

Overview of the Nutrients Action Programme since 2007



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Department of
Agriculture, Environment
and Rural Affairs
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Agriculture in Northern Ireland

- 75% of Total Land Area is Farmed
- 95% of Farmed Area is Grassland, 3% Cereals
- 25,000 Farms. Average Size is 41 Ha
- 19,000 Farms (76%) are Very Small
- Approx 3,000 Medium and Large Farms
- Cattle account for 75% of Manure Nitrogen



Agriculture in Northern Ireland

Agriculture and grassland dominate land area of Northern Ireland

Land Use (m ha)

- Total land area 1.36
- Total area farmed 1.02 (75%)
 - Grass/rough grazing 0.95 (93%)
 - Cereals 0.03 (3%)
 - Other crops/hort. 0.01 (1%)
 - Woods/plantations/other land 0.03 (3%)

Over 40% of NI drains into Lough Neagh



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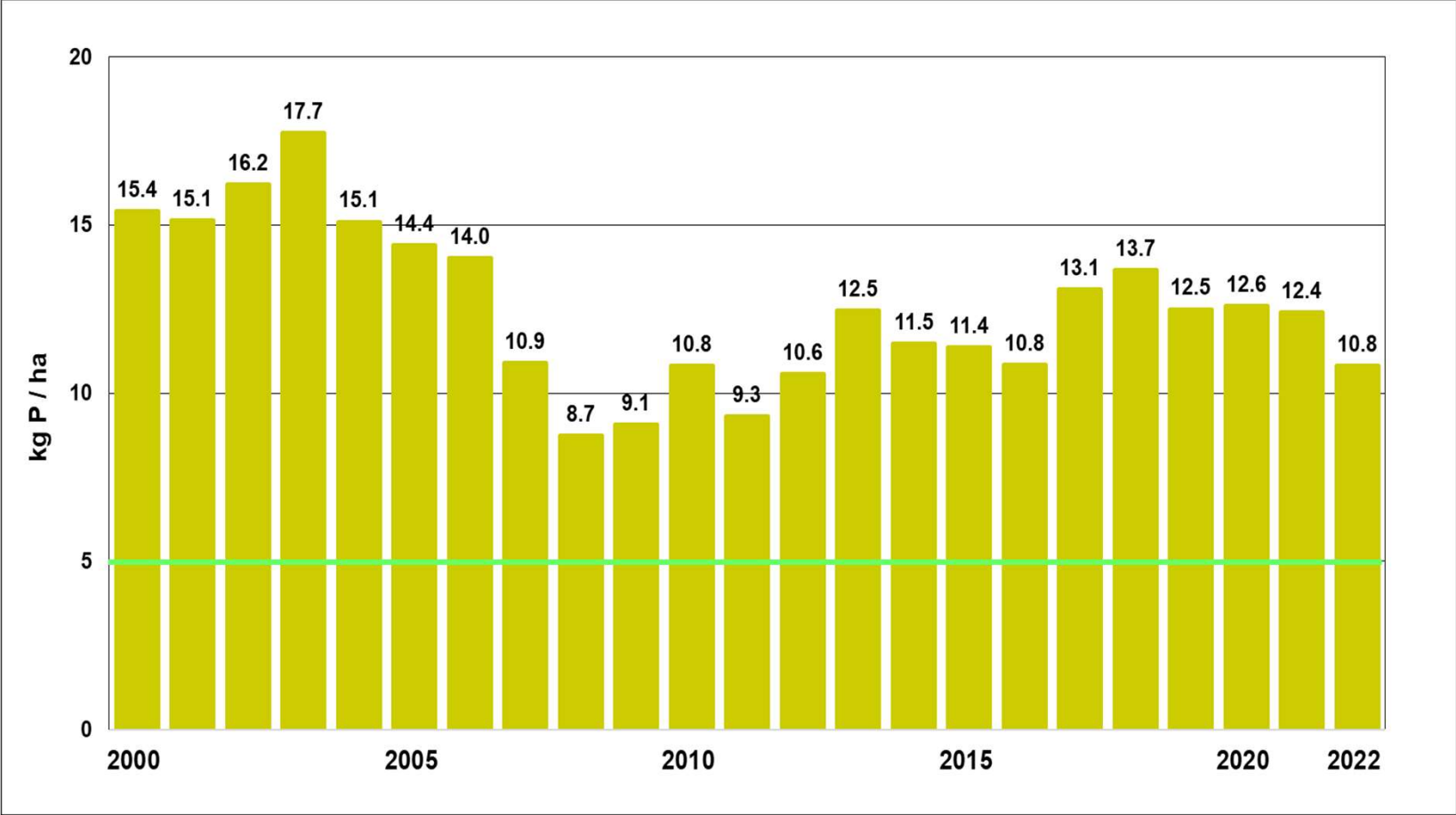
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Main Water Quality Issues for Northern Ireland

- Surface waters exceed or are likely to exceed annual average concentrations of 50 mg NO₃ / l (0% of area)
- Groundwaters exceed or are likely to exceed concentrations of 50 mg NO₃ / l (0.3% of area)
- Waters that are, or are likely, to become eutrophic (~86% of area)
- Phosphorus is the main cause of poor water quality in rivers and lakes



NI Agricultural Sector : Phosphorus Surplus



Nutrient Pressures in NI Agriculture

- 6,000 tonnes of surplus Phosphorus (P) from animal manures per year.
- Deteriorates water quality and causes environmental damage to habitats.
- NI agriculture continues to operate at a significant nutrient surplus.
- More prevalent in certain farming locations across Northern Ireland.
- 43% of fields in NI were found to be above the agronomic optimum P status.
- The Rephokus report indicates that 62% of phosphorus inputs to freshwaters are from agriculture, 24% wastewater treatment, 12% septic tanks.

