Utilisation Of Deimos Data In Land and Resource Management

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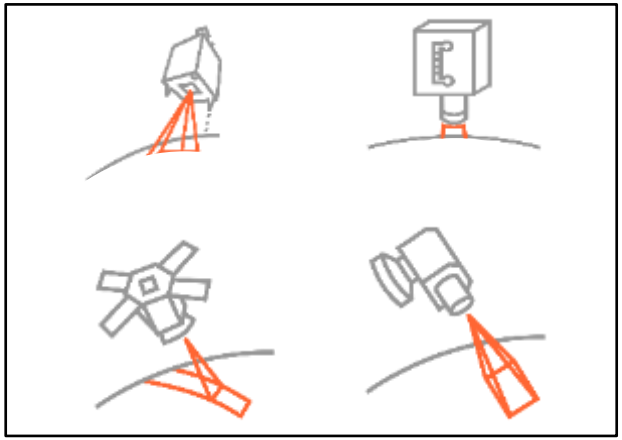
Who is UrtheCast? (pronounced “Earth-Cast”)

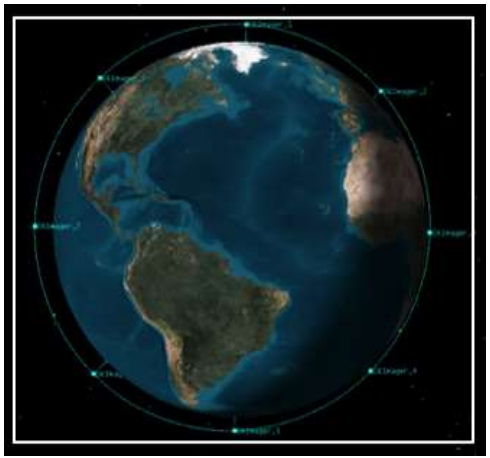
Canada HQ & Engineering | Spain Satellite Operations | USA R&D & Product Development ~ 250 people

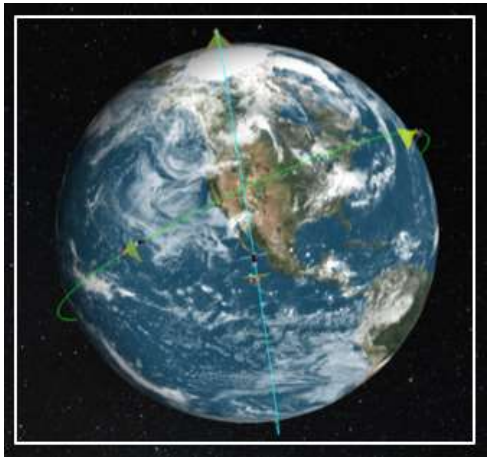
Operational Satellites / ISS Sensors



Serving the rapidly growing and evolving geospatial and geoanalytics markets

Plans Announced for Future Satellite Constellations





8 Satellite UrtheDaily™ 16 Satellite OptiSAR™

Customer funded and financed systems with unprecedented imaging capabilities

UrtheCast's EO Sensor System, Today

It already covers a broad range of imaging technologies, and it's evolving.

