



unesco



UNESCO-IHP International Initiative on Water Quality

Promoting science and innovation on water quality monitoring

UNESCO World Water Quality Portal

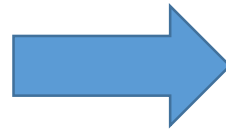
Sarantuyaa Zandaryaa
UNESCO

Division of Water Sciences – Intergovernmental Hydrological Programme

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



Forty years of field laboratories in sustainability, p 2

Natural Sciences
Quarterly Newsletter

Vol. 9, No. 4
October–December 2011

A World of **SCIENCE**

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?

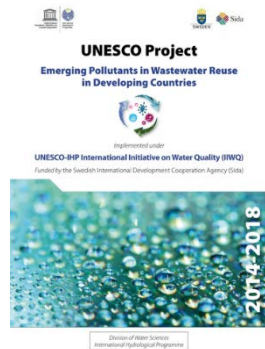
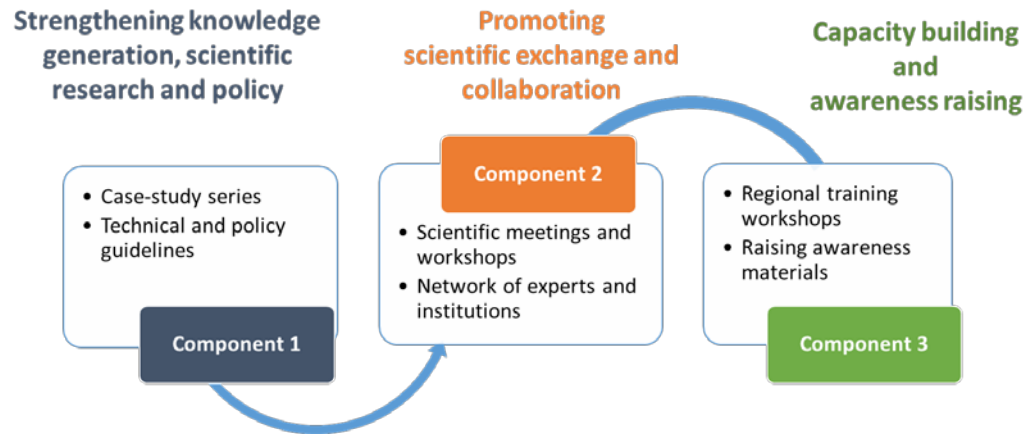
That is the question which UNESCO's International Hydrological Programme has decided to tackle, by promoting research and scientific exchanges on the topic and fostering public awareness. For the first case study within this new project, UNESCO

<https://unesdoc.unesco.org/ark:/48223/pf0000212222>



Development and sharing of knowledge on water quality

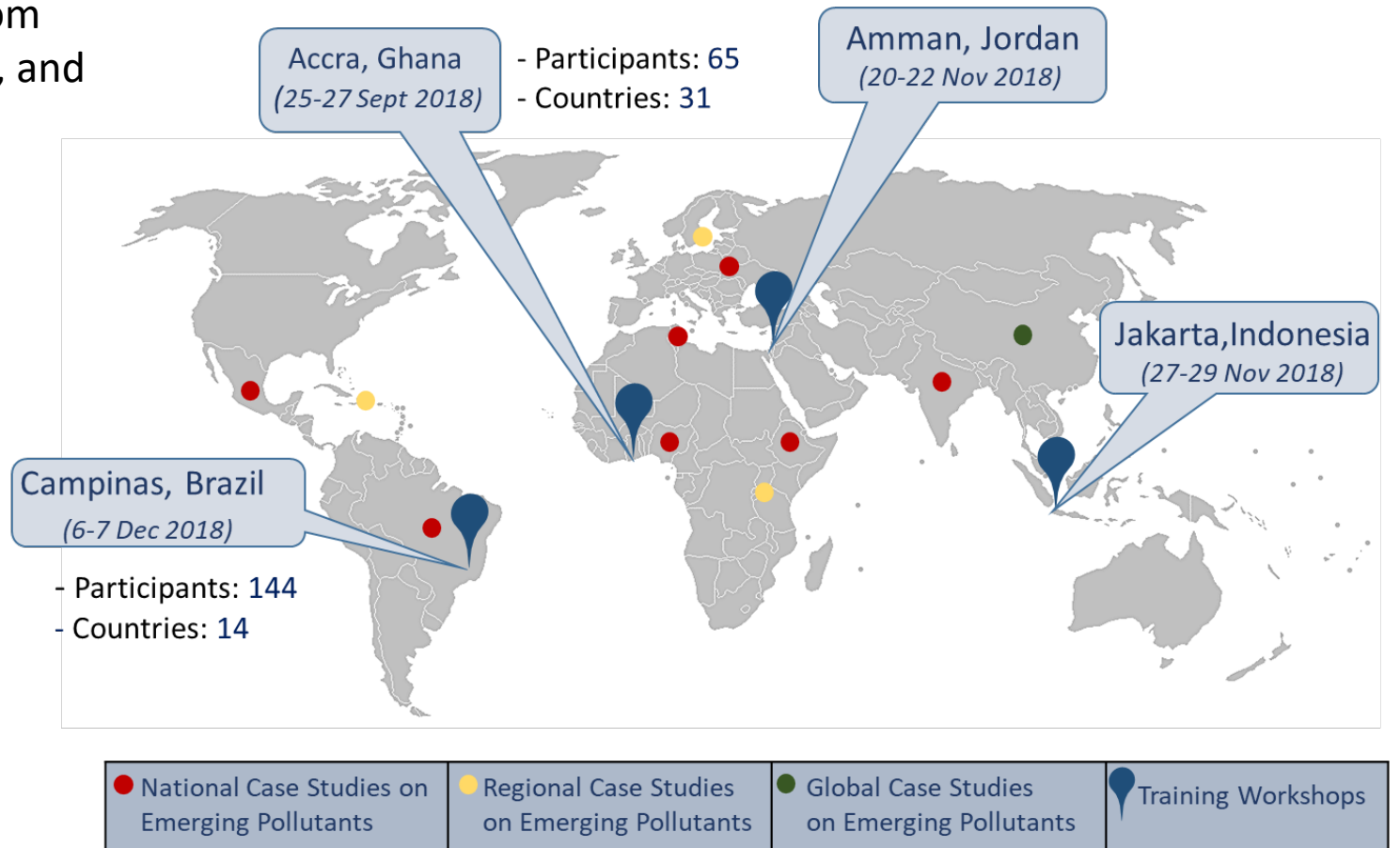
UNESCO Project Emerging Pollutants in Water



- 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

Capacity building on water quality and emerging pollutants

Training for over **360 water professionals, researchers and government officials** from **110 countries** in Africa, Asia, Arab States, and Latin America



Science-based policy and regulatory advice on water quality



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...

