

SIMIP vision, strategy and roadmap for CMIP7

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The Sea Ice MIP Scientific Steering Group

Vision, Mission, and Objectives

The [Sea Ice Model Intercomparison Project](#) (SIMIP) is one of the 35 registered Model Intercomparison Projects (MIPs) that will serve as a basis for the upcoming seventh phase of the Coupled Model Intercomparison Project (CMIP7) of the World Climate Research Programme (WCRP).

Largely building on previous efforts developed in the context of CMIP6, the **vision** of SIMIP for CMIP7 is to “enable a better understanding of the role of sea ice for the changing climate of our planet” (Notz et al., 2016).

The **mission** of SIMIP is to coordinate and facilitate systematic comparisons of sea ice models and sea ice model outputs, and ease the comparison to observations.

The work within SIMIP is defined by its two main objectives:

(O1) Facilitate the analysis of sea ice-related diagnostics in CMIP7.

SIMIP will request and document the data that will be saved in CMIP7 simulations. Critically, SIMIP intends to encourage and support specific data requests that may emerge from the sea ice community itself.

(O2) Develop community building around sea ice research.

The SIMIP SSG will foster exchange within and beyond the sea ice community, putting researchers in contact with each other to ensure a smooth and efficient transfer of information, paying attention to avoid geographical tropism and placing particular emphasis to create linkages between the observational and modeling communities.

SIMIP Activities for CMIP7 and their relationship to the high-level objectives

1. Preparation of the CMIP7 data request (2024-2025; O1)

- SIMIP will participate, through the involvement of the SSG co-chairs in the Oceans and Sea ice Data Request Team, in the creation of the data request related to sea ice. This data request is largely based on the data request for CMIP6, with marginal

improvements (naming, conventions, units) made to harmonize the data request. Also, SIMIP will accommodate topical requests that come from the user community.

- SIMIP will provide, through one of the members of its SSG, guidance for the list of sea ice related variables to be included in the [Rapid Evaluation Framework](#) (REF), an application developed for generating metrics for community evaluation packages, allowing fast and quick monitoring of the CMIP7 simulations.
- SIMIP will contact modeling centers participating in CMIP7 to inform them about the changes needed to operate between the CMIP6 and CMIP7 versions of the sea-ice specific aspects of the data request.

2. Documentation of sea ice model characteristics in CMIP7 (2025-2026; O1, O2)

- The SSG will collect an exhaustive description of the sea ice model characteristics used by each modeling group for CMIP7. This description will be published in a reference document (with DOI) that can be cited in all subsequent scientific studies that use this data. This work will save a significant amount of time and avoid the heavy work for individuals to retrieve highly scattered information.

3. Capacity building and coordination of high-level scientific articles (2026-2028; O2)

- Based on the successful examples of CMIP6 (one paper on Arctic sea ice analyses and one on Antarctic sea ice analyses; SIMIP community, 2020; Roach et al., 2020), SIMIP will produce 2-3 reference articles related to sea ice in CMIP7. To achieve this, a **5-day hackathon** will likely be organized in 2026 or 2027 depending on the timing of CMIP7 data availability. During that hackathon (that will be physically hosted across three continental hubs: North America, Europe, Asia/Australia, with a virtual participation component), researchers will be tasked to analyze CMIP7 sea ice data. The results from the hackathon will be used to write CMIP7 sea ice papers, including all contributing scientists as co-authors.
- A 2-day workshop on **best practices in model/data comparison** will likely be organized (possibly within the hackathon mentioned above) to reflect on the growing availability of new sea ice observational products (year-round sea ice thickness, freeboard, drift, long-term reconstructions, sea ice age). All pitfalls (differences in definitions, underlying assumptions, use of uncertainty information) will be reviewed for each diagnostic and a comprehensive methodological paper will be published to avoid the misinterpretation of model output.

4. Webinars and other activities (2026-2030, O2)

- Topical webinars will be organized periodically (2-4 per year) on sea ice related topics. This may include (but will not be restricted to) inviting a scientist to present the results from his/her modeling team, or present results from a paper, or any other

sea ice research. Most of this activity is expected at the time of peak CMIP7 data processing, namely 2027-2028.

Annex I: Governance and structure

The Scientific Steering Group (SSG) of SIMIP is the body responsible for executing the SIMIP objectives. It is composed of 10 members, including 3 co-chairs¹ and 2 early-career scientists. The co-chairs are responsible for coordinating the work within the SSG, and consulting with it for feedback at all relevant occasions. The SSG is itself in contact with the broader SIMIP community, which is defined by all individuals who have registered on the SIMIP mailing list (simip@climate-cryosphere.org). After transition to new co-chairs, previous co-chairs of SIMIP are expected to remain on the SSG for the next SSG period to ensure continuity and preservation of information within the leadership team.

Annex II: Status of work as of July 24th, 2025

- The [CMIP7 data request](#) has been finalized. The sea ice data request has benefited from the input of the sea ice community, and is structured around specific Opportunities (as all other data requests). The “Sea Ice Changes, Drivers and Impacts” Opportunity has been created to enable performing the same analyses that were done in CMIP6. The “Causality of Polar Amplification” Opportunity has been created by an individual supported by the SSG co-chairs and is a good example of community-driven achievements.
- A list of diagnostics retained for the REF has been published (CMIP Model Benchmarking Task Team, 2024)
- A thematic paper from the Ocean & Sea Ice team is in preparation. This paper is the scientific document that accompanies the Data Request.

References

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