Deimos-1

MRC Theia

Deimos-2

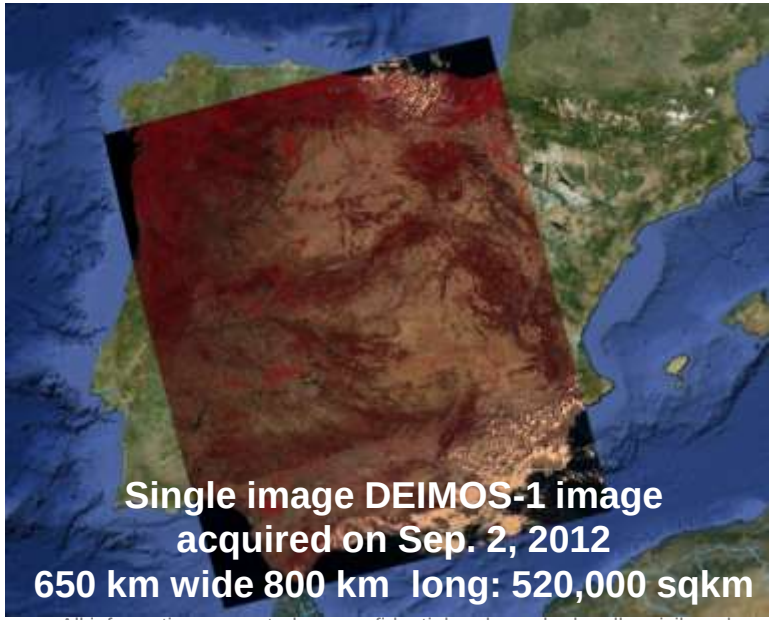
HRC Iris

Agriculture Solutions

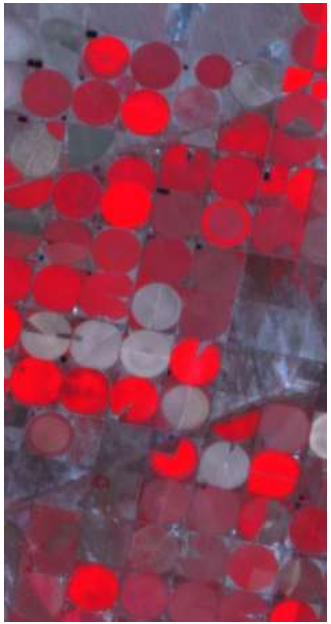
DEIMOS-1

Deimos-1 images

- **Very large images** (up to 650 x 1300 km), **medium resolution** (20m per pixel)
- Example: **almost complete Iberian Peninsula in one image**

