



AFBI Science - Providing the Evidence to Support Sustainable Nutrient Management

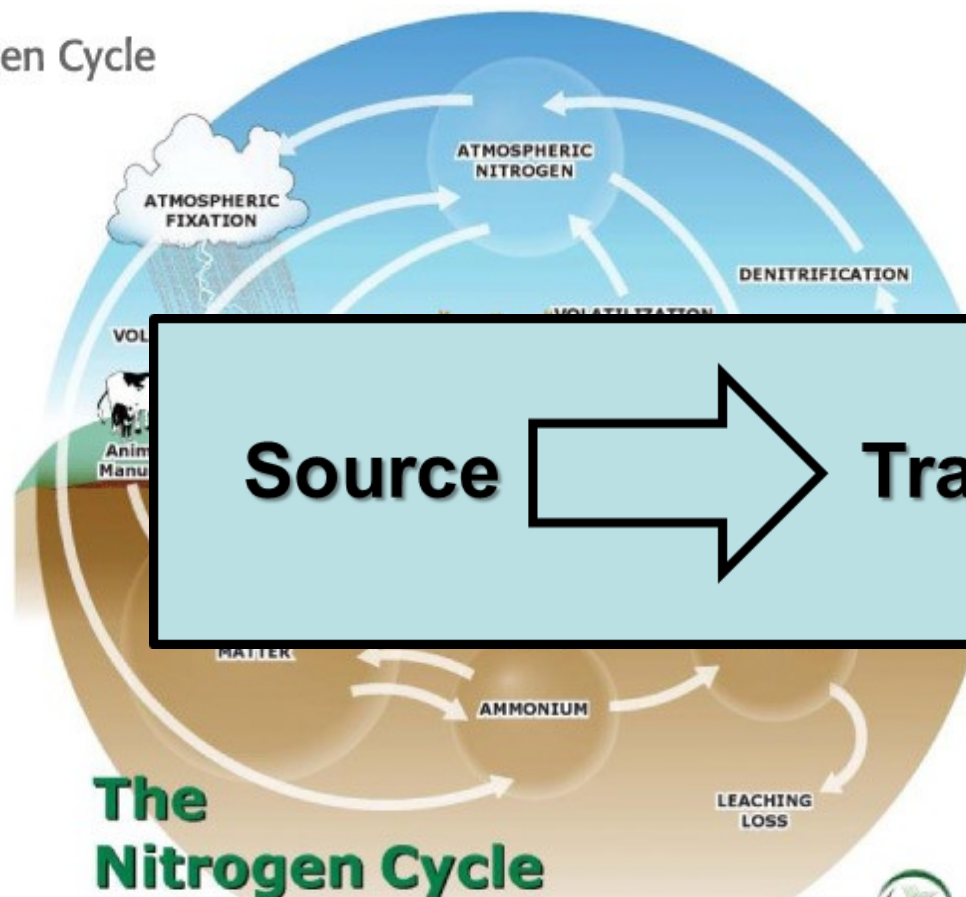
Dr Donnacha Doody

Overview

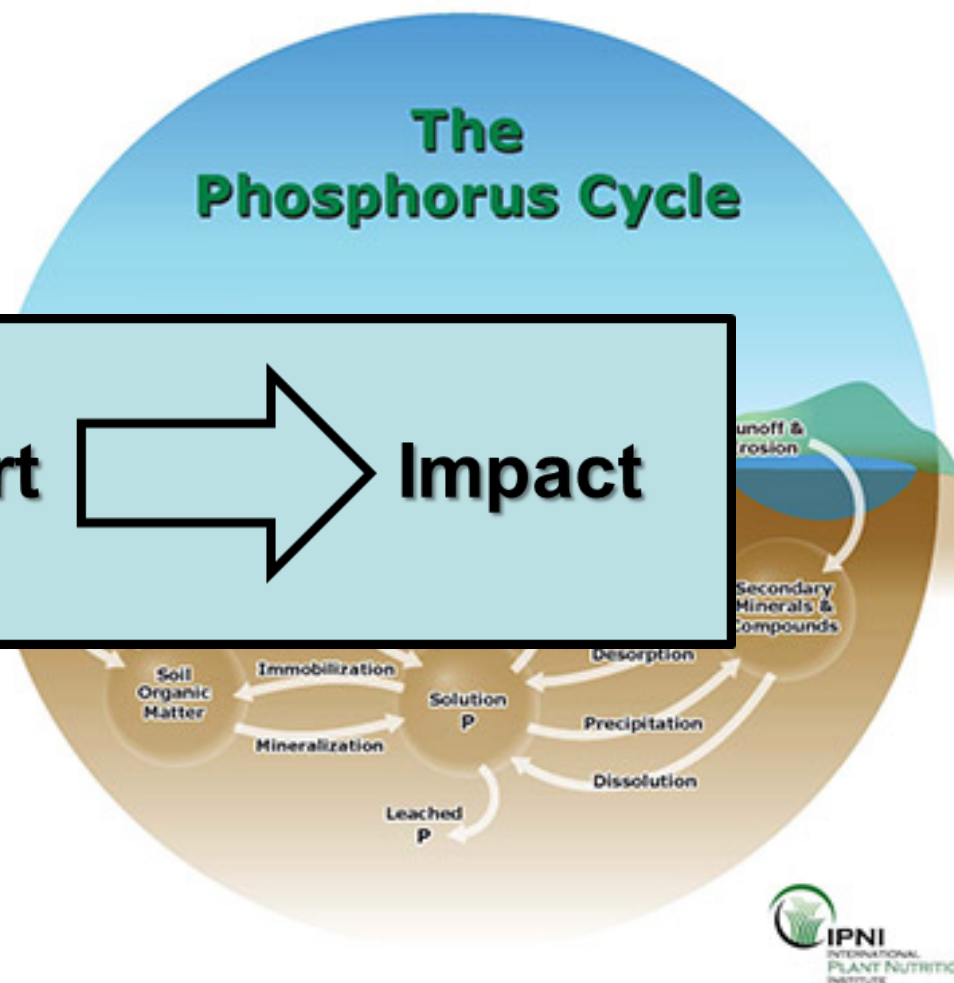
- Context
- Past Research – Delivering Solutions
- New Research – Evidence Base
- New Challenges



