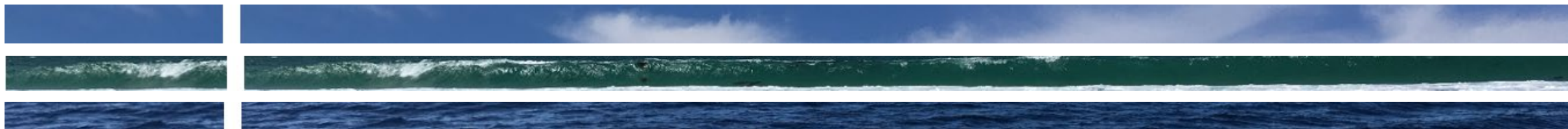




SCOR Virtual Annual Meeting 2020

20-22 October 2020



Session 3. Chair: Peter Burkill / Note taker: Enrique Montes

7:00 – 7:25 am (EDT): Report of the Ad Hoc Finance Committee / Feedback from Nominated Members

7:25 – 7:30 am (EDT): Introduction to Day 3 session

7:30 – 7:55 am (EDT): Affiliated projects reports

- IOCCG – Venetia Stuart (Yoo)
- InterRidge – Sang Mook Lee (Zhang)
- GACS – Anthony Richardson (Burkill)

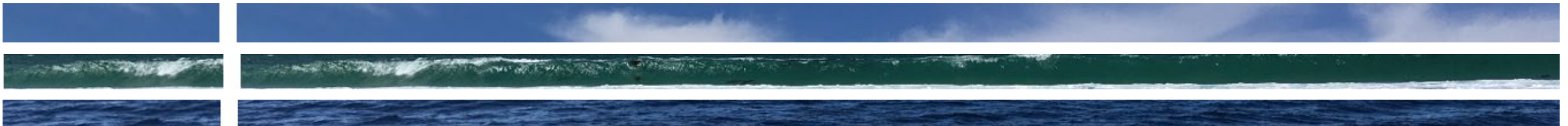
10 minutes Q&A

7:55 – 8:20 am (EDT): Affiliated organizations reports

- IABO – Enrique Montes
- IAPSO – Trevor McDougall
- IAMAS – Joyce Penner

10 minutes Q&A

8:20 – 8:30 am (EDT): BREAK



Session 3. Chair: Peter Burkill / Note taker: Enrique Montes (cont.)

8:30 – 9:25 am (EDT): Partner organization updates

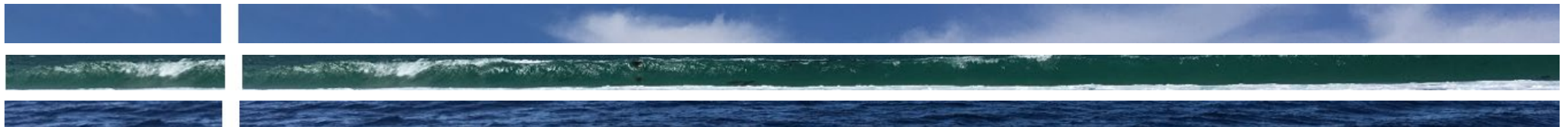
- IOC – Salvatore Arico (Sicre)
- PICES – Hal Batchelder (Yoo)
- GESAMP – Bob Duce
- POGO – Sophie Seeyave (Yoo)
- ISC – Martin Visbeck (Sicre)
- SCAR – Eoghan Griffin (Myers)
- Future Earth / Ocean – Clément Brousse (Sicre)
- WCRP – Mike Sparrow (Halpern)

15 minutes Q&A

9:25 – 9:30 am (EDT): Report on SCOR capacity development activities

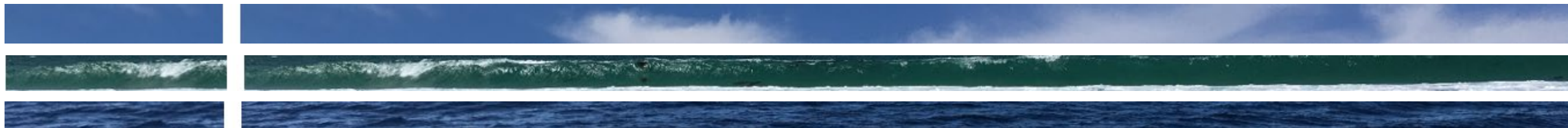
9:30 – 9:35 am (EDT): 2021-2023 meetings: Korea 2021, Ecuador 2022, suggestions for 2023

9:35 – 10:00 am (EDT): Close of meeting





2020 Financial Report



- Financial report 2020 -
given by the Finance Committee,
Virtual Meeting 21st October 2020

The *ad hoc* Finance Committee for 2020:

Isabel Ansorge (South Africa)

Peter Croot (Ireland)

Daniel Weihs (Israel)

Sun Song (China)

What we had to do

- ***Retrospective*** check of 2019 including audit
- Check ***current*** 2020 budget and suggested revisions
- Check ***projected*** budgets for 2021 for affordability and realism

Online meetings as a committee with Patricia and Ed (7 & 15 October 2020)

Summary...

- Finance committee suggests in the future that this committee meet via online meetings in the weeks prior to the SCOR meeting.
- The cash situation for 2020 allows the planned establishment of up to 3/4 new WGs in 2020 (financial situation indicates it is highly likely to be able to fund 2 additional WGs in 2021).
- The WG underspending was substantial in 2020 due to the ongoing pandemic and the move to online meetings.
- Given the current pandemic and associated financial uncertainty we would recommend that it is not necessary *in 2022* to change the current dues (Policy previously has been for dues to incrementally increase 3% in recent years).



Discussion- Finance Report





Affiliated projects reports





International Ocean Colour Coordinating Group (IOCCG)

Promoting the application of remotely-sensed ocean-colour and inland water radiometric data, across all aquatic environments, through coordination, training, liaising between providers and users, and advocacy and provision of expert advice.

Cara Wilson, IOCCG Chair

Venetia Stuart, IOCCG Scientific Coordinator

**Presenter:
Venetia Stuart**

SCOR Annual Meeting • 20-22 October 2020





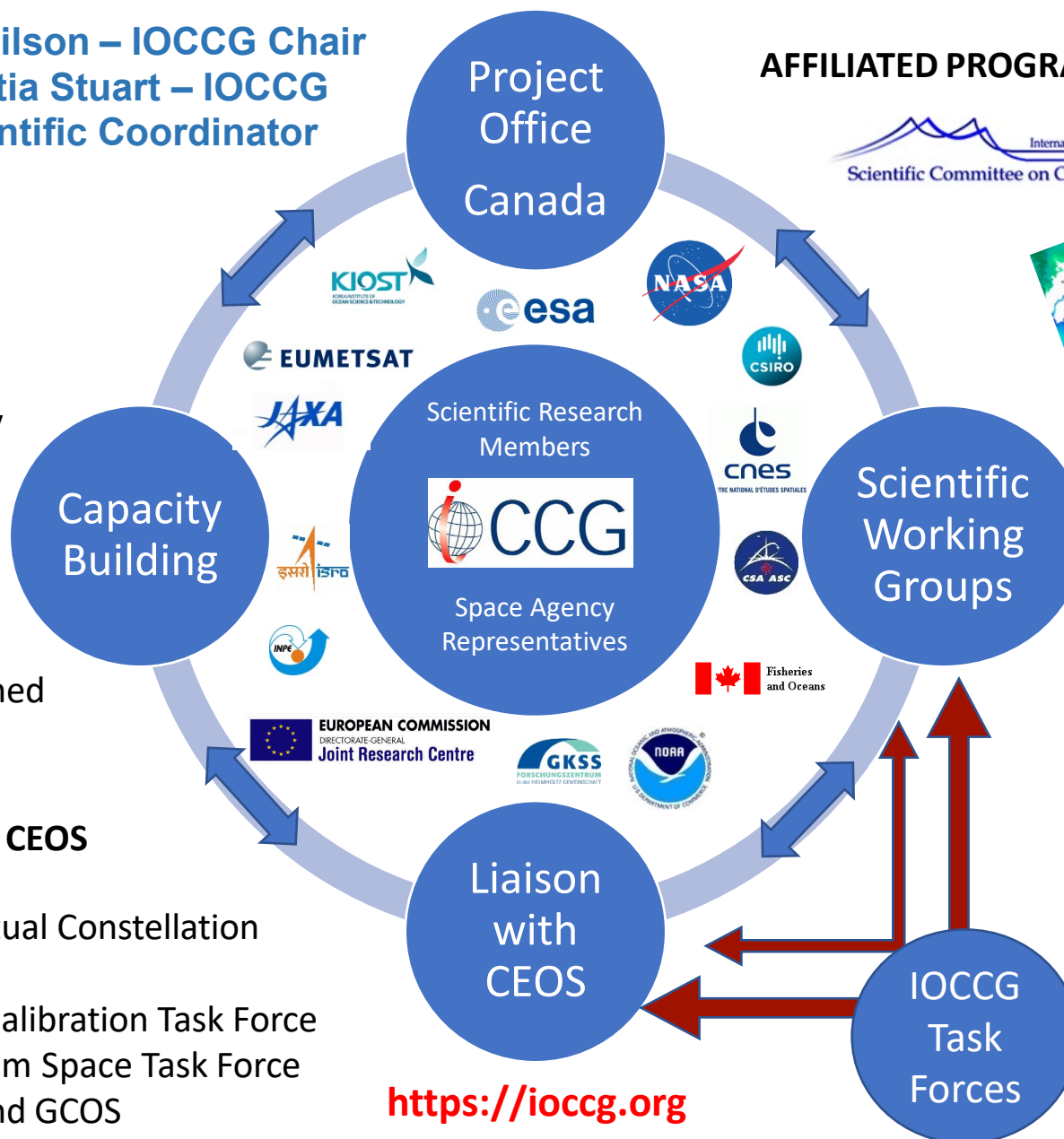
Cara Wilson – IOCCG Chair
Venetia Stuart – IOCCG Scientific Coordinator

AFFILIATED PROGRAM of SCOR



PUBLICATIONS

- Scientific Report Series (19)
- IOCCG Protocol Series (4)
- Handbook (1)
- New Technical Report Series
- Quarterly News Bulletins
- Special issue “C from Space”
- Comprehensive website with many resources



<https://ioccg.org>

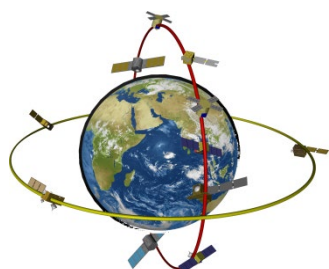
MEETINGS

- Annual Committee Meetings (21)
- Biennial International Ocean Colour Science meetings (4) – breakout workshops, keynotes, training, agency reports

TRAINING and CAPACITY BUILDING

- Advanced Summer Lecture Series (4)
- Introductory courses (24)
- >635 students from 89 countries trained
- Trevor Platt Memorial Scholarship

CEOS ASSOCIATE MEMBER of CEOS



- OCR-Virtual Constellation
- OCR-IT
- Sensor Calibration Task Force
- Litter from Space Task Force
- GOOS and GCOS

Current/Ongoing IOCCG Activities

- Special Journal Issue on “Aquatic Carbon from Space” – led by Chuanmin Hu (USF) and Laura Lorenzoni (NASA). Call for papers will be released soon.
- IOCCG Scientific report on “Observation of Harmful Algal Blooms with Ocean Colour Radiometry”, IOCCG # 20. To be published soon.
- IOCCG Technical Report on “Atmospheric Correction Algorithms over Optically-Complex Waters”. To be published soon.
- Two new protocols to be published soon: (i) – Absorption by CDOM, (ii) POC measurements
- New IOCCG working group on “Conducting Benthic Reflectance Measurements”
- Expected new IOCCG Task Force on “Remote Sensing of Plastic Marine Litter”
- Application for “Trevor Platt Memorial Scholarship” opening soon
- Committee meeting Feb 2021 hosted by ESA (may be cancelled?)



