

Minutes IGWCO CoP meeting 23 November 2021

Attendants

Name	Affiliation
Bente Lilja Bye	Bente Lilja Bye (BLB) research and consulting company
Wolfgang Grabs	Co-Chair IGWCO CoP
Steven Greb	Director AquaWatch / University of Wisconsin-Madison
Eva Haas	EOMap
George Huffman	NASA Goddard Space Flight Center
Guoqiang Jia	Chinese Academy of Sciences (CAS)
Tiit Kutser	Estonian Marine Institute, University of Tartu
Toshio Koike	International Centre for Water Hazard and Risk Management (ICHARM)
Richard Lawford	Morgan State University and former IGWCO Co-Chair
Yubao Qiu	Chinese Academy of Sciences
Jiancheng Shi	Institute of Remote Sensing and Digital Earth - Chinese Academy of Sciences (CAS)
Bob Su	University Twente
Peter van Oevelen	IGPO and Co-Chair IGWCO CoP
Yijian Zeng	University of Twente

Agenda

1. Brief information about ongoing activities
2. Status of the review of the GEOSS Water Strategy
3. Update of the IGWCO workplan
4. Establishment of a IGWCO website
5. New developments in the GEO Secretariat
6. Any other business

Summary

Ad 1. Brief information about ongoing activities

Toshio Koike

ICHARM works on two big activities, one in West Africa and one in Asia.

In cooperation with UNESCO, Prof. Koike developed a flood early warning system by using Global Satellite Mapping of Precipitation (GSMaP), [Data Integration and Analysis System \(DIAS\)](#) and the Japanese hydrological simulation system In West Africa. This successful project was funded by the government of Japan in cooperation with 11 countries in West Africa focusing on the Nigeria and the Volta River basin. In July 2020, the flood early warning system became operational, and the focus shifted to the capacity building program.

iCHARM developed and implemented online e-learning programs, including Training of Experts (ToE) and Training of Trainers (ToT). From the more than 300 experts who joined the ToEs we selected 40 leaders for the ToTs which was completed in March 2021.

Due to the COVID-19 pandemic the way of working together also changed in Asia. iCHARM also introduced an online learning system and implemented two courses in the Philippines and one in Indonesia. iCHARM is now planning one in Shri Lanka. Unfortunately, working together with Yaoming Ma is not possible at the moment.

All activities have been reported at the Asia-Oceania Group on Earth Observations (AOGEO) meeting early November. The model will be reported at the GEO plenary.

Jiancheng Shi

Currently, Dr. Shi is working mainly on two projects. The first project is called 'The second expedition of the Tibet'. This project is supported by the Chinese Science and Technology department at the administration. Within this big project there are two smaller projects: i) focused on remote sensing measurements for 16 components of the energy and water cycles and ii) high resolution, 3-km re-analysis to drive the surface and groundwater model aiming to understand what special water mobility is and how does these changes for four water balance components (evapotranspiration, precipitation, surface water storage and runoff).

The second project, supported by CAS, looks at the global synergy of the system measurements of the water cycle by integrating water cycle components measurements from different satellites.

The many good results from these projects can contribute to the work of IGWCO.

Guoqiang Jia

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Yijian Zeng and Bob Su

The [iAqueduct](#) project of the European Union Water Joint Programming Initiative ([JPI](#)) is an integrative information aqueduct focused on closing the gaps between global satellite observation of water cycle and local needs of information for sustainable management of water resources. The goal is to bridge the gap between the coarse (?) resolution earth observation products to local scale water resources management for end users. In one of the working groups there was discussion about how to utilize remote sensing data to reduce the uncertainty of SWAP type of modeling and then provide use for uncertainty information for the stakeholders like the Waterboard with certain guidelines for example.

