



[wcrp-climate.org](http://wcrp-climate.org)

# 45<sup>th</sup> Session of the WCRP Joint Scientific Committee (JSC-45)

Hybrid Plenary Session, Lima, Peru

May 2024

Publication No: 04/2024



## **Bibliographic information**

This report should be cited as:

World Climate Research Programme, 2024. 45<sup>th</sup> Session of the Joint Scientific Committee, 04/2024, 27-30 May 2024, Lima, Peru.

## **Contact information**

All enquiries regarding this report should be directed to [wcrp@wmo.int](mailto:wcrp@wmo.int) or:

World Climate Research Programme  
c/o World Meteorological Organization 7 bis, Avenue de la Paix  
Case Postale 2300  
CH-1211 Geneva 2 Switzerland

## **Cover image credit**

Image: [Pixabay 6784100](#)

## **Copyright notice**

This report is published by the World Climate Research Programme (WCRP) under a [Attribution-NonCommercial-NoDerivatives 4.0 International](#) license) and thereunder made available for reuse for any purpose, subject to the license's terms, including proper attribution.

## **Authorship and publisher's notice**

This report was authored by the WCRP Joint Scientific Committee 2024 and the WCRP Secretariat.

WCRP is co-sponsored by the World Meteorological Organization (WMO), the Intergovernmental Oceanographic Commission (IOC) of UNESCO and the International Science Council (ISC), see <https://wmo.int>, <https://www.ioc.unesco.org/en> and <https://council.science>.

## **Disclaimer**

The designations employed in WCRP publications and the presentation of material in this publication do not imply the expression of any opinion whatsoever on the part of neither the World Climate Research Programme (WCRP) nor its Sponsor Organizations – the World Meteorological Organization (WMO), the Intergovernmental Oceanographic Commission (IOC) of UNESCO and the International Science Council (ISC) – concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The findings, interpretations and conclusions expressed in WCRP publications with named authors are those of the authors alone and do not necessarily reflect those of WCRP, of its Sponsor Organizations – the World Meteorological Organization (WMO), the Intergovernmental Oceanographic Commission (IOC) of UNESCO and the International Science Council (ISC) – or of their Members.

Recommendations of WCRP groups and activities shall have no status within WCRP and its Sponsor Organizations until they have been approved by the Joint Scientific Committee (JSC) of WCRP. The recommendations must be concurred with by the Chair of the JSC before being submitted to the designated constituent body or bodies.

This document is not an official publication of the World Meteorological Organization (WMO) and has been issued without formal editing. The views expressed herein do not necessarily have the endorsement of WMO or its Members.

Any potential mention of specific companies or products does not imply that they are endorsed or recommended by WMO in preference to others of a similar nature which are not mentioned or advertised

## Decisions

- *JSC Member Lisa Alexander will act as a liaison to CORDEX.*
- *WCRP will complete the process for 10 New Insights in Climate Science (10NICS) in 2024 and will let Future Earth know of its intention to exit the collaboration due to competing priorities (JSC Chair; ASAP)*
- *JSC to decide on the location of the annual in-person JSC Session (or report that it is online only) earlier (as early as possible in the preceding year) to enable better planning (JSC Chair; ASAP).*

- *Core activity membership*

*CLIC: Membership proposal accepted. Future membership requests should address disciplinary gaps, specifically in terms of sea ice and permafrost expertise. If possible, an expert from Africa working on tropical glaciers should also be considered.*

*GPEX: The membership proposal was accepted, with the exception that the JSC requires that Xubin Zeng cannot be co-chair of both GEWEX and GPEX. In addition, GPEX must improve its geographic and disciplinary (the observational and modelling sides are not well represented) balance in the future.*

*Safe Landing Climates: The membership proposal was accepted. Future membership requests should improve the geographic and gender balance. The JSC suggests that SLC increases its membership, since the Lighthouse Activity has many different activities planned and underway.*

## Actions

### Opening

- *WCRP to put together a paper on required climate research actions along with the Intergovernmental Panel on Climate Change (IPCC) and Future Earth for COP30 in Brazil (WCRP JSC and Regina Rodrigues together with Future Earth and IPCC; in advance of COP30).*

### WCRP Open Science Conference outcomes

- *Prepare the final WCRP Open Science Conference lessons learned report (Michael Sparrow; by Oct. 2024).*

### WCRP Science and Implementation Plan

- *Suggestions for Science and Implementation Plan cover images to be sent via online form on JSC-45 website. (all; ASAP).*

- *Revise Science and Implementation Plan taking comments from the WCRP co-sponsoring organizations into account and submit final version for approval (JSC leadership and WCRP Secretariat; by end of 2024).*
- *Produce a “brochure” from the Science and Implementation Plan on key topics (WCRP Secretariat and JSC leadership).*

### **Budgeting and finances**

- *Hold leadership meetings as part of the budgeting process to allow two-way communication with the JSC and for core activities to discuss proposals; the first to be held in July/August to finalize 2025 budget (JSC and WCRP Secretariat; ongoing).*
- *Finance Task Team to deliver a 2025 proposal to the entire JSC for further discussion and decision (Finance Task Team; July 2024).*
- *Individual core activities to receive a detailed letter with justification for their approved allocation (WCRP Chair; July 2024).*
- *Hold a WCRP leadership meeting to discuss the budget proposal with all core-activities and to deliberate possible adjustments (WCRP Secretariat and JSC Chair; August 2024).*
- *Set up a virtual JSC meeting for the conclusion of the 2025 budget (WCRP Secretariat; September 2024).*

### **CMIP7 and scenarios**

- *Schedule meeting between the JSC leadership and CMIP co-chairs to discuss WCRP’s endorsement of the CMIP scenarios for CMIP7. (JSC Chair, Vice-chair and CMIP co-chairs; ASAP).*
- *JSC to consider CMIP’s request for a letter from the WCRP JSC defining CMIP plans and calling on countries and institutions to support planned activities particularly with regard to CMIP data infrastructure. (JSC; ASAP).*

### **Budget and cycles**

- *Discuss with Jan Polcher (Co-chair, GEWEX) the progress of the work and related collaborations with GCOS on cycles and budgets. (JSC Chair, Vice-chair, Mike Sparrow, Jan Polcher; September 2024).*

### **WCRP Global Fellowships**

- *Fellowship Task team to provide the JSC with a revised WCRP Global Fellowships proposal (Fellowship Task Team; ASAP).*

### **WCRP Core Projects and Lighthouse Activities**

- *JSC to discuss approving a budget to hire a consultant to look into requirements for a WCRP wide collaboration platform, taking into account who would use it and for what, set-up costs, and any ongoing costs. (JSC, Narelle van der Wel; ASAP).*
- *Research on Climate Intervention Lighthouse Activity co-chairs to approach relevant people in WCRP for informed and timely advice and guidance in relation to the political sensitivity of some of the climate intervention research topics (Research on Climate Intervention co-chairs; ongoing).*
- *Research on Climate Intervention Lighthouse Activity co-chairs to reach out to organizations such as UNEP and other groups that would be interested in contributing to a joint statement on climate intervention research, standards, and best practices. (Research on Climate Intervention co-chairs; ASAP).*
- *Amadou Gaye to discuss with CliC leadership about possible African representatives for CliC activities (Amadou Gaye, CliC leadership; ongoing).*
- *CLIVAR, ESMO and EPESC to discuss a possible joint workshop to look at coupled ocean-atmospheric circulation changes. (CLIVAR, ESMO, EPESC and other relevant activities; before end of 2024).*
- *Amadou Gaye to email Sonya Legg (CLIVAR co-chair) about relevant West African ocean-related activities. (Amadou Gaye; ASAP).*
- *WCRP Secretariat to link relevant colleagues in WMO Services Department with WCRP's event attribution work (WCRP Secretariat; ongoing).*

#### **Partner interactions**

- *Arrange a meeting with IPCC working group leads, copying in Working Group I Technical Support Unit, to discuss and refine key topics for collaborations or joint assessments. (JSC Chair and Vice-chair; ASAP).*
- *WCRP Secretariat to follow up with Asia Pacific Network Secretariat on connections with Academy and other activities as appropriate (Yuki Imanari, Narelle van der Wel, Academy Support Unit and others; as applicable).*

#### **Joint Scientific Committee**

- *Establish and determine the composition and terms of reference of a task team to provide recommendations toward better inclusion of Global South researchers in WCRP activities and committees (JSC; ASAP).*
- *The JSC to provide feedback on all core activity reports (JSC; ASAP).*
- *The JSC to look at core activity reports to identify key overarching topics that may need community-wide discussion and identify if, when, how, and by who such discussions should be facilitated. (JSC; by JSC45B).*

- Consider how to better define the role of JSC liaisons to WCRP core activities (WCRP JSC and Secretariat; ASAP).
- Amadou to work with GPEX to help with African membership and CliC regarding including possible expert workings on tropical glaciers to consider in future membership rounds (Amadou, WCRP Secretariat, respective activity chairs; ASAP).
- Agree on updates to the Guidelines on Membership and Responsibilities of WCRP High-level Steering Committees and send out to the community for comment (JSC and WCRP Secretariat; ASAP).
- Reply to Manila Observatory regarding invitation to host the 2025 Session of the JSC in Manila and ask if hosting the Session in 2026 would be possible (lead: JSC Chair; ASAP).

### **WCRP Secretariat**

- WCRP to send a communication to core activities on how potential contributions from private enterprises must be dealt with (WCRP Secretariat; by end July 2024).
- Review the terms of reference of each WCRP activity and provide the JSC with an overview of them (WCRP Secretariat, by JSC-46)
- Investigate what is needed to deliver a WCRP-wide communication platform (WCRP Secretariat; before the end of 2024).
- Prepare membership decision letters and send to all activities, including advice from the JSC for future rounds (WCRP Secretariat; ASAP).

# Table of contents

<b>1.</b>	<b>Introduction</b>	<b>1</b>
<b>2.</b>	<b>Session opening and welcome</b>	<b>1</b>
2.1.	Welcome from local authorities	1
2.2.	Opening comments from the WCRP co-sponsoring organizations	1
2.3.	Opening of the 45 <sup>th</sup> Session of the JSC	2
2.4.	ANDEX Scientific Steering Committee meeting	3
2.5.	Welcome and approval of the JSC agenda	3
<b>3.</b>	<b>WCRP Open Science Conference outcomes</b>	<b>3</b>
<b>4.</b>	<b>WCRP Science and Implementation Plan</b>	<b>4</b>
4.1.	Completion of the WCRP Science and Implementation Plan	4
4.2.	Status of WCRP branding	5
4.3.	New WCRP funding strategy	5
<b>5.</b>	<b>Strategic initiatives and issues: update and discussion</b>	<b>7</b>
5.1.	Status of CMIP 7 and scenarios	7
5.2.	WCRP Cycles and Budgets Task Team	10
5.3.	Collaboration on monsoons activities	11
5.4.	Outcome of CliC Review	12
5.5.	IPCC – WCRP collaborations	13
<b>6.</b>	<b>Lighthouse Activities</b>	<b>15</b>
6.1.	My Climate Risk (MCR)	15
6.2.	The Global Precipitation EXperiment (GPEX)	16
6.3.	Explaining and Predicting Earth System Change (EPESC)	18
6.4.	Digital Earths	19



6.5.	Safe Landing Climates (SLC)	21
6.6.	Research on Climate Intervention	23
6.7.	General discussion on the Lighthouse Activities	24
<b>7.</b>	<b>Core Projects</b>	<b>24</b>
7.1.	Atmospheric Processes and their Role in Climate (APARC)	24
7.2.	Climate and Cryosphere (CliC)	26
7.3.	Climate and Ocean Variability, Predictability and Change (CLIVAR)	28
7.4.	Global Energy and Water Exchanges (GEWEX)	29
7.5.	Regional Information for Society (RIfS)	30
7.5.1.	Global Extremes Platform (GEP)	31
7.5.2.	Coordinated Regional Climate Downscaling Experiment (CORDEX)	32
7.6.	Earth System Modelling and Observations (ESMO)	33
7.6.1.	Coupled Model Intercomparison Project (CMIP)	36
7.7.	The WCRP Academy	37
<b>8.</b>	<b>Improving connections between WCRP core activities</b>	<b>38</b>
<b>9.</b>	<b>Early and Mid-Career Researcher (EMCR) Tiger Team</b>	<b>40</b>
9.1.	Young Earth System Scientists (YESS)	41
<b>10.</b>	<b>WCRP Global Fellowships</b>	<b>41</b>
<b>11.</b>	<b>Partner interactions</b>	<b>42</b>
11.1.	United States Global Change Research Program (USGCRP)	42
11.2.	Future Earth	43
11.2.1.	International Global Atmospheric Chemistry (IGAC)	43
11.2.2.	Past Global Changes (PAGES)	44
11.2.3.	Surface Ocean-Lower Atmosphere Study (SOLAS)	44
11.2.4.	Risk KAN	44

11.2.5. Integrated Land Ecosystem Atmosphere Processes Study (ileaps)	44
11.2.6. Analysis, Integration and Modelling of the Earth System (AIMES)	44
11.2.7. General discussion	45
11.3. World Meteorological Organization (WMO)	45
11.3.1. Global Framework for Climate Services (GFCS)	45
11.3.2. World Weather Research Programme (WWRP)	45
11.3.3. Global Atmosphere Watch	46
11.4. Other partners	46
11.4.1. Scientific Committee on Oceanic Research (SCOR)	46
11.4.2. Global Climate Observing System (GCOS)	47
11.4.3. Asia Pacific Network (APN)	47
<b>12. Other business</b>	<b>47</b>
12.1. JSC Task Team on Finance and the New Budgeting Process	47
12.2. Secretariat Report	48
<b>13. JSC Session Closing</b>	<b>48</b>
<b>14. Outcomes of the JSC-only session</b>	<b>49</b>
14.1. Task Team to ensure better inclusion of the Global South in WCRP	49
14.2. Budget for 2025	50
14.3. 10 New Insights in Climate Science (1ONICS)	50
14.4. Private enterprise contributions to WCRP	50
14.5. WCRP Global Fellowships	50
14.6. Feedback on core activity reports	51
14.7. Core activities terms of reference	51
14.8. Overarching research areas	51
14.9. WCRP communication platform	51

14.10. Core activities membership	52
14.11. Membership guidelines	52
14.12. JSC Session 2025	53
<b>Annex 1: List of acronyms</b>	<b>54</b>
<b>Annex 2: List of participants</b>	<b>58</b>
<b>Annex 3: Agenda</b>	<b>61</b>

## 1. Introduction

This report is a summary of the main outcomes from the 45th Session of the World Climate Research Programme (WCRP) Joint Scientific Committee (JSC-45), which took place in May 2024 in Lima, Peru. This report does not reflect all the discussions that took place during the Session. For more detailed reports, please refer to the presentations given during the meeting (<https://www.wcrp-climate.org/jsc45-presentations>) and reports submitted prior to the meeting by individual core activities.<sup>1</sup>

## 2. Session opening and welcome

### 2.1. Welcome from local authorities

Edmundo Norabuena (Scientific Director of the Instituto Geofísico del Perú (IGP)), welcomed everyone and highlighted the contributions to and linkages between IGP and WCRP, ANDEX (the Hydroclimate Research Program for the Andes) and the Global Energy and Water Exchanges (GEWEX) Core Project of WCRP.

Bruno Turcq (Representative in Peru of the French National Research Institute for Sustainable Development (IRD)), thanked the Universidad Peruana Cayetano Heredia (UPCH), WCRP, and IGP for organizing the ANDEX meeting. He said that the geography and the diversity of Peru is its real treasure and highlighted that it is very vulnerable to climate change effects. He also welcomed the WCRP Chair, Vice-chair, and ANDEX lead scientists.

Enrique Castaneda (University President of UPCH) welcomed all participants to the university and highlighted the importance of WCRP's work in understanding the Earth and its climate. He encouraged collaborations between the university and WCRP in the coming years towards a sustainable future.

Berioska Quispe (Director General of Climate Change and Desertification, Ministerio del Ambiente (MINAM), Peru), welcomed all to the country of Peru. She emphasized that climate change is a reality and dealing with it must be at the center of our efforts and attention. She added that addressing climate change requires concerted efforts from all stakeholders, with a focus on adaptation and mitigation, and called for engagement with the private sector in this endeavor.

### 2.2. Opening comments from the WCRP co-sponsoring organizations

Celeste Saulo (Secretary General of the World Meteorological Organization (WMO)), extended heartfelt congratulations to WCRP for holding this JSC meeting

---

<sup>1</sup><https://www.wcrp-climate.org/jsc45-presentations>

in Peru. She said that WMO looks forward to working with partners and the other co-sponsoring organizations to ensure the continued success of WCRP and thanked all the experts working to address issues related to climate, climate variability, and climate change. Pointing out that collaborations are crucial to understanding and advancing climate science, she congratulated WCRP on the launch of the “[Kigali Declaration](#)” as a mechanism to push for more political strength behind all efforts undertaken by the scientific community. She commended WCRP’s Global Fellowship scheme and its mission to ensure that the voices of the Global South are heard at the highest level of our activities.

Salvatore Aricò (Chief Executive Officer of the International Science Council (ISC)), underlined that the ISC has evolved in its mission to support science in times of conflict and recognizes the importance of science diplomacy. He said that WCRP enables ISC’s mission to be the global voice of science. He called for WCRP to embrace perspectives from social sciences and ensure transdisciplinarity in its work. Stating that the co-production of knowledge found in domains other than academia is also important, he emphasized the role of WCRP in bringing social sciences and climate science together. He welcomed the new Lighthouse Activity on Research on Climate Intervention and added that ISC looks forward to working with WCRP to ensure a strong presence at the 29<sup>th</sup> Conference of the Parties (COP29).

Vidar Helgesen (Executive Secretary of the Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO)) highlighted that social action is needed to address climate change. He mentioned WCRP’s draft Science and Implementation Plan and stressed the importance of communication to spotlight the urgency of action towards addressing climate change. Underlining the importance of collaboration to co-design and co-deliver the knowledge and solutions needed to scale up and speed up climate action, he pledged that IOC-UNESCO will continue to support WCRP and will increase support to communication and outreach activities so that the urgency of the climate crisis can be effectively conveyed.

### **2.3. Opening of the 45<sup>th</sup> Session of the JSC**

Detlef Stammer (Chair, WCRP JSC) welcomed all participants, both in person and online, to the 45<sup>th</sup> Session of the JSC. He introduced WCRP and its mission and highlighted WCRP’s crucial role in international climate research coordination. He showcased WCRP’s Science and Implementation Plan, which is currently being finalized. He also spoke about the WCRP Open Science Conference in 2023 and one of its key outcomes, the “[Kigali Declaration](#)”. He then went on to list the salient features of the Declaration, including the three calls for action.

## 2.4. ANDEX Scientific Steering Committee meeting

The JSC Session was held in parallel to the ANDEX Scientific Steering Committee meeting. Jhan-Carlo Espinoza (IRD, Pontifical Catholic University of Peru) introduced the ANDEX project to participants and outlined that its work is centered on regional hydroclimatology. He explained that the ANDEX annual meeting will be held in parallel to the JSC Session to enable fruitful collaborations.

## 2.5. Welcome and approval of the JSC agenda

Detlef continued his opening address and highlighted that participants at this meeting should strive to maintain the momentum generated by the WCRP Open Science Conference and the “Kigali Declaration.” He mentioned that he had met with Ana Toni, Secretary of State, Ministry of Environment and Climate Change, Brazil, and summarized how WCRP's work in the future would feed into the 30<sup>th</sup> Conference of the Parties (COP30), including plans for a paper on climate research actions with key partners. This paper will be presented to the COP30 president. Regina Rodrigues will act as the Brazil/local representative of WCRP in this endeavor.

