



DLR/TerraSAR-X: development of IPY portofolio - status November 2009 -

Dana Floricioiu

Remote Sensing Technology Institute (IMF), TerraSAR-X processing team, DLR



Deutsches Zentrum
für Luft- und Raumfahrt e.V.
in der Helmholtz-Gemeinschaft

IPY STG 5 Meeting, WMO, Geneva, 30 Nov. – 2 Dec. 2009

IPY STG SAR Coordinated plan – Oct. 2008

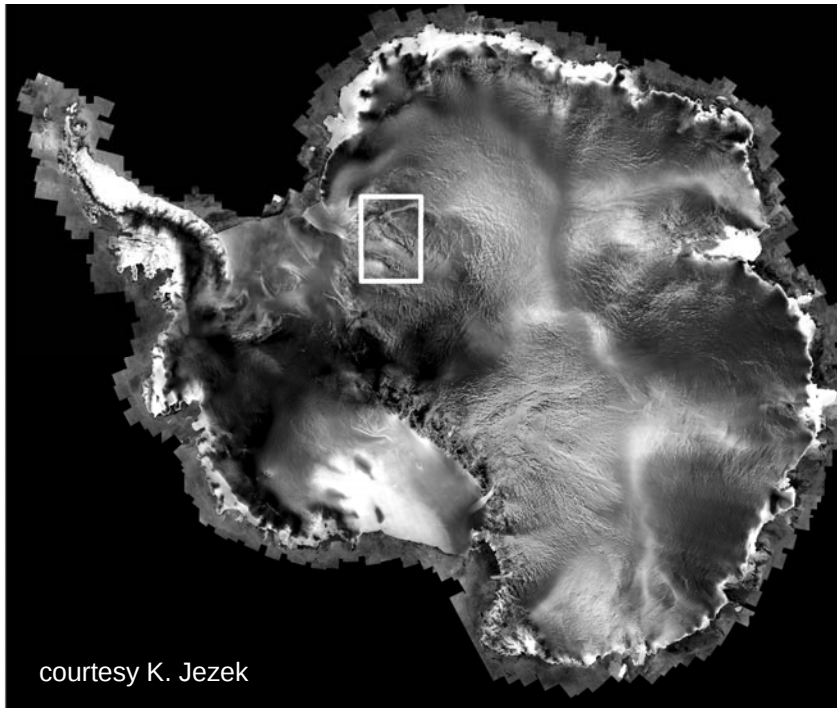
Sensors	3-day Arctic Basin snapshots	Pole to coast InSAR	Greenland - Ice fields	Supersites
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PROPOSED	N-A	Primary contribution to the ASAR pole hole gap will be the acquisitions planned in Transantarctic Mountains, Filchner Ice Streams & Coats Land.	Margins and coastal areas. InSAR coverage, minimum 2 cycles. Need a proposal to DLR.	Ideal sensor for this application. Supersites already identified in Antarctic. Proposal submitted for 2 regions. Possibility for interferometry at Greenland glaciers matching SPOT super-sites. See below for list. Proposal required for Greenland and Canadian super-sites.
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ACHIEVED  Deutsches DLR für Luft- u in der Helmh	N-A	Left looking acquisitions status: •Recovery glacier system (3 coverages completed) •Transantarctic Mts: - Nimrode Gl. (2 coverages completed) - Beardmore/ Shackleton Gl. (1st coverage ongoing)	-	Greenland outlet glaciers acquisition status: •22 glaciers surveyed Jan-Dec 2009 Background mission Ant. Peninsula & Ice Shelves ongoing
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(1) TerraSAR-X science project HYD0438 - Antarctica

Left looking (not nominal)
TerraSAR-X acquisitions over
Antarctic ice sheet, south of
80°S: Tributary ice stream of
Recovery glacier