Due to the need for water resource management at farm level among others there are several other activities within the project like downscaling remote sensing products utilizing the machine learning approach e.g., random forest and trying to combine this with drone data. With drone data remote sensing data can be downscaled from 25 km to 16 cm. However, this is not a continuous time series and is depended on when the drone is used. Along this line, the goal is to produce 10 m resolution downscaled essential water cycle variables combined with remote sensing data.

Several process level studies are trying to understand the less ecosystem functioning under very dry conditions and trying to use process level models like STEMMUS-SCOPE and link the soil process level to remote sensing as well.

A 1 km-soil moisture dataset for over 20 years on a global scale has been produced as well and is being validated with more intensive measurements of different groups, which can be offered as a product at a certain point.

Compared to current low-resolution products, this product is much better due to high special resolution and the use of additional data in the retrieval. The product is more consistent for the application at field scale.

Additionally, in iAqueduct, a web-based application is being developed which can be applied to other groups too. In principle, hydrological modeling can be done by selecting a catchment and enter satellite data. This is probably similar to what Dr. Koike has developed previously, only on a different scale. Using this for smaller catchments a piece can be cut out. A few students are already tasked with this. If there is a need, additional dedicated effort could be assigned. Now, the priority of this research activity lies on physical consistency and not on user friendliness.

Note: The International Soil Moisture Network database is being transferred to the [International Center for Water Resources and Global Change](#) in Koblenz, Germany. They maintain the in-situ database for the soil moisture observations.

Bente Lilja Bye

Noteworthy development since our last meeting:

1. the newly established collaboration between the Research Council in Norway and the Ministry of Science and Technology (MoST) in China on funding level. The submission deadline of the call for proposals is approaching and about to be concluded. One proposal is with a group in Norway and China, called 'Snow Ice Artic', is on changes of snow and ice in the Pan-Artic region and their hydrological and climatic effects. It's a way to explore if the same modeling and methodology can be used in both places. It involves hydrological modeling and making in-situ data and space-based data interoperable. UBOUW (?) might also be one of the competitors. Results should be available before Christmas.
2. GEO's data working group is primarily focused on in-situ data. It is highly recommended that members from IGWCO participate in discussions on water in-situ data. Additionally, legal and policy barriers is an issue relevant to this group. If you want to participate in this group, please contact the [GEO-secretariat](#) and let them know.
3. later today, there will be a side event in GEO Week on the activities in the data working group. Celebrating the data sharing and data management principles and marking the transition from calling it the [GEOS](#) data sharing and data management principles to [GEO](#). These principles are being promoted as the Earth Observation Group is taking the lead and showing the way for later principles like fair, trust, etc.
4. invitation to engage in looking at future interoperability. The IGWCO-community has the expertise and experience beneficial for looking at how we can improve the interoperability of earth observations in GEO. It looks like this group is of the opinion that earth observations solutions are both space and in-situ based. This view is not evident for everybody. Additionally, evolvement of data and information expanding further and include knowledge, services, and applications as part of what we are trying to make interoperable in GEO. The IGWCO community can contribute to the writing of a Green Paper on the subject 'Called for faster uptake of earth observations and services', which is coordinated by a community activity called the Next Generation of Earth Observation Services (Next EOS). Dr. Bente is one of the co-chairs of this group. If you are interested in contributing to this Green Paper that will be part of the input to the follow-up to the midterm evaluation about the need to revisit the concept of GEOS.

It is a welcome development that the data working group focuses on in-situ observations as there has not been much activity on this topic since 2019.

Eva Haas

At EOMap we are experts in aquatic water observations and focus on water quality. Our group is active in [GEO AquaWatch](#) in working group 3 'Products and Information' and in the working group 4 'Distribution Access and Visualization'. Our group is building under the umbrella of the European Space Agency program 'Investing in Industrial Innovation' ([InCubed](#)). InCubed focuses on developing innovative and commercially viable products and services that exploit the value of Earth observation imagery and datasets. EOMap is building a water quality portal that will allow decision makers to get easier access to water quality data. The goal is to build a portal similar to the weather forecasting apps on mobile phones to make it easier to access complex information. More news on the development is expected at the next IGWCO meeting.

