



ENCOUNTER SOLUTIONS
CONNECTED CONSERVATION

INNOVATION AND NEW TECHNOLOGIES

Background & Celium overview

Innovation in conservation

Encouraging participation

Some of the challenges

Next steps



PLANETARY BOUNDARY: BIOSPHERE INTEGRITY

- Past tipping point
- Urgent need to radically reduce biodiversity loss



Business-as-usual vs sustaining biodiversity



High costs



Labour intensive



Large scale, difficult conditions



Health and safety risks

VISION - Develop transformative tools for conservation

LONG RANGE – landscape scale coverage

EFFICIENT – low power + long life

AFFORDABLE – high benefit to cost ratios

ROBUST – environmental + livestock + wildlife

SIMPLE – wide range of users, fast roll out

ADAPTABLE – multiple applications



VISION - New integrated models

**Community
Conservation
Groups**



**Businesses &
Corporates**



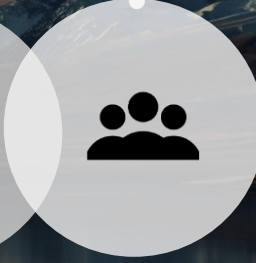
**Primary
Production**

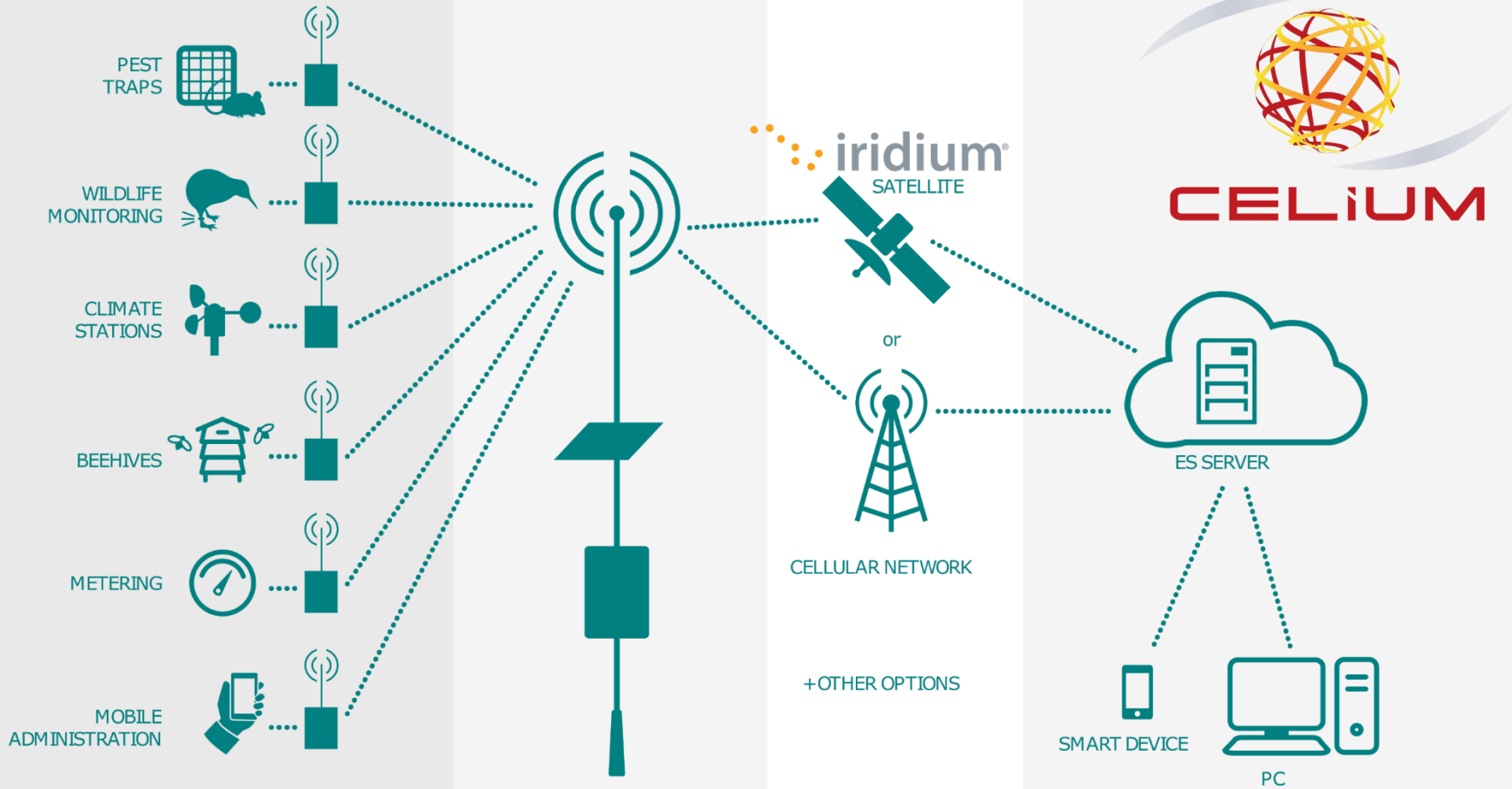


**Schools &
Universities**



**Government
agencies
Regionals Councils**





Example Celium applications

Encounter Solutions
hub site

Backhaul

Delivery



New Zealand

Twizel

Quailburn

Omarama

Benmore



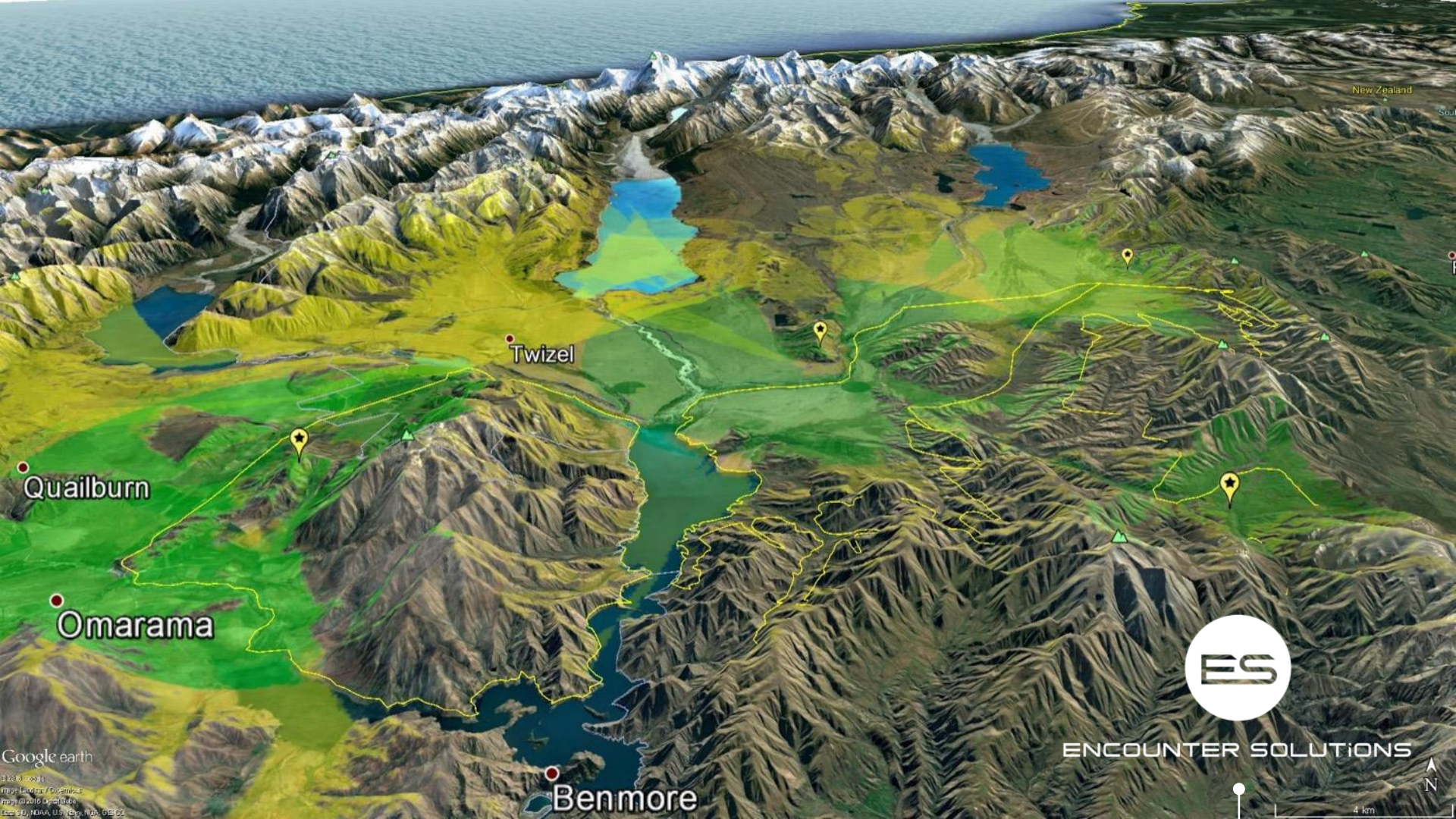
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Google earth

