Seventh Session of the GOOS Regional Alliances Forum

22-24 September - Aquila Atlantis Hotel, Heraklion, Crete, Greece
http://ioc-goos.org/GRF-VII

Left to right: Glenn Nolan, Mika Odido, Zdenka Willis, Atanas Palazov, Pablo Tabarez, Pimwhalan Chueapudee, Maciej Telszewski, George Petihakis, Laura Griesbauer, Somkiat Khokiattiwong, John Gunn, Douglas Wilson, Tommy Moore, Tom Gross, Andreas Schiller, Tim Moltmann, Andrea McCurdy, Patrick Gorringe, Albert Fischer, Linda Glover, Erik Buch, Juan Moreno Rincon.

Executive Summary

The Seventh Session of the GOOS Regional Alliances Forum was held in Heraklion, Crete, Greece on 22-24 September, 2015. Zdenka Willis chaired the Forum which was attended by representatives of GRAs for Black Sea GOOS, EuroGOOS, GOOS for Africa, GRASP, IMOS Australian Integrated Marine Observing System, Indian Ocean GOOS, IOCARIBE-GOOS, Mediterranean Ocean Network GOOS (MONGOOS), OCEATLAN, PI-GOOS, Southeast Asian GOOS (SEA-GOOS), and USA IOOS. NEAR-GOOS was not represented. Also in attendance were representatives of the GOOS Steering Committee, GOOS Project Office and the GOOS Panel for Biogeochemistry.

The Forum discussed the role of the GRAs in GOOS and emphasized the importance of the GRAs to regional observation goals of GOOS. The GRAs will be better represented at GOOS-SC and GOOS Panel meetings in the future. In addition it was pointed out that the GRAs could play a greater role in JCOMM activities, in particular the newly formed TT-MOWIS. Activities of the GOOS Panels were reviewed and methods of involving the GRAs in Panel activities, especially review of EOV specifications were discussed.

The *GOOS Regional Alliances Survey, Draft Report* was discussed and suggested activities were reviewed. Communications and mechanisms to improve involvement of GRAs within GOOS activities were emphasized.

A joint session with the Fourth Meeting of The Global High Frequency Radar Network, elicited lively discussion of the GOOS procedures for approval of new networks and projects. The HFR network could become another global GOOS network, but first clarification of its global mandate and how it will address GOOS Essential Ocean Variables is necessary.

The GRA Modelling Inventory was greeted with great enthusiasm for its ability to demonstrate shared resources of GRAs which can be used to build new cooperation and programmes. The Forum agreed that the inventory should be maintained and expanded in future editions.

Further discussion of GOOS projects, partnering and pairing of GRAs agreed that while programs should address global GOOS needs, the projects will gain greater acceptance and support if they are responsive to local and regional needs. The GRAs require demonstrable locally relevant marine management products to sustain their funding base. Education of their national decision makers on the goals of GOOS and how the GRAs fit into intergovernmental programmes are key. Capacity development for observation networks means developing the political will to sustain and fund national observation programmes at appropriate levels. Capacity development should address this by producing demonstrations of value while improving technical capabilities and technology transfer.

The Forum thanked Zdenka Willis for leading the GOOS Regional Council (GRC) through difficult times, and for making the GRC much more relevant and active than it has ever been in the past. Tim Moltmann, chair of IMOS, was elected to chair the GRC, beginning his first term Jan. 1, 2016.

1. Opening

The Chair of the GOOS Regional Council (GRC), Zdenka Willis, welcomed the representatives of the GRAs to the Seventh Session of the GOOS Regional Alliances Forum, Sept. 22-24 2015 and thanked the Hellenic Centre for Marine Research (HCMR) for graciously hosting the event at the Aquila Atlantis Hotel, Heraklion, Crete, Greece. Representatives of the following GRAs were present:

Black Sea GOOS
EuroGOOS
GOOS for Africa
GRASP
IMOS Australian Integrated Marine Observing System
Indian Ocean GOOS
IOCARIBE-GOOS
Mediterranean Ocean Network GOOS
OCEATLAN
PI-GOOS
Southeast Asian GOOS (SEA-GOOS)
USA IOOS
The GRA for North-East Asian Region, NEAR-GOOS, was not present.

2. Review Goals of Forum

Ms Willis set the stage for the forum by emphasizing goals of the forum to build partnerships and collaboration between regional representatives of GOOS, IOC and WMO. The GRA assessments and the GRC modeling inventory provide tools to understand one another and help build partnerships to execute GOOS goals. The Forum will explore cooperative activities between GRAs and how involvement with the global goals of GOOS improves regional observation systems of the GRAs.

3. Welcome Keynote

The Forum welcomed Dr. Vasilis Lykousis, Director of the Institute of Oceanography and Vice President of the Hellenic Centre for Marine Research (HCMR) who introduced the Forum to the accomplishments

of the HCMR in ocean observations and the development of the Poseidon Marine Observing System and the Hellenic Integrated Forecast system.

Dr Erik Buch, chair of EuroGOOS, and Dr Enrique Fanjul, co-chair MON-GOOS, introduced the Forum to the history of their GRAs, emphasizing their growth through sharing of data and services. In the early years very few countries would share their basic data. As data was shown and posted, the value of shared and open data became a fundamental part of the growth of the EuroGOOS. Now delivery of services reinforces the value of regional cooperation in improving value of shared resources and quality of services. The EuroGOOS has well-developed systems for sharing data and modeling products, EMODnet and COPERNICUS Marine Services (CMEMS). The Forum discussed the value of a "GOOS Data Portal", with some opinions that such a portal would have great outreach value, while others pointed out that data interoperability and identified user groups were more important than a centralized, exhaustive data collection. The GRAs encouraged the GOOS Steering Committee to consider how a common principle on the data issue could be established to guide GOOS activities.

