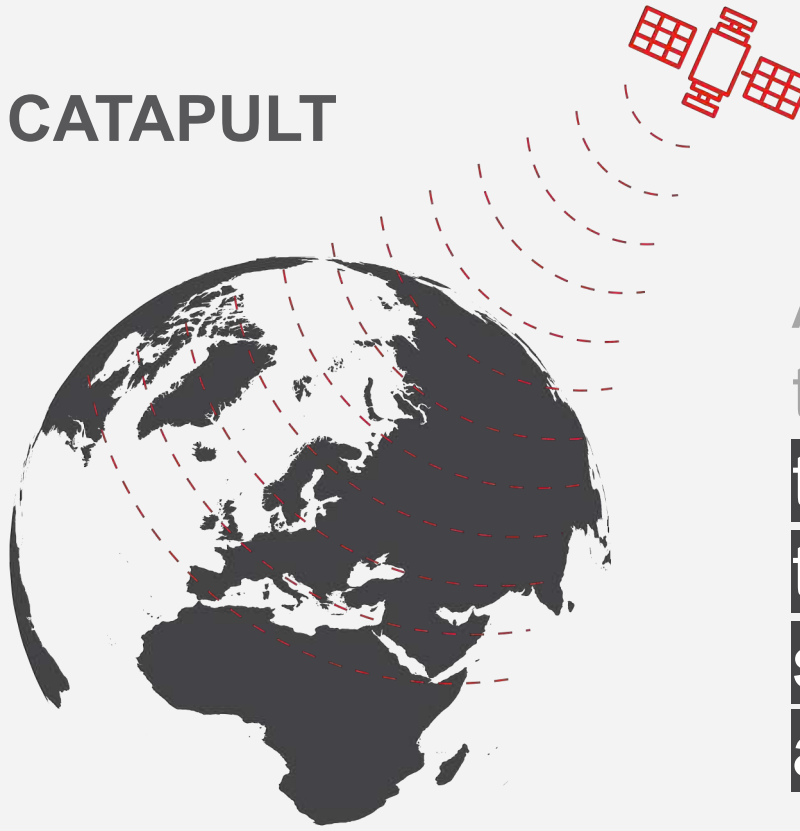




# Satellite Services – Feeding the Digital Twin

## SATELLITE APPLICATIONS CATAPULT

# Who are we?



An innovation and technology company transforming the way the world uses satellite technology and data.



### WE HELP ORGANISATIONS GROW THEIR BUSINESS

We help organisations to use satellite applications to grow their business in the UK and internationally.



### WE ARE INDEPENDENT

We bring together industry, researchers, end-users and government to explore and develop new ideas.



### WE ARE GOVERNMENT BACKED

We are partly-funded by the Government and work closely with Innovate UK, UK Space Agency, UK Science & Innovation Network, and other public bodies.

# Encouraging Growth in UK Space Sector - Globally

Combining the benefits of three space services

- **Positioning Navigation Timing (GPS / Galileo)**
- **Hybrid global Communications**
- **Remote Sensing – Optical, Radar, Thermal & Weather**

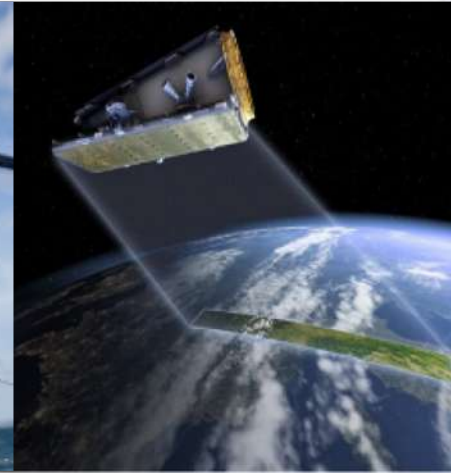
New Space “Cubesats”



Global Navigation  
Satellite Services  
(GNSS)



Satellite  
Communications



Earth  
Observation

- Supporting business in the use of space services & applications
- Transfer innovation between Space and non-space organisations
- Help space sector engage with markets

## STRATEGIC VISION – Focus Satellite Services on:



### INTELLIGENT TRANSPORT

Communicating with vehicles  
Positioning and location-  
based services  
Ships, planes, cars, trains -  
Autonomy