Implementation of the Nitrates Directive in Northern Ireland

- Total Territory Approach to implementation in 2004
- The 1st Nitrates Action Programme Regulations to apply to all of Northern Ireland came into force on 01 January 2007
- Reviews and Revisions
 - NAP 2 in 2011
 - NAP 3 in 2015
- The current Nutrients Action Programme (NAP 4) came into operation on 11 April 2019
- NAP 4 currently being reviewed and revised



Nutrients Action Programme

- The Nutrients Action Programme (NAP) aims to improve water quality by protecting water against pollution caused by nutrients from agriculture sources.
- The NAP promotes efficient management of animal manures, chemical fertilisers and other nutrient-containing materials spread onto land.
- The NAP Regulations apply to all agriculture land in Northern Ireland.
- Compliance with the NAP is one of the Cross Compliance Statutory Management Requirements. Therefore, farmers claiming Basic Payment Scheme and other direct payments are required to comply with the NAP Regulations.



Key Measures - Nutrients Action Programme

- Livestock manure storage requirements (26 weeks for pigs and poultry, 22 weeks for other livestock)
- Closed periods for N fertiliser application to land
 - ❖ Chemical fertiliser- 15 September to 31 January
 - ❖ Organic manures - 15 October to 31 January
- Limit application of livestock manure to 170 kg N/ha/year



Key Measures - Nutrients Action Programme

- Land application restrictions for fertilisers
(waterlogged/frozen/flooded ground, steep slopes, forecast of rain, buffer distances from waterbodies)
- Limits on chemical fertiliser to crop requirements
- Land management - crop and soil management to minimise erosion
- Record keeping



Improving Water Quality - a combination of Actions

- Regulation – Nutrients Action Programme (NAP)
- Advice and Knowledge Transfer
- Financial Support: FNMS, METS, SUPL,EFS, etc...
- Research and Partnership Working



DAERA Advice and Support

- Advice and support for farmers provided by DAERA College of Agriculture, Food & Rural Enterprise (CAFRE)
- Training workshops
- Guidance booklets
- One to one advice on request
- Online nutrient calculators



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Online Farm Nutrient Calculators

- Livestock Manure Loading
- Manure Storage Capacity
- Nitrogen for Grassland
- Crop Nutrient Calculator
- Phosphorus Balance
- Help Farmers to meet NAP Requirements on Nutrient Limits, Manure Storage and Record Keeping



Agricultural schemes – Nutrients, Water and Soil.

- Farm Nutrient Management Scheme
- Manure Efficiency Technology Scheme (METS)
- Sustainable Use of Poultry Litter (SUPL) initiative
- Environmental Farming Scheme (EFS)
- EEAA Soil Scheme
- Sustainable Catchment Programme (SCP)
- Sustainable Use of Livestock Slurry (SULS) initiative
- Soil Nutrient Health Scheme (SNHS)



Farm Nutrient Management Scheme (FNMS)

- In support of NAP 1 - completed in Dec 2008
- 60% grant aid for the construction of additional slurry/manure storage to meet livestock manure storage requirements
- Over £200m investment in improved storage facilities
- Grant support of £123 m industry investment exceeded £80 m
- Over 3,900 projects completed



Manure Efficiency Technology Scheme (METS)

- Provided 40% grant aid for low emission slurry spreading equipment - trailing hose, trailing shoe.
- 307 machines funded
- £6m total investment
- Support continued under Farm Business Improvement Scheme (FBIS)
- Some £15m in further support under FBIS.



Sustainable Use of Poultry Litter (SUPL) Project

Stream Bio-Energy

- Feedstock – 100% Poultry Litter
- Capacity 40k Tonnes/Year
- Phosphorus in Fibre Fraction is exported
- Generates electricity for 6000 homes

- “Enhanced” Anaerobic Digestion process



Environmental Farming Scheme (EFS)

Objective

- Protect and Enhance Biodiversity and Water Quality

Water Protection measures

- Fencing of Watercourses
- Creation of Riparian Margins



Environmental Farming Scheme (EFS)

- After 6 tranches; 2,500 km of watercourses protected through fencing and/or riparian margins at cost of approximately £3.2 million
- Prevents livestock accessing water courses and causing pollution and sedimentation
- 5500 farmers in EFS
- EFS Group Projects for Water Quality in 4 catchments, facilitated by eNGOs



Environmental Farming Scheme (EFS)

- A published study by Ulster University and AFBI researchers has shown that riverside fencing through the EFS has potentially saved up to 10,000 tonnes of soil and 4 tonnes of phosphorus from entering water courses every year.
- The research paper can be read open access in Ecological Indicators at <https://doi.org/10.1016/j.ecolind.2023.111067>
- Lead author Alison Scott is a DAERA-funded PhD student.



Sustainable Catchment Programme

- Delivered in partnership with the River's Trust, currently across 4 catchments
 - Ballinderry Salterstown Upper Bann
 - Ballinderry Tirnaskea Dundrum
- River's Trust Farm Advisers deliver the project on the ground
- Advisors meet with farmer, survey farm and produce a Water Environmental Management Plan (WEMP)
 - identifies appropriate measures and provides funding for the farmer to implement
 - RT advisor ensures measures are targeted to achieve greatest impact :
“what needs done and where”
- Capital grant support for water quality protection measures including riparian margins, tree planting and farmyard pollution prevention works.

DAERA's Challenge for Sustainable Use of Livestock Slurry (SULS)



New SBRI competition aims to identify practical solutions for livestock waste



DAERA has funded six projects to identify practical and self-sufficient models applicable to NI, which must address the core aim of ...

