

## EMCR engagement in WCRP: synthesis and recommendations

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### Introduction

This document provides a synthesis of the status of Early and Mid-Career Researchers (EMCR) in World Climate Research Programme (WCRP) activities. It has been assembled by a dedicated task team created on the WCRP Joint Scientific Committee's (JSC's) request after the success of the Kigali conference and its EMCR symposium. The overarching objective is to ensure EMCRs' continuous engagements in WCRP and increase EMCR visibility and leadership in the Programme.

The term EMCR is used in WCRP to refer to master's and PhD students, researchers, and practitioners within 15 years of the highest obtained degree (excluding parental and care leave)<sup>1</sup>. Even though some of the needs for early career and mid-career researchers are different depending on the exact stage in the career and the type of position (soft money, permanent), the broad questions addressed in this document appear to be common to EMCR in general. This is because the WCRP considers all aspects of research activity, including training or summer courses, which are somewhat disconnected from university courses and training programs.

In most WCRP documents specific actions or issues related to EMCR engagement are embedded in the "capacity building" sections of the documents, which both cover a broader range of issues and are incomplete when considering EMCR issues in all their diversity. It was thus difficult from existing documents to have a complete overview of actions and practices across the whole program. To overcome this difficulty, the task team members were chosen so as to cover diverse career stages and represent the different core activities, the WCRP Academy and the JSC. They act as a relay to the community on this particular topic.

Following the terms of reference of the task team, the report presents:

- an overview of current EMCR engagement in the different WCRP activities,
- a list of short-term actions and solutions to better share good practices and improve EMCR networking across the Programs,
- common guidelines and rules to improve EMCR visibility and engagement in WCRP.

The survey of the EMCR engagement in the different activities highlights different types of specific interactions between EMCR and WCRP activities. They can be classified as **EMCR representation in WCRP, Interactions and collaborations with EMCR networks, Education and training, Exchange of knowledge and networking, specific sessions at conferences, and Support, visibility, and funding**. The status of what is being done in the different categories by the different activities is presented with a

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<sup>1</sup> We acknowledge that there are multiple definitions of ECR and MCR, each with subtle differences. The definition currently adopted by WCRP may not encompass the full scope of these definitions, and we are working on developing a common terminology that takes into account the definitions used by partner institutions, EMCR networks, and others.

rapid analysis highlighting points of attention. The last part of the project provides [Recommendations](#) and guidelines to improve EMCR visibility and engagement.

## EMCR representation in WCRP

- The **APARC** Core Project community includes a large body of early career researchers (ECRs). These researchers are engaged, proactive, and bring new perspectives to APARC. APARC encourages involvement of ECRs in Activity leadership and now has an IPO staff focusing on ECR capacity development.
- **CLIVAR** actively engages with ECRs and ensures ECR representation in most of its panels.
- The **GEWEX** Core Project ensures ECR representation on the SSG and its four panels. GEWEX panels are, at present, co-led by a mid-career scientist.
- **Rifs** works to ensure ECR representation in all activities and working groups according to WCRP guidelines. The Global Extremes Platform (GEP), under Rifs, plans to form an early career group on the topic of extremes, inviting other WCRP Core Projects and LHAs that touch this topic to nominate an ECR to this group - to design and work on a project together, as well as enhance communication across WCRP activities.
- The newly formed **ESMO** coordinates all modelling, data assimilation and observational activities within WCRP, and will encourage representation and support of ECRs in its three already established working groups: WGCM, WGSIP, WGNE, and in the newly proposed Working Group on Observations for Researching Climate (WGORC).
- *The Fresh Eyes* on **CMIP** working group with over 150 members which integrates the voices of early career researchers, scientists and practitioners in CMIP. The co-leads of *Fresh Eyes* sit on the CMIP Extended Panel, actively working to design the next phase of CMIP. Additionally, *Fresh Eyes* on CMIP has seven subgroups that are affiliated with various CMIP task teams to directly engage with task team activities. For example, *Fresh Eyes* model evaluation subgroup is working with CMIP Model Benchmarking Task Team to develop a review paper. Recent restructuring (started at the end of 2024) of *Fresh Eyes on CMIP* provides a new mechanism for ECRs to propose new projects that can benefit the CMIP community.
- **MCR** Hubs maintain networks with various ECR groups and open partnerships with EMCR-led sandbox grant teams focusing on climate.

