# WMO-UNEP-UNESCO-WHO-OGC co-organized Workshop Series on Water Quality Monitoring hosted under the banner of the World Water Quality Alliance (WWQA)

## Opening Workshop

29, 30 & 31 March 2022

Workshop Report (Day 1 & 2)

April 2022

# Table of Contents


**Workshop Day 1 ..... 3**

Opening ..... 3

World Water Quality Alliance (WWQA) & Proposed Series of Workshops ..... 3

United Nations Environment Programme (UNEP) Global Environment Monitoring System for freshwater (GEMS/Water) ..... 3

United Nations Educational, Scientific and Cultural Organization (UNESCO) – Intergovernmental Hydrological Programme (IHP) International Initiative on Water Quality (IIWQ) ..... 3

World Health Organization (WHO) - Water Sanitation and Health ..... 4

World Meteorological Organization (WMO) Water Quality Long-Term ambition ..... 4

Open Geospatial Consortium (OGC) - WMO Hydrology Domain Working Group (HDWG) ..... 4

What are the countries' gaps and needs regarding Regulatory and Guidance material on Water Quality observations, management and sharing? ..... 4

What is a synergized system we want to agree on? & What is the added value of working together on Water Quality Regulatory and guidance material? ..... 5

Closing ..... 5

**Workshop Day 2 ..... 6**

Coordinated operational support to UN Member States and WWQA – Part 1 ..... 6

Coordinated operational support to UN Member States and WWQA – Part 2 ..... 8

Coordinated operational support to UN Member States and WWQA – Part 3 ..... 10

Proposed series of workshops in 2022-2023: Ideas and Prioritization ..... 11

Table of proposed actions ..... 12

Closing ..... 13

# Workshop Day 1

## Opening

Johannes Cullmann (Water & Cryosphere Director, WMO) and Hartwig Kremer (Head of the Global Environment Monitoring Unit, UNEP) opened the first day of the Workshop by delivering their welcoming remarks.

Mr Cullmann highlighted the fact that better communication on water quality with national and UN agencies is a priority for WMO. In addition, Mr Cullmann introduced the objectives of the Opening Workshop.

Mr Kremer underlined the fact that the UNEP community of Global Environment Monitoring Programs (GEMS Water Programs) has a lot of experience in the water quality field, but at the same time it is moving into a new direction which is more impact oriented. He highlighted the fact that UNEP has a particular interest in working with partners to improve the impact and quantity of environmental data on water quality.

## World Water Quality Alliance (WWQA) & Proposed Series of Workshops

Nina Raasakka (UNEP) presented the WWQA giving some background information about its creation and scope. In addition, Ms Raasakka introduced the proposed series of workshops on Water Quality to be carried out in 2022-2023.

The presentation is available here.

## United Nations Environment Programme (UNEP) Global Environment Monitoring System for freshwater (GEMS/Water)

Kilian Christ (UNEP) presented the UNEP's Global Environment Monitoring System for Freshwater.

The presentation is available here.

## United Nations Educational, Scientific and Cultural Organization (UNESCO) – Intergovernmental Hydrological Programme (IHP) International Initiative on Water Quality (IIWQ)

Sarantuyaa Zandaryaa (UNESCO) presented the UNESCO-IHP International Initiative on Water Quality aimed at promoting science and innovation on water quality monitoring. Further, Ms Zandaryaa introduced the UNESCO World Water Quality Portal for freshwater quality monitoring through satellite Earth Observation and the Portal's application in Lake Chad and La Plata basins.

The presentation is available here.

## World Health Organization (WHO) - Water Sanitation and Health

Kate Medlicott (WHO) gave a presentation on WHO normative and monitoring products for water quality. Ms Medlicott introduced WHO Guidelines for drinking-water quality, WHO Guidelines for recreational water quality and the WHO-UNICEF Joint Monitoring Programme (JMP), which focuses on water quality.

The presentation is available here.

## World Meteorological Organization (WMO) Water Quality Long-Term ambition

Tommaso Abrate (WMO) introduced the WMO long-term ambition on water quality, including current needs, gaps to fill, action needed and the WMO Action plan on water quality.

The presentation is available here.

## Open Geospatial Consortium (OGC) - WMO Hydrology Domain Working Group (HDWG)

Scott Simmons (OGC) presented the OGC-WMO Hydrology Domain Working Group, explained what OGC is and introduced the OGC hydrology standards.

The presentation is available here.

## What are the countries' gaps and needs regarding Regulatory and Guidance material on Water Quality observations, management and sharing?

Fred Nyongesa (Water Resources Authority, Kenya) introduced the Water Resources Authority, which has the regulatory mandate to observe and monitor water quality and quantity, and to ensure that water resources are used in a sustainable way.

Mr Nyongesa spoke about the challenges that the Water Resources Authority of Kenya faces in different fields when working with water resources, e.g.:

- Lack of capacity in water quality monitoring;
- Making sure that data is captured consistently and sustainably;
- Information sharing platforms – recipients are not from the same backgrounds, and communities need to be informed in a certain way;
- Advocacy – communicating at the national and local levels.

Mr Nyongesa underlined the importance of working together, jointly with other UN Agencies, to address SDG 6.3.2. He stated that from a global perspective, countries need to have some minimum parameters on water, and a broader water monitoring protocol so that each country can make measurements in the same way and compare results.

In addition, he spoke about the Lake Victoria Basin Commission, consisting of six countries who created a framework for water monitoring and data sharing. Further, Mr Nyongesa spoke about the importance of capacity building, research, and education on water quality.

## What is a synergized system we want to agree on? & What is the added value of working together on Water Quality Regulatory and guidance material?

Melchior Elsler (UNEP) spoke about the objectives of the workshop, namely:

- Working together as a whole UN to strengthen activities related to water quality while remaining coherent to our mandates;
- Harmonizing our approach to water quality.

He further spoke about the added value of working together on water quality.

The presentation is available here.

## Closing

In delivering his closing remarks, Mr Cullmann spoke about the necessity of being more coherent and creating a more synergized support mechanism for members, understanding their respective needs and capacities.

Mr Kremer spoke about the importance of country engagement and harmonized guidance. Lastly, he highlighted the importance of speaking about water quality with one voice, as United Nations.

# Workshop Day 2

## Coordinated operational support to UN Member States and WWQA – Part 1

*Moderator: Johannes Cullmann (Water & Cryosphere Director, WMO)*

Mr Cullmann started the discussion by announcing the two **main discussion points**:

1. What is the **added value** that we see from our standpoints if we extend our collaboration and if we agree on ways or mechanisms that help us work more easily together?
2. How do we **strengthen the outreach** and how do we foster synergies among our national focal points and the whole community?

**SUMMARY OF THE DISCUSSION ON THE ADDED VALUE**

**Johannes Cullmann (WMO):**

- For WMO, the added value would be in the communication with our members, where we usually encounter some shortcomings: first, we don't have all the right impact because we are not entirely sure if the people who deal with water quality are well connected with our communications channels. So, the first added value is the connectivity we could get if we create a better way of managing and systematizing our collaboration on water quality.
- Secondly, there are so many different publications already all around, so there is a plethora of different information that Members States can access. There should be a place where all this information is collected, and anyone could go and find what they are looking for: the added value would be having a "bookstore" and having someone advising people on what information they need to reach their purpose and have a better orientation.
- The third added value would be to "save money": sometimes different organizations and countries do the same things, and if we had a better planning, it would have been easier to spend less money and have a better final product.

**Jodie Miller (International Atomic Energy Agency)**:

- The added value of working collaboratively would be to get the language right (concerning the collection of metadata). There has been a lot of discussion on how the data is compiled, stored, and shared. Having this discussion on how different UN agencies talk about water quality is helpful to make sure that our language and terminology are compatible with other people's language and terminology, and data can be transferred across sections.

**Claudio Caponi (WMO):**

- The added value would be to have a coordinated set of regulatory and guidance material on water quality which is developed by different agencies from their perspective.

**Melchior Elsler (UNEP):**

- From UNEP's perspective, everything that has been said before resonates with us as added value. We are keen to explore how further collaboration can extend the database we have

as a monitoring program, and that is another aspect we would like to see reflected as a value proposition from our side that brings together different types of data on water quality.

**Kilian Christ (UNEP):**

- We need cooperation to draw on collective knowledge and expertise from different agencies, to avoid duplicating efforts.