*Action: WCRP to put together a paper on required climate research actions along with the Intergovernmental Panel on Climate Change (IPCC) and Future Earth for COP30 in Brazil (WCRP JSC and Regina Rodrigues together with Future Earth and IPCC; in advance of COP30).*

Detlef provided an overview of the draft WCRP Science and Implementation Plan, specifically highlighting the new structure of WCRP where the Academy is now part of the permanent structure and no longer a limited-lifetime Lighthouse Activity. He then came back to the goals of the Session and reiterated that we should use the current momentum of the Programme to become truly global and inclusive. He also mentioned that the current JSC Session was planned to be “mostly virtual” with a full in-person meeting planned in 2025. Pascale Braconnot (JSC Vice-chair) re-emphasized the importance of the current JSC session. The agenda was approved without objections.

## 3. WCRP Open Science Conference outcomes

Detlef provided a summary of the WCRP Open Science Conference in Kigali in October 2023 and its outcomes, with a brief reminder of the three conference themes ((1) Advances in Climate Research, (2) Human Interactions with Climate, and (3) Co-produced Climate Services and Solutions) and its various sessions.<sup>2</sup> The fact that the conference was self-contained in the convention center allowed interactions around the clock. Further to this, the WCRP Open Science

---

<sup>2</sup> <https://wcrp-osc2023.org/program/program-sessions>

Conference turned out to be a transformative conference with contributions from both the impacts and social science communities underpinning WCRP's vision of climate science connecting with society. Having been held in Africa in recognition of the disparities in the drivers and consequences of climate change around the world with persistent inequities in the global scientific community, the conference emphasized the need for a collective commitment.

Almost 1500 delegates participated in the hybrid event, with about half present onsite. Approximately 32% of delegates originated from Africa and 26% from other regions in the Global South. In terms of regional distribution of participants (onsite and online), 100 countries were represented with 69% from the Global South. One third of the total onsite participants were early career scientists.

As one of the major outcomes of the WCRP Open Science Conference, the Kigali Declaration was negotiated during the final day of the conference and served as an input to the 28<sup>th</sup> Conference of the Parties (COP28). In addition, around twenty WCRP Open Science Conference Concept Papers are in production as a major outcome from various Open Science Conference sessions (two are already published). A concept paper is also under preparation following the Early and Mid-Career Researcher (EMCR) Symposium.

Detlef emphasized the importance of maintaining the momentum generated by the Open Science Conference and hence emphasized an urgent need to convene a post Open Science Conference WCRP task team to brainstorm on how to take this effort forward.

Several WCRP JSC members noted the success and congratulated WCRP on the outcomes of the Open Science Conference. WCRP's hard work on ensuring participation from the African region including from Early Career Researchers (ECRs) was also applauded. A 'lessons learned' report on the Open Science Conference will be prepared.

*Action: Prepare the final WCRP Open Science Conference lessons learned report (Michael Sparrow; by Oct.2024).*

## **4. WCRP Science and Implementation Plan**

### **4.1. Completion of the WCRP Science and Implementation Plan**

Detlef briefed participants on the status of WCRP's Science and Implementation Plan, a draft of which is now complete. He thanked the WCRP core activities for their input. Detlef also emphasized the importance of calling this a Science and Implementation Plan and not only an implementation plan. He explained that the Plan is not only for the co-sponsors but will also serve the WCRP community in terms of WCRP operations, organization, governance and terms of reference. He noted that the WCRP co-sponsoring organizations (WMO, ISC, IOC-UNESCO) are now providing initial comments following which WCRP will revise the content. The

finalized Science and Implementation Plan will then be formally submitted to the WCRP co-sponsoring organizations for approval after being made available for partner and community comment. The approximate timeline of submission and approval by the co-sponsors is:

- ISC by October/November 2024
- WMO June 2025
- IOC-UNESCO July/August 2025

Detlef invited the WCRP community to provide possible images for the cover of the Plan.

*Action: Suggestions for Science and Implementation Plan cover images to be sent via online form on JSC-45 website. (all; ASAP).*

*Action: Revise Science and Implementation Plan taking comments from the WCRP co-sponsoring organizations into account and submit final version for approval (JSC leadership and WCRP Secretariat; by end of 2024).*

Pascale also briefly explained the importance of a WCRP brochure that would complement the Science and Implementation Plan. The brochure will highlight WCRP's key topics of interest and how WCRP core activities address science questions.

*Action: Produce a "brochure" from the Science and Implementation Plan on key topics (WCRP Secretariat and JSC leadership).*

## **4.2. Status of WCRP branding**

Detlef provided background to WCRP's recent rebranding, undertaken by the Geneva-based design company Parenti & Co. The design company providing new logos for the WCRP Core Projects in addition to WCRP, with the aim of improving the overall branding and identity for the Programme. As a result, WCRP is now rebranding all templates for reports, presentations and other materials. The WCRP Academy and some of the Core Projects have already implemented the branding. Narelle van der Wel (WCRP Secretariat) also mentioned that the WCRP website has been rebranded and that new brand guidelines will be uploaded on the website soon. Core activities with their own websites and materials were asked to ensure that their branding is updated accordingly.

## **4.3. New WCRP funding strategy**

Detlef explained the new WCRP funding strategy to JSC Session participants. He recalled how, in the past, resources came in without much dedicated fundraising in place. This was partly because no detailed strategy existed for spending resources. In general, available resources were provided to the Core Projects and other activities such as the Lighthouse Activities and Grand Challenges. He said that with the implementation of the new WCRP Strategic Plan, there is now a need



to significantly rethink WCRP's financial situation and resource allocation. Moreover, WCRP has also adopted a 50% travel reduction strategy with at least 50% of meetings taking place virtually and new initiatives requiring additional resources.

Detlef outlined the strategy, which was produced by a JSC finance and budget task team. The new strategy has five budget categories:

1. Baseline funds
2. Strategic fund
3. Capacity building
4. Overarching operational activities
5. Administration support to Academy and Lighthouse Activities

The procedure and timeline are as follows:

- The JSC requests proposals for financial support from each core activity as well as asking the JSC for any other strategic items as appropriate (e.g., for strategic funding such as a high-level assessment) for each year.
- Baseline funding needs will be revised every 2-3 years.
- Core activities are to seek funding through proposals for strategic events and capacity building activities.

The finance task team will review these requests, open a dialog with the activities where needed, and a final decision will be made by the JSC. A key aspect is to promote cross-cutting strategic activities for community enrolment in addressing questions that are particularly important for society, identifying topics for which extra income will need to be solicited e.g., for a special report for the next IPCC assessment.

A summary on the current financial status of WCRP was also provided:

- WCRP is in a relatively good situation with additional income from the U.S. Global Change Research Program (USGCRP) until 2025 or 2026. However, WCRP must not consistently overspend and should keep its budget as close to its annual income as possible (~1 million CHF).
- There is a need for WCRP to continue to monitor its expenditure and income, ensuring a closer connection between the resources available and how funds are being used to create a better connection to funders.

During the discussion session, Peter van Oevelen (GEWEX International Project Office (IPO) Director) expressed concern that the WCRP core activities have not been consulted or kept involved in the budget strategy discussions. A general discussion ensued in which several people expressed the wish to have a more bottom-up approach to some of these high-level decisions. Pascale clarified that

2025 would only be a trial period and that there would be ample discussions with all WCRP core activities going forward. Mike Sparrow (Head of the WCRP Secretariat) also clarified that in the next round more opportunities will be set up for core activities to meet virtually and discuss potential joint funding proposals. However, it was also mentioned that if the core activities wished to propose a joint activity, the concerned activities should get in touch with each other directly and not wait for a leadership meeting to be set up. Several other core activities also expressed the need for regular leadership meetings to enable better two-way communications.

*Action: Hold leadership meetings as part of the budgeting process to allow two-way communication with the JSC and for core activities to discuss proposals; the first to be held in July/August to finalize 2025 budget (JSC and WCRP Secretariat; ongoing).*

## **5. Strategic initiatives and issues: update and discussion**

### **5.1. Status of CMIP 7 and scenarios**

Helene Hewitt (Coupled Model Intercomparison (CMIP) Co-chair) provided an update on CMIP Phase Seven (CMIP7) preparation. She highlighted a move towards a more continuous approach for CMIP7, with targeted ‘fast track’ experiment sets focused on specific needs. For example, the IPCC Seventh Assessment Report (AR7) Fast Track is targeted at the IPCC AR7 cycle, and its design is based on feedback from both modeling centers and wider user communities.

The CMIP Panel has also been discussing and prioritizing CMIP7 science goals. Though not yet confirmed, the potential focal themes have been identified as pattern effects, high impact weather patterns, the carbon cycle, and tipping points risks.

The DECK, which is often described as the entry card for CMIP7, will be kept as it was for CMIP Phase Six (CMIP6) but will have a few more extra options. The Fast Track was approved by the Working Group on Coupled Modelling (WGCM) in March 2024 – experiments including scenarios directed towards climate services and other experiments supporting understanding from scenarios as well as real process understanding. Having Fast Track simulations will hopefully mean there are opportunities for the Coordinated Regional Climate Downscaling Experiment (CORDEX) and other projects such as the Ice Sheet Model Intercomparison Project for CMIP7 (ISMIP7) to utilize these simulations in time for AR7 timelines.

Surveys with modeling centers were conducted with responses from 27 centers on their plans to contribute to the next CMIP cycle. The models are expected to start running later in 2024 and control runs to run from early 2025. All modeling centers have expressed an interest in contributing to the scenarios and interest in the other AR7 Fast Track experiments varies from center to center.

The CMIP Panel plans to issue guidance to help the functioning of the Model Intercomparison Projects (MIPs), especially since CMIP is moving from concentration driven models to emission driven models. A workshop will be organized on the strategy for emission driven model configurations.

A major cause of delays in CMIP6 was the historical forcings. A task team on CMIP forcing has been set up to resolve known forcing issues for CMIP7 DECK experiments and to deliver data updates (at least until December 2021). Pre-release versions will be available for testing in mid 2024 and the plan is to have the CMIP7 DECK datasets finalized and frozen for wider use, including in the AR7 Fast Track, in 2025.

CMIP is identifying data requests for variables that the users want and has decided on a three-set approach with respect to data access: (1) a core set for baseline climate variables. This list will be updated and governed by WCRP's Earth System Modelling and Observations (ESMO) Core Project; (2) a harmonized data set which will be community driven list of variables under themed categories, and suitable for AR7 Fast Track and AR7 deadlines; and (3) an unharmonized data sets which will be MIP driven and with high flexibility in terms of timelines and content. A journal paper is planned for each of the thematic variable groups under (2).

In terms of key risks for AR7 delivery, there is a challenging timeline especially when the forcing dataset delivery depends on unfunded providers, though the situation has improved from CMIP6. The ScenarioMIP timeline is also very ambitious. The capacity of modeling centers needs to be considered. Lastly, the IPCC AR7 timeline is still uncertain. Uncertainty in funding support for the infrastructure (Earth System Grid Federation (ESGF)) that would deliver the datasets has to be considered as well. Therefore, she noted, a letter from the WCRP JSC defining CMIP plans and calling on countries and institutions to support planned activities, particularly with regard to the CMIP data infrastructure, would be useful.

Given the tight timeline of the AR7 Fast Track, the growing demand for CMIP output, and the rapid evolution of data technologies and user expectations, the CMIP/ WGCM Infrastructure Panel (WIP) Panels have concerns regarding the lack of a structural agreement with the ESGF consortium and a lack of clarity in terms of responsibilities/governance across the WIP and ESGF Executive and Steering Committees. Funding uncertainty makes navigating this terrain complex. Helene noted that having a letter from the JSC to the community would help.

Given the increased profile and importance of scenario development to climate policy assessments, CMIP feels greater visibility within WCRP may be beneficial to ensure timely delivery, adequate structural support, and establishing a closer connection with the Integrated Assessment Modelling (IAM) community.

Detlef van Vuuren (ScenarioMIP co-chair) presented the CMIP7 Scenarios and the relevant ongoing work. ScenarioMIP will be focusing on services, science and policy as these three rationales have consequences relevant in different research

scenarios. i.e. (1) a wide and plausible range for different forcing variables, including outcomes consistent with current climate targets; (2) relevance in different research domains (physics, impacts, mitigation/adaptation) and (3) that they provide insights into uncertainty.

Given the important role of ScenarioMIP, specific attention to transparency is being given with more members in the steering committee (to maximize diversity). In addition, an advisory board has also been set up. Extensive consultation opportunities have been put in place to support enhanced community input and engagement. Concentration driven scenarios will also be available, but emission driven scenarios are being promoted. A range of scenarios are being explored: medium scenario consistent with current policy (2.5 to 3 °C warming), high end scenario indicating policy failure (but lower than Representative Concentration Pathway (RCP) 8.5), several other scenarios relevant to the Paris agreement (e.g., close to 1.5°C target, overshoot variant as well). There will also be one scenario on major overshoot. The scenario proposal is being finalized. The IAM community will be asked to develop scenarios based on this (until October 2025) after which the data will be made available for climate model runs.

Krishnan Raghavan (JSC Member) asked whether emission driven scenarios were mandatory for all experiments due to the tight timeline for the AR7 Fast Track (which includes the DECK and scenarios). Helene responded that they were not mandatory but rather encouraged as flagship projects. Both emission and concentration driven scenarios will be possible, and options will be provided for these cases and made accessible to everybody.

Rowan Sutton (Explaining and Predicting Earth System Change Lighthouse Activity (EPESC) Co-chair) requested more information on the scale, i.e., the requirements for the AR7 Fast Track will mean a rush and hence should be at as small a scale as possible. Helene agreed and mentioned that currently what is being recommended for the AR7 Fast Track is much smaller than for CMIP6 (as an example, one tenth of what was run in the UK for CMIP6). All experiments were carefully thought out and there will be no obligation for modeling centers to do everything. Helene noted that if they wish to do only DECK and scenarios, that would be fine. Everything will be documented clearly in a special paper in the journal of Geoscientific Model Development (GMD).

Detlef thanked the speakers for the presentation and all the work that has been done. He emphasized the importance of the JSC endorsing the scenarios from ScenarioMIP. It was suggested that the JSC could endorse the set of scenarios before the ScenarioMIP paper gets published.

Amadou Gaye (JSC Member) asked Helene if CMIP was contributing to the global stocktake. Helene responded that CMIP cannot commit to the global stocktake as the timeline is too tight.

*Action: Schedule a meeting between the JSC leadership and CMIP co-chairs to discuss WCRP's endorsement of the CMIP scenarios for CMIP7 as soon as possible (JSC Chair, co-chair and CMIP co-chairs; ASAP).*

*Action: JSC to consider CMIP's request for a letter from the WCRP JSC defining CMIP plans and calling on countries and institutions to support planned activities, particularly with regards to CMIP data infrastructure (JSC; ASAP).*

## **5.2. WCRP Cycles and Budgets Task Team**

Jan Polcher (GEWEX Co-chair) presented progress with the work on water, energy and carbon cycles and budgets, which is a joint effort between WCRP and the Global Climate Observing System (GCOS). The outcomes presented at the meeting came from a joint workshop that took place in June 2023 in Geneva, Switzerland and include:

- Most of the variables needed to close the cycles are Essential Climate Variables (ECVs).
- How can we ensure that these observations are of sufficient quality? One way is to monitor the closure of the cycles. But how? Request each ECV producer to report the global integrals.

Jan mentioned that the idea of the workshop was to define the Earth system domains, with the cryosphere being the most complex due to the volume changes over time. Therefore, the group decided to limit itself to three domains – atmosphere, ocean, and land, considering that cryosphere would come under both land and ocean. It was hence decided to lean towards three domains where the volumes were well defined. The workshop also emphasized the importance and need to clearly identify the meaning of cycles and the difference between cycles and budgets. Jan emphasized that it was clear for WCRP and GCOS that more research on cycle and budget quantifications was needed. Concrete steps will be jointly taken, and such an effort should help identify priorities. Concrete analysis steps or questions include whether cycles stationary or not and error analysis.

During the discussion it was mentioned that most of Jan's presentation was about the water cycle, with the energy cycle included to some extent. However, the carbon cycle, which is equally important, was not very well considered. It was asked if this is relevant to the work of the Global Carbon Project. Pierre Friedlingstein (JSC Member) replied that for the carbon cycle, the continuity equation is the same, but the approach needed is different. The main problem is that the ECVs from observations for carbon are not sufficient, even though there is sufficient modeling data available for the carbon component. Jan mentioned that the initial idea of the concept paper was to provide a stocktake and identify variables that need to be recommended to GCOS.

Gabi Hegerl (Co-chair, Safe Landing Climates Lighthouse Activity) mentioned that the community are probably more interested in anomalies than absolute values as sampling changes in absolute values remains very complicated. On Krishnan's question as to whether there was adequate data to check the conservation of the water cycle, Jan and others responded that they do not have that information yet.

In terms of the timeline of the activities on cycles and budgets, Jan mentioned that a draft paper on the workshop outcomes is being jointly written with Li Jing (GCOS) and would be ready soon. He expected new activities to develop out of the joint paper. Pierre mentioned that the task team can look at connections between the cycles as the budget of one cycle could help refine the other cycles. Pascale and Detlef closed the discussion session with a request for a discussion on how WCRP and GCOS would jointly move forward in this work.

*Action: Discuss with Jan Polcher (Co-chair, GEWEX) the progress of the work and related collaborations with GCOS on cycles and budgets. (JSC Chair, Vice-chair, Michael Sparrow, Jan Polcher; September 2024).*

### **5.3. Collaboration on monsoons activities**

Leila Carvalho (Co-chair, Monsoons Panel) presented activities of the Climate and Ocean Variability, Predictability and Change (CLIVAR)/GEWEX Monsoons Panel. The overarching goal of the Panel is: Advancing understanding of monsoon variability and improving its prediction with observations and modeling as cornerstones of research activities. Under the Monsoons Panel there are three regional working groups on Asian Australian Monsoons, American Monsoons, and African Monsoons. The regional working groups are tasked with identifying priority areas for targeting advances and are relatively flexible, organizing themselves with guidance from the Monsoons Panel.

The Monsoon Panel's current focus is on identifying bottlenecks to improving skill in representing all monsoons in dynamical models. These activities include:

- Assessing the skill of dynamical models in simulating rainfall in regional monsoons and identifying bottlenecks for further improvement.
- Supporting Research to Operations activities to help the WMO Regional Climate Outlook Forums and operational meteorological services.
- Communicating existing products and providing guidance on their (adequate) application and limitations focusing on the operational and (relevant) impacts communities and participating in relevant training activities.
- Building capacity in the working groups by promoting ECR representation in the working groups and subgroups.

Leila summarized the different activities of the monsoon working groups as well as the focus on scientific capacity building and career support activities in 2023-24.

There are also various cross panel and cross activity foci, in particular with the Atmospheric Processes And their Role in Climate (APARC) and Climate and Cryosphere (CliC) Core Projects, My Climate Risk, and Safe Landing Climates, as well as proposed activities with GEWEX's Global Atmospheric System Studies (GASS) and Global Land Atmosphere System Studies (GLASS) Panels.

