

# Land use, landscapes & Carbon

*Dr. Stuart Green*

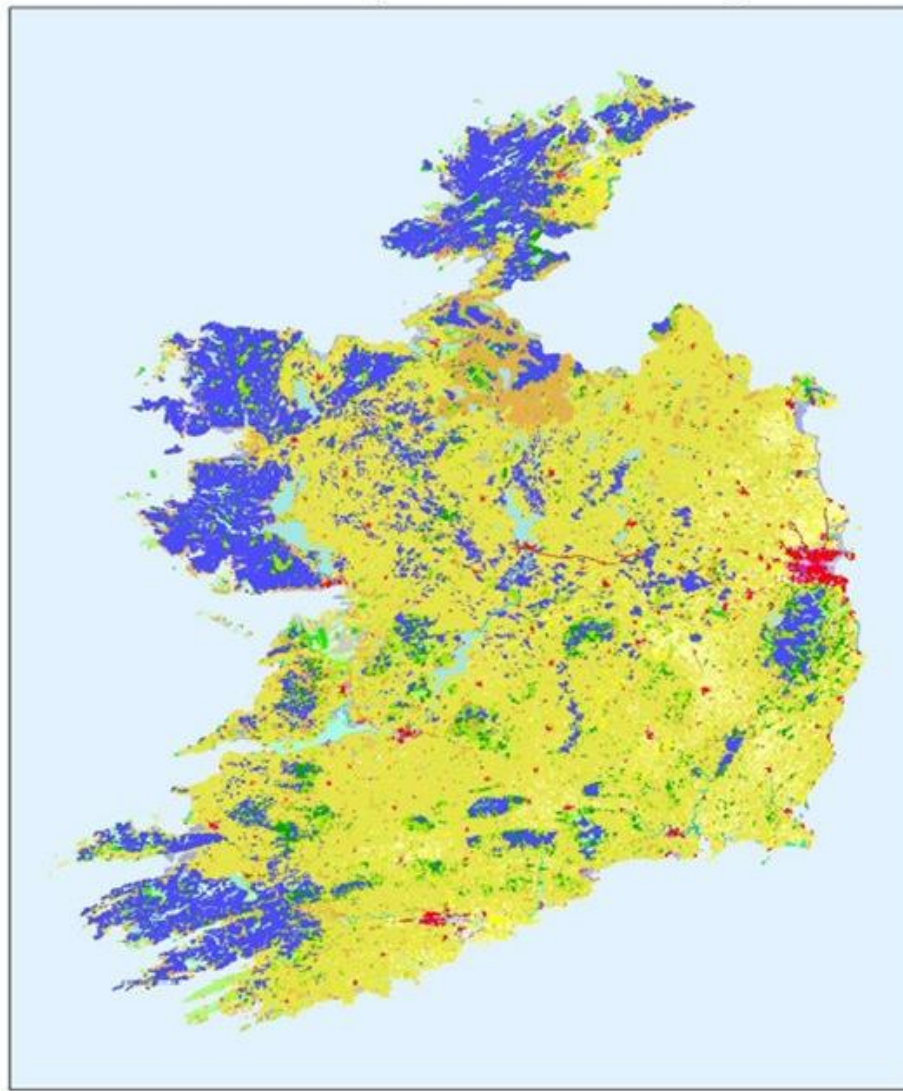
2<sup>nd</sup> October

**Science, consumers, and Irish food – evidence and insights**

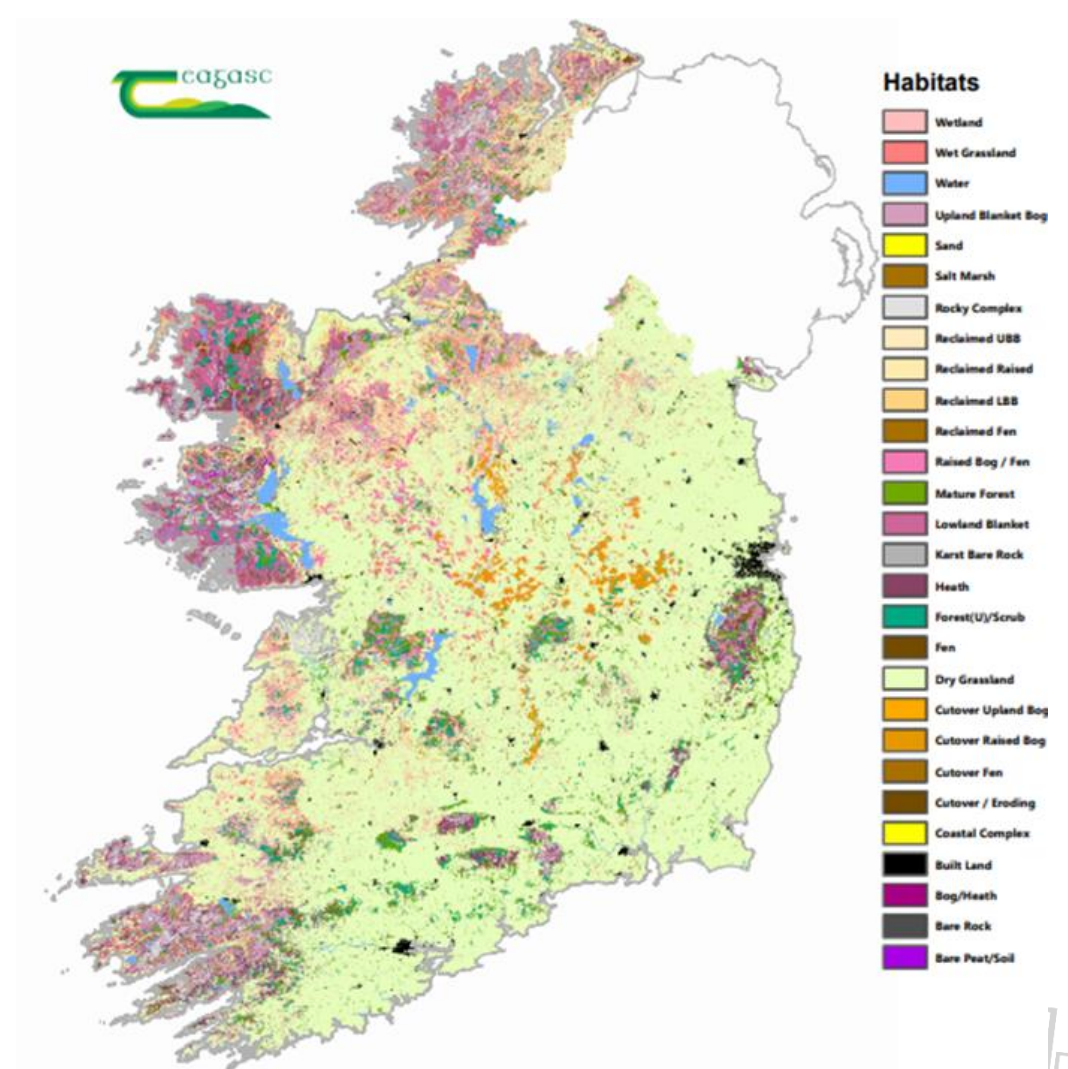
Ashtown



# CORINE 1990-2000-2006-2012-2018



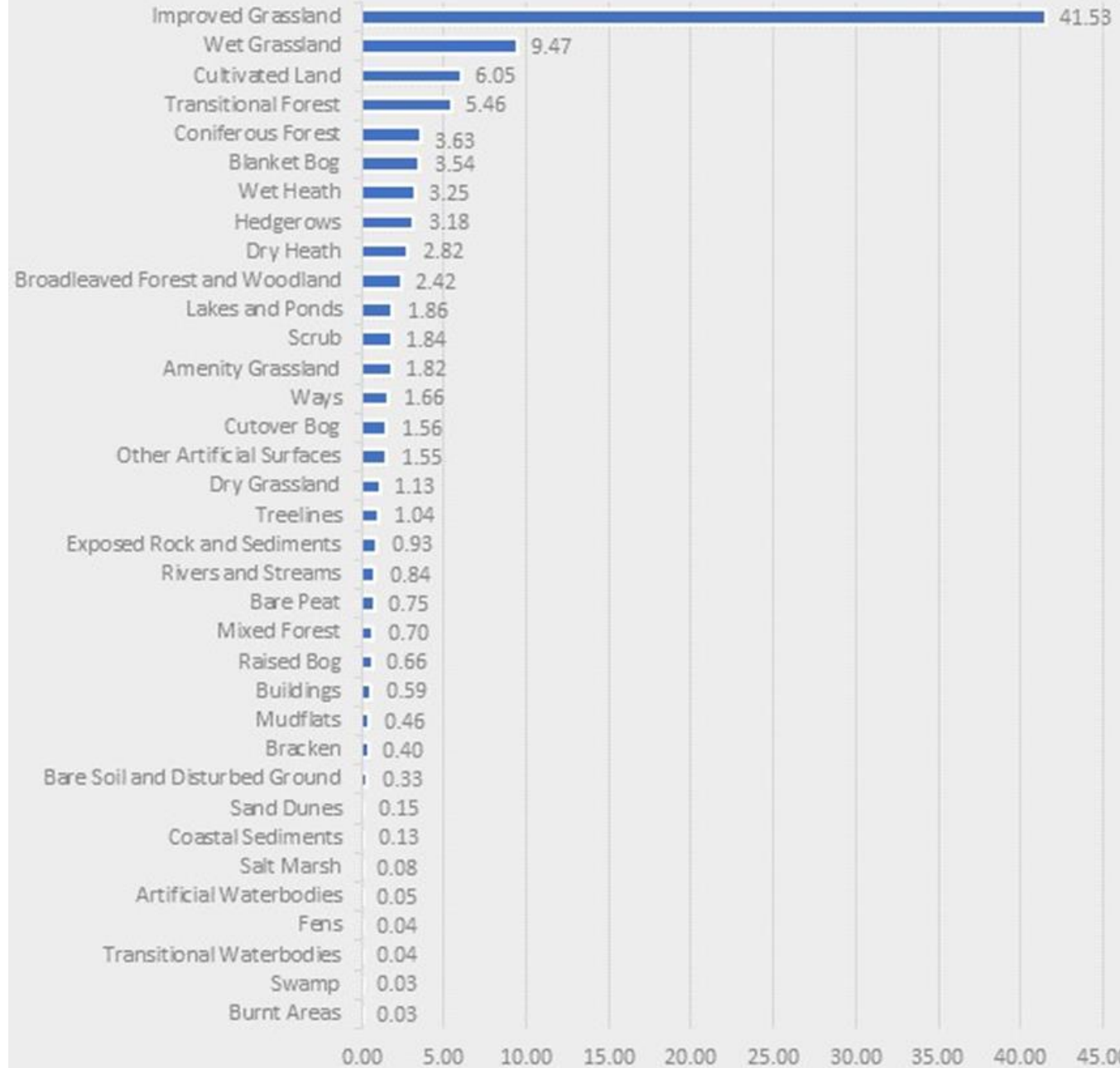
# TLC95



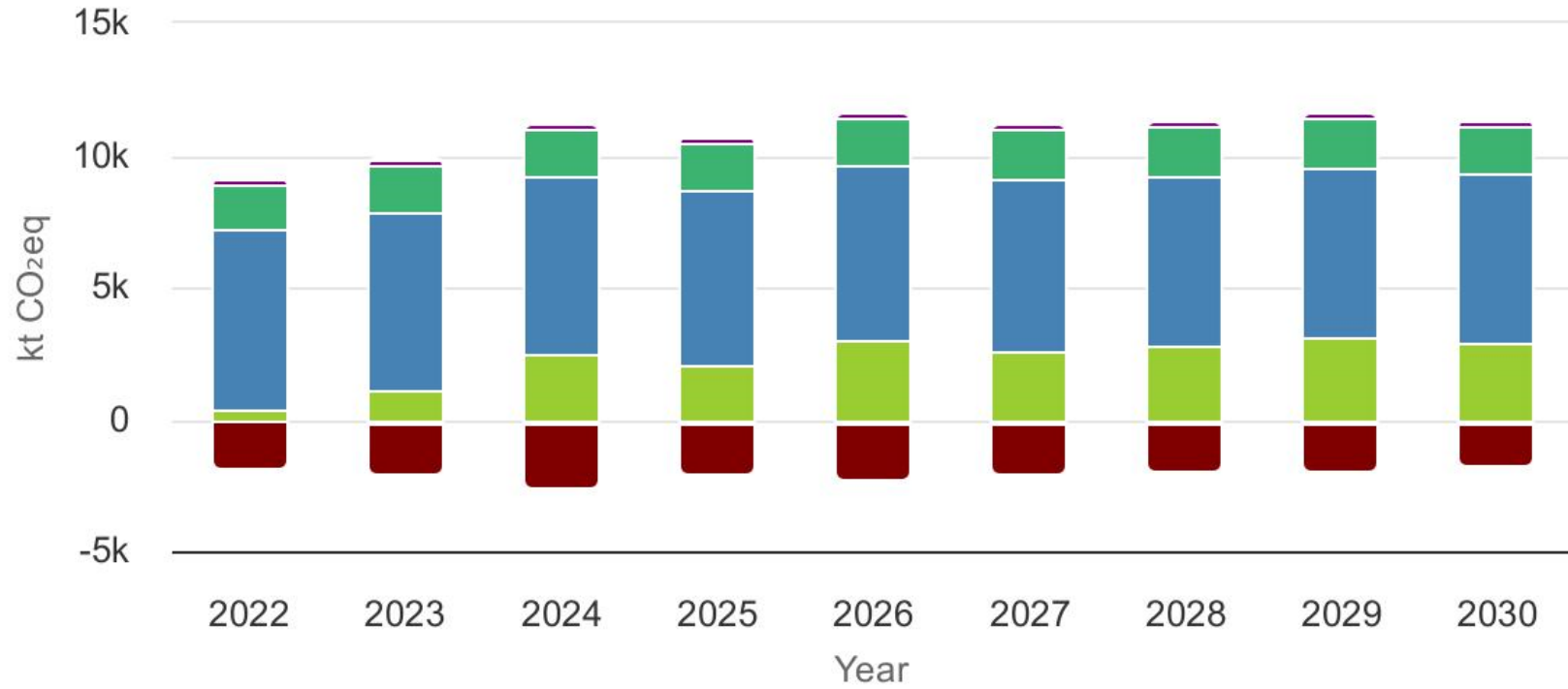
# THE MAP - TE NLC 2018

Level 2 Areas

■ Percent of National area



# LULUCF projected emissions and removals 2022-2030



- Harvested Wood Products
- Other land
- Settlements
- Wetlands
- Grassland
- Cropland
- Forest land

Highcharts.com



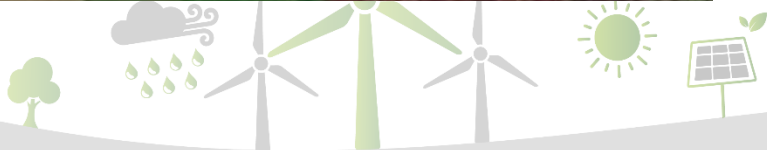
# On the Horizon

- No LULUCF Ceiling Yet- wait for conclusion of Land Use Review
- Move toward AFOLU accounting post 2026
- Move toward gross-net accounting
- Requirement for Tier 3 reporting
- National Carbon Farming Framework- consultation open



# Carbon on the Farm

- Plants (Biomass)
- Soil (SOC)



# Two approaches to assessing Carbon Storage on Farms

## RESULTS BASED

Establish a baseline and repeat measurement after 5, 10 or 15 years.

Carbon Credits-Voluntary Market approach.