**Synthesis:** WCRP recommendations for a better representation of EMCR in different core project activities and panel membership are effective. Growing attention is paid to EMCR engagement and advice. WCRP leadership and core activities ensure that ECRs are entrained in WCRP activities and have a say in WCRP's strategic planning. New initiatives to strengthen their participation and voice are very encouraging and should be monitored and experiences shared across WCRP.

## Interactions and collaborations with EMCR networks

- [Young Earth System Scientist \(YESS\)](#) network, which itself has over 2000 members, contributed to the organization of several conferences, including the Kigali EMCR symposium (programs, leaders of sessions and working group, search for leadership renewal, opinion papers etc.....)
- Other networks (depending on CP or subset of activities). For example, the CliC Core Project works closely with both the [Association of Polar Early Career Scientists \(APECS\)](#) and [Polar Educators International \(PEI\)](#), to ensure the next generation of researchers are included in their activities. For CliC, moving forward here should balance serving relevant EMCR and working together with existing cryosphere groups that are already working in this space (IACS, IGS,

AGU). CliC also welcomes a new SSG member who was the president of APECS-Spain and will act as a liaison.

**Synthesis:** interactions are effective and several initiatives in collaboration with international early to mid-career scientific networks. Some of these networks such as YESS are very active. For others the linkage with WCRP should be strengthened or revisited. The overall status of these interactions should be revisited to minimize duplication or overlap and to better integrate and promote them within Core activities and across the WCRP as a whole. The presentation at the JSC is appreciated and is worth continuing in future. In addition, a dedicated section on our website is needed. EMCR international networks should also be interviewed to provide their analysis of what is working well in the WCRP (or WCRP CP) collaboration, as well as areas that may need clarification or improvement (a point highlighted by YESS at the JSC-45).

### Education and training

- **The WCRP Academy** determines the requirements for climate research education and builds enabling mechanisms. These might be for Early Career Scientists focused on regions of the world (in particular the Global South) and are usually on a specific topic. Each individual core activity also contributes to capacity building, with a few examples given below. The Academy has proposed a workshop on WCRP mentoring/future leaders development approaches for 2025. If successful in gaining funding, it would be ideal to partner with this group.
- **CLIVAR** contributes to the education of the next generation of climate scientists with a particular focus on interdisciplinary studies and scientists from developing countries. CLIVAR offers a regular Series of Summer Courses in collaboration with the First Institute of Oceanography (China), and the International Centre for Theoretical Physics (Italy).
- **APARC** provides training through programs such as APARC-sponsored Summer Schools.
- **CORDEX** workshops and training courses are regularly held, especially in developing regions, and at some of them young scientists have also been trained in writing scientific publications. This has, for instance, resulted in many publications being included in the Intergovernmental Panel on Climate Change (IPCC) reports.
- **CMIP** has Fresh Eyes Documentation Subgroup which is working on an introductory guide on how to use CMIP experiment simulations.
- **GEWEX** organizes dedicated workshops, training, and competitions for ECRs at large conferences. Prioritization of ECR travel support to attend in-person SSG and panel meetings as well as courses, workshops, and conferences.
- **CliC** has workshops and summer schools which are held that prioritize ECR travel support and engagement. Different working groups have ECRs as members of their steering groups in leadership positions of task forces that often lead to major syntheses and publications. One working group has started an Early Career Scientist Exchange Program to work on collaborative projects at other institutions. CliC also co-sponsors a Summer Course in collaboration with CLIVAR, and the International Centre for Theoretical Physics (Italy).
- **MCR** has internship and mentorship programs which are also hosted for young researchers from different fields and exploring the interdisciplinary nature of climate and sustainability work. Workshops (topics vary from systems thinking to climate change and data) are also conducted for EMCRs.

**Synthesis:** The regular organization of schools and training with a focus on EMCR participation or leadership role has been implemented in almost all CP. It is important to share information and avoid too much overlap. Joint training or school should be encouraged when it is relevant. This needs to be discussed well in advance during the planning phase and involves both a discussion at the time of the

preparation of the annual funding and discussions between the CP/LHA/WCRP Academy for subjects with overlaps.

The Academy has a role to play in gathering and sharing the information and training material. These schools and training are also often done in association with specific sponsors and require co-funding.

The WCRP network should be strengthened and its visibility enhanced to attract a broad interest of WCRP partners and sponsors.