Detlef asked if having a Monsoon Panel sitting between two Core Project works and also reminded participants that the International Monsoons Project Office (IMPO) is joint with the World Weather Research Programme (WWRP). Leila commented that it works well, but that perhaps the Panel needs to do more to take advantage of these collaborations and synergies. There is also more of a focus now on exploring collaborations with e.g., APARC on the role of aerosols. She noted that the IMPO has provided excellent support. Both Sonya Legg (Co-chair, CLIVAR) and Jan Polcher (Co-chair, GEWEX) acknowledged the work of the Monsoons Panel and thanked Leila, the Panel and the IMPO for their work.

Krishnan said that the IMPO at Indian Institute of Tropical Meteorology (IITM), Pune, India, is playing a strong role in organizing the Stratosphere-Troposphere Interactions and Prediction of Monsoon weather EXtremes (STIPMEX) Workshop 2-7 June 2024 and the 8th International Workshop on Monsoons jointly with WWRP.

#### **5.4. Outcome of CliC Review**

Detlef reminded participants that the JSC made a commitment to review all WCRP core activities over time, starting with CliC. A review committee was set up and at the time of the JSC meeting a final report was being drafted.

Status:

- Relevant groups were interviewed and a discussion with the CliC Scientific Steering Group (SSG) took place.
- Verbal feedback has already been given to CliC SSG.
- A written report is being drafted and will be provided to CliC SSG Co-chairs and the JSC within the next 2-4 weeks.
- A response is expected from the CliC leadership at the 46th Session of the JSC.

General WCRP related outcomes:

- The role of the cryosphere in shaping climate variability and changes in the climate system is present in many aspects of the ongoing WCRP activities in the ocean, the atmosphere or over land. In terms of linking with other WCRP activities, the cryosphere is therefore a key component of Earth system change in the planetary climate system.

- It is strongly advised to strengthen the interaction of CliC within WCRP with all other activities and develop active collaborations on already existing (maybe dormant) projects or start new projects that lend themselves on emerging important problems, such as declining water storage in mountainous regions, instabilities in polar ice sheets, the role and impacts in regional and large scale dynamics, the energy budget of the Earth system, the carbon cycle and budget changes, etc.
- As a general recommendation to WCRP: a platform should be created that provides opportunities for better interactions between core activities. The Lighthouse Activities were largely created for this reason, and it is therefore also strongly recommended to CliC and all other Core Projects to improve their participation in the Lighthouse Activities.
- It should also be realized that funding agencies look at what WCRP says that funding priorities are. This highlights the opportunity the WCRP Science and Implementation Plan has for helping ECRs to obtain funding for their research. Respective key words need to appear in the CliC Strategic Plan. There should be a working group around each of these priorities in which ECRs can then participate.
- Making CliC/WCRP more known to individual nations would be desirable. As an example, CliC could be known better in Australia where they are developing a decadal science plan.
- CliC has played a lead role in initiating, coordinating, and promoting Arctic linkages research – but there is not an Antarctic equivalent which would be extremely helpful for Southern Hemisphere nations. CliC could engage much better with Antarctic programs and liaise to bring together cryosphere scientists, stakeholders/policymakers and funding agencies in a more effective fashion.

Jan made the point that CliC-GEWEX interactions have been excellent over the last few years. He presented ANDEX as another new opportunity for collaboration with CliC. Sonya Legg (CLIVAR co-chair) reminded participants that there are several joint panels between CLIVAR and CliC, focused on the Southern and Northern-Arctic Oceans.

## **5.5. IPCC – WCRP collaborations**

Pascale emphasized the need for better IPCC–WCRP collaborations to ensure science is relevant for IPCC assessment reports. She presented the expectations of WCRP regarding the AR7 agenda and organization, noting that WCRP aims to provide IPCC with a better understanding of ongoing science research. She further noted that it is important to understand what is expected for the AR7, identify research gaps, and identify key collaborations. She highlighted some of



the key points of discussion as well as expectations from the WCRP side, referring to the draft WCRP Science and Implementation Plan.

Gabi presented two proposed assessment papers that are underway: one on tipping points and high-impact events and one on Transient Climate Response to cumulative carbon Emission (TCRE) and Zero Emissions Commitment (ZEC). Other assessments planned are on climate Intervention landscaping and on heat, water, and carbon budgets and cycles. Robert Vautard (IPCC) and Roberto Sanchez (JSC member) noted that potential interactions between the IPCC Working Groups I and II are key for cross-cutting topics on science and governance, but it is important for these interactions to be developed at the very beginning of the assessment process.

Nadine Mengis (Co-chair, Research on Climate Intervention Lighthouse Activity) thanked Gabi for sharing the work of the TCRE and ZEC workshops and asked if they have discussed the development of metrics under net-negative emissions and overshoot. Pierre confirmed that they have and added that until now all TCRE and ZEC information is based on 1% of RCP/ Shared Socioeconomic Pathway (SSP) scenarios and that they need to assess how this holds up when emissions decline and when emissions are negative.

Detlef presented plans to pull together climate science actions to be highlighted at COP30. He pointed out the need to start developing a concept paper between WCRP, Future Earth, and IPCC for this purpose.

Francois Engelbrecht (Co-chair, CLIVAR Core Project) noted that Climate Change and Cities will be the only approved special report in the AR7 cycle but that there is an increase in demand for an assessment report on climate tipping points at a regional scale.

Baylor Fox-Kemper (Co-chair, ESMO Core Project) intervened mentioning that the AR6 suggested that global tipping points were less likely to be of concern than local tipping points. He added that local tipping points were discussed extensively in the AR6 Technical Summary as well as in the regional chapters and he mentioned that it is likely that these topics will receive a similar treatment in AR7, updated to include the latest literature, even without a special report. He noted that this will all be decided at the IPCC AR7 Scoping Meeting. Francois responded that regional tipping points did not feature prominently in the IPCC Working Group I report or in many of the Working Group II regional chapters. He said that it remains a major gap, carrying pronounced risks.

Roberto and Gabi agreed that regional tipping points are a crucial topic for IPCC-WCRP collaboration and emphasized the need for a broad definition of tipping points, as the terminology is used to mean different things.

From the IPCC side, Robert, representing IPCC Working Group I, presented a brief update on the AR7 work program, noting that the two methodology reports are

due in 2027 and that there is call underway for AR7 scoping meeting experts for a meeting in December 2024 in Malaysia.

Regarding IPCC expectations on collaborating with WCRP, Robert emphasized the need for regular meetings with the community, to follow up on facilitating work in support of AR7, and the need to widen expert networks when nominating experts to ensure a balanced representation. Some of the challenges identified where WCRP may step in included facilitating work on climate change and cities, tipping points (recent trends and extremes) and scenarios.

Winston Chow (Co-chair, IPCC Working Group II) presented the vision of IPCC Working Group II, noting potential links with WCRP on impacts and risk assessment including crosscutting science activities with vulnerability assessments.

Kate Calvin (Co-chair, IPCC Working Group III) presented on behalf of Working Group III, highlighting the focus, goals and potential links to WCRP. She noted limited direct contact between WCRP and IPCC Working Group III in AR6 and the importance of continuous collaboration on topics of mutual interest such as water, land use/cover, carbon dioxide removal and other topics.

Robert noted the need to have seamless coordination going forward, for instance a list of topics and relevant meetings from June 2024 until the AR7 scoping meeting would be needed. He noted that synthesis papers and other assessment reports would be useful and noted that it would be advantageous to organize expert workshops on relevant AR7 topics such as High Impact Low Likelihood (HILL) events, tipping points, and other topics.

Detlef noted that it is important to have further discussions to refine the expectations which resonate with the WCRP community, since all the above-mentioned topics can facilitate possible collaborations and need some investments in terms of time and support. Pascale pointed out the need to set a date to discuss and refine key topics from both the IPCC and WCRP sides. It was noted that Gerrit Hansen (IPCC Working Group I Technical Support Unit) should be copied in all the communications and discussions on WCRP-IPCC collaborations.

*Action: Arrange a meeting with IPCC Working Group leads, copying in IPCC Working Group I Technical Support Unit, to discuss and refine key topics for collaborations or joint assessments (JSC Chair and Vice-chair; ASAP).*

## **6. Lighthouse Activities**

### **6.1. My Climate Risk (MCR)**

Regina Rodrigues (Co-chair, MCR Lighthouse Activity) presented on behalf of the Lighthouse Activity. She began by reminding participants of the background and goals of My Climate Risk: “to develop and mainstream a bottom-up approach to climate risk starting from decision context and scale” and “to build an ecosystem

of communities of practice, especially in the Global South”. MCR is built around a structure of regional hubs.<sup>3</sup>

Over the last year MCR has focused on the establishment of an ECR Group and on consolidation of its Education Working Group. As well as the activities of the individual regional hubs, including many webinars, it also holds General Assemblies online (the last one held over several days in May 2024) twice a year.

In terms of planned activities, MCR is focusing on (a) developing robust methodologies, including through a special journal issue, influencing pedagogy (through the Education Working Group and links to the Academy), specific training activities, and by exploring collaborations with groups needing such methodologies across multiple sites, e.g., Red Cross/Red Crescent Climate Centre and the BASE initiative; (b) building and nurturing a network of communities of practice, including through in person meetings involving subsets of MCR members, local workshops and training schools, online hub-to-hub collaborations, and various other ways of connecting mycorrhizae. Regina emphasized that one of the limiting factors is that MCR needs more dedicated administration and secretariat support.

Regina highlighted that discussions are currently underway for new hubs, including in Singapore, Central America, Senegal, and Serbia. MCR has many linkages across WCRP, including with CLIVAR, the Academy, EPESC, GEWEX, CORDEX, the Regional Information for Society (RIfS) Core Project and others.

Detlef asked how the “risk” aspect is present in “My Climate Risk”? Regina replied with an example, also noting that the Argentina Hub are discussing what “risk” actually means. She explained that for each hub the problems are different. Ted Shepherd (Co-chair, MCR Lighthouse Activity) added that the hub members are roughly 50% social and 50% physical sciences.

Detlef asked if My Climate Risk could write an overview paper on risk? Ted agreed that this should be done, although it would be the MCR perspective on climate risk, not an overview of climate risk in general.

Roberto added that the scale in vulnerability analysis is critical. What works for the local level does not necessarily work on other scales, but this does not diminish its scientific value. Risk and vulnerability are contextual, and the local level is essential to making a difference on the ground.

## **6.2. The Global Precipitation EXperiment (GPEX)**

Xubin Zeng (Chair, GPEX Lighthouse Activity) explained that GPEX has only recently become a WCRP Lighthouse Activity (launched during the WCRP Open Science

---

<sup>3</sup> <https://www.wcrp-climate.org/mcr-hubs>

Conference in October 2023). The GPEX Science Plan is now available<sup>4</sup> and a Bulletin of the American Meteorological Society (BAMS) article<sup>5</sup> has recently been published (the article showcased the GPEX structure, as depicted in Figure 1).

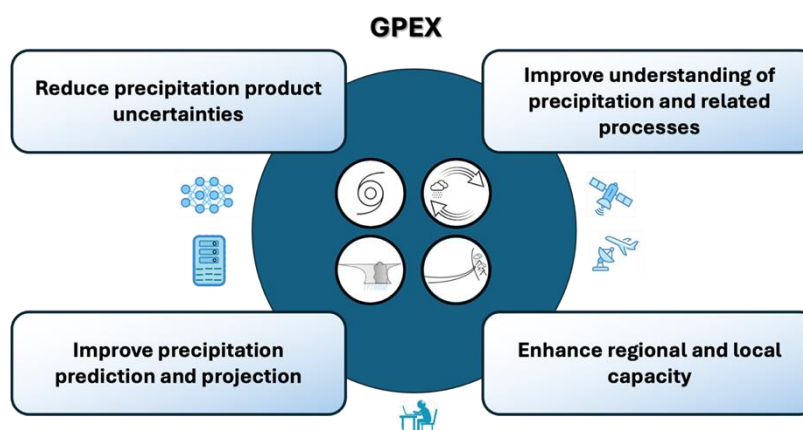


Figure 1: GPEX structure

Xubin highlighted that there have been good interactions with other WCRP activities, mainly due to the broad nature of interim SSG membership. The GPEX SSG has been working on interacting with other key partners, including WMO. Planned activities include a WCRP Years of Precipitation (YoP) campaign that involves: (a) identifying and endorsing 3–4 anchor projects for global coordinated field campaigns on four storm types (atmospheric rivers, mesoscale convective systems, tropical cyclones, and monsoons) in 1–2 years; (b) launching the YoP in 2–3 years; and (c) completing GPEX globally coordinated field campaigns in 4–6 years.

Xubin noted that GPEX will discuss generating analysis/reanalysis, forecasting, and modeling products for the YoP with forecasting and modeling centers in 1–2 years. He explained that GPEX will focus on a few tasks and aim to do them well rather than taking on many tasks.

Cristiana Stan (JSC Member) asked if GPEX has the resources and expertise associated with the generation of reanalysis. Xubin answered that there are many things that need to be done that will not solely be done by GPEX – noting that for this purpose they plan to talk to other groups e.g., the European Centre for Medium-Range Weather Forecasts (ECMWF) and the National Centers for Environmental Prediction (NCEP).

---

<sup>4</sup> <https://www.wcrp-climate.org/gpex-overview>

<sup>5</sup> <https://doi.org/10.1175/BAMS-D-23-0242.1>

Amadou asked about data rescue. Xubin highlighted that they have an activity focused on historical data, however they are not sure how much GPEX will do in relation to data rescue.

Krishnan noted that the IMPO is planning an international monsoons workshop in 2025 with a session on observational campaigns on global monsoons. He said this may fit with the planned YoP. Xubin noted that they have started talking to their Indian colleagues about this.

### 6.3. Explaining and Predicting Earth System Change (EPESC)

Rowan started by reminding participants of the climate anomalies we have seen over the last year. What were the short and long-term causes? Is this a one-two year anomaly or a lasting regime change? What are the immediate and longer-term impacts and implications? Why did we fail to predict it? These are the type of issues that EPESC focuses on.

Rowan reminded meeting attendees of EPESC’s overarching objective, “to design, and take major steps toward delivery of, an integrated capability for quantitative observation, explanation, early warning and prediction of Earth system change on global and regional scales and annual to decadal timescales.”

Rowan went through the different EPESC themes and working groups (see Figure 2), outlining progress in each. EPESC Working Group I, for example, is looking at trends in the Earth’s Energy Imbalance and has submitted a proposal to the International Space Sciences Institute (ISSI) on causes and consequences of the current trend in Earth’s energy imbalance.

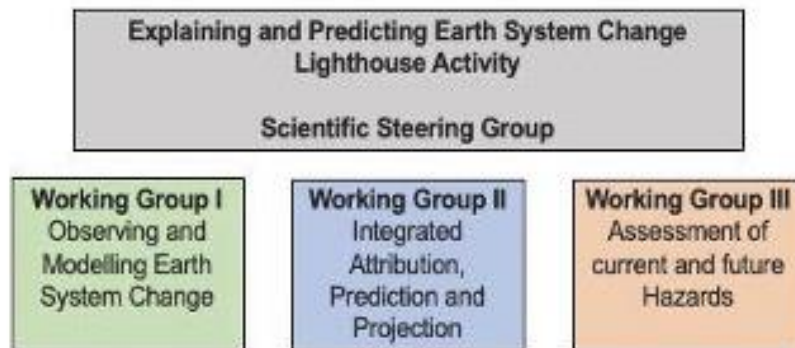


Figure 2: EPESC Structure

EPESC Working Group II provides regular input to the WMO Global Annual to Decadal Climate Update and WMO State of Climate reports, particularly around attribution. All working groups have made substantial progress despite being relatively small. There are also several cross-cutting activities including one looking at trends in summer circulation and heatwaves, a new group looking at explaining and predicting changes in African climate, a webinar series, and a new EPESC-initiated paper on “Global and Regional Drivers for Exceptional Climate

Extremes in 2023–2024: Beyond the New Normal.”<sup>6</sup> Rowan also noted the close links to the new European funded project “EXPECT – Towards an Integrated Capability to Explain and Predict Regional Climate Changes.”

Detlef noted that it was exciting to see the progress this activity has made. He asked about linkages with Digital Earths and with ESMO. Kirsten Findell (Co-chair, EPESC Lighthouse Activity) noted that there have been informal but no official interactions, but that this is being explored. Pascale noted there are also potential interactions with the CLIVAR Dynamics Panel. Pier Luigi (Digital Earths Co-chair) asked about work on attribution and extremes and how this links to world weather attribution work. Rowan answered that EPESC Working Group III is currently working on this as well as other linkages with e.g., the WCRP Global Extremes Platform (GEP). Pierre asked if there was a focus on the carbon cycle. Rowan replied that they cannot do everything but yes there were issues in common and that they needed to think a little more about this.

A general discussion followed during which the need for a collaboration platform for WCRP activities was raised. The platform needs to be usable by people in different countries for sharing and discussing results, work in progress etc. Narelle pointed out that different groups also have different needs, and we also have some restrictions in the Secretariat and IPOs in terms of tools for which we have institutional licenses. It requires an investment.

*Action: JSC to approve a budget to hire a consultant to look into requirements for a WCRP wide collaboration platform, taking into account who would use it and for what, set-up costs, and any ongoing costs (JSC, Narelle van der Wel; ASAP).*

## 6.4. Digital Earths

Andrew Gettelman (Co-chair, Digital Earths) outlined that the aim of the Digital Earths Lighthouse Activity is to support the design and building of integrated interactive digital information systems that provides global and regional information on the past, present, and future of our planet, including both natural and human systems. He noted that they aim to refine the vision statement later this year. He explained that there are three areas of activity: fully coupled kilometer-scale regional climate models, data assimilation for climate, and topics that are beyond the physical Earth system, which include human interactions on and impacts to human systems in Earth system models. They have identified 21 different kilometer-scale modeling efforts, 12 global and 9 regional scale. So far, they have connected with two thirds of these efforts.

---

<sup>6</sup> <https://doi.org/10.21203/rs.3.rs-5454786/v1>

Current activities of Digital Earths include land-atmosphere coupling, convective schemes at kilometer-scale (with GEWEX GASS), a high-resolution processes seminar series, an urban digital twin group, the launch of a kilometer-scale modeling working group (with ESMO's Working Group on Numerical Experimentation (WGNE)), a group for initialization/spin up of kilometer-scale coupled models (with ESMO and the Ocean Model Development Panel (OMDP)) and a joint hackathon to encourage analysis of kilometer-scale models (planned for 2025). Digital Earths highlights include a coordinated WMO Bulletin Special issue on Climate Modelling.

Andrew explained the activities of the Kilometer-scale Working Group, which has the goals to advance kilometer-scale (1-10 kilometer) coupled global and regional Earth system models, to share information on the construction and use of such models, and to identify specific common issues, and ideas for tackling them. The planned outcomes are updates on the most pressing shortcomings, challenges and recommendations for future kilometer-scale model development efforts. There are plans to nurture the development process and teams, and to contribute to several planned conferences and workshops. In addition to the hackathon, the Digital Earths Lighthouse Activity may host a topical meeting in 2025 or 2026.

Andrew showed the linkages with other WCRP activities, especially GEWEX and ESMO. They are building better connections with RfS and, especially, CORDEX. Outside of WCRP, they are collaborating with the Earth Visualization Engines (EVE) project, and global kilometer-scale model comparison and evaluation efforts (e.g., DYAMOND). Andrew highlighted that organizing data assets and assessing how we can use them is important to ensure we are ready for kilometer-scale modeling. There may need to be an infrastructure group working on this. The traditional way of doing things will not work with kilometer-scale modeling.

Andrew noted that the Data Assimilation for Climate Working Group is planning to add a co-chair with expertise in climate and machine learning, as they are seeking to evolve the human systems component of the Digital Earth and revisit efforts on collecting data sets and workflows for kilometer-scale modelling.

