

46th Session of the WCRP Joint Scientific Committee (JSC)

Date: 12-16 May 2025

DEADLINE: 15 Feb 2025

Instructions

Overarching content/goal: To provide an update on progress made during the last year, and to identify issues etc. in advance of the JSC meeting. This will allow more discussion and less reporting at the JSC meeting itself. The outcomes from this report will also feed into a highlights brochure planned for the first quarter of the year. The Secretariat will arrange calls prior to the JSC meeting with JSC liaisons (as appropriate) to discuss the input and any issues to the JSC meeting itself. Please work with the WCRP secretariat responsible for your activity, in the preparation of the report.

Please keep the information as focused as possible and provide links to websites where more details can be accessed.

Update report for the WCRP Joint Scientific Committee

CLIVAR: Climate and Ocean - Variability, Predictability and Change

1. High-level publications (in particular strategic publications/assessments that are direct outcomes of your activity)

- Foltz Gregory R., Eddebbar Yassir A., Sprintall Janet, Capotondi Antonietta, Cravatte Sophie, Brandt Peter, Sutton Adrienne J., Morris Tamaryn, Hermes Juliet, McMahon Clive R., McPhaden Michael J., Looney Lev B., Tuchen Franz Philip, Roxy Mathew Koll, Wang Fan, Chai Fei, Rodrigues Regina R., Rodriguez-Fonseca Belen, Subramanian Aneesh C., Dengler Marcus, Stienbarger Cheyenne, Bailey Kathleen, Yu Weidong, 2025: Toward an integrated pantropical ocean observing system. **Frontiers in Marine Science**, 12, <https://doi.org/10.3389/fmars.2025.1539183> (CLIVAR Research Focus on Tropical Basin Interactions Working Group 3 on Observations, PRP, MHW RF, ARP)
- Capotondi, A., Rodrigues, R.R., Sen Gupta, A., *et al.* 2024: A global overview of marine heatwaves in a changing climate. **Commun Earth Environ**, 5, 701. <https://doi.org/10.1038/s43247-024-01806-9> (CLIVAR Research Focus on Marine Heatwaves in the Global Ocean)
- Watanabe, M., Kang, S M., Collins, M., Hwang, Y.-T., McGregor, S., and Stuecker, M. F., 2024: Possible Shift in Controls of the Tropical Pacific Surface Warming Pattern. **Nature**, 630, 315–324. <https://doi.org/10.1038/s41586-024-07452-7> (Climate Dynamics Panel TROPICS working group)
- Sprintall, J., Nagura, M., Hermes, J., Roxy, M. K., McPhaden, M. J., Rama Rao, E. P., Tummala, S. K., Thurston, S., Li, J., Belbeoch, M., Turpin, V., 2024: COVID Impacts Cause Critical Gaps in the Indian Ocean Observing System. **Bull. Amer. Meteor. Soc.**, doi:10.1175/BAMS-D-22-0270.1. (Indian Ocean Region Panel)
- Singh, S., Sprintall, J., Capotondi, A., and Rodrigues, R., 2024: First International Summer School on Marine Heatwaves. **Bull. Amer. Meteor. Soc.**, <https://doi.org/10.1175/BAMS-D->

23-0288.1. (Indian Ocean Region Panel, Atlantic Region Panel, Marine Heatwaves in the Global Ocean RF, Summer School)

