The DMC Concept

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

The Coordinator

The Consortium

The Constellation

Applications; Commercial, Government and Humanitarian
Full Spectrum Satellite Solutions

- Design
- Manufacture
- Assembly, Integration & Test
- Launch Services
- Ground Segment & Operations
- Processing & Supply
**Hands-on training & capacity building programmes**

- 6 Space Agencies / Space programmes formed
- 6 Priming own space missions
- 2 Spin-out companies

All but 1 remain active in space

<table>
<thead>
<tr>
<th>Nation</th>
<th>Period</th>
<th>Mission</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA, NASA / MSU</td>
<td>(2007-2008)</td>
<td>Magnolia</td>
</tr>
<tr>
<td>Turkey, Bilten</td>
<td>(2001-2003)</td>
<td>BILSAT-1</td>
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<td>Algeria, CNTS</td>
<td>(2000-2002)</td>
<td>AlSAT-1</td>
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<td>Malaysia, ATSB</td>
<td>(1996-1998)</td>
<td>TiungSat-1</td>
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<td>Thailand, MU</td>
<td>(1995-1997)</td>
<td>Thai-Phutt</td>
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<td>Chile, FACH</td>
<td>(1994-1998)</td>
<td>FASAT-A&amp;B</td>
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<tr>
<td>Portugal</td>
<td>(1992-1994)</td>
<td>PoSAT-1</td>
</tr>
<tr>
<td>S.Korea, KAIST</td>
<td>(1989-1993)</td>
<td>KITSAT</td>
</tr>
<tr>
<td>Pakistan, Suparco</td>
<td>(1984-1988)</td>
<td>BADR-1</td>
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</tbody>
</table>
Disaster Monitoring Constellation
Constellations overcome cloud

Multiple MODIS images May 2006

Single DMC image April 2007
Rapid Regional Coverage

LANDSAT 185 x 185 km Images

DMC Beijing-1 600 x 560 km Image
Australia
Example:
650km swath, 3000km along-track
Monitoring Europe; Working with GMES

Delivered

• Single year
• 38 countries
• 5.8 million km$^2$
• <5% cloud
• 32 metre gsd
Satellite Constellation Sustainability Principles

<table>
<thead>
<tr>
<th>2002</th>
<th>2009</th>
<th>2010</th>
<th>2015+</th>
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</thead>
<tbody>
<tr>
<td>1st Generation – 32m Data</td>
<td></td>
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<tr>
<td>2nd Generation – 22m Data</td>
<td></td>
<td></td>
<td>More Launches</td>
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<tr>
<td>1st Generation VHR – 2.5m Data</td>
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</tbody>
</table>

Cost effective SSTL satellites, and self-sustaining funding principles of commercial organisations delivers data continuity

Consistent design principles delivers imagery consistency
Expansion in DMC Imaging Capacity

DMC daily imaging capacity

Major capacity change in 2010
DMCii Commercial Service

DMCii coordinates DMC Constellation to deliver

**On-demand rapid imaging**
- Fast responsive imaging service
  - 2.8 and 4 metre panchromatic
  - 5.6 metre multispectral
  - 32 metre multispectral
  - 22 metre multispectral
New sensors
  - 2.5 metre pan / 5 m multispectral (2010)

**Country / regional mapping**
- Multi-season coverage

**Precision Agriculture**
- Flexible, short imaging windows to cover large or small AoIs

**Forest monitoring**
- Large area change detection and classification

**Direct downlink near real-time imaging**
- 22 metre multispectral

**On-line Archive access**

**Training**
Applications of DMC imagery

Benefits of rapid revisit and wide area coverage

Precision Agriculture

Deforestation monitoring

Flood mapping

Burnt Area mapping
Annual DMC campaigns:

• 2005
• 2006
• 2007
• 2008
• 2009

Brazilian Government annual Amazon deforestation PRODES program has used DMC imagery since 2005.
Forest Area Classification Map

Thematic Content:
• Basic Landcover

Scale:
• 1:50 000

Projection/Ref:
• UTM WGS84

Format:
• GeoTiff
• ERDAS.img
• ENVI
• PDF
• KML/KMZ

Legend:
- Mature forest
- Degraded forest
- Flooded / burnt
- Water
- Bare / urban
- Dense urban
- Cultivated
Forest Change Indicator Map

