

22nd Session of the CLIVAR Scientific Steering Group

23-24 September 2016, Qingdao, China



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Recommendations and Action Items

WCRP and Future Earth:

ACTION: Discuss with WCRP means to improve communication between WMAC and CLIVAR/core projects (SSG co-chairs, ICPO, OMDP) - **ASAP**

ACTION: OMDP to propose means to maximize impact of OMDP on WCRP activities (OMDP chairs); (SSG to transmit message to JPS/JSC) – **October/2017**

ACTION: Determine next steps for creating ocean knowledge action network (Stammer to discuss with Kiefer and Visbeck) - **ASAP**

ACTION: Encourage members of CLIVAR panels to answer Future Earth survey on oceans-related initiatives (ICPO, SSG co-chairs) - **ASAP**

Panels:

ACTION – GSOP to serve as CLIVAR interface with AtlantOS (in addition to OOPC link), but should also liaise with Atlantic Region Panel (GSOP, ARP, ICPO) - **ASAP**

ACTION: Discuss GEWEX expectations and IGPO role vis a vis Monsoon Panel (Dirmeyer/Turner/ICMPO) - **ASAP**

ACTION: Increase interaction between US AMOC Science Team and Atlantic Region Panel (ARP co-chairs) – **May 2017**

ACTION: ARP to work with GSOP on AMOC in ocean reanalysis for improving AMOC estimates (ARP co-chairs, GSOP co-chairs) – **June 2017**

ACTION: Communicate TACE summary paper and PREFACE activities to Africa climate research community interested in tropical Atlantic observing systems (ICPO w/ Arame Tall and Monsoons Panel Africa subgroup) - **ASAP**

ACTION: Explore possible joint Arctic panel with CliC focused on teleconnections and to facilitate interactions with ARP, PRP, GSOP, Climate Dynamics panel and CMIP. (Stammer) – **January 2017**

Research Foci:

RECOMMENDATION: Sea level GC/RF should review membership to entrain more Asian scientists (Sea Level RF co-chairs) - **ASAP**

ACTION: CLIVAR SSG co-chairs to discuss with IMBER SSG co-chairs on the evolution of the EBUS RF (SSG co-chairs) – **January 2017**

RECOMMENDATION: DCVP should connect with PMIP decadal variability group (DCVP co-chairs)

SSG and pan-CLIVAR issues:

RECOMMENDATION: Organize more CLIVAR meetings in USA (ICPO with panels/RF)

ACTION – Invite programme managers from EU and other countries to CLIVAR SSG meetings (SSG co-chairs w/ ICPO) – **Next SSG meeting**

ACTION: Further discuss with FIO the proposal to host biannual ECS Symposium (ICPO with FIO) – **May 2017**

RECOMMENDATION: Organize CLIVAR sessions at major meetings like EGU, AGU and in Asia to raise visibility (ICPO to develop calendar of deadlines and alert Panel chairs, etc).

ACTION: Further discuss with ICTP and WCRP on possible ways to develop or propose more summer schools (ICPO) – **July 2017**

ACTION: Develop a “funding portal” with opportunities for panels (e.g., Newton Fund (UK), Belmont Forum, NATO fellowship, ...) (ICPO) - **ASAP**

ACTION: Prepare issue of Exchanges with articles from winners of poster awards (Nico Caltabiano, ICPO) – **February 2017**

ACTION: Discuss guidelines for green initiatives in future meeting and conferences with WCRP (ICPO, JPS) – **December 2016**

ACTION: Prepare doodle poll for joint CLIVAR SSG and US CLIVAR SSC joint meeting during US CLIVAR Summit in Summer 2017 (ICPO) - **ASAP**

ACTION: Check correct end of term date for CLIVAR SSG members with terms expiring in 2017, according to CLIVAR website (Mike Sparrow, ICPO) - **ASAP**

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1. Introductory Session

The CLIVAR Scientific Steering Group (SSG) co-chairs, Detlef Stammer and Annalisa Bracco, welcomed all participants (Annex 1). All participants agreed to the agenda of the meeting (Annex 2).

Guy Brasseur, Chair of the World Climate Research Programme's (WCRP) Joint Scientific Committee (JSC) congratulated CLIVAR for the successful Open Science Conference (OSC). Brasseur also reviewed WCRP's activities and the JSC structure, with its new officers and liaison for core projects. In-Sik Kang and Amanda Lynch are the new liaisons to CLIVAR.

