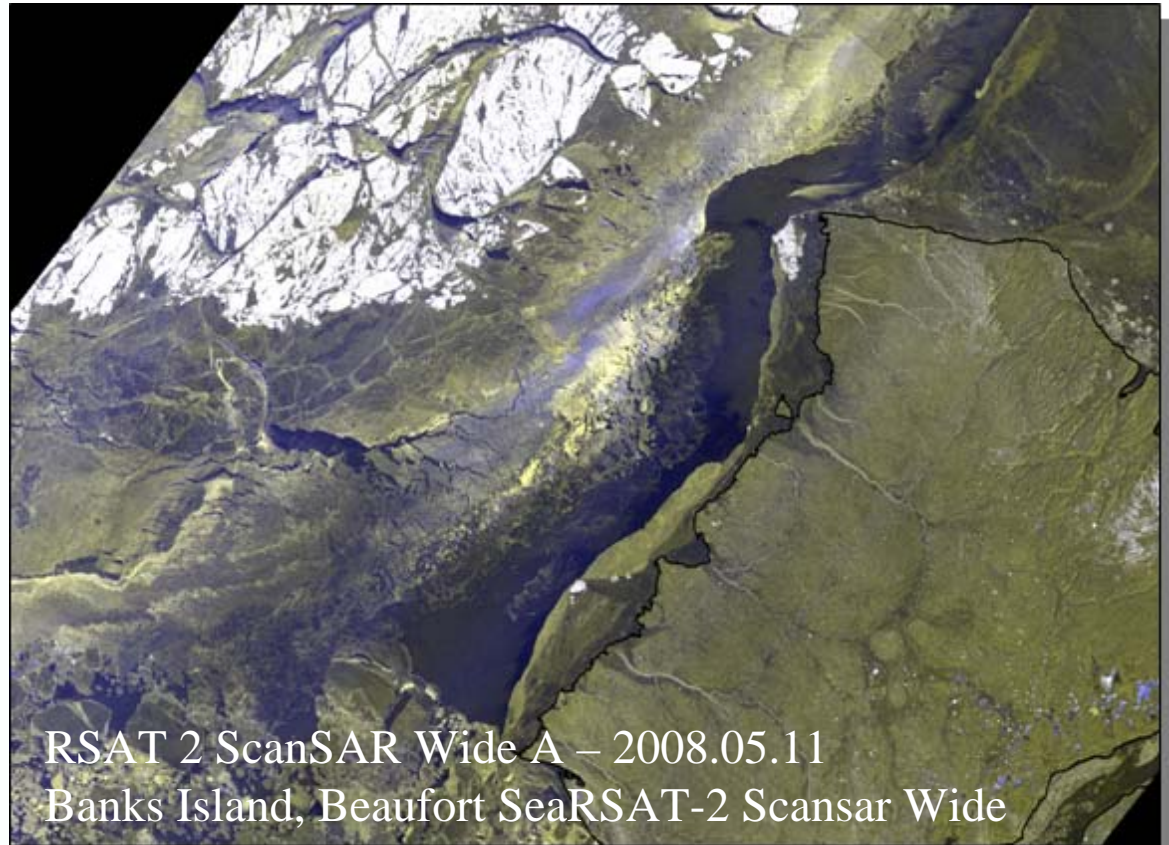


Space Task Group of the IPY Sub-Committee on Observations

Results of a Coordinated Response – From Acquisition to Products

COORDINATED RESPONSE OF THE SPACE AGENCIES TO IPY SCIENCE OBJECTIVES

Yves Crevier
Canadian Space Agency

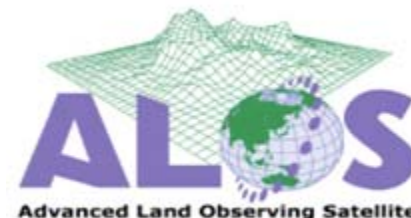


RSAT 2 ScanSAR Wide A – 2008.05.11

