



THERE'S MORE TO SEE

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Centre for
Space Science
Technology

WHY? THE OPPORTUNITY

New Space Age: commercialisation of space is leading to a flurry of innovations, enabling the launch of new products and services across a wide range of industries.

Many of New Zealand's researchers and regional industries are challenged to effectively use EO data.



CSST WHAT IS IT?

Private research institute whose focus is on scientific research with a strong emphasis on the transfer of research into new technologies, new firms, and new products and services.

Our purpose is to use Earth observation (EO) data to drive regional economic prosperity.



GOALS

Foster an innovative and competitive EO industry.

Focus on solving real problems important to New Zealand and Pacific regions.

Develop a skilled workforce that is equipped to deal with the engineering, commercial, legal and programmatic challenges associated with an advanced EO industry.



PROGRESS

Formed May 2017

Just completed
establishment phase

Developed Research
Plan

- Research Programme
- EO Data Platform
- EO Products/Services



RESEARCH PROGRAMME

Building a nucleus of high-quality researchers to do in-house research as well as partner with other institutions. Initial focus:

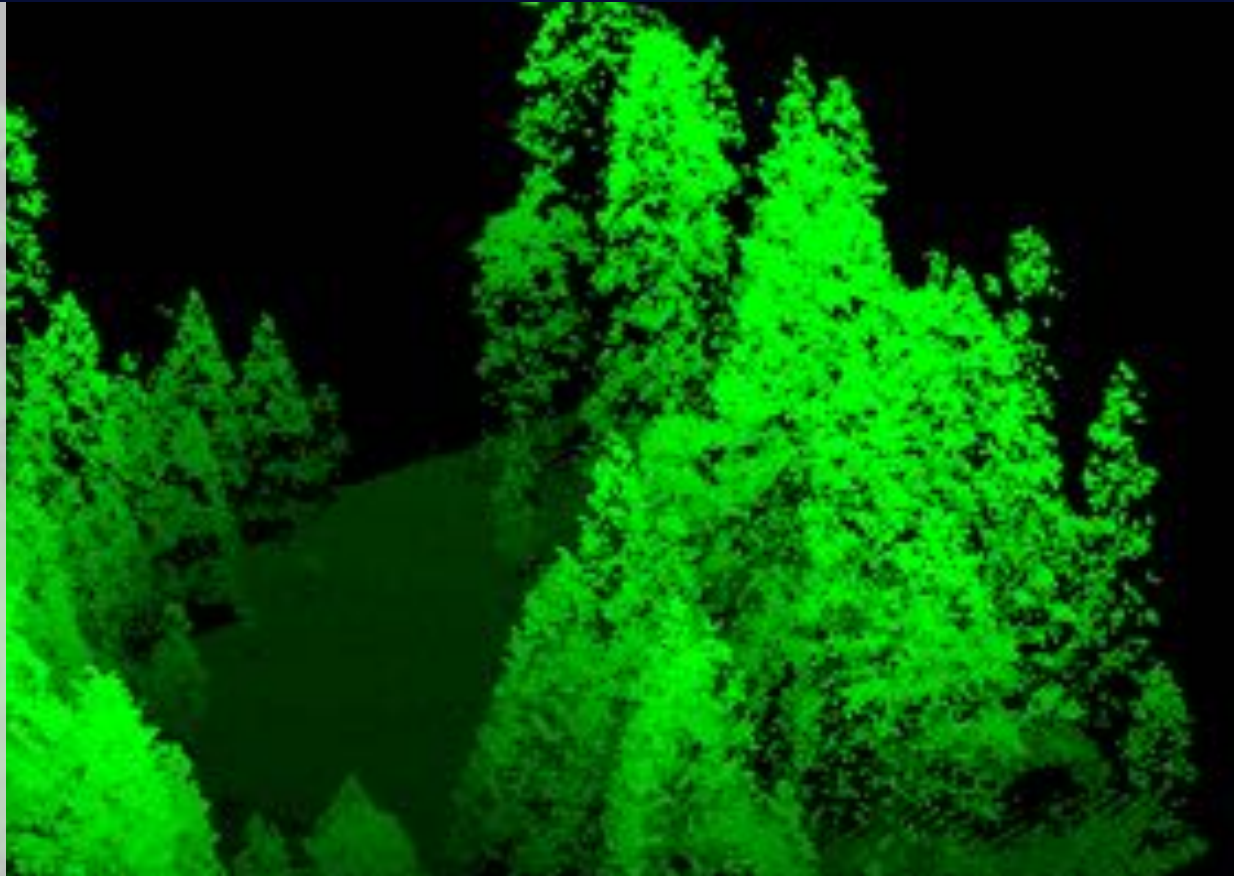
- Root-zone soil moisture measurement
- Algal bloom detection and water quality
- Machine vision for crop assessment