***Presenter:
Sang-Mook Lee***

InterRidge 2020 Update for SCOR

Prof. Sang-Mook Lee
Seoul National University
InterRidge Chair



Membership

Principle Members

- China
- France
- Norway
- Korea

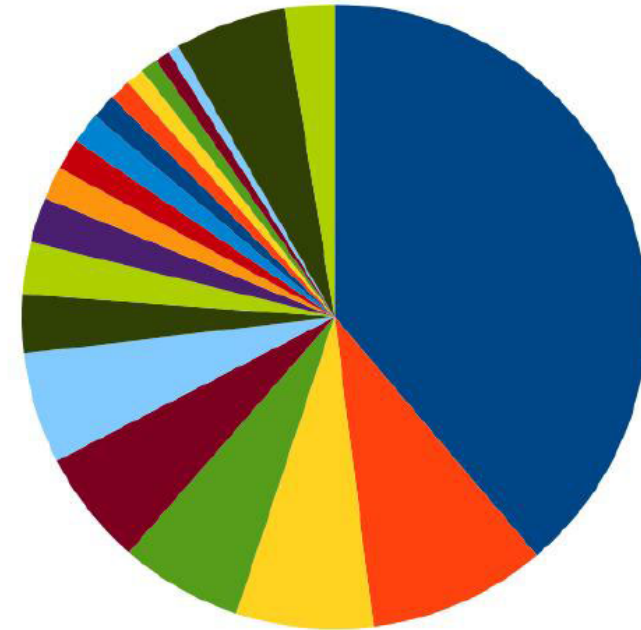
Regular Members

- Canada
- Germany
- India
- Japan
- *Poland*

Corresponding Members:

Australia, Brazil, Chile, Italy, Mauritius, New Zealand, Philippines, Portugal, Russia, United Kingdom, United States, South Africa

Increase of interest in InterRidge from developing nations, like Poland who are upgrading their membership this year



based on interridge-members list of 1708 records



Current Status:

InterRidge is hosted by Korea at Seoul National University (SNU)

Sang-Mook Lee is the Chair

Erik Sevre is the Coordinator

Seongjun "Kyle" Park is the Logistics Coordinator

InterRidge is following the Third Decadal Plan 2014-23

Promotion of MOR Scientific Collaborations

- To advance understanding of global mid-ocean ridge systems through seagoing observations and international collaborations
- Promoting basic science as well as possible applications and technologies
- Covering not just ridge crests but entire oceanic crust (from rich to subduction zones)
- Focused studies via Working Groups
- Started a new Working Group MACROCHESS to promote multidisciplinary studies of deep-sea vents and ecology

Interest & Future Directions

- Age of Coronavirus changing how we communicate
- Running online webinars on diverse topics related with deep-sea and mid-ocean ridges
- Constructing useful databases for ridge scientists and public outreach

Upgrading InterRidge Website (<https://www.interridge.org/>)

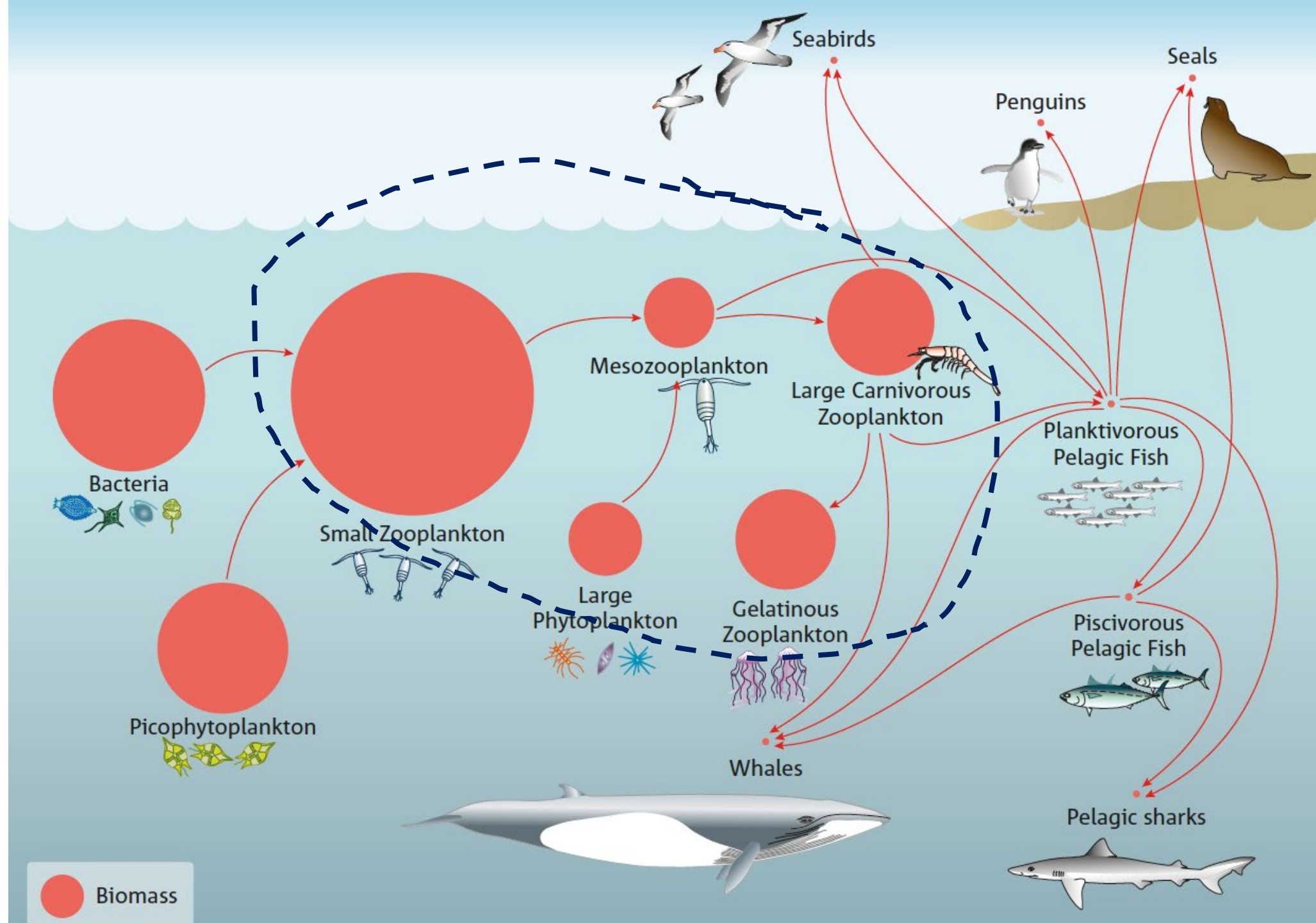
- Website will host Vents Database and new MACHROCHESS additions
- Working to upgrade the website to better facilitate collaboration



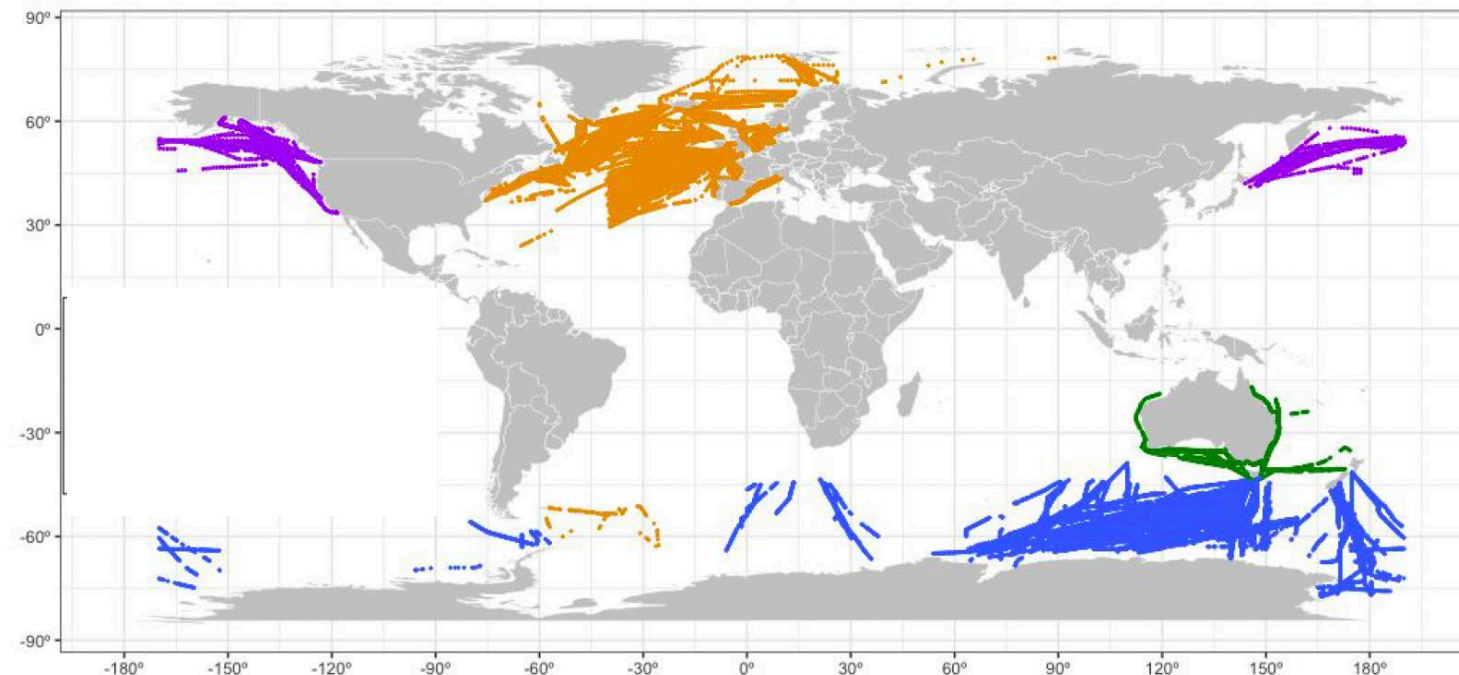
Global Alliance of Continuous Plankton Recorder Surveys (GACS)

Anthony J. Richardson





“Global” Alliance of CPR Surveys (GACS)



GACS partners

North Atlantic (UK)
Northeast Pacific (Canada)
Northwest Pacific (Japan)
IMOS (Australia)
Japan Antarctic program (Japan)
New Zealand program (New Zealand)
Brazilian Antarctic program (Brazil)
Benguela LME (South Africa)
China program (China)
Marion Dufresne (France)
Cyprus program (Cyprus)
Indian program (India)

1. GACS data are evolving...



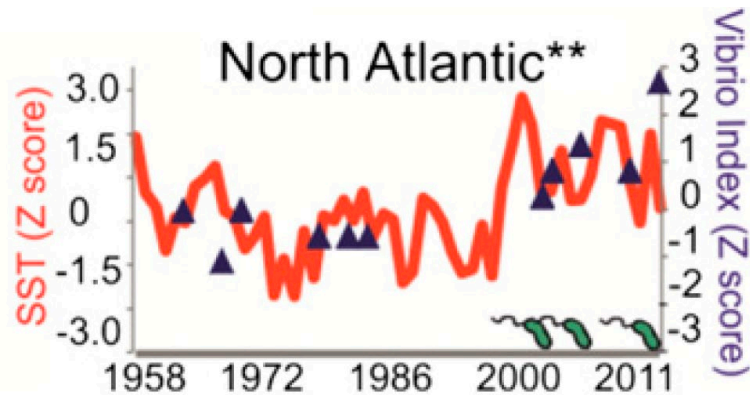
Links to SCOR WG 154 P-OBS

1. GACS data are evolving...

Climate influence on *Vibrio* and associated human diseases during the past half-century in the coastal North Atlantic

Luigi Vezzulli^{a,1}, Chiara Grande^a, Philip C. Reid^b, Pierre Hélaouët^b, Martin Edwards^{b,c}, Manfred G. Höfle^d, Ingrid Brettar^d, Rita R. Colwell^{e,f,1}, and Carla Pruzzo^a

^aDepartment of Earth, Environmental, and Life Sciences, University of Genoa, 16132 Genoa, Italy; ^bSir Alister Hardy Foundation for Ocean Science, Plymouth PL1 2PB, United Kingdom; ^cInstitute of Marine Studies, University of Plymouth, Plymouth PL4 8AA, United Kingdom; ^dDepartment of Vaccinology and Applied



Links to SCOR WG 157 MetaZooGene

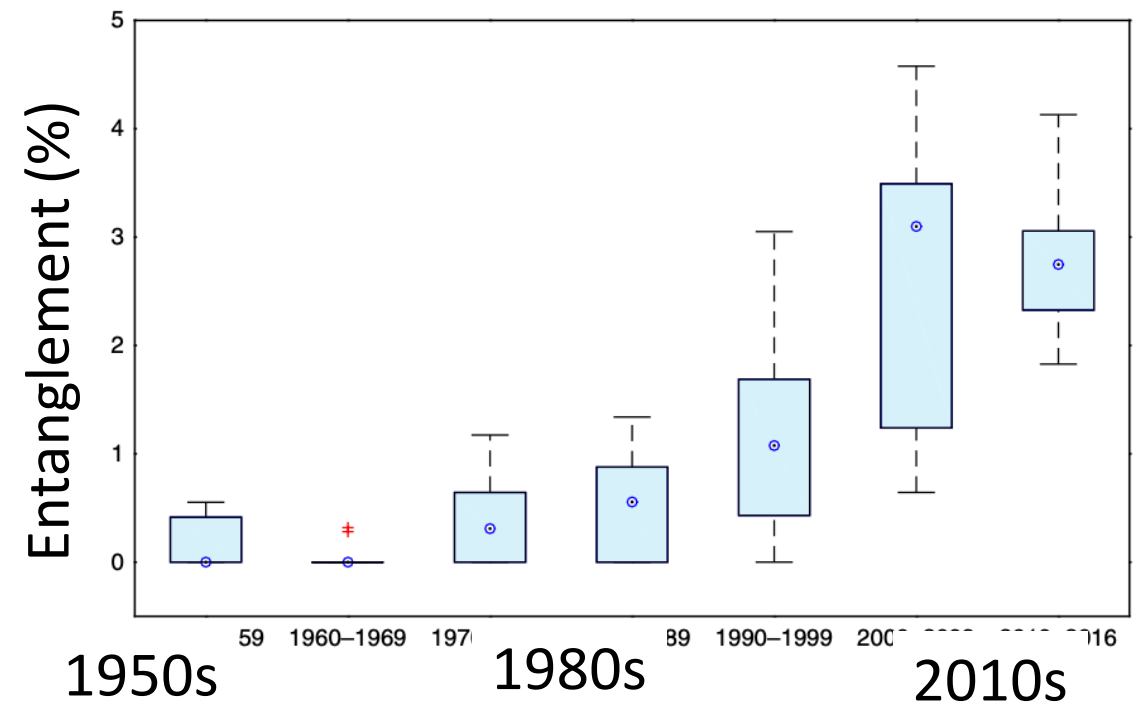
ARTICLE

<https://doi.org/10.1038/s41467-019-09506-1>

OPEN

The rise in ocean plastics evidenced from a 60-year time series

Clare Ostle¹, Richard C. Thompson², Derek Broughton¹, Lance Gregory¹, Marianne Wootton¹ & David G. Johns¹



