The Value of High Resolution Imagery in Land Administration

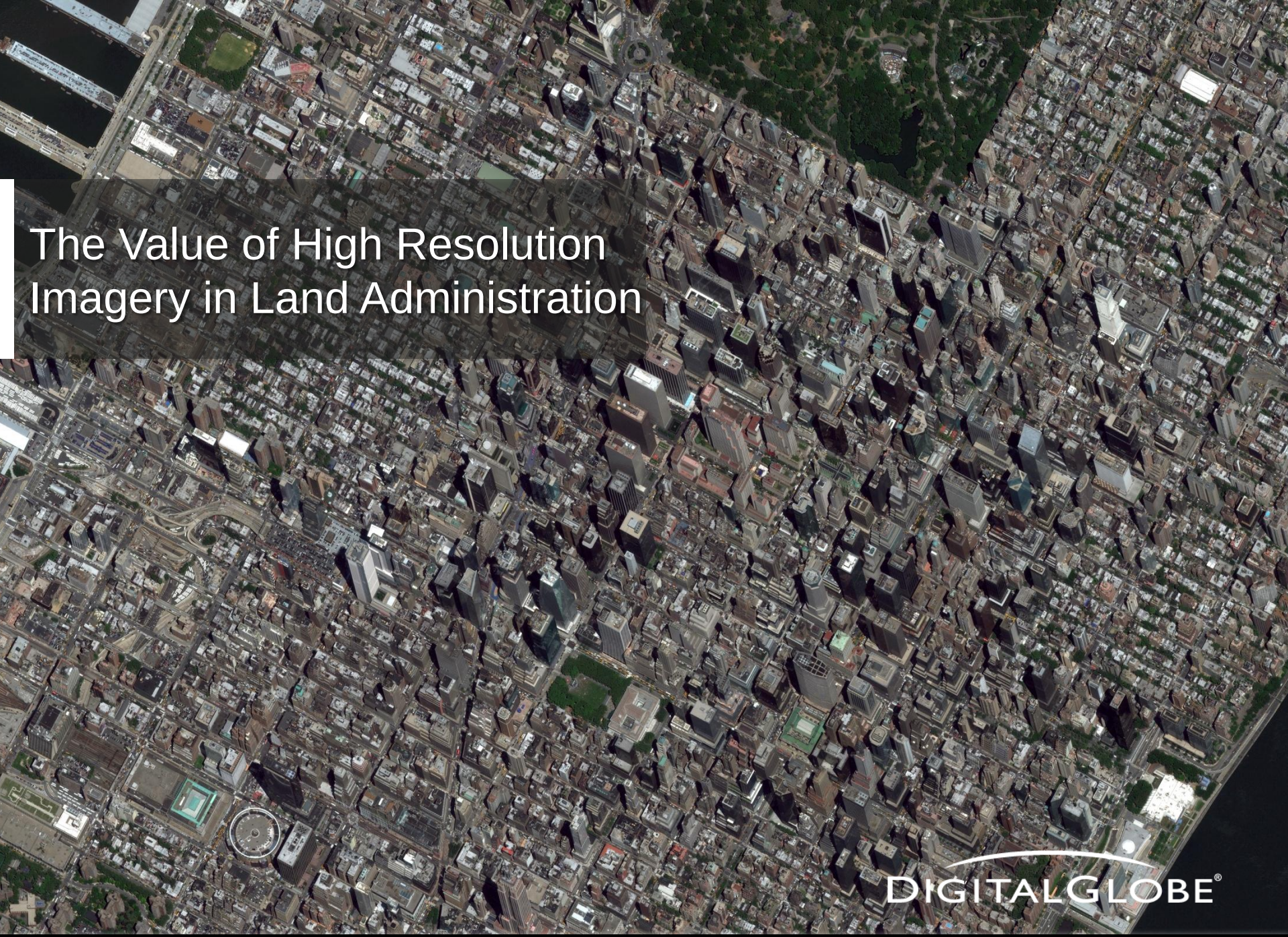


Image: San Francisco, CA | March 7, 2010 | 50cm

DigitalGlobe Proprietary and Business Confidential

See the world around you – anytime, anywhere – **and act on it**

Background

- Founded in 1992
- DigitalGlobe is a leading global provider of commercial high-resolution earth imagery products and services, sourced from our own advanced satellite constellation.
- Global presence with offices in Longmont, Washington D.C., London, Singapore, with 700 global employees
- Listed on NYSE (DGI)

Leading Provider of World Imagery Solutions

- High resolution satellite constellation & advanced aerial program
- Most comprehensive Digital Globe
- Highly scalable Geospatial Cloud Computing capabilities
- Innovative products and services providing insight analysis, saving time, resources and cost.

.

DIGITALGLOBE®

Challenges for Effective Planning & Digital Mapping

- **Imagery**
  - Historical imagery for accurate change detection within infrastructure
  - Current imagery updated regularly
  - Seasonal consistency

- **Access**
  - Distributed access to imagery via online and web based services for in-field, emergency response

- **Cost Efficiency**
  - Low cost access to imagery for planning, in-the-moment access of events, post event mobilization and monitoring
  - Flexible solutions for ease of automating processes/analysis

- **Comprehensive Baseline Coverage**
  - Comprehensive, in-depth world imagery coverage of consistent source, scale and quality

DIGITALGLOBE®

Effective Land Administration Solution

- Worlds Largest Commercial ImageLibrary = >2.6BN km2
- Most Agile satellite constellation available = Collecting 2.5M km2 each day
- World's only 8 band high resolution sensor for better feature extraction and classification
- Digital Elevation Models for elevation and volumetric analysis
- Access offline or online, on mobile devices & desktops

DIGITALGLOBE®

DigitalGlobe Constellation

The best view of the Earth

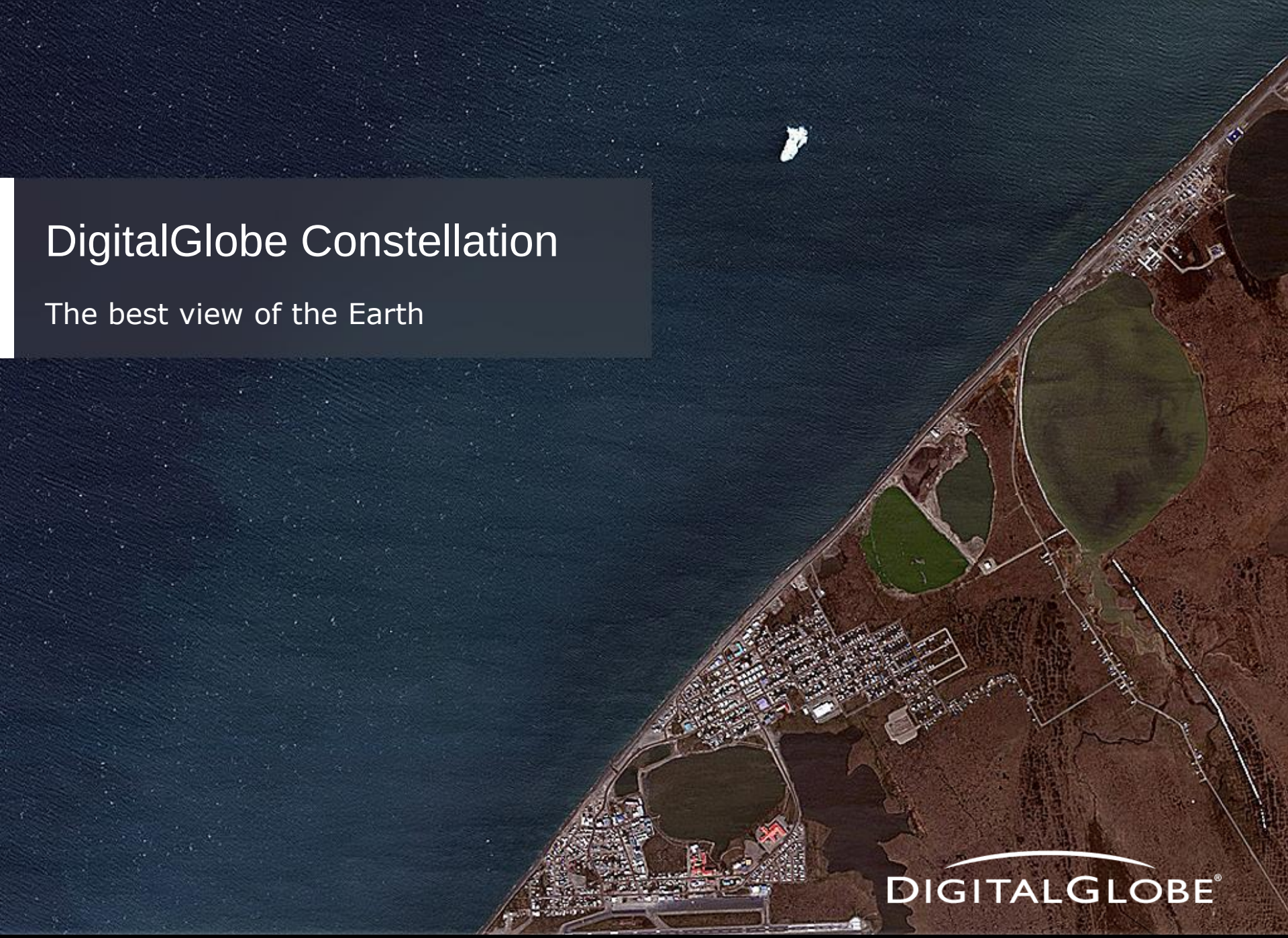
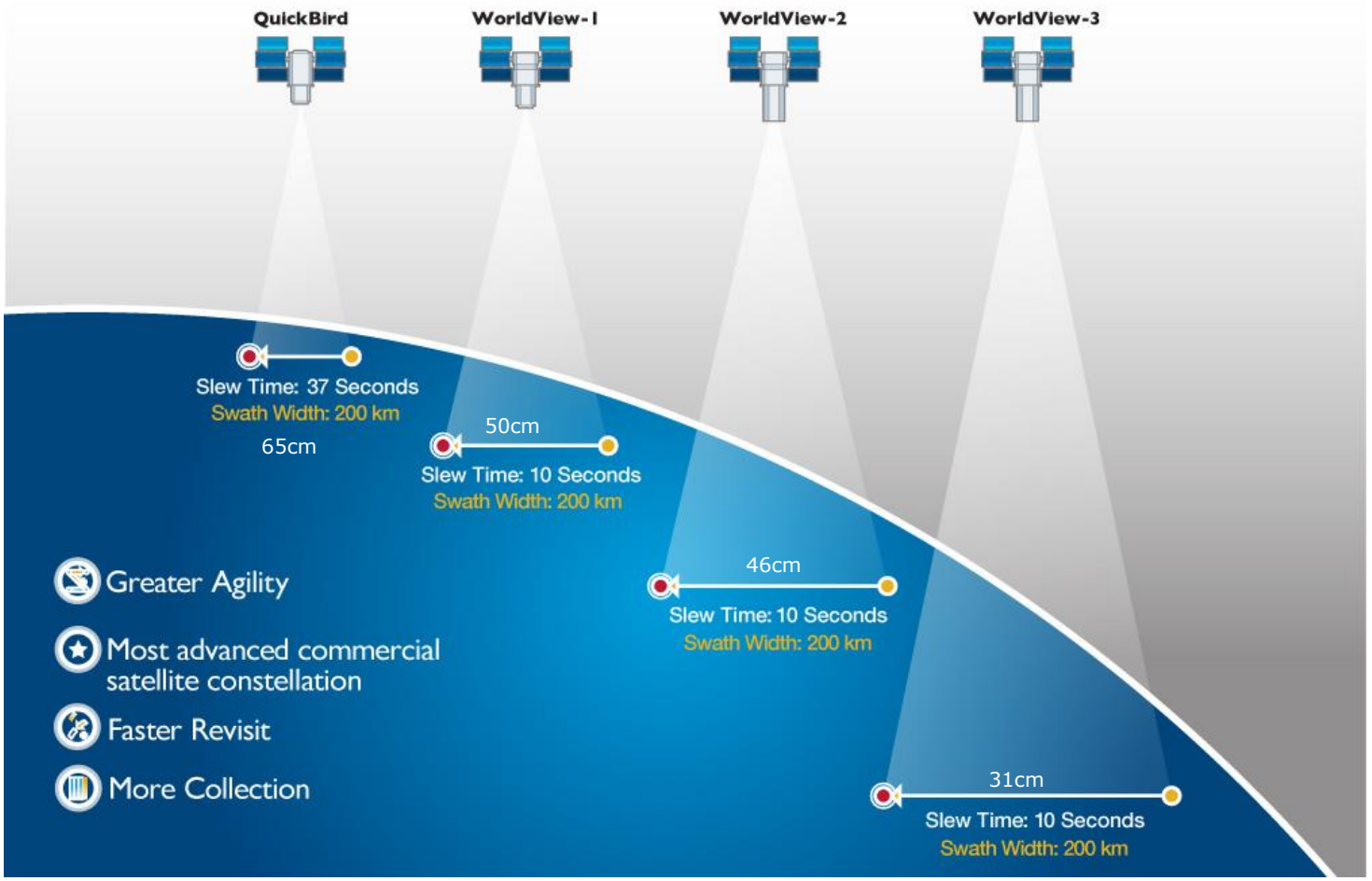