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Map data 2016, OpenStreetMap
Data SRTM30 PLUS, U.S. Dept. of Defense



4 km



New Zealand

Twizel

Quailburn

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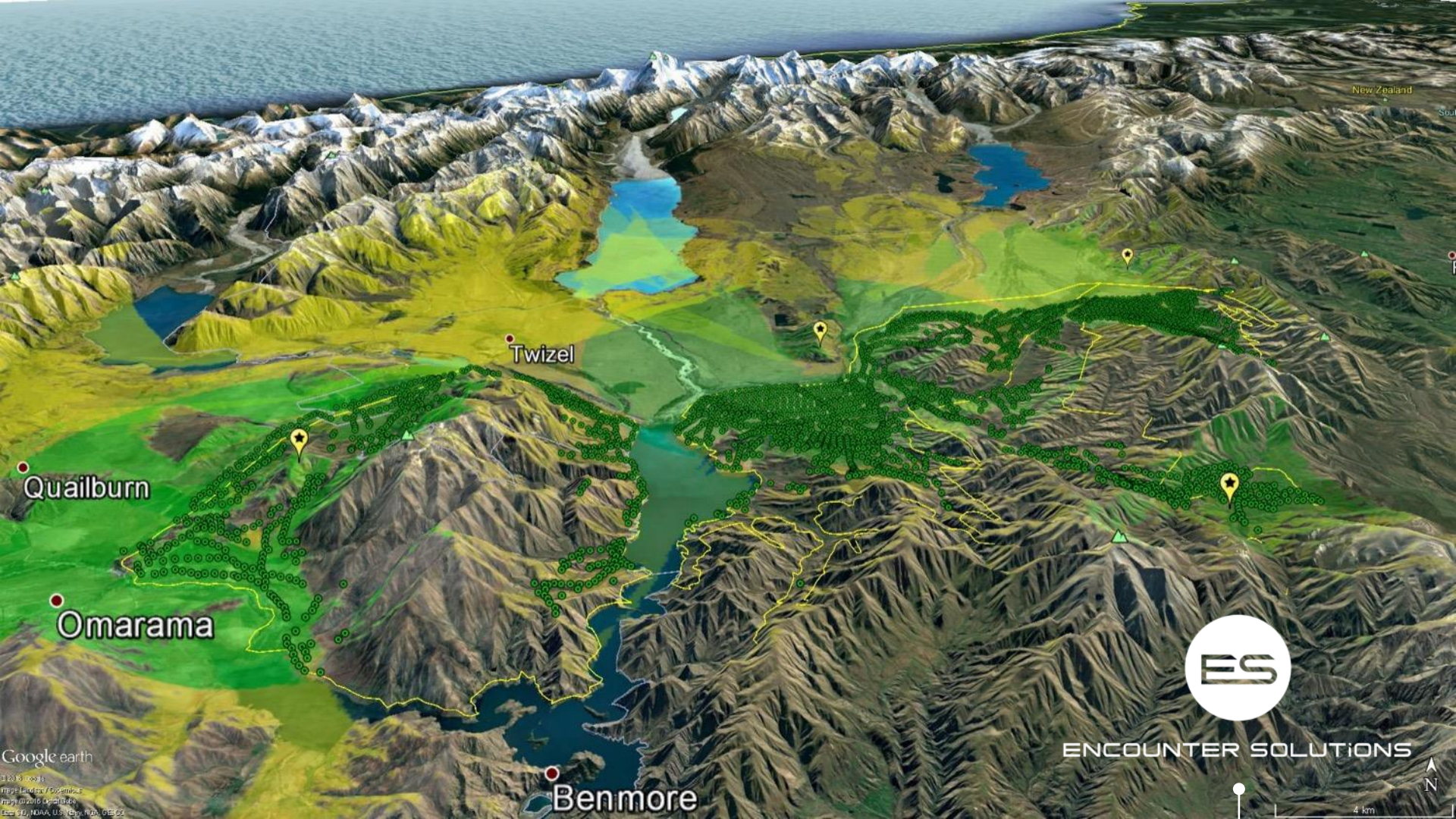
4 km



