

Land use classification case study – barriers and opportunities



Peter Pletnyakov, Federico Tomasetto

agresearch
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Problem: Do we know what we grow where?



Image by LINZ
showing a variety
of land uses in
Gisborne area

Why is it important?



Fall armyworm (*Spodoptera frugiperda*)



Figure 1: Fall armyworm adult moth



Figure 2: Fall armyworm larvae on beans



Figure 3: Fall armyworm egg mass on maize

If you believe you have seen a fall armyworm – either an adult, larvae or egg masses – take a photo and call our Exotic Pest and Disease Hotline on 0800 80 99 66 or report online report.mpi.govt.nz/pest



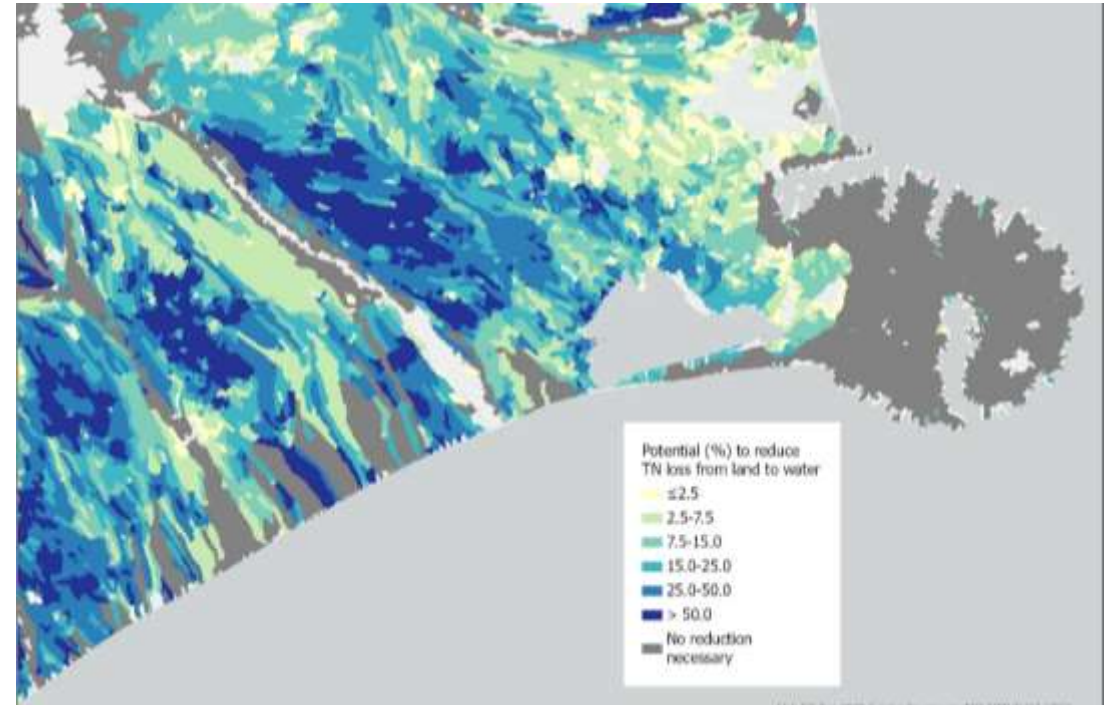
Biosecurity

Emergency response

Why is it important?