### SUSTAINABLE LIVING

Geospatial innovation  
and connectivity often in  
remote or underserved  
areas  
Agriculture, Forestry,  
Mining, Future Cities



### BLUE ECONOMY

Satellites “see” over the  
horizon and  
communicate around  
the planet.  
Fisheries, Offshore  
Energy, Shipping, Ports,  
Coastal Monitoring



### GOVERNMENT SERVICES

Early use cases for emergency  
services and health and  
geospatial systems across  
local government  
Environment Agencies, Health,  
Security

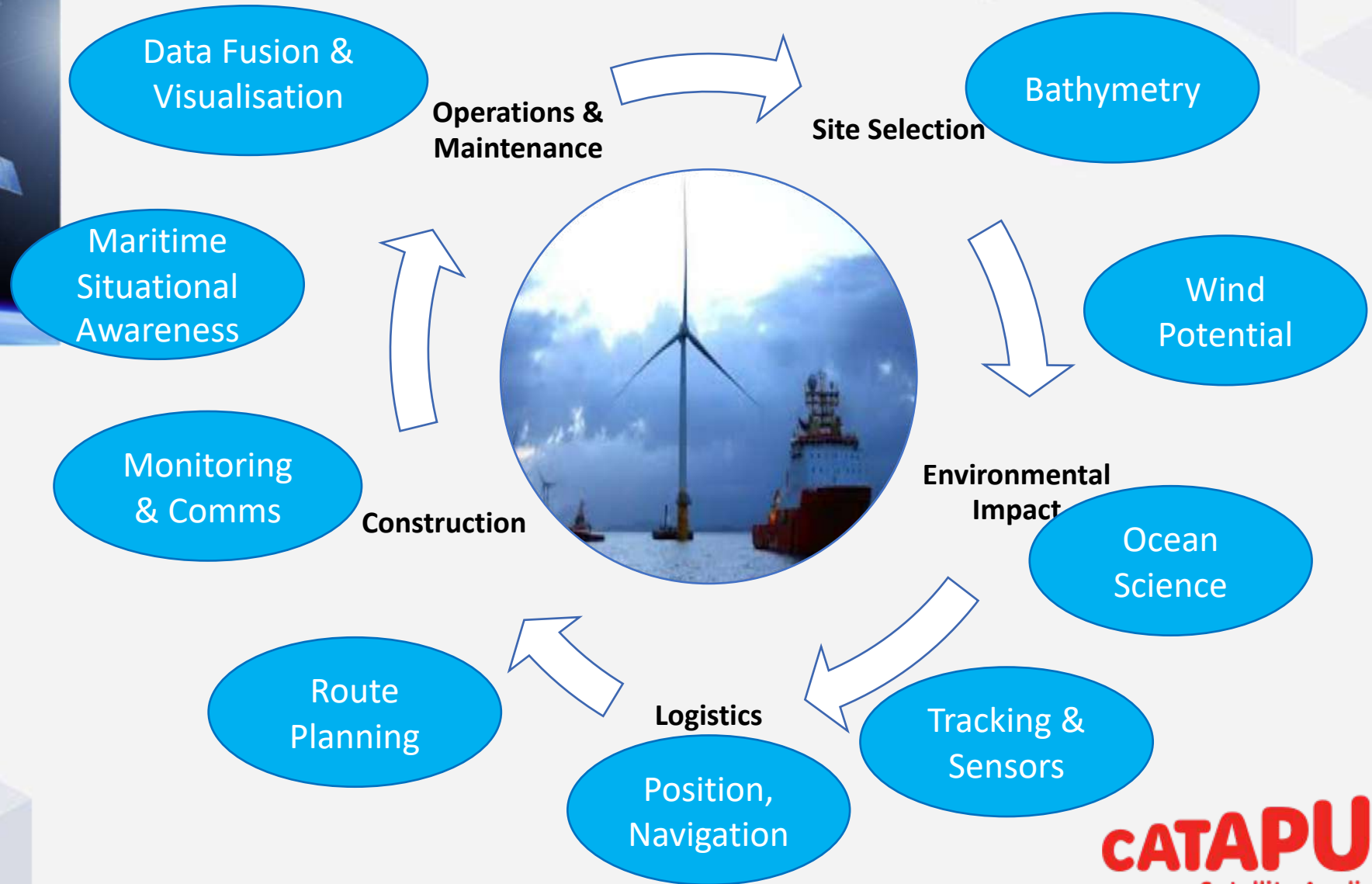


# Satellite Information – Throughout Offshore Project Lifecycle



**Extensive use of Satellites underpins majority of business activities**

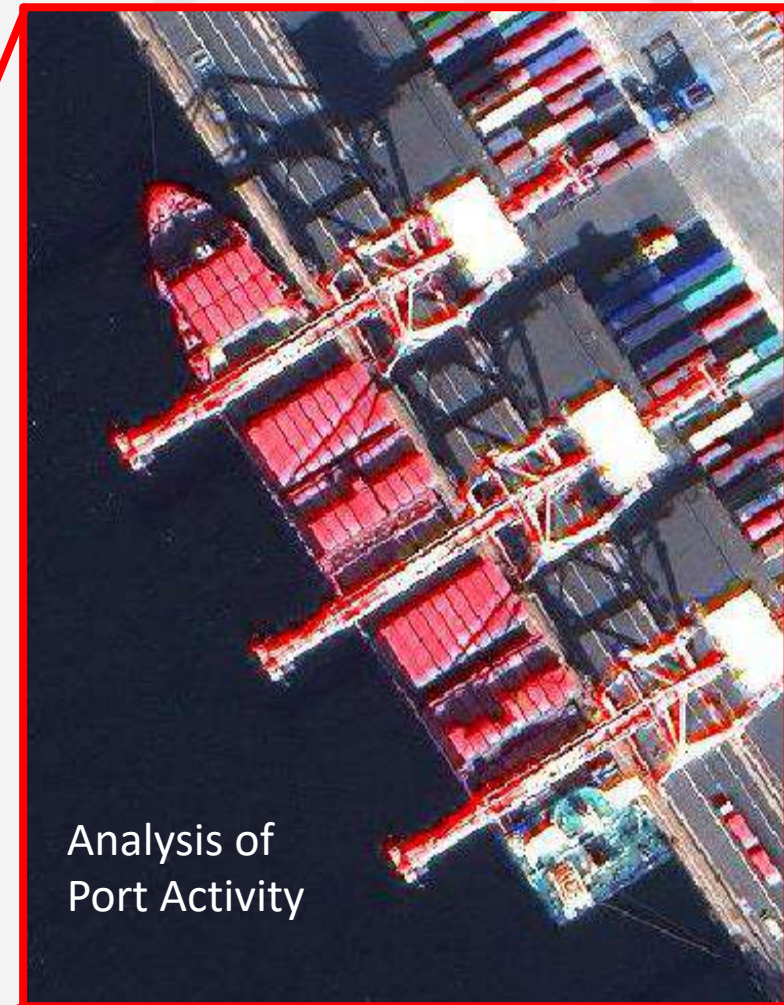
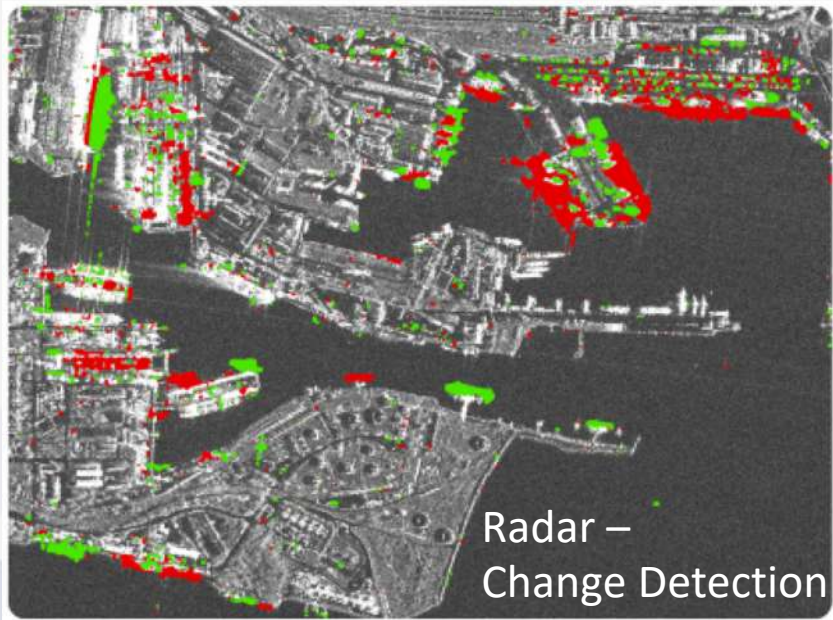
**Especially in remote locations**