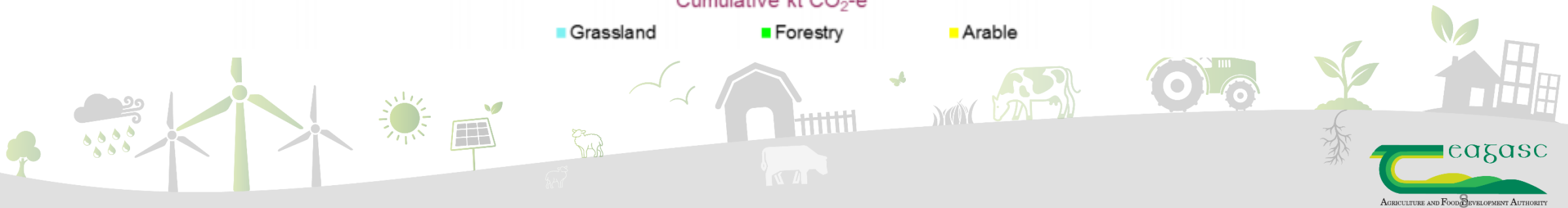
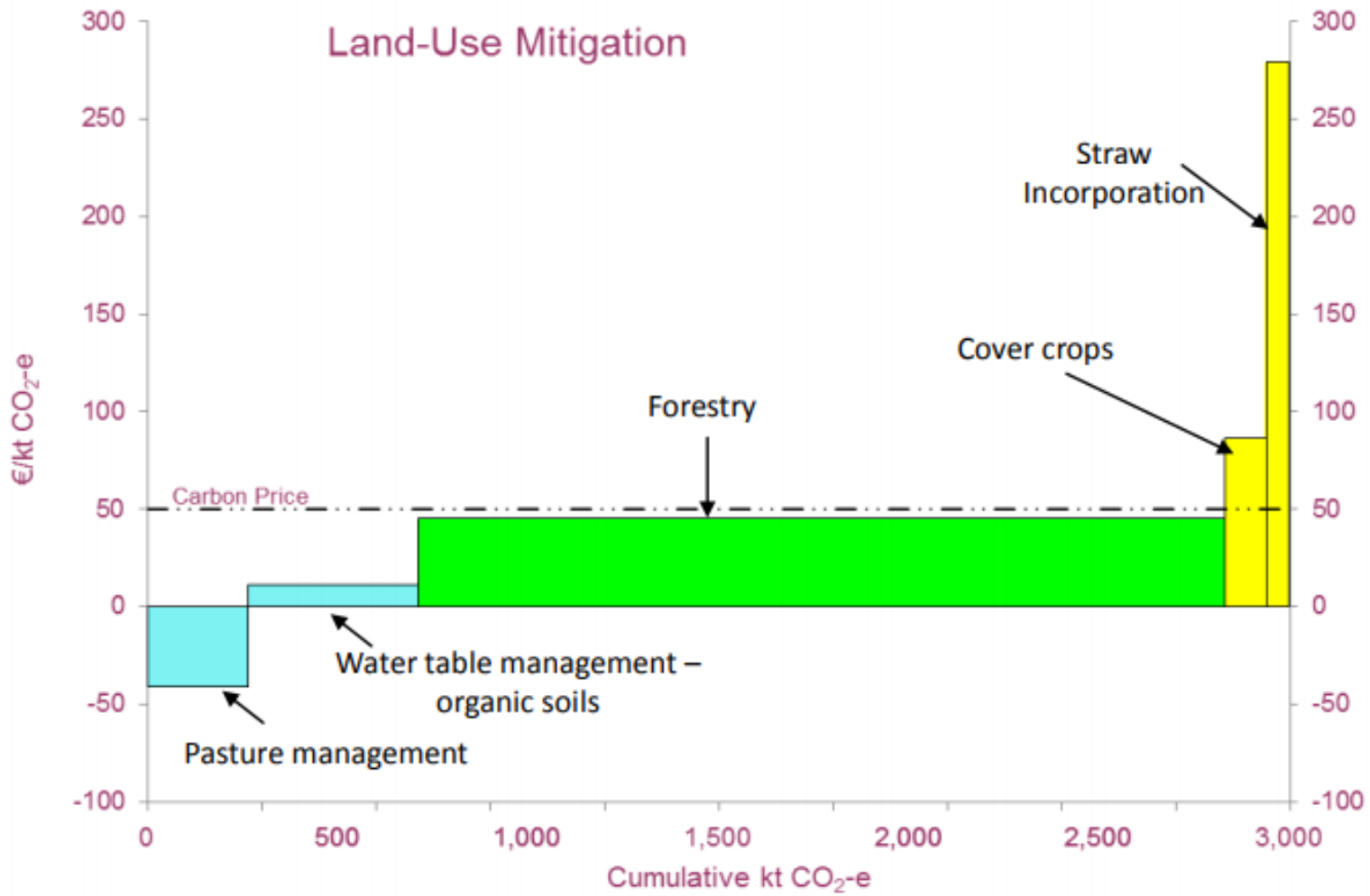
This is NOT the same as a Carbon Footprint

## ACTION BASED

Identify actions that will increase carbon storage (e.g. catch crop)

Use Monitoring Technologies to demonstrate action is being undertaken

Approach likely for Policy Lead Carbon Farming



# Infrastructure

- Terrain-AI – 10 sites
- NASCO – 28 sites (by year end)
- Signpost- 120 Farms
- Agricultural Catchments – 6
- FarmCarbon
- Life Carbon Farming