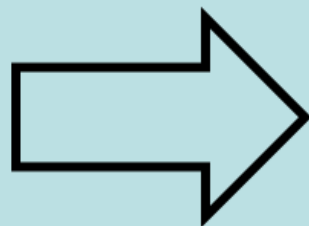
Nitrogen Cycle



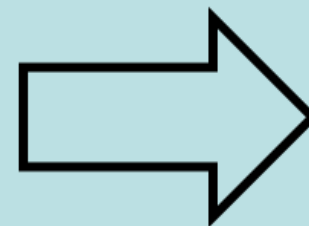
The Phosphorus Cycle



Source



Transport

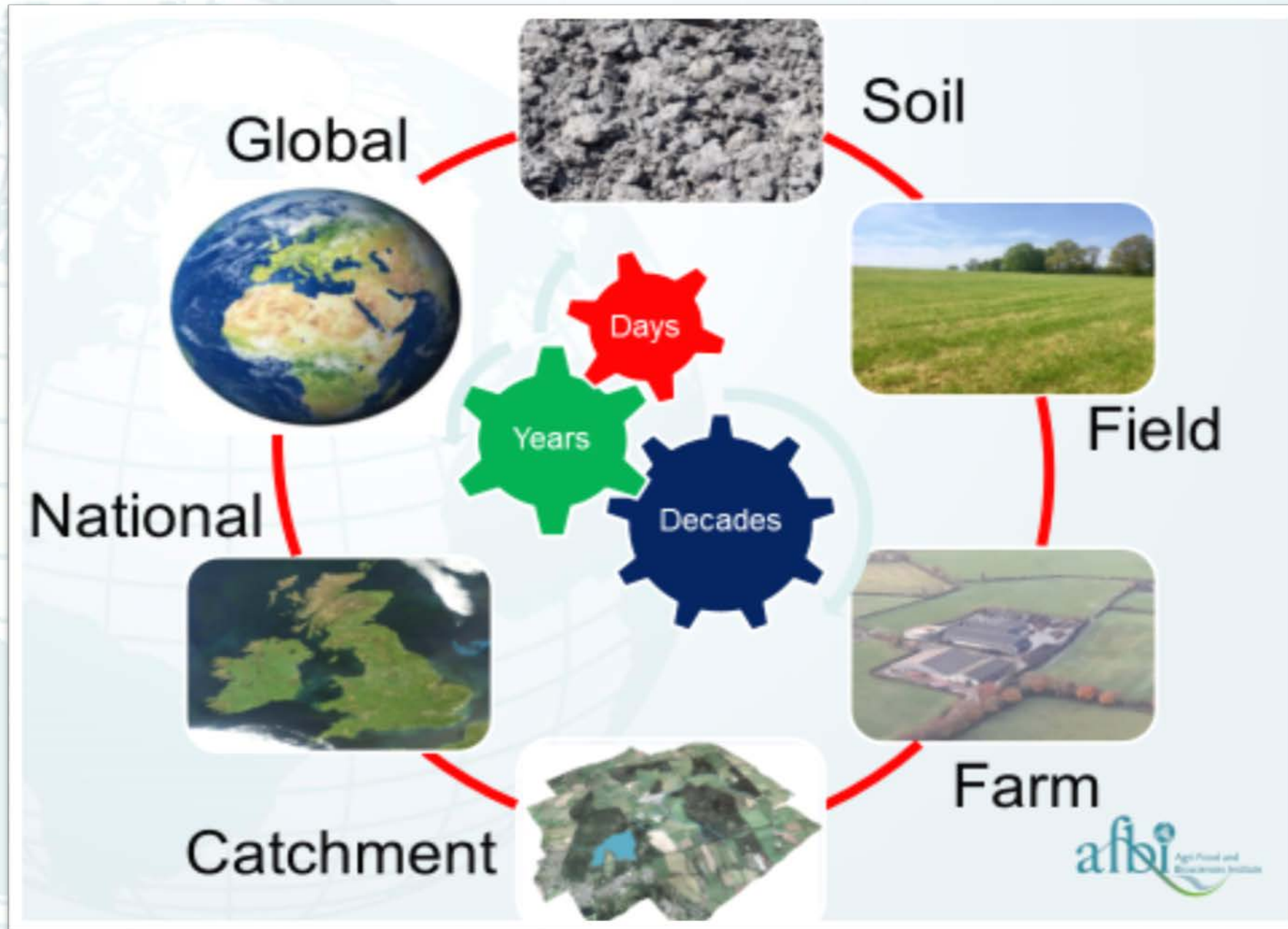


Impact

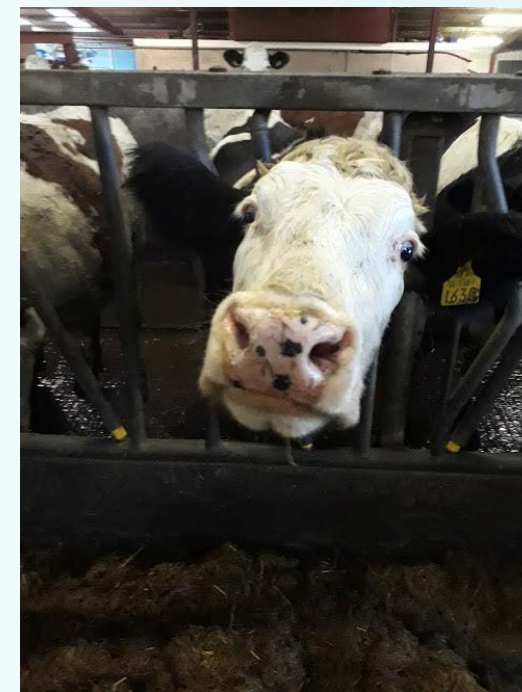
Sustainable Intensification means simultaneously improving the productivity and environmental management of agricultural land.



Temporal and Spatial Scale

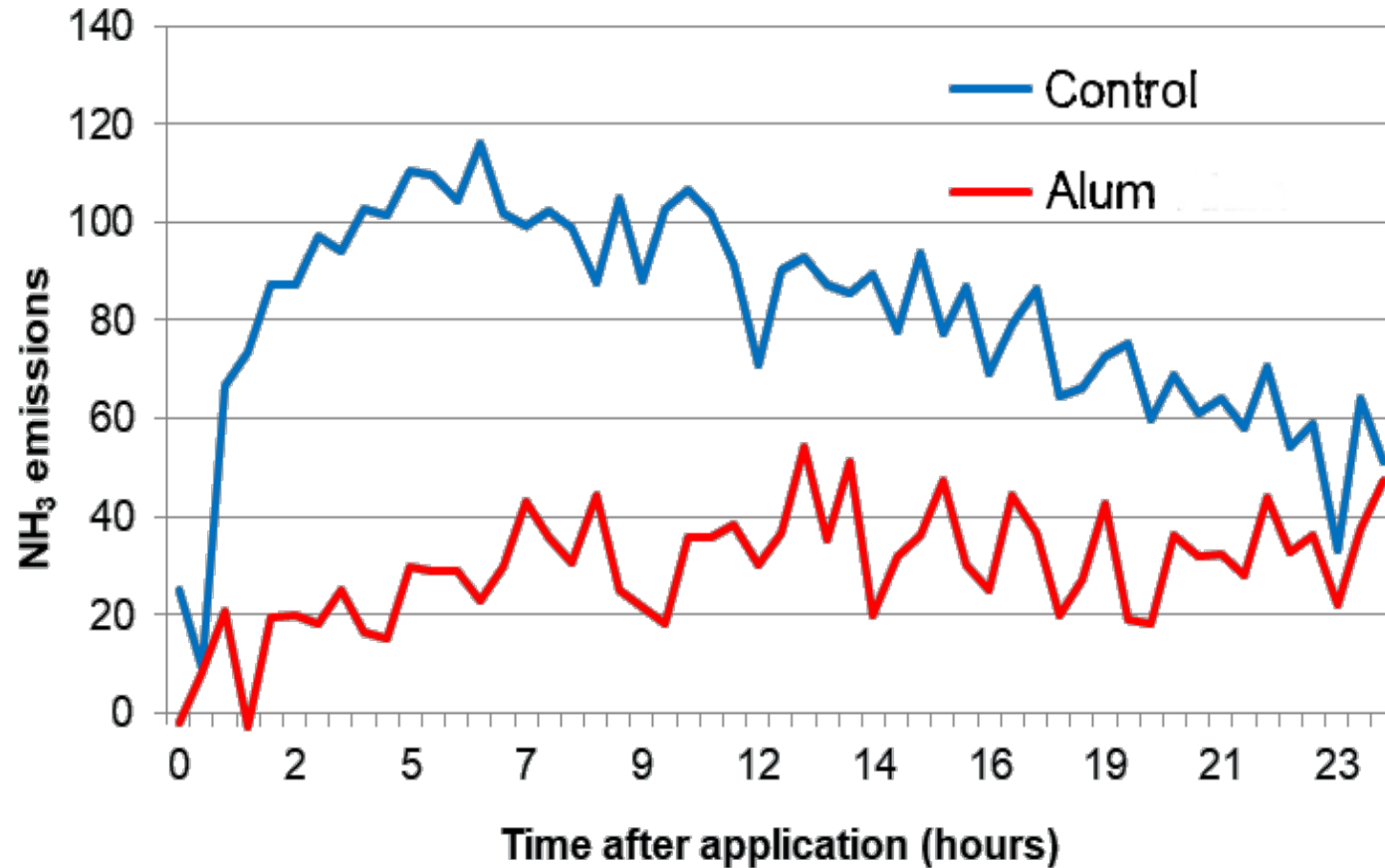


Managing Nutrient Sources



Ammonia Emissions from Housing

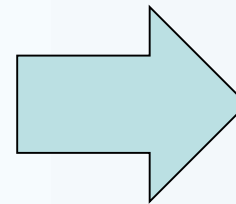
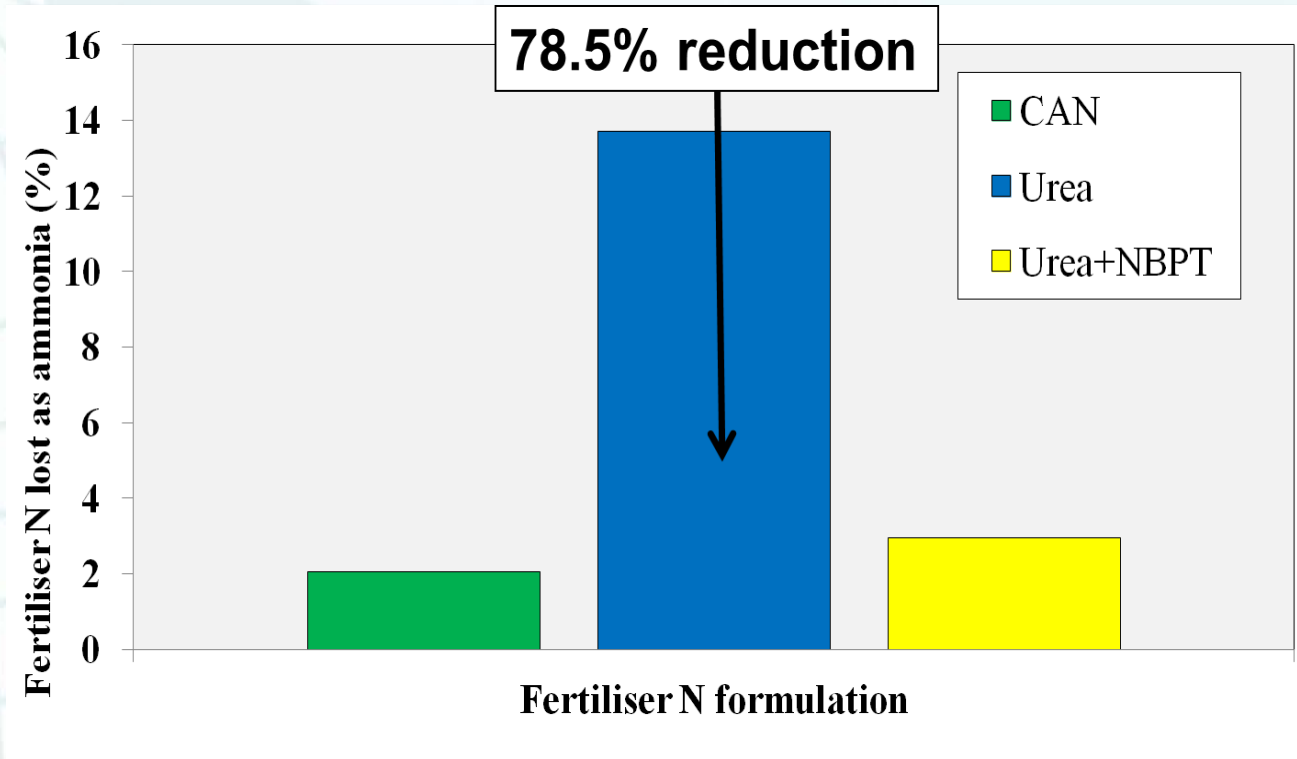
John McIlroy & Rachel Carolan



