

Template for Annual SCOR Working Group Reports to SCOR

Summary / Highlights:

The iron model intercomparison project (FeMIP) SCOR working group 151 made further progress on delivering its four objectives during 2022. The release of a new iron climatological data product and multi model mean across a suite of Earth System Models delivers objective 1 by making these data and model product freely available for the modelling community via Zenodo. Objective 2 was already delivered last year, with the release via Github of a stand-alone tool for the interrogation of model output in a standardised manner. A set of papers published last year have also delivered on objective 3. Objective 4 was contributed to by paper bringing together field and modelling estimates of iron bioavailability and a summary table on the hierarchy of approaches to representing iron biological and biogeochemical processes in Earth System Models is complete and being shared with the modelling community for feedback. This set of deliverables meets the objectives set out for the working group and completes its contribution.

1. Name of group

Working Group 151 FeMIP

2. Activities since previous report to SCOR (e.g., virtual or in-person meetings, email discussions, special sessions). Limit 1000 words

Work has progressed offline

3. Documents published since previous report to SCOR (e.g., peer-reviewed journal articles, reports, Web pages) and should be limited to publications that resulted directly from WG activities and which acknowledge SCOR support

New data based iron climatology, with paper here:

Huang, Y., A. Tagliabue, and N. Cassar (2022), Data-Driven Modeling of Dissolved Iron in the Global Ocean, *Frontiers in Marine Science*, 9, doi:10.3389/fmars.2022.837183.

and dataset freely available here:

<https://doi.org/10.5281/zenodo.6385043>

Paper intercomparing different iron cycle representations and processes:
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Somes, C. J., A. W. Dale, K. Wallmann, F. Scholz, W. Yao, A. Oschlies, J. Muglia, A. Schmittner, and E. P. Achterberg (2021), Constraining Global Marine Iron Sources and Ligand-Mediated Scavenging Fluxes With GEOTRACES Dissolved Iron Measurements in an Ocean Biogeochemical Model, *Global Biogeochemical Cycles*, 35(8), doi:10.1029/2021gb006948.

The multi model mean from the original FeMIP paper has also been shared online:

Tagliabue, Alessandro, Aumont, Olivier, De Ath, Ros, Dunne, John P, Dutkiewicz, Stephanie, Galbraith, Eric, Misumi, Kazuhiro, Moore, J Keith, Ridgwell, Andy, Shermann, Elliot, Stock, Charles, Vichi, Marcello, Voelker, Christoph, & Yool, Andrew. (2022). Iron model intercomparison project multi model dissolved iron data (1.0) [Data set]. Zenodo. <https://doi.org/10.5281/zenodo.5827909>

4. Progress toward achieving group's terms of reference. List each term of reference separately and describe progress on each one. Limit 1000 words

The release of the data product and multi model mean from the original FeMIP delivers objective 1 by making a data product available for the modelling community

Objective 2 was already achieved as per last years report (Iron model evaluation tools - <https://github.com/RGRJON002/FeMIPeval>)

Somes et al paper contributes towards achieving Objective 3

A summary table has been compiled by Boyd, Dutkiewicz, Tagliabue and Twining on the hierarchy of approaches to representing iron biological and biogeochemical processes in earth system models as a part of Objective 4. This table is shared on the FEMIP slack and to various modelling groups to complete.

Work led by Yeala Shaked, including WG members Tagliabue, Twining and Maldonado on the diagnosing of Fe bioavailability from field studies and model results contributed to objective 4.

5. WG activities planned for the coming year. Limit 500 words

Complete the final task for Obj 4 that is underway

6. Is the group having difficulties expected in achieving terms of reference or meeting original time schedule? If so, why, and what is being done to address the difficulties Limit 200 words

We believe we have fully completed our objectives 1-3, partial completion of Objective 4, and the work to complete objective 4 is underway. We feel that completes the goals of the WG.

7. Any special comments or requests to SCOR. Limit 100 words.

Thank you to SCOR for the support for this WG.

Additional information can be submitted and will be included in the background book for the SCOR meeting at the discretion of the SCOR Executive Committee Reporter for the WG and the SCOR Secretariat.