No slowing down of Jakobshavn Isbræ in 2014: Results from feature-tracking five Greenland outlet glaciers using Landsat-8 data and the ImGRAFT toolbox

Alexandra Messerli (1,2), Nanna B. Karlsson (1), and Aslak Grinsted (1)
(1) Centre for Ice and Climate, University of Copenhagen, Copenhagen, Denmark, (2) Section for Glaciers, Snow and Ice, Hydrology Department, Norwegian Water Resources and Energy Directorate, Oslo, Norway

Data from the Landsat-8, panchromatic band, spanning the period (August) 2013 - (September) 2014 have been feature-tracked to construct ice velocities and flux estimates for five major Greenland outlet glaciers: Jakobshavn Isbræ, Nioghalvfjerdsbræ, Kangerdlugssuaq, Helheim and Petermann glaciers. The outlet glaciers are responsible for draining more than 20% of the Greenland Ice Sheet, and thus have a significant impact on its mass balance.

The feature-tracking is performed with the newly developed ImGRAFT toolbox, a Matlab-based, freely available software (http://imgraft.glaciology.net). Overall, the resulting velocity fields and fluxes agree with the findings of existing studies. Notably, we find that Jakobshavn Isbræ has reached an unprecedented speed of over 50m/day, and exhibit large, seasonal fluctuations. In contrast, on the east coast of Greenland, Helheim and Kangerdlugssuaq Glaciers have returned to pre-speed up velocities, following a peak in ice flux about a decade ago. Petermann and Nioghalvfjerdsbræ show little variability in speeds with typical flow speeds of less than 5m/day.