WCRP's co-sponsors, the International Council for Science (ICSU), the World Meteorological Organisation (WMO) and UNESCO's Intergovernmental Oceanographic Commission (IOC), have initiated a review of WCRP. Brasseur highlighted that this is an excellent opportunity for WCRP to develop a new strategic plan, and CLIVAR should contribute to this plan, mainly with the outcomes of the OSC and CLIVAR's new Science Plan.

In relation to regional activities within WCRP, is working to establish clear guidelines and will put out a call for a coordinator for WCRP regional activities, which should facilitate the coordination of ongoing activities as well as identifying new opportunities to expand WCRP's visibility and contributions in the regional . WCRP is also developing a new communication strategy, and a draft document has been prepared by the Joint Planning Staff (JPS). Core projects will have a chance to comment and contribute on that.

During discussion, participants raised concern on the communication aspects among modelling communities within WCRP, and how this can be improved. Since the Working Group on Coupled Modelling (WGCM) and the Working Group on Subseasonal to Interdecadal Prediction (WGSIP) report only to the WCRP Modelling Advisory Council (WMAC), only a very small audience are aware of their activities. Also, CLIVAR's Ocean Model Development Panel (OMDP) is the only CLIVAR representation in WMAC, and it is important to make better use of this link in order to connect CLIVAR and WCRP's modelling activities.

ACTION: Discuss with WCRP means to improve communication between WMAC and CLIVAR/core projects (SSG co-chairs, ICPO, OMDP) - **ASAP**

ACTION: OMDP to propose means to maximize impact of OMDP on WCRP activities (OMDP chairs); (SSG to transmit message to JPS/JSC) - **October/2017**

Thorsten Kiefer, Future Earth's Global Hub Director (Paris), gave an overview of Future Earth's activities, and indicated several opportunities for CLIVAR-Future Earth collaboration. There are many overlaps with CLIVAR activities, e.g., ocean services and sustainable solutions, carbon cycle and budgets, extremes and disaster risk reduction.

Future Earth Knowledge-Action Networks (KAN) are collaborative frameworks that facilitate highly integrative sustainability research, where interaction among groups involved and integration of activities will take place. The Oceans KAN is being proposed but details need to be further discussed. Kiefer also mentioned that a proposal will be made to the Belmont Forum for the development of a Collaborative Research Action (CRA) on "Transdisciplinary Research for Ocean Sustainability". The development of an Ocean KAN will add to this process, which at the moment has an open stakeholder consultation

(<https://www.surveymonkey.com/r/LQD3N5M>) and CLIVAR members should contribute by answering the survey.

ACTION: Determine next steps for creating ocean knowledge action network (Stammer to discuss with Kiefer and Visbeck) - **ASAP**

ACTION: Encourage members of CLIVAR panels to answer Future Earth survey on oceans-related initiatives (ICPO, SSG co-chairs) - **ASAP**

2. CLIVAR Panels Session

Magdalena Balmaseda and **Catia Domingues** presented activities of the Global Synthesis and Observations Panel (GSOP). One of the major panel activities has been the development of the International Quality Control Upper Ocean Database (IQuOD). It aims at developing the most complete, consistent and high quality long term subsurface ocean temperature (EOV/ECV) database, including intelligent metadata and provision of uncertainty. Another important activity has been the Ocean ReAnalysis Intercomparison Project (ORA-IP). GSOP is starting to organize the next phase of ORA-IP, and will be interacting with CLIVAR panels for a new set of metrics. Other more recent activities such as the Realtime ORA-IP for ENSO monitoring and data impact assessment, and the ensemble ocean reanalysis tool for climate model evaluation (CREATE-ORA) have also been initiated by GSOP. The panel has also provided support to projects like TPOS2020 by working on the observing system evaluation and design.

Participants raised the issue that GSOP should be CLIVAR's point of contact for all questions on the scientific needs or justifications for the ocean observing system, and it should have particular strong links with the new funded projects such as AtlantOS, in liaison with CLIVAR regional panels.

ACTION – GSOP to serve as CLIVAR interface with AtlantOS (in addition to OOPC link), but should also liaise with Atlantic Region Panel (GSOP, ARP, ICPO) - **ASAP**

Simon Marsland gave a review of OMDP activities. The panel is coordinating the Ocean Model Intercomparison Project (OMIP), which is one of the endorsed MIPs of the CMIP6 process. OMIP provides a framework to: (i) investigate physical, chemical, and biogeochemical mechanisms that drive seasonal, inter-annual, and decadal variability; (ii) attribute ocean-climate variations to boundary forced versus natural; (iii) evaluate robustness of mechanisms across models and forcing data sets; (iv) bridge observations and modelling by complementing ocean reanalysis from data assimilation; and, (v) provide consistent ocean and sea-ice states useful for initialization of climate (e.g., decadal) predictions.

