



New Sensors; Update on Developments

J. Paul Stephens

Director; Sales & Marketing

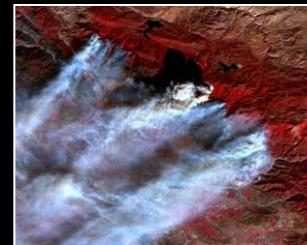
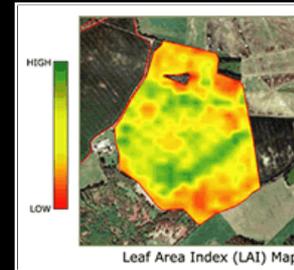
www.dmcii.com

JACIE 2013 April 16



10 years of success !

- First High Resolution daily monitoring capability
 - Stimulating Precision Agriculture
 - Europe
 - Asia
 - North America
 - South America
 - Monitoring Country resources
 - INPE Brazil
 - US Department of Agriculture
 - GeoScience Australia
 - Netherlands Space Portal
 - Actively responding to disasters
 - International Charter
 - 40-50 activations p.a.



Wide area coverage



Very high resolution



Rapid repeat monitoring

Feb

Mar

Apr

May

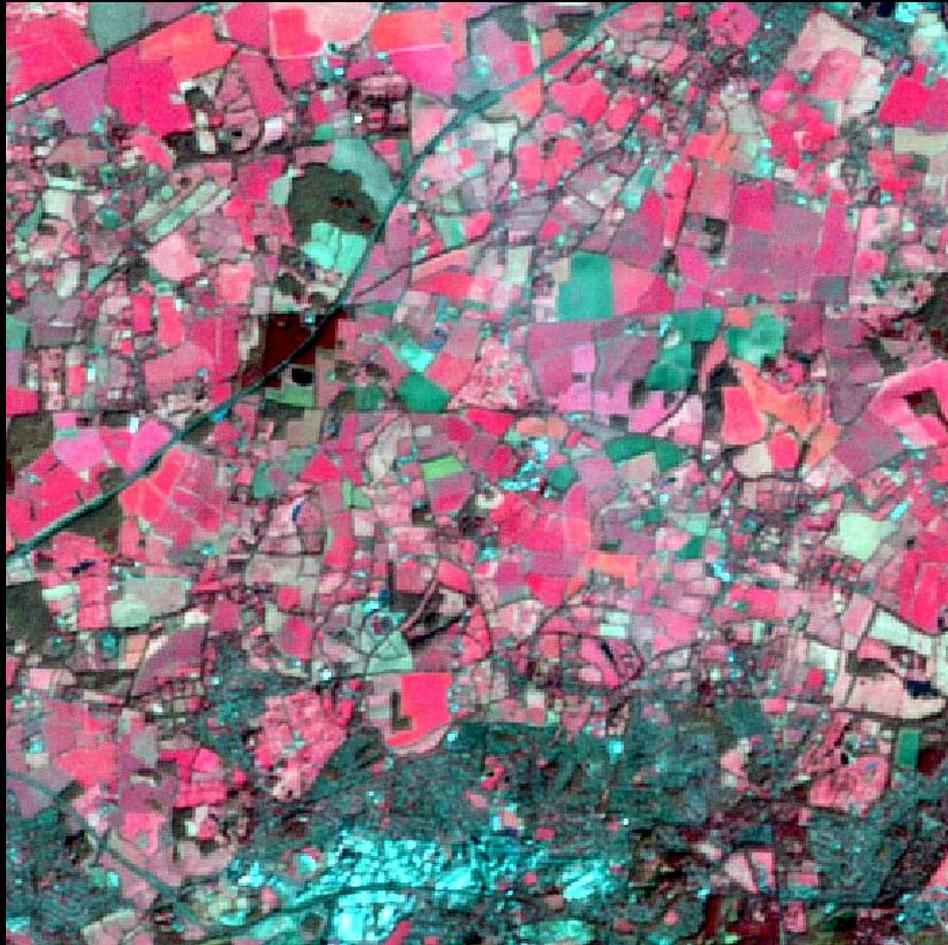
Jun

Jul

Aug

Sep

Oct



Rapid repeat monitoring

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May

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Jul

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Oct



Rapid repeat monitoring

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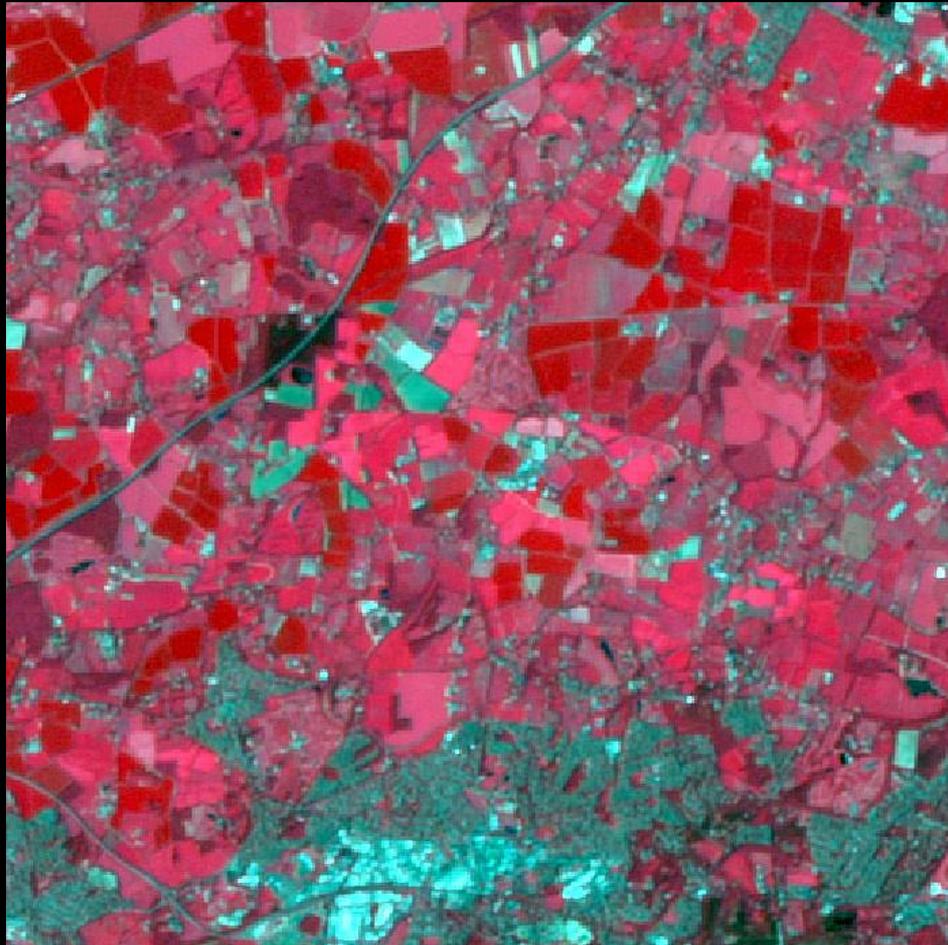
Jun