Alum reduced ammonia > 70% in the first 12 hrs

Ammonia Emissions from Fields

Peter Frost, Catherine Watson, Ronnie Laughlin



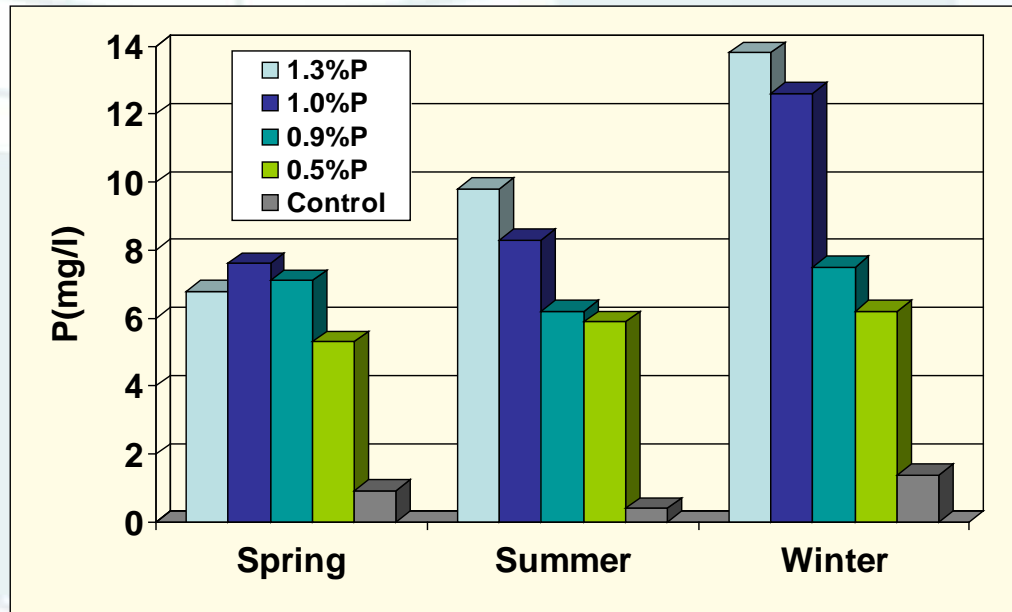
**60% reduction in
ammonia
volatilisation**

Dietary Phosphorus

Conrad Ferris



P Loss in Runoff



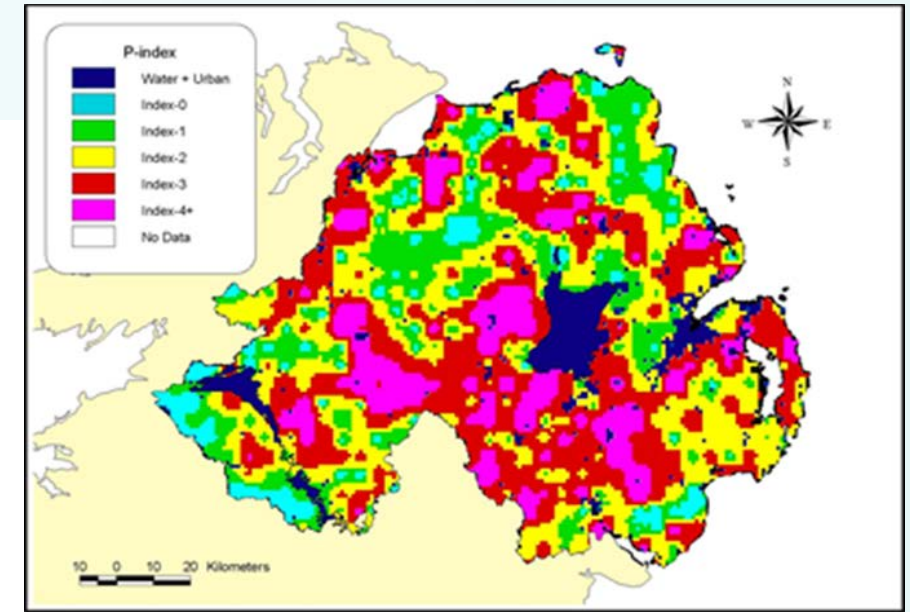
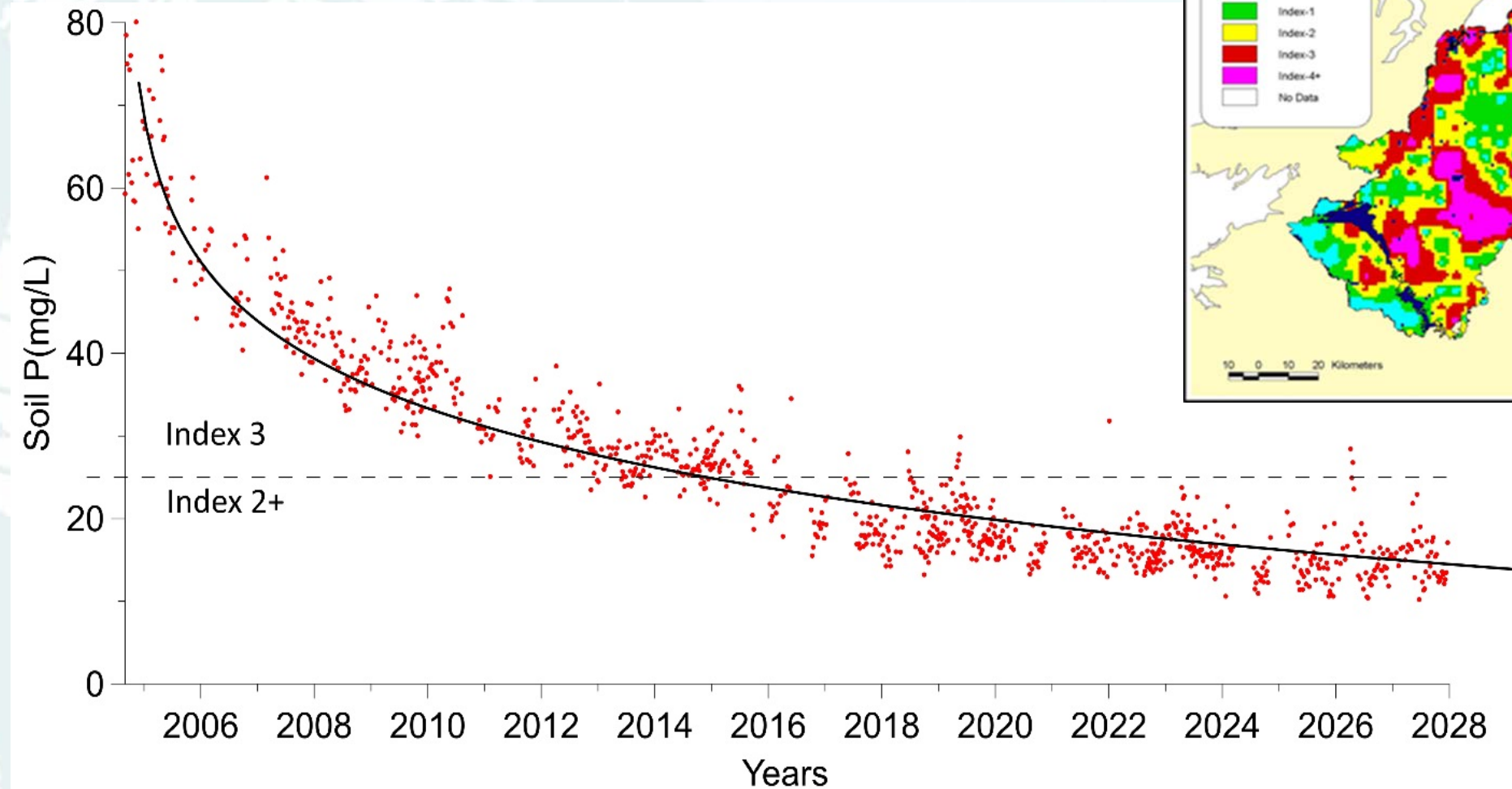
Milk Yield

	<i>Normal P</i> 4.5 g/kg DM	<i>Reduced P</i> 3.6 g/kg DM	<i>SEM</i>	<i>Sig.</i>
Lactation 1	7521	7474	138.5	NS
Lactation 2	8241	8419	166.5	NS
Lactation 3	9177	9219	217.5	NS
Lactation 4	9002	8976	394.0	NS

