

Impact of the Glastir Scheme:

Measure Centric Approach to Modelling Effects of Land Management Options

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GMEP

Glastir Monitoring
and Evaluation
Programme

Glastir outcome: *Result and Impact Indicators

*Common Monitoring and Evaluation Framework

- Improving Soil and Water Management
 - Water Balance and Soil Erosion
 - Nitrate and Phosphorus Leaching
 - Pesticides and Veterinary Medicines
- Combating Climate Change
 - Methane Emissions
 - Nitrous Oxide Emissions
 - Carbon Dioxide Emissions (On-Farm)



Wales Diffuse Pollution Emissions Framework

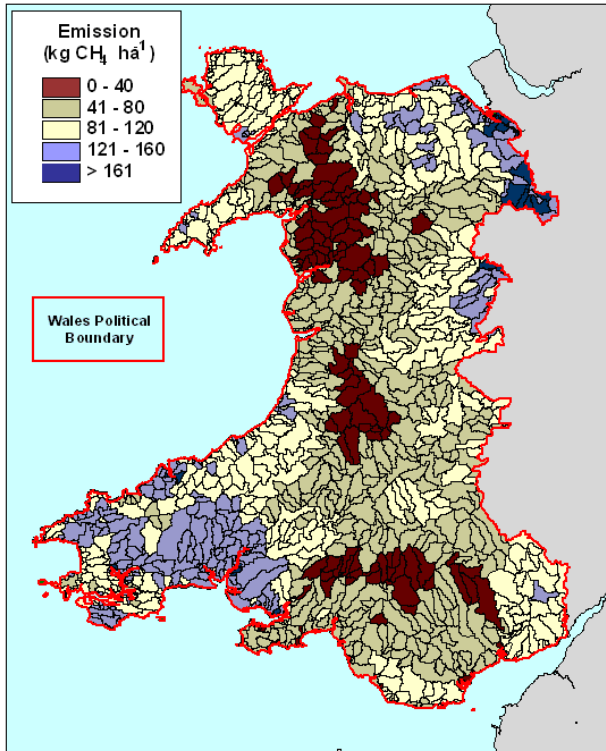
- Integration of pedigree Policy and Regulatory models at Farm Scale driven by surveys of current Farm Management
- Prediction of Multiple Pollutant losses from Multiple Sectors and Sources, Areas and Pathways
- Applied throughout United Kingdom:
 - Nitrate Vulnerable Zones Designation
 - Water Framework Directive Characterisation
 - Multi Media Cost Effectiveness of Mitigation
 - Evaluation of Tir Cynnal and Tir Gofal
 - Impact of General Binding Rules



Agricultural Emissions

Climate Change

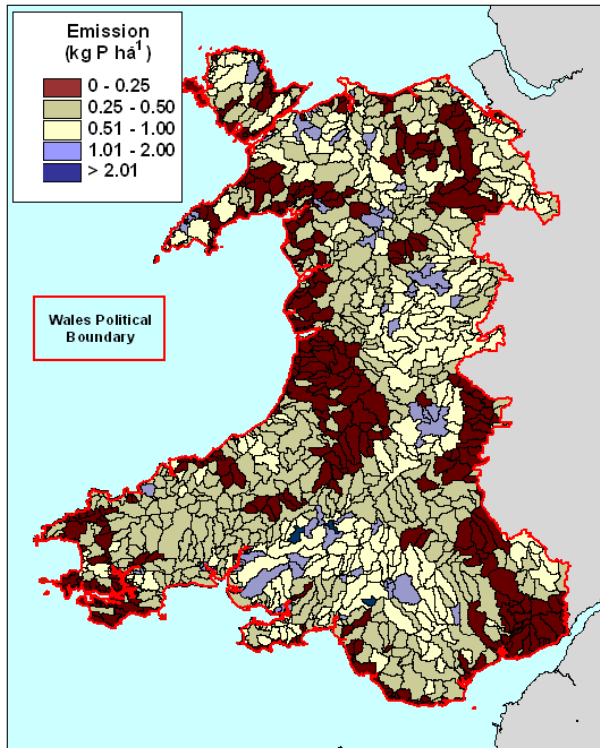
Present Day Modelled Methane Emission from all Agricultural Land Including Commons