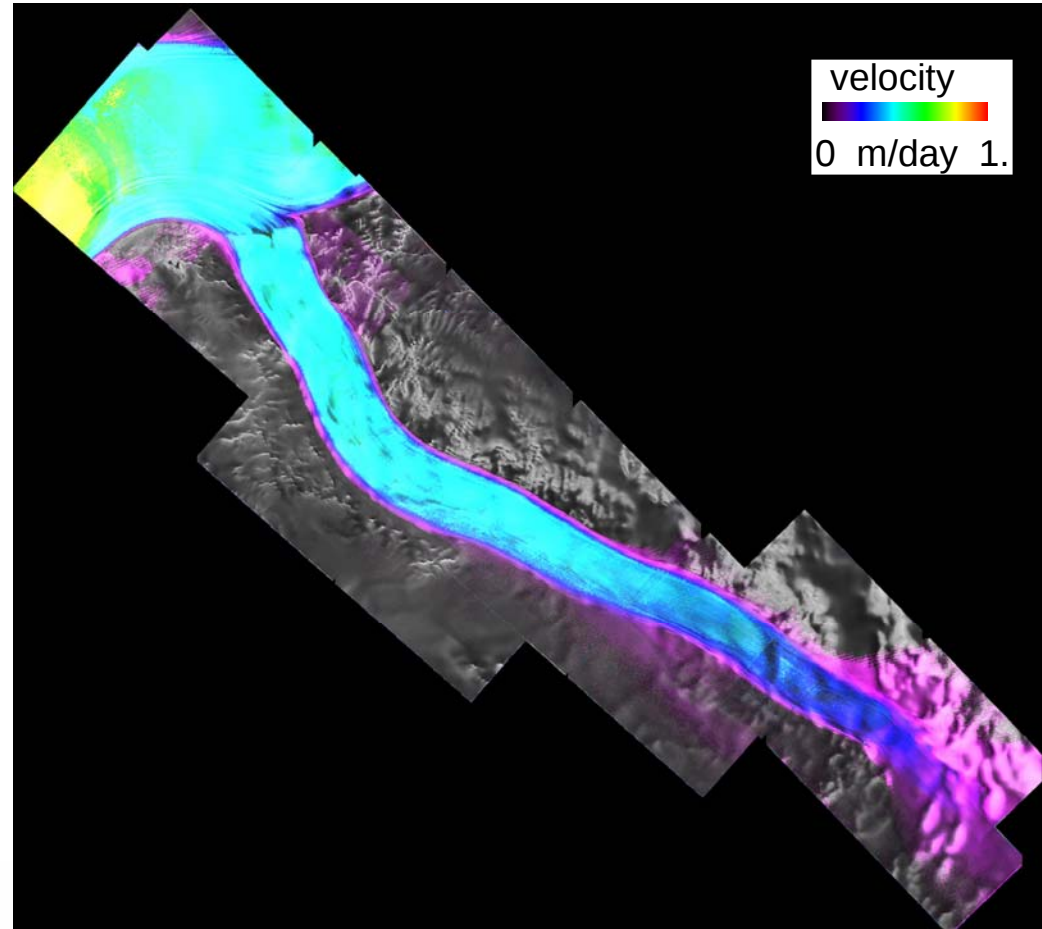


courtesy K. Jezek

TerraSAR-X planned coverage (by Katy Farness)

