Proving the case for operationalising value-add decision support with EO Technologies.

Mark Thompson, GEOTERRAIMAGE

"You can't manage
what you don't ***MEASURE***"

- Peter Drucker

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- The challenge to organisations is to **harness these opportunities** in order to remain relevant and competitive

GEOTERRAIMAGE:

Technologies bringing about **opportunities**:

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- **Big data** crunching algorithms.
- **Machine Learning** and AI functionality
- **Real-time** data **processing**

Opportunity and Possibilities:

"off-the-scale' increases in **speed**, **efficiency** and **volume** of (image) data processing …"

Important to view disruptive (EO) technologies as **positive** catalysts for change:

- **Opportunities** for new or improved client focused solutions
- **Relocating or extending** the value-chain position

Who have been the ***DRIVERS*** and ***ENABLERS*** of this change ?

Drivers

FEWS NET
FAMINE EARLY WARNING SYSTEMS NETWORK

Food and Agriculture Organization of the United Nations

=

Opportunity & Innovation

Enablers

Descartes Labs

DigitalGlobe Platform

USGS science for a changing world

HEXAGON GEOSPATIAL

esa

AIRBUS

planet.

esri

SINERGISE

OSGeo Your Open Source Compass

JS

amazon web services

Google Cloud Platform

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The EVOLUTION of our CLIENTS and the MARKET:

TECHNOLOGY

- What **products** were possible in the past ?

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- What **products** were possible in the past ?
- Creating **project specific maps** and **delivering data products** …
- Now… **integrating data, building business intelligence**, and delivering holistic end-to-end information-based solutions

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STRATEGY

🌍 What was our strategy in the **past** ?

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- What was our strategy in the **past** ?
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- Now… **less projects, more annuity-based products** through scalable solutions, built around a core of universally applicable, in-house maintained, spatial and non-spatial “crown-jewels” data

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- Who were our clients in the **past** ?
- Clients had an **understanding of GIS** and Remote Sensing…
- **Now** … our clients don't have a clue about GIS & RS, but acknowledge the value of spatially-based intelligence

How do we do it ?

By using **EO data** and **cloud-based processing** to provide **near real-time business intelligence at multiple scales:**

Harness the power of satellite imagery to unlock near real-time information to numerous industries.

Develop and innovate automated workflows to extract vital information for from earth imagery.

We do the "brain numbing technical" bit, and deliver the useful information to organisations, businesses or people.

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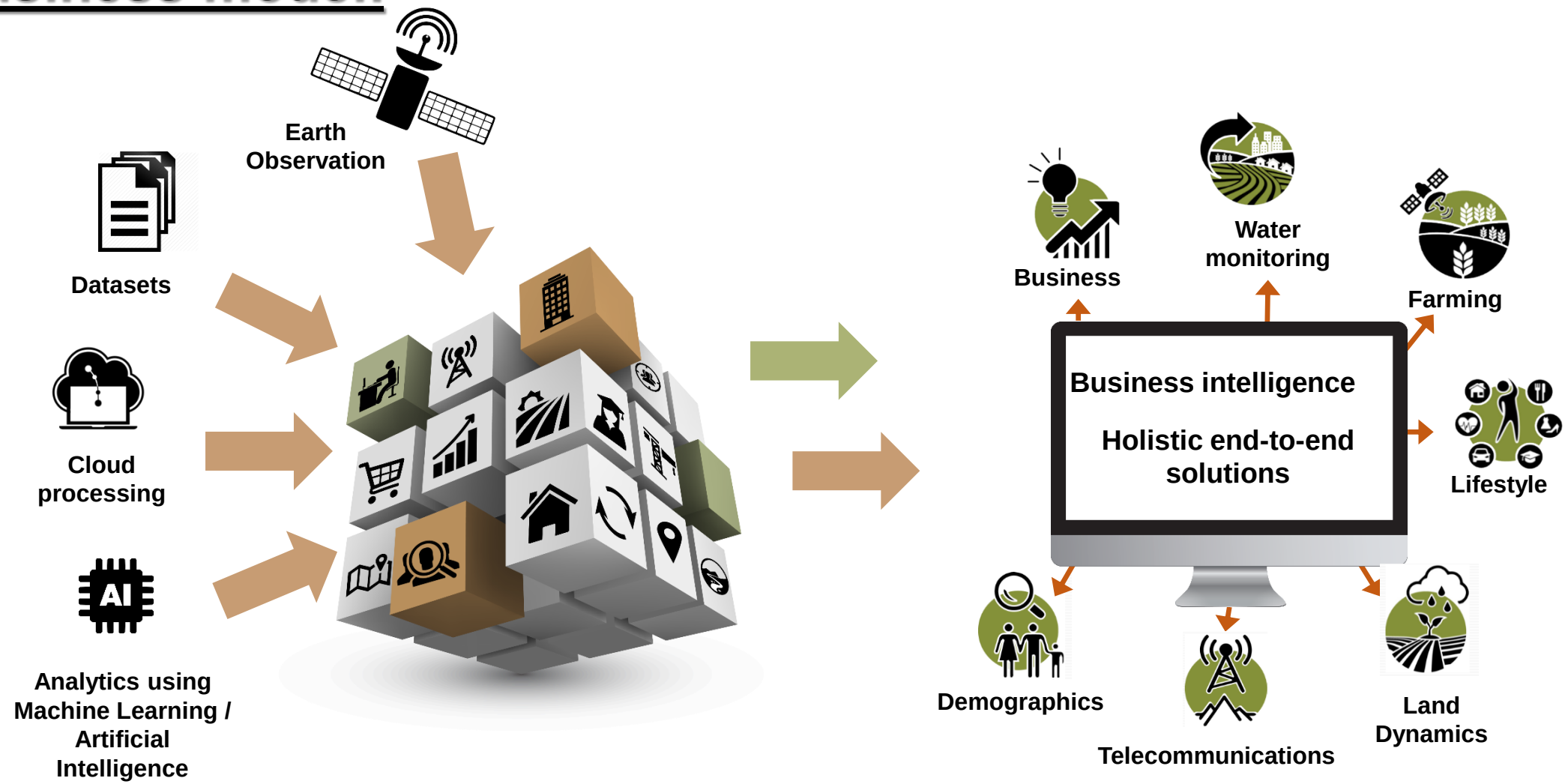
The business model:



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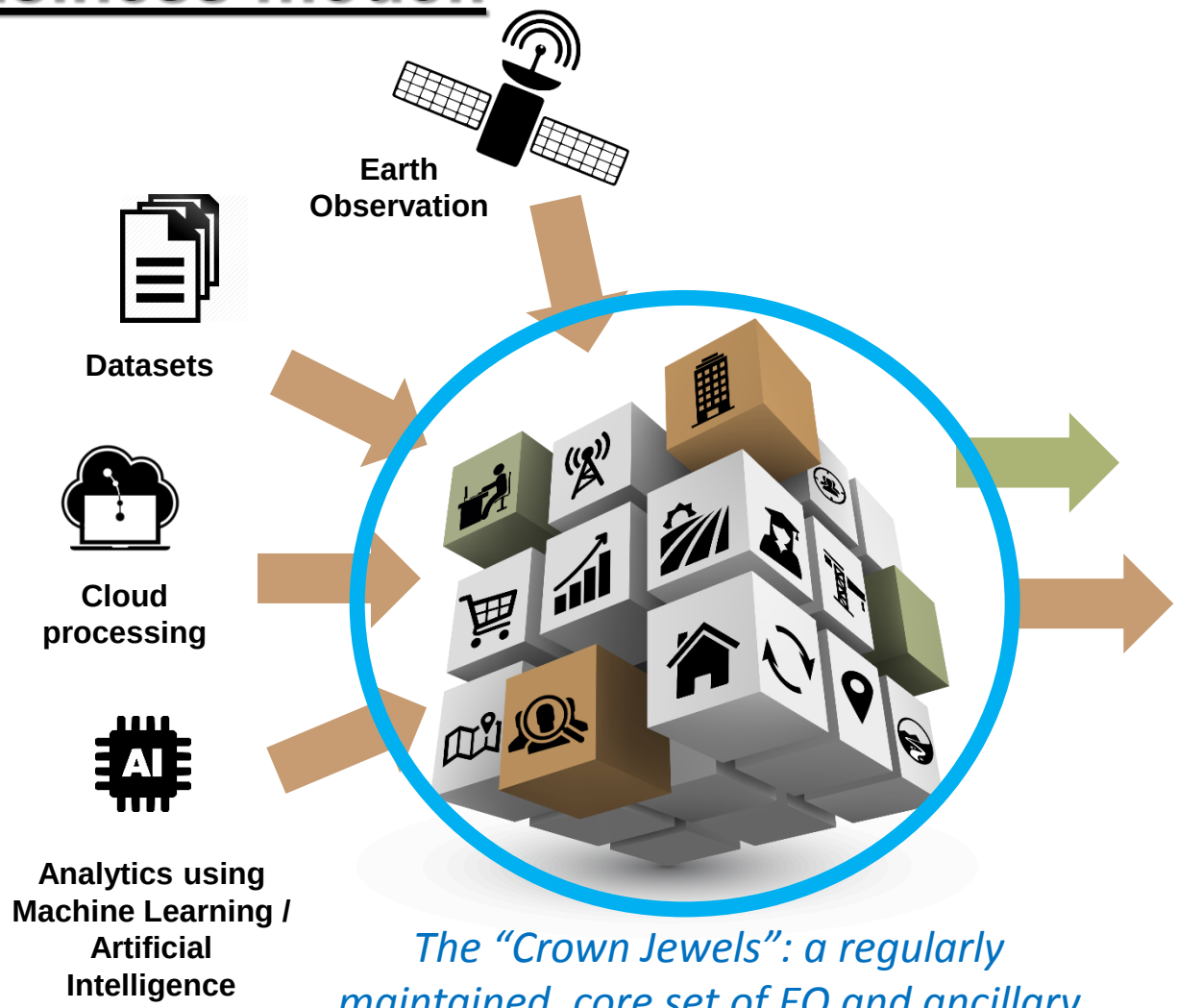