**SUMMARY OF THE DISCUSSION ON JOINT MECHANISMS/PROCESSES/FOCAL POINTS**

**Melchior Elsler (UNEP):**

- We need to communicate with the Member States but at the same time get feedback from them. This is where we learn how different agencies operate and interact, who collects data and through which mechanisms. This is one of the first steps to understanding how we can synergize our processes. From a UNEP perspective, it would be very keen to map our SDG 6.3.2 focal points/national focal points.

**Jodie Miller (International Atomic Energy Agency)**:

- We work in the department of nuclear science and applications, the one where all the peaceful use initiatives sit (food, agriculture, health science, water science etc.). We run projects in two ways: (1) We have a budget for coordinated research projects, and we get the topics we develop based on discussions with Member States, other agencies, and counterparts; (2) The technical cooperation department funds all the projects with member states, projects that run with the National Liaison Officer (NLO), which is normally based at the nuclear regulatory authority. We will work with two nominated counterparts: one is normally based at a government agency and the other one at a research institution. These two are nominated via the NLO.

**Yulya Vystavna (International Atomic Energy Agency):**

- National monitoring in our Member States is based on legislation. Understanding water quality is very different among countries. National monitoring networks operate in the framework of legislation, and terminology is a key point here. Water quality is very different between countries, not only in terms of parameters and indicators, but also in terms of understanding pollutants. Is there some kind of harmonization in this terminology in the UN System? It is important to cover this aspect for monitoring on the ground.

**Johannes Cullmann (WMO):**

- Having a list of focal points and partners in the countries would be very useful. Legislation's information resources would also be helpful. In addition, we could need some way of transparently communicating the major strategic or member decisions prepared in different communities, to be better informed and have outside views.

**Bruce Gordon (WHO)**:

- It would be useful to see some prioritization of what we should work on, to avoid having too much on the table.

**Sarantuyaa Zandaryaa (UNESCO):**

- I agree with what Bruce and Johannes said. Being in different organizations with different mandates, budgets, planning and processes it would be difficult to have joint planning, unless we develop a joint project. Secondly, if that were possible, what kind of mechanism would that be in terms of funding? Regarding the national focal points, UNESCO IHP has IHP National Committees of Focal Points in about 170 countries. The list and contact details of IHP National Committees are available on the UNESCO website and anyone can access this information to see who the chairperson of each of these IHP National Committees is. In fact, IHP National Committees in some countries are the same institutions serving also as Focal Points for WMO Hydrology, whereas in other countries the focal points for different UN organizations may be different. So, coordination and information sharing between national focal points for different UN organizations must also be carried out at the national level, in addition to coordination among UN organizations. On water quality at the national level, UNESCO can support capacity building and knowledge sharing. Regarding coordination among different agencies, the UN-Water Expert Group on Water Quality and Wastewater (EGWQW) has the objective of ensuring coordination among UN agencies in the area of water quality. Does it still exist? If so, what are its activities? Instead of inventing a new coordination mechanism, perhaps we should use the existing one.

**Melchior Elsler (UNEP):**

- Hartwig is the chair of the UN-Water EGWQW. There has been a suggestion by UN-Water about transferring some of the functions of the UN-Water EGWQW to the WWQA moving forward but that would require further discussions among all partners involved.

**Johannes Cullmann (WMO):**

- Regarding the partnership, we could prepare a table where you could write what partners you are working with, what your needs or expectations are, and what your approach to partnering with people in the countries is.

## Coordinated operational support to UN Member States and WWQA – Part 2

*Moderators: Kilian Christ (UNEP) & Melchior Elsler (UNEP)*

Kilian Christ started the second moderated discussion by highlighting the key objective of this session which is to identify a suitable and sustainable coordination mechanism between the different agencies to take the agreed activities forward. Nina Raasakka (UNEP) was invited to provide some background on the workstream structures under the WWQA as background for a possible consideration to establish a separate workstream or working group under the WWQA to coordinate the work of the agencies on water quality. Melchior Elsler highlighted the need to establish a sustainable structure that can provide the coordination of the activities. Feedback was invited on the idea of utilizing the UN-Water EGWQW for this as well as considering linking the EG with the WWQA in future, pending further discussion with the members as well as UN-Water.

**Sarantuyaa Zandaryaa (UNESCO):**

- In order to have such discussions about the EGWQW it would be important to have all UN-Water members and partners of the EGWQW present in the room to not exclude any opinion of partners. Therefore, we shouldn't make any decisions without all relevant stakeholders.

**Kate Medlicott (WHO):**

- The EGWQW should become the body to lead/coordinate the implementation of any activity that comes out of these discussions and will populate a joined workplan. Furthermore, it is important to note that the approach of linking it to the WWQA would need to be well prepared and presented as it is a somewhat unusual approach for UN-Water and needs some careful consideration and discussion with UN-Water beforehand.

**Melchior Elsler (UNEP):**

- The idea of linking the EGWQW with the WWQA was in fact a suggestion from UN-Water itself to UNEP in an earlier discussion. It hasn't been picked up specifically since, but the idea is not entirely novel and wouldn't be an ambush on UN-Water by us.

**Johannes Cullmann (WMO):**

- The goal is to focus on activities that are needed in countries and regions without enforcing any joint planning.
- He also highlighted the importance and benefits of joint messaging to make water quality visible on the global agenda.
- We should focus our activities on a few areas e.g., capacity development, regional information and activity hubs to target our interventions.

**Nina Raasakka (UNEP):**

- There was an initial suggestion to establish a workstream/working group under the WWQA but in light of the discussions around the EGWQW it makes more sense to revisit the EG and discuss with the members of the EGWQW as well as UN-Water on the best way forward and define the role the WWQA can play to support this EG and vice versa.
- It was agreed that the overlapping of the WWQA and the Expert Group created some unusual precedent by having a wider membership than the UN-Water Members and Partners however this can be resolved in a dialogue with UN-Water.

**Stuart Warner (UNEP):**

- We should use the SDG Framework to frame our overall work on water quality as it provides a globally agreed framework and agenda. Target 6.3 is all about water quality and provides a good guideline on what needs to be done and an understanding of what limitations countries face.

**Kate Medlicott (WHO):**

- A potential way to harmonize the work of various agencies, for example on different types of water quality guidelines (drinking water, bathing water, ecosystems) was to in future ensure

cross-referencing between different guidelines and highlight the need be aware of their respective framing.
- When revitalizing the Expert Group, the participation of important UN actors in the field of water, such as FAO, should be ensured.

**Sarantuyaa Zandaryaa (UNESCO):**

- If the UN-Water Expert Group on Water Quality is not active, in order to revive it, UNESCO-IHP offers to lead the EGWQW together with WHO, or alternatively co-lead with UNEP, if UNEP wants to continue with it. In any case, this is a good opportunity to make use of the Expert Group.

**Johannes Cullmann (WMO):**

- The idea of coordinated operational support is really to see how we can harmonize our joint activities better to serve the Member States in a more coherent manner. Example: Merge GEMS/Water and HydroSOS and other water quality case studies from UNESCO into one source for Member States to have consolidated entry point for information. Then use WWQA experts to modify and tailor for countries and involve other partners for policy recommendations.

**Bruce Gordon (WHO):**

- We should select some thematic focus areas. Water Quality is too broad of a topic to capture all of it. We might want to come up with a list of themes identified by the various partners of which we then prioritize a few to focus on initially.

**Yulya Vystavna (International Atomic Energy Agency):**

- At this point many countries don't even have water laws and standards/guidelines including on water quality this might be an area to look into. Probably some of the activities that we do can support those countries to adapt or develop water laws and particularly on water quality matters.

**Sarantuyaa Zandaryaa (UNESCO):**

- IWA has produced a compendium on existing national guidelines available from here: https://www.unwater.org/publications/compendium-water-quality-regulatory-frameworks-water-use/

## Coordinated operational support to UN Member States and WWQA – Part 3

*Moderator: Kate Medlicott (WHO)*

Kate Medlicott started the discussion by stating its purpose, namely, to identify the steps to develop a joint workplan, the targets to achieve, the resources needed etc.

The discussion mainly focused on the table of proposed actions available on page 12.

**Johannes Cullmann (WMO):**

- We need to find an easy way to reach everybody who needs to be informed/included in activities through agreed mechanisms.
- We need joint resources to engage with partners and Members.
- We need to ensure that Members always have access to appropriate resources and are supported at all times.

**Kate Medlicott (WHO):**

- We want to be able to provide clearer guidance to Member States.