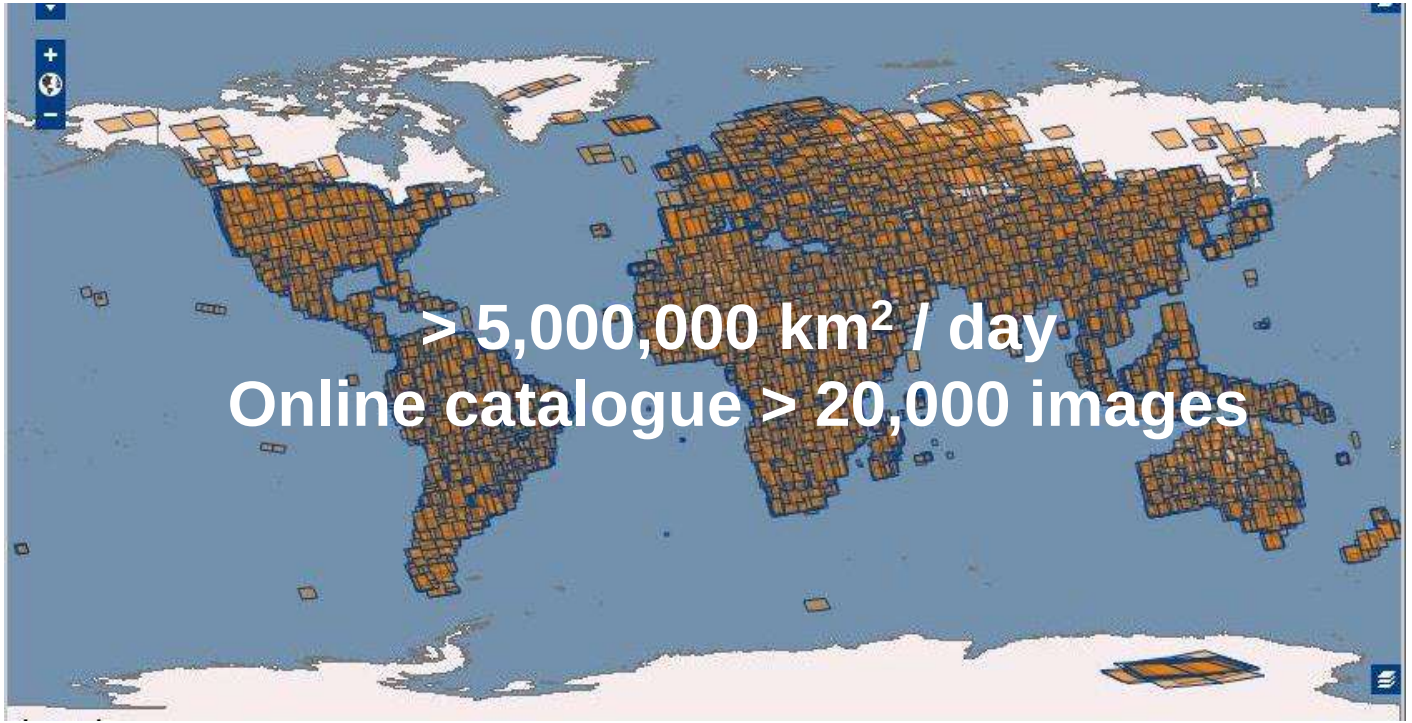


Single image DEIMOS-1 image acquired on Sep. 2, 2012
650 km wide 800 km long: 520,000 sqkm



DEIMOS-1

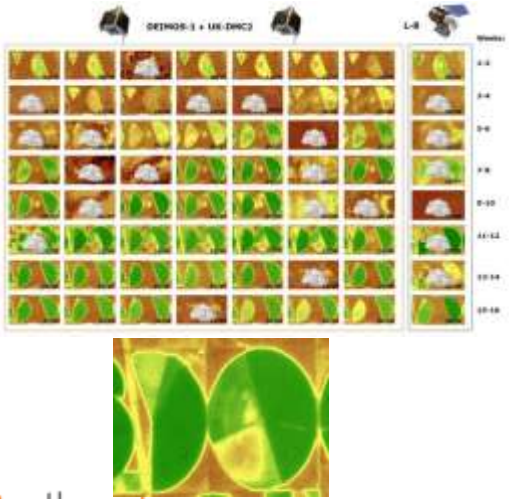
System Capacity

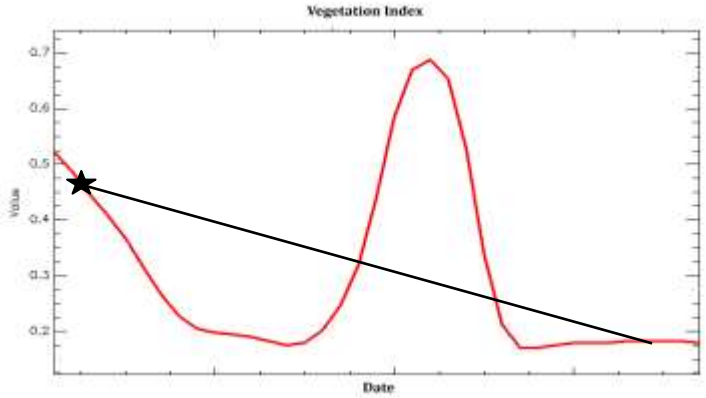


DEIMOS-1

Multi-temporal Coverage Capabilities

- Comparison of the temporal evolution derived from DEIMOS-1/UK-DMC2 data series, to the values extracted from Landsat 8 scenes
- Vegetation evolution can only be derived with high-frequency monitoring