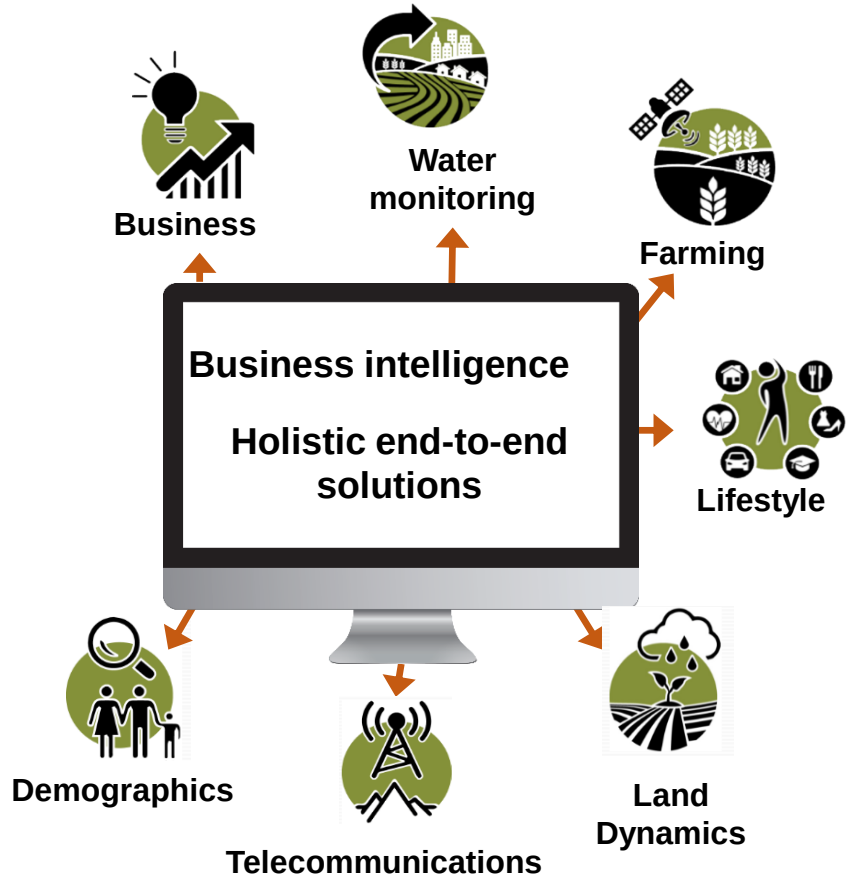

The "Crown Jewels": a regularly maintained, core set of EO and ancillary data, with multiple market value and application.

Three case examples of products & services:

GEOFARMER a **monthly crop monitoring** service

NEW DEVELOPMENTS a **monthly urban change** monitoring service

MZANSI AMANZI a **monthly national water** monitoring service

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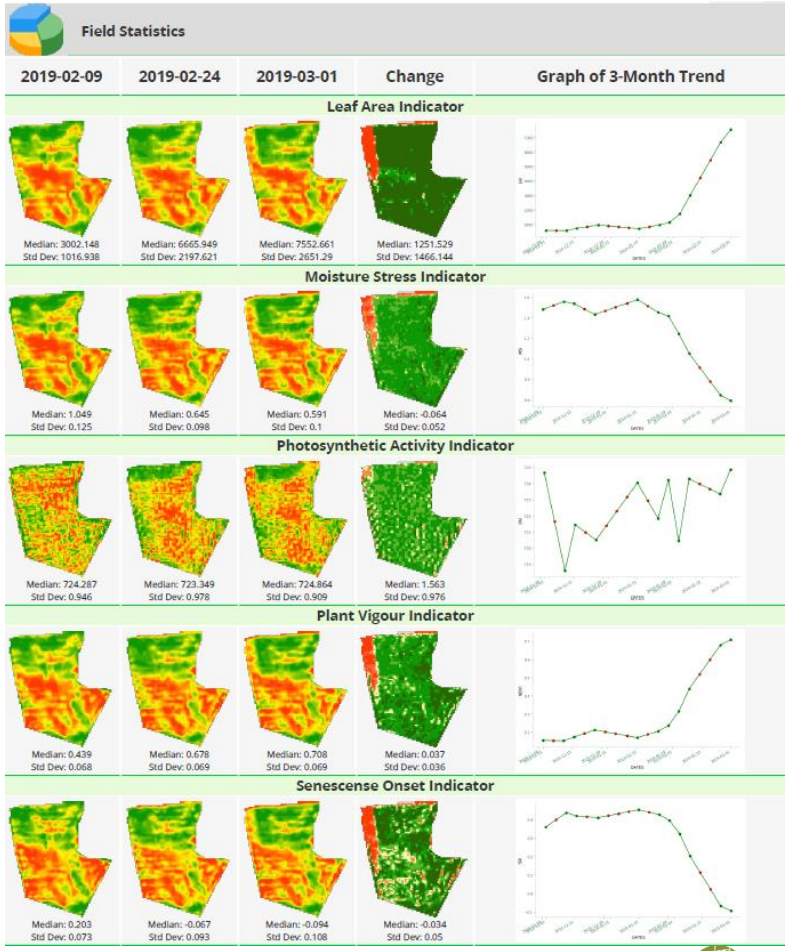
All are completely automated, operational procedures, utilising cloud-based technologies and typically process several Terrabytes of data per process run.