**Jodie Miller (International Atomic Energy Agency)**:

- We need to provide a reference metric: creating a technical document stating which UN Agency has the guidelines/documents for a certain topic.

**Bruce Gordon (WHO):**

- It would be potentially useful to have an overview of every document that exists. The fact is that, when there is an issue, this can fall under different UN Agencies' mandates. What are the areas that might be addressed in multiple guidelines?

**Stuart Warner (UNEP):**

- We should support Members to do the basics.

**Nina Raasakka (UNEP):**

- We need prioritization, we need to clarify our respective roles and understand how we merge or delineate between the WWQA and the UN-Water EGWQW.

## Proposed series of workshops in 2022-2023: Ideas and Prioritization

*Moderator: Nina Raasakka (UNEP)*

Nina Raasakka started the final moderated discussion of the day to gather ideas and points regarding the proposed series of workshops in 2022-2023, with the aim to help identify and agree on at least 5 workshops out of an initial long-list of proposed workshops and corresponding proposed lead agencies that had been presented in the WWQA 3rd Annual General Meeting held in January 2022.

She resumed that the proposed series of workshops running through the remainder of 2022 and into 2023 aims to address the broad spectrum of water quality monitoring, including modelling, earth observation, citizen sciences etc., with the goal to foster development and operationalization of innovative solutions for water quality monitoring, improve data harmonization and interoperability, and arrive at a common road map for strengthened cooperation on water quality monitoring across the various institutions and data streams to enable a better global view on water quality and achievement of SDG 6.3.2. The full rationale of this is resumed in the Concept Note for the WMO-UNEP-UNESCO-WHO-OGC co-organized Workshop Series on Water Quality Monitoring.

The long-list of proposed workshops was presented as the following. Nina stressed that this was for now a proposal based on brainstorming and some initial discussions with proposed lead agencies hence including it for consultation at this workshop. Workshops could be arranged either virtually or in-person depending on the costs involved and where maximum cost efficiency could be found.

Many participants at the workshop expressed concern as to whether their organizations' name appearing in the long-list of proposals committed them to arrange a workshop. Nina assured this was not the case, rather emphasizing that this was a first long-list of which approximately 3 had so far been confirmed for go-ahead by lead agency, and we are seeking another 2-3 during this session to confirm their willingness to arrange such a workshop. WWQA can support workshops through identifying experts and partners and advertising them through its network but does not have the means to support workshops financially fully – for these co-contributions are required.

At the end of the session, the following workshops were identified to go ahead:

- ***Interoperability of EO and RS data*** to be led by the University of Stirling;
- ***Needs and requirements of Member States in the area of WQ monitoring*** to be led by WMO & UNEP (to take place in later half of 2022)
- ***Innovation in WQ monitoring*** to be led by UNEP & WMO (possibly with UNESCO – tbc) (to take place in 2023)
- ***WQ Interoperability Experiment*** to be led by WMO & OGC (to take place in 2023 end of the year)
- In addition, Jodie Miller (IAEA) stated that IAEA could host a workshop on their isotope modelling work.

Comments from audience included:

- Whether there is value in consolidating some of these workshops, to which the answer was that there certainly is and this will be reviewed together with the proposed lead agencies.
- Whether there is a workshop missing on the basics of water monitoring under SDG 6.3.2 - Stuart Warner, UNEP consultant, replied emphasizing that this calls for a larger capacity-building programme that is currently running in partnership between UNEP GEMS/Water and WWQA and the University College Cork and its Capacity Development Centre.

## Table of proposed actions

| **Coordinated operational support to UN Members & WWQA** | | | |
|---|---|---|---|
| Action item | Desired outcomes | Lead | Remarks |
| Call for the meeting of the UN-Water EGWQW to present the outcomes of the Workshop | - | UNEP | • ToRs of the UN-Water EGWQW |
| Joint document on WQ partners (with focal points) and communication | • Easy way to reach stakeholders needed to be informed about relevant activities<br>• Joint resource to engaging with partners and Members | UN-Water EGWQW + WWQA | • Needs and expectations of each organization to be highlighted |

| Coordinated operational support to UN Members & WWQA | | | |
|---|---|---|---|
| Action item | Desired outcomes | Lead | Remarks |
| processes/mechanisms of each organization | • Understand who does what<br>• Understand where for Members to start – "basics" to "advanced" | | |
| Proposal to develop a joint portal for guidance material and publications on WQ (with mapping of the material) | • Ensuring that Members have access to appropriate resources and are supported at all times | UN-Water TAU | |
| WQ national legislation mapping | • Strengthen national environmental regulations/legislations in operational water quality monitoring<br>• Analysis of national needs and Member States capacities in operational water quality monitoring<br>• Promotion and facilitations of the operational water quality monitoring in Member States through the regulation framework | UN-Water EGWQW + WWQA + Consultants + IAEA | • Legislation highlights by Yulya Vystavna (IAEA)<br>• Compendium of Water Quality Regulatory Frameworks: Which Water for Which Use? |
| Compilation of existing guidance/technical products & Identifying priority areas for harmonization of guidance/technical products | • Provide clearer guidance to Members so that they are not unsure what guidance to consult<br>• Evaluation of how many technical documents exist<br>• Capacitating Members with the basics | UN-Water EGWQW + Consultants | |

## Closing

In delivering his closing remarks, Mr Cullmann spoke about the responsibility we have as UN system to be efficient, effective, and responsible while responding to difficult situations, even though we might encounter many constraints while trying to cooperate in a more transparent way.

# WMO-UNEP-UNESCO-WHO-OGC co-organized Workshop Series on Water Quality Monitoring hosted under the banner of the World Water Quality Alliance (WWQA)

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## Opening Workshop

29, 30 & 31 March 2022

Workshop Report (Day 3)

April 2022

# Table of Contents

**Workshop Day 3: Water Quality Data Interoperability Experiment** ..... 3

Opening ..... 3

Introduction ..... 3

Water quality data in practice ..... 3

WHOS & Discovery and Access Broker (DAB) technology ..... 3

Interoperability and interconnection of the existing Water Quality Data Systems ..... 4

Water quality Ontology and WaterML-WQ ..... 8

Identifying how to support the WaterML development in the domain of Water Quality ..... 8

Water Quality Data Interoperability Experiment ..... 11

Defining the Roadmap for the Interoperability Experiment of water quality data with pilot use cases ..... 11

Way forward for the Roadmap ..... 12

Closing ..... 12

# Workshop Day 3: Water Quality Data Interoperability Experiment

## Opening

Tony Boston (Chair of the OGC-WMO Hydrology Domain Working Group) opened the third day of the workshop by delivering his welcoming remarks. He highlighted the fact that the OGC-WMO Hydrology Domain Working Group (HDWG) would like to identify how to further develop the WaterML2 suite of standards with the goal of endorsing a new international standard for water quality data exchange. Further, he introduced the main topic of the day, the Water Quality Interoperability Experiment, and highlighted the need to create a roadmap for it.

## Introduction

Silvano Pecora (Vice-President of the WMO Infrastructure Commission) introduced the workshop by giving a presentation on "Water quality is known", which is one of the eight long-term ambitions that guide WMO activities related to water. Mr Pecora further spoke about the work of the OGC-WMO HDWG, and the development and adoption of the WaterML2.0 standards.

The presentation is available here.

## Water quality data in practice

- Philipp Saile (UNEP GEMS/Water Data Centre) started this session by giving a presentation on water quality data in practice, focusing on the work of UNEP GEMS/Water and its water quality information system. The presentation is available here.

- Dwane Young (U.S. Environmental Protection Agency) gave a presentation on the U.S. Water Quality data monitoring and sharing, Water Quality Exchange approach and Water Quality Portal. The presentation is available here.

- Sylvain Grellet (BRGM) gave an overview of Water Quality Data Exchange in France and in Europe, focusing on the French Water Information System, its structure, purpose, and projects. The presentation is available here.

## WHOS & Discovery and Access Broker (DAB) technology

- Igor Chernov (WMO HydroHub) opened this session with a presentation on the WMO Hydrological Observing System (WHOS) and its brokering and standardization approaches, highlighting the importance of data interoperability. The presentation is available here.