Image: Barrow, Alaska | July 20, 2009 | QuickBird 60cm

DigitalGlobe Proprietary and Business Confidential

The best view of the Earth



DIGITALGLOBE®

Large Area Collections

Collection Capacity

2.5 million km²
collected daily

Collection Rate

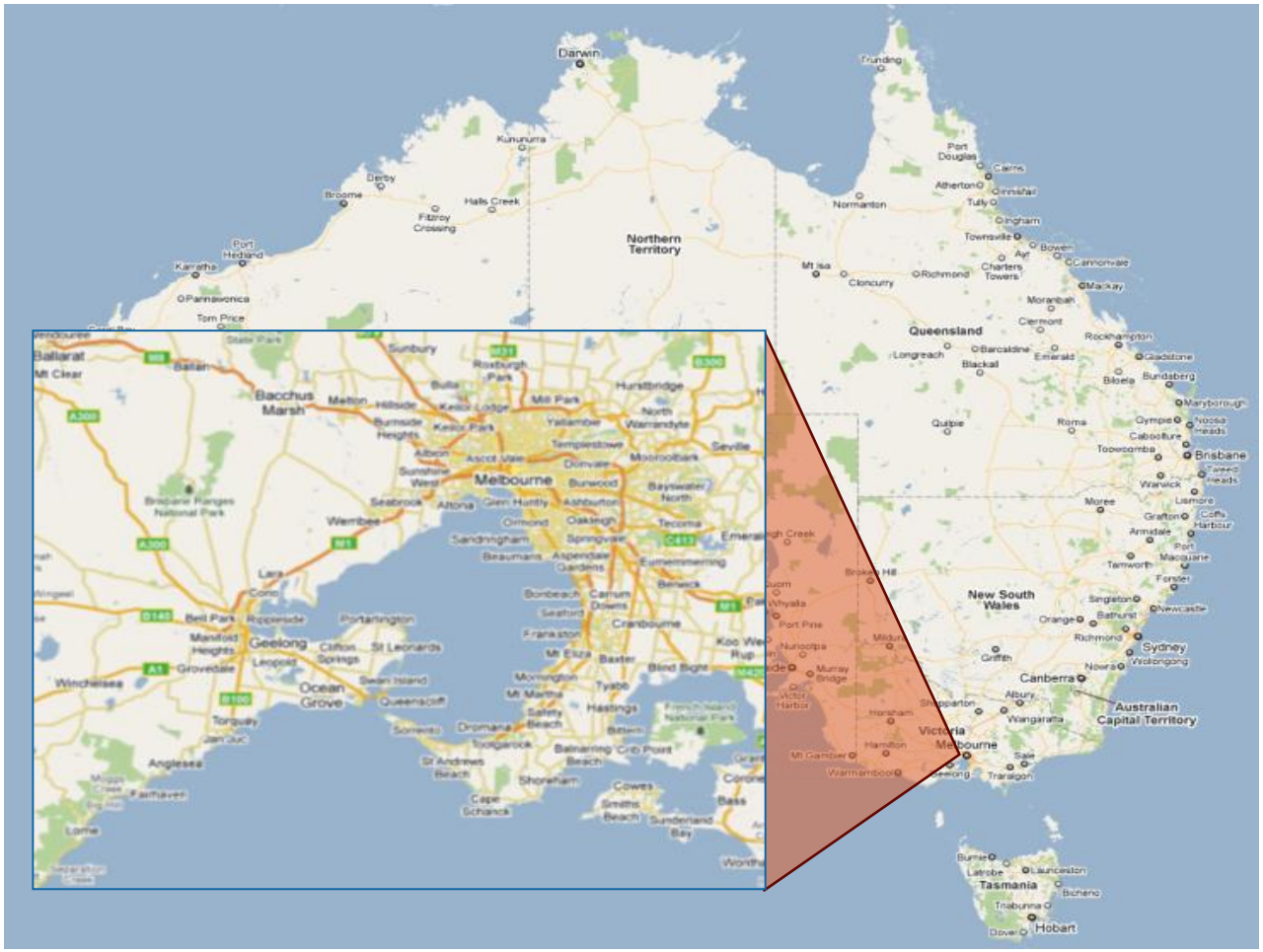
Six times the
world's land mass
each year