Vladimir Ryabinin, Executive Secretary IOC and Assistant Director General of UNESCO, addressed the Forum through a pre-recorded address, as he was not able to attend. Mr Ryabinin emphasized the primary role of communication to IOC. The recent high level visibility of IOC in UN mandates for UNFCCC, Sustainable Development Goals and the Bluegreen economy agenda are providing the potential for GOOS to capitalize by developing ambitious ocean projects in the near future. Collaborative initiatives, such as between the GRAs, are being sought out and will be positively welcomed by the international governance community.

4a. Set the Scene - GOOS and JCOMM Updates

Documents: Components of the GOOS Strategic Mapping and Control Vocabulary (link to document)
IOCCP EOV Specification Sheets (9 documents on bottom of webpage http://www.ioccp.org/foo)

John Gunn, co-chair GOOS Steering Committee, and Albert Fischer, Director GOOS Project Office, led a discussion of the high level organization of the Global Ocean Observing System (GOOS). Recognizing that ocean observations with an ocean knowledge base provide societal and economic benefits, the GOOS was reorganized to support the societal benefits through the Framework for Ocean Observing (FOO 2012). The FOO provides a set of principles which well supports the global GOOS and allows metrics of

the GOOS to be monitored and used for justification of national contributions and satellite mission planning. Argo, TAO/TRITON and new projects such as TPOS 2020 and the Deep Ocean Observing Strategy (DOOS) benefit from these strategies. The GOOS Panels, OOPC, IOCCP and the new Biology and Ecosystems (bio-eco) panel are broadening the scope of GOOS, and are most successful where existing networks can be utilized. However its application to regional GRAs has not advanced as well. Only some of the GRAs are directly linked into some of the platform networks (Argo, DBCP, SOT etc.) The GOOS Project office has become geographically diffuse, but the workplan has taken clearer definition under FOO. The Strategic Mapping vision; FOO processes, science oversight and coordination of common standards and platform organization are moving forward based on a strong outreach and advocacy communications strategy. These same intellectual resources can be made available to the GRAs, but we must find more ways to make them more relevant to GRAs.

The Forum discussed the GOOS organization chart and noted that it could map better to the strategic mapping. It also does not clearly delineate data management needs within GOOS. The GRAs are often defined as end to end systems, but the global networks are not defined that way. Global GOOS networks underpin systems, but do not specify them. While GRAs, which rely on local funding for regional interests, must create deliverable services. The GRAs could play a greater role in GOOS by demonstrating products and services.

Prof. Nadia Pinardi,co-president JCOMM, described the observation systems of the WMO, including the GTS, WIS and GFCS, which are supported by the JCOMM. The JCOMM has recently launched the Task Team for Integrated Marine Meteorological and Oceanographic Services within WIS (TT-MOWIS), which is bringing forward the issues of data integration and interoperability within the context of WMO Information System (WIS). These developments could provide an opportunity for the GRAs to be involved with data sharing and interoperability solutions. The multiple layers of data centers within the Marine Climate Data System (MCDS), such as DCPCs, DACS, NODCs, CMOCs, ODINs etc., require a strong on the ground basis, which the GRAs can uniquely provide for oceanographic observing systems. It was recommended that GRAs become more integrated with JCOMM, through the TT-MOWIS, JCOMM-MAN and coordinate with WMO structures such as the WMO Regional Associations. Some members of the Forum were hesitant to embrace the perceived excess bureaucratic structure of the WMO. Prof. Pinardi suggested that it is time for ocean observation systems to better embrace operational requirements, and perhaps help WMO to loosen some of its restrictions. The development of coupled (ocean atmosphere) Numerical Weather Prediction (NWP) provides a strong driver for enhanced cooperation. The engagement is necessary and will cascade good effects if we have a good framework and good relations with WMO.

1	GRF-VII #4	Appoint members to JCOMM Cross-cutting Task team for integrated Marine meteorological and Oceanographic Services within WIS (TT-MOWIS) Note – EuroGOOS, IOCaribe,MonGOOS, U.S. IOOS and IMOS have nominated members.	Erik Buch	30 Oct. 2015	Open
2	GRF-VII #4	Request PIGOOS, GOOS Africa, and IOCARIBE-GOOS report their engagement with the WMO Regional Associations	GRA Chairs from PIGOOS, GOOS Africa, and IOCARIBE-GOOS	30 Oct. 2015	Open
3	GRF-VII #4	Explore having a GRA lead representing the GRAs on JCOMM Management Committee • Need to define benefits and risks. • Zdenka will put together background information and provide a recommendation to GRAs for agreement by 1 December. She will provide recommendation to Nadia by 15 Dec.	Zdenka Willis	15 Dec. 2015	Open

5. Preliminary Results from Review of the GRA Survey

Documents: *Review of GOOS Regional Alliances Survey, Draft Report* 2015-09-08_DRAFT (link to document)
Compilation of GRA Assessments 2013 (link to document)

John Gunn led the discussion of the GRA Survey and the draft Report on the GRA Survey. *Review of GOOS Regional Alliances Survey, Draft Report* was commissioned to provide succinct summary of the GRA survey assessments of 2013. The consultant was charged to provide draft findings, recommendations and actions based on the survey assessments. The Draft Report's actions were reviewed by the GOOS SC and GRC prior to the Forum which discussed these proposed actions at length:

Action 1: *Foster a more robust sense of community among the GRAs and improve communications.* Some GRAs reported that their internal linkages to national and institutional partners are difficult to maintain, and are a higher priority than external links with other GRAs. But working together as a

community has value, especially in improving and projecting the image of the GRAs and the GRC to local sponsors and parent organizations such as the IOC and the GOOS SC.
The primary mechanism for communication discussed was the use of web pages. The GOOS Project Office is developing a new web site which may be useful as a group tool. IOCARIBE, for one, identified a need to share hosting of their web page. The issue with maintaining a successful web page and web presence is a requirement for all GRAs to work with the GPO to operationalize a sustained flow of information. Technical solutions such as blogs, wikis, mailing lists etc. are minor contributions compared to sustaining the flow of information.

