

Irish agriculture and Copernicus

Monitoring Farm Productivity, Management and Systems via Satellite

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Why does Ireland need Copernicus for Agriculture?

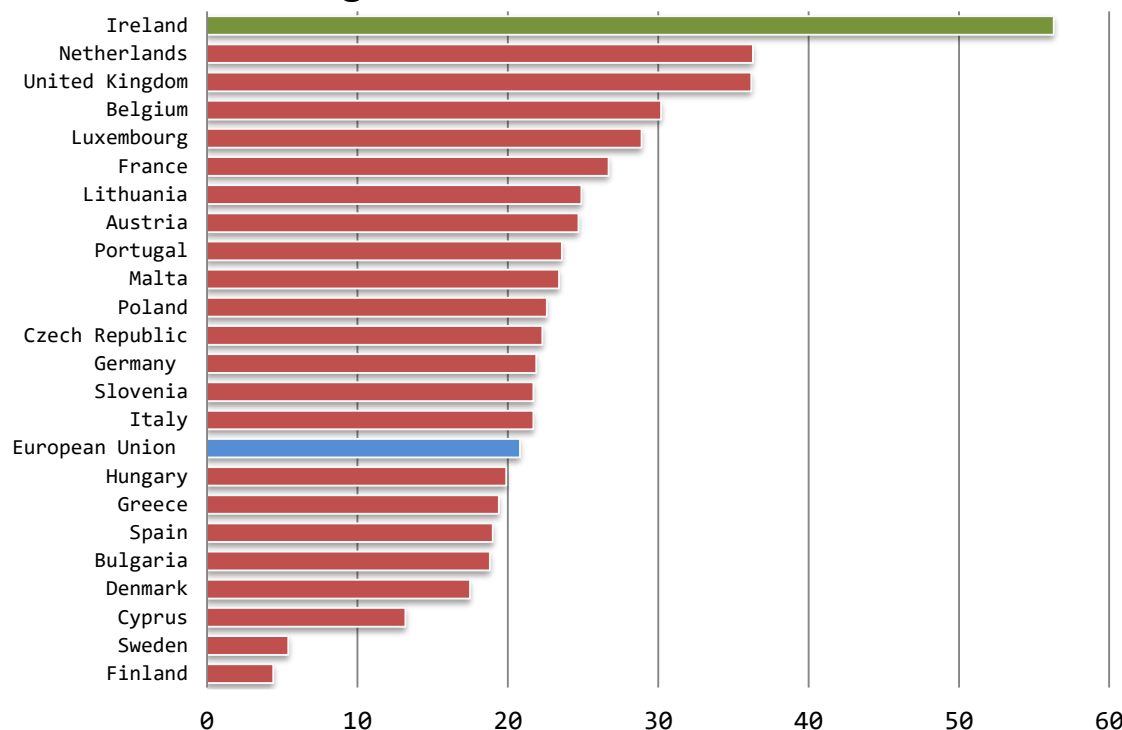
Ireland is an agricultural country- but its main crop is grass.

Grass is a very varied crop in composition , performance and management.

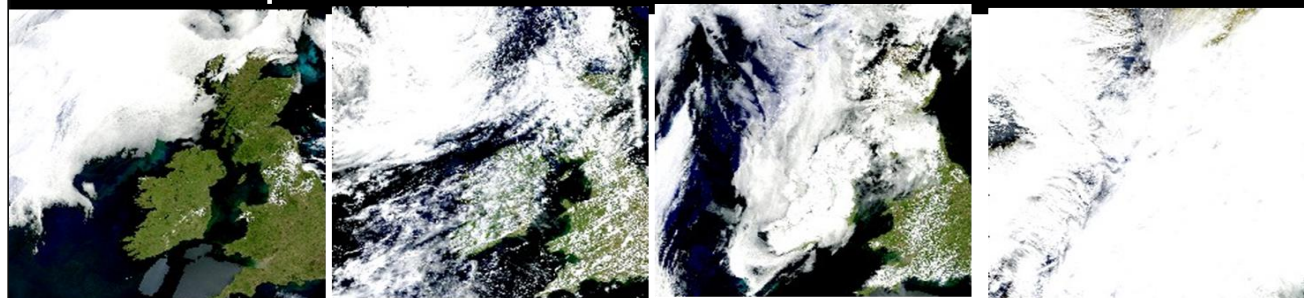
The Irish landscape is very dynamic. In the height of summer, grazing intervals can be as short as 3 weeks.

