Breakout Session Summary

Room 1

Report-Out by: *Eric Lindstrom, Natalya Gallo*

Duplicate slides per question as needed

What are the most critical functions and capabilities of an organization that could support sustained ocean observations?

- Need for more rigorous framework for ocean obs: select organizations that are within the domain and which aren't & **clear guidance** on how data will be shared. Ocean obs needs to become more mature: curate the data in a more explicit way.
- How do you deal with emerging technology? Improve pipeline from experimental research activity to something that can contribute in a sustained way.
- Funding agencies need to be involved and buy into the concept (integrated conversation at the funding level)
- What counts in an ocean obs system? What ocean obs system are we managing? Be open to the evolution of the system: GOOS moving now to be more inclusive of observations which energizes the community of researchers more.
- Operational setting of standards & communications and fundraising: do these need to go hand in hand or can they be separate?
- Backbone organizations

What are the most critical functions and capabilities of an organization that could support sustained ocean observations?

- Risk Prediction Initiative – partnered with reinsurance group successfully
- Lots of professionals out there who are skilled in marketing and outreach (not successful to just leave this to scientists)
- Need to identify top users about ocean obs data and to bring them to the table as key stakeholders
- Weather is a good example – lots of demand, lots of stakeholders, high investment, opportunities for R&D

Are there models of organizations that currently embody these functions/capabilities? If yes, what needs do they not meet and are there opportunities to modify the model to address them?...

- IOOS regional network (nested model) -- different standards for different uses of data based on stakeholder needs
- GOOS Observations Coordination Group: https://www.goosocean.org/index.php?option=com_content&view=article&id=32&Itemid=130: guidance on what to consider as part of a sustainable observing network
- World Ocean Council – global business investment ecosystem (focus on observations); all industries that operate in the ocean (lots of partnerships; promoting involvement of industry in data collection) (Annual Sustainable Oceans Summit – Smart Oceans/Smart Industry panel): https://www.oceancouncil.org/global-issues-platforms/program-focus/smart-oceans-smart-industries/
- Community of practice approach (bring together small organizations that share a similar vision): needs minimal funding to get kicked off (possible intermediate step to collective impact organization vision)

Are there models of organizations that currently embody these functions/capabilities? If yes, what needs do they not meet and are there opportunities to modify the model to address them?...

- www.cocorahs.org - a good citizen science network with good data.
- Academic model – big bottleneck = keeping communications open (busy people are often not your people of choice for maintaining good communication)
- shipmap.org. You may have seen it, but it's a neat animation of ship data from AIS. SOT is trying to work with industry to try to leverage more of the data that's out there, and thinking about trying to get it into the GTS.
- GOOS: the "wet" Office
- The Ocean Foundation is happy to help with the collective impact goals through our community foundation model.

Other pertinent, high-level ideas that arose during the breakout session.

- Encouraging inclusion and innovation (less organized, less standardized, more engagement) versus having clear guidance on what's in and what's out (more standardized, with clear data management expectations)
- Goals and objectives of a collective impact organization are mainly the same as a community of practice approach: COMMUNICATION IS KEY
- Why aren't we further ahead?
- Division between weather and ocean may not be a helpful framework moving forward
- Biological feedbacks are critical (even for things like heat flux)
- Desire to measure everything but how do you prioritize?

Breakout Session Summary

Room # 2

Report-Out by: *Ray Schmitt, Karina Khazmutdinova*

Duplicate slides per question as needed

What are the most critical functions and capabilities of an organization that could support sustained ocean observations?