Action 2: *Improve external understanding of GRA programs and progress*.
Recognizing that the GOOS and GRA labels are not known or valued at the local level, the GRAs requested help in explaining the GOOS mechanism to national programme sponsors. Examples were given where the connection to an intergovernmental organization was an important factor in the development of regional programmes (SEAGOOS, WESTPAC). This is not intended to impose top down control of programmes, but to enable bottom up developments to benefit from connection with high level, international agreements. The GRAs cannot expect to educate their policy makers in the nuances of GOOS-GRA organization, so a differentiation of GOOS from GRAs is not useful. Clarification on these issues is needed, and should be provided in the form of shared resources for presentations to be used by members of GRAs when selling their programmes.

Action 3: *Establish a mechanism to establish, maintain and operate virtual and/or mobile GRA Assist Teams.*
Recognizing that successful GRA projects are best targeted to products requested by countries, the Forum discussed ways to communicate successful products and services between GRAs. This is an adaptation of capacity development, which will consist less of training technicians, and more transfer of system methods, including the incorporation of global GOOS systems into local projects.

Action 4: *Foster ongoing links between GRAs and the GOOS Panels*.
The Forum agreed that the GRAs need to be represented on all GOOS Panels, and noted that this was already the case through individuals who serve both GRAs and the Panels. Discussion on the topic of the GOOS Panels was continued under agenda item 6.

Action 5: *Include related ocean observing programs in the GOOS Regional Alliance (GRA) family*.
The Forum briefly discussed the possibilities of additional GRAs: Sustained Arctic Observing Network (SAON), Southern Ocean Observing System (SOOS) and; Sargasso Sea Alliance (SSA). The forum acknowledged the process required by the GOOS Regional Policy 2012 to become a GRA, and noted that the request must come from the organizing states. The forum encouraged the continuation of the process to develop an Arctic GOOS. The forum recognized that there are countries which must clarify their position relative to Arctic observation systems

4	GRF-VII #5	Finalize the GRA Report based on discussion at the Forum.	Linda Glover and Andrea McCurdy	23 Oct. 2015	Done
5	#5.1	Expand GOOS Web page to include GRA shared information			
6	#5.2	Presentation, or side event, about GRAs at next IOC Executive Council	GOOS-SC, GRC	June 2016	
7	#5.2	GOOS representatives to attend GRA events. Utilize common GOOS presentations.	GOOS P. O. to coordinate		
8	#5.2	Develop common GOOS presentation, with emphasis on value added of intergovernmental organization. GOOS SC to clarify role of GRAs within GOOS.	GOOS SC and GPO		

6. How can the GRAs coordinate with GOOS Panels – working session

Documents: EOV specification sheets from GOOS CBG - http://www.ioccp.org/index.php/foo

Maciej Telszewski and John Gunn described how the GOOS Biogeochemistry Panel (IOCCP) and the Biology/Ecosystems Panel are building their lists of Essential Ocean Variables (EOVs). The IOCCP has well developed programmes within GOOS networks (GOSHIP and OceanSITES), a well-developed data system, and the Global Ocean Acidification Observing Network (GOA-ON), all of which were mobilized to define the globally relevant issues which BGC EOVs would address. Recognizing that Panels should bridge EOVs to globally relevant issues, the panel based their work on questions concerning societal drivers and applications. A long list of EOVs was derived, which was reduced using the tests of feasibility and impact.

The bio-eco panel is taking a different approach given that ecosystem descriptors and biology monitoring require almost innumerable inputs. Therefore the concepts of “essential” and “readiness” must be applied early on. The panel used a questionnaire addressed to many coordinated observations systems. The FOO was applied, with an emphasis on completing the cycle of Input>Process>Output and aligning with the DPSIR (Drivers, Pressures, State, Impact, Response) framework used in many ecology planning exercises. Drivers in the form of international conventions were identified. Ecosystem Essential Ocean Variables, eEOVs, capable of satisfying needs for State and Impact indices, and satisfying readiness requirements were identified, and winnowed down to a reasonable sized list. But much more community work is still needed before the eEOVs can be used in observation network planning.

The GRAs enthusiastically embraced the concept of the EOVs and noted that relevant GOOS publications are needed for GRA programme planning. It was also noted that the GRA emphasis on societal useful products on the regional scale must considered by the GOOS Panels in crafting useful EOV lists. On the other hand the GRAs need to communicate with the panels about their problems and needs. The Panels need the GRAs to bring the EOVs and the EOV specification sheets back to their members to help panels do their evaluations. A two way communication is needed, so GRAs should be represented on the GOOS Panels. Some GRAs, which are organized around different national priorities, may not be as receptive to non-operational questions which may appear to be more relevant only to university research needs given how much we still need to discover and understand about the functioning of marine ecosystems.

9	GRF-VII #6	GOOS EOV Specification Sheets to be circulated to GRAs for review	GOOS Panels		
10	GRF-VII #6	GRAs to nominate members to the GOOS Panels	GRAs, GOOS Panels		

7. GRA success stories

Documents:
GRA Success presentations (link to documents)

GRAs provided short presentations on the best recent accomplishments of the GRA. The variety of activities and the depth of quality is quite remarkable. All GRAs are accomplishing much, but each has its own ambitions which remain unsatisfied. The GRA Forum takes from this variety the impetus to work together to learn and support ocean observation systems across the globe.

8. Day 1 Wrap Up

Continued discussions were reported under their respective agenda items.

9. Special Topic Presentation: Global HF Radar

Documents: Backgrounder on HF Radar technology (link to document)

The Seventh GRA Forum shared a session with the Fourth Meeting of The Global High Frequency Radar Network. Dr. Hugh Roarty, Rutgers Univ and MARACOOS, provided an overview of the HFR technology and its growth into a global observation network under the Group on Earth Observations (GEO). Example success stories of aiding search and rescue, and oil spill response have been used effectively to garner support for further development of the system, which now includes 349 systems worldwide in 38 countries. Julien Mader, AZTI-Tecnalia, provided further information concerning the work of the EuroGOOS HF Radar Task Team. Dr. Mader recounted how the EuroGOOS framework was very useful for building cooperation, integrating systems and the formation of the shared data structures of the European HFR.