Jul

Aug

Sep

Oct



Rapid repeat monitoring

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May

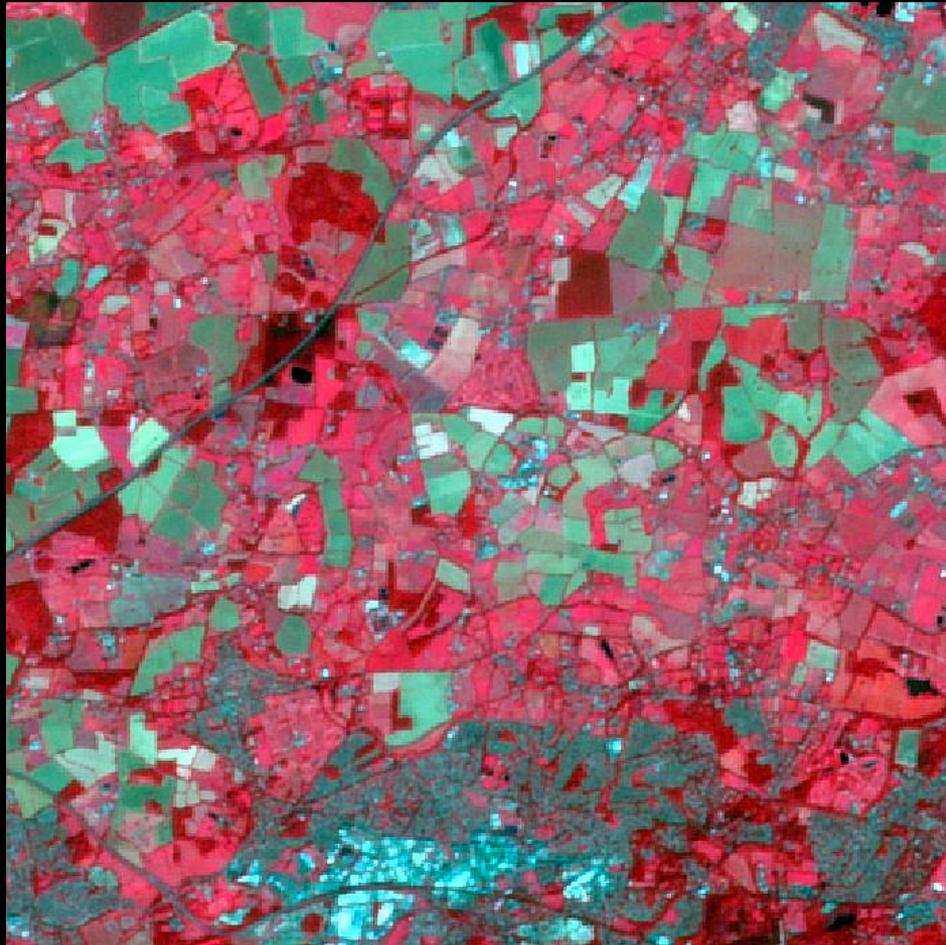
Jun

Jul

Aug

Sep

Oct



Rapid repeat monitoring

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May

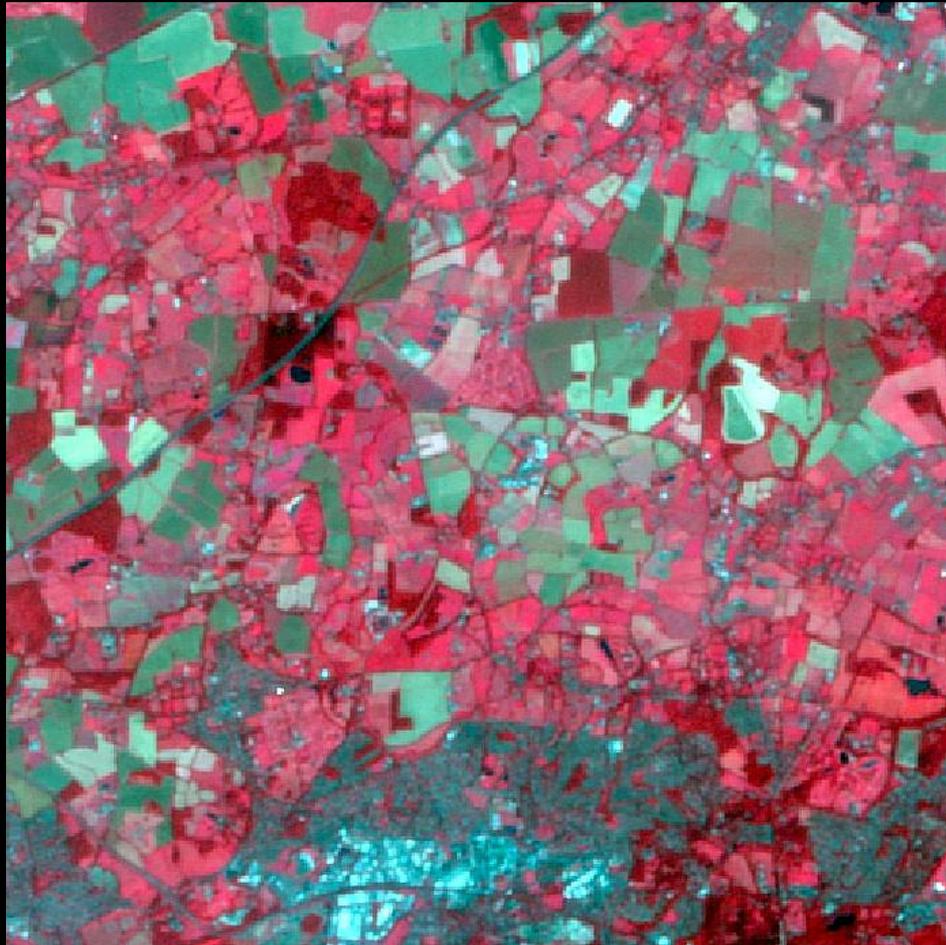
Jun

Jul

Aug

Sep

Oct



Rapid repeat monitoring

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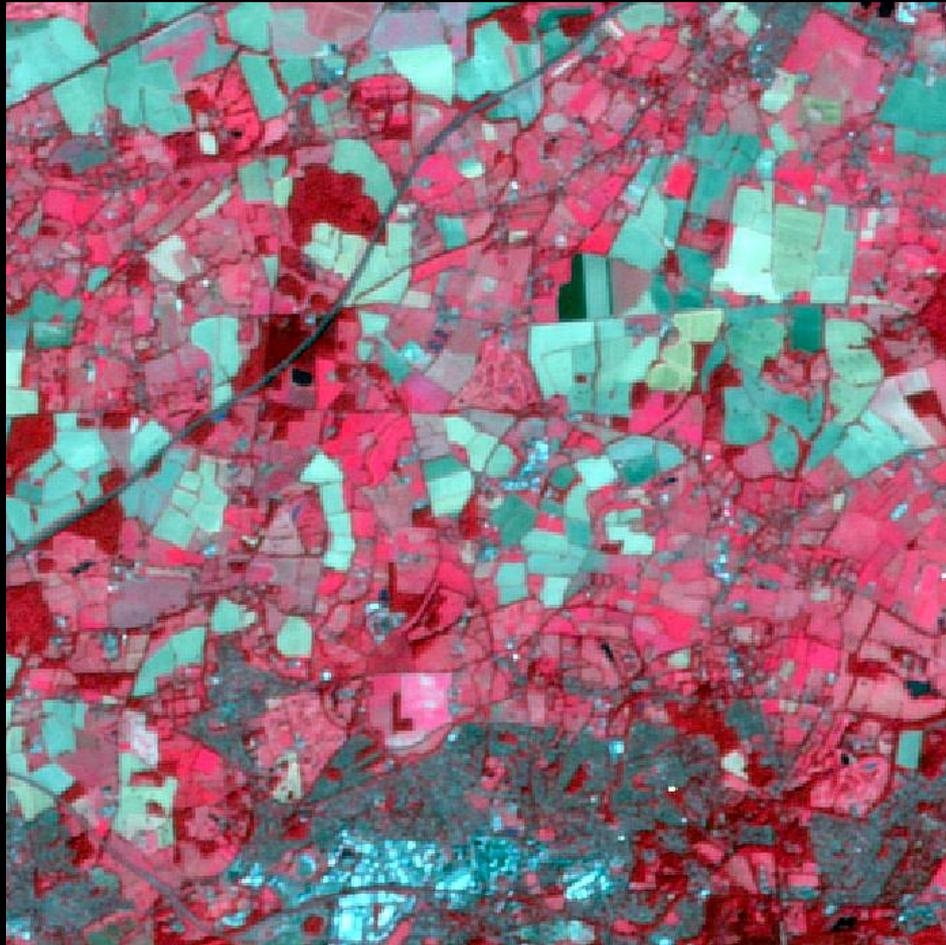
Jun

