Joint IGWCO and AquaWatch Community of Practice Meetings
Koblenz, Germany
June 8, 2016
GEO Water Quality Summit Goal

Define specific requirements of the water quality system components and develop a plan to implement an integrated end-to-end water quality monitoring and forecasting service.
Global Water Quality Products and Services

- AquaWatch aims to develop international operational water quality information systems based on Earth observation with a focus on the developing world.
- The Community of Practice has chosen to focus on transforming data to information based on user needs within this water quality theme.
AquaWatch Structure

Executive Committee

Secretariat

Steering and Advisory Committee

Implementation Board

Working Group 1

Working Group 2

Working Group 3

Working Group 4

Working Group 5

Steering and Advisory Committee

Executive Committee

Implementation Board

Working Group 1

Working Group 2

Working Group 3

Working Group 4

Working Group 5
AquaWatch Structure

Executive Committee

Secretariat

Steering and Advisory Committee

Implementation Board

- Steve Greb, Paul DiGiacomo & Arnold Dekker
- Emily Smail

Stakeholders (User representatives) & shareholders (patrons & representatives contributing funds or resources)

- Working Group 1
- Working Group 2
- Working Group 3
- Working Group 4
- Working Group 5
AquaWatch Structure

User needs
- Working Group 1
  Outreach & User Engagement

Data
- Working Group 2
  Observations & Data

Products
- Working Group 3
  Products & Information

Information
- Working Group 4
  Distribution, Access & Visualization

Knowledge
- Working Group 5
  Education & Capacity Building
Working Groups

- **Working group 1 – Outreach & user engagement**
  - 4 members
  - Facilitators: Carsten Brockmann & Emily Smail

- **Working group 2 – Observations & data**
  - 24 members
  - Facilitators: Maycira Costa & Philipp Saile

- **Working group 3 – Products & information**
  - 34 members
  - Facilitators: Blake Schaffer & Ghada El Serafy

- **Working group 4 – Data, access & visualization**
  - 13 members
  - Facilitator: Steve Groom

- **Working group 5 – Education & capacity building**
  - 9 members
  - Andrew Tyler and Bilqis Hoque
Work Packages

0-1 year
- Work Package 1: Initiation of GEO Water Quality CoP

0-2 years
- Work Package 2: Ongoing and developing water quality project inventory

1-3 years
- Work Package 3: Development of baseline global water quality products
- Work Package 4: Local/regional end-to-end prototype project demonstration

3-5 years
- Work Package 5: Develop initial demonstration global water quality monitoring service

5-10 years
- Work Package 6: Transition to routine and sustained global water quality monitoring service
- Work Package 7: Expand water quality monitoring service to include forecasting service