**Reduced P in diets
results in
reduced P loss to water**

Soil P Management

Rachel Cassidy & John Bailey



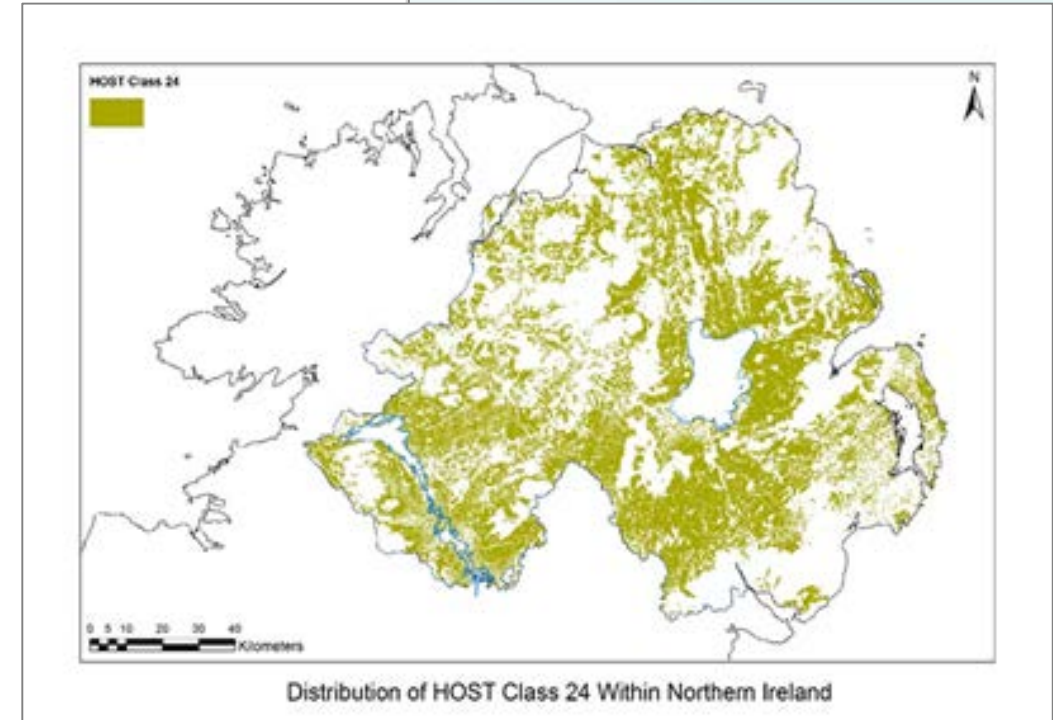
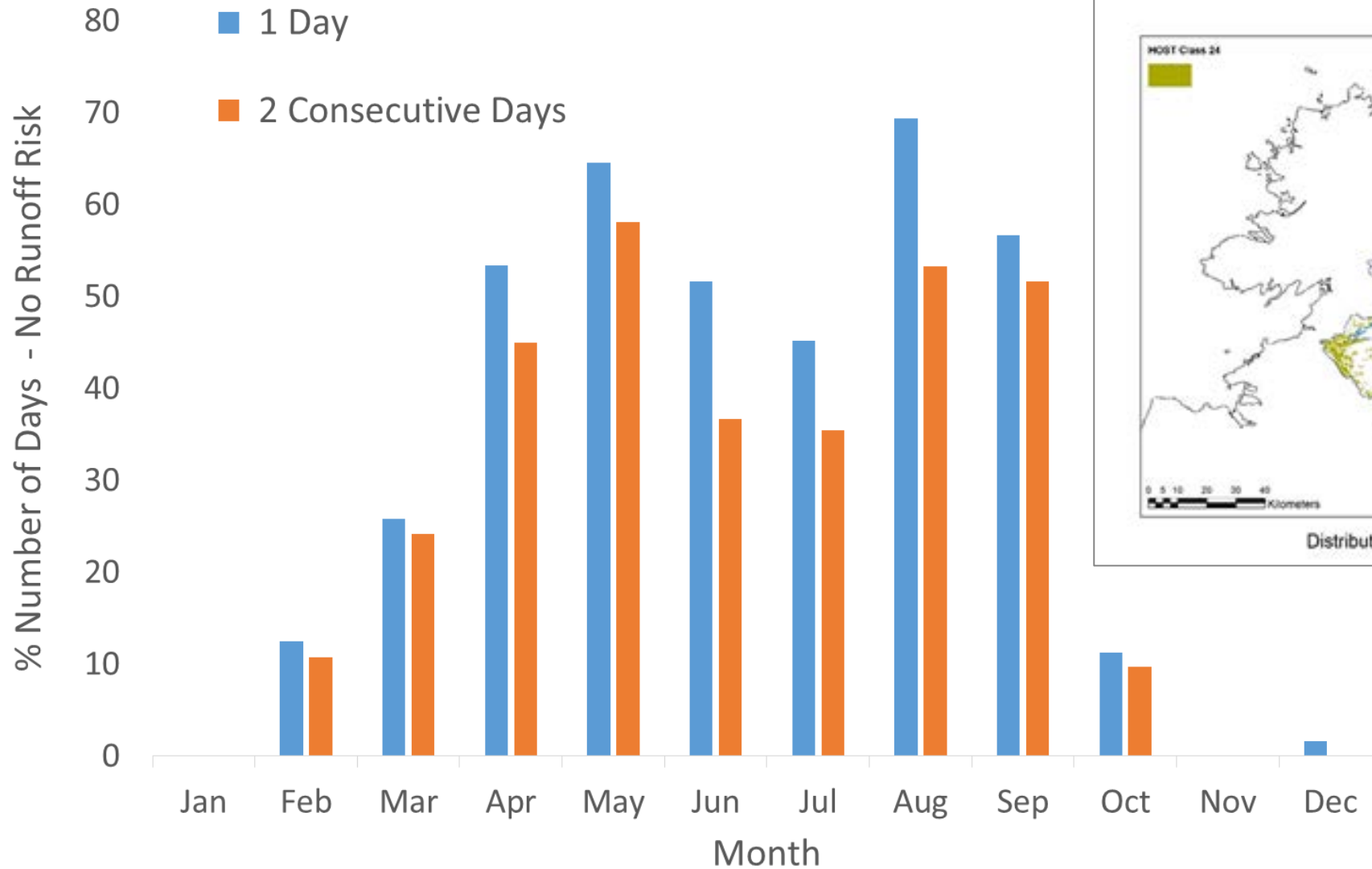
> 10 years for soils with excessive P to reach soil P Index 2+

