23rd October 2020

Agricultural Catchments Programme

Nitrates Derogation Evaluation

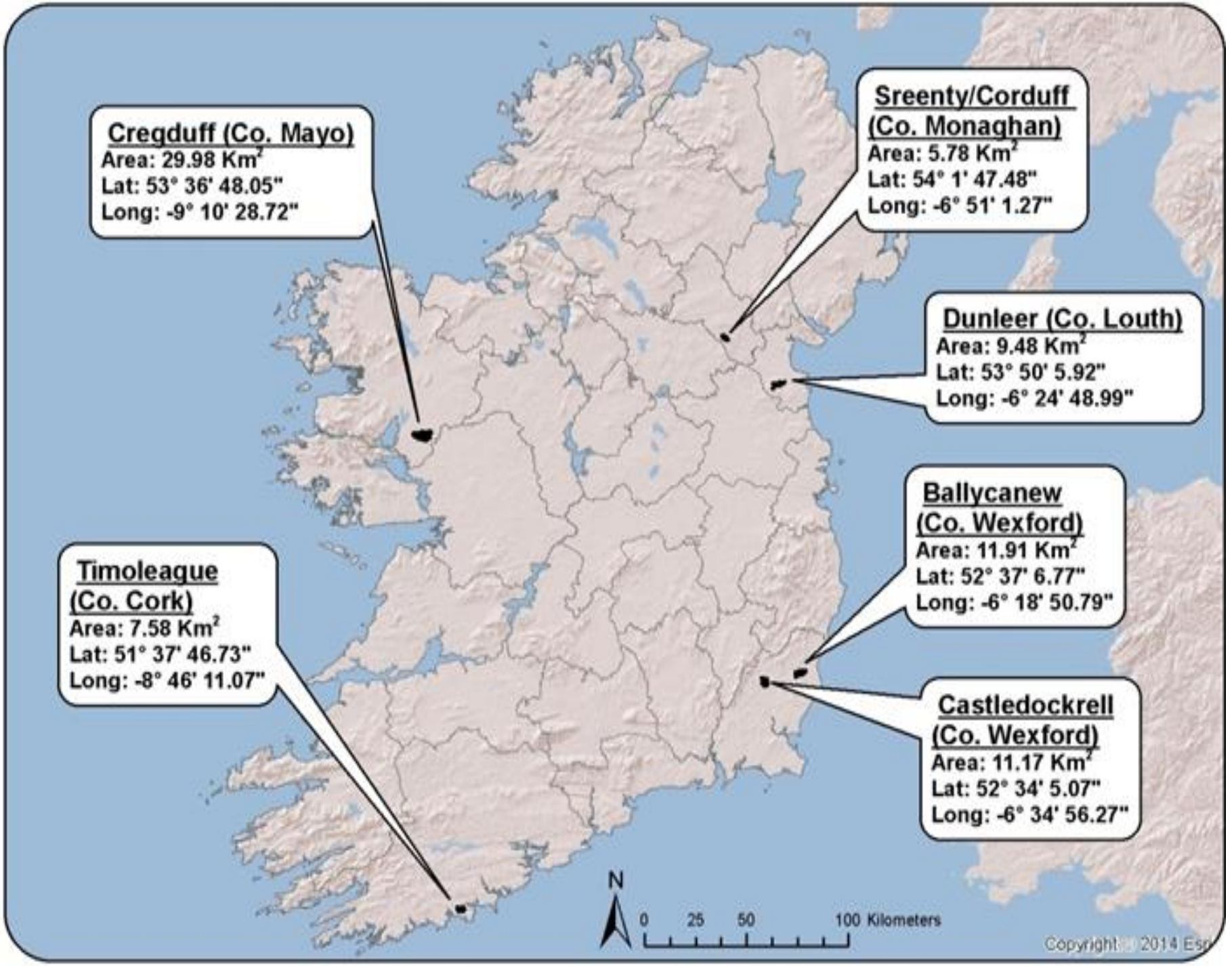
Edward Burgess

Agriculture and Food Development Authority

What is the ACP ?

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

- Funded by the Dept. of Ag. Food & Marine
- Almost 12 years old (4 year funding cycle)
- Combined Research and Knowledge Transfer
- 6 catchments with 300+ farmers
- Biophysical and socio-economic research
- Focus points for Catchment Science KT


Cregduff (Co. Mayo)
Area: 29.98 Km²
Lat: 53° 36' 48.05"
Long: -9° 10' 28.72"
Sreenty/Corduff (Co. Monaghan)
Area: 5.78 Km²
Lat: 54° 1' 47.48"
Long: -6° 51' 1.27"
Dunleer (Co. Louth)
Area: 9.48 Km²
Lat: 53° 50' 5.92"
Long: -6° 24' 48.99"
Ballycanew (Co. Wexford)
Area: 11.91 Km²
Lat: 52° 37' 6.77"
Long: -6° 18' 50.79"
Timoleague (Co. Cork)
Area: 7.58 Km²
Lat: 51° 37' 46.73"
Long: -8° 46' 11.07"
Castledockrell (Co. Wexford)
Area: 11.17 Km²
Lat: 52° 34' 5.07"
Long: -6° 34' 56.27"
N
0 25 50 100 Kilometers
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European Environmental Policy

Nitrates Directive

- Member States required "*to assess…action programmes*"
- Minister legally responsible for monitoring NAP and derogation

Water Framework Directive

- Attain and sustain at least good status waters by 2015

(2021, 2027 etc)

Farm to Fork strategy

- 50% reduction in nutrient loss & 20% reduction in fertilise use

Nitrates Directive ?

- Council Directive of 12 December 1991
- Objective
  - Reducing Water Pollution … by Nitrates from Agriculture
  - Preventing further such pollution
- Pollution:
  - Discharge of N compounds into the aquatic environment causing
    - Human health hazard
    - Harm to aquatic ecosystem
    - Damage to amenities
- Nitrate Vulnerable Zone or Whole Country

Nitrates Directive

- NVZ criteria & Monitoring
  - Drinking water standard 50 NO_3 (or 11.3 Nitrate N)
  - Eutrophic state WFD
- Measures
  - Fertiliser application periods
  - Storage capacity
  - Fertiliser limits & application
  - Livestock manure shall not exceed 170 kg N per hectare
- Derogation to 170 Kg limit
  - Must be justified

DECISIONS

COMMISSION IMPLEMENTING DECISION (EU) 2018/209

of 8 February 2018

granting a derogation requested by Ireland pursuant to Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources

(notified under document C(2018) 624)

(Only the English text is authentic)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources ([1]) and, in particular, the third subparagraph of paragraph 2 of Annex III thereto,

(2) On 22 October 2007, the Commission adopted Decision 2007/697/EC ([2]) granting a derogation requested by Ireland pursuant to Directive 91/676/EEC for the purpose of allowing the application of livestock manure up to a limit of 250 kg nitrogen per hectare per year, under certain conditions, on farms with at least 80 % grassland, in the context of the Irish Action Programme as implemented in the European Communities *(Good Agricultural Practices for Protection of waters) Regulations 2006 (Statutory Instrument No 378 of 2006)*.

(3) On 24 February 2011, the Commission adopted Decision 2011/127/EU ([3]), amending Decision 2007/697/EC and extending the derogation until 31 December 2013, in the context of the Irish Action Programme as implemented in the *European Communities (Good Agricultural Practices for Protection of waters) Regulations 2010 (Statutory Instrument No 610 of 2010)*.

(4) On 27 February 2014, the Commission adopted Decision 2014/112/EU ([4]), granting a derogation requested by Ireland pursuant to Directive 91/676/EEC for the purpose of allowing the application of livestock manure up to a limit of 250 kg nitrogen per hectare per year, under certain conditions, on farms with at least 80 % grassland, in the context of the Irish Action Programme as implemented in the *European Communities (Good Agricultural Practices for Protection of waters) Regulations 2014 (Statutory Instrument No 31 of 2014)*. Decision 2014/112/EU expired on 31 December 2017.

