UNESCO-IHP International Initiative on Water Quality

Promoting science and innovation on water quality monitoring

UNESCO World Water Quality Portal

Sarantuyaa Zandaryaa
UNESCO
Division of Water Sciences – Intergovernmental Hydrological Programme

WMO-UNEP-UNESCO-WHO-OGC Water Quality Workshop | 29-31 March 2022
The 8th phase of IHP (IHP-VIII, 2014-2021)

Theme 3 “Addressing water scarcity and quality” aimed at: **strengthening the knowledge base on the quality of the world’s water resources**, and promoting new **innovative tools for water quality management and pollution control**.

- **Focal Area 3.4**: Addressing water quality and pollution issues within an IWRM framework
- **Focal Area 3.5**: Promoting innovative tools for safety of water supplies and controlling pollution

The 9th phase of IHP (IHP-IX, 2022-2029)

- Development and sharing of **knowledge and innovative solutions on improving water quality and reducing water pollution to support science-based decision-making** (*Output 1.8*)
- Development and sharing of **new technologies** (i.e. Earth Observation) for use in hydrological planning and assessment, as well as monitoring and distribution (*Output 1.9*)
- Improving understanding and knowledge on pollutants’ sources, fate and transport in **freshwater systems** to prevent and reduce water pollution and underpin water resources management strategies (*Output 4.5*) - **a particular focus on emerging pollutants**
Emerging Pollutants in Water

Since 2009, UNESCO has been promoting knowledge generation, research, scientific cooperation, science-based policy development, capacity building and awareness raising on emerging pollutants in water.

Chemical contaminants: those invisible additives in our drink

More than 60 million organic and inorganic substances have been documented by the Registry of the American Chemical Society, the most up to date and comprehensive database on chemicals worldwide. Every day, 12,000 new chemical products join the market. Of this ever-expanding universe, more than 49 million chemicals are commercially available, yet less than 1% of them are inventoried or regulated.

The life cycle of these chemical compounds extends well beyond the use for which they were originally intended. Many seep into the soil, air, rivers and sea. Moreover, early research indicates that many chemicals that have not historically been considered as contaminants – such as pharmaceuticals – are now present in water and the wider environment. As a result, humans and ecosystems are being continuously exposed to these invisible contaminants. How extensive is the problem and what kind of threat does it pose to our health and ecosystems?

That is the question which UNESCO’s International Hydrological Programme has decided to tackle, by promoting research and scientific exchanges on the topic and fostering public awareness. For the first case study within this new project, UNESCO
Development and sharing of knowledge on water quality

UNESCO Project
Emerging Pollutants in Water

- Generated new knowledge and promoted research through **16 case studies on emerging pollutants** (20 countries in all regions)
- Provided the platform for **knowledge dissemination and scientific cooperation** through numerous technical and experts’ meetings
- Carried out extensive capacity building on water quality and emerging pollutants by **training over 360 water professionals, researchers and government officials from 110 countries in Africa, Asia, Arab States, Latin America**
- Provided **the scientific basis for the development of new policies on emerging pollutants**
- Published **knowledge materials and policy recommendations** on emerging pollutants

https://en.unesco.org/emergingpollutantsinwaterandwastewater
Training for over **360 water professionals, researchers and government officials** from **110 countries** in Africa, Asia, Arab States, and Latin America.

[https://en.unesco.org/emergingpollutantsinwaterandwastewater](https://en.unesco.org/emergingpollutantsinwaterandwastewater)
Hazardous substances

35. **WE AGREE** to re-examine the effectiveness of measures and recommendations for legacy pollutants and to identify the scale of problems of contaminants of emerging concern, including micro-pollutants in coastal and marine waters and, based on this knowledge, to consider possible cost-effective mitigation measures.

**WE WELCOME** the joint HELCOM-UNESCO-EUSBSR status report on pharmaceuticals in the aquatic environment in the Baltic Sea Region as the information basis for developing measures, as appropriate, to prevent pharmaceuticals from reaching the Baltic Sea...