### Exchange of knowledge, networking, specific sessions at conferences

- **CLIVAR** provides global and regional fora for the exchange of ideas and knowledge amongst climate researchers and students.
- **APARC**: For instance, the growth in Artificial Intelligence (AI) and Machine Learning (ML) in atmospheric science, and the fact that ECRs are rapidly becoming the new generation of experts in the application of AI/ML techniques. APARC plans to consult with the APARC ECR community on the appetite for an AI/ML Researcher Forum that could comprise presentations, discussion sessions and an online base for sharing code/tools.
- **GEWEX** approaches other ECR organizations (e.g. YESS, AGU Hydrology Section Student Subcommittee) to prepare dedicated ECR workshops/training and competitions when organizing conferences. A new initiative for GEWEX OSC in 2024 was to create a “Space Agency Event” dedicated to ECRs exchange with experts from space agencies, including considerations of status and future professional development and enhancement of career prospects of ECRs.
- **CORDEX** has built up regional teams in several of the CORDEX domains and they collaborate within and across the groups.
- **CMIP**: Fresh Eyes on CMIP working group members have been working with CMIP IPO and CMIP task teams on organizing workshops and scientific sessions during international conferences. For example, an introductory CMIP workshop was held during the AOGS meeting in June 2024.
- **MCR** has Different hubs to organize webinars and virtual activities which foster an interdisciplinary lens of looking at climate risk and climate impacts and involve EMCRs in their organization, moderation, and presentation.
- **WCRP** had close links with YESS for the organization of the EMCR Symposium in Kigali. Production of a concept note paper by the participants submitted to the WCRP special issue in Frontier.

**Synthesis:** EMCR are well included in the different types of networking both in core activities and at WCRP level. Their leadership is recognized, and several examples are now available where they are part of or directly the conveners of workshop symposium, session at conference. It seems that more visibility should be provided to these initiatives across WCRP, which would be needed to enlarge EMCR engagement and leadership in the different types of networking. Specific requests to EMCR groups, such as what is done through *CMIP Fresh Eyes* should be encouraged in other groups.

### Support, visibility, and funding

- Most of **CLiC** activities and working groups allocated funds for ECR travel and support to meetings and workshops. For example, CLiC repurposed funds in 2022 and 2023 to support several ECR grants, which were big successes. There were 8 awards, ranging from

approximately 3,000 to 12,000 CHF, for fieldwork. Half of the recipients were women, and the awardees represented institutions in Mongolia, Nepal, Uzbekistan, Pakistan, and Argentina, alongside institutions in Europe and Canada. The awards have been paused due to pandemic and other delays related to the fact that fieldtrip and instruments are difficult to fund using WMO funding and rules. Support has also been requested for funding for an ECR summit led by APECS and PSECCO at the Arctic Science Summit Week in Denver, CO in 2025.

- **CMIP** IPO provides travel support within the available budget for Fresh Eyes members to participate in conferences and provide support within the available budget for Fresh Eyes to carry out some projects when resources are needed (for example, publication fees).
- **RIFS**: Invitations to the recent expert meeting on Robustness of Climate Change Information for Decisions were 15% ECRs, and 32% of those receiving financial support were ECRs.
- **MCR** Hubs direct students to grant opportunities, and some also provide support in possible communication of research results.
- Most **APARC** activities use their core financial support to promote ECR networking and engagement with high-level WCRP scientists at workshops and training schools by financially supporting their travel flights, accommodation and/or local transport. The ECR corner under construction on the upcoming new APARC web page aims to enhance the viability of ECR activities within APARC.
- **WCRP Fellowship**: the global WCRP fellowship program is being put into place. It has been developed as part of a dedicated JSC task team and the proposition discussed at JSC45. The task team will provide an updated document at JSC46 in 2025. The fellowship call will be defined with the JSC activities. A first example is provided in 2024 for Africa. The region is a choice made to strengthen EMCR in Africa and benefit from the momentum of the Kigali conference. There appears to be a disconnect between the information provided about the fellowship and the way the different core activities are indeed engaged in the process.

**Synthesis:** The WCRP recommendations prioritize travel support for EMCRs and people from under-represented countries who are naturally applied in the different WCRP activities to allow EMCR to participate in workshops, trainings, and schools organized by WCRP. When developed, fellowships or grants for EMCR have been well received. However, several members of the task team were not fully aware of what is going on with the new WCRP Global fellowship and find the process unclear and top down, which should be more widely and frequently circulated to make sure that it reaches the intended audience. There is a growing demand for financial support for all the activities to guarantee EMCR engagement in the different WCRP activities. A mechanism needs to be put in place to identify funding requests in advance and benefit from the WCRP network to enlarge the co-sponsor interest.