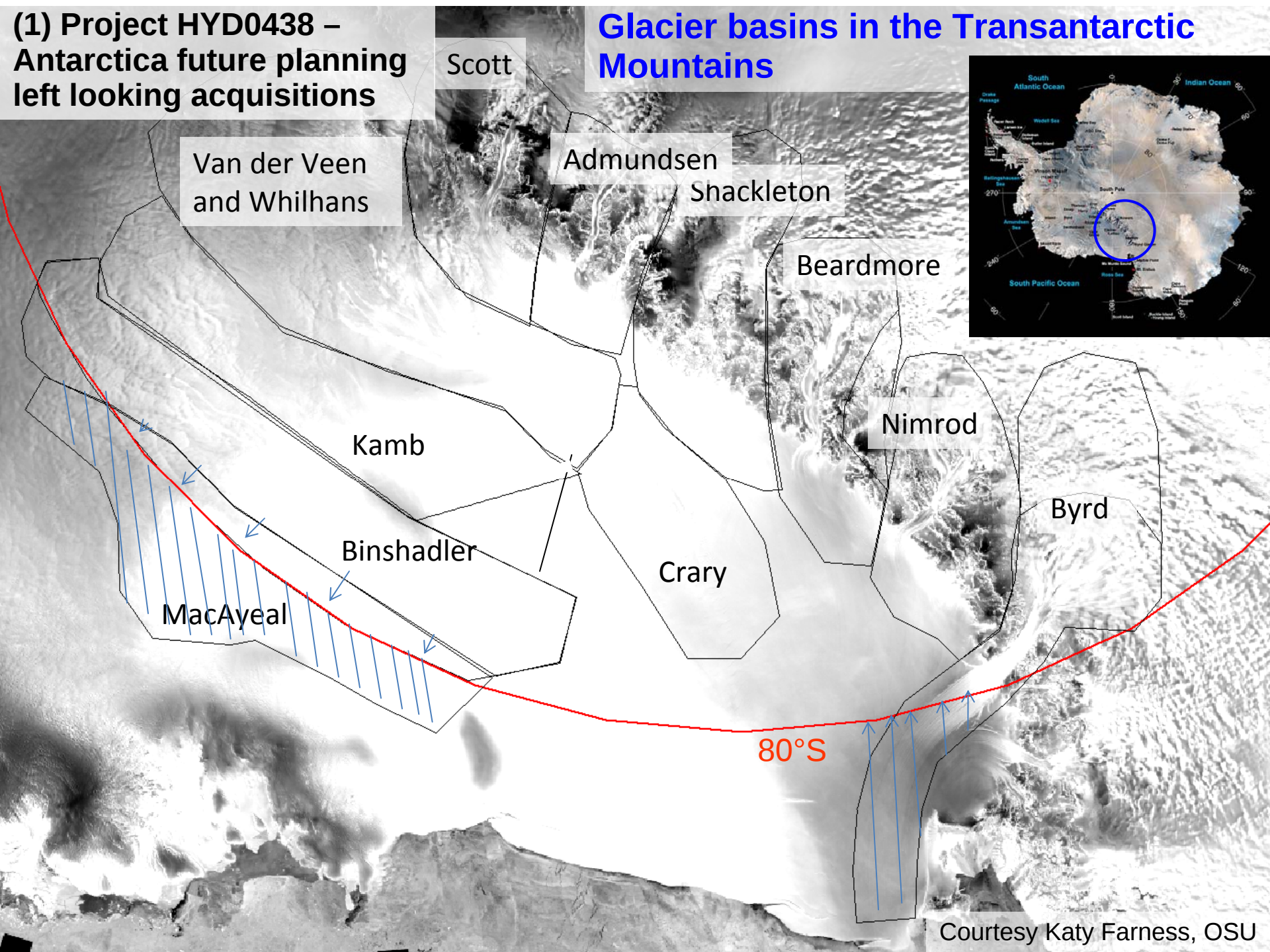
Background: Radarsat-1 (RAMP) mosaic

**Surface velocity of RAMP tributary derived
by speckle tracking; InSAR processing
ongoing (to be presented at Fringe 2009)**