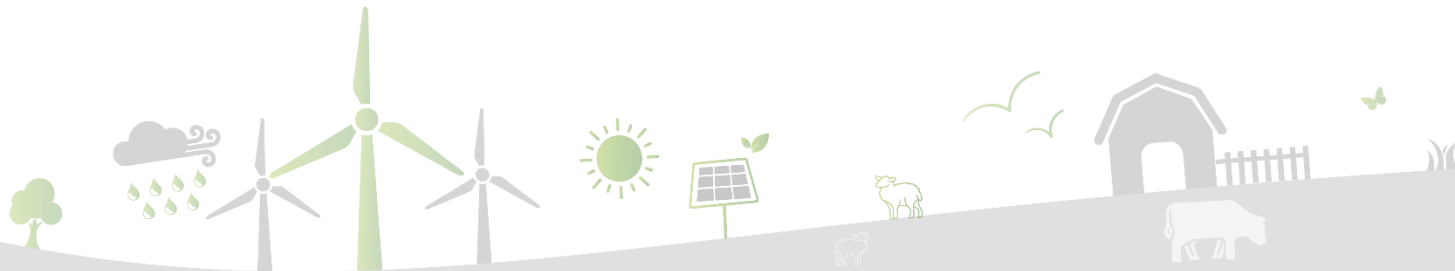


Terrain-AI



# NASCO

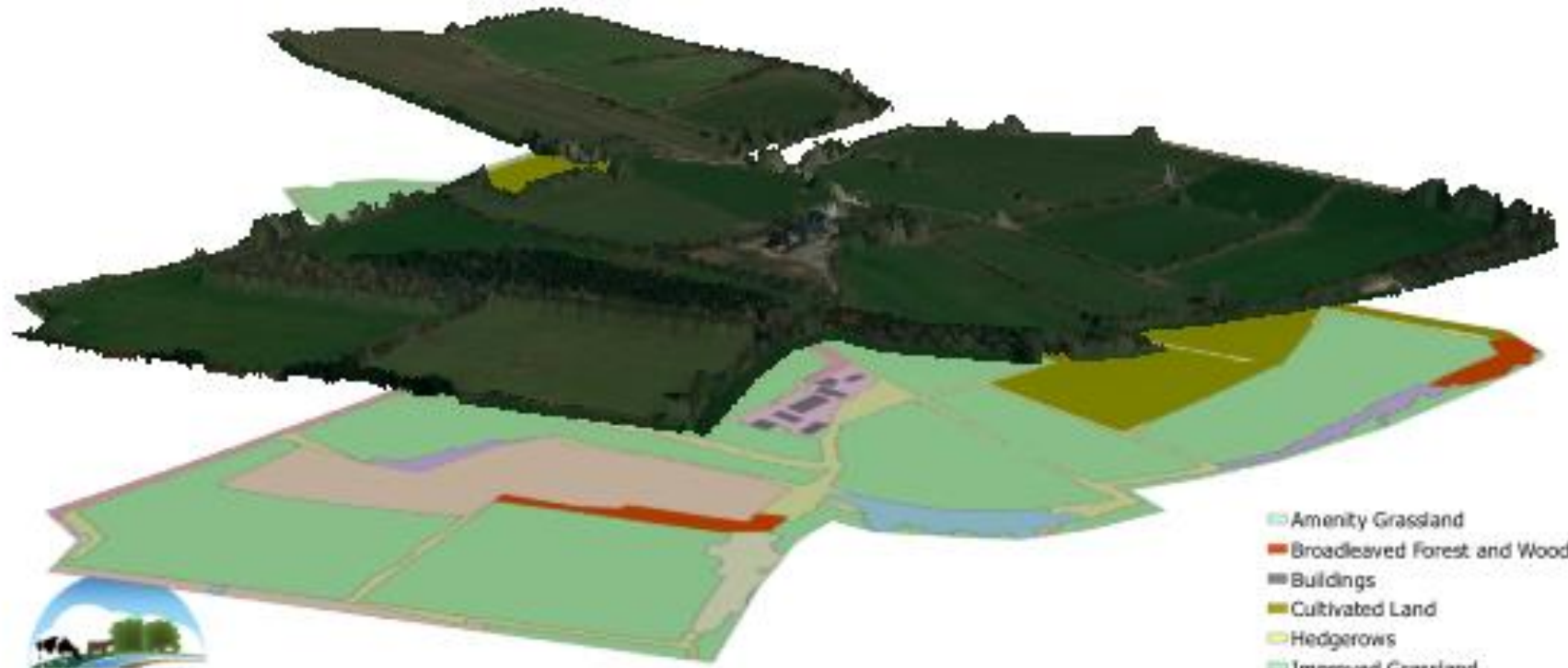
- 28 Eddy covariance Towers by end of year



# Sign Post Farms



## 3D Model & Landcover Map



- Amenity Grassland
- Broadleaved Forest and Woodland
- Buildings
- Cultivated Land
- Hedgerows
- Improved Grassland
- Other Artificial Surfaces
- Scrub
- Transitional Forest
- Treelines
- Ways
- Wet Grassland

