



日本学術振興会
Japan Society for the Promotion of Science



The Research Council
of Norway

International collaborations to explore changing Antarctic Ice Sheet

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Norwegian Polar Institute



CENTRE FOR ICE, CLIMATE AND ECOSYSTEMS

JSPS and RCN have fueled my research

- **JSPS fellowships**



日本学術振興会
Japan Society for the Promotion of Science

- DC2 Fellowship (1998)
- Postdoctoral Fellowship (2002-04)
- Researcher's Visitorship (2016, hosted by Prof. Kawamura of NIPR)

- **Research Council of Norway's research grants**



The Research Council
of Norway

- **POLARPROG (2016-19)** MADICE with India
- **FRINATEK (2015-18)** IceGRAV/PolarGAP with Denmark and UK
- **ROMFORSKNING (2014-18)** Satellite remote sensing

Little bit about myself



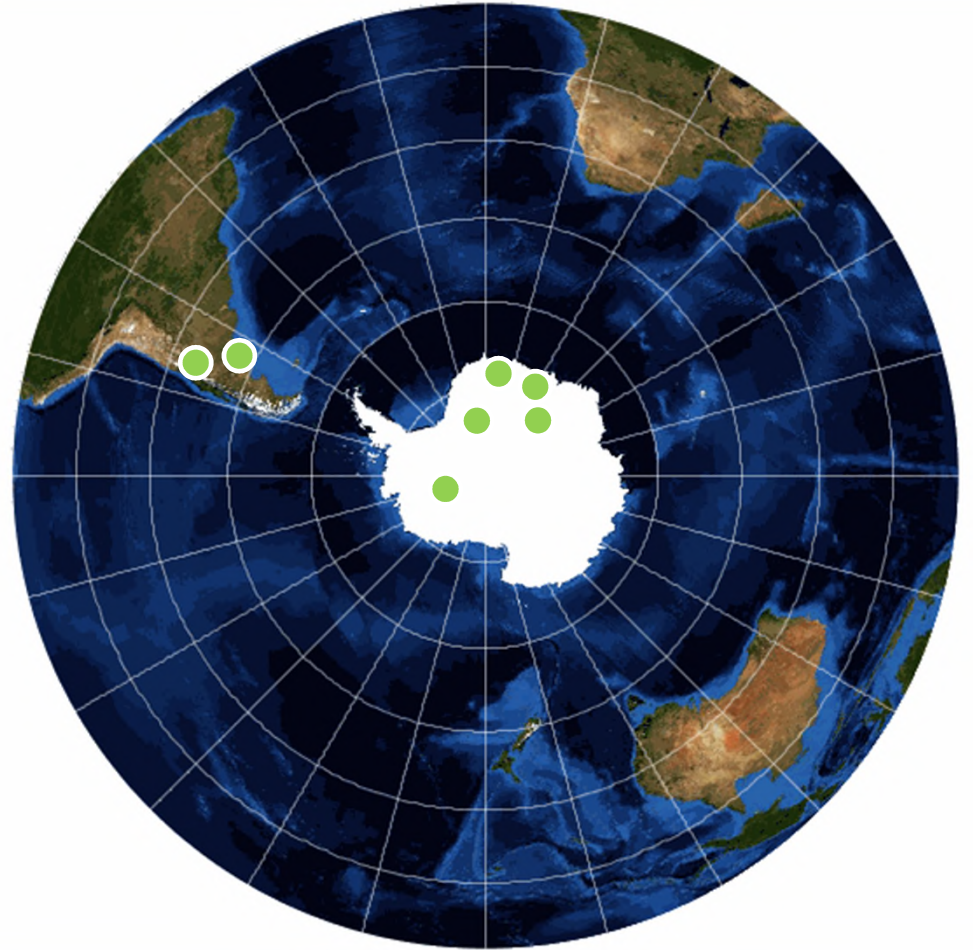
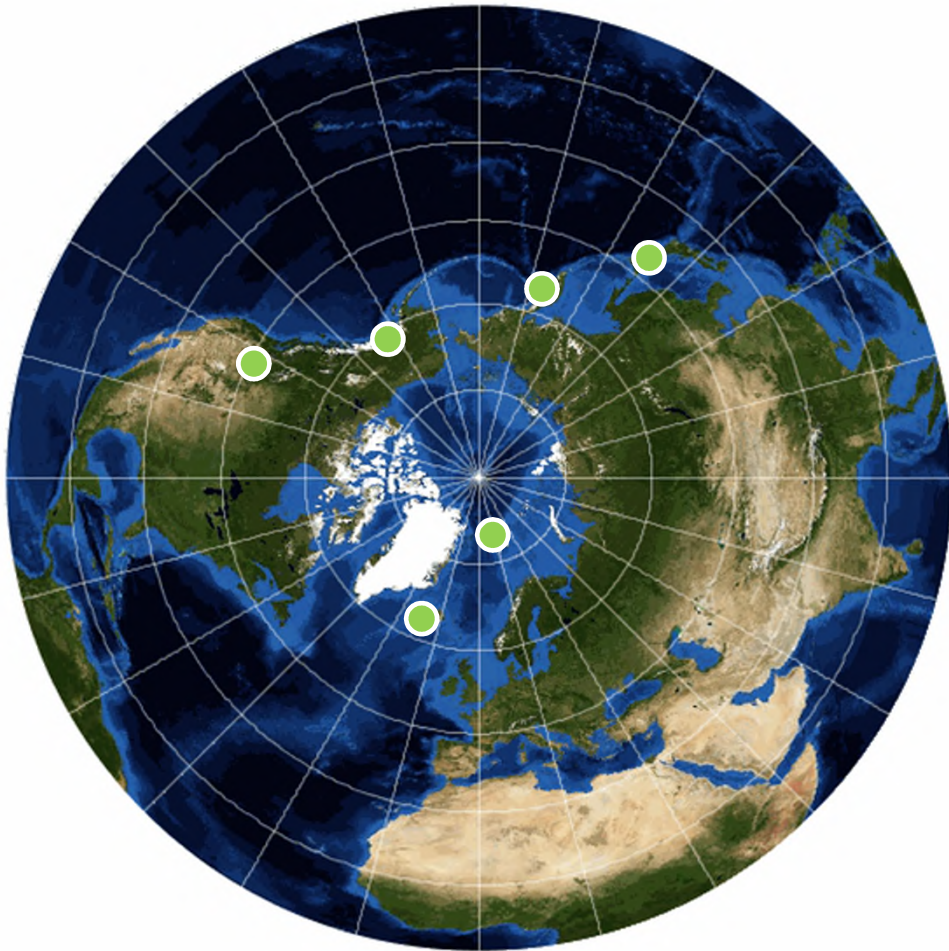
**2010-
Norwegian
Polar
Institute
*Senior scientist***

