Global Land Survey 2005*: Status Update

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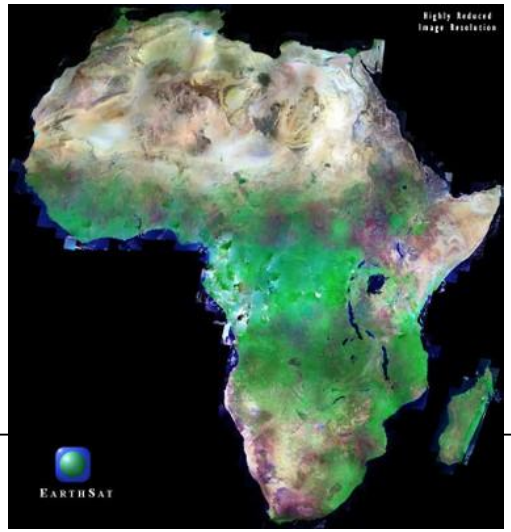
*formerly known as "Mid-decadal Global Land Survey"

Global Land Survey (GLS 2005)

Follow-on to the GeoCover orthorectified global data sets (1975, 1990, and 2000 epochs) nominally referred to as the middle-of-the-decade dataset (covering 2004-2007)

- Partnership between USGS and NASA, in support of CCSP
- Support global assessments of land-cover, land-cover change, and ecosystem dynamics (disturbance, vegetation health, etc)
- Pilot project for routine global monitoring in LDCM era
- Primarily Landsat-7 ETM+ and Landsat-5 TM imagery, with ASTER and EO-1 ALI data as needed



GLS2005 Development

Phase 1: assure global coverage by Landsat or Landsat-like observations. Identify all candidate scenes and ingest into the USGS archive

- *Landsat-5 from IC and Campaign stations*
- *USGS EROS Landsat-7 and Landsat-5 archives*
- *ASTER and EO-1 ALI acquisitions as needed*

Phase 2: Process selected data into an ortho-rectified dataset compatible with previous surveys

- *orthorectification*
- *gap filling for Landsat-7*
- *EROS to carry out processing*

Phase 3: Develop LCLUC products. Analyze data set to quantify trends in land cover and vegetation dynamics

What will GLS2005 look like?

For most of globe:
- *One Landsat-5 image or one gap-filled L7 pair*

Where Landsat-5 is not available/suitable and no cloud free L7 pair is available:
- *Two L7 SLC-off images, without gap filling*

For humid tropics where no cloud free L7 pair is available:
- *Three L7 SLC-off images, without gap filling*

Where no Landsat data are available:
- *EO-1 ALI or ASTER image*

Pre-Production Activities

- **GeoCover data sets are currently being reprocessed to improve geometric accuracy through improved SRTM DEMs and added control**
  - Two changes:
    - 15/30/60 meter pixels from 14.25/28.5/57
    - Remove 10,000,000m false northing in UTM coordinate system (i.e. southern hemisphere has negative values)
  - NAM reprocessing delivered Nov 2007; initial validation indicates ~18m RMS error on per-scene basis
- **MDGLS completion depends on LPGS 9.0 release for L5 production**
  - Currently scheduled for August 2008 delivery
  - Until then, process all needed L7 data

GLS Status: Data Sources & Phase I Activities

- Global Landsat-7 available at EROS

- Landsat-5 data received from campaign stations (Moscow, Irkutsk, Magadan, Maspalomas, Chetumal, Kiruna)
  - *Malindi campaign station not operational for GLS2005*

- Landsat-5 metadata & browse received from most IC's
  - *Anticipate IC data delivery during Spring 2008*