Grass in the N Atlantic region is a specialised crop- not a managed resource.

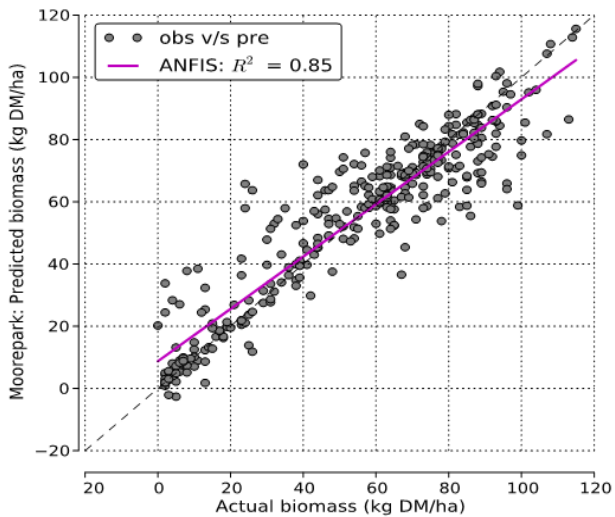
Percentage Grass Cover, LUCAS 2015



Ireland does not yet have national landcover, landuse or habitat maps.



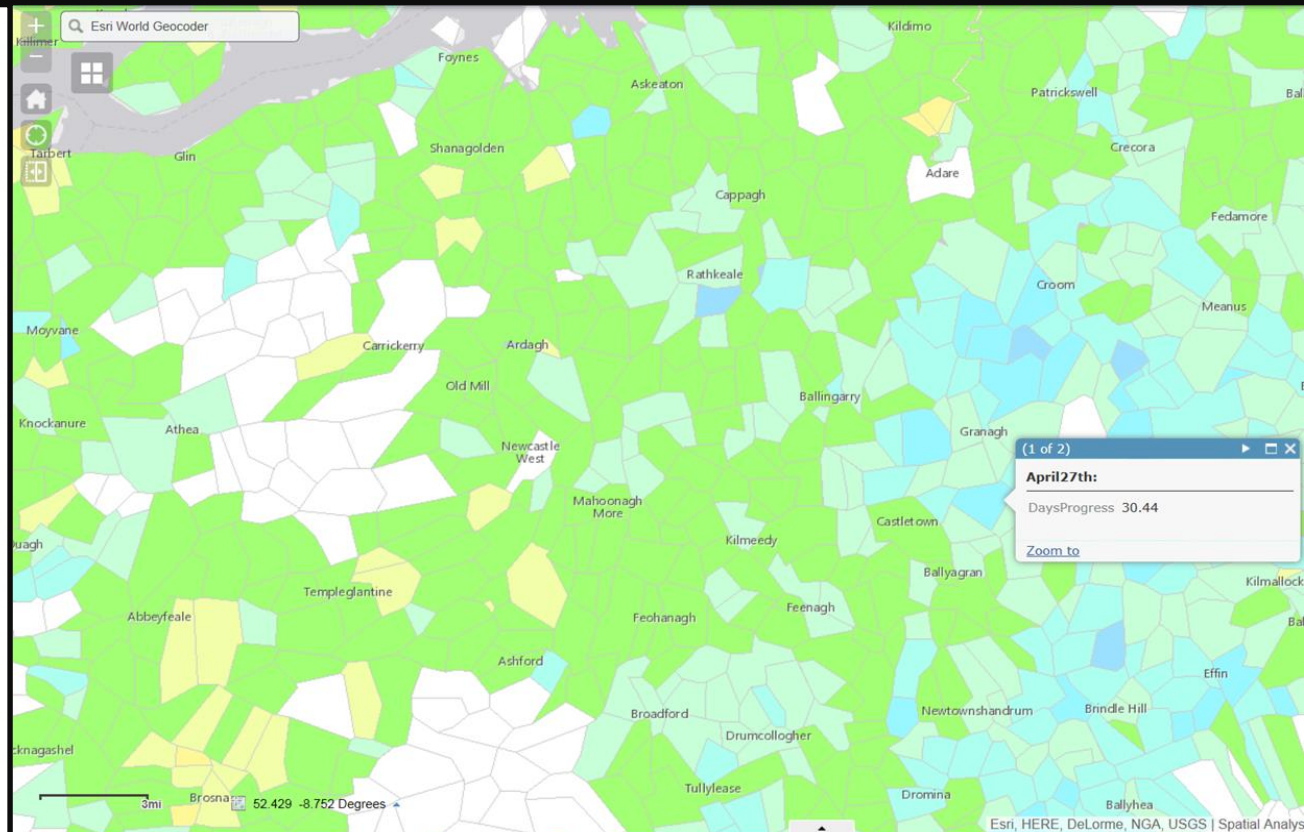
Monitoring grass from space – precision agriculture for Ireland's most important crop.



