GEMS/Water and the Sustainable Development Goal for Water

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The GEMS/Water Programme

Global Environment Monitoring System for Freshwater (GEMS/Water)

GEMS/Water was established in 1978 with the purpose of generating a database of global freshwater quality data for global assessments

2014 United Nations Environment Assembly (UNEA) Resolution 1/9 gave a mandate for UN Environment to revitalize the programme with support from the Governments of Germany and Ireland

The GEMS/Water Programme: New structure

UN Environment, Global Programme Co-ordination Unit, Nairobi, Kenya

GEMS/Water Capacity Development Centre, Cork, Ireland

GEMS/Water Data Centre, Koblenz, Germany

Regional hub for Latin America and Caribbean

National Water Agency (ANA), Brasilia, Brazil

The GEMS/Water mission 2014-2024

Mission*

To provide the world community with quality assured data, data services, capacity development and other products on freshwater quality at national, regional and global scales in order to:

- support scientific assessments, and
- inform decision-making on the challenge of pollution and water quality, including the related Sustainable Development Goals (SDGs)

Objectives*

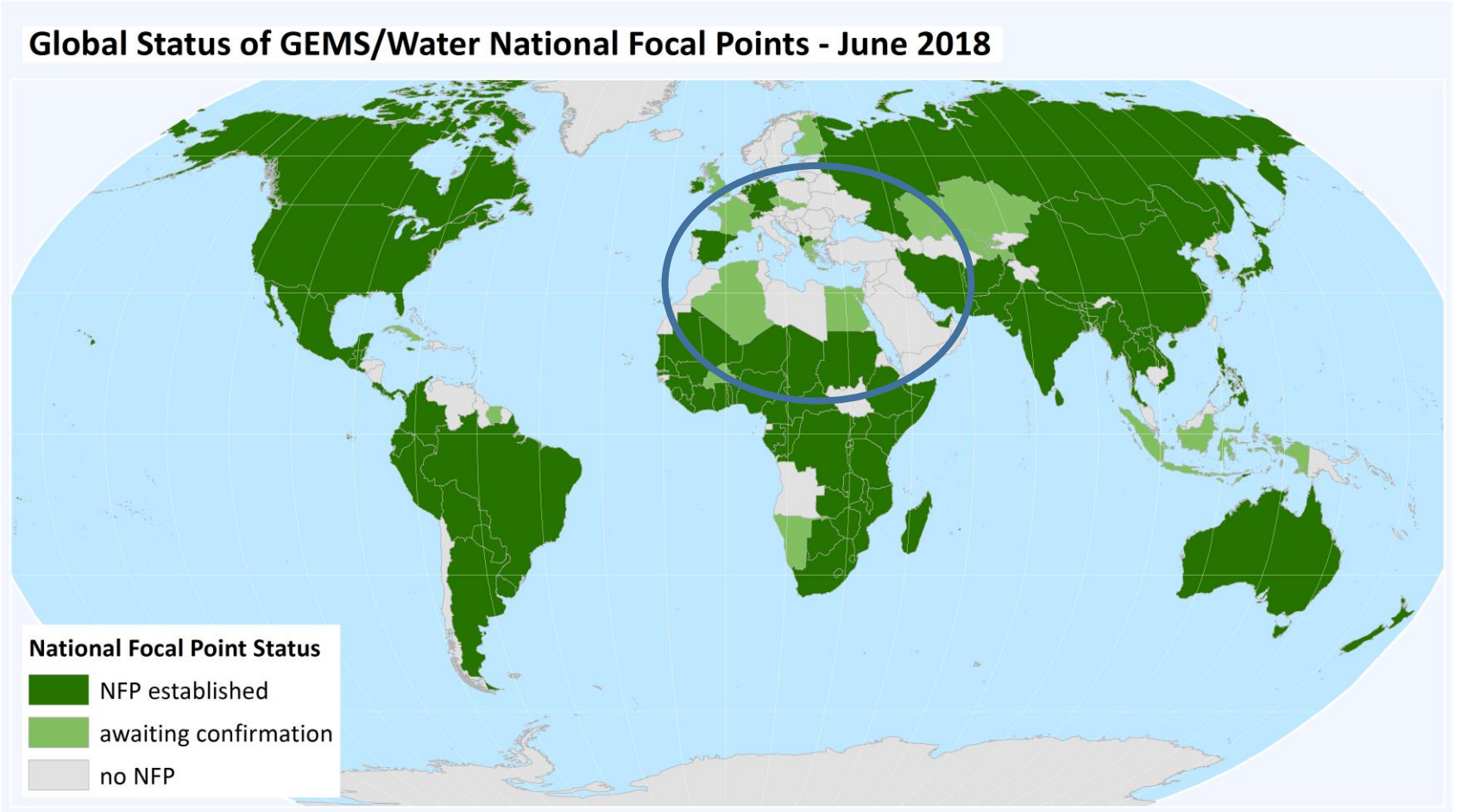
- Build and maintain a global network of governmental and scientific water quality monitoring experts/institutions
- Collect, quality assure and share water quality data for scientific studies and assessments
- Support GEMS/Water partners in developing their capacity to monitor, assess and manage the quality of their freshwater ecosystems.
- Develop and share fit-for-purpose water quality data products & services
- Integrate water quality data from in situ measurements, remote sensing and modelling

