Polar
Space
Task
Group

Polar Space Task Group
An Overview

Jeff Key (NOAA)
PSTG Vice-Chair

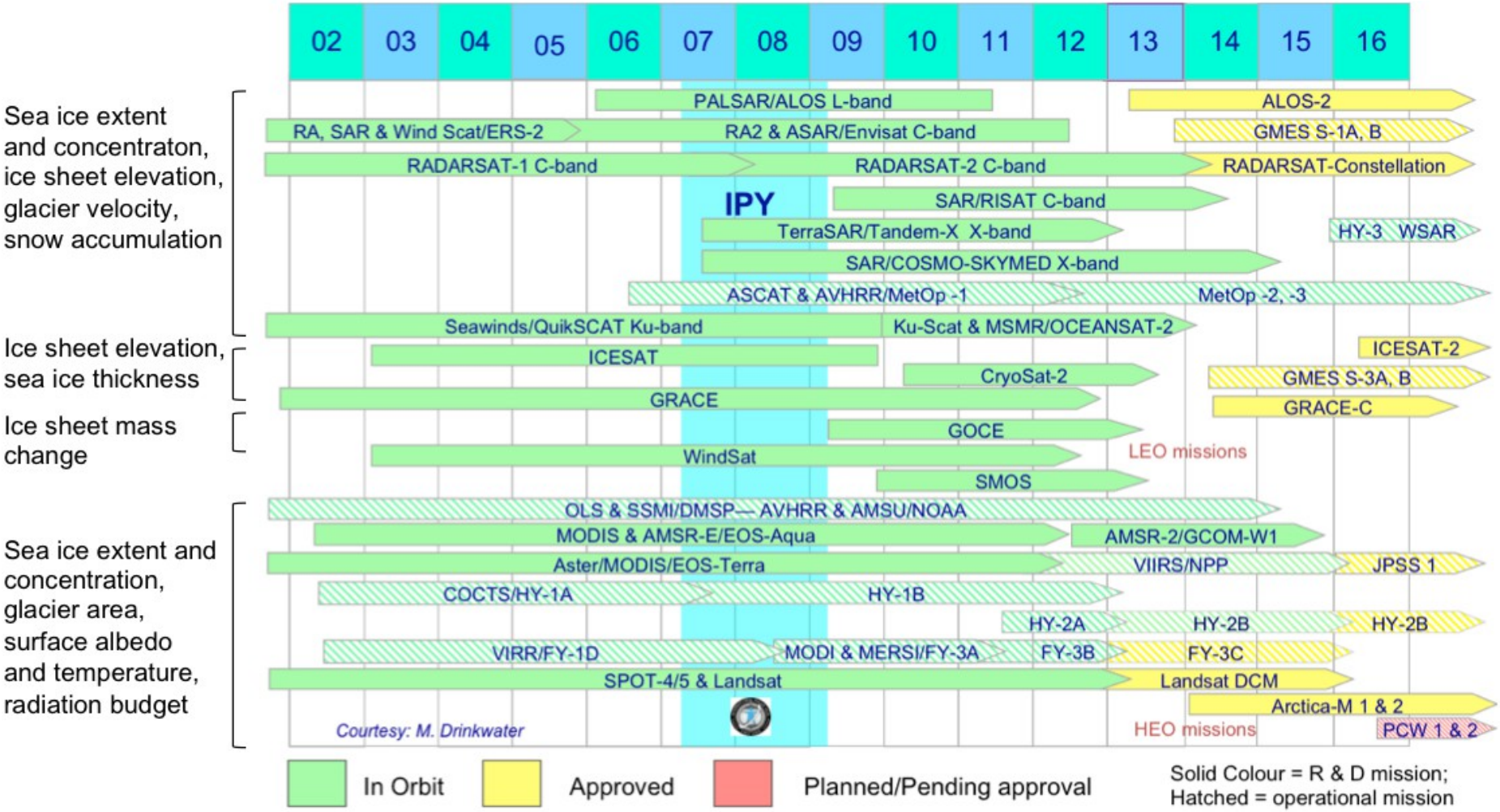
on behalf of Polar Space Task Group

Asia CryoNet Meeting

4 December 2013, Beijing

Polar Space Task Group

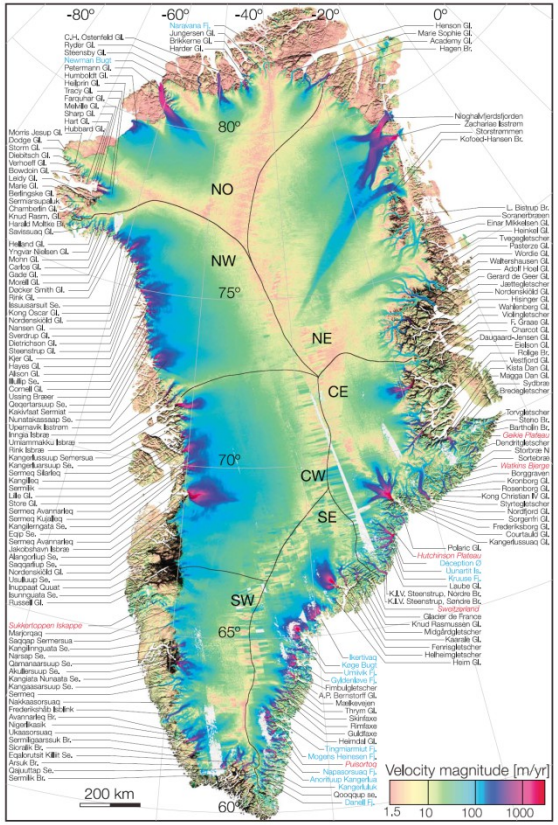
Cryosphere Satellite Missions



Polar Space Task Group

International Polar Year (IPY) Space Task Group

Credit: Rignot, E. and J. Mouginot (2012)



Combined result using RADARSAT-1, ALOS PALSAR, and Envisat ASAR InSAR data – and funded by NASA

- The IPY provided an international framework for understanding polar processes and high-latitude climate
- <u>Spaceborne technology offered unique capabilities</u> for obtaining essential data for predictive models
