ORBICA

LOCATION.
DATA.
CONNECTIVITY.

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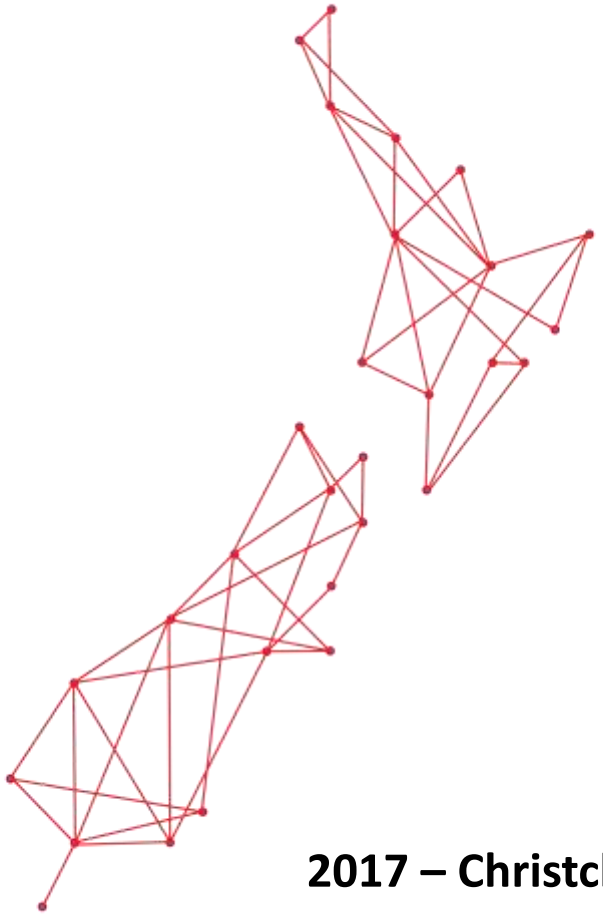
GeoAI: The Future of Feature Extraction and Classification

8th GeoIT Wherecamp Conference
Berlin (24 October 2018)

ORBICA.WORLD

ORBICA IS A PROGRESSIVE LOCATION INTELLIGENCE PROVIDER



2017 – Christchurch NZ

2018 – Berlin DE

MEET THE ORBICANS

KURT JANSSEN
CEO & Founder

NEAL JOHNSTON
Location Data Specialist

ANTONIN CAEN
Geospatial Architect

BANIKA SIROHI
Full-stack Developer

FAISAL ABBAS
Geospatial Craftsman

LOUISA TAYLOR
Chief Operating Officer

JUSTIN FAIL
Location Data Specialist

PETER ROSE
Director (Europe)

SUNNY SUN
Geospatial Developer

PHIL CLUNIES-ROSS
Freshwater Scientist

SANTOSH SESHADRI
Geospatial Innovator

LAURA WINDERS
PA/team support

RIMU BODDY
Full-stack Developer

BRIDGET EDWARDS
Chief Financial Officer

ANDY HOLT
Location Data Specialist

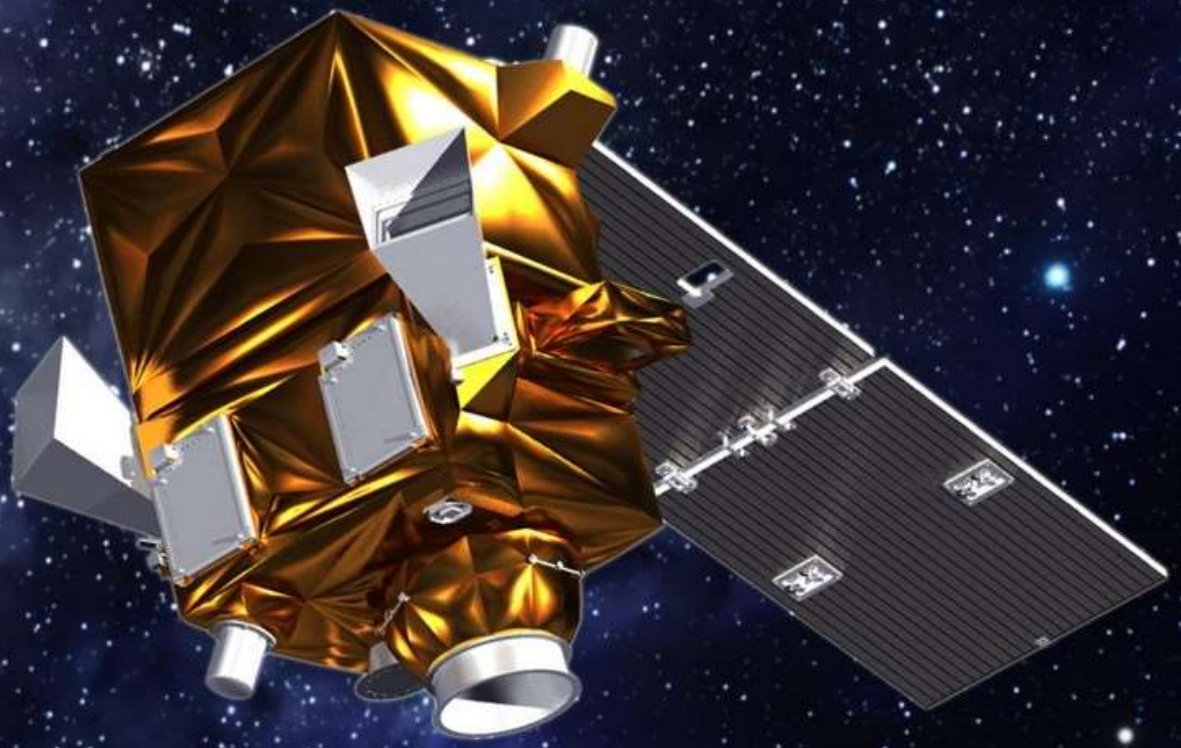
WILL JONES
Location Data Specialist

SAGAR SONI
Data Scientist (AI)