Biomass from Satellite

Using Moorepark grass growth data a Machine Learning algorithm (ANNFIS) has been taught to estimate biomass at field scale from daily satellite observations.

We are now incorporating biophysical models of grass growth.



Who creates the services for farmers?



GEOGLAM RAPP
Rangeland and Pasture Productivity

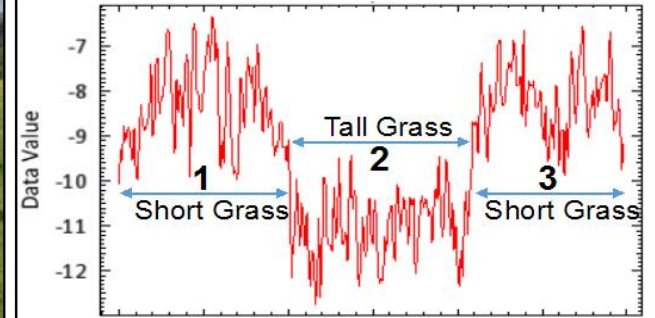
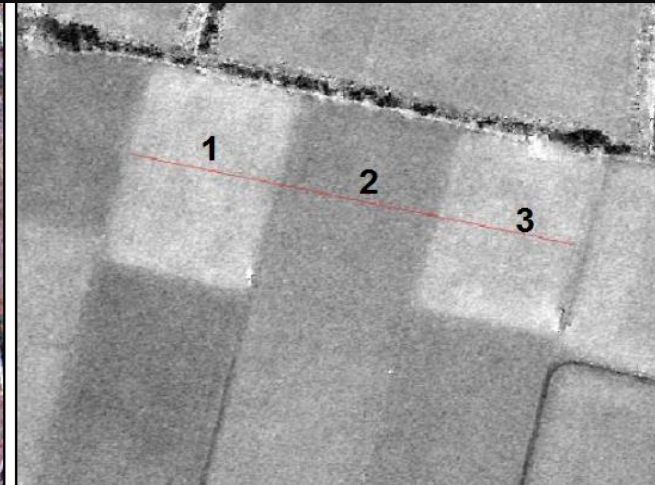
Current services don't really satisfy our needs

Monitoring grass from space – precision agriculture for Ireland's most important crop.

Grass is not a single crop
Or a dual-crop but a
multi-cropping event.

