

Working with Farmers to Improve Water Quality

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WATER QUALITY WEEK

Monday, 22 - Friday, 26 March



Find out more!

Dairy Sustainability
Ireland

Local Authority
Waters Programme



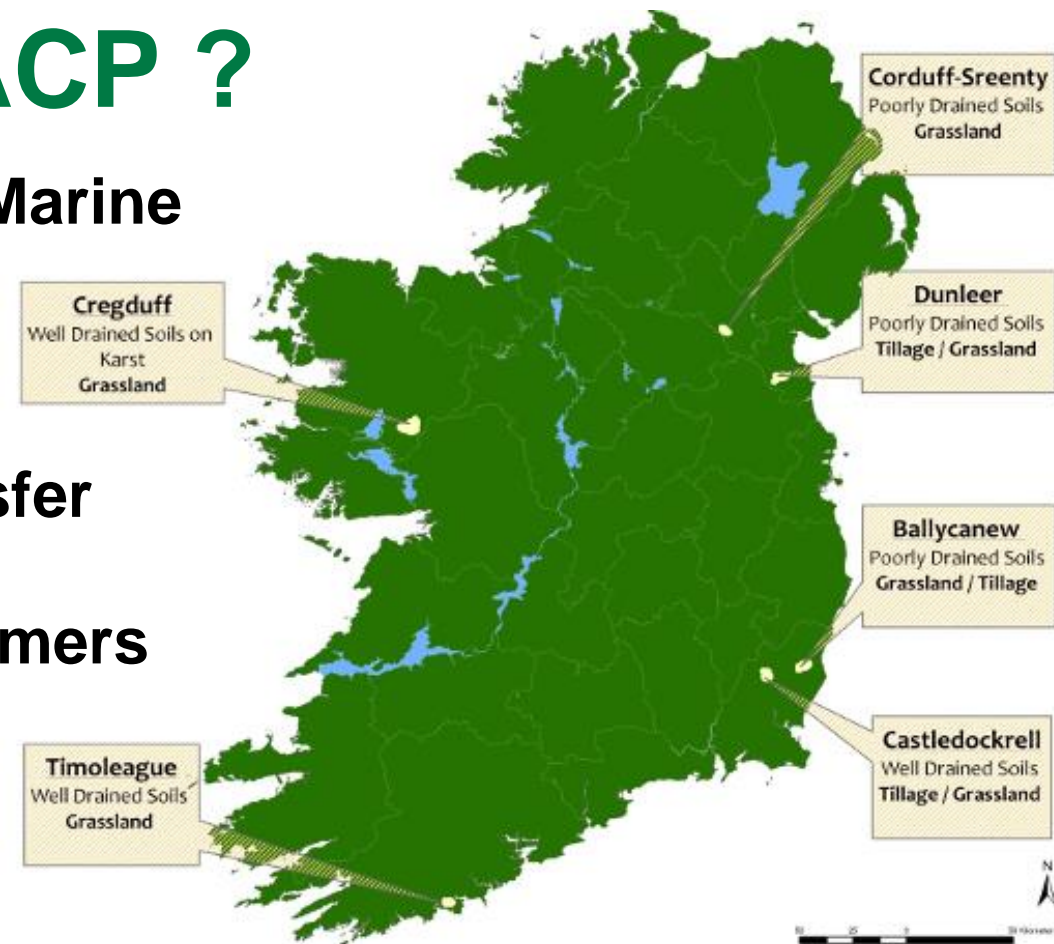
An Roinn Talmhaíochta,
Bia agus Mara
Department of Agriculture,
Food and the Marine



An Roinn Tithíochta,
Rialtais Aitiúil agus Oidhreachta
Department of Housing,
Local Government and Heritage

What is the ACP ?

- Funded by the Department of Ag. Food & Marine
- 12 years on the ground (in the river)
- Combined Research and Knowledge Transfer
- 23 staff across 6 catchments with 300+ farmers
- Biophysical and socio-economic research
- Focus points for Catchment Science KT
- Policy Evaluation
 - Nitrates & Derogation, WFD, Food Wise 2025, Climate Action Plan