Managing Transport Pathways



Runoff Risk in Northern Ireland

Donnacha Doody & Alex Higgins



Identifying Flow Pathways-LiDar

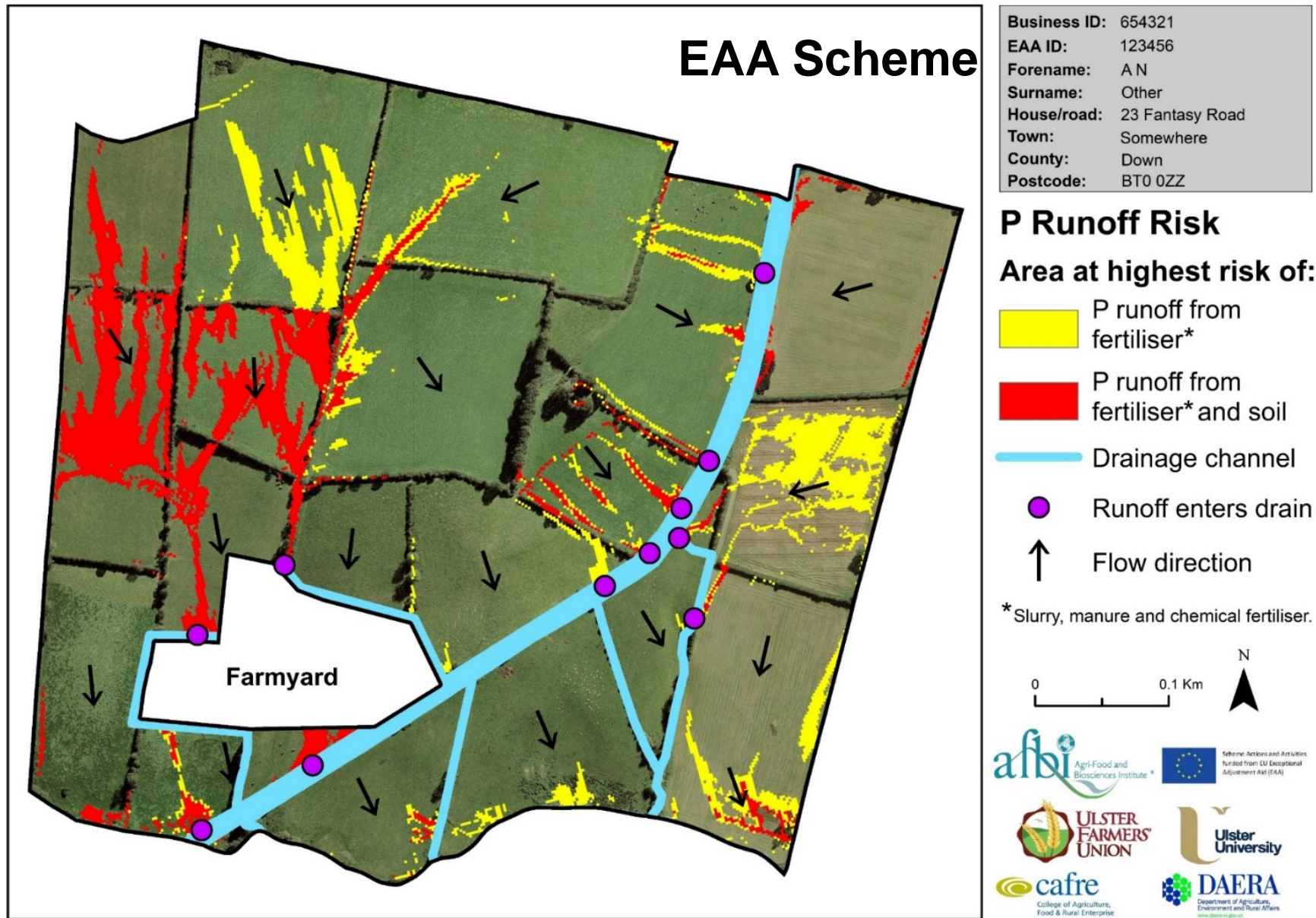
Rachel Cassidy



Identifying pathways enables us to manage them

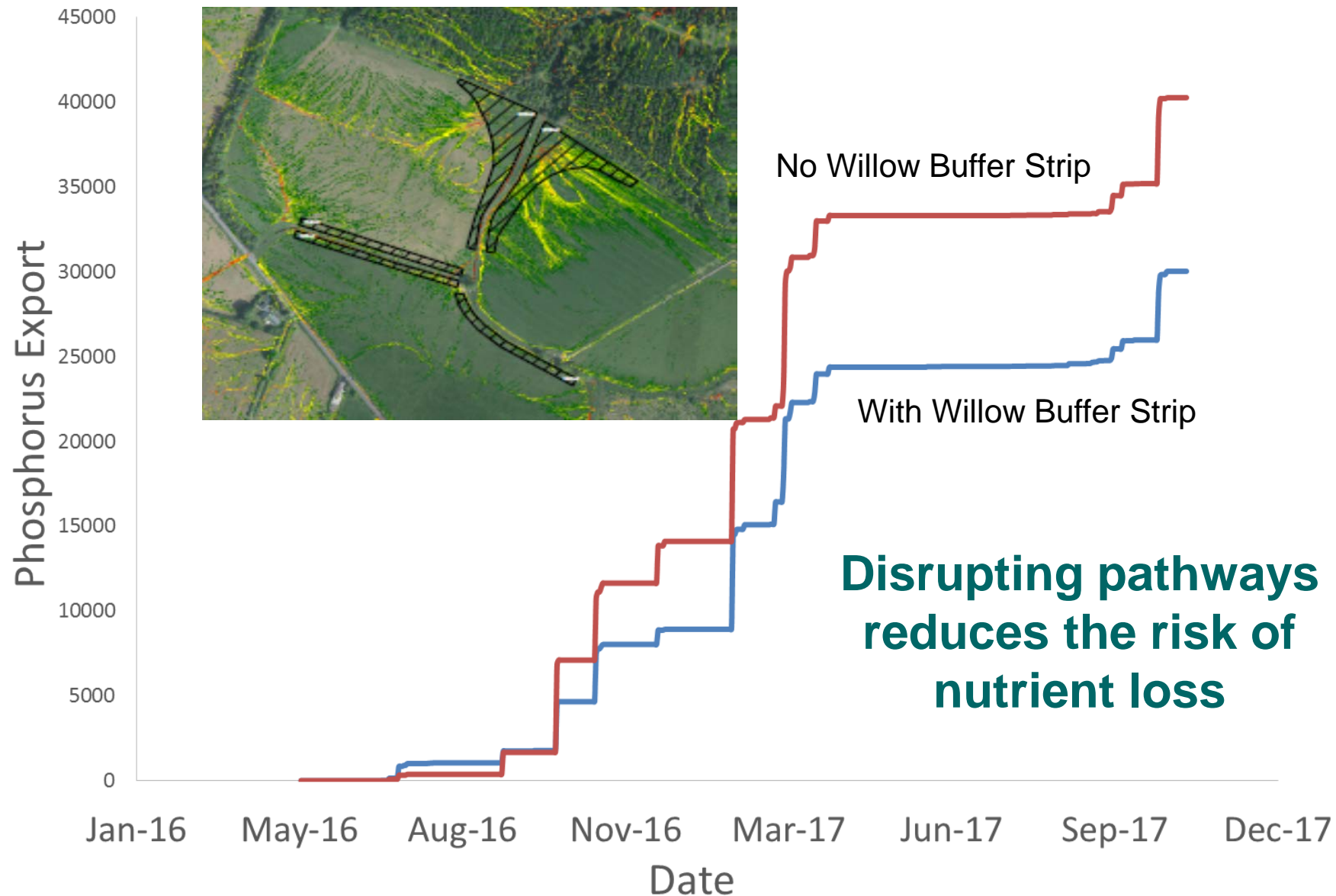
Managing Pathways

Ian Thomas, Rachel Cassidy, Alex Higgins



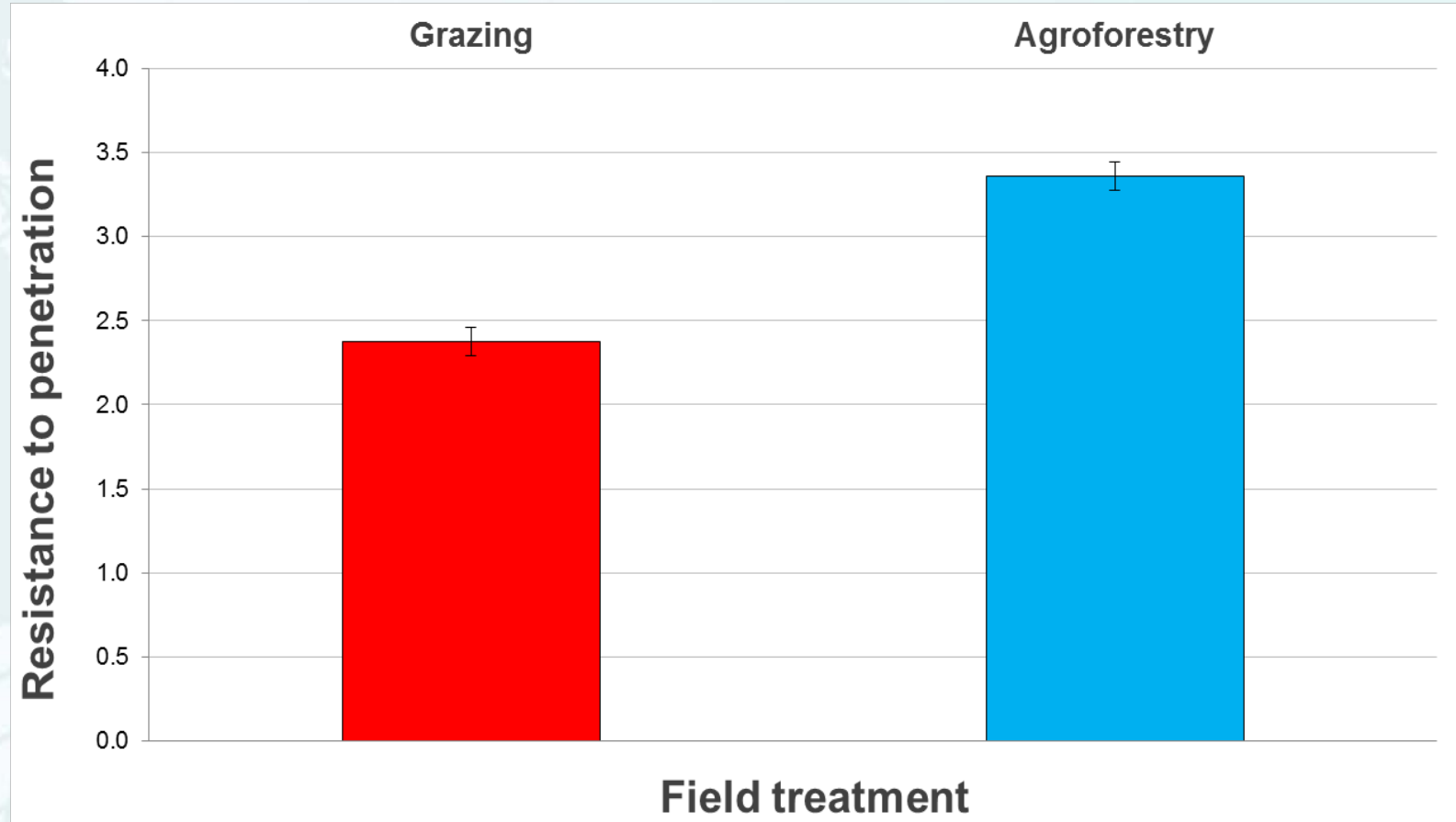
Disrupting Pathways

Donnacha Doody & Chris Johnston



Agro-forestry-Improving Trafficability

Jim McAdam



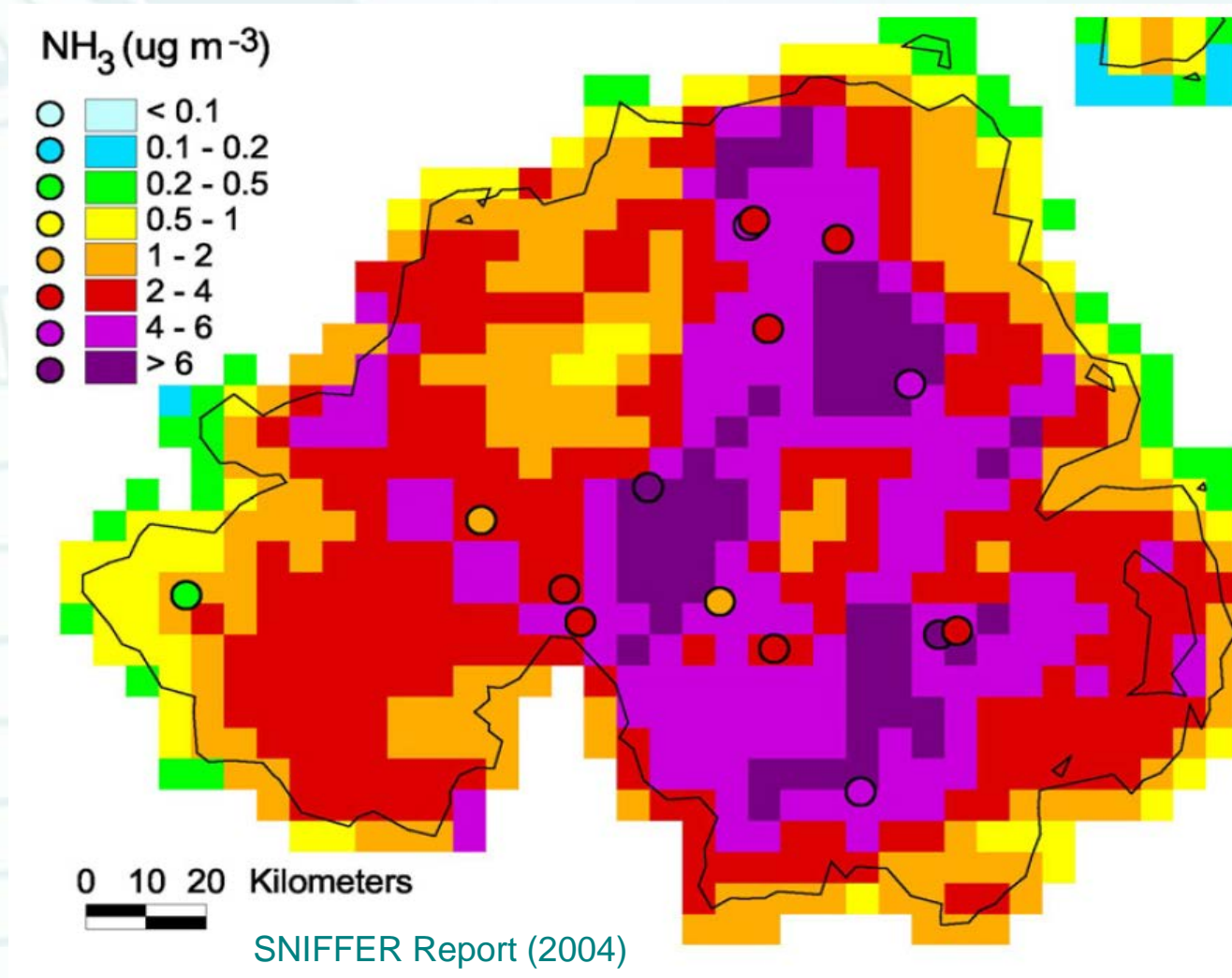
Increased the grazing season by 17 weeks