**(1) Project HYD0438 –
Antarctica future planning
left looking acquisitions**

Glacier basins in the Transantarctic Mountains



**Transantarctic Mts: TerraSAR-X
DESCENDING COVERAGE, left
looking**

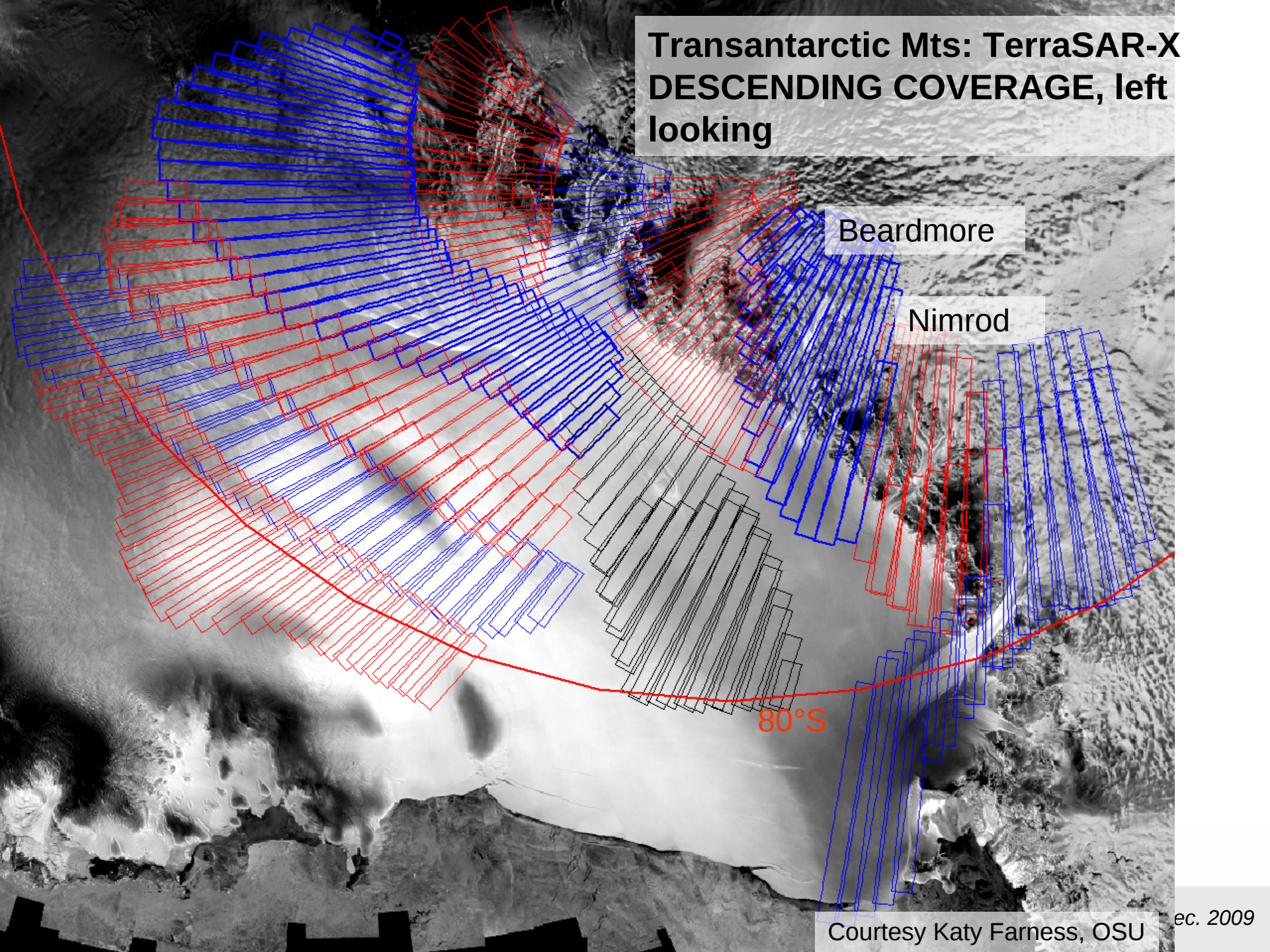
Beardmore

Nimrod

80°S