Links to SCOR WG 153 FLOTSAM

2. GACS data uses: Model assessment



Ecological Modelling

journal homepage: www.elsevier.com/locate/ecolmodel

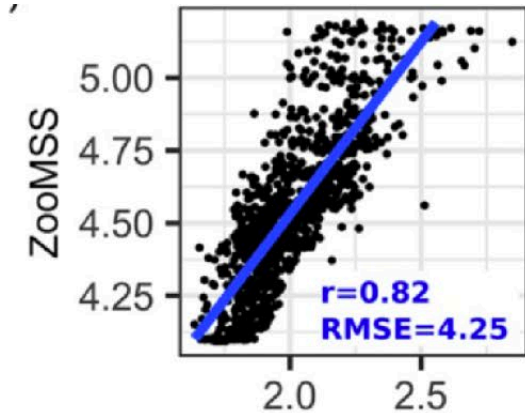
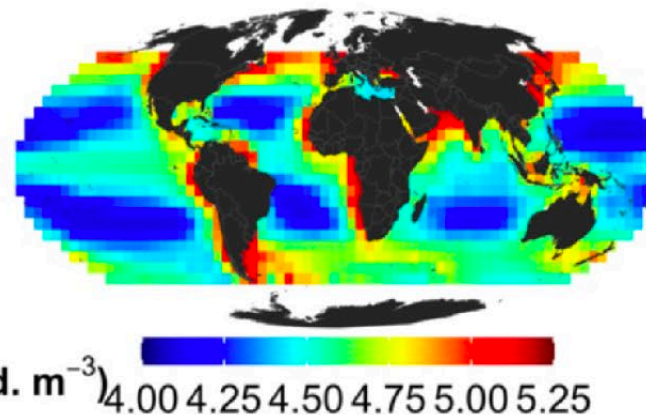
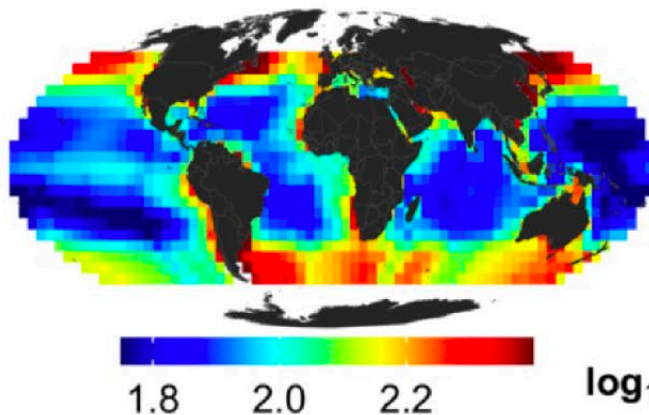
A functional size-spectrum model of the global marine ecosystem that resolves zooplankton composition

Ryan F. Heneghan^{a,b,c,*}, Jason D. Everett^{a,d,e}, Patrick Sykes^a, Sonia D. Batten^f, Martin Edwards^g, Kunio Takahashi^h, Iain M. Suthers^d, Julia L. Blanchard^e, Anthony J. Richardson^{a,i}

GACS + Net data

Size spectrum model

Omnivorous
Copepods

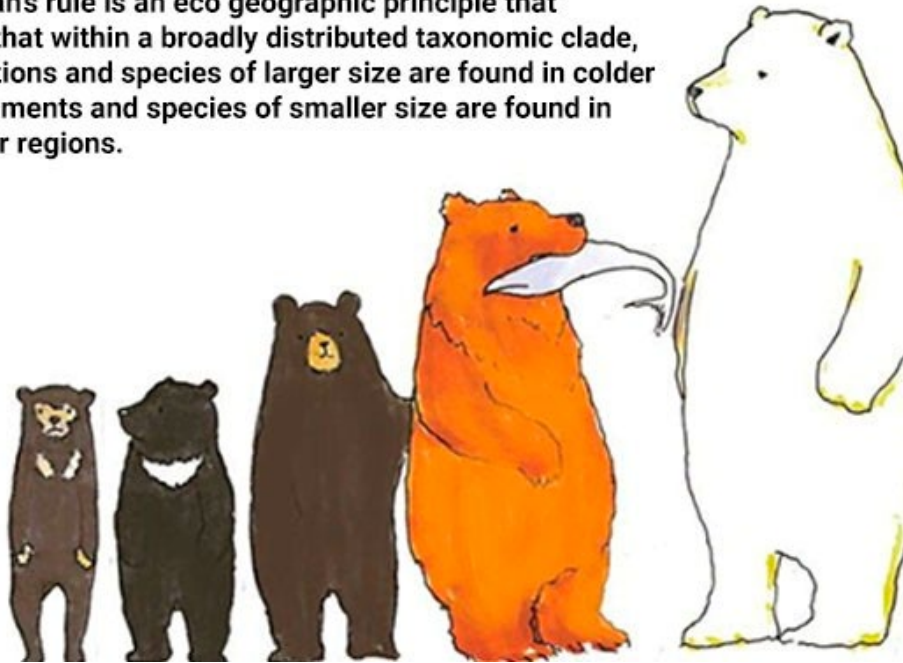


Carnivorous copepods, Euphausiids, Chaetognaths, Larvaceans, Salps, Jellyfish

2. GACS data: Testing ecological theory

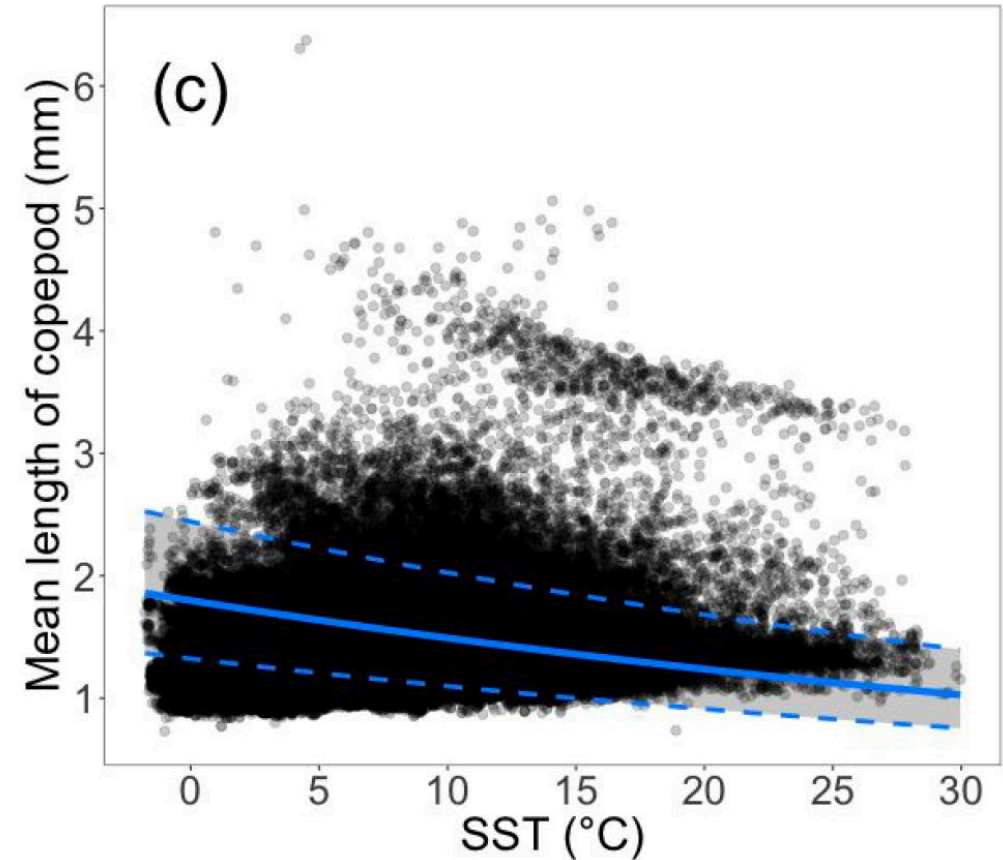
Bergman's Rule

Bergman's rule is an eco geographic principle that states that within a broadly distributed taxonomic clade, populations and species of larger size are found in colder environments and species of smaller size are found in warmer regions.



Tropical

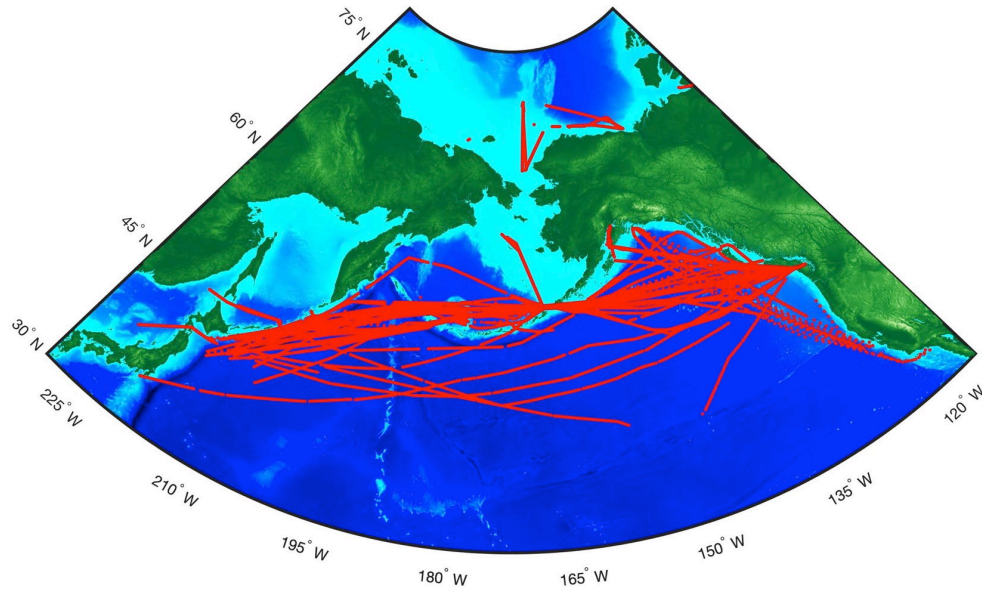
Polar



~7% decline in copepod body mass globally

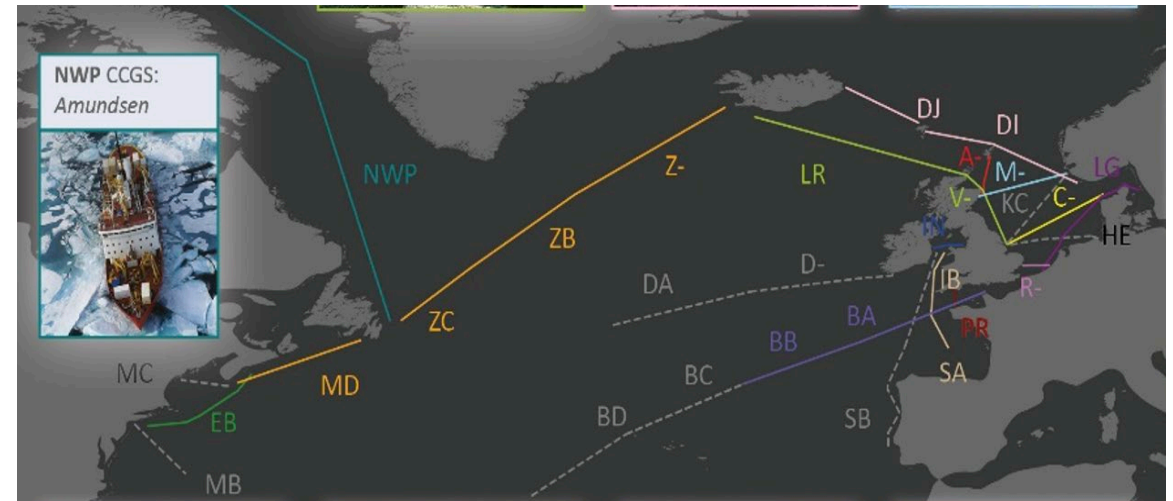
Campbell et al. (submitted) *Ecography*

3. GACS expansion



Arctic Ocean CPR route funded by NERC Arctic Office and BEIS Tows during summer 2018-2020, looking for ongoing funding...

Gulf of Maine route re-starting (Chris Melrose, NOAA)



Restarting route west of Ireland



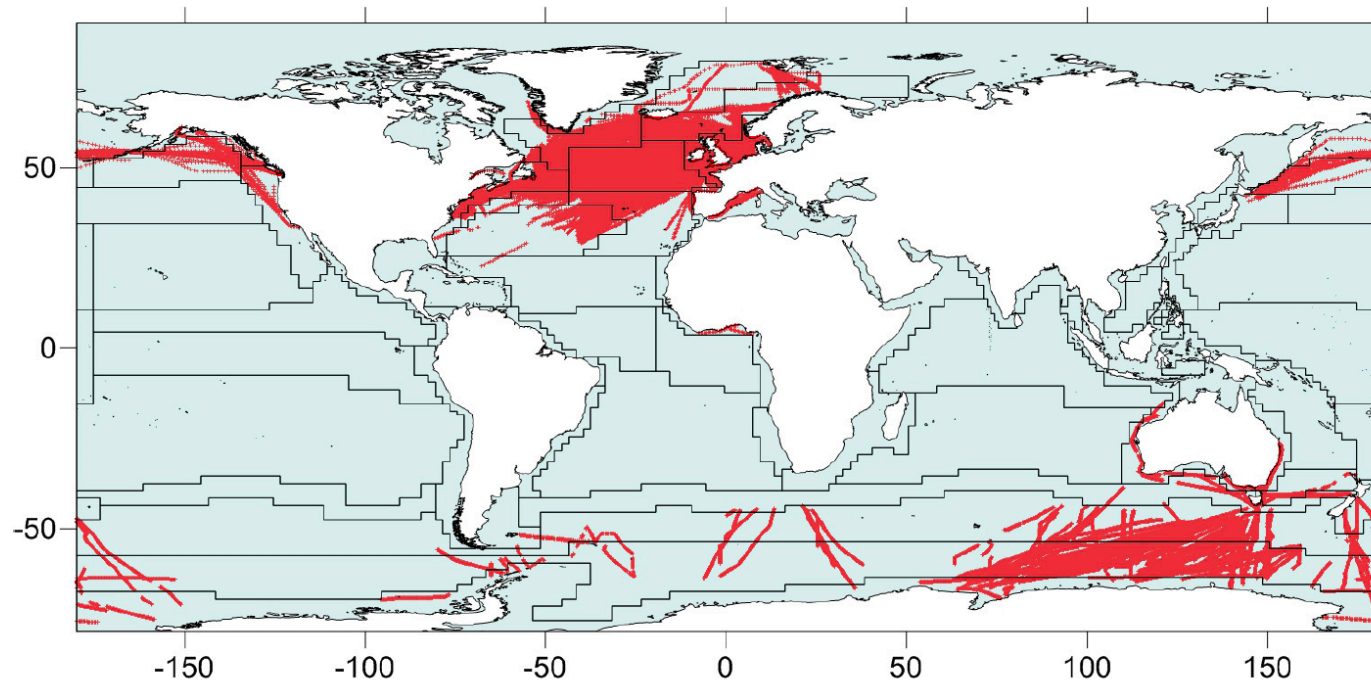
3. GACS expansion

A Global Plankton Diversity Monitoring Program

<https://www.frontiersin.org/articles/10.3389/fmars.2019.00321/full>

Sonia D. Batten^{1}, Rana Abu-Alhaija², Sanae Chelloufi³, Martin Edwards⁴, George Graham⁵, R. Jyothibabu⁶, John A. Kitchener⁷, Philippe Koubbi⁸, Abigail McQuatters-Gollop⁹, Erik Muxagata¹⁰, Clare Ostle⁵, Anthony J. Richardson^{11,12}, Karen V. Robinson¹³, Kunio T. Takahashi¹⁴, Hans M. Verheye^{15,16} and Willie Wilson⁵*

