

**GOFC/GOLD Strategy re.  
High Resolution Observation  
Requirements**

# Two Urgent Areas for High Resolution Breakout Group Consideration

- **In the context of a failed Landsat we need a Strategy for Meeting Current GOFC/GOLD High Resolution Data Needs**
  - Current satellite capabilities
  - Acquisition Plan
  - Multi-source Data Management (Archive, Process, Distribution)
  - Technical Inter-use issues
    - Calibration, Radiometry, Geometry, Processing, Formats
- **Steps to Secure the Operational High Resolution System to Meet GOFC/GOLD Needs**
  - Document and Articulate GOFC/GOLD Requirements
    - Specifications for US IPO OLI Instrument
    - Data Acquisition Strategy
    - Data Policy and Pricing
    - Beyond Current Plans for OLI
  - Promote similar initiatives in other operational agencies (long term agenda)

# Recent Background

- GOFC/GOLD recognizes the advance made by Landsat 7 in terms of global data acquisition
  - However we note that for some applications (in the framework of IGOL) higher frequency than 16 days is needed (e.g. agricultural monitoring)
- GOFC/GOLD recognizes the important contribution and cost of the NASA Global Data Buys (1990/2000) and encourage other agencies to contribute to similar efforts
  - Orthorectified Data
  - C. \$24 M
  - Free easily accessible data
- GOFC/GOLD recognizes the large number of high resolution systems in place and planned by the international community in the next decade which could help meet our needs
- In the near-term (5 years) we recognize we need practical, affordable and realizable solutions
- For the operational system need a well-crafted statement of our real requirements

# Point of Departure for the Discussions

- The Earth observation community is facing a gap in Landsat data continuity
  - Landsat 5 limited lifetime/coverage
  - Degraded Landsat 7 operations; probable failure 2007
  - OLI data 2010?
- Based on NASA/USGS analysis (incompleted report), the following systems are the leading candidates for addressing the minimum requirements:
  - Global coverage
    - ResourceSat (India)
    - CBERS (China and Brazil)
  - Special coverage
    - EO-1/ALI
    - ASTER (Japan)
    - SPOT (France)

# GOFC/GOLD High Res Requirements

- Land Cover and Change (Documented Rpt 4)
  - Global Coverage Wall to Wall forest cover products generated
    - Baseline Year 1
    - Reproduced Year 3
    - Repeated every 5 years thereafter
    - This would require 4 times per year acquisition
  - Global Sampling Annually
  - Regional (Hot Spot change) – multiple scenes per year
  - Hyperspatial samples for validation  
(Could benefit from an exploration of multi-scale sampling)
- Fire (First Cut Estimate)
  - Stage 3 Burned Area validation (Fire Strategic Plan) – 300 scenes (2005/2006) – protocol two scenes per location 4-6 weeks apart
  - Fire events imaging and Post Fire Assessments – c.100 scenes per year

## Near Term Needs (next 5 years – starting 2005)

- **Discussion**

- Global coverage is needed but unlikely that 1 system provide all the data
- Suggest take advantage of all the available resources to meet the international data needs
  - The IGBP DIS High Resn Project provide an early proof of concept
- Different GOFC activities (with different data quality needs) could be met by a patchwork of data types and sets
  - Places emphasis on the acquisition plan and the data integration
  - Places emphasis data policy and sharing
  - Places emphasis on technical aspects of multi-source data
  - Additional ground stations may be needed

- **Suggested Approach (Fire / Land Cover)**

- Annual multi-date coverage would meet our needs
- Global 5 year cloud-free will satisfy some of our needs
- Annual multi-date coverage is essential for some regions and tasks (areas of rapid change)
- For some regions the latter is currently being obtained

- **Instrument Specifications are known - however Current and Near Term Acquisition Capabilities are not**
  - The full acquisition potential of current systems (ground stations, central) is not well known
  - The current situation in terms of implemented acquisition strategies is also not known – central and ground stations
  - Operation and data sharing restrictions also not well known
  - Combination of Pan sharpening and Multispectral data could meet some of the data needs (e.g. SAC-C)
- **Proposed Actions**
  - What is needed is a rapid assessment (4 months) study of real capabilities and potentialities
  - What is needed is some demonstrations of multi-satellite data acquisition and utilization (CEOP for Land)
  - What is needed is understanding of what flexibility exists for regional acquisition
  - Need acquisition requests for priority regions acquisitions ASAP – so that retrospective studies can be undertaken

# OLI Requirements and Beyond

- Recognize that *operational* status is a major advance – e.g. replacement (need reassurance that this will in fact be the case)
- Need to carefully evaluate proposed specs for instrument and acquisition and operations concept
  - Need clarification of DB for OLI
  - OLI needs an Operational Requirements Document with associated identified Environmental Data Records
- Need to ensure open data policy and advocate free data
- Recognize that OLI will not meet all community needs
  - Higher temporal frequency of coverage e.g. 8 day
  - Advocate continued multi-satellite acquisition to complement OLI – which would indicate that the near term solution should perhaps become a permanent capability
- We need to characterize the High Resolution System that is ultimately needed (for GEOSS) – where multiple nations can participate
  - The proposed initiative can be considered as a prototype
  - From our technical perspective would encourage the space agencies to
    - Explore well calibrated small-sat constellations
    - Explore sensor web technology
    - Pursue the provision of information from high resolution SAR (X,C,L Band)