*Revised in 2018 following UNEA Resolution 3/10. Addressing water pollution to protect and restore water-related ecosystems (UNEP/EA.3/Res.10)

The GEMS/Water Programme: current status

GEMS/Water operates through a network of National Focal Points nominated by Government Departments or Ministries responsible for water.

Activity late in 2018 and in 2019 will focus on engaging with Europe, Central Asia and West Asia



The GEMS/Water Programme: GEMStat and data products

Creation of a more user friendly data collection and analysis system

Collection and quality assurance of new water quality data:

- Water authorities
- Research partners
- Private sector

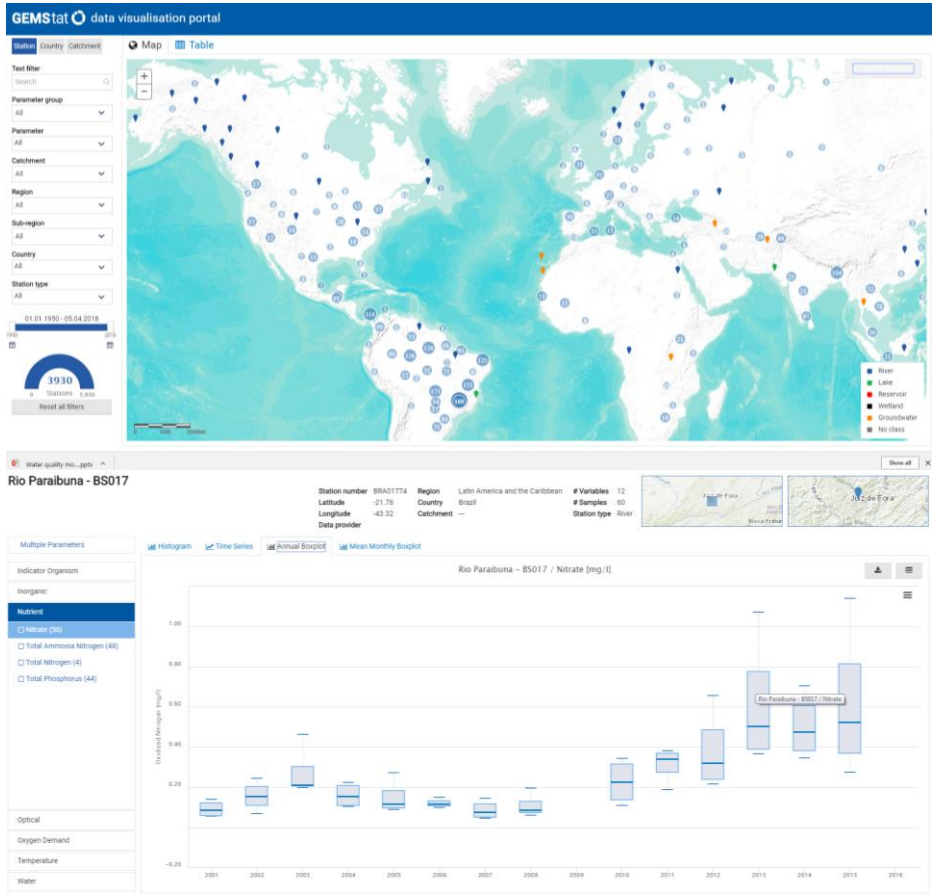
Providing data for:

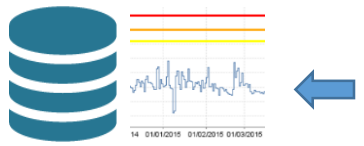
- Global and regional assessments and reports
- Data analysis and water quality index calculations
- Load calculations

Exploring new sources of water quality data

- Satellite and model data
- Sensor data

GEMStat portal: http://portal.gemstat.org/
GEMStat information: https://gemstat.org/about/
Data submission guidance: https://gemstat.org/data/data-submission/