Farmer collaboration is more important than any of the equipment

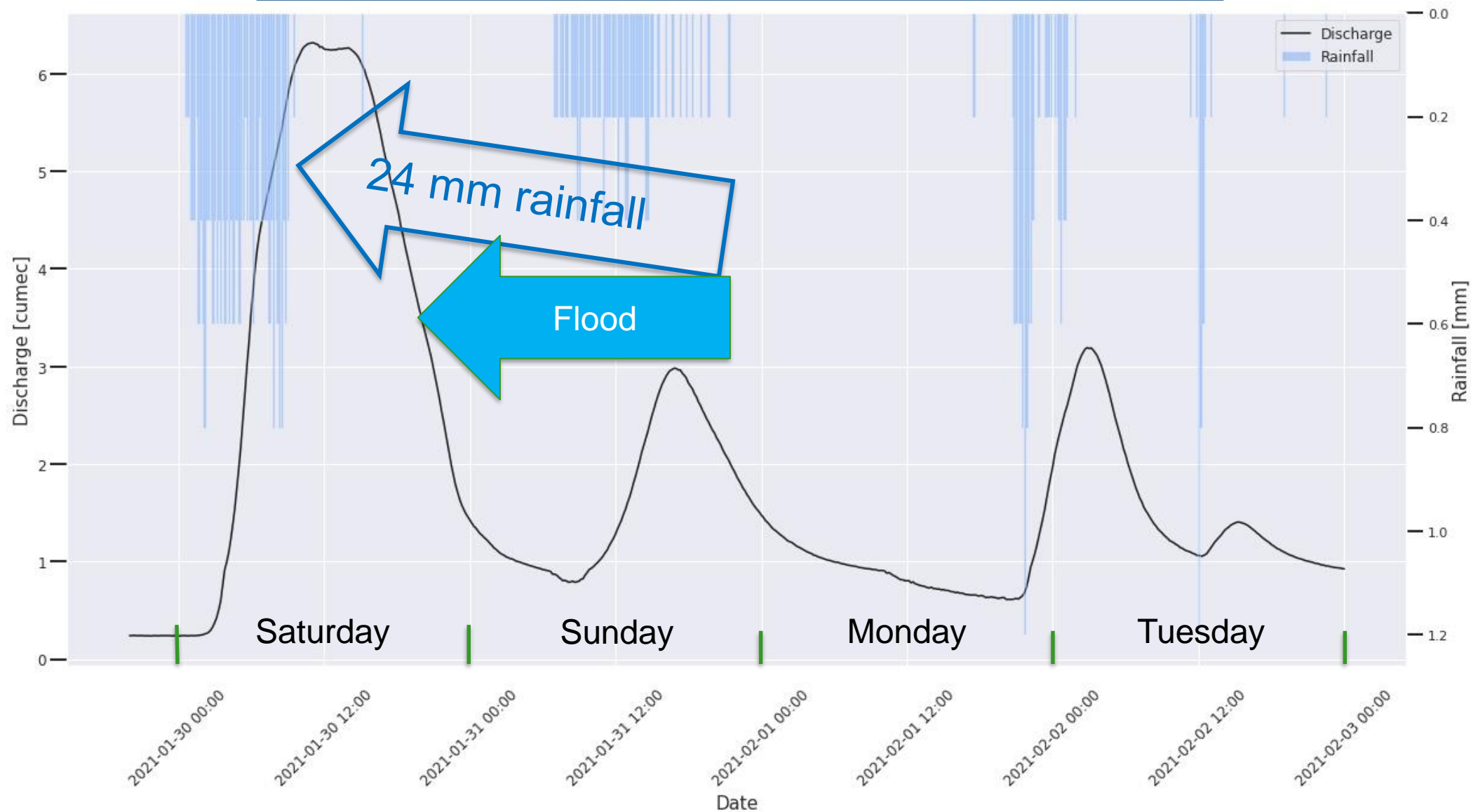
30th January 2021 Ballycanew Catchment



Video: Eamonn Harty

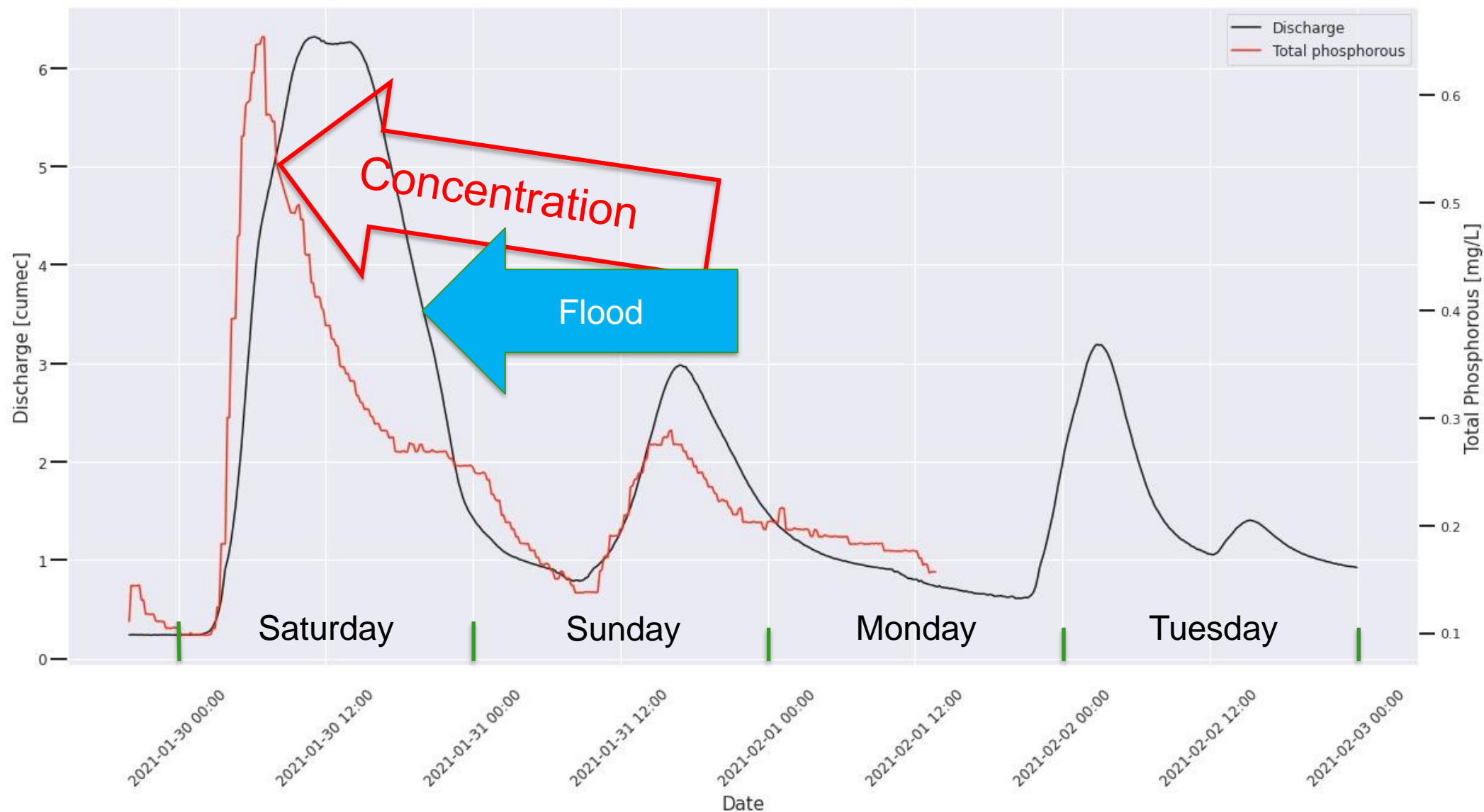
Graph:
Jason
Galloway

30th January 2021 Ballycanew Catchment Rainfall and Flood



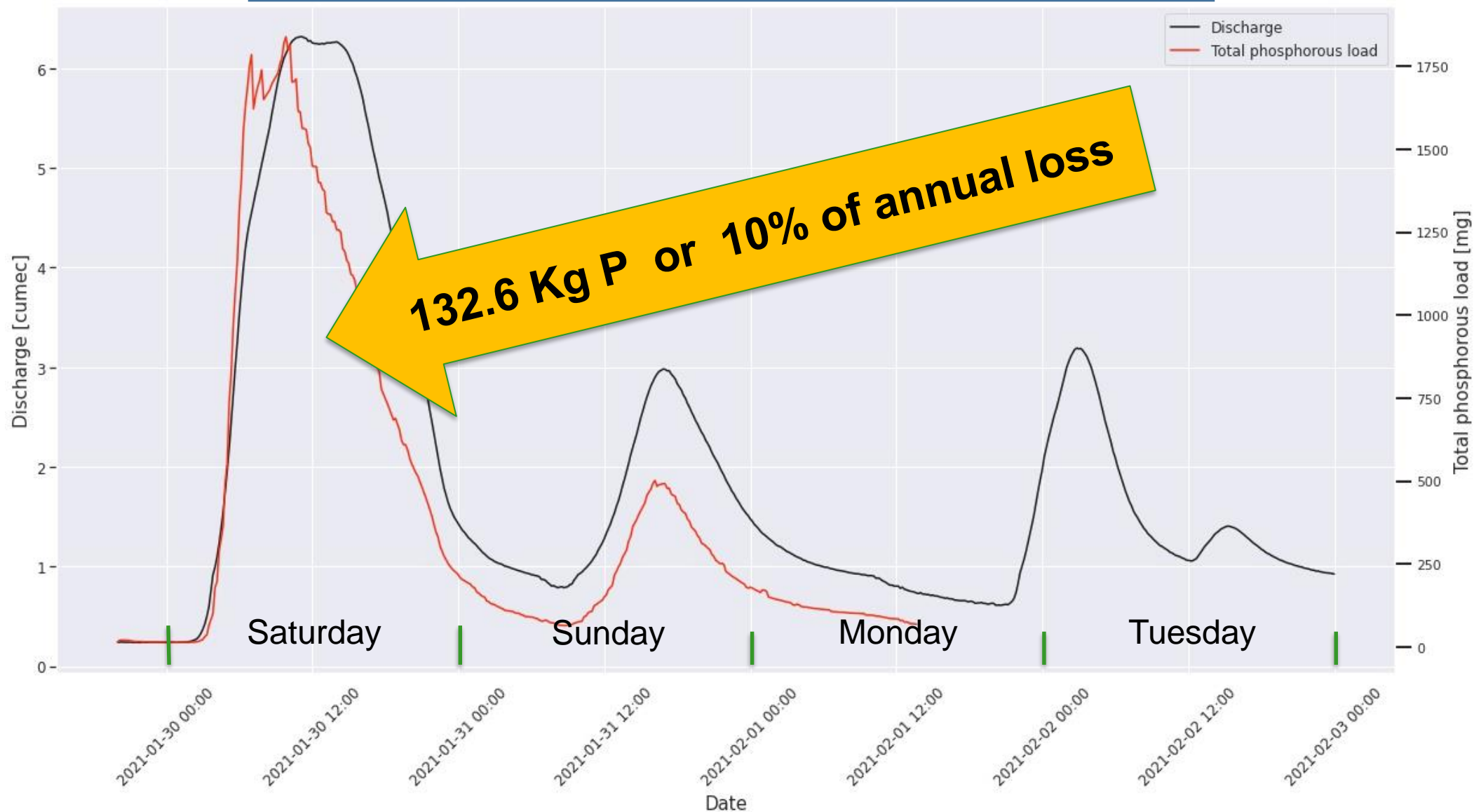
Graph:
Jason
Galloway

30th January 2021 Ballycanew Catchment P Concentration



Graph:
Jason
Galloway

30th January 2021 Ballycanew Catchment P Load



What is the P Concentration at Low Flow ?

- WFD status High 0.025 mg/l Good 0.035 mg/l
- What has most impact on river ecology ? Big flush out or elevated base flow ?
- Low or Very Low Soil test P index across the Catchment
- Low application rates of P being applied
- Low Flow is not a run off event – spring fed - Low P concentration expectations ?