A global analysis of BGC models and existing data are needed to design a global program



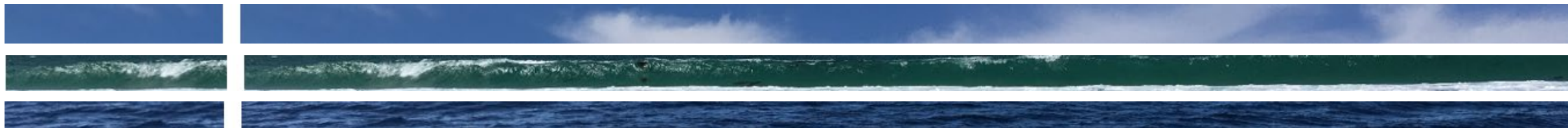


IOCCG – Ocean colour

InterRidge – Ridge studies

GACS – Alliance of Plankton Recorders

Q&A





Affiliated organizations reports



Presenter:
Enrique Montes



International Association for Biological Oceanography - IABO

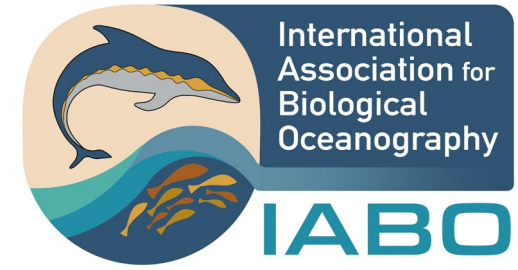
2020 SCOR Annual Meeting – Virtual

20 October 2020 - 22 October 2020

Enrique Montes – Acting President
College of Marine Science
University of South Florida
emontesh@usf.edu

Mission

IABO seeks to promote the advancement of knowledge of the biology of the sea, by providing opportunities for communication between marine biologists and co-operating with organizations and individuals with similar aims and interests.



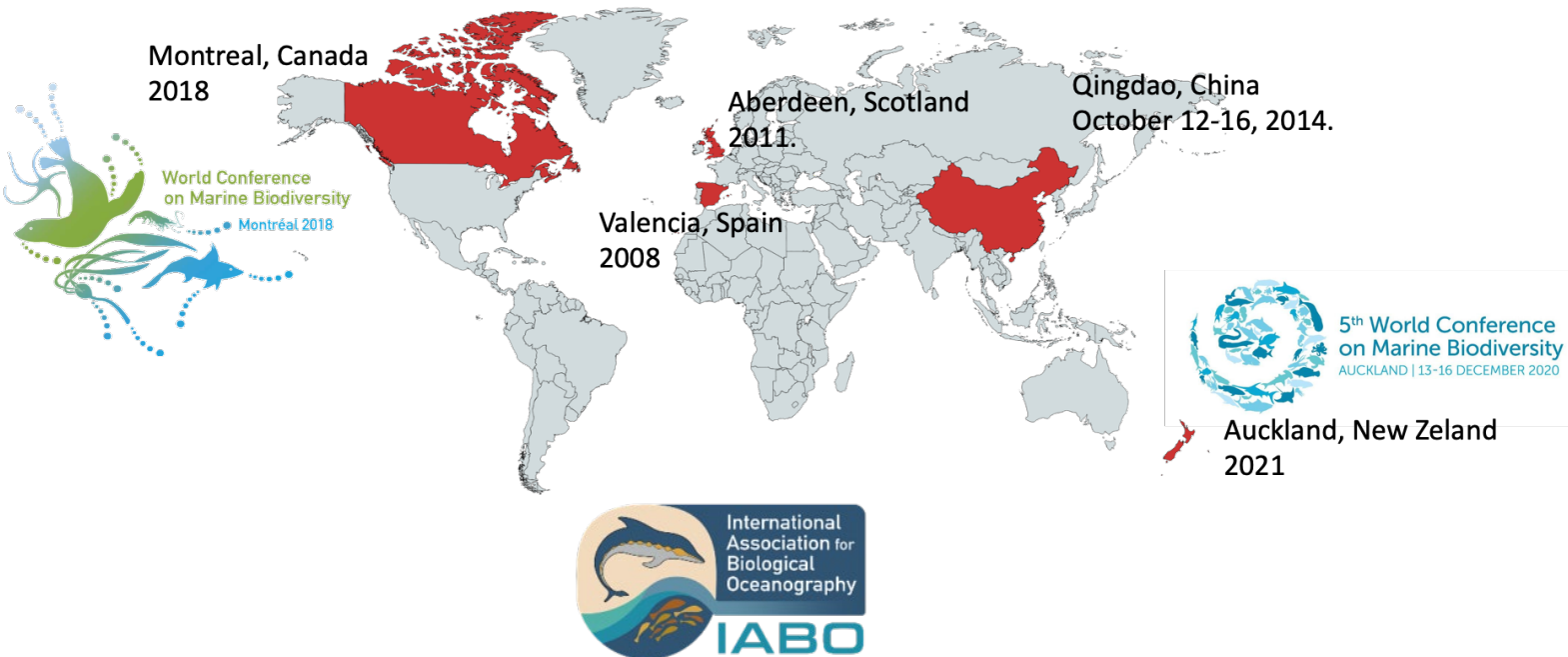
Objectives

- Promote the study of marine biology, biological oceanography and other related sciences.
- Promote interdisciplinary communication between marine biologists and other ocean stakeholders by organizing and supporting international fora.
- Encourage international networking and collaboration between organizations and individuals with similar aims and interests around the world.
- Recognize and award outstanding accomplishments in marine biodiversity science.



World Conference on Marine Biodiversity

The World Conference on Marine Biodiversity has become the major focal assembly for sharing research outcomes, management and policy issues, and for discussions of the role of biodiversity and biodiversity conservation in sustaining ocean ecosystems.



Carlo Heip Excellence Award

2020
Prof. Steve Hawkins
University of Southampton



2019
Prof. Graham Edgar
University of Tasmania



2018
Prof. Carlos Duarte
King Abdullah University



***Presenter:
Trevor McDougall***



**International Association
for the Physical Sciences of the Oceans**

International Association for the Physical Sciences of the Oceans (IAPSO)

2019 Assembly

The IAPSO scientific sessions were held from 9-14 July in Montreal and included 11 IAPSO symposia (216 oral presentations and 94 posters) and 5 IAPSO-lead Association Joint symposia (111 oral presentations and 51 posters). IAPSO also co-sponsored 12 Joint symposia led by another Association (189 oral presentations and 104 posters). The program details can be found on the Assembly's website: <http://www.iugg2019montreal.com/p.html>. Approximately 4000 participants attended this General Assembly, of which 359 registered as IAPSO.

The IAPSO highlight during the assembly included

- the Union Lecture 'The Ocean's Role in Atmospheric Carbon Dioxide Changes During Ice Age Cycles' given by Prof. Karen Kohfeld (Simon Fraser University, Canada);
- the Prince Albert I, 2019 lecture 'Decadal variability in the ocean CO₂ sink' given by Prof. Corinne Le Quéré (University of East Anglia, United Kingdom), who was awarded the Prince Albert I Medal in connection with the lecture;
- the ECS Medal in Physical Oceanography, 2019 talk 'Overtuning variability with observations' given by Gerard McCarthy (Maynooth University, Ireland);
- the ECS Medal in Chemical Oceanography, 2019 talk 'Nitrogen fixation across scales' given by Mar Benavides (Mediterranean Institute of Oceanography, France).

IAPSO also awarded a further medal, the Eugene Lafond Medal, to a developing world scientist who gave a notable paper at an IAPSO sponsored or co-sponsored symposium. Following the procedure, presentations (oral or poster) of selfnominating candidates The medal was awarded to Mr. Rohith Balakrishnan, for his oral presentation 'Basin-wide sea level coherency in the tropical Indian Ocean driven by Madden-Julian oscillations'.

2021 Assembly

IAPSO has been actively organizing the IAPSO-IAMAS-IACS Joint Assembly in Busan, South Korea, 18-23, July 2021, but in early June 2020, in a Zoom meeting held between the Local Organizing Committee and the Presidents and Secretary Generals of IAPSO, IAMAS and IACS, we decided to cancel this in-person joint assembly, due to the COVID-induced uncertainty surrounding international travel. We are now in active discussions regarding what IAPSO on-line activity might occur on these same dates in 2021.

IAPSO Early Career Scientist Working Group

The IAPSO Early Career Scientist (ECS) Working Group was established in 2018, chaired by Alejandra Sanchez-Franks (United Kingdom) and co-chaired by Malin Ödalen (Sweden). The first IAPSO ECS networking event was organized on 9 July, 2019, during the IUGG 2019 General Assembly, with about 30 early career scientists participating. This IAPSO ECS group has now produced a website (<https://www.iapsoecs.org>) and a twitter account (https://twitter.com/iapso_ecs?s=20) for this working group, where the newsletters, job and research cruise opportunities and ECS-related events get routinely updated. There are now over 100 members in the IAPSO ECS network signed up to the mailing list. The IAPSO ECS Working Group organized and submitted a review of the Second Order Draft of the Working Group I (WG1) contribution to the sixth IPCC Assessment Report.

IAPSO Best Practice Study Groups

IAPSO has begun to fund IAPSO Best Practice Study Groups, expecting to fund one of these per year. An IAPSO Best Practice Study Group will address an issue whose resolution will assist in the conduct of oceanographic research. In carrying out oceanographic research, a choice must frequently be made between a few options for measuring data, analysing data, processing software, or modelling a system. The reasons for choosing between competing methods are often not well documented and the relative strengths and weaknesses of these routes are usually not published or well known. Each Best Practice Study Group will receive up to US\$10,000 towards the costs of a meeting. In January 2020 we chose the first two such IAPSO Best Practise Study Groups (out of nine quality applications), one concerned the use of data from moored CTD instruments, and the other with the measurement accuracy and interpretation of pH measurements.

IUGG 100 years anniversary

Formed in Brussels (Belgium) on 28 July 1919, the International Union of Geodesy and Geophysics (IUGG) celebrated its 100th anniversary in 2019. At the meeting in Brussels in 1919 a Section of Physical Oceanography was also formed, which gave birth to the current IAPSO. The centennial year marks an important milestone for IUGG. Since its inception as a union of international scientific associations, IUGG has developed into a prominent scientific organizations promoting Earth and space sciences worldwide in the complicated political, economic and scientific landscapes of the 20th and the beginning of the 21st centuries. To celebrate the centenary of the IUGG and its Associations, various initiatives were implemented including:

- the implementation of a website that traces the history: <http://100.iugg.org/index.php>;
- the publication of the special issue of History of Geo- and Space Sciences (HGSS), ‘The International Union of Geodesy and Geophysics: from different spheres to a common globe’, https://www.hist-geo-space-sci.net/special_issue996.html, including the paper “IAPSO: tales from the ocean frontier”, <https://www.hist-geo-space-sci.net/10/137/2019/>;
- the event ‘Centennial International Cooperation in Earth and Space Sciences at the UNESCO Headquarters, Paris, FRANCE, 29 July 2019, program: http://100.iugg.org/events/IUGG_program_Paris_Jul_29_2019.pdf.

The Guest of Honour was HMSH Prince Albert II of Monaco and he made reference to the work of his great great grandfather who was the first President of IAPSO and applauded IAPSO’s work. In turn Denise Smythe-Wright was able to thank him personally for his support of IAPSO and the IAPSO Prince Albert I medal.

IUGG/IAPSO support to scientific meetings

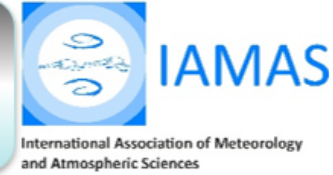
IAPSO endorsed the following two scientific meetings that were supported by IUGG:

- Workshop on Sea Level Data Archaeology, which took place in Paris, France, 10-12 March 2020.
- Tsunamis in Latin America and the Caribbean: Recent Developments and Plans for the Future, Quito, Ecuador, 3-5 August 2020. This meeting has been postponed due to the covid pandemic.