Courtesy Katy Farness, OSU

ec. 2009



TerraSAR-X mosaic Nimrod glacier

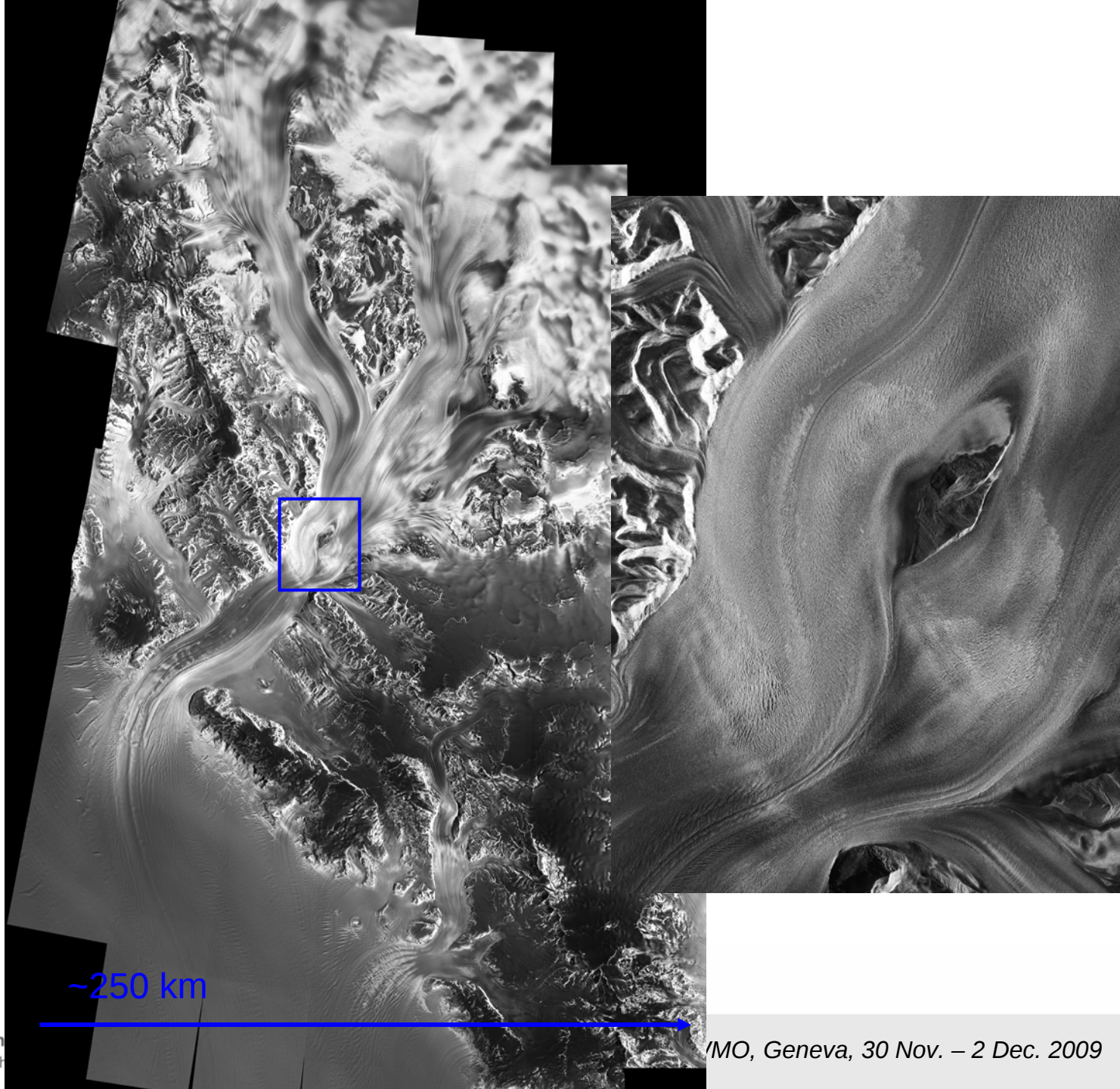
Stripmap
acquisitions

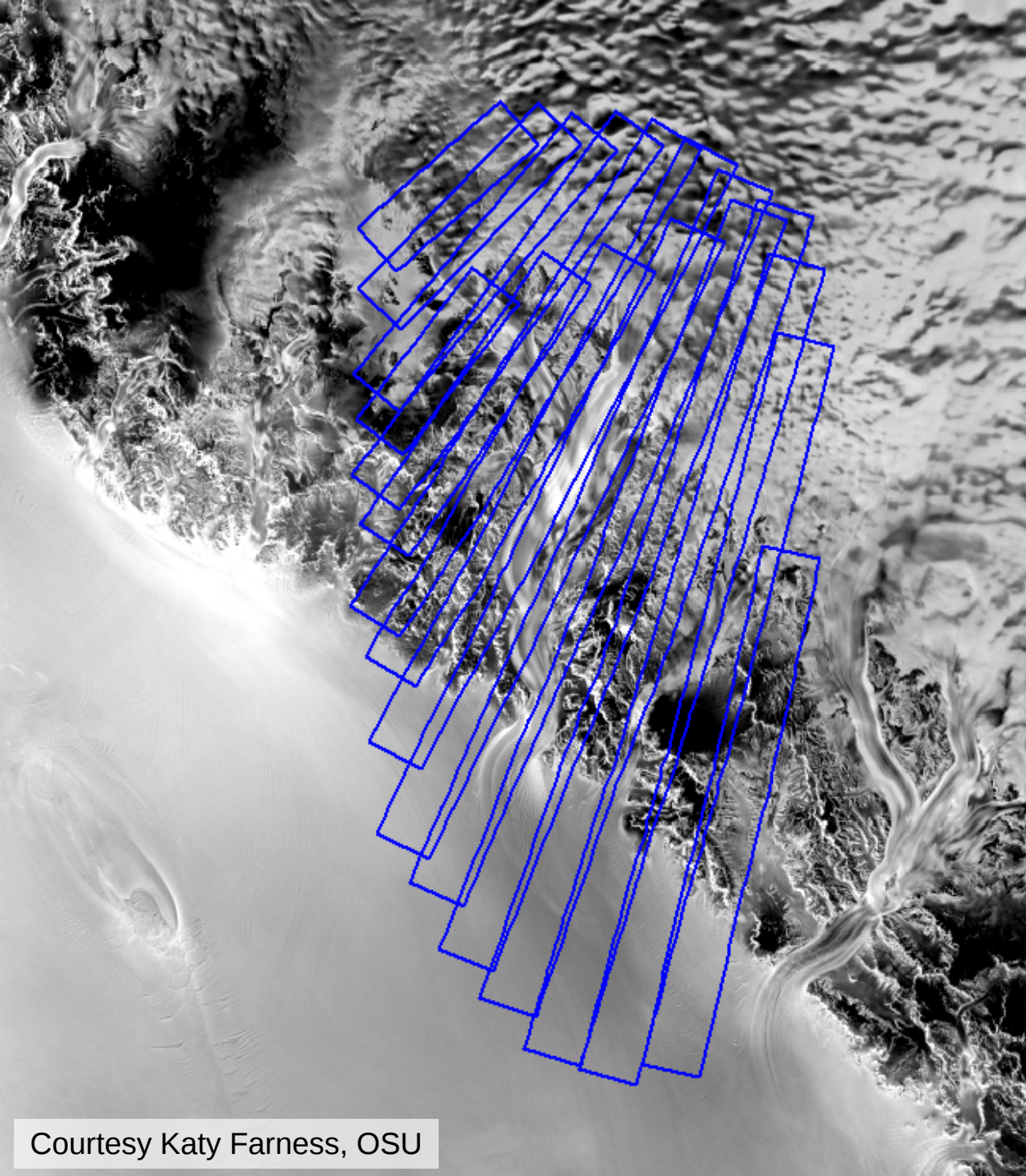
6 Oct. – 14 Nov.
2009

2 repeat pass
coverages

(545s for one
complete coverage)