**2002-10
Univ.
Washington
Postdoc
*Assistant prof***

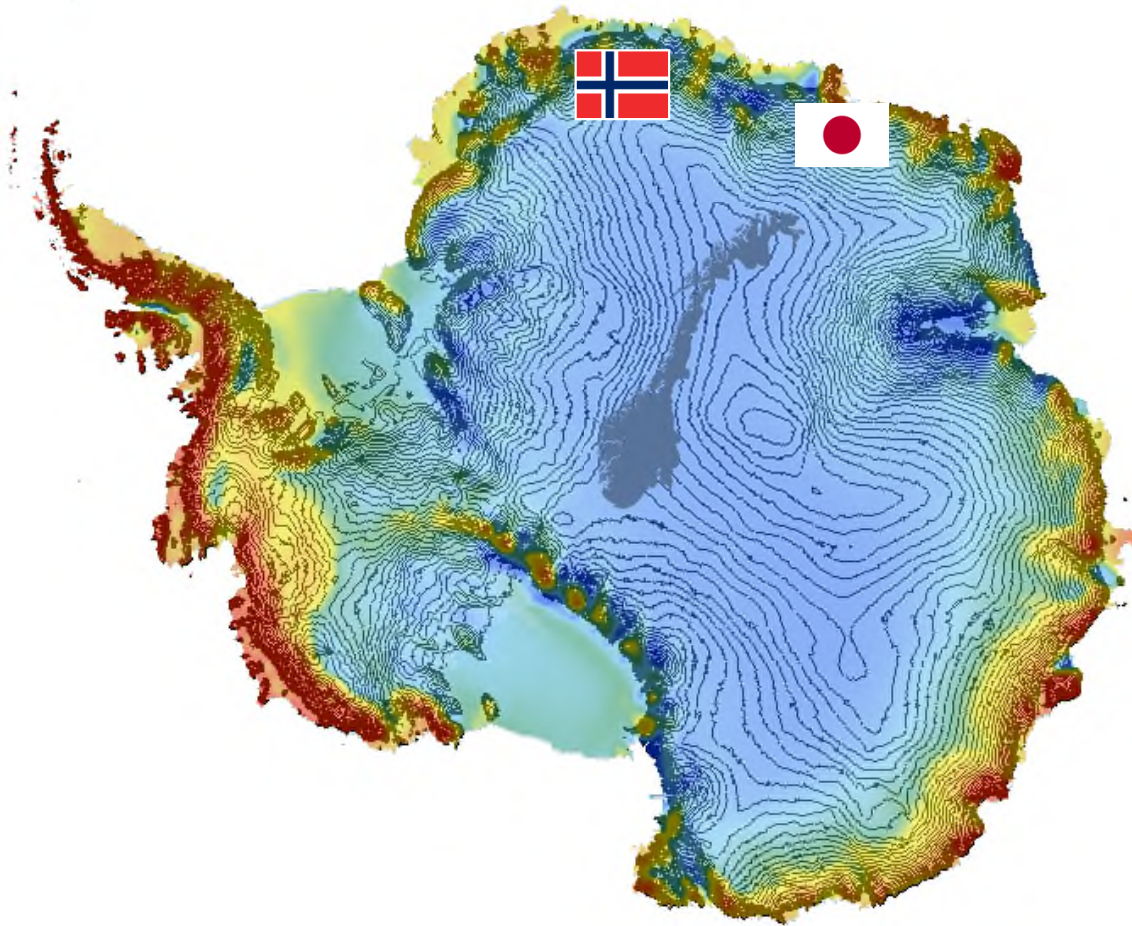
**2002
Hokkaido
Univ.
*PhD***



Research activities in remote, cold places



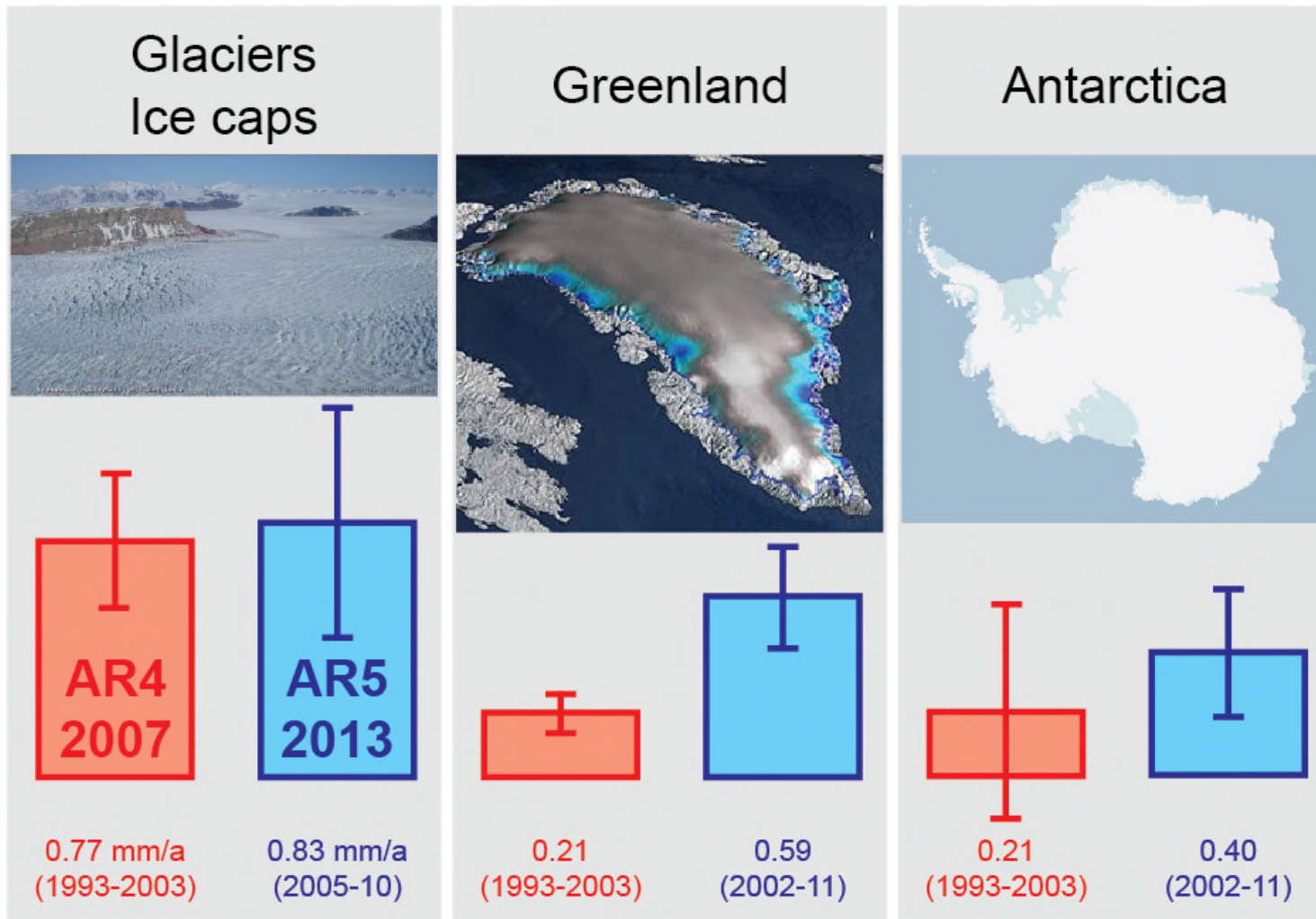
Antarctica: x36 of Norway's main land



**Tallest (mean: ~ 2 km),
driest (white desert),
whitest, coldest, windiest,
and least populated continent**

Visualized with Quantarctica
quantarctica.npolar.no

Antarctica is losing ice, rising the sea level

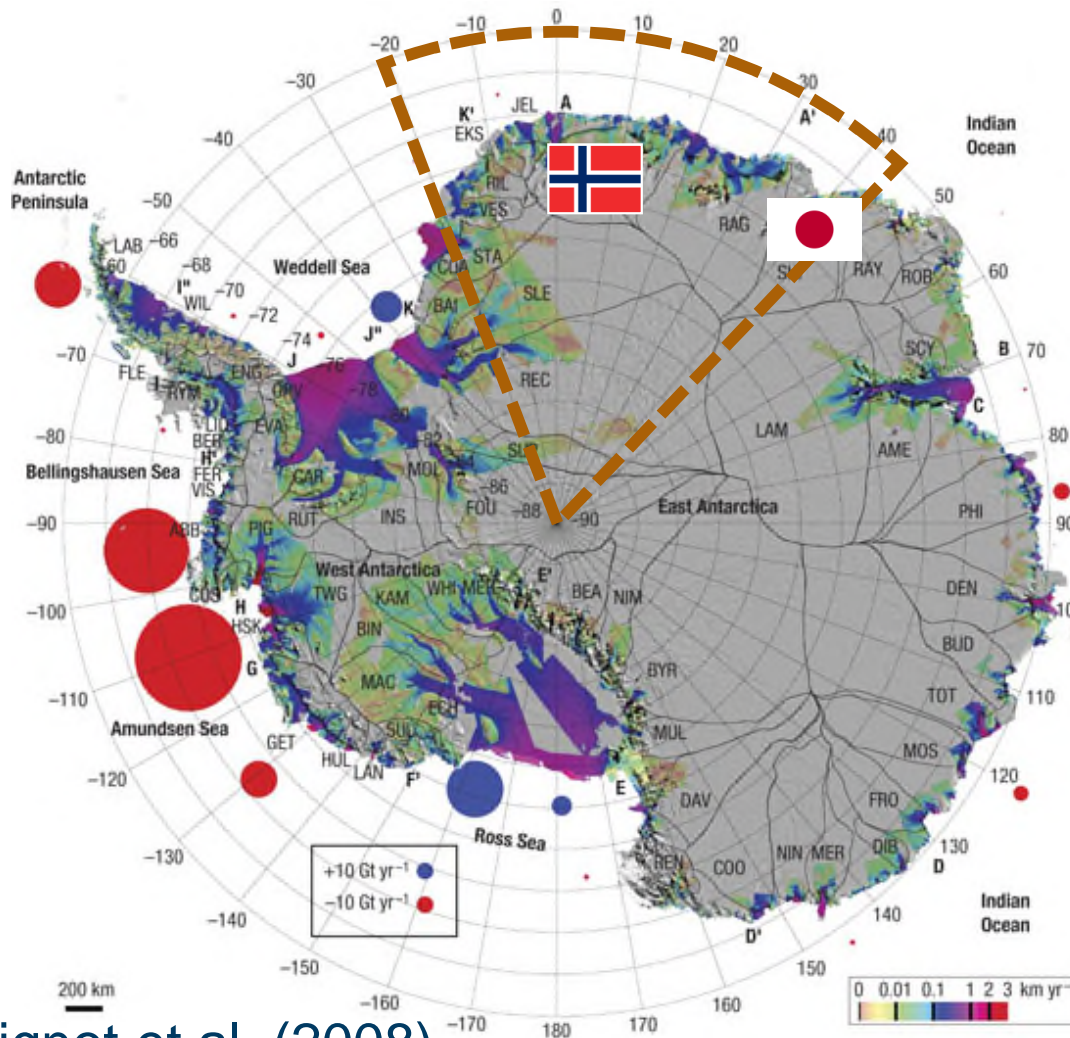


IPCC's
AR4 (1997)
AR5 (2013)
Scheduled AR6
(2021)

Which parts of Antarctica is loosing ice?

Dronning Maud Land (DML) is not currently a hot spot.

Is DML a boring spot?



The New York Times

Pine Island and Thwaites glaciers

In Antarctica, Two Crucial
Glaciers Accelerate Toward the Sea

By JUGAL K. PATEL OCT. 26, 2017

Rignot et al. (2008)

Rapidly changing volatile regions have (floating) ice shelf fed by glacier



Animation: Anders Skoglund (NPI)

**There are no huge ongoing changes in DML,
but ice shelves and outlet glaciers**

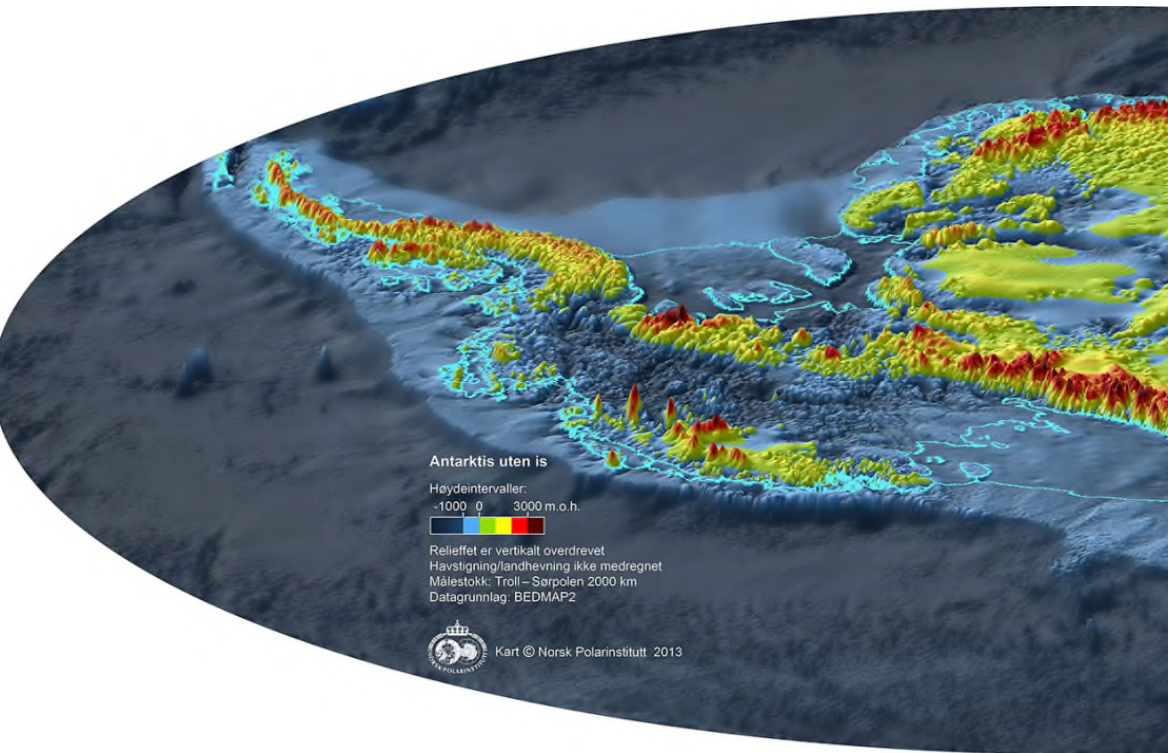
Is DML a sleeping lion?



