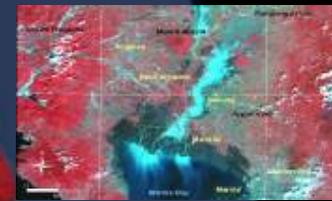
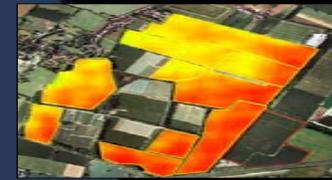


Developments and Applications of the Disaster Monitoring Constellation



JACIE , Washington DC, 21st March 2007

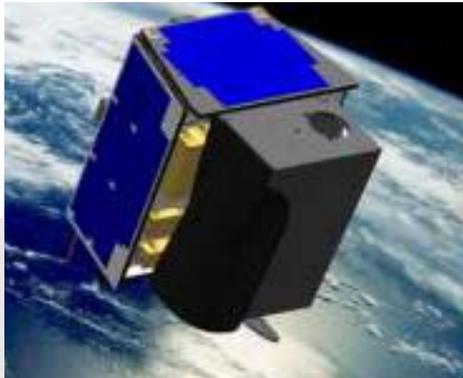
Paul Stephens

Sales & Marketing Director
DMC International Imaging Ltd

“Changing the economics of Space”

This is achieved through:

Rapid-response small-satellites built from advanced terrestrial technology





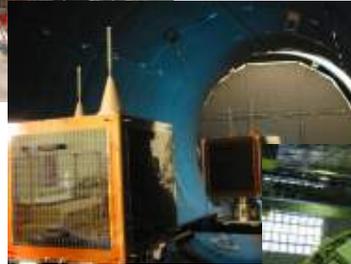
Mission & Instrument Design



Sub System & Instrument Manufacture



Assembly, Integration & Test

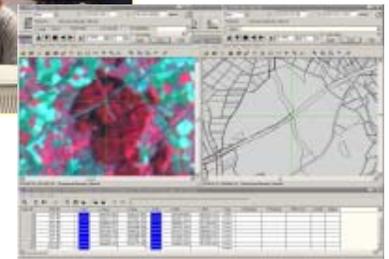


Launch Services



Ground Segment & Operations

Image Processing & Supply



27 Satellites completed – 150 satellite years on-orbit experience

HERITAGE: Flight proven - low risk

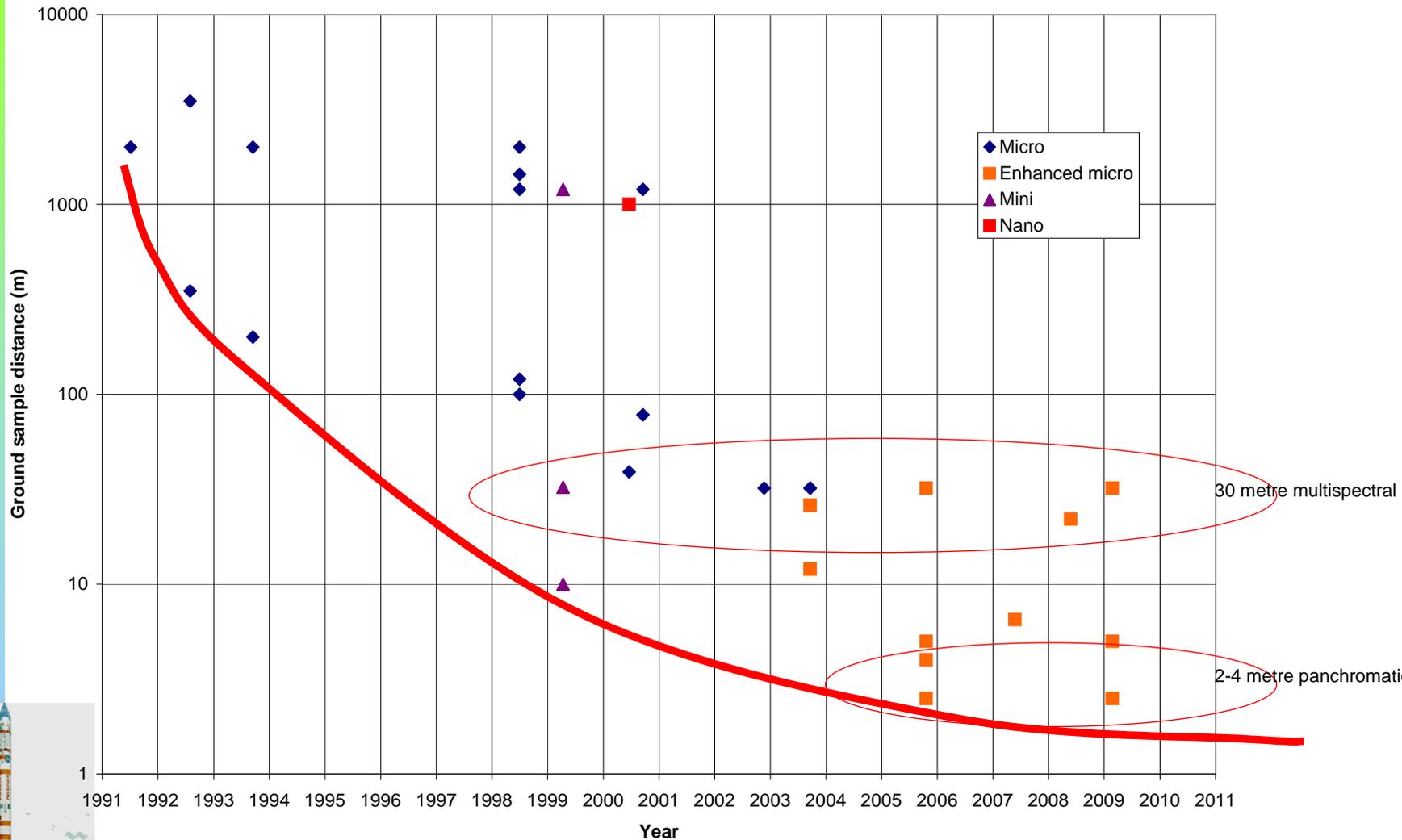
RESULTS: All projects delivered on-time and on-budget, very high mission success rate

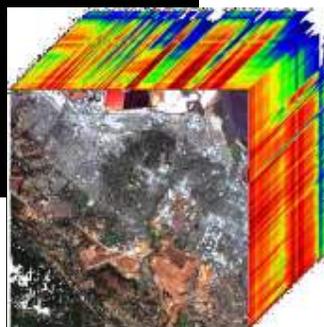
SUCCESS: Enjoyed by our customers, satellites serving real applications

CUSTOMERS: Developed and developing world, “blue chip” customers, 11 “know-how” transfer programmes

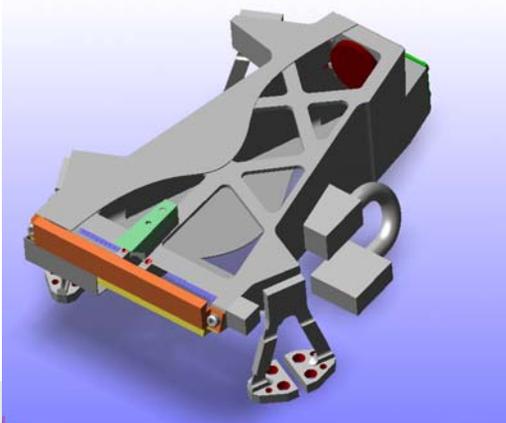


Small Satellite Optical Sensor Development History

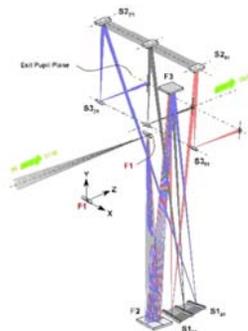




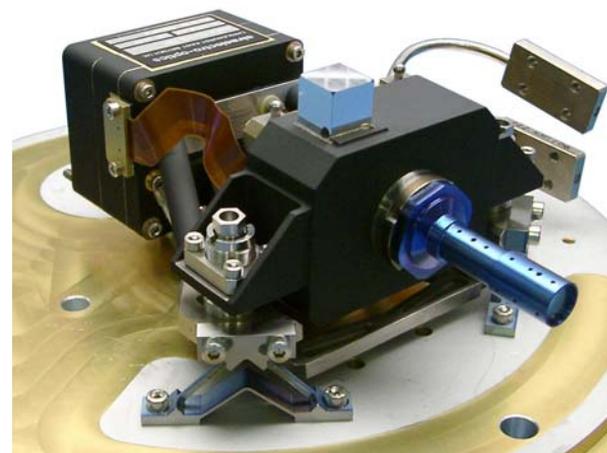
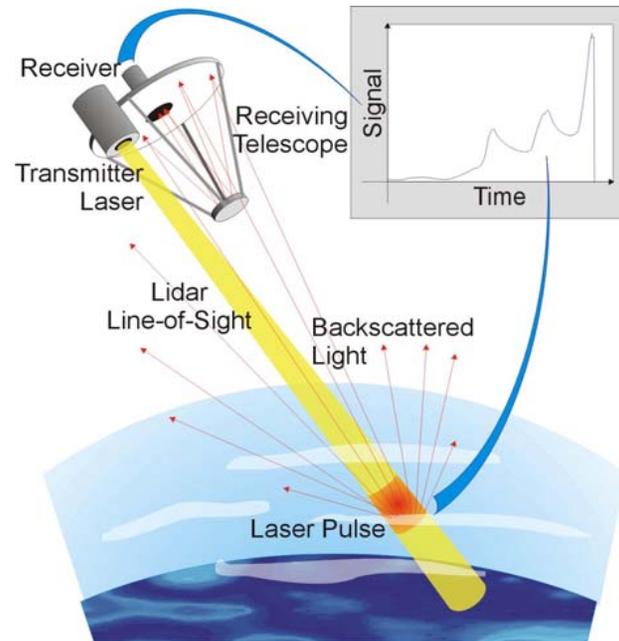
Hyperspectral cube