Resolution: 3 m

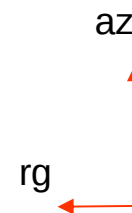




**Planned TerraSAR-X
acquisitions over
Beardmore Glacier:
descending coverage,
left looking**

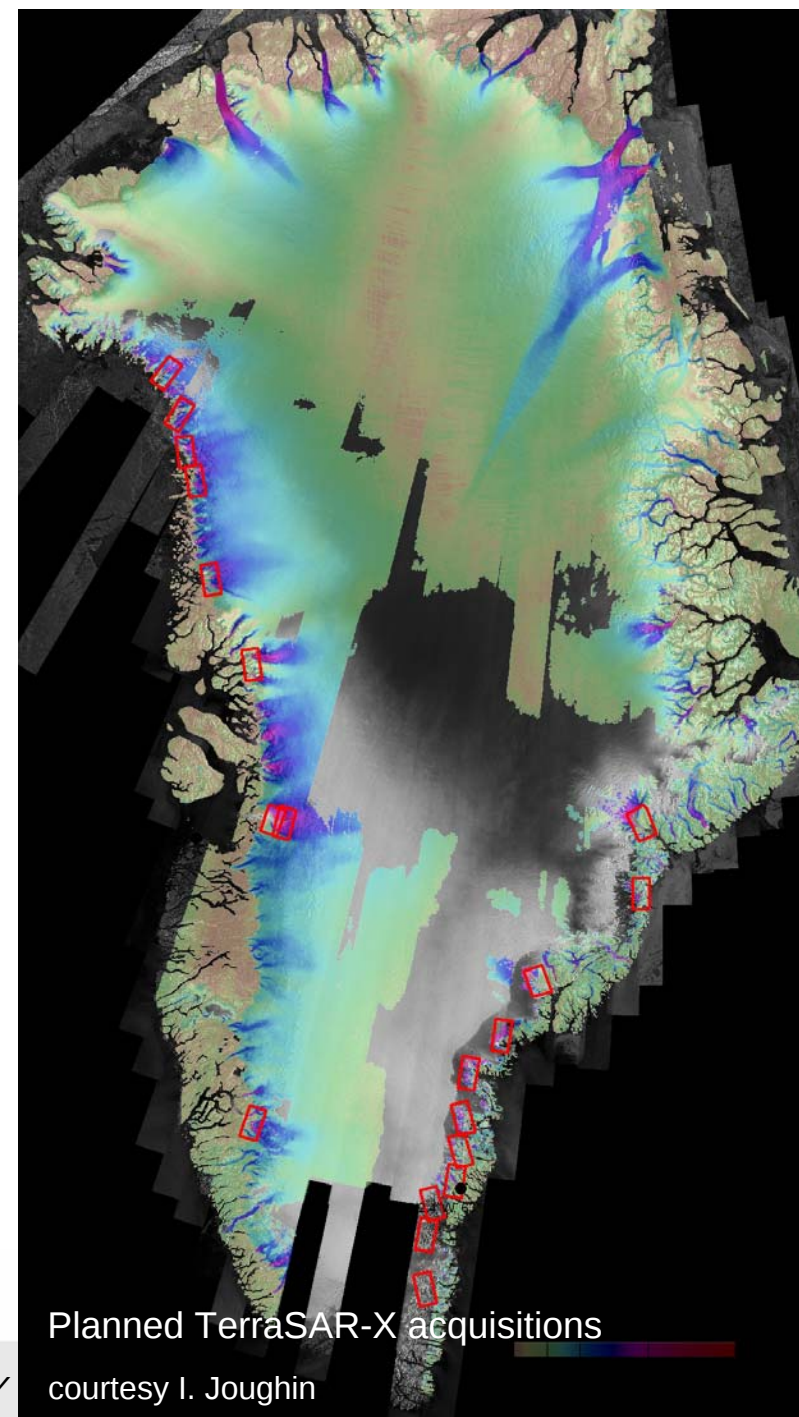
acquisitions started
on 20.11.2009

16 strip_014 swaths 



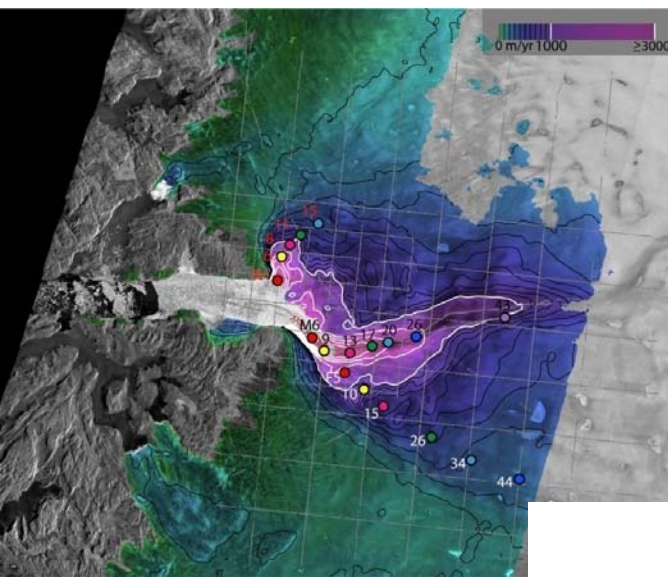
(2) TerraSAR-X science project HYD0492 - Greenland

- 245 TerraSAR-X products approved
- Repeat pass pairs were collected several times per year over about 22 rapidly changing outlet glaciers. Planning by Ian Joughin (Univ. of Washington)
- TerraSAR-X data acquired from January to December 2009 and processed. Status November 2009: 218 products delivered



(2) TerraSAR-X science project HYD0492 - Greenland

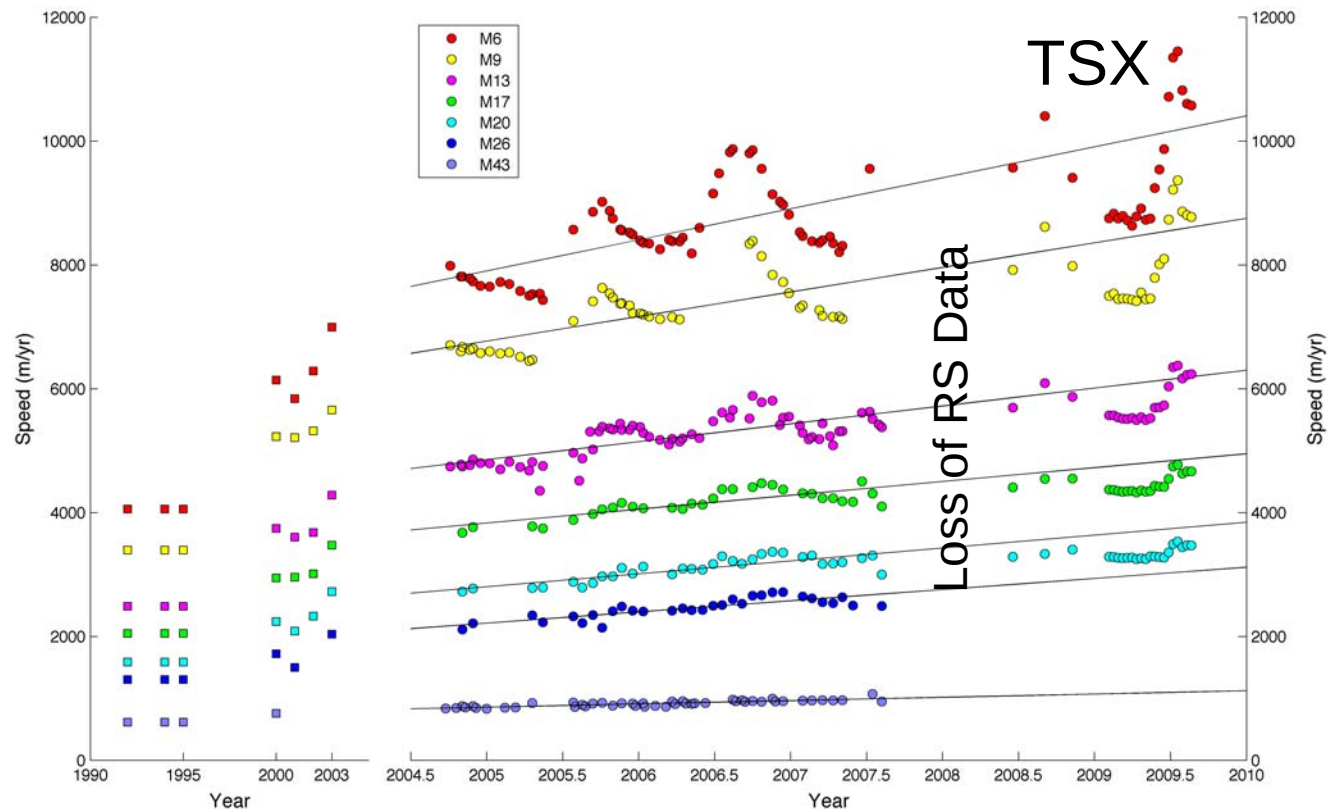
*Time series are critical to
understanding recent variability and
future sea level rise*