Jul

Aug

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Oct



Rapid repeat monitoring

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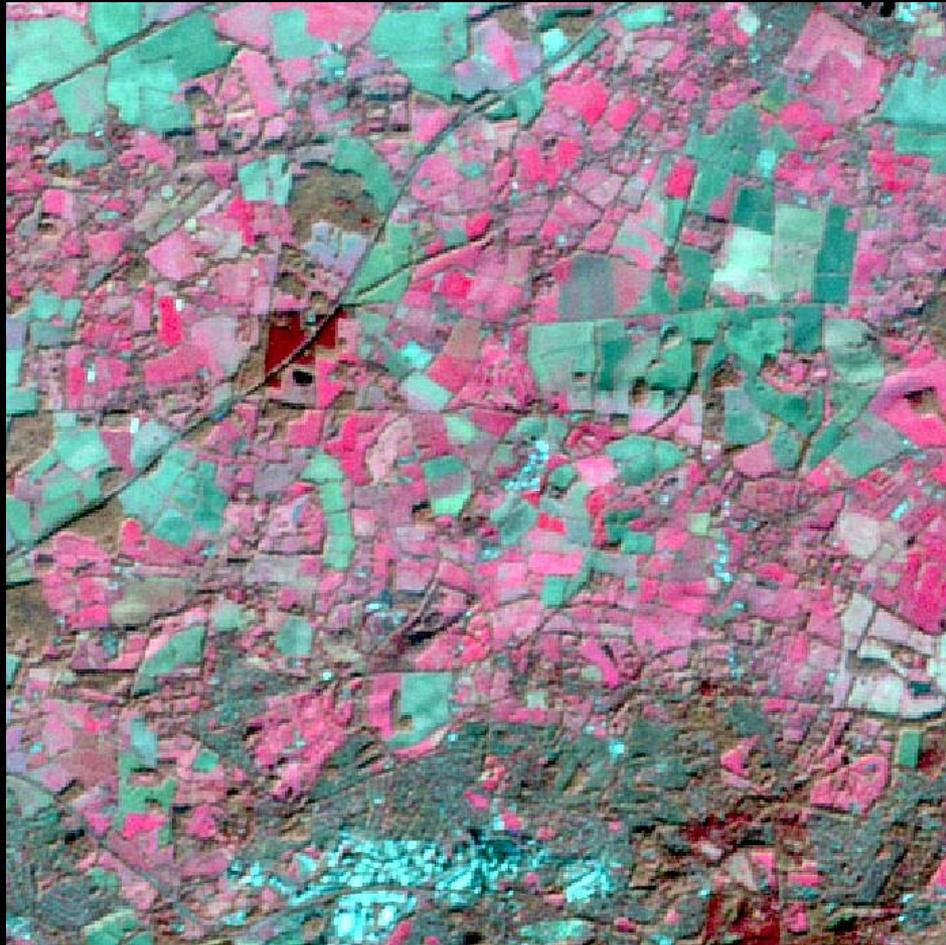
Jun

Jul

Aug

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Oct



Rapid repeat monitoring

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May

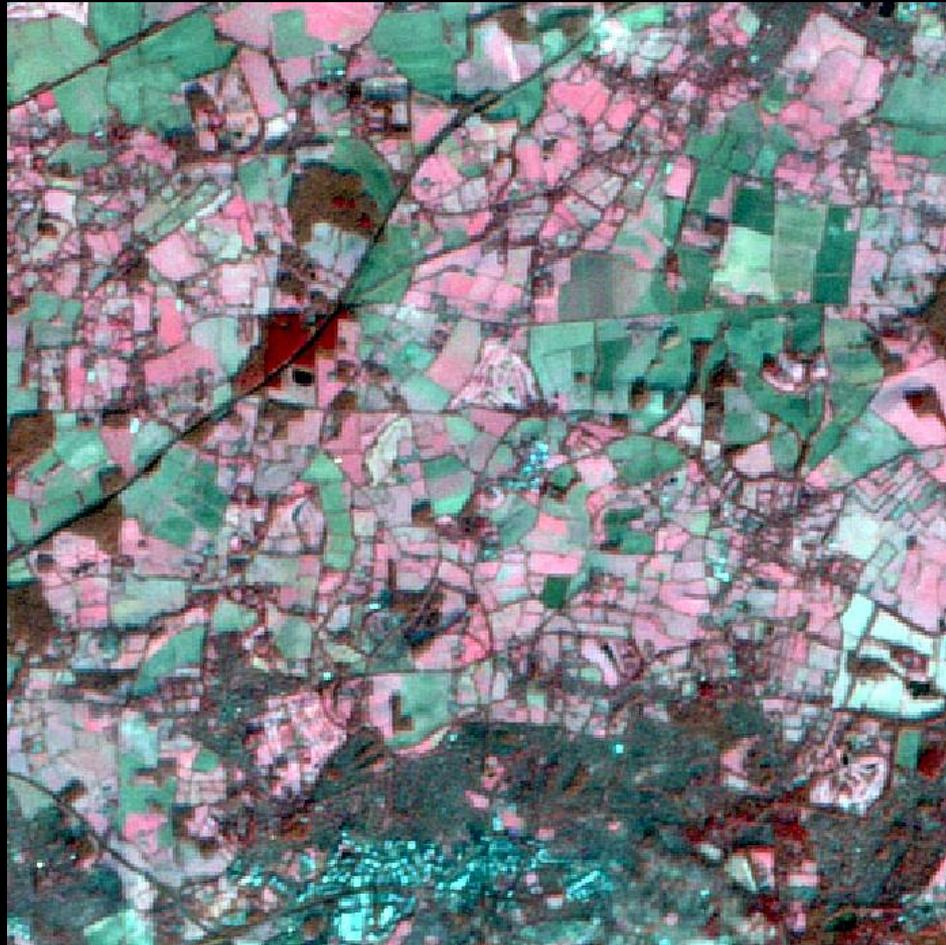
Jun

Jul

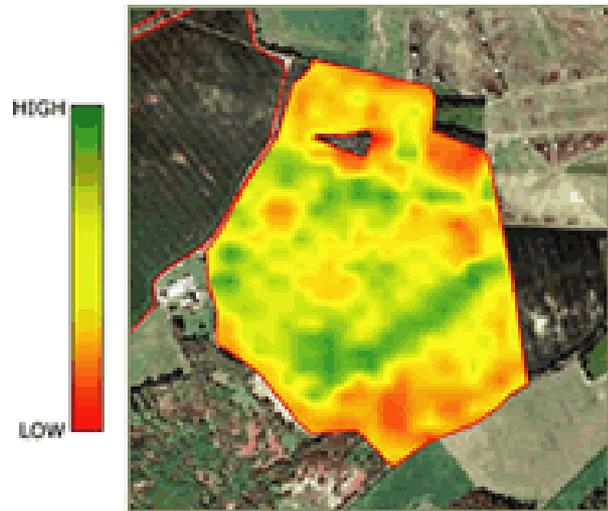
Aug

Sep

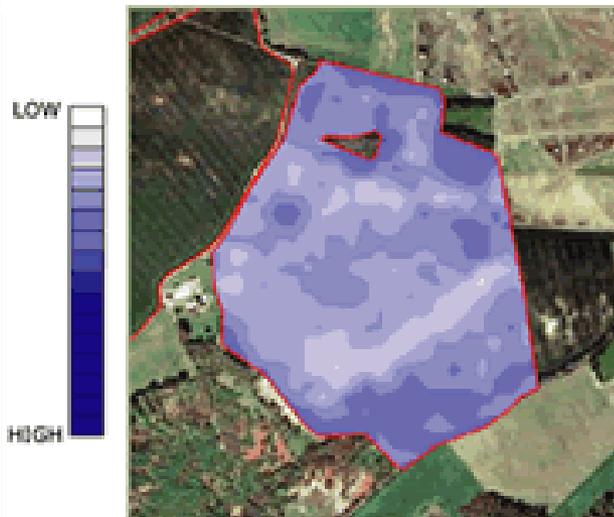
Oct



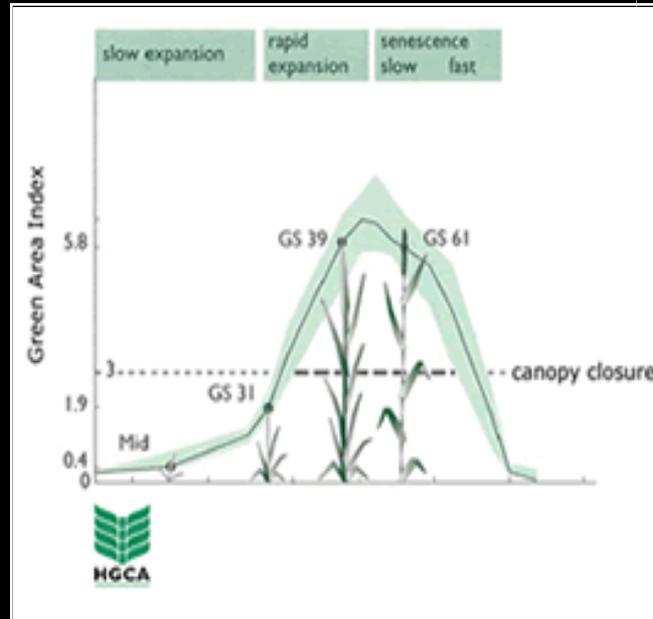
Daily Field monitoring = improved agriculture