On a more personal note, Mrs. Haas is selected as the first Earth observation evangelist at the 1st FIRE Forum Event in June 2021. [Fire](#) is the industry-led Forum for Innovation and Research in European Earth Observation. The EO Evangelists are aimed to advocate the benefits of EO to the key sectors. Mrs. Haas is planning to go to Unier (??) five in Nairobi, Oceanology and other important conferences and meetings next year. If we want Mrs. Haas to advocate certain ideas or examples, she can do so in name of this group.

The IGWCO community will support Mrs. Haas in her efforts.

Steven Greb

Dr. Greb is director of GEO AquaWatch. Some of the activities AquaWatch is involved with are:

- Analysis Ready Data (ARD). ARD helps remove the preparation burden, particularly for the less experienced data user. The aim is to promote data quality and consistency with defined specifications. ARD is processing data to a minimum set of requirements and organizes it so that it can be analyzed immediately without much additional user effort and promotes interoperability both through time and with other datasets.
- Project at the University of Wisconsin-Madison compiling existing datasets into what is called 'the real Earth portal'. It's bringing together disparate datasets both in-situ data and satellite remote sensor data into this common database or visualization tool, where you can compare some of these different products which are being currently generated.
- AquaWatch received one of the GEO Google Earth Engine awards last year. One group is using a couple of new algorithms, starting with the total suspended solids. The solid algorithm along with some of the atmosphere correction algorithms is adapted into Google earth engine to build this global layer for Total Suspended Solids (TSS).
- A global validation workshop will be organized at the University of Wisconsin-Madison in June 2022, paid for by a grant from NASA.
- An open invitation to attend the next AquaWatch bi-annual meeting in Delft, The Netherlands in the third week March 2022.
- In the context of the discussion at the GEO Secretariat on how much engagement with commercial could service providers should be pursued it is worth mentioning that Dr. Greb is also related to the GEO Google Earth Agent program. This relates to several data management data sharing activities to which some of the partners here might be interested.

George Huffman

Thanks to Dr. Van Oevelen, Dr. Huffman published a short article on Essential Water Variables in the [GEWEX Quarterly, Vol. 31, No. 3 , pg 16-17](#).

There is much interest in essential variables. The GEO working group focused on this topic will have a side meeting later today to get organized and begin a White Paper.

The GPCP version 3.2 will be coming out in a few weeks and the GPM precip products are coming out as version 7 in the next six months. The IPWG list of publicly available long term quasi global precipitation data sets has been updated. C-US Analysis Ready Data (?) is looking to establish analysis ready data standards.

Tiit Kutser

The Horizon project 'Water-ForCE' aims to create a roadmap on how Copernicus water related services should be organized in the next funding cycle. Currently, water (quality, quantity, precipitation, soil moisture, etc.) is covered by six Copernicus services. To make it easier for people doing water cycle studies to find relevant information, a plan should be developed to organize this topic effectively and efficiently. By Spring 2023, the first draft of how Copernicus water related services should look like, will be ready followed by an international workshop where this draft will be discussed. The aim is to have the final roadmap ready by the end of 2023. People from around the world are invited to join the many different working groups and give their perspective on how to improve future Copernicus services. The link to the project website is <https://waterforce.eu>.

Copernicus has a global approach. Although Copernicus Water Services are spread across many central areas, IGWCO as a group can contribute to the Water-ForCE project to develop a roadmap for the consolidation of water services. The consolidation of services is very much the core of what IGWCO is as an integrating body attached to GEO.

IGWCO members are asked to send their ideas to gewex@gewex.org. Dr. Van Oevelen will collect and summarize how we as a group and the individual group members can contribute to the Water-ForCE project.

