Summary of Community Feedback on Future OMWG Development and Applications

Ocean Model Working Group Meeting 2025

Gustavo Marques & Ian Grooms
*Co-chairs Ocean Model Working Group (OMWG)*

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Purpose of the Survey

- The OMWG has very limited resources, and we must allocate them strategically to best serve the community;

- Helps us identify high-priority development needs based on collective input, including interest in tutorials and specific model improvements;

- While we value all feedback, participation does not guarantee that specific requests will be implemented;

- Important to clarify that this survey is meant to guide community-driven development within our resource constraints;

- Our goal is to align development efforts with broad community needs, ensuring that our limited resources are used effectively.
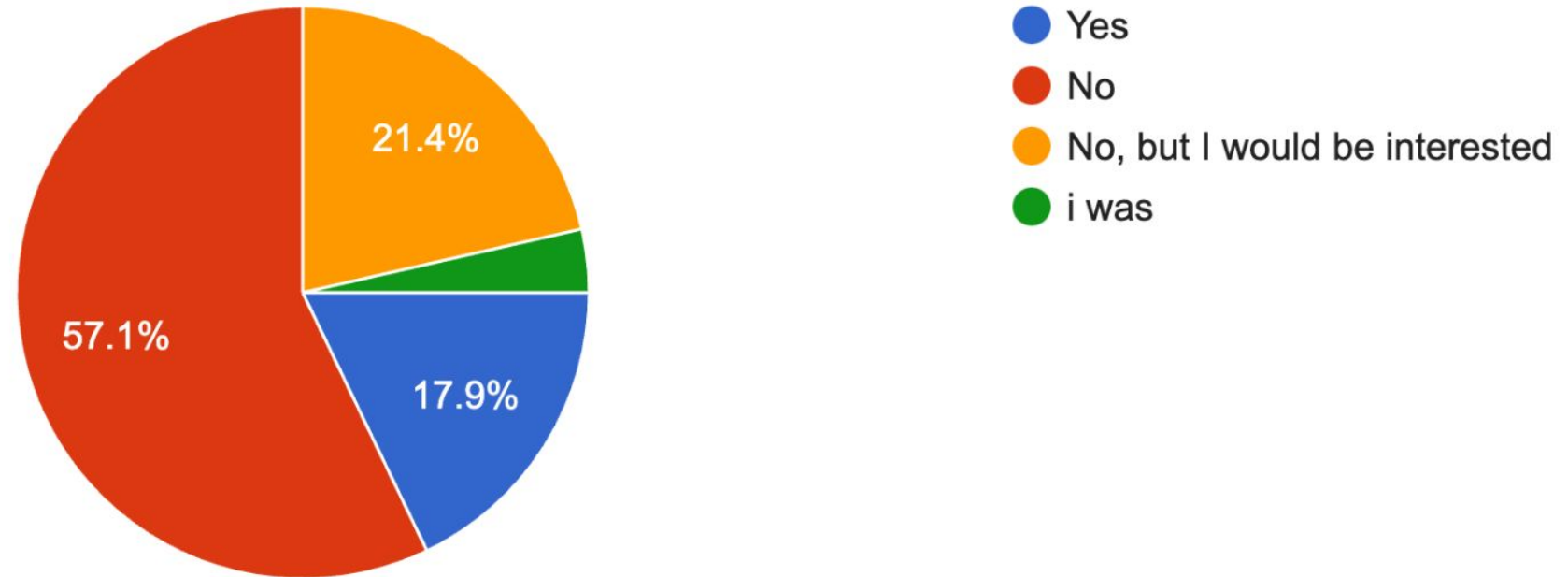
Survey Participation
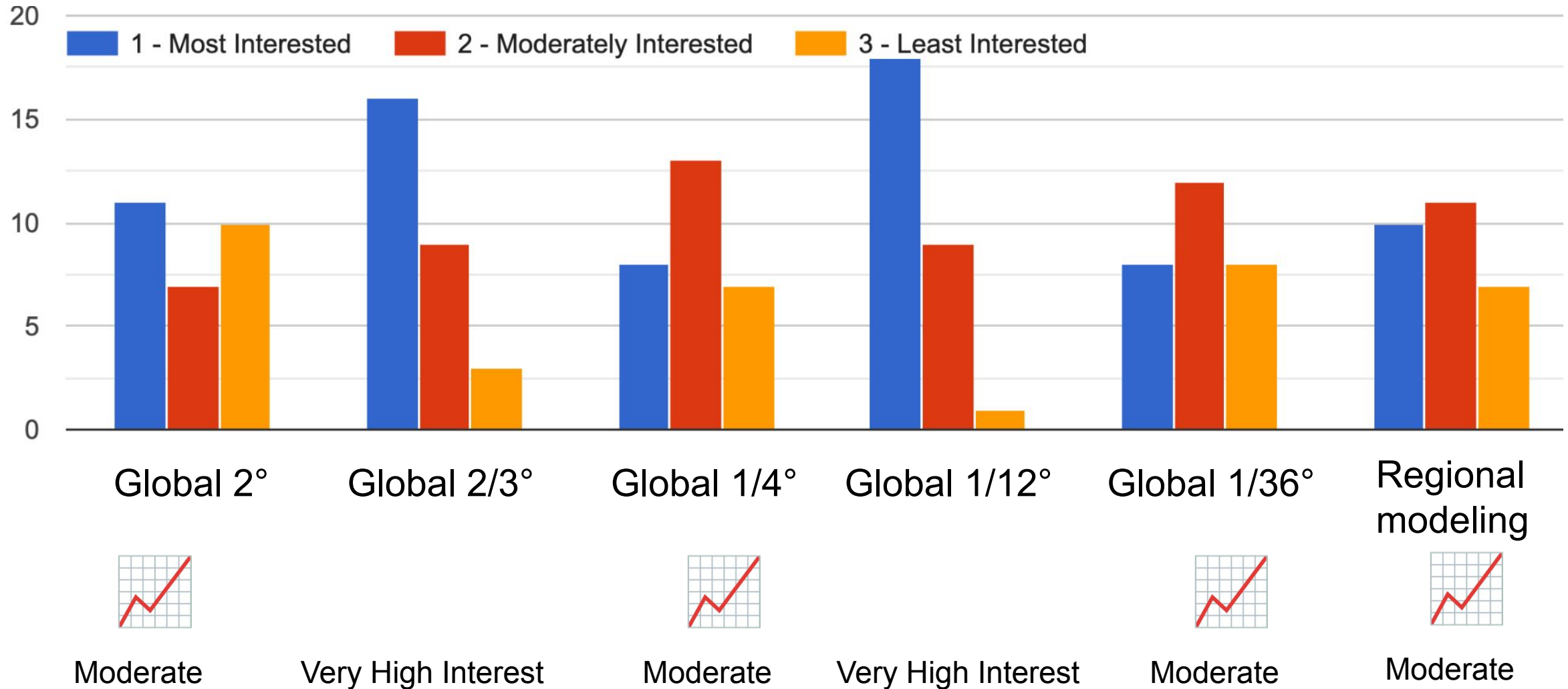
- Total responses: 28;
- Affiliation breakdown:
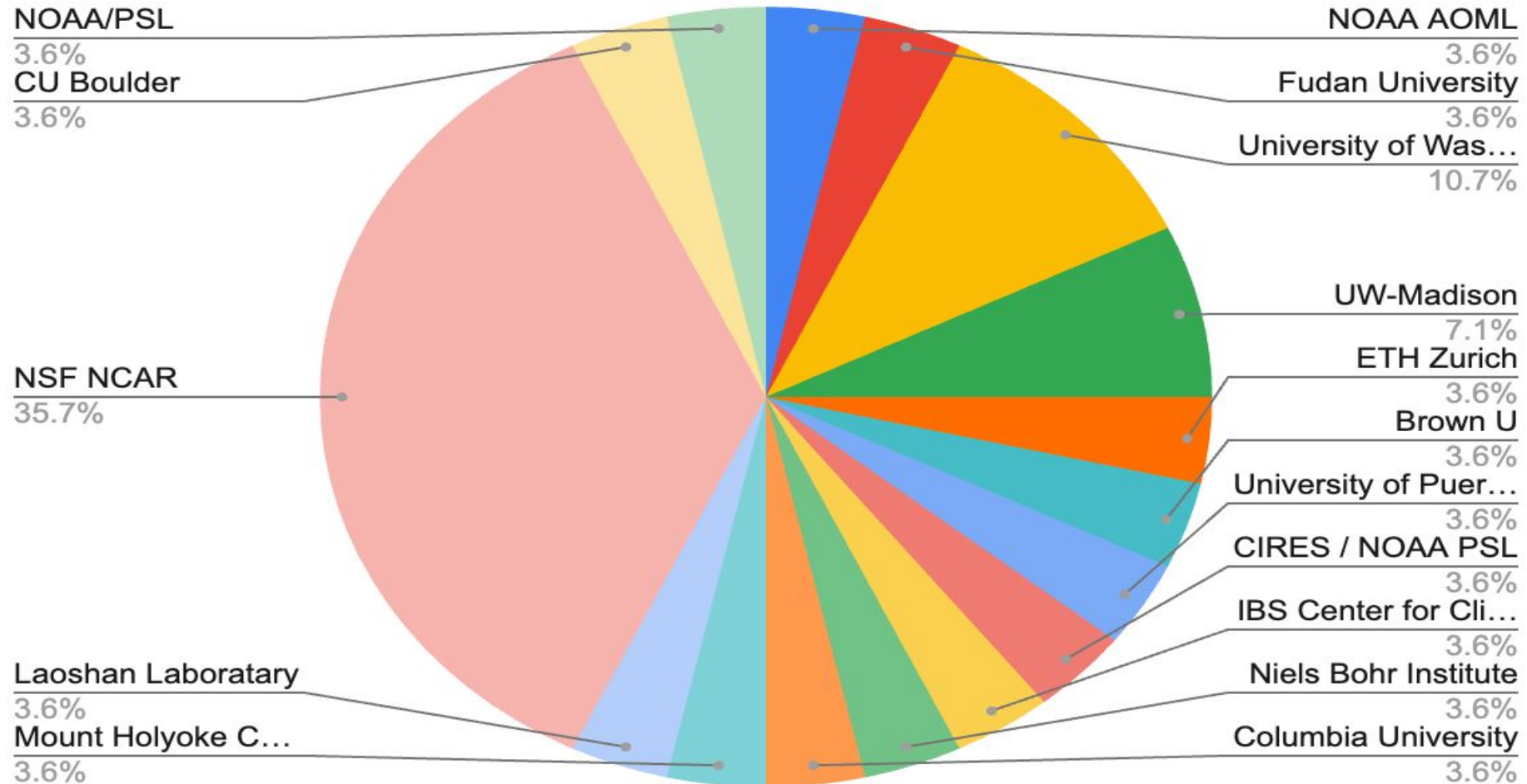
Interest in MOM6 development

