→ FRINGE 2015 WORKSHOP

Advances in the Science and Applications of SAR Interferometry and Sentinel-1 InSAR Workshop

Rapid dynamic activation of a marine-based Arctic ice cap

N. Gourmelen[1], M. McMillan[2], A. Shepherd[2,3], A. Dehecq[4], A. Leeson[2], A. Ridout[3], T. Flament[2], A. Hogg[2], L. Gilbert[3], T. Benham[5], M. van den Broeke[6], J. Dowdeswell[5], X. Fettweis[7], B. Noel[6], T. Strozzi[8]

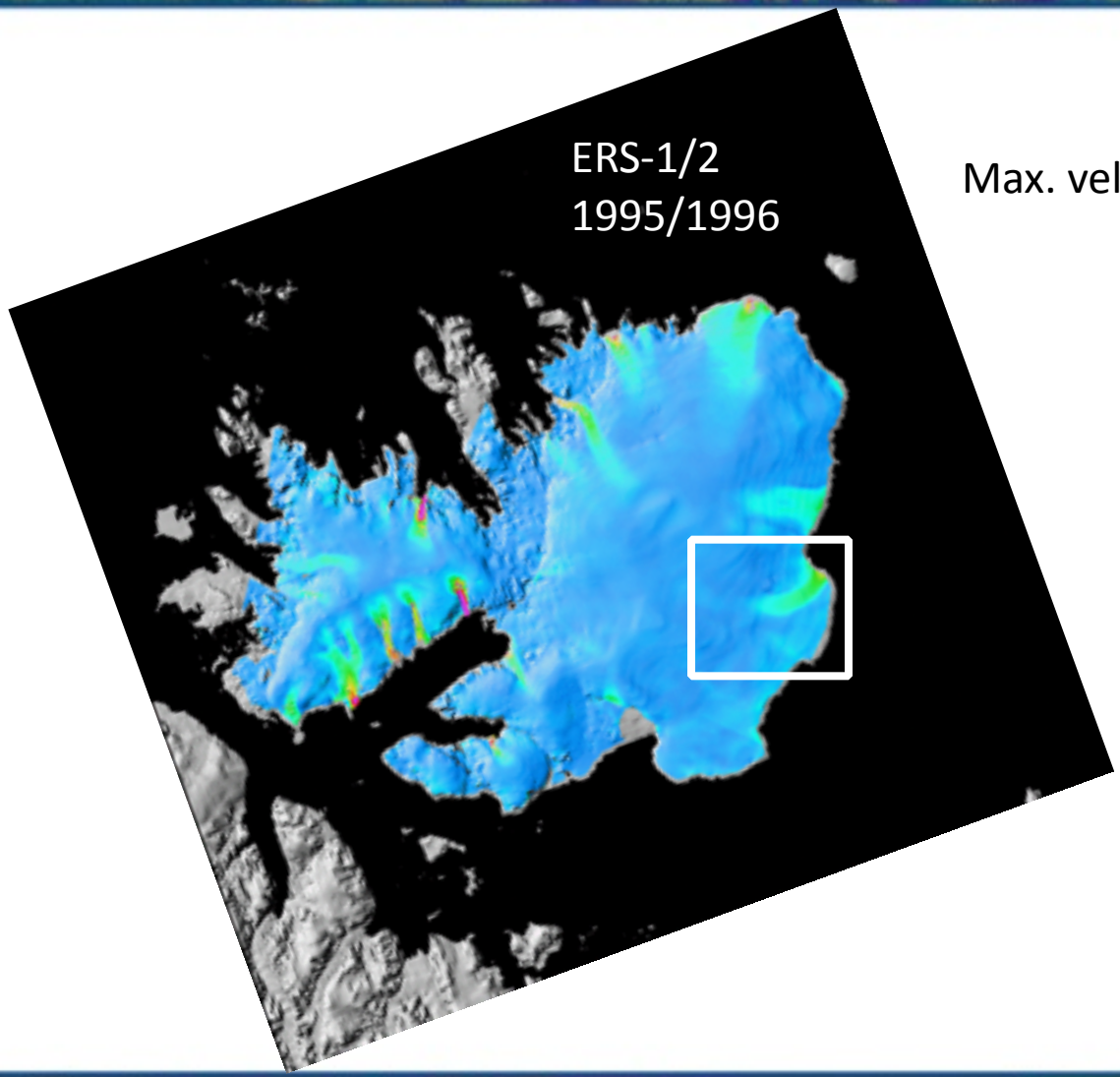
1 School of Geosciences, University of Edinburgh, Edinburgh, UK
2 Centre for Polar Observation and Modelling, University of Leeds, Leeds, UK
3 Centre for Polar Observation and Modelling, University College London, London, UK
4 LISTIC, Université de Savoie, Chambéry, France
5 Scott Polar Research Institute, University of Cambridge, Cambridge, UK
6 Institute for Marine and Atmospheric Research, Utrecht University, Utrecht, Netherlands
7 Department of Geography, University of Liège, Liège, Belgium
8 GAMMA Remote Sensing Research and Consulting AG, Gümligen, Switzerland