131.9 kt CH₄

Nutrients / Sediment

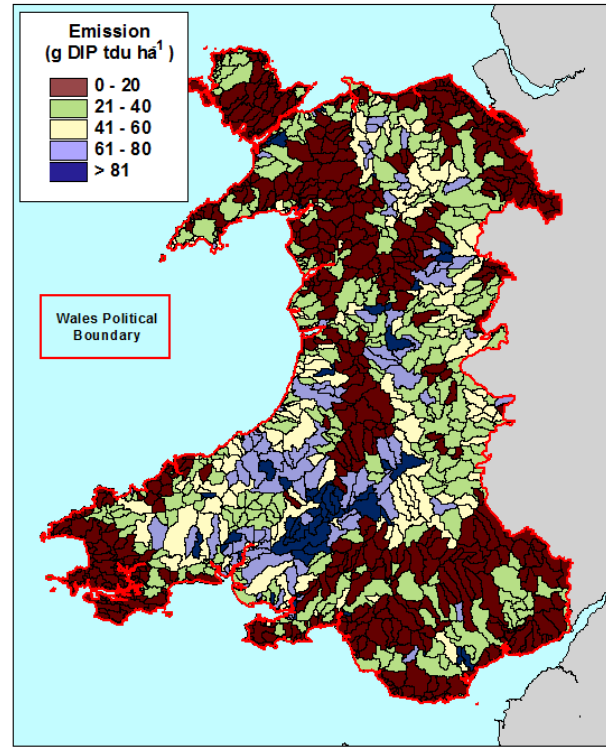
Present Day Modelled Phosphorus Emission from all Agricultural Land Including Commons



719.4 t P

Chemicals / Veterinary

Present Day Modelled Spent Sheep Dip Emission from all Agricultural Land Including Commons