Presenter:
Joyce Penner



**International Association of Meteorology and
Atmospheric Sciences sponsors 10
Commissions:**



Radiation



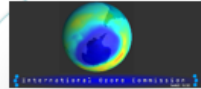
**Atmospheric
Chemistry and
Global Pollution**



**Atmospheric
Electricity**



**Clouds and
Precipitation**



Ozone

- Understanding atmospheric phenomena
- Earth observation and monitoring
- Weather and climate modeling
- Study of climate variability and change on the Earth and other planets
- Next generation education



**Polar
Meteorology**



**Planetary
Atmospheres
and their
Evolution**



**Meteorology
of the Middle
Atmosphere**



**Dynamic
Meteorology**



Climate



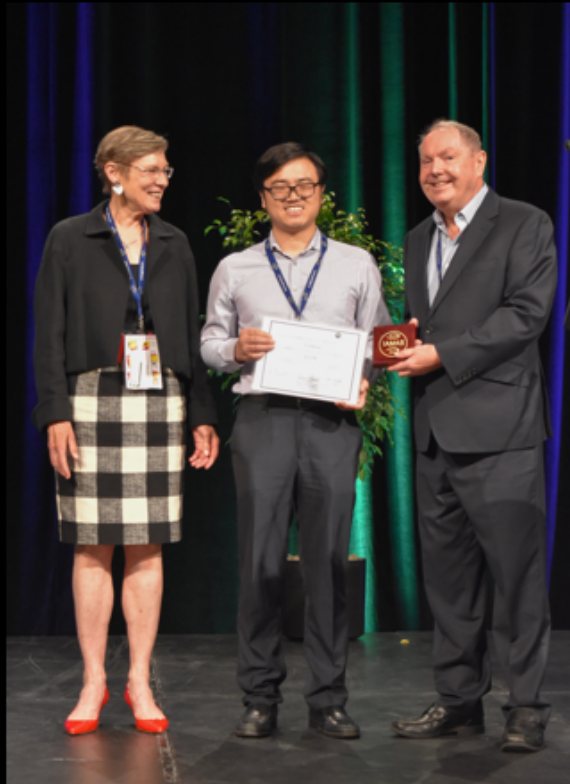
Union Geodesique et Geophysique Internationale International Union of Geodesy and Geophysics



- Quadrennial International Radiation Symposium planned for Thessaloniki, Greece, from 6 to 10 July 2020 has been postponed to 14 to 18 June 2021.
- International Conference on Clouds and Precipitation planned for Pune, India, from 3 to 7 August 2020 has been postponed to 2021.
- The International Global Atmospheric Chemistry Conference planned for Manchester, UK, from 14 to 18 September 2020 has been postponed to 12 to 16 September.
- International Ozone Commission Quadrennial Ozone Symposium QOS2020 planned for Seoul, from 4 to 10 October 2020 has been postponed to 3 to 9 October 2021.
- Our IAMAS-sponsored commission meetings that were scheduled for 2020 have been delayed to 2021
- As a result the joint IAMAS-IACS-IAPSO Joint Assembly planned for Busan, S. Korea in July 2021 will be an on-line meeting featuring all invited talks with the total time roughly 2 hours/day



Union Geodesique et Geophysique Internationale International Union of Geodesy and Geophysics



We are working through our Strategic Plan: Involvement of Early Career Scientists:

- IAMAS Early Career Scientist Medal given every 2 years
- We are in the process of interviewing applicants for our Early Career representative to the Bureau and hope he/she will help us organize our appeal to Early Career scientists for future meetings (such as an invited Early Career session for 2021)

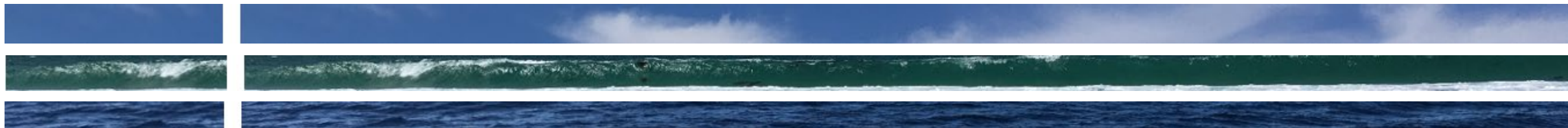


IABO – Biological Oceanography

IAPSO – Physical Oceanography

IAMAS – Meteorology and Atmosphere

Q&A

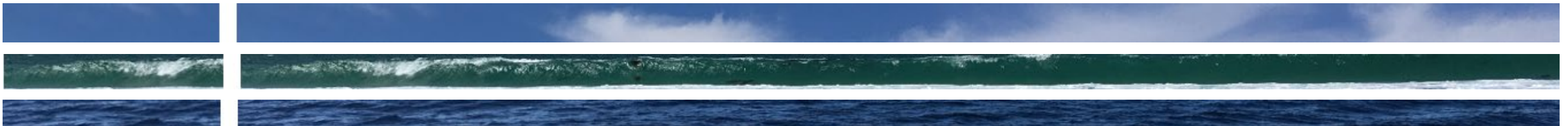




10-minute BREAK

8:20 – 8:30 am /

12:20 – 12:30 UTC





Partner organization updates



SCOR 2020 ANNUAL MEETING

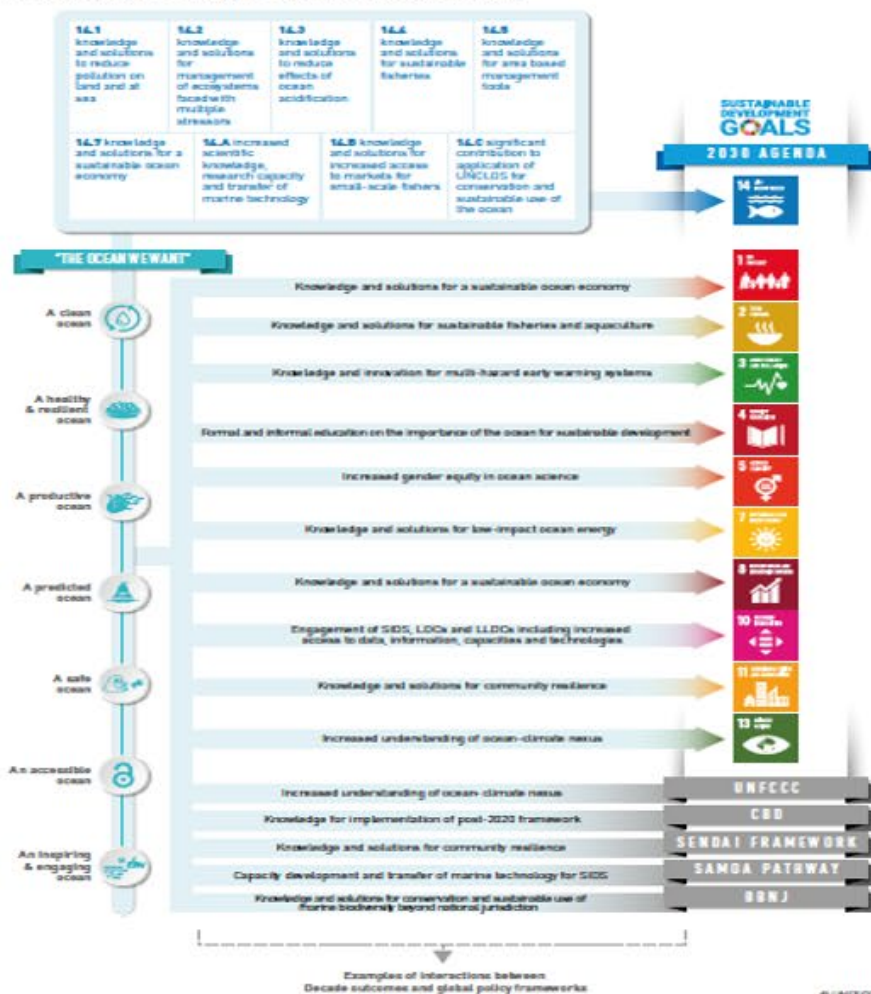
Salvatore Aricò, PhD

Intergovernmental Oceanographic Commission

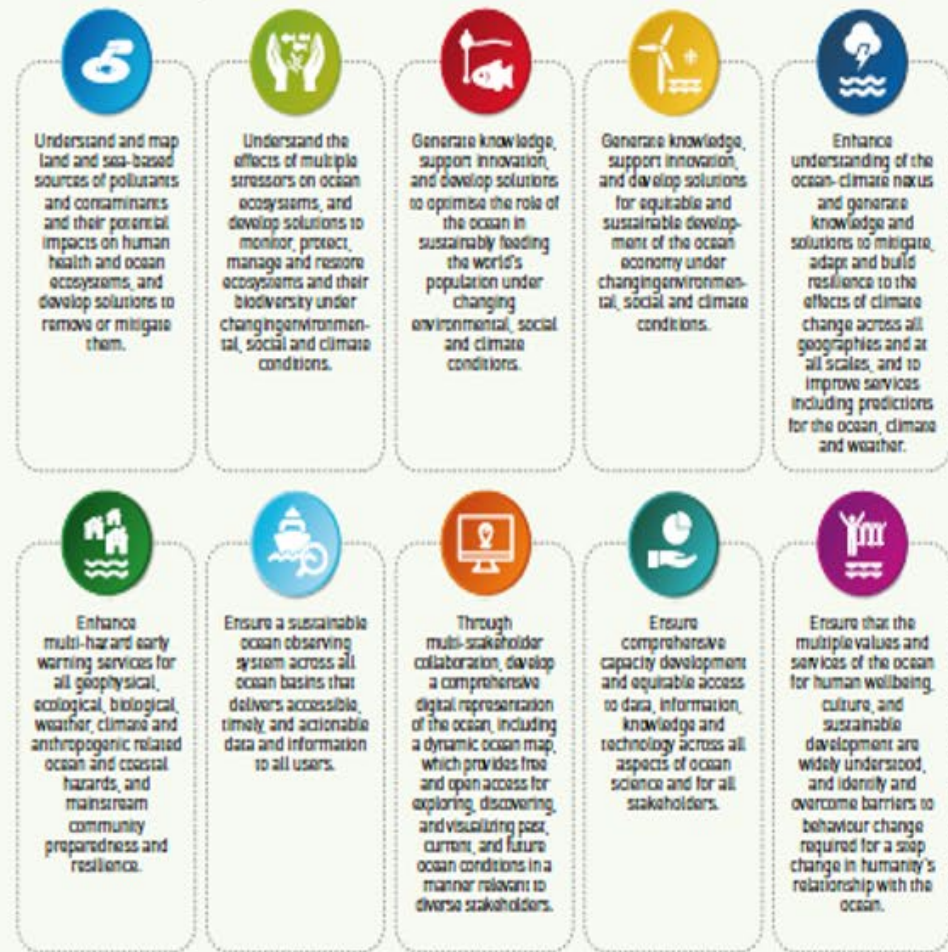


The Ocean Decade: Outcomes, Challenges and Engagement

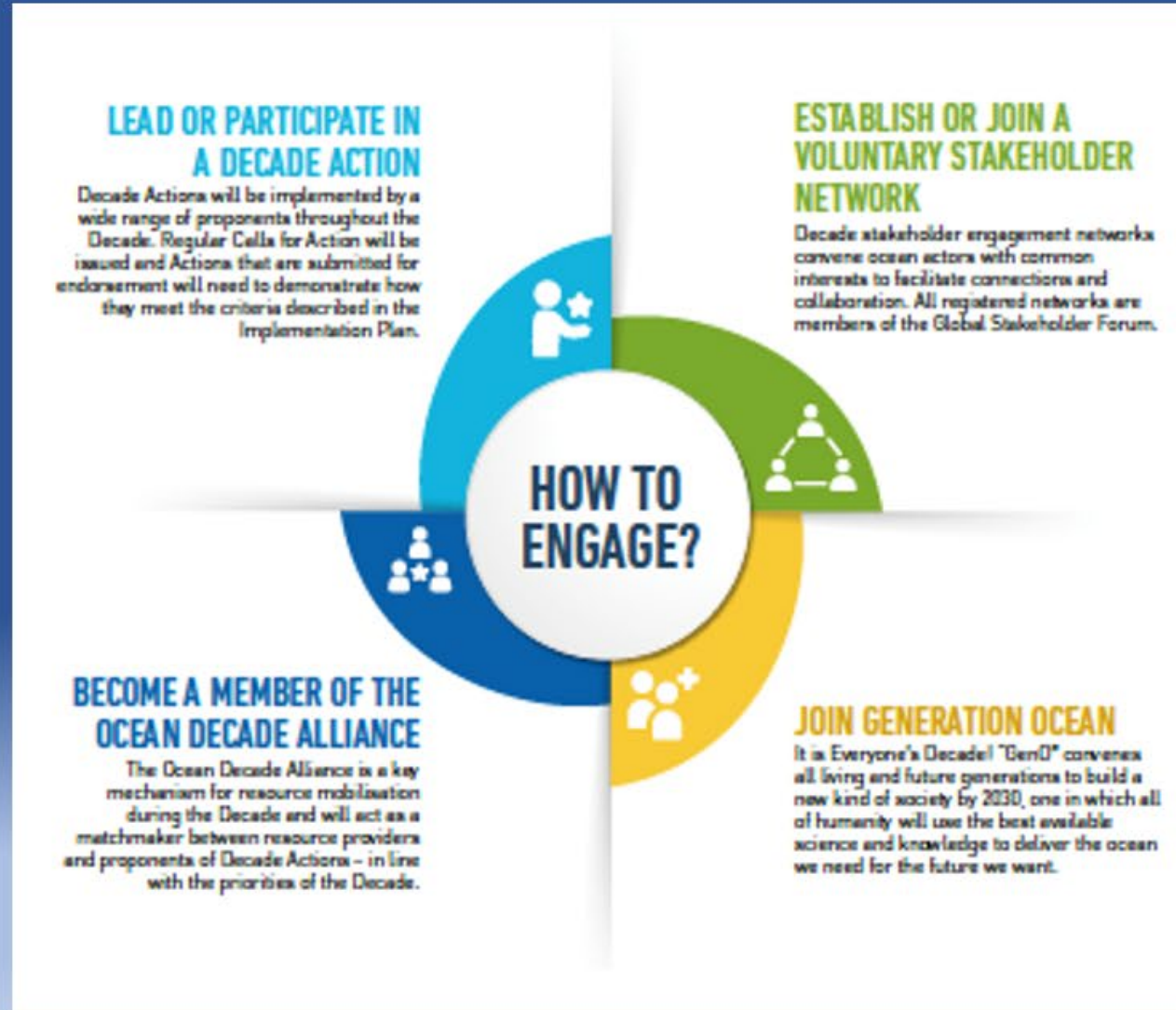
Interactions with the 2030 Agenda and related policy frameworks



