ISTerre
Institut des Sciences de la Terre

Grand Séminaire 2015/2016

GNET: Geodetic Sensing of Climate Cycles, Climate Change and Glacial Isostatic Adjustment in Greenland

Michael Bevis

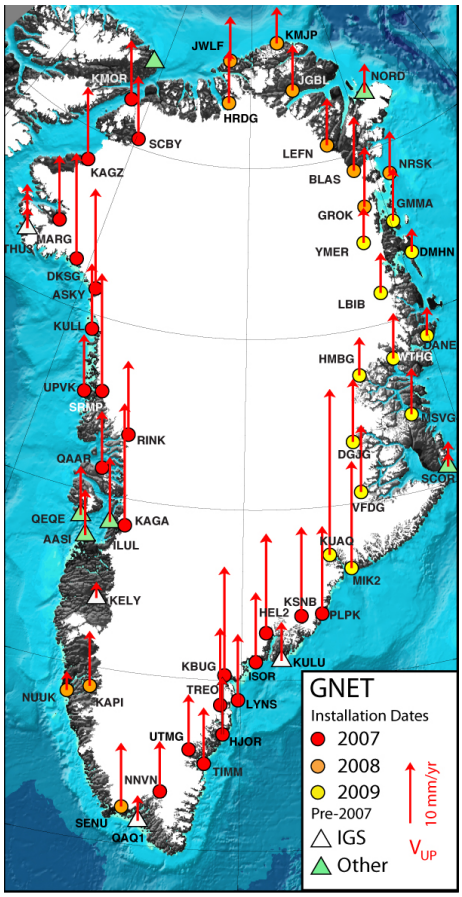
Ohio State University

GNET is being used to observe modern-day ice mass balance in the Greenland Ice Sheet (GrIS) by measuring the solid earth's elastic response to changes in surface loading. It is also being used to study glacial isostatic adjustment (GIA), so as to help GRACE improve its crucial "PGR correction". We are assessing GIA by assuming that the observed uplift rate

$$V_{GPS} = V_{Elastic} + V_{GIA}$$

and estimating the elastic response using mass change fields derived from repeat altimetry. Our solution for GIA manifests a remarkable and unanticipated tectonic control – there is unusually low mantle viscosity within the Iceland Hotspot track in SE Greenland.

GNET is also being used as an atmospheric sensor. I will illustrate all of these applications, and show how GNET's mass sensing abilities complement those of the GRACE satellite mission. I will place particular emphasis on the astonishing 2013 Pause in the de-glaciation of Greenland. The impact of climate cycles and climate change on the GrIS is far more complex that anyone suspected a decade ago.



Mean uplift rates time-averaged thru 2011.3 (Bevis et al., 2012). The highest velocity, at station KUAQ, was 30.5 mm/yr. Stations are color-coded by date.

Jeudi 16 juin 2016 à 11 h

Salle de conférences d'ISTerre

OSUG-C, 1381 rue de la piscine, Campus Universitaire
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