# Examples of Earth Observation Satellite Data

Digital Optical and Radar data can be analysed using Artificial Intelligence





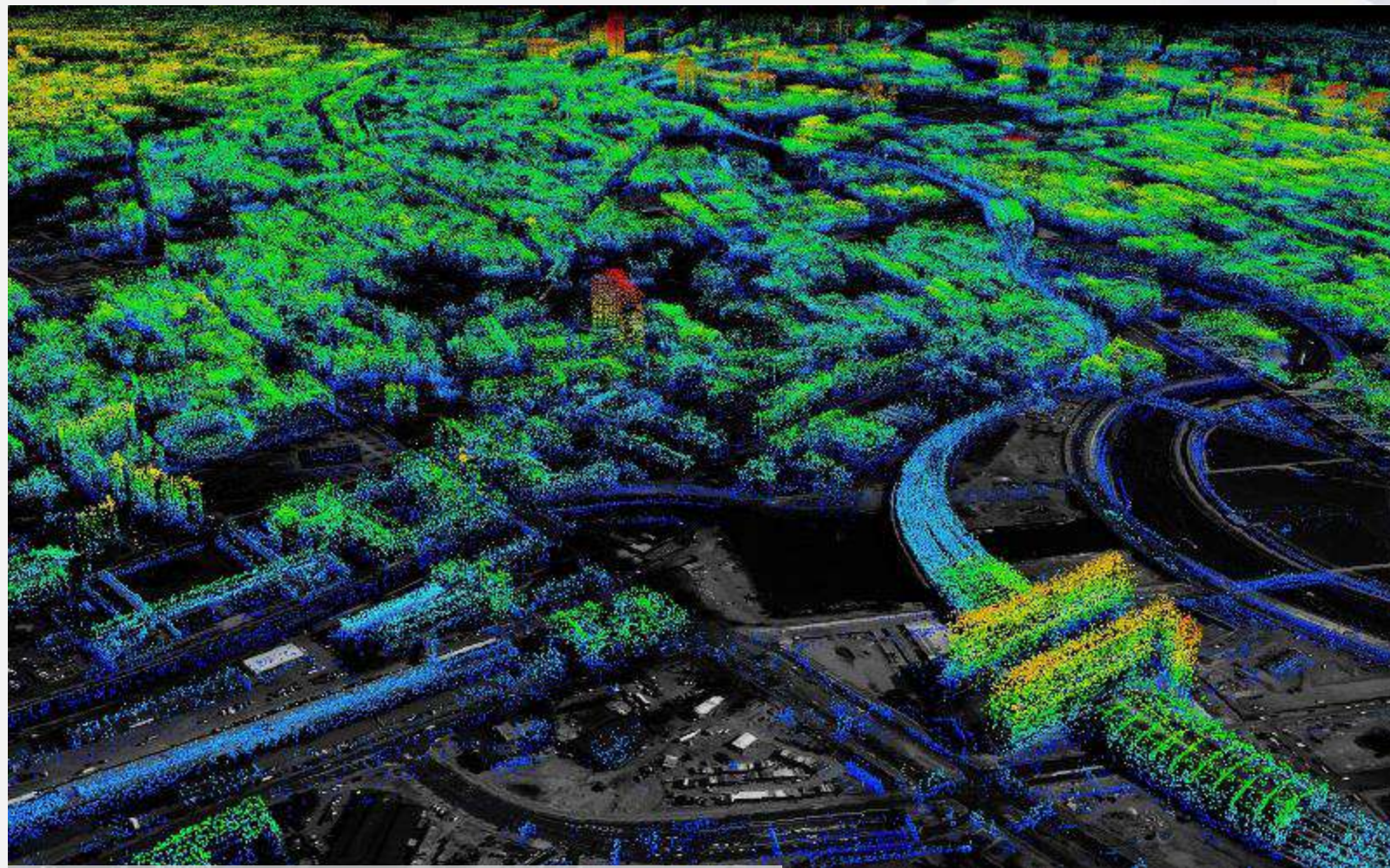
# High resolution Infrastructure Monitoring

