GOOS Network OCG-15 USV Global Network

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1. Highlight the key network successes

This year the USV network focussed on the development of the manuscript Patterson et al. 2025, *'Uncrewed Surface Vehicles in the Global Ocean Observing System: A new frontier for observing and monitoring the air-sea interface.'* The paper discusses how the USV Global Network is progressing towards the ten attributes of a Global Ocean Observing System (GOOS) network laid out by the Observations Coordination Group (OCG). Through this publication, we proposed our 'place' in GOOS, developed an understanding of our common network goals, proposed terms of reference, and set out goals for our data management priorities. Most importantly, our network was strengthened by the publication, and now we have a motivated group working collaboratively towards a common goal of working towards this USV Global Network being recognized as an emerging OCG network.

A group from the network also bidded for funding under the OAR Climate Program Office (CPO) Funding Opportunity Leveraging Uncrewed Systems Data for Climate Applications (NOAA-OAR-CPO-2025-27829), where we proposed the development of a Global Data Assembly Center (GDAC) for USV data that would be hosted at NOAA PMEL. An important facet of this grant application was the provision of funding to support a USV Global Network coordinator to formalise the network, manage 'members' and volunteers, report to the OCG network, organise forums through which the community could collaborate and liaise with the community on the GDAC developments.

In addition, the U. Gothenburg team is holding a USV training course, which received significant interest. This training course is currently being held (March 23-26) in South Africa, comprising at least 40 attendees and more interested people from industry, academia, defence and government. It is clear that this technology is burgeoning, and we intend on harnessing this strength as a global organisation to pursue development of the scientific USV industry.

2. How has the network advanced across the OCG Network Attribute areas

Since last year, our network mainly progressed across the following attribute areas: (1) we have better developed our understanding of the data governance, metadata quality and delivery, and data standards and best practices, by researching examples of how the other networks meet their data governance goals and responsibilities (see Patterson et al. 2025, attributes 5-8). We have a clearer idea of our data management needs, industry capability to deliver some of those needs, and have been able to communicate amongst the community the importance of data governance in the scientific industry. This work fed into our OAR GDAC and community development funding application (described above in question 1.)

(2) The community has grown stronger, and is closer to establishing a governance structure that works for our community. (3) USV missions are moving forward from within individual organisations. For example, the TPOS GO-USV transits are continuing, complementing shorter time-frames of GO-SHIPs. However, a sustained funding line for missions remains an issue. It is likely that we will follow

in the other networks' missions, and we will seek to support individual and independent USV missions by providing advice for data quality assurance and developing standards and best practices alongside industry and USV and instrument manufacturers.

3. Future Plans and Opportunities - at network and/or cross-network OCG level

One important and exciting opportunity we have come to realise as a community is our advantage in having industry backing the network activities. Currently, the USV network does not hold any formal entity (e.g. not for profit or NGO). One of our main goals this year is to establish an entity that would be able to receive philanthropic and industry funding (e.g. USV manufacturers, instrument manufacturers) to pursue our most pressing network activities, which are: developing our governance framework during an in-person meeting, and start to develop standards and best practices for the USV industry, to bolster and strengthen the USV scientific industry. Therefore, we are pursuing an international not-for-profit organisational structure, and have begun formalising this process with accountants and lawyers within our network. By doing this, we would not only be developing global industry capability (within the USV and instrument manufacturing market), but we would develop our scientific market by placing value on the data and processes required for delivery to end-users (e.g GTS/WIS and oceanographers and meteorologists worldwide). With the USV global lead, Ruth Patterson, sitting on the external advisory committee of the Ocean Enterprise Initiative, our USV global network is gaining exposure to important industry technology groups, advice, funding opportunity, and is also influencing the community through the experiences of the USV network. Lastly, we have recently developed an online community page: https://www.usvgoos.org/ which we will populate with USV network information in the coming months.

4. Challenges and Concerns - at network and/or cross-network OCG level

Our main challenges and concerns at a network level are: (1) funding, and (2) building trust in the technology. Our network is actively pursuing funding opportunities in the form of grant applications. Aside from the OAR grant application mentioned above, our network has also applied for CLIVAR funding to host the network governance meeting. However, in the meantime our network lead has received standing offers of funding from industry (USV manufacturers), which happened recently and we will actively be pursuing by developing our organisation into an international entity, for example, a not for profit. This offer of financial support is a result of the active leadership, industry inclusivity and community participation during the paper-writing process. There is a feeling of potential and forward momentum, which the leaders of the network fully intend on harnessing.

One major benefit to our community will be the OCG's endorsement of USV global network as an emerging network. This will be our fourth year pitching our network to the OCG, and each year we gain more and more knowledge about what it means to be an OCG network, and we know that there is more knowledge to gain. We are committed to this endeavour, and it is a significant part of our journey to build rigour and trust into data collection using USVs for the global scientific community to improve air-sea interactions and multidisciplinary data collection. We have considered joining another network, however, with the community we have built thus far based on unique and common experiences, we feel that the shared experiences, knowledge and enthusiasm are important to acknowledge as standing apart from other networks. We aim to address the unique data

requirements, which are specialised, as is the fast-paced and rapidly growing diverse industry and science we are working with.