New policies to monitor emerging pollutants for the protection of the ecosystem health of the Baltic Sea

- Adoption of a pre-core test indicator on *diclofenac*
- Consideration of an indicator on hormones (*estrogen*)

[https://en.unesco.org/emergingpollutantsinwaterandwastewater](https://en.unesco.org/emergingpollutantsinwaterandwastewater)
Promoting innovative tools on water quality
Satellite Earth Observation for freshwater quality monitoring
The **UNESCO World Water Quality Portal** is the first-of-its-kind innovative tool for *freshwater quality monitoring* through satellite Earth Observation coupled with field/in-situ measurements.

The Portal supports basin organizations with innovative water quality monitoring towards:

- sustainable management of water resources and ecosystems
- reducing impacts of human activities on water and ecosystems
- protecting human health and biodiversity

The Portal can potentially support the national-level implementation of the SDGs and water quality and ecosystem related targets.

https://en.unesco.org/waterqualitymonitor
Demonstration phase (2015-2018)

https://en.unesco.org/waterqualitymonitor
UNESCO World Water Quality Portal: Lake Chad Basin
UNESCO World Water Quality Portal: Lake Chad Basin

https://en.unesco.org/waterqualitymonitor
https://lakechad.waterqualitymonitor.unesco.org/portal/
UNESCO World Water Quality Portal: Lake Chad Basin

https://en.unesco.org/waterqualitymonitor
https://lakechad.waterqualitymonitor.unesco.org/portal/
Field measurements of water quality by LCBC experts using a modern sonde provided by UNESCO for calibration and validation of satellite-derived data on the UNESCO World Water Quality Portal.
UNESCO World Water Quality Portal: Lake Chad Basin

Field measurement/in-situ data

https://en.unesco.org/waterqualitymonitor
https://lakechad.waterqualitymonitor.unesco.org/portal/
UNESCO World Water Quality Portal: Lake Chad Basin

Water surface area

https://en.unesco.org/waterqualitymonitor
https://lakechad.waterqualitymonitor.unesco.org/portal/
UNESCO World Water Quality Portal: Lake Chad Basin

Water surface area

1973  1986  2000  2018

https://en.unesco.org/waterqualitymonitor
https://lakechad.waterqualitymonitor.unesco.org/portal/
UNESCO World Water Quality Portal: La Plata Basin

https://en.unesco.org/waterqualitymonitor
https://laplata.waterqualitymonitor.unesco.org/portal/
A worldwide network of **IHP National Committees**, **UNESCO Water Centres** and **UNESCO Water Chairs** to disseminate knowledge and build capacities to manage freshwater resources in a sustainable way.
Established by the endorsement of the UNESCO IHP Intergovernmental Council in its 20th session in 2012, upon the proposal by African countries.

**An international scientific cooperation initiative**, aimed at supporting UNESCO Member States to address water quality issues in a holistic manner by:

- Strengthening the knowledge base through research promotion, and knowledge generation and dissemination
- Promoting technological solutions, innovative approaches and best practices
- Supporting science-based decision-making and bridging the science-policy interface
- Building capacity and creating awareness
- Fostering international scientific cooperation
UNESCO-IHP
International Initiative on Water Quality (IIWQ)

The IIWQ Expert Advisory Group, comprising experts on water quality and in other areas related water quality:

- Provides scientific, technical and expert advice on water quality challenges, priorities, and emerging issues, as well as on future directions of IIWQ

The IIWQ partners include:

- Experts in fields related to water quality, wastewater and other areas with related to water quality
- Research institutions and governmental/non-governmental organizations in both developing and developed countries
- Strategic collaboration with UN and international organizations

Active in all regions: Africa, Asia and the Pacific, Arab States, Europe, Latin America and the Caribbean, North America, and SIDS.

IIWQ is ranked as one of the best-performing initiatives by the external evaluation of IHP Flagship Initiatives (2018)

https://en.unesco.org/internationalinitiativeonwaterquality
Thank you!

Sarantuyaa Zandaryaa
UNESCO
(s.zandaryaa(а)unesco.org)
Division of Water Sciences – Intergovernmental Hydrological Programme (IHP)
International Initiative on Water Quality (IIWQ)

Emerging Pollutants in Water - https://en.unesco.org/emergingpollutantsinwaterandwastewater