23–27 March 2015 | ESA–ESRIN | Frascati (Rome), Italy

European Space Agency

Austfonna

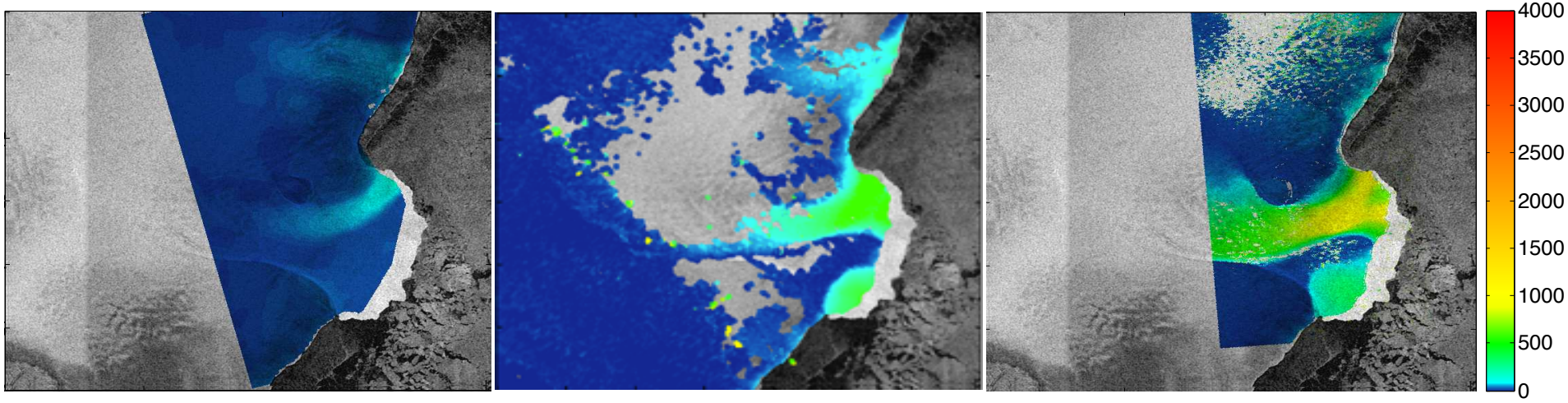
Ice velocity, Austfonna



Max. velocities: 300 m/yr

Ice velocity, Basin-3

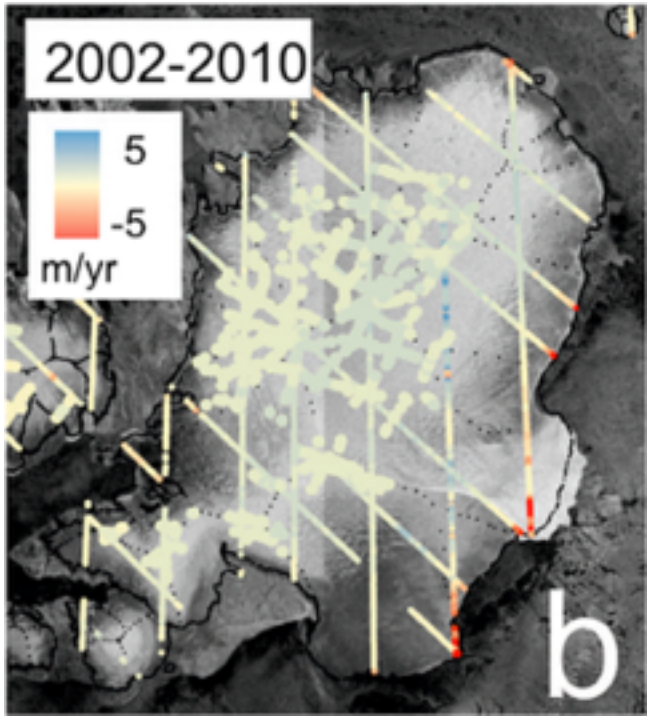
