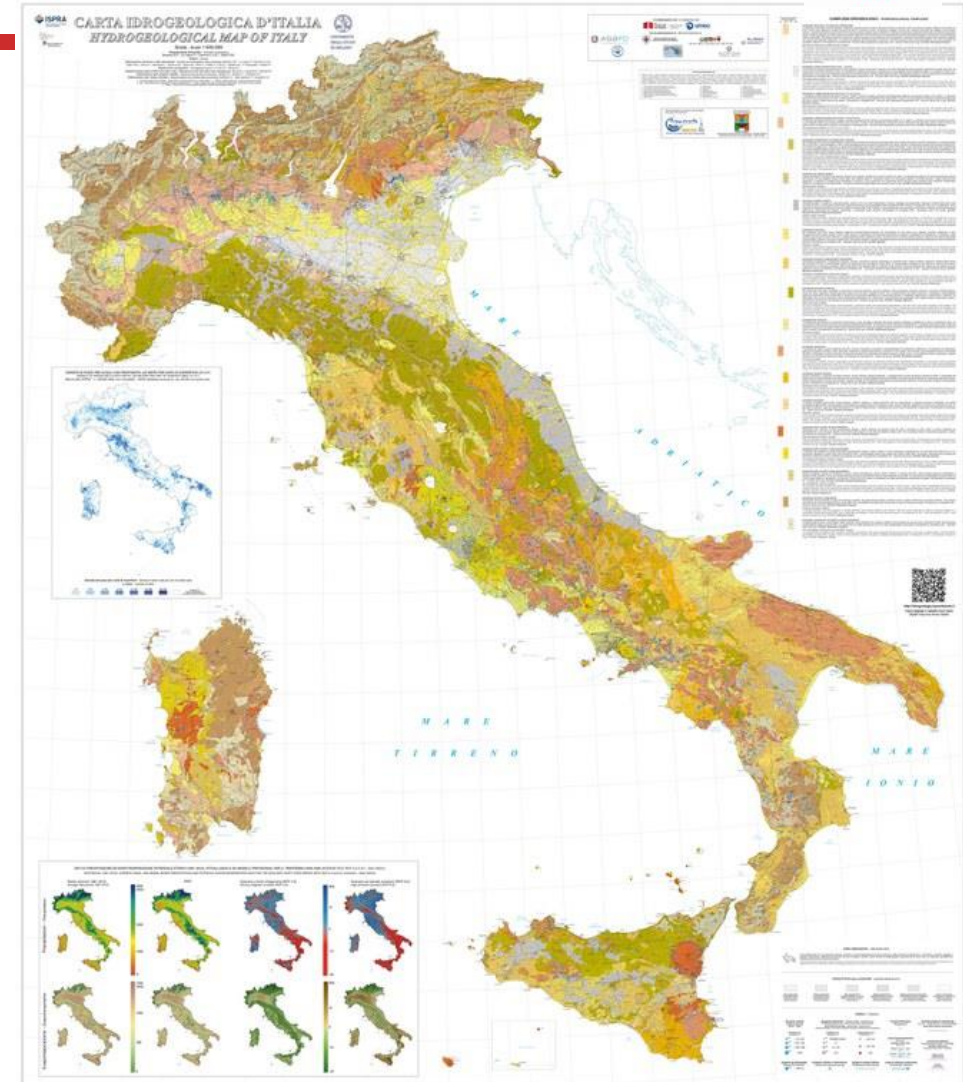
# Mapping of water withdrawals for PWS



- Enhancement of the mapping of withdrawal sources for public water supply (~**37.400 points**; **Urban water census**)
- Over 900 springs (~5% of all abstraction points) have withdrawal rates equal to or greater than 10 liters per second and supply 2.7 billion cubic meters of water for drinking use, representing 80% of the total volume from springs and 29% of the overall volume withdrawn from all sources in use for PWS. These points were used in



*Hydrogeological map of Italy*  
(collaboration between ISPRA, Istat, CMCC, University of Milan and others; 2025 )



<https://www.isprambiente.gov.it/en/news/preview-at-flowpath-2025-the-new-hydrogeological-map-of-italy-at-1-500-000-scale>

# Urban wastewater treatment



- ❖ First-time calculation of the **total amount of wastewater treated in UWWTPs** (Istat, Urban water census):
  - 6.7 billion cubic meters in 2020
  - 70% of the volume (4.7 billion cubic meters), underwent an advanced type of treatment
  - Data also provided to Eurostat/Oecd.
  - This volume can be considered a resource potentially available for subsequent **reuse** and it is equivalent to just under a quarter (22%) of the entire volume abstracted on average in the period 2015-2019 for irrigation and industrial uses.