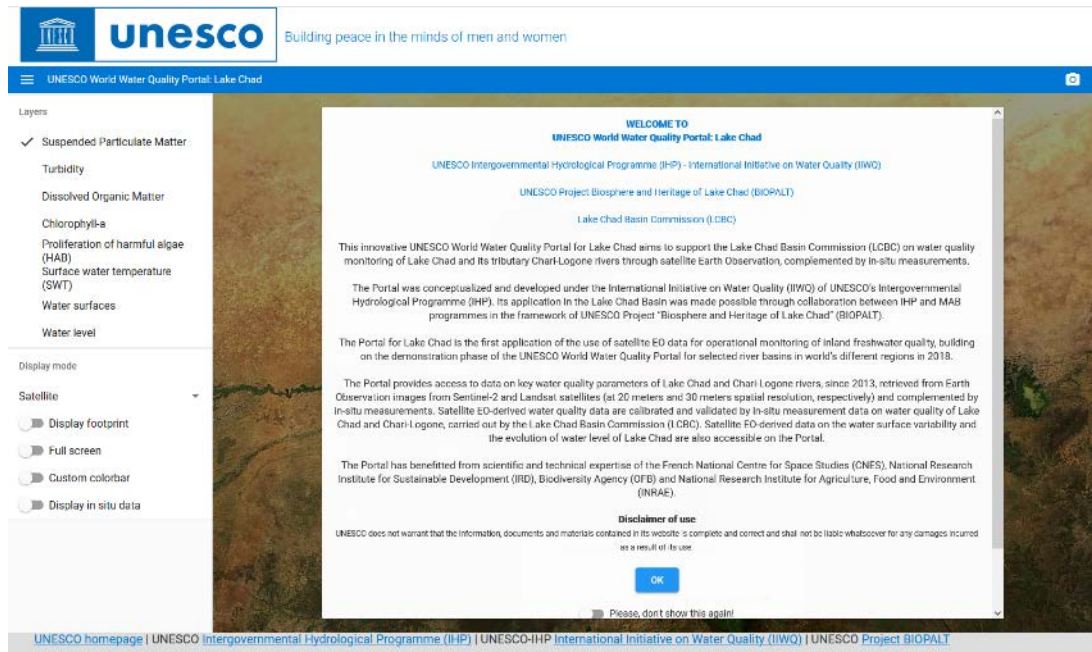
New policies to monitor emerging pollutants for the protection of the ecosystem health of the Baltic Sea

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



Promoting innovative tools on water quality
Satellite Earth Observation for freshwater quality monitoring

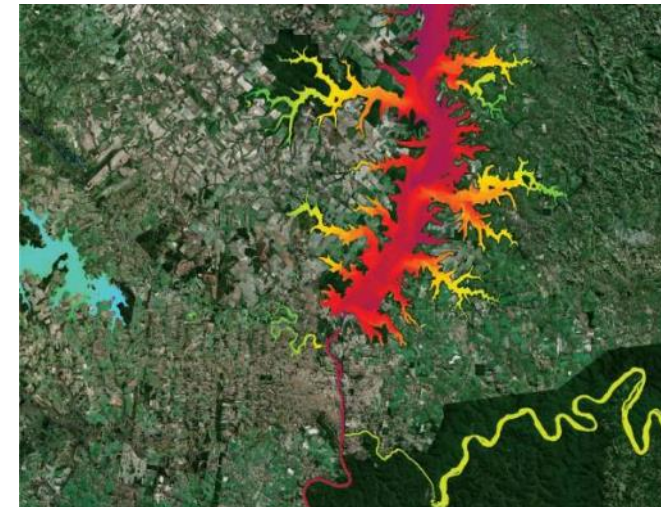
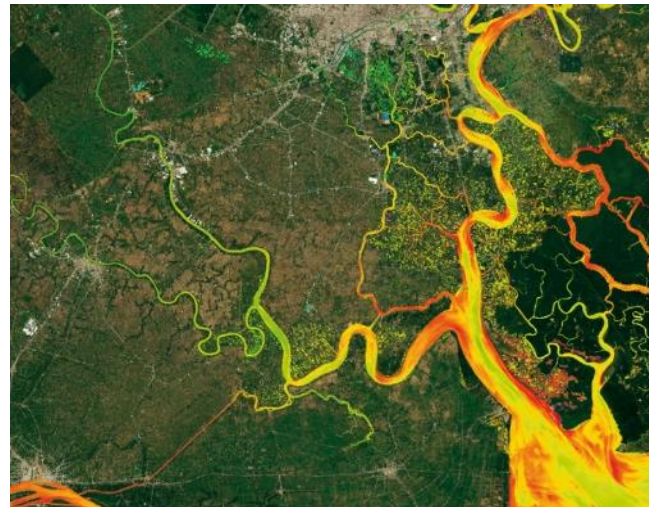
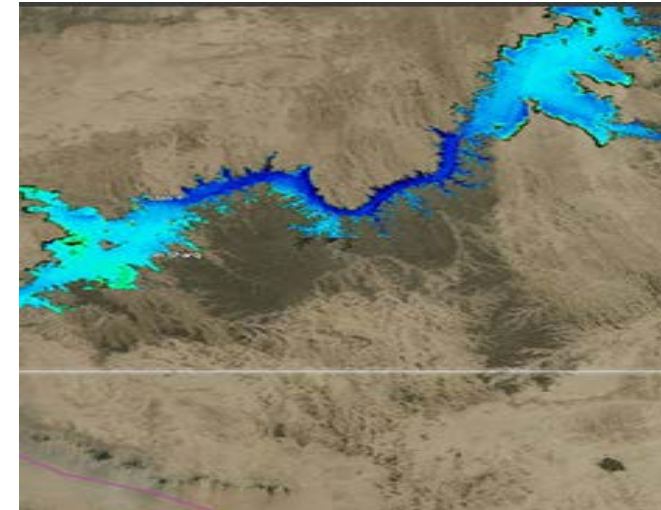
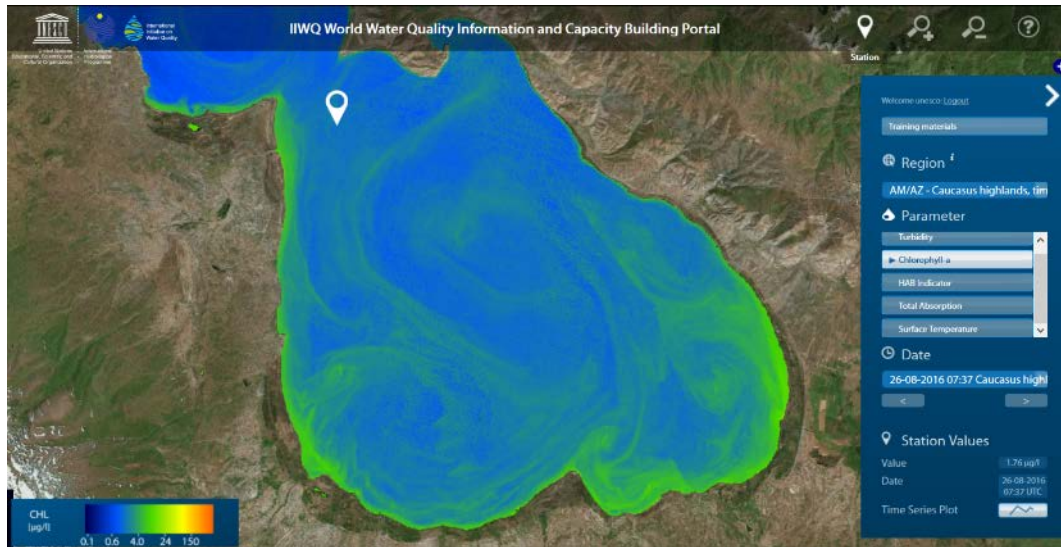
UNESCO Intergovernmental Hydrological Programme (IHP) UNESCO World Water Quality Portal

