

ESM-SnowMIP Workshop 2016

10 December 2016

Landmark Building C, Room 205, Fort Mason, San Francisco (<https://fortmason.org/visit/>)

Aims of the workshop

- Discuss site simulation strategy. What is missing?
- Presentation of first preliminary site simulation results; strategies for evaluation
- Discuss analysis strategies for site and global-scale simulations, and identify leaders of these analyses
- Refine the planning of global-scale offline and coupled ESM simulations
- Foster links to CMIP6 sub-projects: LS3MIP (land-surface, snow and soil humidity) and ISMIP6 (ice sheet modeling) and other activities

Agenda and Presentation Summaries

Time	Topic	Presenter	Presentation Summary
8:15 AM	Breakfast – FireHouse Building		Presentation Summary
9:00 AM	Welcome and general introduction: General aims, links to other MIPs, overview of simulation plans, etc.	G. Krinner	-overview of ESM-SnowMIP objectives and timeline, connections with LS3MIP
9:20 AM	Global snow observations: SnowPEX	C. Derksen	-overview of observed snow products, results from SnowPEX assessment of SWE and snow extent products; -impact of observational uncertainty on historical trends and temperature sensitivity; -overview of snow albedo products
9:40 AM	Recent progress in land surface modeling and land surface model evaluation/benchmarking	A. Boone	-overview of ISBA-DF and ISBA-ES; -2 layer Arctic snowpacks not simulated properly with respect to density and thermal conductivity profiles -benchmarking options: is there a simple baseline for snow to beat? What are the lower and upper limits to predictability?
10:10 AM	ESM-SnowMIP site simulations: Lessons learned from SnowMIP 1&2. Which sites, years, planned experiments, forcing data, evaluation data	R. Essery	-potential additional sites and forcing data requirements -site by site status report on datasets, metadata, remaining issues, pilot simulations
10:50 AM	Coffee break		
11:10 AM	Preliminary site simulation results	R. Essery	-evaluation data: SWE, snow depth, albedo, IR skin temp, runoff, Tsoil; -time series plots and calculation of metrics between model results and evaluation data to be automated; -evaluation data not released with draft instructions; Pilot results from Col de Porte with 32 member Factorial Snow Model

			simulation: cross-validation between sites and variables; no single best model, but model configuration that works best at one site, tends to work well at other sites; model configurations simulating snow mass poorly tend to simulate runoff, depth, albedo and temperatures poorly
12:00 PM	Discussion of site simulations: additional analyses, identify leaders for these analyses. How to optimize synergies between specialized snow models and global land surface models?	R. Essery	<ul style="list-style-type: none"> -calibration: will complicate comparisons with CMIP6 and GSWP3 if different configurations are used; -provide standardized data and protocol for calibration, and encourage calibration as an additional experiment; -extract GSWP3 forcing for points with in situ data and run in 1-D mode for comparison with observations; -required analysis: in situ evaluation of control simulations; interpretation of fixed albedo, no thermal insulation, and shallow soil experiments; radiative forcing; performance of models in calibration; downscaling from GSWP3; evaluation of snow in global simulations; using behavior of models at sites to understand global simulations and climate sensitivity
12:30 PM	Lunch		
1:30 PM	Global offline simulations for land surface model evaluation: plans for LMIP and GSWP3; Meteorological forcing data	H. Kim	<ul style="list-style-type: none"> -overview of GSWP3: start with 20CR reanalysis, dynamical downscale to 0.5 degree/3 hour resolution, daily statistical bias correction from observational products; -CMIP6 variable list to be finalized soon; -GSWP3 forcing data finalized by early 2017
2:00 PM	ESM-SnowMIP global offline simulations: Planned experiments, timing, analysis strategies. Identify leaders for planned and additional analyses	G. Krinner; C. Thackeray	<p>Krinner</p> <ul style="list-style-type: none"> -overview of global offline simulations <p>Thackeray</p> <ul style="list-style-type: none"> -global offline runs with CLM4; -fixed albedo @ 0.7 = very little impact during DJF; 0.5 – 1 deg impact on Tsurf in MAM; -no snow insulation: set thermal conductivity to $50 \text{ W m}^{-1} \text{ K}^{-1}$ = 1-2 degree warming; cooling of DJF soil exceeds 12 degrees;

			-prescribed SWE: regional biases of both signs between Blended-5 SWE product and CLM climatology
2:40 PM	Coupled simulations: Planned experiments, timing, analysis strategies. Analysis of snow SW radiative effect. Identify leaders for planned and additional analyses.	G. Krinner; J. Perket	<p>Krinner</p> <p>-overview of global coupled simulations</p> <p>Perket</p> <p>-overview of Snow Shortwave Radiative Effect;</p> <p>-in RCP8.5 projections, snow becomes a great CRE contributor than sea ice</p>
3:30 PM	Coffee break		
3:45 PM	Wrap-up, action items	C. Derksen	-meeting notes and actions to be circulated via ESM-SnowMIP mailing list by C. Derksen
4:30 PM	Joint session with ISMIP6: MIP overviews, potential synergy, future opportunities	G. Krinner	-G. Krinner to follow-up with ISMIP re. potential reference site simulations at Summit and/or Dome C
5:00 PM	Adjourn to reception (food provided; 10\$ donation required for drinks)		