(5) The derogation granted by Decision 2014/112/EU concerned 6 802 farms in 2016, corresponding to approximately 5,4 % of the total number of holdings with grazing animals, 20,2 % of the total number of livestock units and 9,3 % of the total net agricultural area in Ireland.

(7) In conformity with Article 3(5) of Directive 91/676/EEC, Ireland applies an action programme throughout its whole territory.

(8) The data provided by Ireland in the context of the reporting obligation required by Article 10 of Directive 91/676/EEC shows that, for the period 2012-2015, the waters are of generally good quality. All monitoring stations for groundwater in Ireland had mean nitrate concentrations below 50 mg/l and 87 % of those monitoring stations had mean nitrate concentrations below 25 mg/l. All monitoring stations for surface water in Ireland had mean nitrate concentrations below 40 mg/l and 99,5 % of those monitoring stations had mean nitrate concentrations below 25 mg/l.

(9) The number of livestock in Ireland has increased over the last number of years. Cattle, pig and sheep numbers increased respectively by 3,8 %, 3,7 % and 5,1 % from the period 2008-2011 to the period 2012-2015, reversing the declines in the previous reporting period. Average nitrogen loading from livestock manure in the period 2012-2015 was 104 kg/ha, similar to the period 2008-2011. Average phosphorus loading in the period 2012-2015 was 15 kg/ha, also similar to the period 2008-2011. Average chemical N fertiliser use increased by 5 % in the period 2012-2015 compared to the period 2008-2011. Average chemical P fertiliser use increased by 32,7 % in the period 2012-2015 compared to the period 2008-2011. However, the average use of chemical P fertiliser in the period 2012-2015 was still 9,5 % lower compared to the average use of that fertiliser in the period 2004-2008 ([1]).

(10) In Ireland, 92 % of agricultural land is devoted to grassland. Overall, in grassland farms, 50 % of the land area is farmed extensively and has therefore a relatively low stocking rate and low fertiliser inputs, 21 % is farmed under agro-environmental programmes and only 9,3 % is farmed intensively. 8 % is used for arable agriculture. The average chemical fertiliser use on grassland is 80 kg/ha nitrogen and 8 kg/ha phosphorus ([1]).

(11) The Irish climate, characterised by an annual rainfall evenly distributed throughout the year and a relatively narrow annual temperature range, promotes a long grass-growing season ranging from 330 days per year in the south-west to around 250 days per year in the north-east ([2]).

(12) After examination of the request from Ireland in accordance with the third subparagraph of paragraph 2 of Annex III to Directive 91/676/EEC and in the light of the Irish Action Programme and the experience gained from the derogation provided for in Decisions 2007/697/EC and 2014/112/EU, the Commission considers that

HAS ADOPTED THIS DECISION:

Article 1

Article 11

Application

This Decision shall apply in the context of the Irish Action Programme as implemented in the *European Union (Good Agricultural Practice for Protection of Waters) Regulations 2017 (Statutory Instrument No 605 of 2017).*

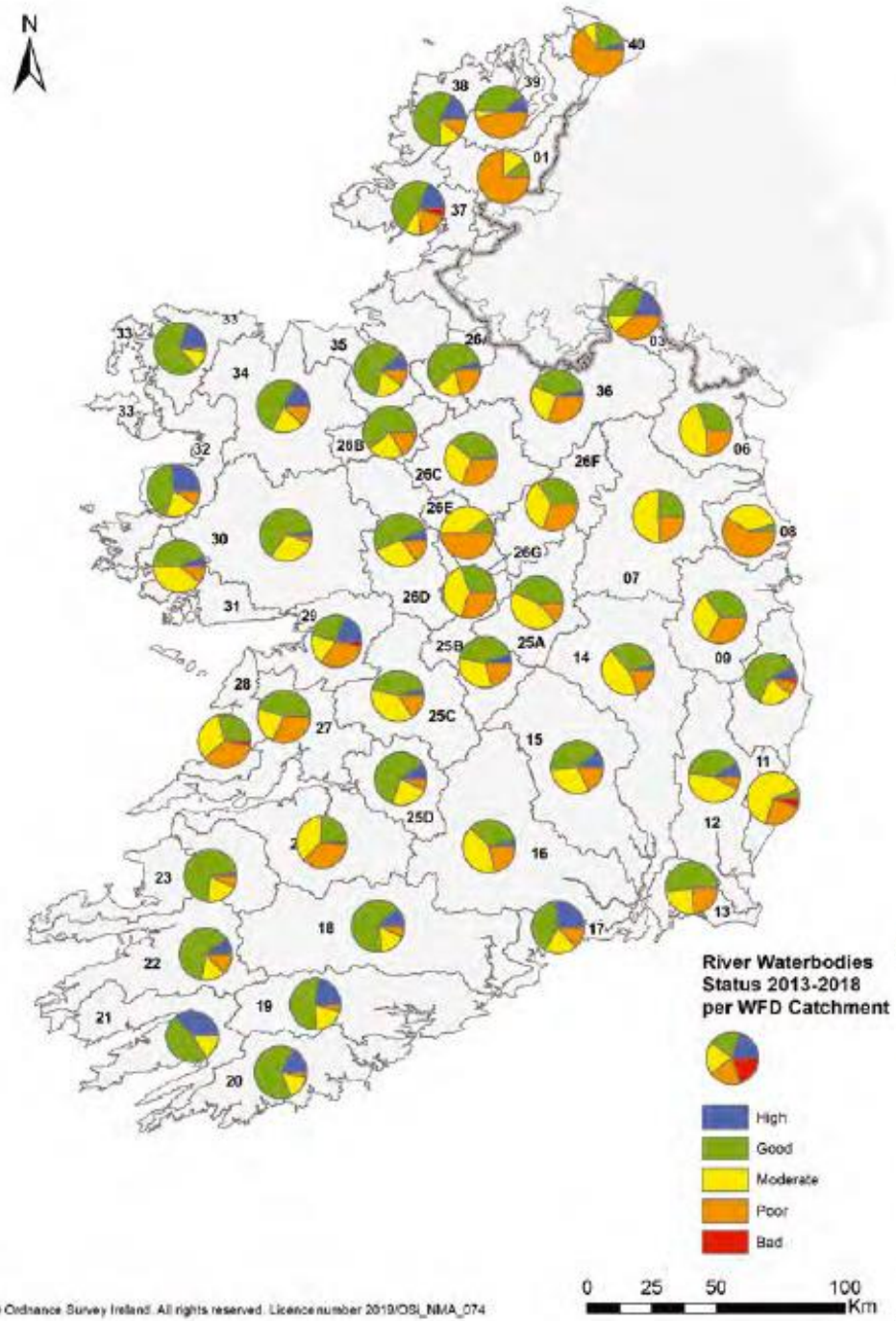
This Decision shall apply until 31 December 2021.