GEOFARMER: A tool for near real-time agricultural information

- ✓ Sentinel 2 based **crop specific indicators** for plant vigour, senescence onset, moisture stress, photosynthetic activity
- ✓ RSA **national coverage**, with international expansion & interest
- ✓ **Scalable reporting** from individual field, to farm or region
- ✓ **Weekly reporting**, 24 hr turn-around from image acquisition

GEOFARMER: A B2B service (not business-to-farmer)

- ✓ Agriculture business **decision support to farmers** (fertiliser>>seed>>insurance)
- ✓ **Agriculture business intelligence**: crop growth & production monitoring, financial risk assessment & insurance, food security planning
- ✓ **API** direct client data ingestion or **weekly pdf reporting**



NEW DEVELOPMENTS: Urban & Settlement Monitoring

- ✓ **Monthly monitoring** & reporting on national urban change
- ✓ **New level** of populated area change monitoring detail
- ✓ ID **where change** has taken place and,
- ✓ Classify **what change** in terms of Land Use
- ✓ **Web-accessible service** for non-GIS users or API direct client GIS data access

NEW DEVELOPMENTS

What *type* of changes are identified ?

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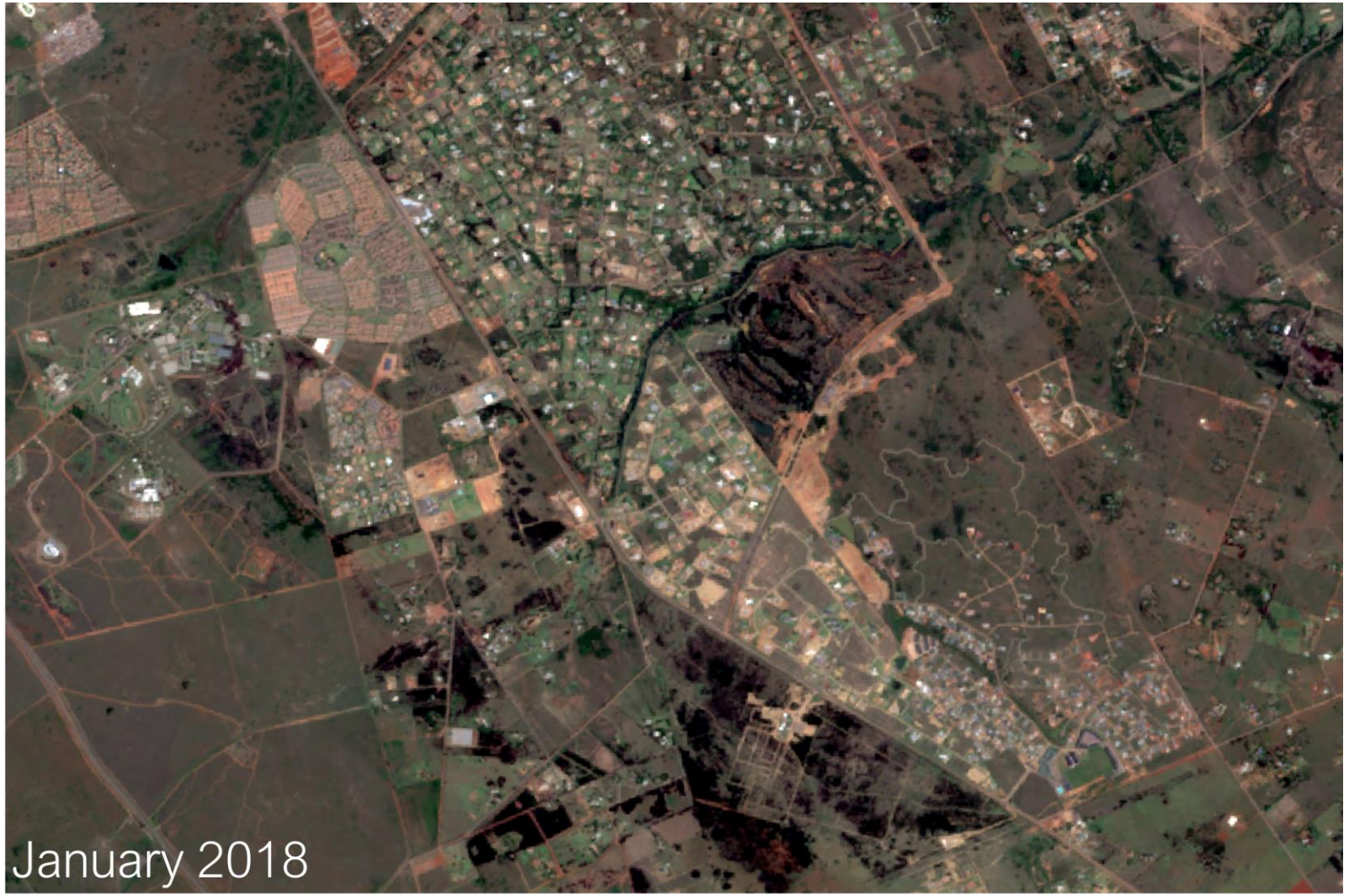