Yubao Qiu

Dr. Qiu's group participates in the proposal from the group in Norway and China, called 'Snow Ice Arctic' mentioned earlier by Dr. Bye One of Dr. Qiu group members is working with Cabe (?) from the University of Oslo on the Arctic and the high mountains in Asia. The Arctic part of snow and ice and the connection between Norway and the land and ocean areas. They participate in two of the working groups. Additionally, they work in a group on ocean sea ice.

Dr. Van Oevelen joined the DBAR external evaluation group, which is almost finalized.

Prof. Jia Li and Dr. Qiu are working on high mountains and cold regions. Prof. Jia Li is leading the water task under the Digital Belt and Road initiative. Later, these activities will be linked to IGWCO.

Prof. Huadong Guo is leading the [International Research Center of Big Data for Sustainable Development Goals](#) (SDGs). Certain activities of this newly established institute might be also linked to the programs in GEO later.

Ad 2. Status of the review of the GEOSS Water Strategy

Rick Lawford

The GEOS Strategy report is a document which came out in 2014. Although, significant progress was made in several areas, a few recommendations in the report are outside the GEO remap. These recommendations require a research organization like WCRP need to be involved and lead the exercise. The challenge the CoP faces is how to address those different groups. Incentives are needed to get these organizations engaged and have them use resources to address these recommendations. The GEO Strategy report is updated every quarter and contains a list of those organizations. If you are interested in receiving a copy of the latest update, contact Prof. Lawford.

The information in the GEOS strategy report is getting dated. A lot of changes are happening in the community and in GEO. It might be time to rethink and develop a new strategy for the coming decade to bring people up to date with the systems that are in place with the research that's being done.

The IGWCO meetings are important for getting input on the latest developments. It's therefore recommended to have the IGWCO CoP meetings regularly, for instance on a quarterly basis. It's a good way of getting the community to provide feedback and interaction and we can see where progress is being made.

The article summarizing the GEOS Strategy report for the journal of American Water Resources Association is in its final stages. It focuses a bit more on the quantity side. The new document might integrate the quality side better and might also be more directed to developments in the public policy area like SDG's and climate change.

Prof. Lawford will send the latest update of the GEOS Strategy report to gewex@gewex.org for distribution to the IGWCO CoP mailing list.

Ad 3. Update of the IGWCO workplan

The roadmap of IGWCO will be resent to its members. All members are asked to read through the document, especially the draft work plan and to send in suggestions or volunteer to lead one or more of the items listed under the heading Next Steps. Until now, we have received little feedback on the work plan.

Ad 4. Establishment of a IGWCO website

The goal is to increase visibility outside this group. Currently, visibility is only given through the activities of the members of the IGWCO group, which is not enough if we want to create a greater impact and recognition of the services that combine and also as individual by each of the members of the group can offer.

Dr. Grabs and Dr. Van Oevelen suggest the development of a website consisting of static items like reports, including the GEO water strategy, the basic baseline documents what IGWCO is, member activities and minutes of the meetings.

It's unclear if the website could be placed under the GEO Flag. Currently, the capacity of the GEO Secretariat is limited. If not, the aim is to have a IGWCO webpage live by the end of 2021. In the annex, you'll find a draft set up of the IGWCO CoP Website and the headings we need content for. Members are asked to send content and information on their various activities.

To increase visibility of your products and services, Dr. Bye suggests using the Next GEOS data hub. Although, it started out as a project for one year it is still running and maintained. It supports a Meta data catalog that also enables cataloguing data services and applications for free. It will give some visibility as a data provider. If you are using standards like standard API's, etc. your services will be visible within a short timeframe. Next year's data hub is connected to GEOS, so you can be found by other GEOS portal if you're listed in next year's catalog. Google data search can also find products and data from the Next GEO portal.