ImageLibrary

2.6 billion km²
to date

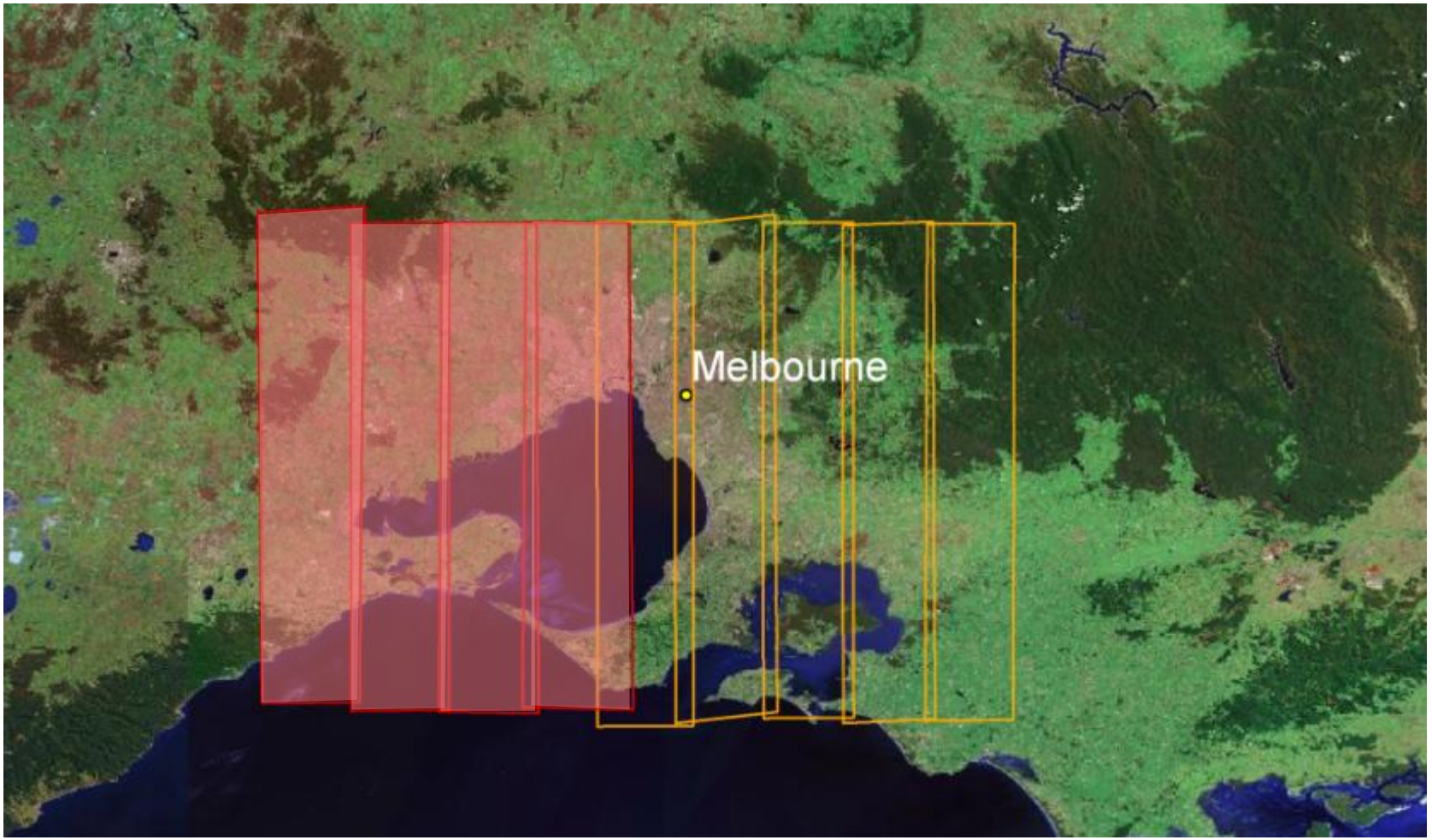
DIGITALGLOBE®

Large Area Collection



DIGITALGLOBE®

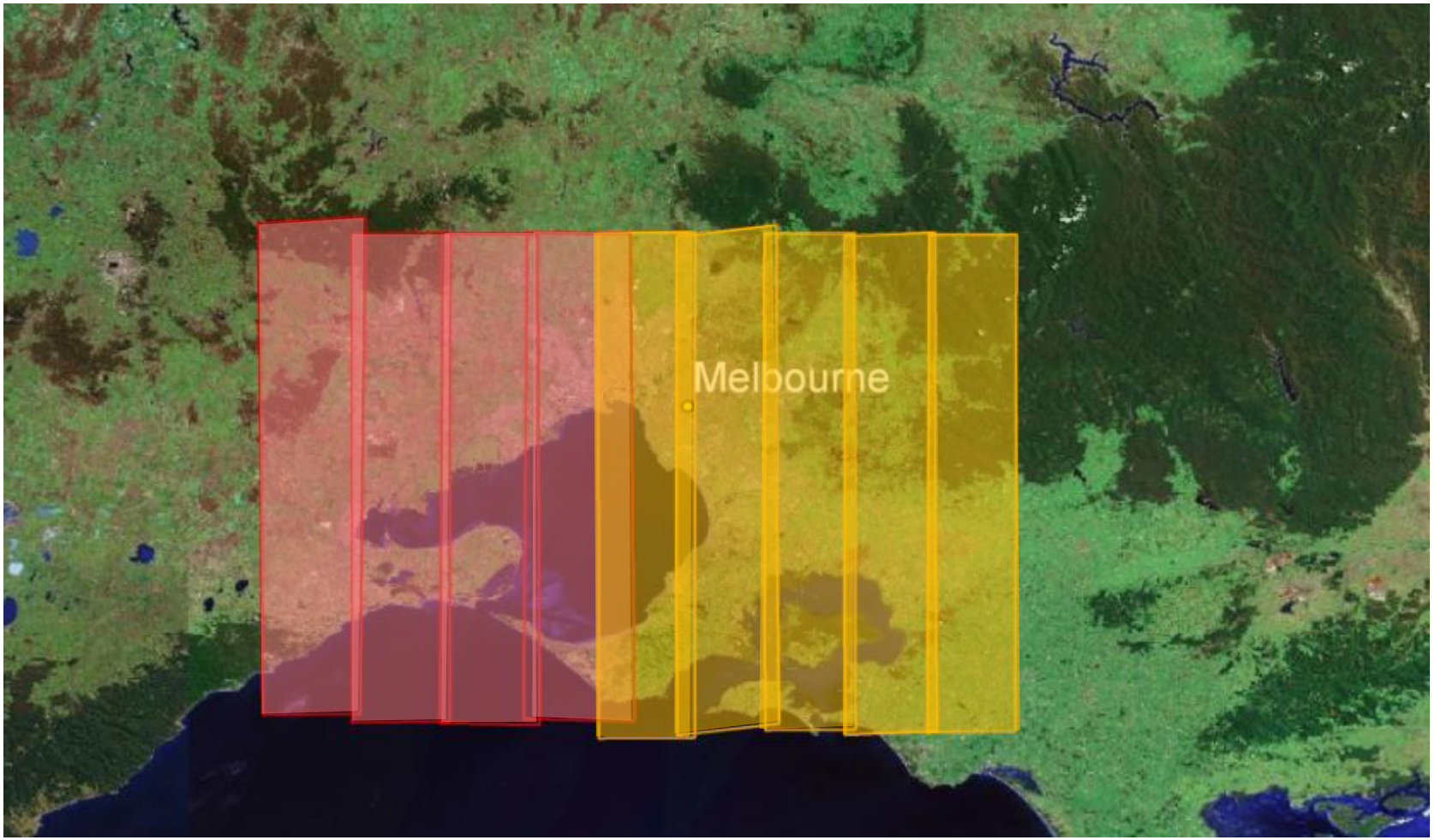
WorldView-1 Single Pass



WorldView-1: 9,018 km^2 in a single pass

DIGITALGLOBE®

WorldView-2 Single Pass



WorldView-2: 10,662 km^2 in a single pass

DIGITALGLOBE®

Projects in Brazil

Paraná State Mapping 220.000 km2

COPEL
Pura Energia

Project requirements

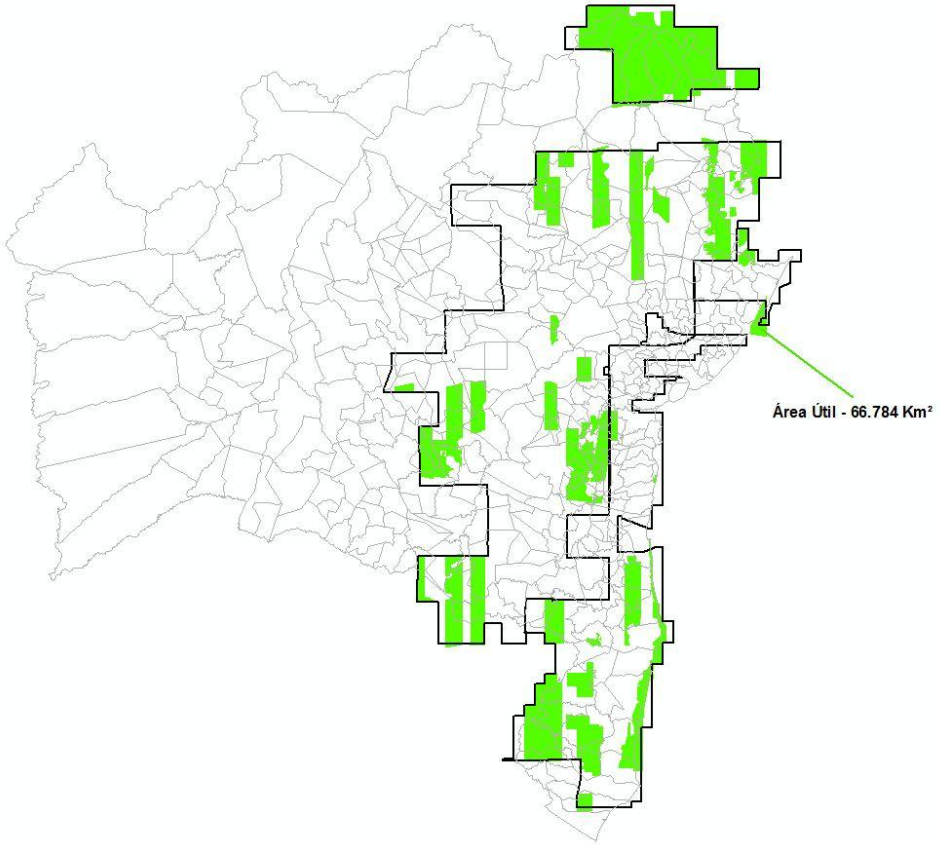
- **Area: 220.000 km²**
- **2 m resolution, RGB, 5% cloud cover.**