RESEARCH PROGRAMME

Apply cutting-edge machine learning and big data science techniques to conduct research beyond the scope of existing GIS solutions.

Forming an Advisory Panel with members from industry and the research community co-opted as needed based on their background and area of expertise.



EO DATA PLATFORM

Building capability to task, process and deliver imagery from a variety of suppliers & sensors for a number of applications including:

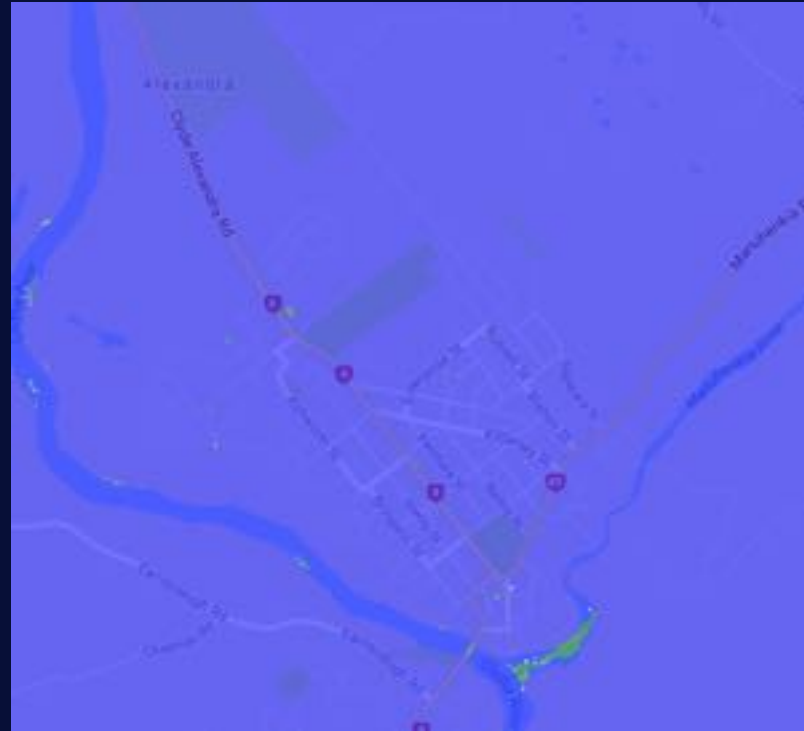
- Vegetation and crop monitoring
- Environmental monitoring
- Natural disaster monitoring
- Reef and coastal monitoring



PRACTICAL APPLICATIONS

Toxic Algae killing local dogs. Source attributed to dairy effluent entering the Clutha:

- Used Sentinel 2 satellite data in Google Earth Engine
- Not dairy farms but Alexandra residents via sewage outfall
- BUT.....





EO DATA PLATFORM

Leverage existing systems, like Google's Earth Engine and Open Data Cube, to minimise storage and compute costs.

Facilitate the uploading of aerial, drone and in-situ data, as well as derived datasets for storage and access by others.

Act as a broker for commercially available satellite data in NZ market.