- nutrient separation / processing of livestock slurry (particularly from cattle and pigs)
- reduce surplus phosphorus within NI agriculture
- ensure efficient recycling of organic nutrients.
- Phase 2 will launch in 2024

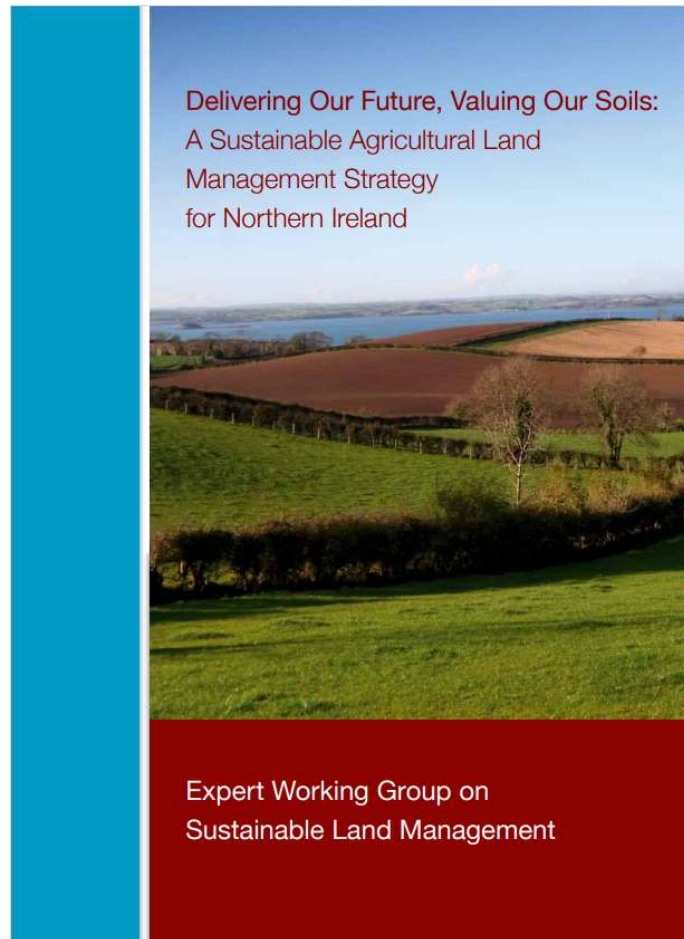
Research to underpin policy

A wide range of agri environmental and livestock research at AFBI to support NAP measures.

- Nitrogen excretion of dairy cows
- Phosphorus fertiliser limits for grassland
- Soils : Long Term Slurry (LTS) Project
- EEAA Soil Testing and Analysis Scheme
- Slurry Spreading – closed period



Sustainable Agricultural Land Management Strategy



The Aim

“To provide Farmers, Policy Makers & Regulators, with a Strategy for Land Management, that delivers a Future for N. Ireland Agriculture, which is

Economically, Environmentally & Socially Sustainable

while achieving the “Ambition,” laid out in the “Going for Growth” Report.”

Background to the Long-Term Slurry (LTS) experiment

- Increase in livestock numbers
- Slurry/manure disposal problems
- Potential “unknown” hazards

Problems related to the disposal of slurry 419

Table 1
Hazards associated with spreading slurry on land

	Initial effect	Result
In atmosphere	odours offend animal pathogens survive	legal proceedings against farmer. disease dispersal.
In soil	plant nutrients accumulate heavy metals accumulate	nutrient imbalance; shallow rooting. uptake by plants; suppression of microbial activity.
	drainage impedence anaerobic phytotoxins accumulate earthworms die	structure weakened; soil poches. roots restricted, plants die. structure damaged.
In plants	nutrient imbalance occurs heavy metals accumulate animal pathogens survive palatability impaired	physiological disorders of stock. stock poisoned. stock infected. grazing restricted.
In water	plant nutrients accumulate organic materials accumulate heavy metals accumulate	increased algal growth; fish death. increased oxygen demand; oxygen depletion; fish death. fish death; stock poisoned.

McAllister J. S. V. (1976) Studies in Northern Ireland on problems related to the disposal of slurry. In *Agriculture and Water Quality*, pp. 418-431. Ministry of Agriculture, Fisheries and Food Technical Bulletin No. 32. H.M.S.O, London.

LTS site description

Established: 1970

Location: near Hillsborough, Northern Ireland

Altitude: 120 m a.s.l.

Soil texture: clay loam (42% sand, 24% silt and 34% clay)

Soil classification: Cambisol

Climate: temperate oceanic (mild/ moist); mean annual precipitation = 898 mm;
annual mean temperature = 9.4°C.