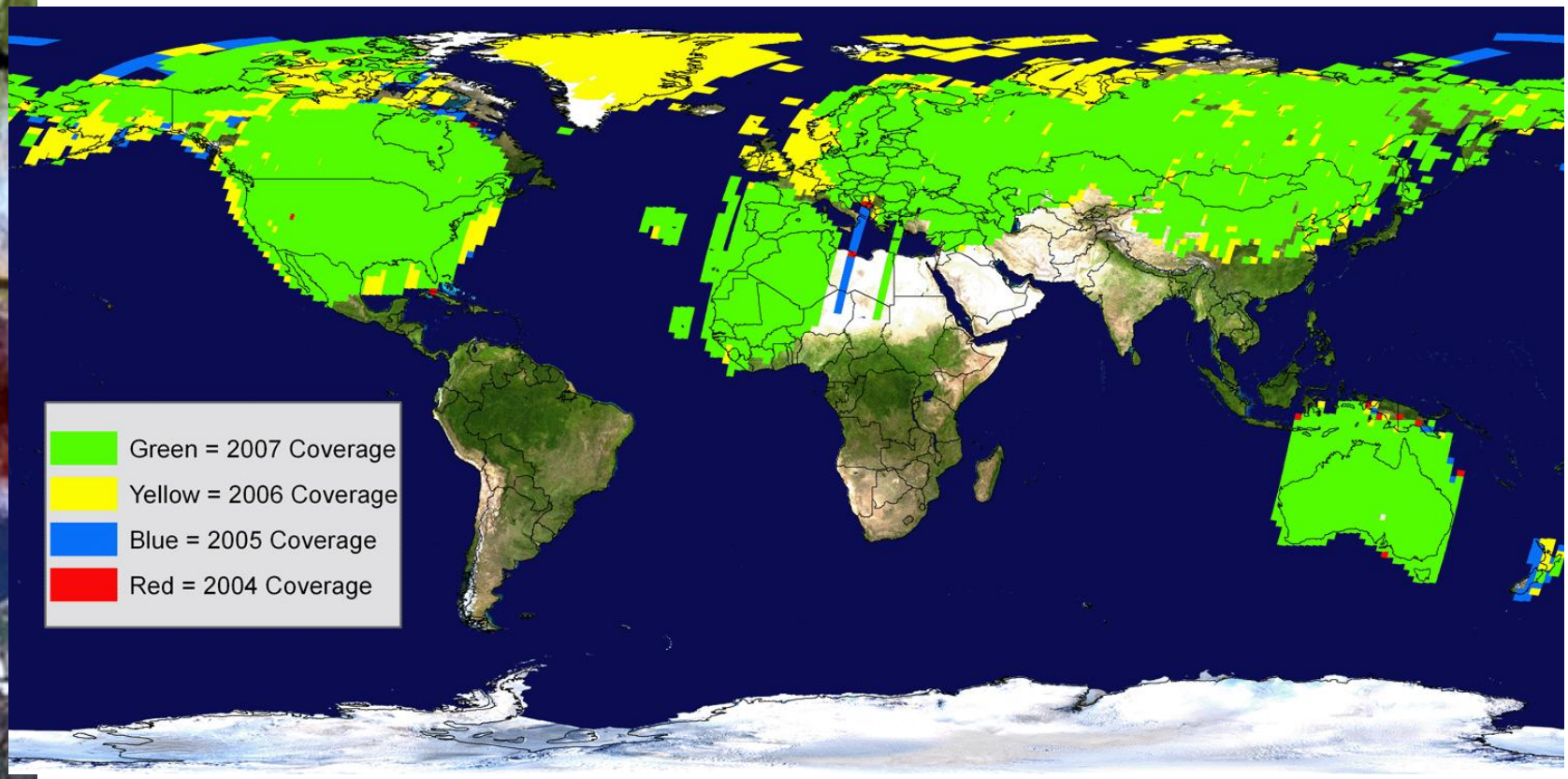
- EO-1 ALI data being acquired for reefs and islands
  - *current yield is ~40% of desired targets*