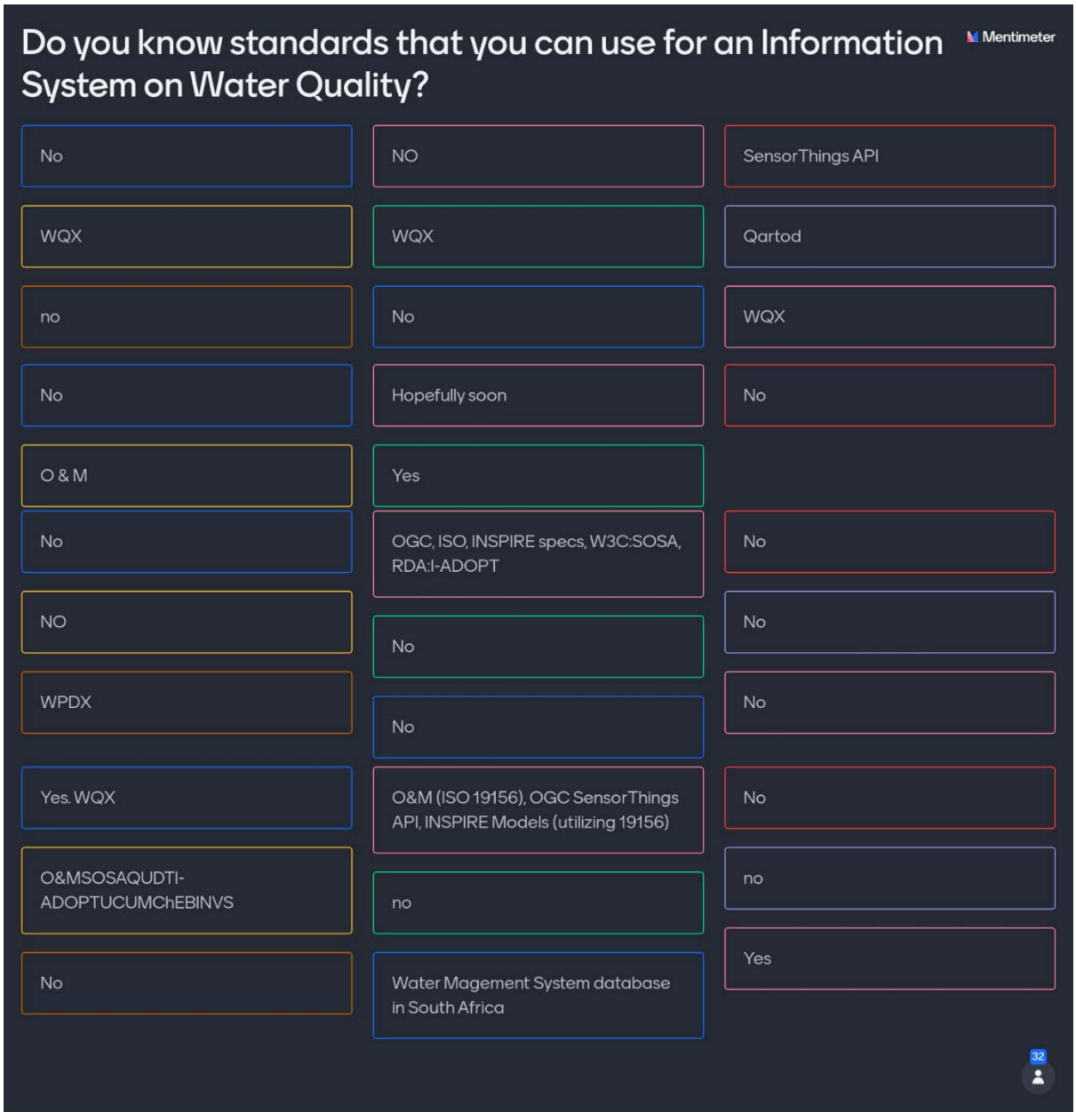
- Enrico Boldrini (National Research Council of Italy) gave a presentation on the Discovery and Access Broker (DAB) technology, explaining how the DAB brokering framework works and what are the benefits of the brokering approach. The presentation is available here.

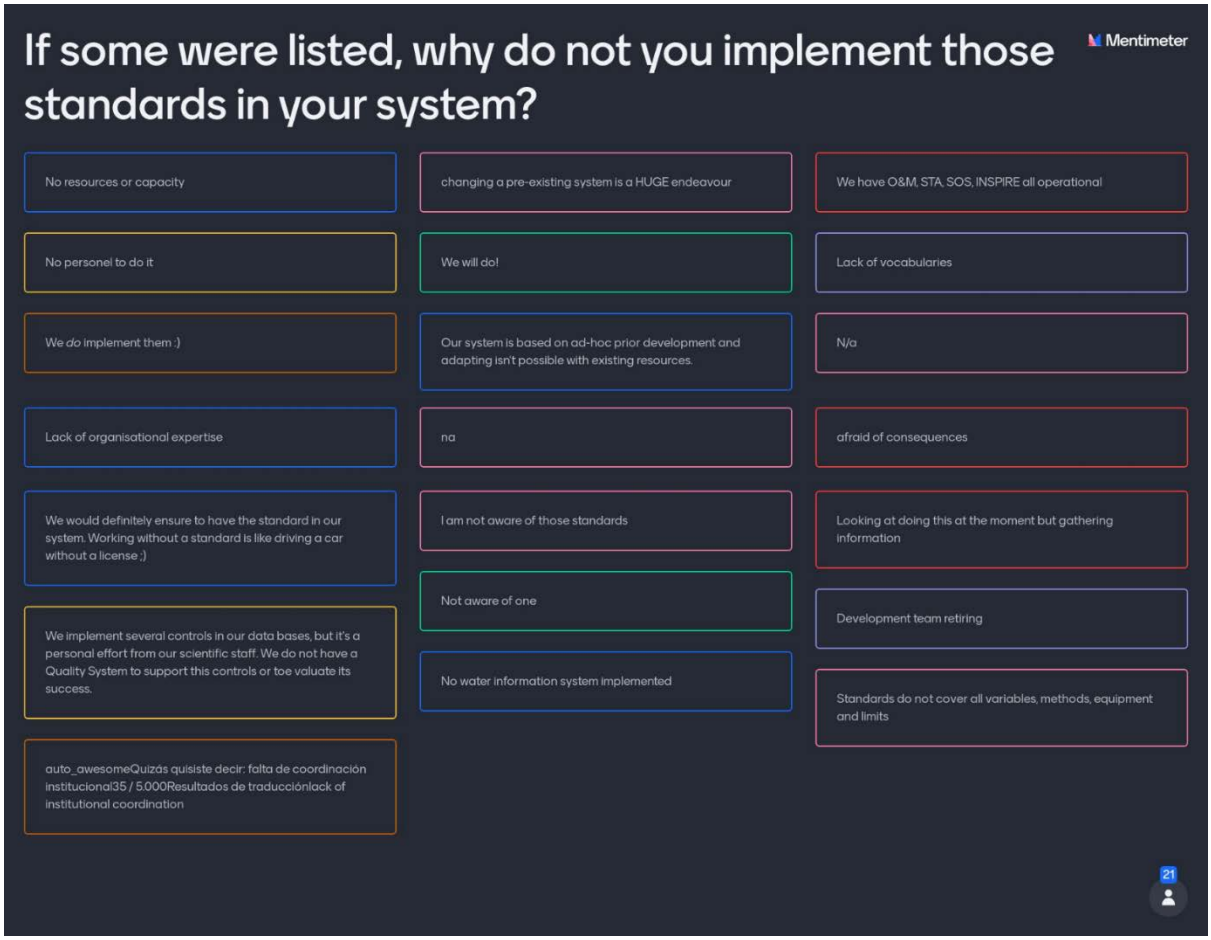
## Interoperability and interconnection of the existing Water Quality Data Systems

