

The UNEP GEMS/Water

A Global Water Quality Monitoring and Assessment Programme

3rd GEOSS African Water Cycle Coordination
Initiative (AfWCCI) Workshop
Venue: L'Hotel Art Suites, El Jadida, Morocco.
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This presentation

- ❖ **Brief history** – what is GEMS/Water?, the global network, its management
- ❖ **Network building and strengthening** at national, global and watershed levels to improve water quality - objectives and outcomes

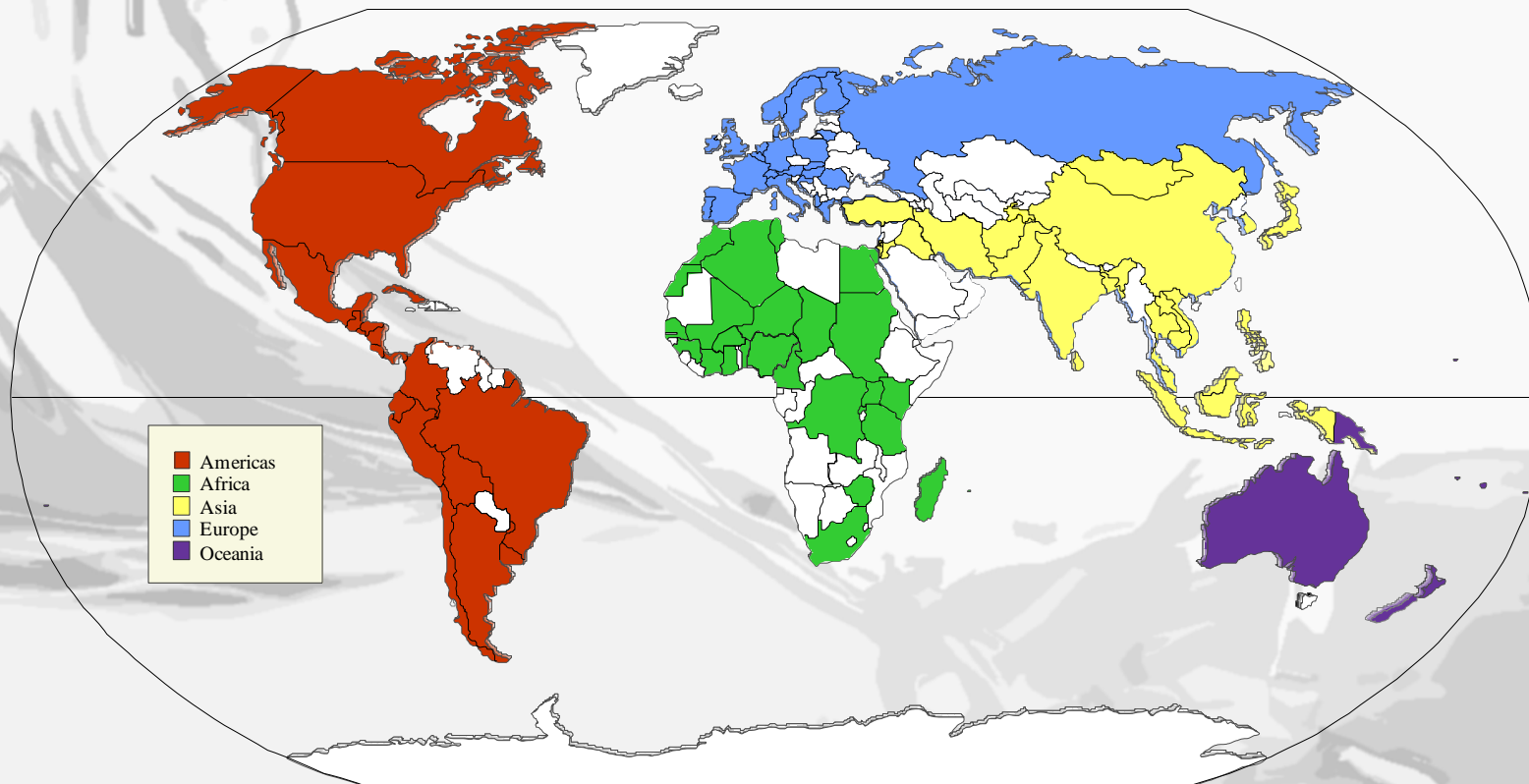


GEMS/Water brief history and partnerships...