- **A strong need for end-user pull, who needs ocean observations?** There is a whole set of end-users that need ocean observations and they should be the driver for the observations. There is a strong connection to energy sector, fisheries management, deepsea mining, etc.
- **Utilize traditional knowledge:** Traditional knowledge is holistic, people are part of natural environment. Where systems are able to take in traditional knowledge? Show how system can function on the local level
- **Integration and intersection:** Emphasize the importance of ocean observations for societal benefits
- **Enhancing communication and messaging:** We have to make people understand that they rely on ocean data (goods transported by sea, fisheries, weather forecasts). Consistent communication message.
- **Include Business development professionals & economists** for marketing and outreach in addition to engineers and subject matter experts.
- **Funding:** Where does it come from? Sustainable ocean observations need to be supported by government. Strengthen our message and ask for more funding:
  - Government is doing things in public interest
  - Industries are interested in profit
  - Philanthropies support high risk projects that may be too risky for government and industry

What are the most critical functions and capabilities of an organization that could support sustained ocean observations?

- **Reliable telecommunication & smart cables:** Improving telecommunication systems, temperature, seismic sensors. Governments can provide initial funding but there is a need to motivate industry to participate. Working with international telecommunication union & regulators: outcome may be a requirement to use smart cables.
- **Deepsea observations:** Governance structure should look strategically how infrastructure is developed
- **Global view:** Strategic view for global observations
- **International participation:** Operating on an international scale
- **Ocean observations** is a very competitive space, need for stronger cooperation
- Bringing all stakeholders together to develop common goals and agenda. Do we need a new organization? We already have organizations working hard on the problem.

Are there models of organizations that currently embody these functions/capabilities? If yes, what needs do they not meet and are there opportunities to modify the model to address them?...

- NOPP is one of the models to bring different agencies together. Industry & philanthropic organizations can also participate in NOPP.
- CLIVAR as an example of collective organization
- Collective impact: IOOS has to include regional partners and incorporate end-user needs. The system that has worked well.
- Global observations: Think out of the box to engage other countries to contribute to support of global ocean observing

Breakout Session Summary

Room #3

Report-Out by: *Julie Pullen, Sheri Schwartz*

Duplicate slides per question as needed

What are the most critical functions and capabilities of an organization that could support sustained ocean observations?

- M. Luther: Most essential element is funding, and consistent funding in particular.
  - A lot of struggle to obtain operations/maintenance funding to keep things going over the years.
  - Core principle: Critical to have a long-term presence, build trust, and maintain relationships with constituencies.
- J. Newton: Scale is another key area, remember the importance of local/regional/global scales and go back-and-forth between them.
  - Experience with Global OA observing network – has been very eye-opening. Coastal observations have to be locally based, but it can't stop there. GO-ON has regional hubs (and IOOS has RAs), which makes it useful for people to see what's happening and share.
  - When something is on a global scale, can utilize the work/data from regional and smaller scales. Need to have ability to go back and forth nimbly.
- M. Briscoe: Keep coming back to the desire for a simple model to make it all work. Consider doing away with that, "looking for a 6-legged sheep."

What are the most critical functions and capabilities of an organization that could support sustained ocean observations?

- Now have a 3-part model (observers, users, and funders). Trying to do things that have impact in the world we're living in (well beyond thinking of the researcher's next paper).
- Have to listen to the user community and ask what they need and build out from there.
- Shouldn't be asking traditionally research-funding community to pay for societally relevant observations, we should parse the problem down smaller.
- Agrees with J. Newton's comments, but also need to do that with timescales we're working on. Need to provide daily, weekly, monthly output that someone cares about and wants to pay for it. This is a much more complicated system to be playing in.
- Polycentric model is exactly what is needed. Doesn't need to be chaotic, can use IOOS as a starting point but it's important to start wanting to give credit to others.
- The small contributing to the whole should make sense. And the whole will have a collaborative voice to speak to the government.

- M. Leinen: Even with IOOS and GOOS, we continue to say, "we don't have sustainability" – floats that need to be replaced aren't, and glue that keeps the system together goes away.

What are the most critical functions and capabilities of an organization that could support sustained ocean observations?