	Outlet	Forty sampling points up-stream		
	Annual Avg.	Spring	Summer	Autumn
P mg L ⁻¹	0.076	0.024	0.046	0.037

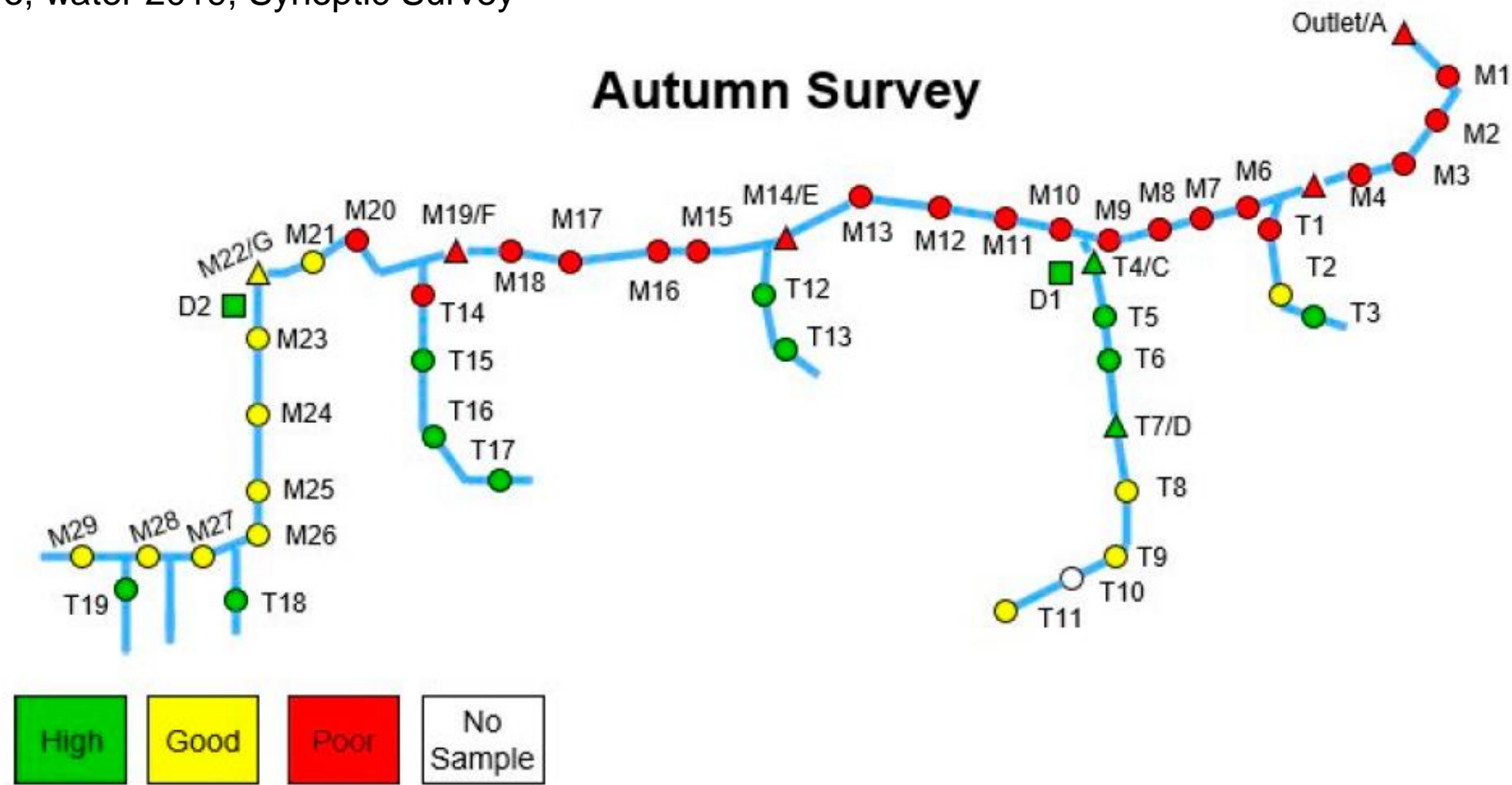


Figure 4. WFD status (according to TRP thresholds) for synoptic sampling points in the poorly drained grassland (Ballycanew) catchment. M = Main stream sample points, T = Tributary sample points, and D = Ditch sample points.