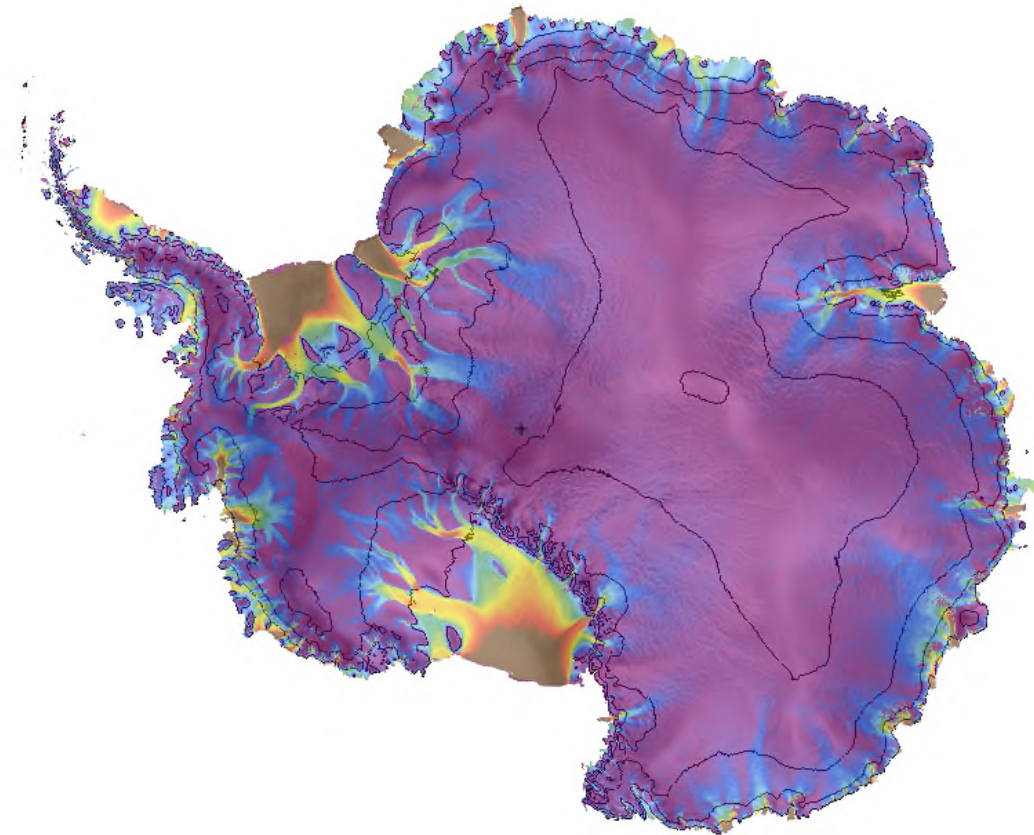
Or just a very nice kitty?



Deep valleys: cradle of glaciers



Fretwell and BEDMAP2 consortium (2013)
3D visualization: Anders Skoglund



Mouginot et al. (2017)

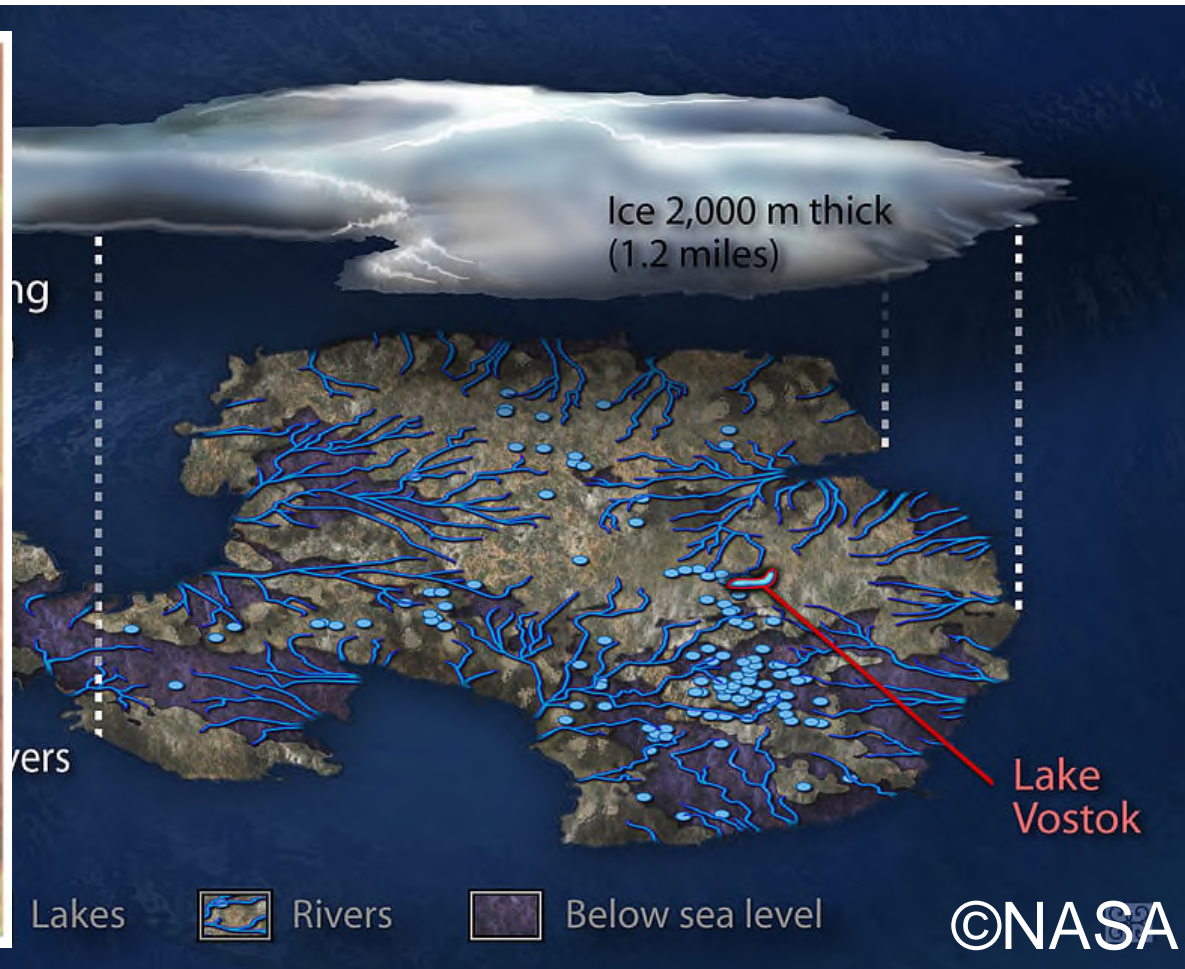
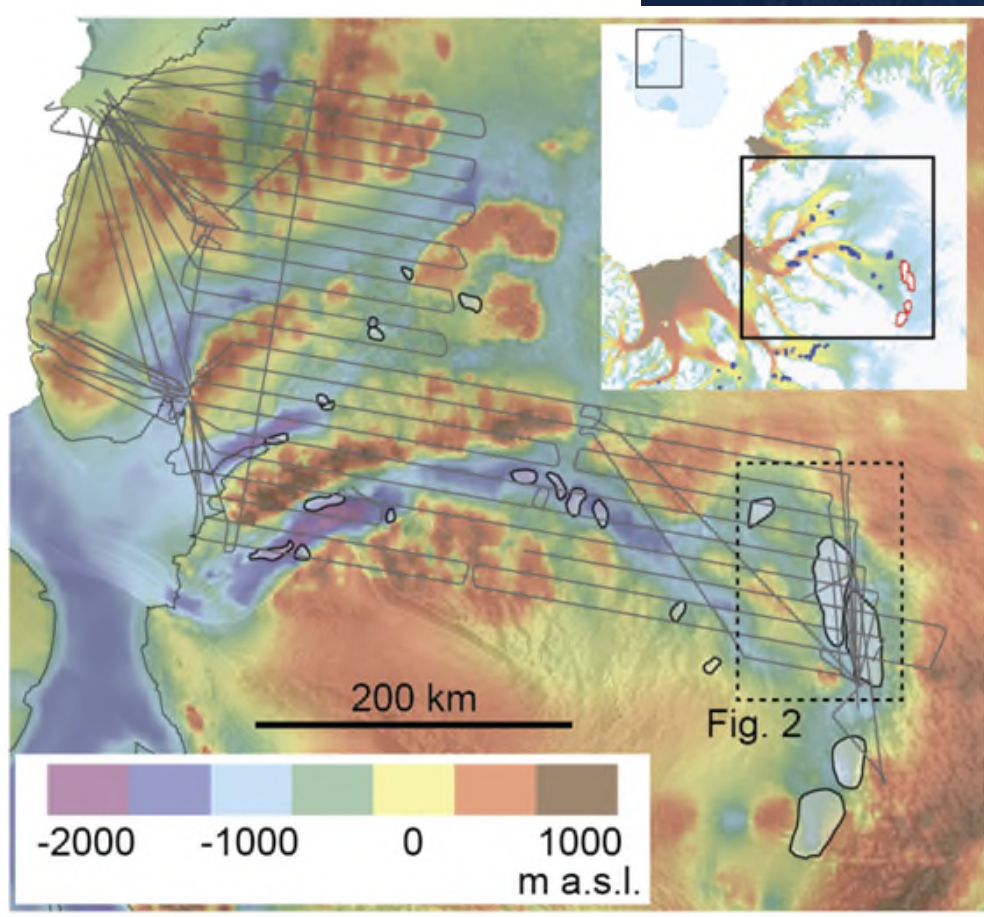
IceGRAV and PolarGAP collaborations



More pictures at Instagram [#PolarGAPAntarctica](#)



Dynamic link between subglacial water and fast ice flow



Diez, Matsuoka et al. (in review)

Glacier discharges ice toward floating ice shelf

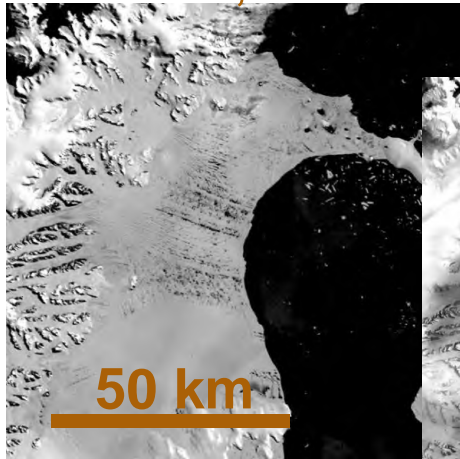


Photo: Reinhard Drews

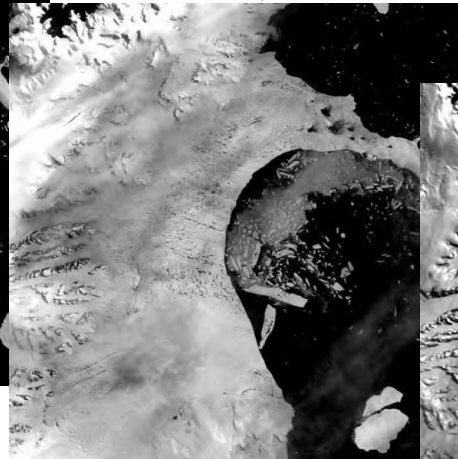
Most dynamic satellite images in Antarctica