Phase 1 Activities

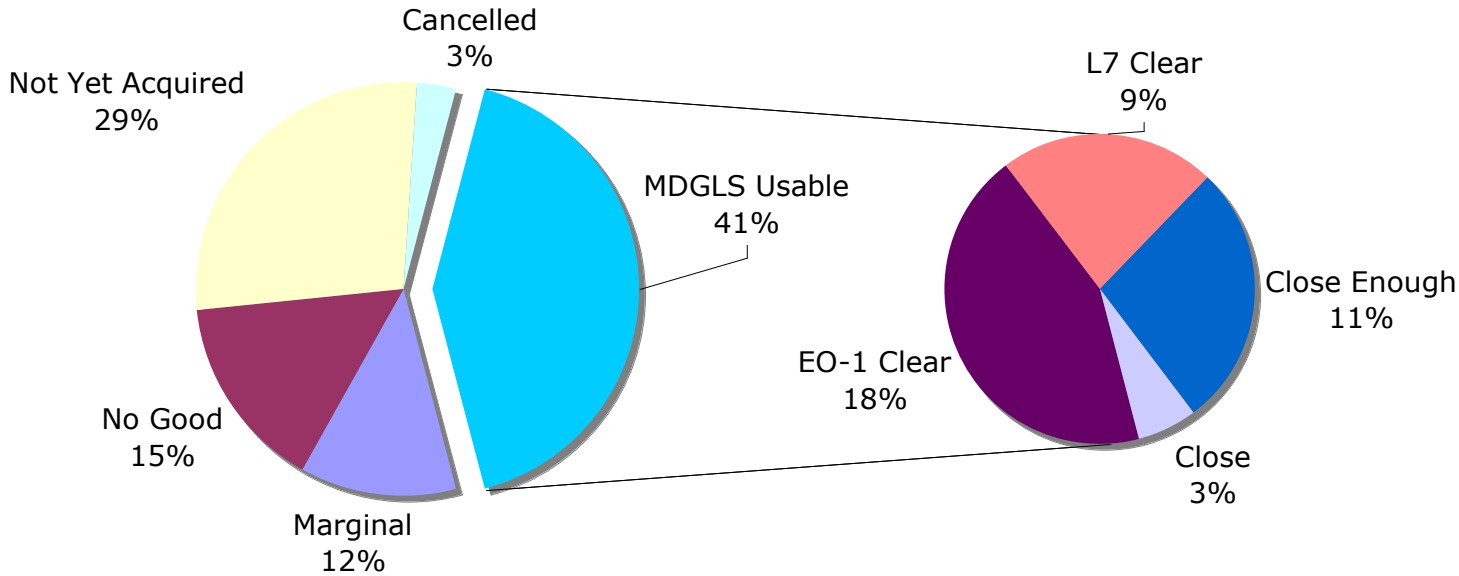
- **Number of scenes ingested from each campaign station**

Station	Scenes	Cloud Score = 0
Kiruna	8,597	18%
Mas Palomas	8,262	56%
Irkutsk	19,534	23%
Moscow	15,716	28%
Magadan	3,505	22%
Chetumal	383	?

Landsat 5 Coverage in US Archive



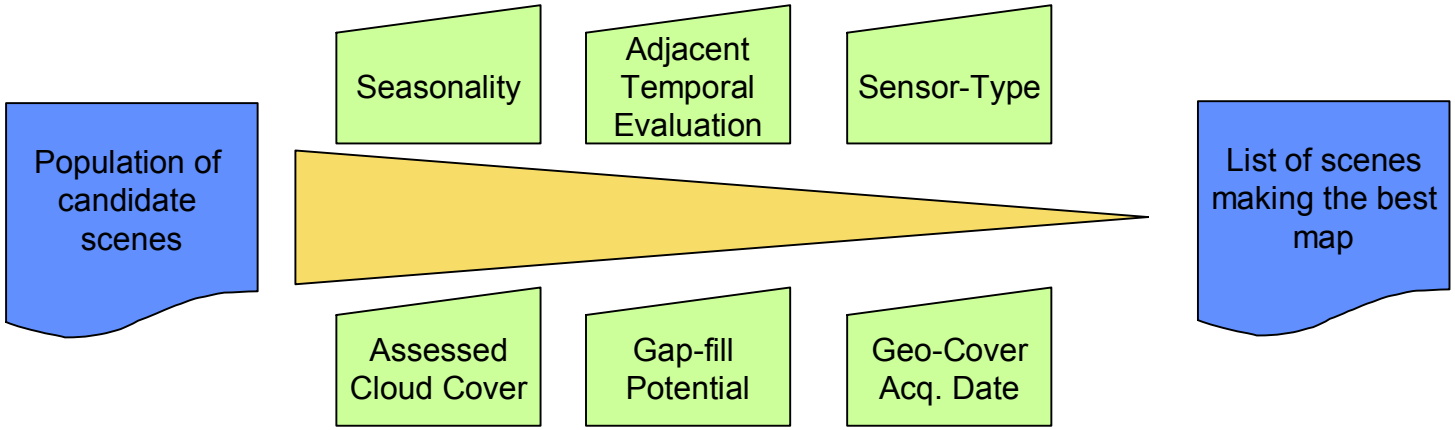
EO-1 MDGLS Island Acquisition Status



Status as of November 7, 2007

Large Area Scene Selection Interface (LASSI)

Optimization algorithm to ingest a metadata archive and select the best overall data set based on multiple weighting factors