- Ajayamohan, R. S., Martin, G., Turkington, T., Fujinami, H., Basconcillo, J., Annamalai, H., Jayawardena, S., Ashrit, R., Takahashi, H., and Koh, T. Y., on behalf of the CLIVAR/GEWEX Regional Working Group on Asian Australian Monsoons, 2024: “Asian Summer Monsoon Variability during 2022–2023: Beyond Canonical Teleconnection Patterns”, **GEWEX Quarterly**, Vol. 34, No. 3 Quarter 3, 2024. (CLIVAR/GEWEX Monsoons Panel)
- Pradhan, M., Srivastava, A., Rao, S. A., 2024: Soil Moisture Feedback over Wet vs. Arid Regions of India. Working Group on Numerical Experimentation. **WCRP Report** No.12/2024. WMO, Geneva. <https://wgne.net/bluebook/> (CLIVAR/GEWEX Monsoons Panel)
- **CLIVAR Exchanges**, Special Issue: Advances in Emerging Antarctic Research Programs, doi: 10.36071/clivar.83.2024. (CLIVAR/CliC/SCAR Southern Ocean Region Panel)
- Zhao, S., Jin, F.F., Stuecker, M. F., *et al.*, 2024: Explainable El Niño predictability from climate mode interactions. **Nature**, 630, 891–898. <https://doi.org/10.1038/s41586-024-07534-6> (CLIVAR Research Focus on Tropical Basin Interactions)
- Richter, I., Chang, P., Danabasoglu, G., Dommenget, D., Gastineau, G., Hu, A., Kataoka, T., Keenlyside, N., Kucharski, F., Okumura, Y., Park, W., Stuecker, M., Taschetto, A., Wang, C., Yeager, S., and Yeh, S.-W.: The Tropical Basin Interaction Model Intercomparison Project (TBIMIP), EGU sphere [preprint], <https://doi.org/10.5194/egusphere-2024-3110>, 2024 (just accepted, to be published in 2025; CLIVAR Research Focus on Tropical Basin Interactions)

2. Capacity Building/Education and Training Highlights

- [ICTP-SORP-NORP Summer School on Polar Climates: Theoretical, Observational and Modelling Advances](#), Trieste, Italy, 22-31 July 2024. This included a 3-day workshop on the “[Role of Sea Ice and its Variability in the Climate System](#)”. In total, the school and workshop attracted 123 participants (with 90 being on site) including more than 80 students and postdocs from five continents and more than 20 countries. One of the main objectives was to review the recent scientific advances on understanding the polar climate and its variability, in particular the observed regime shift in Antarctic sea ice.
- [CLIVAR-FIO Summer School on Biogeochemical Processes in Earth System Models](#), Qingdao, China, 15-20 July 2024. The summer school brought together 12 lecturers and 40 in-person students from 21 countries (mostly low-middle income, e.g., Nigeria, Philippines, Bangladesh, Sri Lanka, India, Cameroon, Ethiopia, Vietnam, Thailand, Ecuador). Students attended 15 lectures, lab sessions, and worked in groups to develop research proposals, and visited FIO research vessels.
- CLIVAR supported ECR participation to our workshops
[Workshop on “Interaction among the tropical basins: observations and simulation”](#), Seoul, S. Korea, 22-23 June 2024
[OMDP-COMMODEORE Workshop 2024](#), Boulder, USA, 9-13 September 2024
[Climate Dynamics Panel 5th Annual Workshop](#), Lorne, Australia, 24-27 February 2025
- Workshops organised by CLIVAR working groups: CLIVAR TROPICS Working Group Workshop (Hamburg, 17-19 September 2024), Workshop on Improving Modelling of the AMOC (Exeter, 23-25 September 2024).

3. Linkages with other Core Projects, Lighthouse Activities, Academy etc.

Activities or actions done in collaboration with other CPs, LHAs or Academy

- Three CLIVAR's panels are co-sponsored by other WCRP CPs: **CliC** co-sponsors NORP and SORP; **GEWEX** co-sponsors the Monsoons Panel.
- CLIVAR Climate Dynamics Panel (CDP) member has partnership with **APARC** and **CFMIP** through their members who hold leadership position at the respective core projects: Amanda Maycock (co-chair of APARC and its activity on Atmospheric Temperature Change and their Drivers) and Sarah Kang (recently rotated off CDP co-chair, now co-chair of CFMIP). The 3rd annual CDP workshop was held as a session within the CFMIP meeting (June 3-6 2024, Boston). The session topic targeted the understanding of internal and externally forced contributions to the tropical Pacific SST warming pattern during the historical period as well as in the future projections.
- WCRP "Explaining and Predicting Earth System Change" (**EPESC**) LHA: Antonietta Capotondi (PRP, MHW RF) served as liaison for EPESC WG-2 at its meeting on July 4, 2024 to introduce the TROPICS working group headed by CLIVAR CDP, leading to discussions on potential coordinated experiments to be conducted in the future.
- Gokhan Danabasoglu participated in the WGSIP25 and WGENE 39 Joint Meeting that was held in Toulouse, France during 04-08 November as an invited participant. He gave a presentation on "Ocean Initialization for Climate Simulations". This is related to the joint effort between ESMO and CLIVAR – also involving other interested participants – on fully documenting initialization and spin-up procedures used by modeling groups across the world in their pre-industrial, historical, transient, and prediction simulations, the latter across all time scales.
- Gokhan Danabasoglu virtually presented about the CLIVAR efforts and potential collaboration opportunities at the APARC SSG meeting on 29 October 2024.
- SSG Co-Chairs Sonya Legg and Francois Engelbrecht participated in the WCRP JSC-45 session in May and the 6th Session of CLIVAR/GEWEX Monsoons Panel in Sapporo, Japan in July at the GEWEX Open Science Conference.