OMDP has also undertaken work to create a new and improved version of the CORE atmospheric forcing data sets based on the JRA-55 (Japanese Re-Analysis) reanalysis product from the Japanese Meteorological Agency (JMA). This product meets a set of desired features such as higher spatial and temporal resolution of the data and, in particular, commitment of the JMA to provide continuous updates. A major short-term goal of the OMDP is to complete the development and initial evaluation of the JRA-55 atmospheric forcing data sets, which should be available to the modelling community in early 2017.

Matt Collins reported on the Climate Dynamics Panel (CDP). The panel has produce a draft of a 'position paper' outlining the scientific gaps and opportunities related to climate dynamics with a focus on the role of the ocean and its interaction with the atmosphere, with the aim to submit

it to Nature Climate Change by November 2016. The panel also anticipates a strong interaction with the HighResMIP project, particularly in the area of storm tracks. Such analysis would be done jointly with the Atlantic Region Panel and the EU-funded PRIMAVERA project.

Andy Turner reviewed activities of the Monsoons Panel. The panel had their first meeting at the CLIVAR OSC, after an initial attempt earlier in the year that had to be cancelled. In the meantime, the panel has formed three regional working groups: Asian-Australian, Americas and Africa. Members of these groups are meeting regularly via teleconferences, and developing their working priorities for the next three years. This will be an important activity of the panel since it plans to look at different regions, and provide lessons learned based on metrics and facilitate knowledge exchange.

The Monsoons Panel will contribute to the review of the Indian Ocean Observing System that is being led by the CLIVAR/IOC-GOOS Indian Ocean Region Panel (IORP), particularly in the relationship and feedbacks of the Indian Ocean and monsoons. The panel has also reviewed the Global Monsoons Model Intercomparison Project (GMMIP), which is more atmosphere focused but with scope to include an ocean component. The panel is jointly sponsored by GEWEX but more interaction with GEWEX groups needs to be strengthened.

ACTION: Discuss GEWEX expectations and IGPO role vis a vis Monsoon Panel (Dirmeyer/Turner/ICMPO) - **ASAP**

Sabrina Speich reported on the Atlantic Region Panel (ARP) activities. The panel has kept a watch briefing in the overall observing system in the Atlantic basin, particularly with PIRATA, and much progress has been made in recent years. It has been felt, however, that the panel should have a closer interaction with the US AMOC Science Team. A great opportunity will be the upcoming US AMOC meeting in Santa Fe, USA, in May 2017. This interaction would also be important since AMOC signature from data synthesis products show a large spread, and therefore, GSOP needs help from regional experts to understand the reason for that.

ACTION: Increase interaction between US AMOC Science Team and Atlantic Region Panel (ARP co-chairs) – **May 2017**

ACTION: ARP to work with GSOP on AMOC in ocean reanalysis for improving AMOC estimates (ARP co-chairs, GSOP co-chairs) – **June 2017**

The panel is also planning a joint workshop with OMDP, and possibly with the CDP focusing on ocean mesoscale eddy, atmosphere feedback and its effect on eddy-resolving ocean model simulations. The panel will also provide information to PREFACE on the need to enhance wind and air-sea fluxes measurements in particular along the coast of West Africa, in order to reveal the spatial structure of the Benguela Jet that is critical to reduce sea surface temperature bias in the region. This issue motivates the discussion that ARP needs to have stronger links with African stakeholders, and communicate activities to the African scientific community.

ACTION: Communicate TACE summary paper and PREFACE activities to Africa climate research community interested in tropical Atlantic observing systems (ICPO w/ Arame Tall and Monsoons Panel Africa subgroup) - **ASAP**

Xiaopei Lin reviewed the Pacific Region Panel (PRP) recent activities and updated participants on the panel's plans. The two main activities have been on understanding the dynamics and teleconnections of ENSO on multiple timescales, with close links to the "ENSO in a warming world" Research Focus, and Western Boundary Currents (WBC) dynamics and observation. The panel has also provided input to TPOS2020, with several members involved in the project's steering group and task teams. The panel is also involved in the PICES/CLIVAR

Study Group on Climate and Ecosystem Predictability. As an outcome of this Study Group, a proposal will be made to PICES leadership to setup a PICES Working Group on Climate and Ecosystem Predictability (WG-CEP), with continued involvement of members of the PRP and the CLIVAR Eastern Boundary Upwelling Systems (EBUS) Research Focus.