Weighting factors

Distribution Policy

- **International data contributors to the GLS 2005 dataset will receive a complete copy once production is complete**
  - Likely to be distributed on a firewire drive
- **The products will all be made available online at no cost**
  - Products will become available immediately after production
  - Glovis and Earth Explorer portals
  - First data to be available, end of January 2008

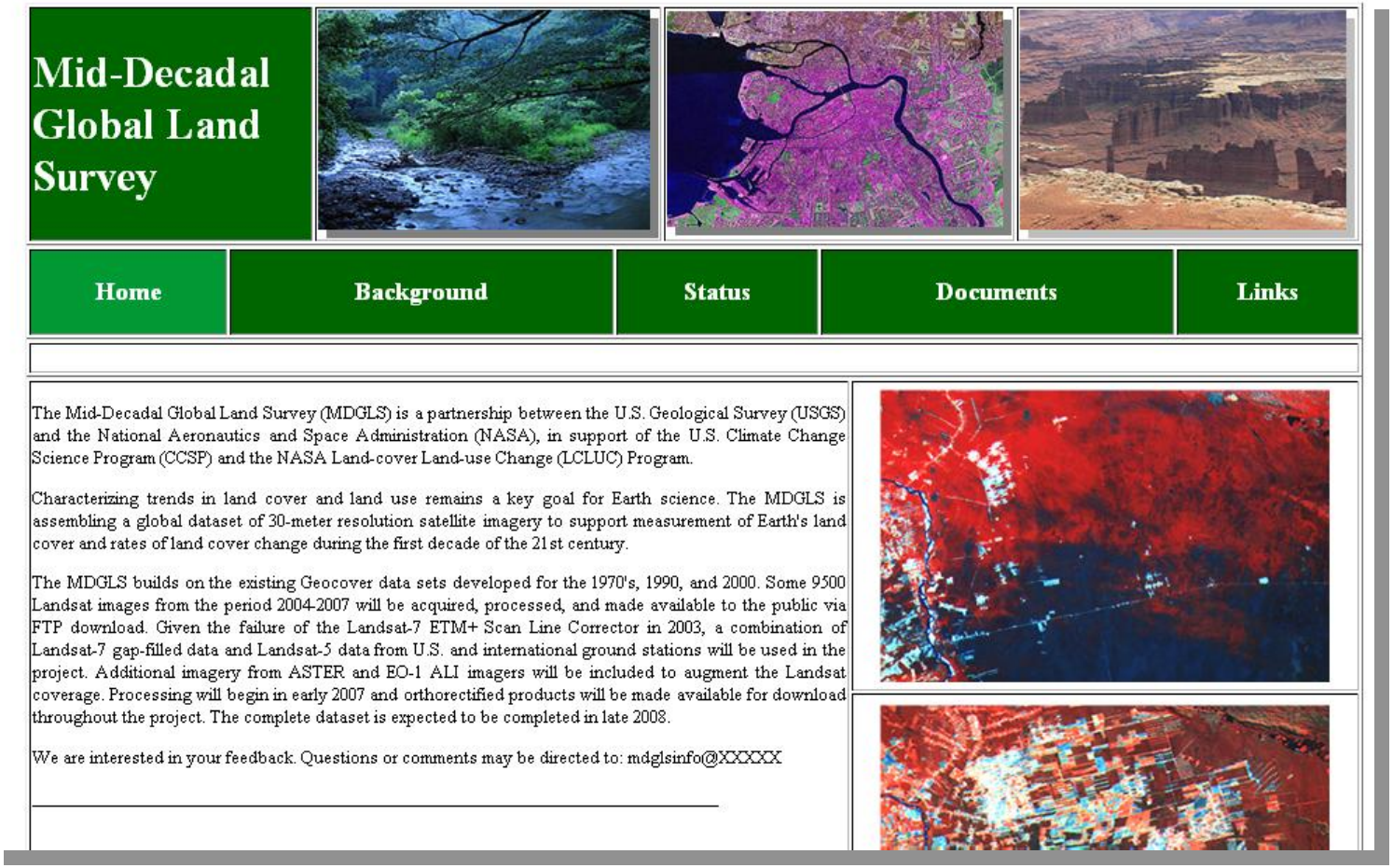
GLS 2005 Schedule

- January 2008: GLS 2005 N. America released (L7 only)
- Spring 2008: receive L5 imagery from IC's
- May 2008: GLS 2000 released
- June 2008: GLS 2005 Globe released (L7 only)
- July 2008: GLS 1975, 1990 released
- August 2008: Begin processing L5
- December 2008: GLS 2005 Globe released (L5+L7)
- 2009: Process ASTER and EO-1 acquisitions