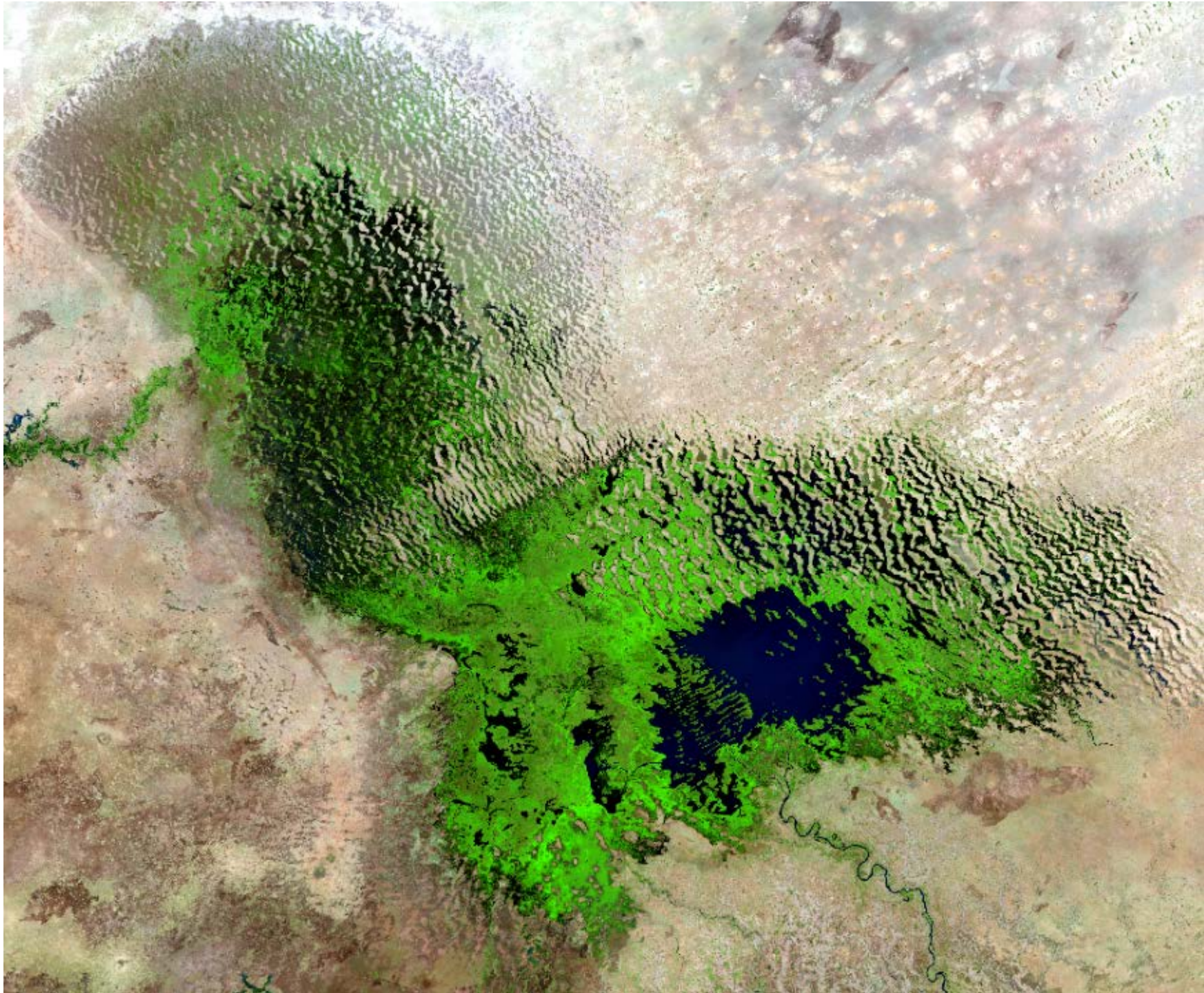


- The **UNESCO World Water Quality Portal** is the first-of-its-kind innovative tool for **freshwater quality monitoring through satellite Earth Observation coupled with field/in-situ measurements**.
- The Portal supports basin organizations with innovative water quality monitoring towards:
 - sustainable 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)

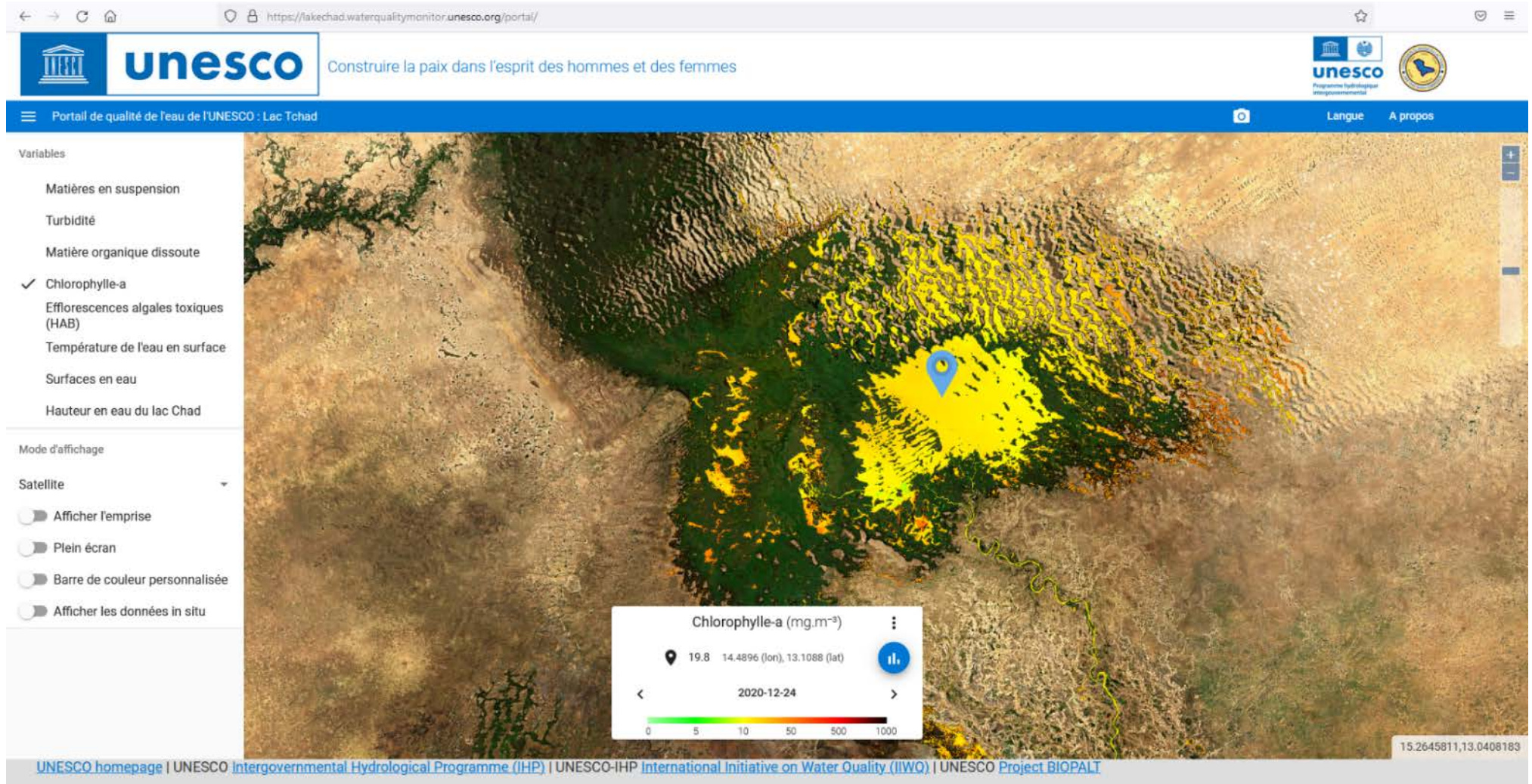




UNESCO World Water Quality Portal
Operational application

Lake Chad Basin

UNESCO World Water Quality Portal: Lake Chad Basin



The screenshot displays the UNESCO World Water Quality Portal for the Lake Chad Basin. The page features a blue header with the UNESCO logo and the tagline "Construire la paix dans l'esprit des hommes et des femmes". The main content area shows a satellite map of the Lake Chad Basin with a color scale for Chlorophyll-a concentration. A data popup window is visible over the map, showing the following information:

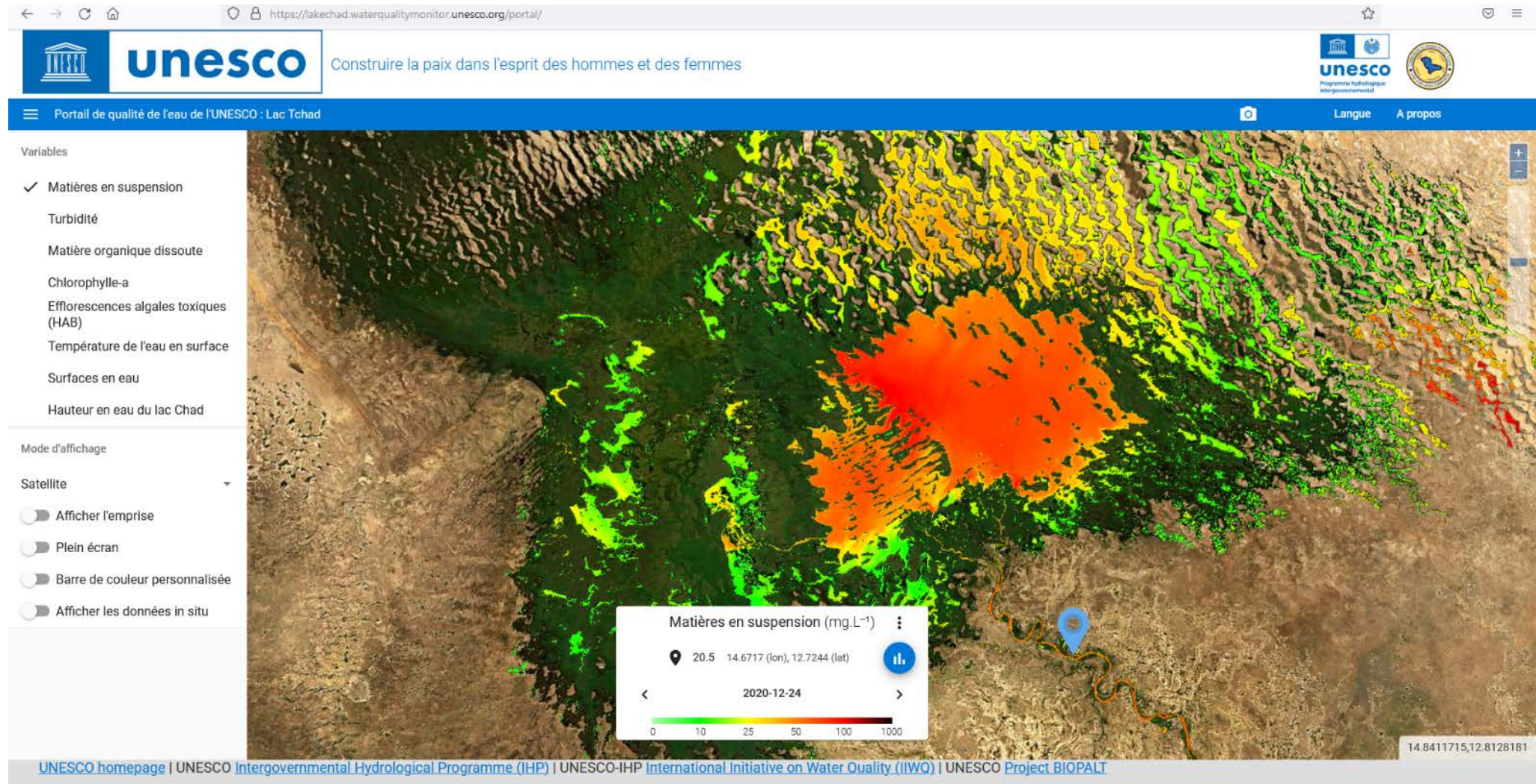
- Variable: Chlorophylle-a ($\text{mg}\cdot\text{m}^{-3}$)
- Location: 19.8 14.4896 (lon), 13.1088 (lat)
- Date: 2020-12-24
- Color scale: 0 to 1000

The left sidebar contains a list of variables and display options:

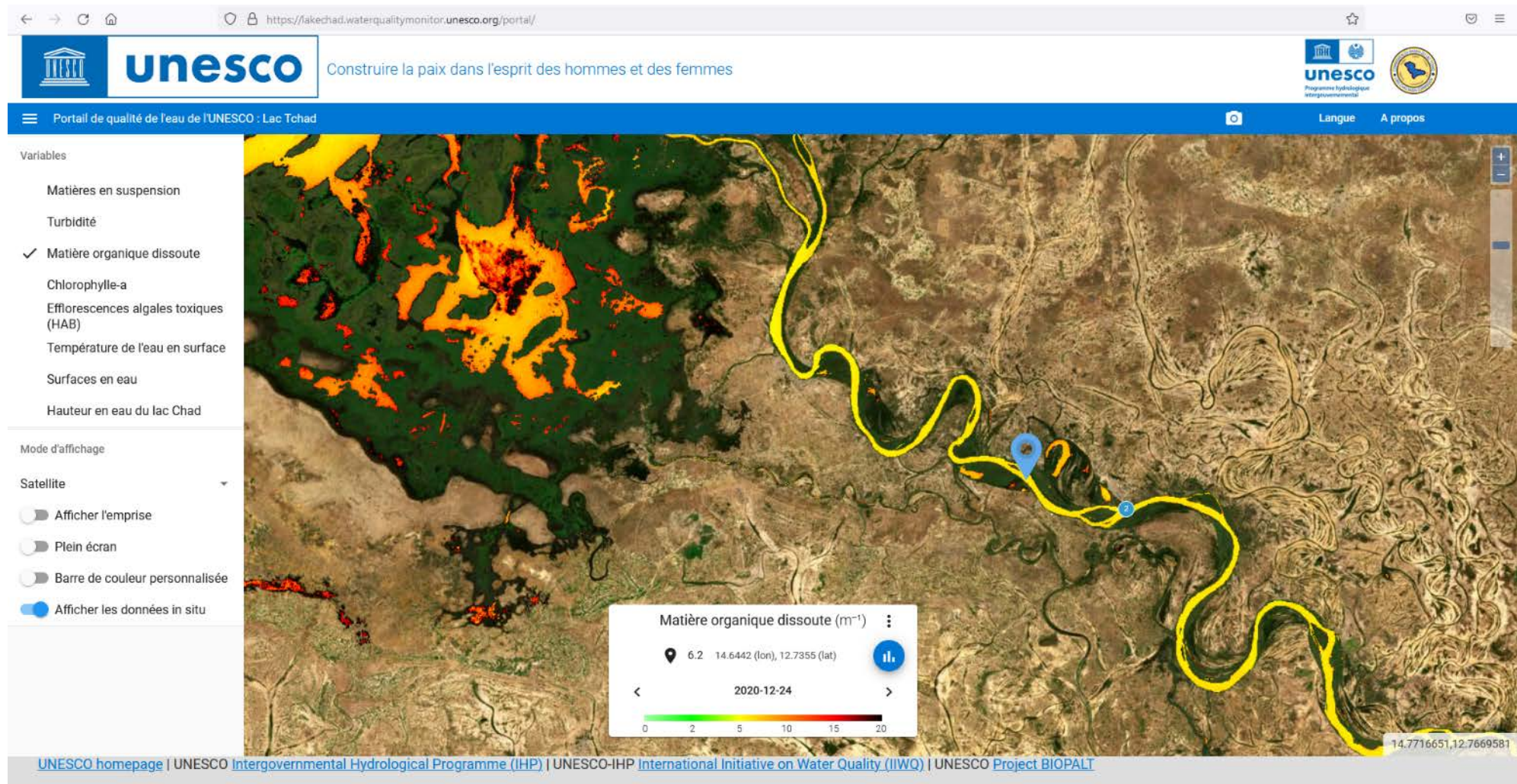
- Variables:
 - Matières en suspension
 - Turbidité
 - Matière organique dissoute
 - ✓ Chlorophylle-a
 - Efflorescences algales toxiques (HAB)
 - Température de l'eau en surface
 - Surfaces en eau
 - Hauteur en eau du lac Chad
- Mode d'affichage:
 - Satellite
 - Afficher l'emprise
 - Plein écran
 - Barre de couleur personnalisée
 - Afficher les données in situ