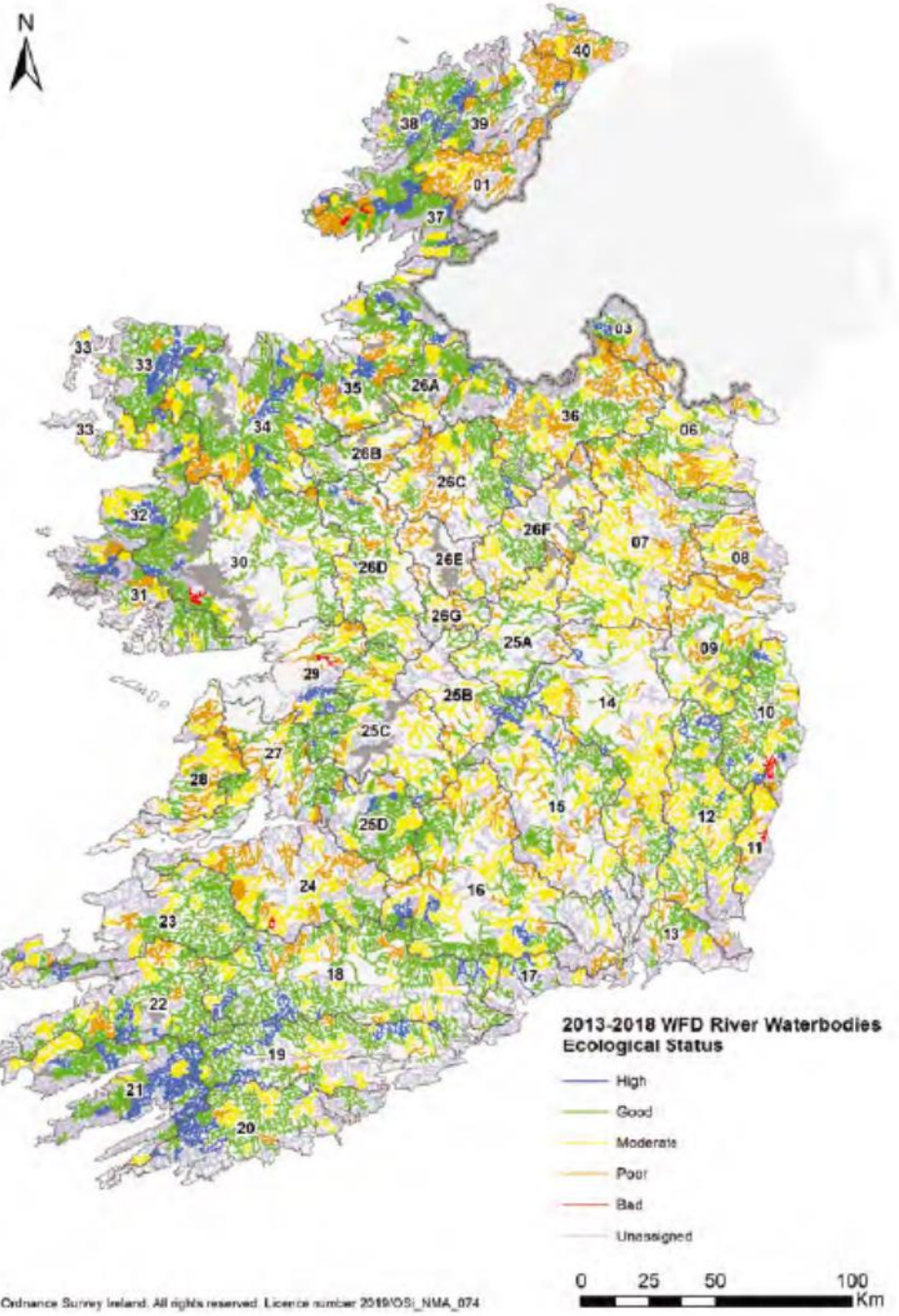
Article 12

Addressee

This Decision is addressed to Ireland.

Done at Brussels, 8 February 2018.



