

TRANSFORMING OCEAN DATA

17-18 OCTOBER 2019

Chaired by Linwood Pendleton on behalf of the Ocean Data Foundation.

This Ditchley conference is organised in partnership with The Ocean Data Foundation.

This year, three high level international reports have made clear that the ocean is changing rapidly and for the worse. At the same time, the UN has announced a Decade of Ocean Science to heal the ocean. To do so will require a step change in the use of evidence and data to create solutions. What will this transformation look like? Who will do it? Can it be done in time? And, what opportunities are there for new kinds of data emerging alongside science and governance systems to deliver innovative services?*

Summary

Better data is recognized as a critical factor in progress on global governance, stewardship and public understanding of the ocean. Verifiable data underpins the full gamut of ocean decision-making from business investment to better management; regulation; shared international frameworks; and academic research. Data on the ocean is growing exponentially but still large tracts of the ocean remain unmapped and unknown and much of the data produced is messy, unused and often as yet unusable. This meeting brings together expertise from ocean research, government and business, along with data and technology specialists to work out how to drive innovation in the availability and use of ocean data for all. Our goal is to define a vision (or set of visions) for ocean data; map the emerging ecosystem – of producers and users; better understand overlaps and gaps; share knowledge of new analytical services, visualisations and data uses; and agree on the immediate and necessary steps in charting a future for ocean data in the UN Decade of Ocean Science.

Detail

Described at the [Ditchley Conference](#) (April 2018) as the largest ecosystem on earth, the ocean is central to human survival and prosperity. As a global resource, it faces a wide range of known threats from climate change to over-fishing. It also faces newer threats as fresh resources are discovered and extracted via the use of modern technologies such as marine mining. Demand for ocean resources can only grow.

Better data sharing and accessible frameworks to allow greater (global) co-ordination of data between national governments, academia, NGOs, business, citizens are long overdue. Calls for controls of over-fishing; greater transparency in decision-making; managing biodiversity and ensuring application of codes of practice, all require evidence on which to make assessments and measure progress. Data should underpin agreed international objectives for example, on Sustainable Development Goal 14. A better data infrastructure will also be critical to efforts to update the UN

Law of the Sea Convention and the Treaty governing areas of the ocean beyond national jurisdiction (ABNJ).

Overcoming the limitations of differing data types, and technical and scientific formats would seem to offer benefits all round. But these ambitions are challenged by the scale and variety of new data; new tools (such as visualisation, machine learning and virtual reality); and new producers and potential users. Underwater technologies, seabed mapping, marine genetics, wave and aquaculture all offer potential for new sources and forms of data, from genetic, microbial and molecular to satellite imagery and acoustic. New forms of big data are being generated by people across the world via use of social media. Data sources thus range from highly rigorous scientific endeavours to completely unintentional, but still useful, incidental production of ocean data by other large scale and distributed processes.

Portals, platforms and projects

A sense of the potential of ocean data to drive change and action has led a number of organisations to create their own data portals, platforms and projects. Players include Google, Space Agencies, Earth Observation companies, insurance companies and NGOs (Schmidt, Fishing Watch, WWF, REV Ocean etc.), alongside many academic projects and inter-governmental agencies and data services. There are many disparate sources of data and storage locations that even creating an overview of the existing global resource is not an easy task. Finding the most appropriate data platform is a challenge, let alone collating and combining data across platforms for analysis.

Sharable, dominant, even profit based formats will emerge for some areas, as will new interfaces. The range of innovation and entrepreneurship is extensive and has capacity to contribute solutions to pressing environmental problems. The demand for data driven, cloud-based, computational and analytical tools is strong. The problem is not a lack of innovation but a lack of coordination. Questions of interoperability and standardization remain central but the sheer scale of ocean data, the range of producers, users and publics now presents far greater opportunities and challenges. A transformation in the production and use of ocean data is likely as a result of the unlocking and release of huge resources of data.