DIGITALGLOBE®

Projects in Brazil

DEM for Bahia State

- 225.000 Km2
- Stereo pairs
- 66.000 km2 already collected



DIGITALGLOBE®

Projects in South America

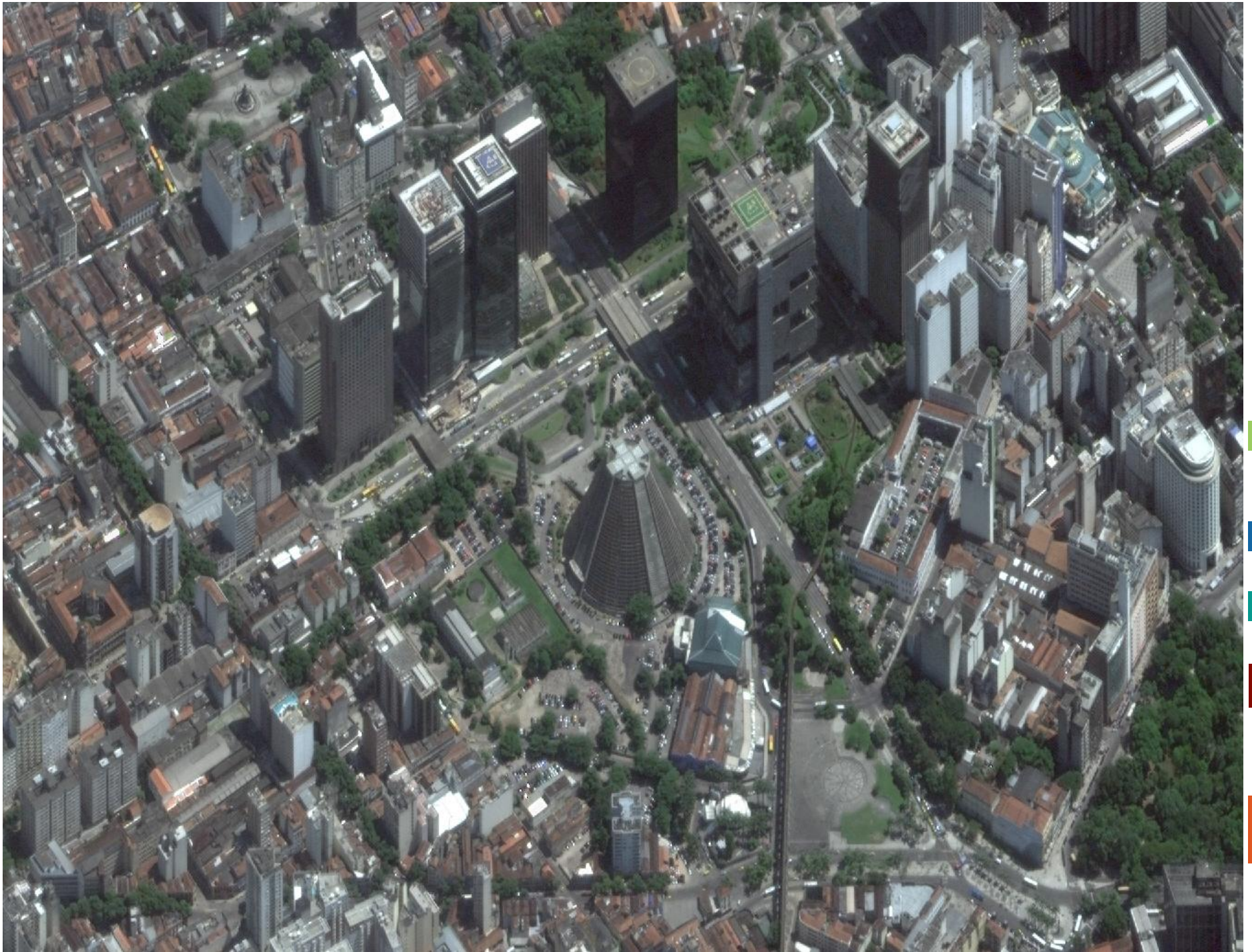
DSM and ortho mosaic for IGM Chile

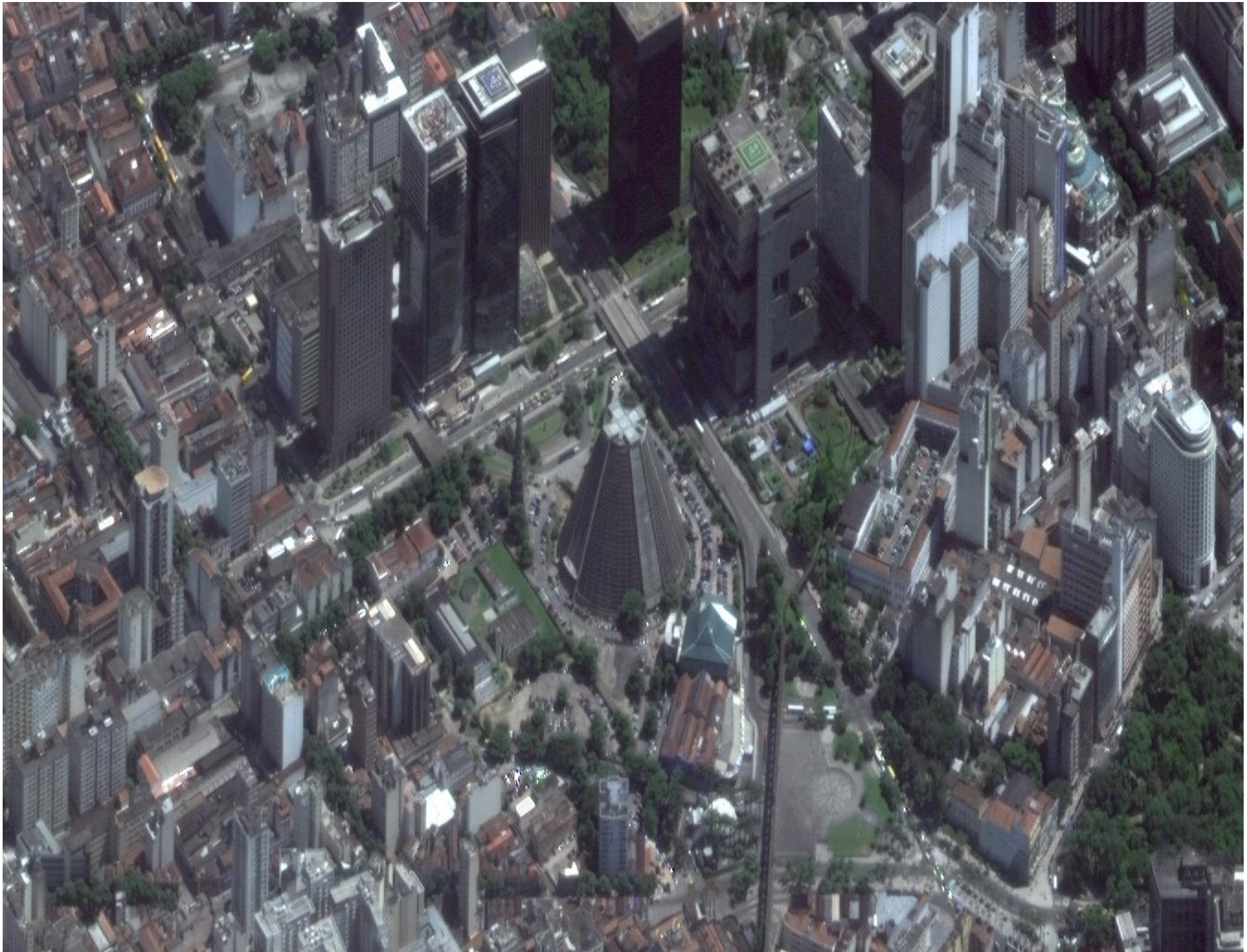
- **185.200 Km2 – (part 1, north of Chile)**
- **Delivery of DSM:**
  - Resolution: 8 meter posting interval
  - Absolute Vertical Accuracy: 8 meter LE90
  - Relative Vertical Accuracy: 5 meter LE90
- **Delivery of ortho-mosaic:**
  - Resolution: .5meter
  - Radiometric Resolution of 8 bit
  - Spectral Resolution of 0.4 to 0.9 micron
  - Accuracy: 6.5m CE90 horizontal.
- **Project schedule (estimated): 9 months**