Increasing Resources required
<table>
<thead>
<tr>
<th>Project Name</th>
<th>Organization</th>
<th>Project Summary</th>
<th>Funding Entity/Other</th>
<th>Point of Contact</th>
<th>Regions of Interest</th>
<th>Status</th>
<th>Obs/Measurement Collected &amp; Generated</th>
<th>Algorithm/Validation/Sampling Protocols</th>
<th>Frequency of Observations</th>
<th>Applications/Outputs/Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Package 2</td>
<td>Cyanobacteria</td>
<td>Several states have adopted WHO guidelines for human health exposure to cyanobacteria.</td>
<td>EPA, NASA, NOAA, USGS</td>
<td>Blake Schelske (EPA)</td>
<td>U.S. lakes and estuaries</td>
<td>R&amp;D mode to move towards operational status</td>
<td>(1) model output from in-situ monitoring vs in-situ metrics for cyanobacteria.</td>
<td>Algorithm to determine cyanobacteriainform. Algal bloom detection and monitoring. Field-based cyanobacterial occurrence, abundance, and phytoplankton pigment concentration, Information provided to decision makers.</td>
<td>Weekly/Daily</td>
<td>Goal is availability of products on a weekly basis.</td>
</tr>
<tr>
<td></td>
<td>Cyanolakes (pty) Ltd</td>
<td>GONET's a project funded by the South African Water Research Commission</td>
<td>Cyanolakes</td>
<td>Mark Matthews</td>
<td>South Africa</td>
<td>R&amp;D project, pre-operational</td>
<td>Biogeography, phytoplankton concentration and identification.</td>
<td>Envisat Medium Resolution Imaging Spectrometer, Sentinel-3 Ocean and Land Products Instrument (OLI)</td>
<td>Maximum Pressure Height (MPH) algorithm</td>
<td>Daily: 500-2500 Weekly: 30-100 Up to daily on request</td>
</tr>
<tr>
<td></td>
<td>Zinio (a)</td>
<td>eWaterQuality services are commercially provided.</td>
<td>Zinio (a)</td>
<td>Thomas Heege</td>
<td>Globally</td>
<td>Operational</td>
<td>Measurements include turbidity, chlorophyll, total suspended matter, visibility (NOD) total absorption (AABS), suspended matter (SMP)</td>
<td>Processing system, watersheds monitoring and information to decision-makers</td>
<td>Ocean colour and spectral indices</td>
<td>Daily: 500-2500 Weekly: 30-100 Up to daily on request</td>
</tr>
<tr>
<td></td>
<td>Royal Netherlands Institute for Sea Research</td>
<td>Long-term water monitoring project since August 2001 for automated monitoring of</td>
<td>Royal Netherlands Institute for Sea Research</td>
<td>Marcel Weinreich</td>
<td>The Wadden Sea</td>
<td>Operational</td>
<td>Data can be used for validation they have developed a chlorophyll a derived algorithm, based on the European OAI.</td>
<td>Data can be used for validation for use in environmental assessments, e.g., OAI and other.</td>
<td>Every 15 minutes</td>
<td>Other scientists</td>
</tr>
<tr>
<td></td>
<td>European Commission</td>
<td>Database of water quality monitoring data from the European Union, including the Water Framework Directive</td>
<td>European Commission</td>
<td>Prof. Daniel Heing</td>
<td>Europe (32 countries)</td>
<td>Operational monitoring, established by the European Water Framework Directive</td>
<td>Water bodies in Europe</td>
<td>The project analysed existing field monitoring data from more than 20 European countries, including the Water Framework Directive.</td>
<td>Monthly, often less than one year, for one or more years</td>
<td>Supported implementation of the European Water Framework Directives for many member states.</td>
</tr>
<tr>
<td></td>
<td>Environmental Marine Information System</td>
<td>European Commission</td>
<td>Environmental Marine Information System</td>
<td>Nicholas Höhffler</td>
<td>European Seas</td>
<td>Operational</td>
<td>ENMS relies on biological and physical variables generated by remote sensing models.</td>
<td>Sensors: MERIS, MODIS, SeaWiFS, VIRS, Hydrodynamic models, OCEANIC Processes.</td>
<td>Monthly, often less than one year, for one or more years</td>
<td>Data is stored using regularly updated SeaWiFS, SeaDAS, software and standard.</td>
</tr>
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<tr>
<td></td>
<td>Great Lakes observing system</td>
<td>GLOS is to connect providers</td>
<td>Great Lakes observing system</td>
<td>Keith Page</td>
<td>The Great Lakes and St. Lawrence River</td>
<td>NA</td>
<td>The Great Lakes database is not directly accessible or operated, The Great Lakes are not directly accessible or operated</td>
<td>NA</td>
<td>NA</td>
<td>NA</td>
</tr>
</tbody>
</table>

**Legend:**
- **WQ:** Water Quality
- **EPA:** Environmental Protection Agency
- **NOAA:** National Oceanic and Atmospheric Administration
- **USGS:** U.S. Geological Survey
- **GONET:** Global Ocean Observing System
- **OLI:** Ocean Colour and Land Products Instrument
- **MPH:** Maximum Pressure Height
- **OAI:** Ocean Colour and Information
- **GLOS:** Great Lakes Observing System
- **QA/QC:** Quality Assurance and Quality Control
Work Package 3: Development of baseline global water quality products

• The goal of work package 3 is to develop preliminary, visible demonstration products of water quality parameters. Parameters selected for work package 3 projects should be those that have advanced science, available resources and resonate with the end user community. Parameters should also be appropriate for analysis of inland and coastal waters. The spatial and temporal scales for the projects will be discussed and concurred upon based on expert input from Community of Practice members. Ideally, at least one physical and one biogeochemical parameter should be selected for work package 3. Potential parameters include:

  – Optically active constituents such as chlorophyll, cyanobacteria pigments, Total Suspended Solids & Coloured Dissolved Organic Matter
  – Vertical attenuation of downwelling light (kd)
  – Sechhi disk depth
  – Transparency and Turbidity
  – Water surface Temperature
Work Package 4: Local/regional end-to-end prototype project demonstration

- The goal of work package 4 is to develop local or regional prototype projects that demonstrate the potential of water quality monitoring projects utilizing both remote sensing and in situ data. Work package 4 should include at least 2 prototype projects that address a combination of inland and coastal water bodies in developed and developing countries. Projects can build upon existing work or development of new tools depending on funding availability and interest.
- Prototype projects will aim to link current activities and existing efforts to develop end-to-end products. The projects should focus on utilizing currently produced data to meet user needs. Prototype projects should ultimately demonstrate the use of water quality data and information in management and decision making.
2016 Goals

1. Identify Implementation Board (leads and co-leads of Working Groups)
2. Identify initial members of the Steering and Advisory Committee
3. Complete work package 2 and distribute to Community of Practice (living document)
4. Identify specific tasks for working groups for work packages 3 and 4
5. Select projects for work packages 3 and 4
6. Identify project leaders for work packages 3 and 4
7. Identify sub tasks required to complete work packages 3 and 4
8. Acquire funding and/or in kind support for work packages 3 and 4
9. Begin work on work packages 3 and 4
Questions?
• Review of the 2016-2025 GEO Strategic Plan

• Role of the Secretariat & Foundational Tasks

• Recommendations on the 2017-2019 work programme content
2016-2025 Strategic Plan – key points

• GEO as a broker of Earth Observation data

• GEO as a facilitator of policy-level dialogue

• GEOSS Implementation
  – Empower countries and organizations to strengthen contributions to GEOSS

  – Link GEOSS to socio-economic data through partnerships (e.g. UN Statistics Division)
Encouraging linkages to UN Sustainable Development Goals and international mandates and conventions

Ensure availability and sustainable management of water and sanitation for all

Conserve and sustainably use the oceans, seas and marine resources for sustainable development

Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
Role of the Secretariat & Foundational Tasks

- GEOSS Development and GEOSS Common Infrastructure (GCI) Operations
- Community Developments
- Secretariat Operations
GEOSS and GCI Development (GD-01 through GD-11)

Data Providers Brokered (capacities, systems, networks, etc.)

GEO website Home Page

GEOSS Portal

Private sector (tested interoperability)
Community Developments


- CD-02: Reinforcing engagement at national and regional level

- CD-03: Assess the benefits of Eos and their socio-economic value
Secretariat Operations

• **SO-01**: Management and Support

• **SO-02**: Communications and Engagement
  – New GEO website under development & increased focus on social media

• **SO-03**: Monitoring and Evaluation

• **SO-04**: Resources Mobilization
Recommendations for the 2017-2019 work programme

• Encouraging linkages with policy and Sustainable Development Goals

• Relationships with statistical agencies

• Organization within societal benefit areas
Related GEO Community Activities

- CA-07: Integrated Water-cycle Products and Services
- CA-08: Water Vapor and Clouds
- CA-09: Precipitation
- CA-10: Evapotranspiration
- CA-12: River Discharge
- CA-13: Ground Water
- **CA-14: GEO Water Quality**
- CA-15: Water Cycle Capacity Building
- CA-17: GEO Great Lakes Activity
- CA-18: Water Cycle Integrator (WCI)
- CA-19: E2E Water Indicators
- CA-20: EartH2Observe
- CA-21: Total Water Prediction: Observations Infrastructure
- CA-22: Linking water tasks with wider societal benefit areas and the post-2015 global development framework
- **CA-30: Harmful Algal Bloom (HAB) Early Warning System**
- CA-31: For Global Mangrove Monitoring
Related GEO Initiatives

- GI-02: GEOBON – Global Biodiversity Observation
- GI-06: AfriGEOSS
- GI-07: Blue Planet Initiative
- GI-18: Earth Observations in Service of the 2030 Agenda for Sustainable Development
- GI-19: AmeriGEOSS
- GI-20: GEO Global Water Sustainability (GEOGLOWS)
- GI-22: Asia-Oceana GEOSS
- GEO Wetlands
Questions?