*Jakobshavn Isbrae
flow speed through
time from ERS,
Landsat,
RADARSAT, and
TerraSAR-X.*



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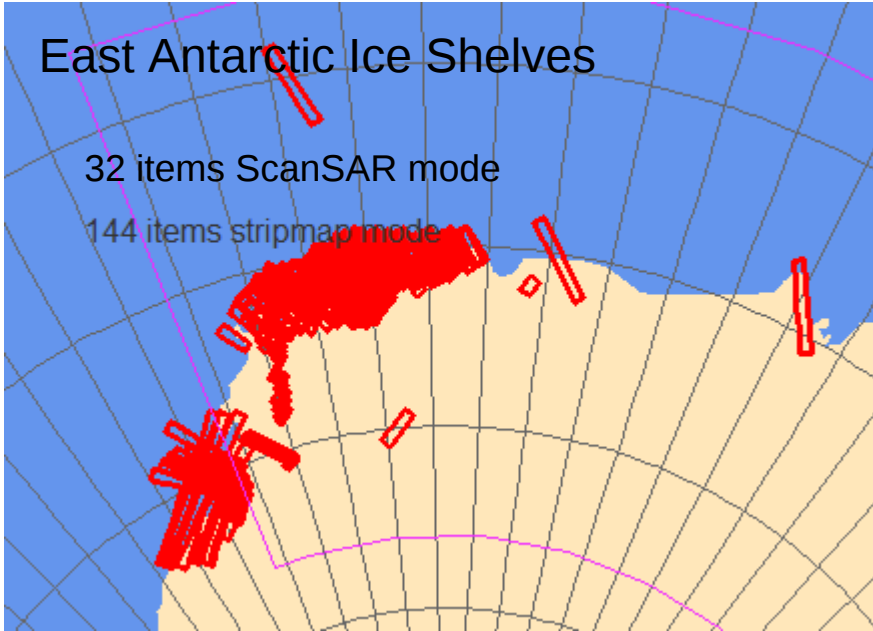
courtesy I. Joughin., Univ. of Washington

(3) TerraSAR-X background mission “Antarctic Peninsula & Antarctic Ice Shelves”