- During the recent IPY era, <u>spaceborne instrumentation</u> represented a <u>technological leap</u> beyond the capabilities of the previous IPYs (1882-83, 1932-33)
- Required <u>coordination</u> in order to optimize space agency contributions - to achieve IPY science objectives

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IPY Space Task Group

Invited participation from national and international Agencies: ASI, CSA, CMA, CNES, DLR, ESA, EUMETSAT, INPE, JAXA, NASA, NOAA, ROSHYDROMET, USGS, WMO, WCRP-CliC.

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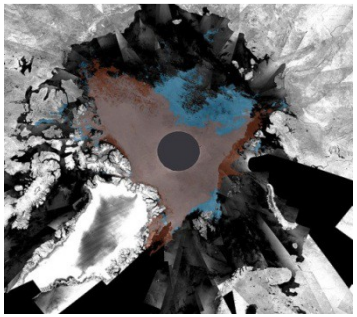
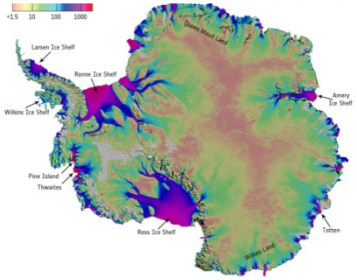
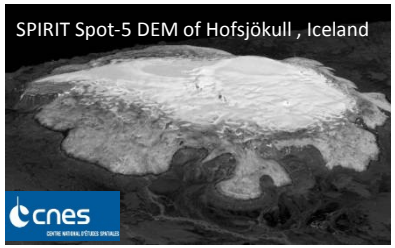
IPY-STG Accomplishments