ROB PARSONS
Geospatialist

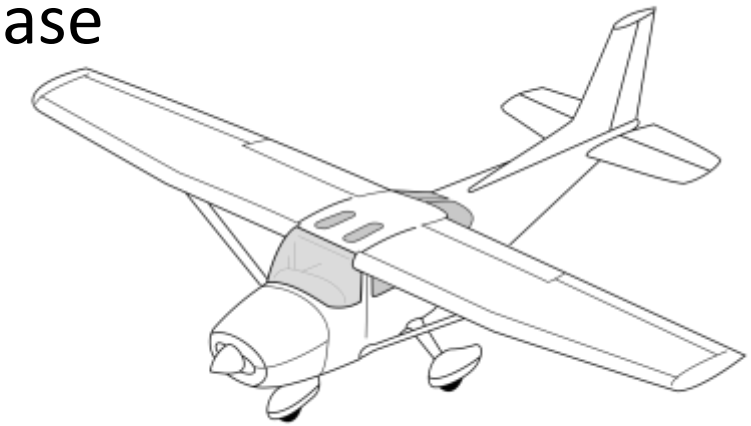
VANESSA O'BRIEN
Communications Manager

THE EARTH OBSERVATION AGE IS HERE, AND IT'S CHANGING THE WAY WE LIVE



Earth observation data – BIG data - is increasing exponentially … and fast

- Optical Imaging: 327 satellites. 98% increase
- Radar imaging: 45 satellites. 32% increase
- Infrared imaging: 7 satellites. No change
- Meteorology: 64 satellites. 73% increase
- Earth Science: 60 satellites. 13% increase
- Electronic intelligence: 50 satellites. 6% increase
- 16 satellites with other purposes. 133% increase
- 51 satellites simply list EO as their purpose. 100% increase



620 in total (2017)