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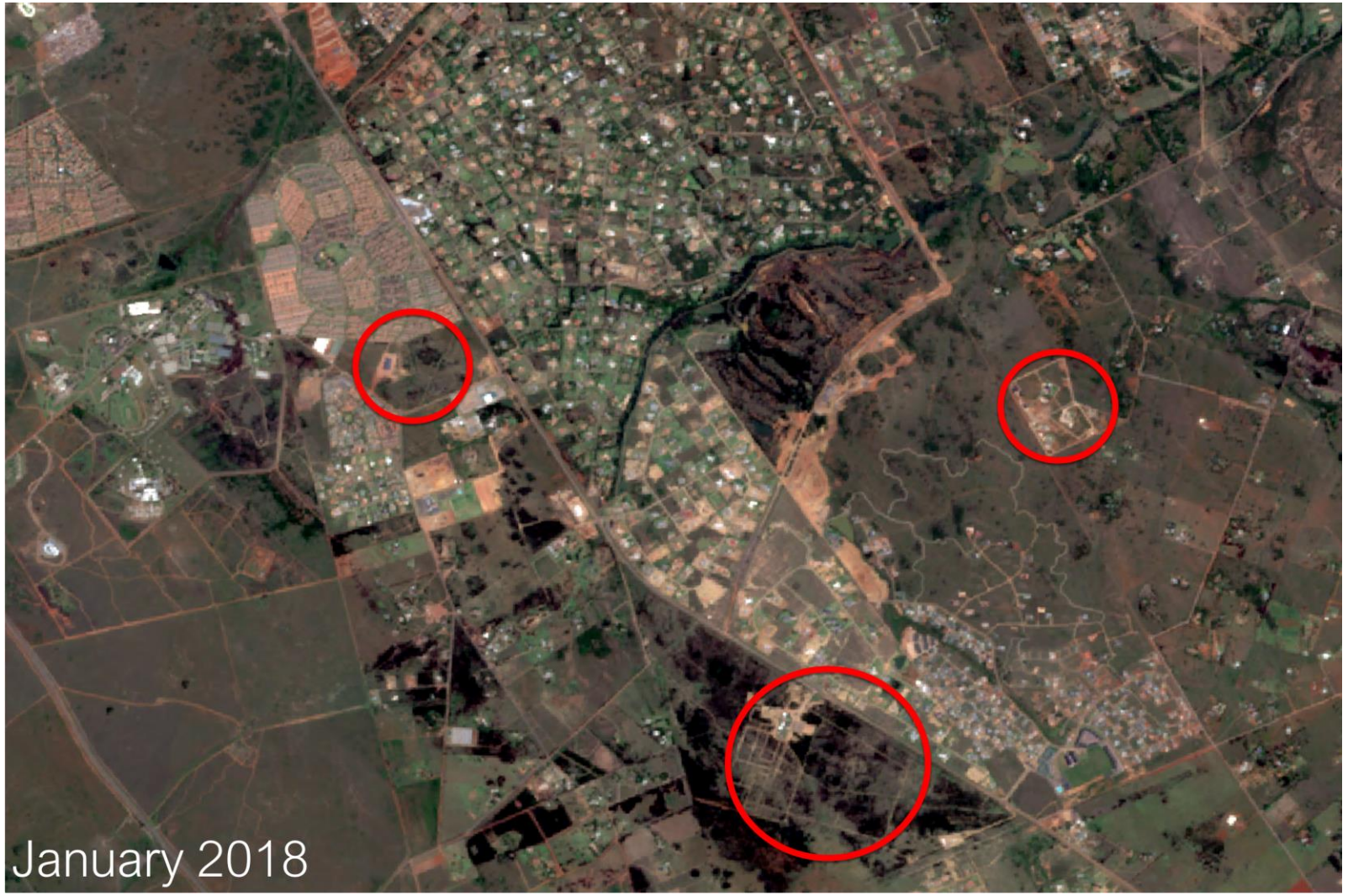

