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INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(of UNESCO)

**2017 Meeting of the Global Ocean Observing System
Steering Committee Executive**

goosocean.org/goos-sc-exec-3

Miami, Florida, USA

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Final Report

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Background

The GOOS Steering Committee Executive is composed of the chairs and secretariat of the GOOS panels, GRAs, and the JCOMM Observations Coordination Group. It met immediately following the NSF Research Coordination Network - GOOS *Implementation of Multi-Disciplinary Sustained Ocean Observations* workshop (8-10 February 2017, Florida International University, Miami, USA).

The GOOS Biology and Ecosystems Panel provided a [written report on activities](#) as a background paper for the meeting.

1. GOOS Strategy

The GOOS SC Executive meeting in 2016 (21 February, New Orleans, USA) agreed that the development of a forward-looking, aspirational, 5-10 year strategy for GOOS was a high priority in order to position the program to potential donors, partners, and users. The Strategy would also drive alignment of the priority actions in the structures of GOOS.

A draft *GOOS Implementation Plan* was presented to the 5th session of the GOOS Steering Committee (June 2016, Sopot, Poland). It provided details on intermediate goals, resourcing available and required, and specifically addressed the development of requirements, observations coordination, and the interface with data management and user communities. It will have to be rewritten, oriented to the Strategy once finished.

A [Draft GOOS Strategy 2017-2021](#) was a background document for the meeting.

The consensus of the Executive was that the draft lacked vision, enthusiasm, assertion, and an incitement to join or invest in GOOS. It was too oriented towards the structures of GOOS, and needed to be more outward-looking. The Executive spent the morning workshopping the concepts.

Raw material from this workshop is in Annex 1.

In summary, the strategy should:

- Assert GOOS's unique and differentiated roles
- position GOOS as a trusted authority on the essential observations, best practices, coordination, built on global consensus
- Focus on information as the end goal, for lives and livelihoods
- Put more emphasis on being an interface from the observational arm to super-users of ocean observations, and the intergovernmental conventions that need observations (adding to the present main emphasis inward to the ocean observing implementing community)
- Recognize that GOOS the 'business' (or programme) does not implement observations, but makes those observations implemented by countries and individual scientists *better*
 - leveraging other investments, and optimizing them
 - using standards and best practices to create global data
 - putting local observations in global context
 - encouraging interdisciplinarity, systems approach
 - focusing on what is essential, being the architects of a system
 - engaging governments
- Recognize different delivery timescales.

- Identify that from space the subsurface ocean cannot be seen and so in situ observations are essential; articulating the interdependencies between satellite and in situ observations and the communities that make them happen
- Use visual communication (diagrams) as a main vehicle for communication of the concepts and main points - these visuals need to be developed
- use a dynamic (and not linear) depiction of the value chain
- Identify the strength that GOOS can bring to capacity development
- Address integration head-on
- identify how branding can help the communities associated with GOOS
- identify partners in delivery, separately for climate, operational ocean services, and ocean health
- Identify what sponsors bring in terms of authority, resources, and access
- Prioritize external engagements
- Identify big stretch objectives: re-energizing or refreshing old networks, stretching into new areas (including coasts), generating new observations of new EOVS...

GOOS also has to clarify 'certification' or how elements become part of the system.

The audience for the strategy include government decision-makers, industry, science, mariners, NGOs with interest in the ocean, military defense, and a broader society, including future generations.

The Exec **requested** the secretariat collectively to make the further development of the Strategy a **priority activity**, probably requiring 4-5 weeks of offline writing time from Albert for drafting and revision.

Action: Albert to generate a new draft from the input of this meeting, by end-April.

Forward timeline:

- GOOS structures (panels, OCG, GRAs) review in June
- Community review in July, with particular call for our users to review
- Adoption by the SC in September
- Roll-out strategy after the SC [to include publication]

2. OceanObs'19

Eric Lindstrom presented the state of planning for the OceanObs'19 meeting (16-20 September 2019, Honolulu HI, USA). He requested feedback on the priority outcomes for the conference and the process for community engagement in preparation of the conference.