Sept. 2007 and 2008 ENVISAT ASAR (c) ESA



Antarctic velocity map: ALOS PALSAR, Envisat ASAR and RADARSAT-1/-2





- CSA/DLR/ESA/JAXA **InSAR acquisitions** over Greenland with NASA commitment to process and distribute velocity products
- CSA/MDA **Radarsat-2 mapping of Antarctica**
- USGS **Landsat Image Mosaic** of Antarctica (LIMA)
- ESA Envisat **ASAR mapping** of Antarctica margins and coastal ice
- DLR **TerraSAR-X repeat mapping of fast glaciers** in Greenland and Antarctica
- ESA, DLR and ASI captured the break-up of the Wilkins Ice Shelf in great detail, spatially and temporally.
- ASI **COSMO-SkyMed velocity mapping** of the Perito Moreno glaciers
- Expanded JAXA **ALOS coverage** in the Arctic
- NRC Canada **MODIS circumpolar mosaic** of the Arctic
- Extension of CNES SPIRIT project to make more stereo image data available and to produce more DEMs

Polar Space Task Group

Re-established PSTG

- The Polar Space Task Group (PSTG) was established in 2011 under the auspices of the World Meteorological Organization's (WMO) Executive Council Panel of Experts on **Polar Observations Research and Services** (**EC-PORS**).
- The group's mandate is to provide coordination across space Agencies to facilitate acquisition and distribution of fundamental satellite datasets, and to contribute to or support development of specific derived products in support of cryospheric scientific research and applications

Polar Space Task Group

Current Nominated PSTG Members

Members of PSTG		
ASI	Battazza, Fabrizio	fabrizio.battazza@asi.it
CNES	Hosford, Stephen	steven.hosford@cnes.fr
CSA/CEOS	Crevier, Yves	yves.crevier@space.gc.ca
CMA	Zhang, Peng	zhangp@cma.gov.cn
DLR	Gottwald, Manfred	manfred.gottwald@dlr.de
DLR	Floricioiu, Dana	dana.floricioiu@dlr.de
ESA/EC-PORS	Drinkwater, Mark (Chair)	mark.drinkwater@esa.int
EUMETSAT	Holmlund, Kenneth	kenneth.holmlund@eumetsat.int
INPE	Buss de Souza, Ronald	ronald@dsr.inpe.br
JAXA	Shimada, Masanobu	shimada.masanobu@jaxa.jp
NASA	Dobson, Craig	craig.dobson-1@nasa.gov
NOAA/EC-PORS	Key, Jeff (Vice-Chair)	jkey@ssec.wisc.edu
NOAA	Clemente-Colon, Pablo	pablo.clemente-colon@noaa.gov
PLANETA	Asmus, Vasilii	asmus@planet.iitp.ru
USGS	Mullins, Jerry	jmullins@usgs.gov

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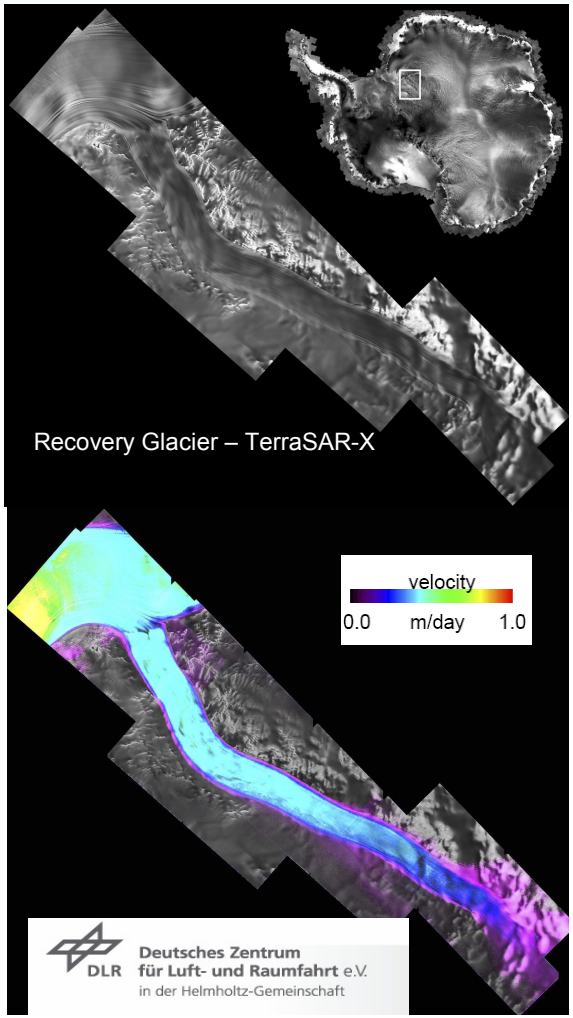
PSTG Potential Areas of Strategic Focus



