SCOR Virtual Annual Meeting 2021

26-28 October 2021

Day 1. Executive and Finance reports / New SCOR Working Groups

In Memoriam

Thomas (Tom) Church (-2021)
USA

José (Pepe) Stuardo (1929-2021)
Chile

Chibo Chikwililwa (1980-2021)
Namibia / South Africa

Satya Prakash (1979-2021)
India

Session 1. Chair: Sinjae Yoo / Note taker: Paul Myers

7:00 – 7:45 am (EDT)

1. Welcome and introduction to agenda
2. Report from SCOR President
3. Report from SCOR Executive Director
4. Report from the SCOR 2021 Finance Committee

7:45 – 8:25 am (EDT)

5. Presentation of new WG proposals

8:25 – 8:30 am (EDT): Break

8:30 – 9:40 am (EDT): Discussion of new WG proposals

9:40 – 10:00 am (EDT): Final recommendations and wrap up

Report from SCOR President – Sinjae Yoo

- The International Science Council (ISC)
  - Patricia and I attended a planning meeting in March 2021 to facilitate exchange among its affiliated bodies.
  - The ISC held the Second Global Forum of Funders (26 - 28 April 2021) where Patricia and I participated.
  - Marie-Alexandrine, Patricia and I participated in the 2nd General Assembly of ISC held in Oct 11-15.
- The IOC/UNESCO
  - Patricia and I attended the 53rd Executive meeting March 2021.
  - In May 2021, we had an informal leadership meeting with the IOC Secretary. Marie-Alexandrine, Patricia and I participated in the meeting and discussed how we could improve collaboration between the two organizations.
  - In June 2021, the 54th Exec/General Assembly of IOC was held on-line, and Patricia and I participated in the meetings.
- Ocean Knowledge-Action Network
  - The IPO is hosted in Paris. Marie-Alexandrine and I have attended several preparation meetings.
- Proclamation of an International Year of Basic Sciences for Sustainable Development (IYBSSD)
  - Planned for 2022-2023 and SCOR participates with 35 International Unions and Organizations and other entities.
  - An MoU was signed in April 2020 between SCOR and International Union of Pure and Applied Physics (IUPAP) representing the SSC of IYBSSD.

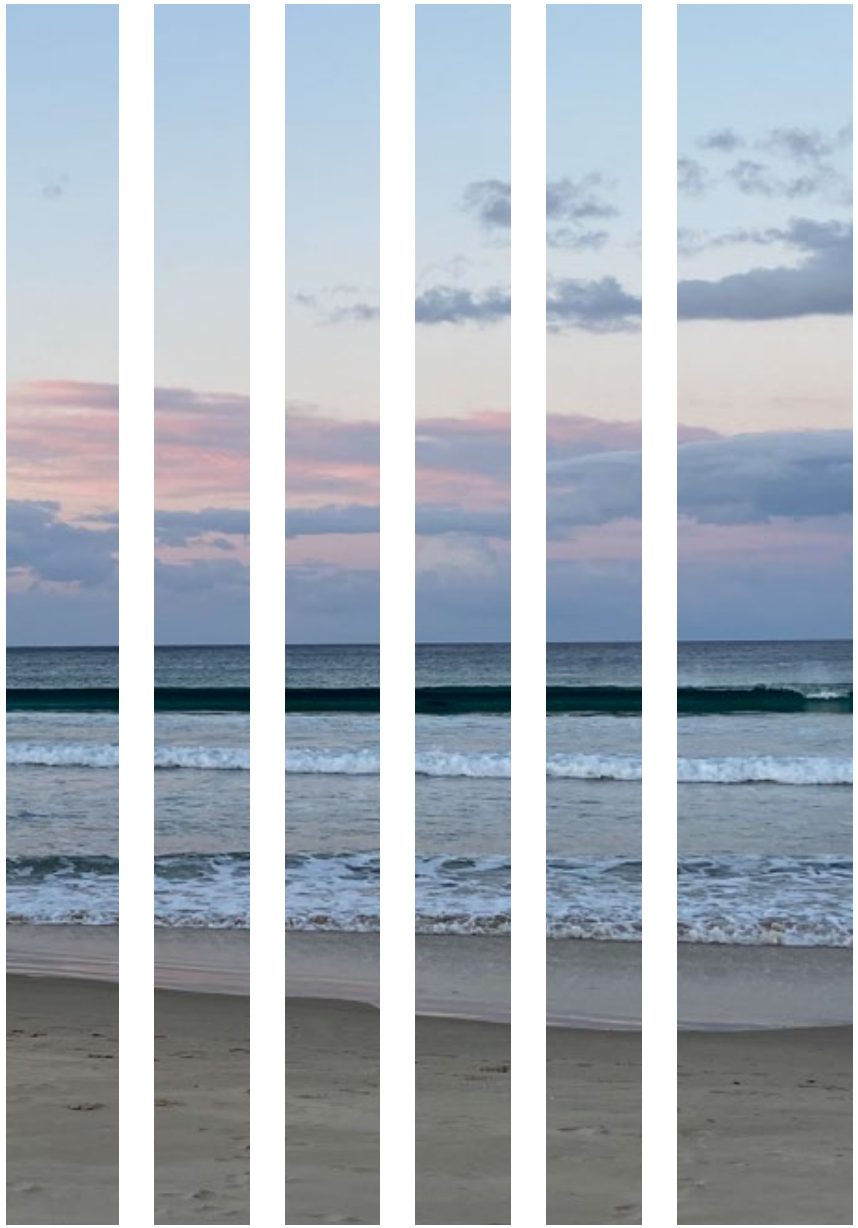


Photo: P. Miloslavich

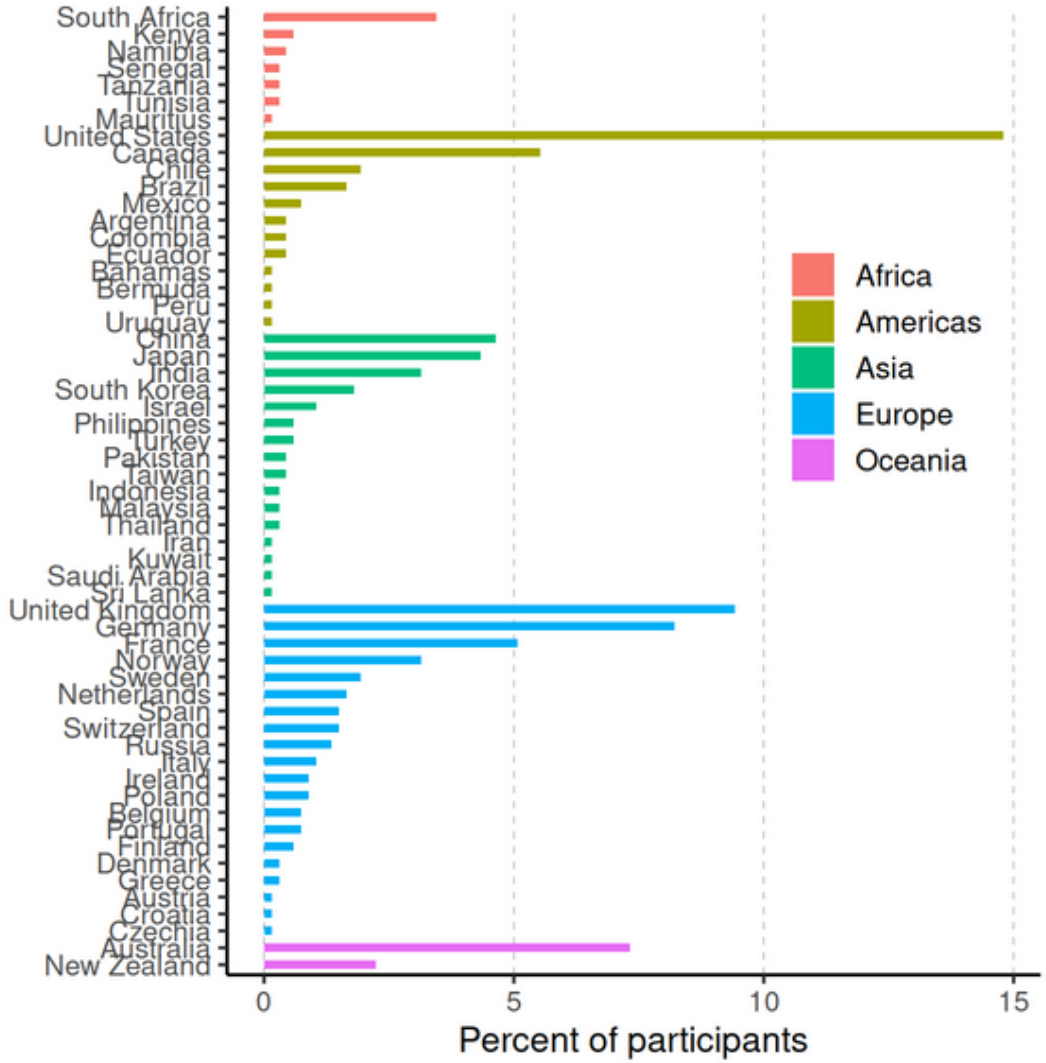
The Scientific Committee on Oceanic Research (SCOR)