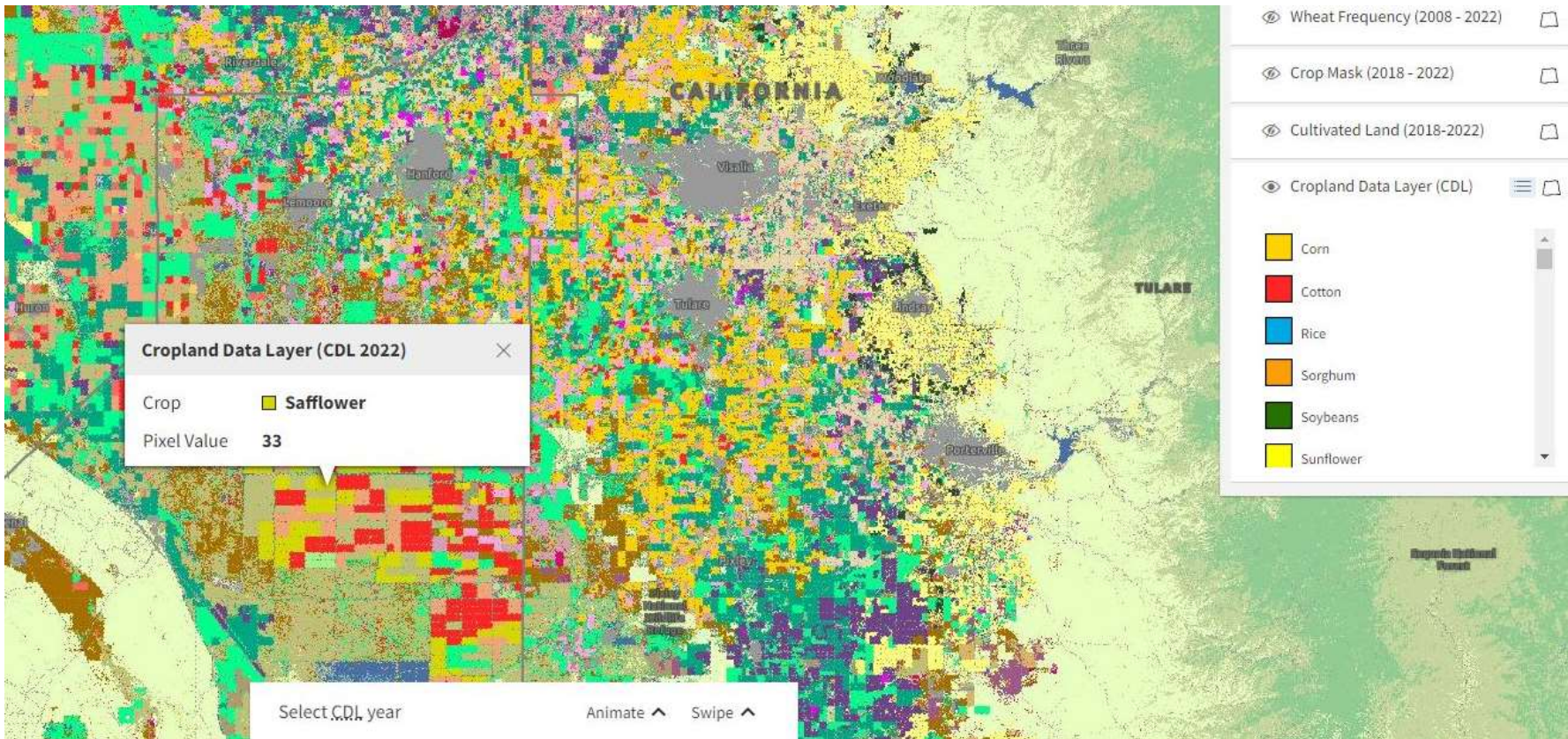


Land suitability / Climate change adaptation



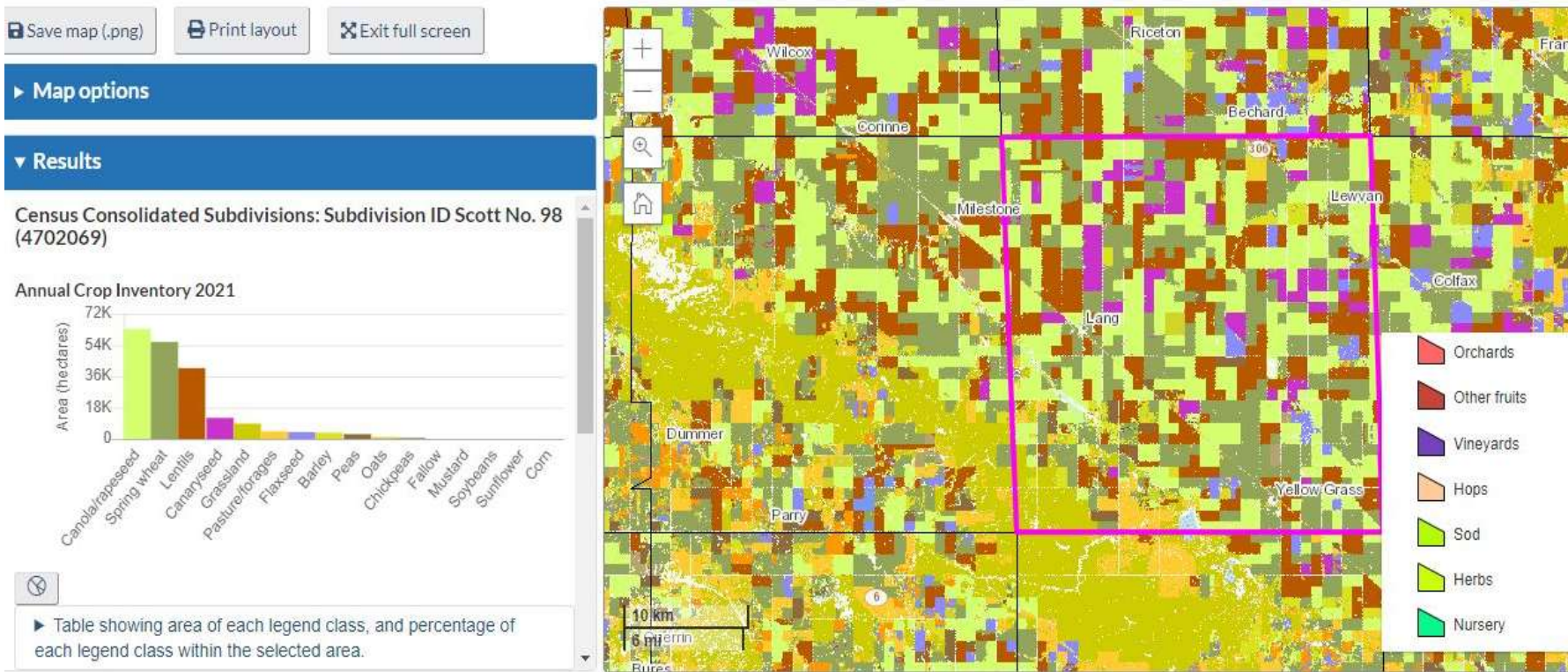
Environmental modelling

Has this problem been solved before somewhere?



