

WA-01 C4

Global Inland and Near-Coastal Water Quality Information System

Tenth GEO IGWCO COP Meeting
University of Tokyo
Tokyo, Japan
May 29-30, 2014

C4 Task leads

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CSIRO

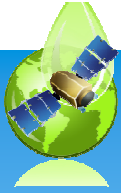
Estonian Marine Institute, University of Tartu



GEO Inland and Coastal Water Quality Working Group

A component of
WA-01: Water Task Work Plan

-  C1 Integrated Water-cycle Products and Services
-  C2 Information Systems for Hydro-meteorological
Extremes (incl. Floods and Droughts)
-  C3 Information Service for Cold Regions
-  **C4 Global Water Quality Products and Services**
-  C5 Information System Development and Capacity Building



C4 Global Water Quality Products and Services

The goal of this component is to develop an international operational water quality information systems based on Earth observation

This component will integrate water quality data from multiple sources in a timely manner and through data assimilation of Earth observations with other sources of data such as water quantity, hydrodynamics, biogeochemical modelling, generate higher level information products such as trends and anomalies and additional “value-added” products such as fluxes and flows

This component encompasses both the collation and development of in-situ water quality databases and remote-sensed data, particularly space-borne data.

The component addresses both flowing and static water bodies, recognizes differing approaches to assessing their water quality and the linkages/interface between them.



Lakes Mendota & Monona -University of Wisconsin SSEC image

2013-2014 Activities

- *New IOCCG working group approved
- *Chapter of GEO Water Strategy Report
- *GEO Webinar Series
- *Funding and Construction of GEO Water Quality Website
- *Consulting with World Bank on Incorporation of EO into World Bank Projects
- *Continued coordination and support efforts between research projects
- *User Consultation Meeting at ESA
- *Town hall meeting at ILC in September and planning GEO Water Quality Summit in Geneva April 2015 (details to follow)

A New IOCCG Working Group –Accepted January 2014

Earth Observations in Support of Global Water Quality Monitoring

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CSIRO Land & Water

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Chief, Satellite Oceanography and Climatology Division (SOCD), NOAA/NESDIS
Center for Satellite Applications and Research

Goal and Vision

- Provide a strategic plan for incorporation of current and future EO information into national and international near-coastal and inland water quality monitoring efforts.
- Promote best practices, coordination of efforts and partnerships, and propose specific new linkages between data providers and data end users.
- Work toward implementation of a global water quality monitoring service under the auspices of GEO.

Terms of Reference

1.) Assess current knowledge regarding coastal and inland water quality and associated use of remote sensing data

- *Provide overview and assessment of global inland and coastal water quality, societal and ecosystem benefits, and trends (current knowledge).
- *Describe existing water quality monitoring frameworks (local, regional, and global) and current gaps.
- *Provide case studies of EO supported water quality activities including baseline monitoring, historic trends and current operational efforts.

Terms of Reference

Identify user needs and requirements; future mission requirements

- *Identify current and future end-user needs with respect to spatial, temporal and accuracy requirements for monitoring and forecasting both long-term and episodic water quality conditions.
- *Recommend specific mission requirements needed to fulfill water quality needs.

Terms of Reference

Assess existing and identify new space-based and in situ observing capabilities

- *Describe current capabilities of earth observations in support of inland and coastal water quality monitoring
- *Describe of current in situ monitoring technologies employed and minimum institutional requirements.
- *Describe planned capabilities of earth observations in support of inland and coastal water quality monitoring, and how these might address existing gaps.

Terms of Reference

Identify supporting research and development activities

- * Describe current research and development activities in support of these missions (e.g., algorithm development, validation) relative to water quality needs
- * Identify emerging areas of investigation and development related to water quality issues.

Terms of Reference

Identify best practices and new & improved data streams and products

*Provide best practices, specific guidance and road map on how management agencies can utilize and implement currently generated products and software in support of their needs, including derived, integrated water quality information products.

*Recommend development of specific new and improved remote sensing-derived products, indicators and services.

Terms of Reference

User engagement and outreach

- *Develop strategy to strengthen linkages between data providers and end users. Propose future collaborative efforts.
- *Work in coordination with GEO and its Blue Planet Task to advance development of a global coastal and inland water monitoring service.

Other topics to potentially be addressed:

- * Data integration, modeling and assimilation
- * Decision support tools
- * Standardization of methods
- * Optical Library
- * Special considerations for developing countries
- * Education and capacity building
- * Potential supportive role of citizen-based monitoring and crowdsourcing
- * Role and responsibilities of CEOS agencies, World Bank, and other international organizations (e.g., UNEP, IOC/GOOS)
- * Science and/or application traceability matrices
- * Water body size considerations