- ✓ A comprehensive global water quality monitoring system and network.
- ✓ Provides evidence-based information on the state and trends of global inland water quality.
- ✓ In place since 1978... some 35 years, supported by Environment Canada.
- ✓ Initially implemented as a collaborative effort of UN agencies (UNEP, WHO, UNESCO, WMO, the IAEA) and other relevant water organizations globally with member countries

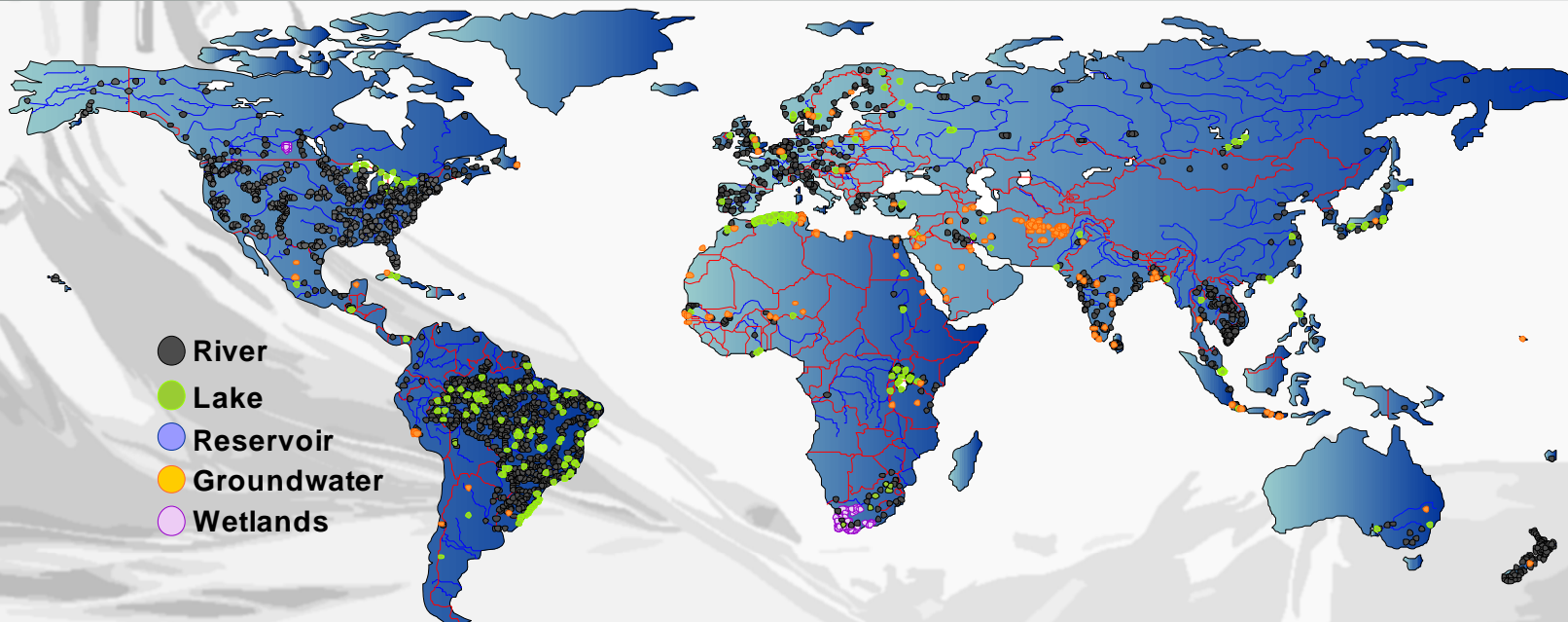


Participants in GEMS/Water



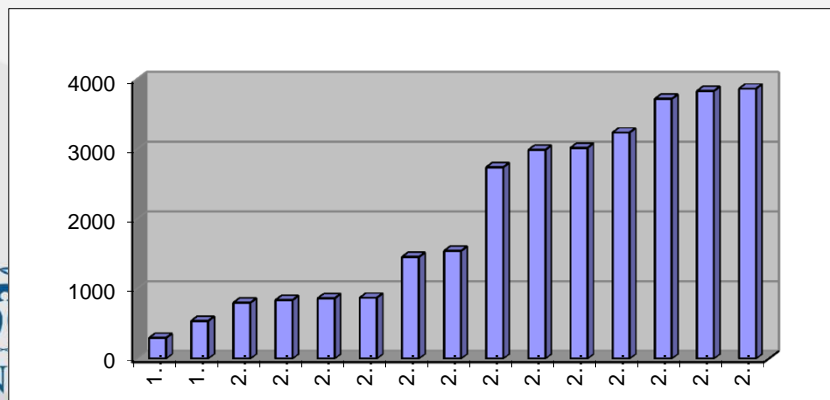
Region	Africa	Americas	Asia	Europe	Oceania	Totals
# of Stations	368	2446	596	344	95	3869
# of Values	312,932	1,825,340	907,002	1,047,452	447,006	4,539,732
Date Range	1977-2010	1965-2012	1969-2012	1974-2011	1979-2011	1965-2012