Understanding the Impacts



Measuring Ammonia Deposition

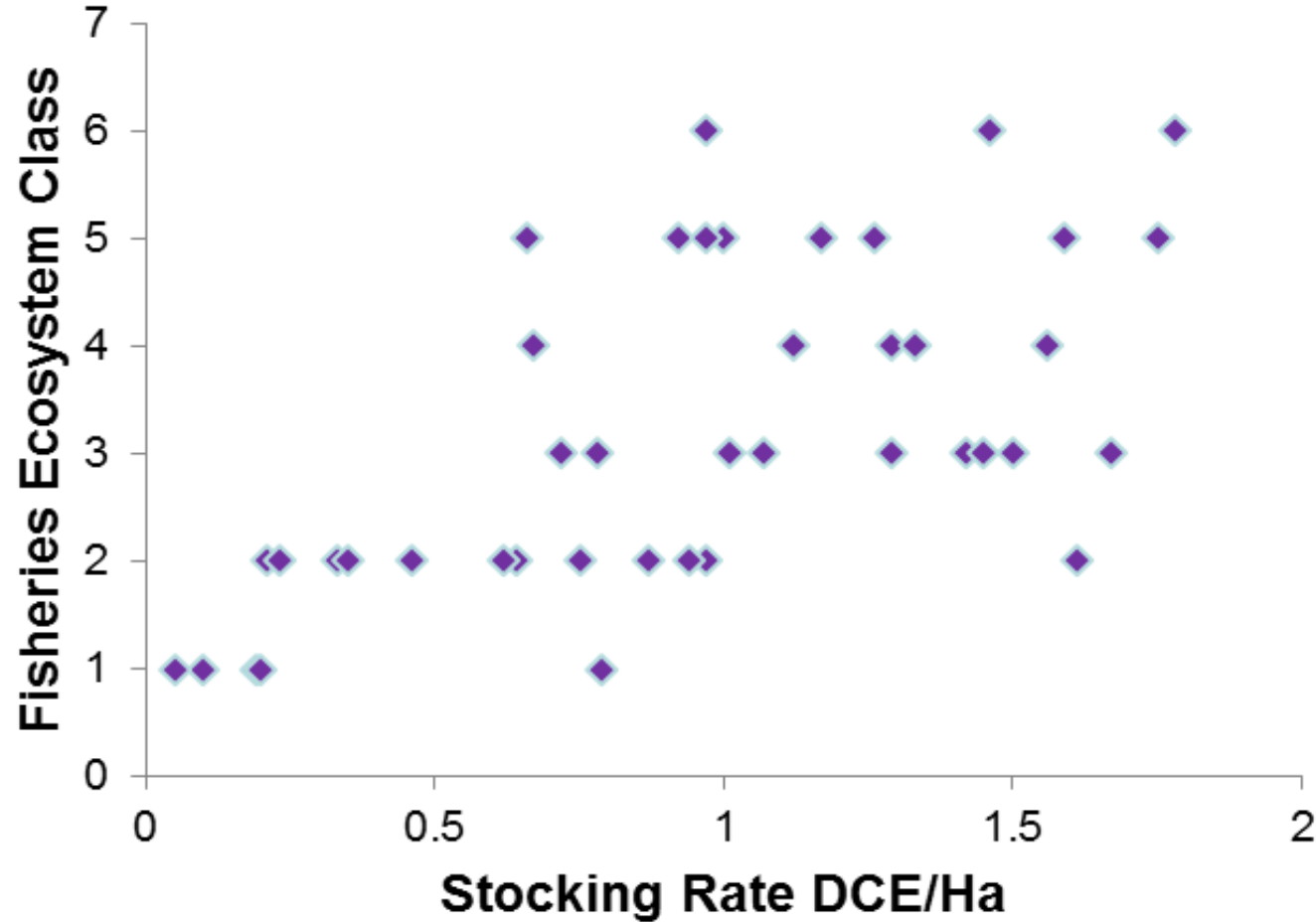
John McIlroy & Rachel Carolan



New AFBI research – 25 monitoring sites across NI

Catchment Scale Studies - AFBI

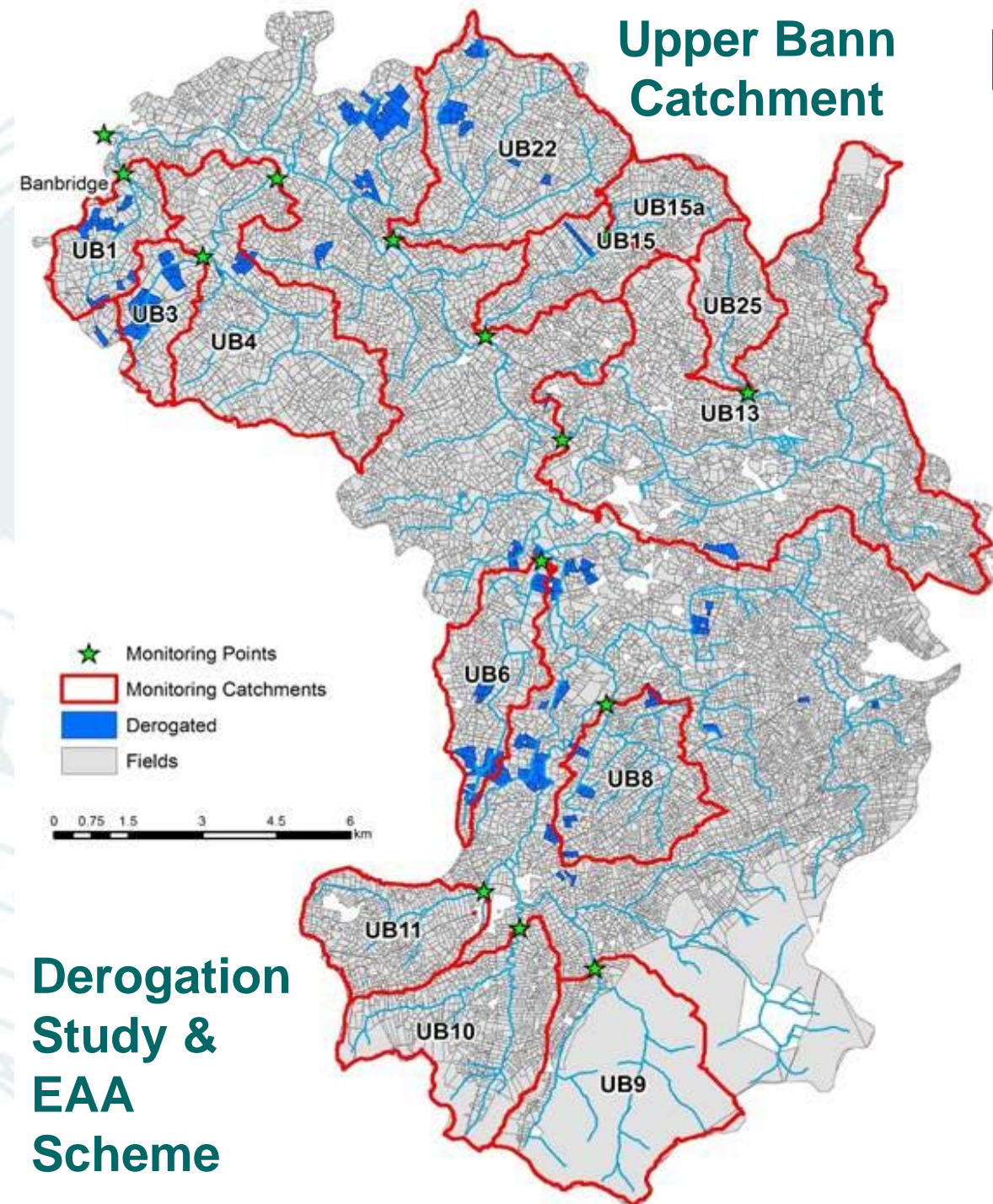
Donnacha Doody, Rachel Cassidy, Yvonne McElarney