In the past, water did not have representation in the GEO Secretariat as representation was according to societal benefit areas like water and others. However, in the past years, the societal benefit areas were worked in a more integrative way and water lost visibility in GEO. Only IGWCO represented water topics but had to regain its status as a Community of Practice. Additionally, only GEO GLOWS had an official affiliation with the GEO Secretariat. With the new directorship in GEO came change. In short, the new director is particularly interested in demonstrating how GEO serves and integrating roll across observational data development of services to respond, the policy agenda and needs whether global or region scope and excels include GEO engagement priority areas ACG Paris agreement. It offers valuable points to reconnect to GEO and to offer our services. Douglas Cripe is now back in the GEO Secretariat as contact and focal point for water. A teleconference is organized on 3 December 2021 with several IGWCO members. He asks for a couple slides proposing where the water sector could be supported by ongoing plan activities. Dr. Grabs will make a summary of his meeting with Dr. Cripe and distribute it through the IGWCO mailing list.

Dr. Van Oevelen will look into how to improve the connection with activities in WMO and in particularly WCRP with IGWCO. Although, a new core project "Regional information for Society (RifS) is formed, because of its diversity the IGWCO can play a role in providing a rationale and links to these communities. In the last two years, reconnecting to GEO Secretariat did improve like the work done by AquaWatch, but not everywhere at the same pace. Looking at the article on Essential Water Variables in the GEWEX Quarterly, what type of data sets do you put under that context, how do you assess the value of these data sets, how do you go about it is an area where IGWCO can or should play a role, which is not utilized yet.

Ad 5. New developments in the GEO Secretariat

On behalf of DR Cripe from GEO-Sec. Dr. Grabs reported that with the change of directors at the GEO Secretariat, Dr. Cripe has been requested to engage once again with the full GEO water portfolio and looks forward to cooperating with IGWCO and related partners.

The new GEO director, Yana Gevorgyan, is particularly interested in demonstrating how GEO serves an integrating role across observational data and development of services, to respond to policy agendas and needs, whether global or regional in scope. Examples include the GEO engagement priority areas - SDGs, Paris Agreement, Sendai Framework for DRR, and Urban Resilience, as well as the Ramsar Convention, the EU Green Deal, and so forth. To carry on the water issues in GEO-Sec, the view of Dr. Cripe is

- The need to work more closely with UN agencies (UNEP, UN-Water, UNESCO, WMO, etc) to identify areas where/how GEO can support policy needs and coordinate work on identifying essential water variables.
- A closer coordination (through IGWCO?) across activities of the GEO Work Programme so that we can leverage work (for example, how can GEOGLAM benefit from GEOGLOWS stream flow forecasts in predicting crop yields?).
- Are there water services that could be developed through an integrative approach of EO (in situ, remote, citizen science).

- Need to identify existing water services developed in open science approach that can be included in the GEO Knowledge Hub.
- Copernicus water services are currently spread across several sectors; can the IGWCO help the Water-ForCE project (Tiit Kutser) develop a roadmap for the consolidation of water services?

Ad 6. Any other business

- Dr. Bye is asked to send a short summary on GEO, in situ, etc. to the IGWCO mailing list. Additionally, she will forward the slide deck of the Data working group used for the meeting later today as well. If you have any questions or need additional information, you can contact Paola De Salvo from the GEO Secretariat at pdesalvo@geosec.org.
- Prof. Lawford will ask Dr. Gutierrez, co-chair of GEOGLOWS for an update and where IGWCO can connect as she could not be present today because of another engagement in GEO Weeks.
- Dr. Koike mentions that the implementation strategy of UNESCO's IHP IX phase is almost finalized. On 24 and 25 November 2021, there will be open and working group by IHP after which the implementation is complete, and its ninth phase will start in January 2022.
- On behalf of Dr. Cripe, Dr. Grabs mentions that the connection between GEO water activities and UN water programs should be improved, especially with UNESCO with which we don't have a connection at all.
- The German side of GEO is interested in how to improve the anchoring of the GEO water strategy into the UN water programs. There are many overlapping themes. With the review of the GEOS water strategy and when we come to terms with it which would result in action items for IGWCO, then over the mid-term we could find champions as Prof. Lawford proposed to rewrite or reedit the water strategy and adapt it to developments up to 2022. IGWCO needs to rethink what it envisions will happen in the next decade and predict how water is going to fit into these developments.
- Dr. Van Oevelen will send out a doodle for the next IGWCO meeting, scheduled early January 2022 and will discuss with Dr. Gutierrez her availability for this meeting.