LESS THAN 1% OF EO DATA IS USED

https://www.pixalytics.com/eo-sats-in-space-2017/

Market identification

Change Detection

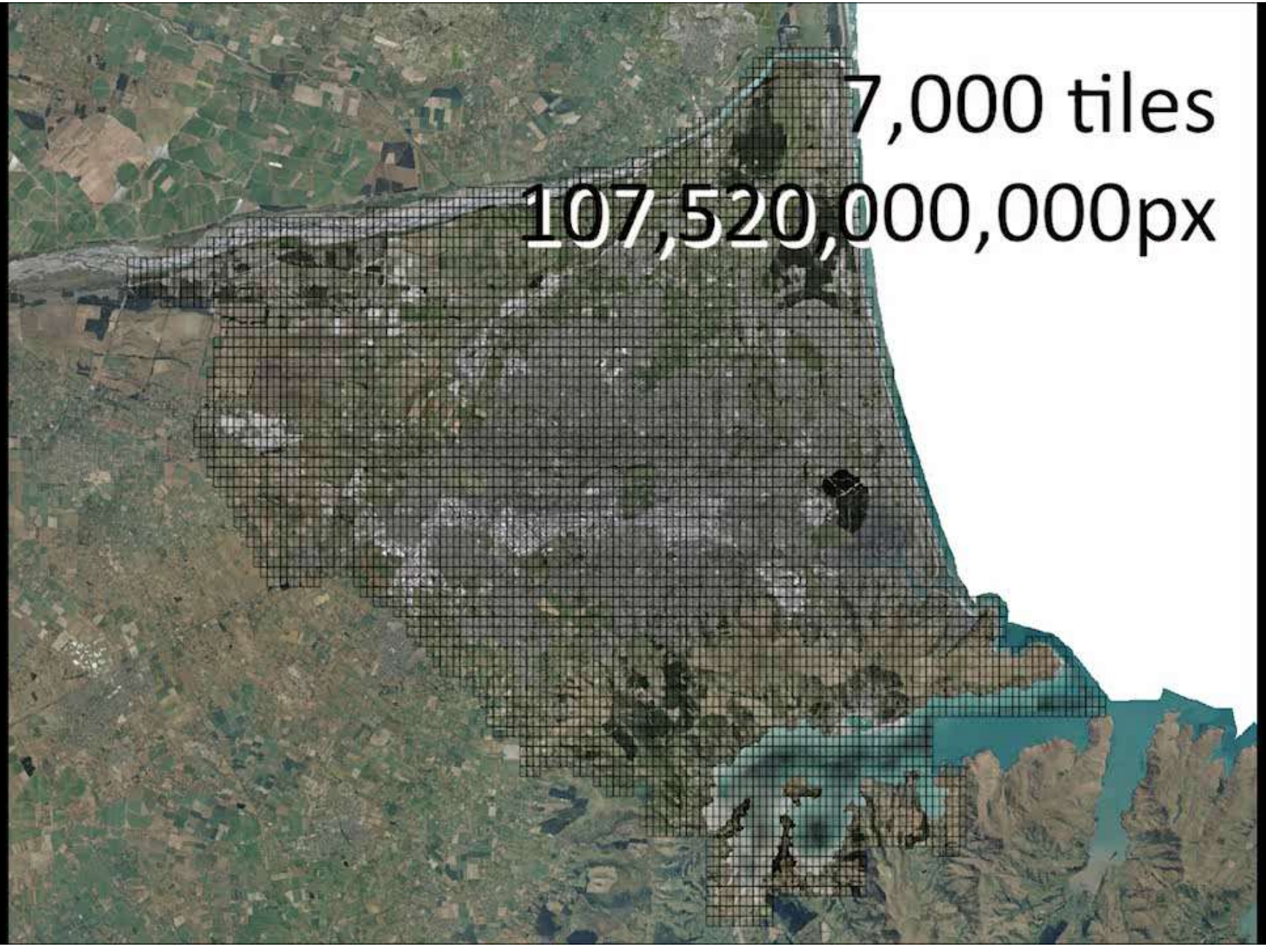
Environmental change

TRANSFORMING DATA INTO INSIGHT, IN NEAR REAL TIME, CREATES VALUE

Urban development

Construction progress reporting

Disaster management


7,000 tiles
