







Role of CSA in IPY

- Ensure the use of Space Technologies in IPY Science initiatives
 - •Guarantee fluid and continued availability and access to EO data from CSA supported mission
 - Dedicate programs and resources to support science, application demonstration, and operational use of EO data for IPY
- Encourage strong collaborations (National and International)





Canadian Space-based Assets

- RADARSAT series
 - RADARSAT 1 11+ year archive
 - RADARSAT 1 New acquisitions to enhance the value of the archive Satellite available until March 2009
 - RADARSAT 2 Use the Canadian Government data allocation for science activities under IPY
 - RADARSAT Constellation Mission IPY Legacy
- Focus on National and International consultation and coordination





CSA IPY Activities

- 1. Arctic Science Archive Processing project
- 2. RADARSAT Polar Science Database
- 3. Coordination through Space Task Group

Addressing 3 of the IPY objectives as stated in the STG terms of reference – SAR perspective







1. ASAP

• Objectives:

- Initiate the processing of RSAT 1 archive collected over both poles.
- Ensure accessibility for scientific activities
- Direct contribution to IPY national and International science programs
- 12 years of relevant datasets based on operational and background missions activities







Canada

ASAP Legacy

- Blanket coverage in Fine 1 of the Canadian polar region and the Arctic Archipelago (collected during the CIM, 2000-2001)
- Max and Min ice extent Arctic snapshots from 2003 to ...
- Thematically relevant dataset acquired over specific areas of interest (supersites) identified by the research communities
- Canadian Ice Service dataset acquired since 1996
- Canadian Arctic land mass mosaics summer and winter 1998-99
- Canadian Interferometric Mission dataset

ASAP Portefolio:

Name	lmage Type	Geographical coverage	Mission	Start date	End date	Product	Number of	Extension	Мар
Frozen Baseline	Fine Descending orbits only	North of 60 + coastal regions of Hudson and James Bay and Arctic Archipelago	Canadian Interferometric mission	Sept 2000	Feb 2001	Individual mage product Include only data received as real-time or playback data in Gatineau or Prince	3106	Processing of multiple passes over site-specific areas RSAT 1 and 2 new acquisitions	1
Sea Ice Min and Max Snapshots	ScanSAR Wide A&B	Circum-Polar Basin	Extended Background Mission	Sept 2003 2004 2005 2006	March 2003 2004 2005 2006	Albert. Individual image products only over Canadian waters Mosaics of annual min and max ice extent	358	Continued the snapshots in time with RSAT 1 and 2 Processing of circum-polar data sets – require the archive content of ASF and Tromso	2
Arctic Supersites Site 1-7	ScanSAR Wide A&B	ArcticNet research sites	Shoulder seasons to capture freeze and thaw cycles	1996		Individual image products	2878	RSAT 1 and 2 new acquisitions	3
Great Slave Site 8	ScanSAR Wide A&B	Great Slave Lake	Shoulder seasons to capture freeze and thaw cycles	1996		Individual image products	237	RSAT 1 and 2 new acquisitions	3
Great Bear Site 9	ScanSAR Wide A&B	Great Bear Lake	Shoulder seasons to capture freeze and thaw cycles	1996		Individual image products	221	RSAT 1 and 2 new acquisitions	3
NWT Site 10	Standard		Radargrammetry mission – S2, S7	1996		Individual image products	117	RSAT 1 and 2 new acquisitions	3
Mackenzie Delta	Fine, Wide and	Mackenzie Delta		1996			203	RSAT 1 and 2 new acquisitions	3
Axel Heidberg Site 12	Fine 1 Descending	Axel Heidberg Island	Canadian Interferometric Mission	Sept 2000	Feb 2001	Individual image products Single-look complex	389	RSAT 1 and 2 new acquisitions	3
CIS Image Archive	Scansar Wide	Canadian waters	Normal operations	March 1997		Block-averaged images (2x2) and full res. Images	35000 +	RSAT 1 and 2 new acquisitions	4
Canadian Arctic Land masses	Scansar Narrow	Canadian Arctic	CSA background	Winter 1998,99		Single images and mosaics at 250, 500 and 1000m pixel size.	600	No plans	5
RAMP AMM	Mixed	Antarctica – full coverage	Antarctic Mapping Mission	Sept 1997	Oct 1997	Continental mosaic produced by the Polar Byrd Laboratory.	8000	MiniMAMM 2	
RAMP MAMM	Fine	Antarctica – partial coverage	Modified Antarctic Mapping Mission	Sept 2000	Oct 2000	Individual images Continental mosaic produced by the Polar Byrd Laboratory. Individual images		MiniMAMM 2	



Continued Imaging Initiatives ASAP Follow-on phases

- Antarctic Mapping Mission (MiniMAMM 2 completed)
- Polar Snapshots Sea ice min and max series (2003 20…)
- Canadian Arctic Land masses (InSAR Descending cycles completed)
- New data: Radarsat 1 and Radarsat 2 data products
 - In line with the outcomes of the STG SAR coordination meeting







CSA current activities

- Currently, CSA Background Mission is acquiring a seasonal full sea ice coverage of the Arctic basin
 - Arctic coverage is defined per the 10°C July isotherm
 - ScanSAR Wide A+B coverage
 - Data is acquired and archived only (not processed)
- Western and (often) Eastern arctic coverage every 3-6 days

To obtain detailed maps of deformation, seasonal ice age and, ice volume production







CSA future activities - Snapshots

- Requirement: Build a 3-day C-band Background Mission coverage of Arctic
 - 3-day ScanSAR Wide B coverage
- Constraints
 - Eclipse season in summer
 - Resources intensive
 - To be performed within an operational framework context
 - Background mission
- Actions: Coordinate CSA-ESA SAR (RADARSAT-Envisat) data acquisitions
 - To optimize and complement coverage
 - To compensate for end of RADARSAT-1 data downlinks at ASF







CSA future activities - Antarctica

- Requirement Pole to coast coverage in Fine or Standard Mode. One winter and one summer coverage.
- RADARAST-2 routine left or right looking provides coverage at extreme southern latitudes
- Constraints
 - Eclipse season
 - Coordinating the slew plan with other mission requirements (switching from left to right looking modes)
 - South of ~90 deg S need higher incidence angle modes (e.g. EH3)
- Actions
 - MDA GSI is currently updating the slew plan to accommodate mapping south of ~78 deg S to complete first RADARSAT-2 coverage for Antarctic winter '08.
 - Acquisition plan to be developed and implemented with CSA order desk.







2. RADARSAT Polar Science Database

Objectives

 to <u>create</u> and <u>disseminate</u> a circumpolar Arctic data treasury of satellite-based radar data and derived information products in support of science and local needs of northern peoples and communities.

Highlights

- Making use of Radarsat archives and missions RSAT-1,-2,-C
- Done through collaboration with recognized Arctic portals (CCIN-Arcticnet, ASF DAAC, PolarVIEW, and others)
- Serve urgent Canadian & international goals
- A lasting legacy







3. Coordination Through STG

- Support the objective of STG
- Ensure CSA collaboration for:
 - Acquisition and planning coordination
 - Data management (archiving, standard, inter-operability, etc.)
 - Open data policy for science activities







Summary

Continue to make RADARSAT 1 archive available
Ensure RADARSAT 1 operations continuity
Extend the Canadian RADARSAT-2 data GoC allocation framework to the International IPY science community

✓ <u>Contribute to</u> and <u>Witness</u> the implementation of a virtual SAR constellation in support to operational and science activities...