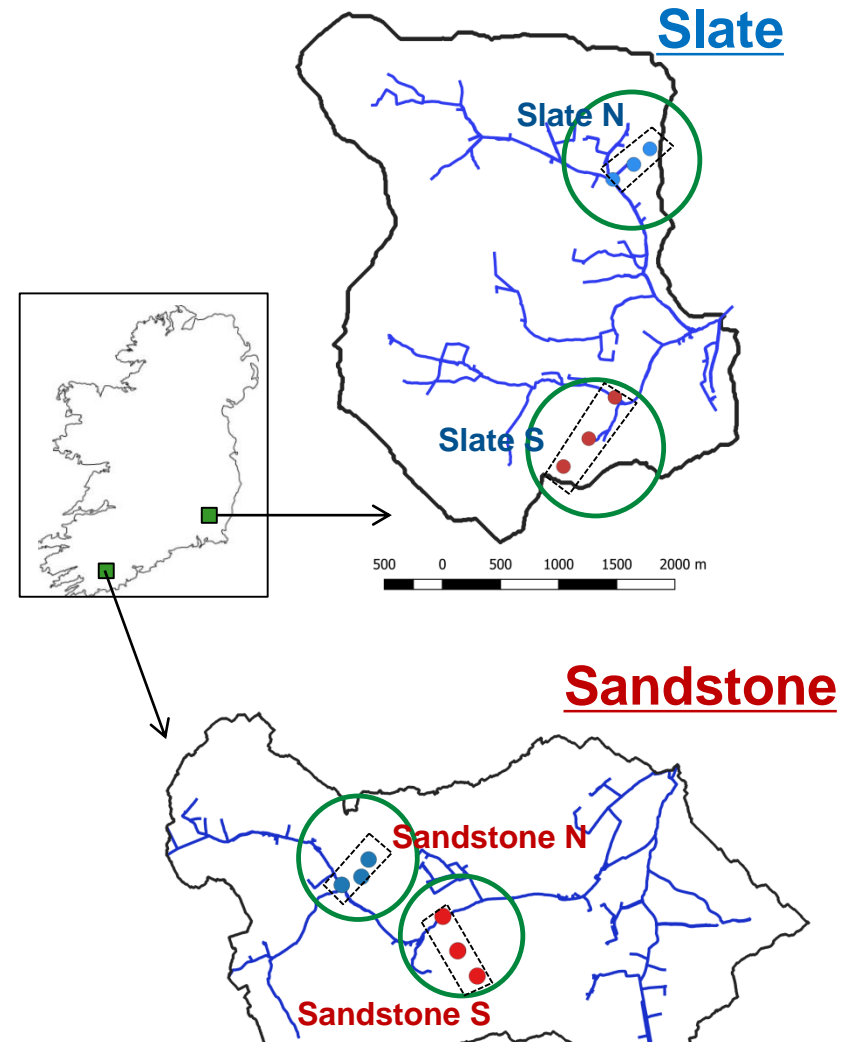
Catchment Contrast

- ❖ **Two** free draining catchments
- ❖ **Two** hill slopes per catchment
- ❖ **Three** Bore holes per hill slope

Castledockrell
Arable
Slate



Timoleague
Grassland
Sandstone



Dr. Eoin
McAleer

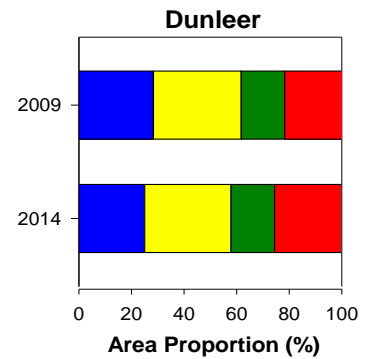
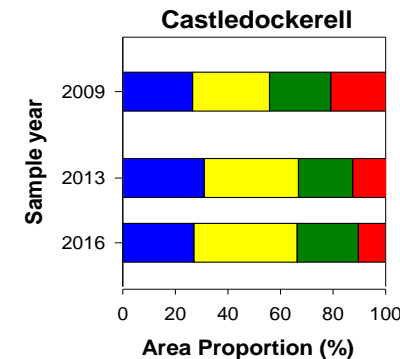
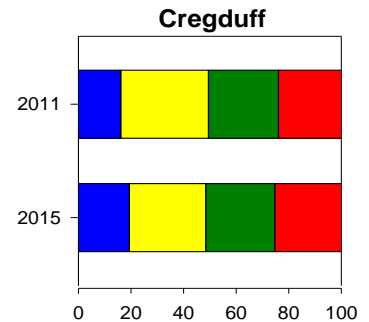
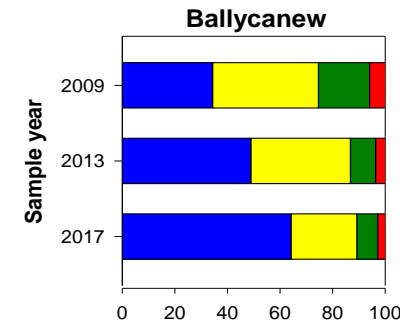
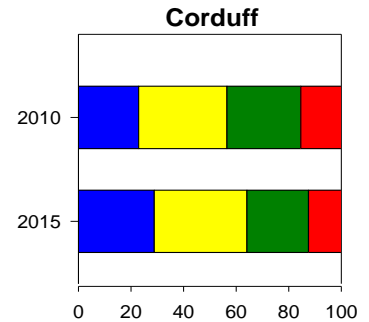
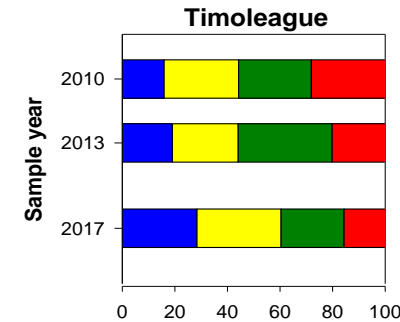
*Why does the hillslope with almost **triple** the N loading to the land surface have 50% less NO_3^- in the stream??*

Why do we have such contradictions ?

- **Factors affecting water quality are complex**
 - **Farm Practice, Soil Type and Weather**
- **One size does not fit all - mitigating action selection**
- **Understanding of processes involved is essential**
 - **Advisory knowledge**
 - **the farmer needs to know why**
- **It can be easy to over simplify the cause**

Increasing Farmer Motivation

- **Multi-functional benefits**
 - Soil sampling, Soil Fertility Trends, Nutrient Use Efficiency
 - Working Conditions
- **Marketing of Food & Agricultural Products**
 - Origin Green, Dairy Sustainability Ireland
- **Regulations**
 - Threat of increased restrictions
 - Scheme Incentive
- **Actions applied must work**



What is the ASSAP?

- **Agricultural Sustainability Support and Advisory Programme**
- Focus is on water quality in 190 Priority Areas for Action (PAA)
- Provides free farm advice, confidential and acceptance is voluntary
- 30 Advisors - 20 Teagasc, 10 from Dairy Co-ops
- Work in collaboration with LAWPRO (Local Authority Waters Programme)
- Under the Water Framework Directive Ireland is required to have all waters at least at 'Good Status' by 2027 ★★★★★
- LAWPRO provide the catchment science, identify pressures and locations
- ASSAP advisor contact farmers offering service
- Water Quality Week – to bring learnings from ASSAP to wider farmer/industry audience