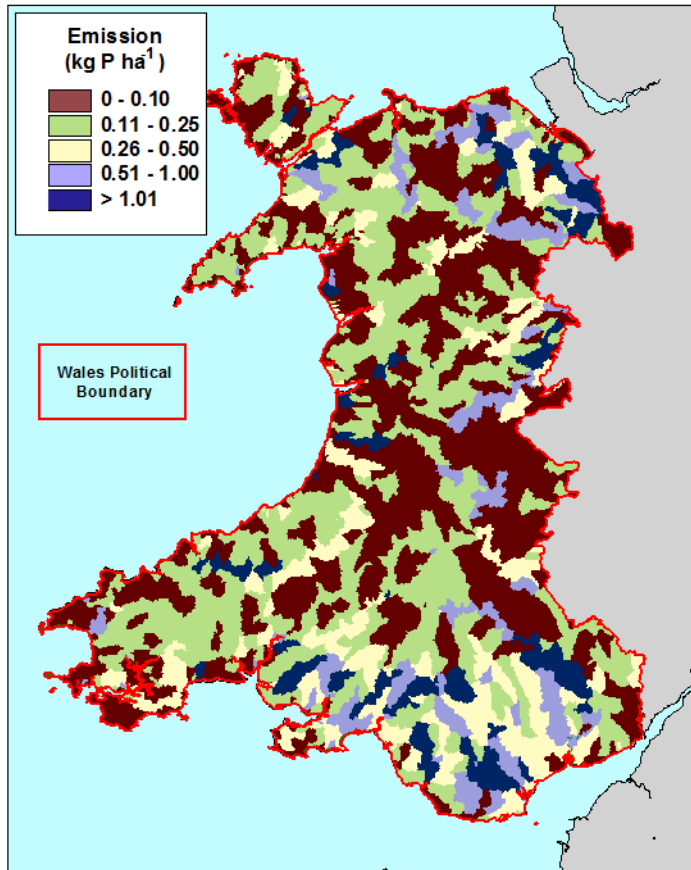
49.2 t TDU

Farm Management Interactions *with* Soils, Climate and Connectivity

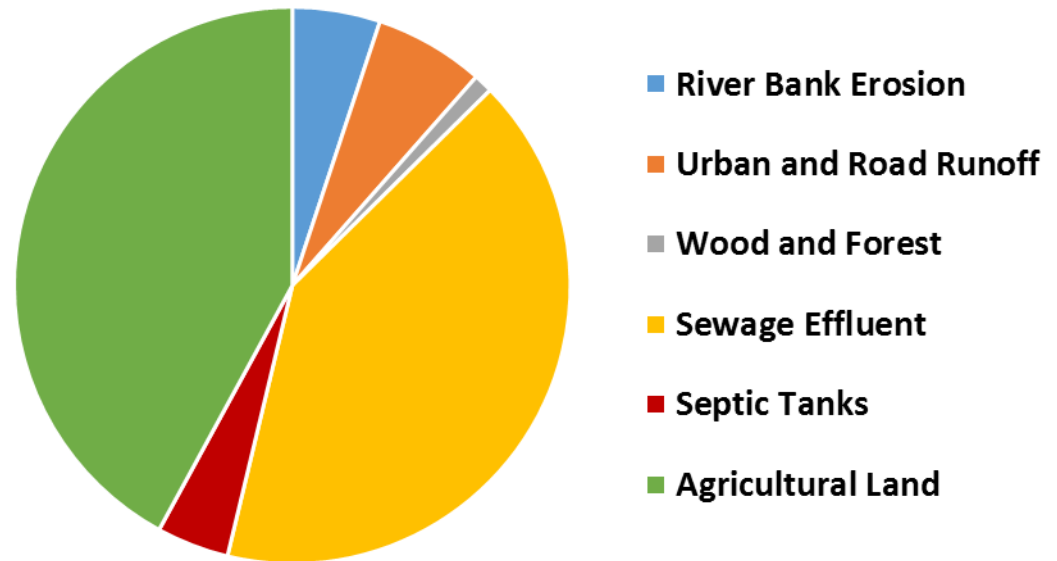


Non Agricultural Emissions

Present Day Modelled Phosphorus Emission from all Non-Agricultural Sources

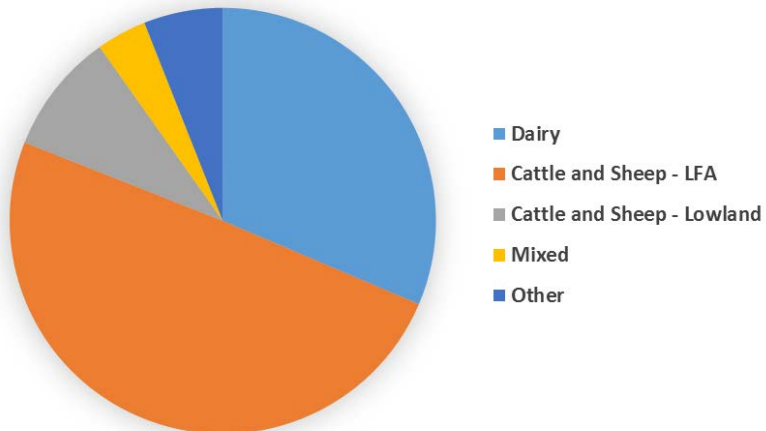


Phosphorus Sector Apportionment