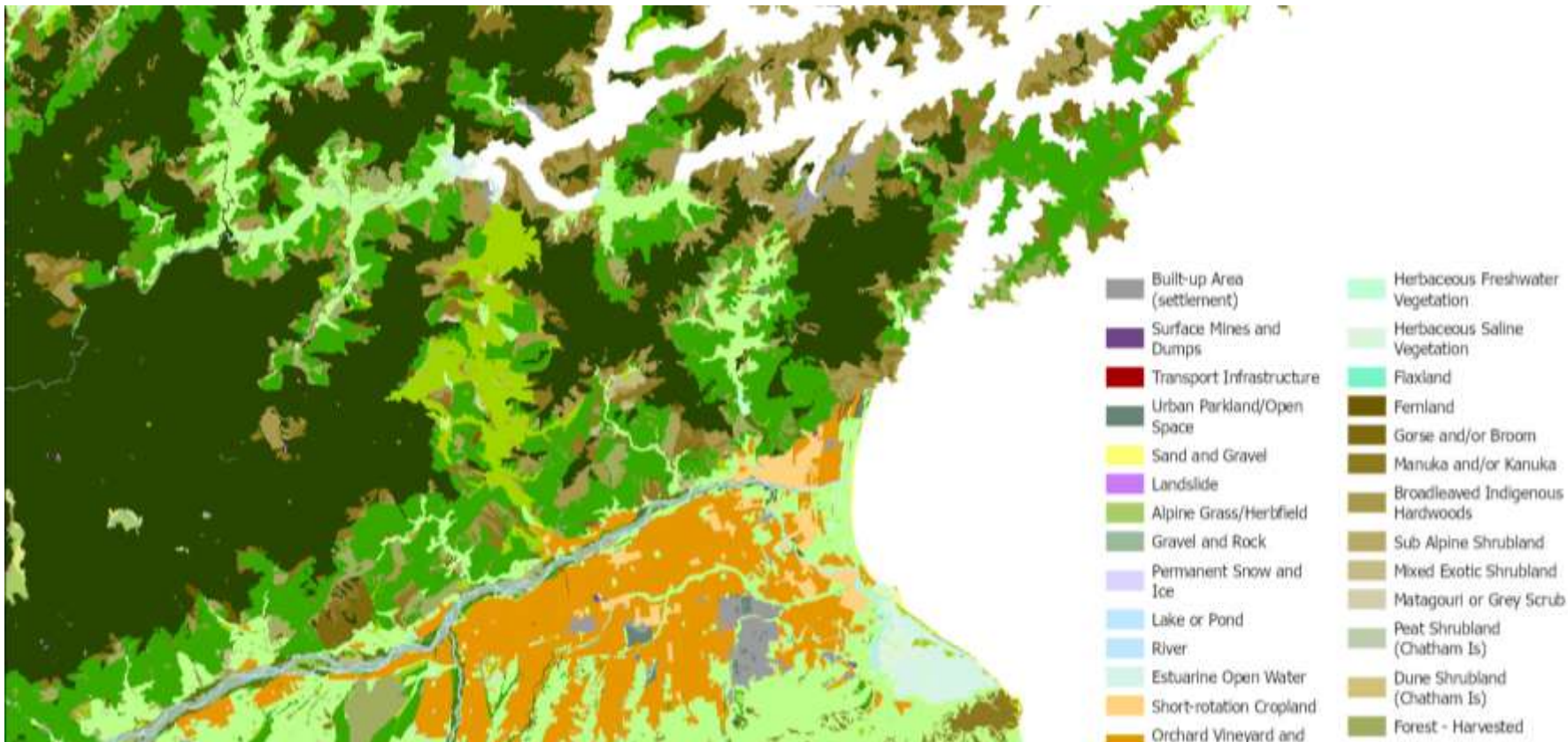
- USA CropScape:**
- National coverage
 - 133 classes
 - Annual update
 - 30 m / pixel

Has this problem been solved before somewhere?