- Sea and **glacial ice mass variability** and glacial ice **contribution to sea level**
- Polar atmospheric, ocean, cryosphere and terrestrial **products to facilitate improved weather, climate** and environmental observation, monitoring and prediction
- **Freshwater budget closure** at high latitudes (snow and permafrost impact on polar hydrological cycle)
- Circumpolar changes in **permafrost and terrestrial biosphere**
- Physical and biological forcing **of atmospheric chemistry** in polar atmosphere
- Identifying new opportunities for integrated applications in response to emerging socio-economic issues of polar regions

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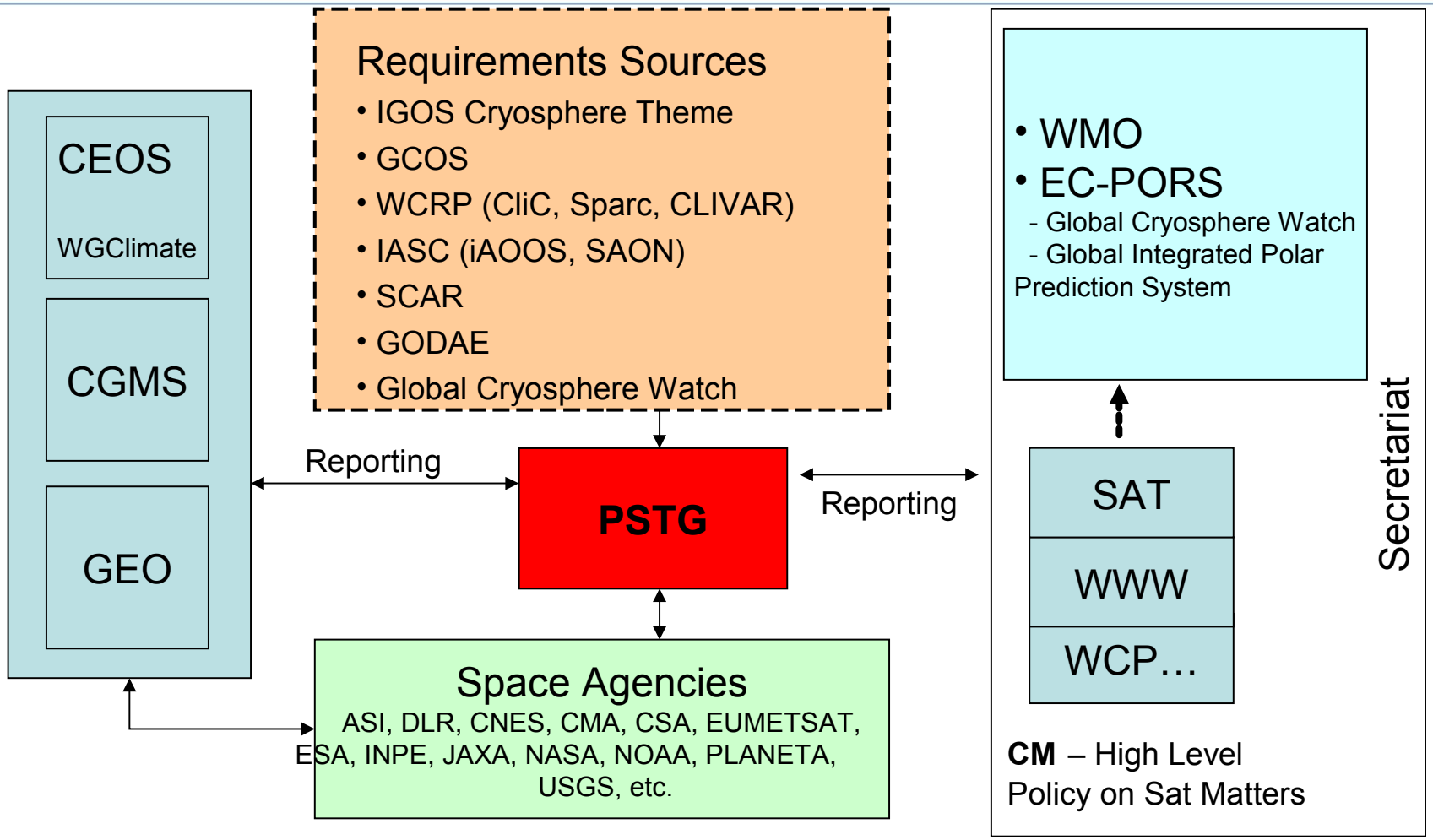
Polar Space Task Group (PSTG) relationships