107,520,000,000px

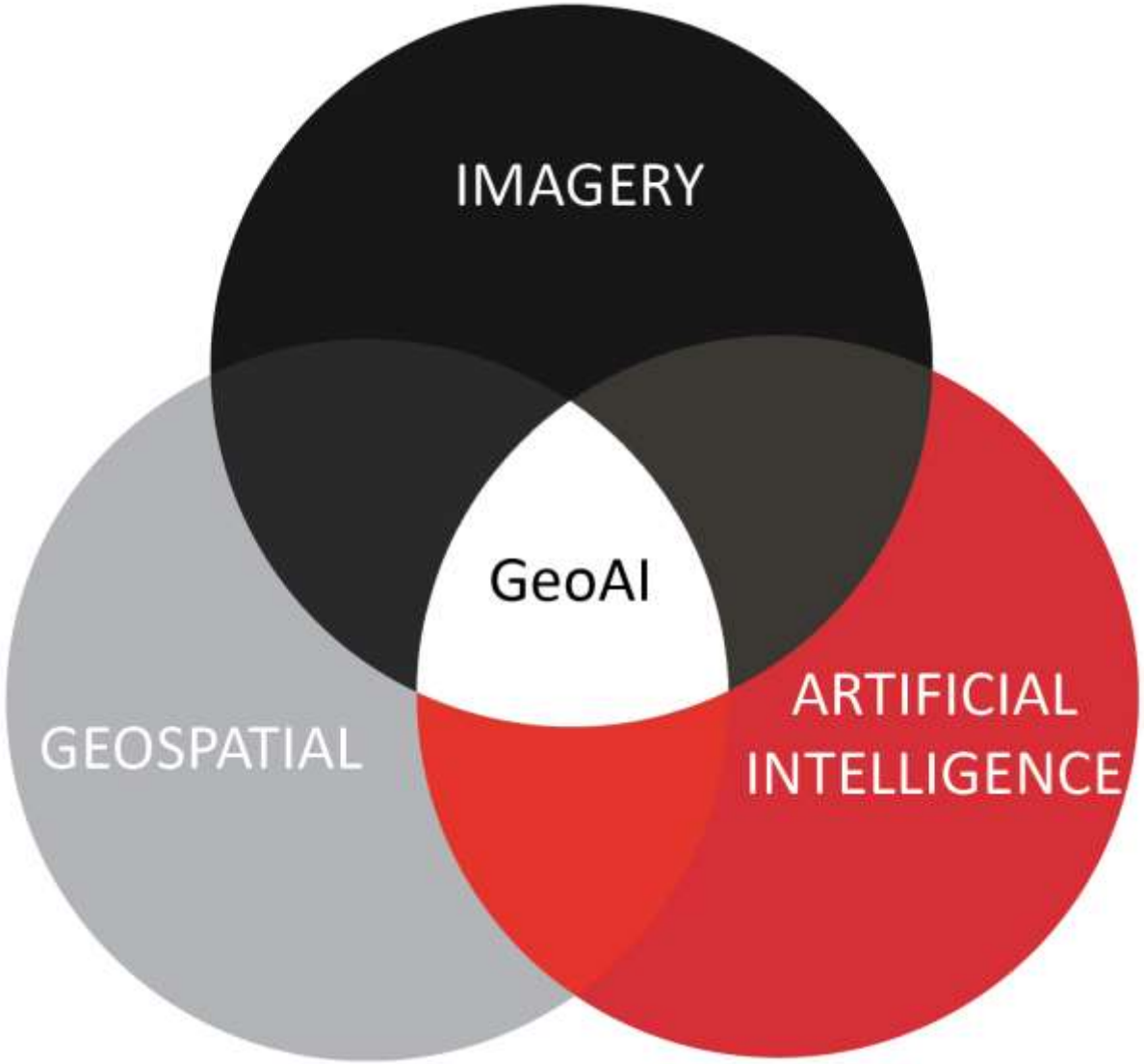
OLD METHOD

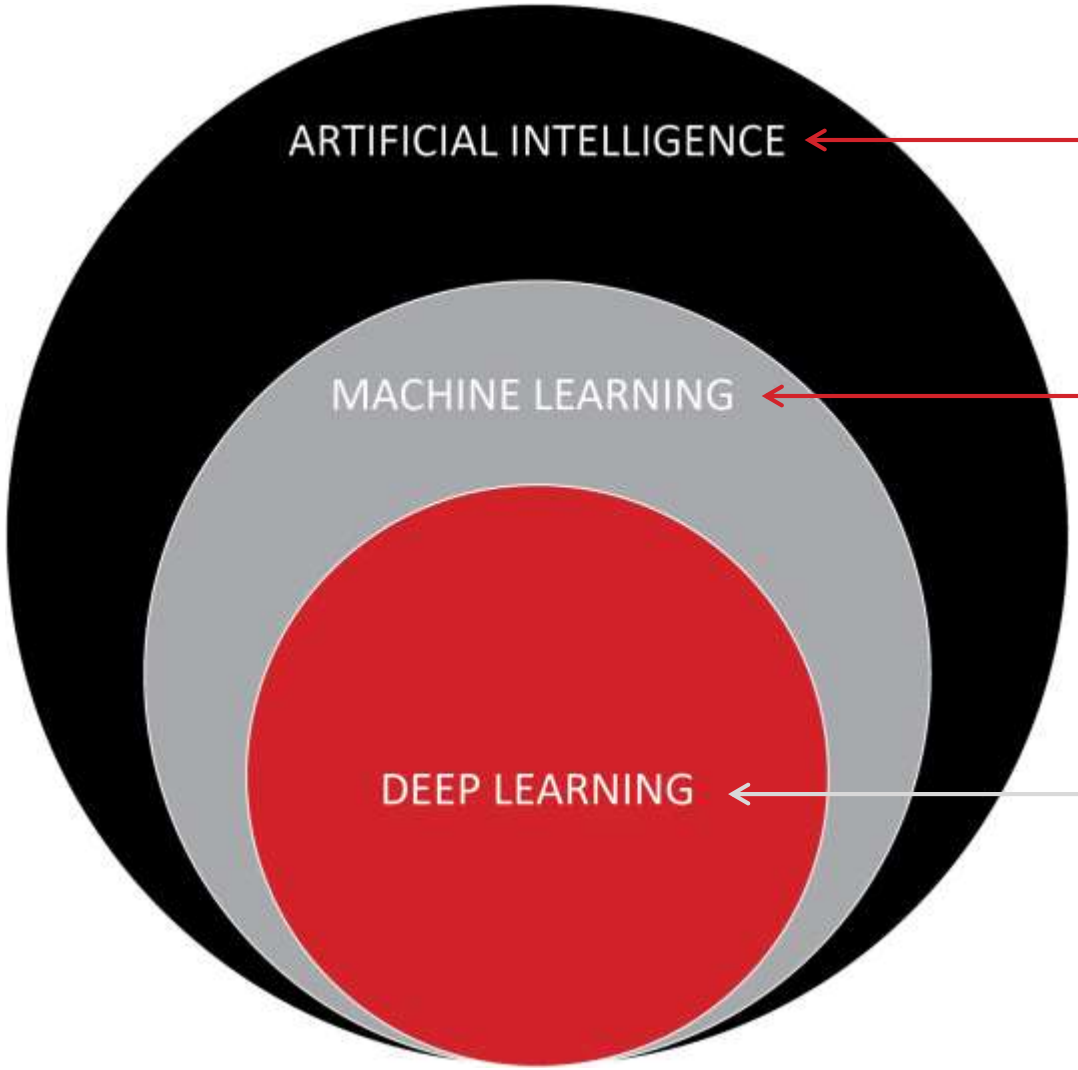
- Time consuming process
- Delayed results
- Human resource heavy
- Inaccurate
- Cost prohibitive

NEW METHOD

- Quick process
- Near real time results
- Automated
- Consistently accurate
- Scalable
- Cost effective

What is GeoAI?