## Synthetic Aperture Radar Interferometry (InSAR)

Multiple images over time create a point cloud

Colour difference (red) indicate Vertical movement (<cm)

Used with Building Information Modelling (BIM) system

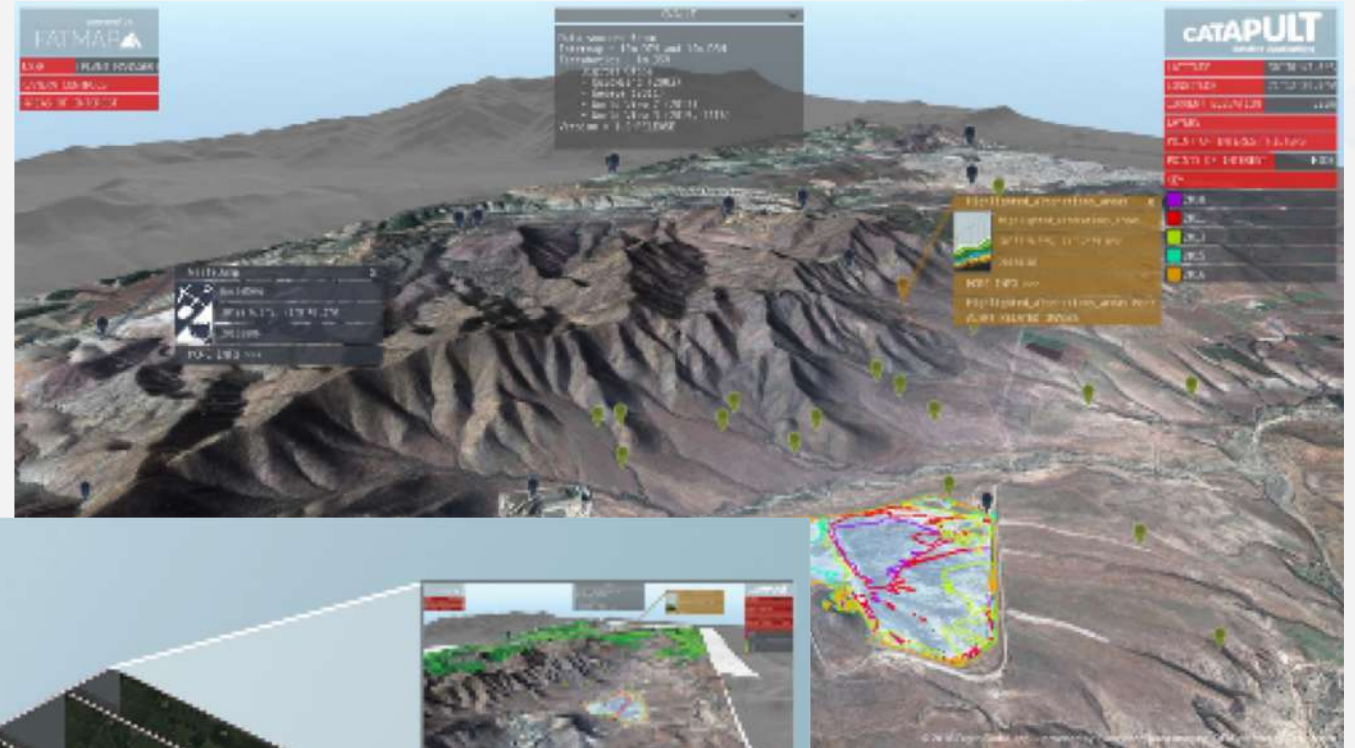


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# Examples Of Layered Satellite Data To Monitoring Open Cast Mining

- 3D Modelling of major assets
- Geospatial DataCube
- Machine learning for EO and geospatial data (e.g. Identify buildings)
- Future satellites – Improved temporal and spatial resolution
- Infrastructure monitoring