JWST - Integral Field Unit

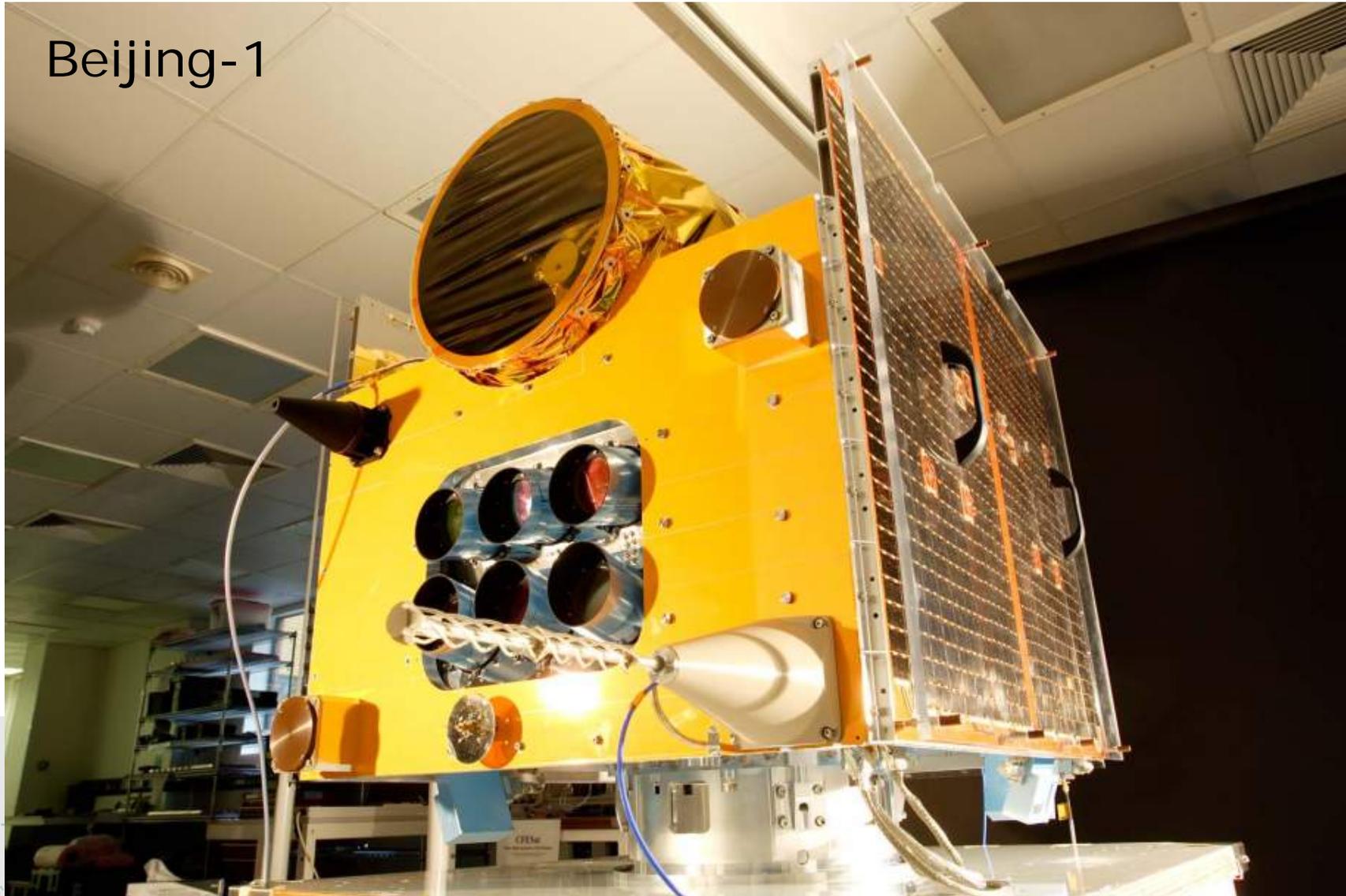


Aladin Wind Lidar Detection Unit



- DMC 32+4 satellite Launched on 27 October 2005

Beijing-1



- Two operational units:
 - SSTL-UK, Satellites and supporting infrastructure
 - DMCii, Data sales and value-added data products

SSTL Group



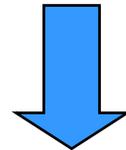
A Unique International Partnership Combining National Objectives, Humanitarian Aid and Commerce...



