The Cryosphere Discuss.,
https://doi.org/10.5194/tc-2020-353-SC1, 2021

The Cryosphere
Discussions

Interactive comment on "PISM-LakeCC: Implementing an adaptive proglacial lake boundary into an ice sheet model" *by* Sebastian Hinck et al.

Evan Gowan

evangowan@gmail.com

Received and published: 5 February 2021

The Lingle-Clark GIA module that we use calculates the effects of the ice load on a self-gravitating, spherical Earth that responds to changes in the ice load. It is calculating the visco-elastic and elastic deformation and gravitational changes, i.e. changes in the geoid. We fully acknowledge that the Lingle-Clark model is not as sophisticated as a full sea level equation solver like SELEN, particularly because it does not include a higher viscosity lower mantle that is responsible for a substantial amount of the GIA response in North America. However, for the purposes of our experiments where we want to demonstrate that dynamically evolving lakes affect ice sheet retreat in a sub-

stantial way, the Lingle-Clark model includes the two components most important for determining lake geometry - Earth deformation and gravitational changes. The lake module responds to dynamic changes in the topography, and therefore evolves when there are changes in the geoid in the experiment.

Interactive comment on The Cryosphere Discuss., https://doi.org/10.5194/tc-2020-353, 2020.