



NKG201xGIA – first results for a new model of glacial isostatic adjustment in Fennoscandia

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Glacial isostatic adjustment (GIA) is a dominant process in northern Europe, which is observed with several geodetic and geophysical methods. The observed land uplift due to this process amounts to about 1 cm/year in the northern Gulf of Bothnia. GIA affects the establishment and maintenance of reliable geodetic and gravimetric reference networks in the Nordic countries. To support a high level of accuracy in the determination of position, adequate corrections have to be applied with dedicated models.

Currently, there are efforts within a Nordic Geodetic Commission (NKG) activity towards a model of glacial isostatic adjustment for Fennoscandia. The new model, NKG201xGIA, to be developed in the near future will complement the forthcoming empirical NKG land uplift model, which will substitute the currently used empirical land uplift model NKG2005LU (Ågren & Svensson, 2007). Together, the models will be a reference for vertical and horizontal motion, gravity and geoid change and more. NKG201xGIA will also provide uncertainty estimates for each field.

Following former investigations, the GIA model is based on a combination of an ice and an earth model. The selected reference ice model, GLAC, for Fennoscandia, the Barents/Kara seas and the British Isles is provided by Lev Tarasov and co-workers. Tests of different ice and earth models will be performed based on the expertise of each involved modeler. This includes studies on high resolution ice sheets, different rheologies, lateral variations in lithosphere and mantle viscosity and more. This will also be done in co-operation with scientists outside NKG who help in the development and testing of the model.

References

Ågren, J., Svensson, R. (2007): Postglacial Land Uplift Model and System Definition for the New Swedish Height System RH 2000. Reports in Geodesy and Geographical Information Systems Rapportserie, LMV-Rapport 4, Lantmäteriet, Gävle.