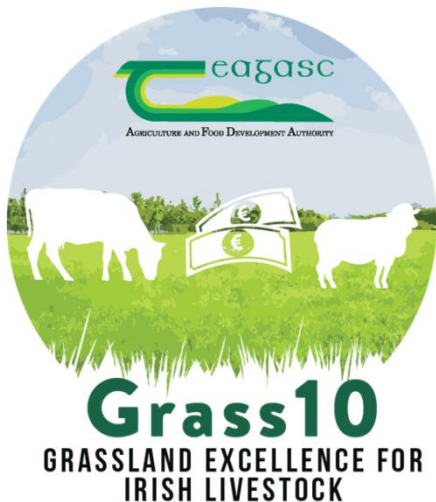
Teagasc current advice
is 10Grazing or cuttings per
paddock per season.

Using 10 tonnes DM/Ha



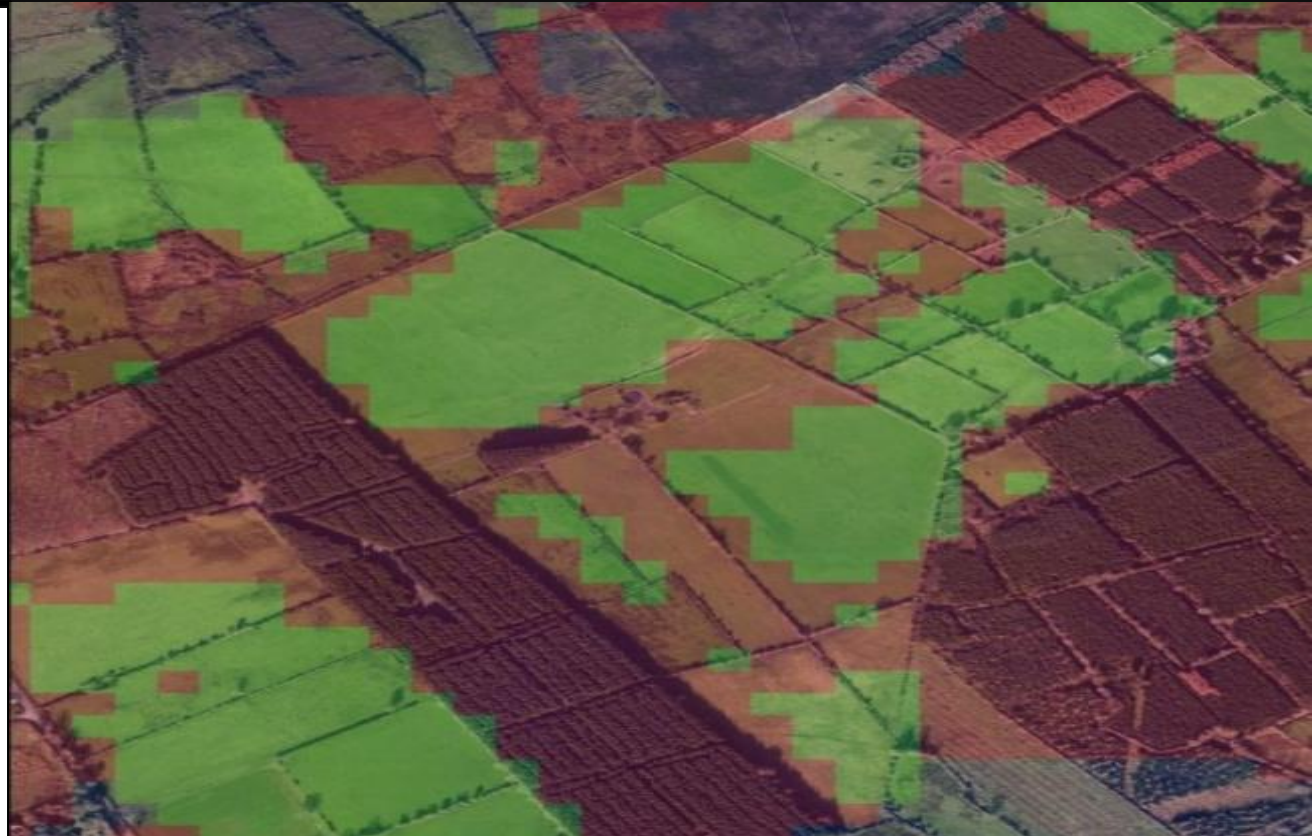
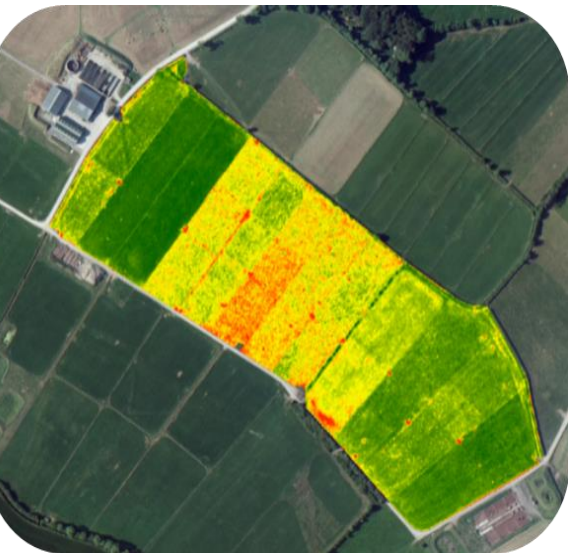
New RADAR Imagery from ESA allows us to observe
management in all weathers.