Collapse of Larsen B Ice Shelf in a single month

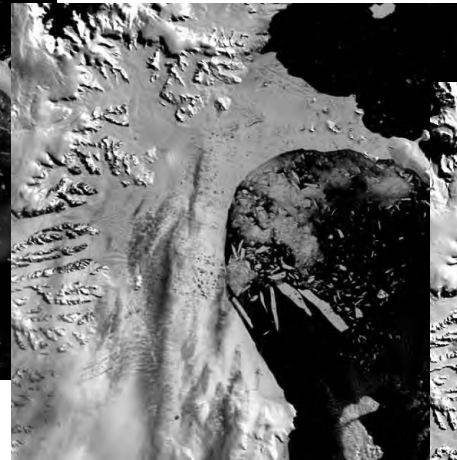
Jan 31, 2002



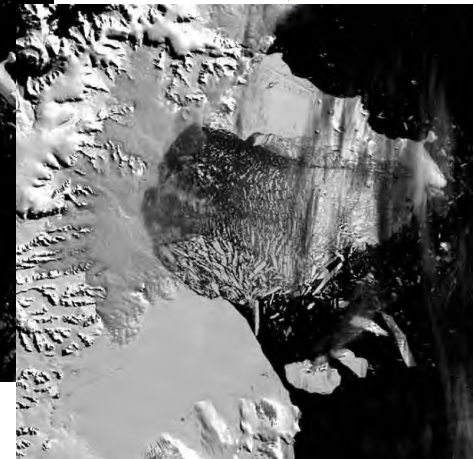
Feb 17, 2002



Feb 23, 2002

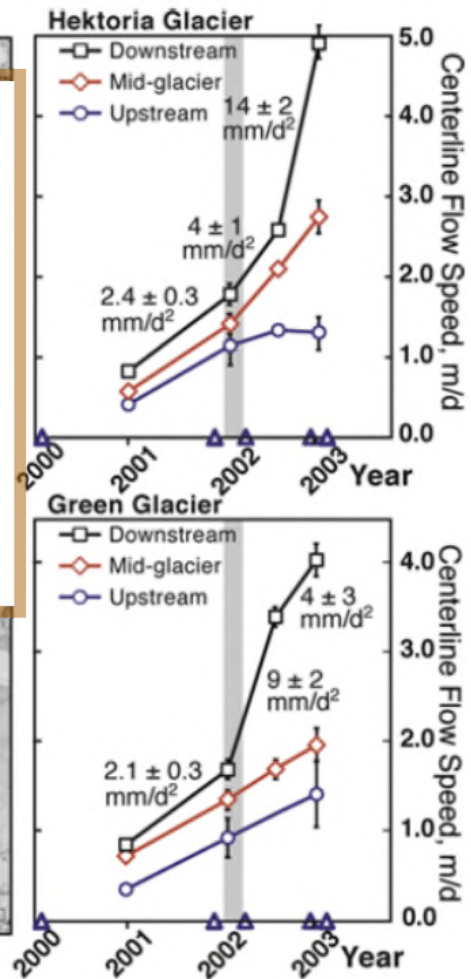
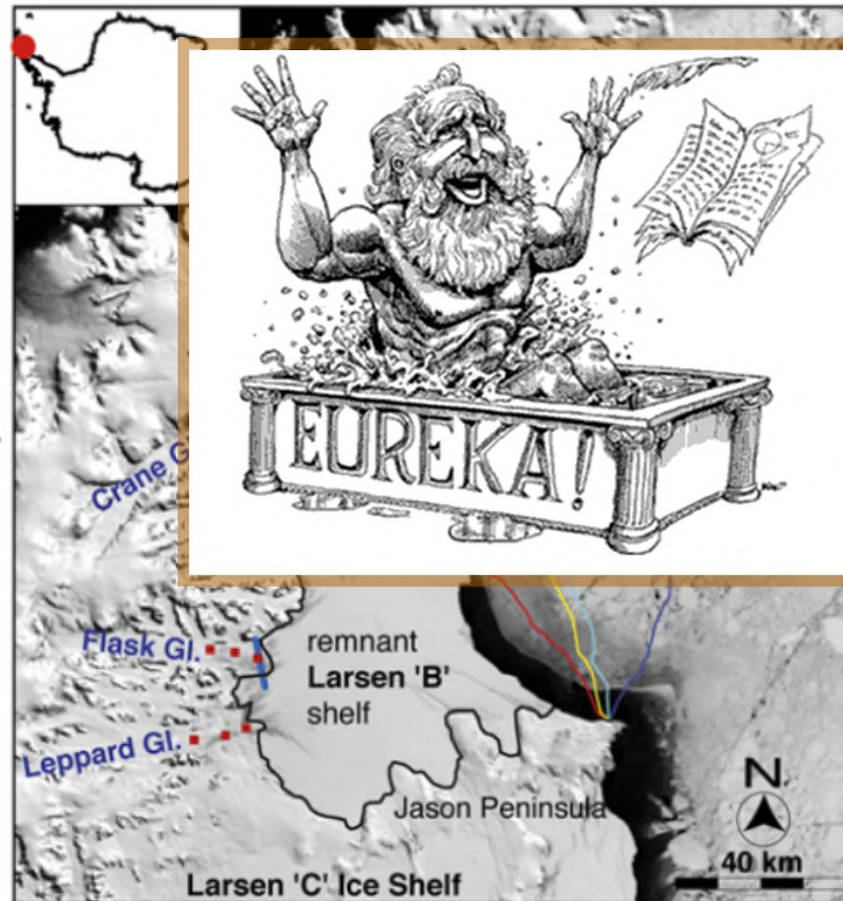
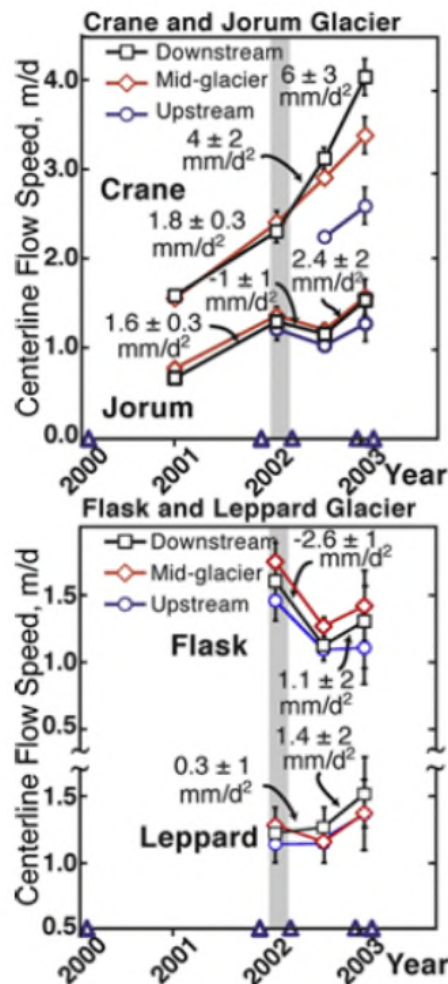


March 5, 2002



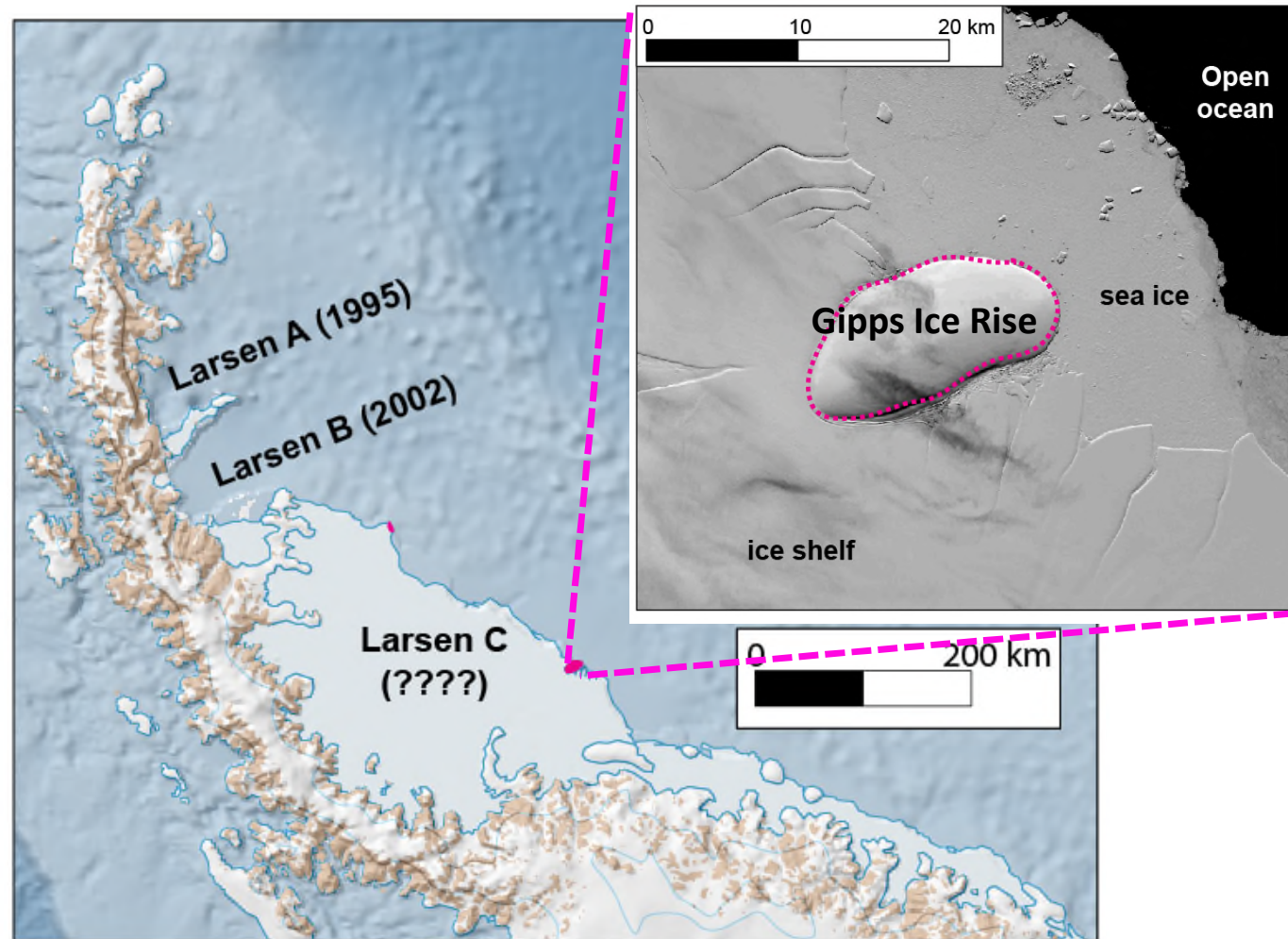
Natl. Snow and Ice Data Center (2002)

Ice shelf already contributed to the sea level, so what's a matter?