Ocean Decade Challenges



The Ocean Decade: Outcomes, Challenges and Engagement



Activities involving close cooperation and coordination between IOC and SCOR

- GlobalHAB, joint endeavor
- Multiple stressors (re SCOR WG 149)
- EBUS? (re SCOR WG 155)
- IOC-R (re SOLAS, IMBER, Joint Carbon Implementation Plan...)
- IGMETS (Time Series – formerly SCOR WG137)

Ocean Acidification, SDG 14.3.1 (re InterSEEP)

Thank you.

s.arico@unesco.org



North Pacific Marine Science Organization (PICES)

- **Intergovernmental science** organization, est. in 1992
- **Member countries:** Canada, Japan, China, Korea, Russia, USA
- **Mission:** *"To promote and coordinate marine scientific research in the North Pacific Ocean and adjacent seas in order to advance scientific knowledge of the area concerned and its living resources."*
- PICES provides science expertise to SCOR Research: **GlobalHAB, IMBER, SOLAS, GACS, IOCCP.**
- PICES sponsors members to SCOR WG's: **125, 134, 137, 146, 149, 154, and 155.**
- Together, PICES/SCOR support capacity building:
 - SCOR's generous **USD\$10,000 GlobalHAB program fund donation** supported a well-attended **2.5 day** workshop in Oct 2019. **Result:** A 7-Chapter PICES *Special Publication* on HABs (to be posted on PICES and GlobalHAB websites).
 - **PICES/SCOR share capacity building ideas / support:** Dr. Batchelder – serves as an external liaison to SCOR's Capacity Building Committee (since 2012)
 - SCOR funded 7 ECS to PICES-2019 from: Nigeria, India, China(3), Russia, Peru
 - *(more details in the report in your briefing book)*



PICES/SCOR Collaboration Success: Sharing Strengths and Travel Funding



PICES greatly appreciates SCOR's long standing willingness to provide financial support for participants from non-PICES countries to our annual meetings and sponsored international activities. Examples from 2018 are:

a) SCOR provided \$3000 USD to support international travel of participants from developing countries to attend an international symposium on Understanding Changes in Transitional Areas of the Pacific, held in La Paz, Mexico in April 2018.

b) SCOR provided \$3000 USD to support international travel of ECS from developing countries to attend the 4th Effects of Climate Change on the World's Oceans Symposium that was held in Washington, DC in June 2018.

COMMENT: the close relationship between PICES and SCOR extends back to the period when Liz Gross was Executive Secretary of SCOR and continued through the Ed Urban era. PICES hopes to continue to collaborate with SCOR through the Patricia Miloslavich period also.



PICES request for sponsorship



- **PICES appreciates SCOR's previous generous financial support**, providing travel for scientists from developing countries to attend International Symposia such as those held in La Paz, Mexico, and Washington DC, in 2018 (previous page).
- **PICES requests new support from SCOR of USD\$5000 to support scientists from “economies in transition” to attend the Small Pelagic Fish (SPF) Symposium:**
SPF website: <https://meetings.pices.int/meetings/international/2022/pelagic/scope>
- ***Small Pelagic Fish: New Frontiers in Science for Sustainable Management***, February 21-25, 2022, Lisbon, Portugal. (Est: 250-300 participants).
Small pelagic fish (SPF) account for more than 30% by weight of the total landings of marine capture fisheries around the world and are crucial for ensuring global food security. SPF also play an important role in the transfer of energy in food webs through mid-trophic levels. The symposium will highlight the state-of-the-art in various topics linked to the ecological role of SPF, the dynamics of their populations, and the conditions necessary for their sustainable exploitation.
- **Selection:** by Symposium coordinators and SSC members; Criteria: Age; relevant abstract; priority given to applicants requiring partial support.
- **Mentoring:** Subcommittee organizing networking opportunities for ECS; Session conveners written judging of ECS oral/poster presentations; post-symposium survey.



GESAMP WORKING GROUP 38

THE ATMOSPHERIC INPUT OF CHEMICALS TO THE OCEANS

Annual Report to SCOR by the Co-Chairmen of GESAMP Working Group 38

Robert Duce and Timothy Jickells

Development of a workshop on the ocean management and policy implications of the air/sea exchange of chemicals.

Plans have been developed, funds have been obtained from several UN agencies and from SOLAS, and individuals have been invited for a workshop which was to be held in October, 2020 at Nelson Mandela University, Port Elizabeth, South Africa, entitled “**What is the potential role of atmospheric deposition in driving ocean productivity in the Madagascar Channel and Southwest Indian Ocean – an adaptive-dynamic management approach within Large Marine Ecosystems**”. Unfortunately, due to COVID-19, this in-person workshop has now been postponed, likely until October, 2021.

Preparatory work for this workshop will be done during the interim period. This workshop, which will include international scientists, managers, and policymakers, will evaluate the atmospheric inputs and impacts of nutrients from biomass burning and industrial emissions in the southern Africa region. It will also include a significant capacity building activity for African students.

Presenter: Bob Duce

Development of a virtual workshop on the atmospheric transport of microplastics to and from the ocean

WG 38 has developed, in cooperation with GESAMP WG 40 (Plastics and Microplastics in the Ocean), a virtual workshop entitled **“The Atmospheric Transport of Microplastics to and from the Ocean”**. The early scientific evidence suggests that atmospheric transport of microplastics to the ocean may be a quantitatively important and under-studied aspect of the broader issue of oceanic microplastic contamination. Thus WG 38 and WG 40 are proposing a joint activity - a virtual workshop, with the following Terms of Reference:

- ❖ Identification of our current understanding and estimations of significant sources and types of atmospheric microplastics, their atmospheric transport paths, and their inputs to and from the global ocean; and
- ❖ Identification of an appropriate future atmospheric and marine sampling and measurement strategy to enable more accurate estimations of the above to be made.

This virtual workshop will take place from November 17-19, 2020, and will include 20-25 invited scientists.

Recent publications of WG 38

WG 38 continues its effort to publish the results of its activities and workshops in the peer-reviewed scientific literature. Following are publications since our report last year:

16. Ito, A., S. Myriokefalalitikis, M. Kanakidou, et al., 2019, "Pyrogenic iron: The missing link to high iron solubility in aerosols", Science Advances, **5**: eaau7671.
17. Smith, S.R., G. Alory, A. Andersson, W. Asher, A. Baker, et al. 2019, "Ship-based contributions to global ocean, weather, and climate observing systems, Frontiers in Marine Science, **6**, 434, 10.3389/fmars.2019.00434.
18. Hopkins, F.E., P. Suntharalingam, M. Gehlen, O. Andrews, et al., 2020, "The impacts of ocean acidification on marine trace gases and the implications for atmospheric chemistry and climate. Proceeding of the Royal Society A, **476**: 20190769. <http://dx.doi.org/10.1098/rspa.2019.0769>.
19. Liss, P.S., 2020, "Microplastics: All up in the air?", Marine Pollution Bulletin, **153**, <https://doi.org/10.1016/j.marpolbul.2020.110952>.
20. Baker, A.R., M. Kanakidou, A. Nenes, et al., 2020, "Changing atmospheric acidity as a modulator of nutrient deposition and ocean biogeochemistry", submitted to Science Advances.

Presenter:
Sophie Seeyave



POGO – a snapshot

- What is the Partnership for Observation of the Global Ocean (POGO)?
 - Created in 1999: Celebrating 20 Years of Ocean Partnerships
 - An international consortium of major oceanographic institutes, represented by their Directors
- 51 members; 28 countries; 6 continents
- POGO's Vision and mission: the Three Pillars
 - Innovation & development of the ocean observing system
 - Capacity development
 - Outreach & advocacy





Innovation in Ocean Observing



POGO seeks to lead innovation and development of the crucial components of the ocean observing system.

Approaches include:

POGO Annual Workshops (during Annual Meeting)

- Example topics: Long-term data visualisation; Deep ocean obs; MPAs; Arctic obs; Innovative biological sampling; UN Decade of Ocean Sciences and Global Transparent Ocean Community

POGO-funded Working Groups & Projects, eg

- **Biological Observations Working Group**
 - Workshops on Machine Learning/Artificial Intelligence applications; Upcoming workshop on eDNA
 - Macroalgal communities; DNA tools for Global CPR; EO for Water Associated Diseases
- **OpenMODs and SAGITTA**
 - Two approaches to development of simple-to-use, inexpensive, yet scientifically reliable measurement devices
- **BIOTTA and Oceanographic Data Acquisition Gulf of Guinea**
 - Two projects led by and involving African members in Ghana, Nigeria, Benin, Côte d'Ivoire and Togo aiming Essential Ocean Variables and Acidification monitoring in Gulf of Guinea (West Africa)

Working through Partnerships

- **Supporting** (eg SOOS, GACS, OceanSITES, ARGO), **collaborating with** (eg SCOR, GOOS, IOC, IODE, GEO), and **co-founding/co-sponsoring** (eg OCU, Blue Planet, IQOE) other projects and organisations.



Capacity Development



POGO's training and education activities are targeted primarily at scientists from developing countries and economies in transition.

POGO-SCOR Visiting Fellowship Programme

- Joint programme with Scientific Committee on Oceanic Research (SCOR) to support young professionals from developing countries to spend up to three months training in their speciality at a major oceanographic institution.

Shipboard Training & Ocean Training Partnership (OTP)

- NF-POGO fellowships for early-career scientists to receive hands-on training and shipboard experience
- OTP pools infrastructure, resources & expertise to provide offshore technical skills & experience on research vessels

NF-POGO Centre of Excellence

- 10 scholars from 10 countries, hosted for 10 months at Alfred Wegener Institute for Polar and Marine Research.
- Supported by the Nippon Foundation (NF)

Training in Developing Countries

- NF-POGO Centre of Excellence Regional Training (Malaysia, Brazil, Vietnam, India, Philippines, Mexico etc)
- POGO grants for Training Initiatives by POGO Member Institutes^[P]_[SEP]
- NF-POGO Alumni network for Oceans (NANO)
- POGO support for existing initiatives in developing countries, eg Austral Summer Institute (Chile), Master in Physical Oceanography (Benin).



Outreach & Advocacy

POGO aims to articulate the societal benefits of ocean observing to people at all levels – from the general public to policy makers.



OceanScape.org

- A new web portal, in collaboration with GEO Blue Planet
- Aims to identify existing and create new relationships within the ocean observing community.



Shipboard outreach initiatives targeting primary and secondary schools

- Eg, SoNoAT linked students at 14 schools in 5 countries with trainee scientists onboard RV Polarstern

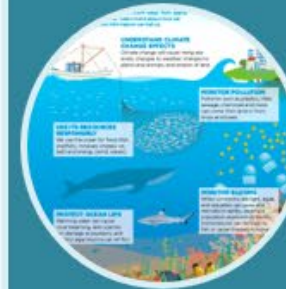


NANO alumni network Outreach

- Webinars
- Public workshops & seminars in schools etc
- 9 countries in Africa, Asia and Latin America, so far



Participation in UN events such as UNFCCC Climate Change Conferences ('COP')



Statements & Brochures

- Aimed at all levels: governments and intergovernmental organisations (e.g G7, UN, IPCC...), policy makers, the general public, schools



Ocean Communicators United

- Forum for those working in marine science communications to share information, expertise, best practices and materials
- Production of Best Practice Guidelines



GEO Blue Planet

- Task within GEO
- Mission to Exploit Synergies, Improve Engagement and raise awareness of societal benefits

Examples of POGO's Outreach work

How to get involved



Become a POGO Member

Full or Associate membership categories

Attend annual meetings (with opportunity to host)

Propose collaborative ocean observing initiatives, and more...

Become an Ocean Training Partner

POGO can fund a Fellow to make use of spare berths

Or provide funding for training cruises on 'empty legs'

Visit oceantrainingpartnership.org

Contribute to Oceanscape

Sign up at Oceanscape.org

Find out more...