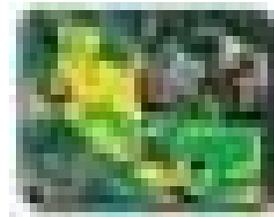
The Consortium



The Coordinator



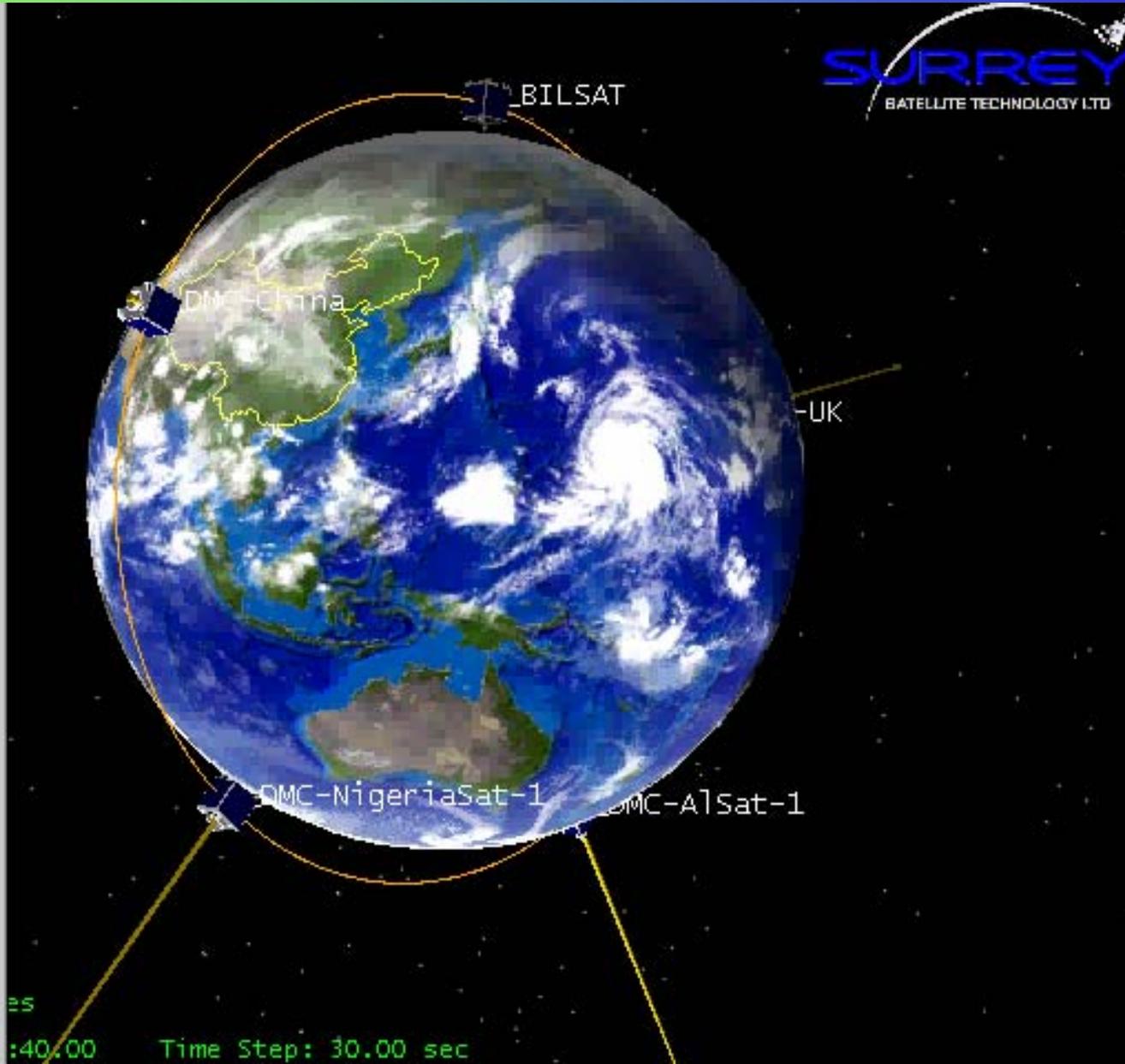
The Constellation



Applications;
Commercial, Government and Humanitarian



Size: 2x2
Length: 0.5000
d...
Help



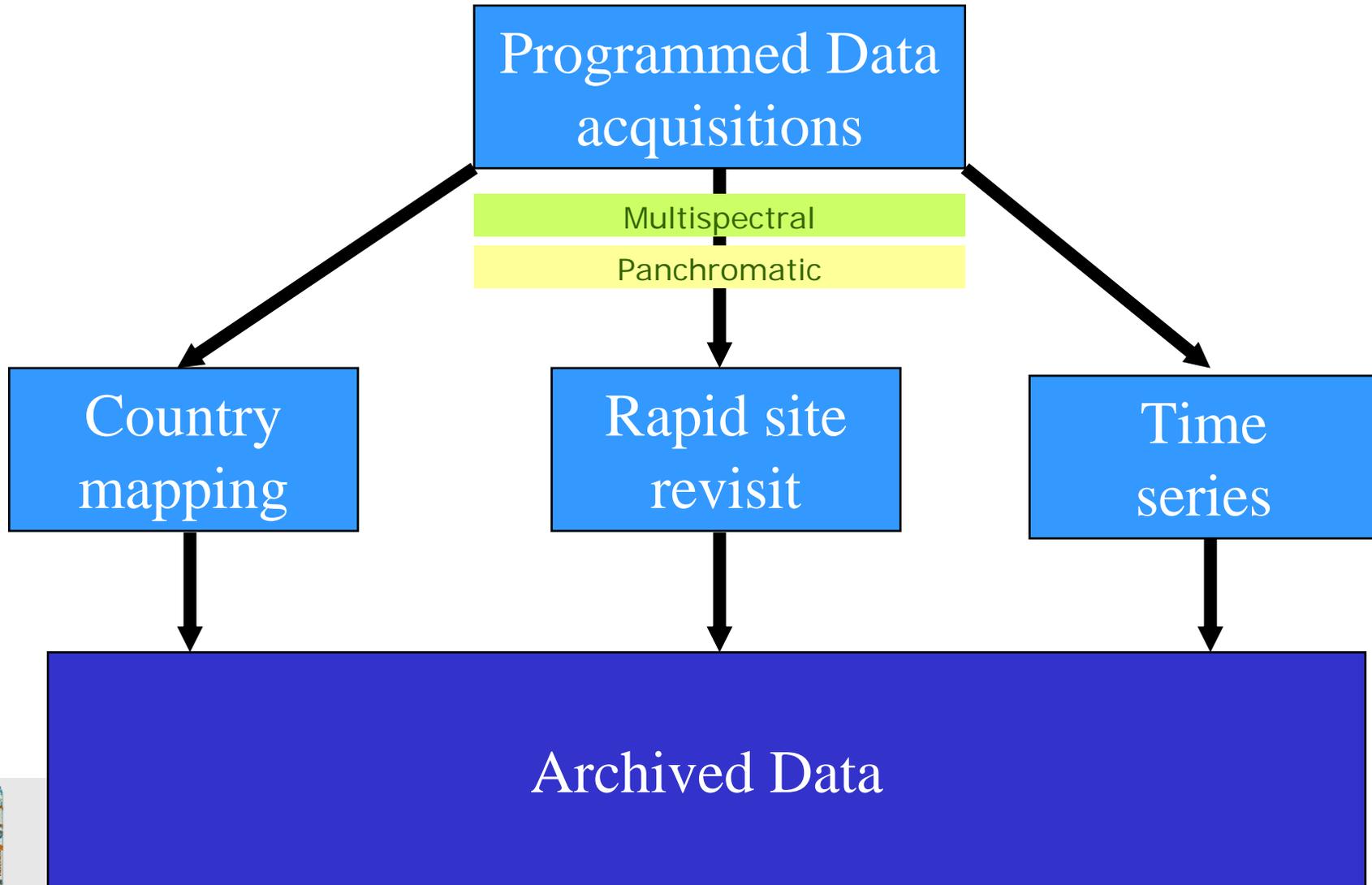


Commercial Supplier for DMC Imagery

What we deliver

1. Rapid response high quality optical images
2. Daily global imaging with sustainable constellation
3. Coordinate effective Disaster Response





Multispectral

- Gsd 32 metre
- Swath 660km
- Along track 160-4100km
- Revisit – daily
- Radiometric accuracy <10%
- Orthorectify <25m RMSE



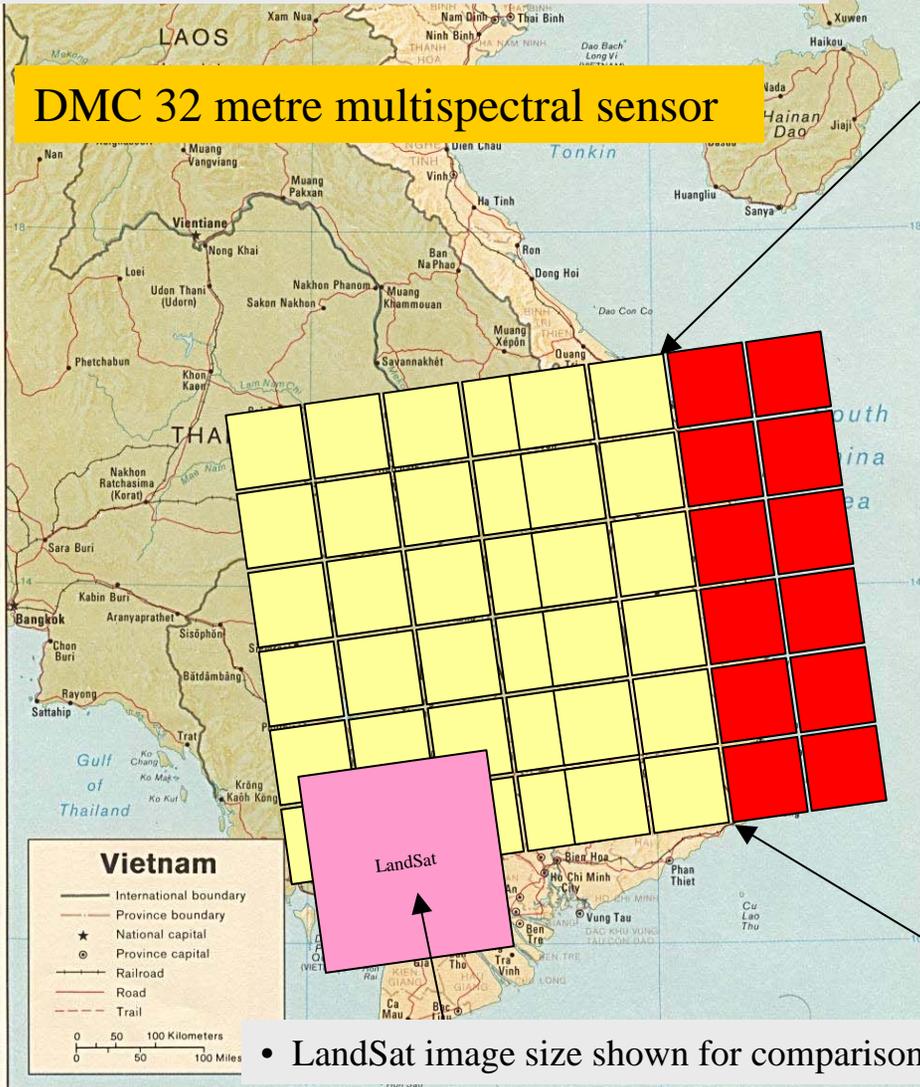
Panchromatic

- Gsd 4 metres
- Swath 24km
- Along track 24-4100km
- Revisit - 5 days (offpoint)



- DMC satellite 32m gsd multispectral image - maximum onboard storage is 600km swath x 570km along track. Imaging area normally 24 tiles, but can be selected to cover maximum of 48 image tiles. Each tile is 80x80km