Landuse, landcover, habitats- we need to move toward
Land activity



Shining a new light on the ditch —carbon sequestration in hedgerows and drainage status of fields calculated using the latest remote sensing techniques.

**Can thermal imaging allow
Us to see the effectiveness
Of underground drainage**



**In DRAINMAP we are monitoring the effectiveness of
artificial drainage using RS.**

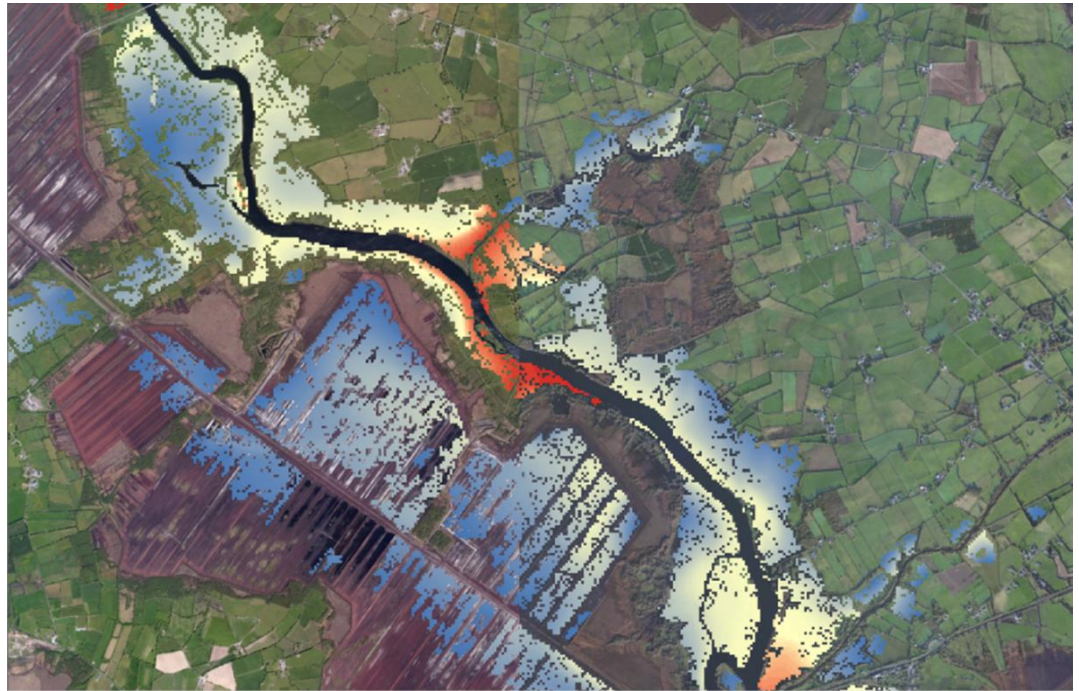
Irish soils often have negative soil moisture deficits

S1 allows us to see flood waters and track over time.

