Panel discussion -Data as an integral part of the Ocean Decade Challenges

Dick M.A. Schaap–MARIS (SeaDataNet, EMODnet, Blue-Cloud)

International Ocean Data Conference – Sopot, Poland, 16 Feb 2022



Data as an integral part of the Ocean Decade Challenges:

- End-to-end needs for data to address key Decade Challenges
- Barriers, challenges and opportunities to achieve the vision towards a global digital ecosystem contributing to addressing the Decade challenges
- FAIR Data in the Ocean Decade and guiding principles for implementing the vision and measuring success
- Key components and transformation requirements for the data ecosystem we need for the ocean we want

Panel members:

- Emma Heslop GOOS
- Bjorn A. Satren –HI
- Rishi Sharma FAO
- Ward Appeltans OBIS



The Global Ocean Observing System

Ocean Data for the Ocean Decade

View from an ocean observing perspective

International Ocean Data Conference 2022

Ocean Data for the Ocean Decade View from an ocean observing perspective



Dr. Emma Heslop -IOC/UNESCO

Physical oceanographer with significant strategic & business development expertise. Her initial career in the technology industry developed skills in market development and comms. Sailing and a PhD made her profoundly aware of the importance of the oceans passionate about the need for sustained monitoring of ocean data for science, government and industry applications. joined the IOC of UNESCO to support the development of the Global Ocean Observing System (GOOS), in implementing its ambitious 2030 Strategy.

Kevin O'Brien - University of Washington, NOAA/PMEL

Senior Research Scientist at the University of Washington. He currently serves as the Vice-Chair for Data and Information for the **GOOS** Observations Coordination Group (OCG), and is developing a data implementation strategy for the OCG global ocean in situ networks. He has also developed and leads the Open Access to GTS (Open-GTS) project whose aim is to increase the volume of marine in situ data that is available through the WIS/GTS. He is involved in data management projects with NOAA, GOOS, WMO, IODE and IOCCP.







- Building harmonised low friction data flows with all the the 12 OCG global ocean observing networks
- 'End nodes' with data services that will support harvesting by external stakeholders (WMO, IODE OBIS, Google search)

Example: GOOS/OCG Fair-based data services are testing data exchange through WIS 2.0 protocols



Currently:

- Mapping data and metadata flows through the 12 global ocean observing networks - looking for gaps, opportunities to simplify, automate, etc.
 Communication support for external partners and to harmonize data flows towards single harvestable end nodes
- Unifying data and metadata standards and interfaces across GOOS observing networks in physical, biogeochemical and biological realms -OceanOPS and OBIS important infrastructure elements - FAIR data compliance across GOOS
- WIS, IODE ODIS and Google/DITTO are currently identified key federated system stakeholders (boundary)

GOOS is already moving towards a digital ecosystem based upon community standards and best practices - this will support the Ocean Decade - a federated system that will provide access to stakeholders at all levels, yet allow harvesting across networks / communities from a single endpoint





Unpacking the value chains in marine data - UK study

Mapping from role to sector to action – first steps in a novel value chain approach

The results of an initial OECD - GOOS - MEDIN survey were published last year in a new paper. For the first time identify:

- the types of action data is informing by sector
- which actions are most frequent use for data
- the actions that sectors engage in by data type

Jolly, C., et al. (2021), « Value chains in public marine data : A UK case study » <u>https://doi.org/10.1787/d8bbdcfa-en</u>.









But...

Challenges

- Each network works to support uniform standards (EOVs, sub-variables, calibration methods, platforms, RT/DM data flow and quality control) this needs support and increased work towards automation
- What entity will be managing the boundary / interfaces between observing data flow and data management - how do we ensure current efforts (by GOOS and others) towards improved interoperability are part of considerations
- This is not a one way flow data management has a potential role in providing feedback:
 - automated 'bad ' data notification
 - Information on data usage, see OECD work, that would feed into priority setting

Opportunities - resolutions?