The growth of GEMStat

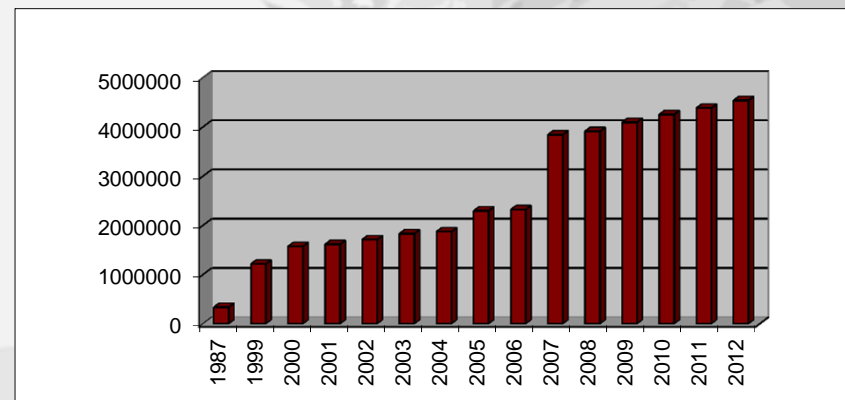


GEMStat Holdings: >3850 stations; >4.5 million data; Date Range 1965-2012

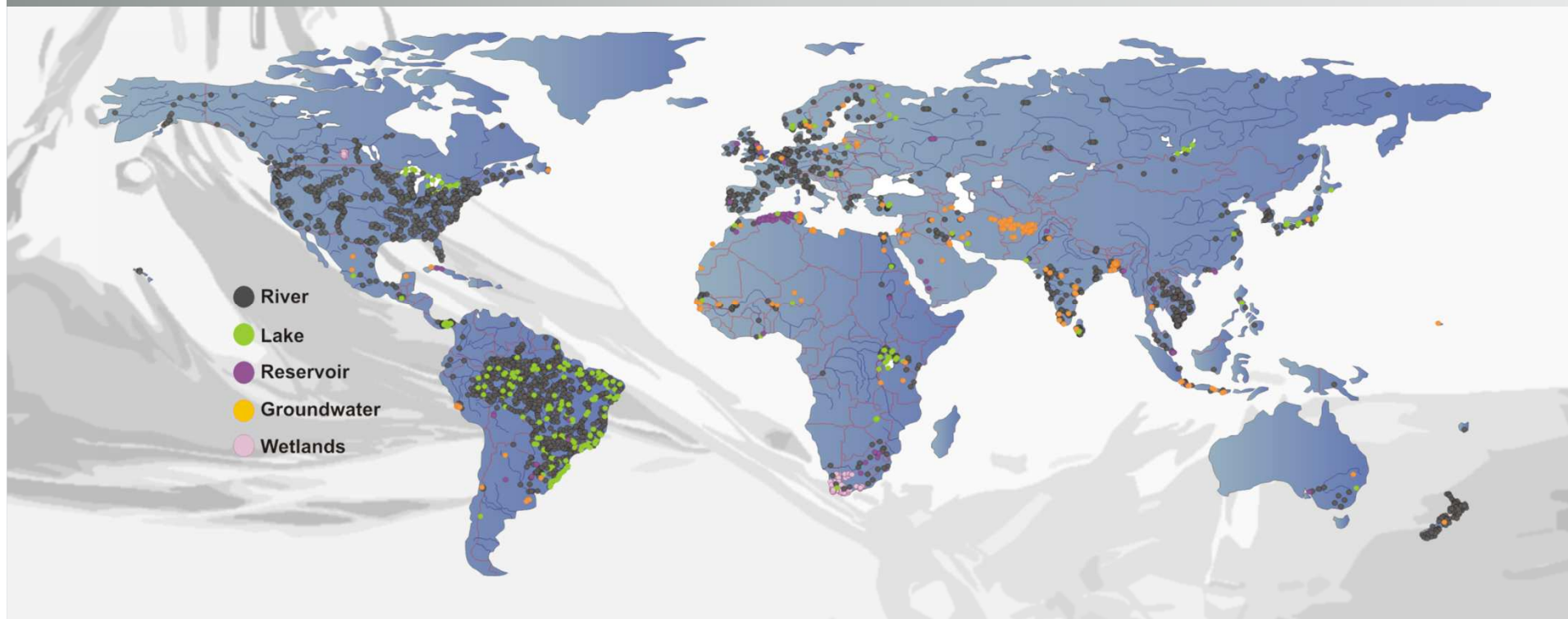
No. of Stations 1987- Sept 2012



No. of Data points 1987- Sept 2012



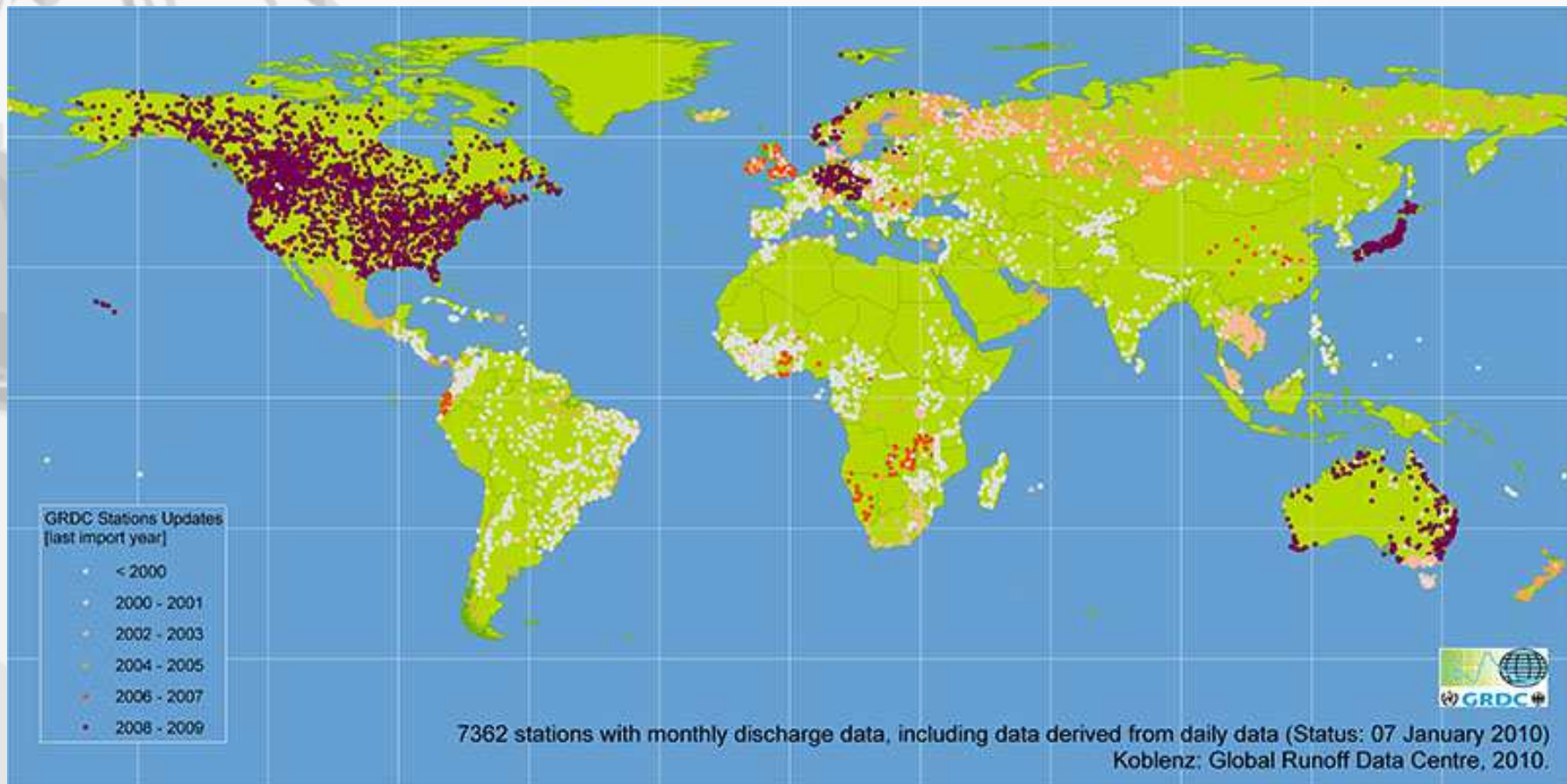
The global water quality network