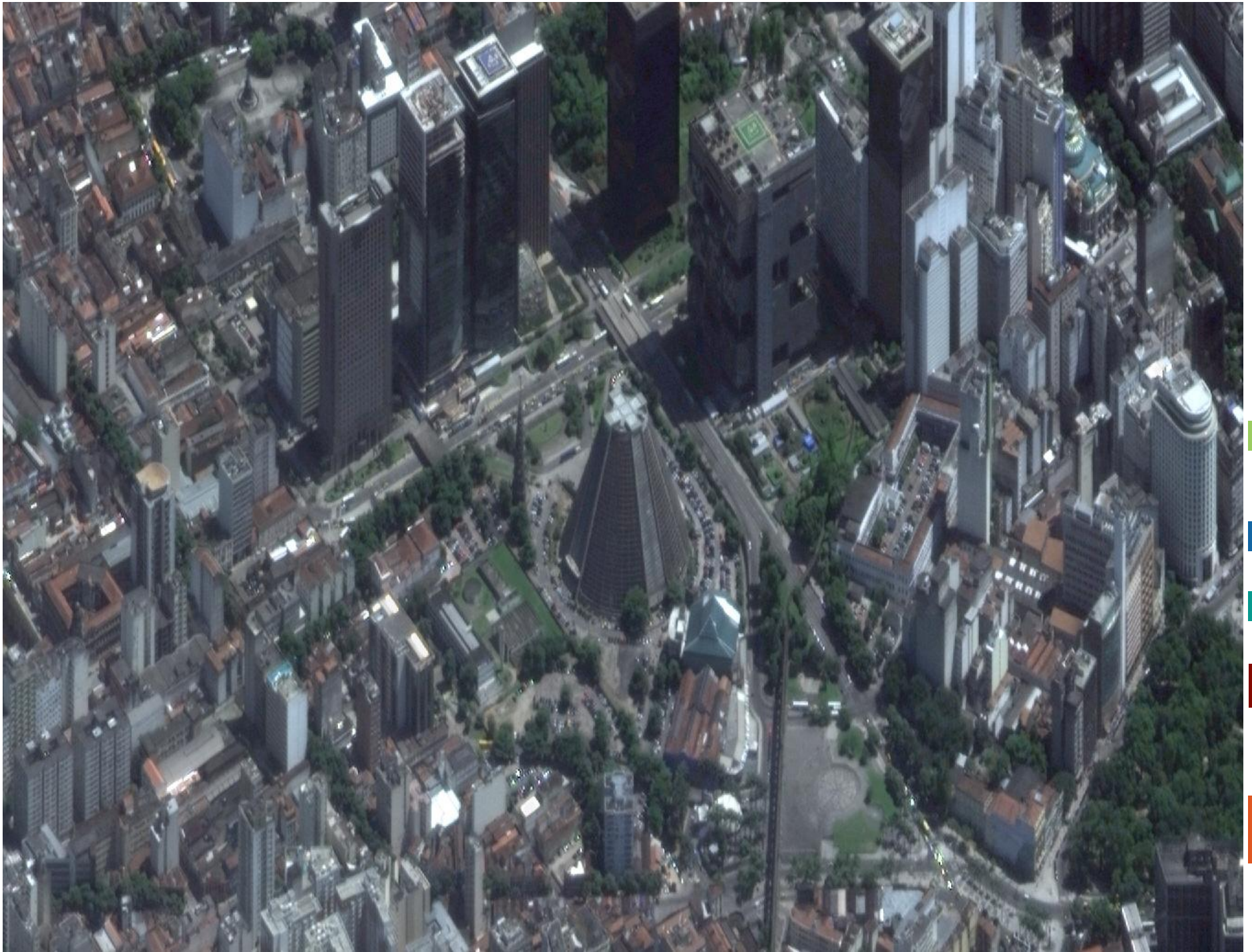
DIGITALGLOBE®

Industry leading Agility

DIGITALGLOBE®







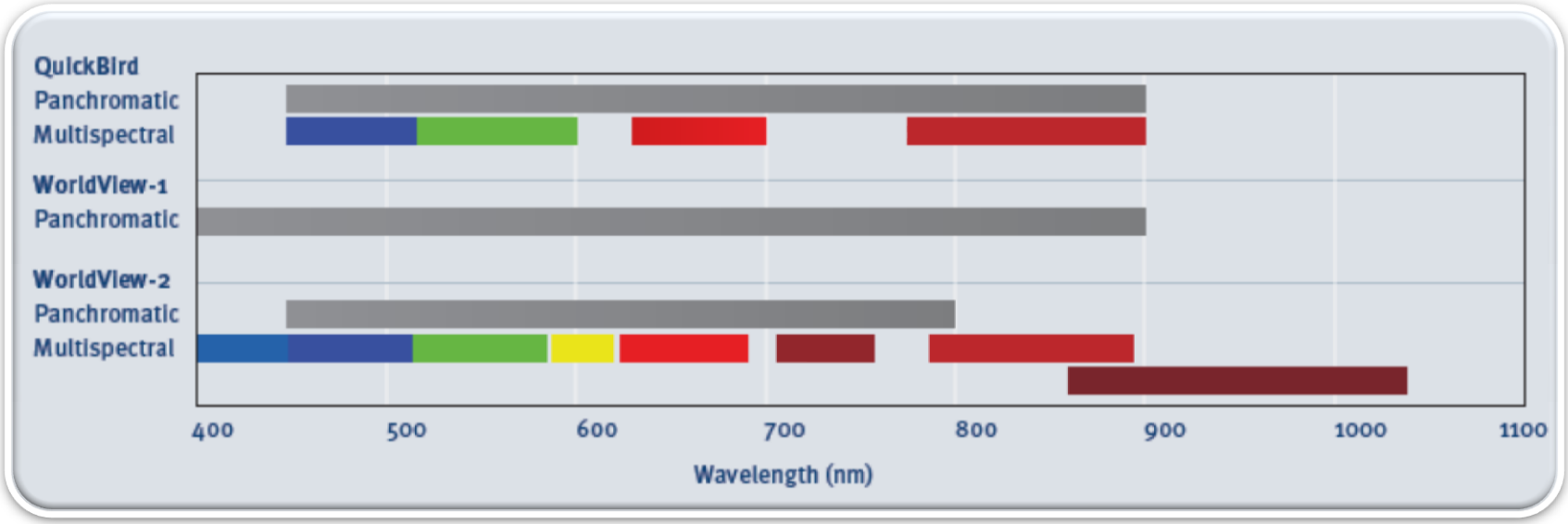
A New Approach to Land Management

Image: Dubai Airport, UAE | 2010 | WorldView-2 50cm

DigitalGlobe Proprietary and Business Confidential

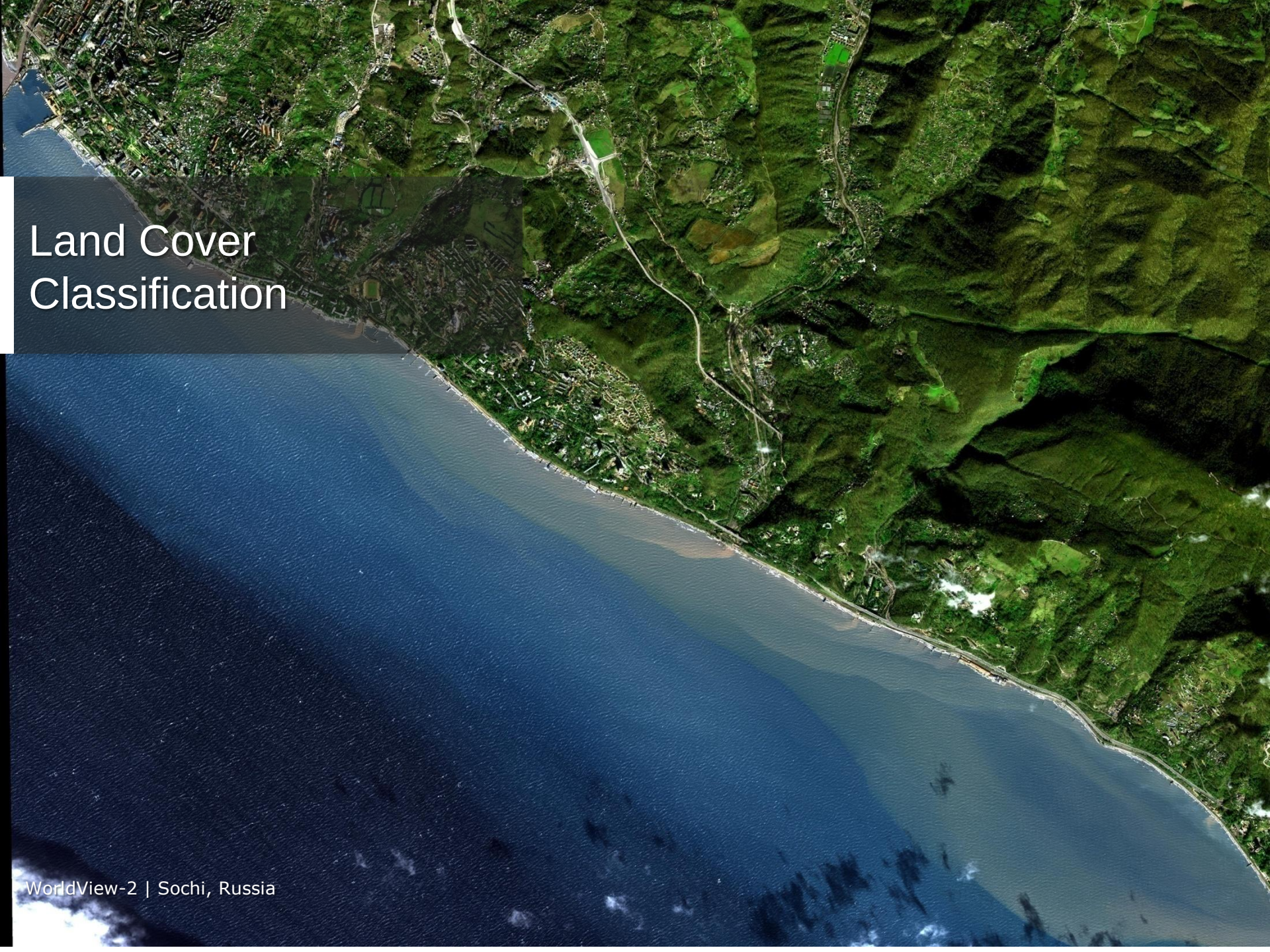
8 Bands – More Detail, Better Insight

- DigitalGlobe (WorldView-2) has the only commercial high resolution satellite to capture in 8 band imagery, allowing for greater feature extraction, vegetation & bathymetric analysis.



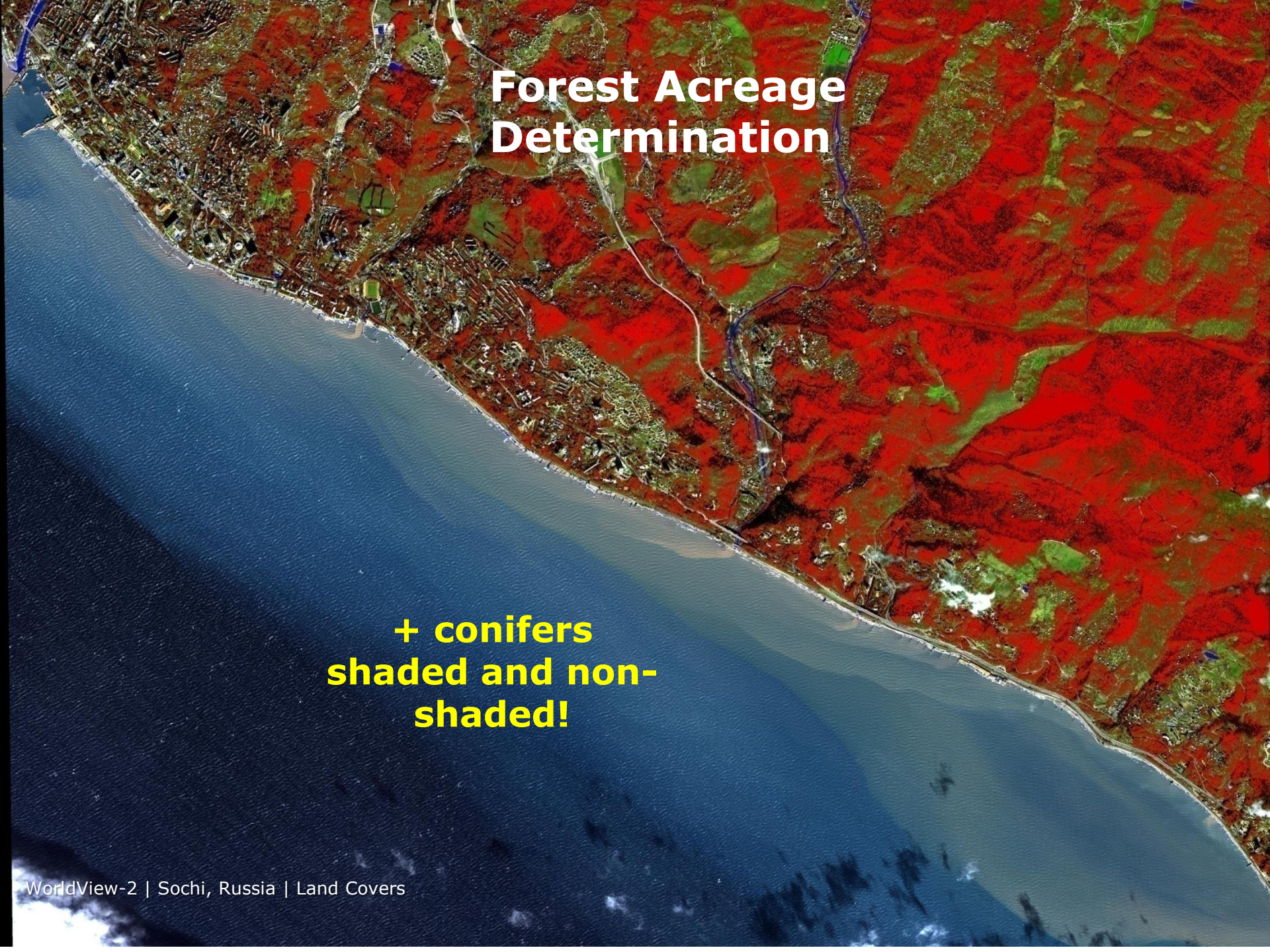
- Additional bands include coastal blue, red edge, yellow and near infra-red 2.