Priority outcomes

- Observing system community buy-in that the GOOS Framework for Ocean Observing approach is working
- A shift in thinking of the design of the observing system from platform-based networks to integrative design
- full engagement of the modeling community, telling us about the value of the observing system
- some focus on integrated data products
- attracting intermediate/end users to the meeting, by selling them influence in the requirements and design of the system (once in a decade opportunity)
- advocacy from end users
- developing country participation

Process

- avoid fatiguing the community with a complex tiered white paper process (OO'09)
- there will be a need for observing network-based white papers for observing community engagement
- the call for white papers should not just from the provider side, but also on the user side, for example: what are the requirements for a World Ocean Assessment, IPCC, or SDG 14?

Eric noted that he was preparing a planning surge in the first half of 2017, to:

1. identify chairs of the Programme Committee and put them in place (where the most important quality, above disciplinary/geographic balance, is their community organizing ability).
2. allow them to flesh out the Programme Committee, who will drive the preparatory process for the conference
3. identify additional sponsors for the Sponsors Committee, who will drive the end outcomes
4. set up the back office to support the process.

white avoiding too much tax to the standing structures of GOOS.

(Action for Eric, Katy, Andrea and Nick Rome, planning surge for OceanObs'19, well-advanced by mid-2017)

3. EOVS: scientific paper and associated issues

Toste Tanhua raised a point coming from the presentation of GOOS EOVS as separated by discipline, which had fed a debate with the ocean colour community. A number of the EOVS are cross-disciplinary, providing essential information to different scientific disciplines.

The Executive **decided** to change the visual representation of the EOVS in presentations and on the GOOS website to avoid placing them into three disciplinary columns, while retaining information about which panel takes the lead responsibility for each EOVS (**Action: for secretariat** to change website display and GOOS slide on EOVS to avoid a 3 column approach (perhaps a cloud), asap).

3.1 EOVS paper

Bernadette Sloyan presented the [outline of the journal paper](#) defining the GOOS process to identify the Essential Ocean Variables. Due to the evolving nature of the EOVS specification sheets, the Executive decided not to include it as supplementary material. There was not consensus if the EOVS Spec Sheets, with their potential annual updates, should have a DOI (for version control), although it was **stressed** that the EOVS should have an essentially stable character for GOOS to be seen as a "trusted authority," with no more than an annual update, clearly marked for version control. The paper should identify the *Framework's* concept of *Essential*, balancing feasibility and impact, in the introduction - making reference to both the GCOS Essential Climate Variables, and to the BioEco panel approach (expected to be published before the general EOVS paper). It is an opportunity to scientifically publish the concepts of the *Framework*.

Action, for Bernadette, complete initial draft of the EOVS paper, beginning of March (3 weeks)

Action, for Maciej and Artur, to provide additional input before review by the panel chairs and secretariat, late March (additional 2 weeks).

Action, for GOOS Exec, to review the draft before submission, by end April.

The Executive **agreed** to a process for community review of the EOVS specification sheets, **after** publication of the EOVS paper: the secretariats of the panels should be the focal points to receive comments, which should go to a single e-mail address, and be input for the 2018 edition of the EOVS specification sheets (**Action**, for panel secretariats, after publication - by end of 2017).

The Executive **decided** to keep the authorship list to the Executive (panel chairs and secretariat), with authorship of each individual EOVS specification sheet clearly identified on each sheet.

3.2 Future/emerging EOVSs, Ocean Pressure Variables, and regional and thematic core variables

Contaminants / Pollutants

Artur Palacz presented a [working paper](#) on the followup from the GOOS SC-5 request from UNEP to explore the development of an EOVS around marine pollution, notably with the participation of Peter Kershaw, the chair of the UN system Joint group of Experts on the Scientific Aspects of Marine Pollution (GESAMP). Possible components of this EOVS include plastics, heavy metals, hydrocarbons, PCBs and POPs. GESAMP would be interested in continuing this cooperative work with GOOS under an appropriate funding model.

Acoustic Environment

Sam Simmons presented a [working paper](#) on sound in the environment (similar to ocean colour a cross-cutting variable whose measurement can provide information about physical phenomena or biological/ecological variables). The International Quiet Ocean Experiment prepared a draft "Acoustic Environment" EOVS for consideration by GOOS, and would be willing to maintain expert input for this variable.