Region	Physical/ Chemical	Nutrients	Major Ions	Metals	Organic Matter	Organic Contaminants	Micro- biology	Hydrological & Sampling Variables	Date Range
Africa	77945	83982	116310	11531	7708	2282	8165	313	1977-2010
Americas	232331	231994	262138	313717	43031	603106	27728	13835	1965-2012
Asia	270996	159558	167623	104651	59110	10567	49921	83609	1969-2012
Europe	271095	158652	147287	217559	78511	49024	41299	78075	1974-2011
Oceania	267345	111839	11160	3199	14356	1438	14462	22619	1979-2011
Total	1119712	746025	704518	650657	202716	666417	141575	198451	1965-2012

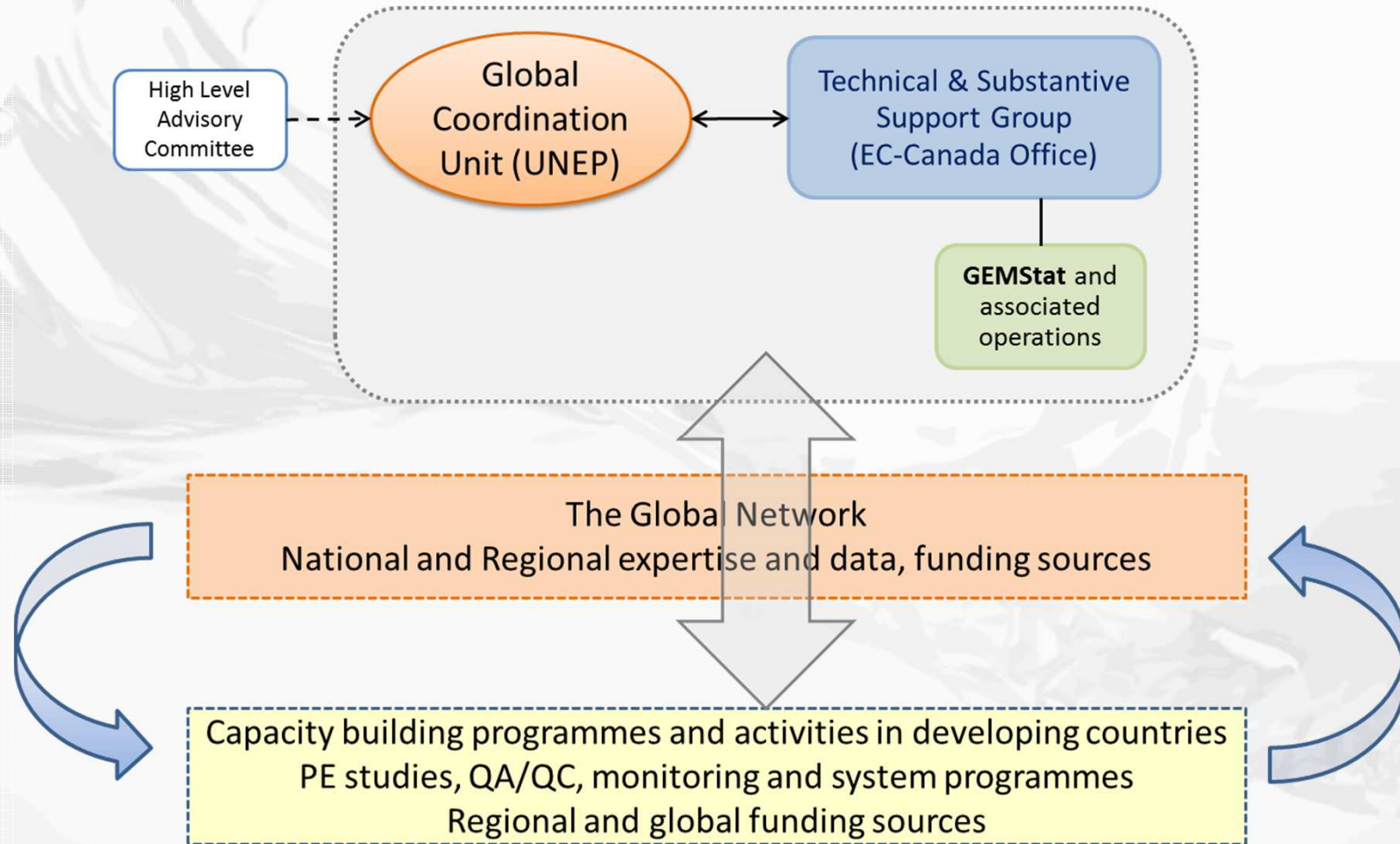
The GEMS/Water's hydrological counterpart