★ **Landsat 8 cloud-free data** — **Simulated Landsat 8 Vegetation Index**

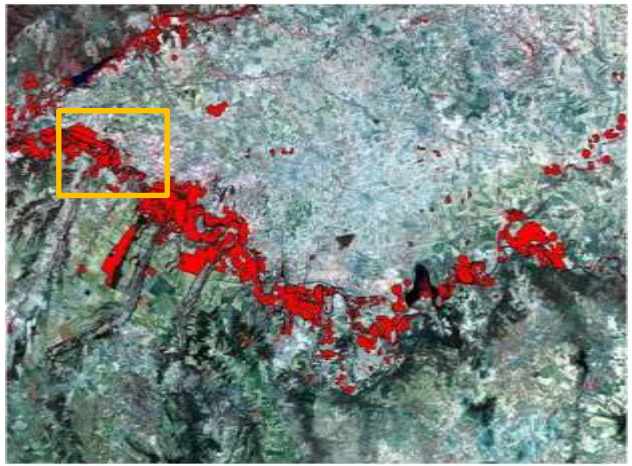
— **Demos-1/UK-DMC-2 Vegetation Index**

DEIMOS-1

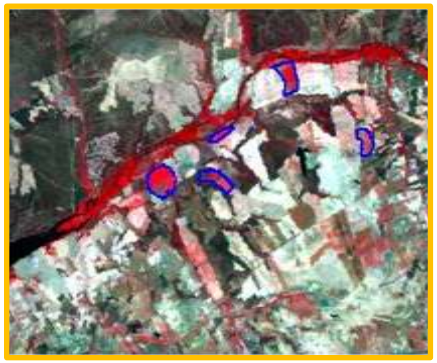
Agriculture Services

- ❑ Analysis of Irrigated Areas
- ❑ Crop condition estimation & classification
- ❑ Grazing management
- ❑ Accumulated Drought Assessment

Total irrigated surface



Spring irrigation



Summer irrigation

DEIMOS-1

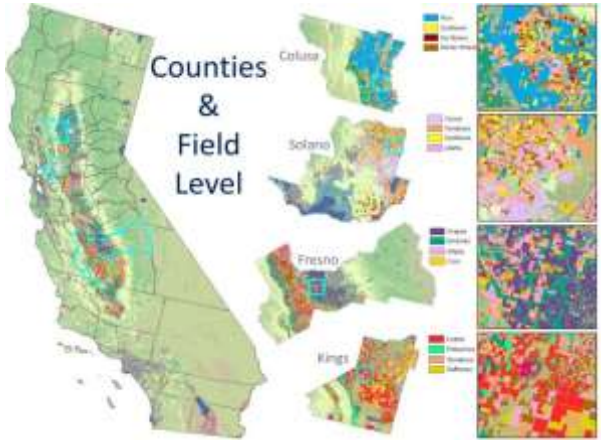
Case Study: USDA Crop Campaigns

- Large contract with USDA
- 12 bi-weekly coverage of the US each year during crop seasons (see figure), with DEIMOS-1 & UK-DMC2, since 2011

DEIMOS-1

Case Study: USDA Crop Campaigns

- Final USDA products: 30-m Cropland Data Layers with 9 billion pixels

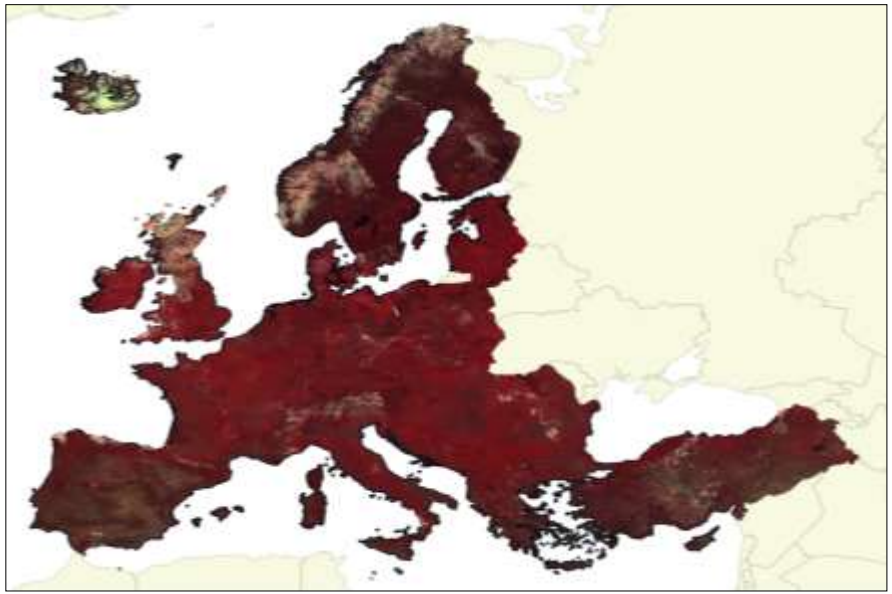


From Audra Zakzeski (USDA-NASS), "Evaluating the Classification Accuracy of Specialty Crops in California Using 22m DMC Imagery Compared to 30m Imagery", presented at ASPRS 2013.