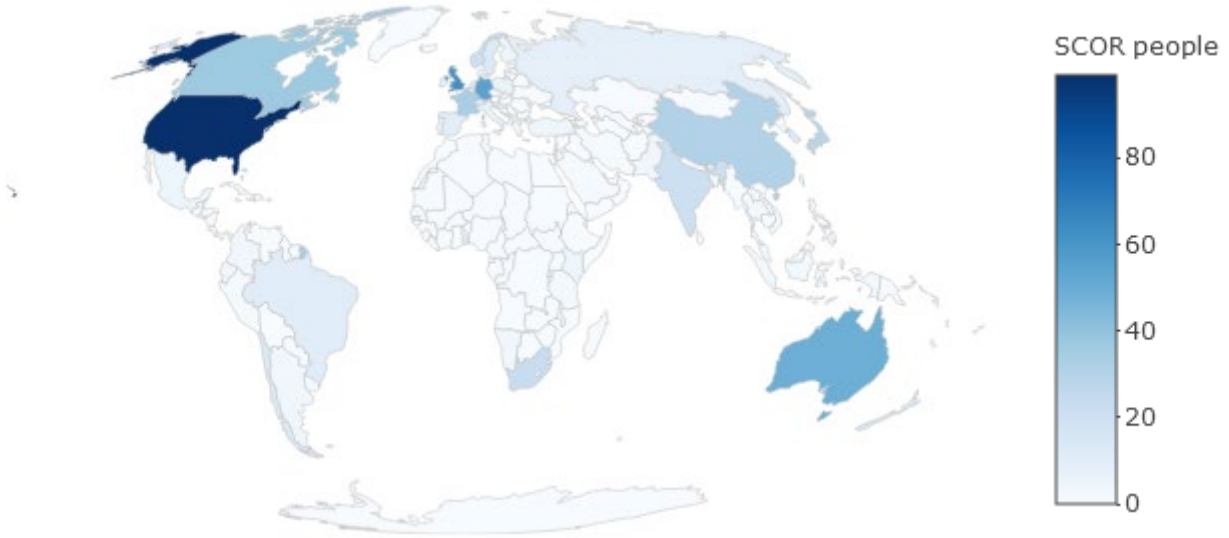
2021 Report of Executive Director

International Science Council
Thematic organization

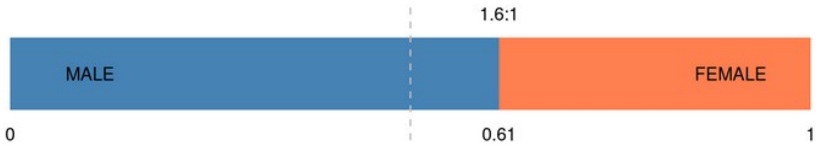
Patricia Miloslavich
Executive Director

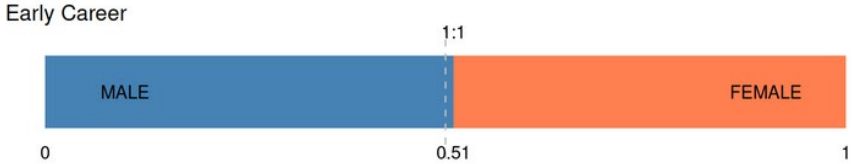
SCOR active community: 2020-2021





Total Countries 57	**F**	215	
	M	338	
		553	
Early Careers Countries 21	**F**	25	
	M	26	
		51	





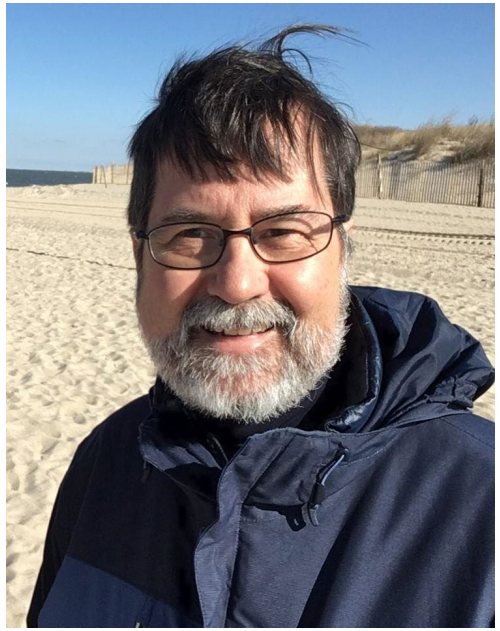
~2300 scientists in former Working Groups, projects and national committees since 1957!

Changes in National Committees and Nominated Members

National Committee	Updates
Australia	A, Schiller, P. Doherty and T. McDougall stepped down, replaced by Brett Molony, Lesley Clementson, and Bernadette Sloyan
Chile	Carmen Morales retired, replaced by Marcela Cornejo D'Ottone
Italy	Annalisa Griffa retired – seeking for new nominated members
Japan	Kaoru Kubokawa and Toshio Yamagata stepped down, replaced by Naomi Harada and Toshiyuki Hibiya
Korea	Eun Young Kwon incorporated
Netherlands	G.M. (Gerald) Ganssen retired
Russia	Sergei Dobrolyubov retired, replaced by Peter Zavyalov
UK	Peter Burkill and Gideon Henderson stepped down, replaced by Kerry Howell and Rosalind (Ros) Rickeby

International recognition

2020-2021 The Oceanography Society (TOS) honours

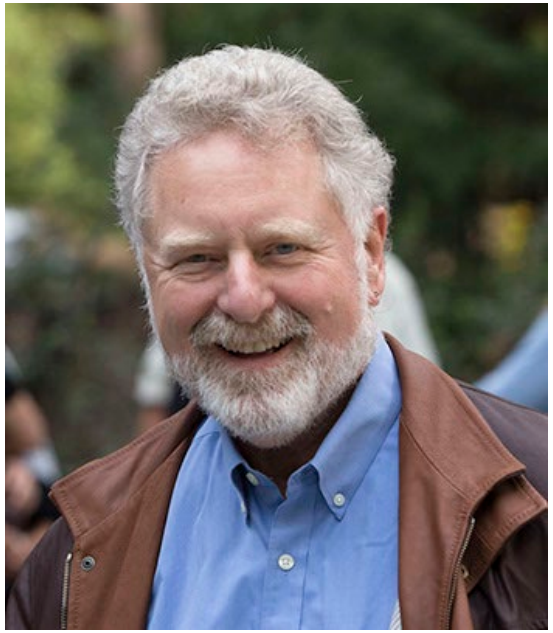


Ed Urban, Fellow TOS
Former SCOR Executive Director

Emmanuelle Boss, Fellow TOS
Co-chair SCOR WG 154 P-OBS
SSG Member IOCCP

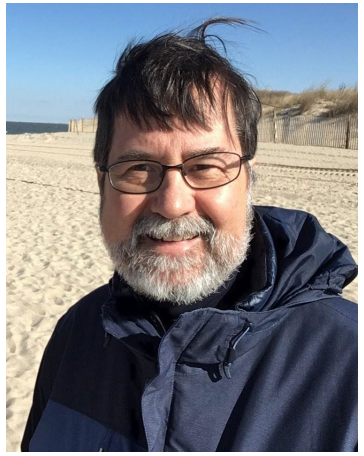
Claudia Benitez-Nelson, Mentoring Award
Chair of the SCOR Capacity Development Committee
Also appointed Chair of the Ocean Studies Board of the National Academies of Science, Engineering and Medicine of the USA

2021 Society for Marine Mammology



Dan Costa, Fellow SMM
SCOR Nominated Member USA
Former IMBeR SSC
SOOS Science Strategy

International recognition 2020-2021



Ed Urban, 2020-21 Fellow TOS
Former SCOR Executive Director

Emmanuelle Boss, 2020-21 Fellow TOS
Co-chair SCOR WG 154 P-OBS
SSG Member IOCCP

Claudia Benitez-Nelson, 2020-21
Mentoring Award TOS
Chair of the SCOR Cap. Dev. Committee

Sinjae Yoo, 2021
PICES Wooster Award
SCOR President

Dan Costa, 2021
Fellow Society for Marine Mammalogy
USA SCOR Nominated Member

Peter Burkil, 202
Fellow of the MBA, UK
Former SCOR President

Marie Alexandrine Sicre, Vice-Chairperson of the Executive Council of the IOC
SCOR Past President

Paul Myers, 2021 Fellow Canadian Meteorological and Oceanographic Society
SCOR Secretary

Patricia Miloslavich, 2021 Appointed Member of the Latin-American Academy of Sciences
SCOR Executive Director

Working Group meetings

2020

October
- 156 Chlorophyll
- 148 IQuOD
- 158 C-GRASS
- 159 DeepSeaDecade

November
- 148 IQuOD
- 162 OASIS

December
- 156 Chlorophyll
- 151 FeMIP
- 158 C-GRASS
- 161 ReMO
- 160 ATOMIX
- 162 OASIS

2021

January
- 158 C-GRASS
- 161 ReMO
- 160 ATOMIX
- 162 OASIS

February
- 158 C-GRASS
- 161 ReMO
- 160 ATOMIX
- 162 OASIS
- 159 DeepSeaDecade

March
- 158 C-GRASS
- 161 ReMO
- 160 ATOMIX
- 162 OASIS

2021

April
- 156 Chlorophyll
- 158 C-GRASS
- 161 ReMO
- 160 ATOMIX
- 162 OASIS
- 159 DeepSeaDecade

May
- 161 ReMO
- 160 ATOMIX
- 153 FLOTSAM
- 162 OASIS

June
- 157 MetaZooGene Conf.
- 145 MARCHEMSPEC
- 161 ReMO
- 160 ATOMIX
- 162 OASIS

July
- 159 DeepSeaDecade workshop

August

September
- 162 OASIS Workshop

October
- 158 C-GRASS

2021

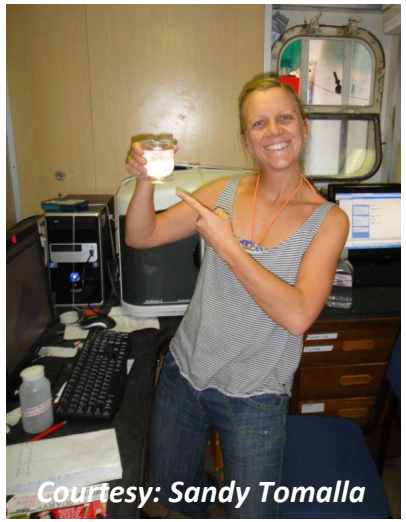
November

December
- 160 ATOMIX

In summary:

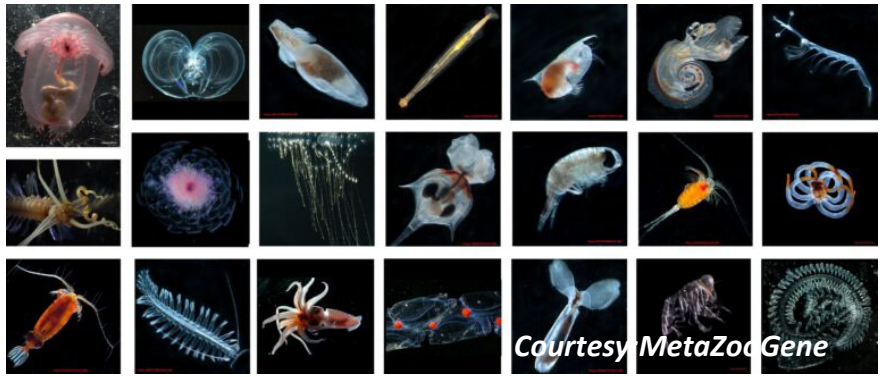
- 47 online Working Group meetings
- 13 of the 16 WGs met virtually
- 82% (n= 39 with early career scientists)
- N= 143 ECS participated in WG meetings

SCOR scientific publications (2019-2021)


Courtesy: Sandy Tomalla


Courtesy: GEOTRACES

Class	2019	2020	2021	Total
Working Groups	17	11	17	45
GEOTRACES	146	106	78	330
IMBeR	159	229	58	446
SOLAS	3	6	6	15
IOCCP	2	8		10
IIOE-2	10	3	1	14
SOOS	10	5	1	16
GlobalHAB	1			1
	348	368	161	877


Courtesy MetaZooGene

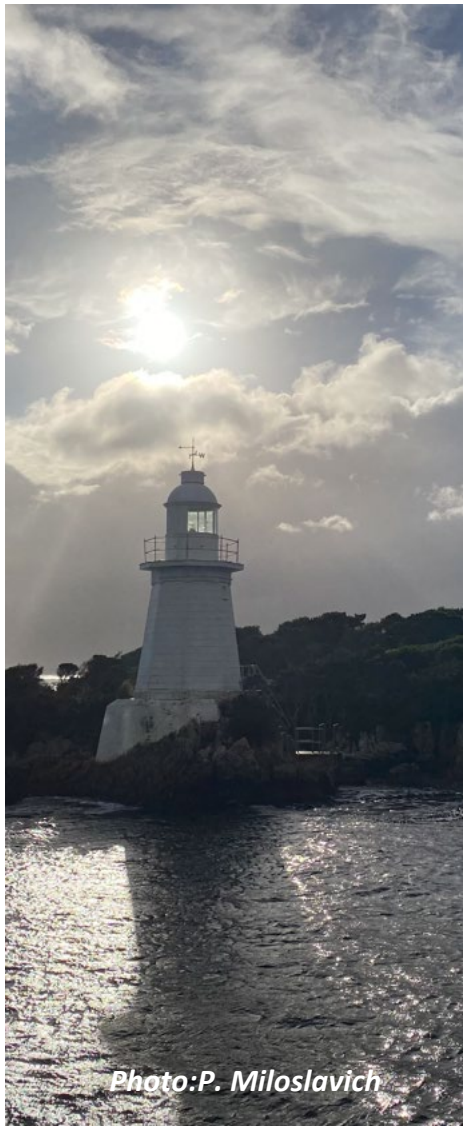
At least 18 publications in 2020-2021 were co-authored by Early Career Scientists

https://scor-int.org/work/publications/

Projects

Project	SSC leadership renovations / other
RESEARCH PROJECTS	
GEOTRACES	Andy Bowie (Australia) stepped down and Karen Casciotti (USA) and Maeve Lohan (UK) the new co-chairs
SOLAS	Lisa Miller (Canada) stepped down and Minhan Dai (China) and Cliff Law (New Zealand) the new co-chairs (Cliff Law had to resign) – Cecile Guieu (France) to take over **Mid term review by SCOR and other sponsors**
IMBeR	Carol Robinson (UK) stepping down in December 2021. Search for new co-chairs in process. Call open for nominations for new SSC members (to start in January 2021) GiHoon Hong was appointed the Strategy Director at the IPO-China in March 2021. Both IPO-Canada and IPO-China are now fully operational. **Mid term review by SCOR and other sponsors**
IQOE	IQOE Strategic Workshop - 2021
IIOE-2	Marie A. Sicre (France) is the new co-chair to replace Peter Burkill (UK) The Perth JPO (Nick D'Adamo) will no longer receive hosting support from Australia Satya Prakash (India), coordinator of the India JPO passed away
INFRASTRUCTURAL PROJECTS	
COBS	New ToRs and SSC approved as it transitioned from WG to project
GlobalHAB	Elisa Berdalet (Spain) continues to co-chair until December 2022, Po Teen Lim (Malaysia) new vice-chair
IOCCP	Co-chair Masao Ishi (Japan) stepped down and replaced by Véronique Garcon (France) Renovation of SSG with six new members
SOOS	Executive Officer Louise Newman resigned and replaced by Alyce Hancock Sebastien Moreau (Norway) is the new Vice Chair and member of SOOS EXCOM, renovation of SSC (one new member) **SCOR/SCAR review of Science and Implementation Plan 2021-2025**
JCS	Member Stefan Weinreben retired in 2021

SCOR Secretariat at international meetings



2020

- **October-December:** Ocean KAN Development Team, and IPO discussion meetings
- **November:** SCOR presentation for INOCAR, Ecuador
- **December:** IOC 60th anniversary – invited speaker
- **December 2020:** World Conference Marine Biodiversity -Early Career Researcher Panel

2021:

- **January:** POGO Annual Meeeting
- **February:** IOC Executive Council 53 (Statements for Agenda Items 3.1 on capacity development, and 4.1 on the UN Ocean Decade)
- **March:** signed MOU with Memorandum of Understanding for the organization of the International Year of Basic Sciences for Sustainable Development (IYBSSD)
- **May:** SCOR presentation to the CSIRO-Australia community
- **May:** SCOR presentation at the Canadian Meteorological and Oceanographic Society
- **May:** SCOR presentation for the Senate Commission on Earth System Research - Germany
- **June:** IOC General Assembly 31 (Statements for Agenda items 3.5.2 on the GOOS workplan, 3.5.3 on the capacity development strategy, and 3.7 on the UN Ocean Decade implementation)
- **September:** meeting to discuss synergies with ICES – Science Committee
- **September:** meeting to discuss synergies between UN Decade endorsed project “Marine Life 2030”
- **October:** SCOR presentations at the PICES Fishery Science Committee (FIS) Committee Business Meeting, and at the PICES Science Board meeting
- **October:** SCOR presentation (booth) at the 2nd International Science Council (ISC) assembly

SCOR National Science Foundation (NSF) grants

NSF grants to SCOR fund large-scale research projects, ocean carbon activities, and some working groups:

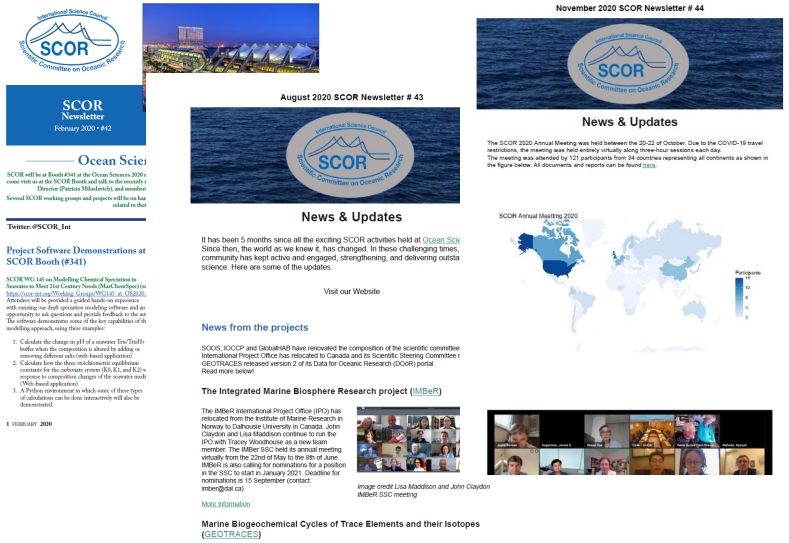
- SCOR is currently on a ‘no cost” extension for an NSF three-year grant to fund science activities (2018-2021).
- A new proposal was submitted this year to NSF for three years to continue to support these science activities – approved (2021-2024).
- We are in the second year ‘no cost” extension for an NSF grant on capacity building (2017-2020), and in the second year of a three-year grant (2020-2023) from NSF to support capacity building in ocean sciences.

