The Current Situation for MODIS Data Acquisition, Processing and Applications in Australia

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http://www.eoc.csiro.au

Presented at APEIS Capacity Building Workshop for the Asia-Pacific Region, Beijing, September 20-21, 2002
Australian Earth Observation Support – Government & Industry

- International Networks (Global Industry, CEOS etc)
- Australian Launch Industry (developing)
- Satellite(s) (FEDSAT & smallISATs)
- Instrumentation (eg [A]ATSR on ENVISAT & others to come)

Ground Segment
- TERSS, WASTAC, ACRES, ABoM
- X-Band, S/L-Band
- European & US tracking and data collection
- Use in: EO-1 reception, ALOS, MODIS-DB, GIFTS
- CalVal
- Data Management & curating
Environmental Satellite Data are highly relevant to Australia – a large island in south Asia
Ayers Rock
The Olgas
Sectors using EO Data – Adding Value

Weather, Climate & Atmosphere
- Smoke, climate and pollution
- Carbon and energy

Marine agencies and industries
- NRT fisheries applications

Land & Water applications
- Drought and flood
- Environmental fluxes

Forestry & Agriculture
- Precision and high value applications

Disaster Monitoring
- Fires and emergencies
Users look to Value Added Products
MODIS DATA PRODUCTS AND ACQUISITION

Two MODIS instruments being used now -

MODIS on TERRA launched December 1999 (1030 Descending)

MODIS on AQUA launched May 2002 (1330 Ascending)

MODIS DATA and PRODUCTS are available from NASA via FTP, Exabyte or DLT tapes, and via Direct Broadcast (DB).

DB in Australia is available from ACRES (Alice Springs and Hobart TERSS), WASTAC-X in Perth and at University of South Australia near Adelaide.
DB Opportunities on AQUA

- **Current Australian Interests:**
  - MODIS
  - Atmospheric Infrared Sounder (AIRS)

- **Potential Interests:**
  - Advanced Microwave Sounding Unit-A (AMSU-A)
  - Humidity Sounder for Brazil (HSB)
  - Cloud's and Earth's Radiant Energy System (CERES)
  - Advanced Microwave Scanning Radiometer-EOS (AMSR-E)
Current and Potential DB Sites on the mainland (Antarctic to come)

Darwin
Alice Springs (2) ACRES
Perth WASTAC
Adelaide ITR
DSN
Melbourne
Hobart TERSS
The Hobart TERSS X-Band site started the activity

A cooperative action by CSIRO, ACRES, ABoM, Utas & AAD
Acquires Landsat, SPOT, EO-1, MODIS, ERS SAR

http://www.terss.org.au
MODIS Data Archive:
http://www.marine.csiro.au
TERSS Current Processing Stream
Geoscience Australia – ACRES Acquisitions

- Three stations – two in Alice Springs one (TERSS) in Hobart

- Level 1 data from DB reception held on the web for 1 week

- Processing sequence
  - TERRA day passes acquired ASP/HBT
  - Processed to Level 1b - GSFC s/w (IMAPP being tried)
  - Catalogue generated
  - Frame relay link to DPF overnight
  - MS2GT processing
TERRA-1
Orbit 10203

Date: 2001-11-18
Time: 01:54:05 (utc)

Granule 1
Window UL: 00:46:06 N
Window UR: 00:08:15 N
Window LL: 11:40:00 S
Window LR: 10:55:21 S
Latitude: 117:25:33 E
Longitude: 139:25:34 E

Granule 2
Window UL: 07:19:31 S
Window UR: 08:21:09 S
Window LL: 21:34:37 S
Window LR: 20:22:38 S
Latitude: 114:45:49 E
Longitude: 138:14:59 E

Granule 3
Window UL: 16:55:47 S
Window UR: 18:27:22 S
Window LL: 31:34:46 S
Window LR: 29:51:13 S
Latitude: 111:27:11 E
Longitude: 136:52:35 E

Granule 4
Window UL: 26:37:29 S
Window UR: 28:52:50 S
Window LL: 42:14:35 S
Window LR: 40:12:24 S
Latitude: 106:43:32 E
Longitude: 134:23:33 E

Bands 1-2 at 250m
Band 1 (620-670 nm) (65.33 MB compressed)
Band 2 (641-876 nm) (70.60 MB compressed)
Metadata uncompressed gzip
All 250m bands (tar of gzip data + metadata) (~136.12 MB) .tar