Are you engaged in MOM6 development?

28 responses

- Yes
- No
- No, but I would be interested
- i was

57.1%

21.4%

17.9%

Science Priorities Behind Interest in Configurations (28 responses)

- **Large-Scale Circulation & Climate**: AMOC, MOC, decadal variability, air-sea interaction, heat transport;

- **High-Resolution Modeling**: 1/12° for mesoscale dynamics, regional Antarctic modeling;

- **Ice-Ocean Interactions**: Southern Ocean, ice-shelf circulation, Antarctic ice sheet coupling;

- **Extreme Events & Predictability**: SST extremes, SSH changes, operational S2S predictability;

- **Paleoclimate & Long-Term Simulations**: 2° for long-term climate, deep ocean equilibrium, millennial-scale simulations, tracer spin-up;

- **Biogeochemistry & Ecosystem Dynamics**: Mode water formation, biogeochemical cycles;

Summary of MOM6 Development Needs (18 responses)

- **Resolution & Performance:** Support for low/high-res, regional models, and GPU compatibility;

- **Paleoclimate & Land Ice:** Enhanced paleo configurations, improved ice-ocean interactions, and sub-shelf cavity modeling;

- **Physics & Parameterizations:** Refined mixing schemes, overflow parameterization, and wave-driven entrainment;

- **Diagnostics & Tools:** Improved post-processing, educational diagnostics, and particle tracking;

- **Other:** Tides, regional coupling, better documentation and analysis tutorials.
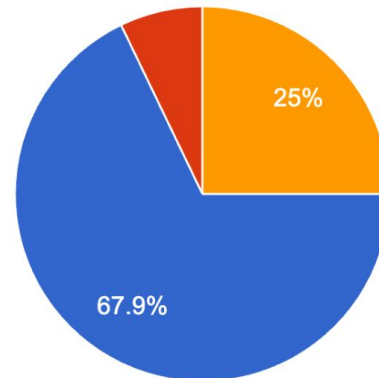
Familiarity with Hybrid-Coordinate Models
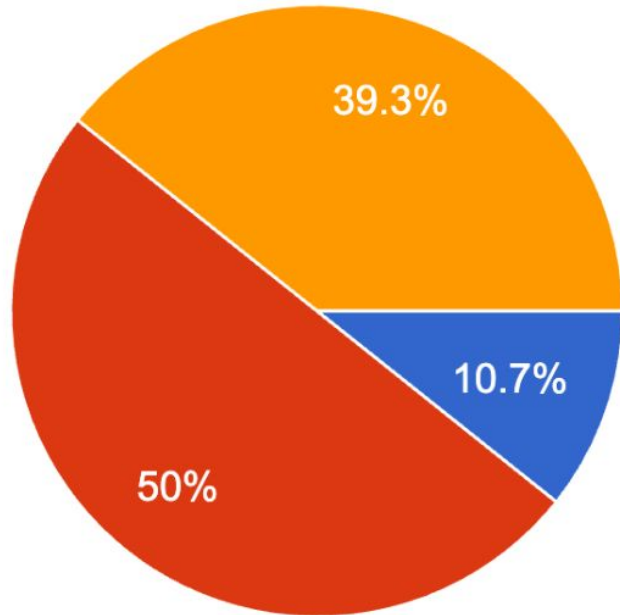
Legend:
- Very familiar
- Somewhat familiar
- Not familiar

39.3%
10.7%
50%

Follow-Up (Optional): Would you like tutorials or example materials (e.g., GitHub repositories) to help you better understand and work with output in native hybrid vertical coordinates?