Communication

Website: +2000 visits and +4000 views / month

https://scor-int.org/

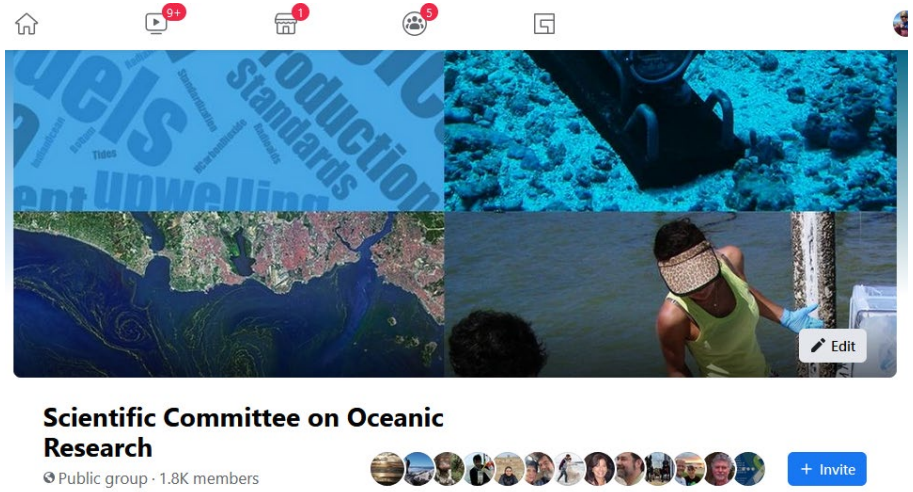
Email: 3 Newsletters/year + news



SCOR proceedings

Twitter: ~930 followers

Facebook group: ~1.9 K members



- Financial report 2021 -
given by the Finance Committee,
Virtual Meeting 26th October 2021

The *ad hoc* Finance Committee for 2021:

Nuria Casacuberta Arola (Switzerland)

Peter Croot (Ireland)

Ilka Peeken (Germany)

Naomi Harada (Japan)

What we had to do

- ***Retrospective*** check of 2020 including audit
- Check ***current*** 2021 budget and suggested revisions
- Check ***projected*** budgets for 2022 and 2023 for affordability and realism

Online meetings as a committee with Patricia and Ed (20 Sept & 5 October 2021)

Budget 2020 (audited)

- ***Income: Membership dues $ 432k NSF + others $28k ($ 460k total)***
- **WG expenses $33k, other science $23k**
- **Administrative expenses $299k**
- **The cash balance changed from $218k (end 2019) to $322k (end 2020).**
- **SCOR requires at least $100k.**
- **We recommend SCOR to accept the 2020 financial report.**

Auditor’s report

- The Finance Committee has reviewed the auditor’s report of 2020 finances.

- The auditor found no accounting discrepancies

- The Finance Committee recommend acceptance of the 2020 statements.

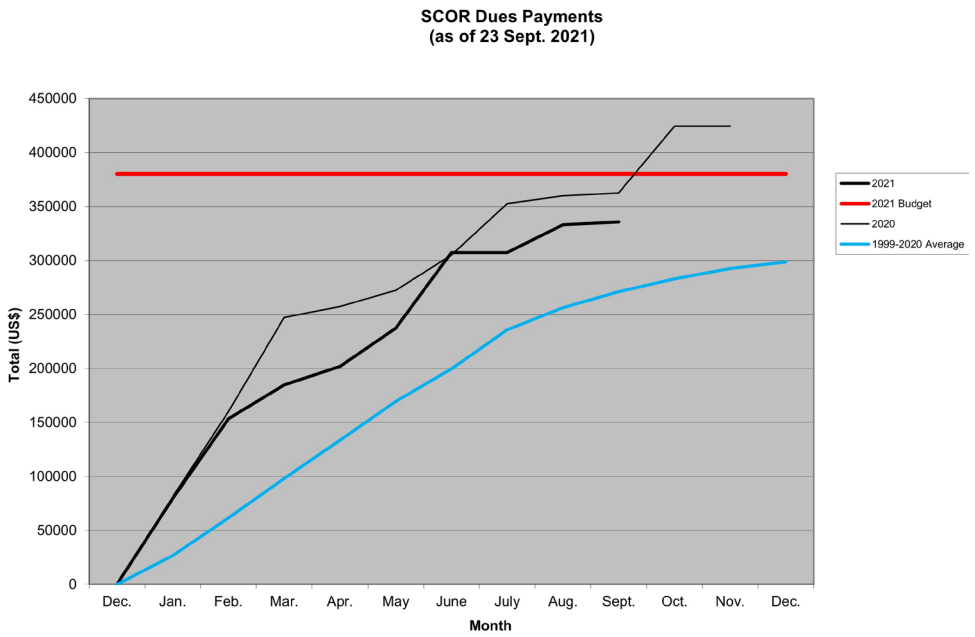
We find the Auditor’s report in accordance with SCOR financial report, and there are no special remarks in the Audit to consider.

2021 budget: approved in 2020 and revised now

Income: Discretionary Funding Income	Approved 2021 Budget	Proposed Revised 2021 Budget
Membership	$380,000	$400,000
NSF Funding for WGs & Projects	$70,000	$6,260
Indirect Cost Recovery from Grants	$2,300	$7,500
Crowdfunding for SCOR visiting Scholars	$0	$0
Interest	$ 1,000	$100
Contributions from other organizations for WGs (MURU, SCAR)	$10,000	$7,500
Total Discretionary Income	$463,300	$421,360

Last year's estimates for 2021

Actual income in 2021



We are still on target to get the dues by the end of the year.

2021 budget: Spending approved in 2020 and revised

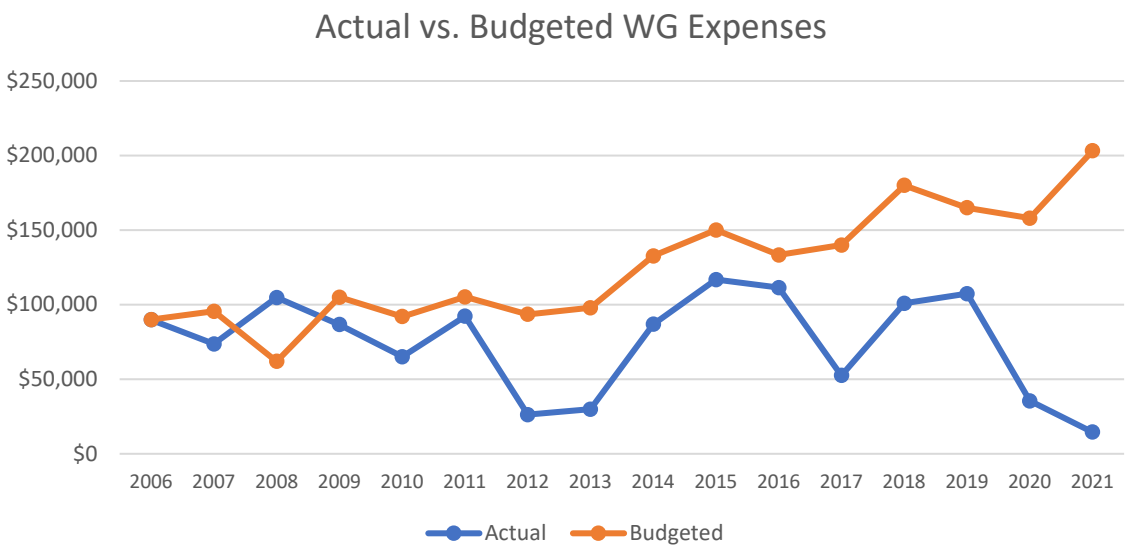
Expenses	2021 Approved	2021 Actual
Working Groups		
WG 143 – N2O and CH4	$0	$0
WG 145 - MARCHEMSPEC	$1,227	$0
WG 148 - IQuOD	$11,151	$0
WG 150 - TOMCAT	$15,000	$0
WG 151 - FeMIP	$15,000	$0
WG 152 - ECV-Ice	$10,712	$0
WG 153 - FLOTSAM	$15,000	$0
WG 154 - P-OBS	$15,000	$0
WG 155 - EBUS	$15,000	$0
WG 156 - Fluoro	$15,000	$2,980
WG 157 - MetaZooGene	$15,000	$3,280
WG 158 - CGRASS	$15,000	$0
WG 159 – DeepSeaDecade	$15,000	$0
WG 160 – ATOMIX	$15,000	$8,000
WG 161 – ReMO	$15,000	$0
WG 162 – OASIS	$15,000	$315
	$203,090	$14,575

Spend ~$188.5K *less* than originally budgeted

What was estimated last year they would spend

What they actually spent in 2021

	Actual	Budgeted	% of budget
2006	$89,834	$90,000	99.82%
2007	$73,699	$95,573	77.11%
2008	$104,714	$62,000	168.89%
2009	$86,638	$105,000	82.51%
2010	$65,098	$92,000	70.76%
2011	$92,178	$105,218	87.61%
2012	$26,253	$93,500	28.08%
2013	$29,855	$97,882	30.50%
2014	$86,861	$132,666	65.47%
2015	$116,749	$150,000	77.83%
2016	$111,453	$133,326	83.59%
2017	$52,544	$140,000	37.53%
2018	$100,851	$180,000	56.03%
2019	$107,316	$165,000	65.04%
2020	$35,504	$158,000	22.47%
2021	$14,575	$203,090	7.18%
Totals	$1,194,122	$2,003,255	59.61%



Historical average (2006-2019) = 70% spend

2021 budget: Spending approved in 2020 and revised

	What was estimated last year they would spend	What they actually spent in 2021
Miscellaneous Scientific Activities		
SCAR/SCOR Expert Group	$20,000	$0
IAPWS/SCOR/IAPSO JSC	$5,000	$0
IIOE-2 Steering Committee and Science WG	$15,000	$0
IQOE Implementation Activities	$15,000	$5,000
Multi-stressors	$0	$955
GlobalHAB	$30,000	$0
IYBSSD2022	$0	$2,300
Capacity Building	$10,000	$0
SCOR Visiting Scholars	$10,000	$0
Outreach (includes Web site maintenance)	$5,000	$2,000
Executive Director's Travel to Project Meetings	$10,000	$0

Central SCOR Administration		
Total Discretionary Income	**$463,300**	**$421,360**
Total Discretionary Expenses	**$639,620**	**$282,873**
Income - Expenses (Discretionary Accounts)	-$176,320	$138,487
Ending Unrestricted Net Assets	**$138,042**	**$413,326**

Cash in bank more than last year. We were really trying to spend it…. We have to keep >$100k.