Detlef congratulated them on the presentation. He asked whether there is an observation component, as you need observations to run data assimilation. Pier Luigi said that there is a lot of data available now that can be used for data assimilation.

Sonya asked why machine learning was such a small component of the work of Digital Earths. Andrew said that it is just timing. When the Lighthouse Activity started, machine learning was not as important and now we need to add it in, since that is where the community is going. It is necessary to identify the specific gap in that space that Digital Earths can fill.

Ken Takahashi (JSC Member) asked about plans to incorporate human systems. Andrew said that this is a huge topic and needs are diverse – it is hard to understand

how to meet all the needs of all the groups on a global scale. He explained that they are not diving into that yet. Eleanor Blyth (JSC Member) noted that Digital Earths seems very focused on the atmosphere, when it is the land surface that connects to people. She argued that there needs to be not only land-atmosphere coupling, but also the land surface processes. Pier Luigi said that the models that Andrew showed do include the land surface. Detlef said that the finer the resolution, the more you see the gaps.

Cristiana asked if there could be a working group focused on large data sets. Pier Luigi said that he is part of a project to experiment with data compression. The European Destination Earth Project is also looking at these kinds of issues.

## **6.5. Safe Landing Climates (SLC)**

Steven Sherwood (Co-chair, SLC Lighthouse Activity) began by providing an overview of the Lighthouse Activity, which has five themes (and Working Groups) on: Understanding High-Risk Events, Perturbed Carbon Cycle, Water Resources, Sea Level Rise, and Safe Landing Pathways. He outlined that the Lighthouse is currently running two different webinar series, one on Tipping Points (with Future Earth, the Analysis, Integration and Modelling of the Earth System (AIMES) Project, the Earth Commission and partners) and one on other Safe Landing Climate topics. He highlighted a recent paper that was published by the Steering Group, published in *Earth's Future*.<sup>7</sup>

Steve explained that the SLC Lighthouse Activity identified several activities at a meeting that took place in London in 2023. Some of these are developing well, some are still in the talking stage. These activities are: CMIP for climate risks (WhatIfMIP), high-risk cascading shocks, connecting across the IAM-General Circulation Model (GCM) - impact hierarchy (centered on economic risk at the moment), gaming and decision/scenario exploration, an assessment on TCRE and ZEC and one on threshold breaching, irreversibility and tipping points, water variability impacts, and signposts for sea-level rise.

Steve selected some of the more advanced (in terms of progress) activities to highlight. The WhatIfMIP activity aims to identify storylines of extreme outcomes in the future. It will design CMIP7 experiments assuming definitive tipping of a subset of Earth system components, assuming that tipping has happened. The outcomes will be policy relevant for assessing local and regional adaptation and vulnerability and for assessing potential far-field impacts (e.g., the El Niño-Southern Oscillation (ENSO)) and global risks (e.g., carbon cycle, wildfire aerosols). The results should provide information for climate services and all three IPCC working groups.

---

<sup>7</sup> <https://doi.org/10.1029/2023EF004297>



Steve then gave a brief overview of the TCRE and ZEC activity, which aims to produce an assessment paper in time for IPCC AR7 and is modeled on the activity on climate sensitivity that one of the WCRP Grand Challenges undertook in 2020. It was initiated with a workshop in Bristol in January 2024 and expects to progress over 2024 and 2025. He further noted that the activities on cascading shocks and economic risk will run a pair of back-to-back workshops at WMO in Geneva in November 2024.

Lastly, Steve gave an overview of the community assessment on threshold breaching, irreversibility and tipping points. It is evident that tipping points will be important in IPCC AR7. Currently, the research community is split on their importance, and even their definition. Consensus building is needed on terminology, level of scientific understanding, predictability, and how to represent these across working groups. In addition, threshold crossing, irreversibility following severe events and climate surprises also need attention. He noted that WCRP can help by supporting an authoritative review paper that builds consensus and that reaches across the three IPCC working groups, focused on physical climate science capabilities. This effort will start as soon as possible, with assessment submission planned well ahead of the IPCC Working Group I publication deadline, anticipated to be in late 2026. He noted that a small scoping group has been formed and is building an author group.

Detlef congratulated the SLC Chairs on the progress made, noting that there will be a discussion with IPCC during this meeting regarding the assessment paper.

Tim Naish (JSC Member) asked about the signposts for the sea level rise activity. Steve said that this activity is moving slowly. They are quite focused on local impacts and adaptation, so there is a hope that there will be some interaction with MCR over time. Tim asked if the activity is physical process based. Steve said that it is based on physical risks in the sense that physical changes affect adaptation planning.

Detlef asked where sea level will sit in the WCRP structure in the future. Steve said that from the SLC perspective, this is unclear. It seems to be everywhere (CliC, CLIVAR, RfS, SLC, etc.), but it is not anywhere as broad as what is perhaps needed. It probably needs to be better coordinated as there seems to be a gap. Sonya noted that in CLIVAR they look at the ocean component of sea level rise, but the risk connection does not belong in CLIVAR. Tim said that the drivers of sea level rise can be dealt with in CliC, but he highlighted that there is a lot we do not understand regarding sea level rise projections, which was something that the Grand Challenge on Regional Sea-Level Change and Coastal Impacts (sunset in 2023) addressed. Detlef said we must think about whether we address this research area in WCRP. Pascale said that people in WCRP are looking at processes, and we may need to think about how we reconnect all the parts related to sea level rise that are distributed across WCRP. She noted that WCRP needs to take care that we don't

lose some of the pieces of the puzzle. Amanda Maycock (Co-chair, APARC) added that there are also links to sea level rise in Past Global Changes (PAGES).

Naomi Goldenson (Director, RfS IPO) asked about the cascading shock/economic risks workshop. She noted that there may be an overlap with interests that were determined in a recent RfS workshop. Amanda highlighted the Scenarios Forum as another possible link on similar topics.

## **6.6. Research on Climate Intervention**

The report on Research on Climate Intervention was delivered by Nadine. She highlighted that since the launch of the Lighthouse Activity in February 2024, 17 interim SSG members were appointed, and the scope and ambition of the activity were defined. For the remainder of 2024, planned activities include supporting the submission of review papers on identified research gaps and organizing an American Geophysical Union (AGU) town hall to foster discussions of the scope of the Activity. Beyond 2024, the Lighthouse Activity aims to identify and highlight potential and emerging risks, unintended consequences, and co-benefits of climate interventions, as well as policy relevant themes that research would need to address in the next 5-10 years. The Lighthouse Activity aims to develop best practices and standards on climate intervention research.

Nadine noted that there is a weak link to other Lighthouse Activities, but that they are open to discussions and collaborations. The Lighthouse Activity aims to participate in the Seventh Session of the United Nations Environment Assembly in 2025 to gain a better information base on ongoing climate intervention research as well as to identify other European Union Horizon funded projects they could collaborate with.

Detlef asked what support Research on Climate Intervention would require from WCRP, especially on how to deal with the private sector and other requests that are highly political. Nadine noted that WCRP can support the Lighthouse Activity by providing timely advice and guidance to the activity and funds to support the recruitment of a full-time research fellow to work on some of the planned research activities. Detlef emphasized the importance of connecting the Lighthouse Activity with the relevant people from WCRP to facilitate a timely response to requests.

Robert noted that in the AR7 scoping mission there is an item on climate intervention and asked to what extent the Lighthouse Activity would address social science and governance aspects that underpin the physical risks. Nadine noted that climate intervention research topics cover a wide scope but as this is a WCRP activity, the Lighthouse Activity aims to cover mainly the technical part. She noted that it would be great if IPCC would continue addressing the social science aspects.

Daniele pointed out that Research on Climate Intervention will aim to do things in-house, that is, looking at best practices and standards of climate intervention. Scenario development incorporating assessment models will also be explored. Detlef highlighted the importance of contacting organizations such as the United Nations Environment Programme (UNEP) and other groups interested in contributing to a joint statement on climate intervention research standards and best practices.

Pierre asked about the differences between Research on Climate Intervention activities and what is done by the Carbon Dioxide Removal Model Intercomparison Project (CDRMIP) group. In her response Nadine noted that the Geoengineering Model Intercomparison Project (GEOMIP) and CDRMIP would link with the Lighthouse Activity to coordinate and work together. Detlef emphasized that more explicit scenarios might be a joint initiative. This was complimented by Robert, who promised to share the IPCC methodology report on climate intervention and information of the upcoming IPCC meeting in July.

*Action: Research on Climate Intervention Lighthouse Activity co-chairs to approach relevant people in WCRP for informed and timely advice and guidance in relation to the political sensitivity of some of the climate intervention research topics (Research on Climate Intervention co-chairs; ongoing).*

*Action: Research on Climate Intervention Lighthouse Activity co-chairs to reach out to organizations such as UNEP and other groups that would be interested in contributing to a joint statement on climate intervention research, standards, and best practices. (Research on Climate Intervention co-chairs; ASAP).*

## **6.7. General discussion on the Lighthouse Activities**

It was highlighted that there are lots of activities going on in the Lighthouse Activities and lots of connections. There was a discussion on how the interactions should work and what can be done to ensure that we can make connections where it adds value, including the possibility of more regular leadership meetings and liaison roles (perhaps focused on particular needs). At the same time, it was thought to be important to allow steering and working groups time to undertake the creative process of designing research in a committee. It was noted that we should not burden that process too early with the need to interact and connect with many other groups. Detlef noted that the JSC will take the concerns raised on board and discuss possible solutions.

## **7. Core Projects**

### **7.1. Atmospheric Processes and their Role in Climate (APARC)**

Amanda presented APARC's key updates, highlights, plans and challenges. APARC has recently experienced a lot of changes, including rebranding (with a

change of name, new website, and logo), a new IPO (the IPO moved from the Das Deutsche Zentrum für Luft- und Raumfahrt (German Aerospace Center) (DLR), Germany, to Forschungszentrum Jülich, Germany), new IPO staff, and a change of SSG leadership, with Seok-Woo Sori appointed as the new APARC Co-chair.

Amanda noted that there are several ongoing research areas in APARC on different topics around the three APARC themes (Atmospheric Dynamics and Predictability, Chemistry and Climate, and Long-term Records for Climate Understanding). New scientific highlights include work on Hunga Tonga-Hunga Ha'apai (HTHH) stratospheric impacts, Large Ensembles for Attribution of Dynamically-driven ExtRemes (LEADER) (joint with EPESC Working Group II), and the impact of chlorinated Very-Short-Lived Substances (VSLS) on stratospheric ozone. Detlef noted that it would be interesting to explore satellite observations of the Hunga Tonga-Hunga Ha'apai explosion.

Amanda noted that APARC held a successful training school for ECRs in the Global South just before the 2023 WCRP Open Science Conference, among other meetings and key publications. She pointed out that the APARC Strategic Plan 2022-2030 is now in the implementation phase, establishing a new project structure. She noted that APARC will hold a General Assembly in 2026 and that they plan capacity building activities in coordination with the Academy, MCR, SLC, ESMO, CMIP and other interested activities. APARC plans to launch an IPO internship scheme to provide experience in scientific coordination and project management to ECRs. There are several planned high level assessment reports and publications planned, some of which will be produced in collaboration with other WCRP core activities and external groups (e.g., International Global Atmospheric Chemistry (IGAC) Asian Summer Monsoon Chemical & CLimate Impact Project (ACCLIP), and Long-term Ozone Trends and Uncertainties in the Stratosphere (LOTUS)). APARC asked whether WCRP could provide a platform for abstract submission/workshop registration and noting the short deadline for budget requests for 2025, requested that the JSC provide sufficient time for the budget process in subsequent years.

Pascale sought to understand why there was no mention of regional foci or linkages with GEWEX and the Atmospheric Composition and the Asian Monsoon (ACAM) initiative in relation to monsoons research. Amanda noted that APARC is in the process of identifying areas of collaboration with some of the activities working at regional scales, such as CORDEX, rather than duplicating those efforts. She said the joint APARC-CLIVAR panel is the best place to explore these linkages.

Amadou also asked if APARC has plans to investigate pollution in cities, especially in the Global South. Amanda explained that APARC's activities have not moved into that area because this is largely covered by IGAC and the Integrated Land Ecosystem Atmosphere Processes Study (iLEAPS), although there may be some areas of collaboration. In addition, she noted that APARC used to have a strong

connection with WWRP through the Subseasonal to Seasonal (S2S) Prediction Project. Since S2S has now sunset, it raises a concern that this connection is now lost. Langley DeWitt (IGAC) confirmed continued interactions with IGAC and iLEAPS, which has worked well with the Chemistry–Climate Model Initiative (CCMI) and ACAM. Robert noted that this was a very good topic to pursue in relation to the IPCC Cities Report. Iréne Lake (CORDEX IPO Director) pointed out that CORDEX Urban Flagship Pilot Study may also be a good connection.

There was significant support for the proposed APARC IPO internship idea. Langley added that the IGAC ECR Scientific Steering Committee (SSC) is hosting some skills training and asked whether there was potential for collaboration. Eleanor O'Rourke (CMIP IPO Director) added that CMIP IPO would also be interested in collaborating on the IPO internship idea and can offer good experience. Baylor chipped in that ESMO IPO also agrees to this. It was also noted that the WCRP Secretariat has had interns for a number of years and may also be able to provide advice and a framework for good practice.

## 7.2. Climate and Cryosphere (CliC)

Edward Hanna (Co-chair, CliC Core Project) reminded participants of the CliC Mission and Vision:

*Mission: "To advance understanding of climate-driven changes in the frozen parts of our planet and to support efforts to mitigate and adapt to their impacts on ecosystems and human society."*

*Vision: "to have a system understanding of global and regional cryosphere that includes physical climate, ecosystems and inhabitants of cryosphere regions, and cryosphere connections and feedbacks to global climate and society."*

Edward outlined that the CliC Strategic Plan 2022-2031 is being refreshed to emphasize the balance between CliC's science priorities (especially ice, snow and permafrost changes, process understanding and predictability, and their links with climate change), impacts and applications.

CliC helps to support four MIPs (most of which are CMIP6 endorsed) addressing knowledge gaps in ice sheets, sea ice and glaciers. CliC also coordinates 10 research projects/activities, on sea ice processes and biogeochemistry, polar climate linkages, ice-sheet mass balance, permafrost carbon, and polar ocean responses. Many of CliC's activities are undertaken in partnership with cryosphere and polar partners, including CLIVAR, the Scientific Committee on Antarctic Research (SCAR), and the International Arctic Science Committee (IASC).

Edward presented a number of highlights including the establishment of a new IPO at the University of Massachusetts Amherst, a new website, newsletter, and a series of webinars. In the last year CliC has held a number of meetings and

workshops to support its key activities as well as providing grants for ECRs. Several high-level scientific publications from CliC activities were highlighted as well as participation in outreach work such as a mini documentary with the Permafrost Carbon Network.

CliC plans to mark its 30th anniversary with an Open Science Conference in 2026. The Conference will: (i) coordinate with other WCRP activities and some key external partners (e.g., the Association of Polar Early Career Scientists (APECS), IASC, SCAR); (ii) have a lasting legacy and benefit for international research, educational and stakeholder communities with an interest in climate and cryosphere research; (iii) further promote CliC.

CliC is working on a special issue for *Science* focusing on the cryosphere and on an Antarctic Climate Indicators Assessment with SCAR. It has high-level representation on the International Conference on Arctic Research Planning (ICARP) IV and in International Polar Year (IPY) planning activities. CliC is very focused on working closely with partners whilst at the same time recognizing where it has a unique role, i.e., a global focus on cryosphere research.

Tim (JSC liaison to CliC) thanked CliC for an excellent report, noting that CliC is far more active and engaged now after a hiatus during the last few years when CliC did not have a full IPO. There is still work to be done, but he noted that CliC was on the right track.

Amadou asked if CliC has any activities focused on tropical African glaciers. Edward replied that CliC does not have any activities with this focus, but it might be interesting to include in the new mountain activity 'Impacts of Changes in the Mountain Cryosphere (IC-MONTC).' He noted that CliC lacks African representation. Amadou agreed to work with the CliC co-chairs to suggest names from the African region.

*Action: Amadou Gaye to discuss with CliC leadership about possible African representatives for CliC activities (Amadou, CliC leadership; ongoing).*

Detlef asked about CliC's involvement with the Ice Sheet Model Intercomparison Project (ISMIP). Mike S. mentioned Antarctic 2300 (CliC helped draft a paper on this to an Antarctic Treaty Meeting). Tim highlighted that CliC supports the MIPs and one of the key points of working with SCAR INSTANT was to better understand certain processes that would help improve the cryosphere MIPs.

Detlef asked about how CliC deals with high-mountain observations. Edward replied that this area of interest is mainly dealt with via WMO's Global Cryosphere Watch (GCW), where Keith Alverson, the CliC IPO Director, has active engagement.

Krishnan (JSC liaison to CliC) asked about whether glacial lake outbursts are a topic of interest for CliC. Edward answered that GlacierMIP focuses on models, but

needs observations, both *in situ* and satellite. Krishnan and Edward agreed to discuss this further.

### **7.3. Climate and Ocean Variability, Predictability and Change (CLIVAR)**

Sonya and Francois presented updates on the CLIVAR Core Project. They noted that the CLIVAR Research Focus on tropical basin interactions has been extended until the end of 2025 and four new activities have started:

- CLIVAR Research Focus on Marine Heatwaves in the Global Ocean
- “TROPICS” Working Group
- RAMA Task Team
- Pacific Atmospheric Teleconnections in a wArming Climate (PATAC)

Other highlights included that the CLIVAR Indian Ocean Region Panel led an article in BAMS documenting the challenges in sustaining the Indian Ocean Observing System (IndOOS) in the face of the COVID pandemic and provided insights on the way forward.<sup>8</sup> The Southern Ocean Freshwater release model experiments Initiative (SOFIA) was registered as a Community MIP under CMIP (“SOFIAMIP”) in November 2023. A number of training and summer schools were held over the last year on marine heatwaves, climate dynamics, biogeochemical processes, and polar climates. Many workshops and webinars were also held.

CLIVAR has been involved in several Ocean Decade conference activities, including on co-designing the ocean observing system for better societal services and ocean-based solutions to mitigate climate change impacts, with Africa used as a demonstration case.

It was noted that a pan-CLIVAR meeting is planned for 2025, to be hosted somewhere in Global South. In addition, CLIVAR is planning several review papers and synthesis articles as well as other products such as an ENSO metrics software package. CLIVAR has joint activities with several other Core Projects, such as the Monsoons Panel with GEWEX and the Southern and Northern Ocean Panels with CliC and plans further interactions with WCRP core activities in the future. External to WCRP, CLIVAR has well-established links with the Ocean Observations Panel for Climate (OOPC), the Global Ocean Observing System (GOOS), the Surface Ocean-Lower Atmosphere Study (SOLAS), the Scientific Committee on Oceanic Research (SCOR), the North Pacific Marine Science Organization (PICES) and others.

---

<sup>8</sup> <https://doi.org/10.1175/BAMS-D-22-0270.1>

Detlef noted that CLIVAR has been very active and asked about interactions with OOPC and GCOS. Sonya replied that there are several examples of such interactions, such as the review of the observing system in the Indian Ocean. Hindumathi Palanisamy (WCRP Secretariat) added that there has also been collaboration through Ocean Decade events. A discussion followed on links between CLIVAR's modeling activities e.g., the Global Synthesis and Observations Panel (GSOP) and ESMO, CORDEX, and Digital Earths. These links exist but could be enhanced to look at new topics, such as sub-mesoscale eddies. Rowan added that coupled ocean atmosphere circulation changes were another topic that perhaps needs more of a systematic focus e.g., Atlantic Meridional Overturning Circulation (AMOC) changes. Sonya agreed and suggested CLIVAR, ESMO and EPESC should consider a joint workshop to look at this.