Phase III: Land Cover Analysis

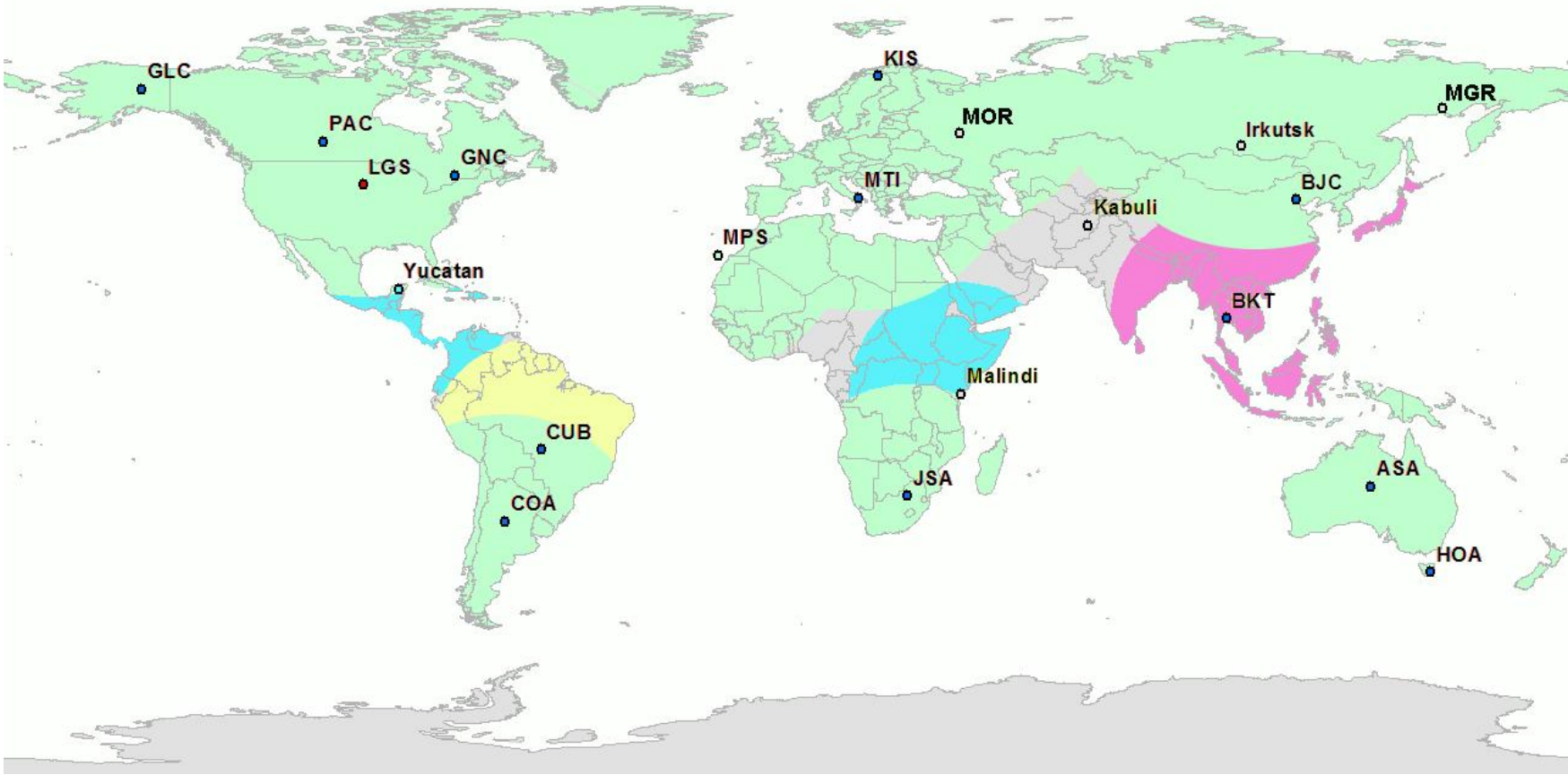
- NASA LCLUC proposals on GLS land over analyses under review – announcements expected by late Winter
- NASA MEASURES projects (Townshend, Roy) and NACP Carbon project (Goward) provide additional support for continent-scale assessments
- Follow-on to Annapolis meeting will discuss opportunities to harmonize land cover/ change mapping across selected projects