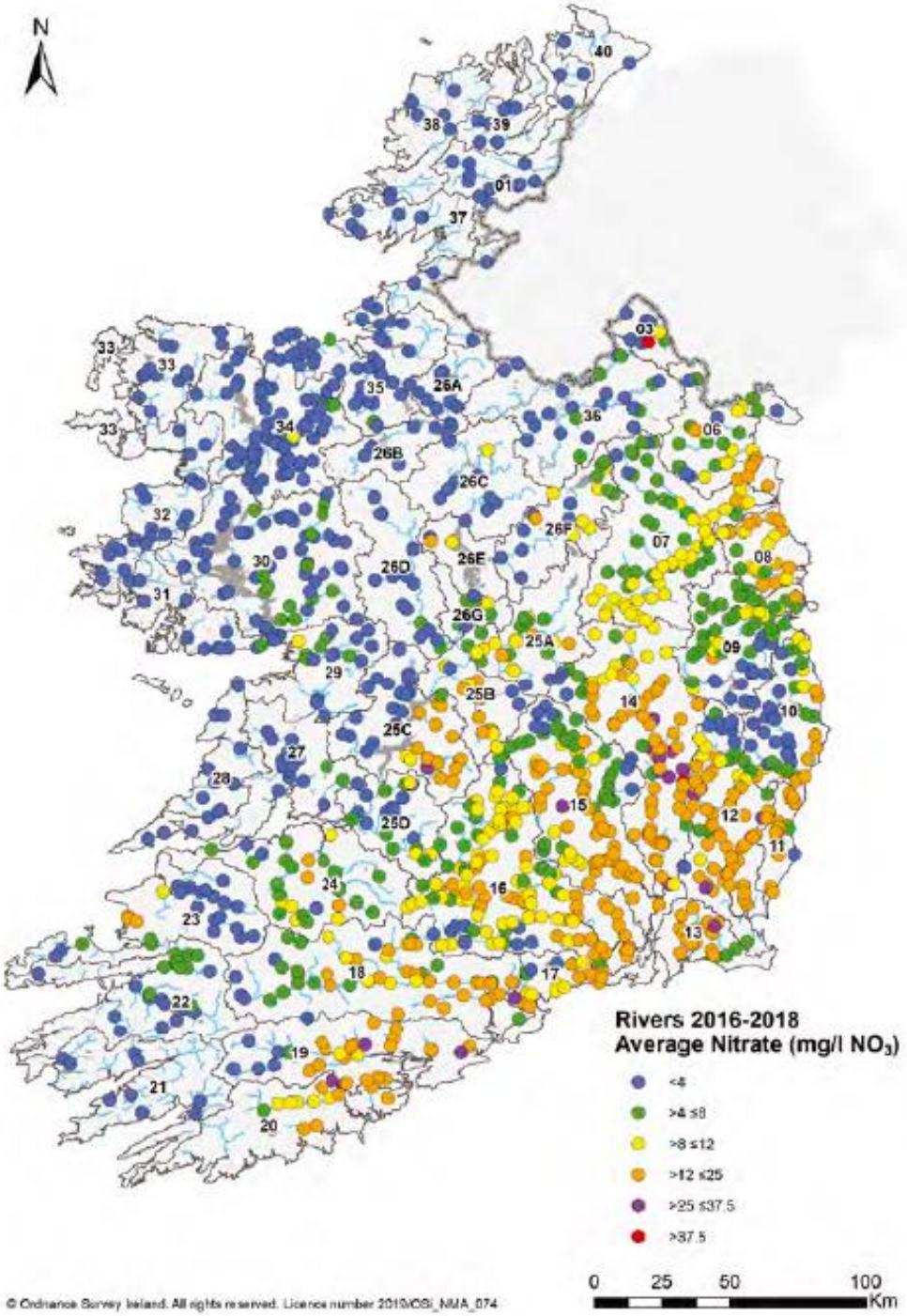


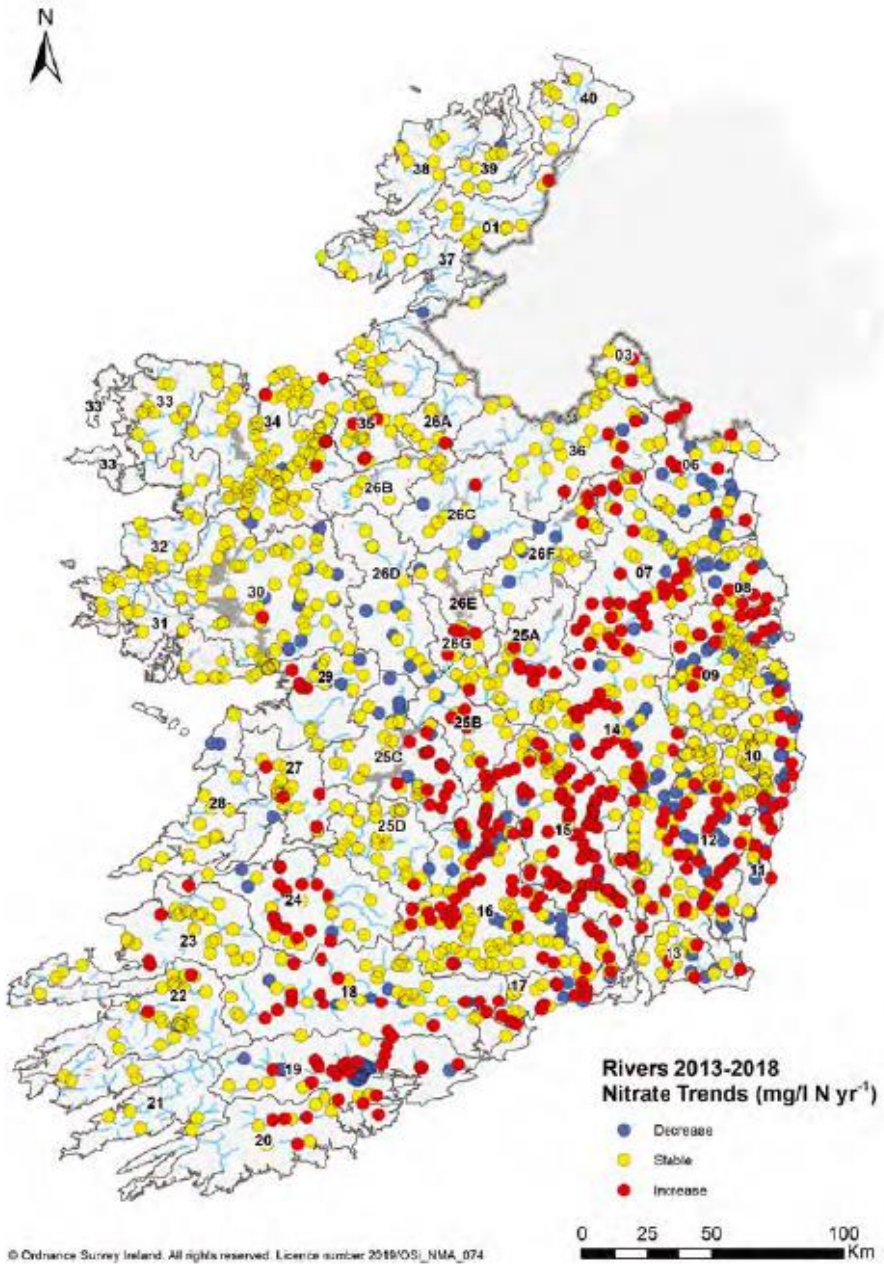
Map 2.1: The ecological status of monitored river water bodies 2013–2018.

Nitrate Concentrations

How do they relate to:

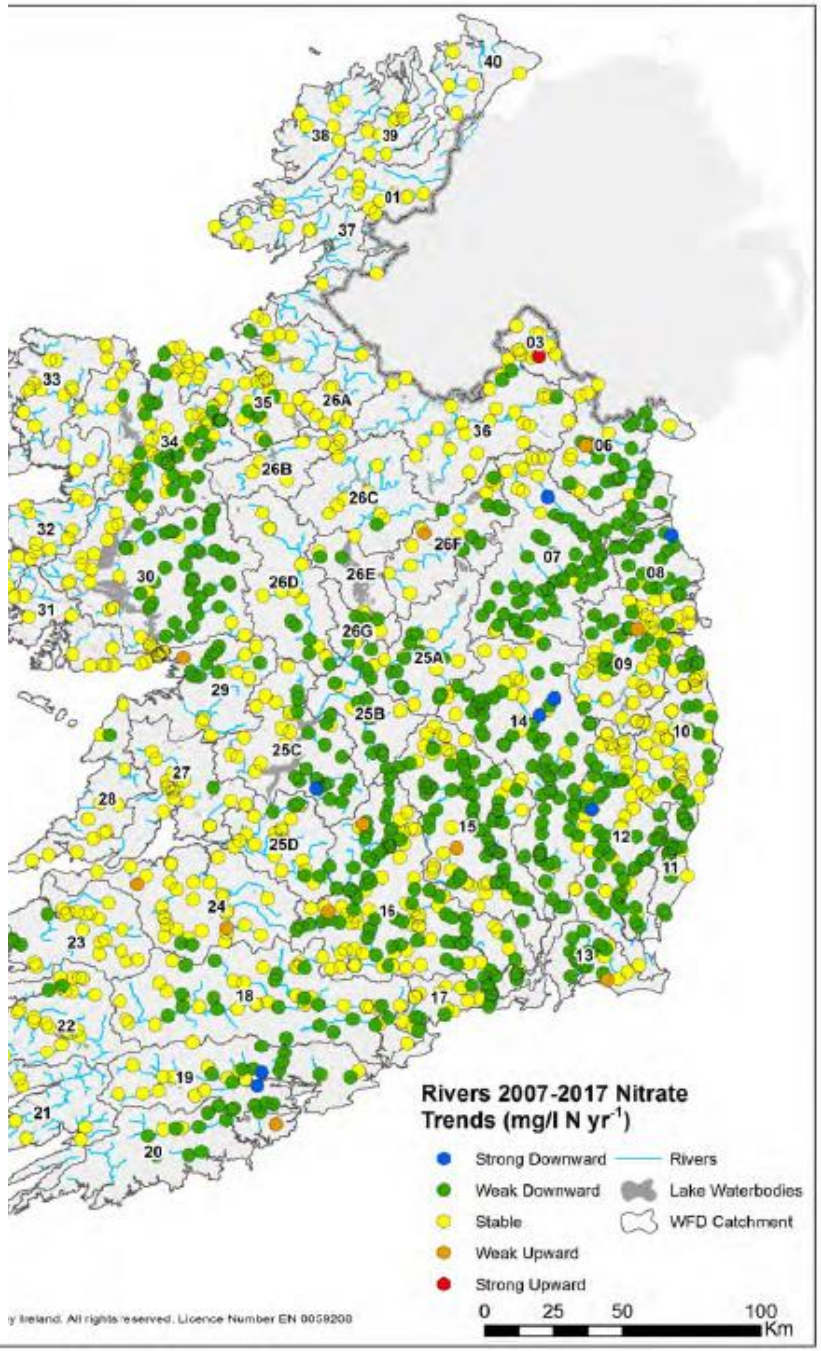
- **Stocking rate**
- **Drier Soils**
- **Drier Summers**
- **River Quality**
- **Estuarine & Costal**