The panel will continue to have a focus on WBCs, with particular interest in connections with the Indonesian Throughflow (ITF) dynamics (and to be further developed jointly with the CLIVAR/IOC-GOOS Indian Ocean Region Panel). Same with ENSO and continued understanding of its basic mechanisms, the specific dynamics and predictability of extreme ENSO events, and the remote influence of regions outside the tropical Pacific on ENSO. An activity that can be further developed jointly with the Decadal Climate Variability and Predictability (DCVP) Research Focus is on the mechanisms responsible for the Pacific Decadal Variability, the regional imprints of the Pacific Decadal Variability, and their representation in CMIP models.

John Fyfe reviewed the activities of the CLIVAR/CliC/SCAR Southern Ocean Region Panel. The panel has provided input to the Year Of Polar Prediction (YOPP) Southern Hemisphere subcommittee plan, and to the Horizon Scan of the Scientific Committee on Antarctic Research (SCAR). The panel, like all the other CLIVAR regional panels, provides advice on Essential Climate Variables (ECVs) to the Ocean Observations Panel for Climate (OOPC), and on observations in general to the Southern Ocean Observing System (SOOS).

During the CLIVAR OSC, the panel has led a discussion exploring the possibility for a joint Northern Oceans panel with CliC, who also showed interest in such initiative. Participants highlighted the importance to entrain other groups with a focus in the Arctic Ocean, mainly with the International Arctic Science Committee (IASC).

ACTION: Explore possible joint Northern Oceans panel with CliC focused on teleconnections and to facilitate interactions with ARP, PRP, GSOP, Climate Dynamics panel and CMIP. (Stammer) – **January 2017**

Jérôme Vialard presented topics and activities that the CLIVAR/IOC-GOOS Indian Ocean Region Panel (IORP) has been developing. Decadal variability of the Indian Ocean is still largely unknown, and very important to predict sea-level regional changes. This will continue as one of the main IORP science topics. The panel will also continue to provide input to the Second International Indian Ocean Expedition (IIOE-2). One of the main activities for the panel is to lead the Indian Ocean Observing System (IndOOS) review. IORP will produce a white paper as background during 2017, with the review itself taking place in a two-day workshop coordinated with the proceeding meeting of IORP/IOGOOS/IRF/SIBER, anticipated in early 2018. A workshop report with specific recommendations for evolving the system would be drafted and circulated to the sponsors for comment before being finalised.

The IORP and SIBER plan to jointly organize a school on Indian Ocean Climate variability and its impact on biogeochemistry and ecology, under the IIOE-2 label. The Indian National Centre for Ocean Information Services (INCOIS) offered to host, support and infrastructure for that school, which should happen in late 2017. Some endorsements and financial support have already been secured.

3. Heading CLIVAR Research Foci Session

Detlef Stammer presented the latest on the WCRP Regional Sea Level Change and Coastal Impacts Grand Challenge. This GC has several parallel, but interconnected, working groups.

Overall objective is to provide an assessment of the state of affairs of sea level research every 2 years, using the resulting information to make adjustments of its science plan and recommendations for international sea level research efforts. Many new science results already available, with a terminology paper, a white paper on status of sea level research, and a paper on uncertainties at coastlines in preparation.

The group is also leading the preparation of the Sea Level Conference that will take place in New York, USA, on 10-14 July 2017, and hosted by the Earth Institute, Columbia University. It is expected a participation of around 400 people from natural sciences, social sciences and the coastal management community.

Participants of the meeting felt that it is necessary to entrain more Asian scientists in the GC steering group, but recognised that the conference may provide this opportunity.

RECOMMENDATION: Sea level GC/RF should review membership to entrain more Asian scientists (Sea Level RF co-chairs) - **ASAP**

Ruben Escribano gave an overview of the Eastern Boundary Upwelling Systems (EBUS) Research Focus. A workshop was organised and took place in Ankara, Turkey in October 2015 to bring together 15 researchers, discuss ideas and set the key scientific issues for a plan. An EBUS RF prospectus was developed after the Ankara workshop, and was revised and approved by the CLIVAR SSG in April 2016. The long term goal is to understand how EBUS will respond to climate change. This RF is a joint activity with IMBER, that is also organizing an upwelling group with different goals. However both groups need to be complimentary rather than in competition and replicating the same activities.