DEIMOS-1

Case Study: Europe Dataset (ESA Copernicus)

- One cloud-free coverage / month

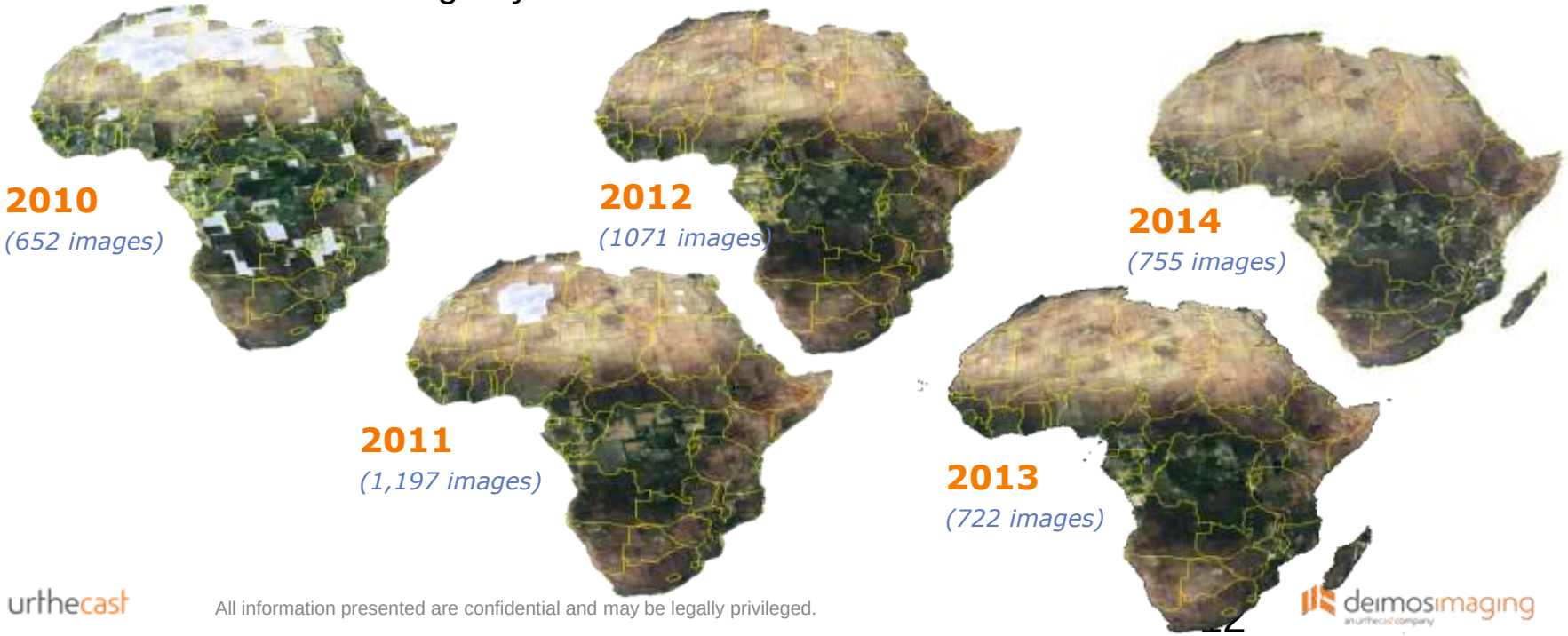


Deimos-1 Coverage Mosaic - June 2015

DEIMOS-1

Case Study: Africa Dataset (ESA Copernicus)

- One cloud-free coverage / year



Few Notable Customers (Agriculture)

Selected customers


urthecast
deimosimaging
Forestry Solutions

DEIMOS-1

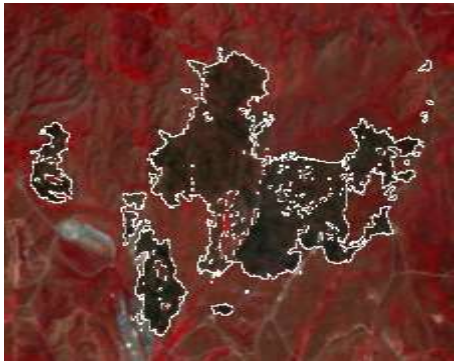
Forest Fire Monitoring

Step 1: Multi-temporal analysis (false color)