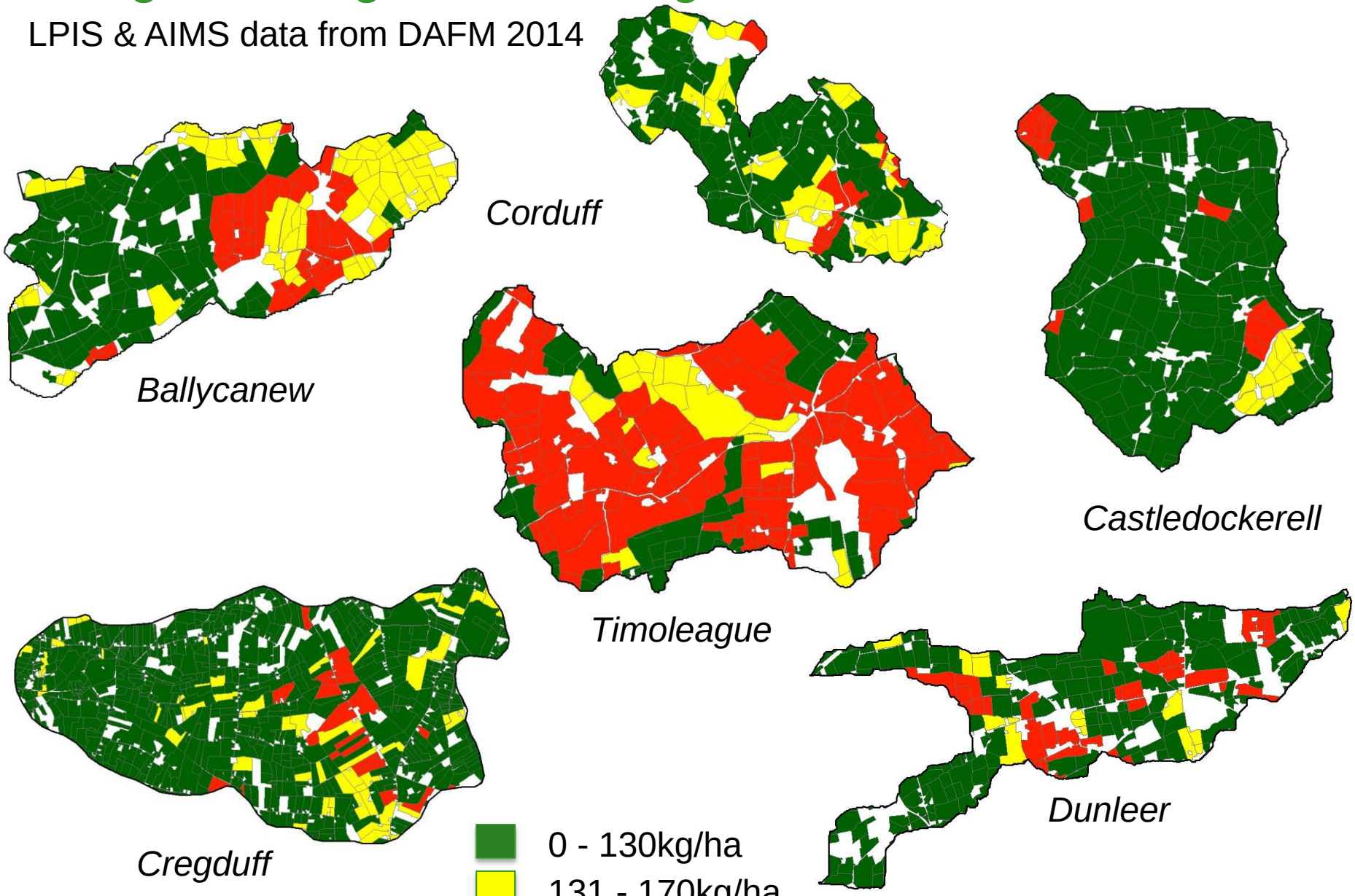
Map 2.6: Trends in average nitrate concentration at river sites from 2013 to 2018.

Map 2.7: Trends in average nitrate concentration at river sites between 2007 and 2017 inclusive.



Derogation: Organic N loading

LPIS & AIMS data from DAFM 2014



A whole catchment approach

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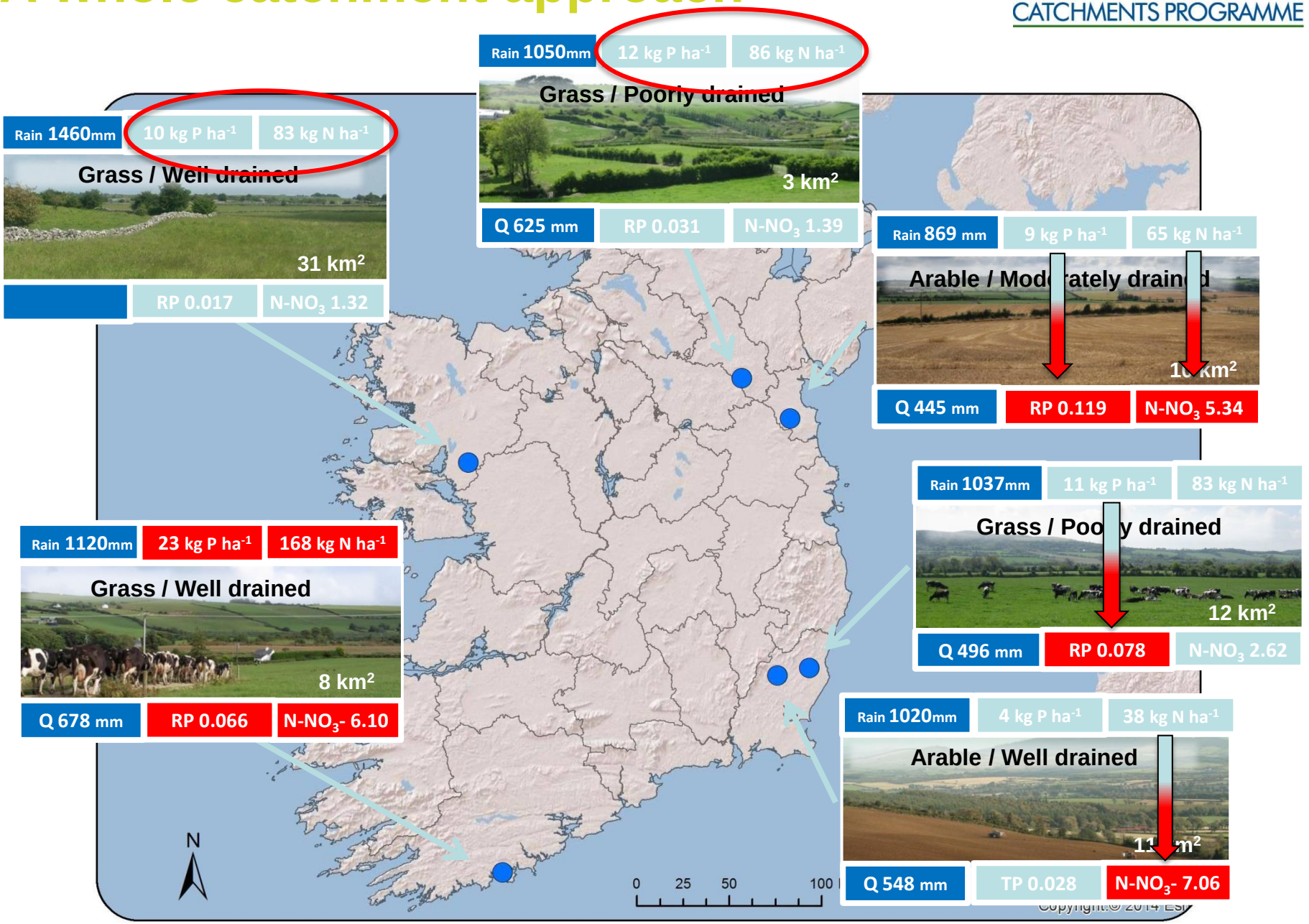