Map: Microsoft



# Terrain-AI: Community based 'Network of Networks'

<https://terrainai.com/>

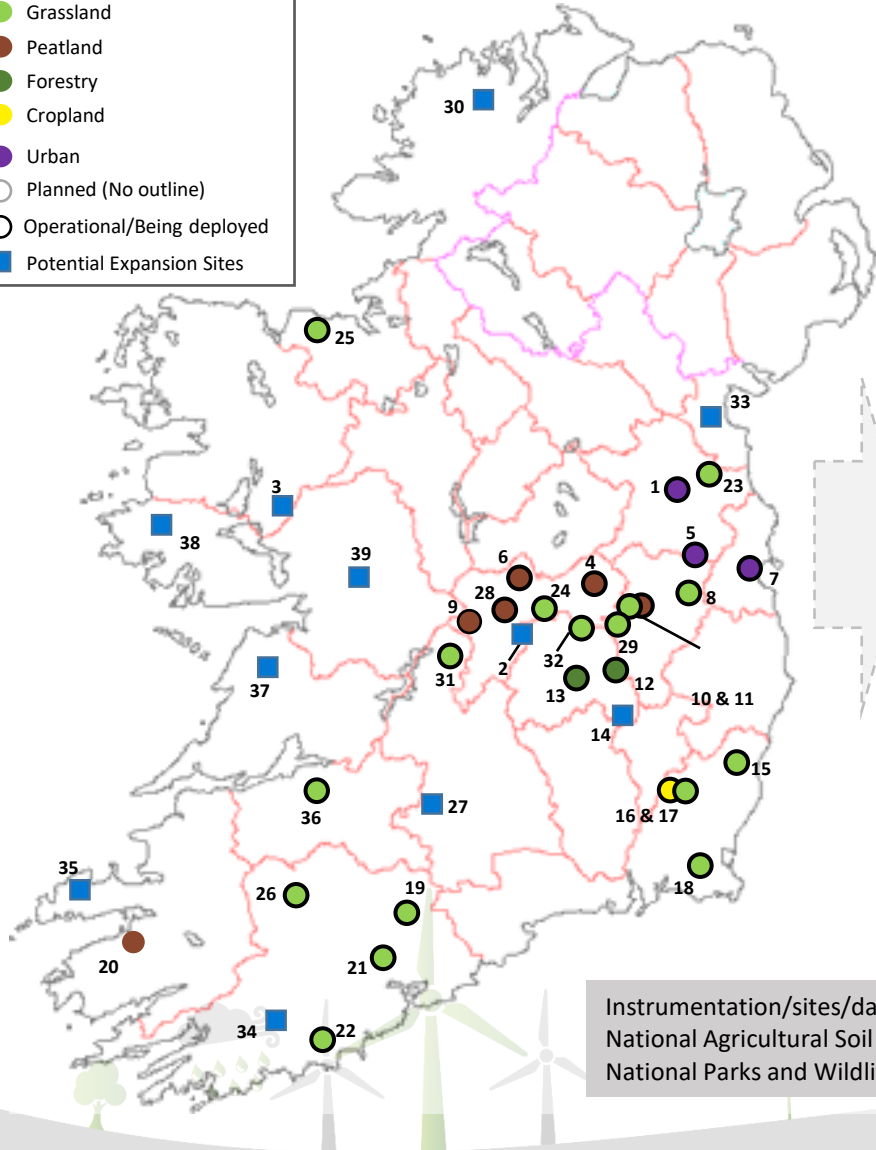


Terrain-AI

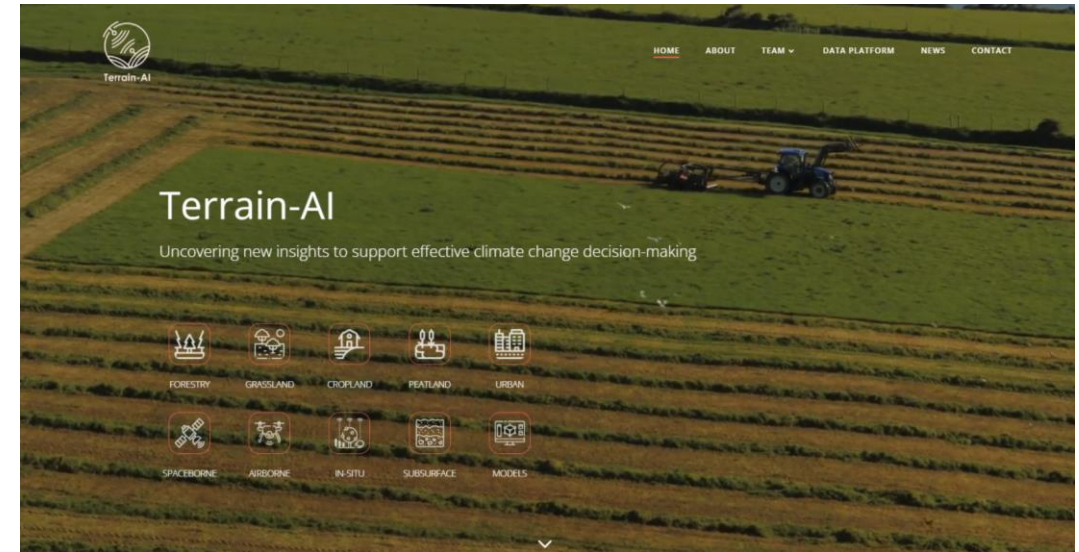


**Flux Sites**

- Grassland
- Peatland
- Forestry
- Cropland
- Urban
- Planned (No outline)
- Operational/Being deployed
- Potential Expansion Sites



Site Install Dec 2021:  
Ballykilcavan 45 metre tower  
established as a long-term  
forest research site