1995 **2008** **2012** *m/yr*

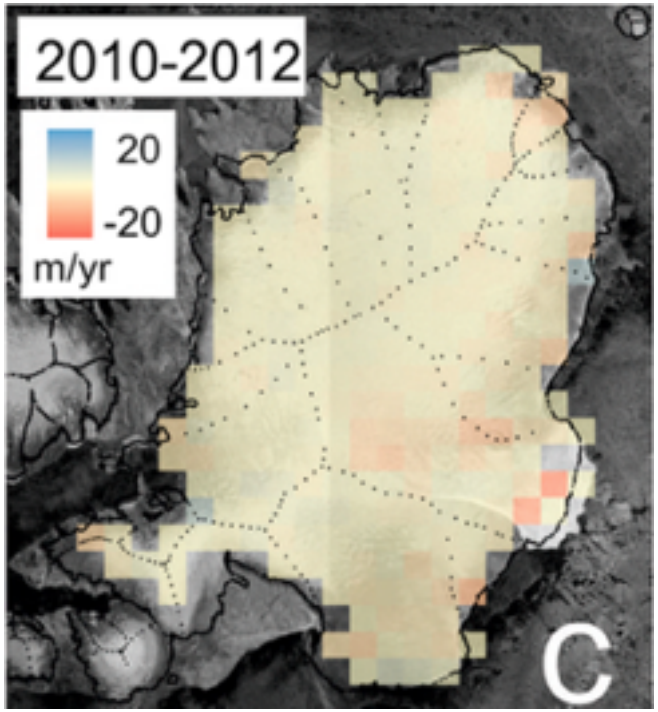


ERS1/2 ALOS TSX

McMillan et al., 2014

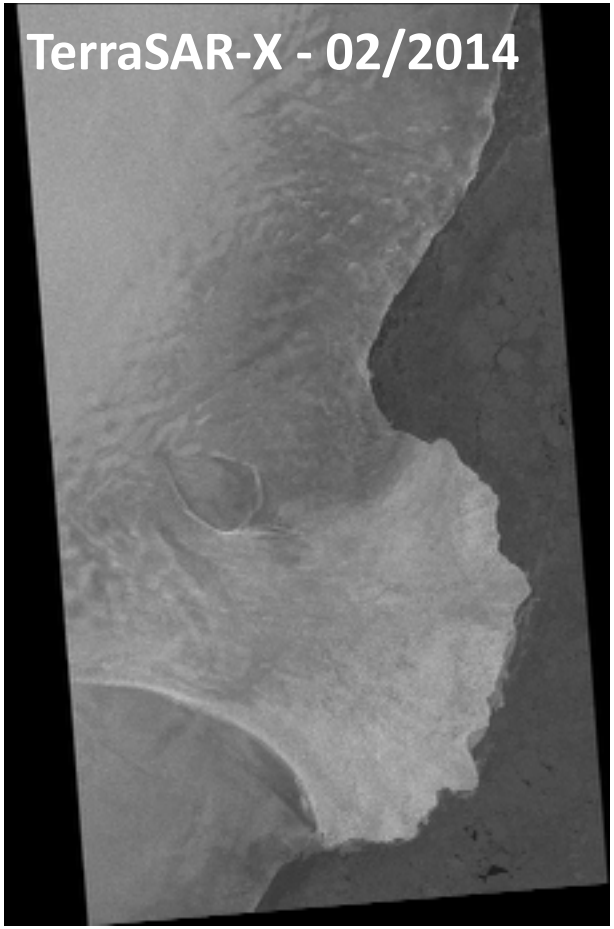
Ice surface elevation change, Basin-3





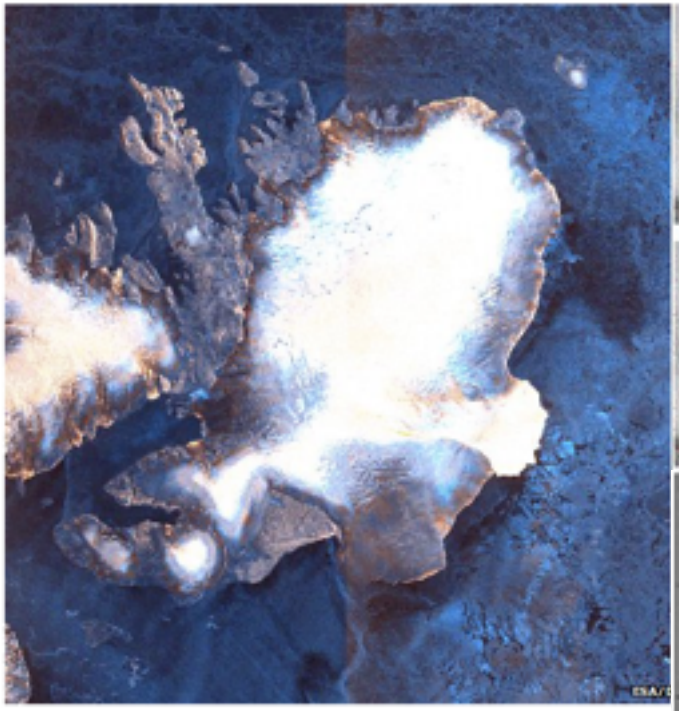
McMillan et al., 2014