*Action: CLIVAR, ESMO and EPESC to discuss a possible joint workshop to look at coupled ocean-atmospheric circulation changes (CLIVAR, ESMO, EPESC and other relevant activities; before end of 2024).*

Amadou asked if CLIVAR were aware of CLIVAR-relevant initiatives in West Africa? Sonya answered that they have been working hard to increase African representation and would welcome a discussion with Amadou about any activities they should be aware of.

*Action: Amadou Gaye to email Sonya Legg (CLIVAR co-chair) about relevant West African ocean-related activities (Amadou Gaye; ASAP).*

Ken asked about model scales. Do we need to go down to 1 kilometer scale? Sonya answered that CLIVAR focuses on modeling at different scales, so it depends on the question. Baylor added that kilometer-scale modeling is interesting for many regions, in terms of science but also in terms of computer technology, sharing data, and making them accessible outside of traditional data sources.

#### **7.4. Global Energy and Water Exchanges (GEWEX)**

Jan gave an overview of GEWEX and its four panels. Several key activities of the panels were highlighted, including assessments, new products, modeling and observational campaigns. Six Regional Hydroclimate Projects (RHPs) are currently active, with others in preparation, and a key focus on mountain regions is emerging.

Jan stated that GEWEX's strategic plan calls for higher resolution models for process understanding and projections. This needs to be supported by commensurate observation-based data sets and requires a rethink of some of the modeling approaches and their validation.

Jan highlighted that at the kilometer-scale, surface heterogeneities are the result of interactions between hydrology, vegetation and human activities. He noted that high resolution models will need to predict these interactions to generate the



observed heterogeneities and boundary layer circulations. GLASS will encourage the land surface modeling community to integrate these processes into their models. The impact of these heterogeneities on the atmosphere will be done jointly with GASS. This effort will be in collaboration with Digital Earths to ensure integration into kilometer-scale Earth system models (regional and global).

The upcoming GEWEX Open Science Conference in Sapporo, Japan (7-12 July 2024) has almost 800 paid registrations already and will include stakeholder engagement and ECR workshops. GEWEX is also planning several assessments, including a comprehensive assessment of satellite-based water vapor products, a third assessment of precipitation products, and an Earth energy imbalance assessment.

A number of ongoing and potential links with other WCRP activities were highlighted, including on coastal regions with CLIVAR, and on mountain regions with CliC. Outside of WCRP, there are strong links with some WWRP activities and with WMO Hydrology, where GEWEX sees potential to help National Meteorological and Hydrometeorological Services to adapt their water resource management to climate change, to collaborate on the annual State of Global Water Resources report and where there may be a common interest in evaporation.

Lisa Alexander (JSC Member) asked about the links between the My Climate Risk Hubs and the RHPs. Jan commented that the RHPs are top down and the MCR Hubs are bottom up so this might not always work, but there is, for example, a link between the hub in Argentina and ANDEX.

Eleanor B. asked about how GEWEX plans to evolve in the future. Jan answered that GLASS is around 25 years old – they are currently interviewing people involved to try to assess what is next. Xubin added that GEWEX made the decision to maintain its current structure, though under this, things may of course change.

Detlef asked if there was collaboration with CLIVAR on surface fluxes. Jan answered that there was no link at the moment but agreed that it could be a topic to explore with CLIVAR.

## **7.5. Regional Information for Society (RIfS)**

Bruce Hewitson (Co-chair, RIfS) presented updates from the RIfS Core Project. RIfS has been fully functional for around a year and has made excellent progress. The IPO, which was established in the later part of 2023, has been providing great support with the first SSG meeting held in October 2023. RIfS' focus in the last year has been on how to prioritize elements of its science plan.

Bruce then provided some highlights from the last year. An expert meeting on the 'Robustness of Climate Change Information for Decisions' took place in April 2024, aimed at addressing how the non-congruence of climate information

sources undermines decision making. This was a very successful meeting and resulted in the establishment of an interim Working Group on Robust Information.

RIfS works closely with CORDEX, GEP and the Working Group on Robust Information. The Core Project plans several major science initiatives and events for 2024 and 2025 and is working on various journal and white papers on, for example:

- A general introduction to RIfS, the science foci, and research imperatives.
- The “ethical-epistemic elephant” of regional climate information.
- An update on a WMO Bulletin paper on ethics and values in climate services.
- A report from the expert meeting on Robustness of Climate Change Information for Decisions in Eos (news magazine of AGU).

RIfS is also exploring opportunities for an article to highlight the need for more research on RIfS-relevant themes. In addition, a “mapping barriers and challenges” group in RIfS intends to produce a report to inform conversations within WCRP about new initiatives.

Bruce then outlined links between RIfS and other WCRP activities, noting that RIfS invited each Core Project and Lighthouse Activity to send a representative for the expert meeting on Robustness of Climate Change Information for Decisions. RIfS is co-developing a collaboration with the GEWEX RHP: ANDEX as a pilot for exemplar studies working with existing regional projects and is exploring other collaborations with GEWEX. RIfS collaborated with CORDEX and CMIP on a town hall and splinter meeting at the European Geosciences Union (EGU) General Assembly in April 2024. The Core Project is also either actively collaborating or exploring connections with the Academy and the Lighthouse Activities, especially in relation to the Academy’s planned mentorship activity, and event attribution and regional climate information themes.

RIfS is currently building connections with external entities such as the Green Climate Fund (GCF), and the European Union (both co-sponsored the “Robustness of Climate Change Information for Decisions” expert meeting). Conversations are being held with other organizations and programmes, including WWRP.

### **7.5.1. Global Extremes Platform (GEP)**

GEP is a key activity of RIfS that works on building upon and integrating activities on weather and climate extremes across WCRP. GEP has two working groups, one on attribution of extreme events and one on assessment of extreme events. Xuebin Zhang (GEP Co-chair) explained that GEP now has a Support Unit in Nanjing, China. He noted that discussions on developing a data portal (different from a data website) are ongoing. The idea of a Working Group on Event Attribution originated at the International ad hoc Detection and Attribution Group (IDAG) meeting in 2023, following which a concept paper was drafted, a Tiger Team

worked on the Terms of Reference and an open call for SSG membership took place. The Working Group on Assessments of Extreme Events is planning an in-person Workshop on annual WCRP Extremes Updates, entitled “Annual Update on Regional Extremes for Society” that will gather international experts from WCRP/IPCC/WMO in early 2025 to contribute to an assessment on attributable extreme events. GEP will focus on developing the extremes data portal, and on writing review papers and guidance documents on extreme event attribution, and on an annual update and assessments of weather and climate extremes.

### **7.5.2. Coordinated Regional Climate Downscaling Experiment (CORDEX)**

CORDEX is a key activity of RfS. Silvina Solman (Co-chair, CORDEX) highlighted a few major CORDEX events in 2023. A hybrid International Conference on Regional Climate-CORDEX 2023 was held in September 2023 in Trieste, Italy, and with a hub in Pune, India. The report of the conference is being finalized. In October 2023, two side events were held at the WCRP Open Science Conference. In addition, six large capacity building activities and planning meetings were held.

CORDEX has been actively producing high level assessment and science papers, on several topics including on the CORDEX-CMIP archiving specification for dynamic downscaling, a white paper on CMIP and the general circulation model selection and matrix design for the EURO CORDEX community and new publications on CORDEX simulations; and a white paper on bridging climate science with society.

Many science initiatives and major events are being planned, including the establishment of task forces on:

- CORDEX CORE simulations
- Downscaling methods/machine learning
- Regional ocean modelling and climate projections
- Convection permitting modelling
- Preparations for CORDEX- CMIP7

It was noted that the task force on oceans could be a joint interaction with CLIVAR. Sonya agreed that if the CORDEX task force is focused on the ocean, it would be beneficial to connect with CLIVAR's Ocean Model Development Panel, which is extending its focus into regional scale modeling (beyond its historical focus on global modeling).

It was noted that in terms of convection permitting models, that CORDEX is not yet able to do this even though regional climate modeling is already capable. Silvina explained that CORDEX must rethink how to coordinate these activities to respond to societal issues at a very local scale. She noted that several capacity building training courses and workshops are being planned in Asia, Africa and

Central-South America and further development of the Flagship Pilot Study initiative is being discussed.

Silvina highlighted that CORDEX has been actively involved with various WCRP initiatives and has jointly organized sessions, townhalls and side events, for example, at the WCRP Open Science Conference (with CMIP), EGU (RfS and CMIP), and at a MCR side event during the CORDEX conference in Pune in 2023. The new CORDEX task forces will also look for collaborations with other WCRP core activities where it adds value. CORDEX have also reinitiated collaborations with relevant Future Earth activities, the European Space Agency (ESA), the European Union and other relevant organizations and projects.

Silvina suggested that WCRP would benefit from a platform or forum for WCRP initiatives to interact and discuss collaborations and joint efforts. In addition, Silvina noted that CORDEX would like more direct contact with the JSC (that is, not only through RfS), noting that transparency within WCRP and bottom-up governance is what will ensure future engagement from the research communities.

### **General discussion**

Lisa commended RfS for the hard work done within the last year. The expert meeting received a lot of positive feedback and the RfS SSG and the IPO were encouraged to continue the momentum. The JSC agreed that Lisa will act as a liaison to CORDEX to ensure a better JSC connection.

There was a discussion on why the Working Group on Event Attribution does not sit under IDAG. Bruce responded that the difference between the proposed Working Group and IDAG is in terms of strategic discussion and coordination, noting that RfS' links with IDAG would continue and are complementary. WMO's interest in event attribution was also mentioned and it was noted that WMO should be regularly informed of this Working Group's activity. Detlef applauded the progress of RfS, CORDEX and the GEP.

*Decision: JSC Member Lisa Alexander will act as a liaison to CORDEX.*

*Action: WCRP Secretariat to link relevant colleagues in WMO Services Department with WCRP's event attribution work (WCRP Secretariat; ongoing).*

## **7.6. Earth System Modelling and Observations (ESMO)**

Baylor presented the updates for ESMO, noting that the major focus of the Core Project so far has been on brainstorming on the focus and on how to coordinate the various working groups and panels of ESMO to ensure that it doesn't work in a silo or duplicate the work of other WCRP activities. The ESMO SSG was established in June 2023 and the IPO at the Deutsche Klimarechenzentrum (German Climate Computing Centre) (DKRZ) in Germany in November 2023, while the ESMO website and logo are both being finalized. Work on the Terms of

Reference for ESMO and its working groups is ongoing to ensure consistency, transparency, and equity.

Baylor highlighted several key meetings that ESMO held in 2023 and 2024. The Working Group on Subseasonal to Interdecadal Prediction (WGSIP) organized a “WCRP hybrid symposium on Frontiers in Subseasonal to Decadal Prediction” at ECMWF, United Kingdom, in March 2023. Also in March 2023, the Decadal Climate Projection Project (DCPP) and EPESC held a workshop on “integrated attribution and prediction” at the MetOffice, United Kingdom. Importantly, ESMO held its first SSG meeting at DKRZ in March 2024.

Baylor discussed several other activities:

- WGNE has a new pilot project called the ‘South American Regional Model Verification Pilot project: Enhancing the assessment of regional forecasts to contribute to the WMO Early Warnings for All (EW4All) initiative’, together with the WWRP/WGNE Joint Working Group on Forecast Verification Research.
- WGSIP, DCPP and APARC have an activity on Volcanic Response Readiness Exercise (VolRes-RE) to provide rapid forecast revisions incorporating volcanic stratospheric aerosol forcing after an eruption to the WMO Lead Centre for Annual to Decadal Prediction (a paper has been submitted to BAMS<sup>9</sup>).
- A Working Group on Observations for Researching Climate (WGORC) will be established to coordinate observational needs across WCRP. This will include Obs4MIPs, Obs4RIP, and Obs4ET. Planning will commence in early 2025.
- A new WGSIP S2S Panel will be established to enhance subseasonal activities in ESMO.

Baylor also showed that the various working groups of ESMO have published or submitted academic papers on topics such as developments in climate modeling, kilometer-scale modeling, climate projections, systematic errors in weather and climate models, effects of including volcanic aerosol forcing in decadal hindcasts, and more.

A number of meetings are being planned in the next year. ESMO will hold a joint WGNE/WGSIP annual meeting in the later part of 2024. The 6th International Reanalysis Conference will take place in October 2024 in Tokyo. ESMO is also currently discussing a cross-cutting activity on the carbon cycle and will engage with SLC Lighthouse Activity on this. The various working groups of ESMO have several scientific initiatives and activities planned for 2024 and 2025 (as listed in the ESMO report).

---

<sup>9</sup> <https://doi.org/10.1175/BAMS-D-23-0111.1>

Baylor highlighted that there are also a lot of cross-collaborations between ESMO and other core activities of WCRP. For example, WGNE and Digital Earths Lighthouse Activity are working together on an assessment of extreme event global and regional forecasts in South America and the Model Uncertainty MIP (MU-MIP). The new WGORC will target links with APARC (S-RIP, TUNER, SNAP), GEWEX (GEWEX Data and Analysis Panel (GDAP), GHP, GLASS, GASS), CLIVAR (OMDP, GSOP), EPESC and Digital Earths. ESMO also has links with IPCC, the Integrated Assessment Modelling Consortium, WWRP, Global Atmosphere Watch (GAW), and WMO. Baylor mentioned that once ready, the WGCM and CMIP Panels would present the CMIP7 proposed socioeconomic scenarios to the JSC for endorsement.

ESMO also intends to promote career development of early and mid-career scientists and provide opportunities to improve scientific and technical skills in high-resolution model development focusing on developing and under-developed countries. As part of this, it will also reestablish a previously held series of WCRP Summer Schools on Climate Model Development. ESMO will work towards facilitating science initiatives to integrate emerging methods with existing streams of research and development. For example, topics such as Earth system reanalysis, and the potentially leveraging machine learning, should be embraced by ESMO.

Baylor noted that presently there is some overlap between the remit of DCP, the EPESC Lighthouse Activity, and the WMO Lead Centre for Annual-to-Decadal Climate Prediction. He explained that DCP will take a coordinating and strategic role supporting the activities of the WMO Lead Centre and EPESC. The current priority is the development and completion of the CMIP7 protocol, but ESMO will work towards enhancing the link between DCP and the WMO Lead Centre during DCP CMIP7 protocol development so that it continues to form the basis of future operational activities. He further noted that it would be advantageous to reactivate links between DCP and CLIVAR (on Atlantic multidecadal variability pacemaker studies).

Francois Engelbrecht highlighted that attribution is very much a part of climate modeling and that ESMO could be a place where aspects of modeling could be further developed. He emphasized that in WCRP, the underlying model technologies for attribution are already being pursued and these must sit under ESMO.

Detlef asked where model improvements, in terms of parametrization and other processes, should sit in WCRP. Baylor responded that ESMO would play the role of facilitator and coordinator instead of claiming and owning all efforts. For instance, OMDP (CLIVAR) is a very successful activity and ESMO would not suggest moving this into ESMO.

Detlef asked if the research on process understanding needed to improve coupled climate models would take place within ESMO. Helene highlighted that CliC, CMIP and ESMO working together on process understanding could be considered a perfect example. Cristiana noted that the S2S panel that WGSIP is developing also has expertise for looking into model issues. Susanna Corti (JSC Member) mentioned the ocean model spin up experiment of the Ocean Model Intercomparison Project (OMIP) and the Sea-Ice Model Intercomparison Project (SIMIP) have experts from both CLIVAR and ESMO communities. Silvina confirmed that CORDEX works closely with ESMO.

### **7.6.1. Coupled Model Intercomparison Project (CMIP)**

Helene presented the updates from CMIP, noting that a lot of points were already presented and discussed at the dedicated CMIP7 and scenarios session (Section 5.1). Helene briefed the audience on the establishment of Fresh Eyes on CMIP ECR activity, which was set up in 2023 to integrate the voices of early career researchers, scientists and practitioners (150 members so far) in CMIP. The initiative is developing a number of activities in addition to working in collaboration with CMIP task teams to offer the opportunity of mentoring from more senior members of the CMIP community.

Helene noted that there will be a CMIP reanalysis workshop in early 2026, together with an early and mid-career hackathon and user engagement event. A scoping report on viability and mechanisms for a CMIP sustained mode is also planned. A number of high-level assessment reports and peer reviewed articles are in preparation, including the publication of the CMIP7 experimental design (and associated papers) and the AR7 Fast Track guidance. There are GMD special issues planned for CMIP7 and CMIP7 Forcings and a group has been established to scope the definition of “operationalization” and a viability analysis of potential mechanisms with an initial focus on CMIP.

Helene noted that CMIP is very active with other WCRP core activities and that more engagement is welcome in contributing to CMIP development. She highlighted that collaborations could be strengthened with the Digital Earths Lighthouse Activity. Outside of WCRP, CMIP has links with ESGF, which is vital to the delivery of open and accessible CMIP output, IPCC AR7 Working Group Chairs and the Climate Match Academy.

Helene highlighted a couple of challenges. The first is the lack of a structural agreement with ESGF. She explained that given the tight timeline of the AR7 Fast Track, the growing demand for CMIP output, and the rapid evolution of data technologies and user expectations, the CMIP/WIP Panels have concerns regarding the lack of clarity in responsibilities/governance across the WIP and ESGF Executive and Steering Committees. She noted that funding uncertainty makes navigating this terrain complex. Secondly, she noted that there is a need for a dedicated scenarios activity within WCRP. Given the increased profile and

importance of scenario development to climate policy assessments, greater visibility within WCRP may be beneficial to ensure timely delivery, adequate structural support, and to establish a closer connection with the Integrated Assessment Modelling community.

Detlef congratulated CMIP for their excellent ongoing work.

## **7.7. The WCRP Academy**

The WCRP Academy was presented by Melissa Hart and Chris Lennard (Academy Co-chairs). Melissa presented highlights from the last year, including the renewed SSG and the launch of the Academy website. The website features an online catalogue of climate science training. She demonstrated to participants how to access and navigate the catalogue. She presented some of the findings of the Academy's global stocktake, which will be published in early 2025. She noted that the Academy has presented their work in several events including EGU, the ANDEX Meeting, and the WCRP Open Science Conference and are looking forward to events later in 2024 such as AGU, the SCAR Open Science Conference and others. She mentioned that the WCRP Academy Support Unit is hosted by the Manila Observatory, managed by Ma. Laurice Jamero, with the rest of the team currently under recruitment.

Melissa outlined that the Academy is organizing a workshop on WCRP Approaches to Mentoring and Leadership Development, aimed at fostering capacity exchange. In addition, the Support Unit are developing social media campaigns and an Academy newsletter to raise visibility of training activities in WCRP. She encouraged all WCRP Core Projects and Lighthouse Activities to use the Academy to help publicize their training events via the online catalog. Outside WCRP, the Academy is working on building partnerships with early career researcher networks around the globe.

Melissa noted that one of the key challenges for the Academy is short-term funding, which makes it hard to have a long planning horizon. Additional funds are also needed to grow the Academy's mandate. In addition, manual screening of new trainings added to the catalogue is unsustainable in the long term. Melissa sought advice on the best way the Academy can interact with other institutions who also work in this space like the WMO Education and Training Programme. Mike S. noted that there are plans to merge the WMO Science and Innovation and Education and Training Departments for seamless research and education operations. Detlef added that most partners are interested in training and capacity building, and it would be useful to engage other organizations outside WCRP such as the ISC and the International Universities Climate Alliance (IUCA). Melissa noted that there is an existing link to IUCA. Detlef confirmed the need to explore avenues to seek additional funding for the Academy.