EO PRODUCTS TERRESTRIAL EXAMPLES

Near real time moisture mapping

Pasture growth rate and crop yield estimates

Pest and disease monitoring

Manuka and floral density

Assess damage from natural and manmade disasters

Fire risk assessment

Monitor illegal activities



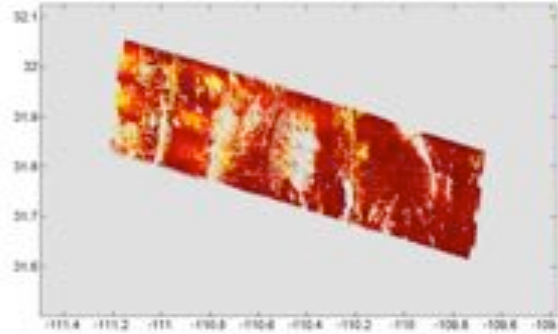
EO PRODUCTS TERRESTRIAL EXAMPLES

A NASA airborne mission has demonstrated the capability to measure soil moisture in the *root-zone*

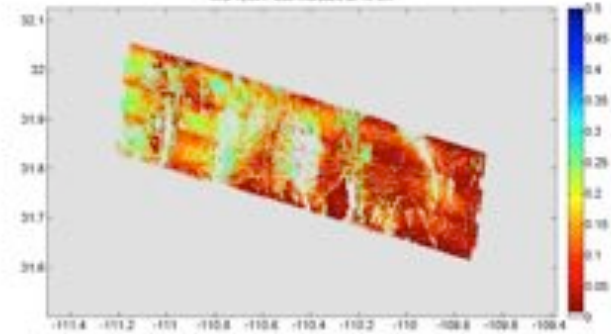
CSST is partnering with the University of Southern California (mission lead) to make this capability operational