The GRA Forum discussed whether GOOS could or should recognize the HFR system as a project, pilot or observing network. The GPO responded that in terms of GOOS this is a community of practice, organized around a technology, driven by local priorities, not a global goal. That the GRAs can make use of this technology is evident, but how the growth of the network can be aided by the GRAs is less obvious. The EuroGOOS philosophy is to accept any platform that provides valuable information for services. The value of the HFR is self-evident by their very spread and use. However within the GOOS FOO model the EOV definition for HFR requires further discussion, noting that 'surface current' (which is measured by HFR) has been an oceanic essential climate variable under GCOS for many years. The Forum recommended that the GOOS Physics panel should examine the issues concerning EOVs which HFR can provide. The HFR community has need of intergovernmental decision making, concerning standards and interoperability of data and data dissemination. For now the HFR has a home within the GEO and will continue to exploit that. GOOS has a need to find a way to accommodate developing observation systems and technology. Clarity on what a GOOS project or pilot requires is needed.

11	GRF-VII #9	HF Radar: Understand the capacity that exists worldwide; commitment from the GRAs that, where HF Radar exists, will contribute to the Global HF Radar network	GRA chairs	Ongoing	Ongoing
12	GRF-VII #9	Engagement with the HF Radar group: • Evaluate submitting HF Radar as a GOOS Element. Develop a template for submission, if necessary. • Engage HFR group and Physics Panel to develop the EOV for Surface Currents.	Tim Moltmann, Zdenka Willis, Enrique Alvarez, Somkiat Khokiattiwong, and Hugh Roarty	Ongoing	Ongoing

10. Progress since last GRA Forum – Modeling Inventory

Documents: Results of the Modeling Inventory (link to documents)

Laura Griesbauer, NOAA IOOS and GRC Secretariat, presented a summary of the results of the Modeling Inventory exercise. Inventory questionnaires were completed by most GRAs (Black Sea GOOS, EuroGOOS, IMOS, IOGOOS, MONGOOS, PI-GOOS, US IOOS), with a few (Oceatlan and GRASP) reporting that their models do not fit the definitions requested. The inventory purposefully restricted attention to operational and pre-operational ocean models sustained by national agencies, attempting to exclude research models. The EuroGOOS has taken the initiative and used its existing resources to display the results of the GRA inventory on the EuroGOOS website (http://eurogoos.eu/models/) The Forum was very pleased with the effort and offered many suggestions to improve and eventually expand the exercise. The variety, but also the similarity of modeling programmes indicates that a standardized vocabulary is necessary. As GOOS is very concerned with observations, it will be crucial that future inventories to list input observations. As models play a key role in the presentation of marine services, revealing the data inputs allows data providers to know how their data is being used. GOOS models are largely possible due to open data sources. Examples of the added value of open data to modeling services needs to be distributed to encourage further open data exchange. The Forum agreed that maintaining and improving the model and model input information should be a priority. The GRAs should identify contact points who can update information for their regional models.

The Forum engaged in discussion on how modelling capabilities can be shared between GRAs and whether this is a good avenue for improving global connectivity between GRAs. Some developing GRAs, PI-GOOS and IOCARIBE, rely on global modelling products, as they do not have the internal capacity to run models, nor the local observing capacity to require local models. Global models and capacity to take advantage of them are prerequisite to local modelling which often require nesting and external boundary conditions. Pollution, fisheries and ecological modelling are all of great local concern, but are still a developing art form. “Readiness” used as a model filter will separate long-term research modelling from operational. The other criterion for operational models is the market for the products. Intermediate companies selling services are more likely to be ocean model users, unlike the Met community, who have traditionally made their model results available to public consumers.

Development of shared modelling systems is a statement of Capacity Development. The GRAs do not lack well-trained mathematicians, computer experts or marine scientists. But many do lack the infrastructure required to build, run and most importantly maintain the employees required to keep the models running. One training course is not sufficient to make a model. Development of modelling capacity must happen with longer goals. If a country needs the model then the government must be convinced to support the development and sustainability of modelling. It is not

enough for the scientists to talk to each other. It is important to demonstrate the value of modelling activities in other countries to develop the buy-in of national governments.

13	GRF-VII #10	Set up a refresh/update cycle for updating the model inventories. • Include what observations went into the models and more specifics on geographies. Coordinate with BODC vocabulary. • Send out an updated template for updating by the GRAs. • Once completed, we will include a specific date of completion of the inventory.	Laura Griesbauer (Patrick Gorringe)	Send out new template by 30 Oct. Updated inventories due 1 April 2016.	Open
14	GRF-VII #10	Use updated modeling inventories to update the modeling visualization web page. Patrick will also work to develop an online mechanism for updating the inventories directly.	Patrick Gorringe	May 2016	Ongoing as inventories are received.
15	GRF-VII #10	Send the current and updated inventories to the IODE Training – Ocean Teach Academy, GODAE OceanView	GOOS PO	30 Oct. 2015 April 2016	Open
16	GRF-VII #10	A need for articulating the benefits of open data sharing was identified. • Develop a two page document on the value of open data. • Similarly, develop a value chain for articulating the value of modeling.	Andreas Schiller, Zdenka Willis, Glenn Nolan	Jan 2016	Open

11. Afternoon field trip

The GRF-VII participants visited the 4000 year old Knossos Palace, built by the Minoan civilization, abandoned around 1700 BC, reoccupied by the Mycenaean Greeks, and sung of by Homer in his Odyssey: “Among their cities is the great city of Cnosus, where Minos reigned when nine years old, he that held converse with great Zeus.”