Thank you all for joining and participating and stay safe!

Wolfgang Grabs and Peter van Oevelen

Action items

- All members: send suggestion and ideas concerning the Water-ForCE project to gewex@gewex.org. Dr. Van Oevelen will forward a summary of this the mailing list.
- Prof. Lawford: send the latest update of the GEOS Strategy report to gewex@gewex.org for distribution to the IGWCO CoP mailing list.
- All members: send suggestions and/or volunteer for activities listed in the IGWCO roadmap to gewex@gewex.org.
- All members: send content the development of an IGWCO web pages to gewex@gewex.org. (see Annex 1)
- Dr. Grabs will send a summary of the meeting with Douglas Cripe.
- Dr. Bye: provide details of the GEO Data Working Group for distribution to the IGWCO mailing list.
- Prof. Lawford will ask Dr. Gutierrez, for an update on GEOGLOWS
- Dr. Van Oevelen will send out a doodle for the next IGWCO meeting scheduled for early January 2022.

ANNEX: Draft IGWCO CoP website text

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 - ◆ [Organization](#)

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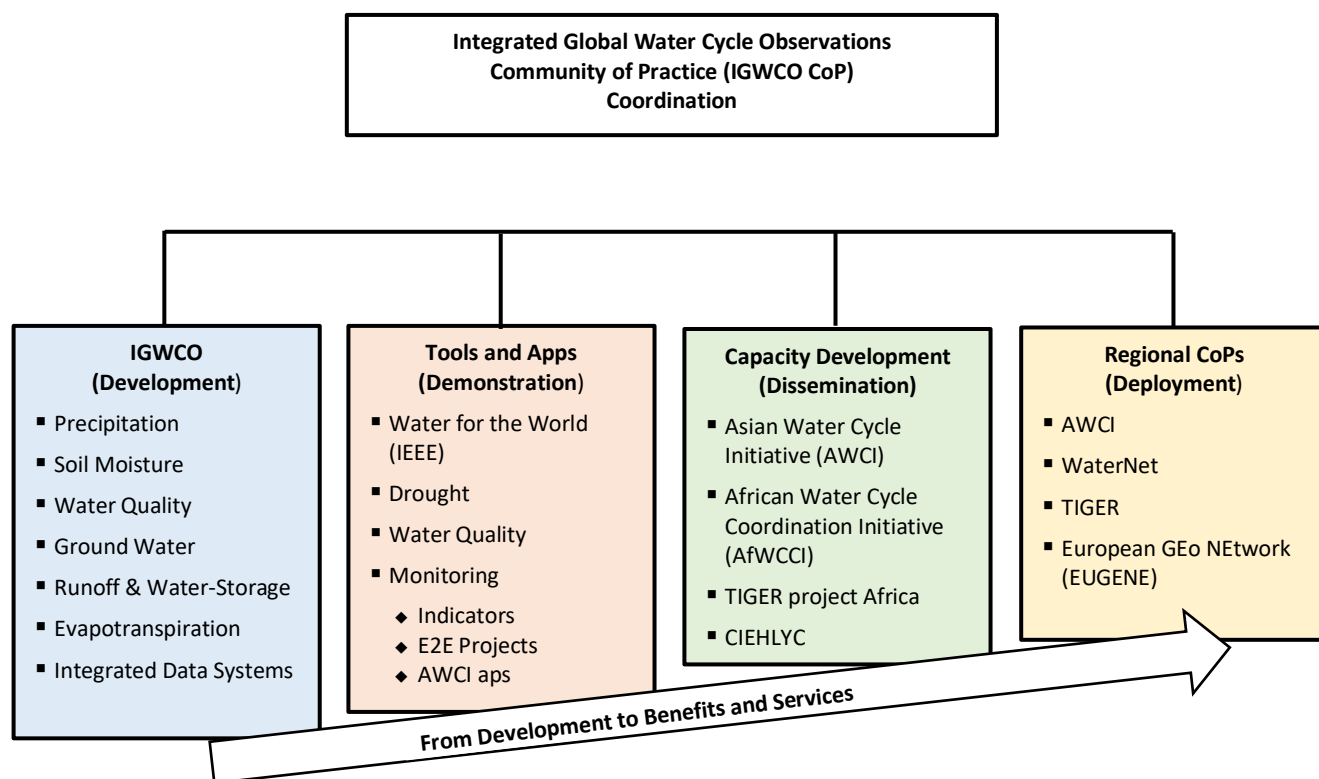
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ABOUT