Catchments vary in their ability to cope with agriculture pressures

High Resolution Monitoring

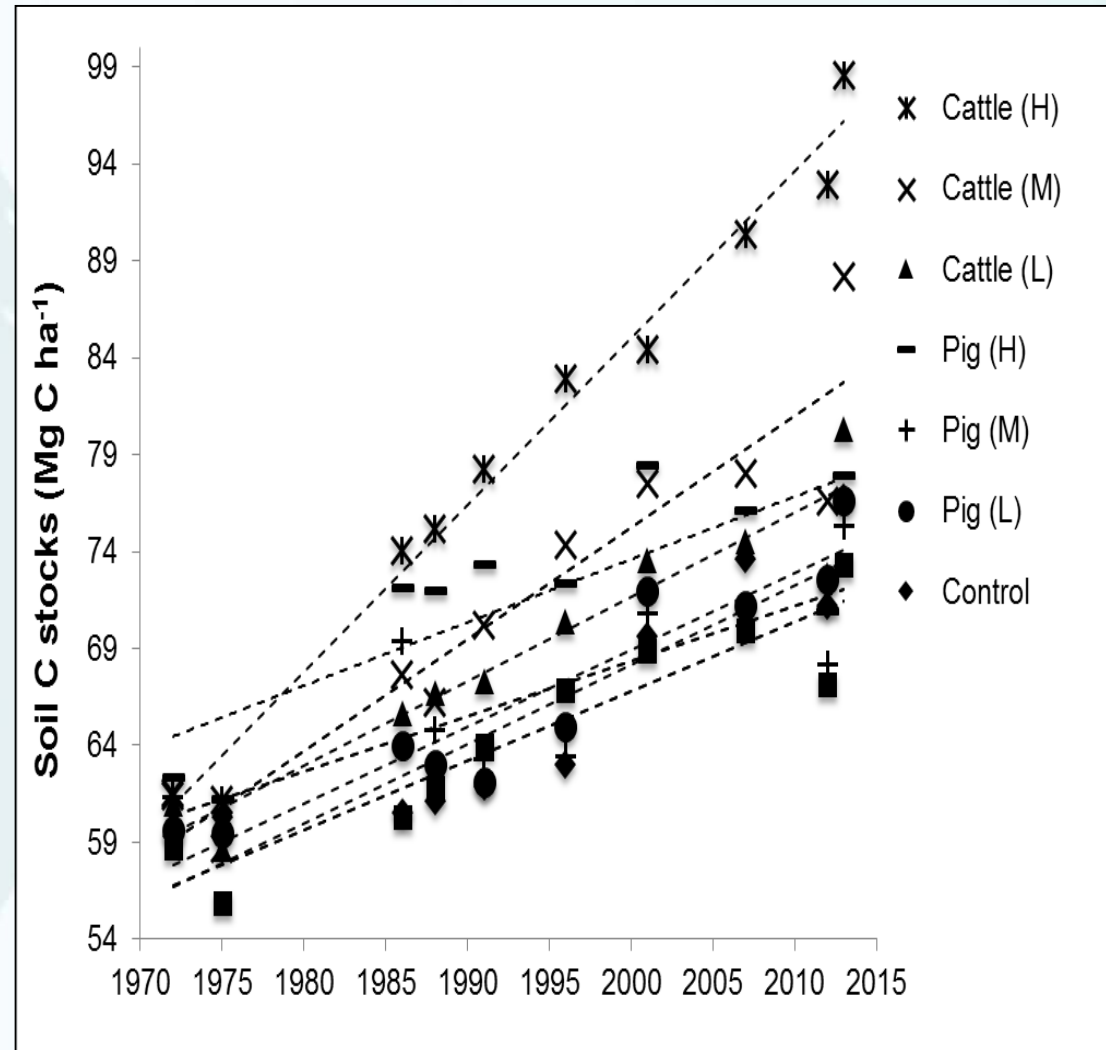
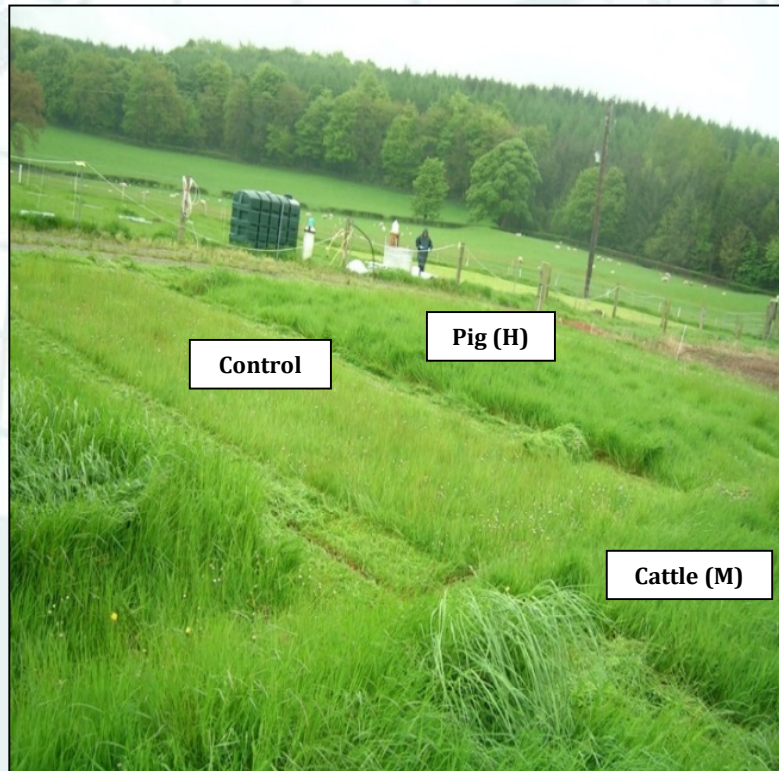
Rachel Cassidy & John Bailey



Improving Soil Health

Dario Fornara

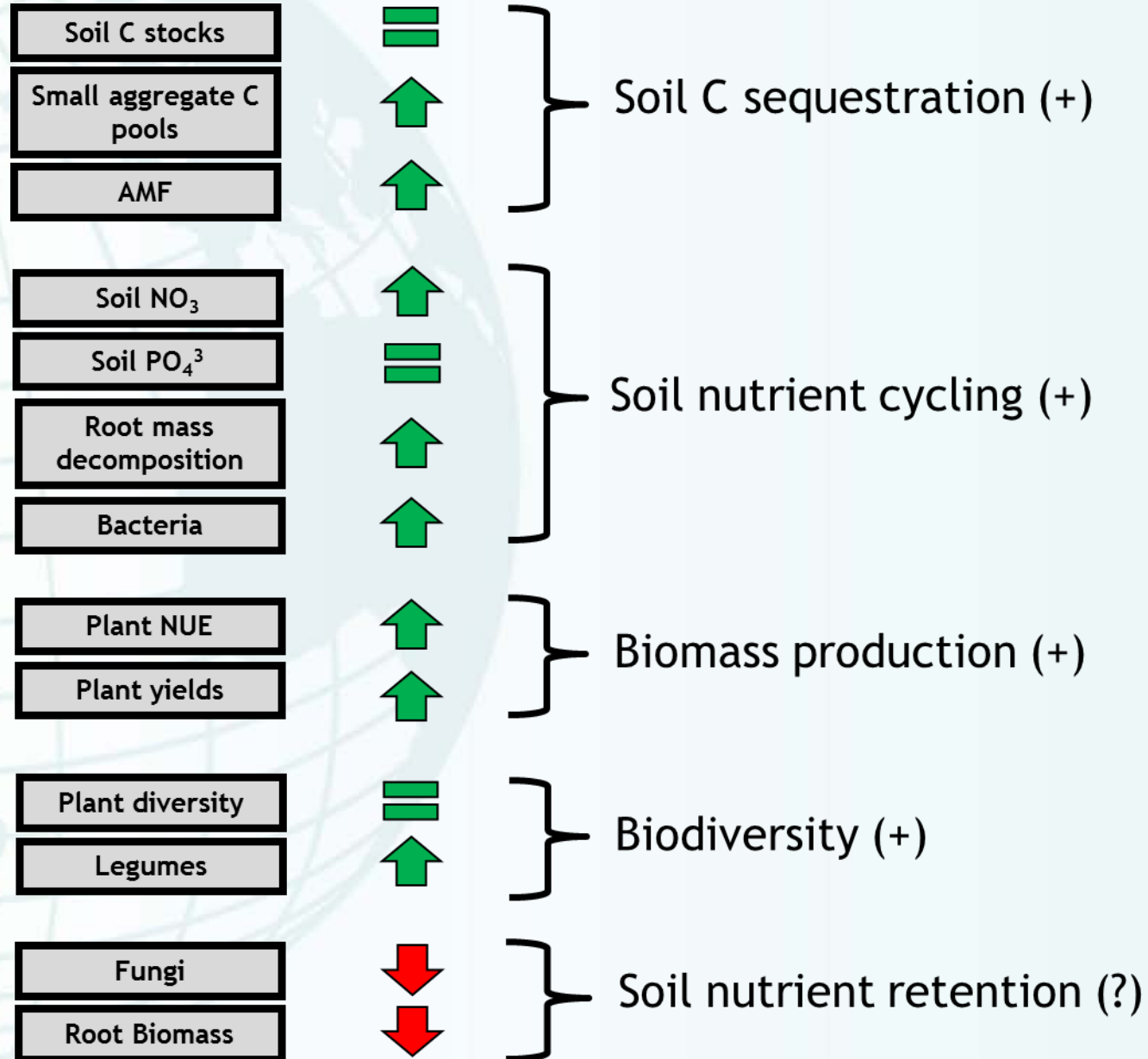
LTS (Long-Term Slurry) grassland experiment established at Hillsborough in 1970



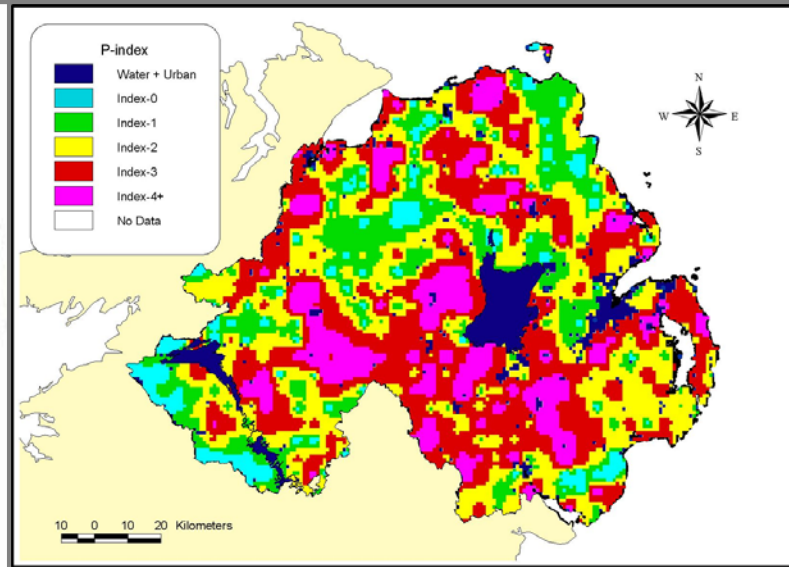
Carbon accumulation in grass continues > 20 years