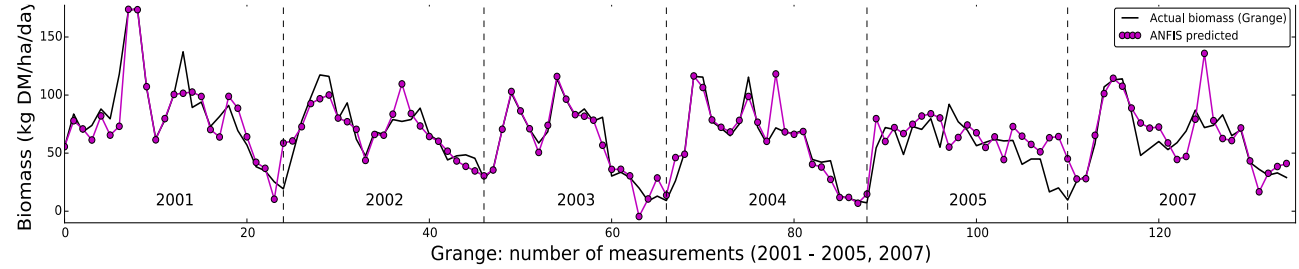
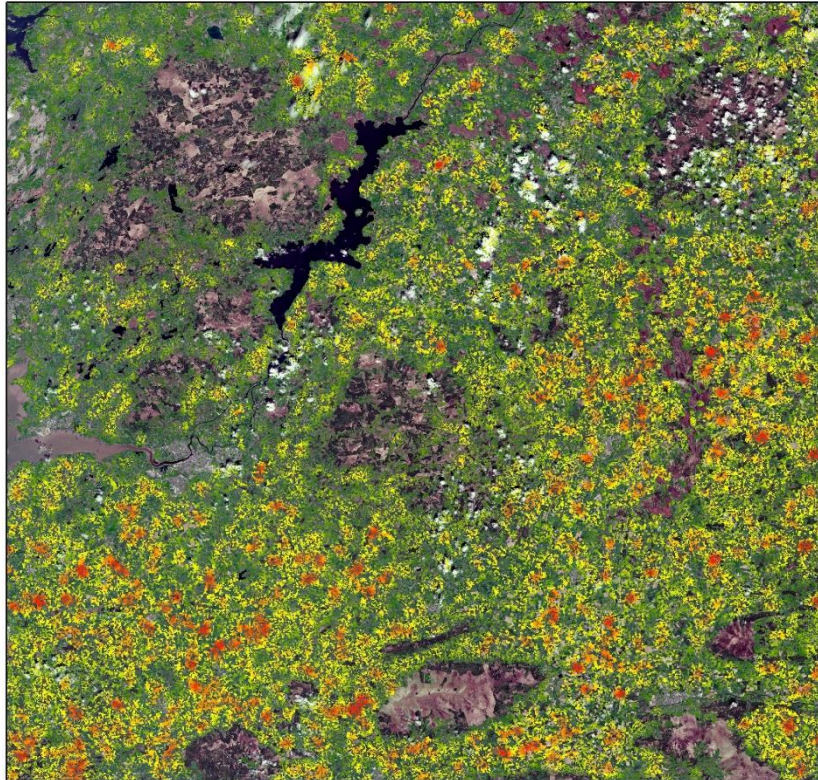
Instrumentation/sites/data provided by the following:  
National Agricultural Soil Carbon Observatory (NASCO);  
National Parks and Wildlife Service; UCC/FLUXNET; T-AI

Ireland now has one of the densest carbon flux monitoring networks globally

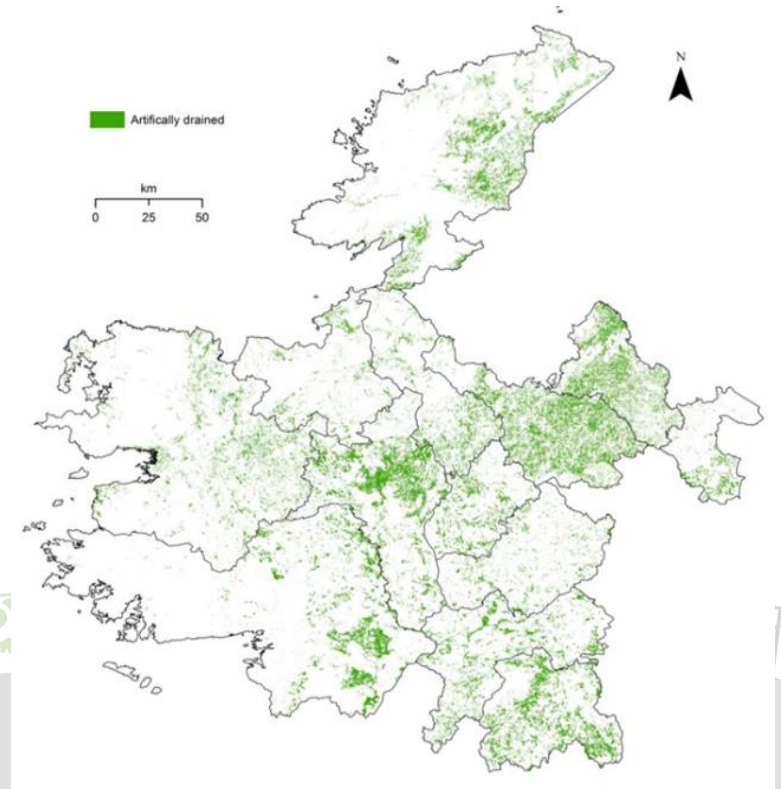
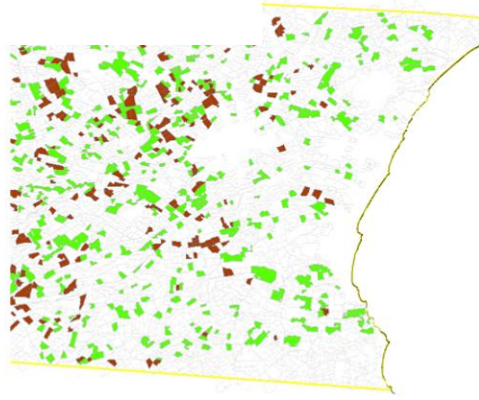


# Land Management

## Paddock Map – winter cover map – biomass -drainage



### Winter Cover



### Paddock density

per km  
High  
Low

km  
0 2 4 8 12 16 20





# FARM CARBON

- Mean aboveground and belowground biomass stocks of 58 tC.ha<sup>-1</sup> and 10 tC.ha<sup>-1</sup> respectively, are similar to studies in other countries.
- Irregular less intensively managed hedgerows contained significantly higher amounts of aboveground biomass compared to intensively managed hedgerows.
- Management regime had a strong effect on carbon stock changes and highlighted a small net emission source for pilot study over the survey period.