Results or activities that you consider contribute to the objectives of other WCRP activities

- The ARP Ocean Climate Risk working group (WG) coordinates alongside **My Climate Risk** LHA, strengthening interactions between the WCRP Core Projects and LHAs linked by Regina Rodrigues who is a co-chair of both ARP and My Climate Risk LHA. The ARP WG has implemented two [Regional Hubs on Ocean Climate Risk](#): (in 2023) South African Environmental Observation Network (SAEON) led by ARP member Jennifer Veitch, and (newly formed in 2024) Caribbean hub led by ARP member Tannecia Stephenson (see Montoya et al. 2024, https://www.wcrp-climate.org/images/MCR_GA_Oct-Nov_2024_Report_1.pdf).
- The activities of the Monsoons Panel contribute to **GEWEX** as its co-sponsor.
- The activities of the Northern Oceans Region Panel and Southern Ocean Region Panel contribute to **CliC** as its co-sponsor.
- Members of CLIVAR/GEWEX Monsoons Panel (Hui Su, Hiroshi Takahashi) are collaborating with **CliC** on understanding the connections between the Himalayan cryosphere and Asian monsoons and impacts of reduced Arctic sea-ice on Asian monsoons. Various members of the panel and its working groups are involved in WCRP projects such as **GPEX** (Joseph Basconillo, Annalisa Cherchi, Hui Su, Samson Hagos), **EPESC** (WG-AFm), **My Climate Risk** (Masilin Gudoshava), **Safe Landing Climates** (Izidine Pinto).