## Recommendations

1. **The EMCR corner on the WCRP website.** The objective is to provide an entry point for EMCR in the program. It will include generic information and redistribute to the CP web pages depending on the questions. This initiative is acknowledged and should be an effective tool to better connect EMCR (individuals and EMCR networks) with WCRP, and to enhance EMCR visibility in the program. Several questions have been raised on the way to maintain it actively and who will decide on the content. An editorial team (or an EMCR committee) should have the mandate to assist the secretariat and IPOs in the development of this initiative. **Update:** The EMCR corner has been set up on WCRP website- <https://www.wcrp-climate.org/emcr>
2. **Enhancing EMCR visibility.** There is a need to publicize EMCR leadership. The fellowship is a part of this, but other types of initiatives would be welcome such as:

- a. Give more value to the contributions/ideas of the younger generations by increasing the representation of the younger generations in WCRP core activities.
  - b. Regular highlights of EMCR achievements on WCRP website. For example, EMCR corner can highlight an "EMCR of the week", highlighting their WCRP-related research. That will be about 52 EMCRs in the limelight per year. This requires some organization and dedicated resources. However, after discussion with the tiger team and the secretariat, weekly highlights are a lot of workloads on the secretariat if managed only by the secretariat. It has therefore been agreed that this would be done on a 3-month basis.
  - c. Other than financial support, which is catered to select few EMCRs, it will be good to recognize EMCRs' contributions, such as awards for scientific achievements, appreciation for outstanding presentations, and recognition for service and leadership.
  - d. Coordinating and promoting EMCR webinars on their research. If established, the My Climate Risk (MCR)-ECR group has confirmed to specifically feature a dedicated MCR-ECR corner where they can upload sessions from their webinars, as an example.
  - e. EMCR prizes: with emphasize that to keep the program flexible these should certainly be at the level of the CP or particular subject. Such prizes already exist in some groups (ex. Model development).
  - f. Creating a catalog of centralized EMCR profiles including contact, expertise, geographical location etc. for all EMCRs in WCRP CP, LHA & Academy. CMIP recently started a Fresh Eye directory with open sign up for ECRs.
  - g. Creating a WCRP-focused calendar of events so that those of us working within WCRP projects can work together to ensure we gain the greatest engagement and best practice with EMCRs for our events.
3. **Strengthen and define the role of the Academy with regards to EMCR engagement.**
    - a. In addition to all events being listed via the Academy catalogue, the Academy needs to also be aware of upcoming events during their planning stage. This will allow the Academy to assess synergies across different events and see where the Academy can engage with WCRP CP and LHA planned events. The Academy catalogue is a public facing mechanism to advertise upcoming events, we also need an internal calendar of events so that those of us working within WCRP projects can work together to ensure we gain the greatest engagement and best practice with EMCRs for our events.
    - b. Develop best practice documents on a range of activities our researchers will find themselves involved in, e.g. how to run a successful workshop, how to chair a meeting with diverse participants, effectively report back from a Board of Governors (BOG), etc.
    - c. Host webinars for career development and soft skills (career path, communication, teamwork, adaptability, etc.) in collaboration with core activities such as APARC, CMIP, and others.
  4. **Providing funding for EMCR participation in WCRP activities.** The ongoing rule for support is effective in prioritizing the meeting attendance to EMCR (and underrepresented countries). Requests for training and school attached to WCRP activities are growing. A mechanism needs to be put into place for co-organization between different CP or LHA when on similar subject and to extra funding.
  5. **A dedicated EMCR engagement session at the JSC meeting** should be maintained to review the EMCR engagement in the program on an annual basis, present the major actions of the year, share good practices across the program, and measure progress.

6. **A dedicated EMCR commission** should be put into place to prepare the JSC session or propose dedicated actions when appropriate. The composition of the EMCR task team would be a good starting point. Once the JSC approves such commission, the composition and terms of reference can be highlighted on the EMCR Hub. An official representation of EMCR networks should be included.
7. **Invite EMCR networks to conduct a survey** in collaboration with WCRP to have their vision on the current status of EMCR's involvement in WCRP and proposition to improve the condition and develop new ideas.
8. Other recommendations that have been discussed (as wish list):
  - a. There should be mechanisms to mentor EMCRs across WCRP to foster diverse leadership which is not always included in one's training/education. This could be simply one-on-one coffee conversations during conferences, shadowing opportunities, etc.
  - b. A flyer summarizing everything WCRP can do for EMCRs in terms of financial support, involvement in core activities, core projects, Academy, etc. could be helpful.