ACTION: CLIVAR SSG co-chairs to discuss with IMBER SSG co-chairs on the evolution of the EBUS RF (SSG co-chairs) – **January 2017**

Yochanan Kushnir and **Christophe Cassou** presented the plans for the Decadal Climate Variability and Predictability (DCVP) RF. The science plan has been developed but the group still is looking for input. A more coherent plan of activities to be presented at US AMOC meeting in Santa Fé, May 2017. DCVP will work as a link for CLIVAR panels and WCRP activities on decadal issues: the Decadal Climate Prediction Project – DCP - and the recently formed Near-term Climate Prediction GC. Since 2015, DCVP taken part in many activities: contributed to planning and execution of the CLIVAR-ICTP “International Workshop on Decadal Climate Variability and Predictability”; it is contributing to framing the objectives of the WCRP/WGSIP/DCPP component-C objectives and the establishment of their experimental protocols; leading preparations for a Special Issue of CLIVAR Exchanges, jointly with PAGES. This led to the discussion that links with the Paleoclimate Modelling Intercomparison Project (PMIP) should be done via DCVP RF, and not via the WCRP GC. DCVP also is planning to develop a comprehensive study of the Atlantic Multidecadal Variability the Climate Dynamics Panel and the Atlantic Region Panel, together with US-AMOC and RAPID.

RECOMMENDATION: DCVP should connect with PMIP decadal variability group (DCVP co-chairs)

Matt Collins, on behalf of the ENSO in a changing climate RF co-chairs, Eric Guilyardi and Andrew Wittenberg, presented the implementation strategy and timelines for their activities. The group has developed key activities and publications on process understanding, ENSO metrics, and identification of new observations needed. Member of the RF are contributing to the TPOS2020 project in several ways, in particular the Backbone Task Team, and Model and Data Assimilation Task Team. The panel is also planning the 5th CLIVAR ENSO workshop in 2017, in South Korea, and an ENSO summer school in 2018.

Karina von Schuckmann gave an overview of the Planetary heat balance and ocean heat storage (CONCEPT-HEAT) RF, a joint activity with GEWEX. The overall goal is to bring together different climate research communities all concerned with the energy flows in the Earth's System to advance on the understanding of the uncertainties through budget constraints. The group has organised its first meeting in 2015, and a couple of workshops to further organise the implementation of its science plan. Two new activities are being planned by the group: estimation of the net surface flux as a residual of the top-of-atmosphere (TOA) radiative fluxes (from CERES) combined with comprehensive estimates of the vertically integrated atmospheric divergence of energy (from ERA-interim reanalyses); and, an analysis of ocean meridional heat transport (MHT) and its variability. Also, the panel is looking into developing methods of creating synthetic profiles for evaluation of ocean heat content and sea level mapping.

4. Report from Agencies

Mike Patterson gave a presentation on the recent US CLIVAR activities, including successful webinars organized by the scientific community. There are strong links and overlaps between US CLIVAR and International CLIVAR, and activities/projects of the former should be reported CLIVAR panels, and then informed to the SSG through panel reporting. US CLIVAR has also encouraged members of the US science community to apply for membership of International CLIVAR panels through the annual open call. There is also a recommendation to organise more CLIVAR panel meetings in the USA. The number of programme manager from US funding agencies shows the commitment from those agencies to the work that CLIVAR has been doing.

The SSG and WCRP thank US CLIVAR and the US funding agencies for all the support received during the years. Participants also commented that programme manager from the EU and other countries should also be invited and attend future SSG meetings, in order to strengthen exchange of ideas and priorities.

RECOMMENDATION: Organize more CLIVAR meetings in USA (ICPO with panels/RF)

ACTION – Invite programme managers from EU and other countries to CLIVAR SSG meetings (SSG co-chairs w/ ICPO) – **Next SSG meeting**

Fangli Qiao presented FIO's contribution in hosting the International CLIVAR Global Project Office (ICGPO). A Memorandum of Understanding (MoU) was signed between the Chinese State Oceanic Administration (SOA) and WCRP to host the ICGPO until 2020, and FIO provides office space and infrastructure support. In the last couple of years, FIO hosted three workshops with CLIVAR, including CLIVAR's 20th anniversary celebration, and the ECSS. FIO is also committed to support a biennial CLIVAR Summer School. The SSG and WCRP thank FIO for hosting the ICGPO and for the continued support to CLIVAR activities.