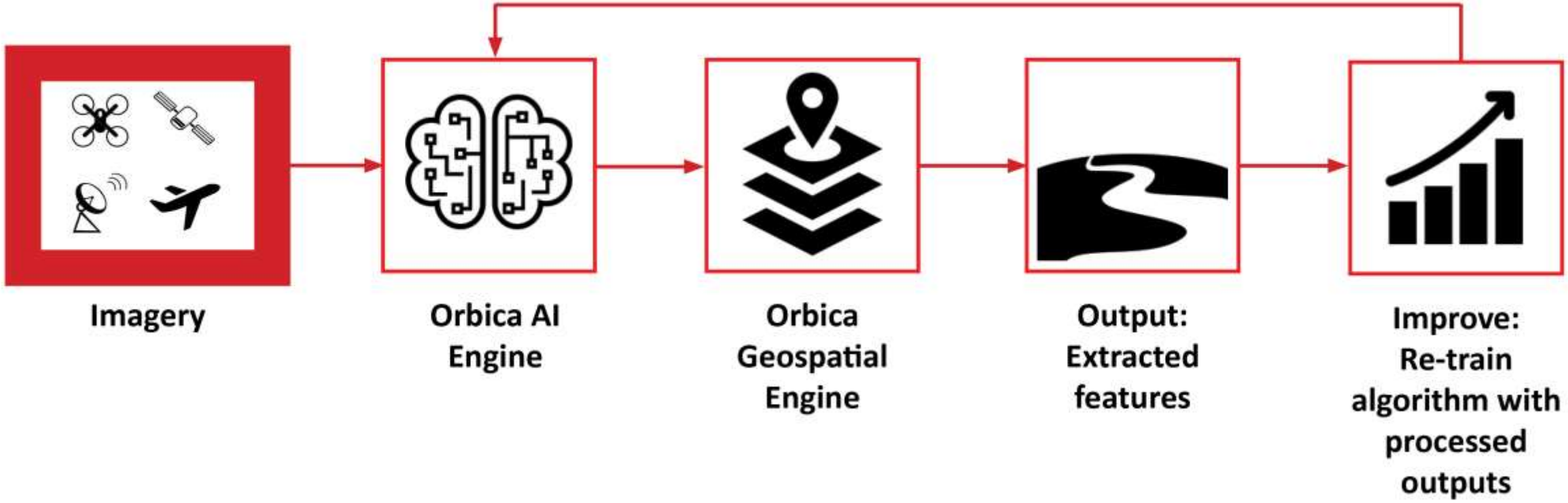


A programme that can sense, reason, act and adapt

Algorithms whose performance improve as they are exposed to more data over time

Subset of machine learning in which multi-layered neural networks learn from vast amounts of data

GeoAI- Orbica Engine



RESULTS – Building Extraction

- RGB (3 bands ONLY)
- 4,800 by 3,200 pixels
- 15 million individual pixels per image
- 7.5cm ground resolution
- Raw results displayed. No clean-up or Passover filters or geoprocessing operations have been applied.

INTERACTIVE DEMO

http://geo.orbica.world/AI

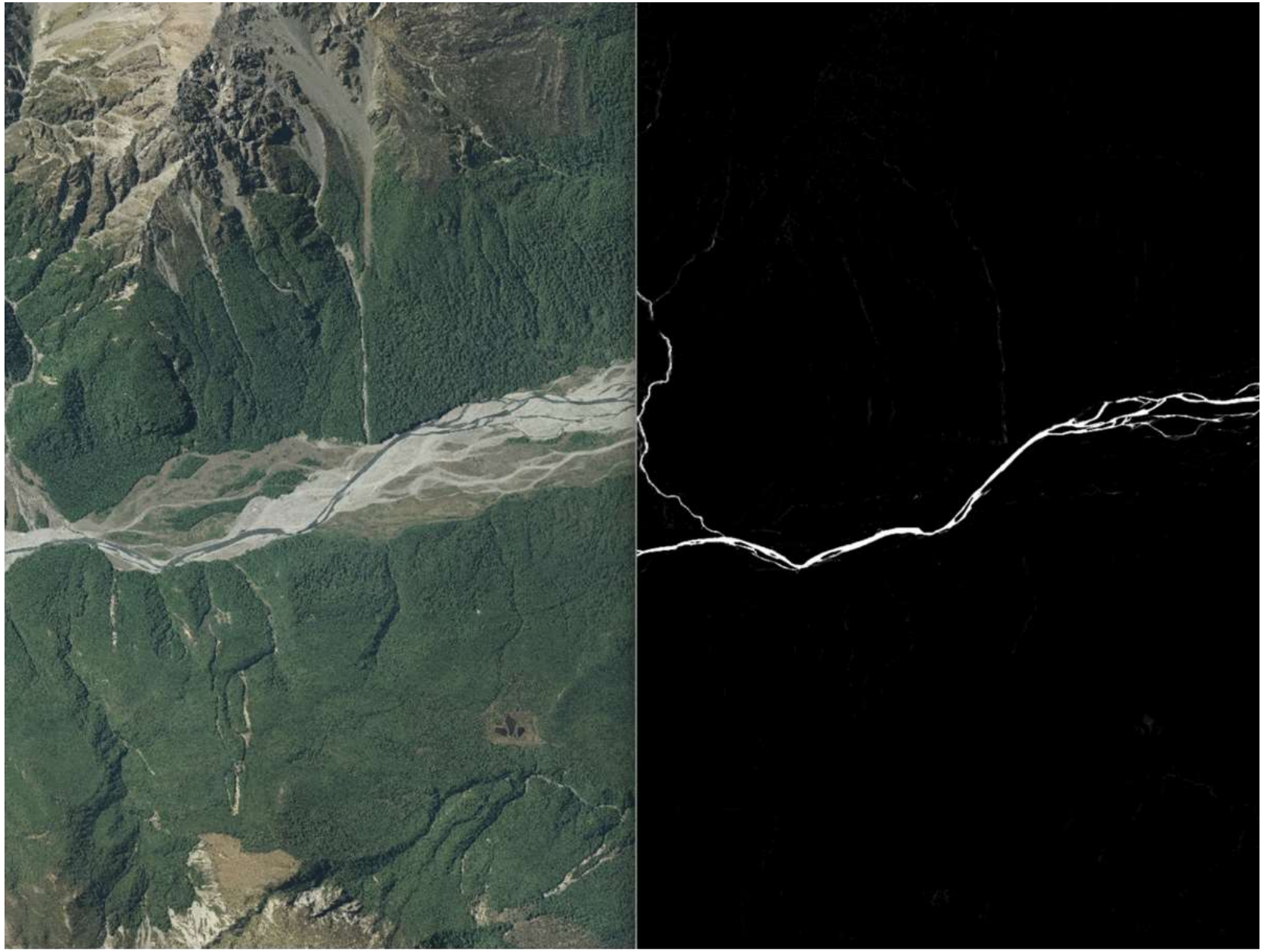
Example of Scale & Speed

Prediction Results

One billion, 350 million pixels in the Waimakariri transformed from data into buildings.