Scambos et al. (2004)

What happens next?



Ice rises: locally elevated features in ice shelf



Photo: Peter Leopold

Ice rises: small in size but big on impact

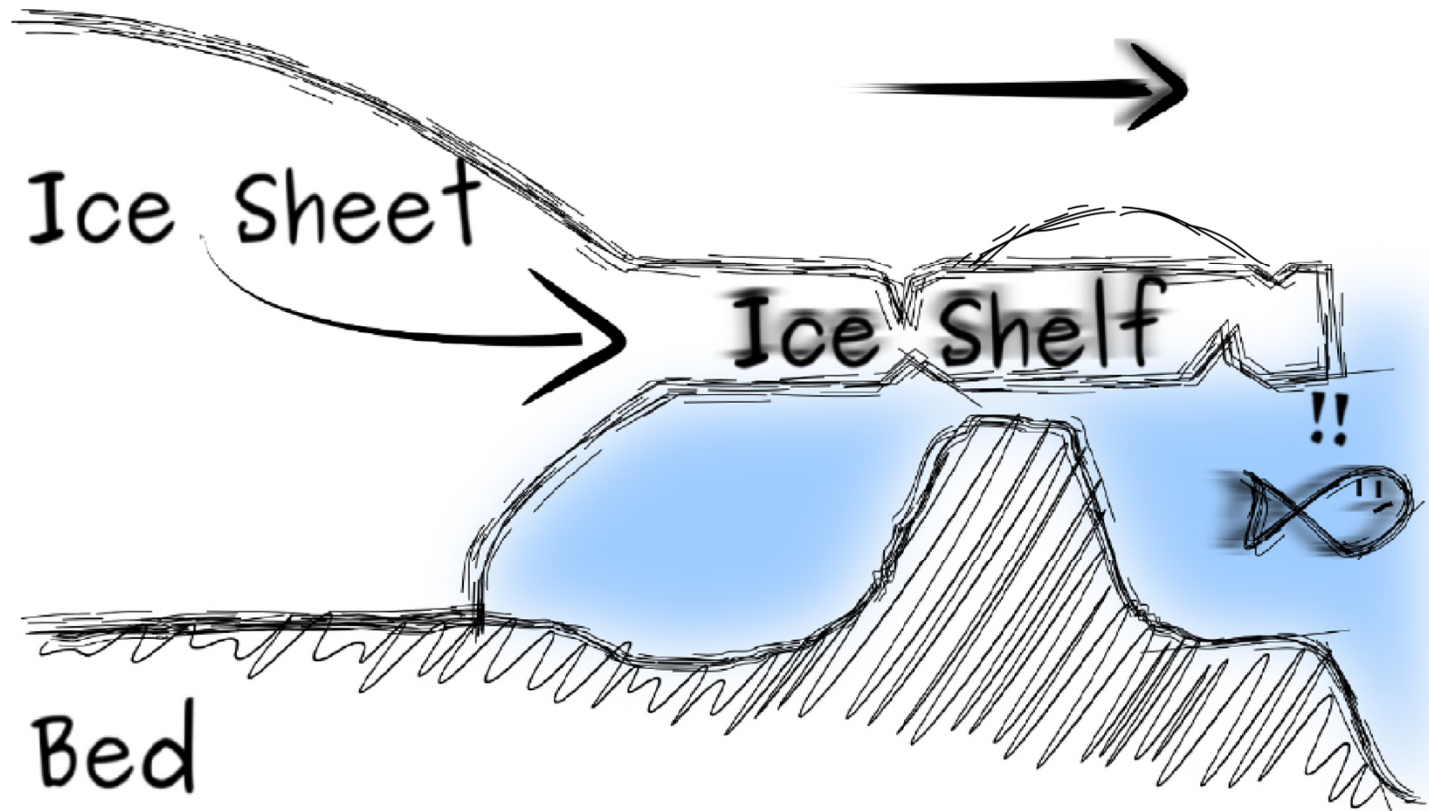
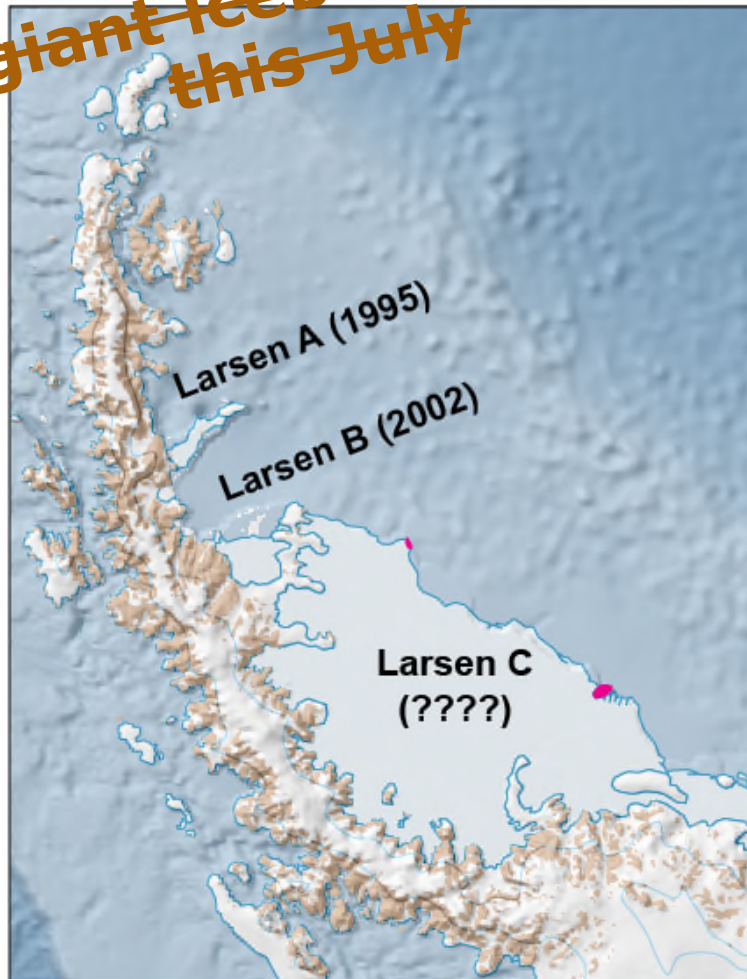


Illustration: Reinhard Drews

Ice rises keep the rest of the ice shelf!

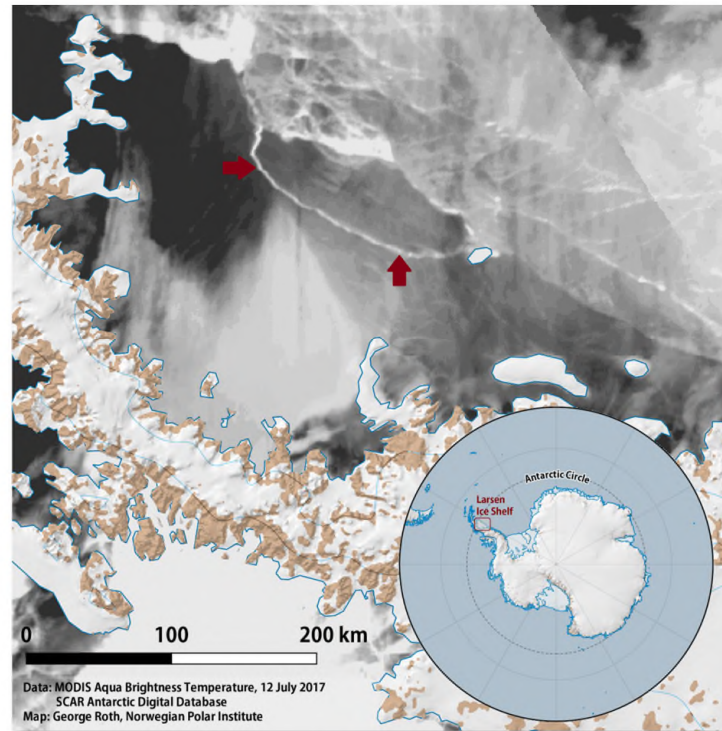
~~A giant iceberg calved this July~~



Isflak større enn Akershus fylke har løsnet i Antarktis

Aftenposten

NTB | HANNE CHRISTIANSEN
OPPDATERT: 12.JUL.2017 17:26 | PUBLISERT: 12.JUL.2017 14:47



Norsk Polarinstitutt sammenligner størrelsen på isflaket som har løsnet fra isbremmen Larsen C i Antarktis med lengden på Lofoten og Vesterålen tilsammen.
Norsk Polarinstitutt



