



## **GEO Water Quality Community of Practice 2016 Work Plan and Structure**

### **Background and Overview**

#### GEO Context

Established in 2005, GEO is a voluntary partnership of governments and organizations that envisions “a future wherein decisions and actions for the benefit of humankind are informed by coordinated, comprehensive and sustained Earth observations and information.” GEO Member governments include 102 nations and the European Commission, and 87 Participating Organizations comprised of international bodies with a mandate in Earth observations. Together, the GEO community is creating a Global Earth Observation System of Systems (GEOSS) that will link Earth observation resources world-wide across multiple Societal Benefit Areas - agriculture, biodiversity, climate, disasters, ecosystems, energy, health, water and weather - and make those resources available for better informed decision-making.

#### Formation of the Water Quality Community of Practice

The GEO Water Quality Community of Practice (previously referred to as the GEO Inland and Near-Coastal Water Quality Working Group) was formed in response to the need for an international operational (i.e., routine and sustained) water quality information system. The group stemmed from a GEO Inland and Nearshore Coastal Water Quality Remote Sensing Workshop that was held in Geneva, Switzerland, on 27-29 March 2007. This seminal gathering of experts from around the world was hosted by the GEO Secretariat and Co-chaired by representatives from GEO and the Integrated Global Observing Strategy Partnership (IGOS-P) Integrated Global Water Cycle Observation (IGWCO). The workshop was endorsed by GEO as a part of their activities on water resources and water quality initiated in 2006. The workshop was attended by 55 participants representing a diversity of backgrounds, expertise and regions of the world, with a total of 26 countries being represented. Follow up workshops included a Water Quality Algorithm Workshop in Washington DC in 2009 and most recently, a Water Quality summit in Geneva in 2015.

During the 2015 summit, the group produced a draft 10-year strategic plan for developing water quality assessment products to be used globally. The summit participants also advocated implementing a GEO Water Quality Community of Practice that would complement GEO initiatives such as Blue Planet, the Biodiversity Observation Network, and GeoHealth. The GEO Water Quality Community of Practice has since been formally recognized by GEO as a community activity (see appendix A for definitions of GEO activities) and will be included in the GEO 2016 Work Programme.

*This document serves to outline the 10-year work plan and structure of the Water Quality Community of Practice (WQ CoP).*



## Missions and Goals

### Mission

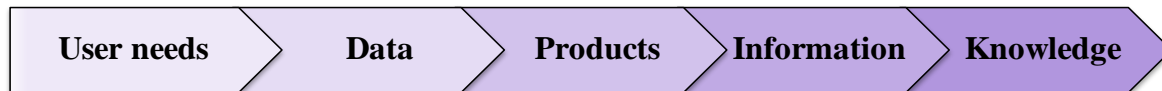
The mission of the WQ CoP is to:

*Deliver, on a routine and sustained basis, timely, consistent, accurate and fit-for-purpose water quality data products and information to support water resource management and decision making in coastal and inland waters.*

### Goals

The WQ CoP aims to develop international operational water quality information systems based on Earth observation with a focus on the developing world. GEO is looking to developed countries to play a lead role. The aims of this international GEO Working Group are aligned with the developing world's requirements because the extensive nature of many surface water resources and the lack of suitable measurement or access infrastructure inhibit intensive in situ water quality sampling networks.

Water quality monitoring is a large multi-faceted field with many areas that need to be addressed. The GEO working group has chosen to focus on transforming data to information based on user needs within this water quality theme.



Two major types of data required for this effort are: (1) remotely-sensed water quality data, including current sensor, algorithm, and data processing and distribution systems and subsequent water quality information systems for inland and coastal waters and (2) in situ water quality data, with the development of new information systems including water-quality data assimilation systems focused on sediment and nutrient fluxes and budgets.



## Structure

The organization of the WQ CoP is reflected in the figure below. The structural elements include:

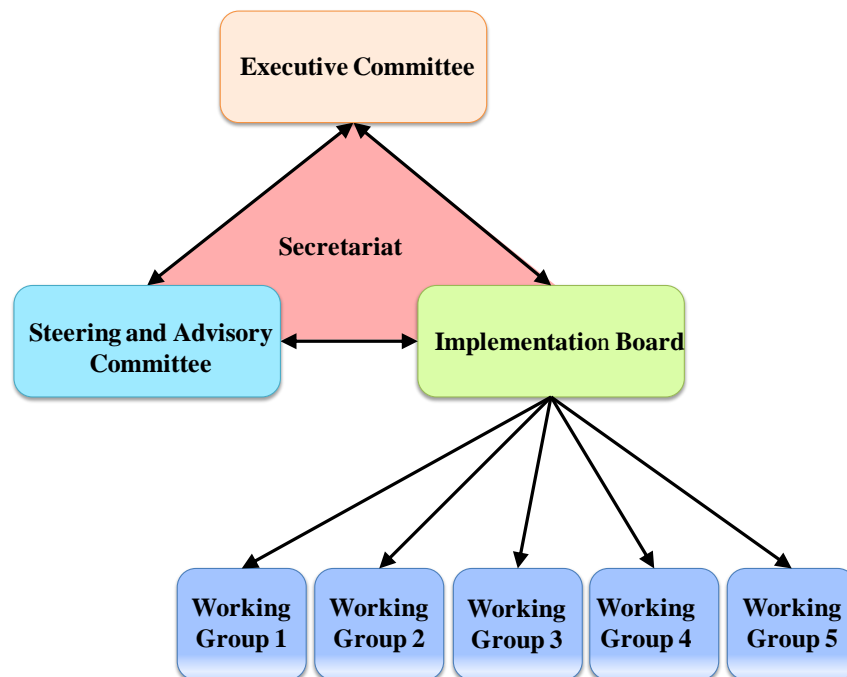
**Steering and Advisory Committee:** This committee will be composed of Water Quality Community of Practice (WQ-CoP) stakeholders and shareholders. The former will include advisory organizations such as United Nations programmes and organizations that provide perspective on user needs, international mandates, et al.; the latter will consist of patrons and other representatives from organizations contributing funds to the WQ-CoP.

**Executive Committee:** This committee will provide leadership and executive oversight of WQ-CoP practices. The committee will work with the Steering and Advisory Committee and Implementation Board to decide upon projects and manage and secure funding for the WQ-CoP's projects. The committee will be supported in day-to-day activities and functions by the WQ CoP Secretariat.

**Water Quality Community of Practice Secretariat:** The Secretariat will provide scientific and technical coordination as well as programmatic support for the overall community of practice.

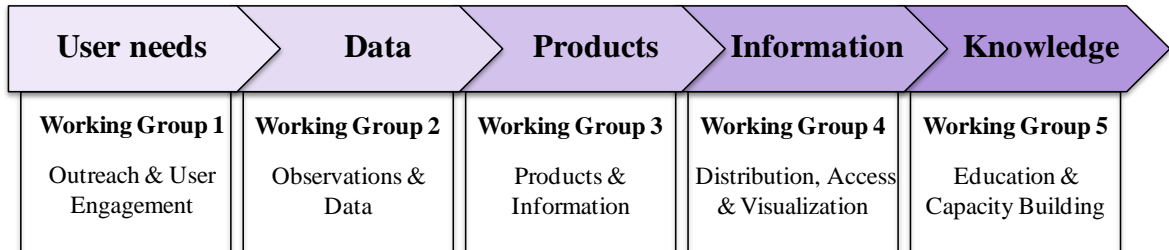
**Implementation Board:** The implementation board will be composed of the leads (and co-leads where applicable) of the five working groups as below. The board will be responsible for the management and implementation of projects and coordination between working groups. The Implementation Board will be supported in day-to-day activities and functions by the WQ CoP Secretariat.

**Working Groups:** The WQ-CoP will have five Working Groups (WGs). The function of the WGs is to support timely and successful project implementation and task execution, and provide necessary scientific, technical and other support as required for CoP projects, tasks and activities.





The five working groups, reflected in the figure below, will perform the work that is necessary to take projects from user needs to informational products and knowledge. Working groups will work in a collaborative manor to accomplish tasks.



Working Group 1 – Outreach and User Engagement: WG-1 will be responsible for outreach to the (potential) users of water quality data, products and derived information. The group will be tasked with generating a communication strategy for the community of practice that will allow for advocacy of Earth Observations in support of water quality monitoring and forecasting and general engagement of diverse users across the globe.

Working Group 2 – Observations and Data: WG-2 will be responsible for evaluating, generating and refining algorithms, protocols, supporting calibration and validation, and linking key data sets from remote sensing and *in situ* data sources.

Working Group 3 – Products and Information: WG-3 will be responsible for identifying, generating and evaluating products derived from complementary remote sensing and *in situ* data sets, as well as supporting modeling and data assimilation activities for regional and global water quality nowcasts, forecasts and predictions. This group will work to facilitate routine and sustained production of fit for purpose products for use in the scientific community as well as information products for policy makers, decision makers, and the general public.

