Geophysical Research Abstracts
Vol. 20, EGU2018-12311-1, 2018
EGU General Assembly 2018

Effect of GIA model resolution on relative sea level and land motion computations in Fennoscandia

Maaria Nordman (1), Glenn Milne (2), Lev Tarasov (3), and Holger Steffen (4)

(1) Finnish Geospatial Research Institute, National Land Survey of Finland, Kirkkonummi, Finland (maaria.nordman@nls.fi), (2) University of Ottawa, Ottawa, Canada, (3) Memorial University of Newfoundland, St. John's, Canada, (4) Lantmäteriet, Gävle, Sweden

Computation of relative sea level and land uplift is usually done by representing spatial fields as truncated series expansions of spherical harmonic functions. These series are typically truncated around degree and order 200, the exact number varying between different codes. In a previous study (Nordman et al. 2015) that examined the sensitivity of decay time computations at Ångerman River in Sweden, we compared results for a truncation level of 256 (spatial resolution of about 0.7 degree) and 512 (spatial resolution of about 0.35 degree) and found that the higher resolution computations changed the computed decay time between -0.2 to 0.7 kyr depending on the adopted viscosity model and ice model (with a mean change of $\sim$0.2 kyr for the range of model parameters considered). This result is most likely due to an overestimate of the influence of water (un)loading in the relatively narrow Bothnian Bay for the lower resolution case. As a result, viscosity estimates based on the Ångerman River decay time will be (on average) biased low when lower truncation values are used. Here, we expand this analysis to consider model output and observations of RSL and present-day land motion at a number of locations in Fennoscandia to determine the impact of model resolution on viscosity inference using this broader class of GIA observables.

Reference:
Nordman, M., Milne, G., & Tarasov, L. (2015). Reappraisal of the Ångerman River decay time estimate and its application to determine uncertainty in Earth viscosity structure. Geophysical Journal International, 201(2), 811-822.