4. Partnerships with entities outside of WCRP

Activities done in collaboration with entities outside of WCRP

- ARP member Jennifer Veitch also represented the **SAEON** My Climate Risk Hub at the **Global Ocean Observing System (GOOS)** Agulhas Current Observing System Co-Design Workshop from 9-12 September 2024, and at the GEO Blue Planet Ocean Observation and Prediction for Coastal Sustainability in Africa (<https://geoblueplanet.org/nairobi-coastal-workshop-post/>) workshop from 4-7 March 2024.
- TBI RF (Gregory Foltz and Ingo Richter) collaborated with the **Ocean Observations and Physics and Climate Panel (OOPC)** regarding enhancing the pan-tropical observing system via organisation of a satellite event at the UN Ocean Decade conference in Barcelona on 11 April 2024: “Co-designing ocean observing system for better societal services – Pan tropics and basin use areas”, and a review paper entitled “Toward an integrated pan-tropical observing system” (Foltz et al. 2025, *Frontiers in Marine Science*).
- TBI RF (Noel Keenlyside) interacted with **DFG Priority Programme “Tropical Climate Variability and Coral Reefs”** leading to the presentation of the program members at TBI webinar in February 2025.
- **US CLIVAR**: CDP member Robert Inglin Wills was on the scientific organizing committee of the US CLIVAR workshop on “Confronting Earth System Model Trends with Observations: The Good, the Bad, and the Ugly”. CLIVAR SSG co-chair (Gokhan Danabasoglu) is the chair of US CLIVAR SSC. ICPO holds monthly meetings with US CLIVAR. US CLIVAR provides funding for CLIVAR US-based members to attend panel meetings.
- IORP maintains interactions with various organisations, such as **LOGOOS, IOCINDIO, IRF, SIBER, KUDOS** through the **International Indian Ocean Science Conference (IIOSC)** that is held annually. The gathering aims to share research highlights and plan future initiatives particularly surrounding the **IIOE-2**. Initially planned for 2015-2020, this global program focusing on collaborative Indian Ocean research was extended to 2025, and discussions at IIOSC 2024 centered on extending it further to 2030. The project Coastal Observation Lab in a Box (COLaB) that started out as a collaboration between IORP and SIBER has now been endorsed by the UN Ocean Decade under **CoastPredict**. The next IIOSC will be held in Mauritius where the IORP will hold a panel meeting as in previous years, with limited participation due to funding. CLIVAR also maintains linkage with **SCOR, SOLAS, IMBER** through CLIVAR presence at their annual meetings/events. Shikha Singh (now IORP co-chair) conducted a workshop on “Mentorship and Career Development” on the Early Career Scientist Day, at SOLAS Open Science Conference in November 2024.
- **OSF** (ocean to climate seamless forecasting system programme) partnered with CLIVAR on a workshop on Ocean-based Solutions to Mitigate Climate Change Impacts with Africa as a Demonstration, as a satellite event of 2024 Ocean Decade Conference. Gokhan Danabasoglu (SSG member then, now co-chair) was a presenter.
- Partnership with **PICES** is ongoing through CLIVAR representative Antonietta Capotondi (PRP, MHW RF); e.g., A. Capotondi convened a session at the PICES annual meeting 2024 on ‘Climate extremes and coastal impacts’ and participated in PICES WG-49 meeting.
- **NPOCE** (Northwestern Pacific Ocean Circulation and Climate Experiment) is a CLIVAR endorsed project since May 2010, co-chaired by Fan Wang (PRP member 2020-2024) with Janet Sprintall (IORP co-chair) as vice chair and Sophie Cravatte (PRP co-chair) as member. NPOCE representatives organised and chaired scientific sessions at several major

conferences last year (AOGS, AGU, 2nd UN Ocean Decade Regional Conference & 11th WESTPAC International Marine Science Conference). At the AGU 2024, NPOCE hosted a Part of Day (POD) meeting to catalyse multidisciplinary collaboration and future partnerships with the recently launched Health of Ocean under Multiple Ecosystem Stressors (HOMEs) program (spearheaded by IOCAS, UN Decade endorsed) to decipher the complex interplay among anthropogenic, ecological, and environmental influences. PRP and MHW RF representative (A. Capotondi) attended the POD and expressed interest for partnership.

- Several Global Synthesis and Observation Panel (GSOP) members are participating in **SynObs**. SynObs is a project under the Ocean Decade that has spawned from the Observing System Evaluation Task Team of OceanPredict. A major SynObs activity in 2024 was publication of a Special Issue in Frontiers in Marine Science on “[Demonstrating Observation Impacts for the Ocean and Coupled Prediction](#)” with GSOP co-chair (Peter Oke) as one of three Topic Editors.
- GSOP has an active linkage with **Argo** through the co-chair (Peter Oke) and former co-chair (Nathalie Zilberman) – both members of the Argo steering team.
- GSOP members have engaged with a new inter-comparison activity that is led under **OceanPredict**, called MER-IP – the Marine Environment Reanalyses – Intercomparison Project. GSOP member (Santha Akella) is part of organising committee for [OceanPredict 2024 symposium](#) (also in particular Theme 5). Two members (Lijing Cheng, Yonghong Yin) served as science committee members for the 6th WCRP International Conference on Reanalysis.
- CLIVAR partnered with ICTP, Yonsei University, and FIO in organising workshops and training schools.
- OMDP collaborated with **COMMODORE** and **NSF-NCAR** in organising a workshop on “[Ocean Model Development, Data-driven Parameterizations, and Machine Learning in Ocean Models of the Earth System](#)” (9-12 September, 2024). The workshop had 109 participants, mostly in person, including 14 students and 55 ECR, from 16 countries (63% from USA).
- The CLIVAR ARP AMOC Task Team organized a workshop supported by the UK Met Office and the EPOC project; EPOC (Explaining and Predicting the Ocean Conveyor, grant number 1010547) is funded by the European Union. The workshop on “Improving Modelling of the AMOC” brought together researchers specializing in the AMOC and related North Atlantic processes, along with those focusing on model development. The workshop was held at the UK Met Office in Exeter, UK during 23-25 September 2024, with about 50 participants from all career stages. Presentations and discussion sessions covered a wide range of topics, including using observations and paleoclimate reconstructions to evaluate models; the impacts of model horizontal resolution; reanalysis products; the representation of critical processes such overflows, transport pathways of light waters (Gulf Stream and North Atlantic current) as well as dense waters (deep western boundary current), eddy mixing; and the role of biases on AMOC variability and projections. A few pressing topics for the community to pursue over the next two to three years were identified.
- Several members of the CLIVAR/GEWEX Monsoons Panel working group on Asia-Australian Monsoons are regular contributors to the **Regional Climate Outlook Forums for the Asian Australian Region** (SASCOF, ASEANCOF).