LTS Experimental Plot Layout

Multi-species swards

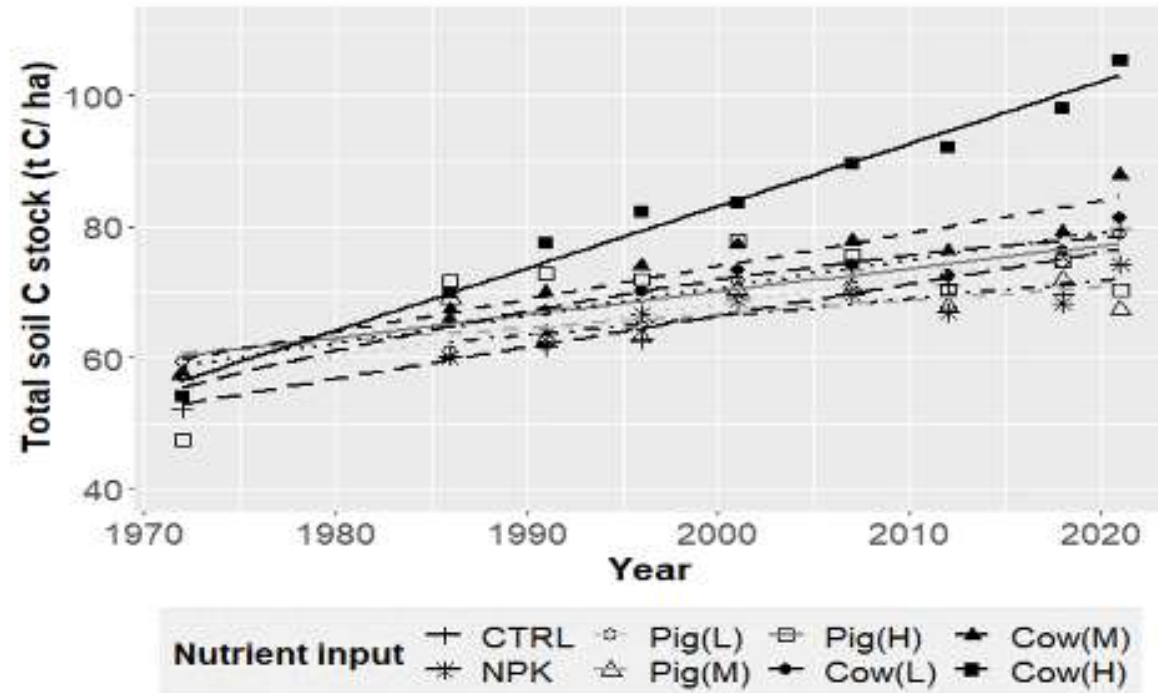


BLOCK 3		BLOCK 2		BLOCK 1	
PIG 100 41	NPK 33	PIG 100 25	PIG 50 17	NPK 9	COW 100 1
PIG 200 42	PIG 100 34	PIG 200 26	COW 50 18	PIG 50 10	COW 50 2
CTRL 43	PIG 200 35	CTRL 27	COW 100 19	CTRL 11	PIG 100 3
COW 50 44	COW 100 36	PIG 100 28	COW 200 20	COW 200 12	NPK 4
CTRL 45	COW 100 37	NPK 29	COW 50 21	COW 50 13	CTRL 5
COW 200 46	COW 50 38	CTRL 30	PIG 50 22	PIG 100 14	PIG 200 6
PIG 50 47	PIG 50 39	NPK 31	COW 100 23	COW 200 15	COW 100 7
NPK 48	COW 200 40	COW 200 32	PIG 200 24	PIG 200 16	PIG 50 8

Plot size = 29.75 m²

Changes in Soil C Stocks at LTS since 1971

- Greatest increase in soil C Stocks for the High Cow treatment
- NPK (inorg. fert.) treatment had a similar C stock increase to the Control treatment



EU EAA Soil Sampling and Analysis Scheme



Funded by the EU Exceptional Adjustment Aid Package to Member States

Objectives: To provide livestock farmers with detailed soil information so that they can apply nutrients (N, P & K) and lime in accordance with crop requirements

Improve PROFITABILITY

- Increase Grass and Forage yields
- Improve Soil Fertility
- Improve the distribution of Manure Nutrients



Improve THE ENVIRONMENT

- Reduce Risk of Nutrient Loss to water-bodies



EU EAA Soil Sampling and Analysis Scheme

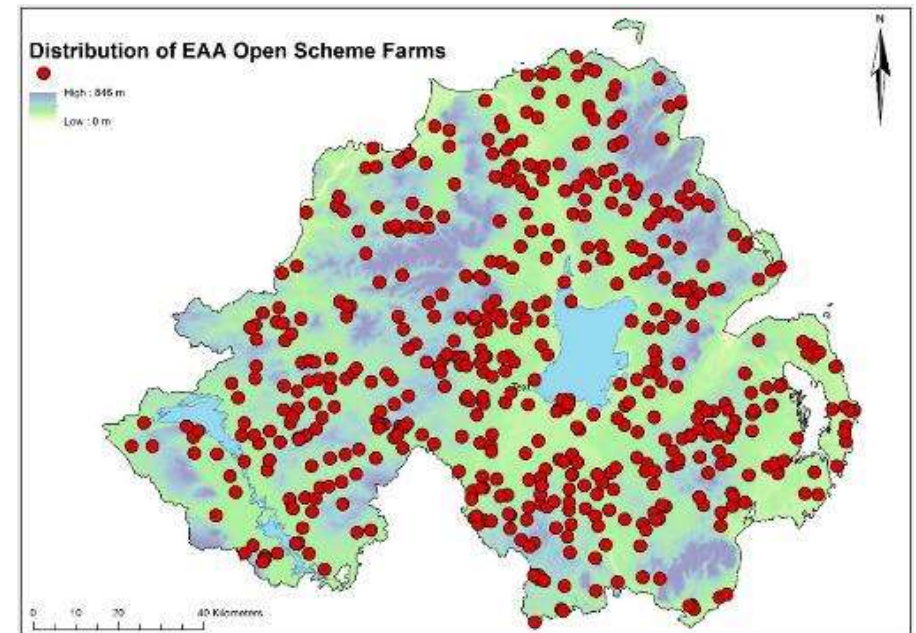
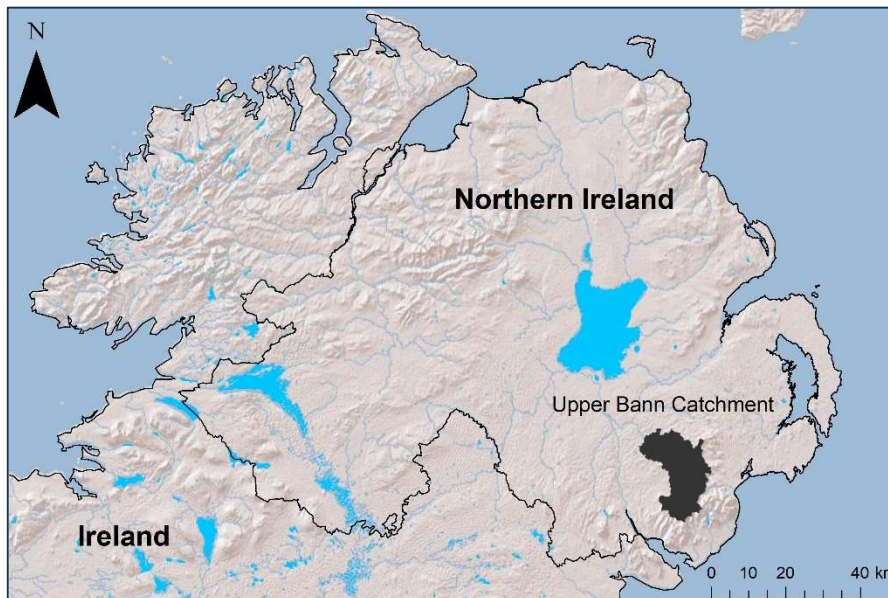
Two Components:

(I) An Open NI Scheme

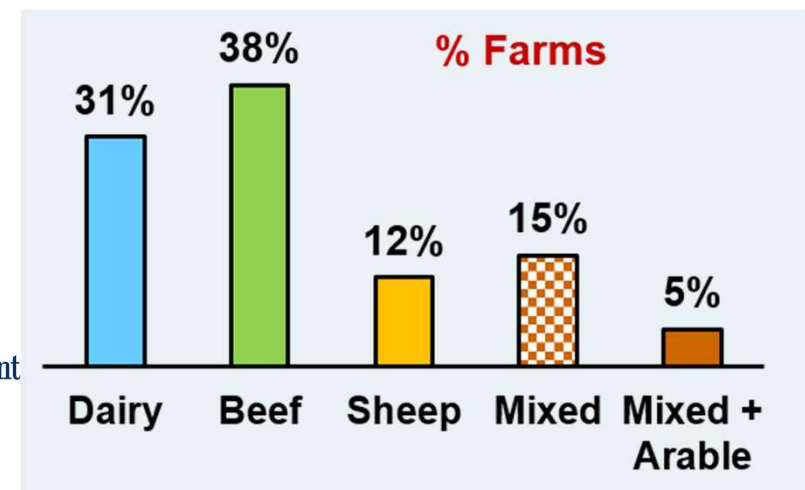
- 522 farms, 12,218 fields
- 3 x over-subscribed

(II) A Catchment Scheme

- 513 farms, 7,772 fields

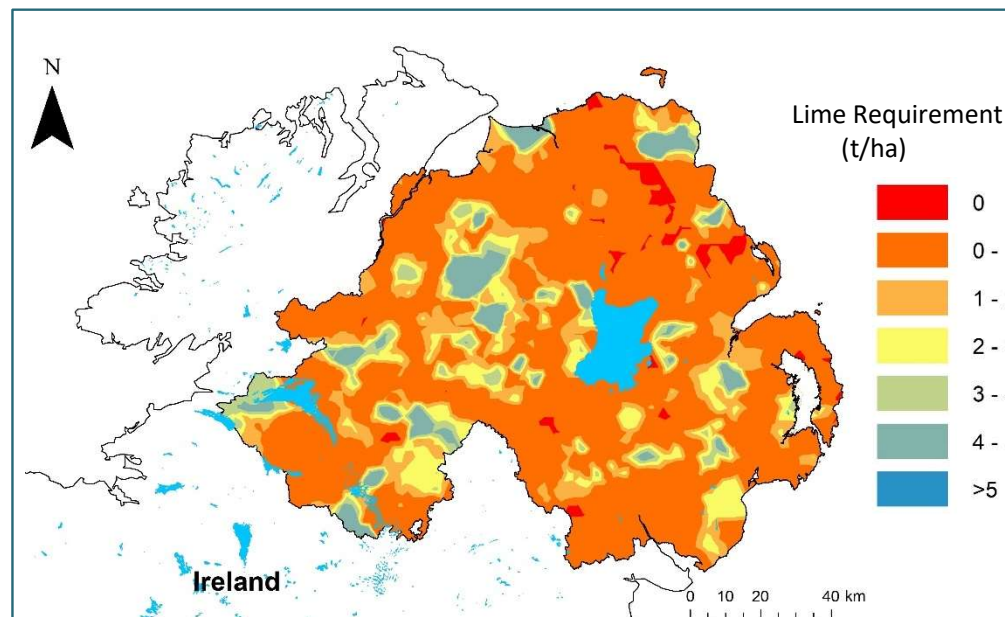
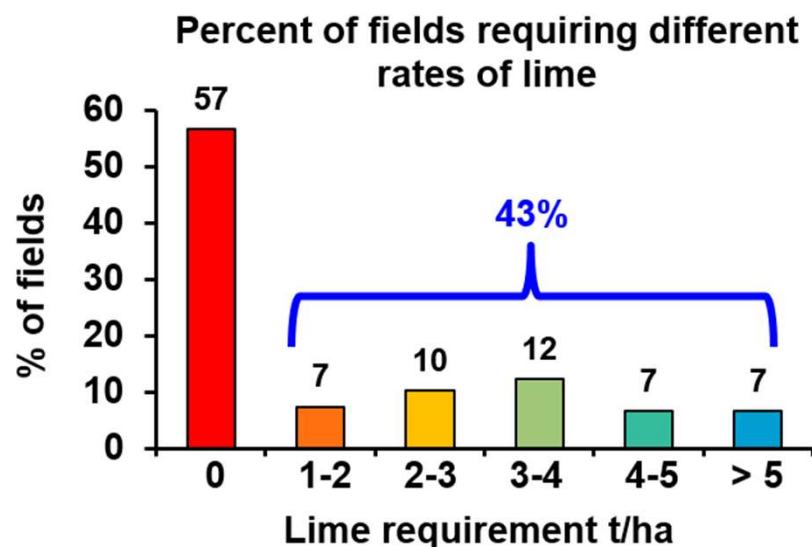


(Points not indicative of specific farm locations)