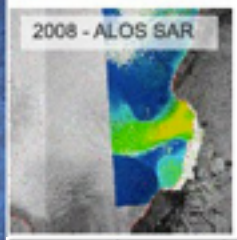
Sentinel-1a over Svalbard 22/04/2014

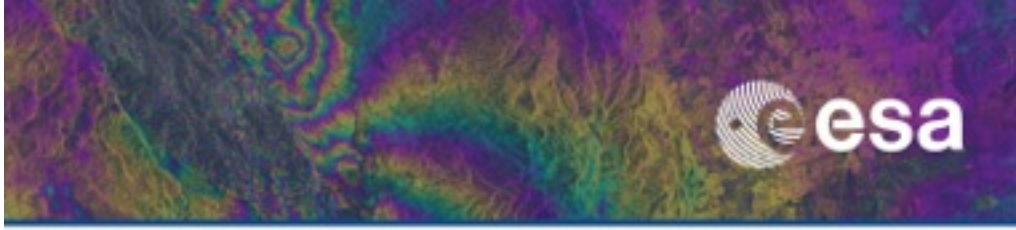


Sentinel satellite spies ice cap speed-up

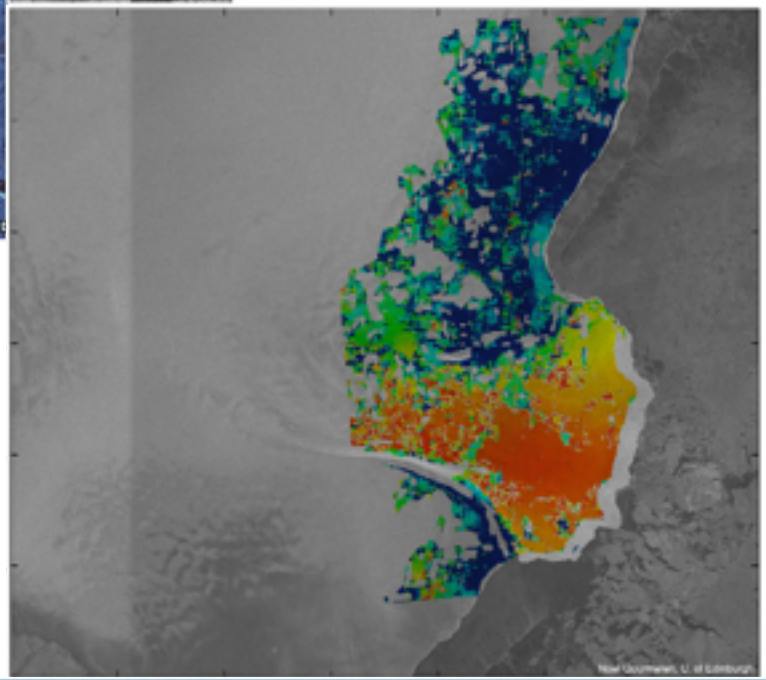
By Jonathan Amos
Science correspondent, BBC News