ACTION: Further discuss with FIO the proposal to host biennial ECS Symposium (ICPO with FIO) – **May 2017**

R. Krishnan gave an overview of the International CLIVAR Monsoons Project Office (ICMPO) and the support provided by the Indian Institute of Tropical Meteorology (IITM). A Memorandum of Understanding (MoU) was signed between the Indian Ministry of Science and Technology and WCRP to host the ICMPO until 2019. Staff at the ICMPO are responsible for the activities of the CLIVAR/GEWEX Monsoons Panel, including support to the new setup regional working

groups, and some activities of the IORP. The layout and final production of CLIVAR Exchanges is also done by ICMPO staff. The SSG and WCRP thank IITM for hosting the ICMPO and for the continued support to CLIVAR activities.

5. ICPO Report

Valery Detemmerman reported on ICPO activities. The work of the ICPO was essential for the success of the CLIVAR Open Science Conference. A high priority for the ICPO is to provide better communication, mainly via the website, but also in providing quick summary from panel meetings that can be circulated in the monthly e-bulletin. Overall, the ICPO can coordinate the organisation of sessions at major meetings (EGU, AGU) but also in Asia in order to raise visibility of CLIVAR activities. The ICPO should also coordinate proposals for more summer schools, in addition to the one proposed by FIO, with institutions like ICTP. Given the current financial pressure for CLIVAR activities, the ICPO should also develop a funding portal, with opportunities for supporting panel meetings and other activities. SSG members should let the ICPO know of national funding calls.

RECOMMENDATION: Organize CLIVAR sessions at major meetings like EGU, AGU and in Asia to raise visibility (ICPO to develop calendar of deadlines and alert Panel chairs, etc).

ACTION: Further discuss with ICTP and WCRP on possible ways to develop or propose more summer schools (ICPO) – **July 2017**

ACTION: Develop a “funding portal” with opportunities for panels (e.g., Newton Fund (UK), Belmont Forum, NATO fellowship, ...) (ICPO) - **ASAP**

6. OSC overview

Participants gave their impression of the CLIVAR Open Science Conference. Overall, it was a very successful event, with a very exciting programme, and particularly engaging with young scientists with their involvement as session chairs, rapporteurs and poster judges. A suggestion was made to capitalise on this involvement of early career scientists and publish an issue of CLIVAR Exchanges with articles by the winners of best poster awards. Ed Hawkins, Pascale Braconnot and Noel Baker have been suggested as part of an editorial team. Another OSC outcome will be a submission of an article to Nature Climate Change. It was mentioned that the number of abstracts submitted for the paleo session was very low, perhaps highlighting that that community has not been involved in CLIVAR science. It is imperative that this is done, perhaps by making it a strong topic in the new CLIVAR Science Plan. A concern raised was the fact that it seems that there was no “green” strategy associated with logistics, with an extreme high number of plastic water bottles. Participants agreed that it would be important the future CLIVAR and WCRP events could promote green initiatives.

ACTION: Prepare issue of Exchanges with articles from winners of poster awards (Nico Caltabiano, ICPO) – **February 2017**

ACTION: Work with WCRP to develop guidelines for green initiatives in future meeting and conferences (ICPO, JPS) – **December 2016**

7. CLIVAR Science Plan

Annalisa Bracco led the discussion on the development of the new CLIVAR Science Plan. The draft version has been made available online for the participants of the OSC but there is still some work to be done in order to be shared with the international community for a formal consultation. The view of the participants is that guidelines need to be prepared so that panels can provide content to Section 3 (Organizational Structure and Implementation) on their achievements and future plans. Also, after the discussion at the Town Hall organised at the OSC, it was clear that further development is necessary for Section 5 (Coordination and Cooperation), particularly regarding collaboration with other programmes. Suggestions for chapter headings have been made and will be circulated to all SSG members for further comments.

8. Membership and Next SSG Meeting

Participants discussed the possible venue and dates for the next SSG meeting. The SSG co-chairs pointed out that there has been a discussion with the US CLIVAR SSC for a joint meeting in the USA in the Summer 2017, and it was agreed that a doodle poll would be prepared in order to find a common date.