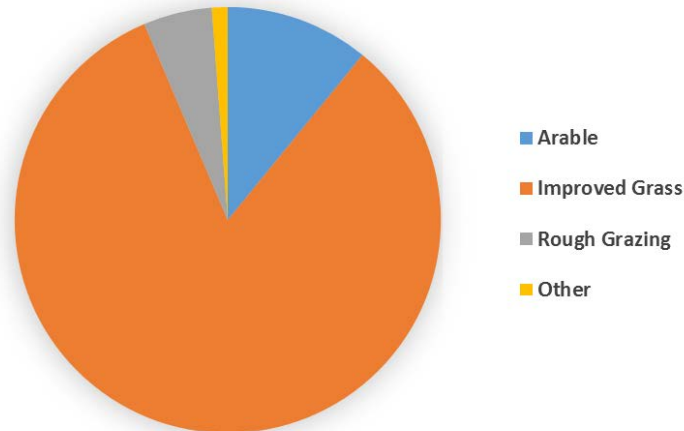


Farm Source Apportionment: Nitrate

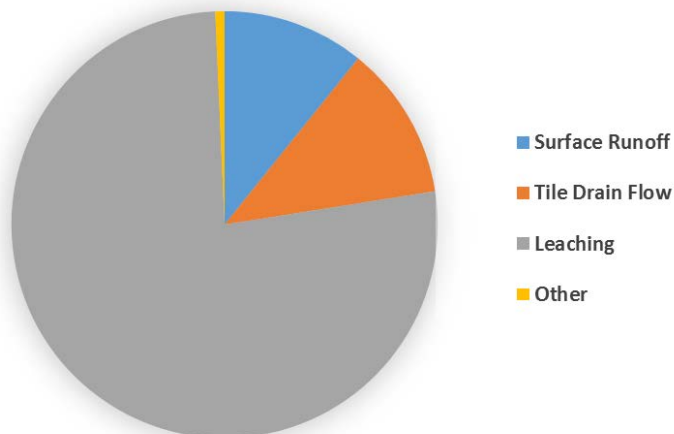
Farm Type



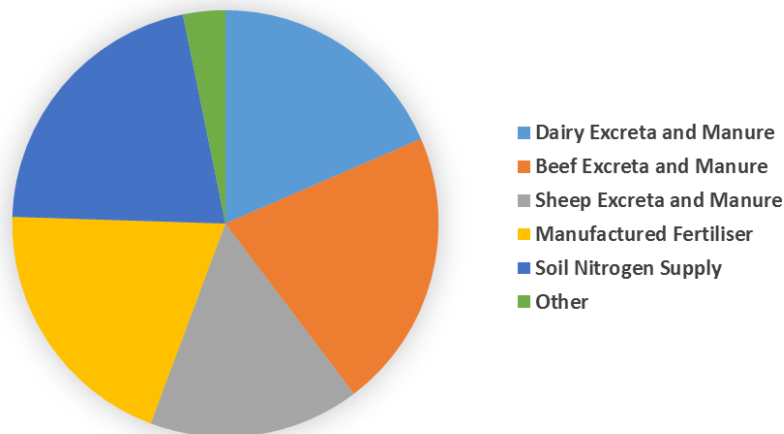
Land Use



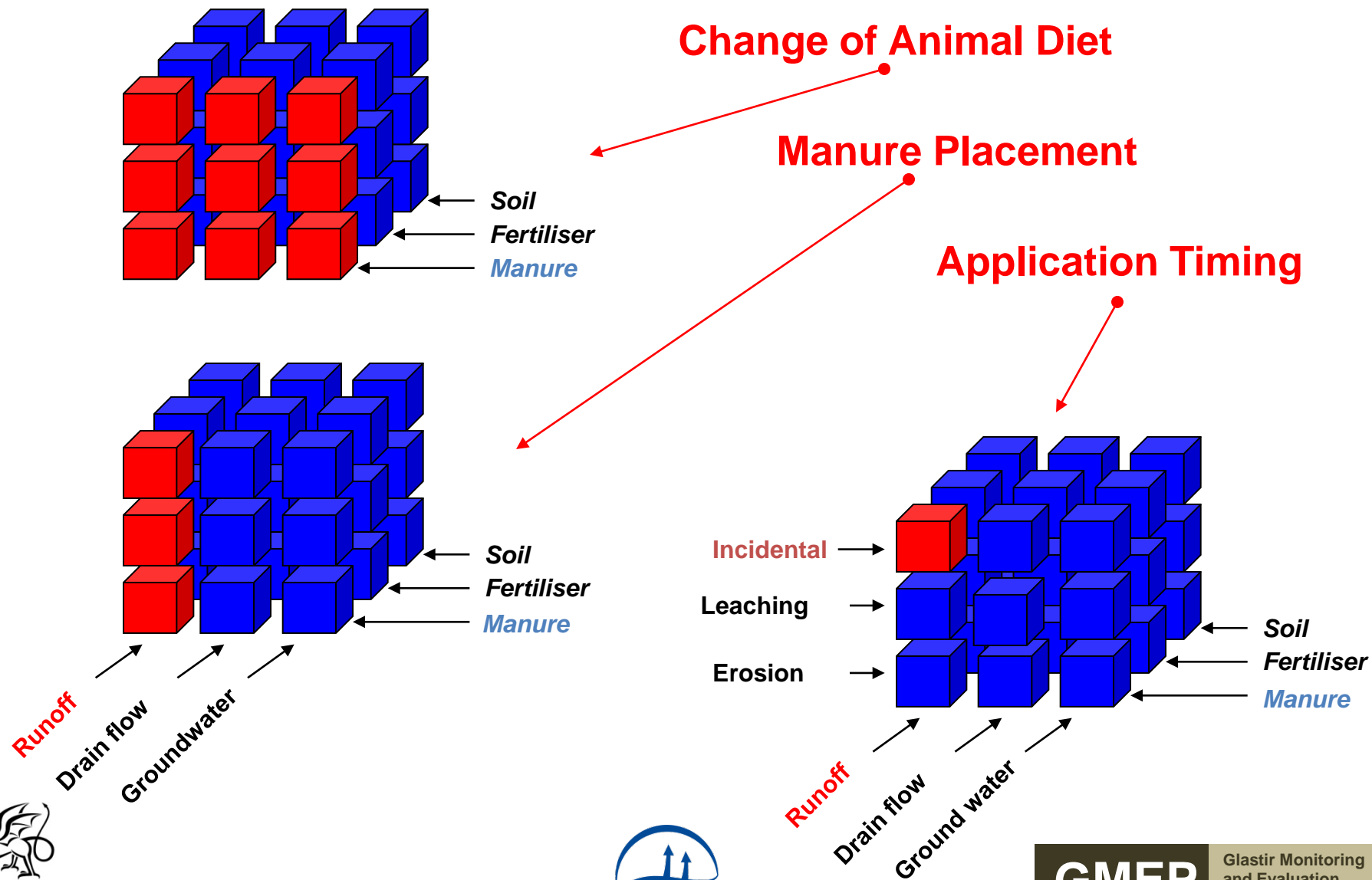
Pathway



Source

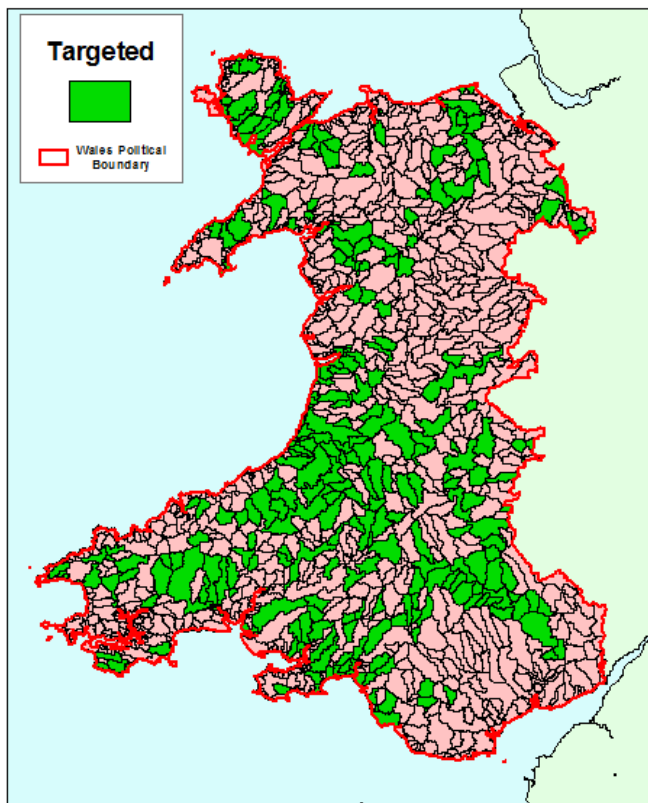


Impact of Changes in Farm Practice



Glastir Scenarios: Direct Impact