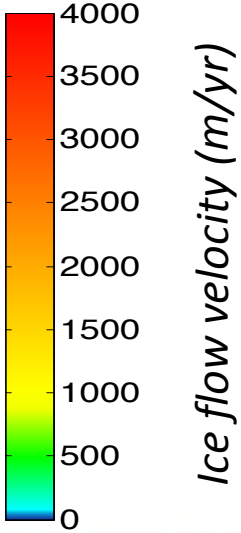






Sentinel-1a, 2014





Sentinel-1a, IW mode availability

Display 1 to 5 of 5 products

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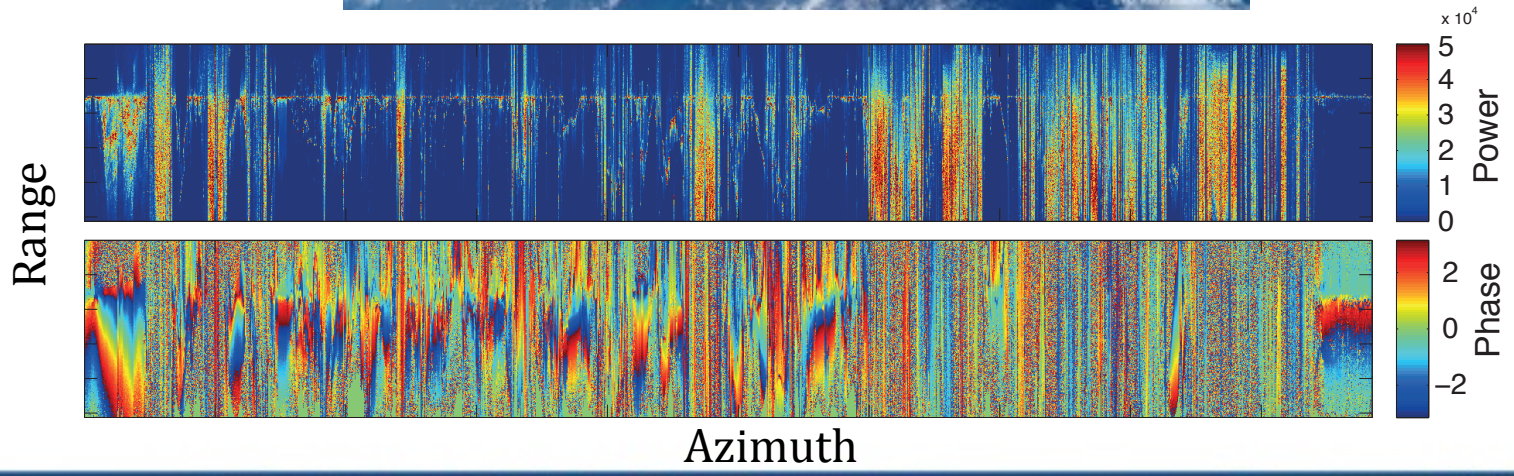
CryoSat, SARIn mode, swath elevation

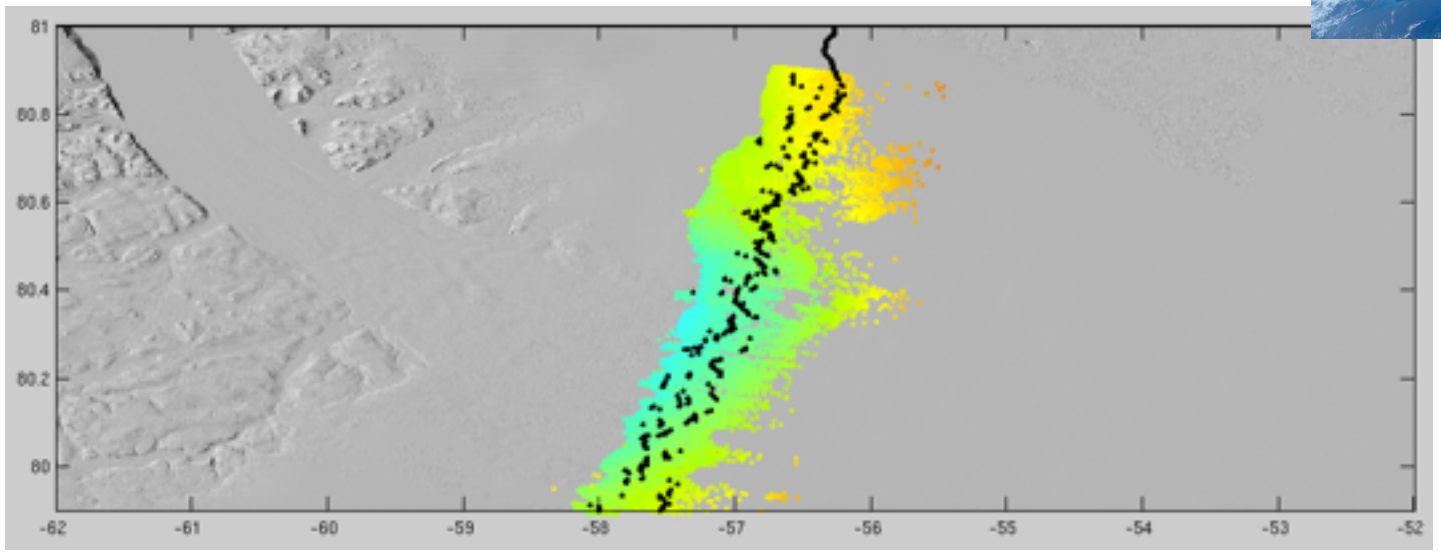
cryosat+ cryotop
support to science element