ACTION: Prepare doodle poll for joint CLIVAR SSG and US CLIVAR SSC joint meeting during US CLIVAR Summit in Summer 2017 (ICPO) - **ASAP**

A proposal for membership will be prepared and submitted to the WCRP JSC. There was some discussion about the end of term for some members and it was agreed that Mike Sparrow, CLIVAR liaison at the JPS, would find out from the JPS records

ACTION: Check correct end of term date for CLIVAR SSG members with terms expiring in 2017, according to CLIVAR website (Mike Sparrow, ICPO) - **ASAP**

Annex 1 - List of Participants

Name	Country	
SSG members		
Detlef Stammer	Germany	Co-chair
Annalisa Bracco	USA	Co-chair
Pascale Braconnot	France	Member
Stephen Griffies	USA	Member
Ed Hawkins	UK	Member
Pedro Monteiro	South Africa	Member
Krishna AchutaRao	India	Member
Nathan Bindoff	Australia	Member
JSC		
Guy Brasseur	Germany	JSC
In-Sik Kang	Korea	JSC
Staff		
Valery Detemmerman	China	ICPO
Nico Caltabiano	UK	ICPO
Lei Han	China	ICPO
Jing Li	China	ICPO
Lina Kang	China	ICPO
Rokkam Rao	India	ICPO
Ramesh Kripalani	India	ICPO
Mike Sparrow	Switzerland	WCRP JPS
Agency reps		
Annarita Mariotti	USA	NOAA Climate Program Office
David Legler	USA	NOAA Ocean Climate Observation Program
Jin Huang	USA	NOAA Climate Prediction Center
Anjali Bamzai	USA	NSF Division of Atmospheric and Geospace Sciences
Eric Itsweire	USA	NSF Ocean Sciences
Xujing Jia Davis	USA	NSF Ocean Sciences
Mike Patterson	USA	USCLIVAR
Panel/Research Focus		
Catia Domingues	Australia	GSOP
Mat Collins	UK	Climate Dynamics Panel
Shoshiro Minobe	Japan	Climate Dynamics Panel
Simon Marsland	Australia	OMDP
Gokhan Danabasoglu	USA	OMDP
Andy Turner	UK	Monsoons Panel
Xiaopei Lin	China	Pacific Region Panel
Sabrina Speich	France	Atlantic Region Panel
Jerome Vialard	France	Indian Ocean Region Panel
John Fyfe	Canada	Southern Ocean Region Panel
Inga Smith	New Zealand	Southern Ocean Region Panel
Christophe Cassou	France	DCVP RF

Yochanan Kushnir	USA	DCVP RF
Ruben Escribano	Chile	EBUS RF
Karina von Schuckmann	France	CONCEPT-HEAT RF
Guests		
R. Krishnan	India	IITM
Fangli Qiao	China	SOA/FIO
Thorsten Kiefer	France	Future Earth

Annex 2 - Final Agenda

Friday 23/9			Hyatt		
15:00			Welcome	Stammer/Bracco	
15:10	1		WCRP and Future Earth		
		1.1	WCRP report	Brasseur	35
		1.2	Future Earth	Kiefer	15
16:00	2		Panel plans for activities in the next 3-5 years; membership proposals		2hrs
		2.1	GSOP	Domingues	15
		2.2	OMDP	Marsland	15
		2.3	Climate Dynamics	Collins & Minobe	15
		2.4	Monsoons Panel	Turner	15
		2.5	Atlantic Region Panel	Speich	15
		2.6	Pacific Region Panel	Lengaigne	15
		2.7	Southern Ocean Region Panel	Fyfe	15
		2.8	Indian Ocean Region Panel	Vialard	15
18:00			Discussion of panel plans	SSG	30
18:30			<i>Adjourn for day</i>		
Friday evening			<i>No-host dinner</i>	SSG	
Saturday 24/9			Hyatt		
09:00	3		Research Focus plans		
		3.1	EBUS	Escribano	15
		3.2	DCVP	Kushnir & Cassou	15
		3.3	ENSO	Cai (tbc)	15
		3.4	CONCEPT-HEAT	von Schuckmann	15
		3.5	SLR	Stammer	15
10:15			Discussion of RF plans	SSG	30
10:45			<i>Coffee/tea break</i>		
11:00	4		CLIVAR and ICPO sponsor reports		60
		4.1	USCLIVAR	Patterson	
		4.2	IITM/Indian Ministry S&T	Krishnan	
		4.3	SOA FIO	Qiao	
		4.4	ICPO report and discussion	Detemmerman et al	
12:00	5		OSC outcomes, lessons learned	Stammer	30
12:30			<i>lunch</i>		
13:30	6		Presentation by SSG OSC rapporteurs and discussion – 15 min presentation on mon-thurs daily themes	SSG rapporteurs	60
14:30	7		OSC discussion including agency feedback	all	60