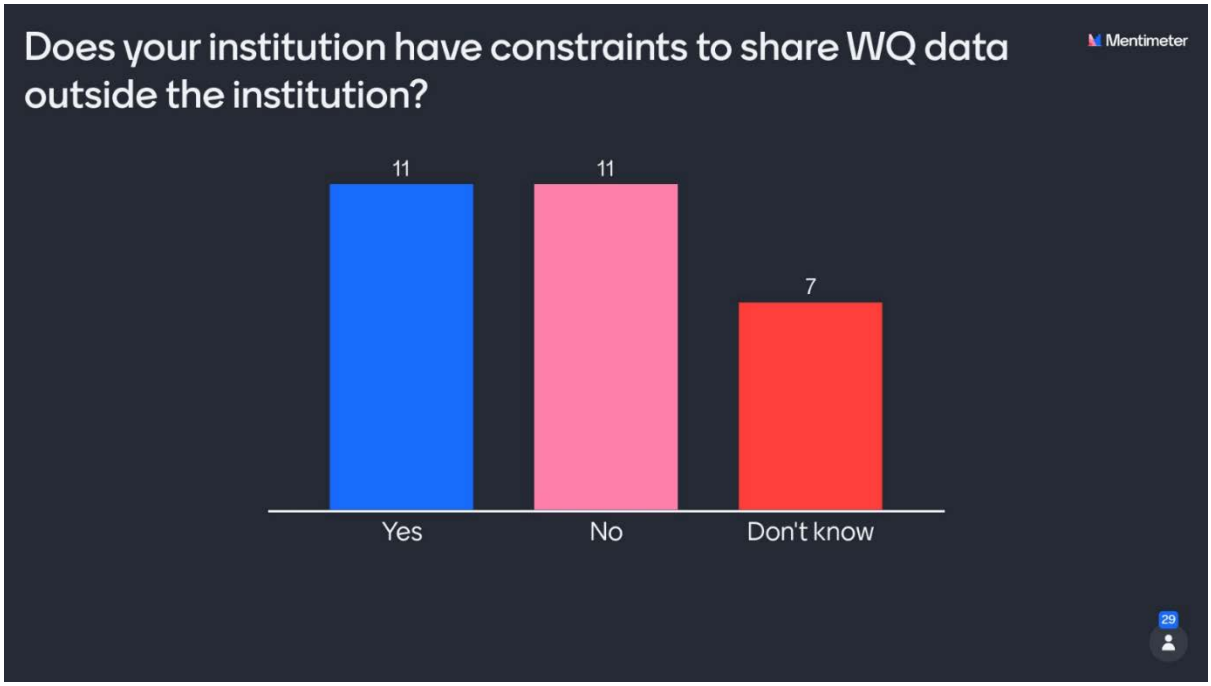
Mr Grellet started the discussion by giving a presentation on Interoperability and interconnection of the existing Water Quality Data Systems. The presentation is available here.

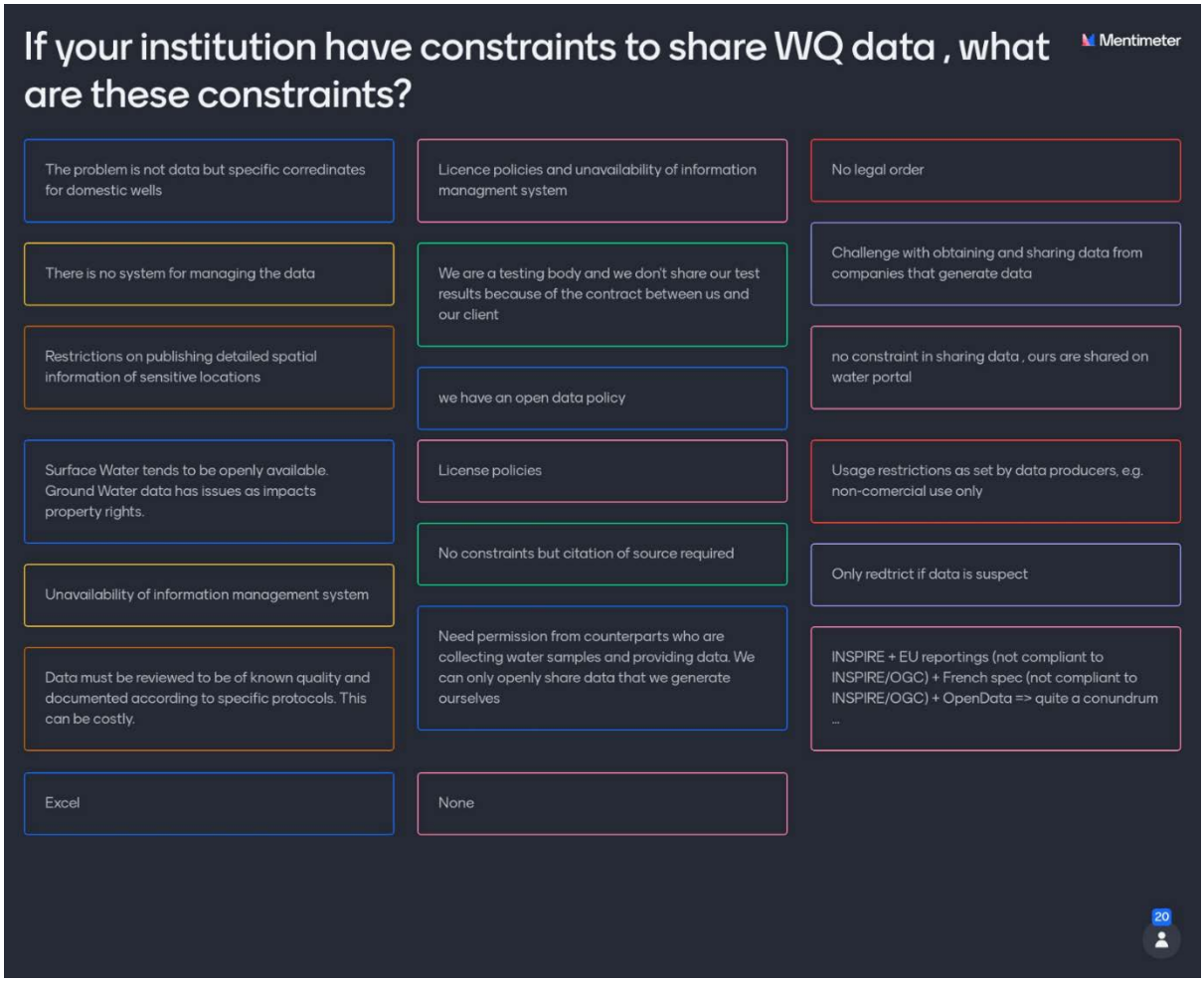
After his presentation, Mr Grellet moderated a discussion which included interactive questions and polls carried out through the Mentimeter tool.

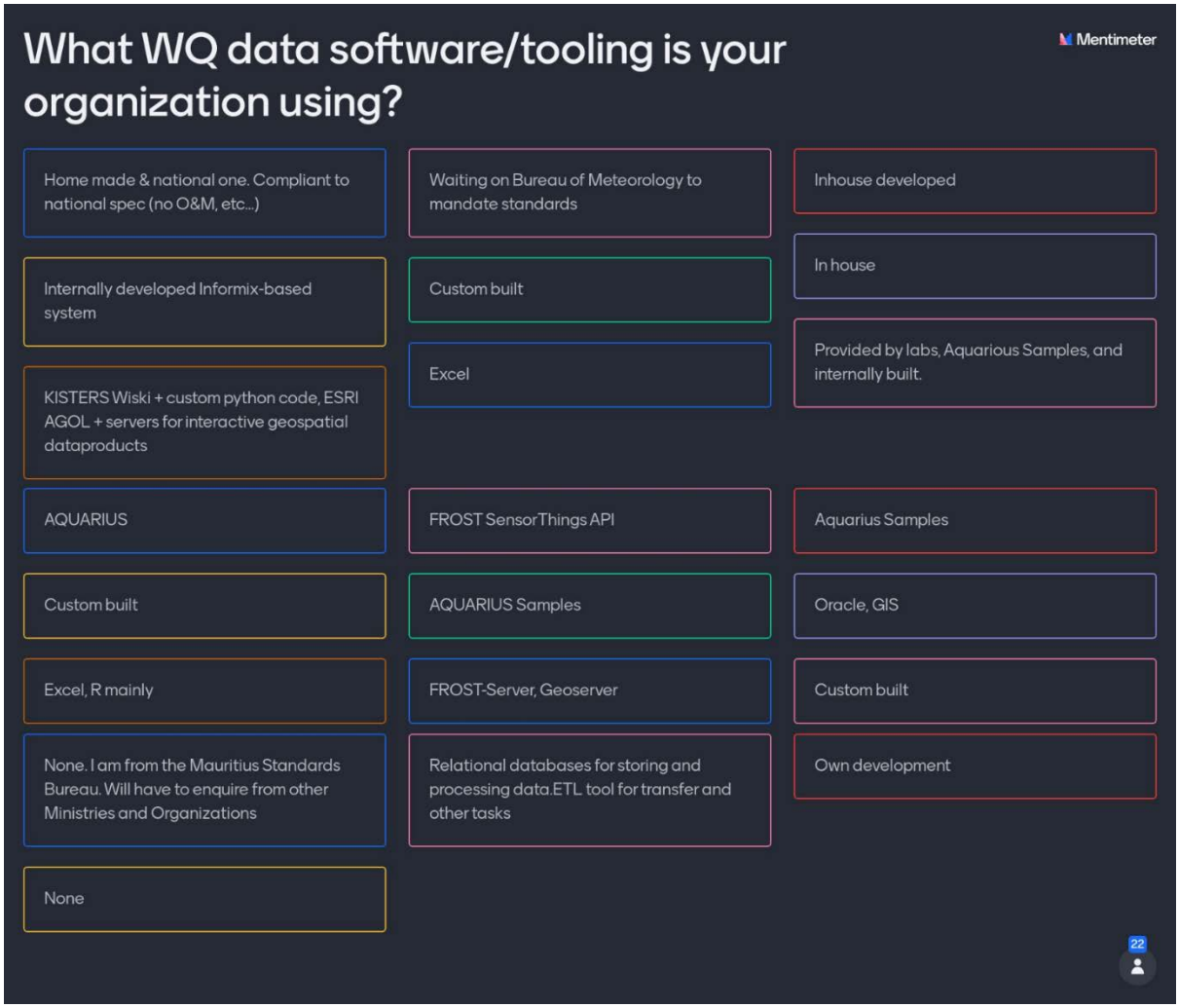
The figures below show the responses of workshop participants.