12. Introduction to GOOS project/partnering/pairing of GRAs

Documents: GOOS Strategic Plan (link to document)
GOOS Regional Policy 2013 (link to document)

Mr Tim Moltmann, Director IMOS, led the discussion of GOOS projects. According to the GOOS Strategic Plan, GOOS should encourage focused finite lifetime GOOS development projects. The projects can originate from the GOOS Steering Committee or the Panels, but might also come as initiatives from GRAs. Presently GOOS SC identifies as GOOS Projects: TPOS2020; Deep Ocean Observing Strategy, a study of the feasibility of extending Argo technology to below 4000m; ATLANTOS; and possibly the Global Ocean Acidification Observing Network (GOA-ON) which IOCCP is developing. The GOOS SC would like to see other smaller projects of limit duration to propagate innovation within the observing systems. The GRAs agreed, but could not identify a process for a project to be adopted by GOOS, nor an advisory group to review projects. The GOOS principles broadly specify what a project should have, but better guidelines which lead to approval by the GOOS SC are needed. In addition there are new elements being added to the GRA observing systems, which are not currently recognized by GOOS (e.g. HF radar, ocean gliders, animal telemetry). These also require guidelines for GOOS recognition. The GOOS Strategic Mapping and its EOV and network specification sheets could serve this purpose, and are providing increased clarity on GOOS principles and criteria, but work is needed.

Mr Moltmann presented an overview of the different governance and funding models of the GRAs, in an attempt to identify structural advantages or impediments to building cooperative programmes. The idea of “developing” and “developed” GRAs is not useful, as level of secretariat funding does not explain the level of participation in GRAs by their member states or institutions. Some GRAs are more closely associated with formal GOOS structures than others. EuroGOOS is known first as a regional observation system and only secondarily as part of a global system. SEA-GOOS is known as a part of the IOC intergovernmental organization, which is very motivating to its member states. GRASP serves its member states individually, but those states do not currently recognize the value of sharing ocean observations and data across their borders. However the GRASP chair encouragingly indicated that it is possible to change, when nations recognize that they work the same for similar goals, but are now isolated. Small steps to build confidence are needed. IOCARIBE was founded on a belief in GOOS principles, but what are needed are improvements in national systems. IOCARIBE needs to move beyond IOC to embrace other aid organizations. Aid organizations, like the Global Environment Fund (GEF), predicate their involvement on developmental changes of national governance structures, which is outside of GOOS’ narrow focus.

Of the existing GOOS projects, most are open ocean oriented and not of immediate concern to the GRAS. TPOS2020 touches six GRAs and should also include GRASP. Greater efforts should be made to include GRAs participation. The Atlantos programme is European Union funded, resulting in some

constraints on participation of non-EU partners. The DOOS is more of a study strategy than a project. Perhaps it requires more outreach to establish itself as a product driven project. Again communication to put GOOS perspective into research and planning programmes is needed. Designating GOOS ambassadors is a viable idea, but they need to be backed up with a more formal GOOS representation role, than just showing up at meetings. IOCCP has used this representative concept very well with other groups.

17	GRF-VII #12	Compile a list of dates for all upcoming annual GRA meetings. Post calendar to GOOS Website. • List should also include any specific requests for attendance by specific groups/experts	Laura Griesbauer (GOOS PO).	16 Nov. 2015	Open
18	GRF-VII #12	Agreement to serve as GOOS Ambassadors when attending specific meetings with other communities. • Need to define specific meetings for outreach. • Need to develop GOOS communication materials (GOOS PO).	Tim Moltmann, Erik Buch, GOOS PO	Ongoing	Open
19	GRF-VII #12	Conduct an EOV view exercise • Match up the variables that are being observed in the GRA with the GOOS Panel EOVs. • Compare with the spec sheets for the EOVs and provide feedback to the panels to better refine. • U.S. IOOS and IMOS will lead on the exercise, but other GRAs that are interested may also conduct the exercise.	U.S. IOOS and IMOS	19 Nov. 2015	Open

13. Presentation on IIOE-2

Lead: Andreas Schiller

Andreas Schiller, IO-GOOS chair, presented on the planning for the International Indian Ocean Expedition II (IIOE-2). On this 50th anniversary (1959-1965) of the completion of IIOE the IOC and SCOR,

with partners across the Indian Ocean region, are celebrating those formative expeditions with an International Symposium 'Dynamics of the Indian Ocean: Perspective and Retrospective' from 30th November to 4th December 2015 in Goa.

The modern IIOE-2 covers a five year period from 2015 to 2020 and has societal drivers, in addition to the discovery science drivers of the 1960's, such as poverty, food security, energy security, climate, extreme events coastal erosion and ecosystem preservation. The Science and Implementation Plans for IIOE-2 have now been drafted and take into account those societal drivers. The official launch of IIOE-2 is due on 4 Dec 2015 in Goa, India. GRAs are invited to participate as they see fit. The data management implementation plan is expected to be a significant accomplishment of this IIOE, and could be of aid to other GRAs.

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14. Continued Discussion of Partnering and Project Opportunities:

Lead: Erik Buch

Dr Erik Buch, chair of EuroGOOS, continued the discussion of partnering and project opportunities. Dr Buch set forth a number of proposals for discussion by the forum:

Model Inventory:

The project should be continued with improvements for additional information. The GOOS Regional Council and Forum will pursue this.

Cooperation between MONGOOS, EuroGOOS and GOOS for Africa on the North African coast:

Dr Fanjul reported on a proposal which would seek to involve North African countries in the MONGOOS, and Mediterranean Tsunami Warning System. The ability of this research proposal to accomplish this goal in association with GOOS or as a GOOS project was questioned, as the proposal could not be considered a GOOS project under the guidelines requiring demonstration of a potentially sustainable new observation network. The need for MONGOOS is clear, the problem is to put it in the proper framework. The discussion led to an agreement that MONGOOS, EuroGOOS and GOOS Africa will work on a project proposal with the aim to increase observations and data exchange from North African countries starting with water level stations.

Guidelines for GOOS projects:

Clarifying the connection between GRA activities and GOOS related programmes are a necessity to gain further engagement by the GRAs. The GRAs request a way to gain intergovernmental approval of programmes. A procedure to vet GOOS or GRA projects and provide approval by GOOS and IOC is needed. In addition to such approval it is recognized that development of the contacts needed by the programme at both the local and international levels are necessary.