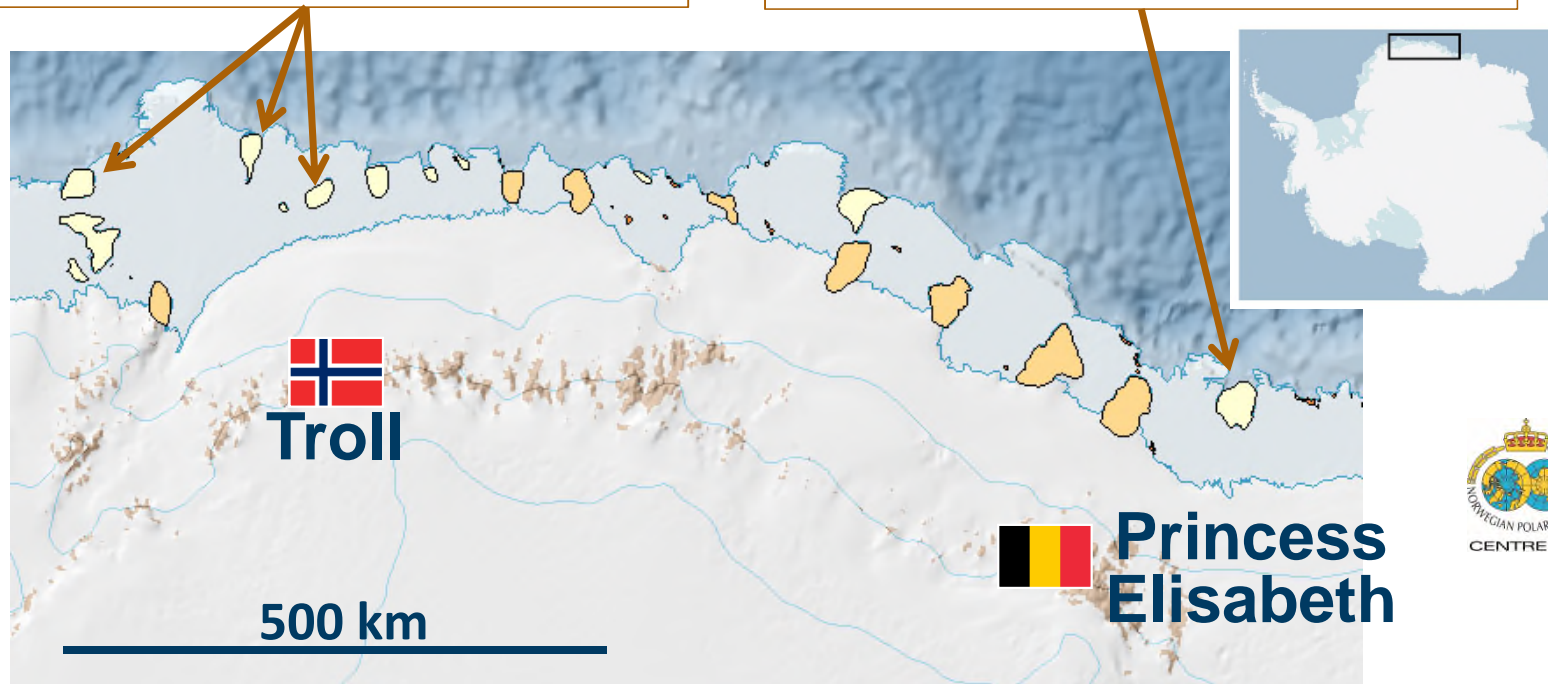
12 July, 2017

Dronning Maud Land: ice-rise garden

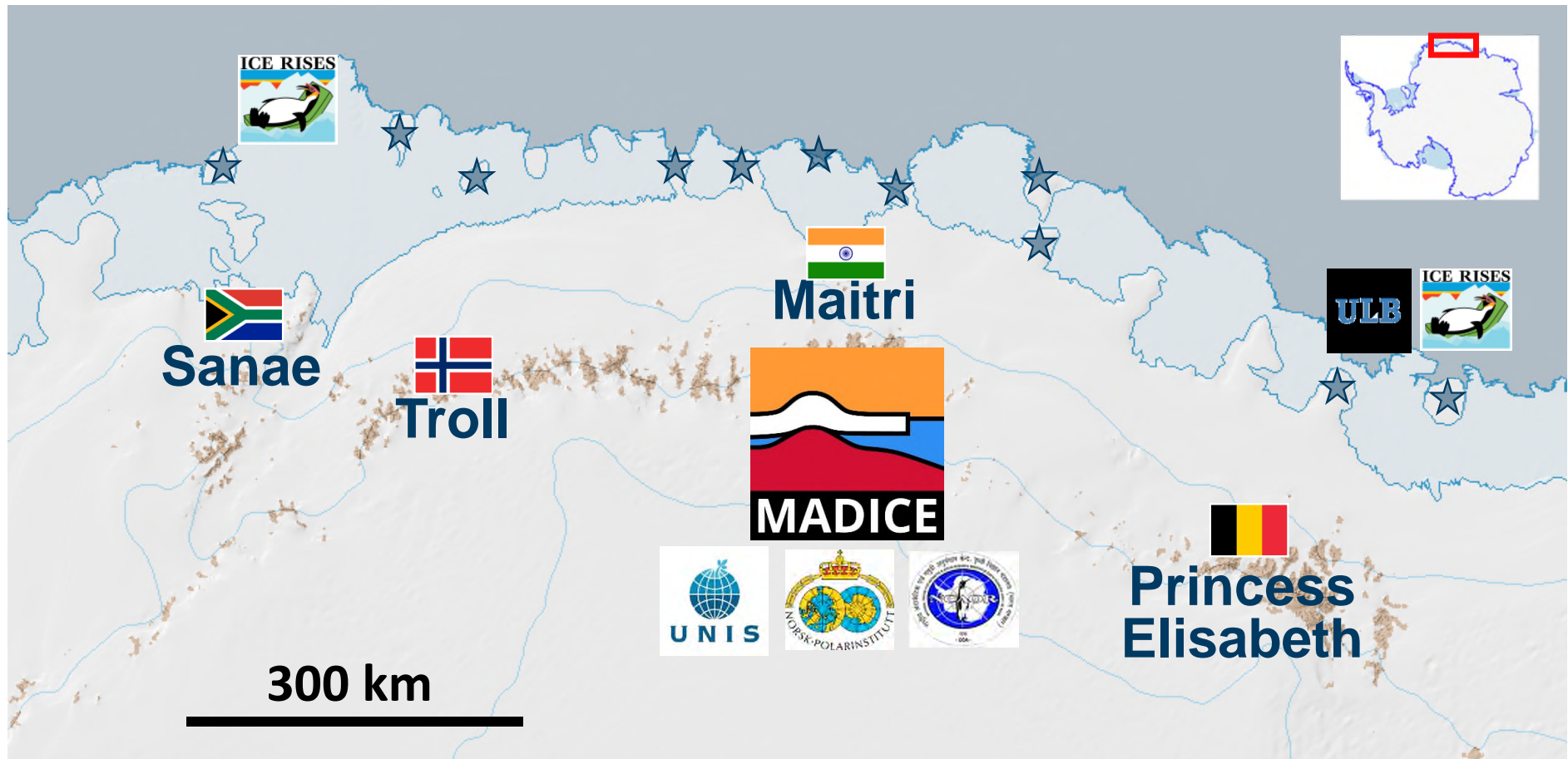
Health check up of a few ice rises

Thickening ($< \sim 10$ cm/a)
in the past decade
(Goel, Brown, Matsuoka, 2017)

Slightly (~ 3 cm/a) thinning
over the past ~ 3400 years
(Drews, Matsuoka et al., 2015)