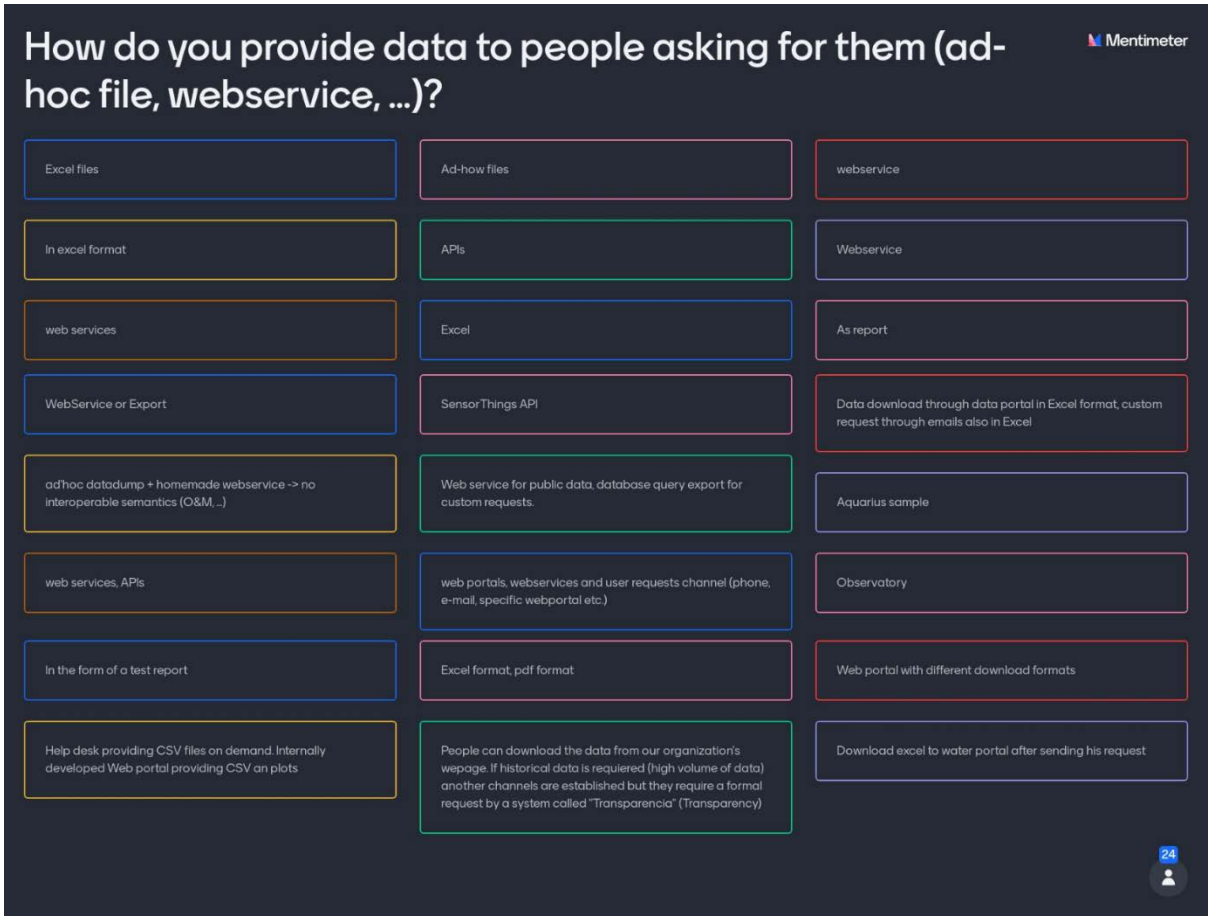



If some were listed, why do not you implement those standards in your system?
Mentimeter
No resources or capacity
changing a pre-existing system is a HUGE endeavour
We have O&M, STA, SOS, INSPIRE all operational
No personel to do it
We will do!
Lack of vocabularies
We do implement them :)
Our system is based on ad-hoc prior development and adapting isn't possible with existing resources.
N/a
Lack of organisational expertise
na
afraid of consequences
We would definitely ensure to have the standard in our system. Working without a standard is like driving a car without a license ;)
I am not aware of those standards
Looking at doing this at the moment but gathering information
Not aware of one
Development team retiring
We implement several controls in our data bases, but it's a personal effort from our scientific staff. We do not have a Quality System to support this controls or toe valuate its success.
No water information system implemented
Standards do not cover all variables, methods, equipment and limits
auto_awesomeQuizás quisiste decir: falta de coordinación institucional35 / 5.000Resultados de traducciónlack of institutional coordination
21


Does your institution have constraints to share WQ data outside the institution?
Mentimeter
11
11
7
Yes
No
Don't know
29


If your institution have constraints to share WQ data , what are these constraints?
Mentimeter
The problem is not data but specific corredinates for domestic wells
There is no system for managing the data
Restrictions on publishing detailed spatial information of sensitive locations
Surface Water tends to be openly available. Ground Water data has issues as impacts property rights.
Unavailability of information management system
Data must be reviewed to be of known quality and documented according to specific protocols. This can be costly.
Excel
Licence policies and unavailability of information managment system
We are a testing body and we don't share our test results because of the contract between us and our client
we have an open data policy
License policies
No constraints but citation of source required
Need permission from counterparts who are collecting water samples and providing data. We can only openly share data that we generate ourselves
None
No legal order
Challenge with obtaining and sharing data from companies that generate data
no constraint in sharing data , ours are shared on water portal
Usage restrictions as set by data producers, e.g. non-comercial use only
Only redtrict if data is suspect
INSPIRE + EU reportings (not compliant to INSPIRE/OGC) + French spec (not compliant to INSPIRE/OGC) + OpenData => quite a conundrum ...
20


What WQ data software/tooling is your organization using?
Mentimeter
Home made & national one. Compliant to national spec (no O&M, etc...)
Waiting on Bureau of Meteorology to mandate standards
Inhouse developed
Internally developed Informix-based system
Custom built
In house
Excel
Provided by labs, Aquarious Samples, and internally built.
KISTERS Wiski + custom python code, ESRI AGOL + servers for interactive geospatial dataproducts
AQUARIUS
FROST SensorThings API
Aquarius Samples
Custom built
AQUARIUS Samples
Oracle, GIS
Excel, R mainly
FROST-Server, Geoserver
Custom built
None. I am from the Mauritius Standards Bureau. Will have to enquire from other Ministries and Organizations
Relational databases for storing and processing data.ETL tool for transfer and other tasks
Own development
None
22