esa



CryoSat, SARIn mode, swath elevation

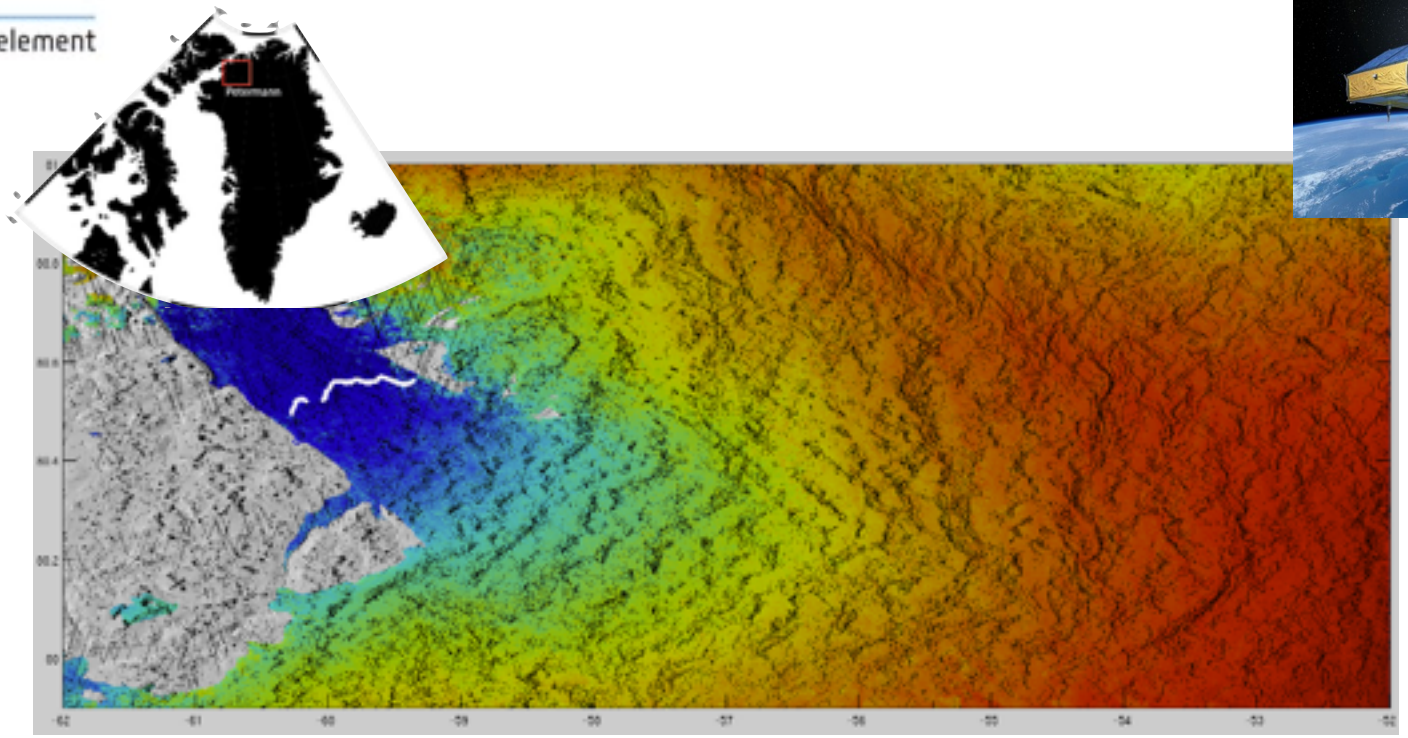
cryosat+
cryotop
support to science element