Banks Island, Beaufort Sea RSAT-2 Scansar Wide

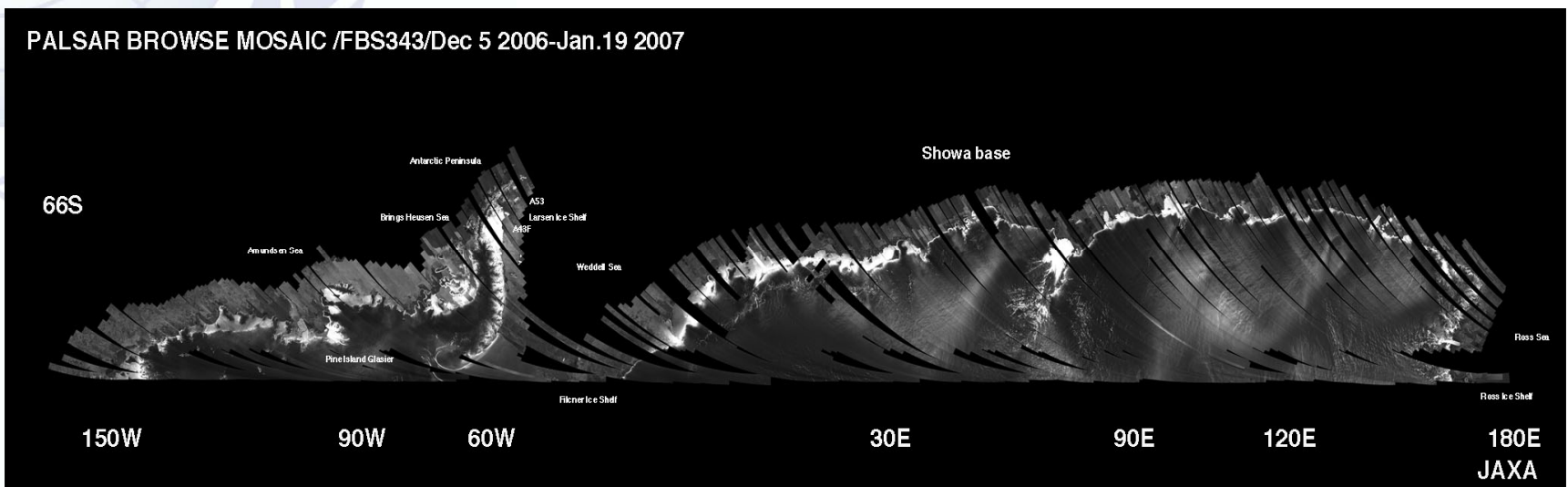
Contributors

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- Private sector and International organisations
 - MDA, ASF, KSAT, GIIPSY, WMO JC



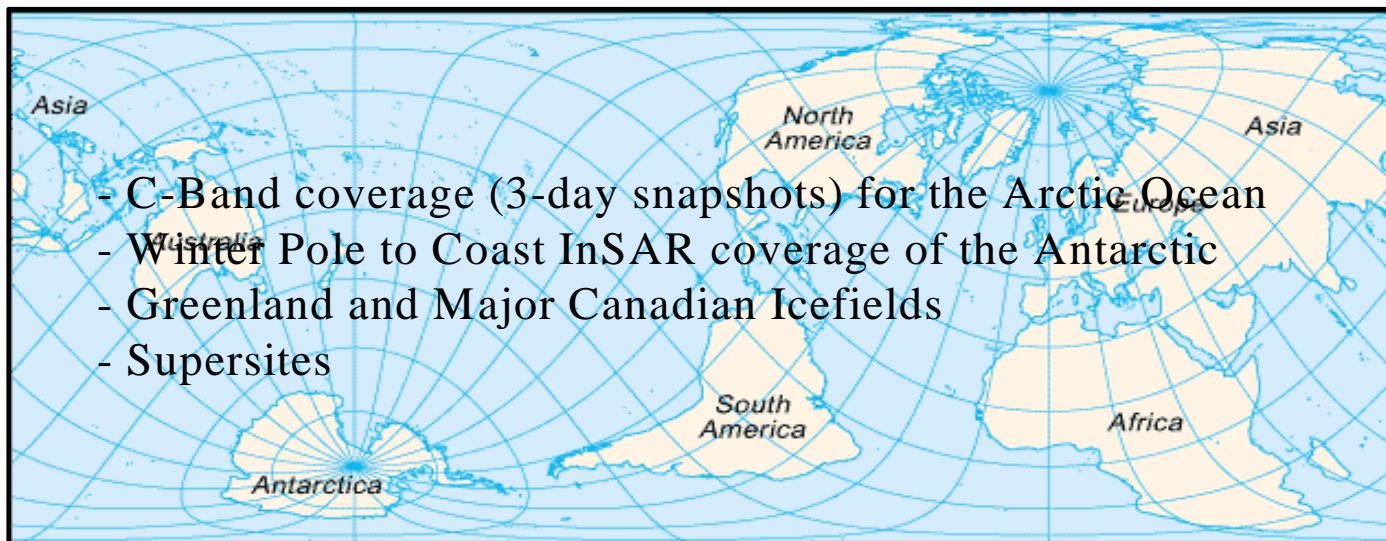
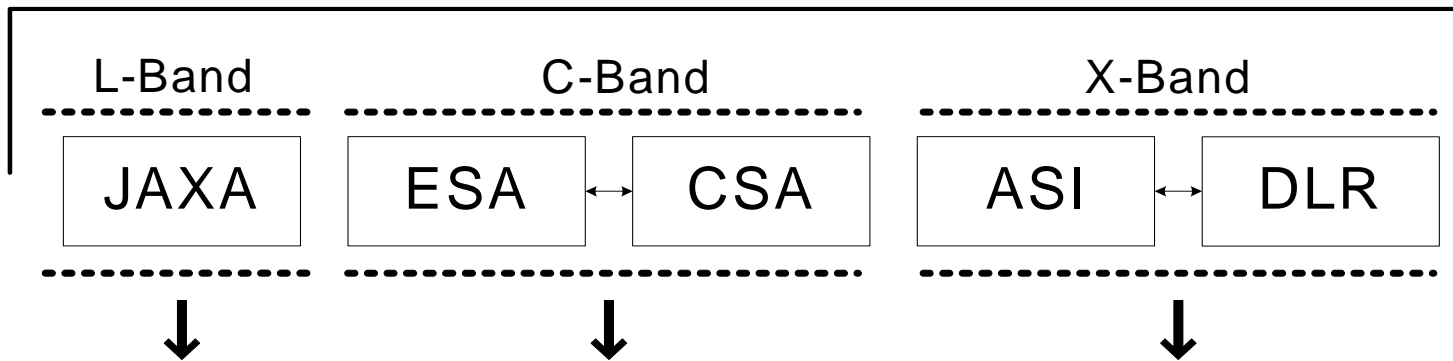
Path Towards SAR Coordination