Highlight any new partnerships

- CLIVAR/CliC/SCAR SORP is involved in [Antarctica InSync](#) (Antarctica International Science and Infrastructure for Synchronous Observation) through SORP member Alexander Haumann who is one of the coordinators and is also a member of SOOS SSG.
- SORP endorsed a letter of support from the CLIVAR SSG for a proposal by Dr **Steve Rintoul and his collaborators** to the Australian Marine National Facility for ship time on the RV Investigator (“Multidisciplinary Investigations of the Southern Ocean: Linking physics, biogeochemistry, plankton, aerosols, clouds, and climate” (still awaiting outcome).
- Several members of ARP and AMOC Task Team participated in the **AAORIA** workshop in Washington DC in August 2024 that brought together ~40 scientists from around the world to discuss priorities and gaps for the Atlantic sector, identifying three main topics that were presented at the October AAORIA meeting in Ontario: (i) the AMOC, (ii) interactions between land, coast and ocean, and (iii) ocean productivity, including fisheries. It is anticipated that international, expert working groups will be established to further discuss scientific priorities in these topics.
- **BRIN** (Indonesian national research agency): CLIVAR-endorsed project NPOCE is in the process of organising a joint IOCAS-BRIN cruise in the Indonesian Sea in May 2025. BRIN hosted IIOSC-24 which included IORP meeting. ICPO director interacted with BRIN at IIOSC-24 and at an international conference on sustainable coral reefs in Manado, Indonesia (13-15 December 2024). BRIN is part of local organising committee for Pan-CLIVAR Meeting 2025.
- ICPO staff also presented and participated at various other events such as **SCOR** meeting (Qingdao 2024, ICPO director), **IMBER** IPO event (Shanghai 2024, ICPO director), **XMAS** conference (Xiamen 2025, Staff Scientists), **POGO** meeting (Penang 2025, Staff Scientist); as well as organising a CLIVAR seminar as part of the Ocean University of China 100th Anniversary. The anniversary week consisted of various symposiums of which a few CLIVAR members and ICPO director took part in giving invited talks.
- OMDP partners with Rifs – **CORDEX** on [regional ocean modelling and climate projections task force](#) coordinated by A. Melet (now OMDP member) and S. Somot.

5. Future Science Directions for JSC consideration (e.g., new groups, activities)

- ARP plans to establish jointly with the WCRP Lighthouse Activity My Climate Risk **more regional hubs on ocean climate risk**.
- **“Polar Heat Workshop”**: NORP, SORP, OMDP, and ARP are jointly planning a workshop in 2026 on ocean heat in polar regions and connections to lower latitudes, to share state-of-the-art knowledge on heat in the polar oceans, to facilitate connection and discussion among researchers from both polar region communities, and the subpolar and low-latitude global oceans research communities. This would be a collaboration between CLIVAR, CliC, and USCLIVAR, with a venue to be determined, but potentially held back-to-back with the AGU OSM26.
- The CDP has begun discussing its plans for the **5th CDP Annual Workshop** to be held in 2026, with Qingdao as a location option.
- Ocean University of China (OUC) as a host of the ICPO takes interest in CLIVAR. The ICPO promotes CLIVAR activities within OUC community (e.g., organised a CLIVAR seminar at their 100th Anniversary celebration weeks). OUC is keen in establishing a **CLIVAR-OUC training school** that can be held every two years in Qingdao, China. An agreement/MoU needs to be formulated. This would be similar to what was done to establish the CLIVAR-

FIO summer school when the First Institute of Oceanography (FIO) was the previous host of ICPO.

