

	Idea	Short (< 1 year) Medium (1-2 yr) Long (2-5 yr)	NRI team
1	Establish a stand alone cryosphere component for ACCESS (ice sheets, sea ice, glaciers, and icebergs) and facilitate community building in Australia towards integrated ACCESS-NRI phase 2. International to national knowledge brokering and links to international efforts.	Immediate	All
2	Provide a tool to assess two-way feedbacks between ice sheets and ocean and assessment of climate impacts: Incorporate/test ice shelf cavities - physics of ice/ocean boundary forcing. E.g. assess suitability of other international approaches for Australian need (e.g. GFDL MOM6)	Short	Ocean
3	Downscaling for ismip6 for ice sheet projections under CMIP7 (better climate forcing and ocean/atmosphere melt parameterisations). Next iteration of ISMIP6 underway	Short	Cryosphere?
4	Provide a tool to assess two-way feedbacks between ice sheets and atmosphere e.g. (Accumulation and surface melt)	Short	Atmosphere
5	Provide a tool to assess two-way feedbacks between ice sheets and atmosphere e.g. (Accumulation and surface melt)	Short	Land
6	Configure ice-sheet/ocean boundary conditions: ice sheet feedbacks into coupled climate models. Beyond hosing/surface runoff experiments and new processes icebergs, subglacial meltwater and dFe.	Short	Ocean
7	Provide ability to make sea level and hydroclimate projections from the models relevant to Australia: Downscaling coastal impacts - high resolution continental shelf sea simulations.	Medium	User
8	Undertake and develop sea level fingerprinting approaches for Australia's national interests	Medium	Ocean
9	Agree and progress ice sheet model and coupled model framework: Assess suitability of Ice-sheet/climate coupling international approaches for Australian need	Long	Coupled

More information on any of the NRI ideas

1. Recognising Ice Sheets is presently not a formal component of ACCESS-NRI. AAD has interest to develop a formal relationship.
2. Ice sheet melt is critical component of global climate system (e.g. rearranging overturning circulation) over short time scales, over decades to century timescales
3. Increased accumulation versus ocean-driven melt
4. Recruitment?

Any other notes

Research collaborations...

Facilitate capacity building and community building in Australia

Decide on the best ice sheet component

E.G.

- Changes to global hydrological cycle and interactions with other climate components (oceans, sea ice, bgc).
- Australia and Pacific in the far-field of Greenland and West Antarctic mass changes.

Too early for full ice sheet coupling

Steps to get there

- Rerun cmip6 models, enhanced runoff
 - Downscale CMIP6 projections for ice sheets ISMIP6
 - Bespoke simulations
 - Fully coupled systems from other larger international efforts.
 - Choice of model and coupling frameworks?
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- Downscaling for ismip6 for ice sheet projections under CMIP7 (better climate forcing and ocean/atmosphere melt parameterisations)
 - Facilitate ice sheet feedbacks into coupled climate models. Beyond hosing/surface runoff experiments. Subglacial meltwater and dFe.
 - Coupled ice sheet into ESM (long-time horizon)
 - Support for bespoke sensitivity tests for ice sheet models and feedbacks for the global ocean
 - Testing and evaluation of Antarctic ice cavity parameterizations with Australian observational activities.

- Policy relevant outcomes sea level and hydroclimate projections from the models relevant to AUstralia: Downscaling coastal impacts.
- Sea level and fingerprinting and analysis - e.g. influence of ice sheet mass changes on pacific islands?

Icebergs?

Coupling frameworks?

- Building towards integrated ACCESS-NRI phase 2.
- Greenland/Antarctica
- Stand alone ice sheet models
- Knowledge brokering?
- Information from
- Timescales