**OCG 15 Session 19: Advancing OCG networks perspective**

**Short background paper to aid discussion**

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*Session Aims:* Evolving our view of OCG networks & c*onsider the future of OCG networks and OCG.*

The Framework for Ocean Observing[[1]](#footnote-0) defines an observing element as ‘any ocean sensing system – based on a specific platform, region, or ocean characteristic – that is driven by agreed requirements, has broad scientific support and adheres to global, common standards for data sharing’.

In practice OCG have used the word network for our observing ‘elements’ and use the OCG Attributes to define what we mean by an OCG network. However the landscape is evolving, BioEco observing communities, commercial networks, non-global networks, network metrics, ‘emerging’ networks. etc. It is time to consider the OCG networks and ensure we all have a consistent vision, that to the greatest extent possible functions across GOOS, to guide the choices that OCG will make in the coming years.

In the observing community network is a broad term, from OA network, to OCG network, to coastal networks, MBON, Arctic MBON, Arctic US Observing Network, etc., see [briefing](https://docs.google.com/document/d/1zyAuY7LBwR9UpiTG1H8cxy8gsnMkOt5U/edit?usp=sharing&ouid=100604834984441011299&rtpof=true&sd=true) developed by Maria Hood for examples.

Although OCG has defined what it means by OCG network, through the attributes, there are many varying understandings of what an observing network might be and encompass.

**Example 1: OCG Networks and & BioEco Networks**

*As closer links are forged with the BioEco Panel, what is the nature of BioEco vs platform based networks, does this impact how we look at interoperability. BioEco networks are EOV based, OCG are primarily platform based. Is the idea of what a network is different between the OCG and BioEco Panel. In a more harmonized view possible. Can we communicate clearly the similarities and differences?*

The GOOS BioEco Panel has defined network attributes in a brochure entitled ‘The Global Ocean Observing System for Marine Life’ to describe the characteristics required of networks that contribute to a comprehensive observing system for biological EOVs.

The BioEco panel has adapted the OCG network attributes :

* A mission that addresses scientific questions relevant to national and regional science, policy and management needs
* Spatial scales that serve local and national needs but contribute (or aspire to contribute) to a global operational system, including regular reporting to support globally-relevant indicators
* Sustainability of surveys that produce information on trends over time and are intended to be repeated in the future
* Best practices that recognize globally-accepted standards from data collection to end-user delivery, is responsive to new technologies, standard operating procedures, data management and delivery
* FAIR and open access data standards
* Capacity development and technology transfer.

many common elements, however a few key differences exist:

* scale (global vs. local / national / regional networks with intent to develop into a global network)
* data requirements (EOV / ECV focus vs. user-defined data needs for science, policy, and management), and
* network missions and targets (Missions and targets focused on platform-based system development vs. missions and targets focused on meeting user data requirements).

An additional difference that the BioEco Panel has noted is that it sees its EOV elements as ‘communities’.

Developing harmonization across GOOS has many advantages;

* making GOOS less complicated and more understandable to funders and those wishing to contribute
* less complicated to develop cross GOOS metrics and tracking - see the system as a whole
* Cost savings across GOOS
* Data and metadata flow and standards

Looking at the differences, 2 recommendations are:

1. Create new definitions for the attributes that work for both OCG and BioEco Networks. The differences do not look insurmountable, for example, the data from many OCG networks has regional and national use too, and some BioEco measurements are perhaps more global than local - the aim is that the network aspires to be as global as possible - this is the commitment. The network's targets should already, and in many cases are, referenced to requirements from science, and increasingly users. This is again not a difference that should stand in the way of harmonization.
2. Given the broad definition of observing networks, GOOS could call OCG platform based and BioEco EOV based both observing networks

**Example 2: Thematic networks**

*OCG-15 we have a request from SOCONET to become an emerging ‘thematic’ network, based around observing surface carbon, using different platforms, how does this compare in function with the platform based networks, what are the responsibilities of SOCONET and what are the underlying platform based networks. Can we unify a view of networks across GOOS?*

As noted above, what it means to be an observing network differs across the ocean observing community, and network is a useful and common word to describe an interconnected group[[2]](#footnote-1). The understanding in the OCG Attributes of an OCG Network would not preclude observing networks based around EOvs or phenomena, as long as the network adhered to the other criteria, for example, aspired to be global and measured EOVs/ECvs etc.