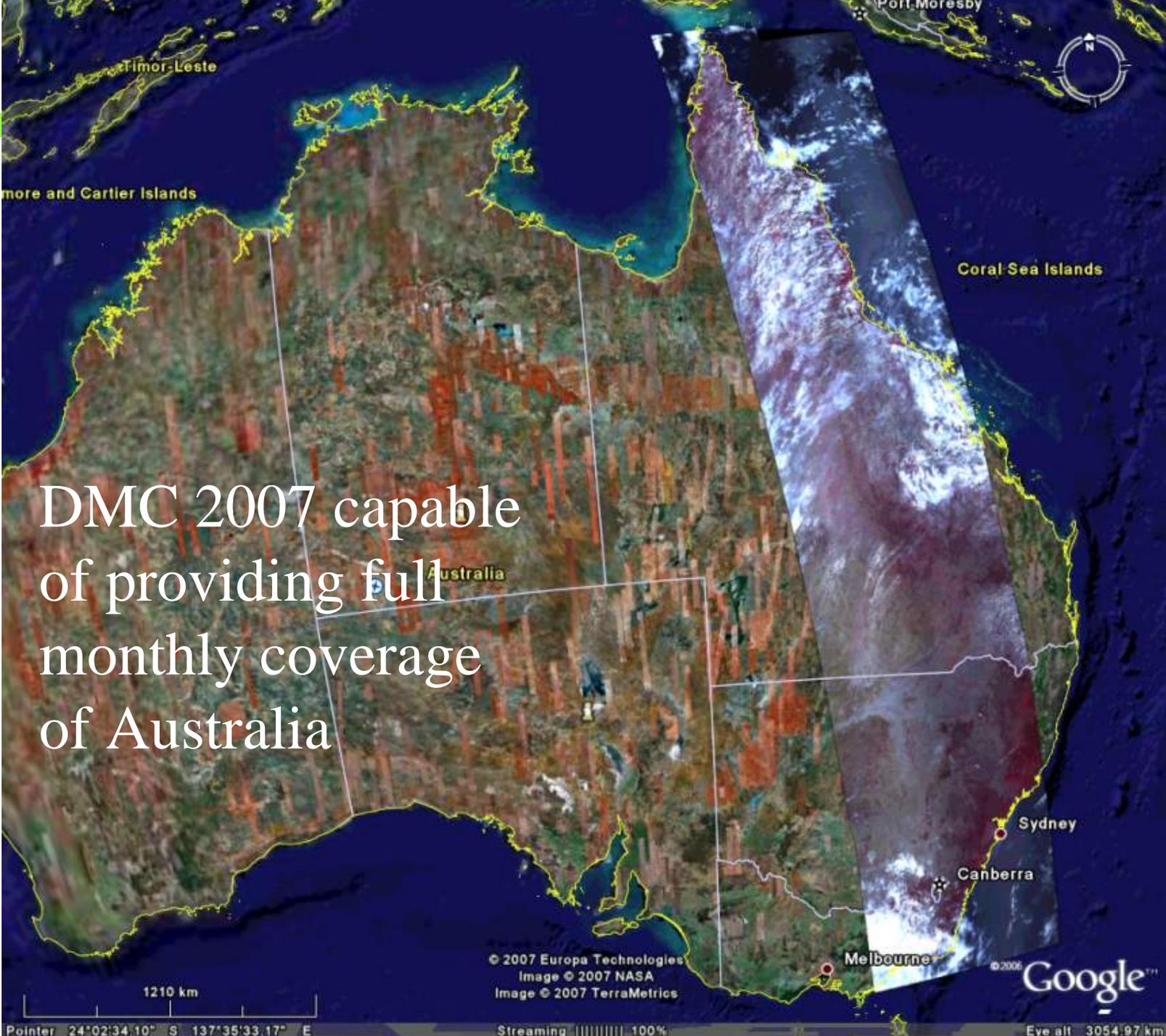
DMC 32 metre multispectral sensor



- LandSat image size shown for comparison

Image from the first Disaster Monitoring Constellation satellite ALSAT-1, 16th June 2003 built by Surrey Satellite Technology at Surrey Space Centre, UK for Centre National des Techniques Spatiales, Algeria





DMC 2007 capable
of providing full
monthly coverage
of Australia



| Satellite | Sensor resolution (m gsd) | Spectral bands | Swath (km) | Along track (min km) | Along track (max km) | Status |
|--------------|---------------------------|----------------|------------|----------------------|----------------------|-----------------|
| AlSat-1 | 32 m | R, G, NIR | 600km | 80km | 600km | DMC Operational |
| NigeriaSat-1 | 32 m | R, G, NIR | 600km | 80km | 600km | DMC Operational |
| UK DMC-1 | 32 m | R, G, NIR | 600km | 80km | 600km | DMC Operational |
| Beijing-1 | 32 m | R, G, NIR | 600km | 80km | 2100km | DMC Operational |
| | 4 m | PAN | 24km | 24km | 2100 km | |
| TOPSAT | 2.5 m | PAN | 20km | 20km | 20km | Operational |
| | 5 m | R,G,B | 20km | 20km | 20km | |



| Satellite | Sensor resolution (m gsd) | Spectral bands | Swath (km) | Along track (min km) | Along track (max km) | Status |
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| AlSat-1 | 32 m | R, G, NIR | 600km | 80km | 600km | DMC Operational |
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| Beijing-1 | 32 m | R, G, NIR | 600km | 80km | 2100km | DMC Operational |
| | 4 m | PAN | 24km | 24km | 2100 km | |
| TOPSAT | 2.5 m | PAN | 20km | 20km | 20km | Operational |
| | 5 m | R,G,B | 20km | 20km | 20km | |
| RapidEye 1, 2, 3, 4,5 | 6.5 m | 5 bands R, G, B, Red edge, NIR | 77km | 77km | | Launch 2007 |
| Spain DMC | 22 m | R, G, NIR | 600km | 80km | 1200km | Launch 2008 |
| UK DMC-2 | 22 m | R, G, NIR | 600km | 80km | 2100km | Launch 2008 |
| NigeriaSat-2 | 32 m | R, G, B, NIR | 300km | 80 km | 2100km | Launch 2009 |
| | 5 m | R, G, B, NIR | 20km | 20km | | |
| | 2.5 | PAN | 20 km | 20 km | | |

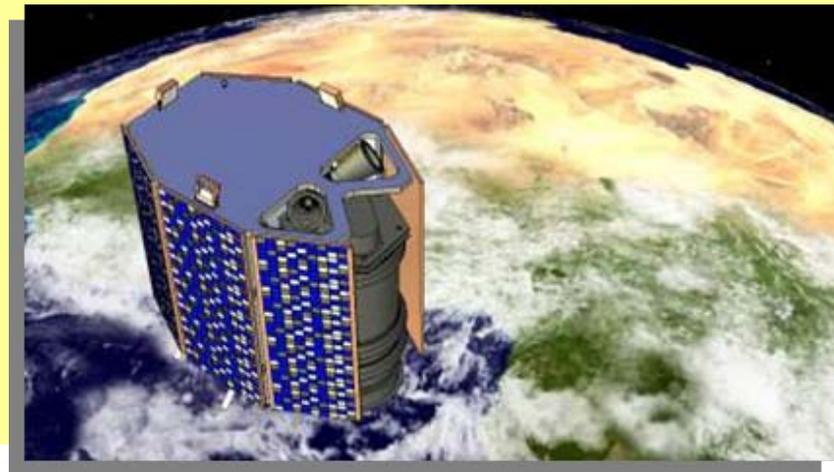
UK DMC-2 & Deimos-1 launch 2008

- High Resolution
 - 22m 3-band multispectral
 - 660km swath
- X-band downlink
 - Enhanced along track imaging



Nigeriasat-2 launch 2009

- Very High Resolution
 - 2.5m PAN
 - 5.0m 4-band multispectral
- High Res Imager
 - 32m 4-band multispectral
- Dual X-band downlink

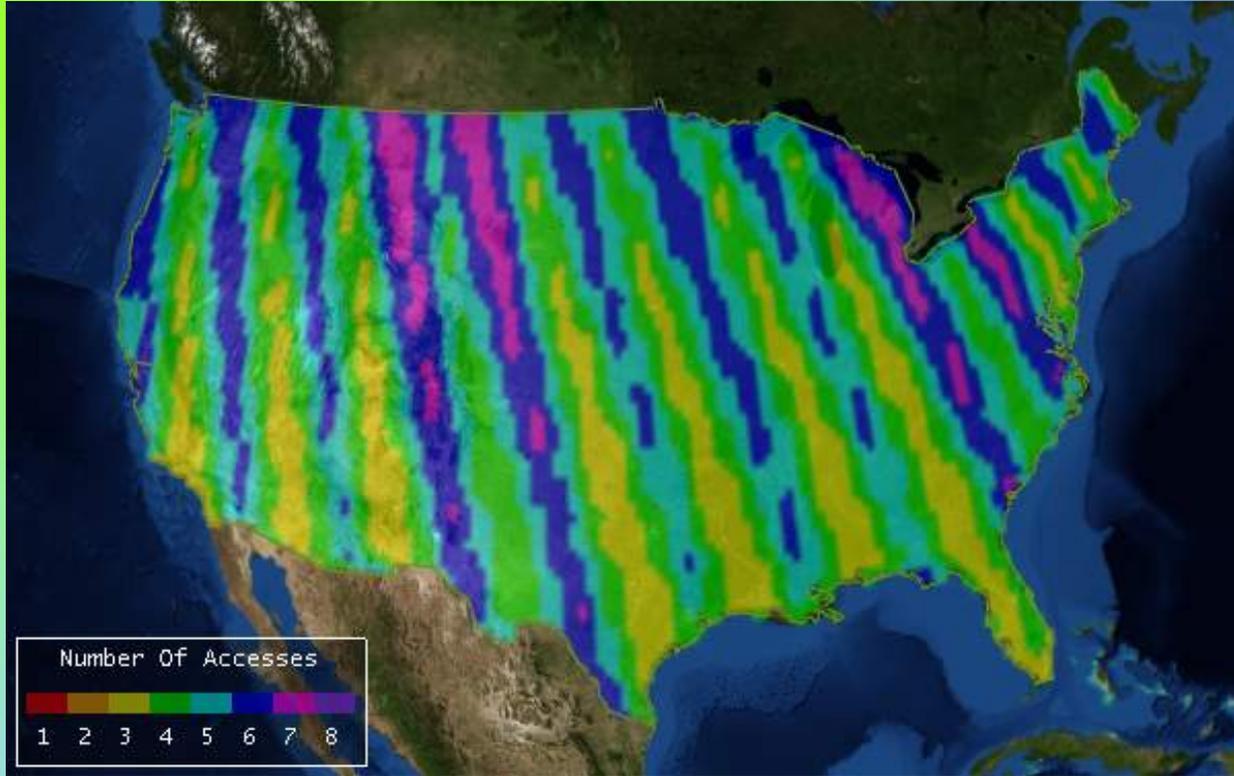




- 22 metre m/s
- R, G, NIR
- 660 km swath
- 4000 km long images

In 2008 DMCii will enable direct broadcast to licensed ground stations





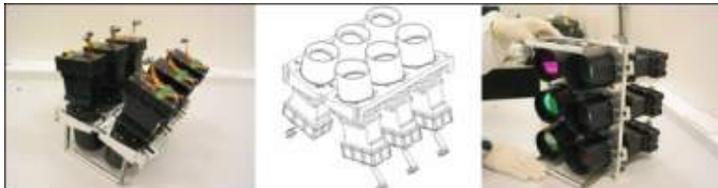
- 22 metre m/s
- R, G, NIR
- 660 km swath
- 4000 km long images
- Direct broadcast to licensed ground stations