Irène mentioned that it has been a challenge for CORDEX to include indigenous knowledge in their work, as it is not so straightforward to find entry points even if we have local contacts/partners. She asked if this was something the Academy was considering. There was a discussion on this, with Roberto suggesting that the global indigenous organizations that attend the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP) meetings could be a good entry point. He added that the Inter-American Institute for Global Change Research (IAI) would also be a good contact for the Academy.

Roberto suggested it would be nice to conduct a short survey to gather feedback from training participants. He said that a follow-up survey could be sent to the same participant after two years asking them about the impact of the Academy on their academic and career development. Narelle replied that this can be done within WCRP, but it would be quite hard to do this for external trainings where we don't have access to training data. She added that this could be part of the stocktake survey the Academy does every year or two. Mohamadou Diallo (APARC IPO) said that the APARC outreach panel is planning a similar survey for the Global South, and it would be good to coordinate with the Academy on it. He added that it would be nice to have an APARC liaison in the Academy.

## **8. Improving connections between WCRP core activities**

This session was held to discuss whether the WCRP core activities need additional support to connect outside of the annual JSC Session. Detlef asked whether a mechanism or tool is needed to help remove silos and to increase connectivity across the Programme.

Sonya said that it would be useful to know what other activities are doing throughout the year. Pascale noted that there is a lot of information on websites so any tool would need to be more targeted and that we need to ensure that people are not swamped by too much information. Sonya said that something like Slack with two-way communication might work. Detlef said that with any platform, you need to put life into it. Jan noted that GEWEX have found it useful to invite all the other WCRP core activities to their annual SSG meeting. He said that he learned a lot from attending the recent ESMO SSG meeting that he could not get from a Slack channel. He continued that the question for him is how to add the extra layer of Lighthouse Activities and ensure that there is good communication with them. He said that we need to travel to the meetings, using people in the Core Projects who are closest to the meeting location.

Roberto said that there are multiple levels of interactions. Core Projects and Lighthouse Activities can identify where they have common interests. A second level of interaction is where there are specific topics for interaction that are newly identified. Not every activity can participate in every topic. Topics like tipping points cut across WCRP and reach out to society. There is a great opportunity to

build on the IPCC discussion that was part of this session, to bring the community together around key issues leading up to AR7. Detlef said that this 'bringing together' could be virtual or in person and could be part of the annual JSC meeting. Roberto said that a lot of work can be done online, before groups come together.

Sonya noted that while we still need in-person meetings, people can also get engaged via virtual meetings. In-person meetings are generally only for a few days. She noted that we need to keep in touch between meetings and relying on emails can be difficult. There are tools that can enable us to share documents, images etc. using a two-way mode of communication. Narelle agreed and noted that this takes investment, both to find the best solution and to maintain it.

Baylor said that ESMO is contemplating asking SSG members to join other core activity meetings to spread out the burden. He agreed that something like Slack could be useful. He reflected that meetings like this where we summarize the annual report are not useful. We should be answering questions and strategizing rather than reporting. We only see an overview of the science. Perhaps the pre-meeting requests to the core activities for the JSC meeting could be prepared slightly differently.

Pascale asked whether a JSC meeting should include a small workshop on key topics every two years. Narelle noted that it is possible to do the reporting part of the Session ahead of time and use the JSC meeting itself to strategize and address key questions. Susann Tegtmeier (Co-chair, ESMO) said that it is hard for core activity co-chairs to attend all the other core activity meetings. Baylor said that other members of the SSG can represent the core activities. Detlef agreed but then it is important that the people who attend report back in a useful way.

Tim was unsure about whether it is a JSC role to try and ensure community interactions. He asked whether the JSC should be doing a top-down request for things like tipping points. It was agreed that these requests should come from the community and that there are a lot of great interactions between core activities. Tim questioned whether the JSC should be pushing for enhanced interactions when there is only limited time. Detlef said that the question came up as to whether there is a need for more interaction. If the core activities conclude that there is no additional need, then we do not need to do more.

Peter said that he likes Slack, but that it did not work in GEWEX. Good interactions cannot rely on a tool alone. We cannot do everything and there needs to be sufficient resources and interest to fuel interactions. He said that the Lighthouse Activities should look to the Core Projects when they need to, and the Core Projects should look at how they interact with each other. Detlef said that the Core Projects and Lighthouse Activities need to come to each other and have bilateral interactions, but he agreed that the activities should come together based on need. He noted that they can then use whatever platform they want to interact. He asked whether the JSC should let it grow and simmer by itself or stimulate it. Peter

said the Lighthouse Activities were created to make connections between communities and so they should do that. Tim said that we have a communication challenge with the complexity and breadth of the Programme.

Baylor noted that there is also a communication problem between the JSC and the Core Projects. Any proposed solution should consider this as well. Detlef noted that we used to have leadership meetings, which were successful when we had a clear topic to discuss. It stopped when we had the Kigali Open Science Conference. He asked if we should start it again, perhaps once every quarter. It was generally agreed that this would be a good idea.

Pascale asked about how the Programme should deal with common and overlapping topics, to avoid duplication. Tim said the IPCC topics are important and that should be the driver. Amadou said that the WCRP Open Science Conference concept papers were very good and asked if this kind of effort could be done regularly. Detlef asked if there is a need to better highlight results and outcomes in brochures. At the end of the discussion Detlef concluded that it seemed best not to over-organize things in a top-down manner. It would, however, be useful to have a tool to help communication. Pascale said that the JSC can look at the activity reports for topics that may need community-wide interactions and discussions.

*Action: JSC to look at core activity reports to identify key overarching topics that may need community-wide discussion and identify if, when, how, and by who such discussions should be facilitated. (JSC; JSC45b).*

## **9. Early and Mid-Career Researcher (EMCR) Tiger Team**

Pascale gave a brief background on the work done with by the EMCR Tiger Team. She noted that the 2023 Open Science Conference EMCR Symposium was an enormous success and a concept paper addressing some of the key topics raised by EMCRs in the Global South is being finalized. The Tiger Team aims to produce a short document providing WCRP with recommendations on how to better engage EMCRs in the Programme.

As a first step, a number of pages on EMCR engagement are planned for the WCRP website, to highlight links to existing EMCR networks and to provide EMCR news, highlights and opportunities specific to WCRP. Rather than duplicate the excellent work done by existing EMCR networks, the pages will spotlight stories that are specific to WCRP (such as about a specific person or event). Narelle suggested that these stories could be added to the WCRP newsletter. Roberto pointed out that many of the challenges identified for mid-career researchers are challenges for everybody and networking and capacity building can partly solve the problems, especially for researchers in the Global South. Detlef said we should think about what WCRP can do to help with networking and the dissemination of

information, working with existing early career networks. Amanda pointed out that APARC has an ECR corner on their website and would be great to coordinate with the WCRP EMCR Task Team to avoid duplication. It was noted that this kind of interaction would be useful for all activities with independent websites.

## **9.1. Young Earth System Scientists (YESS)**

Valentina Rabanal (Young Earth System Scientists (YESS) Executive Officer) presented the background, key highlights, and challenges identified by the YESS community. She noted that YESS now has over 2500 members from over 120 countries. She highlighted that YESS continues to participate in many international events, including the WCRP Open Science Conference and the CORDEX Conference, and members are actively participating in a number of initiatives. YESS is working on a second EMCR perspective paper on growing data-intensive activities in climate research and a manuscript on the EMCR involvement in IPCC assessment reports. A comment for Nature on WCRP Open Science Conference outcomes will be submitted in June 2024.

Valentina noted that the current hosting institution, the Servicio Meteorológico Nacional (Argentinian National Meteorological Service) (SMN), is currently going through budget cuts posing a major challenge to the continuity of the YESS office. It is proposed to shift the office to another location and letters requesting support have been sent to WCRP, WMO and other potential hosting organizations.

Chris L. asked if we could think about developing a “YESS/EMCR for WCRP” type of document that shows why it is beneficial for a young scientist to become involved in WCRP. Hindumathi replied that the Tiger Team is working on this kind of recommendation.

## **10. WCRP Global Fellowships**

Pascale gave an update on the new WCRP Global Fellowships, the first of which was launched (i.e. the call was opened) at the WCRP Open Science Conference in October 2023 with a focus on Africa. Detlef noted that the fellowship call is being co-designed with the African research community and will solicit research proposals from early and mid-career researchers. Fellowship proposals should address key research gaps, and the candidate must be hosted at an African institution.

It is planned that the WCRP Global Fellowship will continue in future years, but it is still under discussion how these will be designed. Pascale suggested that a set of principles for future fellowship calls are needed, which should include how to support the target audience and how to facilitate future WCRP leadership in the regions where the fellowships are hosted. She noted that processes need to be put in place to identify research topics, launch the call, and convene the fellowship committee and evaluation panel. Detlef said that it is important that the fellowship

calls are co-designed with the regions in which they will be hosted in an inclusive way. Jan highlighted the need for WCRP to provide a concrete funding structure that is sustainable, as one fellowship each year may not be a viable solution to the needs in the Global South. Detlef pointed out that this initiative should be seen as a starting point. WCRP should partner with other organizations to build better financial structures in the longer term.

Amanda questioned if there is a reason to stipulate research topics in the fellowship call as that may make it less likely that the topics will matter to the scientists we want to support. She asked if we could keep the topics broad to encourage applications and then match people with hosts during the selection stage. She observed that WCRP is big and broad, so it is likely hosts could be found for most topics, especially if funding is provided. She also expressed that one year is not long for a fellowship and asked if the financial support includes relocation costs. Detlef responded that the fellowship is designed so the researchers remain in their own country.

## **11. Partner interactions**

### **11.1. United States Global Change Research Program (USGCRP)**

Mike Kuperberg gave an overview of USGCRP, which was created in 1990 and aims to understand, assess, predict and respond to human-induced and natural processes of global change. He noted that USGCRP has a new strategic plan for 2022-2031, which has four pillars: advancing science, engaging the nation, informing decisions, and collaborating internationally. The Program has recently expanded to include a subcommittee on climate services, which will form a fifth pillar. USGCRP includes a number of US member agencies and engages with all federal agencies. He discussed the international context of the Global Change Research Act, which includes an aim to promote international cooperation on global change research, which includes interactions with WCRP. USGCRP also supports the travel of United States scientists to meetings for assessments, such as for the IPCC assessments.

Mike K. outlined the work of the Latin American and Caribbean Initiative (LACI), which is active in El Salvador, La Plata, Amazonia and Jamaica. He mentioned GPEX and highlighted the important interactions it has with federal agencies. Recent priorities of interest include the expanded scope of the program, as climate change is not the only aspect of global change that needs attention. This also includes a new emphasis on climate information and services, including how information is used, and greenhouse gas monitoring. Lastly, they have an interest in climate security, collaborating with intelligence and national security communities.

Detlef highlighted the good relations between WCRP and USGCRP. He asked Mike K. for suggestions for things that WCRP could do that would be helpful for USGCRP. Mike K. said that improving the translation of knowledge into information that people can use is critically important – it is a growing need. He noted that we need people who can work with users to identify their needs. The conversation is no longer to prove that there is a climate change issue; it is now ‘what do we do?’ Detlef noted that communication is critically important and there is a need to do this better.

Kirsten highlighted that there are a few United States federal scientists who are also active in the WCRP community. She noted that they could be utilized in a more coherent way and communicate with USGCRP about what is going on in the WCRP community. She applauded his comment about USGCRP being more outward looking. Mike K. said that we need people in the ivory tower, but also people who can translate the outcomes of research. He welcomed her recommendations on how to better engage with federal scientists in WCRP.

Roberto applauded that USGCRP is prioritizing how to make climate information useful to society and noted that climate change is now so rapid that society needs to be informed on the realities that they face. He explained that change requires knowledge and that everyone makes decisions, explaining that it is very important that we close the gap in training climate science. Mike K. agreed and added that climate change will change the way we do business. It may not require scientists to become communicators, but it will require a reimagining. He noted that while the United States has a national weather service, they don’t yet have a national climate service. Naomi said that the RfS Core Project is addressing some aspects of this problem. Lisa said that she is glad to see the focus on climate services. She noted that WMO also has a focus on climate services and asked whether, with multiple agencies focused on this, it may dilute the overall effort. Mike K. said that this is a danger, and he will investigate whether USGCRP will focus only on the United States or also internationally.

## **11.2. Future Earth**

Kristie Ebi (Future Earth) gave an overview of Future Earth is and the current global distribution of hubs and activities. She highlighted recent activities, including the annual 10 New Insights in Climate Science (1ONICS) (with WCRP), a statement on Science at COP28, the Earth Commission (including the Tipping Points Model Intercomparison Project (TIPMIP)), the Tipping Points Discussion Series (with WCRP Safe Landing Climates), and the Future Earth Assembly (Together with the Sustainability Research & Innovation Congress in Finland, June 2024).

### **11.2.1. International Global Atmospheric Chemistry (IGAC)**

Langley introduced IGAC, aimed at advancing atmospheric chemistry towards a sustainable world, which is co-sponsored by APARC.

### **11.2.2. Past Global Changes (PAGES)**

Marie-France Loutre talked about PAGES, which focuses on paleoclimate. She highlighted the recently signed Memorandum of Understanding with WCRP/WMO. Next year there will be a PAGES Open Science Conference and Young Scientists Meeting. She noted that there are many entry points of collaboration between PAGES and WCRP, but currently the connections appear weaker than they perhaps should be. There was a discussion on this, but no conclusions were reached.

### **11.2.3. Surface Ocean-Lower Atmosphere Study (SOLAS)**

Bill Miller gave an overview of SOLAS, including the core and cross-cutting themes of the project (WCRP is a sponsor of SOLAS). SOLAS are currently writing a new science plan, which will elevate science for solutions and capacity building. They are also expanding their global network, currently with around 1200 members. The next SOLAS science meeting will take place in November 2024 in Goa, India.

### **11.2.4. Risk KAN**

Jana Sillmann presented the objectives of the Knowledge-Action Network on Emergent Risks and Extreme Events (Risk KAN) (sponsored by Future Earth, Integrated Research on Disaster Risk (IRDR), WCRP and WWRP). There are nine working groups, working on a range of topics relevant to WCRP. Recent activities include a series of webinars, systemic risk briefing notes, special issues on topics such as resilience and tipping behaviors. In June there is the Third International Conference on Natural Hazards and Risks in a Changing World, in Amsterdam, Netherlands (WCRP provided sponsorship). The leadership of Risk KAN will change after 2024. They would be happy with more interaction with the WCRP Lighthouse Activities.

### **11.2.5. Integrated Land Ecosystem Atmosphere Processes Study (ileaps)**

Garry Hayman (ileaps IPO Science Officer) presented for the Integrated Land Ecosystem Atmosphere Processes Study (ileaps), which focuses on land-atmosphere systems and their feedbacks. He highlighted recent special issues that were published. They are a research network and collaborative platform that convenes webinars, workshops, conferences, develops tools and methods, and works with ECR networks. Within WCRP, ileaps has a good relationship with GEWEX.

### **11.2.6. Analysis, Integration and Modelling of the Earth System (AIMES)**

Detlef noted that WCRP also has good relations with AIMES. Hannah said that AIMES has been working closely with the Safe Landing Climates Lighthouse Activity and would like to work with WGCM in the future.

### **11.2.7. General discussion**

Regarding the comment by Marie-France about the connections with PAGES, it was noted that there were previously good connections in relation to sea level. Detlef noted that we have to see how this topic will sit in WCRP in the future. Pascale said that there is a silo between people working on past climate and those working on current and future climate. It was discussed that in the Lighthouse Activities the links are often between individuals. Wendy Broadgate (Global Hub Director, Sweden Hub, Future Earth) highlighted that modeling can be used as an integrator and TIPMIP may be a good candidate in this case (there is already a good connection between TIPMIP and Safe Landing Climates Lighthouse Activity).

## **11.3. World Meteorological Organization (WMO)**

### **11.3.1. Global Framework for Climate Services (GFCS)**

Chris Hewitt (Director of the Climate Services Branch, WMO) presented the Global Framework for Climate Services (GFCS). This is a framework (launched in 2012) to enable society to better manage the risks and opportunities arising from climate variability and change, using science-based climate information. Priority sectors include agriculture, food security, water resources, health, Disaster Risk Reduction (DRR), and energy. The Climate Services Information System (CSIS) includes global data, which cascades down to the regional and then national levels. All climate timescales are in scope. WMO is currently refocusing GFCS. Of interest to WCRP, they are strengthening availability of and access to climate information. They are looking to establish national frameworks for climate services, and they are supporting adaptation and mitigation, such as the Global State of Climate Services Report and the five regional reports on the State of Climate Services. They are looking to improve capacity and to provide a platform for collaboration.

He noted that there are opportunities for WCRP around facilitating 'rapid science.' He asked if we could mobilize the research community to answer key societal climate issues, such as the recent unprecedented warming and attribution studies. He asked if WCRP can complement IPCC between assessment reports, perhaps on key societal issues such as sea level rise, for example. He highlighted some challenges for climate services, including how to ensure that there is an influence on outcomes, how to facilitate coordination and engagement, an understanding of requirements versus capability, an understanding of the concept of 'users', the role and importance of other disciplines and capabilities, and the capacities of providers and users.

### **11.3.2. World Weather Research Programme (WWRP)**

Chris Davis (Chair, WWRP SSC) presented the work of WWRP, including projects introduced as part of the new WWRP implementation Plan. He highlighted the work of several projects.



- The new Sub-seasonal Applications for Agriculture and Environment (SAGE) Project, which focuses on health, energy, agriculture, and DRR.
- The Polar Coupled Analysis and Prediction for Services (PCAPS), which is still being developed but that will potentially focus on sea-ice prediction, Model Intercomparison and Improvement Projects (MIIPs), and tailored services to address the unique needs of users.
- The Integrated Prediction of Precipitation and Hydrology for Early Actions (InPRHA) project, which will focus on flood warnings.
- The PEOPLE project, which is about how people use and understand weather information.
- The Urban Project, which is currently in its formative stage, focusing on urban areas.

Detlef noted that there are already very good connections between WCRP and WWRP. He highlighted that he could see potential for future collaborations on many topics, including urban, weather/climate, climate information, and decadal scale modeling.

### **11.3.3. Global Atmosphere Watch**

Paolo Laj (Head of GAW) presented the activities of GAW. He gave an overview of GAW infrastructure, an overarching global long-term *in-situ* monitoring network for atmospheric composition. There are a number of science-based assessments, which are community activities for the exploitation of monitoring data and data products. In addition, there are science for services initiatives, which are activities to develop tools and activities in support of international conventions, such as the Montreal Protocol. There are also several capacity building and communication activities.

Paolo noted that WCRP and GAW could develop the proper regional ecosystems for climate research, joint activities on science-based assessments, especially with APARC. There is an opportunity to grow regional networks of scientists and support training and education. Detlef asked if there are opportunities for GEWEX to work with GAW in relation to the RHPs. Jan said that this is in place, but it was noted that there may be further opportunities to explore.