15:30			<i>Coffee/tea break</i>		
15:45			Science plan summary	Bracco	30
16:15			Discussion of science plan and way forward	all	60
17:15			In camera – SSG and ICPO only		
	9		Review of 2017 Meeting proposals and budget	ICPO staff/SSG	20
	10		Membership issues		10
	12		Preparations for next SSG, AOB		15
18:00			adjourn		
Sunday			ECSS - FIO		
0900			SSG members participate in workshops/disc	SSG members	
12:00			ECSS closing ceremony		

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Annex 3 - Abbreviations

AGU	American Geophysical Union
AMOC	Atlantic Meridional Overturning Circulation
ARP	Atlantic Region Panel
ASAP	As Soon As Possible
CDP	Climate Dynamics Panel
CLIC	WCRP Climate and Cryosphere Core Project
CLIVAR	WCRP's Climate and Ocean Variability, Predictability and Change Core Project
CMIP	Coupled Model Intercomparison Project
CMIP6	6 th Phase of CMIP
CRA	Collaborative Research Action
DCPP	Decadal Climate Prediction Project
DCVP	Decadal Climate Variability and Predictability
EBUS	Eastern Boundary Upwelling Systems
ECS	Early Career Scientist
ECSS	Early Career Scientists Symposium
ECV	Essential Climate Variables
EGU	European Geosciences Union
ENSO	El Niño Southern Oscillation
EU	European Union
FIO	First Institute of Oceanography
GC	Grand Challenge
GEWEX	WCRP's Global Energy and Water Exchanges Core Project
GMMIP	Global Monsoons Model Intercomparison Project
GOOS	Global Ocean Observing System
GSOP	Global Synthesis and Observations Panel
IASC	International Arctic Science Committee
ICMPO	International CLIVAR Monsoon Project Office
ICPO	International CLIVAR Project Office
ICSU	International Council for Science
ICTP	International Centre for Theoretical Physics
IIOE-2	Second International Indian Ocean Expedition
IITM	Indian Institute of Tropical Meteorology
INCOIS	Indian National Centre for Ocean Information Services
IndOOS	Indian Ocean Observing System
IOC	Intergovernmental Oceanographic Commission of UNESCO
IOGOOS	Indian Ocean Global Ocean Observing System

IORP	Indian Ocean Region Panel
IQuOD	International Quality Control Upper Ocean Database
IRF	IndOOS Resources Forum
ITF	Indonesian Throughflow
JMA	Japanese Meteorological Agency
JPS	Joint Planning Staff
JSC	Joint Scientific Committee
KAN	Knowledge-Action Networks
MHT	Meridional Heat Transport
MIP	Model Intercomparison Project
MoU	Memorandum of Understanding
OMDP	Ocean Model Development Panel
OMIP	Ocean Model Intercomparison Project
OOPC	Ocean Observations Panel for Climate
ORA-IP	Ocean ReAnalysis Intercomparison Project
OSC	Open Science Conference
PAGES	Past Global Changes
PMIP	Paleoclimate Modelling Intercomparison Project
PRP	Pacific Region Panel
RF	Research Foci
SCAR	Scientific Committee on Antarctic Research
SIBER	Sustained Indian Ocean Biogeochemistry and Ecosystem Research
SOA	Chinese State Oceanic Administration
SOOS	Southern Ocean Observing System
SSC	Scientific Steering Committee
SSG	Scientific Steering Committee
TACE	Tropical Atlantic Climate Experiment
TOA	Top of Atmosphere
UNESCO	United Nations Educational, Scientific and Cultural Organization
WBC	Western Boundary Currents
WCRP	World Climate Research Programme
WG-CEP	Working Group on Climate and Ecosystem Predictability
WGCM	Working Group on Coupled Modelling
WGSIP	Working Group on Subseasonal to Interdecadal Prediction
WMAC	WCRP Modelling Advisory Council
WMO	World Meteorological Organisation
YOPP	Year of Polar Prediction

*The
World Climate
Research Programme
(WCRP)*

*facilitates analysis and
prediction of Earth system change
for use in a range of practical
applications of direct relevance,
benefit and value to society.*