Unburned

Burned

Step 2: Perimeter identification



Step 3: Analysis

Perimeter: 9.7 km
Area: 138,873 acres

Perimeter: 71.4 km
Area: 1,960,912 acres

DEIMOS-1

Support to Crisis Management

- Large Mississippi floods near Memphis (May 2011)

Land Use Monitoring

Land Cover / Land Use (LCLU) Change Mapping Study Between November and December 2016

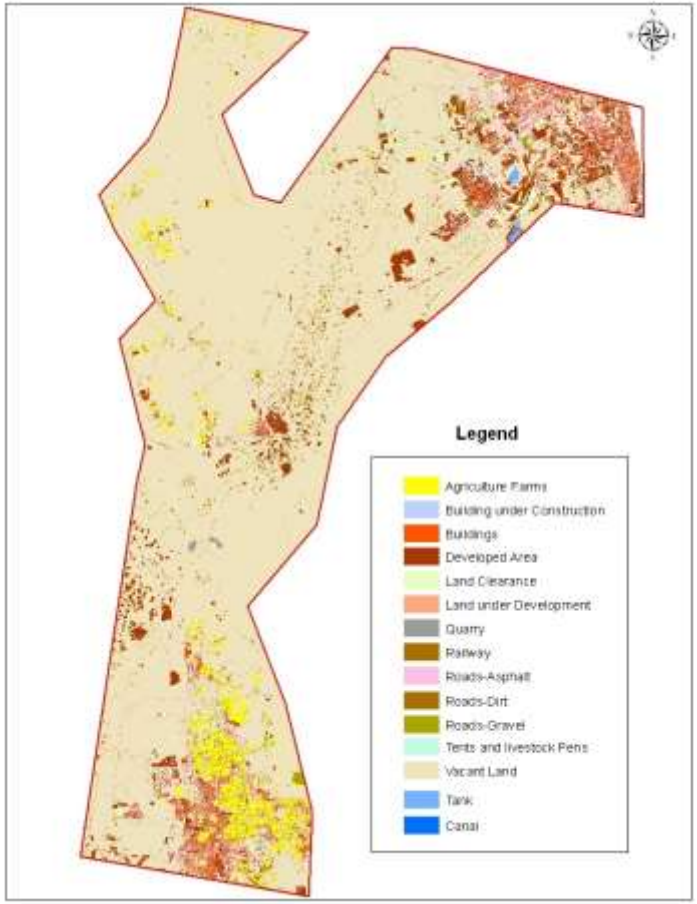
Deimos Data Nov 2016

Deimos Data Dec 2016

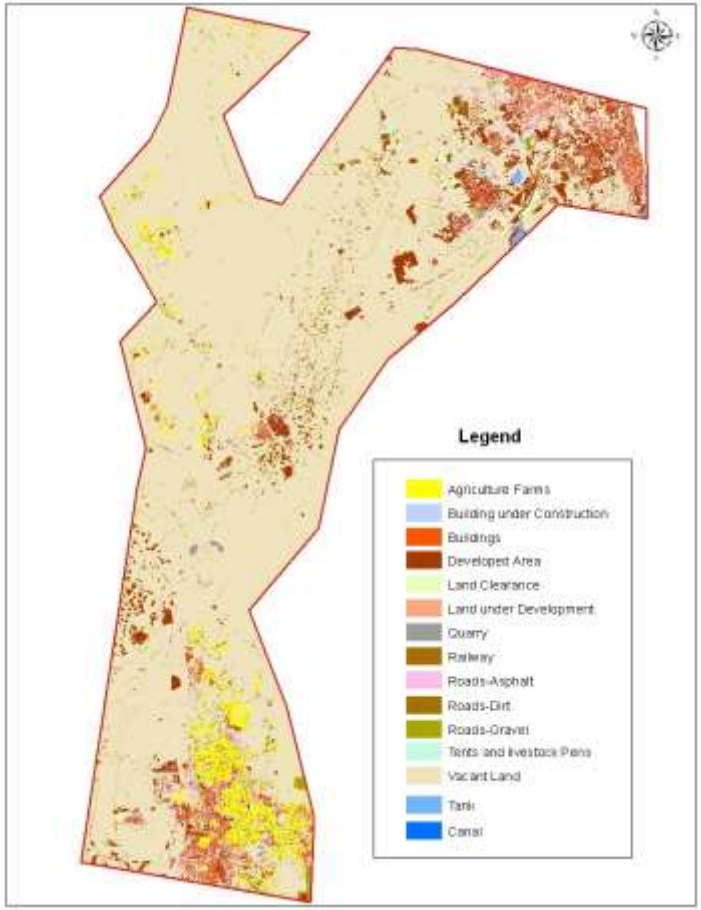
urthecast

deimosimaging

LC LU of Nov 2016

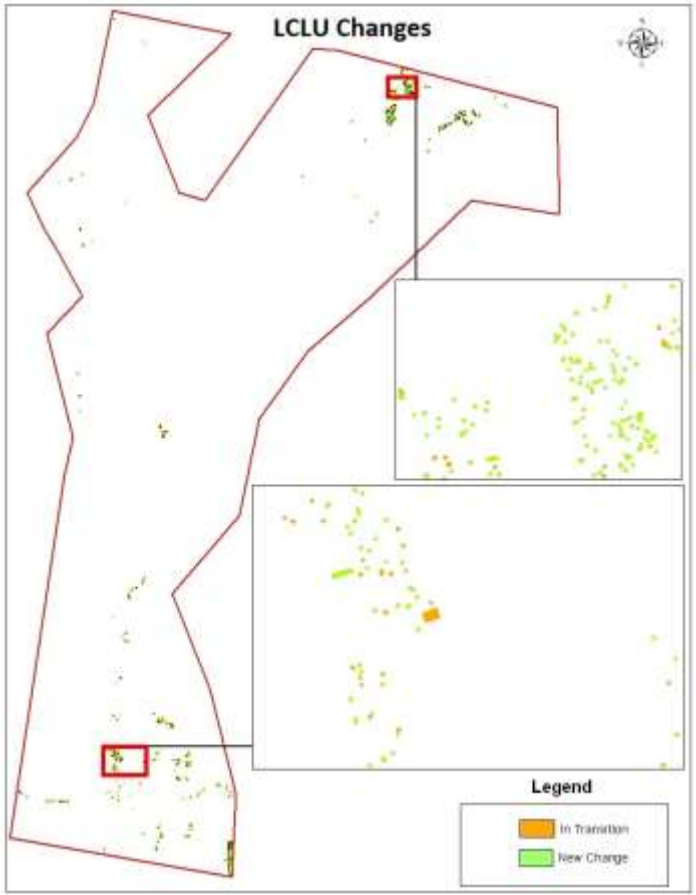


LC LU of Dec 2016



Change of Features

LCLUCD
(Nov- Dec 2016)



DEM Portfolio

Stereo Products

Product Types	Pan band only, Multi-Spectral bands only, or Bundle (Pan and MS)
Processing level	L1B (ortho-ready with RPCs)
Geolocation Accuracy	10 m CE90 with GCP
B/H Range	1.15
Minimum Aoi size	100km²
Delivery Method	FTP
Geometric Correction	The RPCs allows projecting to a plane using a map projection and datum, projected to a constant base elevation

The DEM portfolio

The products generated are compliant with the following specifications:

- 1.5 m seamless DTM and DSM products
- CE90, LE90 or other accuracy index
- GeoTiff and AutoCAD delivery formats
- Grid interval
- Edited DSM with hydrological consistency (i.e. flattening of water bodies, consistent flow of rivers, editing of shoreline)
- DTM corrected for different heights
- Homogenous standardized DEM for any location
- Unique quality: Superior elevation information anywhere

Land Change Monitoring

Land Change Monitoring

- Urban Zonation
- Urban Sprawl Monitoring
- Asset Mapping / Monitoring
- Planning for New Urbanization
- Creation of Land Bank
- Land Use Change Monitoring
- Many More

Conclusion