Ocean Pressure Variables

Albert Fischer presented a [working paper](#) on a possible GOOS approach to ocean pressure variables, caused by human activity on a global (climate) or local scale, with three options for consideration.

Regional and thematic core variables

The Executive noted that before the publication of the GOOS EOVSs (but after its concept was published in the *Framework*), a number of groups identified some regional or thematic "essential ocean variables". It **decided** to ask the GOOS Projects like DOOS and TPOS 2020 to identify these as "**core variables**" for the project if they were not presently identified as EOVSs.

The Executive discussed these **emerging EOVSs**, noting that for the moment the BioEco panel had used a lower bar for 'essential' in the feasibility / impact space than the other panels. Emerging has aspects of being a waiting space, and being low in feasibility and/or impact at the moment.

It **decided** to recommend that the GOOS SC:

- identify "**Ocean Pressure Variables**" that include a suite of pollutants and contaminants and other human activity creating pressures in the ocean environment [between the second and third options in the working paper], with a particular focus

on where GOOS-related observing elements may be measuring the ocean pressure variable.

- **adopt "Acoustic Environment" as an emerging EOVS** under responsibility of the BioEco panel, using the expertise in the IQOE.
- identify **microbes** and **benthic environment** as **emerging EOVS** under responsibility of the BioEco panel.

(**Action**, *for secretariat*, to prepare the "Ocean Pressure Variables" concept for adoption by the SC, in September)

(**Action**, *for Patricia*, to ensure this labelling on the website and in presentations, asap)

4. Capacity Development

Patricia Miloslavich presented a [working paper on the need to build capacity](#) from the GOOS Biology and Ecosystems Panel. She recalled that a truly global observing system, particularly for the coastal EOVS, would require an intense effort in capacity development to ensure the participation of the greatest number of countries, and that this capacity development should cover not only the observations and collection of data, but the quality assurance and control, analysis, and the development of useful products. The definition of the EOVS have identified what needs to be measured, but there is a continued lack of trained human and operational capacity and funding.

The IOC Capacity Development Strategy (2015-2021) identifies six outputs that are required to ensure sustainable development of capacity, including: human resources development, access to physical infrastructure, strengthened global and regional mechanisms, promotion of ocean policies, visibility and awareness, and long-term resource mobilization. The majority of the conventions analyzed during the development of the biological and ecological EOVS identified capacity development as a priority. There are a number of relevant complementary initiatives that address some aspect of ocean observing capacity development, including the IOC's Ocean Teacher Global Academy, the scientific exchanges and training supported by POGO with the Nippon Foundation, work with LMEs funded by the GEF, and others. Possible ways forward included establishing a dialogue with these capacity development programmes, and to build on the expertise in the GOOS-associated observing networks.

The Executive's discussion focused around a number of key points:

- Given the secretariat's limited capacity (human and financial), it is important to focus on **developing partnerships** for capacity development
- The major contribution from GOOS is related to the expertise on observing and sampling techniques, data quality control, and scientific products, including **standards and guidance on best practice**, knowledge which was distributed in the observing networks
- our best practice guidance was generally focused on the highest scientific quality and the accuracy requirements for climate records, and that GOOS could develop guidance (or catalogues) for observing techniques with different standards for other purposes
- an element of capacity development was convincing Member States of the utility and importance of sustained observations, so they would fund it themselves,
- it was more effective to **train the trainers** rather than individual observers,
- for biology and ecosystem observations, developing capacity for the live coral and zooplankton EOVS (deemed at highest readiness level) should be the priority.

The Executive **decided** that the GOOS Strategy should be assertive in what we can offer in an overall capacity development approach, which should be integrated into IOC's overall

efforts, with clear interfaces to other programmes and an appropriately-scoped fundraising effort at the IOC level (**Action for Albert**: to include in the Strategy; and for *Albert and co-chairs* to feed into IOC capacity development discussions including with the IOC Executive Secretary), noting that IOC will discuss a capacity development implementation plan at its Assembly in June.