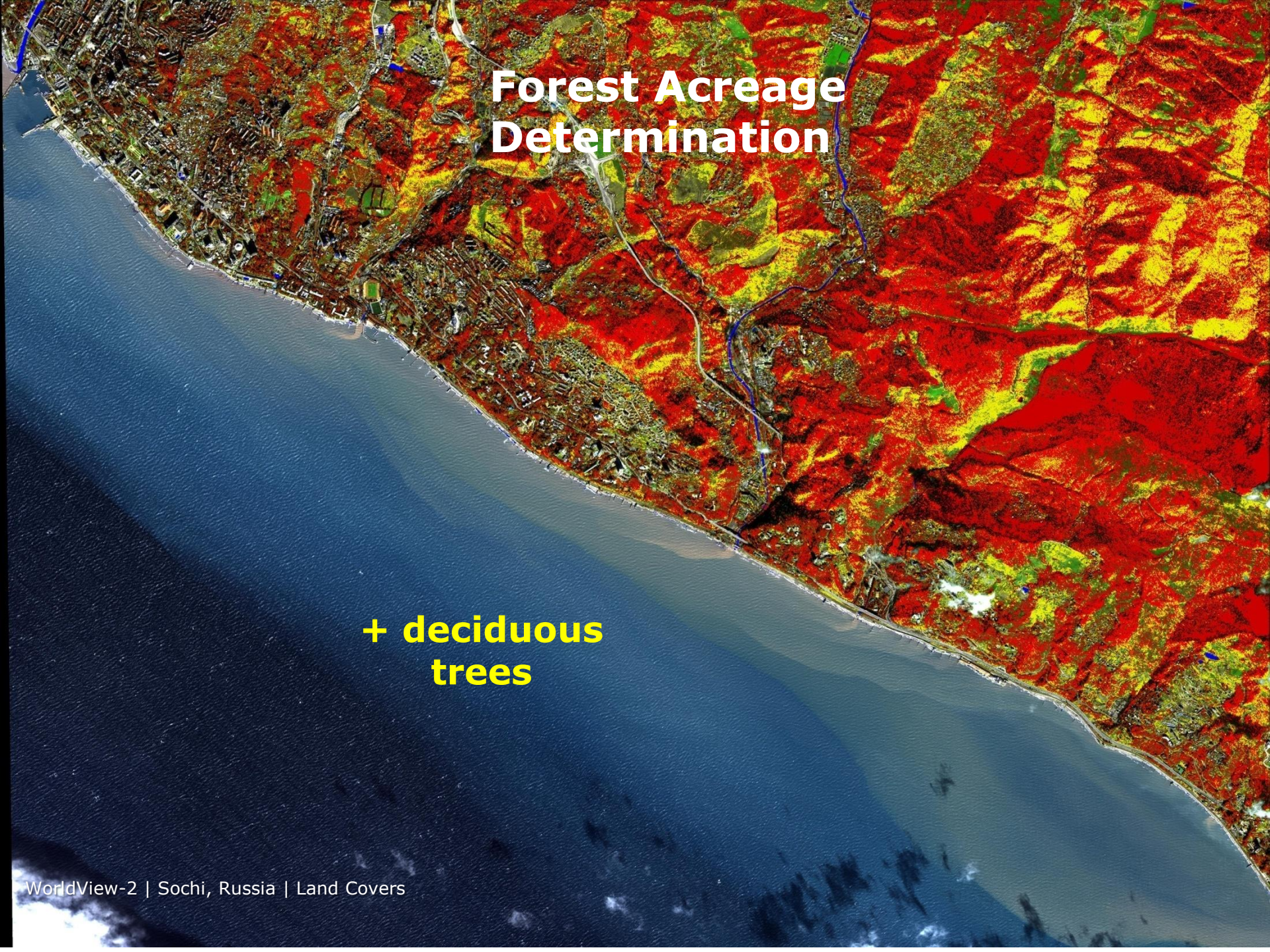
DIGITALGLOBE®

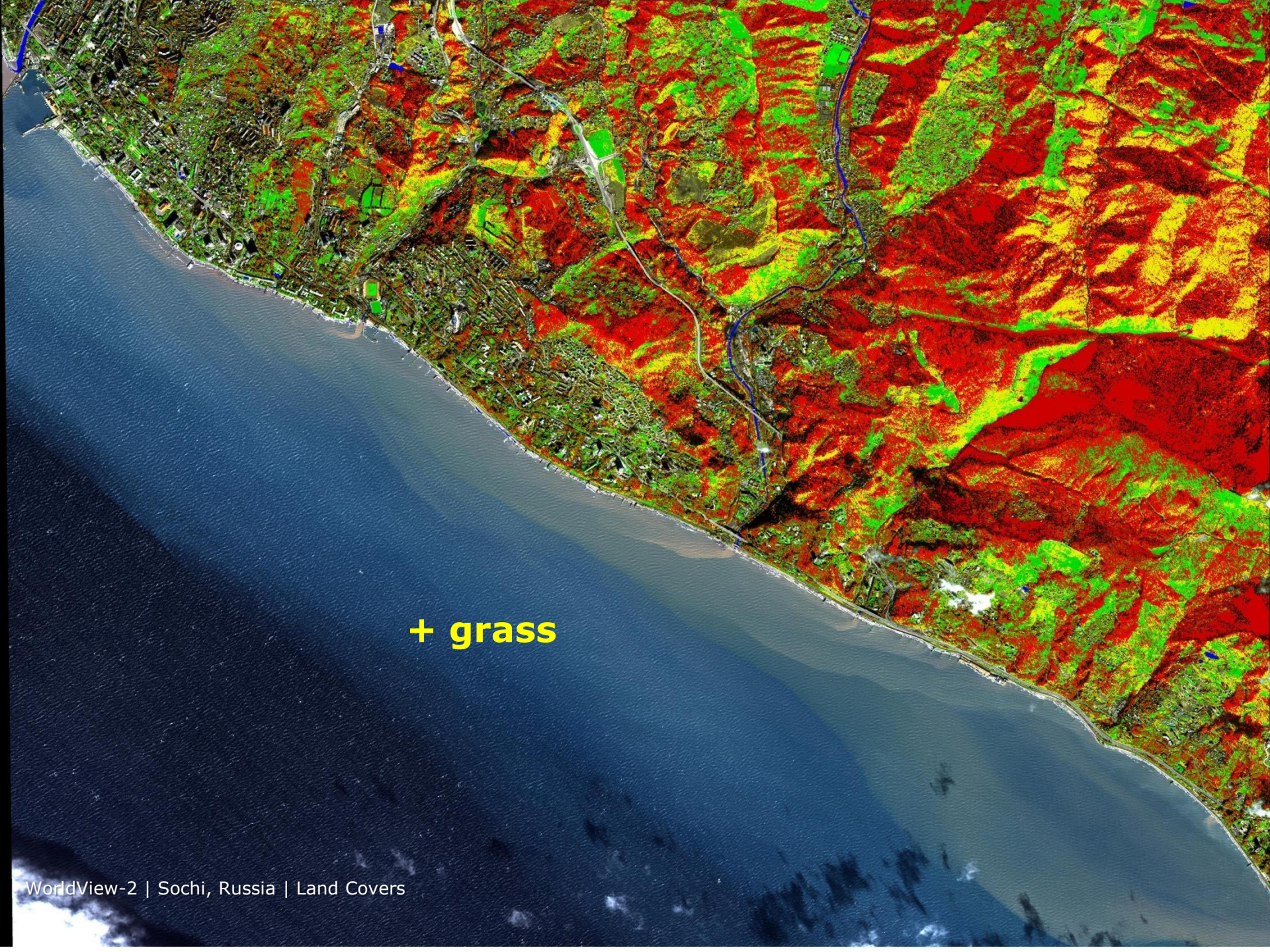

Land Cover
Classification
WorldView-2 | Sochi, Russia

WorldView-2 | Sochi, Russia

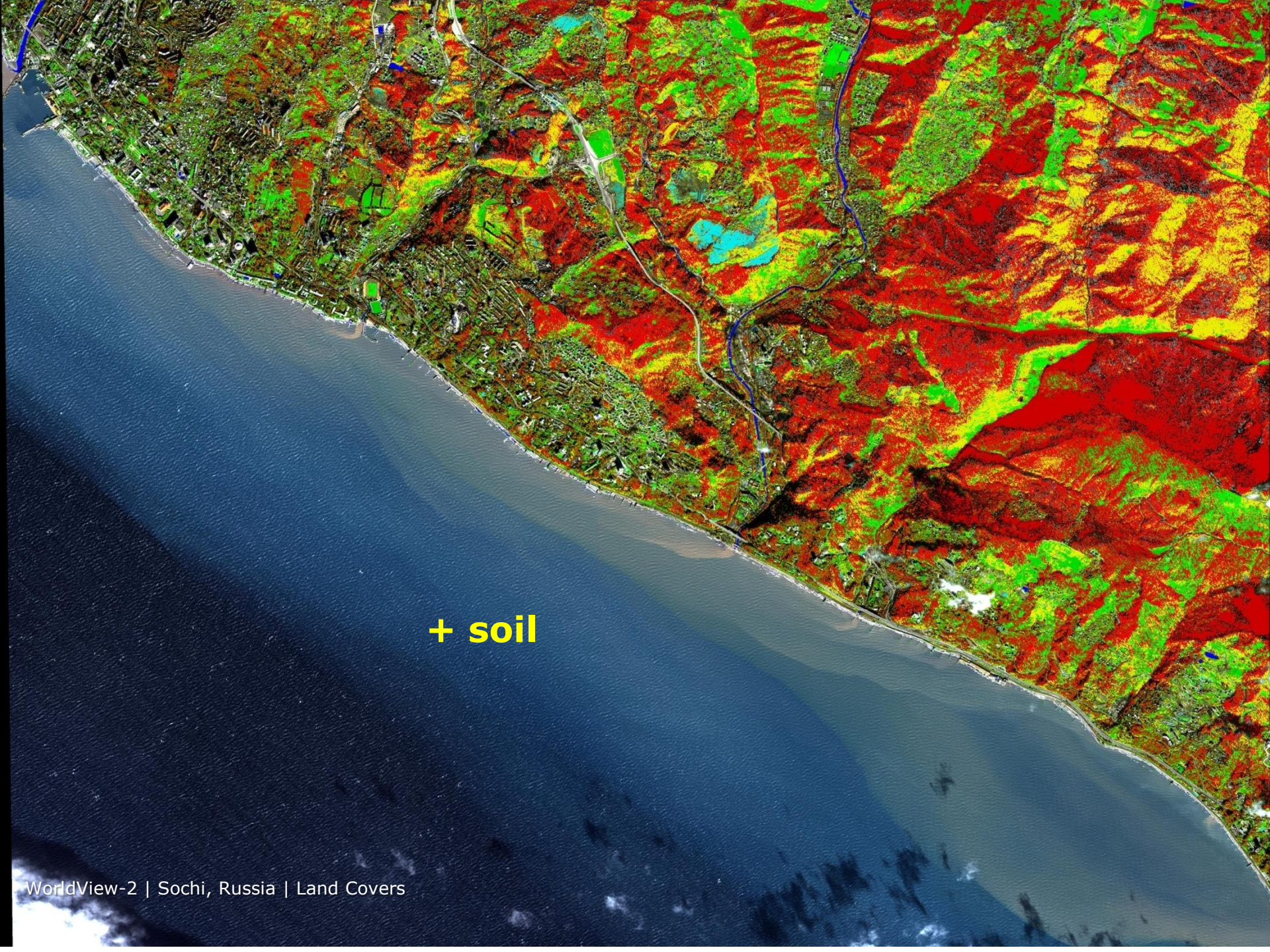
+ water
WorldView-2 | Sochi, Russia | Land Covers


Forest Acreage Determination
+ conifers shaded and non-shaded!
WorldView-2 | Sochi, Russia | Land Covers