The growing distribution and diversity of ocean data requires a conscious effort and collective action to forge some practical coherence if the full potential of data to drive positive action is to be realised.

We aim to address the following higher level questions:

- Are we in a new era for ocean data and how will it make a difference?
- Can ocean data be more effectively and widely shared, to transform access to research and evidence?
- What gaps in data can we identify? What other organisations and players do we need to bring into the conversation? What are the emerging data needs?
- Will new forms of data help to accelerate social movements, policy-making and entrepreneurship?
- Who will meet new data demand and help navigate data supply chains? Can we reimagine the dataflow according to new uses and producers?
- How can we best bring together the various ocean data interests and centres – researchers, those running strategic data gateways, platforms and exchanges?
- How do we facilitate bridging between existing portals and networks?

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- In developing a technological infrastructure – what transformative and catalytic action is required?
 - Can we define a vision to include organisational responses, individual commitments and next steps?

The first Working Group session will consider the role of data: *If we are to transform ocean science and stewardship to meet the needs of sustainable development, what will be the new needs for data? Who, what, how?*

The second Working Group session will consider open data: *What does open data really mean and what challenges are brought to the fore in trying to deliver it? Who are we excluding if we require open data? What current behaviours or market forces prevent opening data (e.g. do science publishing, academic practices, and industry concerns lead to a close-hold of data or even obfuscation)? What are the consequences and how might we deal with them?*

In our discussions we may want to consider:

- The current *trends and drivers* for data collection arising from governance and research and from commercial uses - what does the data demand look like and how best can we describe data supply?
- *Effective precedents* for making data-sets available to start-ups.
- The support available for scientists and others to *make their data available* and to do it quickly.
- How can *provenance, lineage and authenticity* for data users be supported?
- What *models of licensing* and selling of data are being used and which is working best?
- How should we index *different data types* across many formats, scales and metric types?
- Examples of *new analytical services* that are emerging.
- *Public understanding*: how can we create applications and visualisations that drive care and interest in the ocean?
- What incentives might encourage *commercial investment* in data creation and opening access to commercial data?

The conference will conclude with a discussion about next steps, commitments and opportunities for collective action, partnership and individual contributions.

***IPBES** Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem

Services <https://www.ipbes.net/global-assessment-report-biodiversity-ecosystem-services>

LPI Living Planet Index <http://livingplanetindex.org/home/index>

IPCC Special Report on the Ocean and Cryosphere in a changing climate.

<https://www.ipcc.ch/report/srocc/>

Background reading materials can be found on a shared [Google Doc](#) – please feel free to add suggested texts and links.

October, 2019

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Programme

Participants and observers are reminded of the private and confidential basis on which Ditchley Foundation conferences are held. All those attending do so in their personal capacities, not as spokespeople for any country or institution. In addition, all the proceedings take place under the 'Ditchley Rule', akin to the Chatham House Rule and strictly observed: all contributions are unattributable, and interventions are made in strict confidence; this also applies to conversations outside the formal sessions. Those present are free to draw afterwards on the substance of what has been said, but not under any circumstances to reveal to any person not present at the conference who it was that said it. The Rule will be scrupulously observed in the Note later produced on the conference by the Director.

Thursday

12 noon	Arrival
12:30pm	Drinks (<i>Saloon</i>)
1 -2pm	Lunch and Welcome (<i>Dining Room</i>)
2 – 3:45pm	PLENARY SESSION I (<i>Library</i>) Is this a new era for ocean data and how will it make a difference? The case for a transforming the culture of ocean data Introduced by Linwood Pendleton
3:45 –4:15	Tea (<i>Saloon</i>)
4:15 – 5:30pm	FIRST SESSION OF WORKING GROUPS (<i>Tapestry Room, Velvet Room, Breakfast Room and Library</i>) If we are to transform ocean science and stewardship to meet the needs of sustainable development, what will be the new needs for data? Who, what and how? /...