- ❖ Istat & CNR-IRSA-Water Research Institute, National Research Council

## Analysis of the contribution of TWW-treated wastewater to river flow in the Po river basin:

**Q:** *Reuse of treated wastewater in agriculture: is it always a sustainable adaptation measure?*

**A:** *Given the substantial contribution of TWW to river discharge during drought conditions, the reuse of TWW in agriculture as an adaptation measure to address water scarcity requires a critical reassessment from a sustainability perspective.*



- ❖ Update of the indicator relating effective/projected population equivalent to the potential pollutant load in the area.

- ❖ Urban Wastewater Treatment Directive Expert Group



Ministry of Environment and Energy Security



## ❖ Largest set of indicators published

Tabella 6.1 - Elenco delle misure statistiche diffuse dall'Istat, tassonomia rispetto agli indicatori SDGs, variazioni rispetto all'anno precedente e a 10 anni prima e convergenza tra regioni

Rif. SDG	INDICATORE	Rispetto all'indicatore SDG	Valore	VARIAZIONI		CONVERGENZA TRA REGIONI rispetto a 10 anni prima
				Rispetto all'anno precedente	Rispetto a 10 anni prima	
<b>6.1.1 Percentuale di popolazione che fruisce di servizi idrici di acqua potabile gestiti in modo sicuro</b>						
	Acqua erogata pro capite (Istat, 2022, litri per abitante al giorno)	Di contesto nazionale	254	(a)	(b)	↔
	Famiglie che non si fidano di bere l'acqua del rubinetto (Istat, 2024, valori percentuali)	Di contesto nazionale	20,7			↔
	Irregolarità nella distribuzione dell'acqua (Istat, 2024, valori percentuali)	Di contesto nazionale	0,7			=
	Razionalismo dell'erogazione dell'acqua per uso domestico per parte o tutto il territorio comunale (Istat, 2023, numero di Comuni)	Di contesto nazionale	14	(c)	(d)	---
<b>6.3.1 Percentuale di acque reflue civili e industriali trattate in modo sicuro</b>						
	Trattamento delle acque reflue (Istat, 2015, valori percentuali)	Parziale	59,6	(e)	(f)	=
	Acque reflue urbane con trattamento secondario o avanzato (Istat, 2022, %)	Di contesto nazionale	7,946	(a)		↔
	Copertura del servizio pubblico di fognatura (Istat, 2022, valori percentuali)	Di contesto nazionale	88,8	(a)		---
<b>6.3.2 Percentuale di corpi idrici con una buona qualità ambientale</b>						
	Percentuale di corpi idrici fiumi con stato di qualità chimica buono e di qualità ecologica elevato o buono (ISPRA, 2016-2021, valori percentuali)	Proxy	(*)	---	---	---
	Percentuale di corpi idrici laghi con stato di qualità chimica buono e di qualità ecologica elevato o buono (ISPRA, 2016-2021, valori percentuali)	Proxy	(*)	---	---	---
	Percentuale di corpi idrici acque sotterranee con stato di qualità chimica (SCAS) buono (ISPRA, 2016-2021, valori percentuali)	Proxy	(*)	---	---	---
	Percentuale di corpi idrici acque di transizione con stato di qualità ecologica elevato o buono e di qualità chimica buono (ISPRA, 2016-2021, valori percentuali)	Proxy	(*)	---	---	---
	Percentuale di corpi idrici acque marine costiere con stato di qualità ecologica elevato o buono e di qualità chimica buono (ISPRA, 2016-2021, valori percentuali)	Proxy	(*)	---	---	---
<b>6.4.1 Variazione dell'efficienza dell'uso della risorsa idrica nel tempo</b>						
	Efficienza delle reti di distribuzione dell'acqua potabile (Istat, 2022, valori percentuali)	Proxy	57,6	(a)	(b)	↔
<b>6.4.2 Livello di stress idrico: prelievo di acqua dolce in proporzione alle risorse di acqua dolce disponibili</b>						
	Livello di stress idrico: prelievo di acqua dolce in proporzione alle risorse di acqua dolce disponibili (Istat-ISPRA-FAO, 2019, valori percentuali)	Identico	37,1		(a)	---
	Prelievi di acqua per uso potabile (Istat, 2022, milioni di m³)	Di contesto nazionale	9.132,5	(a)		=
<b>6.5.1 Grado di attuazione della gestione integrata delle risorse idriche</b>						
	Grado di attuazione della gestione integrata delle risorse idriche (ISPRA, 2023, indice)	Identico	78,0	(a)	(b)	---
<b>6.5.2 Proporzioni dell'area del bacino transfrontaliero con un accordo operativo per la cooperazione idrica</b>						
	Quota percentuale dell'area del bacino transfrontaliero in cui è in atto un accordo operativo per la cooperazione in materia di risorse idriche (Elaborazione su dati Ministero dell'Ambiente e della Sicurezza Energetica, 2023, valori percentuali)	Identico	97,0		(a)	---
<b>6.6.1 Variazione nel tempo dell'estensione degli ecosistemi legati all'acqua</b>						
	Zone umide di importanza internazionale (ISPRA, 2021, ettari)	Identico	79.826	(a)	(b)	=
<b>6.a.1 Assistenza ufficiale allo sviluppo per l'acqua e i servizi igienico-sanitari come parte di un piano di spesa coordinato dal governo</b>						
	Aiuto Pubblico allo Sviluppo nei settori dell'acqua e sanificazione (Ministero degli Affari Esteri e della Cooperazione Internazionale, 2024, milioni di euro, prezzi correnti)	Proxy	111,28			---
<b>Legenda</b>				<b>Note</b>		
	MIGLIORAMENTO		CONVERGENZA	(a) Variazione calcolata sul 2020		
	STABILITÀ		STABILITÀ	(b) Variazione calcolata sul 2012		
	PEGGIORAMENTO		DIVERGENZA	(c) Variazione calcolata sul 2021		
	NON DISPONIBILE / NON SIGNIFICATIVO			(d) Variazione calcolata sul 2014		
				(e) Variazione calcolata sul 2005		
				(f) Variazione calcolata sul 2013		
				(g) Variazione calcolata sul 2015		
				(h) Variazione calcolata sul 2017		
				(i) Variazione calcolata sul 2018		
				(j) Si rimanda alla tabella dati diffusa su <a href="http://www.istat.it">www.istat.it</a>		