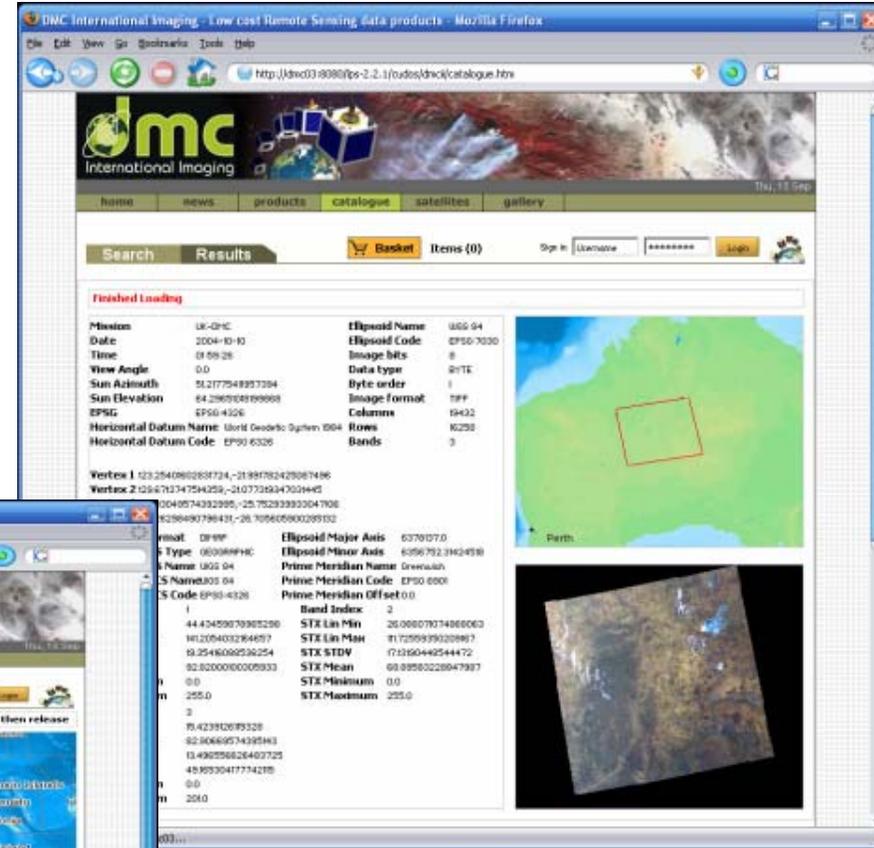
DMCii can provide 3-7 repeat coverages of USA in 16 days

- 32 meters gsd in 2007
- 22 meters gsd in 2008



| | <i>DMC SLIM6</i> | <i>Landsat ETM+</i> |
|---------------------|---------------------------|---------------------------------|
| Noise | <1DN (1 SD) | <1DN (1 SD) |
| Signal-To-Noise | >100:1 | >100:1 |
| Absolute Radiometry | <5% | <10% |
| Gain | Fixed Gain | Earth Surface Dependant Gain |
| Integration Time | Variable | Fixed |
| Swath | 660km (20,000 Pixels) | 182.61km (6,087 pixels) |
| Quantisation | 8bit (From 11) | 8bit |
| Band: Near IR | 0.77 - 0.90 μm | 0.77 - 0.90 μm |
| Band: Red | 0.63 - 0.69 μm | 0.63 - 0.69 μm |
| Band: Green | 0.52 - 0.60 μm | 0.52 - 0.60 μm |





Online Archive Search Coming Soon

DMC Disaster Response 2006

DMCii's role in International Charter; Space & Major Disasters.

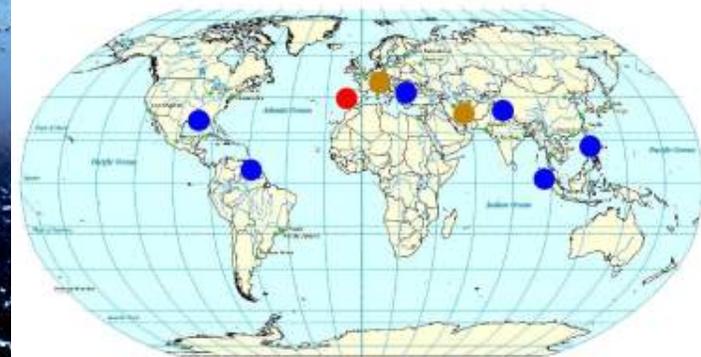
- Rapid response Imagery
- Emergency On Call Officers
- Executive Secretariat member

2006 Charter activations

| Date | Event | Country | DMC role |
|-------------|----------------|----------------|----------|
| February-06 | Chemical spill | UK | ECO duty |
| | landslide | Philippines | data |
| March-06 | Earthquake | Algeria | |
| April-06 | Flood | Czech Republic | data |
| | Flood | Germany | data |
| | Flood | Austria | data |
| | Flood | Hungary | |
| | Flood | Romania | data |
| | Volcano | Java | data |
| May-06 | Flood | Surinam | data |
| | Earthquake | Indonesia | |
| July-06 | Flood | Argentina | data |
| | Oil spill | Lebanon | data |
| August-06 | Flood | Pakistan | data |

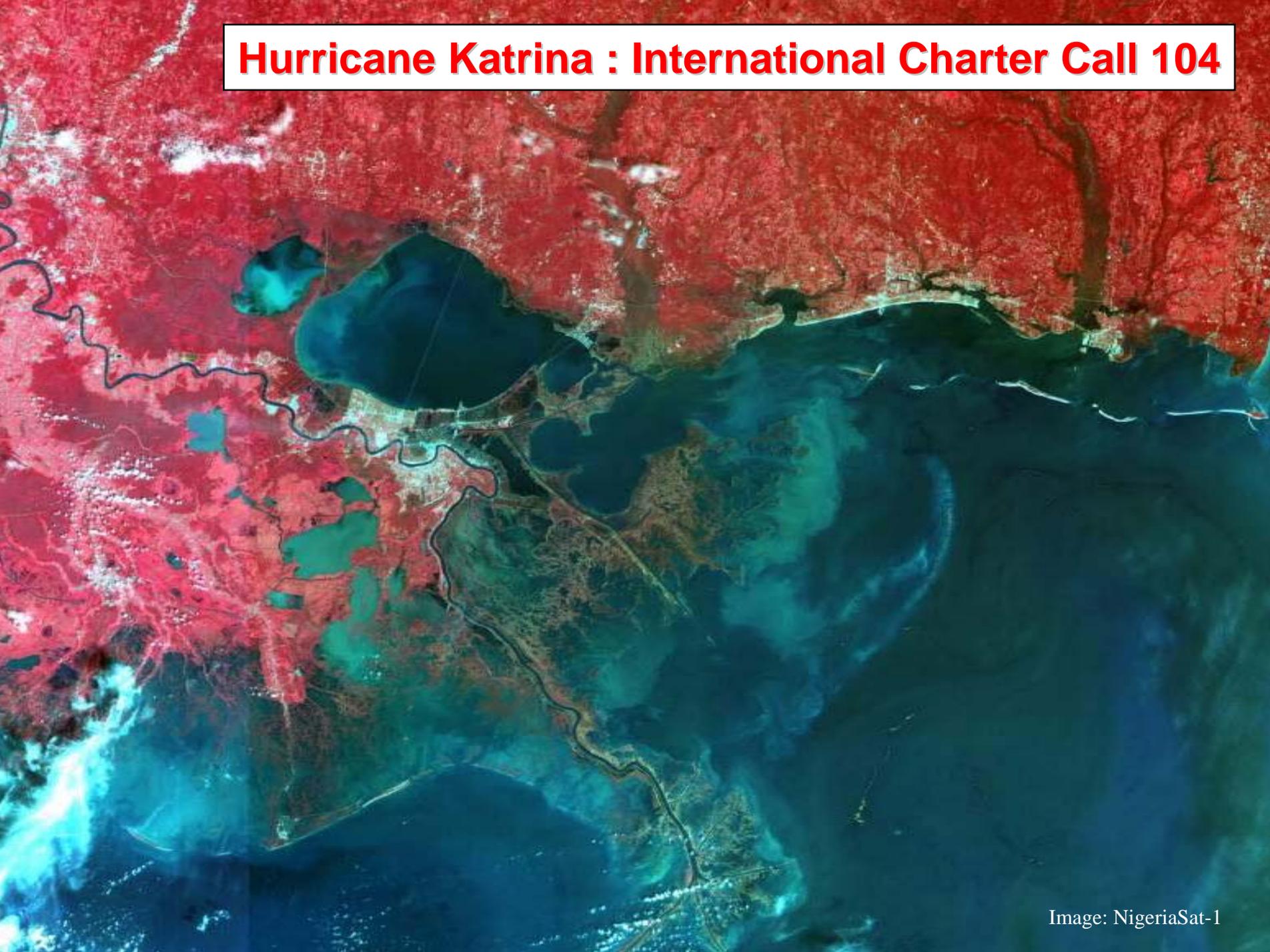


UK Charter Board Member



2005 DMC Disaster Response

Hurricane Katrina : International Charter Call 104



Hurricane Katrina : International Charter Call 104



Superdome

Lake Ponchartrain

Flooded areas

Smoke plume from wharf

Mississippi River

Image: NigeriaSat-1

Hurricane Katrina : Event Map

Charter Call ID-104 - Product 20

Flood and humidity mapping
02 September 2005
New Orleans - Mobile, USA



Flood impact mapping from the 02 September 2005

-  Flooded surfaces
-  Very wet areas
-  Affected urban zones with flooding in New Orleans
-  Reference water bodies (1999-2001)