5:30-5:45pm	Short break (<i>with tea available in the Saloon</i>)
5:45 – 7pm	PLENARY SESSION II (<i>Library</i>) What do we learn from mapping data needs, what and who is missing?
7pm	Pre-dinner drinks (<i>White Drawing Room</i>)
8 - 9:30pm	Dinner (Dining Room)
9:30pm	After-dinner drinks in the <i>Great Hall</i> with a presentation in the <i>Library</i>

Friday

8:00-9am	Breakfast (<i>Dining Room</i>)
9:05-10:15am	PLENARY III (<i>Library</i>) How to meet the demand? Is there a network of networks?
10:15-10:45am	Group photo and coffee (<i>Saloon</i>)
10:45-11:45am	SECOND SESSION OF THE WORKING GROUPS (<i>Tapestry Room, Velvet Room, Breakfast Room and Library</i>) What does open data really mean and what challenges are brought to the fore in trying to deliver it? Who are we excluding if we require open data? What current behaviours or market forces prevent opening data (e.g. do science publishing, academic practices, and industry concerns lead to a close-hold of data or even obfuscation)? What are the consequences and how do we deal with them?
11:45am-12:30pm	PLENARY IV (<i>Library</i>) Define the challenges: cultural, behavioural and other factors. What do people need to provide & find data?
12:30pm	Drinks (<i>Saloon</i>)
1pm	Lunch (<i>Dining Room</i>)
2pm	FINAL PLENARY (<i>Library</i>) Responses, next steps, commitments and partnerships
4pm	Tea (<i>Saloon</i>) CLOSE Transport to Heathrow and Charlbury Train station.

The Ditchley Foundation

Participant Biographies

Transforming ocean data

Thursday 17 October 2019 to Friday 18 October 2019

Mr Steven Adler (USA)

Chairman, The Ocean Data Alliance (2017-) and Advisory Board Member for the US Department of Commerce (2015-). Formerly Chief Data Strategist, IBM (2000-2018); a member of the IBM Academy of Technology Leadership Team; a member of the US Commerce Department Data Advisory Council, New York Civil Liberties Union Board.

Mr Simeon Archer-Rand (UK)

Senior Marine Advisor, Blue Belt Programme, Centre for Environment, Fisheries and Aquaculture Science.

Mr James Arroyo OBE (UK)

Director, The Ditchley Foundation (2016-). Formerly: Her Majesty's Diplomatic Service (1990-2016): Director for Data, Foreign and Commonwealth Office (2014-16); Director, Europe and Economic Issues (2012-14); Deputy Director, Cyber, Knowledge and Information (2011-12); Political Counsellor, British Embassy, Paris (2011-12).

Dr Timothy Bouley (USA)

Founder, Emergence Ocean Biotechnology; Advisor, Oceansafe Genomics Horizon Scan. Previously founder and head of World Bank climate change and health program and coordinator of Global Partnership for Oceans. Broadly, working to explore and apply biological ocean data to improve human health.

Dr Annie Brett (USA)

André Hoffmann Fellow, Stanford Center for Ocean Solutions and World Economic Forum Centre for the Fourth Industrial Revolution.

Dr Pier Luigi Buttigieg (Malta/Germany)

Data Scientist, Alfred Wegener Institute for Polar and Marine Research; Co-chair, Earth Science Information Partners (ESIP) Semantic Technologies Committee; Operations Committee (Editorial), Open Biological and Biomedical Ontology Foundry and Library; Technical lead, IOC-UNESCO Ocean Best Practices System; Essential Ocean Variable lead (Microbial), Global Ocean Observing System Biology and Ecosystems Panel.

Mr Jon Clay (UK)

Documentary filmmaker specializing in wildlife and environmental stories, currently working at Silverback Films on Our Planet - a collaboration between Netflix and WWF which aims to ignite a global conversation about the recovery of biodiversity and humanity's journey to sustainability.