The Executive **asked** Patricia to update the capacity development working paper (**Action for Patricia**) based on its discussions, including identification of the priority variables that should be targeted (live coral and zooplankton?) for the panel.

5. Partnerships

5.1 G7 oceans initiative

Toste Tanhua presented an update on the evolution of the G7 science ministers' ocean observations and information initiative, which followed on from the 2016 G7 summit. More background on the initiative is available in the [meeting working paper](#). A working group was charged with developing actions needed to address the 2016 G7 summit declaration, and was focusing in five areas, two of direct relevance to GOOS: enhancing ocean observations including coordination (led by UK), and enhancing regional observing capacities (led by Italy). The working group identified some priorities, including expanding the capabilities of Argo, gliders, supporting underway data from commercial vessels, improving sensors, and augmenting ocean observatories. There was recognition that research funding had difficulty in supporting systematic observations. There is a need for stronger coordination, with GOOS recognized as the correct vehicle for this, but central funding through IOC was not a preferred model. The idea of creating a G7 GOOS Office outside of the UN system, but coordinated with GOOS, was raised. This could include resources to distribute to the different components of the observing system and technical coordination (including efforts complementary to JCOMMOPS).

The Executive **decided** to contact the UK-led G7 ocean observations and coordination working group to see how we could engage in the process and to offer input (**Action for co-chairs and Albert**, asap). It **decided** to develop a costed plan for a GOOS Support Office that could be used for background by those involved in the G7 effort, as well as for other fundraising efforts (**Action for Albert and secretariat**, by early April). It also noted that Italy was leading a subgroup on enhancing regional observing capacities, and decided to also seek engagement there, in order to advertise possibilities related to developing GRA Projects (**Action for Albert**, to try to identify the leaders of this working group and *for Albert and Tim*, to write to offer engagement, asap).

5.2 Sustainable Development Goal 14

Albert Fischer presented an update on the UN's Sustainable Development Goals, the upcoming UN Oceans Conference (5-9 June 2017) focused on Goal 14 "Life under the Sea", and the opportunities to have GOOS more clearly identified as a key partner. More background is available in the [meeting working paper](#).

The Executive discussed the opportunity provided by indicators for SDG targets, including:

- the possibility of using databases like SOCAT in a partnership to help individual Member States track and report on ocean acidification in their national waters,
- contributing to more robust assessments of ocean health products as the 'trusted authority' - even as the readiness of the observing system remains low at present,

- the possibility of using the Framework for Ocean Observing concepts in the development of indicators (as an analogue to EOVs), and
- using particular examples of success at the local level in using ocean observations for sustainable development.

With IOC named as the custodian agency for two indicators in SDG 14, the Executive **decided** to use any internal opportunities to highlight GOOS in IOC engagement in the SDG process (**Action for Albert**, to push GOOS as a contributor through IOC in SDG 14, ongoing through June and **Action** for secretariat, to include SDG and indicator development on the SC Agenda with input from Julian Barbière and Kirsten Isensee who have been involved in the SDG indicator development), and to collect examples of successful local use of ocean information for sustainable development (**Action for Albert and Tim**, to solicit examples from the SC and from the GRAs, by June).

5.3 Biodiversity of Areas Beyond National Jurisdiction (BBNJ)

Nic Bax introduced UN efforts to develop an international legally binding instrument under UNCLOS on the conservation and sustainable use of marine biodiversity of areas beyond national jurisdiction (BBNJ). A Preparatory Committee is developing recommendations to the General Assembly in late 2017 on the elements of a draft text of a legal instrument. These meetings have identified numerous gaps in research, monitoring, data management, and transparency, and have called on IOC and OBIS to help bridge these gaps. Some major issues are related to deep sea mining, and developing capacity to monitor biodiversity so that all Member States can participate in the agreement on an equal footing.

Action for Ward with input from Nic, by next BBNJ PrepCom: to encourage the IOC to include in input to PrepCom statements about interest from GOOS to use BioEco EOVs as a basis to build capacity to monitor biodiversity in Areas Beyond National Jurisdiction, with the aim of having references in the legally binding instrument (and transferring capacity that can also be used in national waters).