Disaster : hurricane, floods
Charter trigger date : 02 September 2005

Thematic layers :
Flood waters, humid areas and affected urban areas
extracted from NigeriaSAT, DMC International data
Reference water extracted from Landsat 7 ETM+ data

Satellite data source :

NigeriaSAT DMC image, natural colors, 32 m
Acquisition date : 02 September 2005
© DMC International Imaging 2005

Landsat 7 ETM+, 28.5 m
Acquisition date : November 1999, August & October 2001
© USGS 1999, 2001 - Maryland

Datum : WGS 84
Projection : UTM Zone 15 N

Scale : 1/250 000 for A0 prints

Map created the 09 September 2005 by SERTIT
© SERTIT 2005

sertit@sertit.u-strasbg.fr
<http://sertit.u-strasbg.fr>





**Country Fire Service,
Adelaide, Australia**

Canadian Forestry Service, Canada



Centre National des Techniques Spatiales, Algeria



CIC Mining Resources Ltd., China



Countryside Council of Wales, UK



EC GSE Northern View



Coopération Française (through PFBC)

VATTENFALL



NASRDA, Nigeria



MINFOF (Ministère des Forêts et de la Faune)



Agriculture

- *International Precision Farming*
- *Illicit Crop Monitoring*
- *EC AGRIFISH*
- *Food Security*

Environment & Forestry

- *Coastal Erosion Monitoring*
- *Burn Scar Mapping*
- *Forest Powerline Risk Mapping*
- *Landcover & Habitat Mapping*
- *Hydrological Mapping*
- *Logging & Deforestation Management*

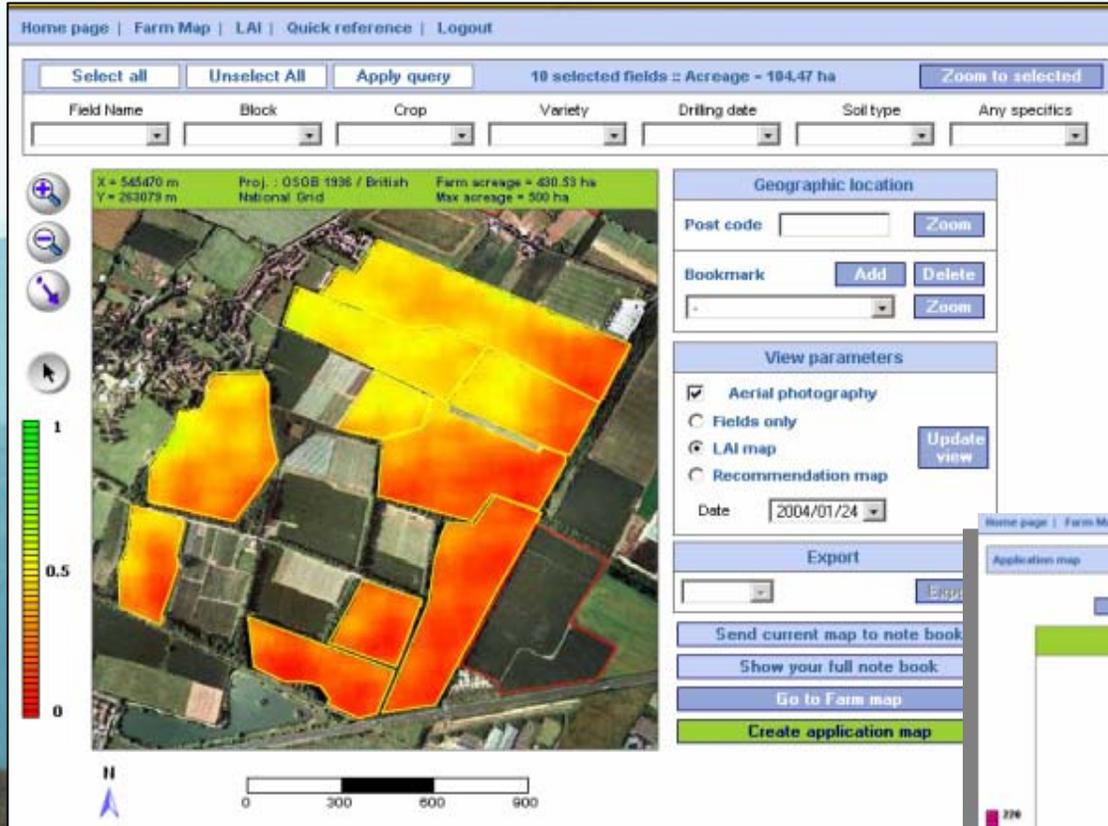


Source: ALSAT-1



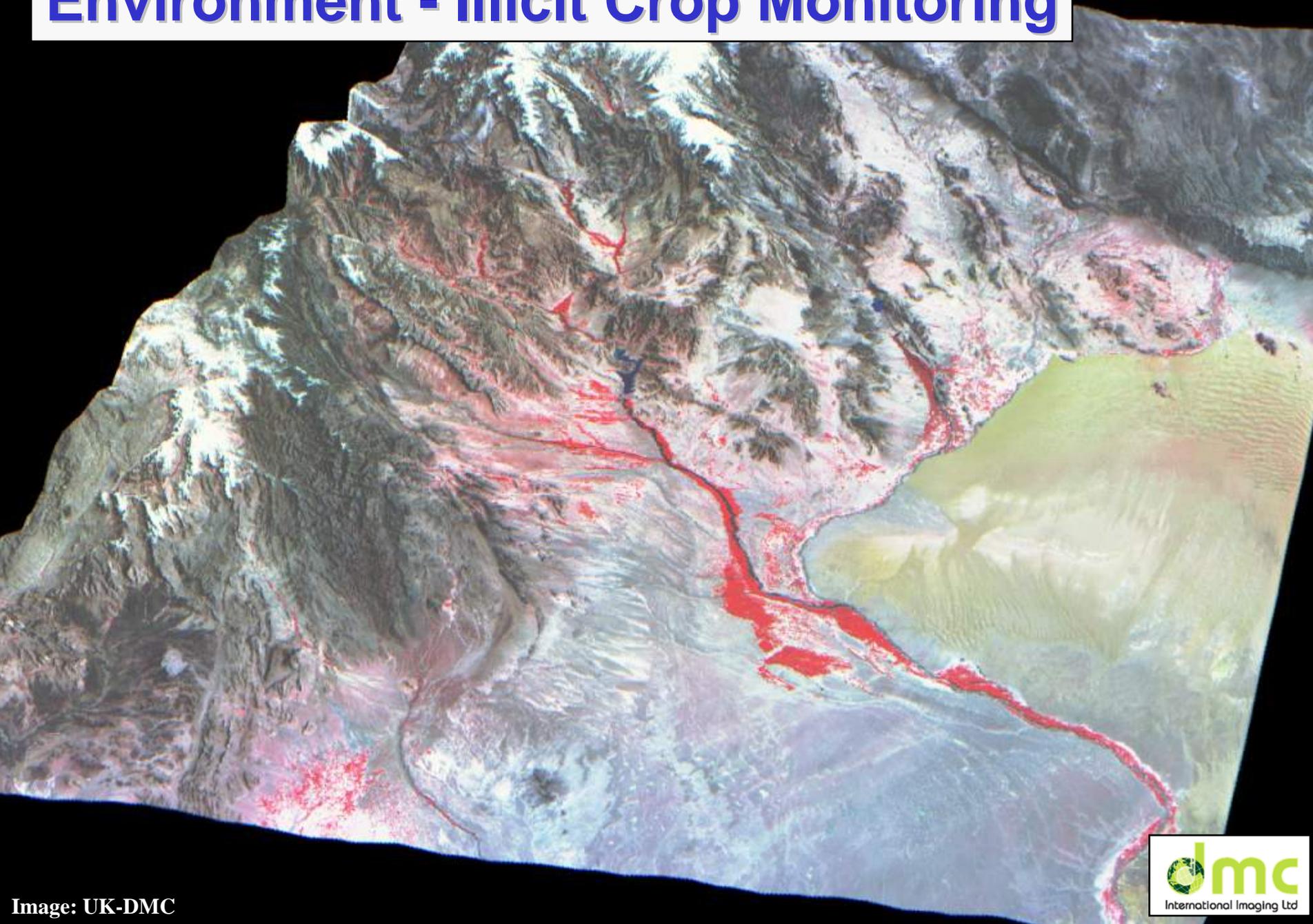
Precision Agriculture – Value Added Services

Online Agricultural services Including Field level monitoring of crop health...