International studies suggest that the biomass of established hedgerows and existing hedgerows potentially sequester 0.43–1.7 tC ha<sup>-1</sup> year<sup>-1</sup> .

However the Farm-Carbon pilot study analysis for counties Waterford and Wexford suggests that hedgerow biomass in these counties could be a small net emission of –0.3 tC ha<sup>-1</sup> year<sup>-1</sup>.

Black, Kevin, Gary Lanigan, Mark Ward, Ian Kavanagh, and Lilian O. Sullivan. "Biomass carbon stocks and stock changes in managed hedgerows." *Science of The Total Environment* 871 (2023): 162073.

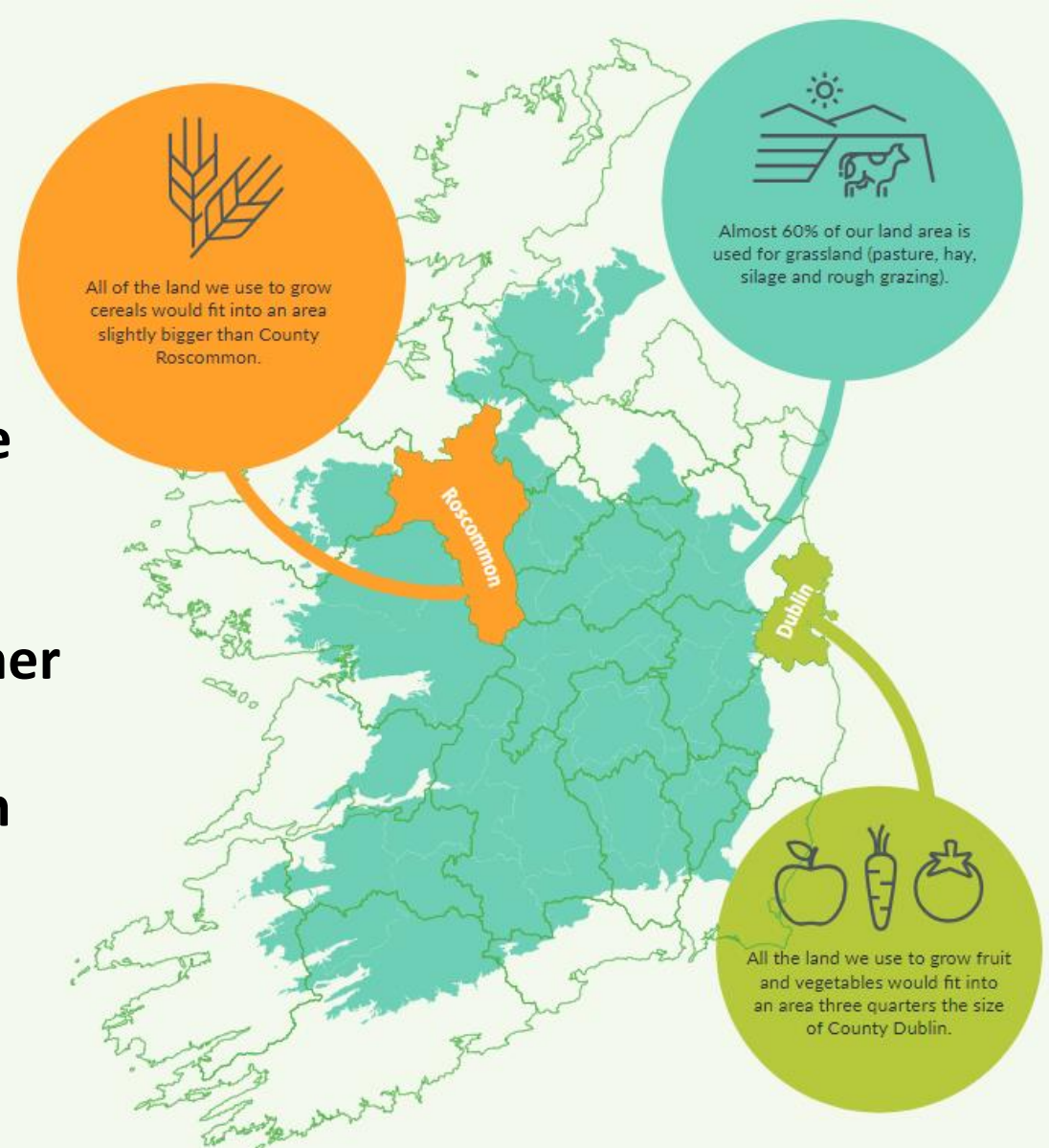
# Take away

**We are at a turning point in land use policy**

**We are moving rapidly from a position of ignorance to one overwhelming knowledge**

**New Targets and reporting are just around the corner**

**Land use change for carbon is not a “simple” switch but perpetual vigilance**



<https://www.gov.ie/en/publication/f272c-land-use-review-phase-1/>