# Dissemination

World water day 2025 - <https://www.istat.it/en/press-release/water-statistics-years-2020-2024/>

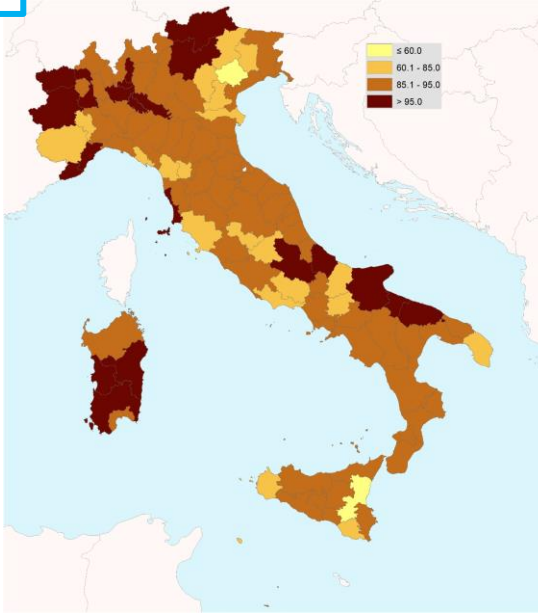
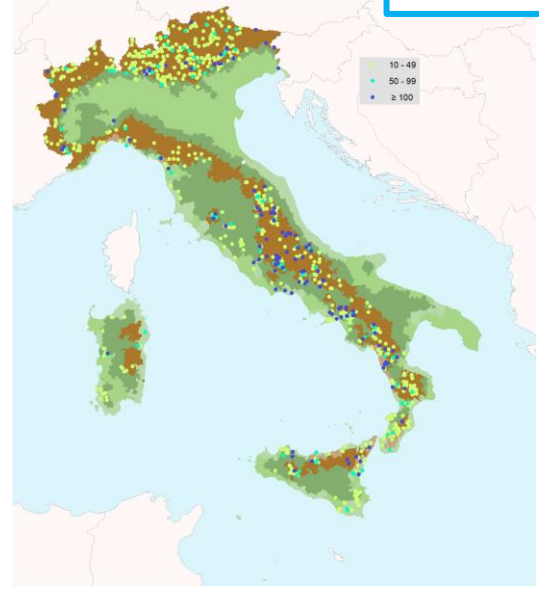
Istat web data base <http://dati.istat.it/> Environmental and Energy / Water

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**Thank you for your attention**  
*Grazie per l'attenzione*

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