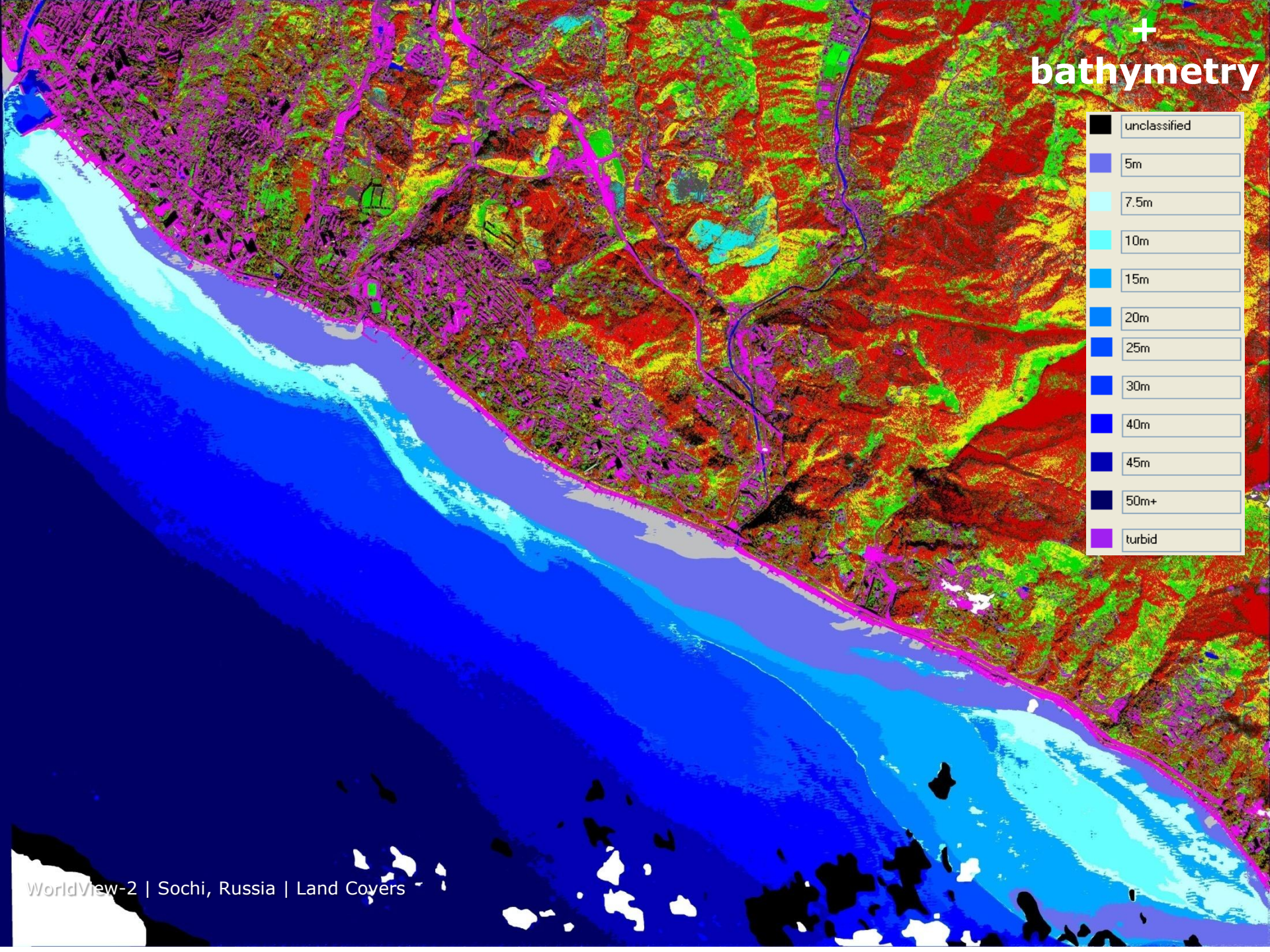

Forest Acreage Determination
+ deciduous trees
WorldView-2 | Sochi, Russia | Land Covers



WorldView-2 | Sochi, Russia | Land Covers


+ soil
WorldView-2 | Sochi, Russia | Land Covers

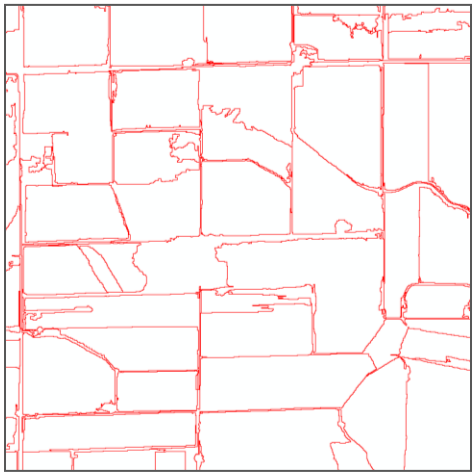
+ man-made
WorldView-2 | Sochi, Russia | Land Covers


+
bathymetry
unclassified
5m
7.5m
10m
15m
20m
25m
30m
40m
45m
50m+
turbid
WorldView-2 | Sochi, Russia | Land Covers