- Planning: Assessment of SAR system capacity vs IPY science objectives
- Acquisition: Coordinated SAR acquisition
- Science Products: Processing of SAR data into science products and data dissemination
- 3 meetings - hosted by STG member agencies (CSA, DLR, ESA)



Space Task Group Coordination

← Horizontal Collaboration →



Coordinated Acquisition Plan from Oct 08 Meeting

Sensors	3-day Arctic Basin snapshots	Pole to coast InSAR	Greenland - Ice fields	Supersites
PALSAR	Fixed image acquisition plan. New L-band mosaic of sea ice.	Fixed image acquisition plan. New L-band mosaic. South pole hole not covered.	Partial InSAR coverage in fine beam and pol mode.	Robust proposal required for augmentation of the basic observation plan.
ASAR	Systematic wide swath coverage – C-Band complementary to RSAT. Acquisition limitation in Chukchi Sea and East Siberian Shelf.	Intense InSAR acquisition plan for regions north of about 78 degrees S.	Intense acquisition plan. Reception hole central Greenland. Continue doing this through IPY period. 2 nd Tandem campaign ERS and ASAR over large supersites.	Available for supersites. Multi-pol capabilities not exploited
RSAT 1	Requires the participation and agreement of ASF and KSAT. Canadian and Norwegian waters well covered under background and operational missions.	Not possible due to lack of receiving station. No rotation planned.	Requires financial participation of foreign receiving stations. Historical coverage -- covered 2-times in InSAR.	Available for supersite monitoring under the Canadian mask – avoid conflicts by avoiding coastal areas.
RSAT 2	Planned background mission. 8 times 3-day snapshot over 24-day cycle.	Plan to acquire entire continent left-looking in cycle 12 (Wide asc) starting Oct 14. Plan to acquire pole hole interferometrically left looking cycle 16 starting Jan 18 and cycle 17 starting Feb 11. Use Standard mode for interferometry with gaps filled by EH4.	Background mission planning. InSAR coverage. 3 cycles in Fine mode in descending orbits in Nov-Feb.	Sites may require polarimetric capabilities of R2.
Terrasar X	N-A	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.	Ideal sensor for this application. Supersites already identified in Antarctic. Possibility for interferometry at Greenland glaciers matching SPOT supersites.
Cosmo-Skymed	N-A	TBD	TBD	Ideal sensor for this application.
Action	Coordinated acquisition plan between ESA and CSA. For R1 – how can receiving stations contribute?	Consolidate acquisition planning to distribute imaging load and meet the requirement.		Select the supersites; Based on science activities and other missions cal/val; identify PIs as POCs for agencies. Distribute the supersites between missions. Identify agencies for supersite monitoring.

 The mission is not appropriate for achieving this particular requirement.
 The mission is ideal for achieving this particular requirement.
 The mission is not optimum for achieving this particular requirement.