Leaf Area Index (LAI) Map



Nitrogen Application Map

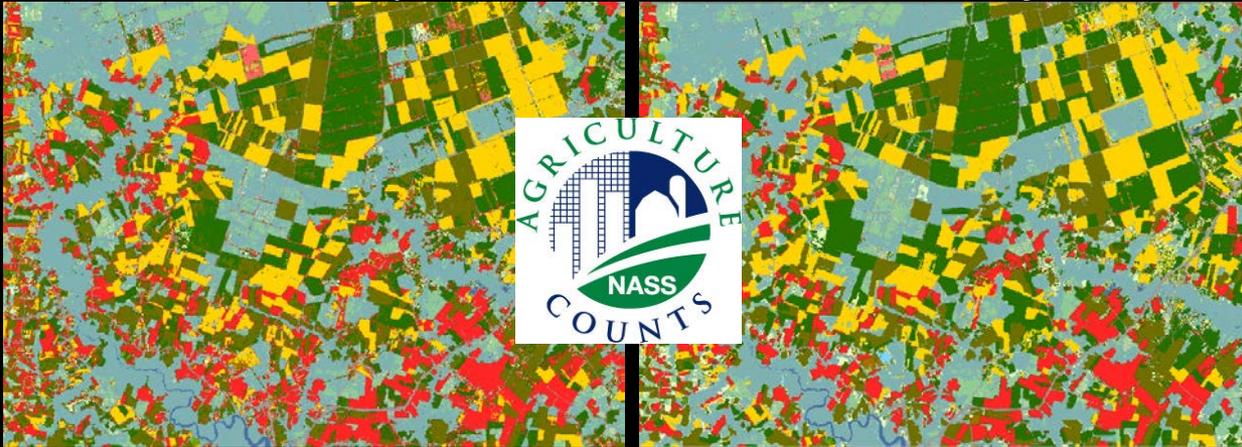


Higher temporal resolution = better crop classification

- 2011
- 2012

Landsat Only

DMC Only



	Producer	User
ALL CROPS	69.0%	
Corn	83.3%	81.9%
Cotton	91.0%	85.3%
Soybeans	62.9%	71.1%
WW/Soy	79.9%	82.0%
Pasture	58.5%	44.0%
Peanuts	71.4%	90.0%

	Producer	User
ALL CROPS	81.6%	
Corn	94.6%	92.1%
Cotton	95.9%	94.4%
Soybeans	84.3%	83.3%
WW/Soy	93.8%	87.7%
Pasture	67.2%	68.9%
Peanuts	82.1%	91.0%

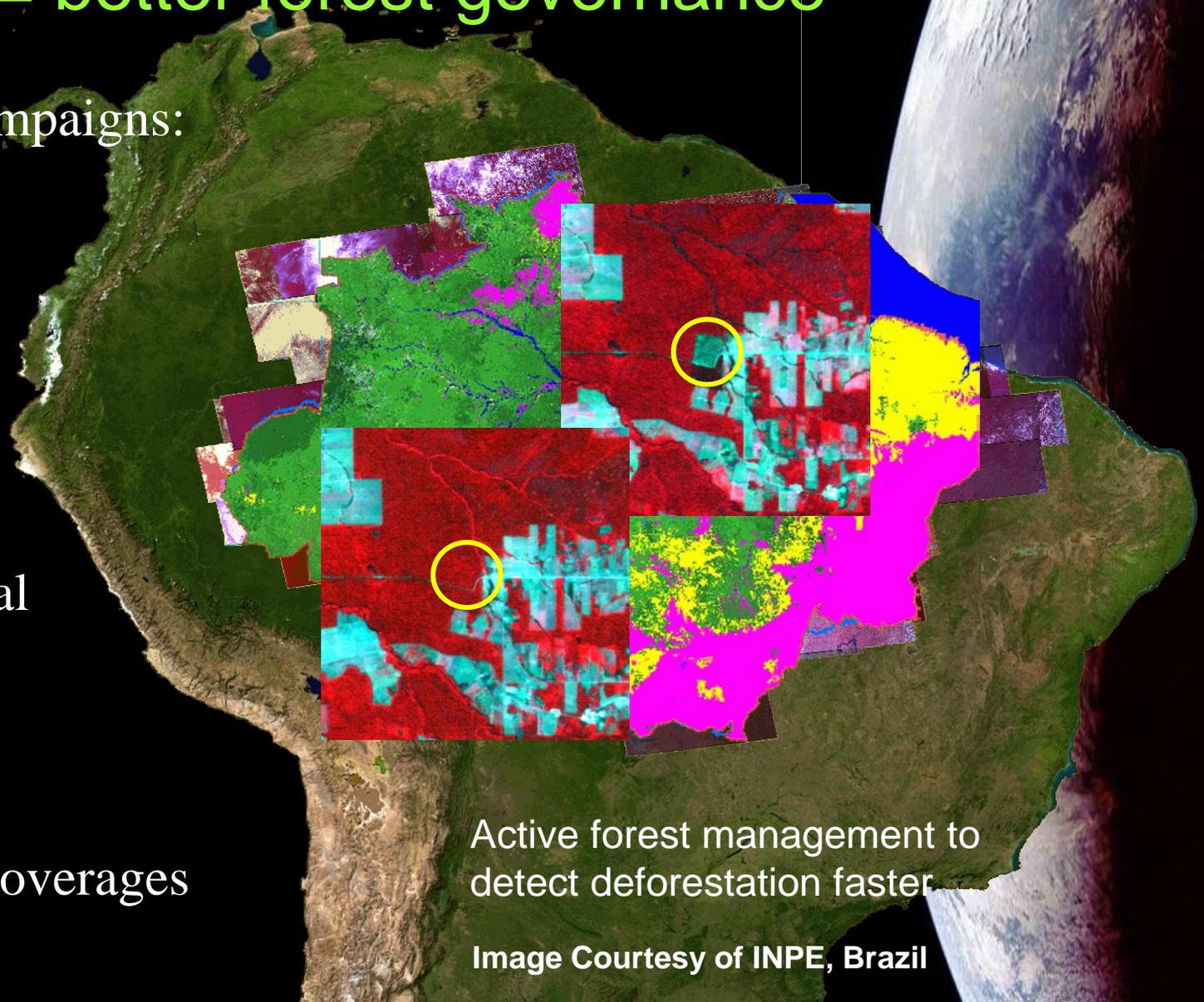
USDA results - North Carolina



Daily forest monitoring = better forest governance

Annual DMC campaigns:

- 2005
- 2006
- 2007
- 2008
- 2009 – bi-annual
- 2010
- 2011
- 2012 - 15 day coverages
- 2013



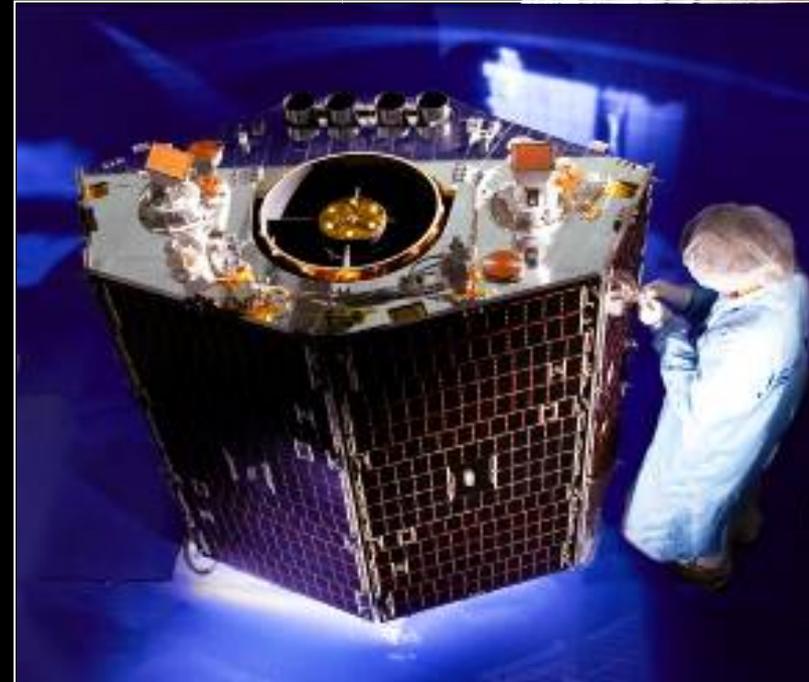
Active forest management to
detect deforestation faster

Image Courtesy of INPE, Brazil

Very High
Resolution

NigeriaSat-2

- 2.5m PAN (20-80km swath)
- 5m MS (20-80km swath)
- 32m MS (330km swath)
- High geolocation accuracy