Tests for Satellite Products:

Remote sensing is used by all GRAs and is an inherently global product, so a collective approach to supporting satellite products by in-situ observations could potentially be a shared GRA project.

Ocean Forecasting and Oil Spill Forecasting:

Following the discussions of the Model Inventory, the discussion of possible modeling projects was focused on the role of model products within the GOOS framework. This is an area where the heterogeneity of GRAs needs to be taken into account. Some GRAs are more about observing systems than end-to-end products, such as oil spill response modeling. In some regions, oil spill modeling exists mainly in the realm of private commercial providers and does not even show up in the GRA Model Inventory. However this is not the case for all GRAs e.g. EuroGOOS. Identification of gaps in global observing networks that serve modeling and forecasting systems will need to take regional differences into account. Asset mapping is seen as a necessary aspect of modeling gap identification. EuroGOOS will continue to develop this capability in concert with EMODnet.

The Forum discussed the role of capacity development in shared GRA activities. Glenn Nolan, EuroGOOS Coordinator, described the EuroGOOS model for a proposal for inter-GRA capacity building. He noted that while observing capacity is being developed, challenges remain in terms of securing sustainable funding for ocean observing and attracting appropriately trained personnel. The approach is to build on the success to date generated by various GOOS capacity building activities in ocean observing and forecasting by securing funding and appropriate partnerships for a number of targeted fellowships in ocean observing. A key deliverable will be the establishment of bespoke Masters and PhD fellowships in ocean observing in each GRA focused on societal benefit area(s) identified in a template to be circulated to GRA Chairs, and in partnership with sponsors within the GRA. A planning group was convened and will follow up on these plans. (See appendix ?)

To develop Capacity Development programmes the Forum agreed that greater outreach would be required. Coordination will be encouraged with other GOOS outreach activities, such as the new GOOS web site and presentations at GOOS and IOC related meetings.

20	GRF-VII #14	Develop a template to submit projects for recognition by GOOS.	Tim Moltmann, Zdenka Willis, Enrique Alvarez, Erik Buch, GOOS PO	20 Dec. 2015	Open
21	GRF-VII #14	Once template has been developed, MONGOOS will work with GOOS Africa and EuroGOOS to submit a proposal to establish a project to increase observations in Northern Africa.	Enrique Alvarez (GOOS-Africa, EuroGOOS)	Jan 2016	Open

22	GRF-VII #14	Formulate a project that involves capacity building design	Glenn Nolan, Mika Odido, and Doug Wilson	Jan 2016	Open
23	GRF-VII #14	Continue effort to advance the asset mapping using EMODnet.	Patrick Gorringe (EuroGOOS)	Ongoing	Open
24	GRF-VII #14	Submit project proposals for partnering across GRAs as they are developed.	All GRAs (GOOS PO)	Ongoing	Open
25	GRF-VII #14	Develop an engagement framework for building capacity in the GRAs	Zdenka Willis	30 Jan 2016	Open
26	GRF-VII #14	EuroGOOS will help to develop IOCARIBE-GOOS Website	Erik Buch (Doug Wilson)	Ongoing	Open
27	GRF-VII #14	News Items – GOOS PO will lead and reach out to feature news items from each GRA.	GOOS PO	Ongoing	Open
28	GRF-VII #14	Request to have OCEATLAN and GRASP representation at the Bio Panel at the Ocean Sciences Meeting in Feb. 2016	Tim Moltmann (GRASP, OCEATLAN)	Feb 2016	Open
29	GRF-VII #14	Explore highlighting the GRAs at the next IOC General Assembly or Executive Council meeting. • Need to determine: "What is the need?" "What is the ask we are bringing?"	Time Moltmann (Erik Buch)	Ongoing	Open

15. Review and Agreement on Meeting Actions

The Actions proposed during the Forum were captured by Laura Griesbauer throughout the meeting, and presented to the participants for review and approval. The resultant actions are presented in Annex XX, and were placed in text of this report for context.

16. GRC Leadership Transition and Meeting Wrap Up

Zdenka Willis had served as GOOS Regional Council chair since GRF-V and was due to step down after having served two terms. The floor was opened to nominations for a GRC chair. Tim Moltmann was nominated and elected by acclimation. Mr Moltmann will begin the first of two possible terms (two years each) as of Jan. 1, 2016. Eric Buch agreed to act as vice-chair.

The Forum warmly thanked Ms Willis for her contributions, which gave focus and impetuous to the GRC which had been lacking. Activities which Ms Willis instigated, such as the GRA survey and Modeling Inventory, have greatly improved the engagement and communication between GRAs. Mr Moltmann promised to continue this momentum and work toward greater communication, and promotion of the GRAs within the GOOS-SC.

Annex I
Action Items

	Agenda	Task	Responsible	Date Due	Status
1	GRF-VII #4	Appoint members to JCOMM Cross-cutting Task team for integrated Marine meteorological and Oceanographic Services within WIS (TT-MOWIS) Note – EuroGOOS, IOCaribe,MonGOOS, U.S. IOOS and IMOS have nominated members.	Erik Buch	30 Oct. 2015	Open
2	GRF-VII #4	Request PIGOOS, GOOS Africa, and IOCARIBE-GOOS report their engagement with the WMO Regional Associations	GRA Chairs from PIGOOS, GOOS Africa, and IOCARIBE-GOOS	30 Oct. 2015	Open
3	GRF-VII #4	Explore having a GRA lead representing the GRAs on JCOMM Management Committee • Need to define benefits and risks. • Zdenka will put together background information and provide a recommendation to GRAs for agreement by 1 December. She will provide recommendation to Nadia by 15 Dec.	Zdenka Willis	15 Dec. 2015	Open
4	GRF-VII #5	Distribute the GRA Report for final comments and incorporate changes to finalize the report.	Linda Glover and Andrea McCurdy	23 Oct. 2015	Open
5	#5.1	Expand GOOS Web page to include GRA shared information			
6	#5.2	Presentation, or side event, about GRAs at next IOC Executive Council	GOOS-SC, GRC	June 2016	
7	#5.2	GOOS representatives to attend GRA events. Utilize common GOOS presentations.	GOOS P. O. to coordinate		
8	#5.2	Develop common GOOS presentation, with emphasis on value added of intergovernmental organization. GOOS SC to clarify role of GRAs within GOOS.	GOOS SC and GPO		
9	GRF-VII #6	GOOS EOV Specification Sheets to be circulated to GRAs for review	GOOS Panels		
10	GRF-VII #6	GRAs to nominate members to the GOOS Panels	GRAs, GOOS Panels		

