Impacts of the interaction between ice sheets and solid Earth on the prediction of sea-level change

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Ice sheet, sea water, and terrestrial water storage act as surface mass loads on the solid Earth. Past and present variations of these loads make the solid Earth deform as the elastic and the viscous responses. These deformations have been clearly observed by geodetic, geomorphological and geological methods based on the field survey and the satellite measurement. To reconstruct the sea-level change associated with the surface mass changes and the solid Earth's response based on these observations, we need to apply the numerical modeling described by the Glacial Isostatic Adjustment (GIA) theory. GIA modeling results indicate that the predicted sea-level changes in any sites are spatially non-uniform because of the crustal deformation due to the GIA depending on the geometry of the surface mass loads, namely distribution of ice and water. Therefore, the precise evaluation of the GIA is vital to elucidate present and past sea-level changes. In this presentation, we show the crustal deformation derived from GIA due to present and past surface load changes and illustrate the importance of GIA component for precise projection of the sea-level change.

Keywords: polar ice sheets, Glacial Isostatic Adjustment, sea-level change