28 responses

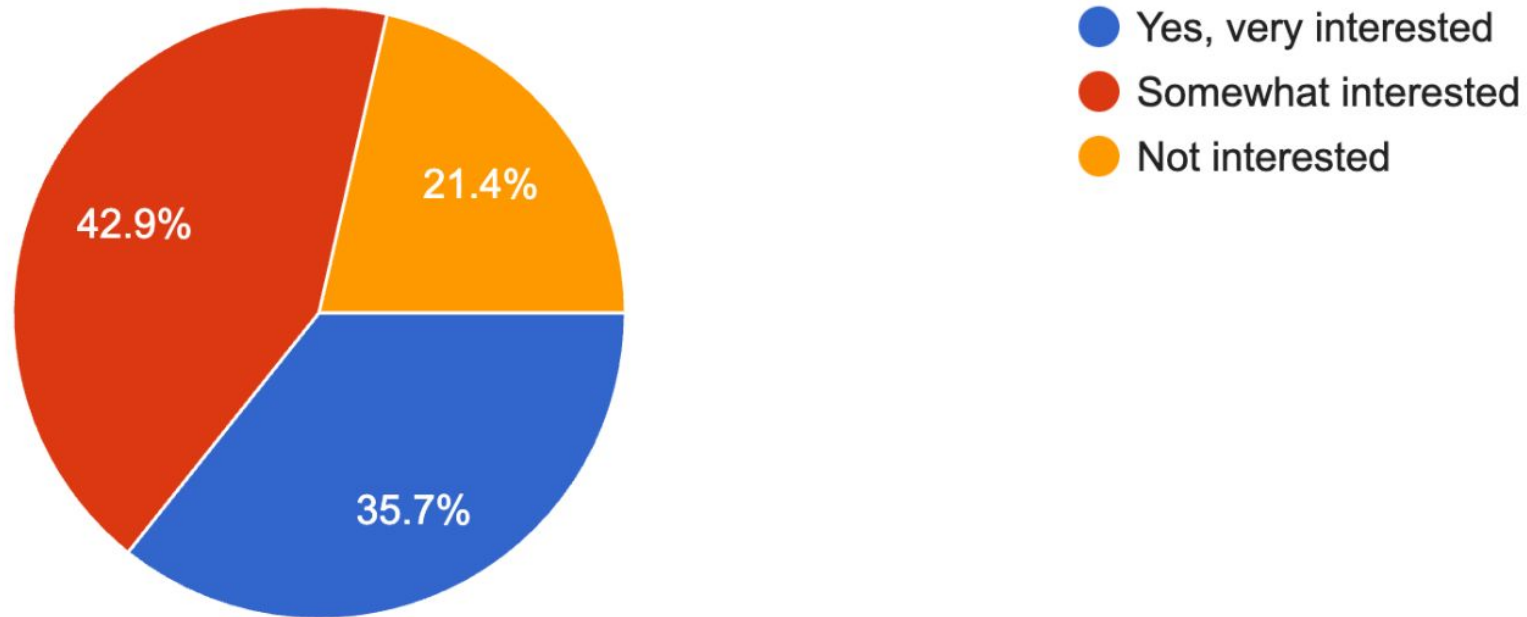

Legend:
- Yes
- No
- Maybe

25%
67.9%

Interest in a MOM6 Tutorial

Would you be interested in attending a MOM6 tutorial planned for Fall 2025?

28 responses

- Yes, very interested
- Somewhat interested
- Not interested

42.9% 21.4% 35.7%

Topics of interest for a MOM6 tutorial (16 responses)

- **Practical Application:** Model configuration within CESM (global/regional), coupled examples, and customization of forcing;

- **Data Handling & Analysis:** Plotting, regridding, diagnostic packages, and tools for budget closure;

- **Model Mechanics:** Namelist/module descriptions, parameterization details, and vertical grid understanding;

- **Development & Best Practices:** Git/GitHub workflows, recent model development updates, and tuning processes;

- **Specific Applications:** Ocean-ice sheet interactions, and setting up MOM6 for specific compsets.

Biases & Uncertainties to Address

- **AMOC:** Improve representation and variability;

- **Temperature Biases:** Reduce systematic model biases;

- **GS/NAC Biases:** Improve strength and position of the Gulf Stream and North Atlantic Current;

- **Mode Water:** Enhance formation and characteristics;

- **Deep Water Formation:** Improve accuracy in key regions;

- **Overflows:** Better representation of Greenland-Iceland-Norwegian sea overflows;

- **Arctic Salinity:** Address biases in Arctic salinity distribution;

- **Deep Ventilation:** Strengthen deep ocean ventilation where needed;

- **Agulhas Leakage:** Improve simulation of Agulhas leakage and its impacts;

- **MLD in MOM6:** Ensure mixed layer depth (MLD) performance is at least as good as in POP.

Summary of Key Takeaways

- Strong interest in global **2/3°** and **1/12°**, moderate interest in global **2°**, **1/4°**, and **1/36°**, and **regional**;

- Need for tutorial examples on working with native coordinates;

- High demand for a MOM6 tutorial;

- Key biases to address include AMOC strength/variability, temperature biases, Gulf Stream/North Atlantic Current position, mode and deep water formation, overflows, Arctic salinity, Agulhas leakage, and MLD, which should not degrade from POP.

Next Steps for OMWG

- Use survey results to prioritize development;

- Explore possible funding mechanisms and pathways based on survey results to support key developments and community priorities;

- Plan for **MOM6 tutorial in 2025** based on interest;

- Address key model biases and uncertainties in upcoming efforts;

- Continue engaging the community for participation and feedback.

Thank you to all survey participants!

Please email Gustavo Marques (gmarques@ucar.edu) and/or Ian Grooms (Ian.Grooms@colorado.edu) with further questions or input.