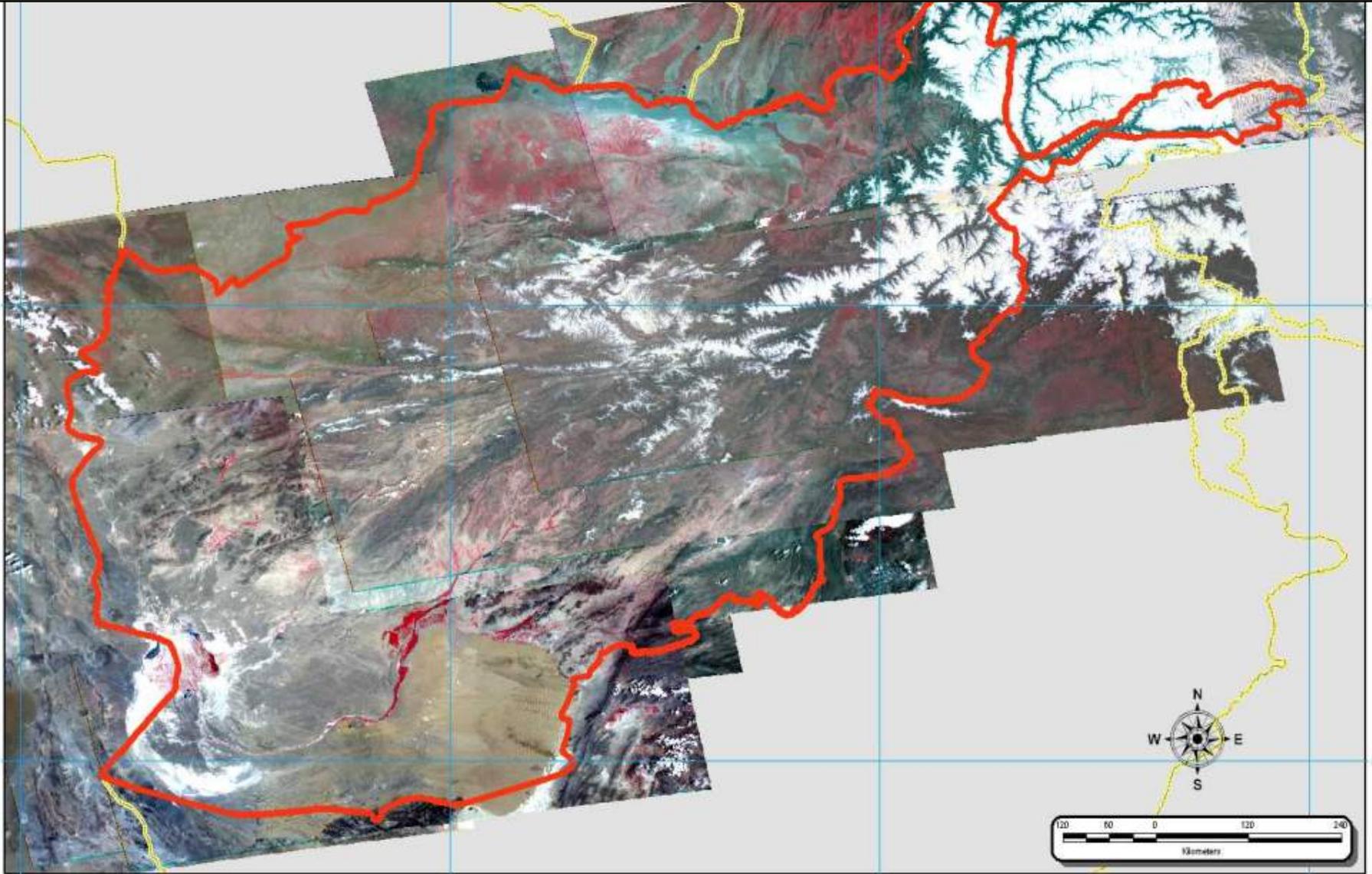


DMC 32m data located over 5m aerial photo in UK

Environment - Illicit Crop Monitoring

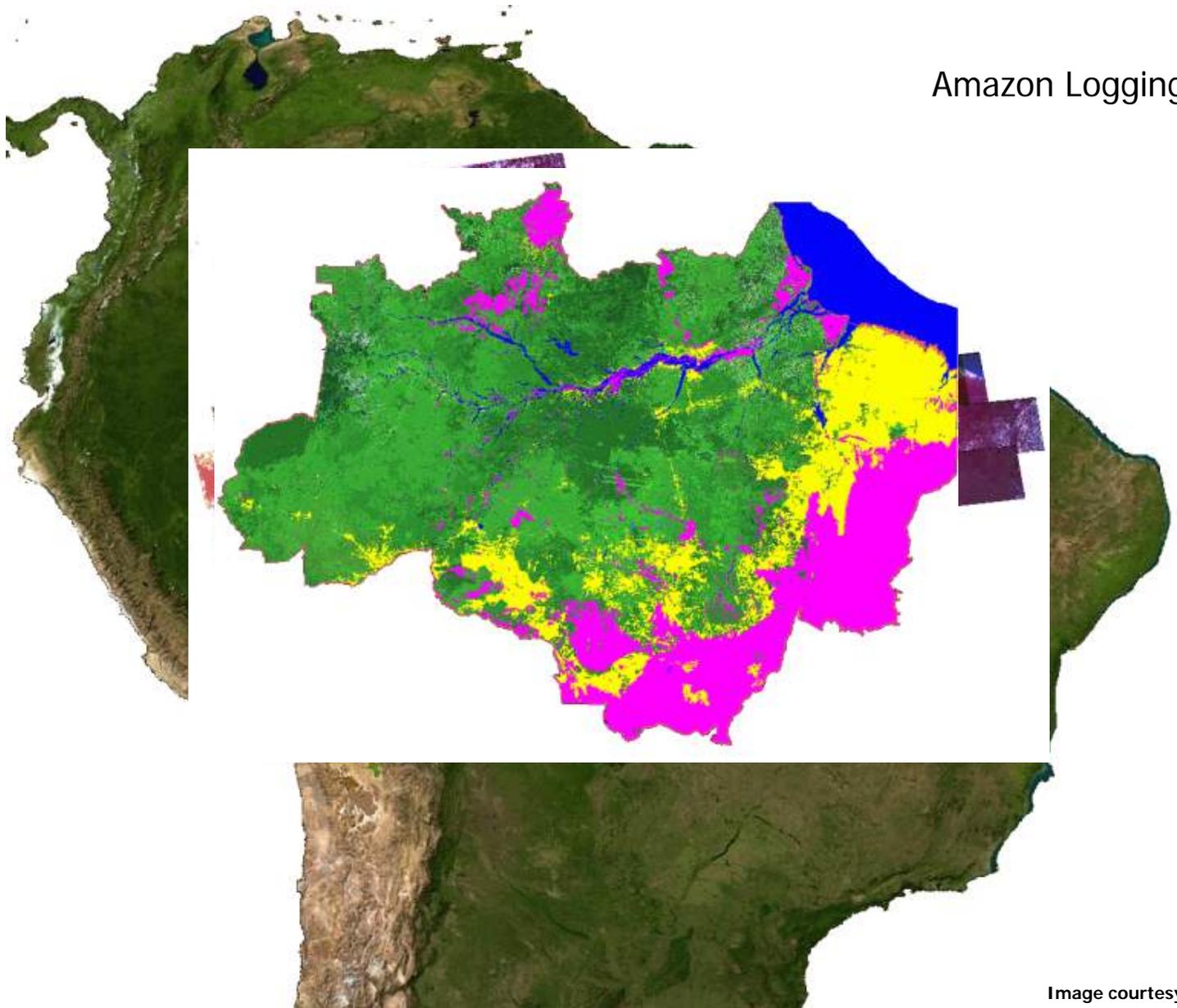


DMC data used for Spring 2005/2006 UN Office on Drugs and Crime (UNODC) Opium Poppy Crop Estimates...