Multiple imaging modes

- 2000 km along track
- 4x4 mode (80x80km)
- Along-track stereo



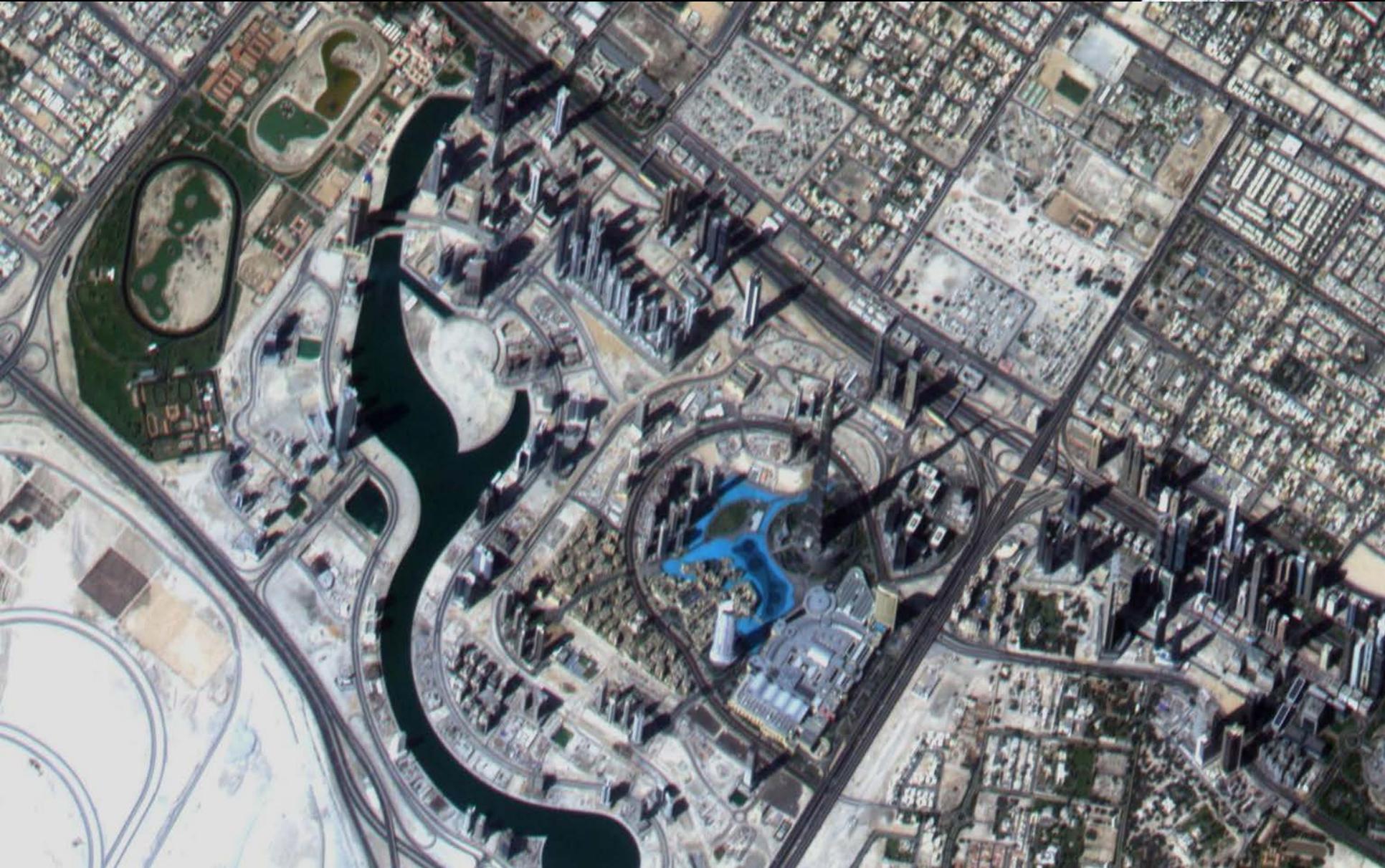


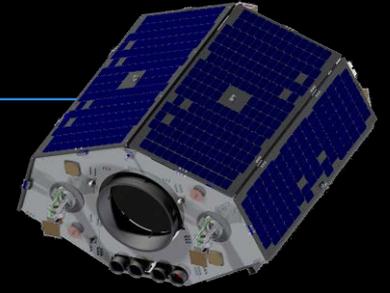




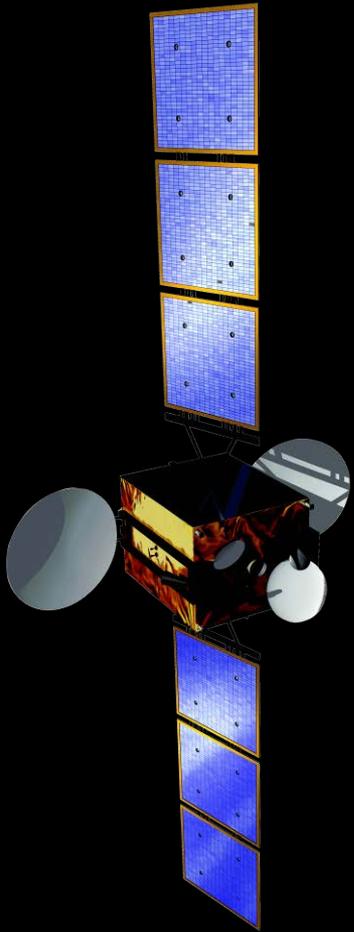
Salt Lake City Airport, USA; 2.5m pan-sharpened NigeriaSat-2 image,