## **11.4. Other partners**

### **11.4.1. Scientific Committee on Oceanic Research (SCOR)**

Emily Twigg (SCOR Executive Director) provided attendees with an overview of SCOR's activities and highlighted several current and future areas of possible cooperation, such as co-sponsorship of activities such as SOLAS and travel grants for ECRs and scientists from the Global South. There are several overlapping communities, such as activities focused on the Southern Ocean (the Southern

Ocean Regional Panel (SORP) (CLIVAR/CliC/SCAR) and the Southern Ocean Observing System (SOOS) (SCOR/SCAR)) and Indian Ocean (the Indian Ocean Regional Panel (IORP) (CLIVAR) and the 2<sup>nd</sup> International Indian Ocean Expedition (IIOE-2) (SCOR/IOC/Global Ocean Observing System in the Indian Ocean (IOGOOS)), Integrated Marine Biosphere Research (IMBeR) Sustained Indian Ocean Biogeochemistry and Ecosystem Research (SIBER) (SCOR/Future Earth).

#### **11.4.2. Global Climate Observing System (GCOS)**

GCOS were not able to present online because of time zone differences but provided a recorded presentation and invited WCRP to the next GCOS steering meeting in Geneva. WCRP and GCOS jointly sponsor three panels (OOPC, the Atmospheric Observation Panel for Climate (AOPC), and the Terrestrial Observation Panel for Climate (TOPC)) and GCOS has good interactions with GEWEX and CLIVAR.

#### **11.4.3. Asia Pacific Network (APN)**

Yuki Imanari (APN Programme Advisor) presented and update from APN. He focused on several possible future interactions with WCRP, including between APN's Early Career Professionals for Global Change Research (ECAP) network and the WCRP Academy. This could include the mutual promotion of activities, training workshops, and webinars. He suggested that APN is currently implementing regional partnerships for localization of nationally determined contributions through community-led local adaptation innovation hubs, and this has potential linkages to the My Climate Risk hubs. He also noted additional potential collaborations with EPESC, RfS, and CORDEX and the possibility of WCRP joining APN on a research proposal to be submitted to the virtual institute for Earth's Water, Schmidt Sciences. If a full proposal is submitted, he noted that WCRP could be invited to participate.

*Action: WCRP Secretariat to follow up with APN Secretariat on connections with Academy and other activities as appropriate (Yuki, Narelle, Academy Support Unit and others; as applicable).*

## **12. Other business**

### **12.1. JSC Task Team on Finance and the New Budgeting Process**

Detlef outlined that a new budgeting process started in 2024, aimed at using WCRP funds more strategically. He explained that 2024 would be a transition year, with the process better integrated in the annual planning of the programme in 2025. In 2024 the JSC formed a Task Team to design the new budgeting process for 2025 funding. The funding call included five categories: baseline funding, strategic funding, capacity building, overarching operational activities, and administration support for the Academy and Lighthouse Activities.

Detlef noted that for 2024 each of the Core Projects received 70k and each Lighthouse Activity received 25k. He noted that this income is better than it used to be. The estimated income for 2025 is CHF 959,500, whereas the budget requests that were submitted by the core activities was about CHF 1.6 million. The Finance Task Team will now work with these requests and provide a preliminary allocation for the 2025 budget. At the end of July there will be a leadership meeting where the allocation is discussed, perhaps together with other topics (see previous action on holding a leadership meeting focused on the budget).

## **12.2. Secretariat Report**

Mike S. gave an update on the WCRP Secretariat, noting that Nico Caltabiano left the Secretariat last year for a higher-level position with WWRP. Maureen Wanzala joined the Secretariat this year to replace Nico Caltabiano. Megha Kaveri Puthucode Sreeram joined the Secretariat on a 1-year temporary contract (she was previously on an internship) to work with Narelle on communications, including to support the large number of webinars and communication needs of the Lighthouse Activities. Lian Xue has joined as a Junior Professional Officer for up to two years, supporting GPEX, hydrology, and APARC. Suhana Sehwat, an intern with the Secretariat since October 2023, is currently supporting My Climate Risk and communications. Two interns, Anne-Lise Hadzopoulos and Wushan Ying moved on to a new position and back to PhD studies, respectively. Mike noted the crucial contribution of Catherine Michaut, hosted at Institut Pierre-Simon Laplace (IPSL), in France, who supports events and the WCRP website.

The WMO Science and Innovation Director, Jürg Luterbacher, recently left WMO. Currently Ko Barrett, Deputy Secretary-General of WMO, oversees the Science and Innovation Department, with the Heads of WCRP, GAW and WWRP sharing the director responsibilities until a new director is recruited.

Mike also presented a graphic showing all the project offices (Figure 3), and there was general discussion on how the offices are funded over time. Detlef noted that we have to acknowledge the significant support from nations that comes from these offices. There was a discussion on the future needs for support and how to grow it in the future, especially for communication and for the Lighthouse Activities. It was agreed that this is a priority.

## **13. JSC Session Closing**

Detlef and Pascale closed the meeting and thanked participants. They warmly thanked Ken and Peruvian colleagues for hosting the meeting.

# WCRP International Project Offices (IPOs) and Support Units



Figure 3: WCRP International Project Offices and Support Units

## 14. Outcomes of the JSC-only session

Following normal procedures, the JSC Session was followed by a closed JSC-only session to make final decisions on finance, membership and other matters. The main outcomes of this session are summarized below.

### 14.1. Task Team to ensure better inclusion of the Global South in WCRP

The JSC discussed the importance of continuing the momentum started at the WCRP Open Science Conference and built on by the WCRP Global Fellowship. They decided to solicit recommendations for ensuring that Global South researchers are included in all WCRP activities and committees.

*Action: Establish and determine the composition and terms of reference of a task team to provide recommendations toward better inclusion of Global South researchers in WCRP activities and committees (JSC; ASAP).*

## **14.2. Budget for 2025**

The JSC recognized that a detailed timeline is needed for decisions on the 2025 budget. They discussed and agreed on the process and timeline below.

*Actions:*

- *Finance Task Team to deliver a 2025 proposal to the entire JSC for further discussion and decision (Finance Task Team; July 2024).*
- *Individual core activities to receive a detailed letter with justification for their approved allocation (WCRP Chair; July 2024).*
- *Hold a WCRP leadership meeting to discuss the budget proposal with all core-activities and to deliberate possible adjustments (WCRP Secretariat and JSC Chair; August 2024).*
- *Set up a virtual JSC meeting for the conclusion of the 2025 budget (WCRP Secretariat; September 2024).*

## **14.3. 10 New Insights in Climate Science (10NICS)**

The JSC discussed strategic priorities for 2025. While the collaboration with Future Earth and the Earth League on the 10NICS has been fruitful over the last few years, it now seems like the time to exit this effort in favor of other priorities.

*Decision: WCRP will complete the process for 10 New Insights in Climate Science (10NICS) in 2024 and will let Future Earth know of its intention to exit the collaboration due to competing priorities (JSC Chair; ASAP)*

## **14.4. Private enterprise contributions to WCRP**

There are growing interactions between WCRP and the private sector. While such interactions are encouraged, it is important that WCRP maintains its legitimacy and only works with reputable enterprises. In this respect, WCRP needs to guide the community, including core activities and IPOs, on such interactions. It was noted that activities should initially approach the WCRP Secretariat for the procedure, as even in WMO the guidance on this topic is changing rapidly. JSC approval for private sector interactions should be sought after appropriate due diligence procedures have been undertaken.

*Action: WCRP to send a communication to core activities on how potential contributions from private enterprises must be dealt with (WCRP Secretariat; by end July 2024).*

## **14.5. WCRP Global Fellowships**

The WCRP Global Fellowship Task Team presented a proposal for the future iterations of the fellowship. Several issues were discussed but no final decisions

were made. The Task Team was asked to work on the proposal further and submit a revised version as soon as possible.

*Action: Fellowship Task team to provide the JSC with a revised WCRP Global Fellowships proposal (Fellowship Task Team; ASAP).*

#### **14.6. Feedback on core activity reports**

The JSC highlighted the importance of providing feedback on the reports submitted by the core activities in advance of the JSC session. JSC liaisons were asked to provide a first draft of the response to the Core Projects that they work with. Detlef and Pascale noted that they would supply a first draft of feedback to the Lighthouse Activities and Academy. The entire JSC would then provide additional feedback on all reports, which would then be sent to the relative activity chairs.

*Action: The JSC to provide feedback on all core activity reports (JSC; ASAP).*

#### **14.7. Core activities terms of reference**

The JSC discussed the need for all core activities to have clear terms of reference and for these to be consistent. As part of this, it may be useful to better define the role of JSC liaisons to WCRP core activities.

Actions:

- *Review the terms of reference of each WCRP activity and provide the JSC with an overview of them (WCRP Secretariat, by JSC-46)*
- *Consider how to better define the role of JSC liaisons to WCRP core activities (WCRP JSC and Secretariat; ASAP).*

#### **14.8. Overarching research areas**

The JSC discussed how to deal with research topics that span WCRP and that may result in duplicated effort. Examples discussed included DCP, high-resolution and regional models, cycles and budgets, and high-level publications. The JSC noted that the first step would be to look at the core activity reports and identify relevant research areas and then decide on a case-by-case basis, how to deal with them.

*Action: The JSC to look at core activity reports to identify key overarching topics that may need community-wide discussion and identify if, when, how, and by who such discussions should be facilitated. (JSC; by JSC45B).*

#### **14.9. WCRP communication platform**

The JSC discussed the need for a WCRP communication platform. They noted that the sharing of information and collaboration via a platform of some kind is seen by the community as a priority and so it is worth WCRP investing in researching the best tool for WCRP and delivering it to the community. The Secretariat was asked

to investigate potential tools, and to advise on the cost and whether a consultant will be needed to deliver and maintain the platform.

*Action: Investigate what is needed to deliver a WCRP-wide communication platform (WCRP Secretariat; before the end of 2024).*

## 14.10. Core activities membership

The JSC reviewed new membership nominations from CliC, GPEX and Safe Landing Climates.

Decisions:

*CliC: Membership proposal accepted. Future membership requests should address disciplinary gaps, specifically in terms of sea ice and permafrost expertise. If possible, an expert from Africa working on tropical glaciers should also be considered.*

*GPEX: The membership proposal was accepted, with the exception that the JSC require that Xubin Zeng cannot be co-chair of both GEWEX and GPEX. In addition, GPEX must improve its geographic and disciplinary (the observational and modelling sides are not well represented) balance in the future.*

*Safe Landing Climates: The membership proposal was accepted. Future membership requests should improve the geographic and gender balance. The JSC suggests that SLC increase its membership, since the Lighthouse Activity has many different activities planned and underway.*

Actions:

- *Prepare membership decision letters and send to all activities, including advice from the JSC for future rounds (WCRP Secretariat; ASAP).*
- *Amadou to work with GPEX to help with African membership and CliC regarding including possible expert workings on tropical glaciers to consider in future membership rounds (Amadou, WCRP Secretariat, respective activity chairs; ASAP).*

## 14.11. Membership guidelines

The JSC discussed updating the current 'Guidelines on Membership and Responsibilities of WCRP High-level Steering Committees'<sup>10</sup> (last version, 2022). In particular, it was thought that better guidance is needed regarding experts undertaking dual leadership roles, which may depend on the activity (Core Project or Lighthouse Activity) and the role undertaken in a committee (co-chair or member). At the moment, decisions are made at the discretion of the JSC, which does not provide clarity and transparency to the community. In addition, the roles

---

<sup>10</sup> The Guidelines can be found on the WCRP website: <https://www.wcrp-climate.org/about-wcrpx/governance/jsc-documents>

of ex-officio members and liaisons should be clarified. This should be considered alongside the terms of reference of WCRP core activities (see actions in Section 14.7).

*Action: Agree on updates to the Guidelines on Membership and Responsibilities of WCRP High-level Steering Committees and send out to the community for comment (JSC and WCRP Secretariat; ASAP).*

## **14.12. JSC Session 2025**

It was agreed to start preparations for the JSC meeting earlier (November of the previous year), so we have material much earlier before an upcoming JSC meeting. This will allow JSC liaisons to work with activities prior to the meeting on any issues and for the meeting to focus on strategic discussions and science presentations. This means that a decision on the location of the next JSC meeting should be made as early as possible in the preceding year.

The proposition from the Manila Observatory to host the 2025 Session of the JSC was considered. This was warmly received by the JSC, but it was decided to rather consider this for the 2026 Session as the Academy Support Unit is new and currently is very busy organizing the first Academy SSG meeting that will take place in the Philippines in October 2024. Narelle (as Scientific Officer responsible for the Academy) supported this decision, also because it would give more time for the Manila Observatory to plan WCRP interactions should the JSC decide to meet there. Detlef noted that the JSC would respond to Father Jose Ramon T Villarin SJ, thanking him for the invitation and asking whether postponement to 2026 is possible.

*Decision: JSC to decide on the location of the annual in-person JSC Session (or report that it is online only) earlier (as early as possible in the preceding year) to enable better planning (JSC Chair; ASAP).*

*Action: Reply to Manila Observatory regarding invitation to host the 2025 Session of the JSC in Manila and ask if hosting the Session in 2026 would be possible (lead: JSC Chair; ASAP).*



## Annex 1: List of acronyms

Acronym	Name
10NICS	10 New Insights in Climate Science
ACAM	Atmospheric Composition and the Asian Monsoon
ACCLIP	Asian Summer Monsoon Chemical & CLimate Impact Project
AGU	American Geophysical Union
AIMES	Analysis, Integration, and Modeling of the Earth System
AMOC	Atlantic Meridional Overturning Circulation
ANDEX	Hydroclimate Research Program for the Andes
AOPC	Atmospheric Observation Panel for Climate
APARC	Atmospheric Processes And their Role in Climate
APECS	Association of Polar Early Career Scientists
APN	Asia-Pacific Network for Global Change Research
AR5	IPCC Fifth Assessment Report
AR6	IPCC Sixth Assessment Report
AR7	IPCC Seventh Assessment Report
BAMS	Bulletin of the American Meteorological Society
CCMI	Chemistry-Climate Model Initiative
CDRMIP	Carbon Dioxide Removal Model Intercomparison Project
CliC	Climate and Cryosphere
CLIVAR	Climate and Ocean Variability, Predictability and Change
CMIP	Coupled Model Intercomparison Project
CMIP6	Coupled Model Intercomparison Project Phase 6
CMIP7	Coupled Model Intercomparison Project Phase 7
COP	Conference of the Parties (United Nations Climate Change Conference)
COP26	26th COP
COP28	28th COP
COP29	29th COP
COP30	30th COP
CORDEX	Coordinated Regional Climate Downscaling Experiment
CSIS	Climate Services Information System
DCPP	Decadal Climate Prediction Project
DKRZ	Deutsche Klimarechenzentrum (German Climate Computing Center)
DLR	Das Deutsche Zentrum für Luft- und Raumfahrt (German Aerospace Center)
DRR	Disaster Risk Reduction
ECMWF	European Centre for Medium-Range Weather Forecasts
ECAP	Early Career Professionals for Global Change Research
ECR	Early Career Researcher

<b>ECV</b>	Essential Climate Variable
<b>EGU</b>	European Geosciences Union
<b>EMCR</b>	Early to Mid-Career Researcher
<b>ENSO</b>	El Niño–Southern Oscillation
<b>EPESC</b>	Expert Panel on Ecosystem Services and Environmental Change
<b>ESA</b>	European Space Agency
<b>ESGF</b>	Earth System Grid Federation
<b>ESMO</b>	Earth System Modelling and Observations
<b>EUMETSAT</b>	European Organisation for the Exploitation of Meteorological Satellites
<b>EVE</b>	Earth Virtual Engine
<b>EW4All</b>	Early Warnings for All (WMO)
<b>GASS</b>	Global Atmospheric System Studies Panel
<b>GAW</b>	Global Atmosphere Watch
<b>GCF</b>	Green Climate Fund
<b>GCM</b>	General Circulation Model
<b>GCOS</b>	Global Climate Observing System
<b>GDAP</b>	GEWEX Data and Analysis Panel
<b>GCW</b>	Global Cryosphere Watch
<b>GEOMIP</b>	Geoengineering Model Intercomparison Project
<b>GEP</b>	Global Extremes Platform
<b>GEWEX</b>	Global Energy and Water Exchanges Project
<b>GFCS</b>	Global Framework for Climate Services
<b>GHP</b>	Global Hydrology Programme
<b>GLASS</b>	Global Land Atmosphere System Studies Panel
<b>GOOS</b>	Global Ocean Observing System
<b>GMD</b>	Geoscientific Model Development (Journal)
<b>GPEX</b>	Global Precipitation Estimation Experiment
<b>GSOP</b>	Global Synthesis and Observations Panel
<b>HTHH</b>	Hunga Tonga–Hunga Ha’apai
<b>IAI</b>	Inter-American Institute for Global Change Research
<b>IAM</b>	Integrated Assessment Model
<b>IASC</b>	International Arctic Science Committee
<b>ICARP</b>	International Conference on Arctic Research Planning
<b>IC-MONTC</b>	Impacts of Changes in the Mountain Cryosphere
<b>IDAG</b>	International ad hoc Detection and Attribution Group
<b>IGAC</b>	International Global Atmospheric Chemistry
<b>IOGOOS</b>	Global Ocean Observing System in the Indian Ocean
<b>IGP</b>	Instituto Geofísico del Perú
<b>IIOE-2</b>	2nd International Indian Ocean Expedition
<b>IITM</b>	Indian Institute of Tropical Meteorology

<b>iLEAPS</b>	Integrated Land Ecosystem Atmosphere Processes Study
<b>IMBeR</b>	Integrated Marine Biosphere Research
<b>IMPO</b>	International Monsoons Project Office
<b>IndOOS</b>	Indian Ocean Observing System
<b>InPRHA</b>	Integrated Prediction of Precipitation and Hydrology for Early Actions
<b>IOC</b>	Intergovernmental Oceanographic Commission
<b>IORP</b>	Indian Ocean Regional Panel
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>IPO</b>	International Project Office
<b>IPSL</b>	Institut Pierre-Simon Laplace
<b>IPY</b>	International Polar Year
<b>IRD</b>	French National Research Institute for Sustainable Development
<b>IRDR</b>	Integrated Research on Disaster Risk
<b>ISC</b>	International Science Council
<b>ISMIP</b>	Ice Sheet Model Intercomparison Project
<b>ISMIP7</b>	Ice Sheet Model Intercomparison Project for CMIP7
<b>ISSI</b>	International Space Sciences Institute
<b>IUCA</b>	International Universities Climate Alliance
<b>JSC</b>	Joint Scientific Committee
<b>JSC-45</b>	45 <sup>th</sup> Session of the Joint Scientific Committee (May 2024)
<b>JSC-45B</b>	45 <sup>th</sup> Session of the Joint Scientific Committee - B Meeting (Nov 2024)
<b>LACI</b>	Latin America and Caribbean Initiative
<b>LEADER</b>	Large Ensembles for Attribution of Dynamically-driven ExtRemes
<b>LOTUS</b>	Long-term Ozone Trends and Uncertainties in the Stratosphere
<b>MCR</b>	My Climate Risk
<b>MINAM</b>	Climate Change and Desertification, Ministerio del Ambiente (Peru)
<b>MIIIP</b>	Model Intercomparison and Improvement Project
<b>MIP</b>	Model Intercomparison Project
<b>MU-MIP</b>	Model Uncertainty Model Intercomparison Project
<b>NCEP</b>	National Centers for Environmental Prediction
<b>OMDP</b>	Ocean Model Development Panel
<b>OMIP</b>	Ocean Model Intercomparison Project
<b>OOPC</b>	Ocean Observations Panel for Climate
<b>PAGES</b>	Past Global Changes
<b>PALSEA</b>	PaLeo constraints on SEA level rise Working Group
<b>PATAC</b>	Pacific Atmospheric Teleconnections in a wArming Climate
<b>PCAPS</b>	Polar Coupled Analysis and Prediction for Services
<b>PICES</b>	North Pacific Marine Science Organization
<b>RCP</b>	Representative Concentration Pathway
<b>RHP</b>	Regional Hydroclimate Project