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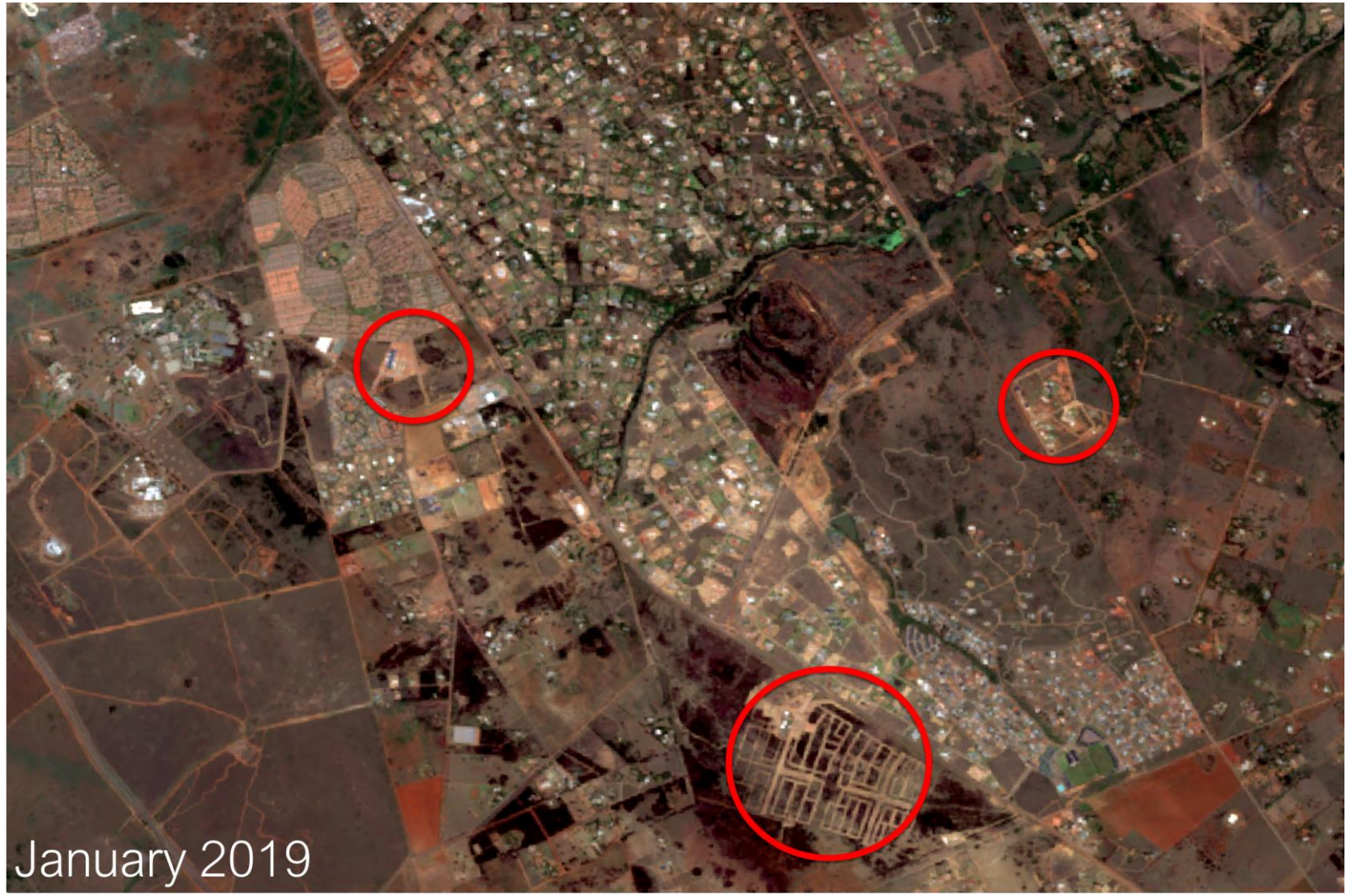

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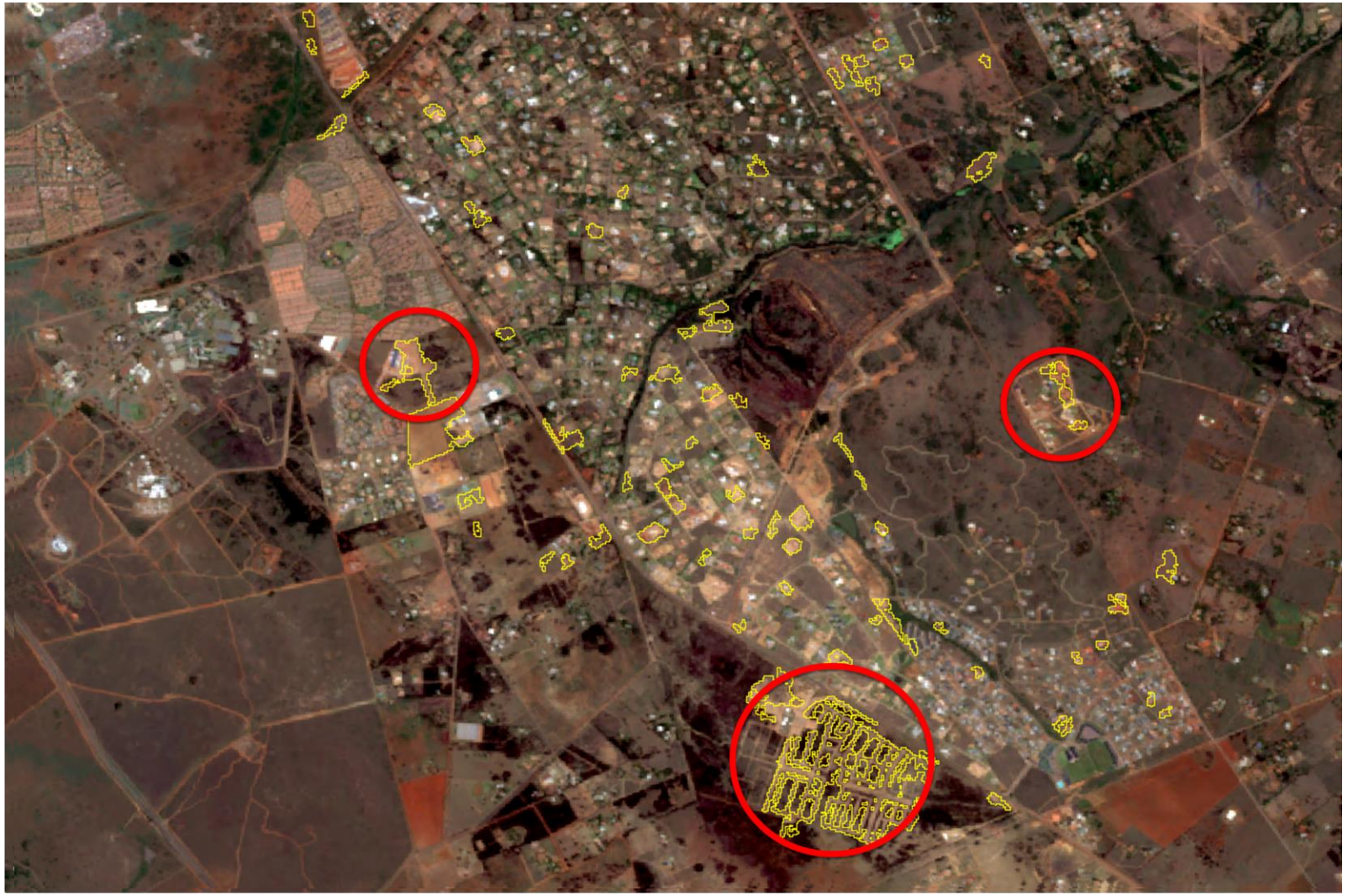