The footer contains the following text: UNESCO homepage | UNESCO Intergovernmental Hydrological Programme (IHP) | UNESCO-IHP International Initiative on Water Quality (IIWQ) | UNESCO Project BIOPALT

UNESCO World Water Quality Portal: Lake Chad Basin



UNESCO World Water Quality Portal: Lake Chad Basin



UNESCO World Water Quality Portal: Lake Chad Basin



unesco

Construire la paix dans l'esprit des hommes et des femmes

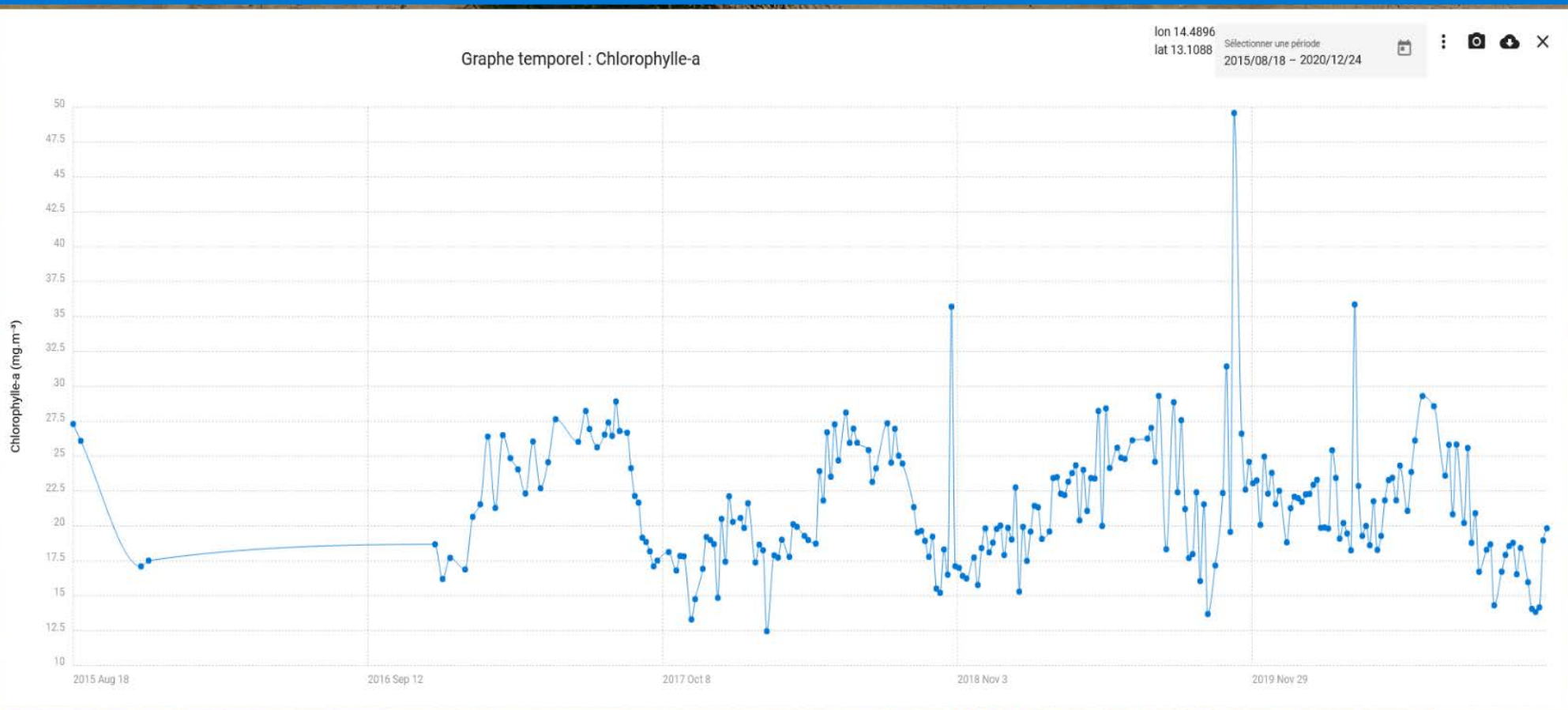


Portail de qualité de l'eau de l'UNESCO : Lac Tchad



Langue

A propos

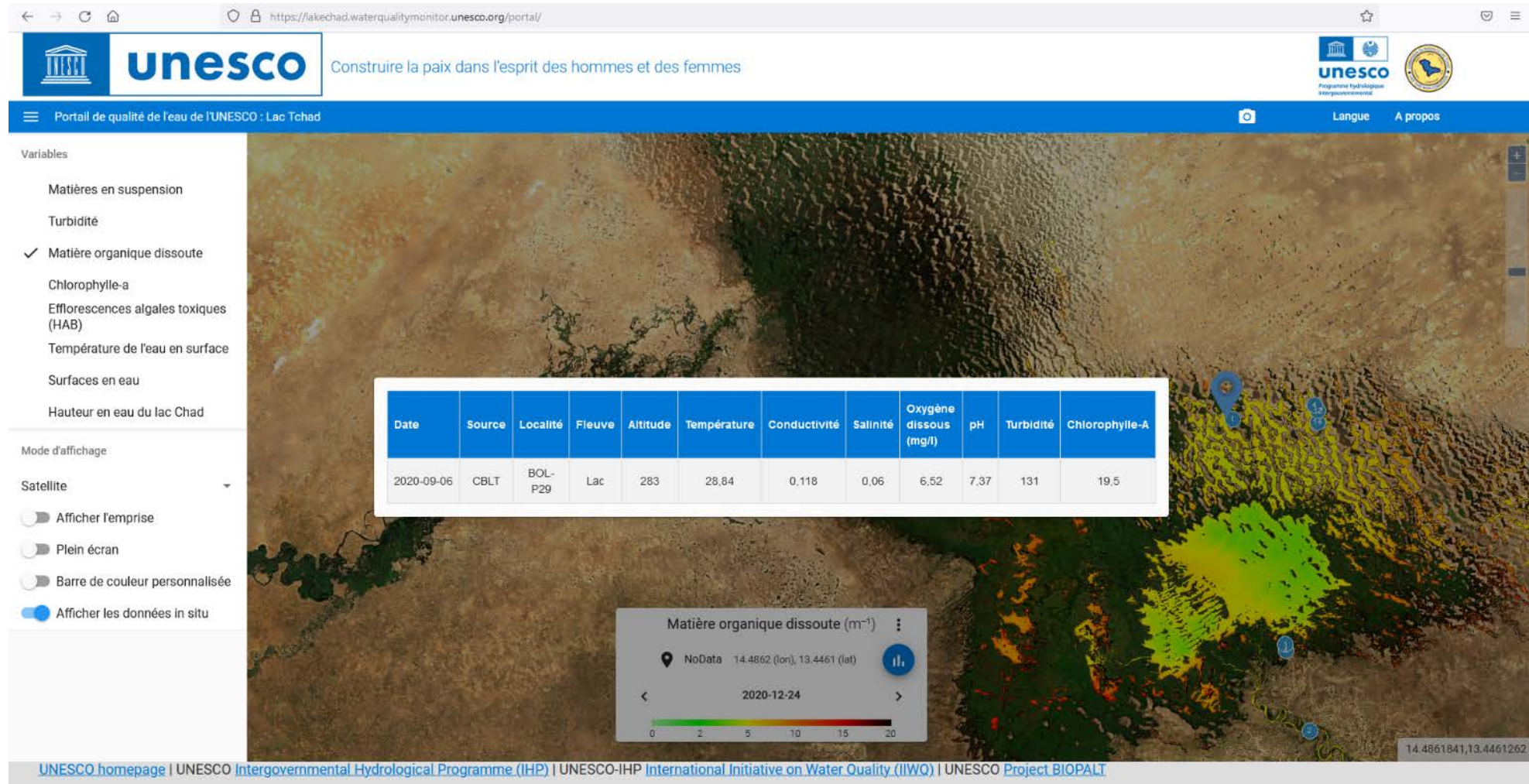


UNESCO World Water Quality Portal: Lake Chad Basin Calibration and validation of satellite-derived data



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



Portail de qualité de l'eau de l'UNESCO : Lac Tchad

Variables

- Matières en suspension
- Turbidité
- Matière organique dissoute
- Chlorophylle-a
- Efflorescences algales toxiques (HAB)
- Température de l'eau en surface
- Surfaces en eau
- Hauteur en eau du lac Chad

Mode d'affichage

Satellite