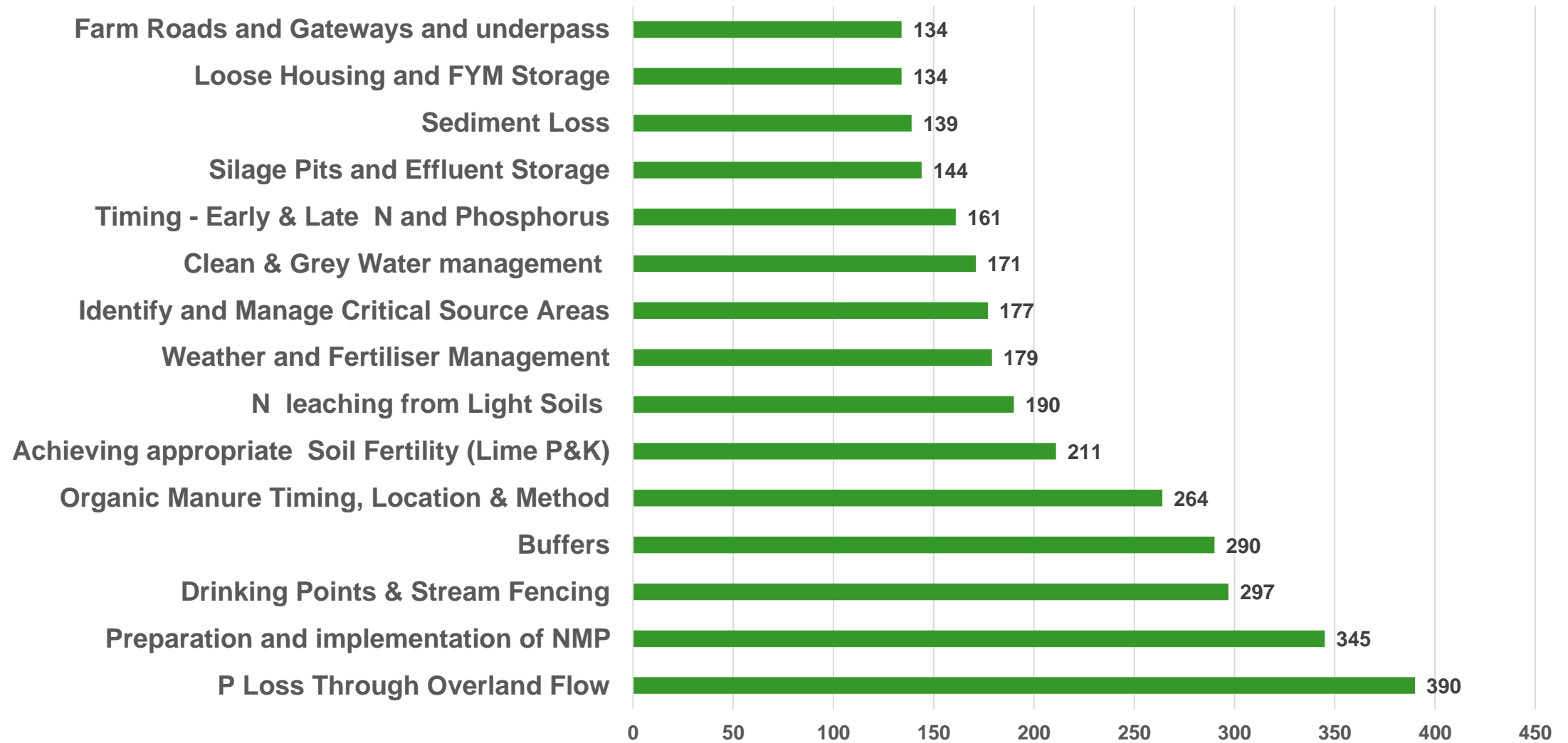
ASSAP Assessments

- 1810 Completed ASSAP Farm Assessments nationally to 31 December 2020
- 391 follow up visits
- 96% of farmers engaged with the ASSAP advisors
- Issues identified - 10233
- Ave. number of issues identified per farm : 6
- Pressures identified in PAA's
 - P Loss (Diffuse) 31%
 - N Loss (Diffuse) 16%
 - Sedimentation 26%
 - Point Source Losses 16%
 - Toxicity & Pesticides 6%
 - Ammonium 5%

Actions reviewed	Not Started	Not Proceeding	Commenced	Complete	Ongoing
8056	2745	269	1235	594	3213
	34%	3%	15%	7%	41%



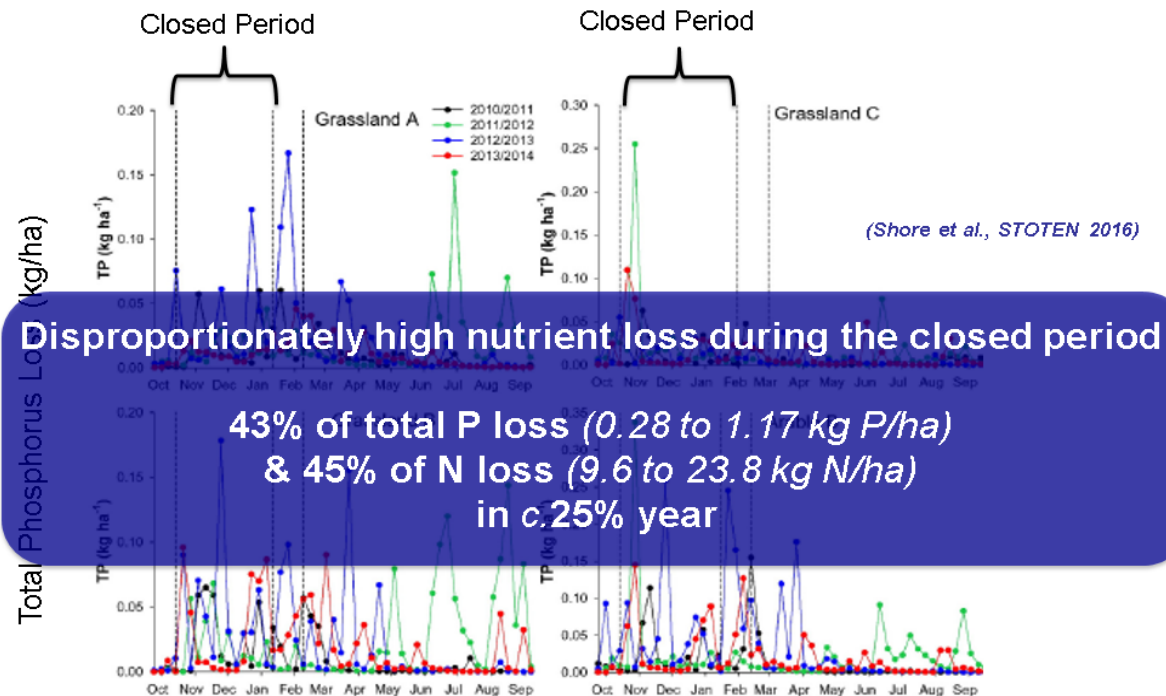
Farm Issues Identified - Risk 1 (High)