Discharge data

The GEMS/Water Programme: Capacity development

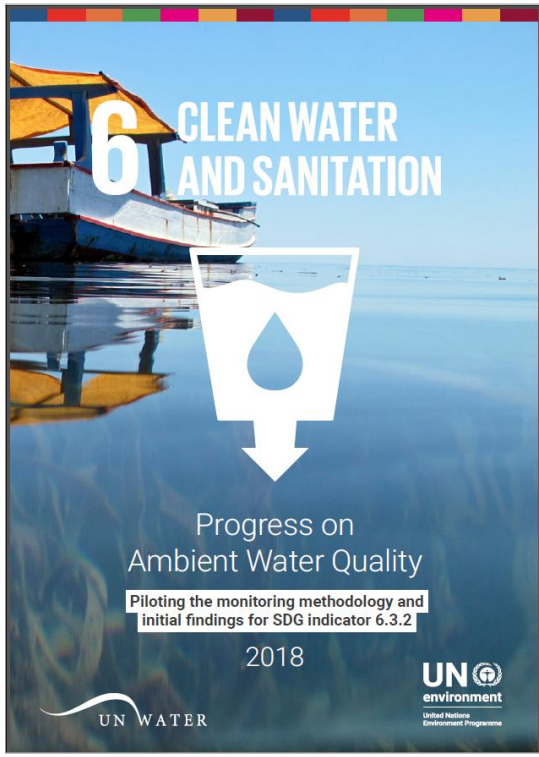
- Determining current monitoring activities, limitations and requirements for capacity development in all world regions
- Training and education in the collection of high quality, reliable water quality data that can be used for national, regional and global assessments, and for SDG 6 reporting
  - Online training – Postgraduate Diploma and CPD courses
  - Regional training workshops
  - In-country training
- Advice and assistance with monitoring programme design, network development, and water quality assessments
- Exploring the potential for citizen science water quality monitoring

The GEMS/Water Programme: SDG Indicator 6.3.2

Implementing SDG Indicator 6.3.2 on behalf of UN Environment

"Proportion of bodies of water with good ambient water quality"

- Methodology development
- 2017 baseline data drive:
  - Online tutorials and support documentation
  - Webinars and in-situ training and assistance
  - Analysis of data submissions and calculation of indicator values
  - Reporting (Contribution to SDG 6 Synthesis report presented to HPLF in July and preparation of baseline UN Environment and UN Water Indicator Report for SDG indicator 6.3.2 launched this week) http://www.unwater.org/publications/progress-on-ambient-water-quality-632/
- Methodology revision and planning for 2021 data drive currently underway