Working Group 4 – Distribution, Access, and Visualization: WG-4 will be responsible for making products and derived information generated (and/or facilitated) by WG-3 visually appealing and broadly accessible to target audiences. The group will also work to distribute scientific, technical and other outputs to applicable end users.

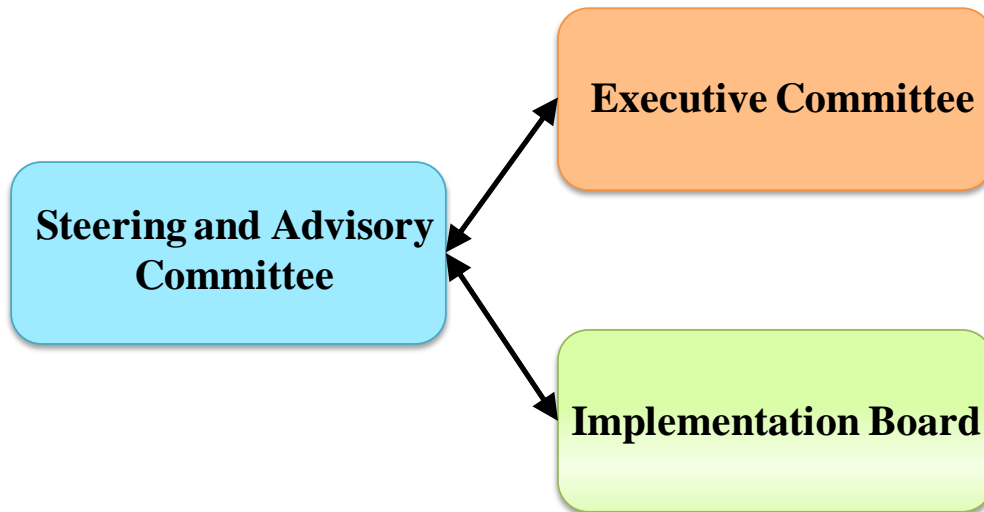
Working Group 5 – Education and Capacity Building: WG-5 will be responsible for educational content for policy makers, decision makers, and the general public. This group will also support, identify and lead capacity building efforts in developed and developing nations to expand the effective and timely utilization of Earth observations for societal benefits.



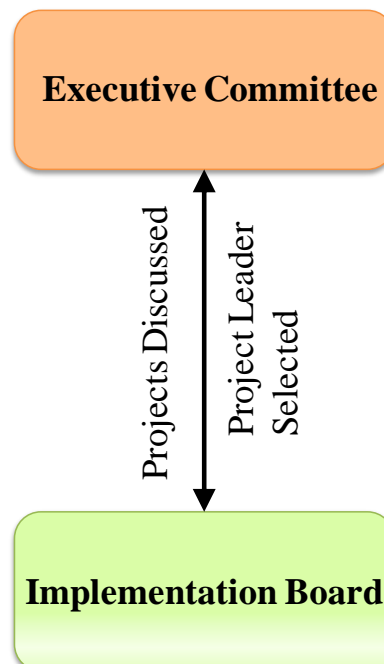
## Work Flow

As presented below, the work flow in the WQ CoP will begin with project selection by the leadership committees and board and flow through the working groups to completion.

1. Project selection: The Steering and Advisory Committee, Executive Committee and Implementation Board discuss project options and select a project.

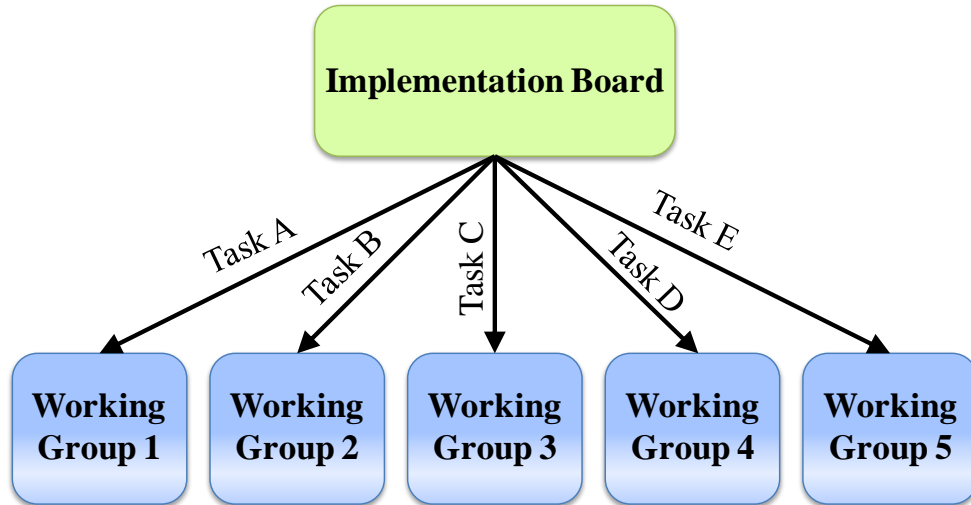


2. Project leader selection: Executive Committee and Implementation Board discuss the project and identify a project leader.