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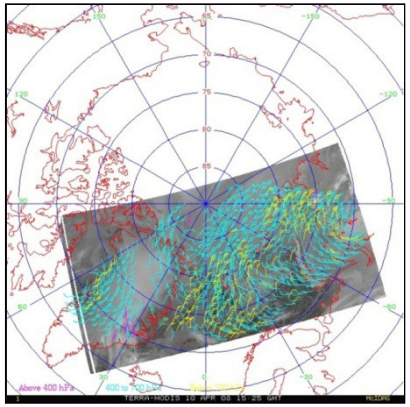
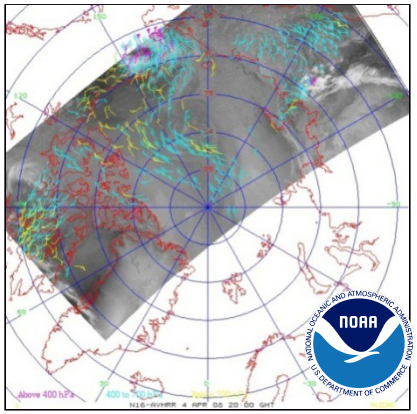
Collaborative Approach for the PSTG

Direct Broadcast (Readout)
MODIS and AVHRR Winds





- Review and understand cryosphere and polar scientific requirements;
- Establish a balanced implementation strategy covering atmosphere, ocean and terrestrial domains;
- Develop a set of key strategic goals and translate them into observational requirements;
- Commitment to support data acquisition, and support for product development and establishment of relevant accompanying scientific studies, as appropriate for the Agency;
- Identify gaps in the existing observation capabilities and formulate recommendations for future satellite missions