The Global Runoff Data Centre in Koblenz, Germany



Under the auspices of the WMO and
hosted by the German Government

GEMS/Water today



The mandate

- ✓ Several UNEP's Governing Council decisions called for furthering the development and the strengthening of GEMS/Water (Decision 23/2, GC 23rd Regular Session, February 2005; Decision 24/16, GC 24th Regular Sessions, February 2007)
- ✓ GC Decision 26/14 (UNEP GC 26th Regular Session, February 2011)

“Encourages Governments and other organisations to participate actively in the GEMS/Water Programme by contributing water quality data and information, and invites Governments and others (...) in a position to do so to provide financial and in-kind support to the GEMS/Water Programme, capacity building and transfer of technology efforts in developing countries.”



UNEP and water quality...

The UNEP Operational Water Strategy 2014-17: ***Addressing vulnerable connections in the water cycle***

Build **ecosystem resilience** and **improve water quality** by providing tools and building capacity for:

- ➔ Global, regional and national assessments
- ➔ Data, monitoring & reporting
- ➔ Water quality standards and guidelines for freshwater ecosystems
- ➔ Ecologically-based solutions

GEMS/water activities and services

1) Global Water Quality Database and Information

- Enhance accessibility to credible data
- Promote interoperability with other environmental information systems

2) Data Quality

- Develop QA/QC tools and resources for developing countries (e.g. manuals, training courses)
- Deliver services that enhance data quality and reliability (e.g. Performance Evaluation studies, on-site lab assessments)

3) Water Quality Assessments

- Contribute to UN water publications (e.g. WWDR, GEO)
- Contribute to policy development for issues affected by water quality (e.g. climate change and human health)

4) Capacity Building and International Network

- Increase participation of developing countries in water quality monitoring, assessment, research and reporting
- Develop training courses and promote partnerships to deliver via regional centres of excellence



Challenges in developing countries

- ✓ **Inadequate water quality data, access and dissemination, regular monitoring**
- ✓ **Capacity building** – technical/institutional to address water challenges under global climate change; trans-boundary issues...
- ✓ **Financial input** for data gathering, monitoring, assessment
- ✓ **Need for effective networks**
- ✓ **Relevance of WQ in policy making**

GEMS/water activities, projects and coverage

- The global water quality assessment (2013-17),
- Strengthening National Focal Points, CFP and regional organization networks (2012-13),
- Support to basin wide ecosystems projects e.g. Water quality and ecosystem monitoring in the Lake Tanganyika basin(2013 - ?).

Assessment of World Water Quality to Meet the Global Water Quality Challenge

A global water quality assessment –

policymakers, stakeholders, and scientists better understand the extent and type of water quality problems around the world.

Partners: Helmholtz Center for Environment Research (UFZ), University of Kassel, UNEP, UN agencies, Stakeholder and Scientists.

Objectives:

- ✓ provide information about policy options for protecting or restoring water quality;
- ✓ A major awareness-raising exercise;
- ✓ provide capacity building in coping with the water quality challenge.



An overview of the WQ Assessment

Two stages.

Stage 1 (2013-14): a preliminary assessment of the current situation using existing data.