Afghanistan - April 2006

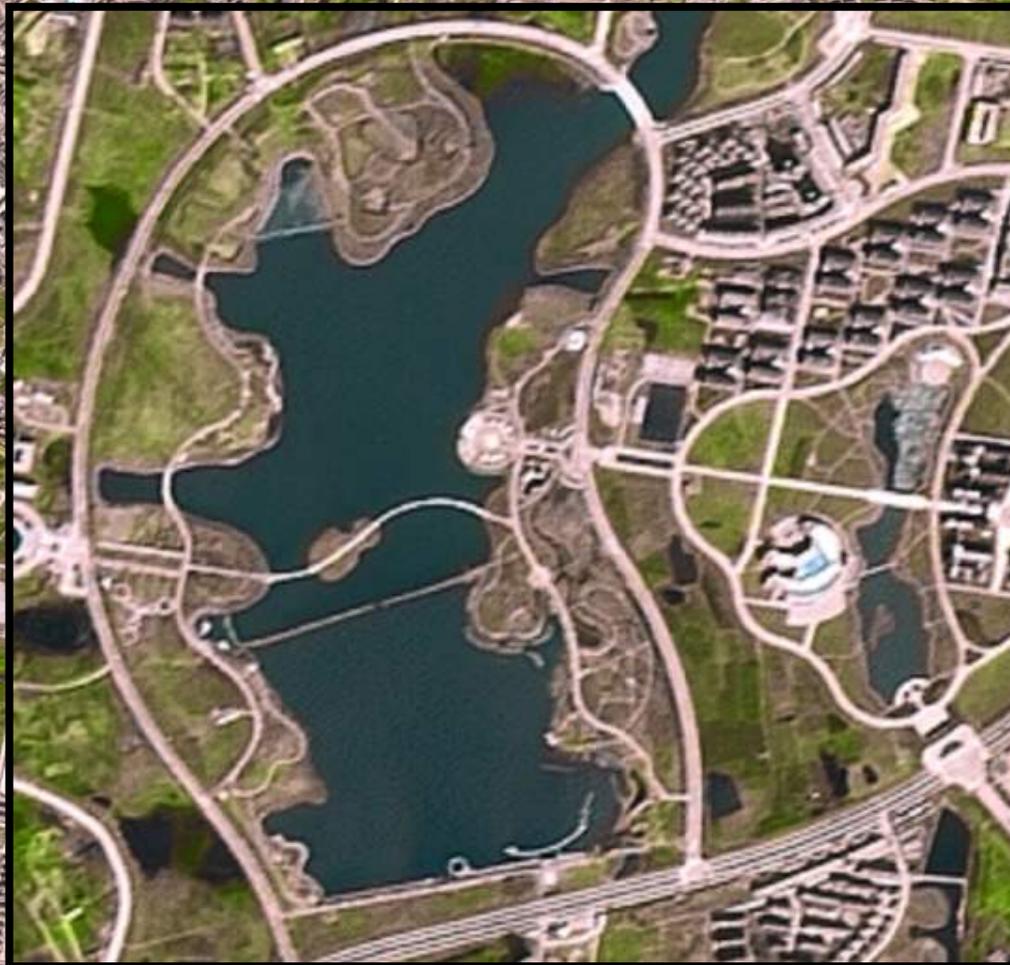
Amazon Logging

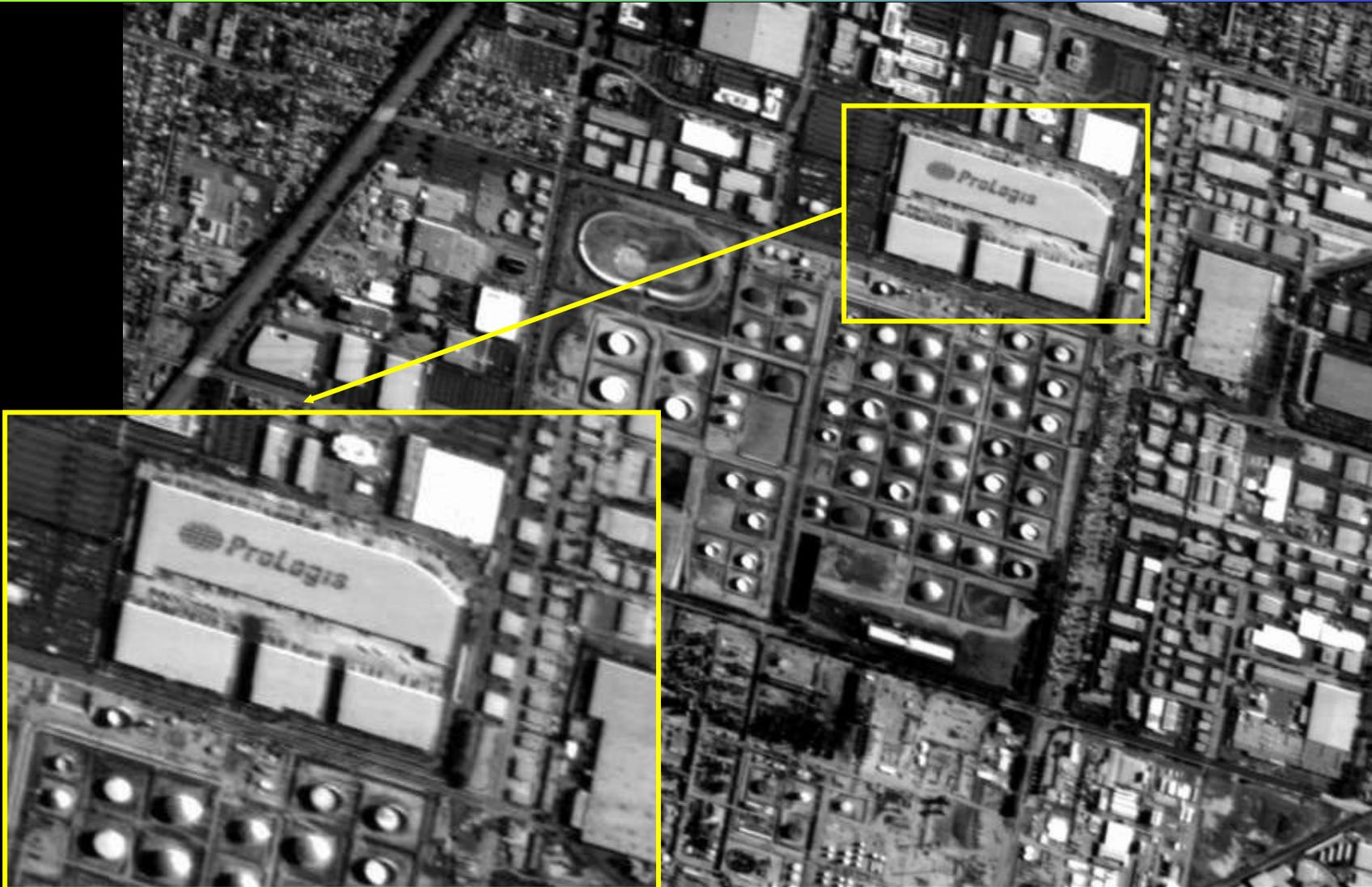


Cairo, Egypt



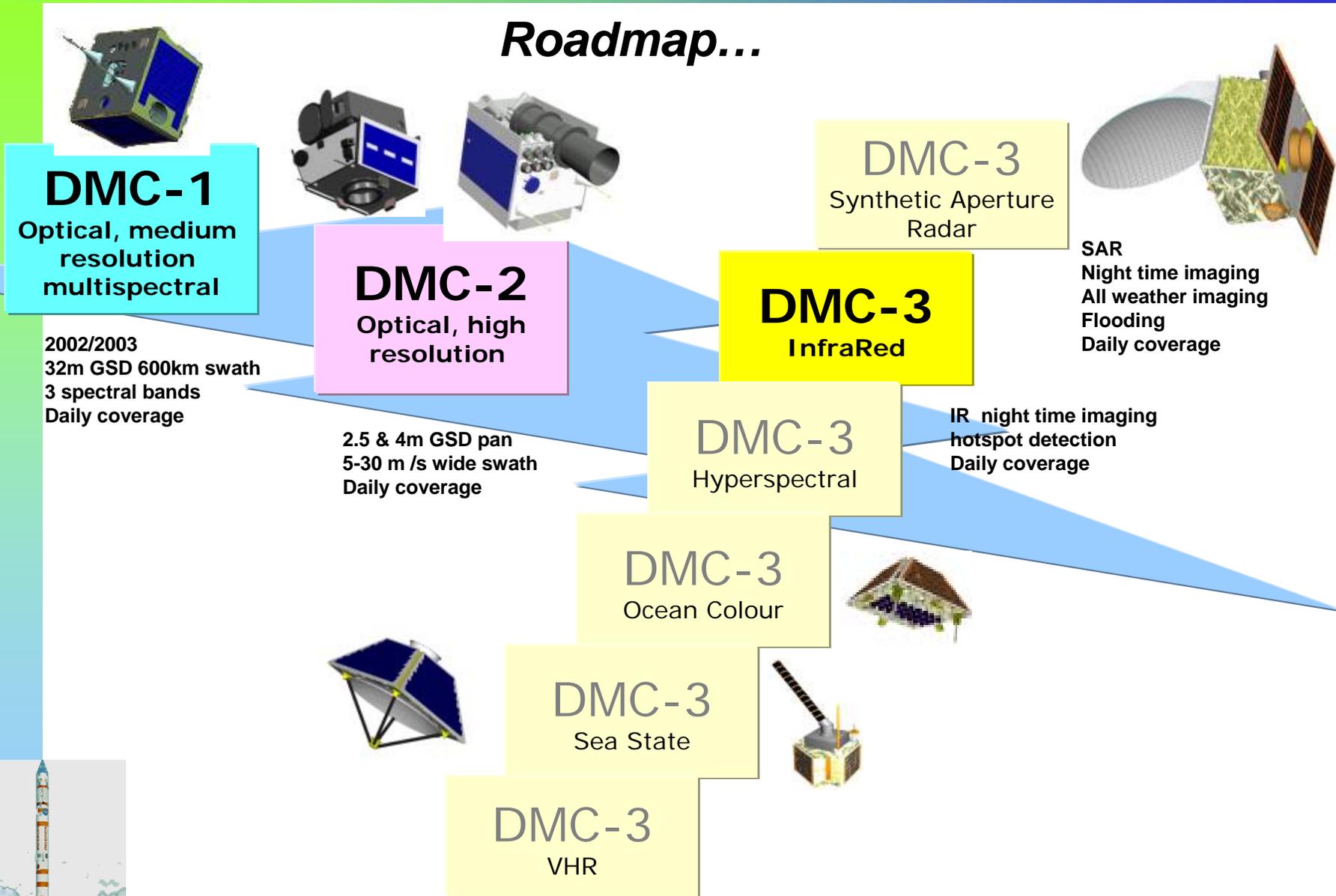
Hei Fei City, China





TopSat 2.5 meter image of Los Angeles, USA

Roadmap...



DMCii provides high quality Earth Observation data service

DMC leads the way in International coordination in space

- **Coordinated Constellation**
High Frequency, High Resolution Imaging
- **Broad coverage**
Single Image Collection of Multiple-Sites
- **Affordable Earth observation**
for natural resource management



Questions

?

Paul Stephens
www.dmcii.com