11	GRF-VII #9	HF Radar: Understand the capacity that exists worldwide; commitment from the GRAs that, where HF Radar exists, will contribute to the Global HF Radar network	GRA chairs	Ongoing	Ongoing
12	GRF-VII #9	Engagement with the HF Radar group: • Evaluate submitting HF Radar as a GOOS Element. Develop a template for submission, if necessary. • Engage HFR group and Physics Panel to develop the EOV for Surface Currents.	Tim Moltmann, Zdenka Willis, Enrique Alvarez, Somkiat Khokiattiwong, and Hugh Roarty	Ongoing	Ongoing
13	GRF-VII #10	Set up a refresh/update cycle for updating the model inventories. • Include what observations went into the models and more specifics on geographies. Coordinate with BODC vocabulary. • Send out an updated template for updating by the GRAs. • Once completed, we will include a specific date of completion of the inventory.	Laura Griesbauer (Patrick Gorringe)	Send out new template by 30 Oct. Updated inventories due 1 April 2016.	Open
14	GRF-VII #10	Use updated modeling inventories to update the modeling visualization web page. Patrick will also work to develop an online mechanism for updating the inventories directly.	Patrick Gorringe	May 2016	Ongoing as inventories are received.
15	GRF-VII #10	Send the current and updated inventories to the IODE Training – Ocean Teach Academy, GODAE OceanView	GOOS PO	30 Oct. 2015 April 2016	Open
16	GRF-VII #10	A need for articulating the benefits of open data sharing was identified. • Develop a two page document on the value of open data. • Similarly, develop a value chain for articulating the value of modeling.	Andreas Schiller, Zdenka Willis, Glenn Nolan	Jan 2016	Open

17	GRF-VII #12	Compile a list of dates for all upcoming annual GRA meetings. Post calendar to GOOS Website. • List should also include any specific requests for attendance by specific groups/experts	Laura Griesbauer (GOOS PO).	16 Nov. 2015	Open
18	GRF-VII #12	Agreement to serve as GOOS Ambassadors when attending specific meetings with other communities. • Need to define specific meetings for outreach. • Need to develop GOOS communication materials (GOOS PO).	Tim Moltmann, Erik Buch, GOOS PO	Ongoing	Open
19	GRF-VII #12	Conduct an EOV view exercise • Match up the variables that are being observed in the GRA with the GOOS Panel EOVs. • Compare with the spec sheets for the EOVs and provide feedback to the panels to better refine. • U.S. IOOS and IMOS will lead on the exercise, but other GRAs that are interested may also conduct the exercise.	U.S. IOOS and IMOS	19 Nov. 2015	Open
20	GRF-VII #14	Develop a template to submit projects for recognition by GOOS.	Tim Moltmann, Zdenka Willis, Enrique Alvarez, Erik Buch, GOOS PO	20 Dec. 2015	Open
21	GRF-VII #14	Once template has been developed, MONGOOS will work with GOOS Africa and EuroGOOS to submit a proposal to establish a project to increase observations in Northern Africa.	Enrique Alvarez (GOOS-Africa, EuroGOOS)	Jan 2016	Open
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29	GRF-VII #14	Explore highlighting the GRAs at the next IOC General Assembly or Executive Council meeting. • Need to determine: "What is the need?" "What is the ask we are bringing?"	Time Moltmann (Erik Buch)	Ongoing	Open

Annex II

Agenda Seventh Session of the GOOS Regional Alliances Forum
22-24 September - Aquila Atlantis Hotel, Heraklion, Crete, Greece
http://ioc-goos.org/GRF-VII

1. Opening

Lead: Zdenka Willis

a. Welcome
b. Round of introductions from participants
c. Adoption of the agenda
d. Logistics announcements

2. Review Goals of Forum

Lead: Zdenka Willis

a. Engaging across the GRAs to build partnerships
b. GRA evolution to regional implementation of GOOS

3. Welcome Keynote

a. Dr. Vasilis Lykousis, Director of the Institute of Oceanography and Vice President of the Hellenic Centre for Marine Research (HCMR)
b. EuroGOOS and MonGOOS Presentations – Erik Buch and Enrique Fanjul
c. Vladimir Ryabinin, Executive Secretary IOC and Assistant Director General of UNESCO

4a. Set the Scene - GOOS and JCOMM Updates

Lead: Albert Fischer, Zdenka Willis

a. Outline of the GOOS Program and its work plan for 2015-19 (John Gunn)
b. Report from GOOS Secretariat (Albert Fischer)
    - Strengthening the role of the GRA's in GOOS
    - Strategic Mapping – Visualizing the interconnectivity of the system. An end-to-end look to attempt to capture the link between SBAs, info products, EOVs and how they are measured, and how systems are used to generate products.
c. Presentation on JCOMM and JCOMMOPS Strategy (Nadia Pinardi)

Outcome: Come up with 2-3 recommendations on how the GOOS GRAs define their role in implementing GOOS. Come up with 2-3 recommendations on how the GRAs think the GOOS SC can best support the development of capacity and OOS elements in each region

Documents: Components of the GOOS Strategic Mapping and Control Vocabulary (link to document)
IOCCP EOV Specification Sheets (9 documents on bottom of webpage http://www.ioccp.org/foo)

4b. Continued Discussion from Setting the Scene

Lead: Albert Fischer, Zdenka Willis

5. Preliminary Results from Review of the GRA Survey

Lead: John Gunn

a. Examine the barriers and challenges for the GRAs
b. Discuss the results focused on recommended steps moving forward

Outcome: Identify 1-2 near-term and 1-2 midterm goals assist the developing GRAs in their growth

Documents: GRA Report 2015-09-08_DRAFT (link to document)
Compilation of GRA Assessments 2013 (link to document)

6. How can the GOOS GRAs coordinate with GOOS Panels – working session

Lead: Maciej Telszewski and John Gunn

a. Using the GOOS Panel for Carbon and Biogeochemistry panel explain the concept of the EOVs
b. Work through CBG EOVs to identify how GRAs are or can be implemented
c. Introduce the Biological Panel – (J. Gunn)

Outcome: GRAs understand the concept of the panels. Advance the marine biogeochemistry essential ocean variables and how the GRAs provide implementation support.