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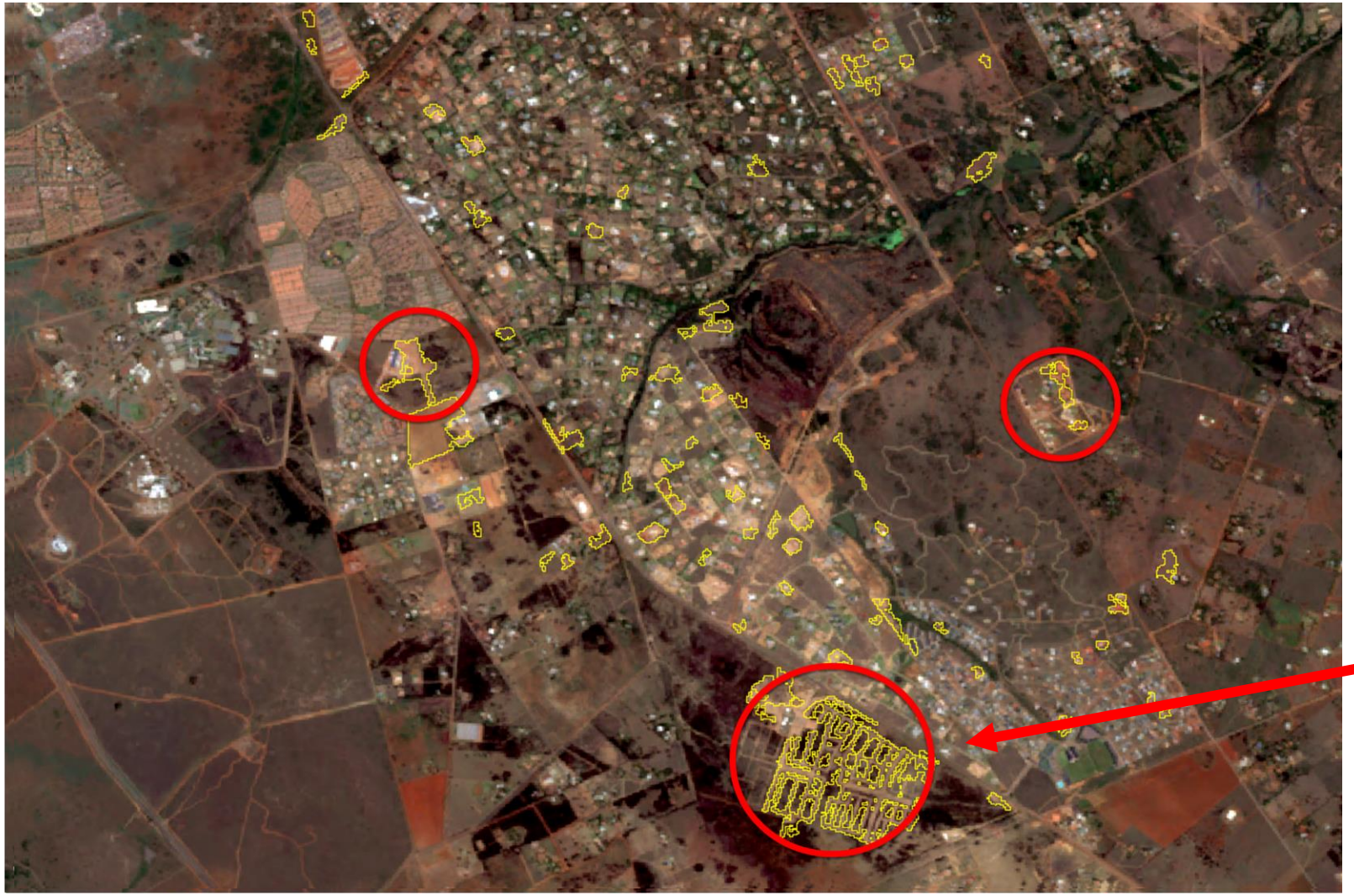

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Each change feature is classified using its recent change history, existing land-use data and rule-based decision tree classifiers to determine most likely new land-use, i.e. **township development**.