~1000-km-wide knowledge gap



First Indo-Norway campaign in Antarctica



Map: George Roth

Photo and video:
Katrin Lindback

Our base camp at an ice-rise summit



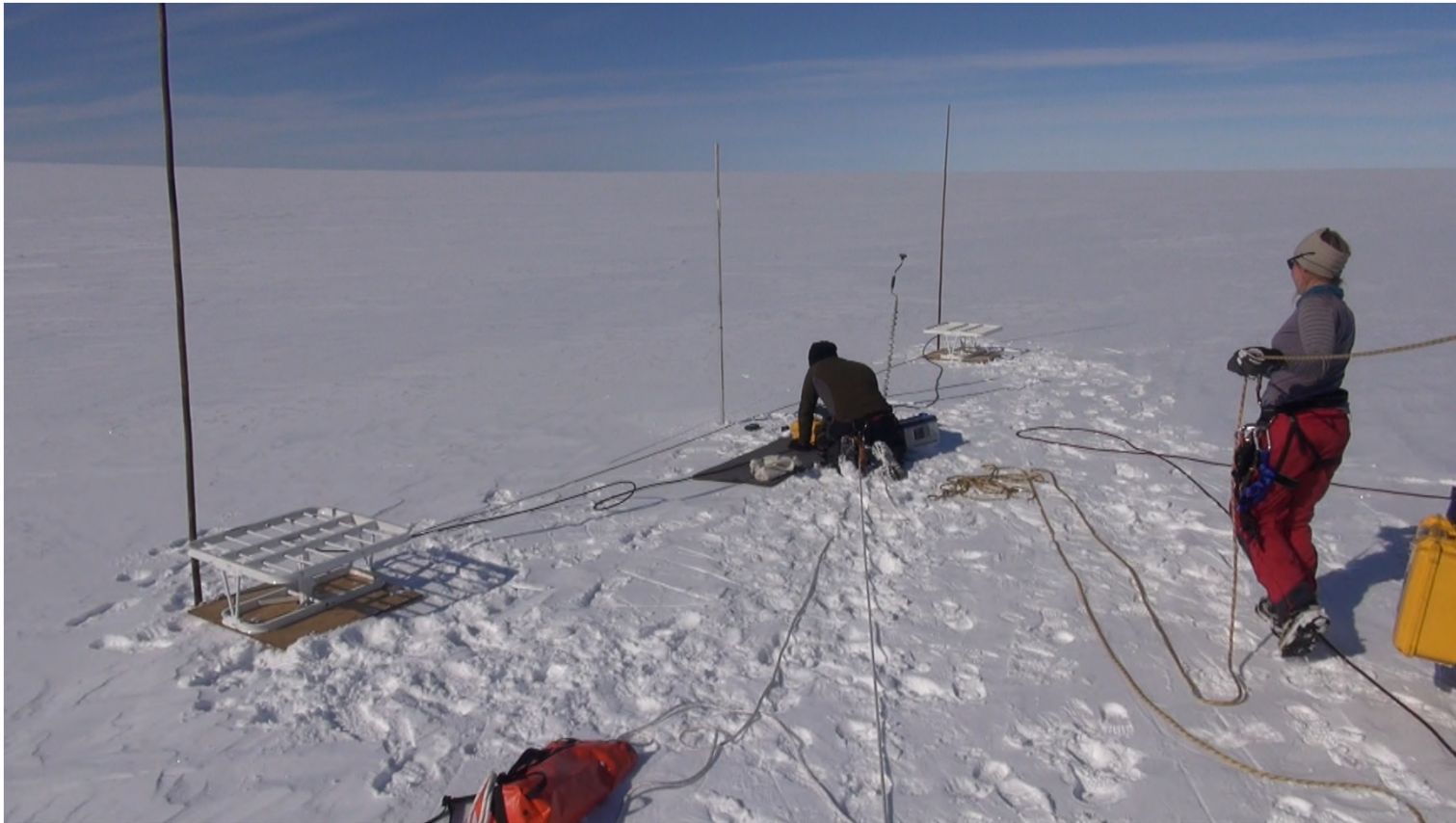
Photo: Katrin Lindback

Joint campaign: live together, eat together



Photo:
Maha Linganathan

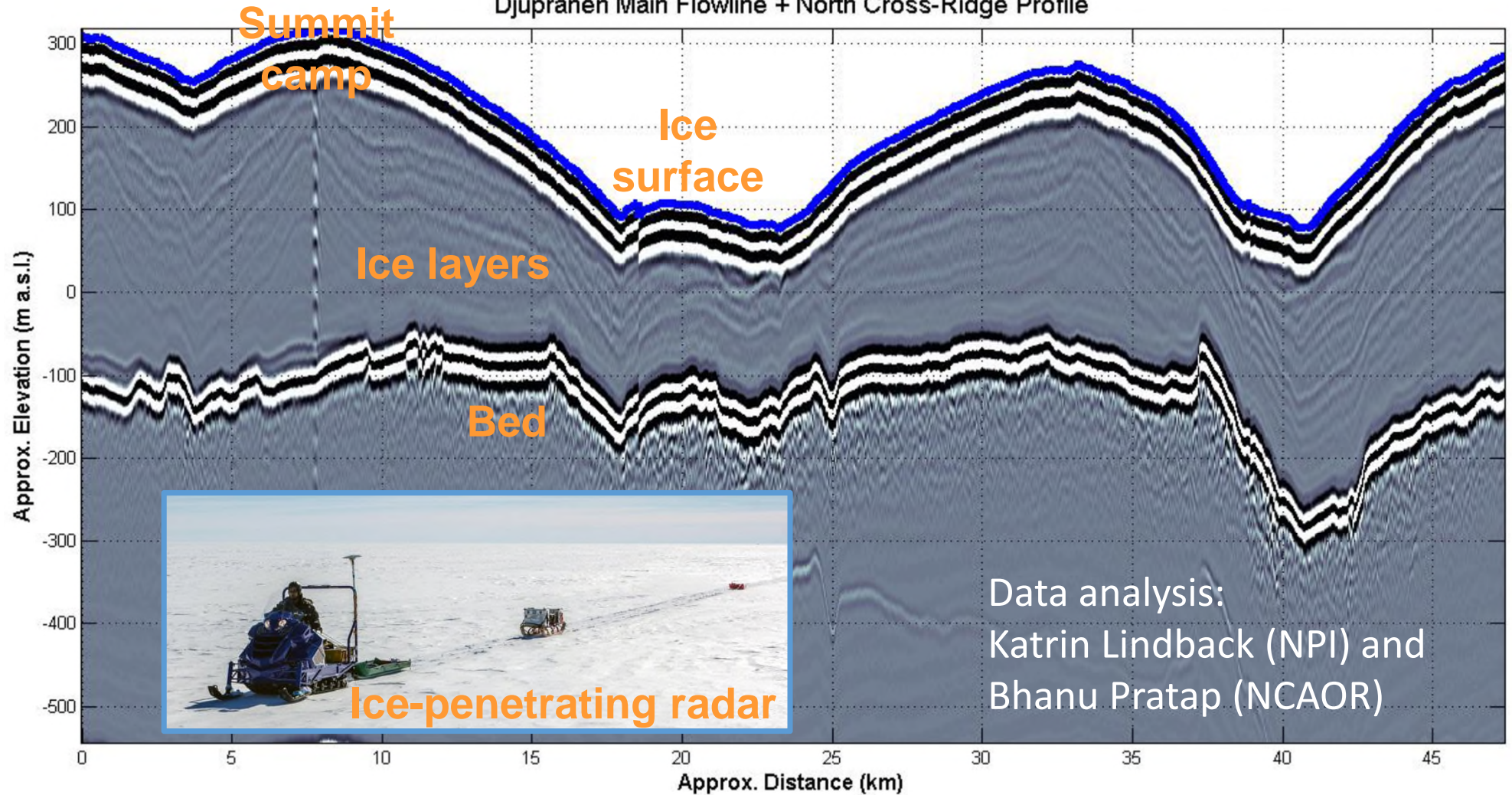
And do science together in hazardous places



Video: Harvey Goodwin

Radar looks into ice stratigraphy

Djupranen Main Flowline + North Cross-Ridge Profile



Ice coring for centurial paleoclimate

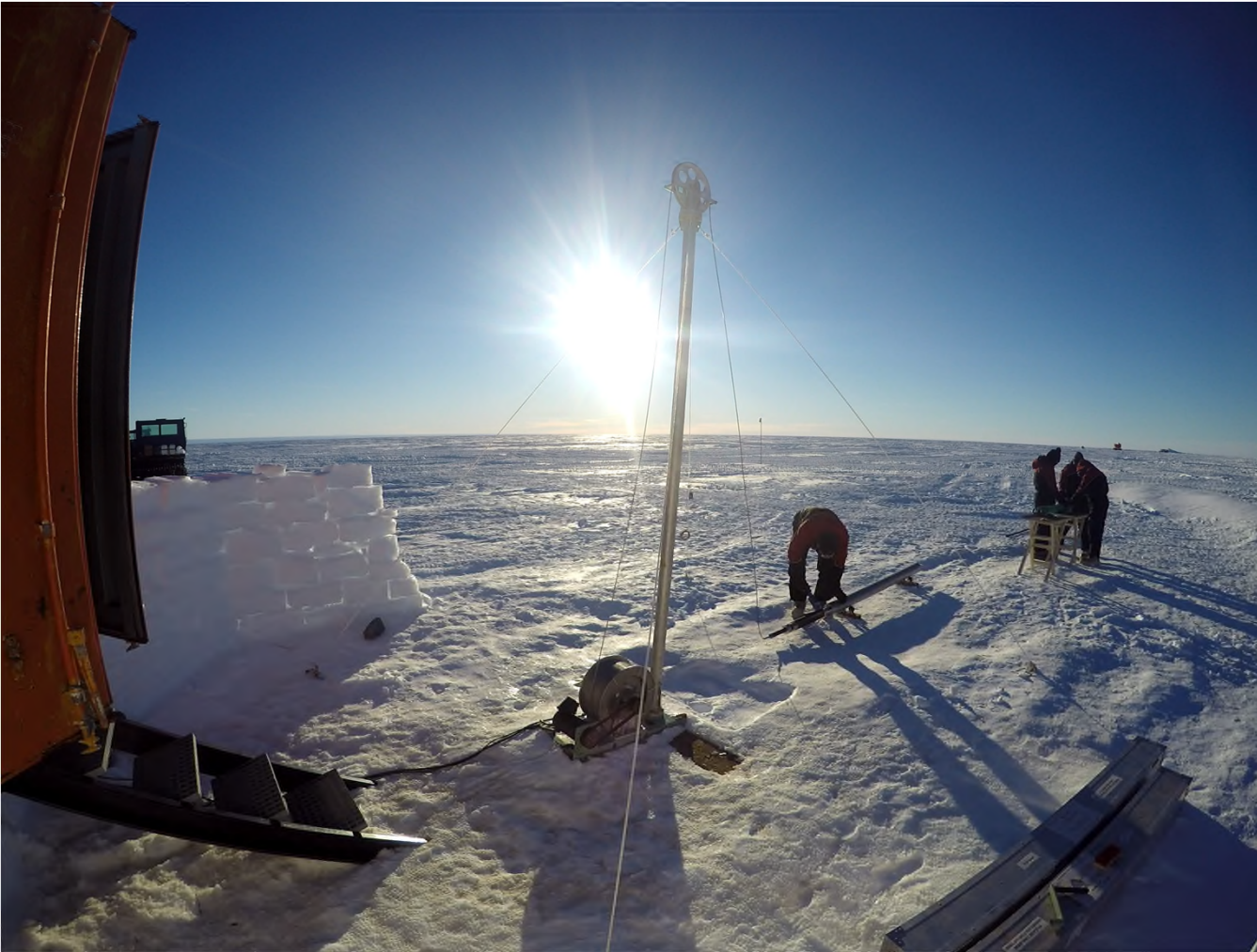
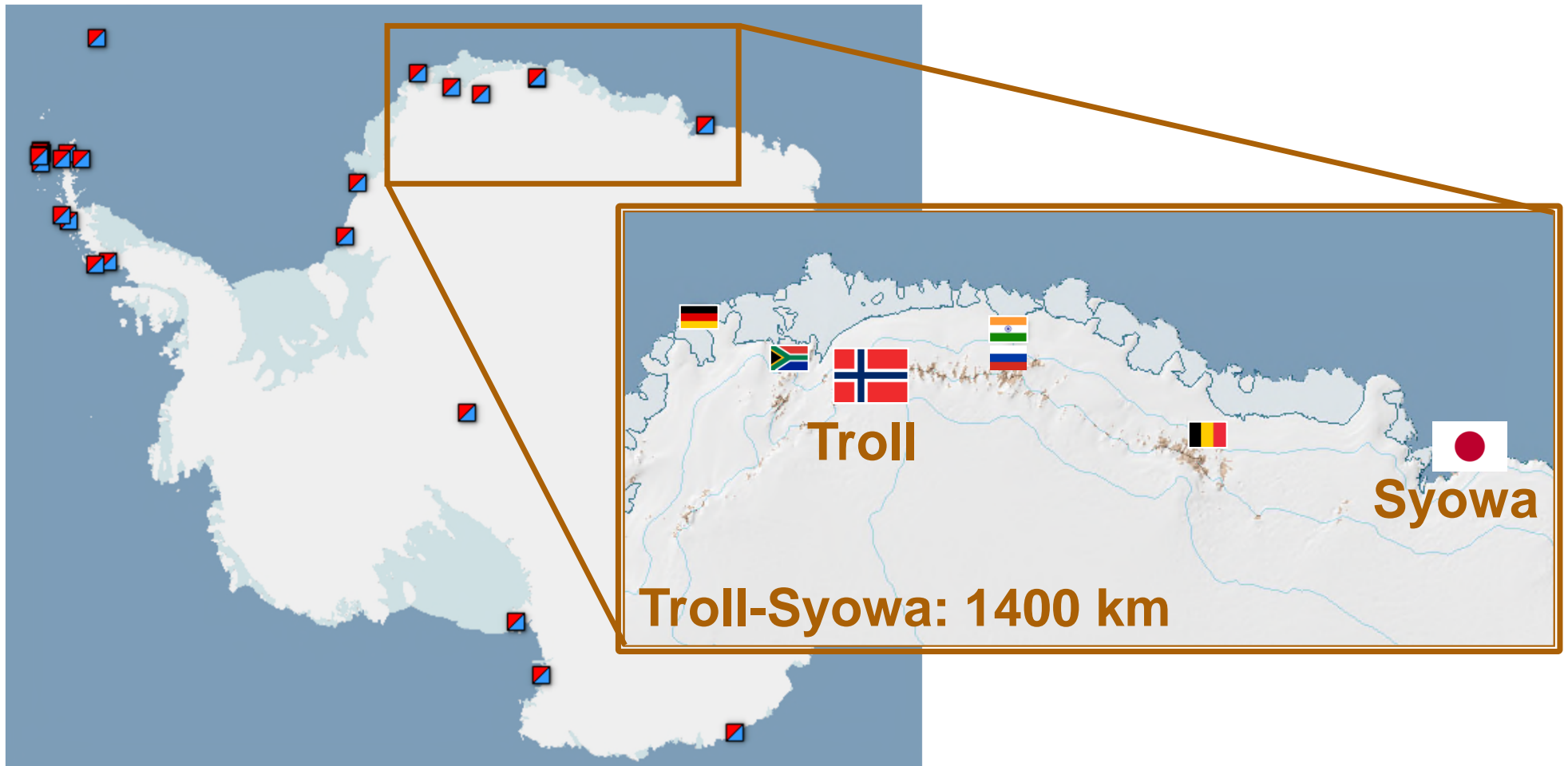