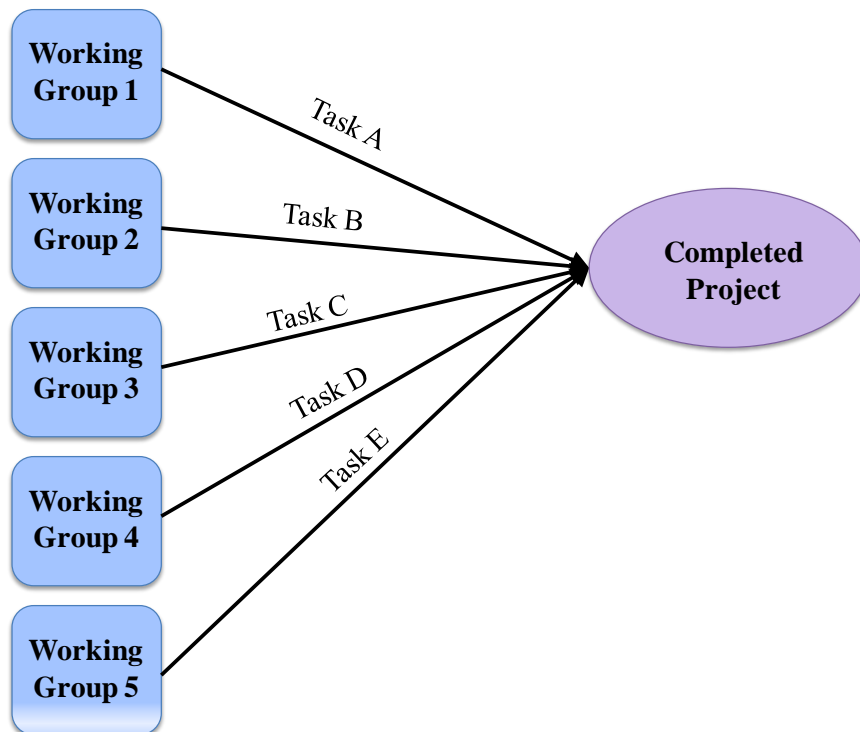




- 3. Task identification and assignment: The project leader and Implementation Board will determine the tasks and sub-tasks required to complete the project and assign duties to the different working groups as applicable (Note: not all working groups will be required for all projects).