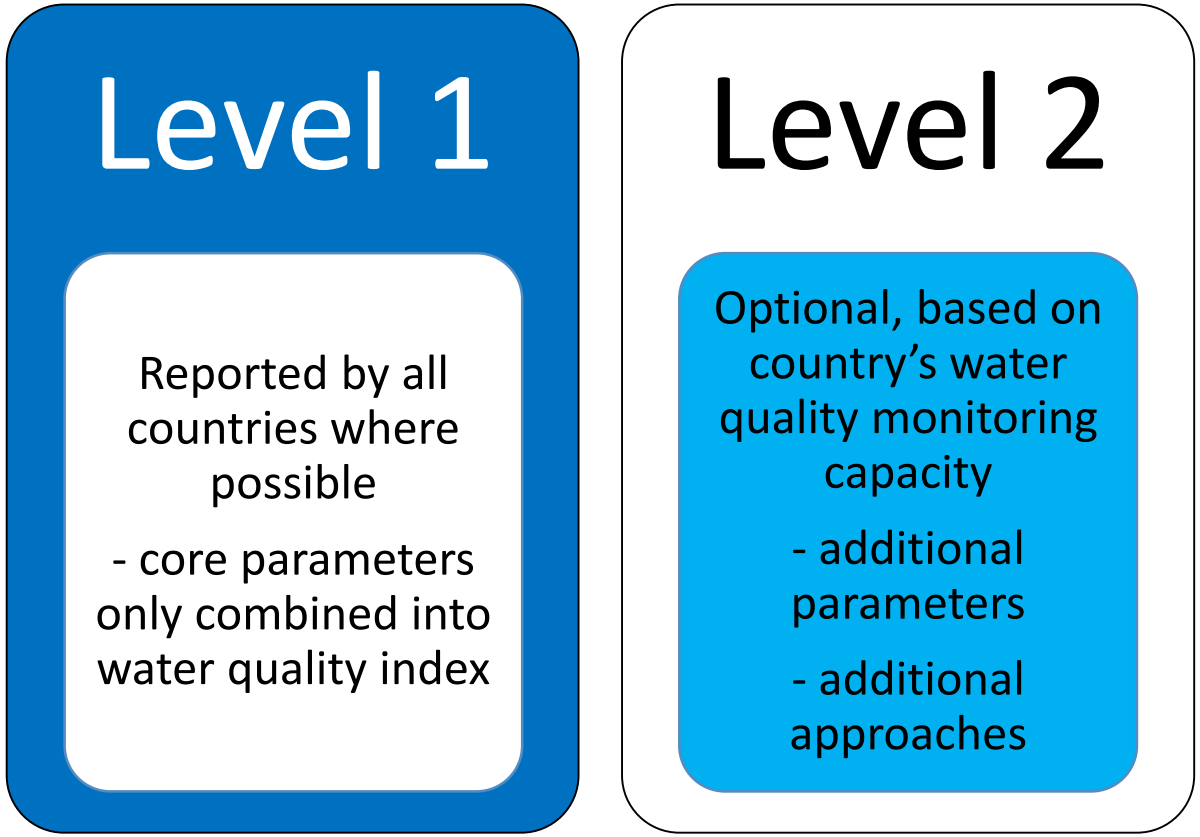


http://www.unwater.org/publications/progress-on-ambient-water-quality-632/

The GEMS/Water Programme: SDG Indicator 6.3.2

The progressive monitoring approach for indicator 6.3.2 is divided into two levels:

- Level 1 uses a water quality index comprised of core physico-chemical water quality parameters; and
- Level 2 includes monitoring of additional parameters and approaches such as biological, microbiological or earth observation.

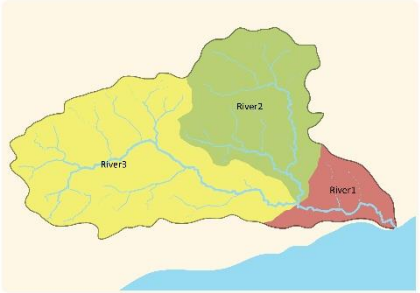


The GEMS/Water Programme: SDG Indicator 6.3.2

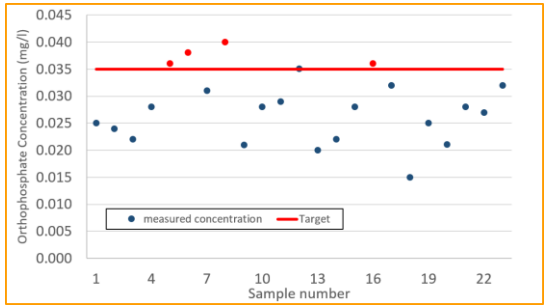
Waterbodies need to be defined within the country - rivers, lakes and groundwaters

Good water quality is assessed by comparing measurements with designated target values for specific parameters (DO, EC, N, P, pH)

Good water quality represents at least 80% compliance of measurements with target values



	Parameter	River	Lake	Groundwater
Core Parameter	Dissolved Oxygen	x	x	
	Electrical Conductivity	x	x	x
	Total Oxidised Nitrogen	x	x	
	Nitrate			x
	Orthophosphate	x	x	
	pH	x	x	x



The GEMS/Water Programme: SDG Indicator 6.3.2

The 2018 methodology revision for Tier upgrade allows countries more flexibility when choosing parameters, but still defines five parameter groups.

For example, rather than having to use electrical conductivity, TDS can be used instead.

Parameter group	Parameter	River	Lake	Ground water
Oxygen	Dissolved oxygen	x	x	
	Biological oxygen demand, Chemical oxygen demand	x		
Salinity	Electrical conductivity	x	x	x
	Salinity, Total dissolved solids			
Nitrogen*	Total oxidised nitrogen	x	x	
	Total nitrogen, Nitrite, Ammoniacal nitrogen			
	Nitrate**			x
Phosphorus*	Orthophosphate	x	x	
	Total phosphorous			
Acidification	pH	x	x	x

* Countries should include the fractions of N and P which are most relevant in the national context

** Nitrate is suggested for groundwater due to associated human health risks

The GEMS/Water Programme: Challenges

Challenges to achieving the GEMS/Water mission and SDG 6.3.2

Capacity in developing countries

- Lack of technical and institutional capacity in many countries to monitor water quality, manage the data and report => large observational gaps
- Lack of knowledge and appreciation amongst policy makers about the importance of ambient water quality

Requirements for data

- Lack of clear end user data and information requirements
- Lack of observational/monitoring requirements for targeted *in situ* water quality data collection

Interoperability

- Lack of international standards to exchange water quality data

Integration of approaches

- Combining traditional with novel data sources (remote sensing, in situ sensors, citizen science, models)

The GEMS/Water Programme: Contacts and links

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