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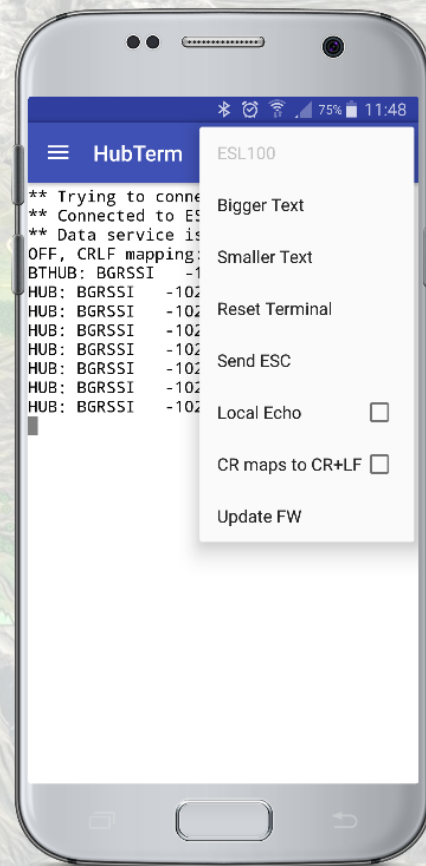
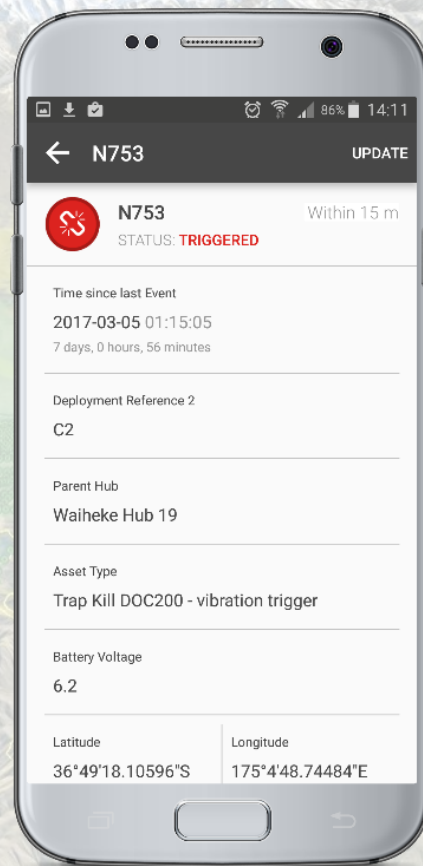
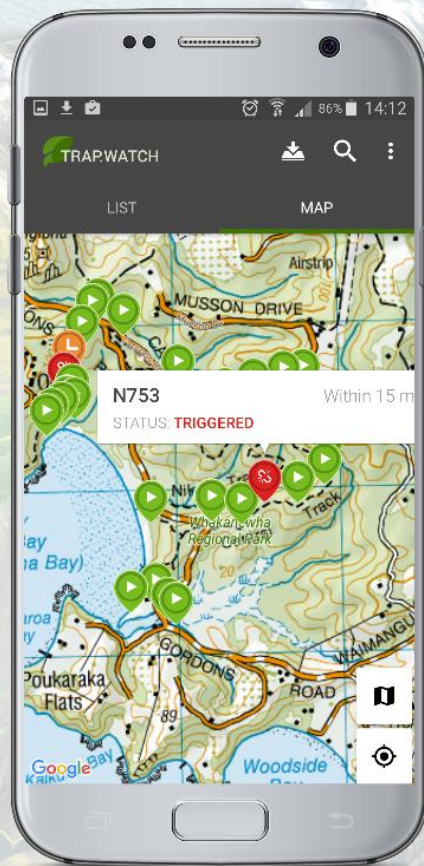
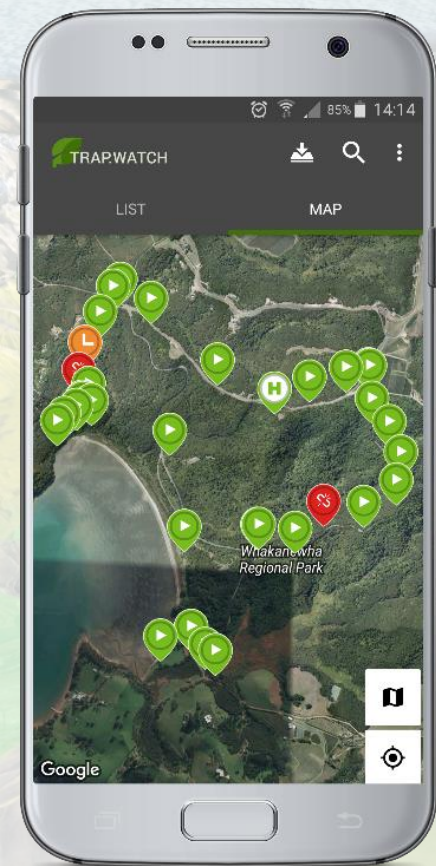
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4 km