High resolution maps of the soil moisture for irrigation and runoff mitigation

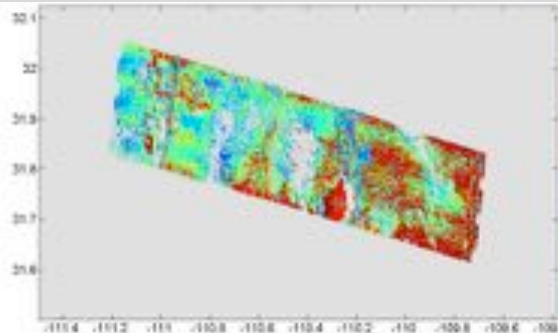
surface soil moisture



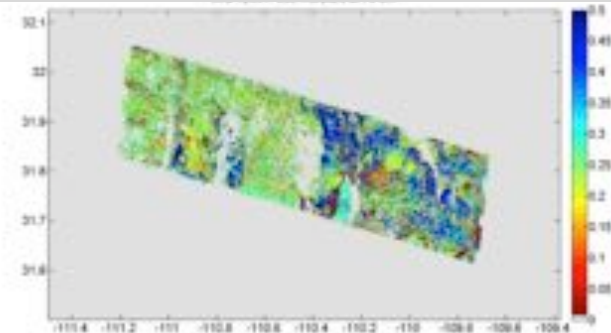
soil moisture @ -10cm



soil moisture @ -30 cm



soil moisture @ -75cm



EO PRODUCTS MARITIME EXAMPLES



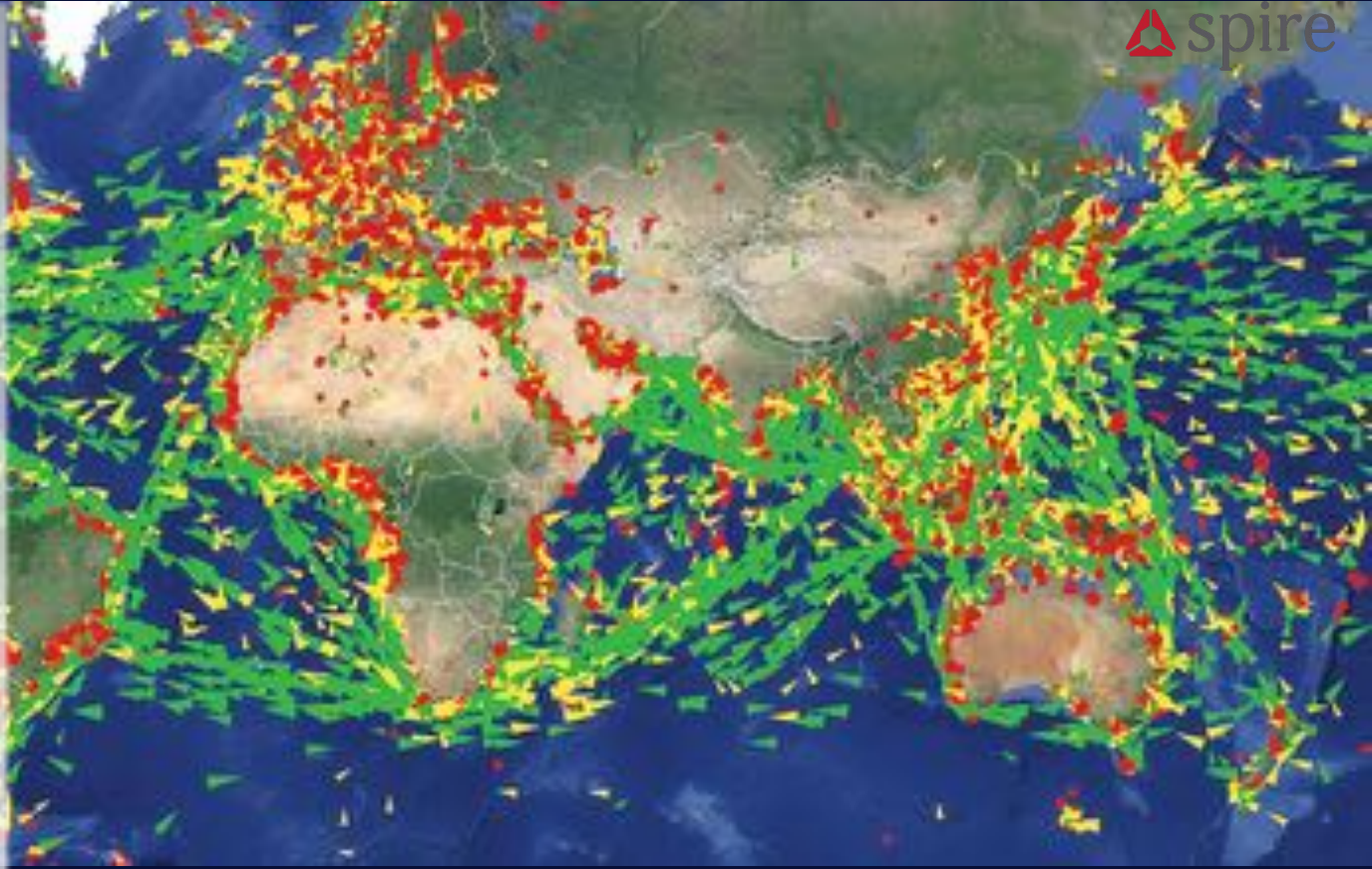
Fishing, fleet monitoring
and control

Vessel tracking services
and collision avoidance

Maritime security

Aid in search and
rescue operations

Navigation aids and
infrastructure
protection



CONCLUSION

CSST is the first of the RRI's to get going. Lots still to do. Lots to learn.

Looking to partner with you to solve your problems and help you stay relevant by gaining access to new Earth observation data-based products and services.

CSST want to hear from you to guide our research agenda and propose products and services to develop. We are looking for partners to develop practical commercial applications that benefit New Zealand.

For more info: <http://www.csst.co.nz>