Nutrient Management Issues

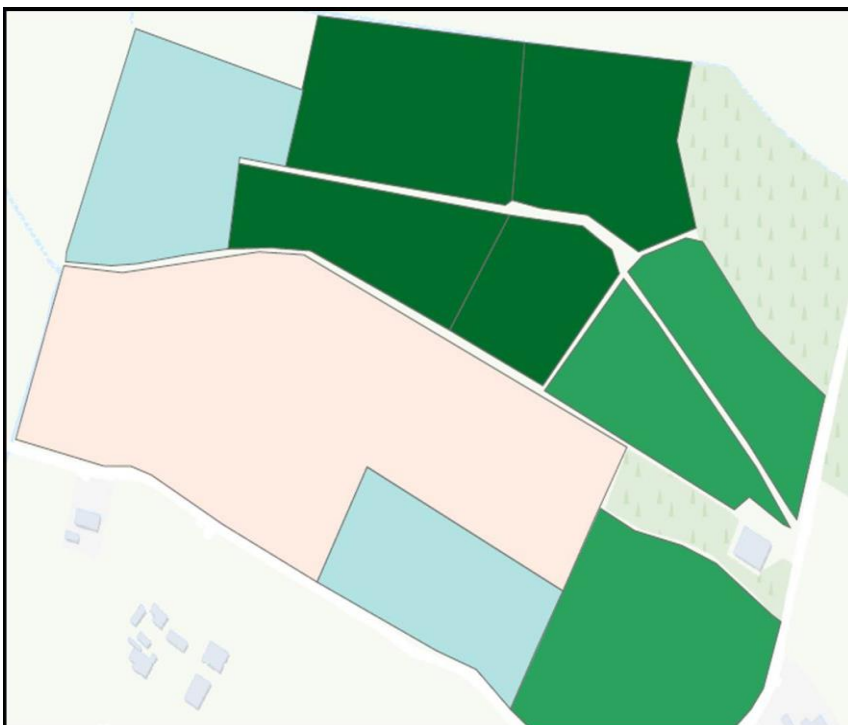
- Organic Manure Timing, Location & Method
- Timing - Early & Late N and P
 - Soil temperature
 - Soil moisture deficit
 - Growth rate
 - Weather forecast


Potential P losses from river catchments



Nutrient Management Issues

- Preparation and implementation of NMP
- Achieving appropriate Soil Fertility (Lime P&K)



			<h1>Soil Analysis Summary Report (3.0)</h1>				Johnstown Castle, Wexford Phone: 053-9171200 Email: soilsampleinfo@teagasc.ie www.teagasc.ie							
Client			Advisor			Sample Details								
						Received		08 March 2021		Authorised		24 March 2021		
						Analysis SDG		GCX_21-03-08 (1)		Sampled By		Soil Sampler		
						Comment on Samples								
Nutrients Test Results				Laboratory Results				Nutrient Advice						
Ident	Field/NMP	Crop	pH	P		K		OM	Other	LR	N	P	K	Slurry Rate
				mg/l	Index	mg/l	Index							
GCX/108-(1)	1 TOP FIELD	Silage - 1 Cut System	6.4	3.9	2	58.6	2			XSL †	125	30	155	0C
GCX/109-(1)	2 CROSS ROADS	Silage - 1 Cut System	6.0	3.4	2	45.3	1			1.5 †	125	30	185	0C
† This sample was taken from an area which has cases of high molybdenum in herbage														
Conversion table: kg/ha x 0.8 = units/acre tonnes/ha x 0.4 = tons/acre litres/ha = gallons/acre x 11(P- Phosphorus, K- Potassium, LR- Lime requirement)														
This advice is given only for the area sampled and is based on test result from a Teagasc selected laboratory and on the information supplied with the soil sample. Do not exceed N & P limits as set out in the NAP on a whole farm basis. Teagasc cannot be responsible for any losses which occur from the use of this report.														