Open Scheme Summary Results

Lime Status

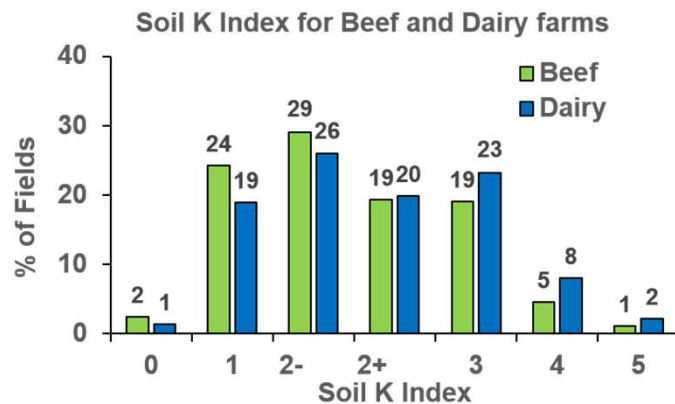
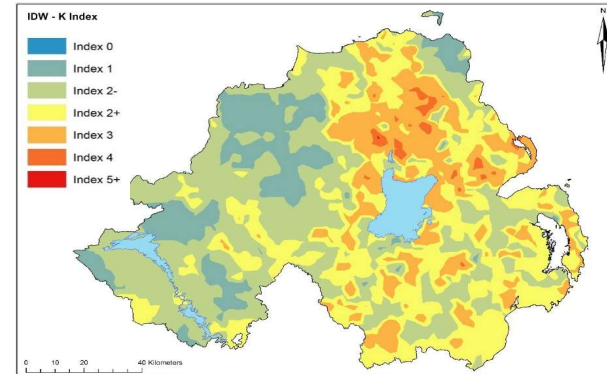
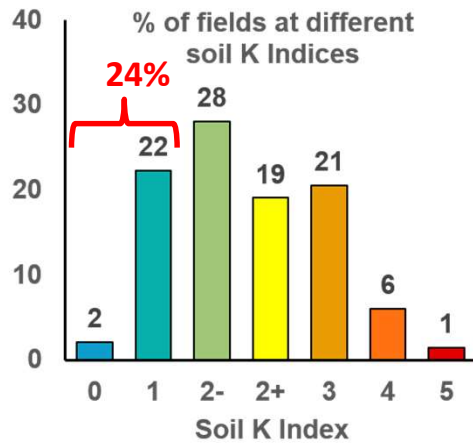


- Overall 43% of 805,000 ha grassland (*excl. rough grazing, peaty land*) requires lime
- Total lime required = 1.2Mt = £30M (£25/t)
- Average increase in grass DM yield (1 t DM/ha/yr for 5 years) = 1.7 million t DM
- Extra grass DM worth £170 million (£100/t DM)



Open Scheme Summary Results

Potassium Status



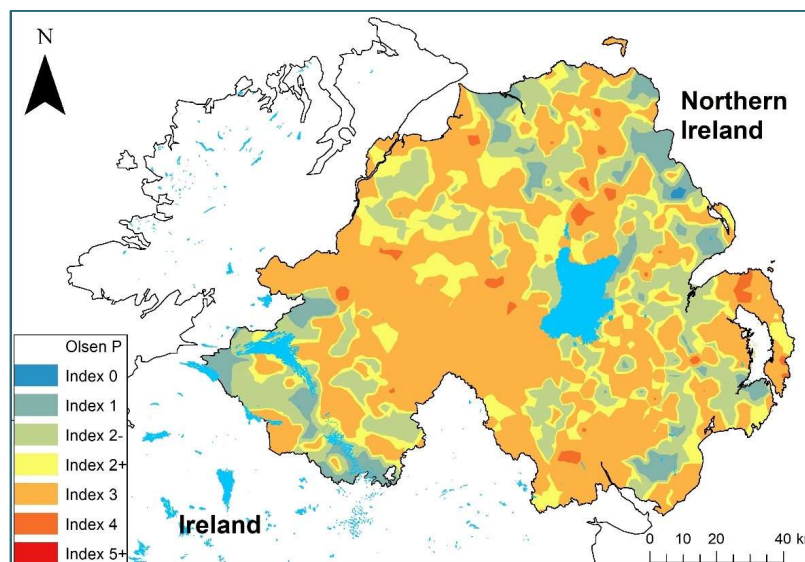
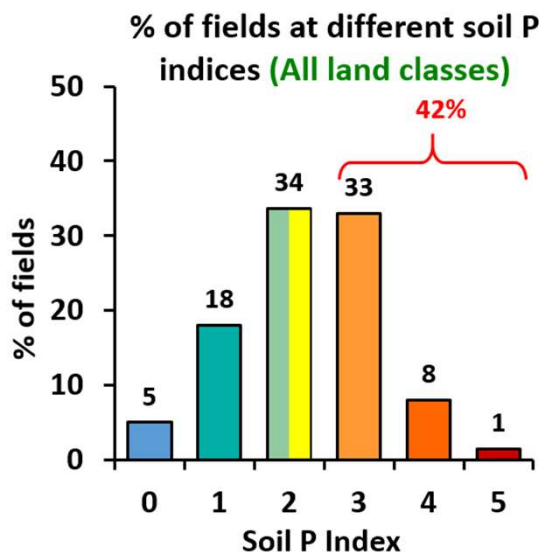
K Under-supply

- 20% of fields on dairy farms < Index 2-
- 26% of fields on beef farms < Index 2-
- Extra potash on 20% of dairy area and 26% of beef area could result in 400kt/yr extra grass DM worth £40m (gross)/yr

Open Scheme Summary Results

Soil P Status

(Agronomic Optimum = Index 2+ 21-26 mg/L)



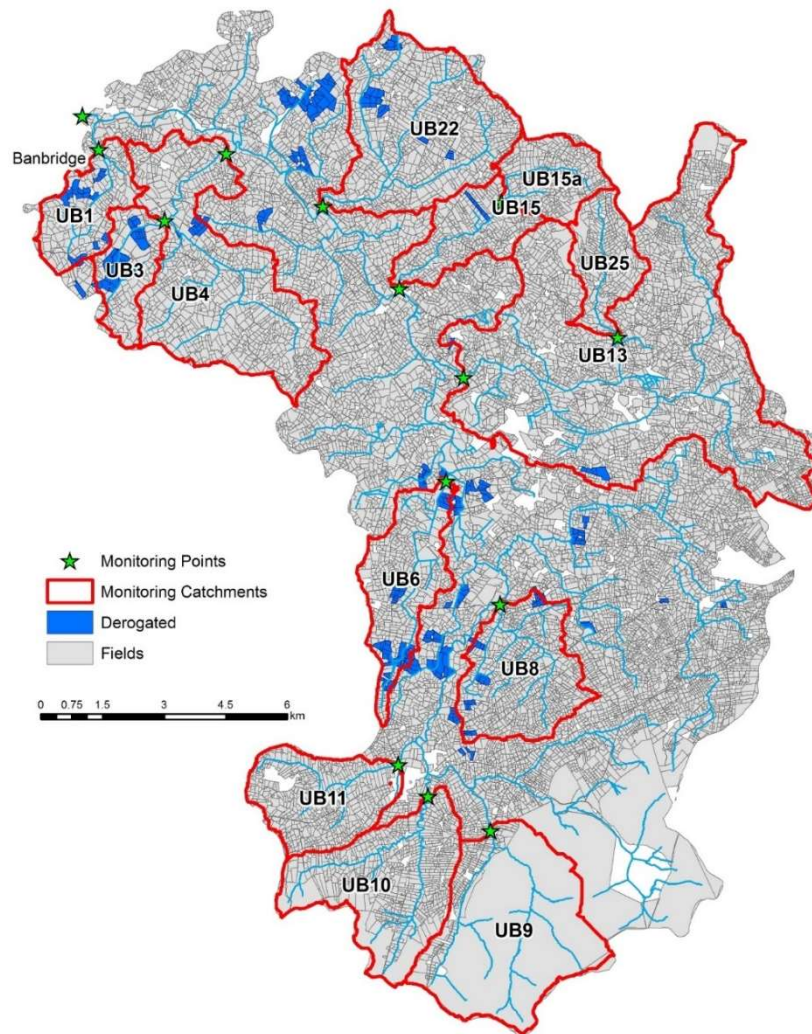
- 42% Fields > Optimum (ALL)
- 47% Fields > Optimum (Lowland)
- 43% Fields > Optimum (Disadvantaged Areas)
- 36% Fields > Optimum (Severely Disadvantaged Areas)