Mr Dave Dyke (UK)

Technology Consultant, Tech HQ (July 2019-); Chief Executive Officer, See2 Ltd (September 2018-); Chief Technology Officer, Agilit Ltd (December 1996-).

Mr Tim Glover (UK)

UK Projects Director, Blue Marine Foundation.

Mr Neil Holdsworth (Denmark/UK)

Head of Data and Information, International Council for the Exploration of the Sea.

Professor Penny Holliday (UK)

Associate Group Head of Marine Physics and Ocean Climate, National Oceanography Centre. Science Coordinator and Principal Investigator for large national and international research programmes. Chief Scientist for oceanographic research ship expeditions.

Dr Dawn Wright (USA)

Chief Scientist, Esri. Fellow, American Association for the Advancement of Science, of the Geological Society of America, of Stanford University's Leopold Leadership Program. Professor of Geography and Oceanography in the College of Earth, Ocean, and Atmospheric Sciences at Oregon State University.

Tuesday, 15 October, 2019

10:23:02

Mr David Kelly (USA)

Chief Executive Officer & Chief Technology Officer, Innovasea. Formerly President and Chief Executive Officer, Bluefin Robotics. Board of Advisor member Hefring Engineering. Former Board of Advisor member Riptide Autonomous Solutions (sold to BAE Systems), and Open Water Power (sold to L-3 Technologies).

Mr Eric King (USA)

Director of Operations, Schmidt Ocean Institute.

Mr Mogens Mathiesen (Norway)

SVP & Head of Technology and Partnerships at the Ocean Data Foundation. Co-Founder of Arundo Analytics. Ocean Engineer.

Dr Chris McOwen (UK)

Lead Marine Scientist, UN Environment World Conservation Monitoring Centre.

Dr Linwood Pendleton (US/France)

Conservation and Innovation Advisor, Ocean Data Foundation; Global Oceans Lead Scientist, World Wildlife Fund; and International Chair of Excellence, European Institute for Marine Studies.

Mr Peter Pissierssens (Belgium)

Head, IOC Project Office for IODE, and IOC capacity development coordinator (2007-). Formerly: Head of IOC's Ocean Services (2000-2007); Marine Information Management, IOC's International Oceanographic Data and Information Exchange (IODE) (1992-2000).

Dr Clare Postlethwaite (UK)

Co-ordinator of the Marine Environmental Data and Information Network (MEDIN), an open partnership of organisations working together to increase access to the UK's valuable marine environmental data.

Mr Aza Raskin (US/UK)

Co-founder & Programme Advisor, Center for Humane Technology.

Professor Alex Rogers (UK)

Science Director, REV Ocean, Norway; Visiting Professor, Department of Zoology, University of Oxford; Senior Research Fellow, Somerville College, University of Oxford; a member of the Group of Experts of the Prime Minister's High-Level Panel for a Sustainable Ocean Economy. Author, *The Deep: The Hidden Wonders of the Ocean and How to Protect Them* (Wildfire, 2019).

Professor Sissel Rogne (Norway)

CEO /Director, Institute for Marine Research and professor at Department of Biosciences, University of Bergen.

Dr Josh Veitch-Michaelis (UK)

Postdoctoral researcher in drone image analyses, Liverpool John Moores University.

Dr Carlie Wiener (USA/Canada)

Director, Marine Communications, Schmidt Ocean Institute. Formerly: Communications Manager, Centers for Ocean Science Education Excellence (COSEE) Island Earth; Research and Outreach Specialist, Hawaii Institute of Marine Biology Northwestern Hawaiian Islands Research Partnership, University of Hawaii. Writer and broadcaster.

Dr Lucy Woodall (UK)

Senior Research Fellow: Department of Zoology, University of Oxford, and Principal Scientist: Nekton Foundation.

Mr Paul Woods (UK)

Chief Innovation Officer, Global Fishing Watch, and architect of the technology platform. Formerly: interim CEO, Global Fishing Watch; CTO, SkyTruth.