Dubai; 2.5m pan sharpened





Looking to
the future



Achieving Daily Planet

EarthMapper satellite

Images 650km wide

22 metre resolution

61million km² / day

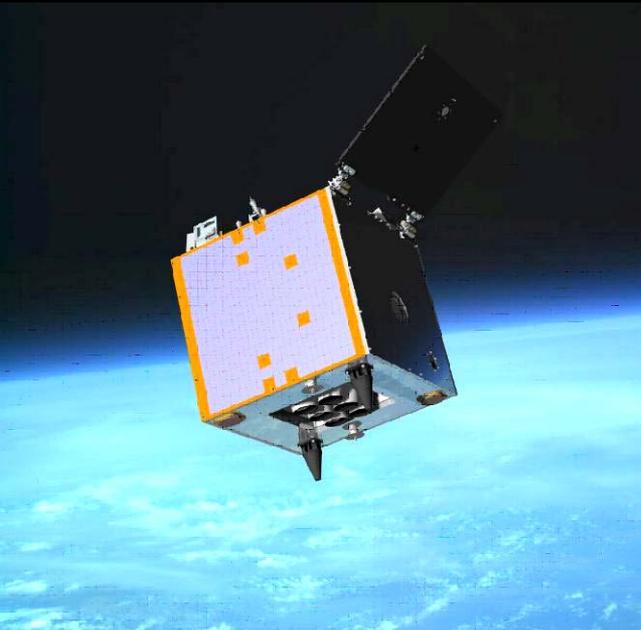
SSTL 100 satellite

Cost effective

Landsat compatible

Data continuity

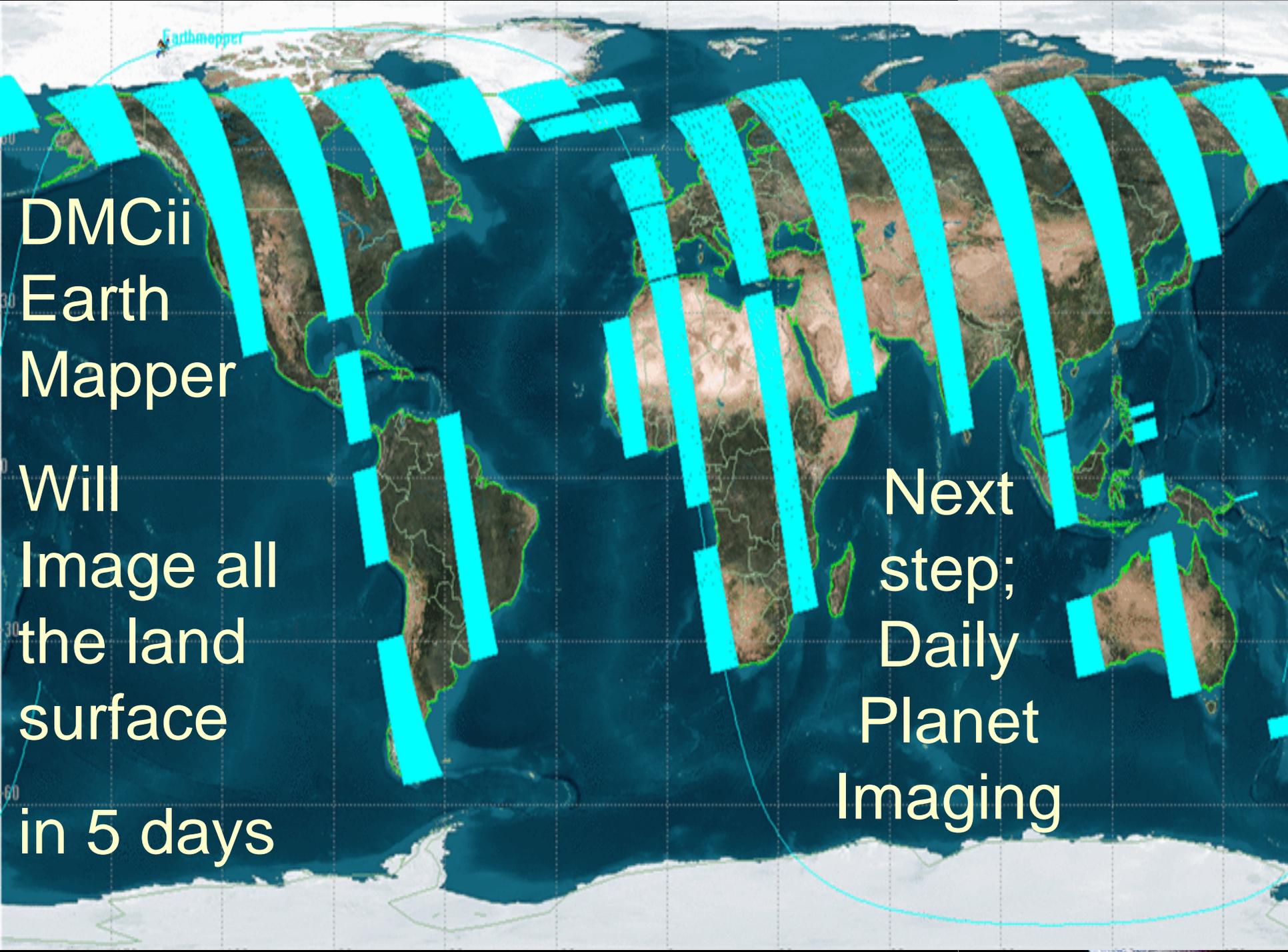
UK-DMC2b



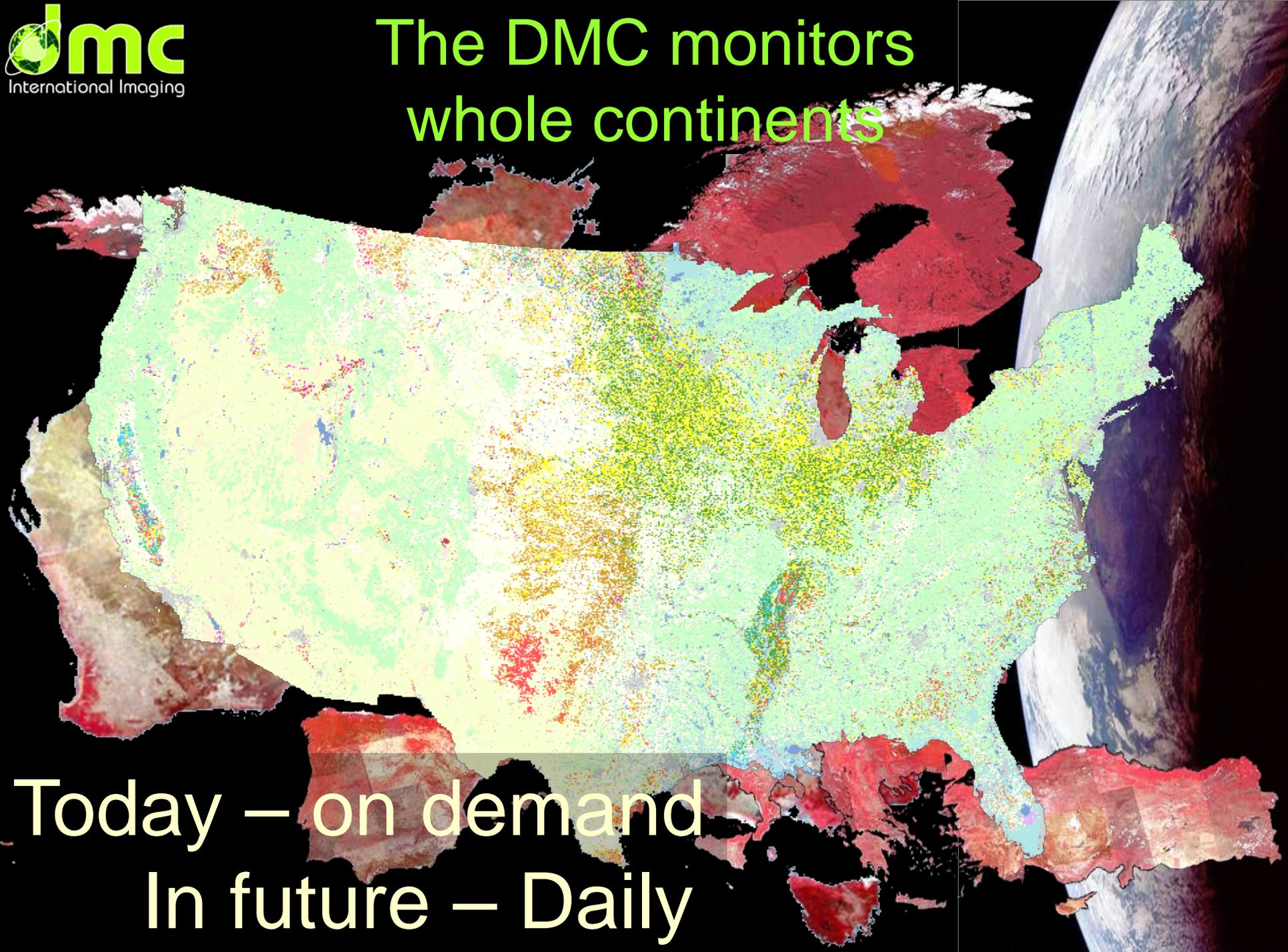
~5x Landsat 8

DMCii
Earth
Mapper
Will
Image all
the land
surface
in 5 days

Next
step;
Daily
Planet
Imaging



The DMC monitors whole continents



Today – on demand
In future – Daily

Reliable information

Multi-temporal
Food
Knowledge
Information
Feedback
Security
Society
Planet
Satellite
Control
Benefits
DMCii
Daily imagery
Economy
Efficiency



Managed Imaging Services

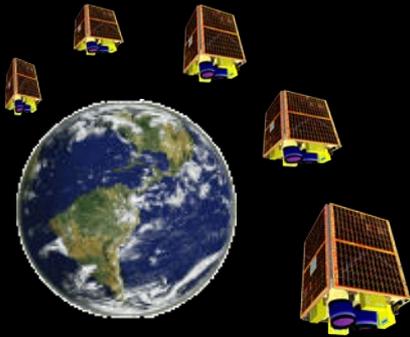
- Cost effective high quality imaging services
 - DMCii owns and operates satellites
 - Customer purchases capacity
 - DMCii delivers data direct to groundstation

- High resolution optical
 - 22m GSD 650km swath
- VHR optical
 - 1m GSD pan/ 4m optical 23km swath
- NovaSAR
 - 6-30m SAR



DMC Imaging service

DMC Constellation



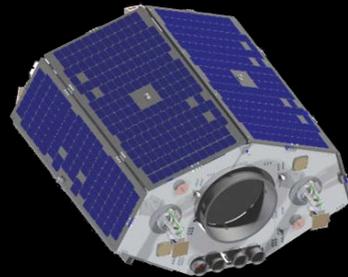
Bands
R,G,NIR

Resolution:
22m MS (x3)

Image Swath:

650 km MS

NigeriaSat-2

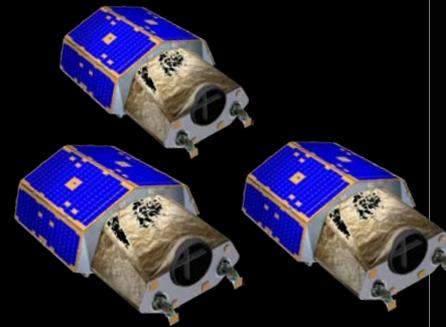


Bands
R,G,B, NIR, Pan

Resolution:
2.5m Pan
5m MS
32m MS

Image Swath:
24 km (Pan/MS)
320 km (32m MS)

DMC3 (2015)

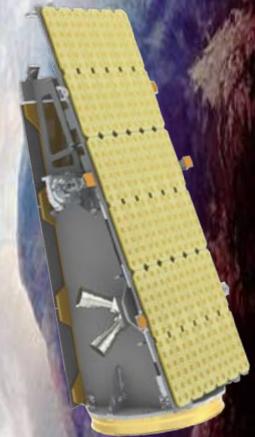


Bands
R,G,B, NIR, Pan

Resolution:
1m Pan
4m MS

Image Swath:
23 km

NovaSAR (2015)