- GSOP is planning **new working groups**, e.g. “Machine Learning” involving the OceanPredict community, “Metrics” to review how reanalysis products are assessed and to try to provide some guidance on best practice, and potentially others on “OneArgo array design”.
- OMDP is working on a new dataset that will replace the JRA55-do that are used as the canonical forcing for the OMIP protocol which have been discontinued, and will continue activities towards CMIP7 including data request and OMIP protocol.
- The **Pan-CLIVAR Meeting** will have a 1-Day Symposium (“CLIVAR Symposium: Bridging Science and Society in Southeast Asia and Beyond”). The organising committee has been set up and the details will be revealed in a website that is currently being designed and to be hosted on a system provided by IPSL. The symposium aims to build partnerships with scientific community in the Southeast Asia region in particular.

6. New Activities (e.g., structural changes to your activity, plans for databases and other products not covered in the above)

- A Pan-CLIVAR meeting will be held in 22-26 September 2025 in Bali, Indonesia, bringing together CLIVAR members from all panels, Research Foci, and SSG, as well as representatives from WCRP core-projects and external partners with the aims:
 1. to develop ideas and input for the next CLIVAR science and implementation plan;
 2. to foster interactions across panels, WCRP core projects, and partners;
 3. to evaluate progress, formulate future priorities, and enhance members cohesion;
 4. to establish new research foci; and
 5. to engage scientists and stakeholders in southeast Asia.

This will be the second Pan-CLIVAR after the first one in 2014 in The Hague (14-19 July 2014) which was held alongside a GEWEX conference. The 2014 meeting was instrumental for the development of the current decadal CLIVAR science plan (2018-2028). The 2025 Pan-CLIVAR Meeting (Pan-CLIVAR 2025) will initiate the formulation of the next science plan.

Pan-CLIVAR 2025 will be held in hybrid mode, consisting of individual panels and Research Foci meetings, SSG sessions, cross-panel meetings, breakout sessions, plenaries, and a Symposium (“CLIVAR Symposium: Bridging Science and Society in Southeast Asia and Beyond”).

- A new task team of CLIVAR/IOC-GOOS IORP is now formally named **QIndOOS** (Quantitative evaluation of the Indian Ocean Observing System to improve climate forecasts), and the Terms of Reference have been determined. The focus of QIndOOS continues to be on the implementation and maintenance of IndOOS, which has suffered from limited deployment opportunities in the Indian Ocean and during Covid, particularly with RAMA returns gradually declining to near zero by the end of 2022. The QIndOOS Task Team includes members from IORP, GSOP, CLIVAR Monsoon Panel, and individual contributors. This year, QIndOOS began to quantitatively assess the impact and consequences of IndOOS degradation using OSSE and OSEs on El Niño prediction. The task team aims to submit a proposal for a SCOR working group in 2025.

- The Pacific Region Panel has just formed a working group “Tropical Pacific Biogeochemical-Physical Interactions (**TP BGC-PI**)” on the need to better integrate ocean biogeochemistry with CLIVAR activities.
- The Pacific Region Panel established the working group “Pacific Atmospheric Teleconnections in a wArming Climate (**PATAC**)” in February 2024. The overarching aim is to synthesise the current knowledge and gaps of the physical mechanisms driving Pacific atmospheric teleconnections, identify their associated impacts of societal importance (including extremes), and investigate how these are projected to change in a warmer future. The team consists of 23 members from Climate Dynamics Panel, TBI Research Foci, ENSO Metrics, TROPICS, and other working groups.
- In addition to webinars by the Monsoons Panel, CLIVAR has launched new **webinar series** by MHW RF, SORP, and TBI RF:
[The first MHW RF webinar](#) March 3, 2025, 23:00 UTC with two talks by Prof Shoshiro Minobe and Dr Hirotaka Sato.
[PROS4SORP](#) (Presenting Recent Ocean Science for the Southern Ocean Regional Panel) has organised 6 webinars.
[The first TBI RF webinar](#) was held on February 19, 12:00 UTC, Tropical Climate Variability and Coral Reefs with two talks by Prof Thomas Felis and Prof Miriam Pfeiffer. The next webinar will be held on 5 March by Dietmar Dommenget on “El Niño Southern Oscillation and Tropical Basin Interaction in Idealized Worlds”.
- TBI RF is sunsetting in 2025. An [Open Call for New Research Foci](#) (RF) has been issued with a closing date of 15 June 2025. Discussions on the proposals will take place at the Pan-CLIVAR Meeting in Bali. It is possible that a biogeochemistry-related RF will be formulated (perhaps to be led by PRP who has recently formed TP BGC-PI).
- TBI RF contributed to the development of “[Extended nonlinear Recharge Oscillator \(XRO\) model](#)” which is used in Zhao et al. (2024, Nature).