Therefore OCG Networks can be thematic, what perhaps needs to be discussed is the relationship with platform based networks. If this is defined in some way the relationship between platforms and themes might be more clear.

Some generalized thoughts;

* Platform based networks are observing multiple phenomena, often via multiple EOVs. Their ‘constraints’ are associated with the nature of the platform, a lot of the best practices are associated with observing, calibrating, quality control and data processing associated with the platform. Often they do not create data products, but ensure that quality controlled EOV/ECV data flow into users systems.
* Thematic networks run across several (often limited) numbers of platforms. These can be in networks and ‘free floating’ added on. A major focus is on sampling protocols, and gathering the data to identify trends in the phenomena. Often products are an output.

There seems to be a different overall focus to the two and one might imagine a 2 tiered system - where platform based networks continue as is, but better collaborate with thematic networks - for example such that best practices and data flows are unified/inclusive. Thematic networks would be able to inform platform networks on coverage and requirements (in the round with other requirements), also undertake capacity development/recruit new members. Thematic networks would not need a specific data flow, but can harvest from existing GDCs (ERDDAP) and create the products required. Themed networks exist to deliver on a specific phenomena/EOV, they do not replace an integrated approach, but they bring focus to specific topics because of urgency, complexity of measurement (different proxies from different networks?), or reporting needs (OA).

Recommendation:

1. Develop idea of levels of networks in a system, with different responsibilities between platform and themed networks - can we identify different roles and responsibilities

This also gives OCG a pathway to interact with for example GOA-ON.

**It’s a numbers game - is there such a thing as too many networks?**

*Will OCG continue to add emerging networks, is there a limit? How can OCG support more networks with no additional resources? What about useful networks that do not make the grade to be global?*

What are we missing?

In both the OCG and the BioEco attributes the notion of intending to be global exists; OCG embedded in the attributes and the BioEco EOVs are global and attributes reference regional, national and global scales. However we often hear that the OCG networks miss many observations. So what is not connected? Networks that are just emerging, observing platforms that are not connected to networks or observing platforms that are not able to form part of networks? Others?

For just emerging networks: OCG has adopted emerging networks OceanGliders, AniBOS, HF Radar and now FVON and Smart Cables. So is this a functioning route for emerging platform base networks? Is the support sufficient? Perhaps a discussion with those networks that have been through the development process would help sharpen or improve the focus here if needed?

For observing platforms that are not connected to networks, e.g. Coastal buoys that are not in our buoy networks, some taking bioeco measurements, sustained smaller R/V observing lines, for example EU PERSEUS project tracked many in the Mediterranean and IGMETS (International Group for Marine Ecological Time Series). These do not fit into GO-SHIP and have many different reasons for the observations. There is also no sense of how they could coalesce into a network - as the drivers are different

For existing platforms (ships and buoys) that are sustained and responding to local/regional phenomena or needs - there could be different possible solutions. For example, in regional systems observing elements (ships/moorings), that at first sight look similar to existing networks, do not meet the criteria for that network, however the data flows to the appropriate designated national or regional data centers and observations are taken using practices evolved or adapted/adopted often from global networks. From any sustained observing element we want the data to flow, to have best practices, common metadata standards, and for the observations to meet requirements etc. Several possibilities exist: existing global networks could be broader in diversity, for example GO-SHIP has developed a level that encompasses more regional sustained monitoring but this still will not capture many smaller sustained RV operations, could IRSO or others help and stand up a network that covers other sustained monitoring? Could the GRAs help in working out the main drivers for those sustained R/V missions and buoys that are not is global networks, to see if groupings emerge (some have already e.g. IGMETS) and GOOS (OCG and GRAs) make the effort to help these groups define practices and data flows. Perhaps these remain connected to and a part of GRAs - a hybrid? If elements are regional, perhaps they could follow the OCG attributes and data/metadata flow etc and be attached to the relevant GRA?