- Identifying resources to help data and metadata work within and across networks - OceanOPS, OCG, OBIS - including increased automation
 - Explore new ways example using Natural Language Processing (NLP) to help ease the burden of creating metadata
- Opportunity for Ocean Decade to take the lead in connecting communities federated system
 - Develop connections/crosswalks across existing community standards, rather than imposing new standards
 - Help disparate communities interoperate by clearly defining metadata needs across those communities
- Federated data management should be a connecting backbone between observing and data use (not an amorphous silo)



Questions - Discussion



Bjørn A. Sætren

Digital Director Institute of Marine Research Norway

- 2012-2020 IT Director the Norwegian Directory of Fisheries
- 25 years of experience within digitalization
- Manufacturing, IT-industry, Fisheries, Fishfarming and Public Sector



Barriers, challenges and opportunities to achieve the vision towards a global digital ecosystem contributing to addressing the challenges

We need a shift towards mor efficient standards for datasharing, to speed data consumption and address current challenges

Challenges

- Time to market
- Data Quality is a major problem – the elephant in the room
- The same data are stored at different locations

Solution can be to

- Implement further common standards for F.A.I.R data
- <u>Only</u> desentralized data management and services
- Further develop a common digital platform to provide information
 - to provide access
 - efficient search algoritms
 - storytelling

Barriers, challenges and opportunities to achieve the vision towards a global digital ecosystem contributing to addressing the challenges



F.A.I.R principles as guidelines for improvement



Bad

Findable

Online access to a API, file or databases

Accessable

Open access for everyone Single point of contact

Interoperable

Reusable

All data are in open standardized formats, i.e. Rest API´s and csv files

Quality, Good metadata and a data management process at a single points only.

where to search? Same data at several datasenters in several versions

Long response times on data requests Multiple contact points

Data can not be combined due to to lack of standards : csv, pdf, rest, xls

Shifting standards, serveral version of the thruth at different physical file locations

Questions - Discussion





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- Data Management and Capacity: Developing countries needs Rishi Sharma, Sr. Fishery Res.Officer
- FAO, Rome HQ

Background

- 25 years of analyzing ocean and fishery data.
- Data Scientist and use of data to understand dynamics of populations in the ocean.
- Scientific Advisor for Global Assessment, EAF Nansen and ABNJ Programs.



Overview

What is a policy that is equitable?

Is open data, unnecessarily advantageous to the developed world?

What would be a balanced policy?

An e.g. "Current Policy on the Nansen"

United Nations response - the State of Ocean Science



'Increasing international cooperation will enable all countries to engage in ocean research, develop communication and publication strategies, and ultimately increase global scientific output and impact.'

Taken from IOC-UNESCO 2017, Global Ocean Science Report <u>https://en.unesco.org/gosr2017</u>

Principles of a "Good" Data Policy

Overarching objective: to facilitate capacity development in partner countries

Governed by six key principles:

- 1. Data **must** be used to enhance knowledge & develop capacity in partner countries
- 2. Data **must** be used to fulfil agreed objectives of the Programme
- 3. Data belong to the **partner country** (within EEZ) or appropriate **regional body** (Areas Beyond National Jurisdiction) and FAO
- 4. All use of data **must** include provision for capacity development in partner countries
- 5. Data must **not** be used for commercial gain
- 6. Holding a copy of the data does **not** give any rights of ownership

UN Decade of Ocean Science 2021 - 2030

EAF Nansen Programme – endorsed as an official Decade Programme

Decade Objectives:

- Identify required knowledge for sustainable development, and increase the capacity of ocean science to deliver ocean data and information.
- 2. Build capacity and generate comprehensive knowledge and understanding ...
- 3. Increase the use of ocean knowledge and understanding, and **develop capacity** to contribute to **sustainable** development solutions

Decade Outcomes - 'the ocean we want' :

- A clean ocean
- A healthy and resilient ocean
- > A productive ocean
- > A predictive ocean
- A safe ocean
- An accessible ocean
- An inspiring and engaging ocean

UN Decade of Ocean Science – Capacity Development

'Human capacity to carry out ocean science is unequally distributed across the world, across generations, and across genders. The 2017 Report highlights the predominance of ocean scientists in developed countries when compared to many SIDS and LDCs.'

'Capacity development is an essential tenet of the Decade.'