30min runtime on a 1080Ti

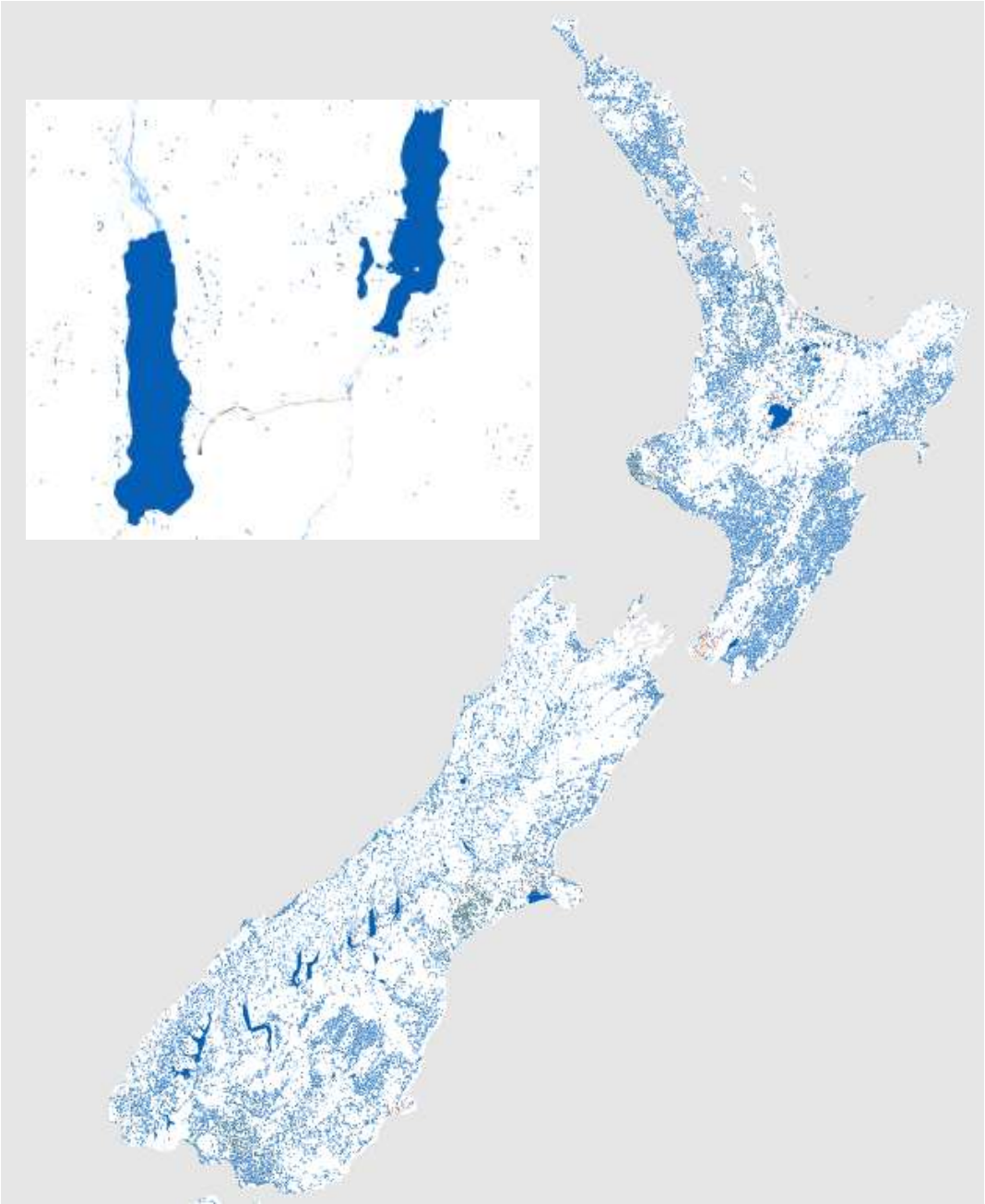
RESULTS – Water Extraction



- RGB (3 bands ONLY)
- 12,000 by 8,000 pixels
- 96 million individual pixels per image
- 30cm ground resolution
- Raw results displayed. No clean-up or Passover filters or geoprocessing operations have been applied.