- Afficher l'emprise
- Plein écran
- Barre de couleur personnalisée
- Afficher les données in situ

Date	Source	Localité	Fleuve	Altitude	Température	Conductivité	Salinité	Oxygène dissous (mg/l)	pH	Turbidité	Chlorophylle-A
2020-09-06	CBLT	BOL-P29	Lac	283	28.84	0,118	0,06	6,52	7,37	131	19,5

Matière organique dissoute (m^{-1})

NoData 14.4862 (lon), 13.4461 (lat)

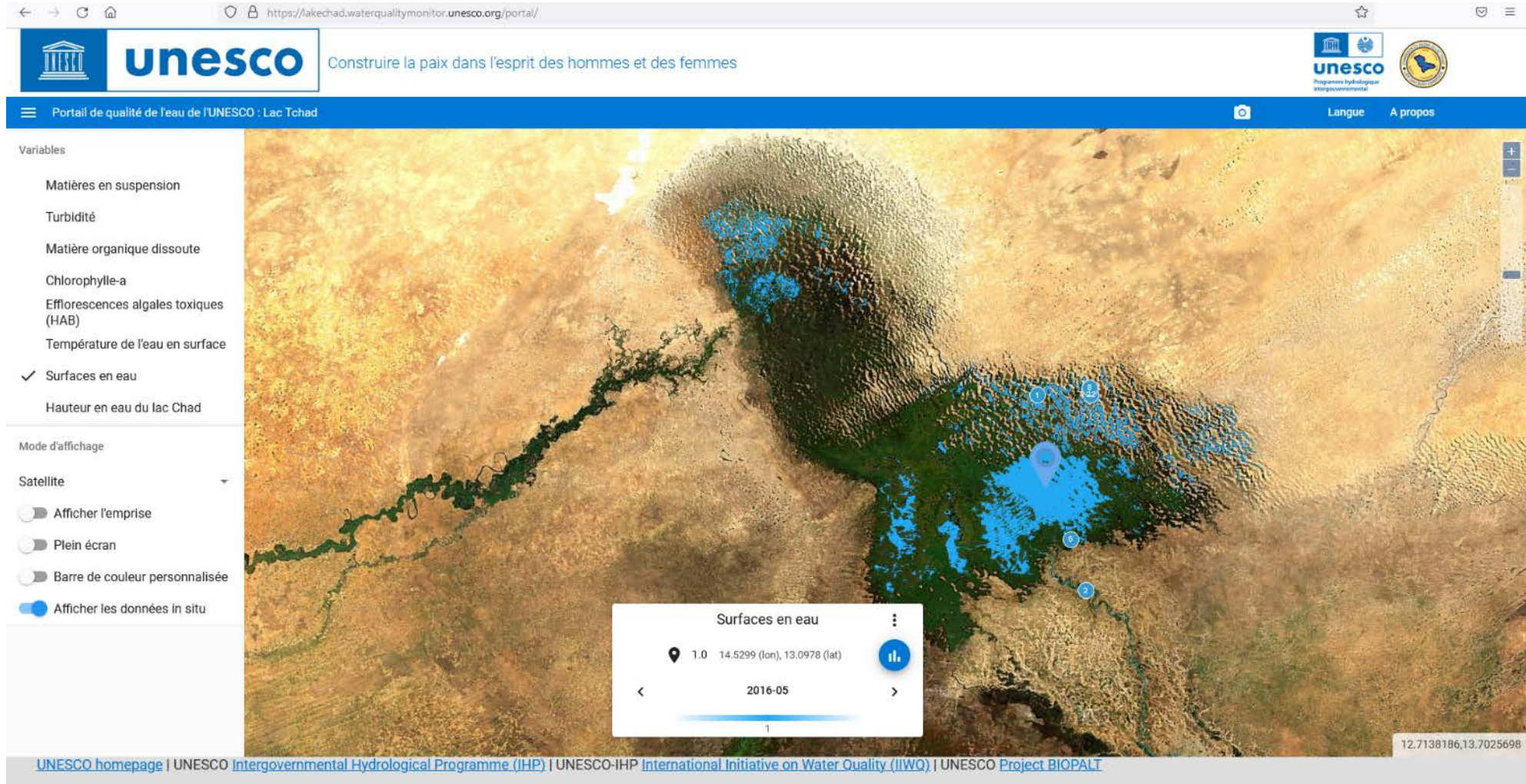
2020-12-24

0 2 5 10 15 20

UNESCO homepage | UNESCO Intergovernmental Hydrological Programme (IHP) | UNESCO-IHP International Initiative on Water Quality (IIWQ) | UNESCO Project BIOPALT

UNESCO World Water Quality Portal: Lake Chad Basin

Water surface area



Portail de qualité de l'eau de l'UNESCO : Lac Tchad

Variables

- Matières en suspension
- Turbidité
- Matière organique dissoute
- Chlorophylle-a
- Efflorescences algales toxiques (HAB)
- Température de l'eau en surface
- Surfaces en eau
- Hauteur en eau du lac Chad

Mode d'affichage

Satellite

- Afficher l'emprise
- Plein écran
- Barre de couleur personnalisée
- Afficher les données in situ