Visit: www.pogo-ocean.org

Email: pogoadmin@pml.ac.uk



International Science Council

The global voice for science

***Presenter:
Martin Visbeck***



@ISC



/InternationalScience



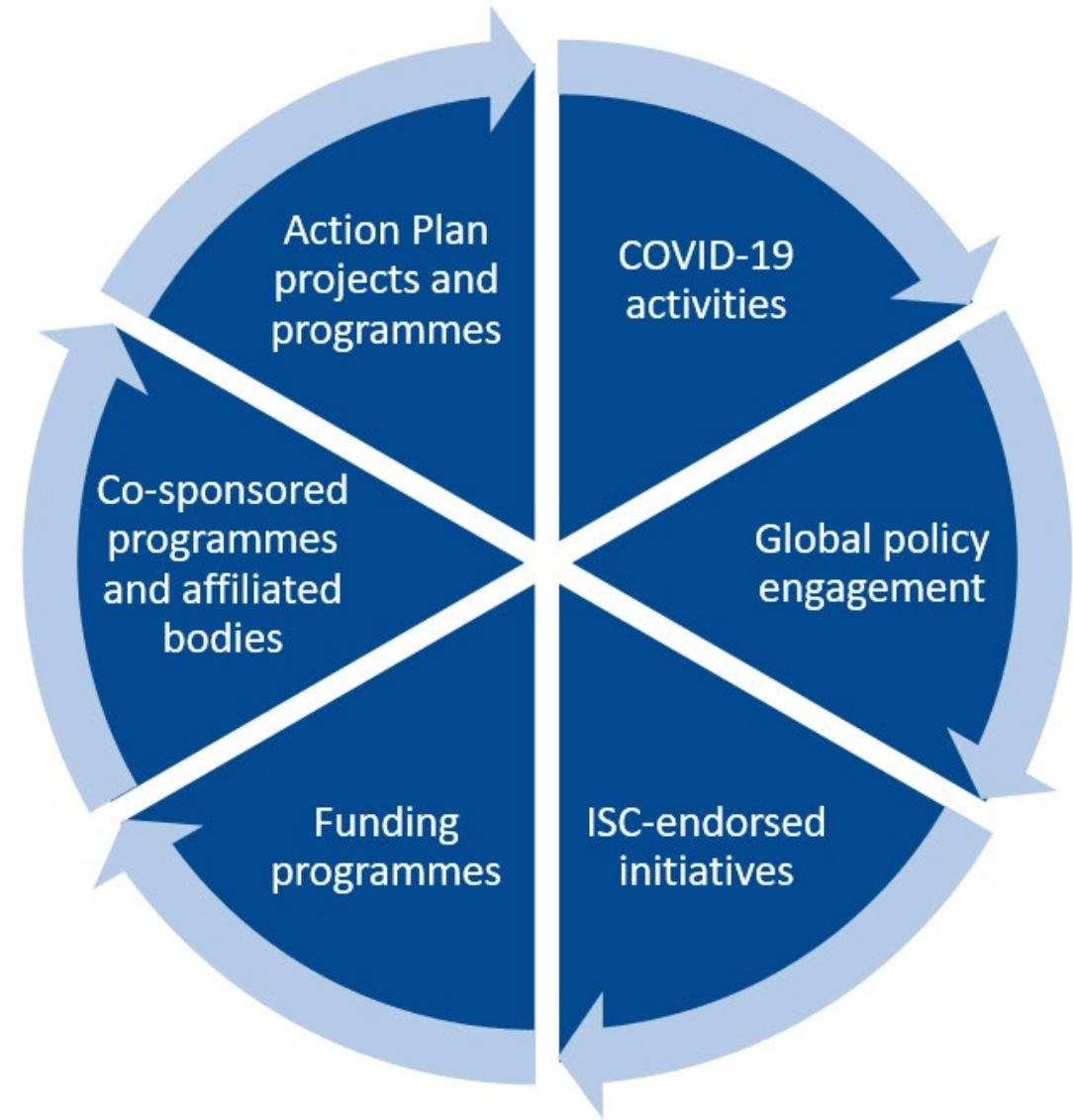
/company/international-science-council



/intsciencecouncil



Key developments and achievements since the publication, one year ago, of the ISC Action Plan





Global Science for the Ocean Decade

- 12 February 2020, Paris - UNESCO's Intergovernmental Oceanographic Commission (IOC) and the International Science Council (ISC) have [signed a Memorandum of Understanding \(MoU\)](#) to work together on the UN Decade of Ocean Science for Sustainable Development.
- Interview with Marie-Alexandrine Sicre: [Towards the UN Ocean Decade](#)

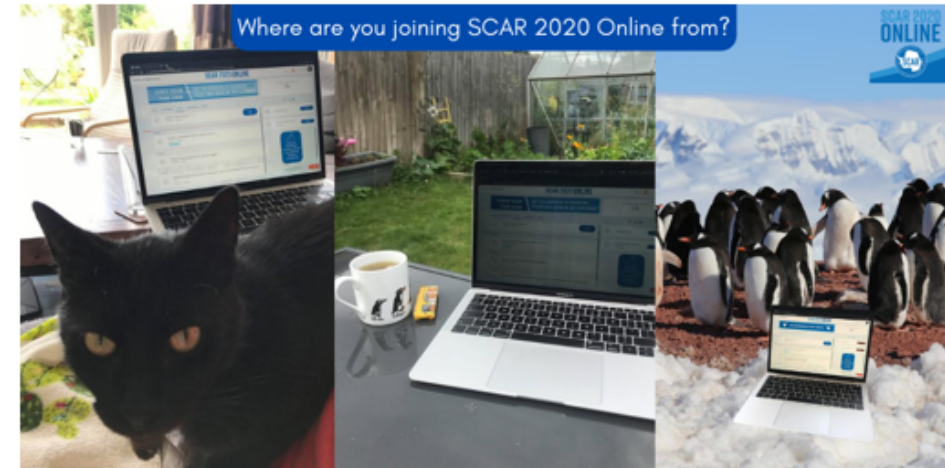


Photo: IOC UNESCO

SCAR Activities in 2020

www.scar.org
info@scar.org

www.scar2020.org



- Replaced 2020 SCAR Open Science Conference Aug 3-7th
- Plenary presentations and Medal ceremonies
- Highlights of SCAR's concluding Scientific Research Programmes and proposed future programs.
- Combination of live-streaming and recorded presentations.
- All recordings still available through portal and Youtube
- Highlighted Capacity Building activities continuing in 2020

| | |
|--|------|
| Total number of registrations | 2712 |
| Total number that logged onto the Event Portal | 853 |
| Total number of YouTube live stream views | 807 |
| Total YouTube views (as of 13 August) | 7827 |



SCAR Activities in 2020

New Scientific Research Programmes

3 proposed new programmes replacing 6 programmes ending in 2020

<https://www.scar.org/science/ppg/>

INStabilities and thresholds in ANTarctica (INSTANT)

Aims to quantify the Antarctic ice sheets contribution to past and future sea level rise

Integrated Science to Inform Antarctic and Southern Ocean Conservation (**Ant-ICON**)

Research to drive and inform international decision-making and policy change

Near-term Variability and Prediction of the Antarctic Climate System (**AntCLIM^{Now}**)

Prediction of near-term conditions in the Antarctic climate system



SCAR Activities in 2020

UN Decade of Ocean Science

February 2020 - prior to the 2020 Ocean Sciences Meeting in San Diego, CA, SCAR co-organised a Workshop on the Southern Ocean contribution to the UN Decade of Ocean Science.



**2021
2030** United Nations Decade
of Ocean Science
for Sustainable Development

30 participants representing 11 countries included representatives with expertise in ocean sciences, policy, governance and science communication, from all career stages.

September 2020 – SCAR along with other partners (including SOOS) was a partner on a proposal to BELSPO for funding to host a second workshop, results of application still pending.



Presenter:
Clément Brousse

Future Earth

2020 SCOR annual meeting(online)

Clément Brousse, science officer, Paris global hub



The Ocean KAN

- Early 2021 the Ocean KAN will have an International Project Office and an Executive Director to implement its strategy for action
- Will actively engage in the IOC-UNESCO Ocean Decade, and already commented on its implementation plan
- The development team (19 members from 15 countries) answers solicitations from UNEP, IPBES, etc. by drawing on the expertise of its members
- Partnered to organize online events such as the Virtual Blue Decade aside of the UNFCCC 2019

Future Earth actions

- PEGASuS grant funded 2 postdocs (Alfredo Giron and Erin Satterthwaite)
 - Participated in the First Global Planning Meeting of the decade and contributed to launch ECOPs (Early Career Ocean Professionals)
- CRA with the Belmont Forum and JPI Ocean
 - 13 international projects funded working on approaches towards the achievement of SDG 14
 - 14,250,000 Euro from 16 countries
- Science-Based Pathways for Sustainability Initiative – Ocean Workshop
 - Future Earth France, with a SC, works on a workshop for 2021 about marine protected areas in France and beyond (how to reach SDG 14 in this context and interactions with other SDGs)

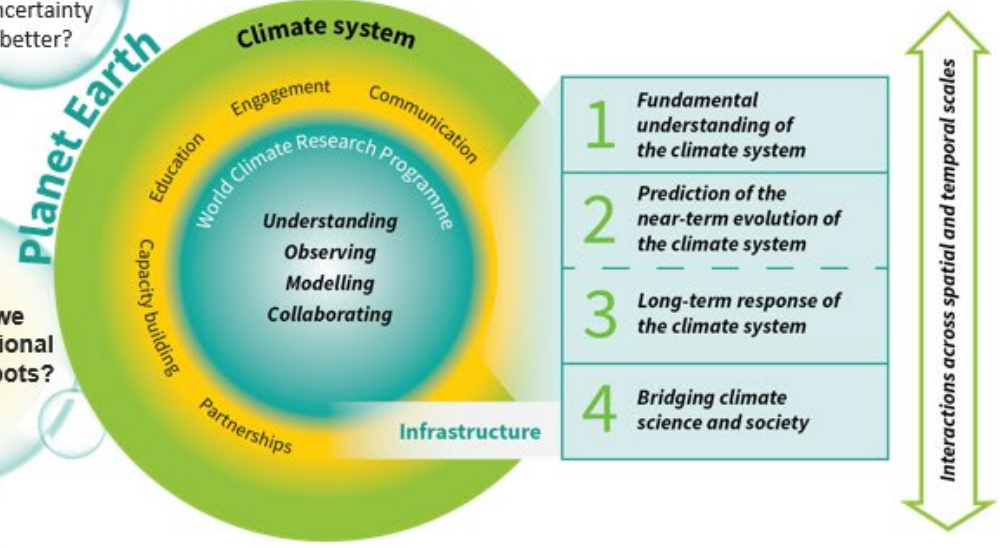
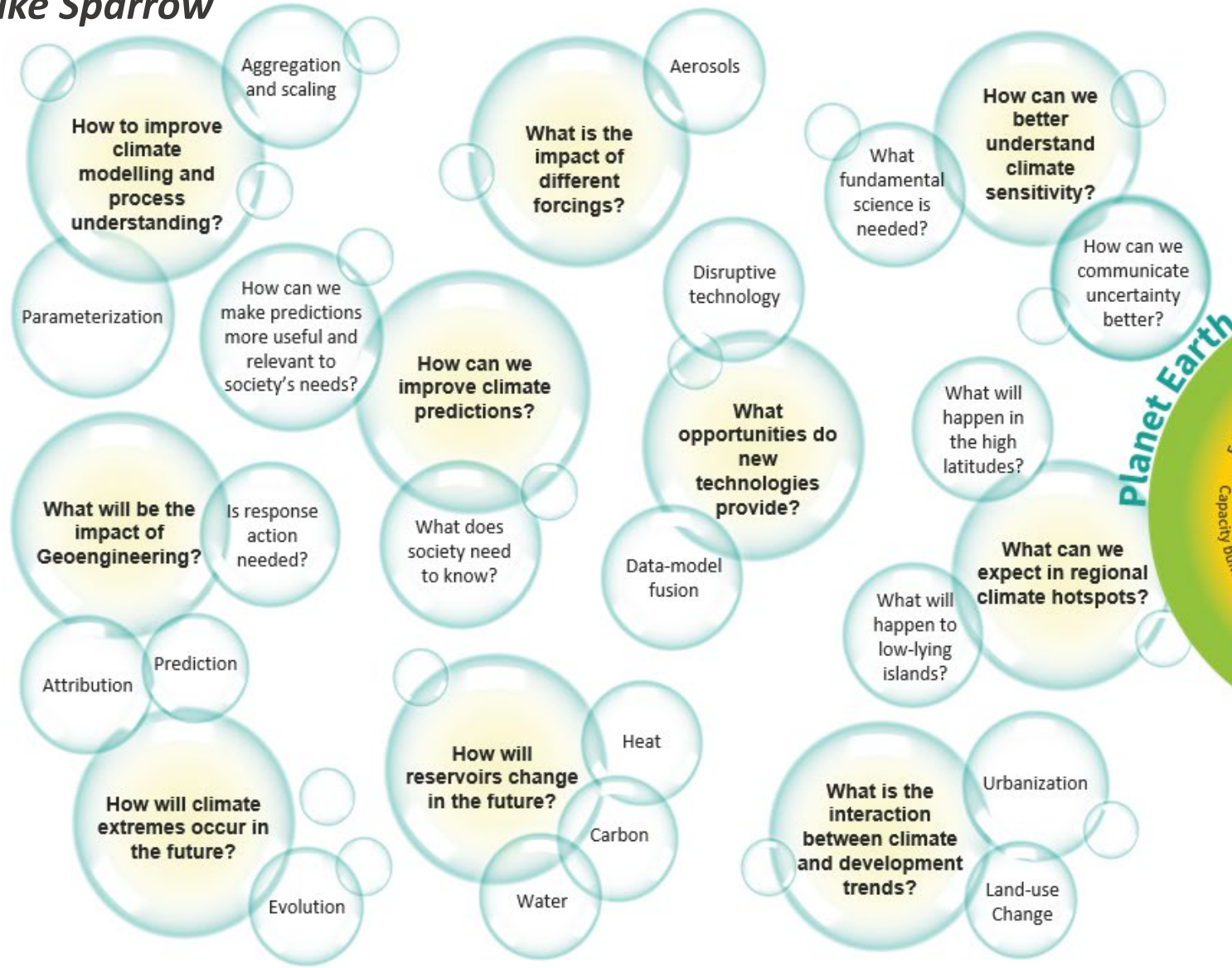
Future Earth actions

- The Earth Commission
 - 19 commissioners from 13 countries
 - building on and complementing existing assessments from IPCC and IPBES to identify thresholds for protecting Earth's life support systems such as biodiversity, freshwater, oceans and land
 - how governance and institutions of our societies can be designed to achieve a desired transformation

Thank you!