Winter 2015/16



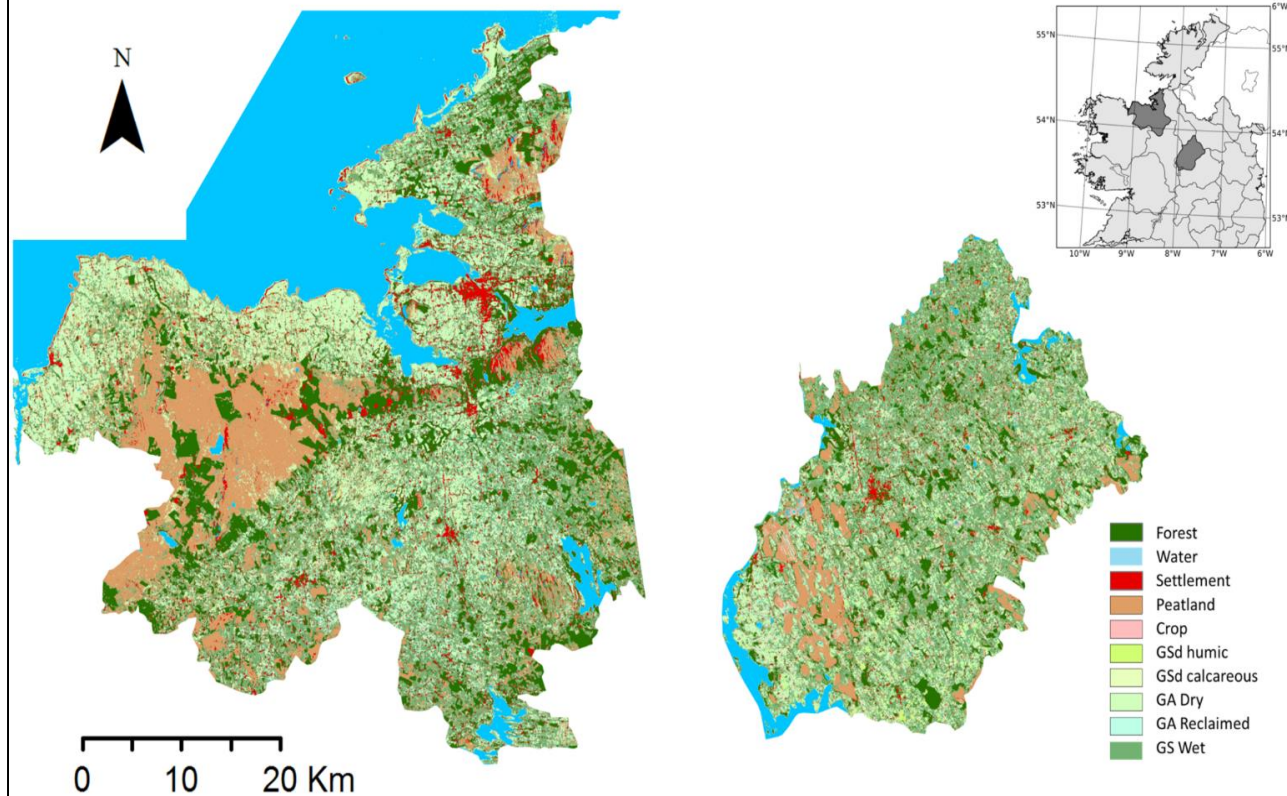
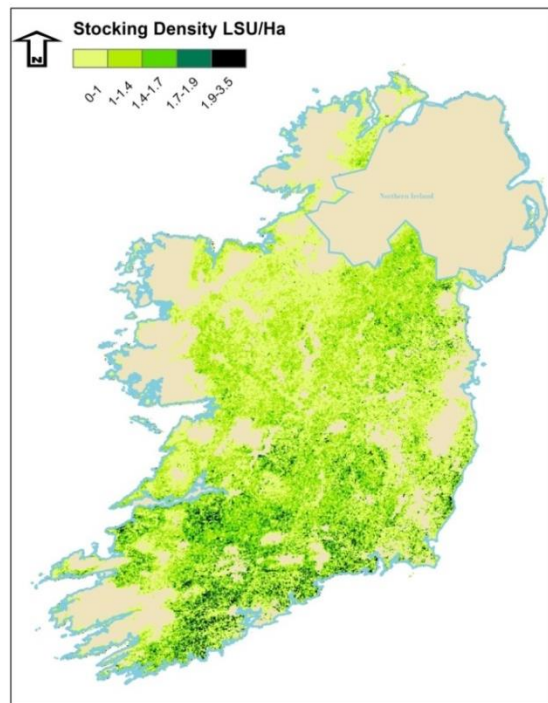
In order to better characterise rainfall impact we are calibrating the National terrestrial rainfall radar and linking those observations with S1 imagery to estimate soil inundation.