Thematic Content:
- Degradation
- Re-growth
- Burnt area
- Flooded area

Scale:
- 1:50 000

Projection/Ref:
- UTM WGS84

Format:
- GeoTiff
- ERDAS.img
- ENVI
- PDF

Multi-temporal NDVI Composite (3 Dates)
Rapid Continental Coverage

- DMCii is supported by the EC-GMES to collect imagery in 12 months 2009/2010

- The EC-GMES state that the coverage is a ‘core dataset’ also for the 2011/2012 period
22m DMC satellite image
650km x 650km
Lisala, D.R. Congo

Congo River

22m detail from UK-DMC2 image
Context in Central Africa

• Remote sensing and forest inventory programmes in Central Africa have produced comprehensive historical high quality records and infrastructure (CARPE, OFAC, OSFAC)
  – Highly accurate surveys are necessary for biomass/carbon flux, these take time and effort
• High frequency satellite surveys for operational monitoring are the future
  – After 1 year, degradation is difficult to detect
  – Enforcement needs information to target ground surveys
• DMCii proposes to monitor key areas of COMIFAC countries two times a year on an ongoing operational basis
  – Countries without operational forest monitoring programmes will be refused entry to the REDD-Plus process
Annual monitoring of Congo Basin Forests

High frequency monitoring to identify annual forest change

DMC
650km swath
3 satellites @ 22metres gsd
3 satellites @ 32metres gsd

Reliable regular information for sustainable forest monitoring
Proposed Congo Forest Monitoring Service

• Covers dense tropical forest area
  – Annual basin wide survey (for policy makers and international projects)
  – more regular surveys - CARPE priority landscapes and other key areas

• Focal points in each country through WRI

• Central focus on capacity building with OSFAC
  – Training events on map interpretation and processing
  – Field training on map interpretation

• Printed and digital map products
  – Products specified to meet REDD-Plus requirements

• Harmonised with existing projects

• Long term project plan for sustainability

• Licensing of all the DMC data, for any user, globally
Partners and Supporters

- Existing initiatives have a strong need for operational annual data supply
- Partners, co-funding bodies and stakeholders
  - UN-FAO, European Space Agency, CIFOR, World Resources Institute, EC-FORAF (OFAC), OSFAC, CARPE, IUCN, Jane Goodall Institute, GMES-REDD
  - DG of Environment (RC)
  - Association Congolese pour la Preservation des Forets
  - Institution Congolese pour la Conservations de la Nature
  - Ministry of Fauna and Forest (Cameroun)
  - Geographical Institute of Burundi
  - Further stakeholders in Gabon, Guinea Equatoriale
  - Other forest responsibles
# Project Responsibilities

<table>
<thead>
<tr>
<th>Task</th>
<th>Primary Partner</th>
<th>Secondary Partner</th>
<th>Other Partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training and Capacity Building</td>
<td>WRI</td>
<td>OSFAC</td>
<td>DMCii</td>
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<tr>
<td>Imagery Acquisition and Pre-Processing</td>
<td>DMCii</td>
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<td>Satellite Partners</td>
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<tr>
<td>Local Map Production</td>
<td>OSFAC</td>
<td>DMCii</td>
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<tr>
<td>Interface with Local Groups</td>
<td>WRI</td>
<td>OSFAC</td>
<td>JGI</td>
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<tr>
<td>Improving Awareness</td>
<td>DMCii</td>
<td>CARPE</td>
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<tr>
<td>Interface with National Governments</td>
<td>CARPE</td>
<td>COMIFAC</td>
<td>DMCii</td>
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<tr>
<td>Data Dissemination and Processing</td>
<td>OSFAC</td>
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<tr>
<td>Basin-Wide Survey</td>
<td>CARPE</td>
<td>OFAC</td>
<td>WRI</td>
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<tr>
<td>Logging Roads Monitoring</td>
<td>WRI</td>
<td>Crowd Sourcing?</td>
<td></td>
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</tbody>
</table>
Thank you
Merci

www.dmcii.com
info@dmcii.com
DMC’s role in International Charter; Space & Major Disasters.

- Rapid response Imagery
- Emergency On Call Officers
- Executive Secretariat chair; Oct’07- Apr’08
- Charter Board chair; Oct’07- Apr’08