<b>RIFS</b>	Regional Information for Society
<b>S2S</b>	Subseasonal to Seasonal
<b>SAGE</b>	Subseasonal to seasonal prediction in the Arctic and Global Environment
<b>SCAR</b>	Scientific Committee on Antarctic Research
<b>SCOR</b>	Scientific Committee on Oceanic Research
<b>SIBER</b>	Sustained Indian Ocean Biogeochemistry and Ecosystem Research
<b>SIMIP</b>	Sea-Ice Model Intercomparison Project
<b>SMN</b>	Servicio Meteorológico Nacional (Argentinian National Meteorological Service)
<b>SOFIA</b>	Southern Ocean Freshwater release model experiments Initiative
<b>SOLAS</b>	Surface Ocean-Lower Atmosphere Study
<b>SOOS</b>	Southern Ocean Observing System
<b>SORP</b>	Southern Ocean Regional Panel
<b>SPARC</b>	Stratosphere-troposphere Processes And their Role in Climate
<b>SSC</b>	Scientific Steering Committee
<b>SSG</b>	Scientific Steering Group
<b>SSP</b>	Shared Socioeconomic Pathway
<b>STIPMEX</b>	Stratosphere-Troposphere Interactions and Prediction of Monsoon weather EXTremes
<b>TCRE</b>	Transient Climate Response to Cumulative Emissions
<b>TOPC</b>	Terrestrial Observation Panel for Climate
<b>UNEP</b>	United Nations Environment Programme
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>UPCH</b>	Universidad Peruana Cayetano Heredia (Peru)
<b>USGCRP</b>	United States Global Change Research Program
<b>VolRes-RE</b>	Volcanic Response Readiness Exercise
<b>VSLs</b>	Very-Short-Lived Substances
<b>WCRP</b>	World Climate Research Programme
<b>WGCM</b>	Working Group on Coupled Modelling
<b>WGNE</b>	Working Group on Numerical Experimentation
<b>WGORC</b>	Working Group on Observations for Researching Climate
<b>WGSIP</b>	Working Group on Subseasonal to Interdecadal Prediction
<b>WIP</b>	WGCM Infrastructure Panel
<b>WMO</b>	World Meteorological Organization
<b>WWRP</b>	World Weather Research Programme
<b>YESS</b>	Young Earth System Scientists
<b>YoP</b>	Years of Precipitation
<b>ZEC</b>	Zero Emissions Commitment

## Annex 2: List of participants

<b>Name</b>	<b>Affiliation</b>
<b>Agus Santoso</b>	Director, CLIVAR ICPO
<b>Amadou Gaye</b>	JSC Member
<b>Amanda Maycock</b>	APARC Chair
<b>Amy Lovecraft</b>	Co-chair, CliC SSG
<b>Andrew Gettelman</b>	Co-chair, Digital Earths LHA
<b>Baylor Fox-Kemper</b>	Co-chair, ESMO SSG
<b>Beth Dingley</b>	CMIP IPO
<b>Bill Miller</b>	UGA / SOLAS
<b>Brian Leung</b>	USGCRP
<b>Bruce Hewitson</b>	Co-chair RfS
<b>Chris Davis</b>	Chair, WWRP SSC
<b>Chris Hewitt</b>	Director of the Climate Services Branch, WMO
<b>Chris Lennard</b>	Academy co-chair
<b>Cristiana Stan</b>	JSC Member
<b>Daniel Ospina</b>	Future Earth
<b>Daniel Thornhill</b>	NSF
<b>Daniele Visoni</b>	Co-chair, Research on Climate Intervention LHA
<b>Detlef Stammer</b>	Chair, WCRP JSC
<b>Edward Hanna</b>	Co-chair, CliC SSG
<b>Eleanor Blythe</b>	JSC Member
<b>Eleanor O'Rourke</b>	CMIP IPO
<b>Emily Twigg</b>	SCOR Secretariat
<b>Emma Needham</b>	SCAR Secretariat
<b>Erica Key</b>	Future Earth
<b>Estelle de Coning</b>	Head, World Weather Research Programme (WWRP)
<b>Fanny Adloff</b>	ESMO IPO
<b>Francois Engelbrecht</b>	CLIVAR Co-chair
<b>Pierre Friedlingstein</b>	JSC Member
<b>Gabi Hegerl</b>	Co-chair, Safe Landing Climates LHA
<b>Garry Hayman</b>	ileaps IPO Science Officer
<b>Gerrit Hansen</b>	Working Group I Technical Support Unit
<b>Hannah Liddy</b>	AIMES; Future Earth
<b>Helene Hewitt</b>	CMIP Co-chair
<b>Henrik Oksfeldt Enevoldsen</b>	IOC-UNESCO
<b>Hindumathi Palanisamy</b>	WCRP Secretariat
<b>Huijun Wang</b>	JSC Member
<b>Ines Tritscher</b>	APARC IPO
<b>Irène Lake</b>	CORDEX

<b>Jan Polcher</b>	GEWEX co-chair
<b>Jana Sillmann</b>	Risk-KAN
<b>Joel Anicama Diaz</b>	IGP, Peru
<b>John Dunne</b>	CMIP Co-chair
<b>Kate Calvin</b>	IPCC Working Group III Co-chair
<b>Katherine Quigley</b>	CLIC IPO
<b>Keith Alverson</b>	CLIC Executive Director
<b>Ken Takahashi</b>	JSC Member
<b>Kirsten Findell</b>	Co-chair, EPESC Lighthouse Activity
<b>Kristie Ebi</b>	Future Earth
<b>Langley DeWitt</b>	IGAC
<b>Li Li</b>	SOLAS IPO
<b>Lian Xue</b>	WCRP Secretariat
<b>Lindha Nilsson</b>	CORDEX IPO
<b>Lisa Alexander</b>	JSC Member
<b>Lisan Yu</b>	SOLAS
<b>LiyeLi</b>	JPO/WWRP
<b>Marie-France Loutre</b>	PAGES
<b>Maureen Wanzala</b>	WCRP Secretariat
<b>Megha Kaveri</b>	WCRP Secretariat
<b>Meghan Taylor</b>	CLIC IPO
<b>Melissa Hart</b>	Academy co-chair
<b>Michael Sparrow</b>	WCRP Secretariat
<b>Mike Kuperberg</b>	USGCRP
<b>Mohamadou Diallo</b>	APARC IPO
<b>Nadine Mengis</b>	LHA on Climate Intervention
<b>Naomi Goldenson</b>	Director, RfS IPO
<b>Narelle van der Wel</b>	WCRP Secretariat
<b>Olaf Morgenstern</b>	Co-chair, APARC SSG
<b>Paolo Laj</b>	Head, Global Atmosphere Watch (GAW)
<b>Pascale Braconnot</b>	Vice-chair, WCRP JSC
<b>Peter van Oevelen</b>	GEWEX IPO Executive Director
<b>Pier Luigi Vidale</b>	Co-chair, Digital Earths LHA
<b>R. Krishnan</b>	JSC Member
<b>Robert Vautard</b>	IPCC Working Group I Co-chair
<b>Roberto Sanchez</b>	JSC Member
<b>Rolf Müller</b>	APARC IPO
<b>Rowan Sutton</b>	Co-chair, EPESC LHA
<b>Silvina Solman</b>	Co-chair, CORDEX and RfS
<b>Sonya Legg</b>	Co-chair, CLIVAR SSG
<b>Sophie Hebden</b>	Future Earth
<b>Steven Sherwood</b>	Co-chair, Safe Landing Climates LHA
<b>Suhana Sehrawat</b>	WCRP Secretariat

<b>Susann Tegtmeier</b>	Co-chair, ESMO SSG
<b>Susanna Corti</b>	JSC Member
<b>Tercio Ambrizzi</b>	JSC Member
<b>Tim Naish</b>	JSC Member
<b>Valentina Rabanal</b>	Executive Officer, YESS Community
<b>Wendy Broadgate</b>	Global Hub Director, Sweden Hub, Future Earth
<b>Winston CHOW</b>	IPCC WG2 Co-chair
<b>Xavier Robert</b>	Research Institute for Development
<b>Xubin Zeng</b>	Co-chair, GEWEX SSG
<b>Xuebin Zhang</b>	GEP
<b>Yamina Silva</b>	IGP, Peru
<b>Yukihiro Imanari</b>	APN

## Annex 3: Agenda

### 45<sup>th</sup> Session of the WCRP Joint Scientific Committee (JSC-45) Agenda

May 27 – 30: *Hybrid* Plenary Session

(Afternoon of May 29th and part of afternoon of 30th: JSC only Session)

#### Background

- The 45th session of WCRP's Joint Scientific Committee (JSC-45) will assess progress made by WCRP activities towards WCRP's goals and will advance the scientific program as documented in the Science and Implementation Plan.
- The session will be essentially virtual but with JSC members gathering in Lima, Peru. The session will be back-to-back with an ANDEX meeting in Lima. WCRP activity representatives participating in the ANDEX meeting can also participate in person in the JSC meeting.
- During Wednesday morning a public Peru Science Day will take place.
- Logistical instructions will be made available through the JSC-45 website at <https://www.wcrp-climate.org/jsc45>.
- Presentations and reports will be made available in advance of the meeting. Due to the limited meeting time, we ask all participants to read through these documents in advance. See <https://www.wcrp-climate.org/jsc45-about>.
- During the meeting, questions from all virtual participants can be submitted via the Chat Box. The WCRP Secretariat will moderate the chat and notify the chair as applicable.
- As always: attendance at this JSC session is by invitation only. Should you wish to attend, please contact Mike Sparrow ([mssparrow@wmo.int](mailto:mssparrow@wmo.int)).
- 

All times in the below agenda are quoted in Lima time.

Please see <https://www.timeanddate.com/worldclock/meeting.html> for the respective times in your area.



## Day 0 (26th of May): 19:00 – 21:00 Icebreaker (IRD headquarter)

## Day 1 (27<sup>th</sup> of May)

Rapporteur: M. Puthucode; Chat: M. Wanzala

Chairs D. Stammer and P. Braconnot

### Joint JSC45–ANDEX Opening Session 08:00 – 09:30

- Welcome from local authorities [up to 10 mins each], (likely reps from IRD, IGP, and UPCH – TBC, MINAM-TBC)
- Welcome and comments from WCRP co-sponsors [up to 10 mins each] C. Saulo (WMO), S. Aricò (ISC), (V. Helgesen – video message) (IOC- UNESCO)
- Opening and Goal of JSC-45 from JSC Chair and Vice-chair [15 mins] (D. Stammer, P. Braconnot)
- Opening and Goal of ANDEX SSC from ANDEX Co-chair [10 mins] (J. Espinoza)

(JSC and ANDEX move to their own sessions: 15 mins)

### 1. JSC Opening Session 09:45–10:00

- Welcome and approval of JSC Agenda [10 mins] (*D. Stammer, P. Braconnot*)
- Welcome on behalf of WCRP Secretariat and guidelines for participants and logistics of JSC-45 [5 mins] (*M. Sparrow*)

### 10:00–10:20 Coffee/Tea

Rapporteur: H. Palanisamy; Chat: N. Van der Wel

### 2. WCRP Open Science Conference Outcomes 10:20–10:40 (D. Stammer)

### 3. WCRP Science and Implementation Plan 10:40–11:10

(D. Stammer, P. Braconnot)

- Plans and timeline with regards to finishing the WCRP Science and Implementation Plan [10 mins] (*D. Stammer, P. Braconnot and M. Sparrow*)
- Status WCRP Branding [10 mins] (*D. Stammer and N. Van der Wel*)
- New approach to annual budgeting [10 mins] (*D. Stammer*)

#### **4. Strategic initiatives and Issues: Update and Discussion part 1 11:10–11:50**

- 4.1 Status of CMIP 7 and Scenarios 11:30–11:50 [20 mins] (H. Hewitt and D. van Vuuren)
- 4.2 WCRP Budget and Cycles Team 11:10–11:30 [20 mins] (J. Polcher, in person)

#### **11:50–13:30 Lunch**

Rapporteur: M. Sparrow; Chat: H. Palanisamy

#### **4. (cont.) Strategic initiatives: Update and Discussion Part 2 13:30–14:10**

- 4.3 Collaboration on monsoons activities [20 mins] (TBC)
- 4.4 Outcome of CliC Review [20 mins] (D. Stammer)

#### **5. Presentations and Discussion of WCRP core activities 14:10–18:00**

##### **Part 1: Lighthouse Activities**

- 14:10–14:40 My Climate Risk Lighthouse Activity [30 mins] (*R. Rodrigues*)
- -14:40–15:10 GPEX [30 mins] (*X Zeng*)
- 15:10–15:40 Explaining and Predicting Earth System Change [30 mins] (*K. Findell*)
- - 15:40–16:00 Discussion

##### **16:00–16:30 Coffee/Tea**

Rapporteur: N. Van der Wel; Chat: M. Sparrow

- 16:30–17:00 Digital Earths Lighthouse Activity [30 mins] (*A. Gettelman*)
- 17:00–17:30 Safe Landing Climates Lighthouse Activity [30 mins] (*S. Sherwood*)
- 17:30–18:00 Discussion

##### **18:00 ANDEX poster session (30 mins)**

## Day 2 (28th of May): 09:00–18:00

Rapporteurs: M. Wanzala; Chat: M Puthucode  
Chairs: D. Stammer and P. Braconnot

### **08:30–09:00 Research on Climate Intervention LHA (*D Visioni*)**

**09:00–09:45 Discussion IPCC–WCRP Collaborations:** R. Vautard, B. Van den Hurk and/or Kate Calvin, W. Chow, D. Stammer, P. Braconnot

- AR7 agenda and organisation
- Key topics for which new information is needed from WCRP, e.g., through assessment papers.
- Interest for common expert workshop on some topics (e.g., tipping points, Science of Climate Intervention)

### **Presentations and Discussion of WCRP core activities (cont.) 09:45-12:00**

#### **Part 2: Core Projects**

- 09:45–10:30 Atmospheric Processes and their Role in Climate (APARC) Core Project [45 mins] (*A. Maycock*)

### **10:30–11:00 Coffee/Tea Break**

Rapporteur: H. Palanisamy; Chat: N. Van der Wel

- 11:00–11:45 Regional Information for Society (RIfS) (including CORDEX and Global Extremes Platform) [45 mins] (*S. Solman, and N. Goldenson*)
- 11:45–12:30 Earth System Modelling and Observations (ESMO) Core Project (including CMIP) [45 mins] (*B Fox-Kemper and H. Hewitt*)

### **12:30–14:00 Lunch**

Rapporteur: M. Sparrow; Chat: H. Palanisamy

#### **Part 2: Core Projects (cont.) 14:00–18:00**

- 14:00–14:45 Climate and Cryosphere (CliC) [45 mins.] (*E. Hanna*)
- 14:45–15:30 Climate and Ocean Variability, Predictability and Change (CLIVAR) [45 mins] (*S. Legg and F. Engelbrecht*)
- 15:30–16:15 Global Energy and Water Exchanges (GEWEX) [45 mins] (*J Polcher – in person*)

## **16:15–16:45 Afternoon Coffee**

Rapporteur: N. Van der Wel; Chat: M. Sparrow

## **Part 3: Discussion 16:45–17:45**

- Improving Connections between Core Activities

**17:45–18:00 Interactions with USGCRP** (M. Kuperberg et al.)

**18:00 ANDEX poster session** (30 mins)

**End of Day 2**

## **Day 3 (29th of May): 8:30–18:00**

### **8:30–13:00 Peruvian Science Session (Auditorium Lumbreras)**

This session is devoted to a discussion with local scientists.

08:30-09:00 Welcome and Opening. (UPCH TBC)

09:00-09:20 The World Climate Research Program (WCRP) and opportunities for climate science in the Andean region D. Stammer, JSC Chair

09:20-09:35 The Global Energy and Water Exchanges Project (GEWEX) and the WCRP Global Precipitation Experiment (GPEX). Jan Polcher (CNRS – GEWEX Co-chair).

09:35-09:50 WCRP-Academy (Christopher Lennard - Co-chair WCRP-Academy)

09:50-10:05 The WCRP Regional Climate Information for Society (RIfS) Project. Silvina Solman (Co-chair of RIfS).

10:05-10:20 The Regional Hydroclimatic Program for the Andes (ANDEX). Jhan-Carlo Espinoza (IRD – Co-chair of ANDEX)

10:20-10:35 A network of young researchers and professionals for the Andes – JovenANDEX (TBC)

10:35-10:50 IPCC-ANDEX. Ken Takahashi (IGP)

10:50-11:05 Challenges in climate modeling for the Andes (Alejandro Martinez (Univ. of Antioquia Colombia) and Clementine Junquas (IRD)

- 11:05-11:20 ANDEX challenges for the coming years. Paola Arias (Univ. of Antioquia Colombia)
- 11:20-11:50 Climate and health (UPCH TBC)
- 11:50-12:00 Awarding of the Joven ANDEX poster session.
- 12:00-12:30 Closing words (TBC)
- 12:30-13:00 Poster visit.

**13:00–14:30 Lunch**

**14:30–18:00 Closed JSC (in camera plus WCRP Secretariat) only session**

**18:00 End of Day 3**

**Day 4 (30th of May): 08:30–18:00**

**08:30–13:00 Open JSC Session**

Rapporteurs: M. Wanzala; Chat: M Puthucode

**Presentations and Discussion of WCRP core activities (cont.) The WCRP Academy 08:30–9:00 [30 mins] (M. Hart and C. Lennard)**

**5. Early and mid-career researchers in WCRP 09:00–09:30 (P. Braconnot, H. Palanisamy)**

- Review of EMCR status and recommendations [20 mins]
- ECS networks (YESS etc.) [10mins] (V Rabanal)

**6. Global Fellowships 09:30–10:00 (P. Braconnot, and D. Stammer)**

- General Concept of Global Fellowships
- Status of the 2024 call focused on Africa
- Preparation of the next calls

**10:00–10:20 Break**

*Rapporteur: N. Van der Wel; Chat: H. Palanisamy*

**6. Partner Interactions 10:20 –11:20 [60 mins]**

**10:20–10:50 Future Earth (lead K. Ebi)**

- Global collaborations
- Collaborations between WCRP and Future Earth Research Projects

**10:50–11:20 WMO:**

- Global Framework for Climate Services (GFCS) [10 mins] (C. Hewitt) Mutual interests, ongoing or required collaborations, next steps
- World Weather Research Programme [10 mins] (C. Davis)
- Global Atmosphere Watch [10 mins] (P. Laj or G Carmichael)

**11:20–12:20 Partnerships: General Discussion [60 mins]**

[Those who wish to show max 4 slides please send to [msparrow@wmo.int](mailto:msparrow@wmo.int) in advance of the meeting]

**7. Final Session 12:20–13:10**

**12:20–12:50 JSC Task Team on Budgeting [30 mins]** - Status of 2025 Budget

**12:50–13:00 WCRP Secretariat [10 mins]** (M Sparrow)

**13:00–13:10 Closing Remarks [10 mins]** (D Stammer, P Braconnot, M Sparrow)

**13:10 –14:30 Lunch**

**JSC Only session (finalization of any open items).  
Start at 14:30. Move to room 304.**