

General Discussion:

Carsten: What are the basic building blocks that we have as a group, providing material we can work with.

Arnold: We need:

- (1) A (one) demonstrator of a global product, preferably at high resolution (Landsat based ??), in order to have that soon. This will help us be visible at a high level. It needs to be a credible product. The large international agencies are looking for this, want to know that it is possible! **Globolakes** is starting to work towards this. This can be a building block.
- (2) We also need a demonstration project where we integrate EO, Models and in-situ. Others (Blake) want to include the MERIS record. Companies can focus on continent scale, process the Meris record for HABS, combine with UNEP data for socio-economic data. Then bring in in-situ data as well.

Steve Groom: Use or build on Earth2Observe: whole water cycle integrator, also with EO, models, in-situ.

Thomas EO MAP is launching a global services in 2 weeks. He could do

What can we do in the next 6 months: Work on the MERIS archive, use Landsat.

We need to be fast but we also need to be Credible !!! (Carsten)

Many people here can deliver global products here, that's not the issue.

Mark: Doing something that is sustainable is also an issue. We shouldn't just make a one-off (demonstrator) product. Philip also supports a demonstrator project. Mentions a GEO xxx? Pilot. The time frame is about 6 months to prepare something. This group could probably prepare something, and this would help promote us.

Thomas:

- 1) Quality assurance role of GEO – can GEO implement this somehow?
- 2) Multiple resolutions: Get success stories for larger systems, show that the technology exists, develop paying services for small systems (?)

Steeff: Does developing a global product really promote us? This is too much technology push. We need the user perspective. Better to focus on our existing success stories, this has his strong preference.

Harmonized product vs. diversity

Dani: We have many different approaches, all of which have developed based on difference user requirements. We could chose to emphasize the variety of services we can provide (complete opposite of Thomas' approach). Mark Mathews also sees the value of our diversity.

Values of harmonization and systematic global products: For non-experienced users harmonized information is key. For international agencies, we need some harmonization, clear baseline.

After Coffee Break

1. Ru & Mark: Strategic Implementation Plan (Minimum version and Highly funded WQ service)

Goal (10 year?): to develop a multi-stream multi-scale WQ monitoring service serving multiple users and providing a baseline set of consistent products for all users and a framework for the development of further products. **For example: *Contribute to global SDG baseline report*** ? Let's be pragmatic about these goals, and try to contribute what we can, and what we think is useful.

As (a) harmonized product(s) and (an) integrated service

Refer to Mission Statement, goal and deliverables of this meeting

Implementation

Getting new resources will depend on having a clear action plan. GEO can address. Need to have clear actions.

System of Systems. Many systems already exist:

- S.Africa developing a national service based on MERIS, preparing for Sentinel
- GlobaLakes
- Australia
- EPA & NOAA cyanobacteria
- EOMAP
- etc

Need to create way to harmonize these and stitch them together.

e.g Define the products: e.g. Chla, turbidity, clarity product for all lakes > 500 ha.

Target for an initial global 'core' service (products), with demonstrations/pilots

- Identify pilots

GEO flagship activities

- Also includes forestry (GFOI) and agriculture (GLAM)

Ru: GEO WQ CoP - Conceptual framework (matrix)

Build on successful programmes.

Role of commercial providers:

A key issue is how the commercial providers can contribute (question of Thomas and Mark Mathews). The inland value-adding community relies on commercial service providers. They are certainly welcome to contribute and provide services (agnostic!). But the financing is an issue (?). Perhaps public-private cooperation is possible? The commercial companies aren't necessarily looking to provide *commercial* services, they also have knowledge to contribute. The key is first to define what we want and then identify the roles of the different types of organizations. The role of

the commercial providers must be (come) clear. To be further discussed with GEO secretariaat. The EU sees Remote Sensing as an important economic sector (job creation)

Users and User Requirements

Who are the users and what are the user needs we are addressing? We should identify the (key groups of) users and compile and consolidate the user needs. We have a very diverse end-user community. This can come from the on-going projects like GLASS, Globalakes, etc., based on the user need documents from these. There are also documents on high level user needs, and as a community we also know what the key problems are: HABS, eutrophication, fate & transport of contaminants, etc. Need to keep the communication going with the end users. This will be an iterative process. Involve a number of the high level, global users: UNEP, Unesco, WB, etc. We also have a role to galvanize the end user community. Get them interested!! (or keep them interested)

What will be the vision for what we will have in 1 year, 5 years and 10 years?

Blake & Erin: Objectives: needs to be clear (go back to Goal of Mark/Ru)

Define System objectives vs. Program Objectives (?) *need to define these*

Results: Mark's ppt is better

1. Strategic objective: Improve uptake of EO derived information for WQ. Make EO the source of information that international users, go to.
 2. Establish harmonized integration of system elements in the global system of systems, for services and products
 3. Provide a framework and approach for development of further surfaces
 4. Identify the key users (or groups of users) and establish (2-way) dialogue with user communities
- Short term issues are based on existing satellite systems. After that Sentinels will be on-line
 - We have modules that make up the system, and a portfolio of services
 - Need clear products we are working towards (indicators). Can we develop some integrated indicators for WQ, perhaps linking WQ to Health (Hartwig).
 - Need GEO brand for products (5 year goal). Involves harmonization of services and protocols.
 - **Develop methods for integrating RS, in-situ and model applications**
 - **Develop a number of showcases (up to date & maintained). What are the good web-sites and demonstration projects**
 - **Need functional working groups,** (use matrix of Mark) e.g. for
 - Harmonization & quality control. Distil the variety of approaches we have for the EO processing. This should happen in the next 2-3 years. Include validation
 - Global baseline products on inland water
 - Others

Other ways to look at our work, considering sectors and scales:

- Scales: Global, regional, national, local
- Sectors: international agencies, national governments, fisheries, recreation, etc. etc. etc. Governmental users may be the most relevant for GEO.