2022 budget proposal

Discretionary Funding Income	Actual income in 2021 Budget Revisions	SCOR estimated income in 2022 2022 Budget
Membership	$400,000	$380,000
NSF Funding for WGs & Projects	$6,260	$80,000
Indirect Cost Recovery from Grants	$7,500	$0
Crowdfunding for SCOR Visiting Scholars	$0	$0
Interest Income	$100	$100
Contributions from other organizations	$7,500	$10,000
Total Discretionary Income	**$421,360**	**$470,100**

2022 budget proposal

Working Groups		
WG 143 – N2O and CH4	$0	$2,000
WG 145 - MARCHEMSPEC	$0	$1,227
WG 148 - IQuOD	$0	$5,000
WG 150 - TOMCAT	$0	$2,000
WG 151 - FeMIP	$0	$15,000
WG 152 - ECV-Ice	$0	$10,712
WG 153 - FLOTSAM	$0	$15,000
WG 154 - P-OBS	$0	$15,000
WG 155 - EBUS	$0	$15,000
WG 156 - Fluoro	$2,980	$13,826
WG 157 - MetaZooGene	$3,280	$5,000
WG 158 - CGRASS	$0	$15,000
WG 159 - DeepSeaDecade	$0	$5,000
WG 160 - ATOMIX	$8,000	$15,000
WG 161 - ReMO	$0	$15,000
WG 162 - OASIS	$315	$15,000
WG 163 - New Group		$15,000
WG 164 - New Group		$15,000
WG 165 - New Group		$15,000

3 WG

Actual spend in 2021

SCOR estimated spend in 2022

2022 budget proposal

	Actual spend in 2021	SCOR estimated spend in 2022
Miscellaneous Scientific Activities		
SCAR/SCOR Expert Group	$0	$20,000
IAPWS/SCOR/IAPSO JSC	$0	$5,000
IIOE-2 Steering Committee and Science WG	$0	$20,000
IQOE Implementation Activities	$5,000	$15,000
Multi-stressors	$955	$0
GlobalHAB	$0	$30,000
IYBSSD2022	$2,300	$2,300
Capacity Building	$0	$10,000
Misc. SCOR Meetings	$0	$7,500
SCOR Visiting Scholars	$0	$7,500
Outreach (including website maintenance)	$2,000	$2,000
Executive Director's Travel to Project Meetings	$0	$10,000
	$10,255	**$129,300**

2022 budget proposal

	Actual spend in 2021	SCOR estimated spend in 2022 (3 WG)
Administrative Expenses		
Salaries and Benefits, Patricia (1 Jan to 31 Dec)	$174,360	$179,591
Outside Services	$15,000	$20,000
Audit and Accounting Services	$25,000	$25,000
Representation	$0	$12,000
Leased Software	$9,003	$6,800
Bank charges	$1,300	$1,300
Publications	$2,000	$2,000
Annual Meeting	$0	$35,000
Postage, telephone, internet	$600	$600
Office Supplies	$500	$500
Office Equipment	$500	$500
UD overhead charges	$26,000	$26,780
Executive Director Professional Expenses	$500	$500
Insurance	$2,780	$2,780
Miscellaneous office expenses	$500	$500
	$258,043	**$313,851**
Total Discretionary Expenses	**$280,573**	**$650,616**

2022 budget proposal
- the bottom line

	Actual situation in 2021	SCOR estimated budget in 2022
Total Discretionary Expenses	$282,873	$652,916
Beginning Unrestricted Net Assets - Accounts Receivable	$274,839	$413,326
Income - Expenses (Discretionary Accounts)	$138,487	-$182,816
Likely underspend of WG (25%)		$52,441
Ending Unrestricted Net Assets - Accounts Receivable	$413,326	$282,951

The Finance committee recommends acceptance of the SCOR budget for 2022.

The Finance committee recommends funding up to 3 new Working Groups.

Summary…

- Finance Committee recommends that this committee continue to meet in future years via online meetings in the weeks prior to the SCOR annual meeting, rather than waiting to meet in person at the annual meeting.
- The cash situation for 2021 allows the planned establishment of up to 3 new WGs to begin in 2022 (financial situation indicates it is highly likely to be able to fund 2 additional WGs in 2023).
- The WG underspending was substantial in 2021 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 2023* to change the current dues (Policy previously has been for dues to incrementally increase 3% in recent years).

Presentation of new Working Group proposals

1. Coupling of ocean-ice-atmosphere processes: from sea-Ice biogeochemistry to aerosols and Clouds (CIce2Clouds) – Jing Zhang

2. Harnessing global pELagic FISH biochemical data to address Sustainability challenges under climate change scenarios (ELFISH) – Brad Moran

3. Advancing standardisation of COastal and Nearshore demersal fish visual CENSUS techniques (CoNCENSUS) – Enrique Montes

4. Mixotrophy in the Oceans – Novel Experimental designs and Tools for a new trophic paradigm (MixONET) – Jacqueline Uku

5. From the Ocean to the Lab to the Ocean: best practices for ecologically sound inferences in fluctuating habitats (OLO) – Stefano Aliani

https://www.dropbox.com/sh/em6xz80156ic9n0/AACCHffzvQ8Mhwc-XybS6kfha?dl=0

Coupling of ocean-ice-atmosphere processes: from sea-Ice biogeochemistry to aerosols and Clouds (**CIce2Clouds**)

SCOR Executive Monitor
Jing Zhang

Clce2Clouds – Terms of Reference

ToR1: To **prioritize key coupled biological and chemical systems** that drive atmospheric reactive trace gas, aerosol, and cloud properties in polar ocean environments. Synthesize expertise from ocean, sea-ice, snow, and atmospheric chemistry communities to provide **a hierarchy of chemical species** that reflect common overlapping science questions (Objective O1).

ToR2: To **identify similarities and differences in controls on exchange processes** between the Arctic and Antarctic O-SI-S-A systems. **Compare and contrast common** sea-ice and snow **properties** at both poles. Use this polar ocean comparison to **describe how** sea-ice properties **control exchange processes**, and **constrain** projections of future changes (Objective O2).

ToR3: To **develop a conceptual model of exchange processes** in O-SI-S-A systems, focusing on key reactive trace gas and aerosol species prioritized in O1. Conceptual model evolution will be based on existing observational and numerical expertise, and will reflect the impact of heterogeneity in sea-ice environments at present and under future climate change scenarios (Objective O3).

ToR4: To **develop interdisciplinary campaign planning recommendations** to guide future studies and address model and measurement gaps. Building on the conceptual model (O3), we will **identify future needs** in observations and model parameterisations, and **outline requirements** for fully integrated, multidisciplinary and collaborative O-SI-S-A field, laboratory, and modeling research (Objective O4).

ToR5: To **facilitate community and capacity building opportunities** for sustainable multidisciplinary science at the O-SI-S-A interface. Engage scientifically emerging countries and early career scientists in both observational and modeling communities (Objective O5).

CIce2Clouds – Full members

Name	Institution, Country	Expertise
Thorsten Bartels-Rausch [M]	Switzerland	Chemistry and micro-physics in ice/snow (senior scientist)
Odile Crabeck [F,EC]	Belgium	Ocean-ice-atmosphere gas exchange measurements (ECS)
Markus Frey [M]	UK	Polar atmospheric, snow & ice core chemistry measurements (senior scientist)
Hakase Hayashida [M, EC]	Australia	Sea-ice/ocean biogeochemical modeling - Arctic/Antarctic (ECS)
Anoop S, Mahajan [M]	India	Atmospheric chemistry in the polar regions (senior scientist)
Daiki Nomura [M]	Japan	Atmosphere-sea-ice interaction for gases (senior scientist)
Nadja Steiner [F,Ch]	Canada	Sea-ice/ocean biogeochemical modeling- Arctic (senior scientist)
Jennie Thomas [F]	France	Polar atmospheric chemistry modelling (senior scientist)
Megan Willis [F, Ch, EC]	USA	Measurements of polar ocean-atmosphere chemical interactions (ECS)
Liyang Zhan [F]	China	Ocean-ice-atmosphere gas exchange measurements (senior scientist)

Ch: Co-chair (2/10); **EC:** Early Career Scientist (3/10); **F:** female (5/10); **M:** male (5/10)

CIce2Clouds – Associate members

Name	Institution, Country	Expertise
Jessie Creamean [F, EC]	USA	Polar aerosol-cloud interactions, ice nucleation (ECS)
Srishti Dasarathy [F, EC]	USA	Tropospheric aerosol, sea ice, and surface ocean biogeochemistry modelling & remote sensing (ECS)
Bruno Delille [M]	Belgium	Ocean-ice-atmosphere gas exchange measurements (senior scientist)
Inge Deschepper [F, EC]	Canada	Sea-ice ocean biogeochemical modelling (ECS)
Francois Fripiat [F]	Belgium	Sea-ice and ocean biogeochemistry measurements (senior scientist)
Sakiko Ishino [F, EC]	Japan	Atmospheric chemistry in polar regions (ECS)
Louis Marelle [M, EC]	Norway/France	Modeling aerosol-cloud interactions in polar regions (ECS)
Klaus Meiners [M]	Australia	Coupled sea-ice physical-chemical-biological processes, sea-ice optics (senior scientist)
Lisa Miller [F]	Canada	Sea-ice chemistry measurements (senior scientist)
Ilka Peeken [F]	Germany	Sea-ice biogeochemistry (senior scientist)
Jacqueline Stefels [F]	Netherland/ Germany	Sea-ice & ocean biogeochemistry & DMS fluxes (senior scientist)
Marcello Vichi [M]	South Africa	Sea-ice physics and biogeochemistry (senior scientist)
Esty Willcox [NB EC]	Canada	Sea-ice interface geochemistry measurements (ECS)
Paul Zieger [M]	Sweden	Aerosol-cloud interactions in polar and pristine regions (senior scientist)

Ch: Co-chair (0/14); **EC:** Early Career Scientist (6/14); **F:** female (8/14); **M:** male (5/14), **NB**: non-binary (1/14)