The Group on Earth Observations (GEO) Integrated Global Water Cycle Observations (IGWCO) Community of Practice (CoP) has its roots in the former Integrated Global Observation Strategy Partnership (IGOS-P) and the community that implemented the IGOS-P water cycle theme. In 2008, this group officially became the GEO IGWCO CoP. In the GEO context, it also fosters the development of broader global and regional networks that deal with science and applications issues.

The IGWCO CoP brings together data providers, scientists, resource managers, and other users from national and international governments, universities, and organizations that are interested in the application of water cycle data in the management of the world’s water on local, regional, and global scales. The four pillars that reflect the scope of the IGWCO CoP are:

- **Global Water Cycle Observations**
Including methods of observations and facilitation of Application Ready Datasets (ARD), fostering exchange of data and information, merging terrestrial and space-based observations, facilitation of the development of data and science-based applications. Improving collaboration with GCOS with regard to the definition of observation requirements of water-related Essential Climate Variables, GTN-H operating under auspices of GCOS and WMO as the main contributor of terrestrial water-related observations and CEOS with regard to space-based observations and products.
- **Regional Activities**
- **Capacity Building**
- **Overarching service functions**
IGWCO-CoP acts and communicates with its partners as a facilitator and coordinator providing them with an overview of water-related activities through which they can keep abreast of activities while seeking harmonization.



Mission

The IGWCO CoP undertakes and contributes to GEO studies involving innovative approaches to data collection and the application of Earth observations to decision making in the water sector. It provides leadership for many of the GEO Water Task activities and provides a forum to discuss their progress and plans. The CoP carries forward activities that have not yet been “vested” in the GEO work plan but take advantage of GEO capabilities.

Objectives

The objectives of the GEO IGWCO CoP include:

- 1) Providing a framework for guiding decisions regarding priorities and strategies for the maintenance and enhancement of water cycle observations.
- 2) Promoting strategies that facilitate the acquisition, processing, and distribution of data products needed for effective management of the world’s water resources.
- 3) Coordinating and facilitating the inputs of the global water community and its user community into the Global Earth Observation System of Systems (GEOSS) plans and reports.
- 4) Fostering the development of tools, applications, and systems that facilitate the inclusion of water cycle information in decision-making.

Organization

The GEO IGWCO CoP is generally a “best efforts” activity and is open for anyone to join, contribute, and to track progress on the GEO Water Task.

Activities

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How to get involved

Become an activity member

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Documents

- Roadmap for Next-Level Development of the Integrated Global Water Cycle Observations (IGWCO) Community of Practice (CoP)
- Implementation of IGWCO CoP: Proposed Next Steps and Outlook
- [2020-2022 GEO Work Programme Summary Document V4](#)
- [The GEOSS Water Strategy from Observations to Decisions](#)

Resources

E-mail list

Links: [GEO](#), [GEOGLOWS](#), [GEWEX](#), [WMO](#), [GTN-H](#), [WCRP](#)

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