- These are issues dependent on ensuring people understand the value proposition (not the primary responsibility of IOOS or GOOS).
- We don't have effective tools to convey the value proposition. When thinking about what's missing or what an organization could do, it's not the jobs that IOOS and GOOS are already doing for us, but the other jobs of really helping the community articulate the value proposition, ensure it reaches the right people, and engage with them regularly.
- Primary responsibilities are fostering collaboration, interoperability, openness of data. IOOS does not have primary responsibility of making value proposition to industry or government. IOOS and GOOS don't have members - especially don't have private sector members. So there's no responsibility to them. No responsibility for making the case to industry.
    - S. Roberts: IOOS and GOOS don't have responsibility to engage with private sector or members.

- M. Pitts: Questioned why private sector does not see the opportunity of the gap or the value proposition?
    - People that have these skills don't know the researchers, the data, the users, the observers, etc etc. and there has to be a way to start to put that private sector piece to fill in the middle.

What are the most critical functions and capabilities of an organization that could support sustained ocean observations?

- D. Legler: Organizations should have the mechanisms in place to partner with others.
  - The federal government is not good at this, or they might not have the right types of mechanisms. Spend a lot of time nurturing relationships that only intergovernmental groups can do. Should also think about any collective organizations that have multiple levels of interoperability and engagement with each other. Build a collection or system-of-systems – need to be interoperable (one ocean, not 100 oceans).
  - Should also be some authority, either granted or assumed by these organizations, to determine who does what. 108 different observing activities, how do we even begin to manage that many?
- L. Levin: Provided deep ocean observing strategy perspective. Organization should emphasize cross-disciplinary, rather than silo-ing different disciplines (chem, bio, etc).
  - They also need to be cross-sectoral, politically, across industry, and academia. Also needs to work across different communities (obs might be separate from exploration, applied monitoring, etc.) and bring them all together.
  - Would also be ideal to have an end-to-end blend, go from the "owners of the ocean" to the data generators, interpretors, users, and policy makers – and need to find a way to bring those groups together.

Are there models of organizations that currently embody these functions/capabilities? If yes, what needs do they not meet and are there opportunities to modify the model to address them?...

- IOOS could be an example or starting point for a polycentric model. GOOS is also a polycentric organization.
- J. Newton: IOOS can visit Congress, and meets many of the characteristics defined.
  - They build trusted, sustained relationships within the system and do national work as well.
  - Also some big deficits, including budget is very low. Also doing well working from local to national but struggling to go from national to global. IOOS is a regional part of GOOS, so would be beneficial to find those missing connections.
  - Also questioned how to connect it.
- D. Legler: IOOS has done well in connecting with users, particularly at regional level. Not sure the same can be said at the national or global levels.
  - Another example is GOOS, as A. Fisher discussed. Moving towards becoming a collective impact organization and trying to encourage/develop through partnerships and embrace wider array of activities. But has its own limitations.

Are there models of organizations that currently embody these functions/capabilities? If yes, what needs do they not meet and are there opportunities to modify the model to address them?…

  - Struggle with communicating and struggle to bring different groups to some level of performance or contribution. That tie between coastal elements and global activities is a struggle, largely because of how systems have been developed.

- M. Patterson: CLIVAR is often referenced as a collective impact organization model. Discussion about organizational paradigms is useful to reflect upon borrowing from others and understanding what is done well.
  - US CLIVAR focuses on ocean's role in climate. Particular sub-focus on obs that support the climate system and to work with the applications communities. Set up structure with representatives that focus on the obs and monitoring phenomena that focus on development and predictions/applications interface.
  - Recognized that they needn't have one structure that includes all of those engagements. An organizational structure should recognize the different aspects of the problems you are trying to address.
  - Multi-faceted problem you can separate into subparts and have structure that supports those activities.
  - CLIVAR and world climate research program have a global focus for the observing system that has this international structure already in place to support design and feeding into GOOS in terms of the climate problem.