Key findings per Sector

- 50% Dairy grassland > Optimum
- 40% Beef and Sheep grassland (LL, DA) > Optimum
- 30% Beef and Sheep grassland (SDA) > Optimum

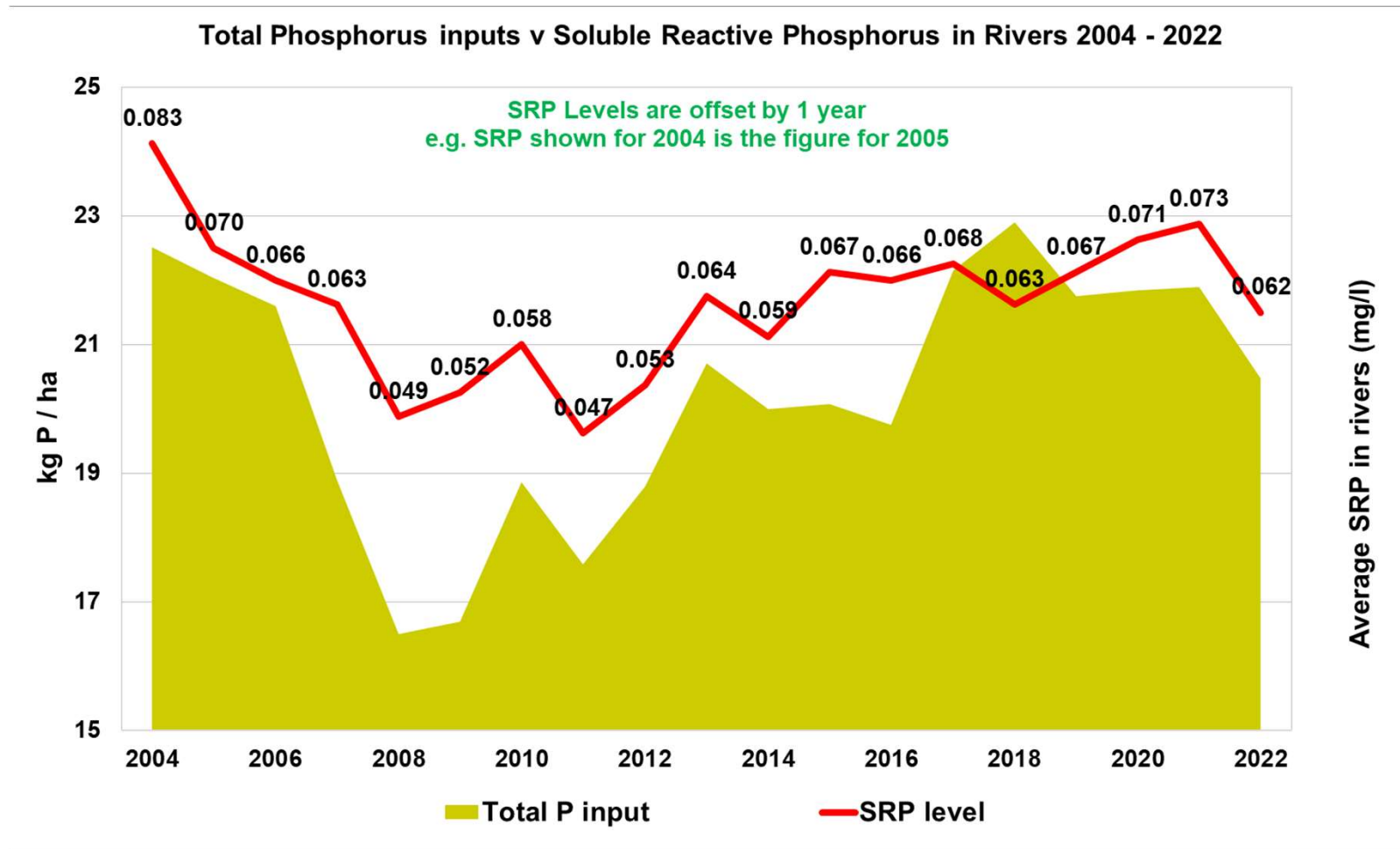
NAP E&I Project

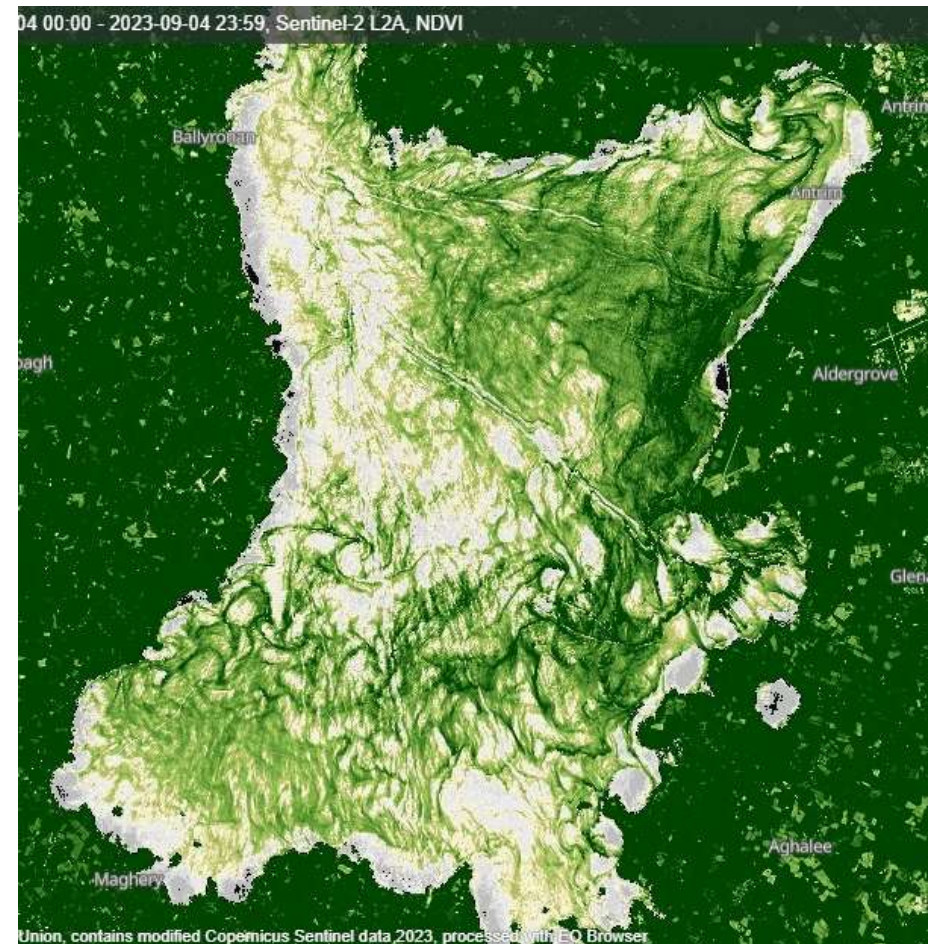
Water quality monitoring in sub-catchments of the Upper Bann (n=13).



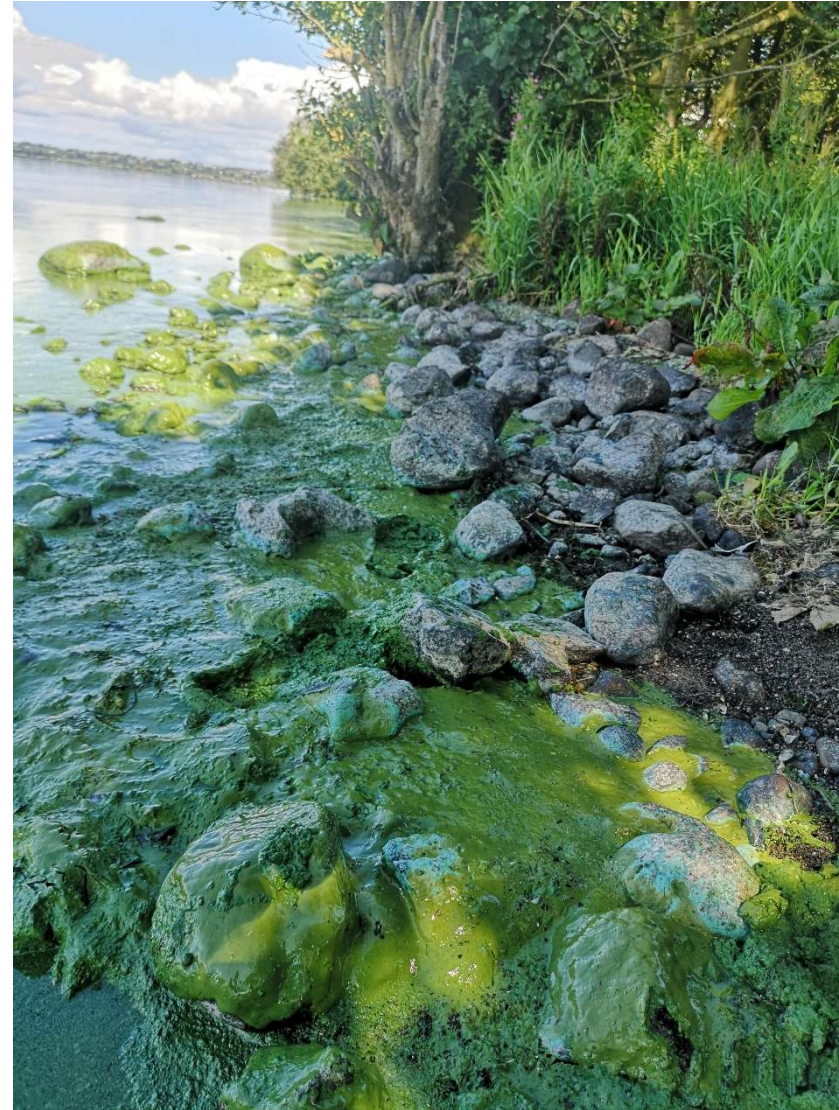


Phosphorus input v Soluble Reactive Phosphorus in Rivers





Credit - European Space Agency - ESA



Timetable for NAP 5 Public Consultation

Strategic Environmental Assessment (SEA) Scoping	To be completed Mid July 2024
Habitats Regulations Assessment (HRA) Scoping	Mid July 2024
Scoping Consultation (5 weeks)	July – August
SEA Environmental Report	End September
HRA Appropriate Assessment Report	End September
Public Consultation (12 weeks)	End September
Consultation Feedback and Review	
Final Reports Drafting and Review	
SEA Final Report	End January 2025
HRA Final Report	End January 2025



Thank you !