WorldView-2 | Sochi, Russia | Land Covers

Crop Identification and Acreage Estimation

Field Boundary Extraction

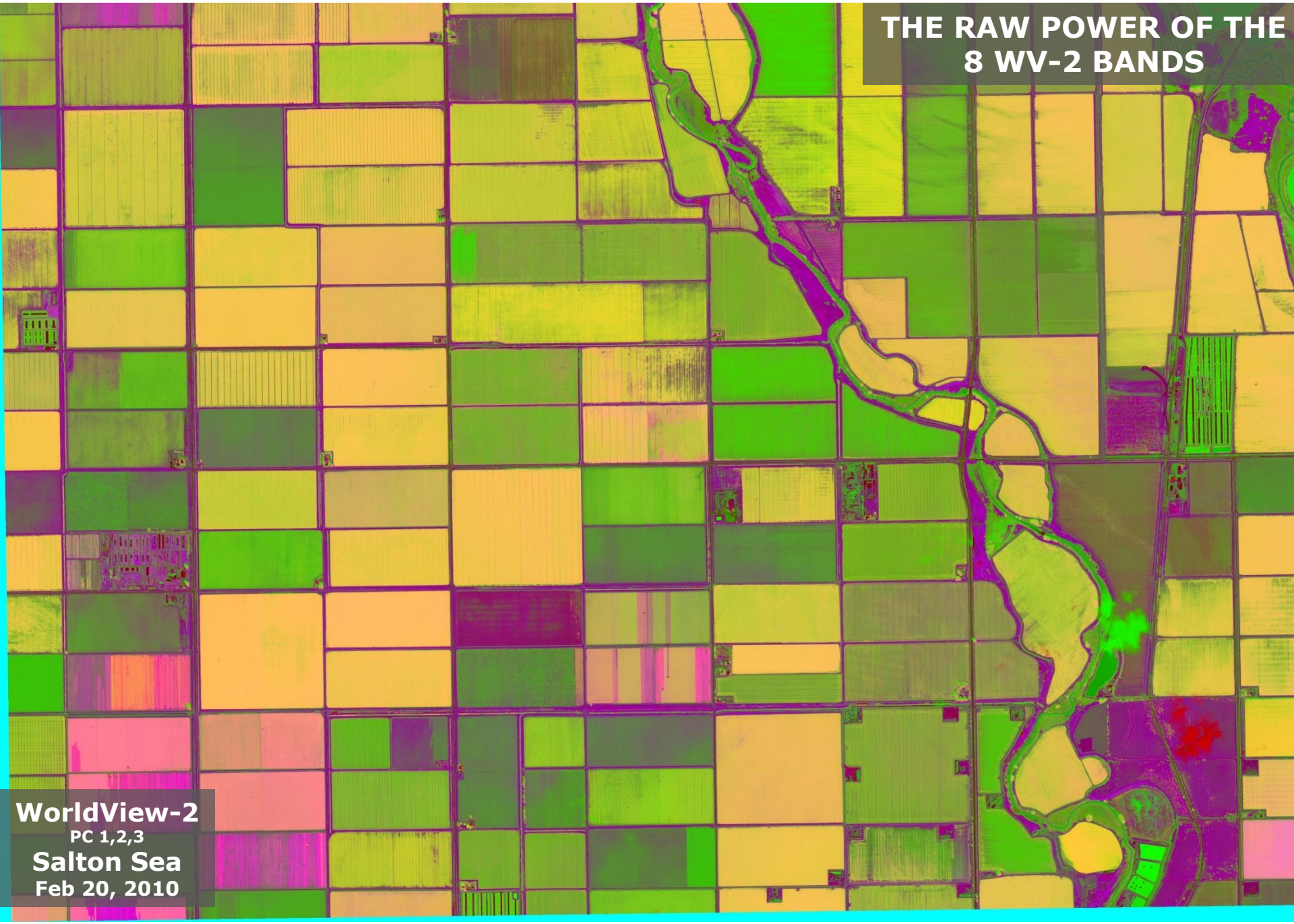


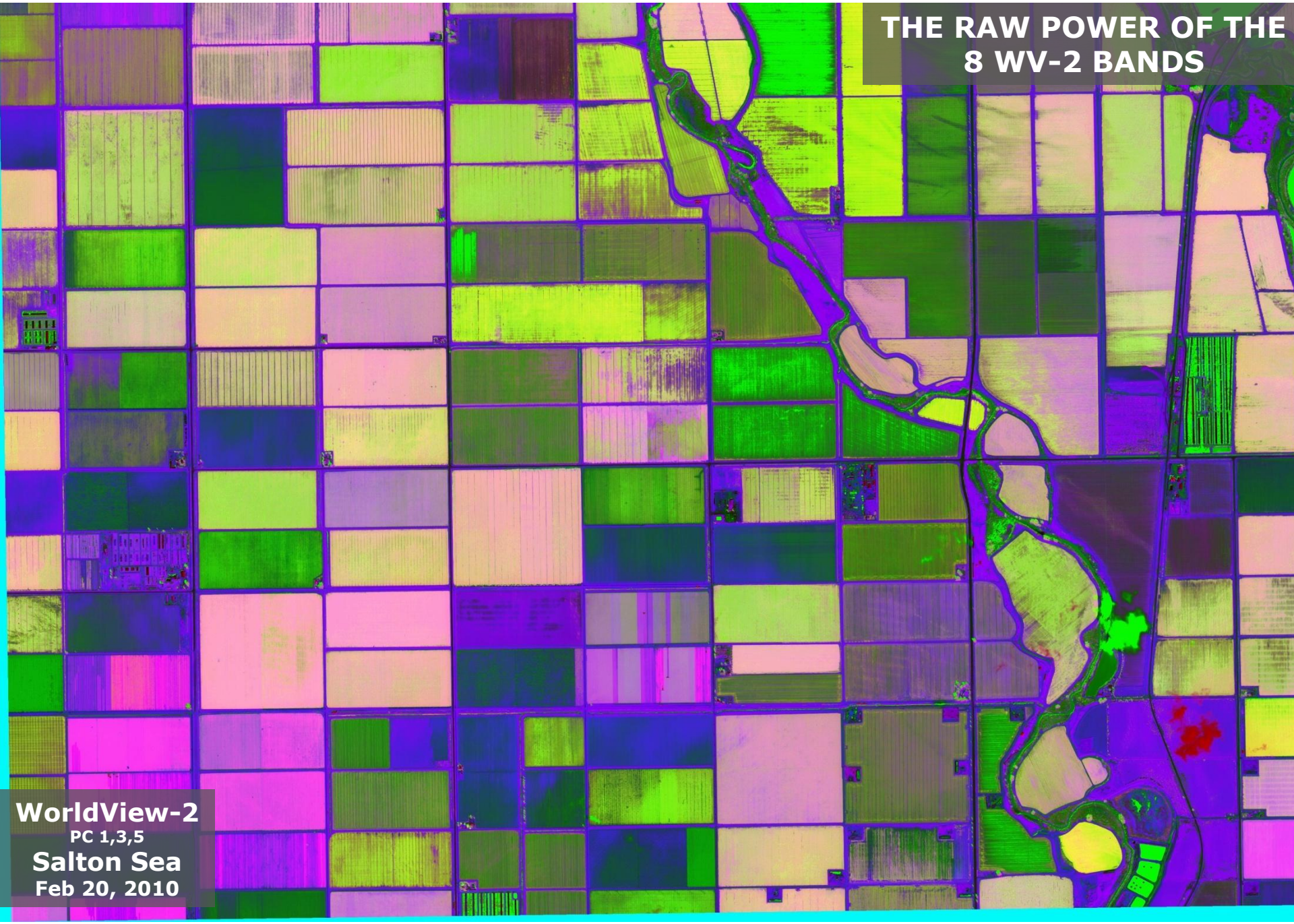
Field Boundaries

Crop Identification and Acreage Estimation

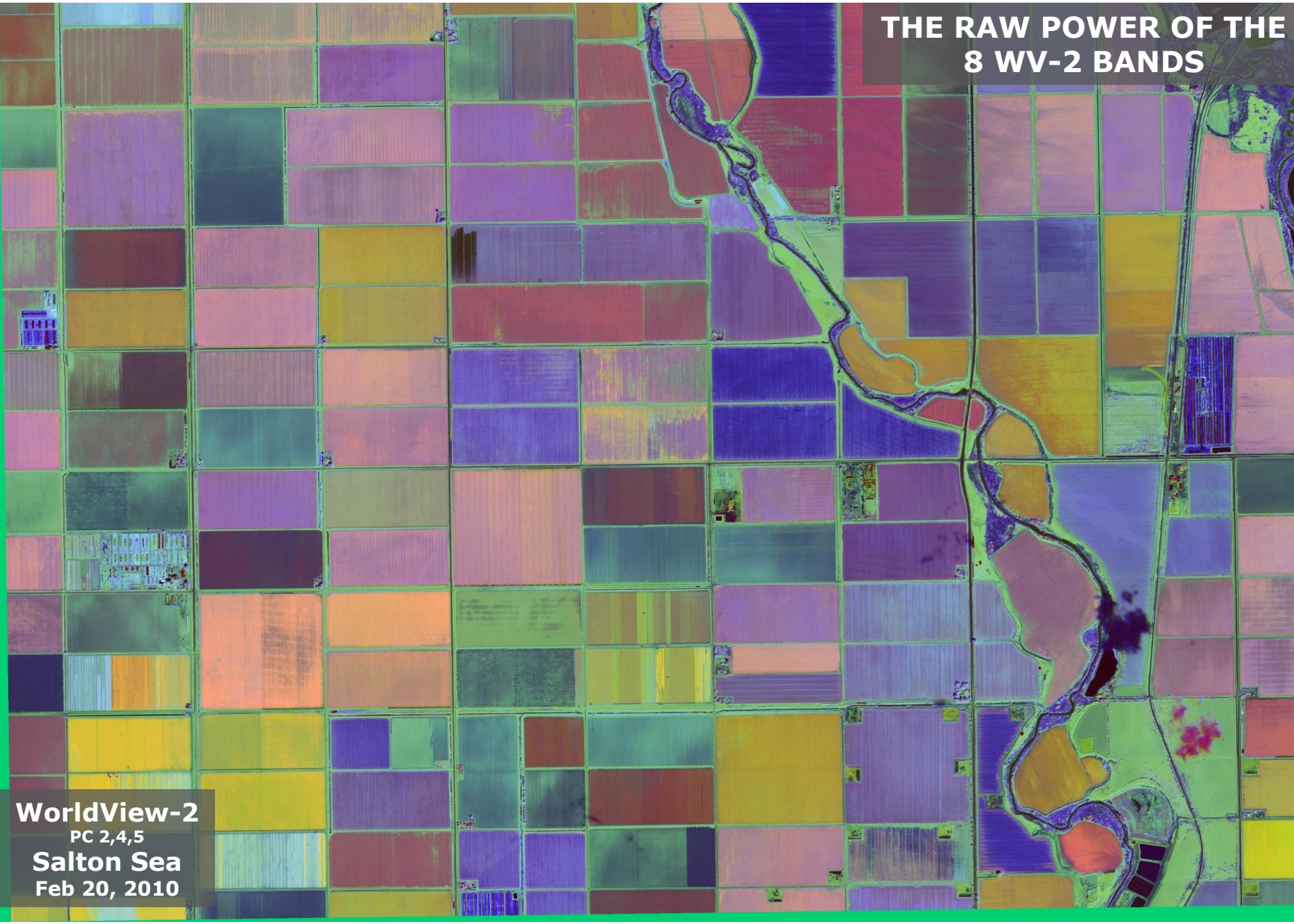
DIGITALGLOBE®

WorldView-2
true color image
Salton Sea
Feb 20, 2010


THE RAW POWER OF THE
8 WV-2 BANDS
WorldView-2
PC 1,2,3
Salton Sea
Feb 20, 2010

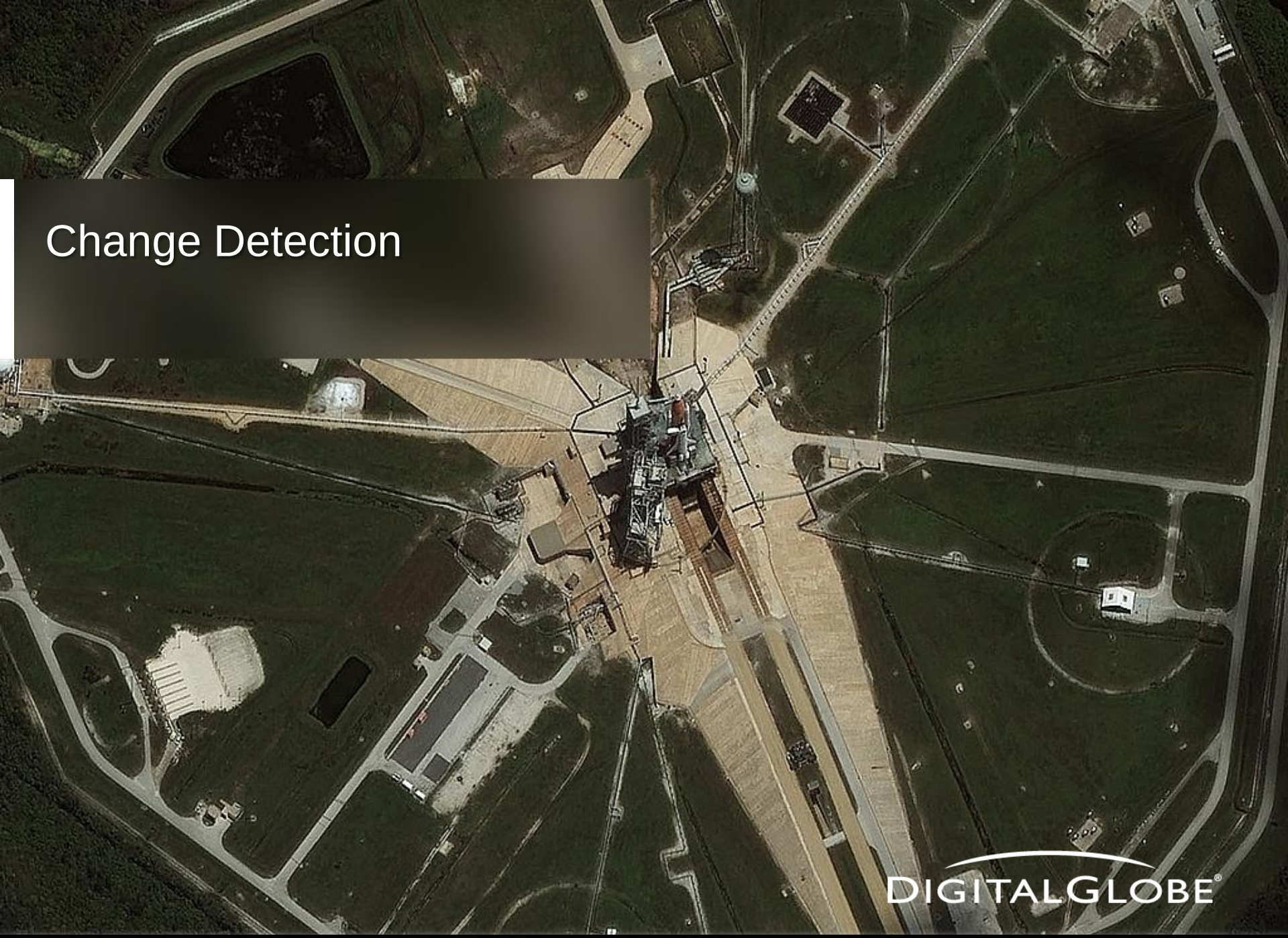

THE RAW POWER OF THE
8 WV-2 BANDS
WorldView-2
PC 1,3,5
Salton Sea
Feb 20, 2010

THE RAW POWER OF THE 8 WV-2 BANDS



WorldView-2
PC 2,4,5
Salton Sea
Feb 20, 2010

Change Detection



Change Detection – Visual Context

DIGITALGLOBE®

Summary

- **Land Management**
  - Highly accurate large area imagery reduces time and cost
  - Building management/codes enforcement
  - Land Classification and Feature Extraction
    - Roads, Buildings, Forests, Water
  - Crisis Event Management
    - Historical & latest images for change detection and emergency planning
    - Elevation data for flood planning and area classification
  - Plot urban sprawl
  - Change Detection
    - Historical vs Current

DIGITALGLOBE®

DigitalGlobe Proprietary and Business Confidential