MH



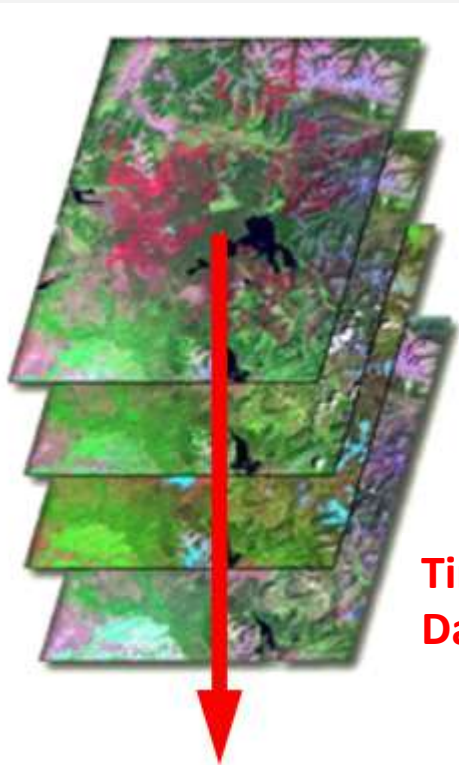
# Island Case Studies:

“Common Sensing project” – using shared EO data to support Civil Contingency Planning and Operations in Fiji, Vanuatu and the Solomon Islands

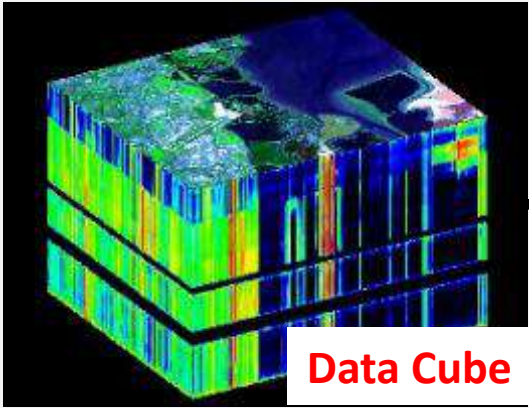


Fiji - Civil Contingency System

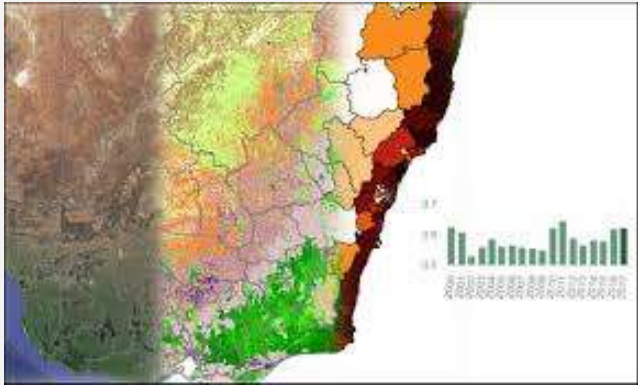
Monitoring and Measuring environmental parameters



Time Series Data



Data Cube



Analysis Ready Data For Decision Support



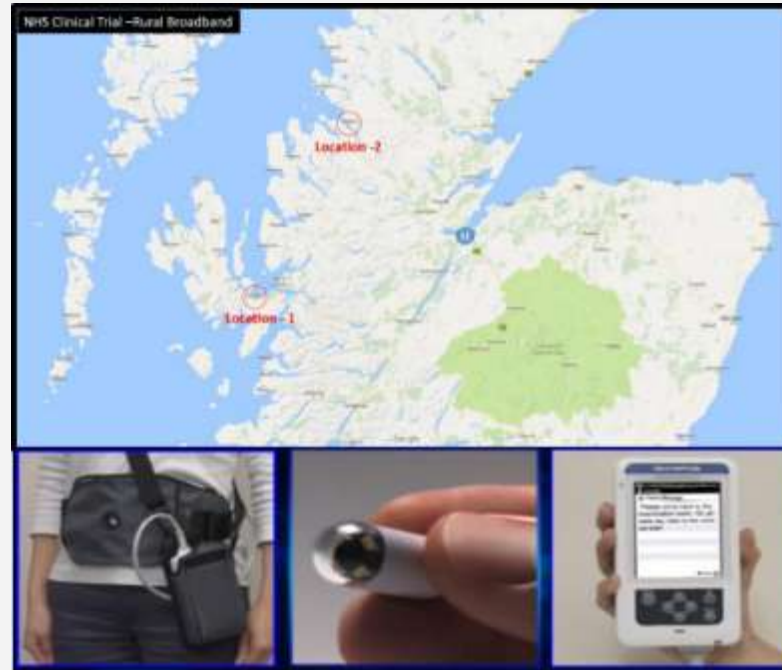
# Island Case Studies:

**“Scottish Islands Connected Health”** – Cost effective Satellite Communications reduces need for patients to travel for specialist consultations



Colonoscopy using a swallowed camera

Data transmitted to specialists by satellite



USB Dock

data

File upload  
200Mbs

Rural GP Practice

HTS

VPN

data

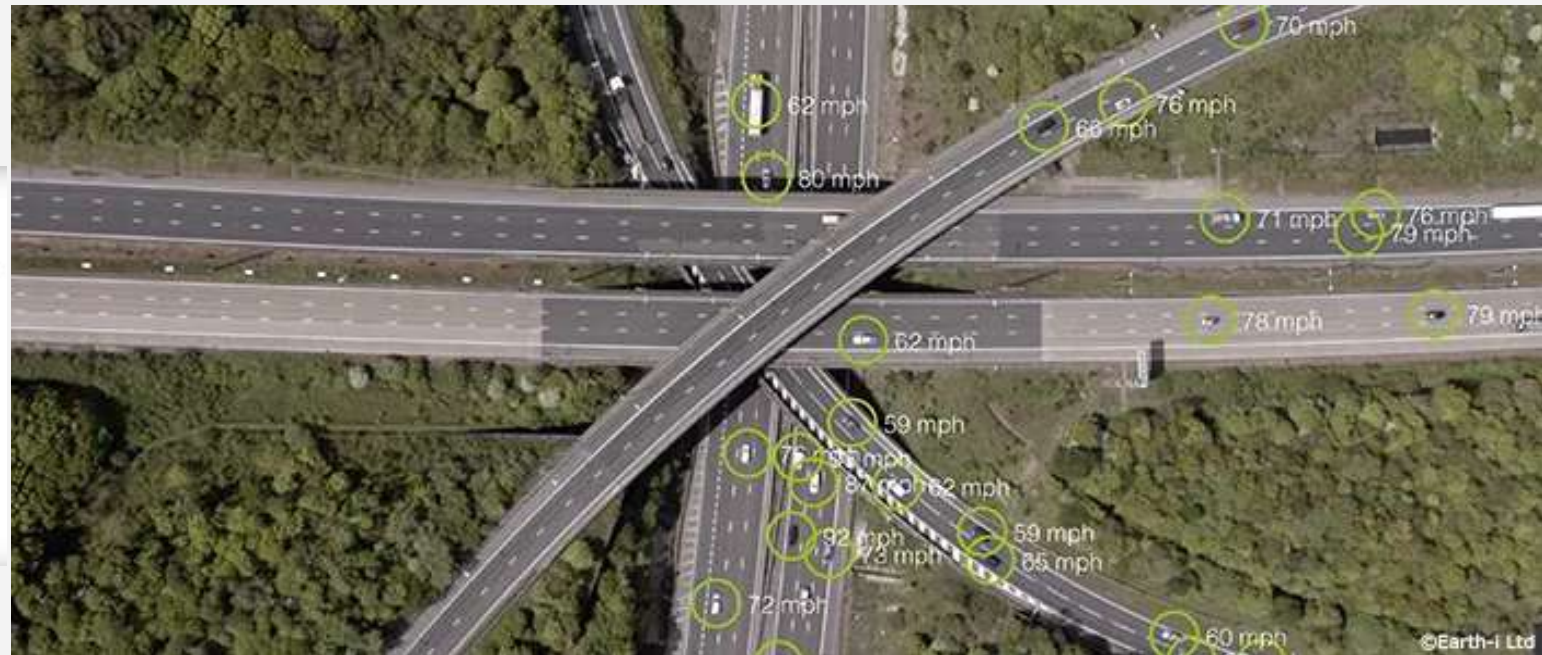
Result

Hospitals, Universities  
Diagnosis centre



# New Generation of Satellites:

- Video from Space
- Low Cost Satellites
- Ubiquitous Communications



Data for Digital Twin –

- Regular Updates
- Legacy Information

# Thank you