## Water quality Ontology and WaterML-WQ

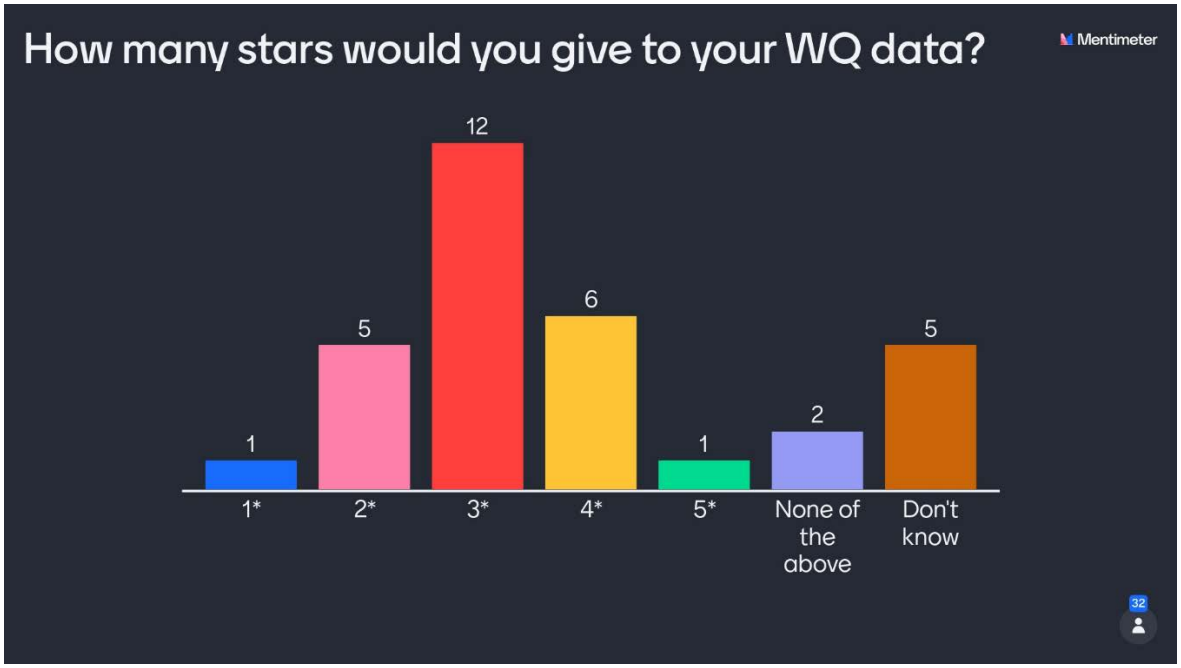
In this session, Simon Cox (CSIRO Land and Water) gave a presentation on Water Quality information models, focusing on the OGC standards and the Observable Property Vocabulary.

The presentation is available here.

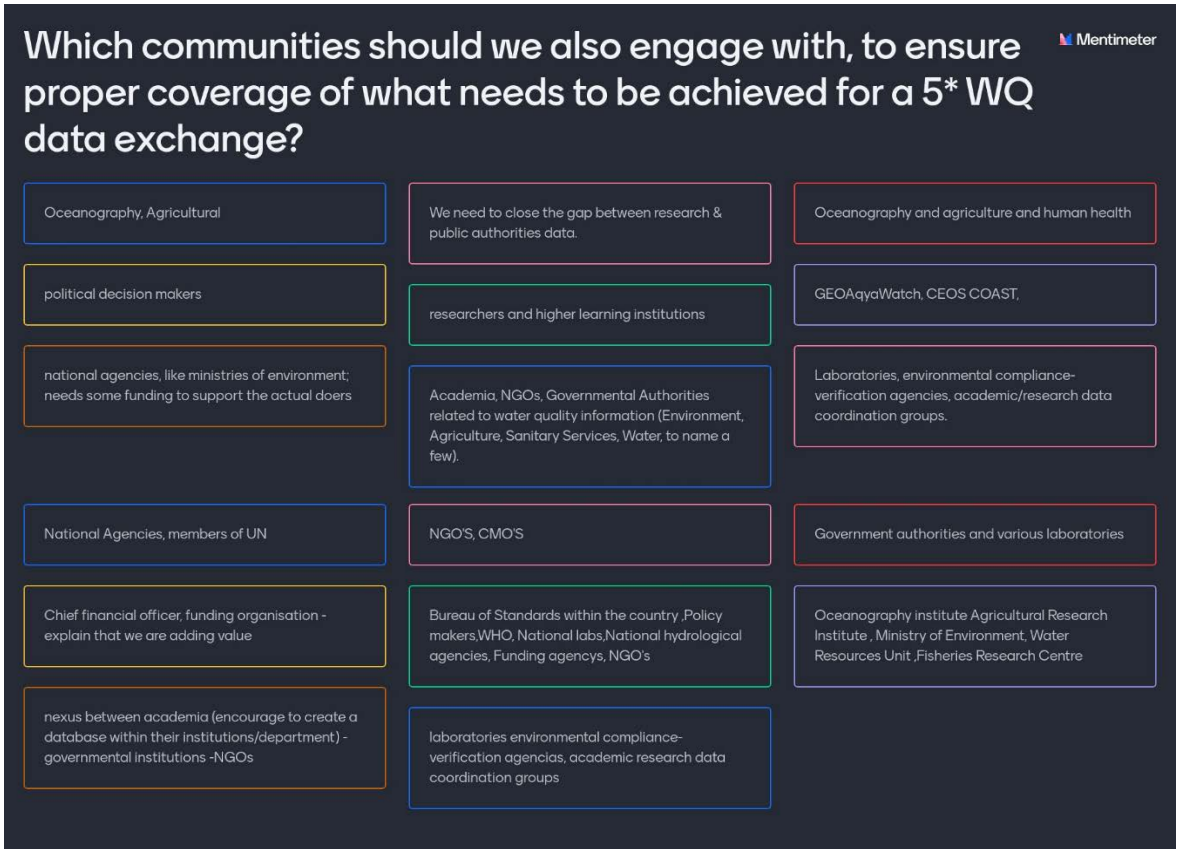
## Identifying how to support the WaterML development in the domain of Water Quality

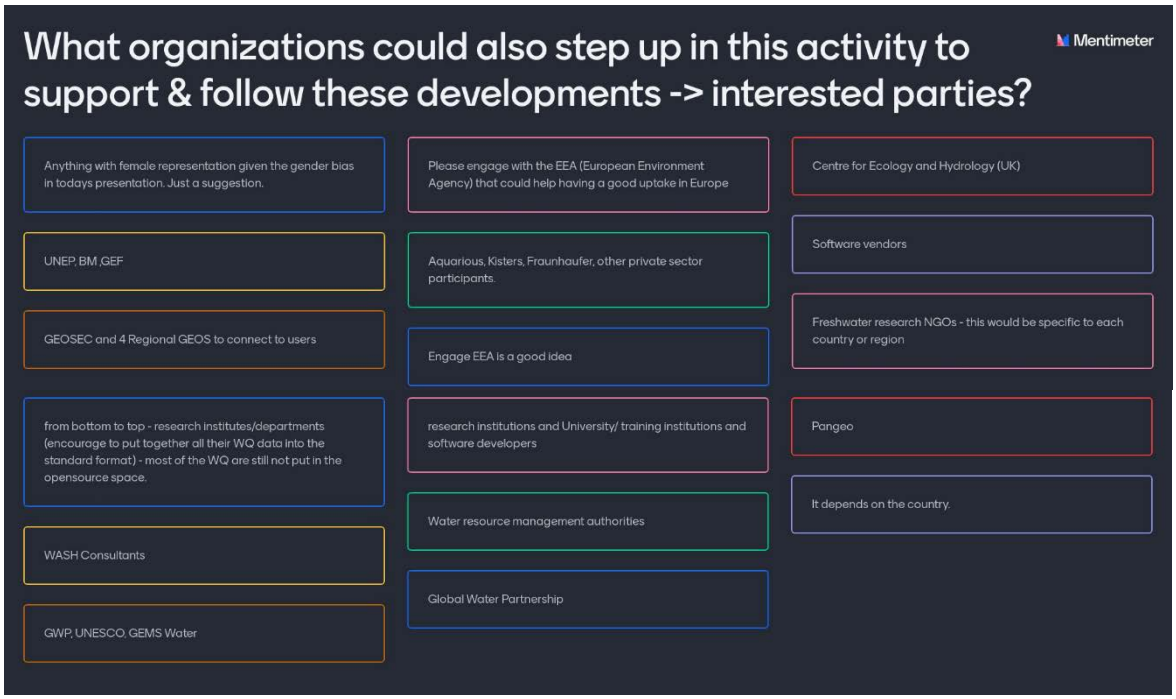
The discussion was moderated by Mr Saile, who gave a presentation on how to support further development of interoperable water quality data in the context of WaterML2 suite of standards and the 5 Star Deployment Scheme for Open Data. The presentation is available here.