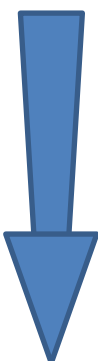
WFD River Catchments Selected for Targeting of Water Quality Mitigation Options



All Wales No. 15: Permanent Pasture No Inputs

No manufactured fertiliser nitrogen or organic manures spread to permanent pasture – to reduce leaching.

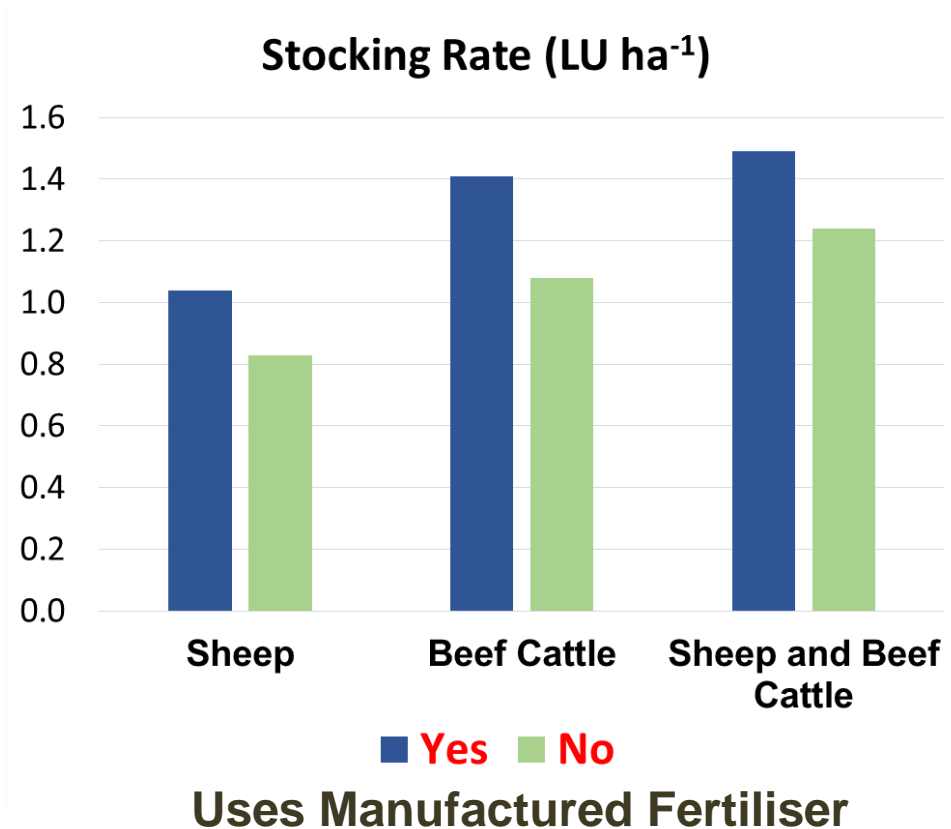
Source Targeting:

- Baseline All Sources (100%) 34.0 kt NO₃-N
 - Cattle and Sheep Farms (58%)
 - Spatial Targeting (28%)
 - Improved Grassland (23%)
 - Manufactured Fertiliser (5%) 1.7 kt NO₃-N
- 



Glastir Scenarios: Indirect Impact

Surveyed Differences in Stock Rates – Welsh Farm Data



Source Targeting:

- **Baseline All Sources (100%)**
- **Cattle and Sheep Farms (58%)**
- **Spatial Targeting (28%)**
- **Beef Cattle and Sheep (15%)**

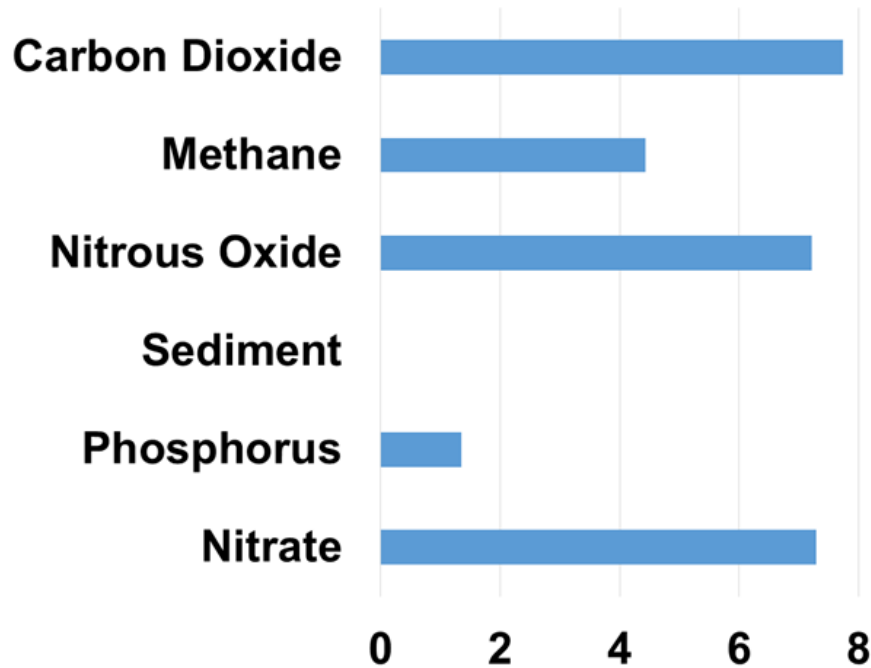


5.3 kt NO₃-N

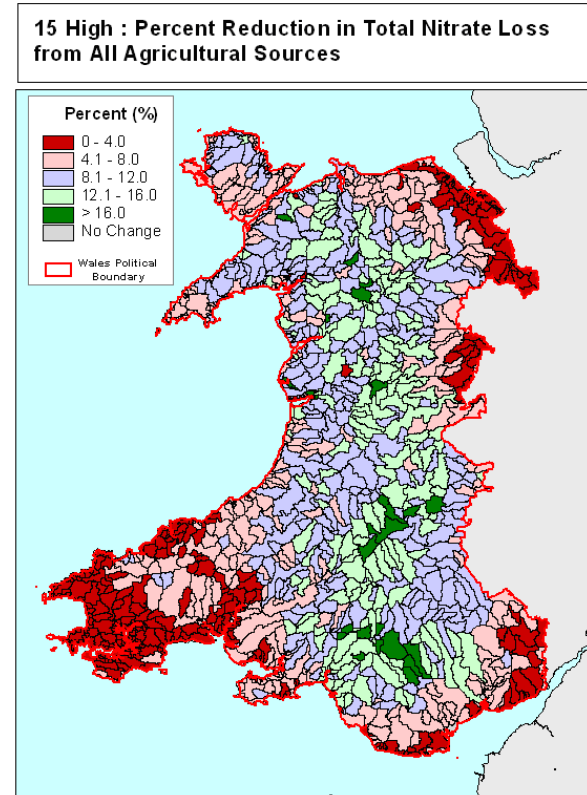


Glastir Scenarios: Net Impact

National Average Agricultural Pollutant Load Reduction (%)