Surfaces en eau

1.0 14.5299 (lon), 13.0978 (lat)

2016-05

12.7138186,13.7025698

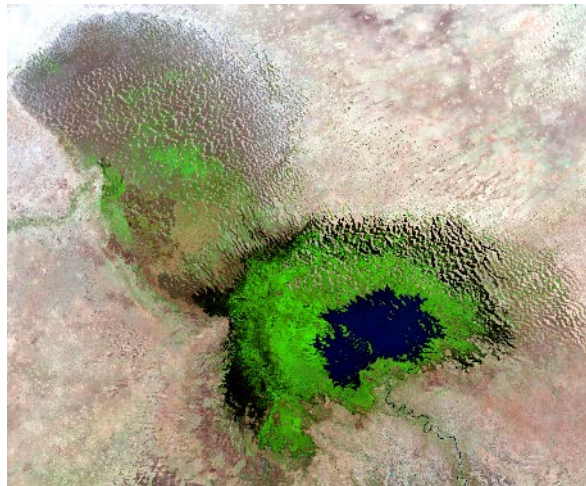
[UNESCO homepage](#) | [UNESCO Intergovernmental Hydrological Programme \(IHP\)](#) | [UNESCO-IHP International Initiative on Water Quality \(IIWQ\)](#) | [UNESCO Project BIOPALT](#)

UNESCO World Water Quality Portal: Lake Chad Basin

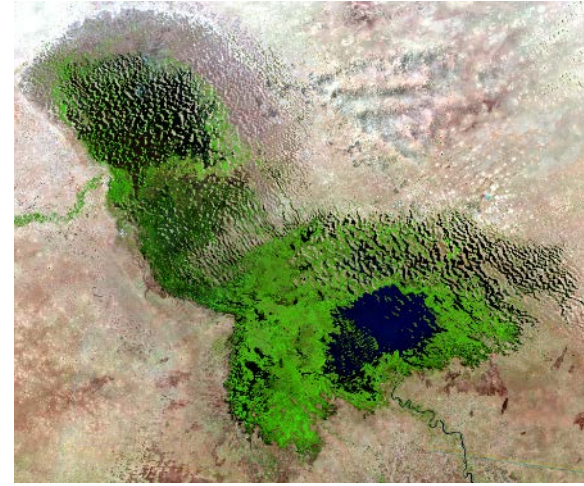
Water surface area



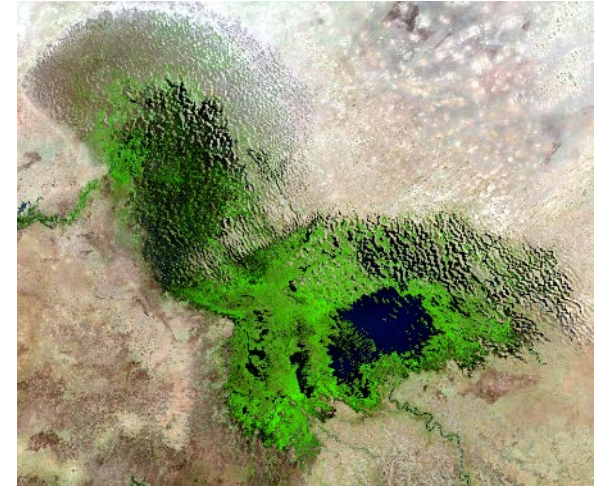
1973



1986



2000



2018



UNESCO World Water Quality Portal
Operational application

La Plata Basin

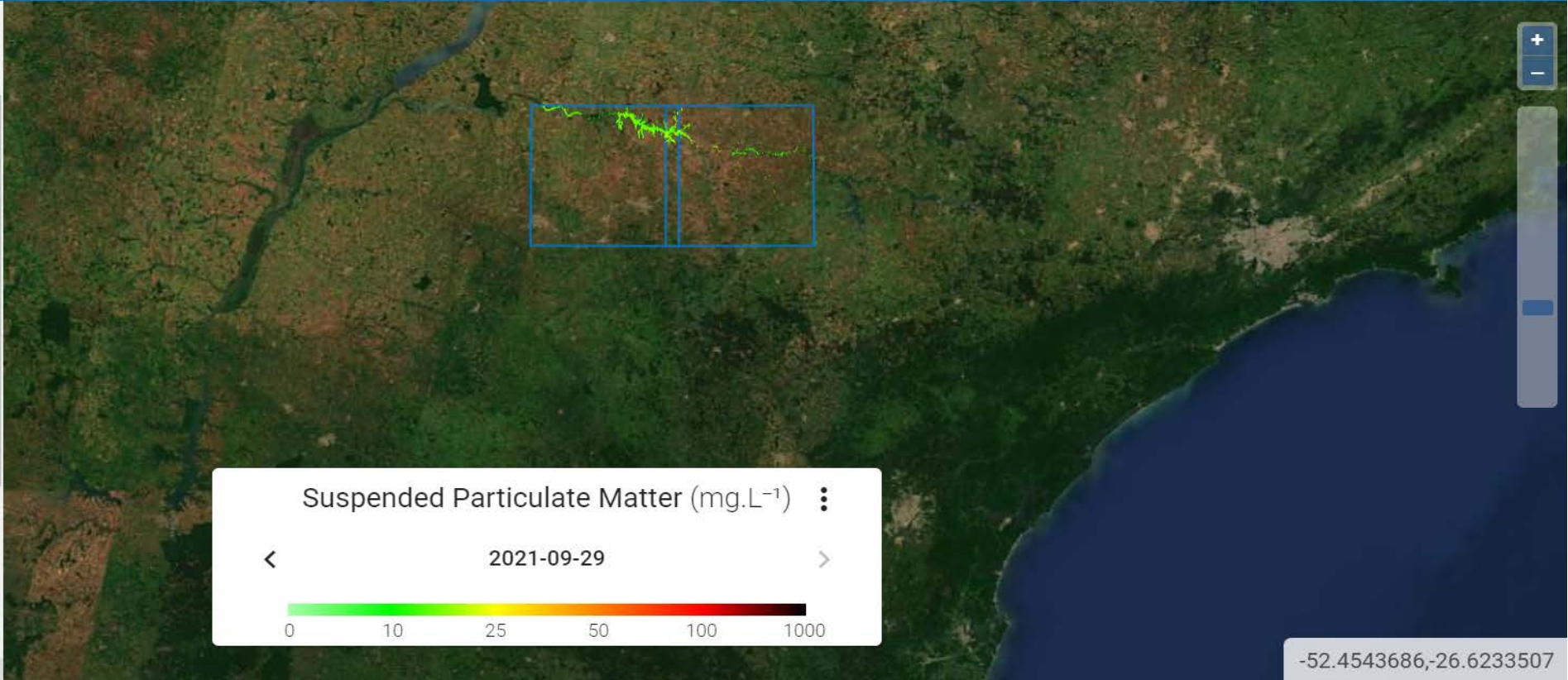
UNESCO World Water Quality Portal: La Plata Basin. **! Portal under development - not to be used for decision-making or other purposes !**

Language About

- Turbidity
- Dissolved Organic Matter
- Chlorophyll-a
- Proliferation of harmful algae (HAB)
- Surface water temperature (SWT)
- Water surfaces
- Water level

Display mode

Satellite



Suspended Particulate Matter (mg.L⁻¹)