7. General (Highlight any other outcomes etc. that you wish to make the JSC and other WCRP activities aware of (in particular regionally focussed activities we could use in any highlights brochure). Are there particular challenges faced in the last year that the JSC should be aware of?

Sprintall et al. (2024) in BAMS (COVID-related challenges on IndOOS) was written into a [policy brief](#) and circulated to key policy makers in South Africa and other countries. The brief highlighted the issues and the main recommendations in language accessible to policy makers.

Prominent CLIVAR presence at the Ocean Sciences in New Orleans (Feb 18-23, 2024)
 MHW RF members organised the session “Marine Heatwaves in a Changing World”, receiving a large number of abstracts including from students who attended CLIVAR/ICTP Summer School on MHWs in Trieste in 2023. TBI RF organised a session “Interbasin Interactions: Processes, Pathways, and Predictability”, and a Town Hall event “Introducing TBI MIP: An intermodel comparison to study interaction among tropical basins” (coordinated GCM experiments coordinated by TBI RF). SORP convened two sessions: 1) Sea Ice-Ocean Interactions at Small Scales in Polar Regions, 2) Understanding Antarctic sea ice variability and trends. SORP also convened two sessions at the EGU 2024: 1) Southern Ocean in a changing climate: open-ocean physical and biogeochemical processes, 2) Under cover: The Southern Ocean’s connection to sea ice and ice shelves.

AGU Fall Meeting, Washington D.C., 9-13 December 2024 had prominent presence of CLIVAR Pacific Region Panel. The panel members convened 5 sessions:

- ENSO 2014-24 Decade (session A001);
- El Niño-Southern Oscillation and Pan-tropical Climate Interactions: Mechanisms, Predictability, Impacts, and Projections (session OS015);
- Pacific Atmospheric Teleconnections: Dynamics, Impacts, and Future Projections (session GC118);
- Coupled Ocean-Atmosphere Processes in the Tropical Pacific: Physical and Biogeochemical Dynamics and Interactions (session OS012);
- Southeast Asia and the Indo-Pacific: Past, Present, and Future Climate and Environment (session PP031)

GEWEX Open Science Conference (Sapporo, 7-12 July 2024) was attended by several Monsoons Panel Working Group on Asia-Australia Monsoons (WG-AAM). WG-AAM members also presented at the AOGS 2024 in Pyeongchang, South Korea (23-28 June 2024). Different members of the Monsoons Panel and working groups attended various conferences throughout 2024. A member (Lin Wang) helped organise a Young Scientist Workshop on Extreme Weather and Climate Events in September in Beijing and an early-career scientist activity during the ICDM workshop in October, also in Beijing attended by 50 ECRs.

[ENSO Special Collection](#) is open for submission at the journals of the American Meteorological Society (e.g., Journal of Climate, BAMS) to focus on the unusual ENSO behavior observed in the past decade. This is a joint initiative from the CLIVAR Pacific Region Panel, Research Foci on Marine Heatwaves in the Global Ocean and Tropical Basin Interaction, Climate Dynamics Panel, CLIVAR Scientific Steering Group, and CLIVAR Project Office.

The ICPO managed to have a complete team in October 2024. Admin assistant (Yang Zhao) joined the office in July, a staff scientist (Di Zhang) in September, and another staff scientist (Joana Gonzalez) in October. GSOP was re-established around June 2024 with new membership and has since productively held four panel meetings.