Local Agricultural Pollutant Load Reduction (<1 to 20%)



Next Steps for GMEP

- Evaluating impact of current Glastir options: scoping uptake and effect in advance of monitoring
- Enable selection and targeting options for maximum utility: potential reduction and environment sensitivity
- Supported by second Wales Farm Practice Survey to assess indirect effects and to establish baseline levels of good practice



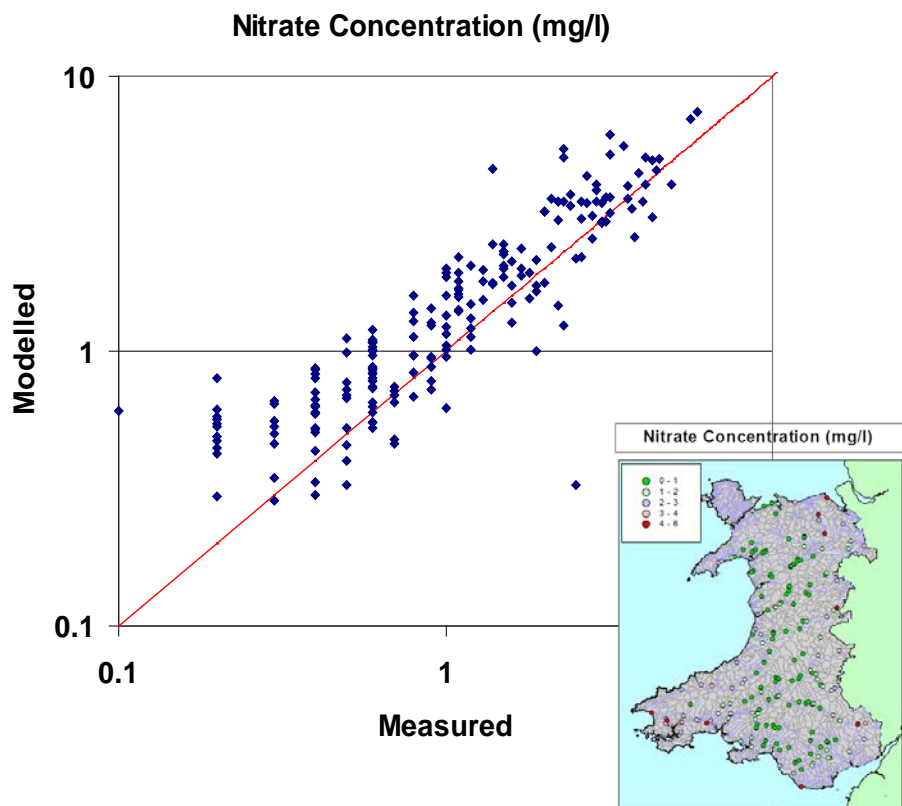
Thank you *and* any questions?

Framework critically depends on farm survey for establishing changes in farm management and additionality.