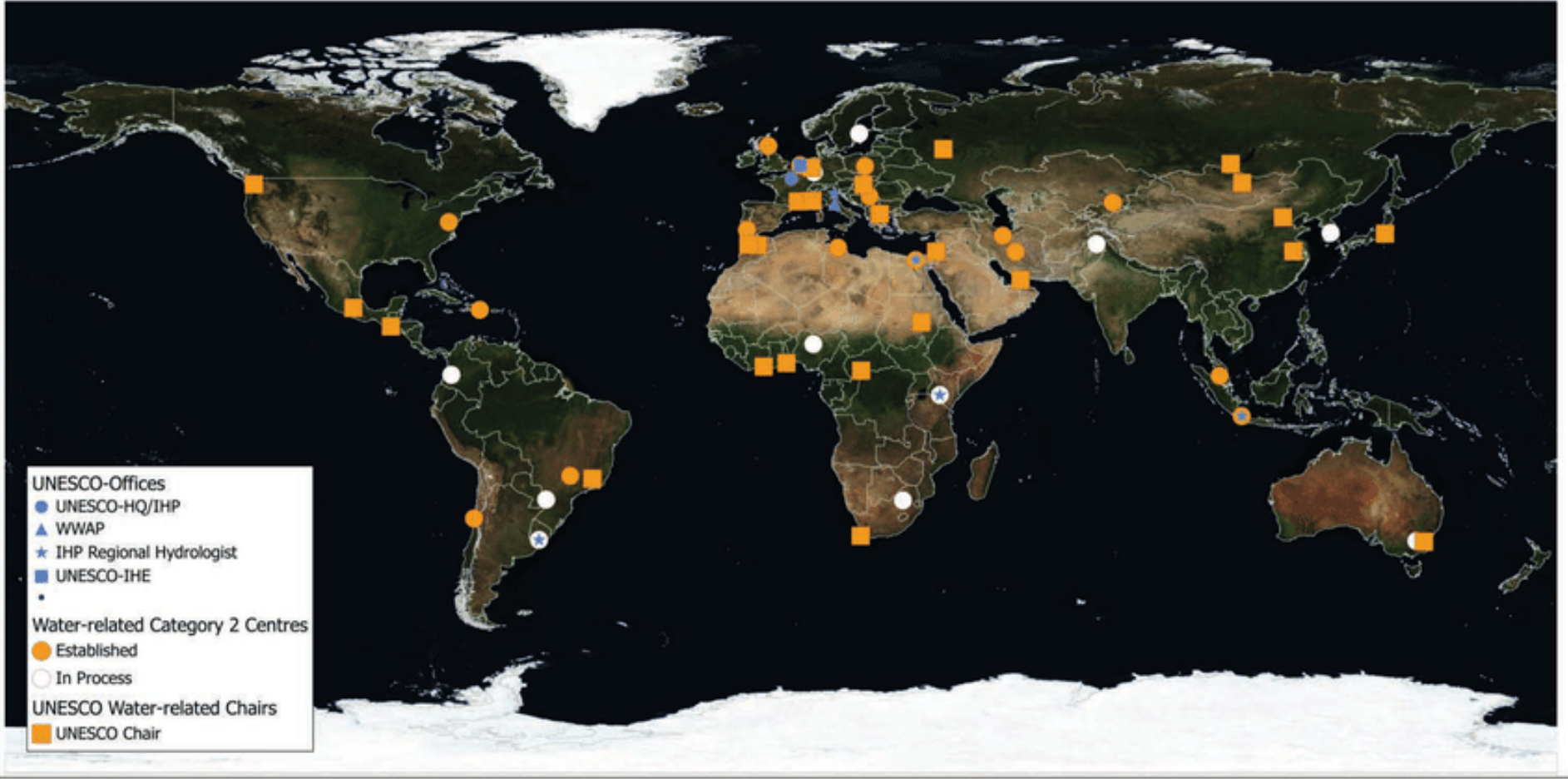
2021-09-29

0 10 25 50 100 1000

-52.4543686,-26.6233507

[UNESCO homepage](#) | [UNESCO Intergovernmental Hydrological Programme \(IHP\)](#) | [UNESCO-IHP International Initiative on Water Quality \(IIWQ\)](#)

UNESCO Water Family

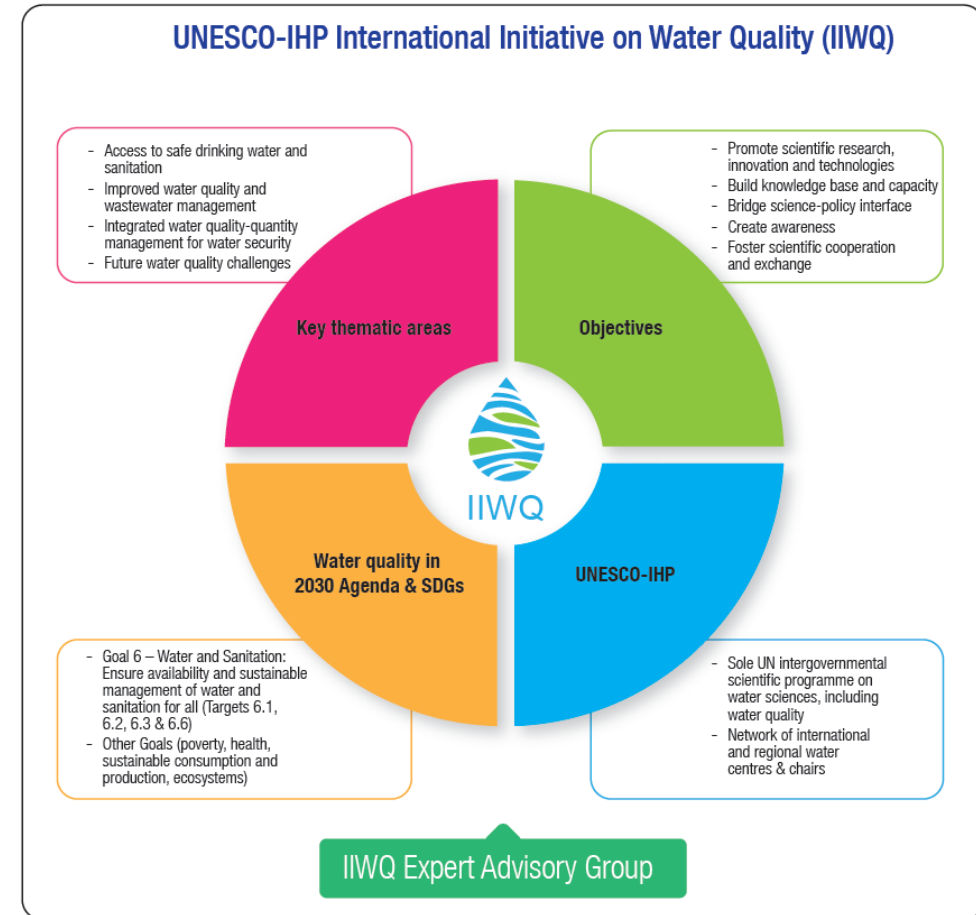


A worldwide network of **IHP National Committees**, **UNESCO Water Centres** and **UNESCO Water Chairs** to disseminate knowledge and build capacities to manage freshwater resources in a sustainable way

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)

Thank you!

Sarantuyaa Zandaryaa
UNESCO

(s.zandaryaa(a)unesco.org)

Division of Water Sciences – Intergovernmental Hydrological Programme (IHP)
International Initiative on Water Quality (IIWQ)

UNESCO IHP International Initiative on Water Quality - <https://en.unesco.org/internationalinitiativeonwaterquality>

UNESCO World Water Quality Portal - <https://en.unesco.org/waterqualitymonitor>

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