- Canada ACI:**
- National coverage
 - 72 classes
 - Annual update
 - 30 m / pixel

What is available in New Zealand now?



LCDB / LUCAS:

- National coverage
- 33 / 12 classes
- 2 crop types
- Biannual update
- 2 year release lag

Are there any barriers for classification improvement?



- Insufficient understanding of benefits of dataset availability within industry
- Lack of local open data for model training
- Limited ground truth data
- No coordinated approach to the solution
- Funding

Here is how we overcoming them

Home > Research > AI Assets > TimeSen2Crop

TimeSen2Crop

TimeSen2Crop is a pixel based dataset made up of more than 1 million samples of Sentinel 2 Time Series associated to 16 crop types, during an agronomic year ranging from September 2017 to August 2018. The dataset contains atmospherically corrected samples, as well as information related to snow, clouds and shadows.

This benchmark dataset has been developed in the framework of the ExtremeEarth project, which received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 825258.

[Dataset](#)

[Link to the asset](#)

[Secondary link to the asset](#)

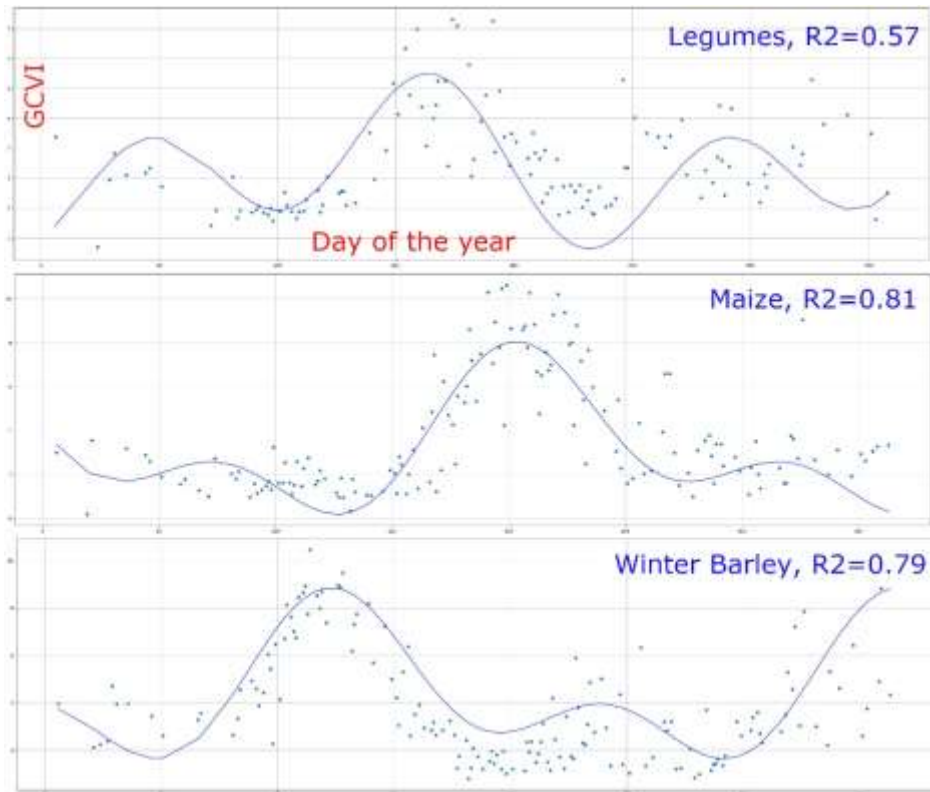
[TimeSen2Crop publication](#)

European training dataset with 16 crop types – needs modification



High resolution aerial imagery from LINZ – semi-automatic labelling of maize

Methodology and technologies



Spatiotemporal variation in vegetation index for different crop types during growing cycle



Resulting datasets with segmented and classified polygons

A scope for productive collaboration

- Data sharing between sector players
- Interoperability to make sharing open and efficient
- Mutual benefits for Research and Commercial sectors from the same datasets
- Agreements between Research sector and Commercial remote sensing providers/start-ups for beta-testing and discounted data supply



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