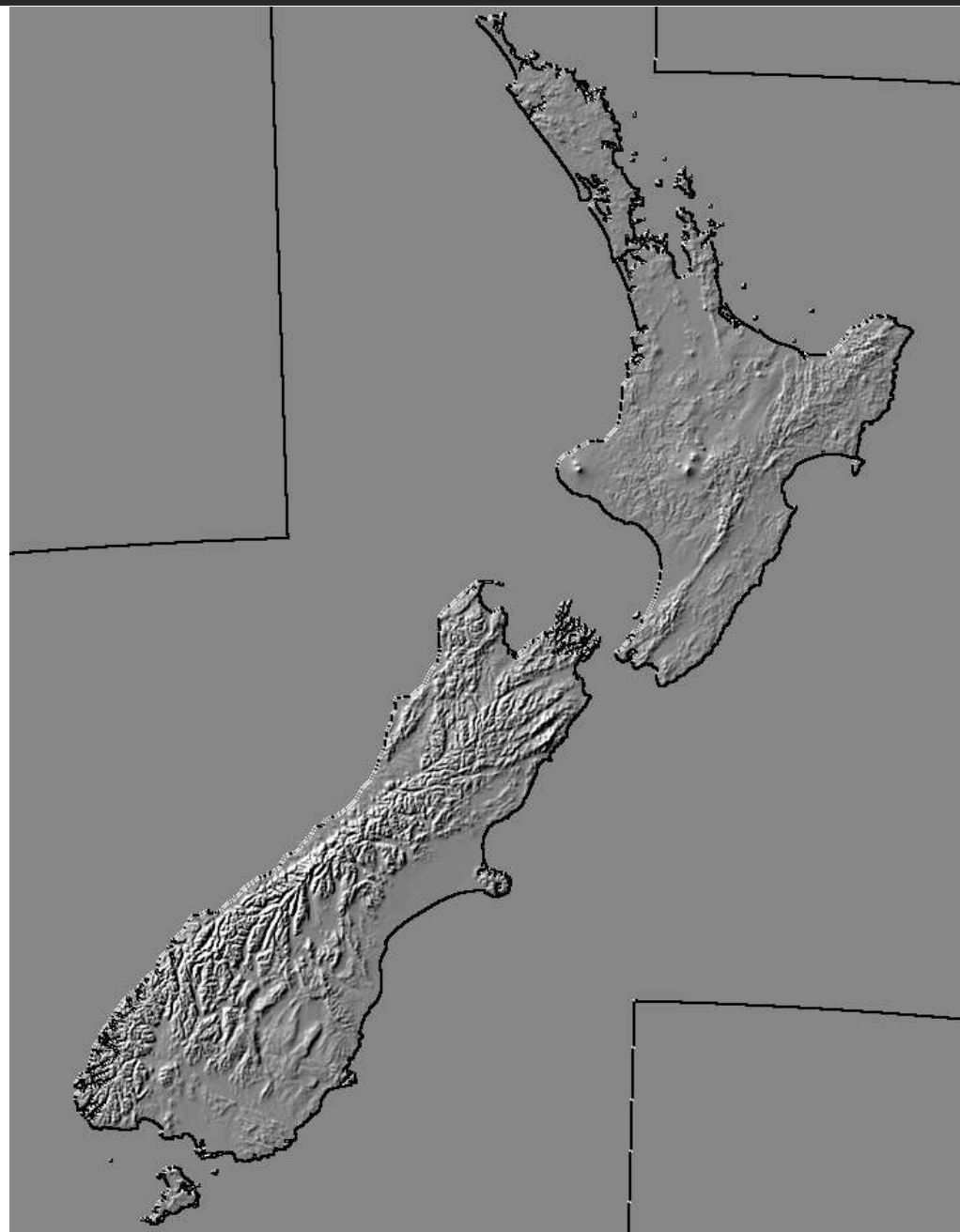
BEYOND RAW EXTRACTED DATA

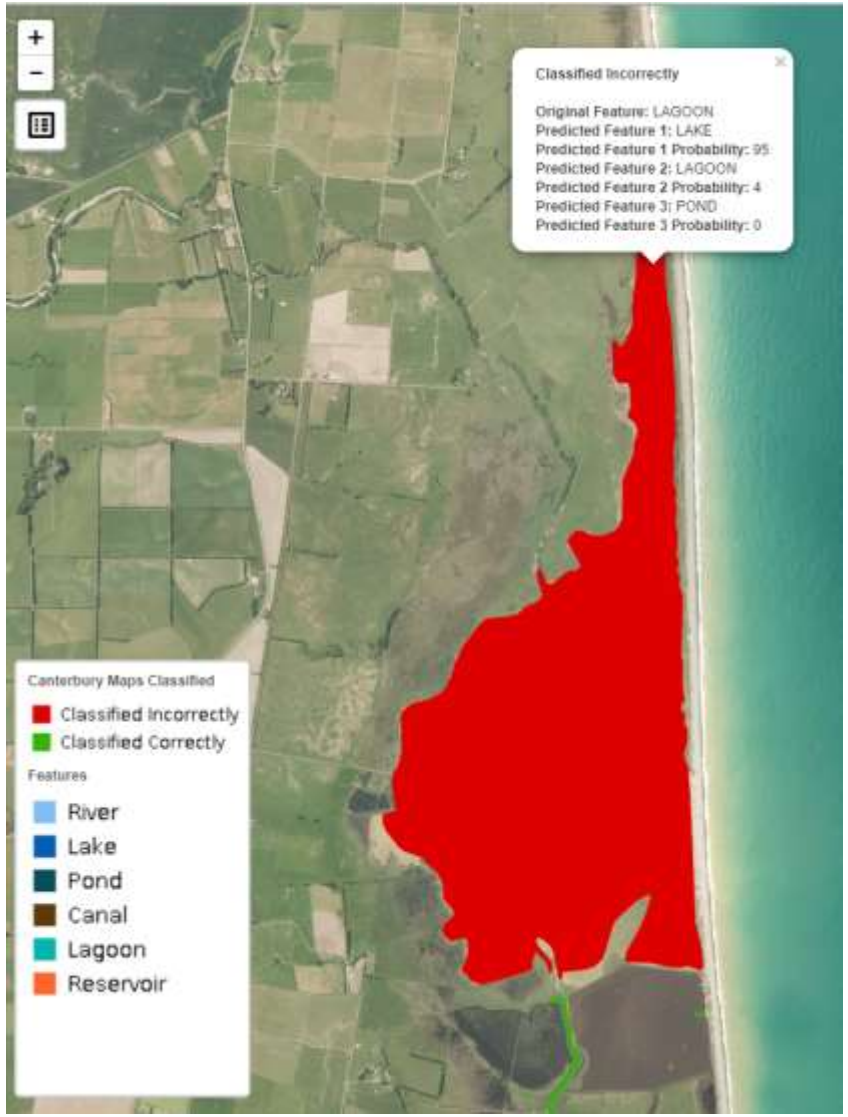
TRANSFORM LOCATION DATA INTO SOLUTIONS

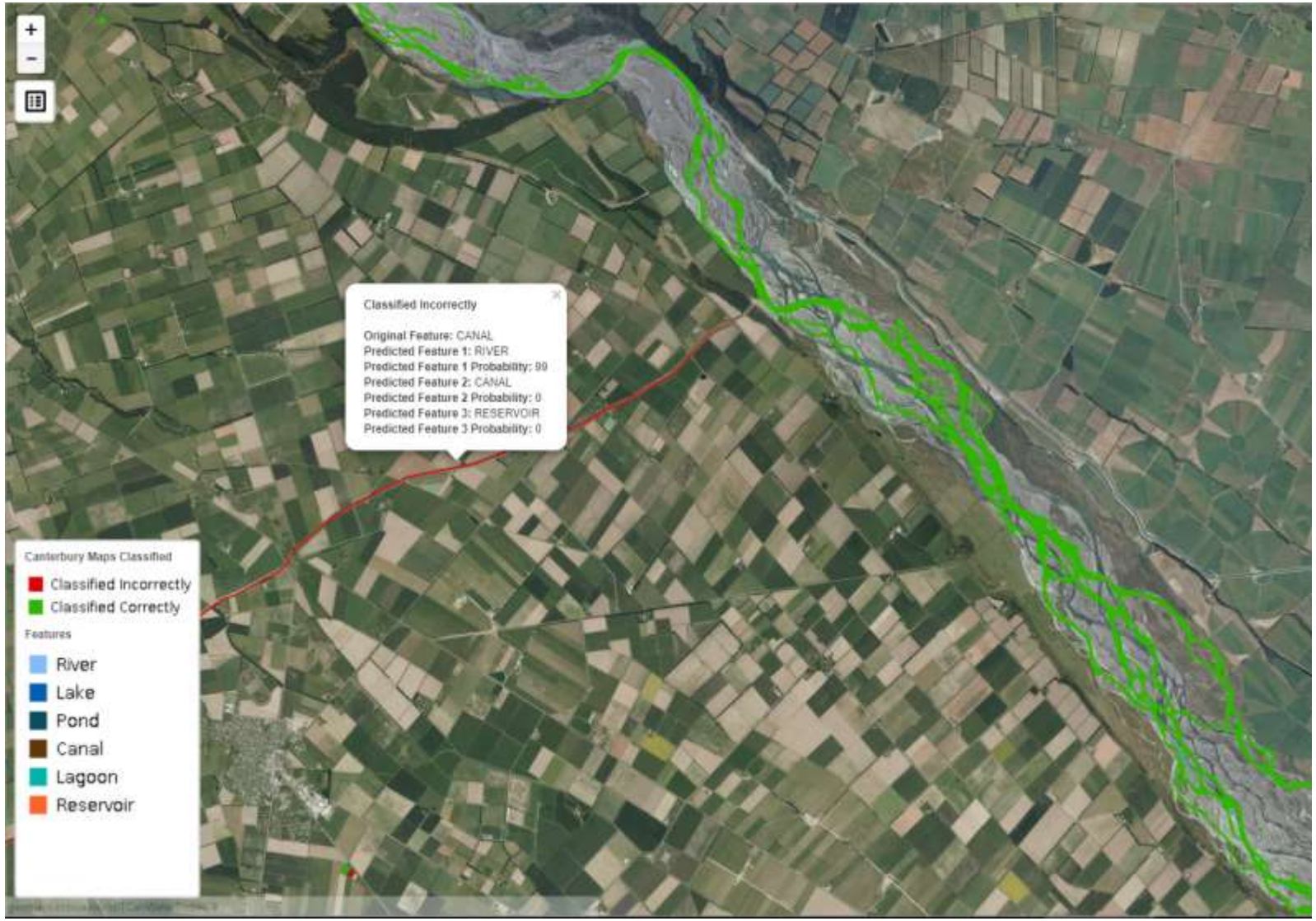


Feature Engineering

- Area
- Perimeter
- Elevation
- Area to length
- No. of vertices
- Avg. width







Testing Accuracy (Canterbury Maps)

95.82 % (5,896 / 6,153)

OTHER IDEAS

TRANSFORM LOCATION DATA INTO SOLUTIONS

Construction Site Monitoring

https://youtu.be/Xsjyu4sh2m4

DATA AGNOSTIC

- Data from any source – satellite, drone, aerial
- No vendor contracts

AS A SERVICE

- Near real-time results
- Instant feedback on results
- Ease of process

VALUE

- Extract value from existing data investments
- Flexible pricing models

GLOBAL

- Data from anywhere
- Algorithm trained to locale specifics
- Custom algorithms on request

THANK YOU FOR ATTENDING

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A FUTURE OF EXPERIENCE, INNOVATION AND CREATIVITY

Let the magic begin…