We are also aware, that while our network committee is currently based on the co-authors of our recent paper (Patterson et al. 2025), there is a burgeoning network 'membership' awaiting guidance and perspective as the technology booms, and there is currently no other global group nurturing the USV industry in particular. It is important technically and strategically that the USV network is able to freely develop a bespoke network.

An endorsement from the OCG committee will make a significant difference in our ability to attract funding to enable funded/paid positions towards the OCG attributes. The value that arises from this endorsement is important for recognition in our pursuit to build trust in the technology, which we know comes down to data management, developing standards and best practices, and funding is required to employ people to do these jobs - and paying employees and analysts will be key to maintaining value in the scientific data collection community.

At a cross-network OCG level, our USV network is still rapidly learning about the best function of our network, and we have decided to first focus on the community of practice and growth of core USV scientific industry needs, such as developing standards and best practices. Understanding other OCG networks requires significant time and resources to connect, collaborate and learn from, and this is something that will take some time until active funding is acquired, and after the governance structure is set.

As a community with many employees from NOAA, we are conscious of the reduction of resourcing in research and development. While this is a significant community concern, we collectively treat this as an opportunity to branch out and create our own funding opportunities. We are new in this journey, but over the past 2-4 months have actively shifted and adapted our thinking toward achieving our objectives without the expectation of funding from the US government. While in the short time this is an adversity, we feel that over the long term this will make us stronger and more innovative, and public-private partnerships will be very important in this endeavour.

5. Asks from OCG (Exec, networks, OceanOPS, and/or GOOS) and any priority topics that should be addressed at OCG-16

We are interested in understanding where the regional alliances fit into the OCG groups in terms of power and structure. Amongst the USV global network, there is confusion about the role of the regional alliances, which is likely embedded in their function within each respective country/region. For example, IOOS appears to be focussed on coastal observations, which may not be very relevant to deep water USV missions, where-as the IMOS 'top-down' funding streams have high relevance for a potential USV observing network around the Australian coastline where there are vast remote regions. If there is a space for collaboration within the regional alliances, we feel the USV network would be very well-placed to become a network within IMOS. Sometimes, the nature of these relationships are best approached from the 'top-down' of GOOS, where there is interest for the OCG networks to succeed in respective countries.

Another way that the USV network could more effectively work into the OCG would be if there was a range of resources/links to the varying strategies and structures of the other networks. This type of information is quite difficult to find, and requires much searching and filtering relevant and new

information from old information. A current list of links of network activities would be an effective way for us to learn more about what we need to do to succeed as an OCG network.

6. Recent publications, articles, etc. (if you want to share)

As previously discussed, the Patterson et al. 2025, 'Uncrewed Surface Vehicles in the Global Ocean Observing System: A new frontier for observing and monitoring the air-sea interface' has been published only about one month ago.

From this there has been significant media surrounding the network endeavours.

[Dr. Patterson is sending ocean vessels to the furtherest parts of the ocean - ABC listen](#)
[Keeping us current: Push for global network of autonomous surface craft | Charles Darwin University](#)
[Uncrewed surface vehicles offer the key to new frontiers in ocean science | NOAA Pacific Marine Environmental Laboratory (PMEL)](#)
[CDU EXPERT: Australia needs a better understanding of its oceans, and a global USV network could be the answer, says oceanographer - News Hub](#)

Additional considerations:

- **What are your links to the Ocean Decade? (List programs etc. you are involved in)**

The USV Global Network is linked to the Observing Air Sea Interaction Strategy, by (1) the origins of the network being within the air-sea interactions community, and (2) the provision of administrative support to help administrate our network, provided by the University Corporation of Atmospheric Research (UCAR). OASIS is a UN Ocean Decade programme, and the 'USV for GOOS' global network is an endorsed UN Ocean Decade project ([Uncrewed Surface Vehicle Network for GOOS (USV Network for GOOS) - Ocean Decade](#)) under the OASIS UN Ocean Decade programme. The reason the USV network started with OASIS is because they have collectively identified USVs as a way in which to capture multivariate air-sea interactions data in high-frequency and long-term (e.g. several months). Now that the USV global network has evolved to include many different disciplines by capturing multivariate data for interdisciplinary observations, we are branching out by creating an international not-for-profit for the USV global network. However, given air-sea interactions are by far the largest scientific group utilising USVs for complex, multivariate data collection (see Patterson et al. 2025, Table 1), the USV network will continue to draw leadership and guidance from OASIS scientists. There is also an important working group within OASIS' who represent (and are) the data end-users for USV data, particularly in the air-sea interactions from space group. In essence, the USV global network will endure beyond the UN Ocean Decade and will remain deeply connected to OASIS because of their past, present and emerging leadership in utilising and standing up the emerging technology.