

Group 3
Satellite observations
and
Ground stations

Discussion Topics

- Acquisition
- Accessibility
- Inconsistent data access and sharing policies restricts user access overall
- Ease of data use
- Near term (<3years)
- Long term (>3 years)
- Optical and Microwave Systems
 - High resn (.5-3m)
 - Mod resn (20-50m)
 - Coarse (250>)
- Ground stations (Malindi, Libreville TBD)
- Products

Current situation: obstacles to full use of facilities

Despite the importance of the forests of Central Africa

- Historically, very poor data acquisition in Central Africa
- Focus has been on optical systems which suffer from serious cloud cover
- The learning curve for routine use of microwave data is steep – few products – little use to-date
- No regional ground receiving station
- Low demand by users of commercial data, commercial archives are not deep
- Low internet bandwidth makes downloading images difficult
- Too few trained professionals
- Software incompatibilities
- Inconsistent data formats
- Inconsistent data policies - the cost of data

Recognizing these limitations

- There have been efforts to remedy the above obstacles e.g. OSFAC, OFAC, NGOs – WRI, WWF, WCS etc
 - Workshops and Training sessions
 - Attempts to provide better access and dissemination of data – DVD's, Disc
 - Advocacy for improved regional acquisition
 - USGS Data-Buy
- However, these remain largely inadequate to meet demand – compared to other regions, C. Africa is severely underserved with data and capacity to use RS data is lagging behind

Data availability - microwave

- **Microwave Systems**
 - Radarsat
 - Disseminated by commercial entity, access needs to be negotiated with Canadian gov
 - Limitations on its use
 - ASAR (Envisat)
 - Access is through demand (proposal) only, if accepted, this data can be shared with project partners/collaborators
 - ALOS PALSAR (L Band) – ALOS 2 continuity planned
 - Japanese have released recently for Central Africa Wall to Wall Palsar coverage (50m) for Central Africa for 2007-09 – This data is freely available to the public through the website
 - Dedicated data continuity with ALOS 2
 - TerraX
 - German, high res (1m; X band)
 - Commercial, negotiate with DLR (?)
 - CosmosSkymed
 - Constellation of 3 satellites
 - Commercial, negotiate through Italian Space Agency
 - Trying to get it available through GEO for National Demonstrators
- **Microwave Data continuity looks good overall**
- **Need to focus better on access and dissemination of higher order products of known accuracy**
- **A regional development and training unit is needed for generating microwave derived products for Central Africa**
- **Long Term we would Advocate open access to the higher resolution data**

Data availability – Optical (1)

- **High resolution**

- Geoeye
- Quickbird
- Ikonos
- Digital Globe
- DMC (2.5m)
- Generally, need to push harder as a community to have images purchased and made available to others. GEO purchasing some of these images over their ND sites. Could push for this under a REDD funding mechanism for key sites.

Data availability – Optical (2)

- **Moderate resolution**

- Landsat

- Landsat 5: direct acquisition only, people are still using it. Only station in this region is Malindi. Lifespan is limited and radiometric issues exist. Lack of receiving station limits data over CB.
 - Landsat 7: SLC off issue remains and hampers its application. Currently, not getting every acquisition over CB.
 - Archive currently open and free. Data access is unrestricted and use has skyrocketed.
 - LDCM will have thermal sensor on same platform, online expected in 2012

- ALOS AVNIR

- More publications coming out of AVNIR (10m) /Prism (2.5) data
 - Could potentially access this archive for free through research institutes (PIs)

- DMCii

- Commercial and disaster projects traditionally
 - Landsat compatible (no SWIR) , same Landsat filters on 2, 3, 4.
 - 2 more satellites launch this year (22m) ; adds to 32m already available
 - Large swath acquisition (650km)
 - Store and forward data collection methods. Could participate in direct downlink to consistently cover the region.
 - Hoping to get a more or less cloud free mosaic over sub-saharan Africa with EC/ESA in near term. Would like to have enough funding to make this dataset freely available. ESA expecting to extend their funding and thus this data would become freely available

Data availability – Optical (3)

Moderate resolution (cont'd):