5.4 CEOS

The Executive **agreed** that engagement with individual CEOS agencies was a priority for GOOS, as well as with the long-term planning processes used by satellite agencies like the US National Research Council Decadal Survey for Earth Science and Applications from Space (due for release in 2017). NASA is proposing a unified ocean data portal as a 3-year project for CEOS (COVERAGE) with multiple agency participation. GOOS could engage to provide in situ data to overlay with satellite data in the project (in particular through the JCOMM Observations Coordination Group data interoperability pilot). Another area of opportunity is around hyperspectral observations and the live coral EOVI and GCRMN.

Action for Emma, Katy, and David, to explore using the OCG data interoperability pilot to engage the CEOS COVERAGE project with in situ data to overlay on space-based ocean data, starting at the April CEOS SIT meeting and continuing over 2017.

Action for GOOS BioEco, to watch for opportunities to engage space agencies GCRMN around the live coral EOVI, ongoing.

5.5 JCOMM

The Executive agreed to use the opportunity of the Fifth Session of JCOMM to formalize with JCOMM the understanding that the Observations Coordination Group is a key observations element coordination mechanism for GOOS, along with the GOOS Regional Alliances.

Action for *Secretariat and David*, to propose in documentation to JCOMM-5 a formal recognition of the sponsorship of the JCOMM Observations Coordination Group by GOOS and reporting to the GOOS SC.

6. Other business

6.1 Steering Committee 2017

The Executive, based on a poll of availability from panel chairs, GRA chair and secretariat, **decided** to hold the **sixth Steering Committee meeting on Monday-Wednesday 11-13 September 2017**, in a location compatible with those participating in the GOOS Regional Forum (Tuesday-Thursday 5-7 September 2017, Singapore). Possible venues: Vietnam or Thailand.

Action for *Albert and John*, to identify a host for the meeting, asap.

6.2 IMSOO workshop followup

The Executive **agreed** to seek funding to support the three pilots emerging from the IMSOO workshop.

Action for *Maciej and Albert*, to use the IOC Assembly and other opportunities to raise funds for IMSOO pilots (including SC endorsement?), by June and September.

Action for *Andrea*, to explore the NSF Research Coordination Network mechanism as a possible way to support pilots

Annex 1: Mission/vision input

David Legler:

Mission

To provide the coordination and international organization required to develop and sustain an integrated and fit-for-purpose global ocean observing system

Vision

A coordinated and integrated global ocean system delivering ocean environmental information for society.

Sam Simmons:

Maximizing the capacity of sustained ocean observations to deliver value to society.

GOOS = "Global Ocean Observations for Society"

Katy Hill:

GOOS: **Enabling** the development and of integrated sustained Ocean Observing Systems for **optimum impact** for Climate, operational services and Ocean Health.

Key words....

Enabling

Sustained

coordinated

Systematic

Integration

Global (regional, national)

Optimum

Impact.

Evidence based

Nic Bax:

Vision

Sustained global ocean monitoring defined by user needs and influencing societal choices

Mission

To become the global representative for sustained ocean monitoring linking observation to influence and needs to implementation.

Patricia Miloslavich:

The passion statement

To observe the oceans...

From waves, currents and heat
molecules and components, to LIFE
How it changes in time
So that everyone, everywhere, anytime now and into the future,
can use this knowledge to fit any purpose.....food, leisure, navigation, business, education,
management, conservation....

Maciej Telszewski:

Ocean holds 93% of the excess heat in the climate system, is the medium for 90% of global trade, harbors 99% of the habitable space for our planet's biodiversity, and provides 17% of the global population's animal protein. Therefore accurate and ever-updated information about the role of the ocean in human well-being for the next many generations can only be gathered when all the observations are gathered with this well-being in mind and implemented by a system that is designed to serve this very purpose throughout. This design is what GOOS provides.

Bernadette Sloyan:

Mission Statement

A coordinate/integrated sustained ocean observations for science advancement and act as the interface to extended users partners for assessment/inclusion of ocean information in climate services provision.

Vision

Integrated sustained ocean observation for science advancement and interface to society requirements for ocean information

Trusted authority of sustained ocean observations for essential understanding to meet society requirements

Tim Moltmann:

Vision statement

The need for sustained ocean observing is understood and valued by societies across the globe. And GOOS is recognised as the global authority.