East Antarctic Ice Shelves

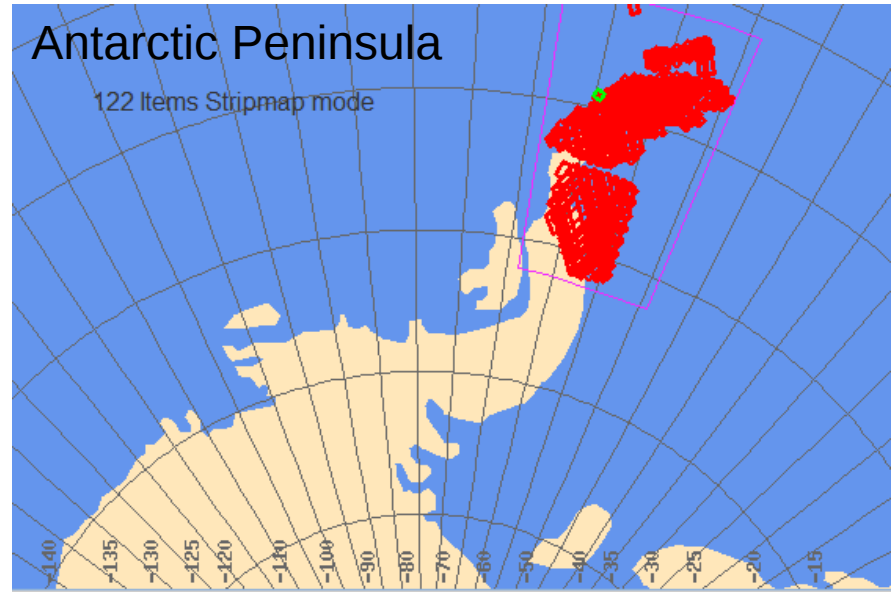
32 items ScanSAR mode

144 items stripmap mode



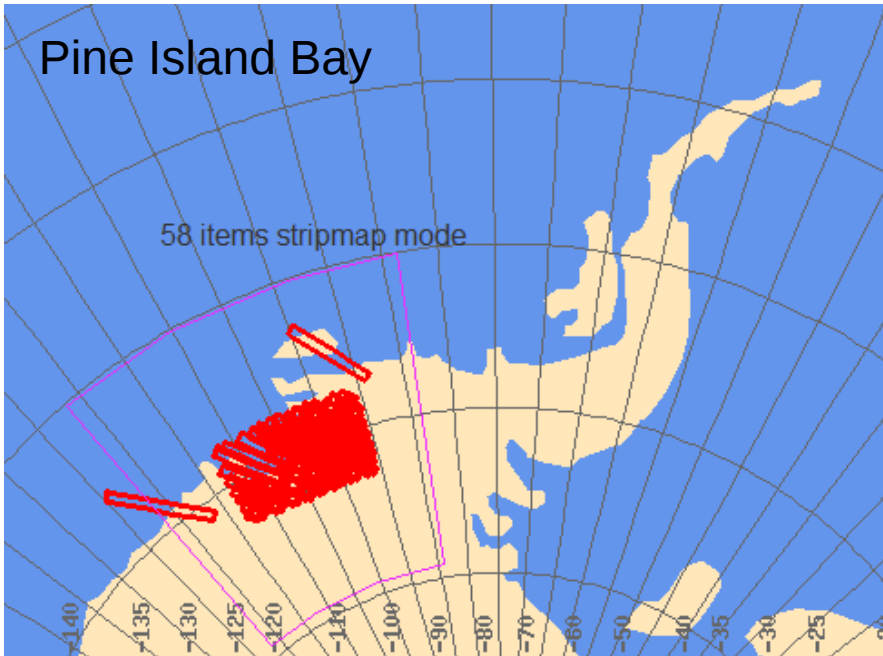
Antarctic Peninsula

122 Items Stripmap mode



Pine Island Bay

58 items stripmap mode

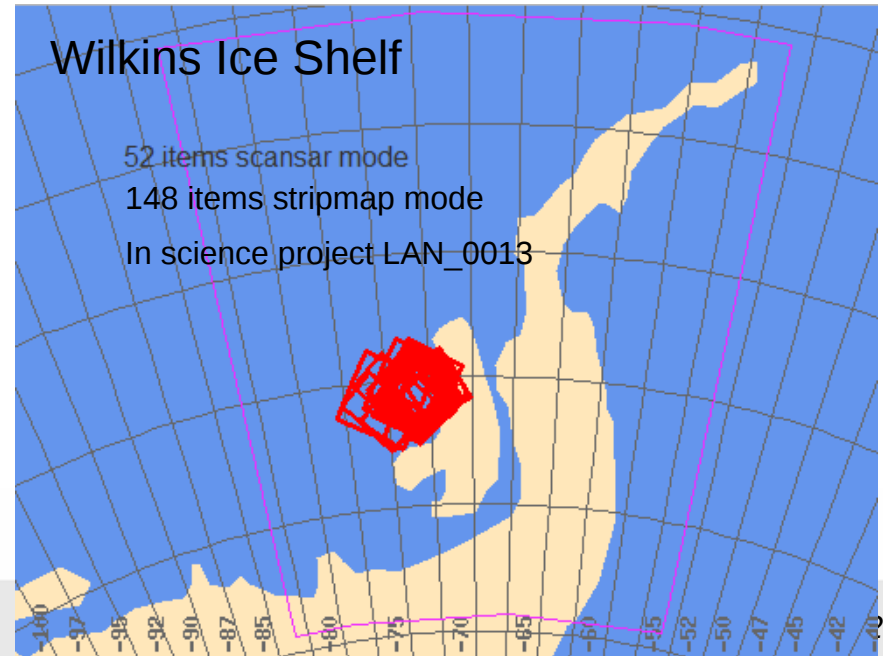


Wilkins Ice Shelf

52 items scansar mode

148 items stripmap mode

In science project LAN_0013





Wilkins Ice shelf collapse April 2009

Mapping
of detailed
structures of
ice shelves
and glaciers

Goal:
Improve the understanding of ice mechanics
and glaciological processes

Ongoing and future activities at DLR with TerraSAR-X:



1. Continuing with left looking acquisitions in the pole hole over Transantarctic Mts.
2. Continuing acquisitions over Antarctic Ice Shelves (background mission)
3. Acquisitions over Greenland runoff glaciers required for MEaSUrES will continue through 2010 as background mission (data will be acquired but not processed). Ian Joughin/Craig Dobson are trying to raise funds for processing.
4. Ice velocity maps generation from TSX left looking data
5. Preparation of visual products for IPY conference in Oslo: high resolution mosaics of backscattering and velocity maps can be generated for areas preferably not larger than about 250 x 250 km²