GLS2005 Web Site (draft)
http://lcluc.umd.edu/mdgls/index.html



Backup

Landsat 5 Global Archive Accessibility



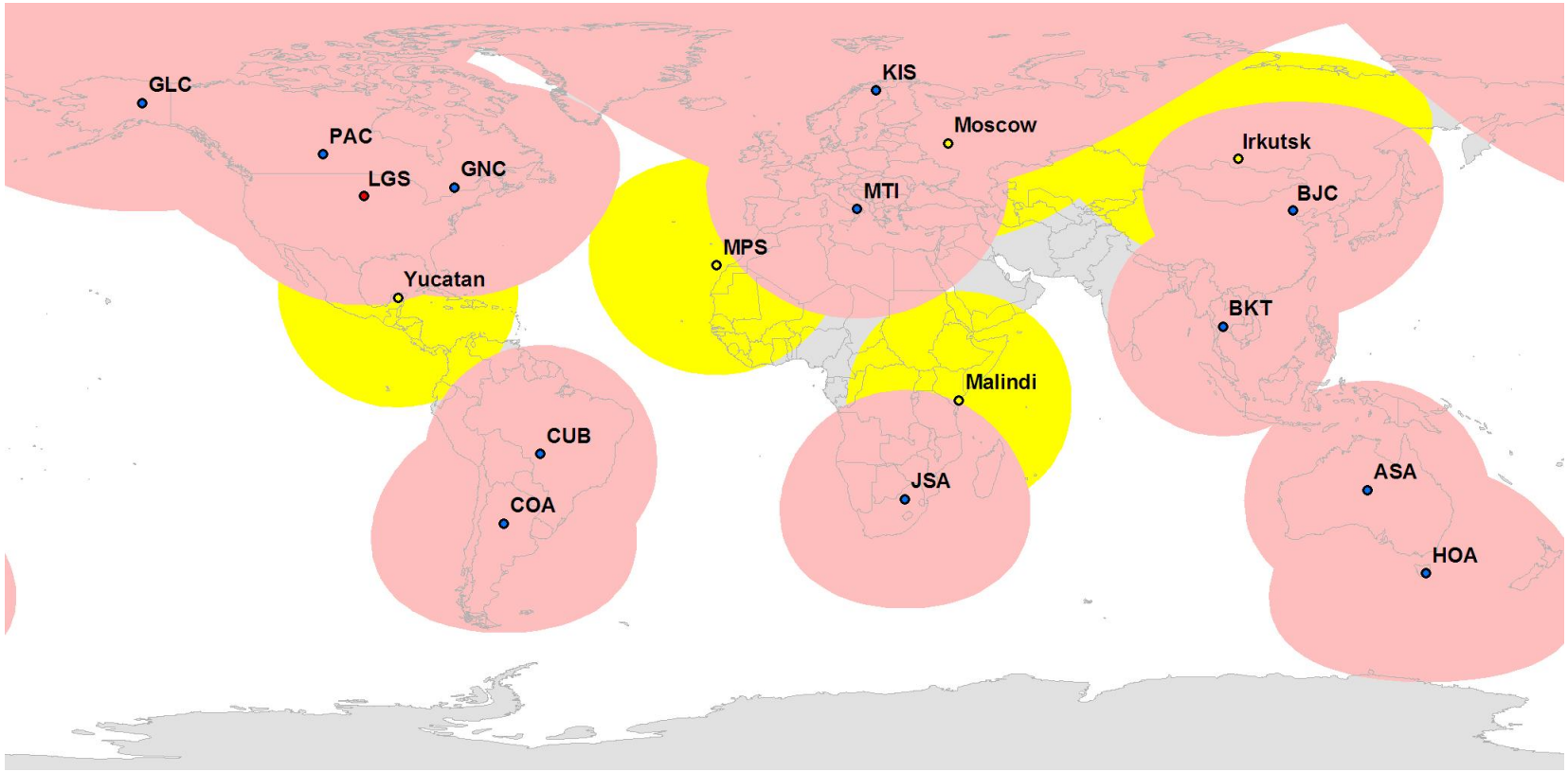
Tested Capability

Untested, Partial Compatibility

Untested, but Compatible

Currently Incompatible

Availability of Landsat-5 TM coverage for GLS2005



Landsat "International Cooperator" Ground Stations
Temporary "Campaign Stations" for GLS2005

Note: Malindi station did not establish Landsat operations by late 2007