Documents: GRAs read the 9 EOVs specification sheets from GOOS CBG and come ready to interact - http://www.ioccp.org/index.php/foo

7. GOOS GRA success stories

Lead: GRA Chairs

a. *GRAs will have 5 mins, 2 slides using the template to provide efforts since the last GRA forum and/or highlight major issues.*

Outcome: Sharing of success stories, ideas and knowledge.

Documents:

1-2 Slides per GRA using GRA Success Template presentation (link to document)
GRAs should complete 1 page Annual Report to the IOC (link to document)

8. Day 1 Wrap Up

9. Special Topic Presentation: Global HF Radar

Lead: Zdenka Willis, Hugh Roarty

a. Presentation on HFR Overview, Success Stories, and Global Network (*30 mins*) - Dr. Hugh Roarty
b. EUROGOOS HFR Task Team Presentation *(30 mins)* - Julien Mader
c. Overview of 1st Day of Meeting (*15 mins)* - Dr. Hugh Roarty
d. Q&A and Discussion (*45 mins)* - should this be submitted to GOOS as a GOOS project?

Outcome: Understand the capacity that exists worldwide; commitment from GRAs where HF Radar exist be a part of the Global HF Radar

Documents: Backgrounder on HF Radar technology (link to document)

10. Progress since last GRA Forum – Modeling Inventory

Lead: Laura Griesbauer

a. Discuss the Modeling Inventory and potential partnerships based on the inventory
b. Demo on Modeling Visualization Tool – Patrick Gorringe

Outcome: Identify 1-3 joint projects to increase modeling capacity and or extend ecosystem modeling

Documents: Results of the Modeling Inventory (link to documents)

11. Afternoon field trip

a. 2 Options (Self funded) - Guided tour to Knossos Palace (15 euro) or a guided tour to the archaeological museum (10 euro).

12. Introduction to GOOS project/partnering/pairing of GRAs

Lead: Tim Moltmann

a. Presentation on the GOOS project principles
b. Discussion on feasibility of GRA projects and how can developed GRAs and/or larger GOOS be helpful

Outcome: Understanding what can constitute a GOOS project

Documents: GOOS Strategic Plan (link to document)
GOOS Regional Policy 2013 (link to document)

13. Presentation on IIOE-2

Lead: Andreas Schiller

14. Continued Discussion of Partnering and Project Opportunities:

Lead: Erik Buch

a. Potential topics:

i. Focused discussion on products and services including applications and relationships to users. Obs → Forecasting → Products
ii. Discussion on Communities of Practice (Gliders, Remote Sensing, HF Radar, etc.)

iii. Discussion on data availability though ODP (short presentation from Patrick Gorringe on progress and discussion)

Outcome: Outline of 3-5 projects the GRAs will undertake in the next 24 months

15. Review and Agreement on Meeting Actions

Lead: Zdenka Willis, Laura Griesbauer

a. Review and approval of action items captured during the Forum.

Outcome: Develop an agreed upon list of follow-on actions from the meeting.

16. GRC Leadership Transition and Meeting Wrap Up

Lead: Zdenka Willis

a. Nominations for Chair and Vice Chair

b. Vote

Outcome: Select a new Chair and Vice Chair of the GOOS Regional Council

Annex II
Participants List

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Annex III

Glenn Nolan's Capacity Development Proposal
Pending permission to include

Annex IV

Acronyms

CMEMS	COPERNICUS Marine Environment Monitoring Service
CMOCS	WMO-IOC Centres for Marine-Meteorological and Oceanographic Climate Data
COPERNICUS	Copernicus is the new name for the Global Monitoring for Environment and Security programme, previously known as GMES.
DAC	Data Assembly Center (WMO)
DBCP	Data Buoy Cooperation Panel (JCOMM)
DCPC	Data Collection or Production Centre (WMO)
DOOS	Deep Ocean Observing Strategy
DPSIR	Drivers, Pressures, State, Impact, Response
EMODnet	European Marine Observation and Data Network
EOV	Essential Ocean Variable
eEOV	ecosystem EOV
FOO	Framework for Ocean Observing
GEF	Global Environment Fund
GFCS	Global Framework for Climate Services (WMO)
GOA-ON	Global Ocean Acidification Observing Network
GOOS	Global Ocean Observing System
GOOS-SC	GOOS Steering Committee
GOSHIP	Global Ocean Ship-Based Hydrographic Investigations Program
GRA	GOOS Regional Alliance
GRC	GOOS Regional Alliance Council
GTS	Global Telecommunications System
HCMR	Hellenic Centre for Marine Research
IOC	Intergovernmental Oceanographic Commission
IOCCP	International Ocean Carbon Cooperation Panel
JCOMM	Joint IOC-WMO Technical Commission for Oceanography and Marine Meteorology
JCOMM_MAN	JCOMM Management panel
MCDS	Marine Climate Data System (WMO)
NWP	Numerical Weather Prediction
OceanSITES	
ODIN	Ocean Data and Information Network
OOPC	Ocean Observations Panel for Climate
SAON	Sustained Arctic Observing Network
SOOS	Southern Ocean Observing System

SSA	Sargasso Sea Alliance
SOT	Ship Observations Team
TPOS2020	Tropical Pacific Observing System 2020
TT-MOWIS	Task Team for Integrated Marine Meteorological and Oceanographic Services within WIS
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
WIS	WMO Information system