GIIPSY Update

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STG-3

MODIS image courtesy P. Gudmandsen
GIIPSY Activities since STG-2

- A. Fleming GIIPSY Presentation at EGU
- Earthzine, STR paper, Imaging Notes articles published or in press
- Preparations for SCAR, St. Petersburg
- Planning for a Town hall meeting at Fall AGU.
- Participation in CSA SAR Workshop (R. Kwok, I. Joughin, B. Goodison, K. Jezek)
SAR Acquisition Templates

- Guided by the objectives of solving an important science problem, filling IPY data gaps, and involving interagency cooperations, the workshop adopted four acquisition themes:
  
  - C-Band coverage (3-day snapshots) for the Arctic Ocean during the remainder of IPY (background missions, operation data acquisitions, etc.).
  - Winter Pole to Coast InSAR coverage of the Antarctic in high-resolution mode (3-4 consecutive cycles in ascending and descending).
  - Greenland and Major Canadian Icefields of InSAR acquisition over 3-4 consecutive cycles of high-resolution in winter.
  - Supersites (where possible using what exists already): determine acquisition parameters (frequency, resolution, etc.) for multi-polarisation and polarimetry data collection.

- Science community tasked with preparing requirements templates
SAR Requirements for Antarctica

- **Thematic Objective:** Sea level rise, and hemispheric climate:
  1) *For the first time*, one summer, one winter SAR snapshot of the polar ice sheet. Near simultaneous imagery at L, C, and X band, polarimetric quad pole for documenting ice surface physical parameters.
  2) *For the first time*, pole-to-coast multi-frequency InSAR measurements of ice surface velocity.
  3) *For the first time*, repeated X-band InSAR topography for detecting local changes in ice sheet elevation associated with motion of subglacial water.

**Coverage Requirement**
1) From pole to 150 km seaward of RAMP coastline (right image)
2) 4 successive cycles of observations
3) Ascending and descending coverage
4) Observations during the period of April to November (can be relaxed for regions south of 80 degrees Latitude)
SAR Requirements for Antarctica

Sensor Requirements

1. Fine beam and standard beam coverage to southerly limit of right looking satellites
2. Fine beam and standard beam coverage between about 78 South to pole for left looking satellites
3. Observations with highest bandwidth and shortest repeat over fast glaciers (right image) and Antarctic Peninsula.
4. Desirable to have overlap between left and right looking coverage areas (extended beams)
SAR Requirements for Arctic Land Ice

Thematic Objective: Sea level rise, and hemispheric climate:
1) One summer, one winter SAR snapshot of the Arctic Ice Caps. Near simultaneous imagery at L, C, and X band, polarimetric quad pole for documenting ice surface physical parameters.
2) One, winter, multi-frequency InSAR measurement of ice surface velocity.
3) Repeated InSAR observations of the most rapidly changing outlet glaciers

Coverage Requirement
1) Canadian Ice Caps InSAR: 4 consecutive cycles in Dec 2008-March 2009 (see map at right)
2) Greenland Ice Sheet InSAR: 4 consecutive cycles covering the entire ice sheet in Dec 2008-March 2009
3) Jakobshavn Glacier: every cycle for 3 adjacent tracks
SAR Requirements for Arctic Land Ice

**Sensor Requirements**

1. InSAR observations: select highest bandwidth radar modes and shortest repeat cycles over fast glaciers (right image). 200 m baseline.

2. One summer and one winter, L, C and X band near simultaneous image mapping with comparable beam modes (25 m, 23º).
SAR Requirements for Sea Ice
(Arctic and Southern Oceans)

• Thematic Objective

Ocean circulation and polar air-sea interactions (Sea ice):

1) *For the first time*, L-band SAR mapping of the Arctic ocean and marginal seas sea ice cover for leads and ridges.
2) *For the first time*, repeat fine resolution SAR mapping of the entire Southern ocean sea ice cover for ice motion.
3) *For the first time*, SAR and optical fine resolution mappings of the entire Arctic ocean.
4) Systematic 3-day medium resolution SAR mapping of sea ice covered waters for motion, and melt pond coverage.

Coverage Requirement

1) Coverage of ice-covered waters with the ice edge of the Arctic and Southern Oceans
2) 3-day systematic mapping of the Arctic Ocean
3) Ascending and descending coverage
4) Year round coverage defined by the time-varying ice edge
SAR Requirements for Sea Ice (Arctic and Southern Oceans)

Sensor Requirements
• **C-band**
  Wide-swath C-band ScanSAR for systematic 3-day mapping of ice-covered oceans.
  Short time-separation (daily) repeat coverage of the Lincoln Sea, Nares Strait and Fram Strait at C-band.

• **L-Band**
  L-band quad-pol SAR coverage of the Arctic and Southern Ocean sea ice.
  L-band ScanSAR coverage of the sea ice cover.

• **Optical coverage**
  Optical coverage of the Arctic and Southern Oceans sea ice.
Arctic Science Super Sites

- Ice Cap: Devon Island; Canadian in situ, airborne and spaceborne campaign
- Ice Sheet: Jacobshavn Glacier Greenland; Multi-national in situ and airborne campaign
- Sea Ice: Amundsen Gulf and Franklin Bay; large, IPY ship-based campaign
- Sea Ice: Fram Strait, Lincoln Sea and Nares Strait. Danish and US areas of science interest
SAR Implementation

• How do we assure data continuity between observations north and south of the 'pole hole' (eg beam selection) and across the arctic basin?
• How do we propagate Antarctic ground control for orbit refinement?
• How do we assemble a consistent set of Antarctic and Greenland velocity control points?
• Where should we allocate highest bandwidth SAR acquisitions?
• At what agency level should these questions be addressed, or is the data portfolio concept sufficient?
• Can developments from the SAR workshop be used to guide thinking on a hi-res optical workshop?
USGS LANDSAT

Data release

AAG Presentation by Rachel Headley, USGS
Landsat Standard Products

All no-charge data will be processed with these parameters.

- **Pixel size:** 15m/30m/60m
- **Media type:** Download (web-enabled), CD/DVD ($50)
- **Product type:** L1T (terrain-corrected)
- **Output format:** GeoTIFF
- **Map projection:** UTM (Polar Stereographic for Antarctica)
- **Orientation:** North up
- **Resampling:** Cubic convolution
- **DEM:** GLS DEM (SRTM, NED, CDAD, DTED, GTOPO 30)
Expansion of Landsat Standard Product

- Landsat 7 SLC-Off global expansion
  - North America & Africa (generated daily)
  - Eurasia/Greenland – May
  - Australia/New Zealand/South America - May
  - Rest of World (Indonesia/Japan/other islands) – June
- Landsat 7 ETM+ archive: late September 2008
- Landsat 5 TM newly acquired: early December 2008
- Landsat 5 TM archive: late December 2008
- Landsat 4 TM archive: January 2009
- Landsat 1-5 MSS archive: January 2009
Landsat Standard Product Release Schedule

- As phased data become available, all other parameters will be discontinued.
- Subscribe to the Landsat Update under ‘About’ @ http://landsat.usgs.gov