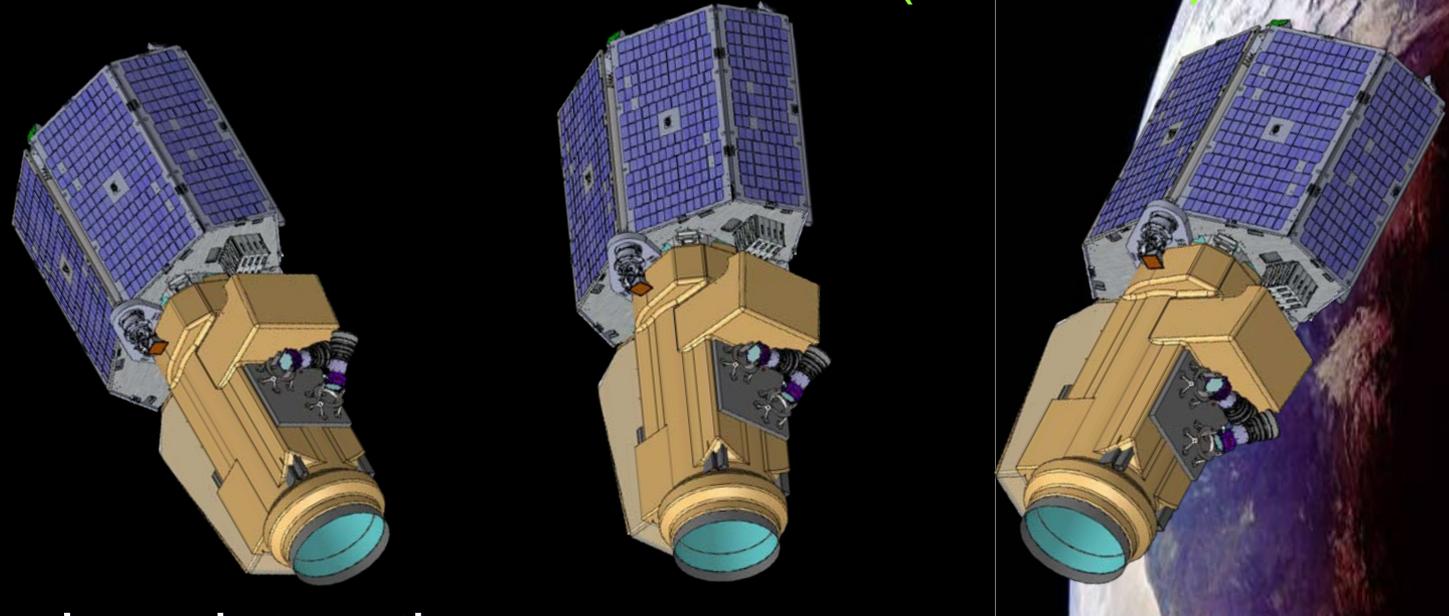
Modes
HH, HV, VH, VV
Single, dual, tri-
or quad polar

Resolution:
6m 20m 30m

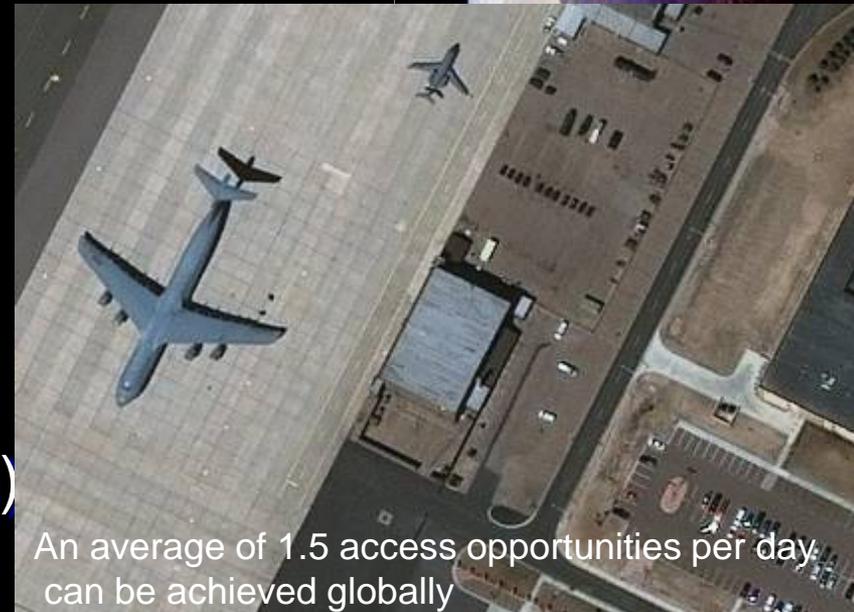
Image Swath:
35 - 750km

VHR Optical DMC3

DMC3 VHR Constellation (2014/15)



- 3 satellites to launch together
- Daily Revisit at 1 meter GSD
- Bands: B, G, R, NIR, Pan
- Resolution: 1m Pan; 4m MS
- Swath 23km
- Single pass 2x2 mode (40x45km)

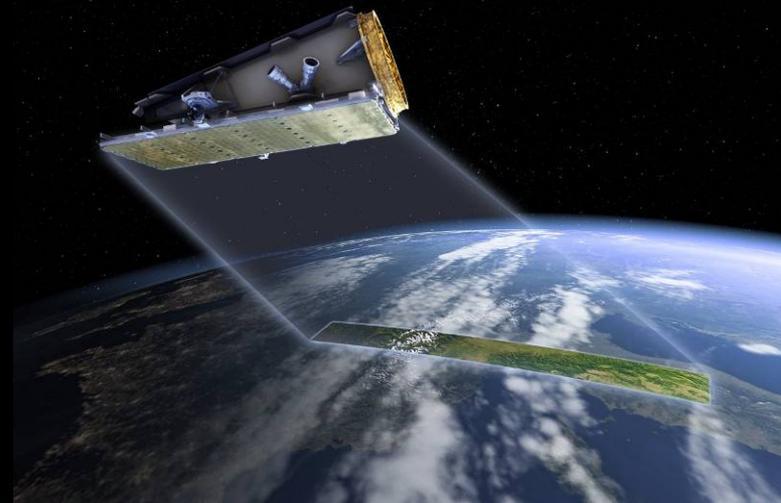


An average of 1.5 access opportunities per day can be achieved globally

Nova SAR

NovaSAR

- Low-Cost SAR Satellite
- Airborne Demonstrator Flown
- 4 Modes: 6-30m Resolution
- TechDemoSat Payload
- Ready 2015





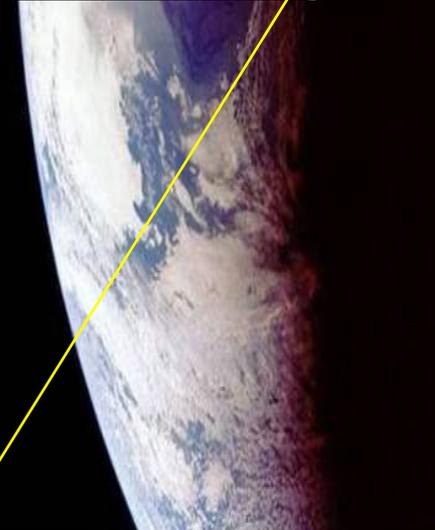
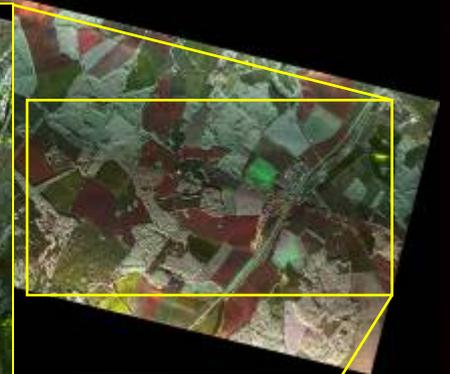
S-Band Polarimetric SAR Image

Mosaic of two parallel images (each 16-42° incidence) acquired in opposite directions covering a total area of 22km x 3.7km from Avebury to Great Bedwyn (Wiltshire)