Clce2Clouds –Summary of review comments

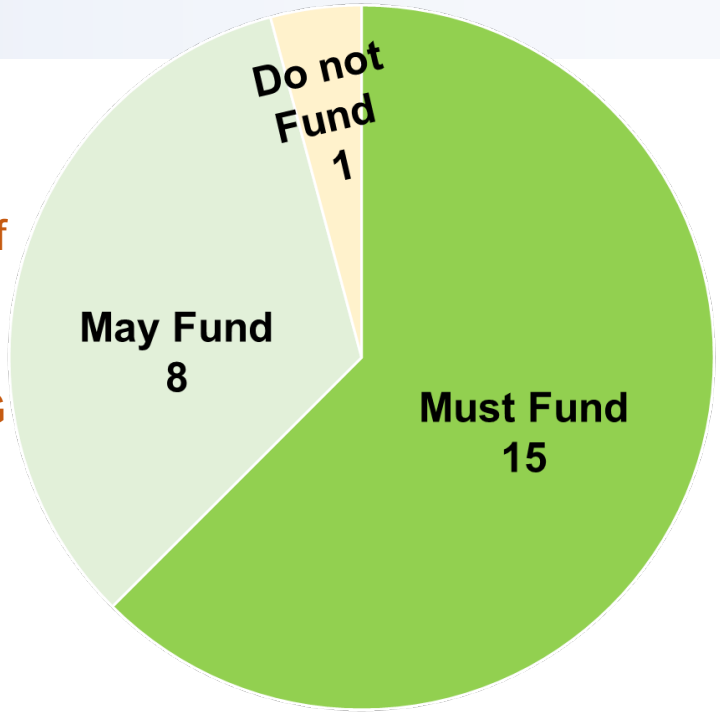
Timeliness
- is key to understanding the rapid environmental and climate changes on the Earth.
- basic, interdisciplinary challenges require timely planning to develop the future direction of the polar research.

High priority
- a very ambitious and challenging proposal; many scientific merits are expected from WG activities.
- can work only person-to-person discussion and online meetings without SCOR funds.

A good mechanism?
- requires international collaboration; can establish the framework for collaboration among atmosphere, sea ice, snow, and ocean communities.
- too wide a range and too much work in 3 years.

Terms of reference
- well planned.
- lack concreteness. It is unclear how the geochemical and biological processes work.
- holistic and ambiguous as to what to do with individual processes.

Membership
- well balanced geographically, gender, and their expertise.
- The involvement of members from developing countries should be considered.
- lack of experts from biological oceanographers, specialist on boundary layer cloud modeling, and physically-based scientists for the sea-ice dynamics.



20 NCs:
- Must Fund: 13
- May Fund: 6
- Do not fund: 1

IABO: May fund
IAPSO: Must fund
SOLAS : Must fund
IMBeR : May fund

Harnessing global pELagic FISH biochemical data to address Sustainability challenges under climate change scenarios (**ELFISH**)

SCOR Executive Monitor
Bradley Moran

ELFISH – Terms of Reference

ToR 1. Develop a global database of biochemical measurements and related spatio-temporal and biological metadata for pelagic fish species (objective 1) gathered from existing ocean-related studies and monitoring programs (example in Figure 1). The focus will be to compile all available records of macro-, micronutrients and contaminants in addition to information on the origin (e.g., date and location), size and trophic level of the fish.

ToR 2. Obtain environmental data known to influence ecosystem and nutrient dynamics (e.g., sea surface temperature, chlorophyll-a, mixed layer depth and oxygen concentrations) to match with the origin of the gathered pelagic biochemical data (objective 1).

ToR 3. Develop novel models that will map and predict the availability and distribution of pelagic-derived biochemical compounds (nutrients and contaminants) under climate change scenarios (objective 2). These models will be first applied at regional scales on particular biochemical compounds and species for which there is sufficient data available, then expanded to larger (ocean basin and global) scales to undertake regional comparative assessments.

ELFISH – Terms of Reference (Cont.)

ToR 4. Identify important next steps by describing the current overlapping and growing requirements for collaborative spatio-temporal biochemical composition data, such as those compiled by WG for pelagic fish, to address ecological and nutrition challenges in a changing environment (objective 3).

ToR 5. Share knowledge and transfer skills in modelling and in the sharing, merging and stewardship of environmental and biochemical data with international (with a focus on early career) scientists in both developed and developing nations (objectives 1-3).

ELFISH – Full members

Name	Institution, Country	Expertise
Anne Lorrain [F, Ch]	IRD, France	Stable C, N, Hg isotopes; marine ecology; biogeochemistry
Heidi Pethybridge [F, Ch]	CSIRO, Australia	Fatty acids, ecosystem models; climate-fisheries interactions
Nathalie Bodin [F, Ch]	SOS, Seychelles	Pelagic fisheries; food web ecology; seafood nutrients; contaminants
Anela Choy [F]	SIO and University of California, USA	Biological oceanography; stable isotopes, mercury; plastics; dietary studies
Christopher Somes [M, EC]	GEOMAR, Germany	Isotope and biogeochemical modelling
Colette Wabnitz [F]	UBC, Canada; and Stanford, USA	Marine fisheries; food web ecology; environmental change and seafood micronutrients; equity.
Felipe Galván-M. [M]	Interdisciplinary Center of Marine Science (ICIMAR), Mexico	Tunas & billfishes trophic ecology; stable C and N isotopes; heavy metals; marine ecology
James Robinson [M, EC]	Lancaster University, UK	Pelagic fisheries; seafood nutrients; tropical ecology
Valérie Allain [F]	The Pacific Community (SPC), New Caledonia	Fisheries scientist; capacity building; stakeholder engagement; knowledge transfer
Zahirah Dhurmeea [F, EC]	Albion Fisheries Research Centre (AFRC), Mauritius	Fisheries assessments; population dynamics; biochemical tracer applications

Ch: Co-chair; **EC:** Early Career Scientist; **F:** female; **M:** male

ELFISH – Associate members

Name	Institution, Country	Expertise
Catherine Munschy [F]	IFREMER, France	Persistent and bioaccumulative organic contaminants in marine biota
Christopher Parrish [M]	Memorial University, Canada	Lipid chemistry and applications of fatty acids as ecological tracers
Eva Maire [F, EC]	Lancaster University, UK	Ecological and environmental determinants of micronutrient availability from fish
Fany Sardenne [F, EC]	CNRS, France	Marine trophic ecology; stable isotopes; fatty acids; trace metals analysis
Joan Navarro [M]	Institute of Marine Sciences (ICM), Spain	Marine pelagic ecosystem dynamics
John Logan [M]	Massachusett Division of Marine Fisheries, USA	Stable isotope ecology; fisheries science
Kirsty Nash [F, EC]	University of Tasmania, Australia	Functional ecology and human nutrition; climate change scientist
Pearse Buchanan [M, EC]	Liverpool University, UK	Ocean biogeochemical modelling, climate change, isotopes

Ch: Co-chair; **EC:** Early Career Scientist; **F:** female; **M:** male

ELFISH – Summary of review comments

20 countries ranked ELFISH: 4 ranked Must Fund, 10 ranked May Fund, 6 ranked Do Not Fund

In addition, IMBER ranked Must Fund, IAPSO ranked May Fund, IABO ranked Do Not Fund

Timeliness: The WG is timely in light of the growing demand for seafood protein and the sustainable fisheries goals integrated into the UN Sustainable Development Goals and global food security. However, there are considerations against an urgent need for yet another data base, and that IUU fishing is arguably of greater urgency to sustainable pelagic fisheries.

Priority: A comprehensive and accessible global database of biochemical parameters associated with seafood protein could be useful as part of monitoring human health impacts associated with fish consumption and for tracking climate change impacts. However, the proposed database offers no solutions to address human activities that are widely known to negatively impact marine ecosystems.

Appropriateness for SCOR: There is a general consensus that a SCOR WG may be appropriate for this fundamentally international work, however there is overlap with prior the IMBeR-CLIOTOP WG.

ELFISH – Summary of review comments (Cont.)

Terms of Reference: The ToRs are generally appropriate for the work as proposed, but more detailed explanation and planning is warranted when considering the global scope of this topic, particularly with regard to forecasting future trends and impacts on pelagic fisheries.

Membership: Generally good expertise, gender, and geographic balance, though no members from China, India, Japan, Russia or Korea with large foreign fishing fleets. There appears to be a lack to statistical expertise needed to merge fish biochemical composition data with environmental observations in the database.

Other: Issue of quality control for data obtained from a wide range of global sources; if the QC/QA is questionable across these data sources, then the proposed database will not be defensible, or useful. Also, it is unclear whether the database will contain sufficient temporal and spatial coverage to detect trends; e.g., variability between individual samples, regions, annual to decadal time scales are not explicitly addressed.

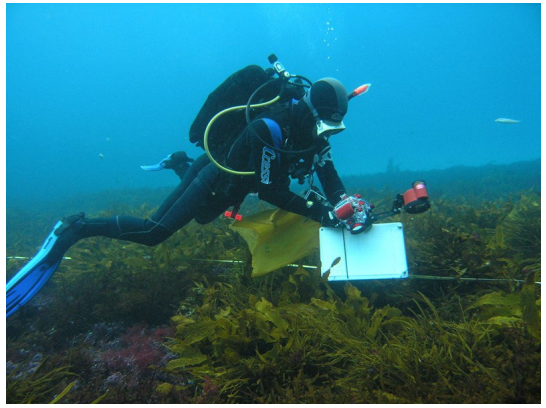
Advancing standardisation of COastal and Nearshore demersal fish visual CENSUS techniques
CoNCENSUS

SCOR Executive Monitor
Enrique Montes

CoNCENSUS – Terms of Reference

- TOR 1: Methodological comparison.
- TOR 2: Best practice guidelines
- TOR 3: Data management policy and infrastructure.
- TOR 4: Determine priority areas for engagement, capacity development and research.
- TOR 5: Establish a global community of practice.