Gourmelen et al., 2013

CryoSat, SARIn mode, swath elevation

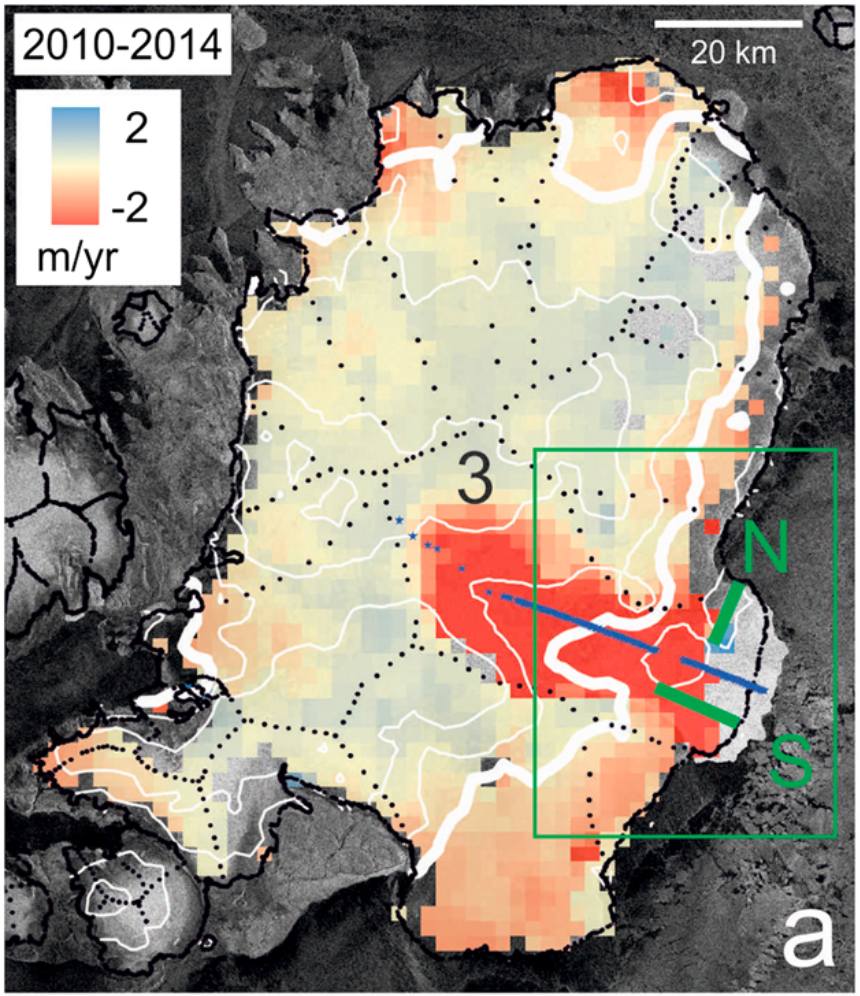
cryosat+
cryotop
support to science element