Liming - Ecosystem Services

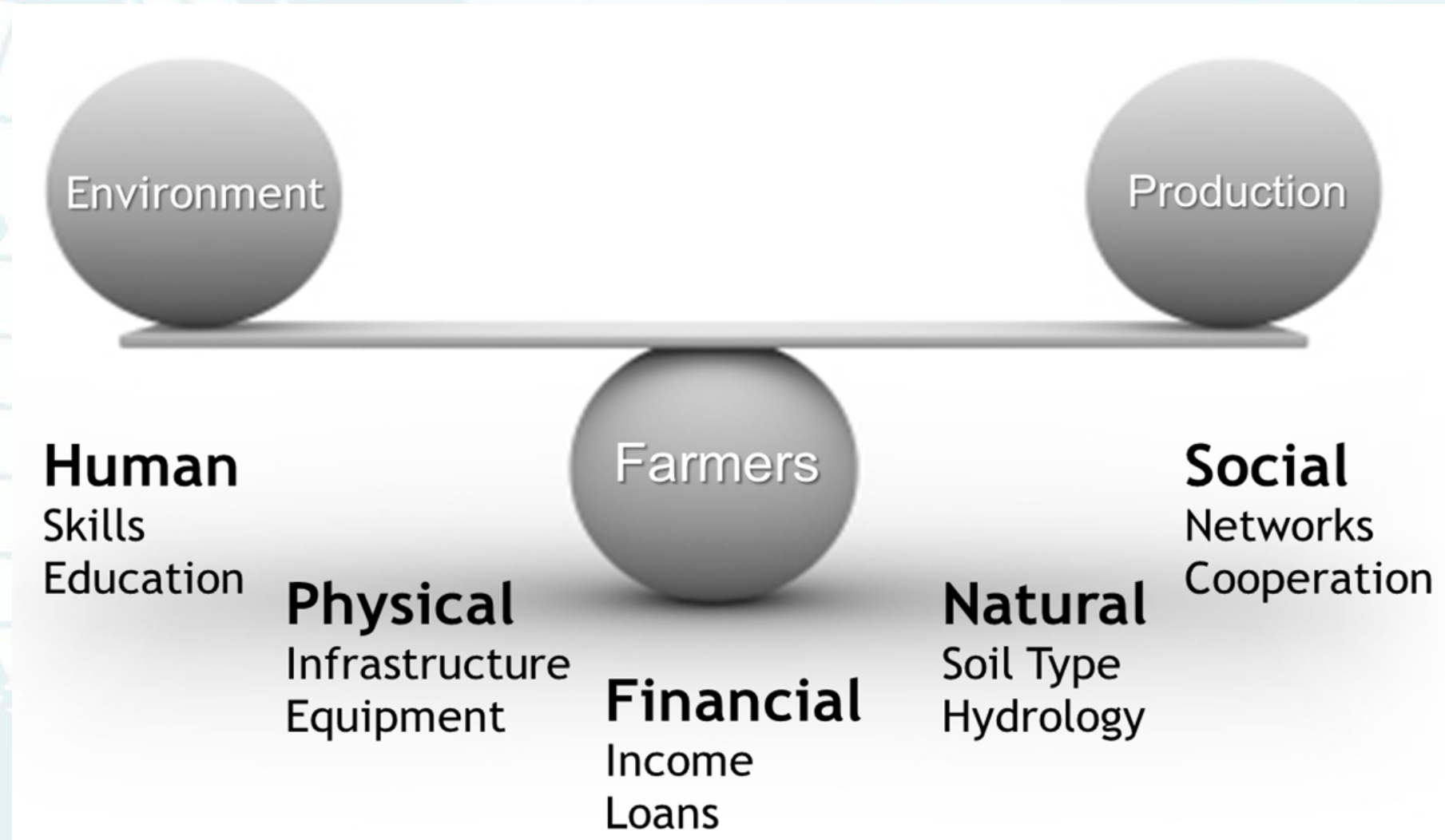
Dario Fornara



New Challenges

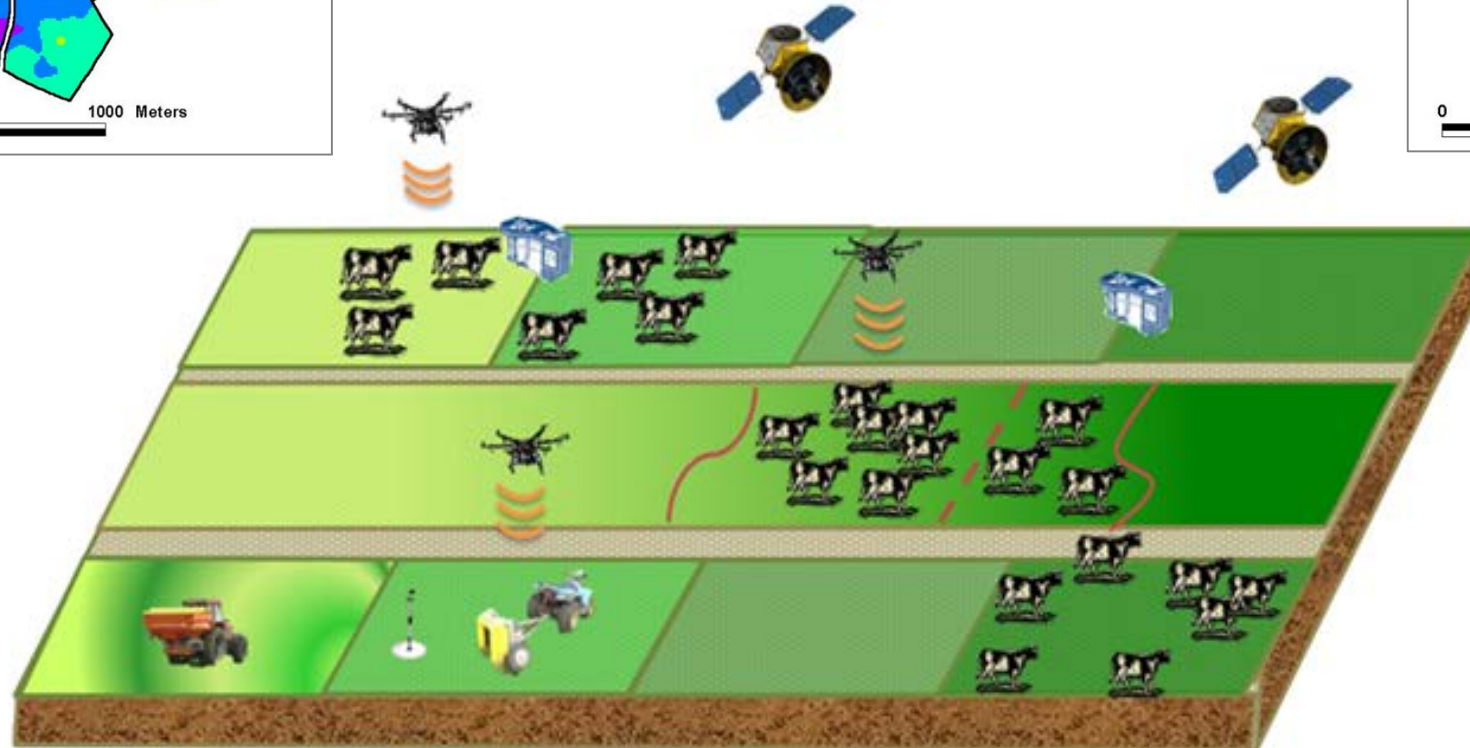
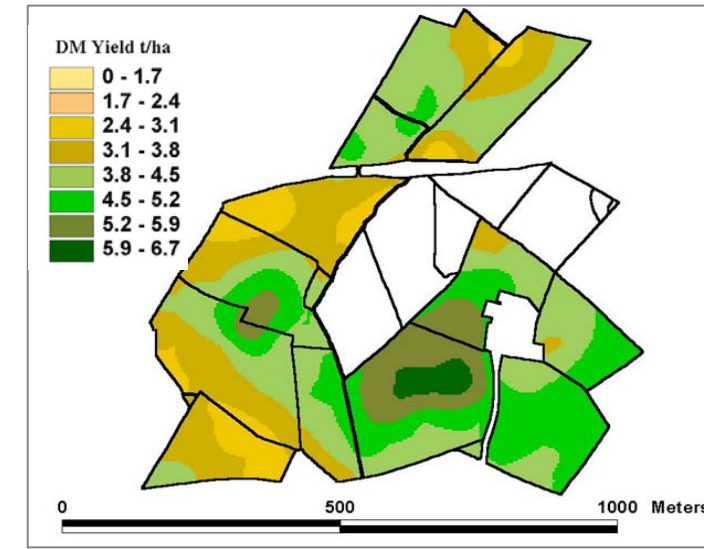
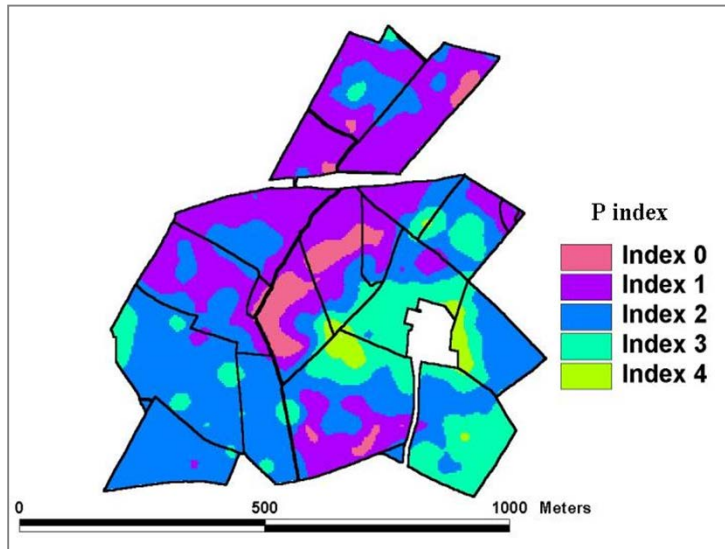


Adapting to Change



Big Data – Precision Agriculture

Suzanne Higgins & Debbie McConnell

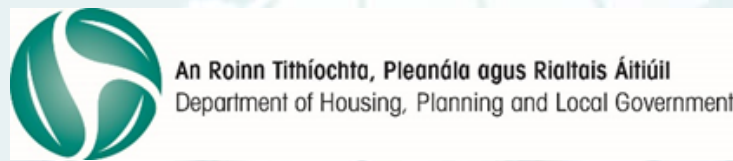


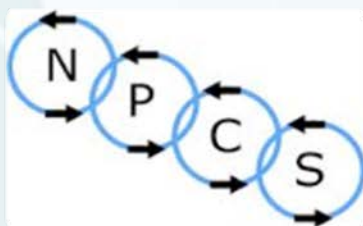
Manure Processing

Gary Lyons



New Research





Thank You

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