How do we better integrate met data with Copernicus Products?

Intensification

By observing the effect of grazing over a season we can calculate Stocking density



Global Studies, even when realised at country scale do not always provide the answers we need.

CSO-2010	FAO-2010	Teagasc-2007
6,607000	10,847024	6,264102

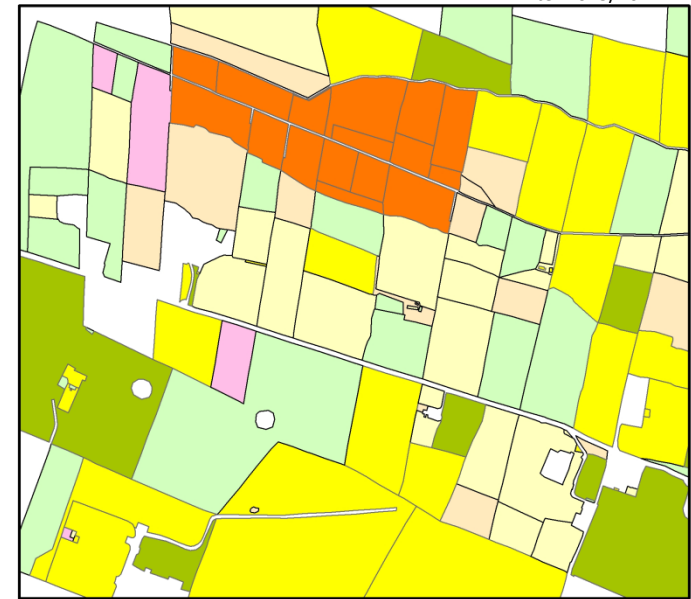
Compare a local study with a global product.
(Robinson et al 2014, Green et al 2016)

Building on ILMO and talam projects- Teagasc Agricultural Land Use Map TALUMH, will finally provide a national landuse database

TALUMH will combine S1 & S2a/b data with Prime 2 Objects using Random Forest Classifiers to produce the output needed- a label on landuse and intensification for every field in Ireland.

Land Uses

- Scrub
- Int. Dry Grassland
- Wet Grassland
- Peat land
- Forestry
- Ext. Grassland
- Permanent Grass



0 0.25 0.5 Kilometers

In the SOLUM project Sentinel2 data is helping in building A landuse/soil carbon model for Ireland.

- Copernicus services will have a big impact on Irish Agriculture over the next decade.
- One size does not fit all, national and regional products needed **EO4Atlantic Pathfinder Platform** a good start.
- Perhaps a dedicated budget to ground truthing campaigns at national level or better utilisation of local expertise through Copernicus or GEO.