- An evaluation of the current status of water quality in rivers and lakes.
- An assessment of freshwater fisheries and to link food security.
- An identification of hot spot areas of water pollution.
- A preliminary estimate of the causes of water pollution at different locations
- A preliminary campaign to boost the amount of data available on water quality and to identify priority data needs.

Stage 2 (3years): will assess - current situation more comprehensively, examine trends of water quality, and evaluate a range of policy options to deal with the water quality challenge.



Outputs

Baseline status of global water quality – generate maps and database: of main rivers and lakes in Africa, Latin America, Asia depicting various indicators of hot spot regions:

Fisheries table and maps – of countries and large river basin
Report on value of freshwater fisheries to food security and economy.

Hot spots maps

Maps of hot spot areas of rivers and lakes subject to a high level of water pollution

Causes of water pollution: Maps and report on immediate causes of water pollution in different rivers and lakes

Digital data campaigns: to expanded digitized global data base
•Report on use of remote sensing data for global water quality assessment.



National Focal Point (NFP) network strengthening – workshops

- ❑ April 2012 NFP workshop for Eastern and Southern Africa countries;
- ❑ November 2012 NFP workshop for Asia and the Pacific
- ❑ March 12-14-2013 NFP workshop for Central North Africa in preparation...
- ❑ Workshops involve regional water organizations

NFP network strengthening – Objectives

- ❑ To **identify prevailing challenges** in WQ data acquisition and sharing, monitoring, assessment and reporting;
- ❑ To **raise awareness** -importance of WQ in freshwater ecosystems to support appropriate decision making;
- ❑ To **enhance participation** of countries and regional institutions in the monitoring of freshwater in river and lake basins.
- ❑ To **determine the level of technical support, expertise and advice** in WQ analysis to laboratories required in the countries and the river and lake basins;
- ❑ To **reinforce collaboration** between and regional water quality monitoring activities and programmes with the GEMS/Water and other relevant networks and programmes of the United Nations.

Regional workshops – outcomes

- **Identification of priority challenges** to acquiring and sharing water quality data, and options to overcome them.
- **Identification of specific capacity building needs** to improve water quality monitoring.
- **Awareness** of what the GEMS/Water network and database (GEMStat) is and a better understanding of its benefits and requirements.

Regional workshops – outcomes

- **Renewed commitment** from (participating) country water institutions to network,
- **Increased communication and sharing of information** and experiences amongst members of the network and capacity building,
- **Agreement on next steps**, viable actions, responsibilities and timelines.

Lake Tanganyika meeting

- The meeting was held 29-31 January 2013- Bujumbura – Burundi

The UNEP and the Lake Tanganyika Authority (LTA) Secretariat cooperation with respect to the Project / Programme entitled “Institutional arrangements for shared natural resources and trans-boundary environmental issues (TIMS).”



Fig. 1. Lake Tanganyika and its catchment basin.

Lake Tanganyika meeting - Objectives

Three objectives:

- **To strengthen trans-boundary institutional mechanisms** for the management of the shared water resources of the Lake Tanganyika;
- **To enhance capacities** within the Lake Tanganyika riparian countries and the LTA Secretariat for water quality monitoring, pollution reduction and control; and
- **To deliberate on ways of improving the health and diversity** of the Lake Tanganyika Basin Ecosystem and services.



LT Conclusions from General Discussions

- agreed that **water quality monitoring is the priority component** of the regional strategy
- **UNEP commitment** to support the member states through Lake Tanganyika Authority to develop a multi-stakeholder project proposal that will seek further funding from potential donors
- Need for **UNEP to facilitate the development and implementation of the monitoring water quality component with NIGLAS/CHINA** playing a complimentary role to the work of UNEP through capacity building of the stakeholders on water quality.



Lake Tanganyika meeting - Outcome

An improved concept note that can be used to develop a full project on water quality monitoring (31/1/2013) focusing on:

- **Identification of priorities** needs for countries on monitoring
- Activities for standardization of methodologies for data collection
- **Priority equipment** for monitoring and analysis
- Mechanisms for data sharing and interpretation among countries
- **Priorities for capacity building and institutional strengthening activities**
- **Elements for sustainability** of monitoring, analysis and financing
- **Modalities of coordination and roles of LTA, UNEP, partners, member states, focal points**



Thank you

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