Artur Palacz:

Vision

The Global Ocean Observing System will demonstrate that enhancing and optimizing regional and global ocean observations through system-wide integration

provides the necessary information in response to the growing societal needs and demands for managing the ocean sustainably.

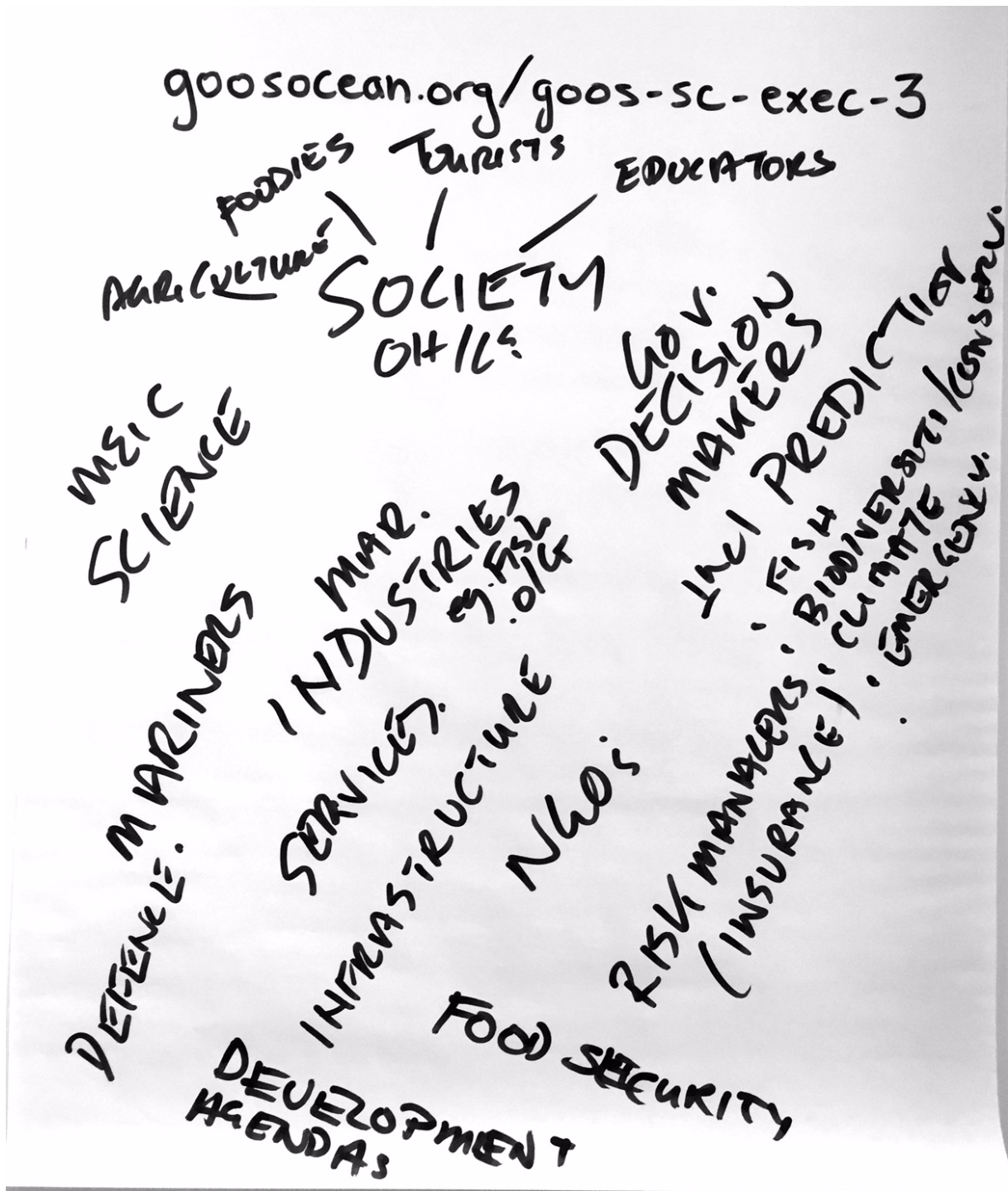
Albert Fischer:

Deliver to a growing set of users the single global sustained ocean observing system, responding to essential societal needs [in climate, business, and ocean health]; building on and adding value to individual national efforts.