Innovation in conservation on a global scale

- Machine learning – e.g. counting fish catch for more sustainable fishing practices
- Real-time sound recognition systems to alert rangers and even deploy drones e.g. cars, gunshots, chainsaws
- Airbourne laser scanning - 3D structural details of forests, estimating biomass, predicting spider populations and mapping forest fire risks

Innovation in conservation in New Zealand

- Celium – remote monitoring of landscape scale trapping programs
- River Watch Water Tester – real-time water quality tracking device so local communities can keep track of the waterways
- Stop Kauri Dieback – an app that allows anyone to record and map Kauri dieback sightings
- CatchIT – school programme and interactive app encouraging children and their families to participate in trapping

Innovation in conservation in New Zealand

- The Cacophony Project – turning birdsong into data and improve trapping
- PAWS – species recognition using footprints
- Goodnature – multi-kill traps and lure systems
- Squawk Squad – collective investment in sensor-connected traps

Can technology encourage more participation in conservation?

**Community
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Groups**

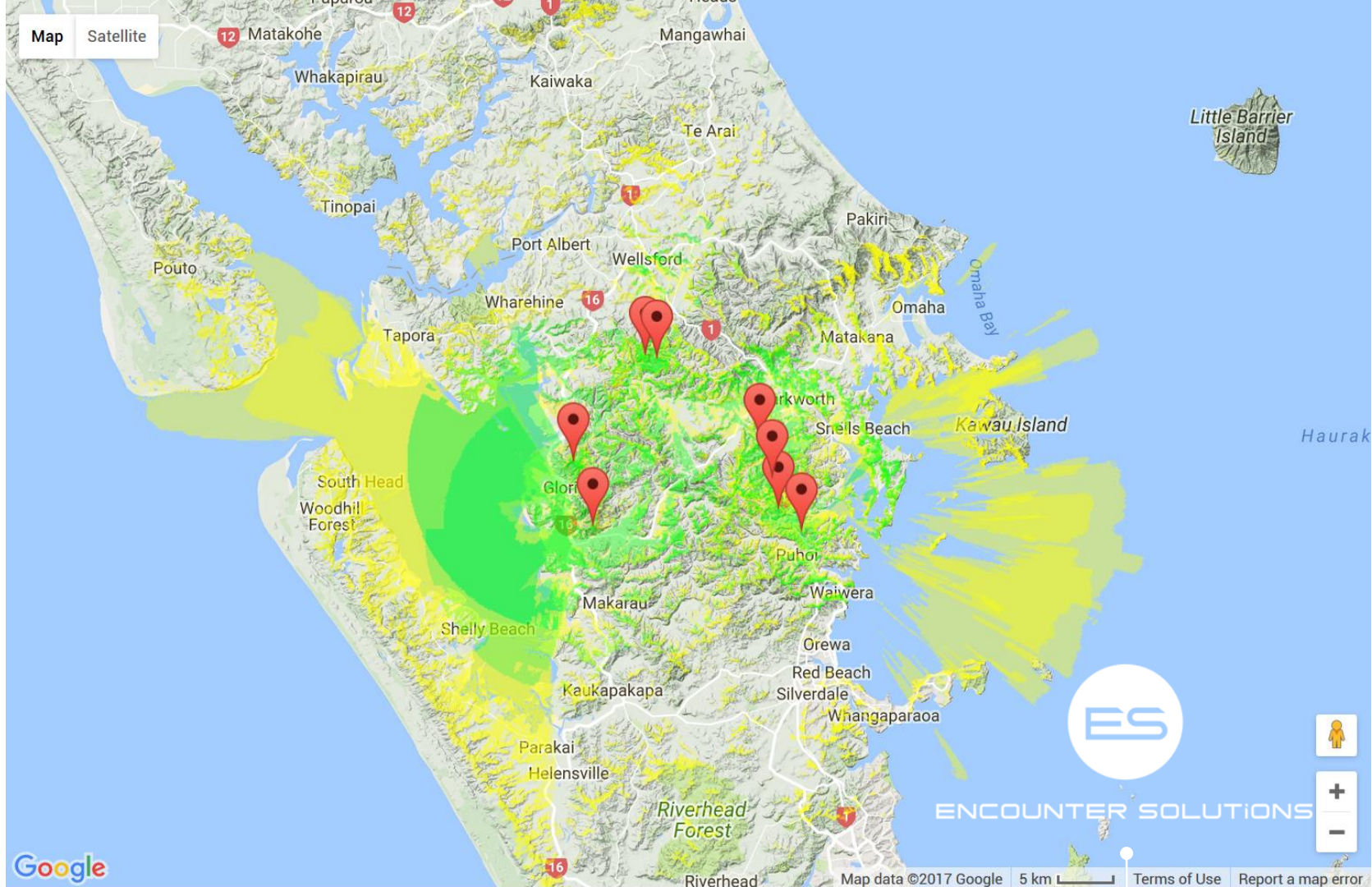
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**Businesses &
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**Primary
Production**

**Schools &
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Some challenges with innovation in conservation

- Development is expensive
- Limited budgets & limited 'market'
- Ease of use – must cater for a wide range of users
- Durability and robustness
- Not everything can be solved with an 'app'
- Validation – significant testing required to determine reliability

➤ DOC / COUNCIL SUPPORT CRITICAL FOR SUSTAINABLE SOLUTIONS

Next steps

Use technology for more effective allocation of human resources

Continue to innovate and test new technologies

Accept that successful innovation involves failures

Don't wait for the perfect solution – we need to get on with it

Demonstrate that NZ truly is a global leader in this arena



Thank you
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