Nutrient Management Issues

- Weather & Fertiliser Management



Farmyard Management Issues

- Clean & Grey Water Management

- Dirty Yards



- Slurry Storage



- Silage Pits & Effluent Storage



- Drain Connection from Yard to Water

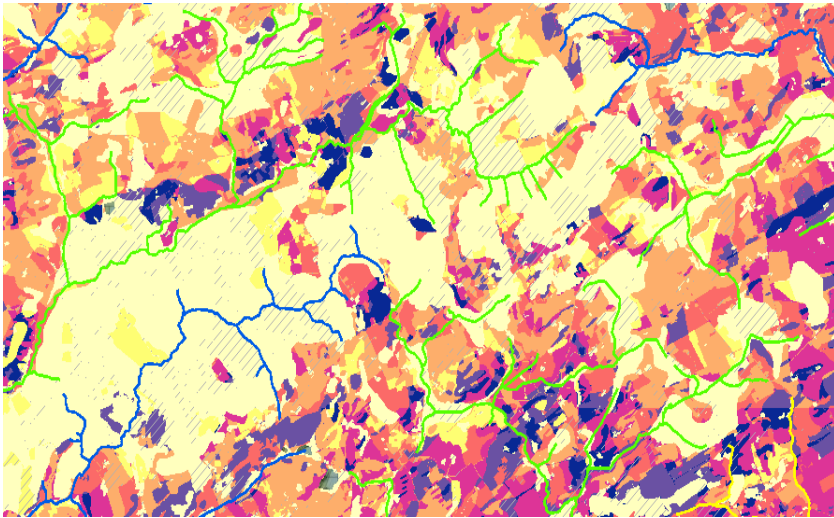


Land Management Issues

- Buffers



- N leaching from Light Soils



- *Right Time – Right Rate – Right Location – Right Product*

- Farm Roads and Gateways and underpass



- Drinking Points & Stream Fencing



Overland Flow - Diffuse P & Sediment Loss?

1. Heavy rainfall leads to **overland flow of water**
2. P and soil sediment washed off into drains & streams

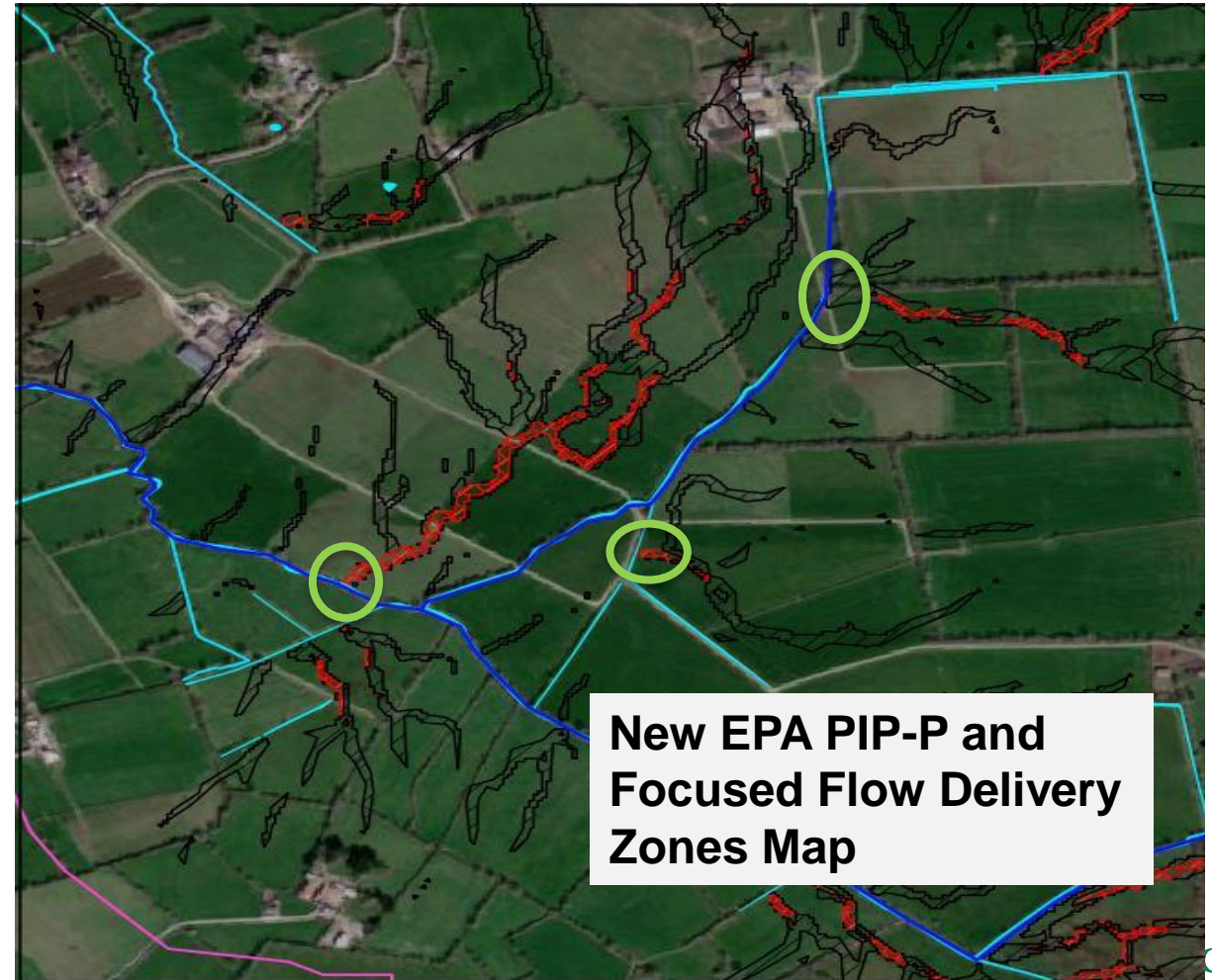




Photo: Allerton farm

Small wetland pond



Low earthen mound

Hedgerows

Woodlands for Water

River bank supports



Photo: Allerton farm

Sediment traps & Leaky dams

Woodlands for Water
New native woodland to both protect and enhance water quality

A B C D

Watercourse Biodiversity zone Riparian Woodland Pasture Grazing

Summary on Water Quality

- Water quality is declining
- Main issues
 - Diffuse P and sediment losses
 - Diffuse N losses
 - Point sources are still an issue
- **Soil Type, Weather and Farm Practice** all influence water quality
- Mitigation actions need to be implemented and maintained to improve water quality



Water Quality Week

22nd - 26th March 2021



Thank you.....