Are there models of organizations that currently embody these functions/capabilities? If yes, what needs do they not meet and are there opportunities to modify the model to address them?…

- CLIVAR, though, is struggling at the local level. How do we engage with regional sea level rise, west coast fires, etc? When looking at different problems, need to be engaging at local level and the parties there.
- Organizational backbone should draw different parties together (like IOOS, CLIVAR, etc) and then we can integrate that much better. Not all to support research, so also need to develop a comprehensive approach that involves all parties and planning.
  - Several, not just one, agencies decided to establish and support the backbone project office (NASA, NOAA, NSF).
- Question about how CLIVAR got started: had benefit of one of the agencies wanting it, so agencies set up the backbone structure, indicated they would invest in the office with a piece of their research budget to leverage each other collaboratively and seed the planning/implementation of a science program to the scientist.

- M. Briscoe: IOOS and CLIVAR is a marriage made in heaven and should consider collaborating.

Breakout Session Summary

Room #4

Report-Out by: *David Millar, Shelby Brunner*

Duplicate slides per question as needed

What are the most critical functions and capabilities of an organization that could support sustained ocean observations?

- Identify where and how existing observing efforts can answer questions that need to be addressed
  - Cooperative approach to connect needs and observations to users beyond the *intended* community
- Collective development of opportunities: Coordination of activities across disparate communities
  - Ability to cross-cut several communities and sectors to meet several needs
- Overcome funding struggles, such as by aligning resources
- Having one voice that groups can speak
- Understanding and leveraging the whole value chain of ocean observing
  - End-to-end observations to data to services and knowledge
- Best Practices
  - Promoting a community of best practices
  - Agreed to common standards and BP
- Develop and cultivate common vision
- Identify champions, marketing efforts, and strategic communicators
- A backbone organization that provides purpose, clear and common objectives, transparency, efficiency
  - Sustainable, adaptive, long-term time horizon, authoritative
- Ability to hold partners accountable for their actions
- Convert science into information and then COMMUNICATE that to stakeholders/public
- Looking beyond our sector for example infrastructure: emergency response

Are there models of organizations that currently embody these functions/capabilities? If yes, what needs do they not meet and are there opportunities to modify the model to address them?…

- IOOS – an organization of organizations with an umbrella
  - IOOS Regions are nested within several other organizations: IOOS← GOOS ← GEOSS
  - IOOS Regions also have ties to other programs and initiatives for cross-cutting impact
- GOOS: A nested set of organizations with multiple intergovernmental ties
  - Requires enhanced mid-level structure to incentivize engagement
- Nested Cooperative's to connect needs and observations to users beyond the intended community
  - E.g. Electric Cooperative structures
- World Ocean Council: Smart Ocean, Smart Industry
- Regional Ocean Partnerships: wide-reaching partnerships in ocean obs stakeholder communities
- National Oceanographic Partnership Program

Several relative groups and an infrastructure already exist– communications structure needs to be rethought for communicating science

Are there models of organizations that currently embody these functions/capabilities? If yes, what needs do they not meet and are there opportunities to modify the model to address them?…

NEEDS to improve existing infrastructure:

- $$$$$: Limited or non-balanced funds can breed competitiveness and lack of sharing
- Common messaging and speaking with one voice
- Increased effectiveness
- Aligned vision in mid-level organizations to increase systematic engagement
- Strategic partnering and engagement with key sectors and businesses (to help recognize the ocean obs value proposition)
  - Embedding experts within an organization is key for long-term/ongoing
- Regular cycle or opportunity to revise the system

OPPORTUNITIES that exist

- Stronger engagement with private sector
- Leverage UN Decade to make new partnerships/strengthen existing partnerships
- Expand stakeholder base beyond operational users and researchers
- Including private sector and other stakeholders in governance for ocean observations

Other pertinent, high-level ideas that arose during the breakout session.

- Ocean Obs ambassador program: Meet and educate various sectors and businesses on their own turf. Identify experts with connections that are trusted
  - Many challenges are related to lack of awareness, not lack of capabilities.
- Alliance of experts and organizations to meet communications gaps
  - Potentially align under