Underwater visual census (UVC)



DOV: diver-operated stereo-video

Baited Remote Underwater Video Station (BRUVs)

CoNCENSUS – Full members

Name	Institution, Country	Expertise
Anthony Bernard [M, Ch]	SAIAB, South Africa	Marine ecology and conservation, stereo-BRUVs
Rick Stuart-Smith [M,Ch]	UTAS, Australia	UVC, Reef Life Survey, global indicators
Rene Abesamis [M]	Silliman U., Philippines	Coral reed ecology and conservation
Emily Darling [F]	WCS, USA	Coral Reefs, Conservation, Climate Refuges, Social-Ecological Systems
Jordan Goetze [M]	DBCA, Australia	Field surveys with Stereo-BRUVs/DOVs, UVC; Global FinPrint, Global Archive
Aaron MacNeil [M]	Dalhousie U., Canada	Bayesian data analysis, reef ecology, fisheries
Eva Maire [F,EC]	**Lancaster U., UK**	**Socio-ecology, conservation, functional ecology**
Ana C. Mazzuco [F, EC]	**UFES, Brazil**	**Biodiversity data management and marine ecology**
C. Pattengill-Semmens [F]	REEF, USA	Marine biology, citizen science, education
Melita Samoilys [F]	CORDIO East Africa, Kenya	Coral reef ecology, management and fisheries

Ch: Co-chair; **EC:** Early Career Scientist; **F:** female; **M:** male

CoNCENSUS – Associate members

Name	Institution, Country	Expertise
Rusty Brainard [M]	KAUST, Saudi Arabia	Coral Reef Ecosystems, Climate Change, Ocean Acidification, Fisheries, Biodiversity
Pascale Chabanet [F]	IRD, France	Coral reef ecology, extensive field experience with UVC and video for fish census
Emmet Duffy [M]	Smithsonian, USA	Marine ecology and Biodiversity, Co-lead on C-GRASS SCOR working group
Laura Ghigliotti[F]	IAS/CNR, Italy	Polar fish biology, ecology and management, field experience with BRUV
Reiji Masuda [M]	Kyoto U., Japan	Subtidal fish ecology, fish behaviour, UVC long term-monitoring
Peter Mitchel [M,EC]	**CEFAS, UK**	**Marine ecologist, specialising in mapping benthic habitats and fish assemblages.**
David Obura [M]	CORDIO, Kenya	Coral reef resilience, biogeography, management and policy
A. Perez-Matus [M]	PUCC, Chile	Fish and kelp ecology. Field experience in UVC and BRUVS
Fernanda Rolim [F]	UESP, Brazil	Marine ecology and management
Peter Walsh [M]	UTAS, Australia	Marine and terrestrial biodiversity data management and information systems

Ch: Co-chair; **EC:** Early Career Scientist; **F:** female; **M:** male

CoNCENSUS – Membership distribution

- 13 countries
- 3 ECS
- 8 Females
- 12 Males

CoNCENSUS – Summary of review comments

Timeliness	Priority for SCOR	Working Group mechanism	ToRs Appropriate?	Membership Appropriate?	Rating
Yes: 20 (91 %) (2020: 84 %)	Yes: 19 (86 %) (2020: 58 %)	Yes: 19 (86 %) (2020: 68 %)	Yes: 20 (91 %) (2020: 79 %)	Yes: 21 (95 %) (2020: 100 %)	Must fund: 11 (50 %) May fund: 10 (45 %)
No: 1 May be: 1 - Not clear why it had to be now, other than to take advantage of the UN Ocean Decade.	No: 1 May be: 2 - Link to eDNA still weak. - Monitoring topic than a science one.	No: 0 May be: 3 - Narrow scope (only demersal fish). - Specialized topic.	No: 1 May be: 1 - Not well matched to the stated aims.	No: 0 May be: 1 - Lack of representation from Asia. - Biased toward coral reef systems.	Do not fund: 1 - Inexpensive systems should be included. - Process for the achievement of the proposal objectives not fully fleshed out.

Comments:

- Much improved proposal compared to last year's submission – 50% Must Fund versus 32% last year.
- Some perceived synergies with the ELFISH proposal.
- Good integration with relevant international bodies, e.g. IOC/GOOS/BioEco, OBPS, GEO, Blue Planet and MBON.
- Contribute significantly to capacity development and towards other projects and initiatives implemented by the United Nations (e.g. IOC/GOOS).
- Addresses 4 goals under UN Decade.
- WG membership was generally perceived as well balanced across dimensions. Higher representation from developing countries and Asia is recommended/
- Robotics applications like AUVs, Internet Operated Vehicles (IOVs), crawlers should be considered.

Mixotrophy in the Oceans
Novel Experimental designs and Tools for a new trophic paradigm
(**MixONET**)

SCOR Co-Opted Executive Committee Member
Dr. Jacqueline Uku

MixONET – Terms of Reference

ToR1. Biological oceanography databases and the mixoplankton paradigm - Advocate for the realignment of existing plankton-facing databases in light of the mixoplankton paradigm. Identify connections between mixoplankton communities and essential ocean variables.

ToR2. Biological oceanography research methods under the mixoplankton paradigm - Re-evaluate standard biological oceanographic research methods and practices for application under the mixoplankton paradigm.

ToR3. Development of new biological oceanography methods accounting for primary and secondary productions by mixoplankton – This includes new methods and simple protocols that could be incorporated in ongoing monitoring programmes to quantify mixoplankton and interpret their activities

ToR4. Ocean literacy - Development of multi-lingual training material for Early Career Researchers (ECRs), ecosystem managers, teachers and students, to enhance ocean literacy - The mixoplankton paradigm nwill bbrought to the attention of students through to policy makers. A Decision Support Tool (DST) will be developed to aid configuration of mixoplankton-centric experiments to determine contributions to primary versus secondary production by these organisms.

MixONET – Team Members

20-member team consists of qualified professionals from 18 countries 9 female, 11 male

Out of this, 6 were early career researchers

Full members	Institution, Country		Associate members	Institution, Country
Aditee Mitra [F, Ch]	Cardiff University, UK		Ahmed Al-Alawi [M, EC]	Marine Science and Fisheries Centre, Oman
George McManus [M, Ch]	U. of Connecticut USA		Aurea M. Ciotti [F]	U. São Paulo, Brazil
Anukul Buranapratheprat [M]	Burapha Univ., Thailand		Patricio Díaz [M]	Los Lagos Univ., Chile
Helga de Rosario Gomes [F]	Lamont-Doherty Earth Observatory, USA		Amany Ismael [F]	Alexandria University, Egypt
Robinson Mugo [M, EC]	SERVIR E&SA/RCMRD, Kenya		Hae Jin Jeong [M]	Seoul National University, Korea
KunnatholickalB. Padmakumar [M, EC]	CUSAT, India		Michaela Larsson [F,EC]	DWER & U. Technology Sydney, Australia
Beatriz Reguera [F]	Instituto Español de Oceanografia, Vigo, Spain		Maite Maldonado [F]	U. British Columbia, Canada
Tina Šilović [F, EC]	CytoBuoy b.v. The Netherlands		Nikola Medić [M, EC]	Copenhagen University, Denmark
Mengmeng Tong [F]	Zhejiang Univ., China		Tim Smyth [M]	PML, UK
Fernando Unrein [M]	UNSAM-CONICET, Argentina		Koji Suzuki [M]	Hokkaido University, Japan

Ch: Co-chair; **EC:** Early Career Scientist; **F:** female; **M:** male

MixONET – Summary of review comments

Reviews: 21 Country reviews, IABO, IAPSO, SOLAS, IMBER

Ranking:
May Fund = 9
Do not Fund = 2
Must fund = 13

Timeliness: It is timely. We have been aware of mixotrophy for decades, yet we are still unable to understand how common it is, what is the contribution of mixoplankton to primary and secondary production and how to sample mixoplankton. The proposal is tagged with the UN Decade of Ocean Science for Sustainable Development, which started in 2021. There are links to biogeochemistry under climate change, as well as global food security. Underdeveloped topic, very timely and important.

High priority for ocean science and for SCOR: A working group on mixotrophic plankton would continue a long history of SCOR working groups for plankton communities and biogeochemical cycles. The new goal would be to establish the importance of mixotrophic processes to the Carbon Pump and the occurrence of harmful algal blooms in an age of climate change. The proposed deliverables will have relevance for five global or regional networks with focus on HABs. They connect SCOR subjects and use previous SCOR experiences and solutions. Some reviewers considered that since we are still at the stage of collecting basic information, it is hard to judge whether it is the appropriate time to deal with it in SCOR right now.

Is a SCOR Working Group a good mechanism here?: A SCOR WG provides an effective forum for combining inputs from a diverse assemblage of global experts with knowledge of ecophysiology and molecular biology of mixotrophic organisms, sampling and observation technology, biogeochemical cycling, and ecosystem services required to deliver the proposed terms of reference.

Appropriateness of the terms of reference: The gradual step forward developmental process is well planned on the terms of reference. Logical and sequential procedure of databases, practical methodology, new technique development, and literacy for Early Career Researchers (ECRs) is a scientific approach connecting educational contribution. Propagation of scientific knowledge will be the best endpoint of this proposal for the study field of mixotrophy in oceans. The ToRs are realistic and the proposed deliverables are feasible within the three-year time frame.

MixONET – Summary of review comments

Appropriateness of membership suggestions: Geographic, gender and age balances are well maintained. The primary panel is very well-balanced with respect to geography combining expertise from UK, USA, Thailand, Kenya, India, Spain, China and Argentina. Associates add other countries including the Oman, Brazil, Chile, Egypt, South Korea, Australia, Canada, Denmark and Japan. There is expertise across a very broad range of disciplines and research topics relevant to the deliverables. In addition, the WG will have members on all five global or regional networks for HABs (above). Some concern was shared about some leaders in the theme of mixotrophy are either not represented or only represented in minor roles. The team is also taking a bet to incorporate a few members who seem to come from more distant subjects and it is hoped that they can integrate in the long term.