Bands 1-7 at 500m
Band 1 (620-670 nm) (16.63 MB compressed)
Band 2 (641-876 nm) (17.98 MB compressed)
Band 3 (459-479 nm) (17.20 MB compressed)
Band 4 (545-555 nm) (17.40 MB compressed)
Band 5 (1230-1250 nm) (18.82 MB compressed)
Band 6 (1626-1652 nm) (18.09 MB compressed)
Band 7 (2105-2159 nm) (18.00 MB compressed)
Metadata uncompressed gzip
All 500m bands (tar of gzip data + metadata) (~123.53 MB) .tar

Bands 1-36 at 1000m
Band 1 (620-670 nm) (2.67 MB compressed)
Band 2 (641-876 nm) (2.93 MB compressed)
Band 3 (459-479 nm) (2.62 MB compressed)
Band 4 (545-555 nm) (2.84 MB compressed)
Band 5 (1230-1250 nm) (2.95 MB compressed)
Band 6 (1626-1652 nm) (2.64 MB compressed)
Band 7 (2105-2159 nm) (2.92 MB compressed)
Band 8 (405-420 nm) (2.68 MB compressed)
Band 9 (438-448 nm) (2.61 MB compressed)
Band 10 (482-493 nm) (2.54 MB compressed)
Band 11 (526-536 nm) (2.47 MB compressed)
Band 12 (546-556 nm) (1.95 MB compressed)

CSIRO Office of Space Science & Applications
Earth Observation Centre
WASTAC-X Band Station, Perth WA

WASTAC-X Band Station - Perth
Bureau of Meteorology
Department of Land Administration, W.A.
Curtin University of Technology
Murdoch University
C.S.I.R.O.
Geoscience Australia
WASTAC-X has been receiving MODIS since September 2001

Station Description

3.6 metre mesh autotrack/programmable antenna
4.0 metre radome
Quorum downconverter
SUN 400MHz workstation
DLT 7000 archive tape drive
Purchased from SeaSpace Corporation
Installed in September 2001 at Murdoch University
The ASTRA system

- Built by ITR
- Ku-band (12.2 - 14.4GHz) Dish
- Ex-NASA Hydraulically controlled X-Y mount pedestal.
Fire Mapping is a Major Activity in North Australia
MODIS SST Products are being used off WA
Applications to the North of Australia are a major activity

Joint CSIRO/Curtin Research in the Timor Sea
Coastal Water Quality – Chl & SSC for aquaculture

2-1(R), 2(G), 1(B) WLR
500 m

2 (R), 4 (G), 3 (B) chl + TSS

Field sites
Superior Ash Identification – a hazard to aircraft
AIM of MEETING:

To determine a coordinated approach to MODIS data acquisition (DB, FTP, and Tapes), analysis, distribution, and archiving within the Australian community.

Outcomes & Presentations on the Web Site
http://www.eoc.csiro.au (soon)
Half-Month NDVI Composite for WASTAC – Need for a Network
Regional Coverage within in 3 years

Modis viewing area from Australian stations

CSIRO, Marine

CSIRO Office of Space Science & Applications
Earth Observation Centre
Australian Meeting Outcomes

MODIS Coordination Group:
Ocean colour: Arnold Dekker
SST: Ian Barton and Paul Tildesley
Atmosphere: Merv Lynch and John Le Marshall
Land: Fred Prata and Ian Grant
Coordination: Ian Shepherd and David Griersmith

The CSIRO EOC will host a list server and web area to support email discussion amongst the meeting participants.
Coordination Group Activities

- Promote validation of MODIS products for the Australian region

- Evaluation of parameters to calibrate base products (in company with developers)

- Assessment of base level software and data standards to Level 1B to encourage standardisation and exchange

- Coordination of data and product standardisation post-Level 1B
Regional Opportunities

- Extend ListServers and Web sites to regional networks
- Exchange visits and joint discussion of issues of format, software, locally calibrated products, validation
- The network advantages spread beyond national borders
- Coordination between stations and users has many benefits – acquisition conflict resolution, QC/QA and product standardisation
- Common areas of study and application: volcanic ash, fires, pollution, global/regional change and emergency management
A Possible DB Network in South Asia?

Modis viewing area from Beijing, Singapore & Darwin

CSIRO, Marine

CSIRO Office of Space Science & Applications
Earth Observation Centre
但愿人长久
千里共婵娟

Mid-Autumn Festival Moon