Acquired on 16th June 2010 at 4:00pm
by the Atrium UK Airborne SAR Demonstrator

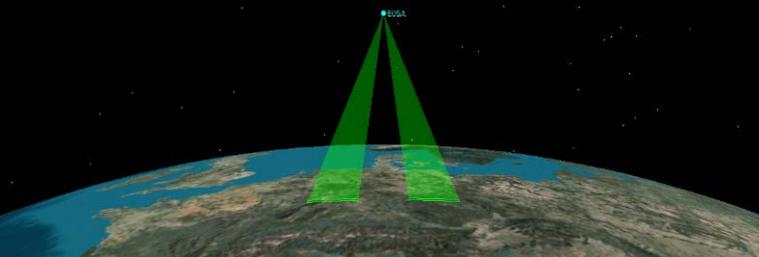
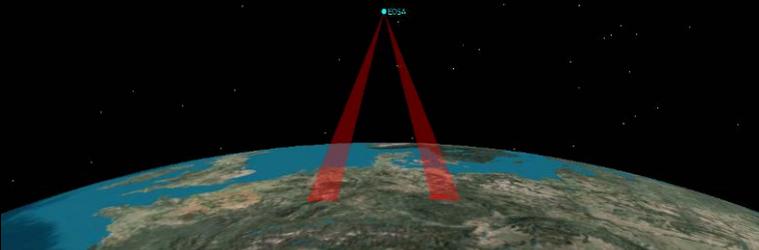
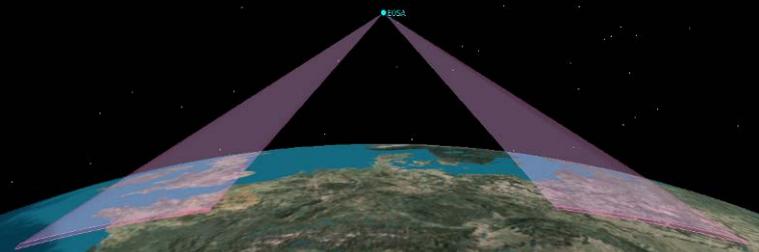
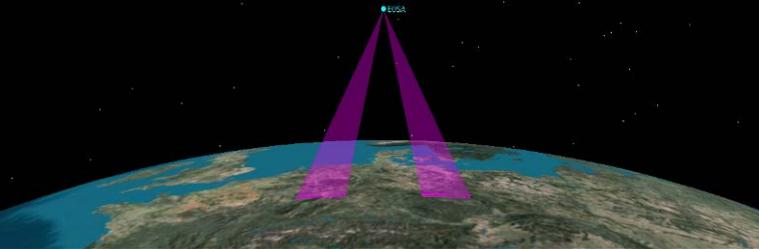
RED : HH, GREEN : VV, BLUE : HV

Contact : Martin Cohen, Tel : 02392 705481



NovaSAR-S Baseline Imaging Modes

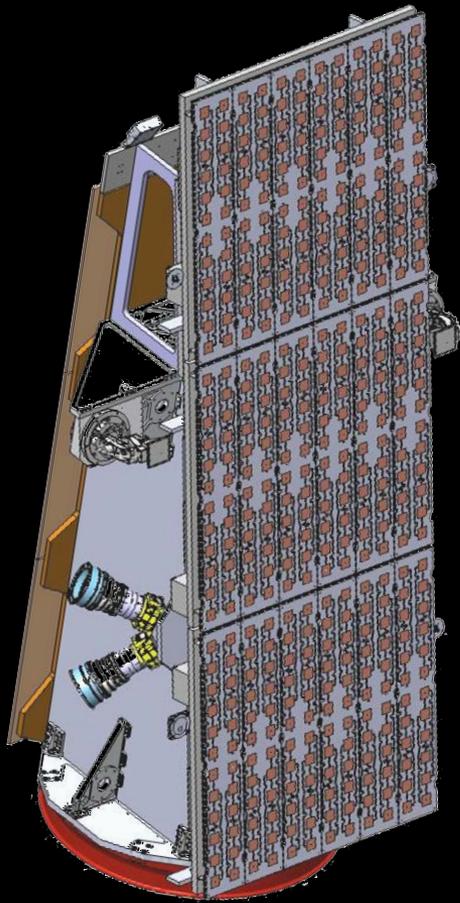
Baseline modes tuned in orbit by adjusting the pulse repetition frequency and beam steering



Mode	Inclination angle	Res. (m)	Swath (km)	Sensitivity (Nec0)	Ambiguity ratio	No. of looks
1	16-29°	20m	100km	<-19dB	<-16dB	4
2	53-75°	30m	750km	<-12dB	<-18dB*	2
3	16-34°	6m	22-35km	<-20dB	<-18dB	3.7
4	16-32°	30m	150km	<-20dB	<-16dB	4



SAR Applications



- Ship detection
 - Illegal shipping/fishing, oil bunkering
- Oil spill monitoring
- Forestry
 - Logging, forest fire damage
- Flood management
 - Flood extent mapping
- Land use mapping
 - Land registry
- Agriculture
- Disaster management
 - Earthquakes / landslides (mapping, infrastructure and building damage assessment)
- Security



DMCii delivers

- High quality optical imagery at 2.5m, 5m, 22m, 32m GSD
- Immediate high temporal resolution optical monitoring of any region
- Country/continent mapping
- VHR and SAR constellation services to meet market needs in 2014/15



DMC Constellations – Sustainable Affordable EO

2002

2009

2011

2013

2015

2017

2019

NovaSAR (6-30m radar)

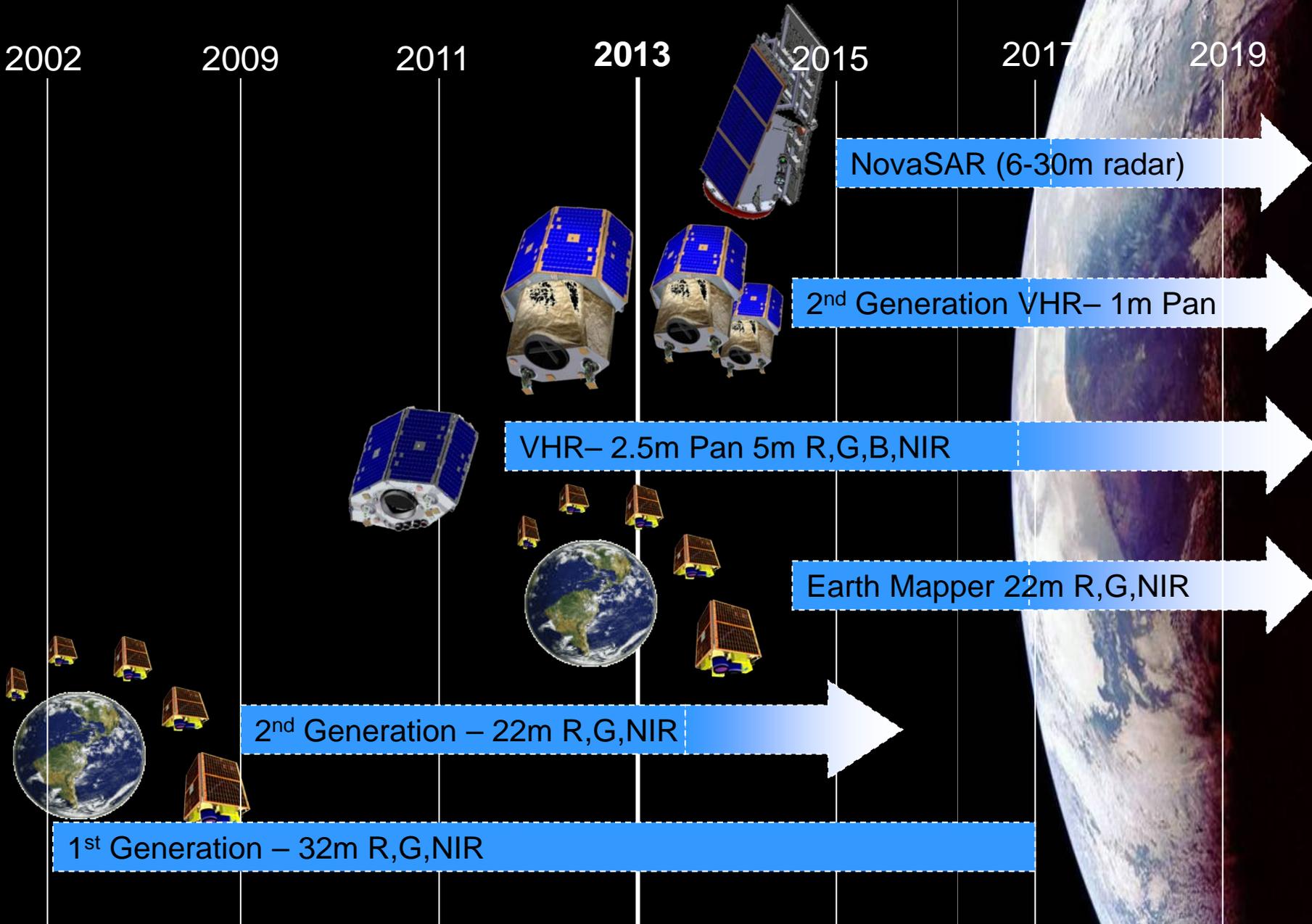
2nd Generation VHR– 1m Pan

VHR– 2.5m Pan 5m R,G,B,NIR

Earth Mapper 22m R,G,NIR

2nd Generation – 22m R,G,NIR

1st Generation – 32m R,G,NIR



Delivering sustainable EO for today and the future

Questions?

info@dmcii.com