Other comments: The link with climate mentioned in the introduction is not addressed in the TORs. The environmental triggers for mixotrophy need to be identified as many organisms switch between nutritional modes, but it is not well known how this is regulated. There is need to incorporate two or three investigators with a high focus in mixotrophy (with a mix of early career and established researchers).

The WG suggests of a side-event at the ICOP Conference on *Optical methods for mixoplankton identification*. This may not be the best approach as participation from the developing countries cannot be achieved.

There is need to ensure that these new sets of best practices are also implemented as part of future regular sampling strategies by linkages to global initiatives such as GOOS (Global Ocean Observing System). Linkage with Ocean Teachers Global Academy would make their capacity development material more visible and increase impact.

Linking with the IOC-Ocean Best Practices to make their methodologies and protocols accessible and available through that system is highly recommended. Linkage to Tara-Ocean that maps the global distribution of marine ecosystems in lower trophic level with genetic information, and Bio-GEOSCAPE that is currently being planned is also recommended.

From the Ocean to the Lab to the Ocean: best practices for ecologically sound inferences in fluctuating habitats Ocean-Lab-Ocean (**OLO**)

The coordinator is Simone Baldanzi from University of Valparaiso in Chile.

SCOR Executive Monitor
Stefano Aliani

OLO - Justification

OLO aims to fulfil the urgent demand for **standardised methods and protocols** to measure environmental **variation in space and time** at ecologically **relevant scales** and establish **informative designed** experiments

These objectives are very ambitious and the outcome highly needed, but it is very difficult to follow the rationale and understand the link with the remaining part of the proposal. Also sorting out the objective was difficult.

OLO – Terms of Reference

ToR 1. Identify, quantify, and prioritise through **a systematic review and published protocols**
ToR 2. Produce an open-access **manual of best-practice methods**
ToR 3. Develop **habitat-specific** (including **urban habitats**) new practices and methodology for implementing **dynamic manipulative experiments** (DME)
ToR 4. Develop methods that provide practical application for integrate monitoring of ecosystem responses
ToR 5. Build capacity on **environmental data-logging**, **ecologically relevant DME** and network analysis

CONS
TOR1 SR individual scholarship than group.
very broad in scope
difficult to see TORs within the timeframe of a WG
Overlap with COBS needs to be addressed.
The ToRs are too ideal.

PRO

Clear ToR aligned with objectives and workplan
Just Yes no description
The ToRs are ambitious, appropriate and realistic

OLO – Products and deliverables

1. A **systematic review**
2. A guidance document summarizing **best practices/protocols**
3. **Two scientific publications**, one on “From the field to the lab: depicting and reproducing environmental fluctuations for ecologically relevant experiments”; and the other on “Modelling environmental variability and fluctuation to understand marine ecological networks” (ToR 2-3).
4. **Two peer-reviewed publications** for ToR 4

WG SCOR as a proper tool

PRO

more appropriate for a research program

The topic is too extensive for a SCOR WG

Some overlap with the earlier SCOR WG 149

SCOR relevance not reported only international view

cannot be accomplished with funding of SCOR WG

OLO – Capacity Building

- **Create a consortium of laboratories**
- **Training of students and scientists** from any country
- **Organize a large workshop/training** course

CONS

SCOR Working Group is one of the mechanisms

Some generic YES with no comments

OLO – Full members

Name	Gender	Institution, Country	Expertise
Simone Baldanzi (Ch)	M	U. Valparaíso, Chile	Marine ecophysiology; environmental epigenetics
Marco Fusi (Ch, EC)	M	Edinburgh Napier U., UK	Mangrove restoration; marine ecophysiology; microbial ecology; network ecology
Francesca Porri	F	SAIAB, South Africa	Larval ecology; marine connectivity; urban ecology
Ramona Marasco	F	KAUST, Saudi Arabia	Microbial Ecology; molecular ecology
Eleonora Puccinelli (EC)	F	LEMAR, France	Trophic ecology; food web; fatty acids
Nicolas Weidberg (EC)	M	U. Vigo, Spain	Remote sensing; global change
Antony Knights	M	U. Plymouth, UK	Marine population dynamics, ecosystem structure and functioning; modelling
Paula Pattrick (EC)	F	SAEON, South Africa	Shallow water ecosystem ecology, ichthyoplankton taxonomy
Laure Carassou	F	INRAE, France	Fish trophic ecology; urban ecology
Fernando Lima	M	CIBIO, Portugal	Global network of biodiversity and thermal data collection; dynamic experiments

Membership

CONS

Track records not consistent with TORs

Lack of any Asian or North American

include statistics, modeling, physical oceanography, and policy

ECS stable research appointments

PRO

Gender and geographic balanced

Coordinator from Chile

Yes Generic

OLO – Summary of review comments

Timeliness

CONS

Timeliness imperative not explicitly established

No motivation now vs another year

Implementation vague

Static vision No shifts

PRO

General endorsement of the broad topic

Importance of the topic and not timeliness

Relevance for ocean science

CONS

Would have benefited from more focus

The priority is unclear and the aim is low

too wide for SCOR

appear to be redundant (WG147 COBS)

proposal does not seem mature enough

Implementation is vague

PRO

better understanding on the consequences of human exploitation

The concept of environmental legacy as a variable to explain resilience is intriguing and innovative

Emerging problem in a dynamic and changing ocean

the consequences of human exploitation

reflect (mimic) conditions experienced by organisms

OLO – Summary of review comments

Australia	Do not Fund
Belgium	Must Fund
Canada	Must Fund
Chile	Must Fund
China	May Fund
Colombia	May Fund
Finland	May Fund
France	Do not Fund
Germany	Do not Fund
Ireland	Do not Fund
Italy	Do not Fund
Japan	Do not Fund
Korea	May Fund
Netherlans	May Fund
Russia	Do not Fund
South Africa	May Fund
Sweden	Do not Fund
Switzerland	May Fund
UK	Do not Fund
USA	Do not Fund
IABO	May Fund
IAPSO	Do not Fund
IMBeR	May Fund

Conclusion

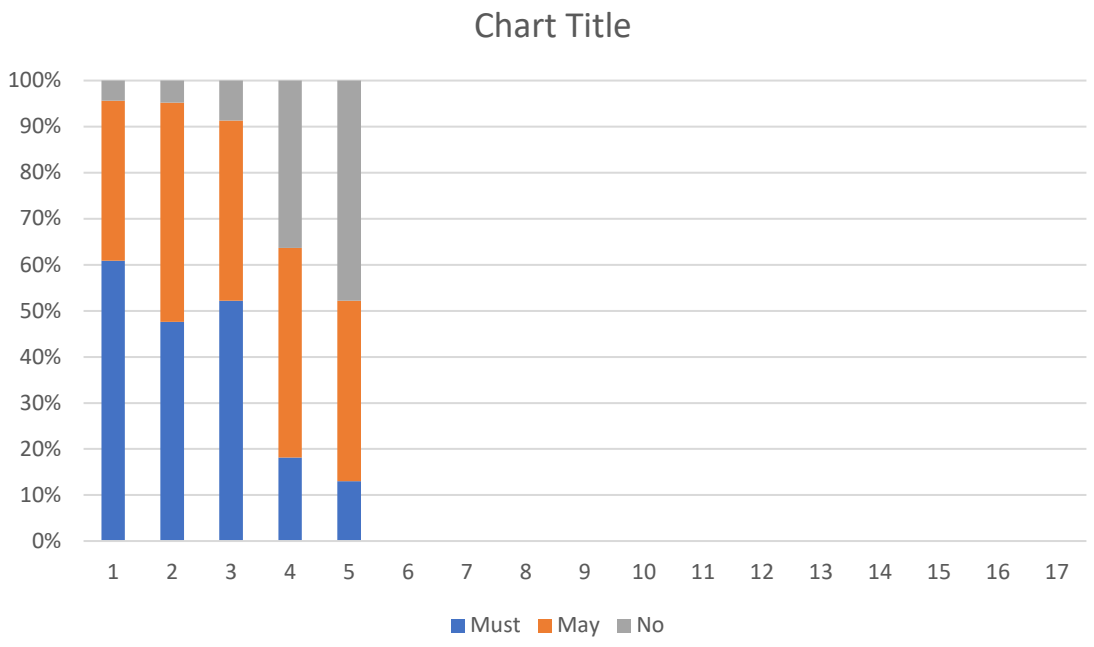
- MUST FUND 3
- MAY FUND 9
- **NOT FUND 11**

5-minute BREAK

Discussion of new Working Group proposals

WG Ranking

Committee	Clce2Clouds	CoNCENSUS	MixONET	ELFISH	OLO
Australia	2	1	2	1	0
Belgium	2	2	1	1	2
Canada	2	2	1	1	2
Chile	1	2	2	1	2
China-Beijing	2	1	2	2	1
Colombia	2	1	1	0	1
Finland	2	NA	1	NA	1
France	2	NA	2	1	0
Germany	2	1	1	0	0
Ireland	1	1	2	2	0
Italy	1	1	2	0	0
Japan	2	0	2	0	0
Korea	1	2	2	0	1
Netherlands	2	2	1	0	1
Poland	2	1	2	1	1
Russia	2	1	2	1	0
South Africa	2	2	0	0	1
Sweden	1	1	2	1	0
Switzerland	1	2	1	2	1
UK	0	1	2	2	0
USA	1	2	0	1	0
IABO	1	2	1	0	1
IAPSO	2	2	1	1	0
Rank	1.57	1.43	1.43	0.82	0.65
Must	60.9	47.6	52.2	18.2	13.0
May	34.8	47.6	39.1	45.5	39.1
No	4.3	4.8	8.7	36.4	47.8



	Clce2Clouds	CoNCENSUS	MixONET	ELFISH	OLO
Must	14	10	12	4	3
May	8	10	9	10	9
Do not	1	1	2	8	11
# reviews	23	21	23	22	23

Must = 2
May = 1
Do not = 0

Wrap up for the day