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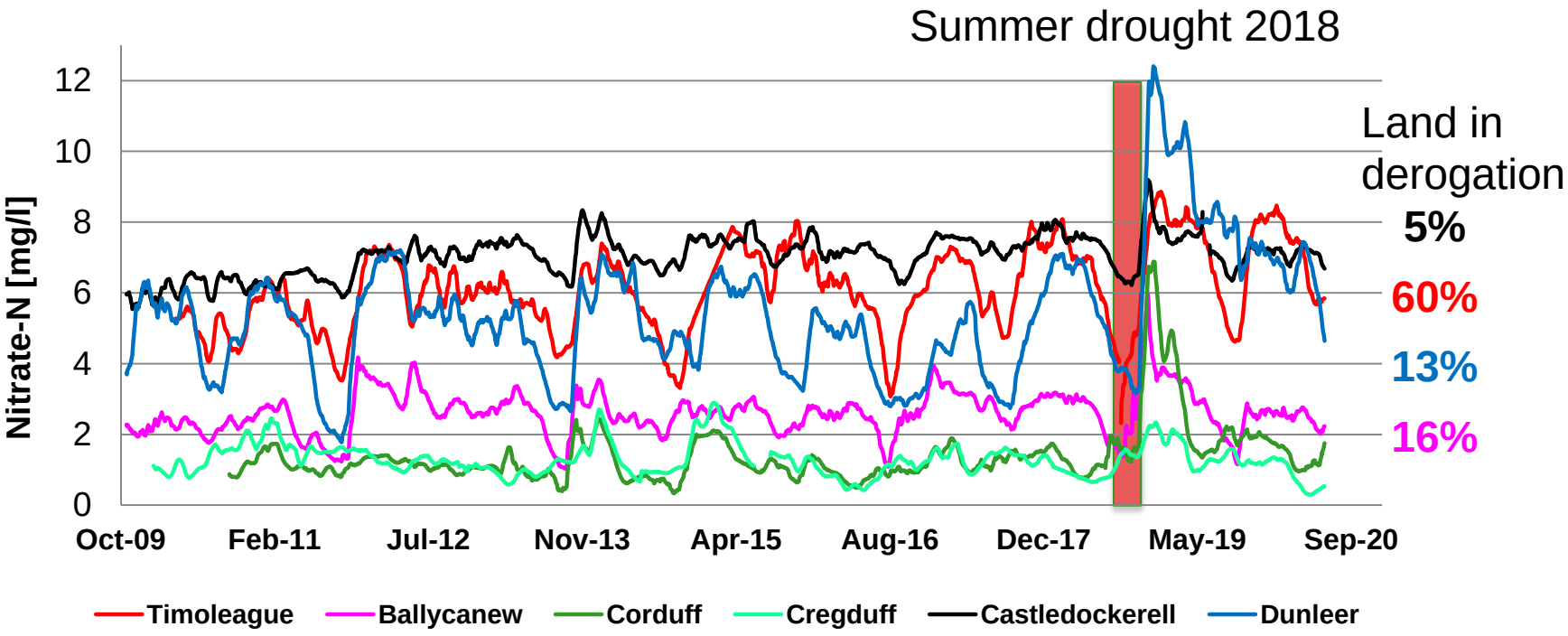
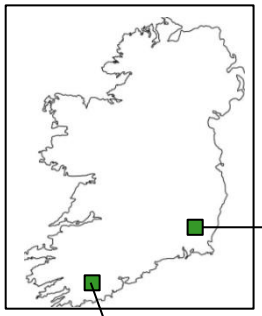
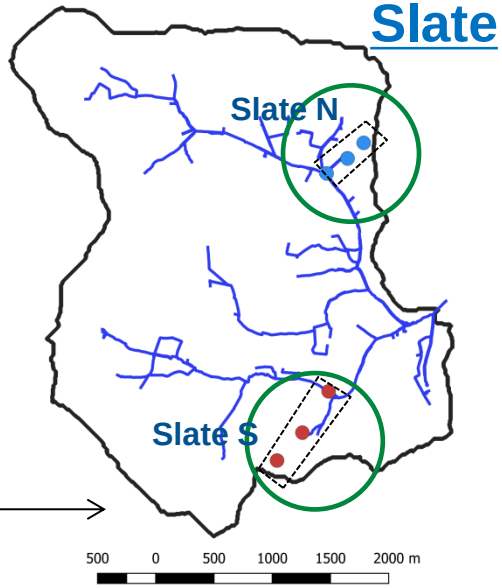


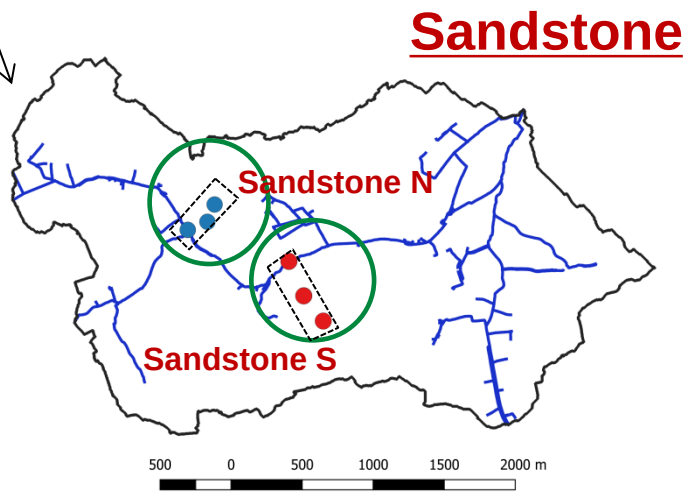
- **Physical setting overrides source pressure**
- **Strong weather signal**

Catchment Contrast

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







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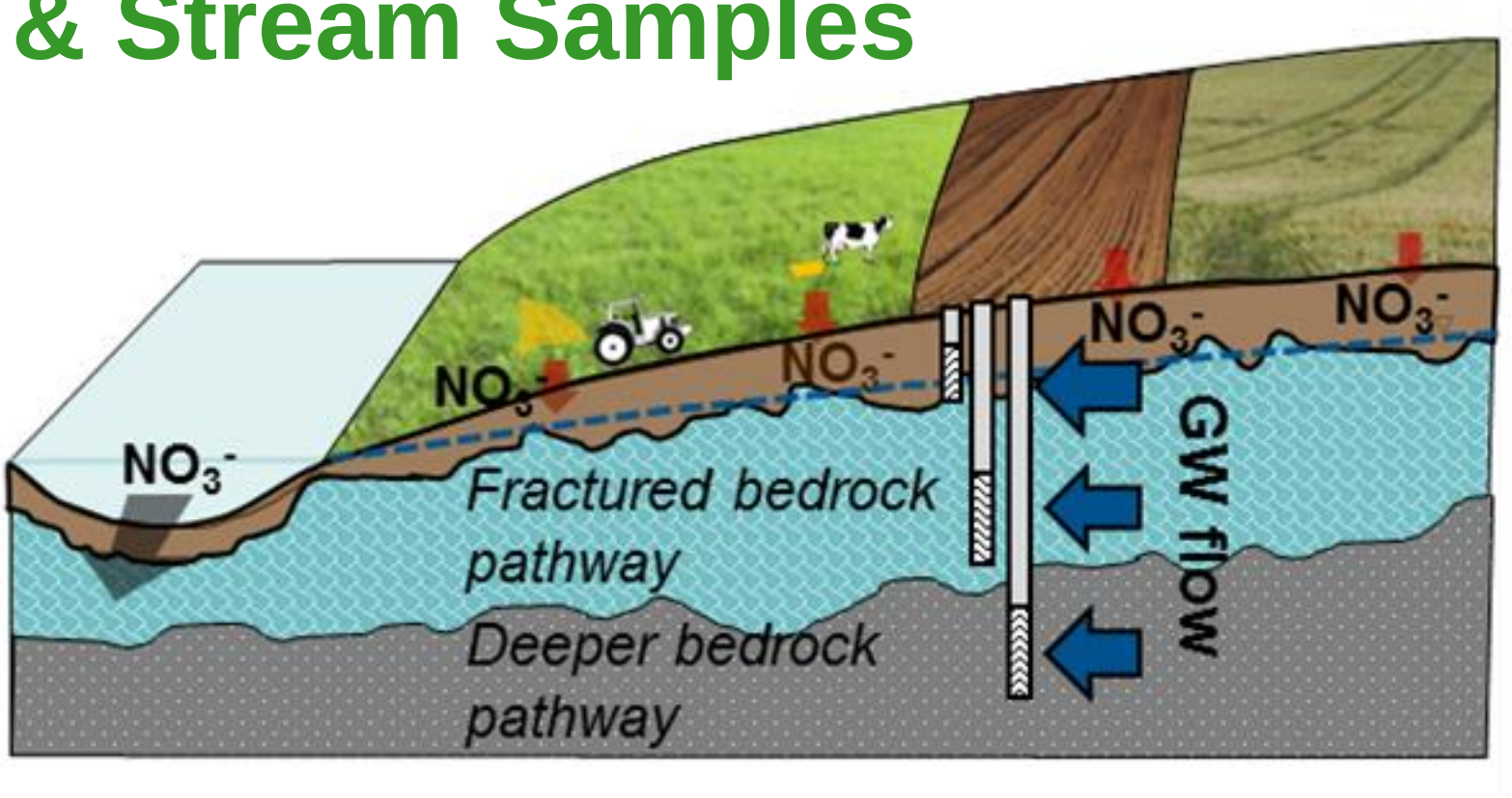
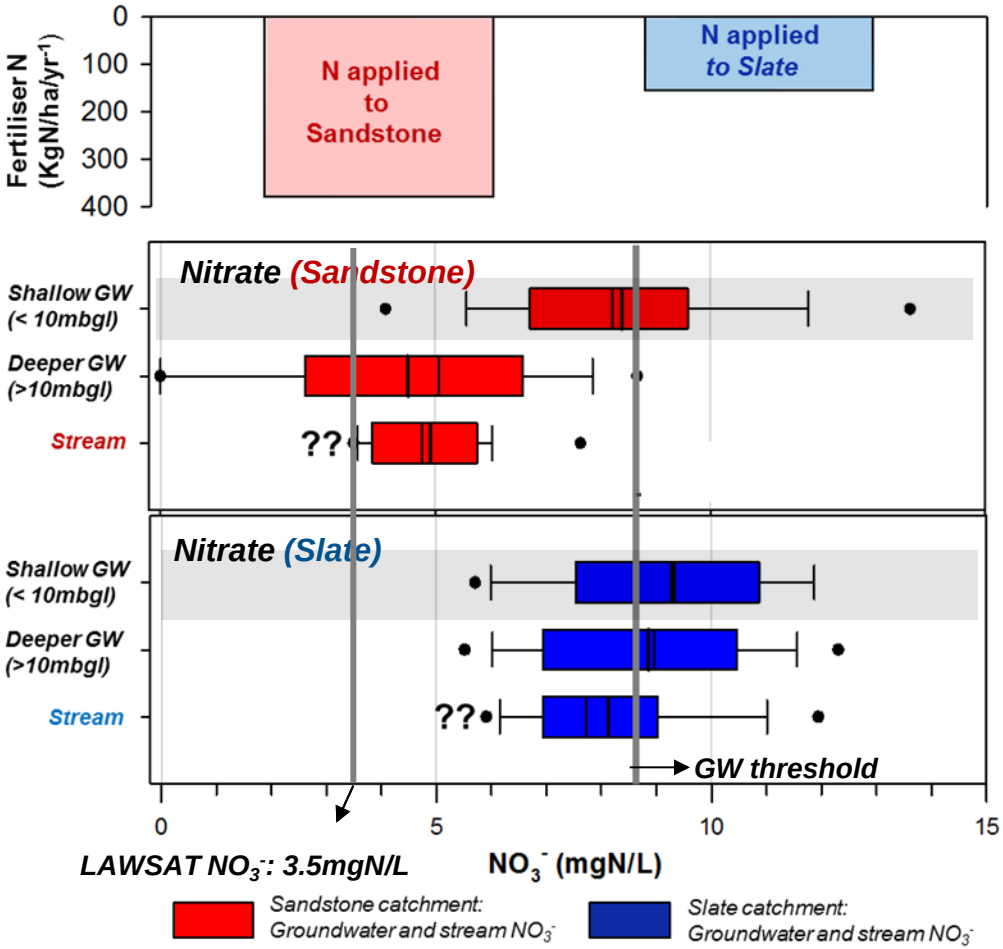
Multi-Level Monitoring Wells & Stream Samples