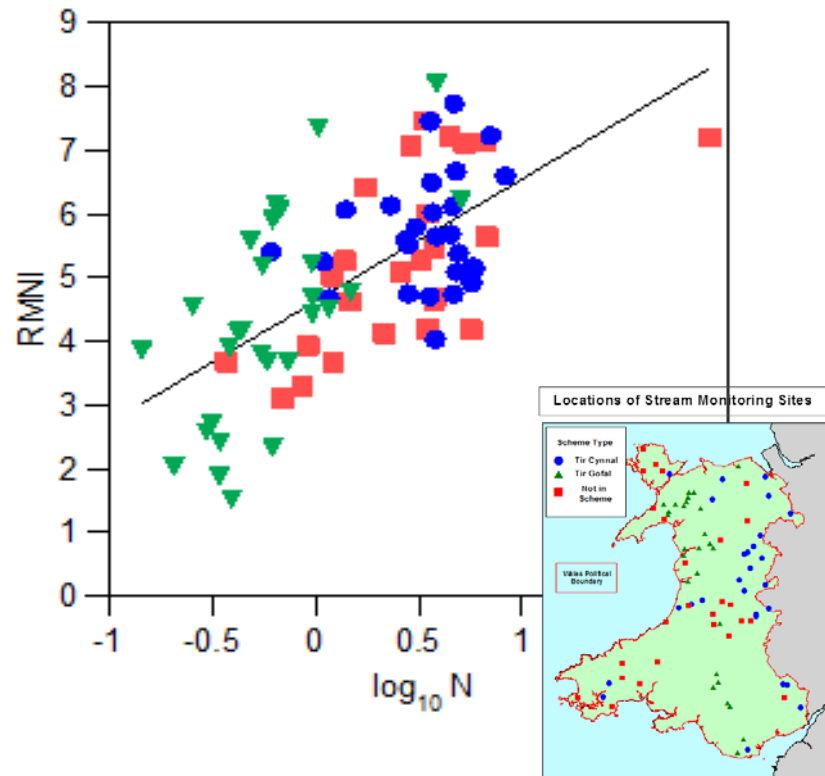


Model Verification: Nitrate

Measured and Modelled River Nitrate Concentrations



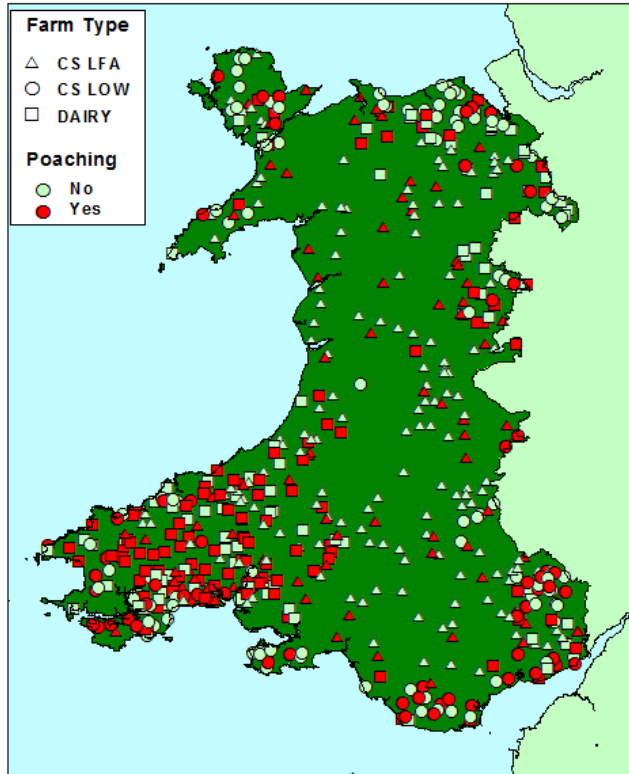
Measured River Plant Community and Modelled Nitrate Concentrations



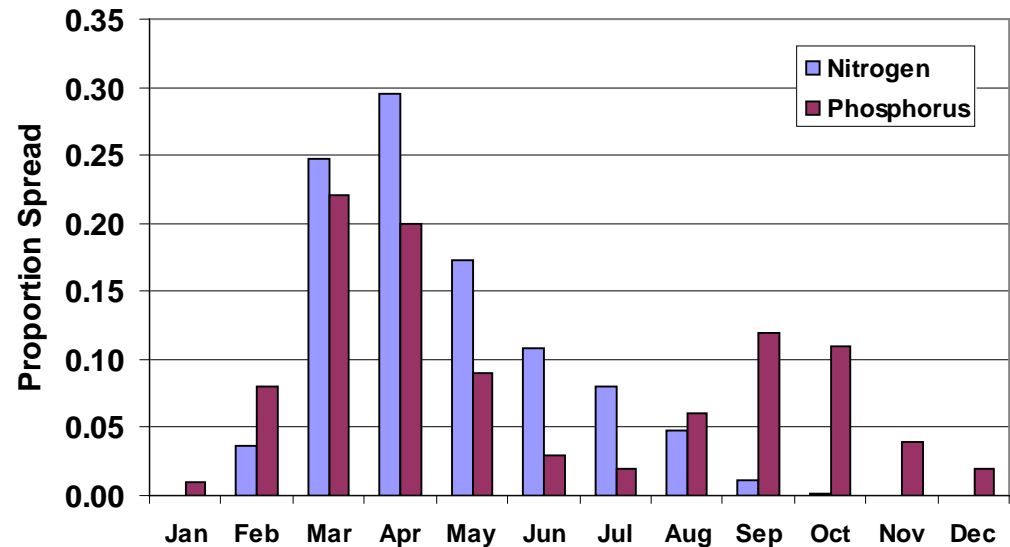
Baseline Condition and Management Surveys

Wales Farm Practice Survey

Farms Reporting Poaching of Soil



Timing of Nitrogen and Phosphorus Fertiliser Applications to Grass



(Welsh extract from British Survey of Fertiliser Practice)



Surveying Management Change



Wales Farm Practice Survey

*Percent of farms completing
a Soil Nutrient Plan*

Scheme Type	Farm Type		
	CS LFA	CS LOW	DAIRY
Non-Scheme	41	31	59
Organic Farming	n/a	n/a	n/a
Tir Cynnal	58	70	88
Tir Gofal	40	39	56