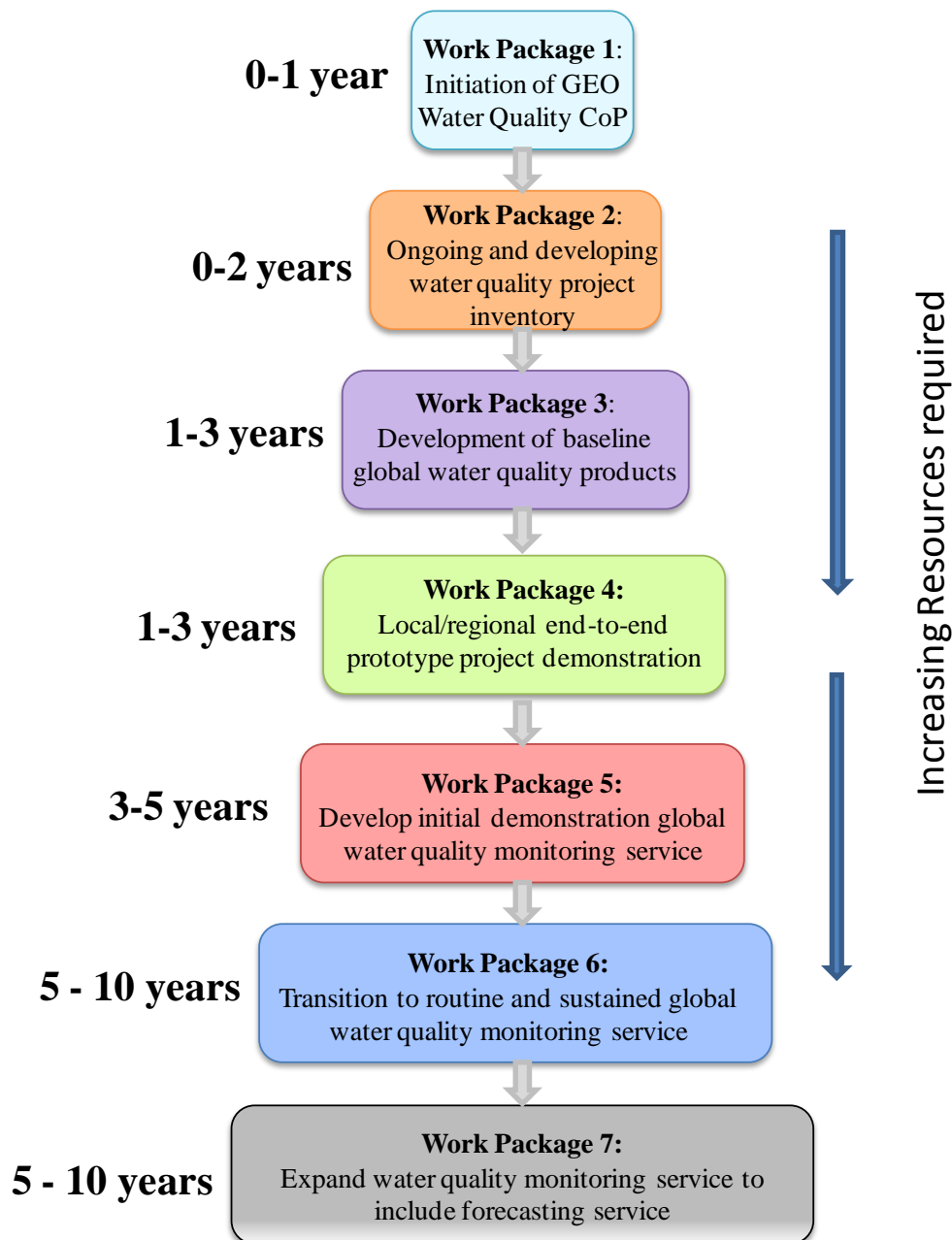
- 4. Task completion: Working groups complete their assigned tasks and project is completed.





## Work Plan

The overall goal of the Water Quality Community of Practice is to produce a global water quality monitoring and forecasting service within 10 years. It is envisioned that this will be accomplished by incrementally completing service-related projects and tasks that will be integrated into the overarching global water quality monitoring and forecasting service. The major deliverables of the CoP are presented below. Efforts required to produce deliverables of projects will be defined as work packages (WP). Milestones are actions that need to be completed within each work package. The seven major work packages are illustrated below.





## Appendix A: GEO Activities

GEO activities are divided into four major categories: community activities, flagships, initiatives and foundational tasks. The GEO 2016 Work Programme<sup>1</sup> defines these as follows:

- **GEO Community Activities** allow stakeholders to cooperate flexibly in a bottom-up fashion and with a low initiation cost. They can include a broad variety of activities with varying degrees of coordination. GEO Community Activities may, for example, define user needs, explore new frontier applications or demonstrate technical possibilities, or agree on specific observation or analysis protocols and data exchange.
- **GEO Initiatives** allow Members and Participating Organizations to coordinate their actions and contributions towards a common objective within an agreed, yet flexible framework. They develop and implement prototype services according to GEO priorities and have identified committed resources to a certain extent. GEO Initiatives may, for example, demonstrate technical feasibilities through pilot services, or serve a user need.
- **GEO Flagships** allow Members and Participating Organizations with a policy-relevant mandate to spin-up a dedicated operational service serving common needs and/or well-defined user groups. They develop and implement near-operational services according to GEO priorities and are fully resourced. GEO Flagships may operate for as long as they are able to generate sufficient impact to attract support for their activities. Once they reach a mature, operational stage, they may be taken up by operational organizations (e.g. GEO Participating Organizations), for their continued operation over the long term.
- **GEO Foundational Tasks** allow GEO to implement selected, often enabling, tasks to achieve GEO Strategic Objectives. These include coordination actions, gap analyses, the implementation of technical elements for accessing GEOSS, and other routine operations of the GEO Secretariat. Thus, they provide important support functions to Flagships, Initiatives, and Community Activities.

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<sup>1</sup> Group on Earth Observations. 2016 Work Programme. GEO-XII – 11-12 November 2015, Document 15. [https://www.earthobservations.org/documents/geo\\_xii/GEO-XII\\_15\\_2016%20Work%20Programme.pdf](https://www.earthobservations.org/documents/geo_xii/GEO-XII_15_2016%20Work%20Programme.pdf)