Working Group Members

	First name	Last name	Affiliation	Country
1	Stewart	Bernard	CSIR	South Africa
2	Caren	Binding	Environment Canada	Canada
3	Carsten	Brockman	CB Assoc.	Germany
4	Arnold	Dekker	CSIRO	Australia
5	Paul	DiGiacomo	NOAA	USA
6	Mark	Dowell	JRC	Italy
7	Steven	Greb	WDNR	USA
8	Steve	Groom	PML	UK
9	Milton	Kampel	INPE	Brazil
10	Chris	Mannaerts	ITC	Netherlands
11	Yuji	Sakuno	Hiroshima Univ.	Japan
12	Blake	Schaeffer	USEPA	USA
13	Richard	Stumpf	NOAA	USA
14	Andrew	Tyler	Univ. Stirling	UK
15	Menghua	Wang	NOAA	USA

GEO Water Quality Webinar Series

February	ESA Diversity II-Inland Lakes 22.02.13 14:00 UTC by Carsten Brockmann, Brockmann Consult, Germany (preceded by a short GEO introduction S.Greb)
April	GloboLakes (Global Observatory of Lake Responses to Environmental Change) by Andrew Tyler, University of Stirling UK
June	GLaSS (Global Lakes Sentinel Services) by Steef Peters, Water Insight, Netherlands
August	GLEON (Global Lake Ecological Observatory Network) by Paul Hanson, University of Wisconsin, USA
October	NETLAKE (Networking Lake Observatories in Europe) by Eleanor Jennings, Dundalk Institute of Technology, Ireland
December	GLTC (Global Lake Temperature Collaboration) by John Lenters, University of Nebraska USA

[New Webinars proposed by Stephanie Palmer starting June 2014 \(details soon\)](#)

THE GEOSS WATER STRATEGY FROM OBSERVATIONS TO DECISIONS Executive Summary

5) Increase availability and use of data, information, and indicators of the quality of inland and near-coastal waters to support an operational water quality decision-making system.

[ftp://ftp.earthobservations.org/TEMP/Water/
GEOSS_WSR_Executive_summary.pdf](ftp://ftp.earthobservations.org/TEMP/Water/GEOSS_WSR_Executive_summary.pdf)

GEO Water Quality Web site

(Our Cyber-home)

GEO Water Quality Website

Image:
USGS

Home

**Water Quality
Working Group**

**Remote sensing
of water quality**



Downloads

Links

Freshwater quality

The degradation of surface- and groundwater quality through the effects of pathogens, contaminants, nutrients, excess heat, and other factors poses a substantial threat to future water availability and human health. Monitoring is necessary to determine the current status of water quality conditions and to help anticipate, mitigate, and even avoid future water catastrophes.

Although the vast majority of water quality data have been obtained through localized point measurements, on-line sensors and remote sensing have the potential to expand available data sets dramatically. This will require, however, that operational observation systems are developed and the resulting information systems made compatible and interoperable as part of the GEO system of systems. Spatial and temporal information from remote sensing can be used to validate and update detailed models for the transport and fate of chemical substances and their effect on drinking water quality and ecosystems.

News

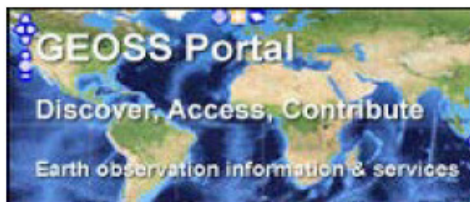
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Opportunities

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GEO water quality

Image: USGS

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Downloads

Links

LINKS

United Nations Global Environment Monitoring
System (GEMS) Water Programme
<http://www.gemstat.org/>

Water for Life Decade: Water quality
<http://www.un.org/waterforlifedecade/quality.shtm>
!

GLaSS: Global Lakes Sentinel Services
<http://www.waterinsight.nl/glass-global-lakes-sentinel-services>

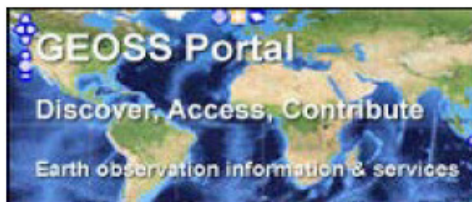
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News

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Opportunities

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Consulting with World Bank on Incorporation of EO into World Bank Projects



Evaluating the Feasibility of Systematic Inland Water Quality Monitoring with Satellite Remote Sensing

Arnold Dekker | Director Earth Observation & Informatics TCP CSIRO, Australia

12th November 2013 @ WorldBank : Water Partnership Program (WPP) and
the Water Resources and Watershed Management Thematic Group (WRWSM TG)

CSIRO EARTH OBSERVATION & INFORMATICS
www.csiro.au



Continued Coordination and Collaboration



GloboLakes

Global Observatory of Lake Responses to Environmental Change



GROUP ON
EARTH OBSERVATIONS



diversity
inland waters



GLaSiS

Continued Coordination and Collaboration



GloboLakes

Global Observatory of Lake Responses to Environmental Change



diversity
inland waters



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GLaSiS

ESA Lake User Consultation Meeting
Monday 19.05.2014
ESRIN
Frascati Roma

This meeting was an opportunity for ecologists, biodiversity experts and lake managers to influence the development of the Diversity II and GloboLakes projects, the two largest EO projects on lakes which will study respectively 300 and 1,000 large natural lakes and reservoirs globally distributed around the world.

Two case studies on lake Natron and Lake Nicaragua were presented