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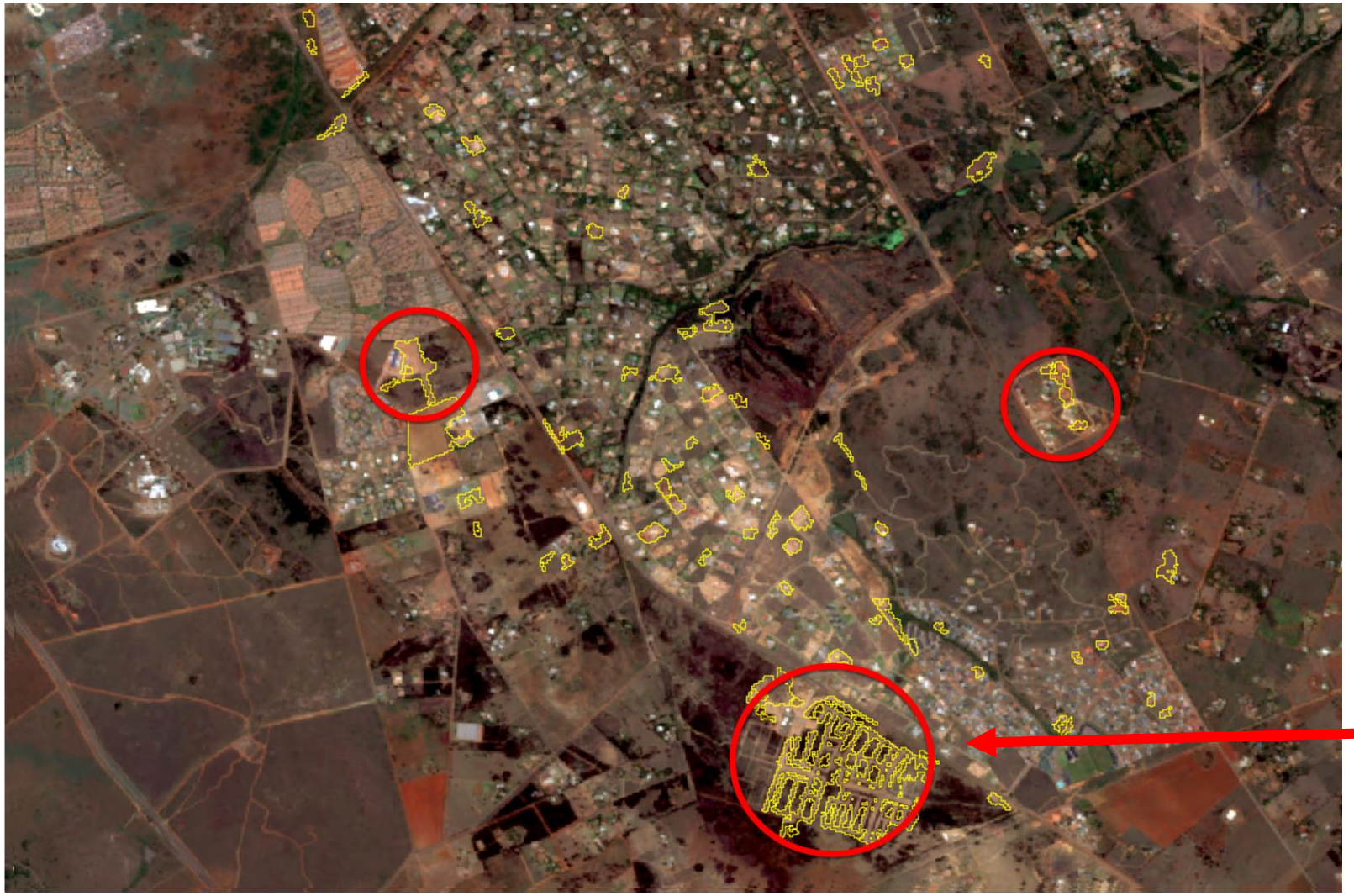

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> 40 possible land-use changes can be identified.

Advancing change detection to the next level:

MARKET DATA VALUE LEVEL 1:

Change Identified

Decision Rules

Advancing change detection to the next level:

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MARKET INTELLIGENCE VALUE LEVEL 3:

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APPLICABLE TO MULTIPLE INDUSTRIES AND MARKETS

- Institutions
- Agriculture
- Forestry
- Conservation
- Mining
- Transport
- Utilities
- Residential
- Village
- Commercial

MZANSI AMANZI: National Water Monitoring Service

- ✓ **Monthly monitoring** of national surface water resources
- ✓ **Operationally transferable** outside of RSA (SADC, Australia)
- ✓ **Sentinel 2** based ID of all water features > 0.25 Ha
- ✓ Determines surface water **area**, and can do **volumes**
- ✓ Time-series **trend analysis** and reporting.
- ✓ **Web-accessible service** for non-GIS users.

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IN CONCLUSION:

- ✓ EO technologies are **not limited to just spatial mapping**
- ✓ EO technologies can now be the **basis for real intelligence support** to planning and management focussed decision making
- ✓ If your **not utilising** or planning to use these new technological opportunities, **you've missed the boat** in terms of global competitiveness

THANK YOU!

Mark Thompson

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