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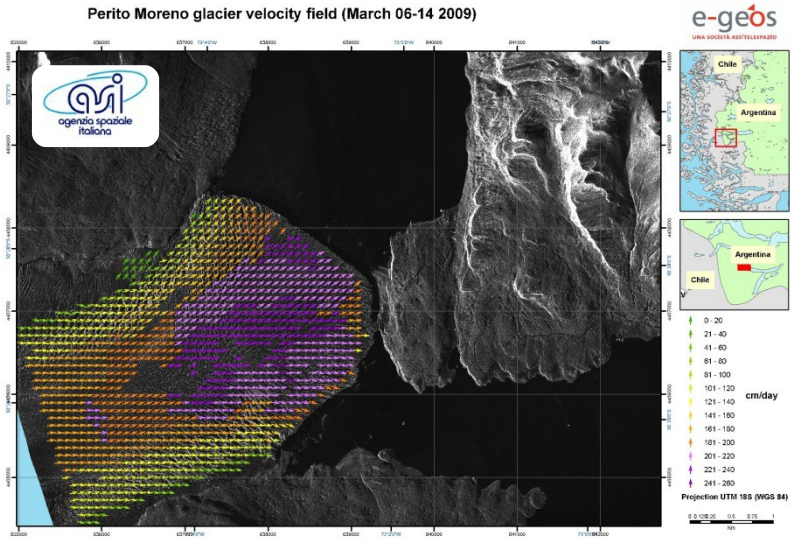
Future Steps



- CEOS SIT: Establish communication link to CEOS and via WG Climate for reporting purposes
- Collect state of art and cryospheric science requirements and priorities via Workshops and interactions with representatives of Cryospheric science community
- Establish WGs (as required) for coordinating data acquisition activities
  - SAR Coordination WG established
- Establish Strategic Implementation Plan
- Implement through annual meetings and alignment of commitments taken through respective Agency programmes
- Periodic reporting to CEOS, CGMS, EC-PORS, CM

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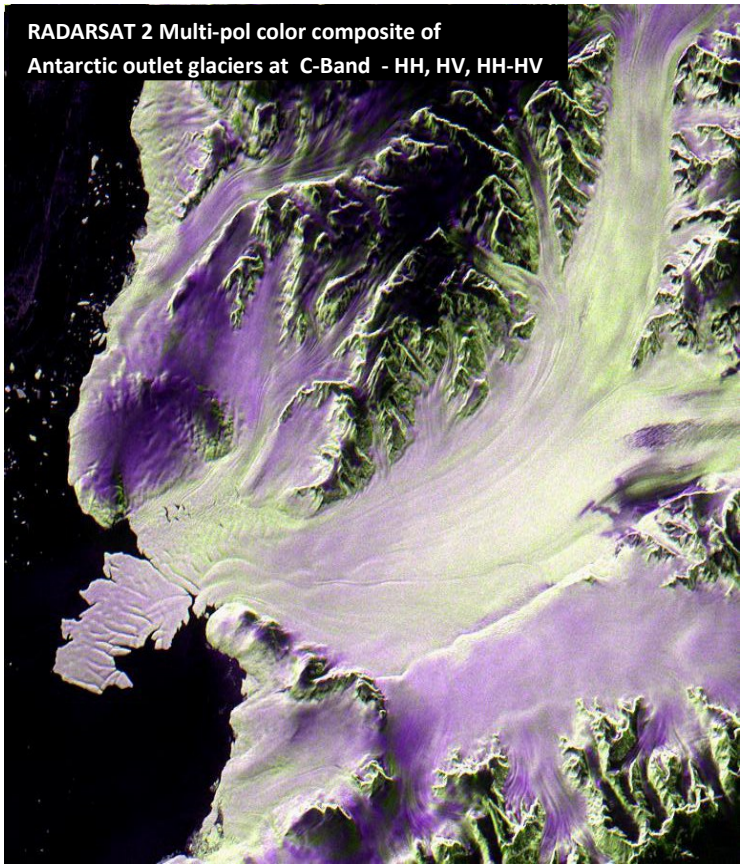
Summary



RADARSAT-2 Data and Products © MacDONALD, DETTWILER AND ASSOCIATES LTD. (2008)"

- The multi-agency Polar Space Task Group is established on the foundation laid by the IPY Space Task Group
- In absence of any other similar coordinating body - PSTG has been re-established to continue to organise and coordinate future earth observing campaigns in support of polar and cryospheric science
- PSTG **facilitates more efficient use of space infrastructure** in polar regions
- It provides an essential **link between the polar science communities and space agencies** for articulating coherent, space-based data requirements in support of the operational implementation