For observing platforms that are not able to form part of networks: e.g. local or regionally sustained but not connected nor likely to become global - in Europe EMSO and EMBRICIs it the role of the OCG to evolve to support more dispersed networks? What are the limits? Do some networks remain at a GRA level (with advice from OCG- hybrid)?

*Will OCG continue to add emerging networks, is there a limit?*

At this OCG-15 we may have 14 Observing Networks, plus 3 new emerging networks. Is there a limit to the number of networks that OCG supports? How do we communicate and represent the increased diversity of networks in our communications, each has its role, are there natural groupings? We will need to think about how we represent our observing system and the logic to supporters, funders and partners.

The OCG will need to ask GOOS for support as the number of networks grows.

**Responsibilities of networks / responsibilities of GOOS**

As the number of networks increases there is an even greater need for cross network integration, especially in data and metadata flows, and for the responsibilities of networks to be clear. As OCG is successful in attracting networks then the need for support and a more operational approach also grows. A ‘system’ needs some rules and guidelines to its operation.

From the briefing paper:

The 9th Session of the GOOS Steering committee recognized that the observing system would have to expand to meet societal needs, but also stressed the importance of establishing criteria for GOOS networks to create a coherent global system:

*As GOOS transforms from a primarily science-driven implementation activity to one that grows to be more responsive to societal needs,* ***GOOS should ensure that it is not only soliciting voluntary contributions, but also driving standards and principles to be a part of GOOS***

* *The OCG and BioEco network attributes are an example of such principles, providing a pathway, and whose adherence is monitored in emerging networks. They could be driven to requirements rather than guidelines.*
* ***GOOS needs clear “standards of acceptance” for being “part of GOOS” as a network, project or a regional system. Move from having guidelines to having requirements.***
* *Best practice adds enormous value, improving the quality of local/national observing systems and building up to a global system, building capacity. It underpins the repeatability of assessment processes that inform policy.*

GOOS needs to evolve to be more user focused and operational (metrics/maturity and requirements sessions discuss).

From the GOOS Session during the Ocean Science Meeting in New Orleans this year, one of the comments GOOS received was that it should stress the operational nature of the system - observations flowing in real time for weather and hazard warnings. This brings in another element, that it is important as we seek to expand the observing system, that GOOS both meets societal needs and is seen as operational/investable.

OCG has the aim of increasing maturity - operational level of the networks? Should those networks that reach maturity have a specific status, should we be more specific about what ‘pilot’ and ‘mature’ means (metrics discussion). Is OCG and the networks ready to be more ‘strict’ about the responsibilities that come with being a mature network.

With more responsibility there should be more support. How do we highlight the needs that are holding back the maturing of networks, what are we missing? Data/metadata flow that is understood and tracked? more visibility of the meaning/status/tracking of the mature network? clear connection to international requirements? Communications that the networks can use? Accessibility/use of data? Recognition by the private sector as a market? Does OCG need to be vocal about its work?

See here for the[briefing](https://docs.google.com/document/d/1zyAuY7LBwR9UpiTG1H8cxy8gsnMkOt5U/edit?usp=sharing&ouid=100604834984441011299&rtpof=true&sd=true) developed by Maria Hood

1. *A Framework for Ocean Observing. By the Task Team for an Integrated Framework for Sustained*

*Ocean Observing, UNESCO 2012 (revised in 2017), IOC/INF-1284 rev.2, doi: 10.5270/OceanObs09-FOO* [↑](#footnote-ref-0)
2. Some definitions - word used to describe a group of interconnected entities, such as computers, devices, or people, that are able to communicate and share resources - an interconnected or interrelated chain, group, or system, and from 1839 any complex interlocking system (railways). [↑](#footnote-ref-1)