clement.brousse@futureearth.org

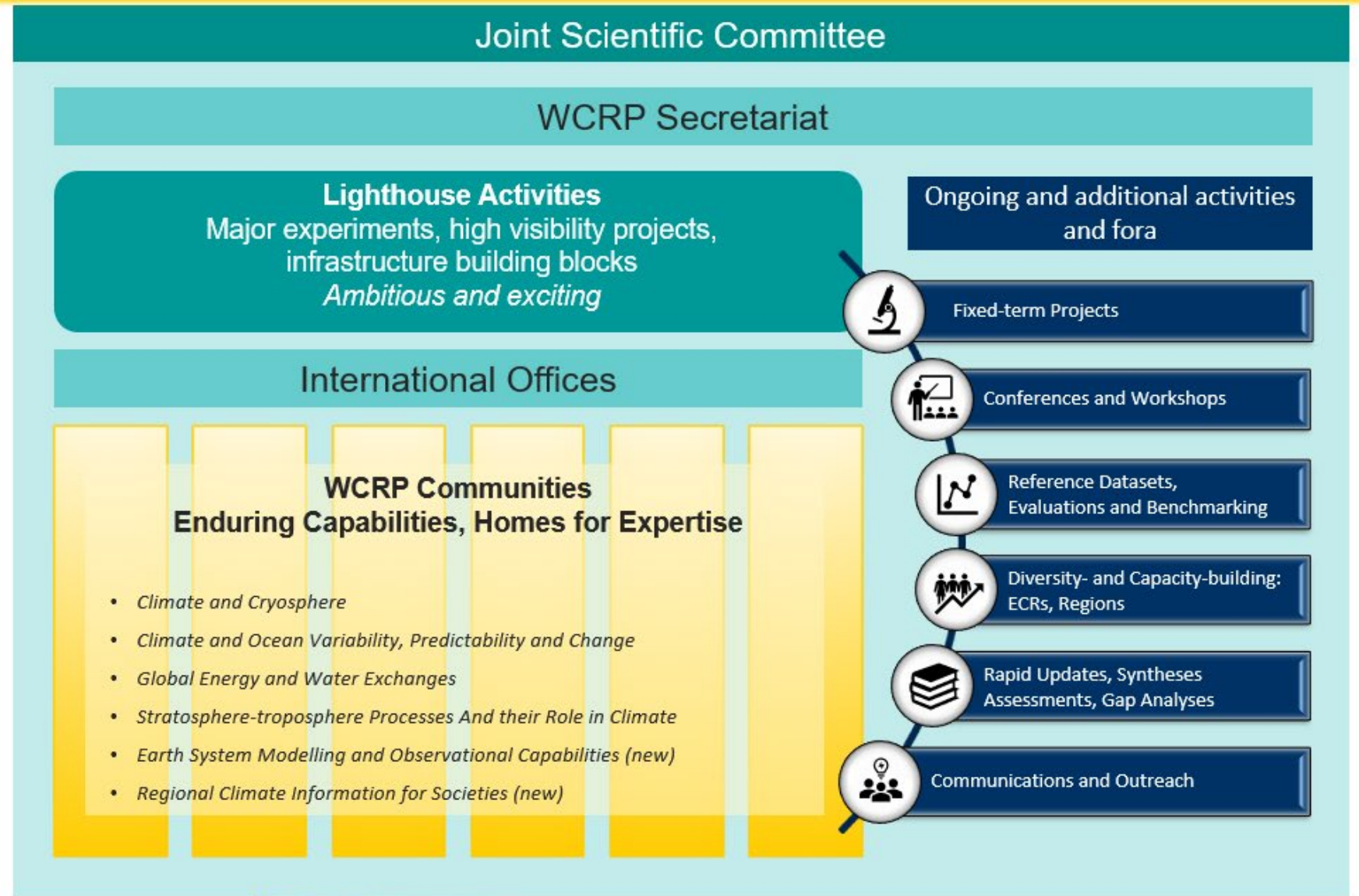
Presenter:
Mike Sparrow



WCRP Strategic Plan
2019 - 2028

WCRP (draft) new structure

WCRP will prioritize its science and implement its Strategy by pursuing a series of Lighthouse Activities, along with other core research activities, to deliver and achieve critical outcomes over the next decade



Proposed Lighthouse Activities

Earth System Change

To design, and take major steps toward delivery of, an integrated capability for quantitative observation, explanation, early warning and prediction of Earth System Change on global and regional scales, with a focus on multi-annual to decadal timescales.

My Climate Risk

To develop a new framework for assessing and explaining regional climate risk to deliver climate information that is meaningful at the local scale.

Safe Landing Climates

To explore the routes to climate-safe landing 'spaces' for human and natural systems, on multi-decadal to centennial timescales; connecting climate, Earth system and socio-economic sciences. Explore present-to-future "pathways" for achievement of key SDGs.

Digital Earths

To develop a digital and dynamic representation of the Earth system, optimally blending models and observations, to enable an exploration of past, present and possible futures of the Earth system.

WCRP Academy

To establish one or more targeted capacity exchange climate programmes, working with one or more of the other lighthouses and established climate education providers, including universities.



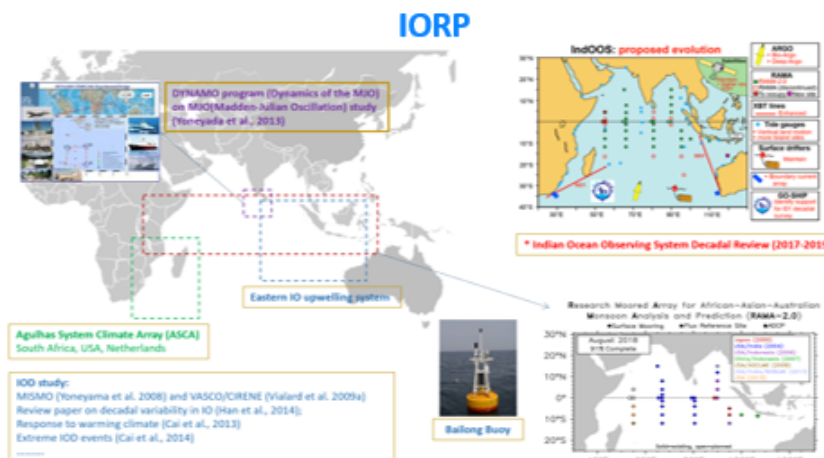
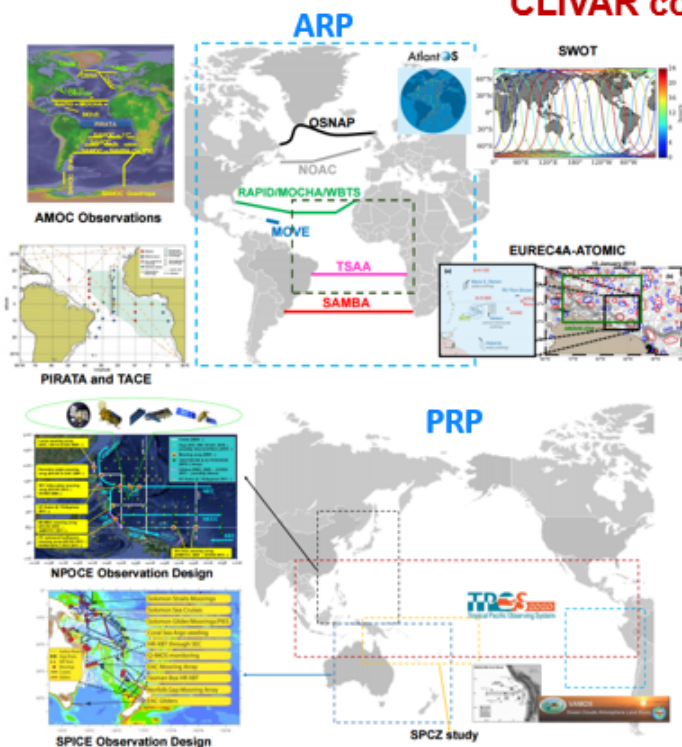
CLIVAR's **mission** is to understand the dynamics, interaction, and predictability of the climate system with emphasis on ocean-atmosphere interactions.

Overarching goal: Building a society resilient to environmental changes

Future CLIVAR activities of interest to SCOR

- GOOS/GCOS workshop on heat and freshwater transport and storage in models and observations, UK, October 2021.
- CLIVAR-FIO Summer School on Ocean Macroturbulence and Its Role in Earth's Climate, July 2022, Qingdao, China
- Summer School: Theory, Mechanisms and Hierarchical Modeling of Climate Dynamics: Tropical Oceans, ENSO and their Teleconnections. 2022, Italy
- WCRP-CLIVAR Workshop on Climate Interactions among the Tropical Basins. Feb 2021 (virtual)
- CLIVAR multi-region panel workshop: 'From global to coastal: Cultivating new solutions and partnerships for an enhanced Ocean Observing System in a decade of accelerating change' (May 2021: online part, May 2022: In person. Trieste, Italy)

CLIVAR cooperates with international organizations to review Observing Systems



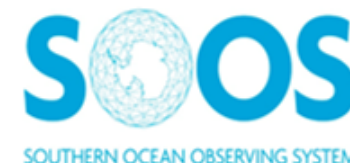
CLIVAR/CIIC Northern Oceans
Region Panel (NORP)

CLIVAR/CIIC/SCAR
Southern Ocean Region Panel (SORP)

1. Developing new tools and methods to observe the Arctic Ocean and neighbouring seas and their climate impacts: further design of buoy and radiosonde in the Arctic (MOSAIC).



2. Standardizing and archiving observations of the Arctic Ocean and the coupling with other components of the climate system.



- ✓ Coordination with SOOS (national planning, ship planning, and data management)
- ✓ SORP national reports.

Download the National reports on Activities in the Southern Ocean:
2015: China
2016: Belgium, Brazil, Canada, China, Finland, Italy, Japan, New Zealand, Russia, South Africa
2017: Argentina, Belgium, Canada, China, Finland, Italy, Japan, New Zealand, Norway, Russia, South



CLIVAR Endorsed Project



Q&A

IOC – Intergovernmental Oceanographic Commission

PICES - North Pacific Marine Science Organization

GESAMP – Group on marine environmental protection

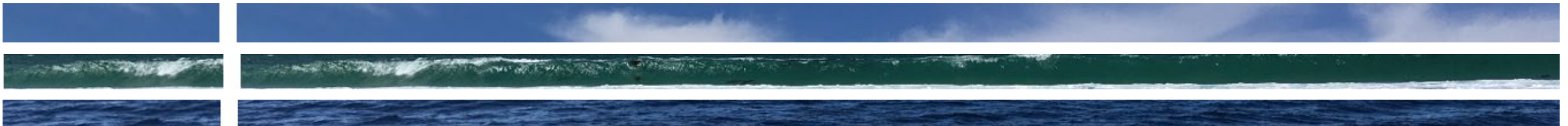
POGO – Partnership for Observation of the Global Ocean

ISC – International Science Council

SCAR – Scientific Committee Antarctic Research

Future Earth-Ocean

WCRP – World Climate Research Program



SCOR - Capacity building activities 2019-2020



| PROGRAM | |
|---------------------------------|--|
| SCOR Visiting Scholars | 5 VS approved for 2019, one of these completed after the 2019 SCOR AM, 6 VS approved for 2020, none able to travel (rescheduling for 2021). Call open for 2021 (deadline 1st December) |
| POGO-SCOR Fellowships | 4 PS-F funded in 2019, 45 applications received in 2020 (40% females, 25 countries) – 5 candidates approved (India, Venezuela, Argentina, Colombia, Morocco) – none able to travel (rescheduling for 2021). |
| NSF Travel Support | Renewal of NSF Travel Grant approved (3 years). 8 + 1 requests received to support travel/ registration / cruise participation (WCMB, COSPAR, PORSEC, WG 150 SS, Conference Copeopoda, IMBeR CLIMECO, Int. HAB Conference, Gordon Research Conf, GEOTRACES cruise) of Early Careers from developing countries. |
| Research Discovery Camps | Supported by the Agouron Institute and Simons Foundation – postponed to 2021 (Namibia) |



Visiting Scholar Brian Helmuth from Northeastern University at the Centro Nacional Patagónico CENPAT in Puerto Madryn, Argentina – November 2019

SCOR Annual Meetings (2021-2023)



SCOR 2021 – KIOST, Busan, Korea



SCOR 2022 – INOCAR, Guayaquil, Ecuador

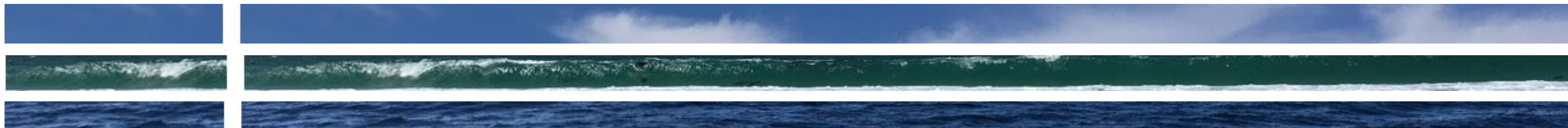


SCOR 2023 – Expression of interest?



Close of meeting

Marie-Alexandrine Sicre



Peter Burkill – 32 years serving SCOR



Peter at the 2003 SCOR Annual Meeting

| Date | What? |
|-----------|--|
| 1988 | SCOR/JGOFS Working Group on 'Microzooplankton Biomass & Grazing' (Chairman). |
| 1989 | SCOR/JGOFS International Cruise Co-ordinating Committee for Atlantic Pilot Study (Member). |
| 1994 -96 | Royal Society UK-JGOFS Working Group (Secretary) |
| 1995-2001 | SCOR/JGOFS Indian Ocean Synthesis Group (Chairman) |
| 1995-2001 | SCOR/JGOFS Joint Scientific Steering Committee (<i>ex officio</i>) |
| 1996-2002 | Royal Society UK-JGOFS Working Group (Chairman) |
| 1996-2020 | Royal Society UK-JGOFS Working Group (Nominated Member) |
| 1998-2000 | SCOR Executive Committee (co-opted) |
| 1999-2001 | SCOR Future Ocean Research in Earth System Science Planning Group (Chairman) |
| 2006-2010 | SCOR Executive Committee (Vice-President) |
| 2012-2016 | SCOR Executive Committee (President) |
| 2015-2020 | SCOR/IOC/IOGOOS IIOE-2 (Co-Chair) |
| 2016-2020 | SCOR Executive Committee (Past-President) |