The Nitrate story: Contrasting hillslopes

- Substantially greater N applications to the **sandstone** (grassland) vs. the **slate** (arable) catchment
- High shallow GW (<10mBGL) NO_3^- in both catchments



Boxplots *of groundwater and stream NO_3^- concentrations during two hydrological years (2013/15) at the* ***sandstone*** *and* ***slate*** *catchments. The lower and upper hinges of the boxes correspond to the first and third quartiles of the data. The thick black line represents the mean of the data, while the red line describes the mean. The top and bottom whiskers of the plot define the 5th and 95th percentiles.*

[McAleer et al., in prep]

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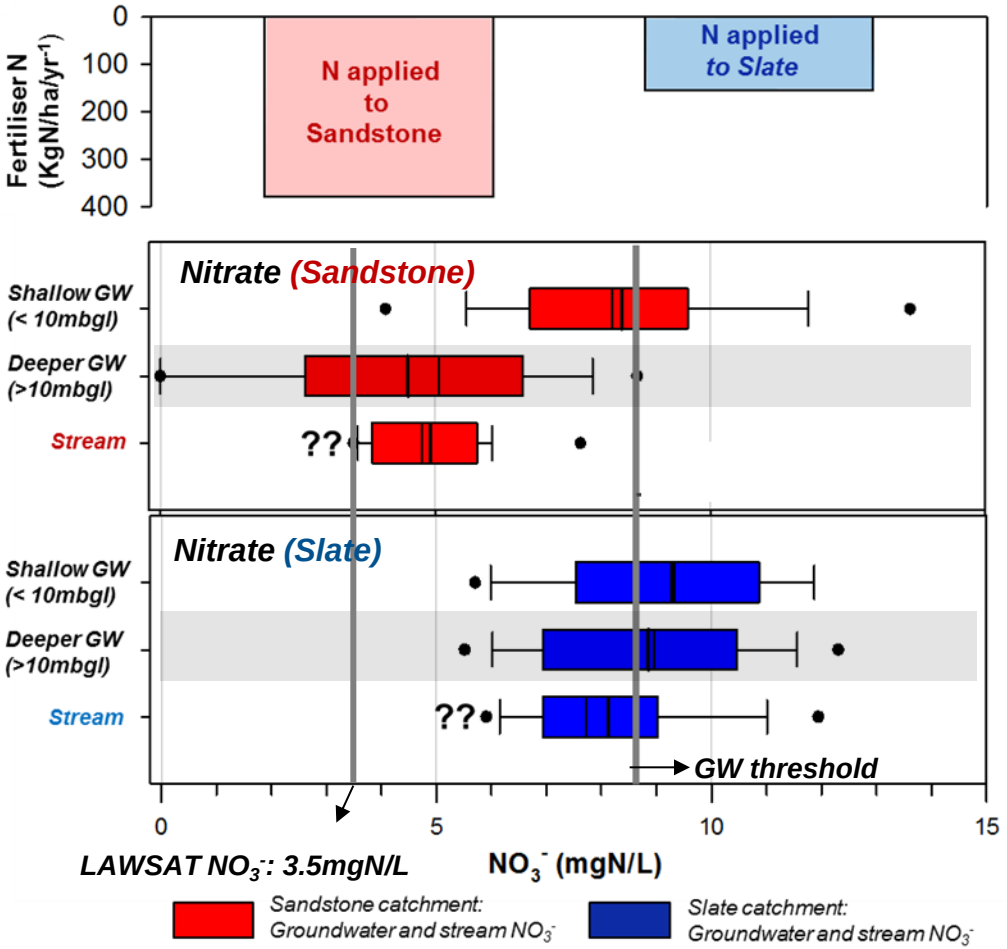

