

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

Date: 12-16 May 2025

Instructions

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

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

Update report for the WCRP Joint Scientific Committee

Research on Climate Intervention Lighthouse Activity

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

1. World Climate Research Program Lighthouse Activity: An Assessment of Major Research Gaps in Solar Radiation Modification Research - **J. Haywood**, O. Boucher, **C. Lennard**, T. Storelvmo, S. Tilmes and **D. Visionsi**
- <https://doi.org/10.3389/fclim.2025.1507479>
2. Perspectives and challenges of marine carbon dioxide removal - A. Oschlies, L. Thomas Bach, K. Fennel, J.-P. Gattuso and **N. Mengis**
- <https://doi.org/10.3389/fclim.2024.1506181%20>
3. Climate Intervention Research in the World Climate Research Programme A Perspective - J. Hurrell, **J. Haywood**, **P. Lawrence**, **C. Lennard** and A. Oschlies
- <https://doi.org/10.3389/fclim.2024.1505860>
4. Several of the R-CI interim SSG members and members of the previous task team led and co-authored the concept papers as a part of the WCRP OSC Special Issue in *Frontiers in Climate Science Journal*. A fourth manuscript '**Lawrence, P. J.**, Morrison, M. A., Roe, S., **Pongratz, J.**, Lapola, D., Fuss, S., et al. (2024). Land Based Carbon Dioxide Removal (CDR) as part of Climate Interventions Research in WCRP', is currently in revision.
5. Publication of AGU Ethical Framework for climate intervention [research, development and deployment] with CI LHA contributions – **Daniele Visionsi**
<https://agu.mediavalet.com/portals/ethicalframework>
6. Overshooting global-warming limits is a risky idea - **Nadine Mengis**
- Nature News and Views on Overshoot narratives with CI LHA contributions
- <https://doi.org/10.1038/d41586-024-03052-7>

2. Capacity Building/Education and Training Highlights

- *The LHA has been actively organising townhall sessions in major international conferences with an objective to introduce the LHA and to gather input from wider audiences, their views and interests in CI research, as well as foster collaborations. One such townhall session took place at the AGU in December 2024. Another one has been proposed at the EGU 2025.*
- *Following interactions with the APARC's Stratospheric Sulphur and its Role in Climate (SSiRC) panel at the APARC SSG meeting in October 2024, several members of the R-CI SSG are currently discussing collaborative work with SSiRC on SAI with the idea of involving more of the observational community to address detection and research needs. A proposal for an ISSI meeting is currently being prepared and one of its aims would be for ECRs to lead potential review papers on what is known about SAI. If successful, the team will R-CI and SSiRC team will organise webinars and workshops.*

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

- *R-CI regularly gives remote or in-person presentations to other WCRP project meetings when invited.*
- *As mentioned under Section 2, R-CI is building connections with APARC's relevant activities and is working on potential proposals.*
- *Discussion about future scenarios in the context of Safe Landing Climates (Ròland Sefarian and Lisa Miller)*
- *Potential collaborations with CLIVAR and CORDEX (Chris Lennard) on regional modelling to understand risks (esp hydrological)*
- *At the recently held GEWEX SSG meeting, they have expressed interest in working with R-CI to compare global water management and the unintended consequences it has had.*
- *R-CI will continue to leverage other WCRP projects and LHAs for synergistic activities.*

4. Partnerships with entities outside of WCRP

- *Several WCRP R-CI SSG members have been invited to participate in the WMO-UNEP joint workshop on SRM methods taking place in May 2025. WCRP is the main representative of WMO at this workshop. This is as a part of discussions with UNEP that commenced in early 2024 following UNEA 2024. The workshop outcomes are expected to feed into the 2025 UNEA.*
- *R-CI LHA is also engaged in discussions with the IPCC for the AR7 in support of a potential chapter in WG1 encompassing Earth System's response under pathways towards temperature stabilization as well as overshoot. The LHA can contribute to the IPCC's need for strong reports/publications with clear ideas on where CI research stands and what the gaps are. Further to this, the R-CI co-chairs are also co leading CDRMIP and GeoMIP, two of WCRP-endorsed MIPs*
- *One of the R-CI SSG member is now a member of Advisory Board of Univ. of Arctic Climate Interventions project.*
- *Several R-CI interim SSG members are also serving in the steering committee of the DEGREES Global Forum 2025 (<https://degreesglobalforum.org/>) and are working very*

closely to make sure the program presents a broad representation of perspectives, and a large participation from the Global South.

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

- *Review of existing best practices on CDR and SRM research (esp. AGU Framework) → development and/or adaptation of best practices and standards on CI research.*
- *Discussion paper on the commonalities between carbon dioxide removal and SRM*
- *Identifying policy relevant themes that climate interventions research would need to address in the next 5-10 years*
- *Identify and highlight potential and emerging risks, unintended consequences, co-benefits of climate interventions*
- *Review and identify resources needed to support best-practice climate intervention research*

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

- *Identified activities have been mentioned in the previous sections.*

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

Nothing in specific.