– CBERS

- Currently with CBERS 2B, 2.5m
- CBERS 3 will be launched in 2011, will have one 5m sensor, one 20m sensor, one 60m sensor (wide scan)
- Open access to CBERS for Africa, but only three receiving stations in Africa. Congo Basin cannot have access without receiving station.
- In Brazil, using CBERS for forest monitoring, works fine. - Who uses CBERS in Africa?
- Onboard energy supply issue with CBERS 2

– SPOT

- Spot 4 no longer commercial, data archive will be made available soon through ESA. GEO will take action to get this data. Data will likely not be freely available like Landsat – modalities to be worked out.
- Spot 5 remains commercial. Lifespan is through 2015.
- Spot 6 will have same characteristics of Spot 5 and set to launch in 2013
- Spot announcement to share data – remains TBD. Data access needs to be requested by a national institution in the CA region for REDD projects... Not yet specified as MOU is still in negotiation. What does a REDD project mean? There are remaining questions on both the licensing and access.

– ASTER-SWIR

- Global coverage over 2-3 year period
- Appropriate research institutes can get free access to limited amount of data through request
- Inconsistent data access policy
- 1.6 channel no longer working
- No replacement foreseen
- Ask for them to switch it on over certain regions – for CB, need to request turning on over region
- DEM freely available through GEO, USGS, etc. Could high grade this and make available through OSFAC or other network.

Accessibility Issues

- Internet Upgrade needed – will happen one day
- Current mode of dissemination – hard disc, DVDs, hand distribution !
- GEONetcast
 - Need to explore the feasibility of regional dissemination of moderate resolution data using this system - could be a big advance especially for the ground station
 - Details need working through

Regional Ground Station

- Malindi (Italian Space Agency)
 - Need Landsat 5 and CBERS 2b
- Gabon (end of 2011) Gabon, Brazil, France
 - Planned to meet national and regional needs
 - CBERS 3, SPOT, ALOS
 - LDCM, Sentinel 2 ?
 - IRS ?
 - DMC ?
 - Will
 - Need for regional advisory and increased consultation on regional services and data nodes

Products

- Current
 - Land Cover / vegetation type
 - Forest cover change
 - % tree cover
 - Coarse biophysical variables LAI, fire, burned area
 - Biomass
- Future
 - Land use (1m will help)
 - Vegetation Structure and Height

Near Term Initiatives

- Next 3 years will be hard
- Alos Palsar Regional Mosaic
- Geo National Demonstrators
 - Coordinated multi-satellite data acquisition and dissemination inc.
- DMC regional coverage 2010, 2011
- Libreville ground station
 - Multisource data, Regional capability and intent

A view to the future (> 3 years)

- Data acquisition will increase (CBERS 3, LDCM, Sentinel 2, Alos, Cosmos Skynet, IRS etc)
 - A Regional Ground Station will really help
- Need a coordinated acquisition strategy – to bring the basin under continuous observation
- Continued emphasis will be on products and accuracy assessment and dissemination
- Need for expanded professional training

Recommendations

- Near Term (now)
 - Open up SPOT (ESA, CNES) and ASTER (Miti, USGS) Archives for the Congo Basin
 - Landsat 7 all acquisitions for the Congo Basin (USGS)
 - Continue producing Alos Mosaic 2010-11 (JAXA)
 - DMC annual wall to wall (inc 2010, 2011) (ESA, CBFF)
 - SPOT Announcement – welcomed but should minimize obstacles to access (licensing) giving broad access for forest monitoring (CNES)
 - Support a center of excellence and training for microwave applications (REDD readiness – UN REDD/GEO)
 - Test use of high resolution data for REDD applications in CA (commercial vendors/GEO FCT task)
 - *An ad-hoc working group is needed on CA data acquisition and availability for the next 3-5 years i.e. this study expanded (COMIFAC/OSFAC technical sub group) in the context of forest and carbon monitoring - report SOF ?*
- Mid Term (3 – 5 yr priorities)
 - Standardized products (pre-processing) and derived products (validated products) - CEOS / GEO
 - Gabon Ground Station – multi-source data- put in place a mechanism for ensuring regional objectives meet the regional user needs (Fr, Gabon, Brazil)
 - Increase level of coordination for data continuity and moderate and high data acquisition (GEO)
 - Open Data Policy put in place (GEO)