Photo and video:
Harvey Goodwin
Maha Linganathan

Japan and Norway are neighbors in Dronning Maud Land (DML), East Antarctica

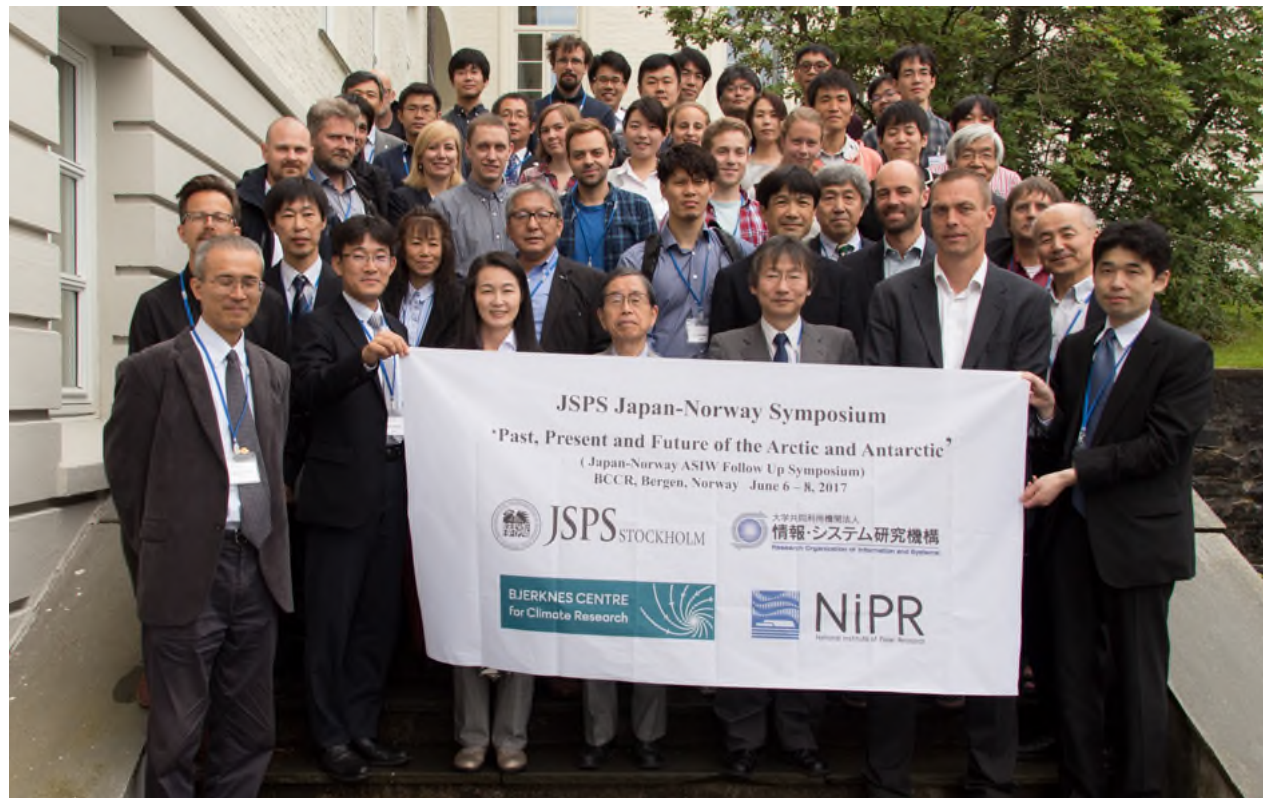


International collaboration is vital

JSPS symposium

«past, present, and future of the Arctic and Antarctic»

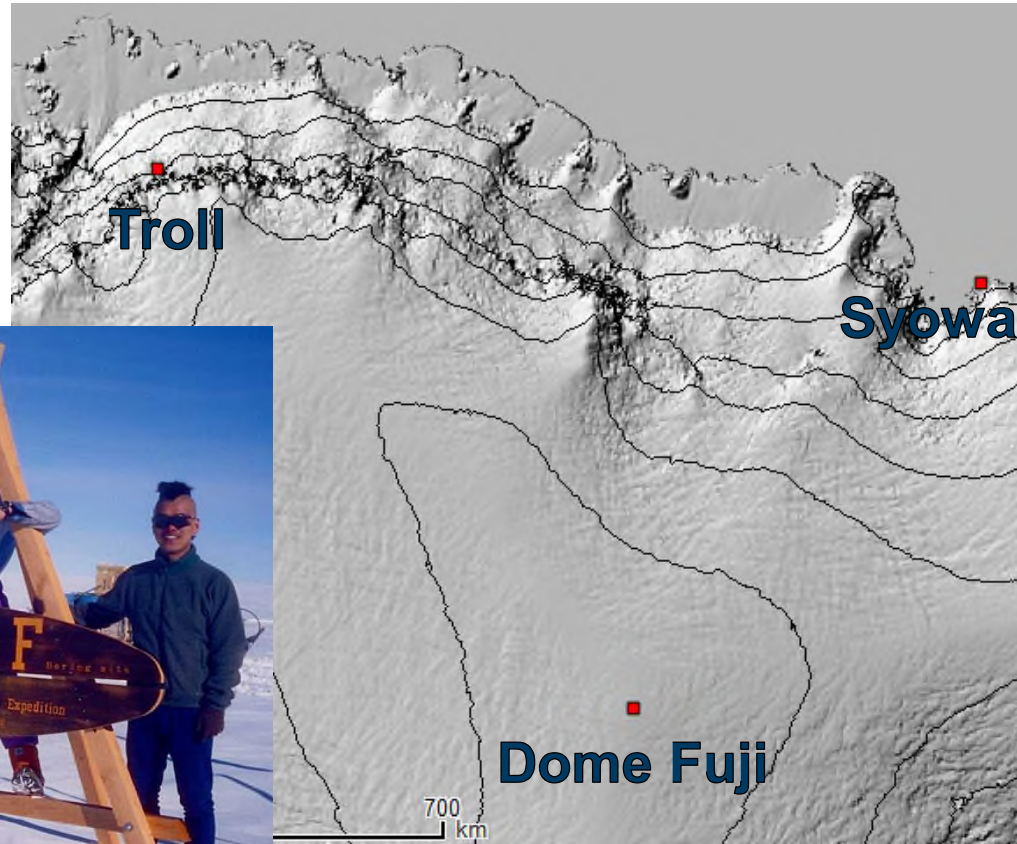
6-8 June, 2017



Japanese geologists at Troll 2015-16



Hunting the (millions years) Oldest Ice in the Dome Fuji region 2018-19



JARE37 in 1996



国立極地研究所
大学共同利用機関法人 情報・システム研究機構



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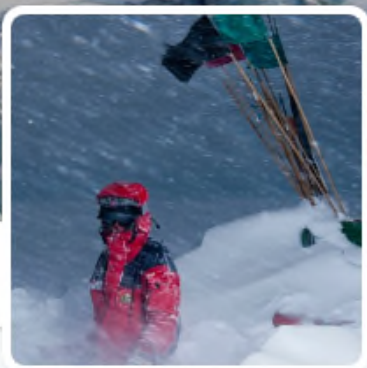


THE UNIVERSITY OF
ALABAMA



We are on social media

facebook.com/NPIglaciology/



TWEETS 125 FOLLOWING 106 FOLLOWERS 230 LIKES 39

Tweets Tweets & replies Media

NPIglaciology

@NPIglaciology **FOLLOWS**

Glaciology group @Norsk about our work in #Antarc #Arctic! #polar #glaciology #forskning #cryosphere



Madice

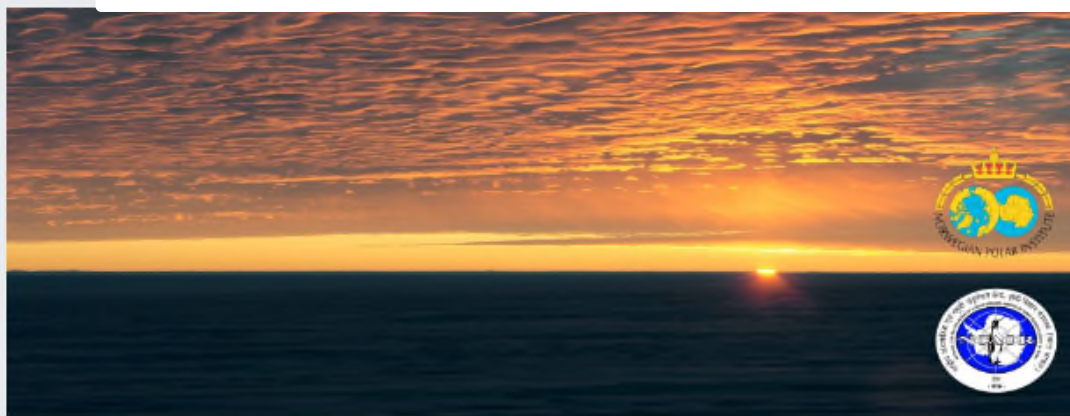
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NPIglaciology @NPIglaciology · Jan 26 Find out why all of the water suddenly disappears from this glacially dammed lake: <https://www.youtube.com/watch?v=...> #Antarc #Arctic! #polar #glaciology #forskning #cryosphere

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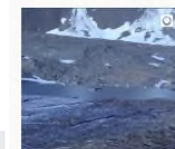
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NPIglaciology We are a team of glaciologists at @Norsk about our work in #Antarc and the #Arctic! #polar #glaciology #forskning #cryosphere



All trees grow from small seeds

Spring, 2001
In a train to the airport

When will you finish your PhD?

Next spring...

What's your plan?

Postdoc....

In Japan? Or abroad?

I don't know....

*Well, I'll send you some info
about postdoc fellowships*

Heart transplant giving climatologist
Lonnie Thompson a second chance

Heart transplant allows Ohio State's renowned climate scientist to
travel again to world's highest ice fields

◀ PREVIOUS | NEXT ▶



REQUEST TO BUY THIS PHOTO

PHOTO BY THOMAS NASH, COURTESY OF OHIO STATE UNIVERSITY.

Lonnie Thompson at the Qori Kalis glacier in the Peruvian Andes in 2000

Tusen takk

ご清聴ありがとうございました

***Sushi party is a new tradition
at Troll Station since 2010-11 season.***

***Troll is the best Sushi restaurant
within 1400 km.***