The figures below show the responses of workshop participants to interactive questions and polls carried out through the Mentimeter tool in this Moderated Discussion.


How many stars would you give to your WQ data?
Mentimeter
12
6
5
5
2
1
1
1*
2*
3*
4*
5*
None of the above
Don't know
32

What do you expect from the WQ standard community to upgrade your WQ data?
Mentimeter
An open community
5.5
Training
6.4
Guidance material
6.1
Workshops
4.8
Tools
6.1
Coordination
5.8
Endorsing standards
5.6
Other
0.5
34


Which communities should we also engage with, to ensure proper coverage of what needs to be achieved for a 5* WQ data exchange?
Mentimeter
Oceanography, Agricultural
We need to close the gap between research & public authorities data.
Oceanography and agriculture and human health
political decision makers
researchers and higher learning institutions
GEOAqyaWatch, CEOS COAST,
national agencies, like ministries of environment; needs some funding to support the actual doers
Academia, NGOs, Governmental Authorities related to water quality information (Environment, Agriculture, Sanitary Services, Water, to name a few).
Laboratories, environmental compliance-verification agencies, academic/research data coordination groups.
National Agencies, members of UN
NGO'S, CMO'S
Government authorities and various laboratories
Chief financial officer, funding organisation - explain that we are adding value
Bureau of Standards within the country ,Policy makers,WHO, National labs,National hydrological agencies, Funding agencys, NGO's
Oceanography institute Agricultural Research Institute , Ministry of Environment, Water Resources Unit ,Fisheries Research Centre
nexus between academia (encourage to create a database within their institutions/department) - governmental institutions -NGOs
laboratories environmental compliance-verification agencias, academic research data coordination groups


What organizations could also step up in this activity to support & follow these developments -> interested parties?
Mentimeter
Anything with female representation given the gender bias in todays presentation. Just a suggestion.
Please engage with the EEA (European Environment Agency) that could help having a good uptake in Europe
Centre for Ecology and Hydrology (UK)
UNEP, BM ,GEF
Aquarious, Kisters, Fraunhaufer, other private sector participants.
Software vendors
GEOSEC and 4 Regional GEOS to connect to users
Engage EEA is a good idea
Freshwater research NGOs - this would be specific to each country or region
from bottom to top - research institutes/departments (encourage to put together all their WQ data into the standard format) - most of the WQ are still not put in the opensource space.
research institutions and University/ training institutions and software developers
Pangeo
Water resource management authorities
It depends on the country.
WASH Consultants
Global Water Partnership
GWP, UNESCO, GEMS Water

## Water Quality Data Interoperability Experiment

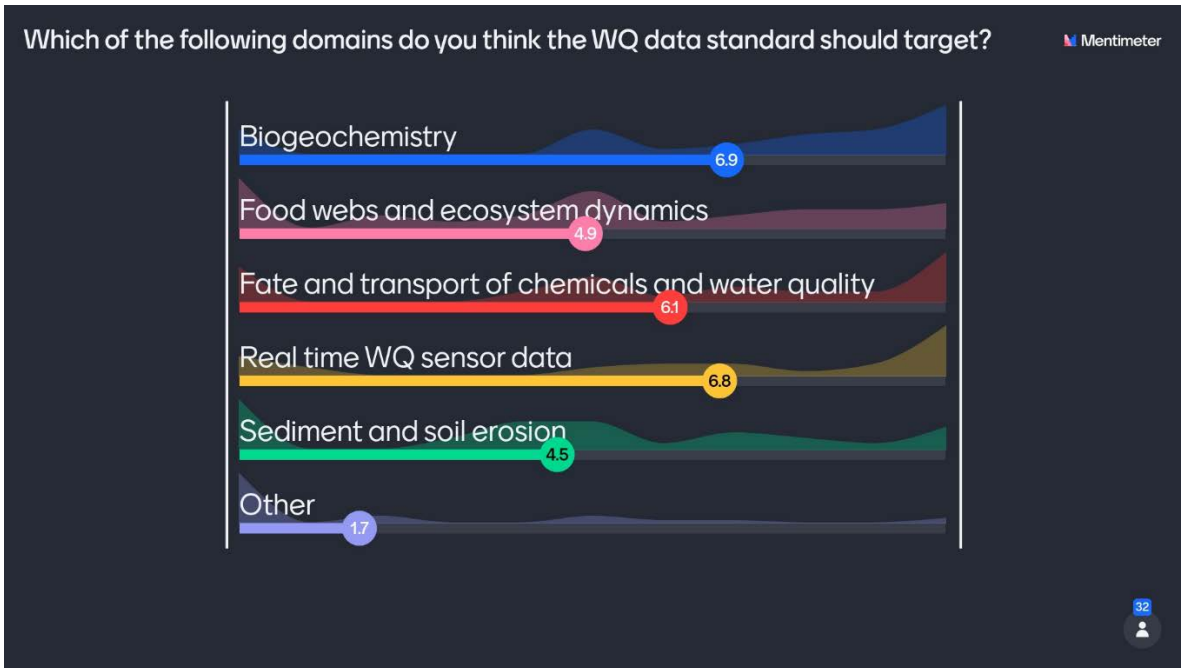
In this session, Mr Grellet introduced the Water Quality Data Interoperability Experiment, one of the OGC innovation initiatives. Mr Grellet explained what an OGC Interoperability Experiment (IE) is, and he gave an overview of the 2022 Water Quality IE.

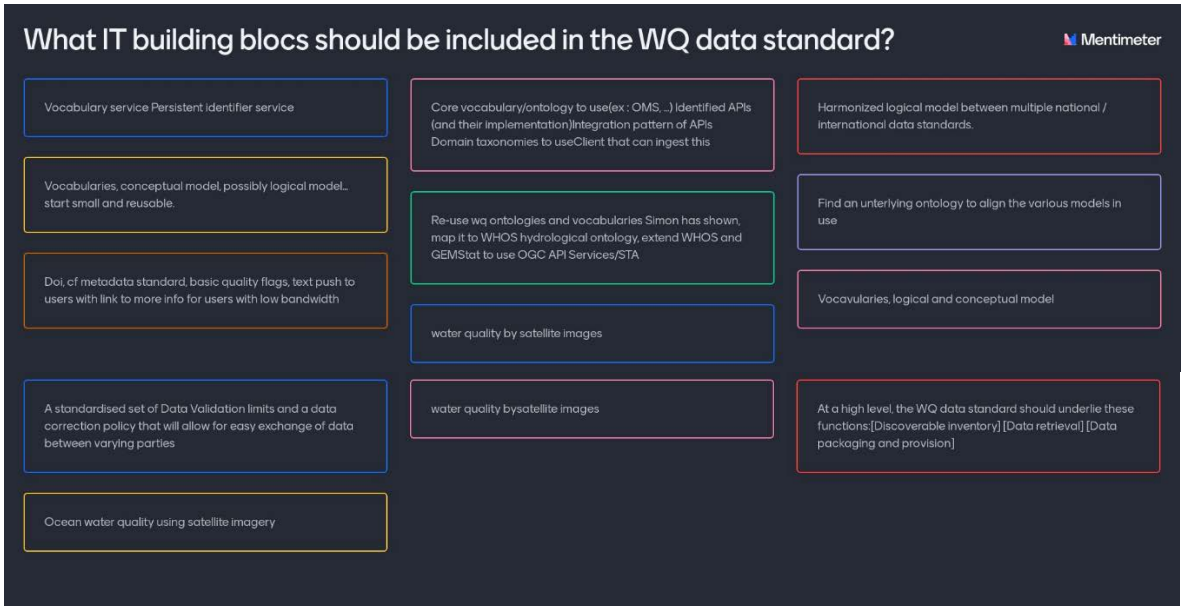
The presentation is available here.

## Defining the Roadmap for the Interoperability Experiment of water quality data with pilot use cases

The discussion was moderated by David Blodgett (U.S. Geological Survey), who gave a presentation on defining a roadmap for the Water Quality Interoperability Experiment (WQ IE). The presentation is available here.

The figures below show the responses of workshop participants to interactive questions and polls carried out through the Mentimeter tool in this Moderated Discussion.






## Way forward for the Roadmap

Mr Blodgett and Mr Grellet led the last session of the workshop, focusing on what are the next steps to take regarding the WQ IE.

## Closing

Mr Cullmann concluded the Workshop by delivering his closing remarks and providing a recap of all three days of the Opening Workshop.