Capacity Building:

Try to have more capacity building so we get more participants from Developing countries, who will be using our products. Capacity building also a key component for GEMS, and many countries are specifically requesting this. Our group could facilitate this? UN (SPIDER) and WB (Water Practice group) also focus on capacity building. UN SPIDER is organizing a training session in June/July of this year

ACTION PLAN – Carsten facilitator (and Arnold)

The action plans starts with the objectives of where we want to be in 1, 5, and 10 years.

Milestones:

1. Develop one (1) global product within 1 year time, available via the GEO website.
 - a. Connect existing systems, with workgroup on harmonization
2. Define “Water Quality” Essential Climate Variables (ECVs) for inland. Note that Chla and water irradiance are ECVs for the ocean. (GCOS(?) process is ongoing now, but we may already be too late. All the input to the different panels has already been given. List of ECVs will be finished by September 2015). Draft White Paper to TOPC.
3. Contribute to GEO architectural integration plan (AIP) document (Philipp can bring this into that meeting). Referencing Earth2Observe project bringing together lots of model and satellite data for the water cycle. This is necessary for harmonizing and bringing together our different systems. Can do an inland water example for e.g. Estonian lakes (PML lead with BC)
4. White Paper to US NRC (relevant to future NASA mission) in 6 months.
5. Catalogue (Meta-data) of existing information system: Inventory of existing systems, (building blocks) within 3 months. Showcase a number of these on GEO website
6. Demonstration of linked system of system building on OGC standards.
 - a. Harmonization is a key issue
 - b. Models are explicitly part of this.
7. Develop and disseminate user engagement plan (types of users). Compile directory of stakeholders & users. Compile user engagement and outreach plan, and iterate with key users. By Dec. 2015.
8. Have working group on definition of global products, including develop a global Water-Health indicator. WHO has an indicator based on cyanobacteria, maybe another one based on TSM?. By June. 2016.
9. Interact with UN organizations. Identify how we can contribute to SDG process. Define requirements for in-situ by GEMS water (1) Identify cost-effectiveness of using EO, to be discussed in Adis Ababa Conference in July 2015. (2) Indicator development . By Dec 2017.
10. WQ Group improved (formal) recognition at GEO, for example a Community of Practice or a Flagship. Blue Planet is an example. Also More visibility of GEO WQ (competition, for e.g. Apps).
11. Preliminary suite of global WQ products implemented, based on Sentinels & VIIRS. Also Indicators. First products in 2 years,
12. Establish coordination and secretariat of this group and necessary financing. Also working structure of group (working groups). Identify what we do on Capacity Building
13. Research: help formulate research priorities in US, Europe, Australia, etc. Identify R&D activities on modelling & forecasting through EO data assimilation. Link to GODAE (coastal).

- Develop a number of showcases (up to date & maintained). What are the good web-sites and demonstration projects

Strategic Plan, comprises:

- Portfolio of services
- Demonstration and pilot projects
- Research
- Contributions to key global WQ activities (e.g. SDG)
- Capacity building
- User Federation and Outreach
- WQ CoP Secretariat

Doug Cripe of GEO

GEO was born in 2005. It is an intergovernmental partnership for cooperation on Earth Observation, and to bring EO into the decision making process. Data Sharing is an important component. GEO is 'us' and all the member governments. There are no restrictions to forming a Community of Practice. Just need to inform the secretariat that we exist. GEO is now working on the strategic plan for the next 10 years (2015-2025). GEO can set up a list-serve for communications, etc.

To be **Flagship** as recognized by GEO, we need:

- Implementation plan, & coordinator and Steering committee
- Overview of resources committed
- Has to get approved by GEO plenary (decision making body)

Current flagships are GEOGLAM, GEOBON, GFOI, (see GEO website

Having support of national GEO principles would help support the idea for a new Flagship

Another option is a **Community Activity**. This has a different set of reporting commitments Also needs implementation plan. GEO secretariat would help guide activities.

Architecture Implementation Pilots (AIPs)

Makes use of GEO

- Focus on inter-operability of data, and standard
- Every January a call is issued, identifying general topic. This year the call was for mobile applications using GEOSS data.
- Results must be ready in about 9 months, to be ready to show by Plenary (Nov)

GEO stamp of approval:

This does not yet exist. No mechanism for this. We could develop this ourselves within our CoP.

The role of GEO (GEOSS) portal in disseminating data:

GEOSS is a metadata portal. It is inter-operable with other information systems (eg. WMO WIS).

It also has nice visualization options. GEO does not provide mechanisms for long-term operational support. But can reach out to other organizations to help sustain systems.
No data standards for disseminating data. Data must be free and open.

Final discussion – Moderation by Arnold

(is included in Milestone overview)

UN organizations & fora that we could interact with (complex)

UNEP water

UNEP has open data platform, we can showcase success stories there.

Global expanded water monitoring initiative – coordinated effort across 6 UN agencies.

Getting ready for Sentinel 2 & 3

Planning:

- Sentinel 3, planned launch Oct. 2015, then 6 month ramp up. Operational data stream in 2016.
- Sentinel 2, planned launch June 2015, then 5 month ramp up, continent by continent.

Process – How do we go further?

Who can contribute, who has time? Paul, Arnold, Steve, Carsten, (etc) can't make this all happen.

Open call for everyone to help make things happen.

Telecons on a 3 month basis.

Outcomes of this summit will be implementation plan and action plan. Presentations (pdfs) and discussion sessions summaries will be put on web site. Make sure that results can be found on EOS (?) and IOGC ? All materials will go on EAWAG web site, they have agreed to host us (not GEO community of practice website - ?) **Current website: www.**

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