John Gunn:

[Trusted/authority on observations required to support: health, climate, business]

[advisor, requirements/design]



UTILITY / DELIVERY TIMESCALE

IMMEDIATE / Real Time
to

LONG TERM / DECADEAL...

Weather → Climate
eg. SLR.

ARGO

OA - Hatching → Ecosystem
Futures

Clean obs ✓✓ (1)

GOOS UNIQUE / DIFFENTIATING ROLES

TO
SERVICE DELIVER
"SUPER-USERS"

- (SAT-INSITU) HITS A SYSTEM DEPENDENCY THINK
- SKIN DEEP.
- CAL/NAL
- INTEGRATION / 'INTEROPERABILITY'
- LOCAL → GLOBAL
- X DISCIPLINARY → X disc.
- (O-ORD) / FOCUS
- OPTIMIZATION

DIFF ROLES

(2)

IN SITU / SAT OBS PLACE IN SCIENCE
 • VALUE CHAIN
 "Data/Obs are critical / essential" UTILITY

TRUSTED
 • AUTHORITY - What is essential
 V sectoral / indivi

• INTER-GOV Roles in

• END-TO-END? . . . Where is the hard work

• CO-ORDINATING Roles?

INTER-FACE Roles . . . Conventions

- End-Users
- Science Comm.

DIFF ROLES (3)

"Holistic 'Package'"

- Connections (synergies)
- Clarity on Requirements
- Advocacy for "Systems" built to meet requirements
- Effective Networks →
- Global Promote Consensus

• Certification (TBC)

Annex 2: Agenda

1. GOOS Strategy

8:00 - 11:30, John chair

- Review and comments on draft strategy
You are asked to read this document, and come ready with suggestions or offers to help with specific sections.
Document 1: Draft GOOS Strategy
- Plan to align the GOOS Implementation Plan with the strategic goals
Background document: draft GOOS implementation plan
- *Get the structures: panels, OCG, GRAs will be asked to say what they want to achieve in 5 years, to capture in the strategy*
- *identify plan to finish, review, publish and publicize*
- *matching the implementation plan to this strategy*
- *Measuring success*

2. OceanObs'19

11:30 - 12:00, Eric chair

- What do GOOS structures want to achieve through this conference?
Document 2: OceanObs'19: Oceans of Opportunity

5. introduction to Partnerships

12:00 - 12:30, Eric chair

3. EOVS scientific paper and associated issues

13:30 - 15:30, Toste chair

- Comments on draft outline
Document 3.1: Outline of EOVS paper and plan for journal submission
- Agreement on review process
- Future/emerging EOVS: acoustic environment, contaminants/pollutants
Document 3.2
- GOOS approach to 'human pressure' variables
Document 3.3
- GOOS EOVS vs. regional/thematic EOVS [DOOS, SOOS, ...]

4. Developing capacity

15:30 - 16:30, Albert chair, introduction by Patricia

- with a particular focus on biological and ecosystems observing networks and funding opportunities, necessary partnerships, connection with GOOS Regional Alliances how to connect fragmented activity within networks. What is the specific role of GOOS and JCOMM; how do we work with partners like POGO.
Document 4
- linked to the strategy discussion

- Some suggestions from the co-chairs:
 - GOOS's capacity development philosophy should fit into larger frameworks like IOC's but be as close to the observations as possible, likely focusing on best practice and standards in observation, through the observing networks
 - To take into account varying capacity, we might need a more unified framework for best practices manuals (tiers)
 - The G7 emphasis on improving regional observing is an opportunity

5. Partnerships

- Review status and plan near-term input/actions
Document 5
 - In addition to the topics covered in Document 5:
 - WMO Marine Strategy, El Niño information system
 - IODE and JCOMM data management

6. Review of actions, as well as outstanding actions from the SC-5 and cross-panel meeting

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