3rd IPY/STG SAR Coordination Meeting Summary

- Held at ESRIN 23 – 24 June 2009
- The space agencies presented the data acquisitions that they had made, following the coordinated plan created at DLR in October 2008

Acquisitions Actually Achieved – to be validated

Sensors	3-day Arctic Basin snapshots	Pole to coast InSAR	Greenland - Ice fields	Supersites
PALSAR	Fixed image acquisition plan. New L-band mosaic of sea ice.	Fixed image acquisition plan. New L-band mosaic. South pole hole not covered.	Partial InSAR coverage in fine beam and pol mode.	Robust proposal required for augmentation of the basic observation plan.
ASAR	Systematic wide swath coverage – C-Band complementary to RSAT. Acquisition limitation in Chukchi Sea and East Siberian Shelf.	Intense InSAR acquisition plan for regions north of about 78 degrees S.	Intense acquisition plan. Reception hole central Greenland. Continue doing this through IPY period. 2 nd Tandem campaign ERS and ASAR over large supersites.	Available for supersites. Multi-pol capabilities not exploited
RSAT 1	No downlink capability was available until May.	Not possible due to lack of receiving station. See RADARSAT-2.	Data acquired for 3 consecutive cycles and downlinked to Tromsø DRF. Fine 1, Dec. 2008 – Feb. 2009	Data acquired and archived in Canada
RSAT 2	Not possible due to operational constraints.	All data acquired and archived in Canada. Mosaic: W2+EH4, Oct. to Dec 08 Interferometry (3 cons. cycles): S5+EH4, Feb. to Apr. 09	Barely possible with RADARSAT 2 due to large number of conflicts. Data acquired mostly with RADARSAT-1	Data acquired through RADARSAT-2 Background Mission. Data archived in Canada
Terrasar X	N-A	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.	Ideal sensor for this application. Supersites already identified in Antarctic. Possibility for interferometry at Greenland glaciers matching SPOT supersites.
Cosmo-SkyMed	N-A	Icestreams, Glaciers velocity fields (Drygalski, Lambert, David). Contributions to cover the gaps (Background Mission).	Incomplete InSAR coverage. Icestreams, Glaciers velocity fields (Jacobshavn, Alaska, Bering).	Only Partially covered.

The mission is not appropriate for achieving this particular requirement.

The mission is ideal for achieving this particular requirement.

The mission is not optimum for achieving this particular requirement.

3rd IPY/STG SAR Coordination Meeting Summary

- IPY Consolidation Meeting in Oslo in June 2010 - an opportunity to advertise the achievements of STG
- STG SAR Coordination Group needs to produce two types of deliverables:
 - Visual products for Oslo meeting
 - Science products of use to scientists
- Discussion of the Product Specification for Antarctic Mosaic and other products
- Need for the products to be created consistently according to agreed product specifications

3rd IPY/STG SAR Coordination Meeting Summary

- Discussion of how to generate products in a coordinated way
- This coordination might entail use of other agencies' data, shared work, shared funding, shared integration
- It was agreed to fill in a table for each of the following product types:
 - Winter Mosaic of Antarctica & Greenland
 - Summer Mosaic of Antarctica & Greenland
 - Velocity Map of Antarctica & Greenland
 - Motion Grids of the Arctic Basin & the Southern Ocean
 - Shelf Break-up in the Arctic Basin & the Southern Ocean

3rd IPY/STG SAR Coordination Meeting Summary

- For each product type (mosaic, velocity map, motion grids, etc), the following information was requested:
 - Has sufficient data been acquired
 - Level of processing required of the ground station
 - Capacity to generate products internally or contract out
 - Distribution of the output product
 - Availability to scientists
 - Integration roles of the agencies

Product Generation Plan – to be completed from Agency reports

Sensors	3-day Arctic Basin snapshots	Pole to coast InSAR	Greenland - Ice fields	Supersites
PALSAR				
ASAR	Produced by 2010 by GlobIce	CSA and ESA have initiated discussions for a Pole to Coast Velocity product		
RSAT 1			CSA working with NASA to develop an velocity map over Greenland	
RSAT 2		CSA working with Canadian industry to develop a high resolution dual pol mosaic of Antarctica. CSA and ESA have initiated discussions for a Pole to Coast Velocity product		
Terrasar X				
Cosmo-Skymed		Subsets linked with the CSK AO Projects	Subsets linked with the CSK AO Projects	
	The mission is not appropriate for achieving this particular requirement.			
	The mission is ideal for achieving this particular requirement.			
	The mission is not optimum for achieving this particular requirement.			

3rd IPY/STG SAR Coordination

- Next Steps:
 - Suggestion that we write down the Lessons Learned from the STG SAR Coordination Group and present to management
 - Need for a teleconference to discuss outreach and sustainability, to be held in fall-winter 2009