<u>'[Capacity development needs to]</u> *respond to regional and* <u>national priorities</u>

> <u>'To ensure that all stakeholders have the skills and can access the technology</u> <u>needed to produce, interpret and use data, information and knowledge, data</u> <u>management initiatives of the Decade will be linked where relevant to capacity</u> <u>development and transfer of marine technology initiatives'</u>

> > (Taken from the UN Decade Implementation Plan, 2020)

UN Decade of Ocean Science 2021 - 2030

EAF Nansen Programme – endorsed as an official Decade Programme

Decade strategy for data stewardship:

- 1. Accommodates principles of global data stewardship:
- FAIR Findable, Accessible, Interoperable, and Reusable
- CARE Collective Benefit, Authority to Control, Responsibility, Ethics
- TRUST Transparency, Responsibility, User Focus, Sustainability, and Technology
- 2. Takes account of:
- '.... the data policies of relevant international organisations and networks.'
- 3. Acknowledges the link to **Capacity Development**

Regional Consultations on UN Decade on Ocean Science for Sustainable Development

'Data is a sensitive issue. "Fly in fly out" research is not acceptable and better systems for curating and managing African data in Africa need to be developed while still maintaining connectivity to the global data landscape.'

Mika Odido, IOC-AFRICA

(Taken from the UN Decade Implementation Plan, 2020) http://www.oceandecade.org

Questions - Discussion







unesco

Ward Appeltans

Intergovernmental Oceanographic Commission

UNESCO-IOC Marine Biodiversity Programme Specialist

- Coordinator of
 - Ocean Biodiversity Information System,
 - Pacific Islands Marine Bioinvasions Alert Network,
 - UNESCO eDNA expeditions,
 - GOOS BioEco metadata portal
- GOOS BioEco panel member
- MBON SC member
- Marine Life 2030 coordination team member

Based at IOC Project Office for IODE in Oostende, Belgium



International Oceanographic Data and Information Exchange



Competition (PPS)

Removing 5 blockers



Lack of global data policy



Lack of standardized protocols



No sustainable funding



No Operational service



Proposed to the Ocean Decade by:



Proposal included:

37 International Academic Institutions
5 International Governmental
Organizations
34 Non-Governmental Organizations
14 National Government Partners
9 Private Sector Partners





https://marinelife2030.org

How do we know that what we do is what GOOS & IODE want us to do?





Communities in OceanBestPractices

Select a community to browse its collections.

- + → ACT: Alliance for Coastal Technologies [81]
- + ⇒ ARCTIC Practices [89]

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[1]

- \Rightarrow ARGO: an international programme using autonomous floats ... [26]
- + ⇒ CalCOFI: California Cooperative Oceanic Fisheries Investigation
 [30]
- + ⇒ DBCP: Data Buoy Cooperation Panel [8]
 - \Rightarrow EAF-Nansen Programme [0]
 - ⇒ EMBRC: European Marine Biological Resource Centre [1]
 - ⇒ EMODnet: European Marine Observation and Data Network [4]
- + ⇒ EU: European Union [38]
- + \Rightarrow EUROGOOS [10]
 - \Rightarrow FAO: Food and Agricultural Organization [7]
 - ⇒ GBIF: Global Biodiversity Information Facility [7]
- ➡ GEOTRACES: internat. study of the marine biogeochemical cycles
 ... [5]
 - ⇒ GGGI: Global Ghost Gear Initiative [5]
- + GO-SHIP: Global Ocean Ship-Based Hydrographic Investigations
 [22]
 - \Rightarrow ICES: International Council for the Exploration of the Sea [87]
 - \Rightarrow IMAS: Institute for Marine and Antarctic Studies, Univ. of Tasmania

GOOS Biology & Ecosystems Monitoring Facility

GOOS BioEco monitoring programs		Under development	Open GeoNode	
Select variables Phytoplankton Fish Birds Hard coral Macroalgae Microbes Select all Deselect all Readiness levels Requirements Coordination Data Data 5779 monitoring programs	 Zooplankton Turtles Mammals Seagrass Mangrove Invertebrates 			
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Questions - Discussion