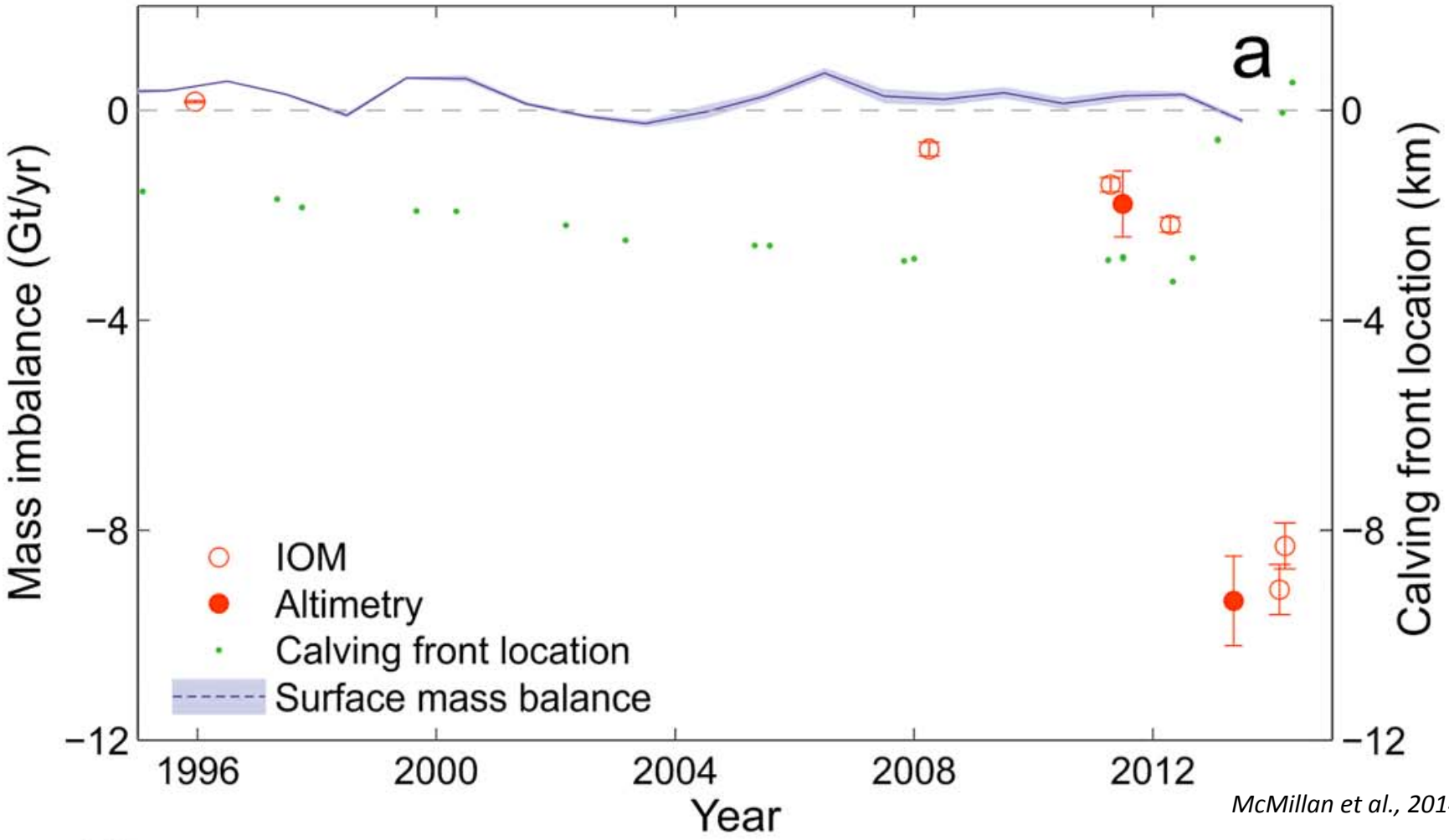
0 **Elevation (m)** 1800

Gourmelen et al., 2013

Elevation change, 2010-2014

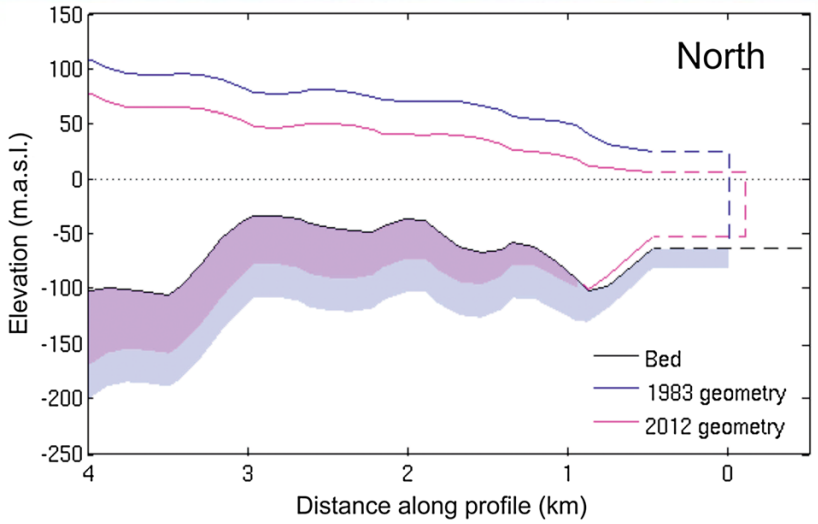


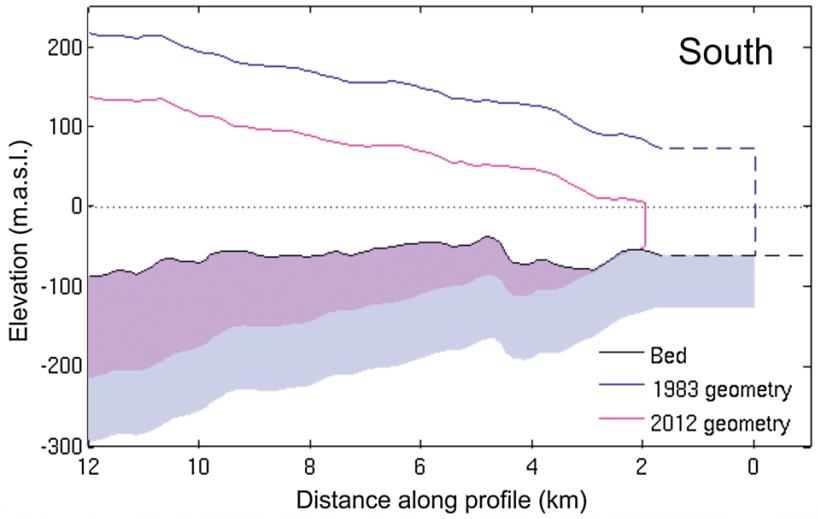
Austfonna - Mass imbalance



McMillan et al., 2014

Floatation





McMillan et al., 2014

Conclusions

- Sentinel-1a reveals Basin-3 ice discharge increased 45-folds over the last 2 decades
- CryoSat SARIn reveals rapid thinning (up to 40m/yr)
- Activation initiated at the ocean front, possibly from ocean warming, and propagated inland to the entire basin
- Destabilisation still ongoing