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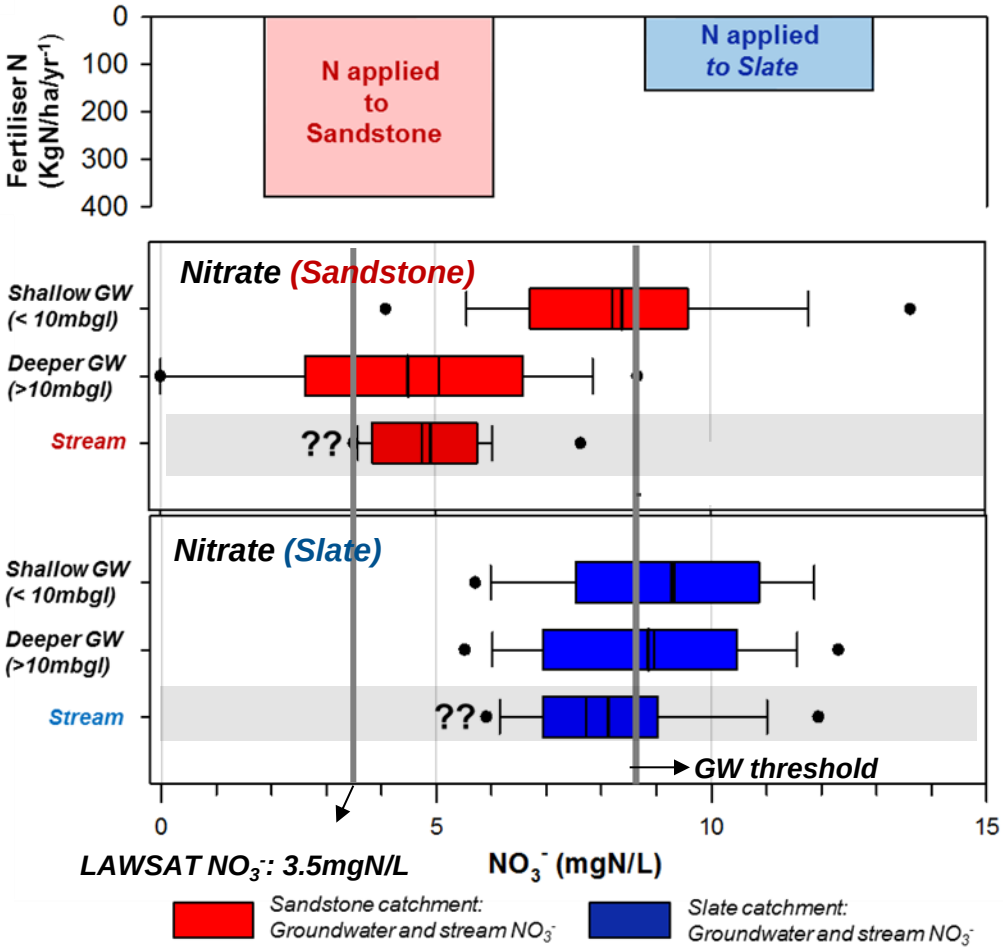

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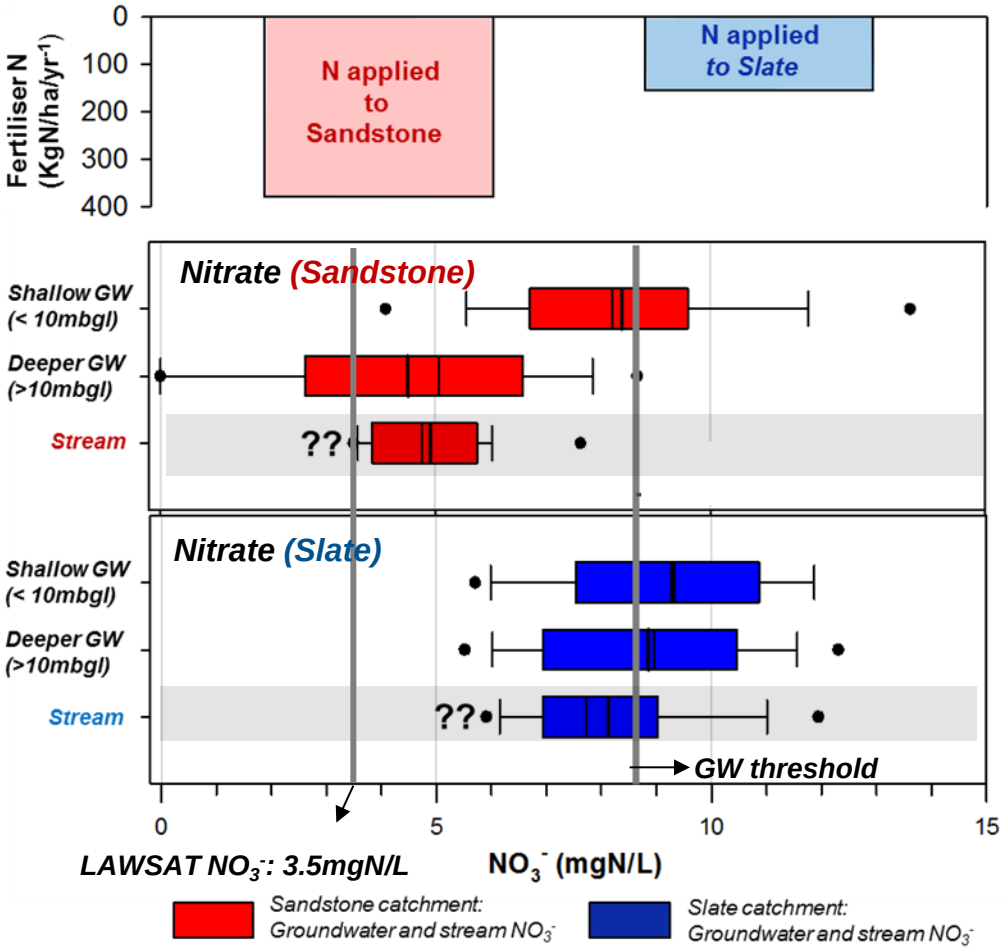

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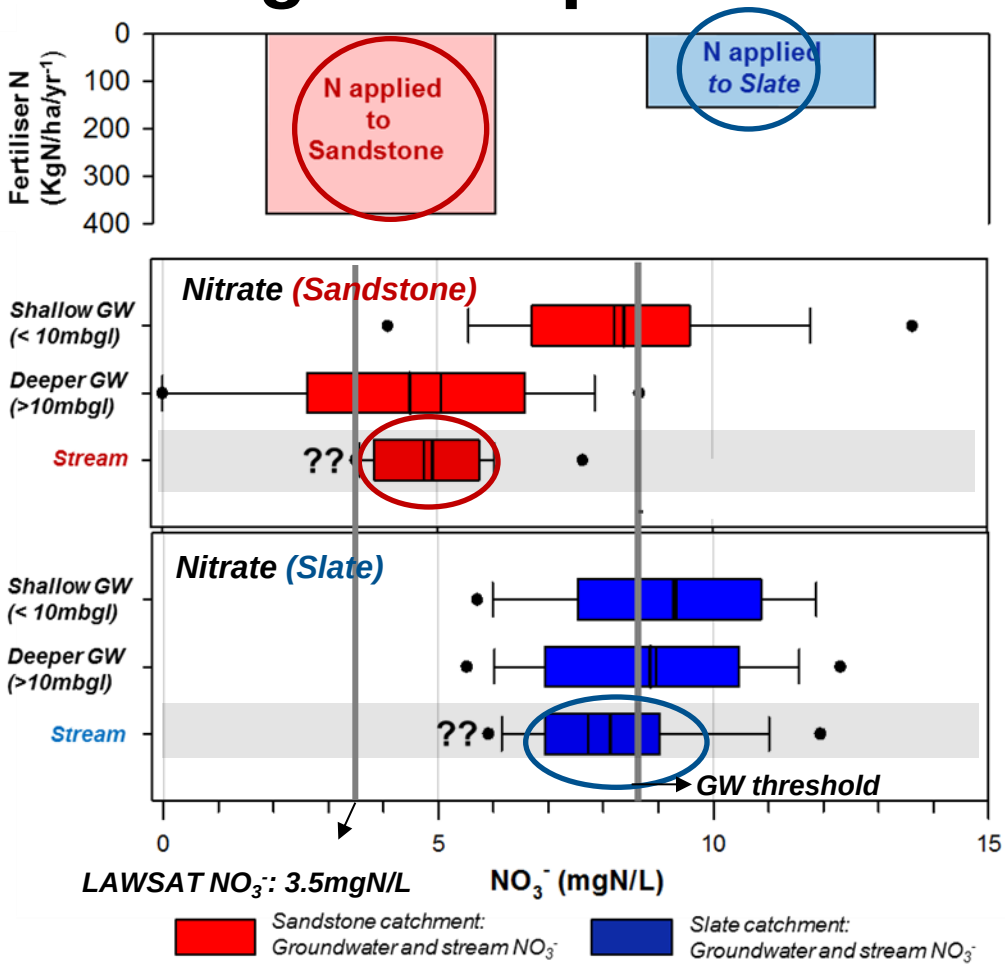
*Why does the hillslope with almost **triple** the N loading to the land surface have 50% less NO_3^- in the stream??*



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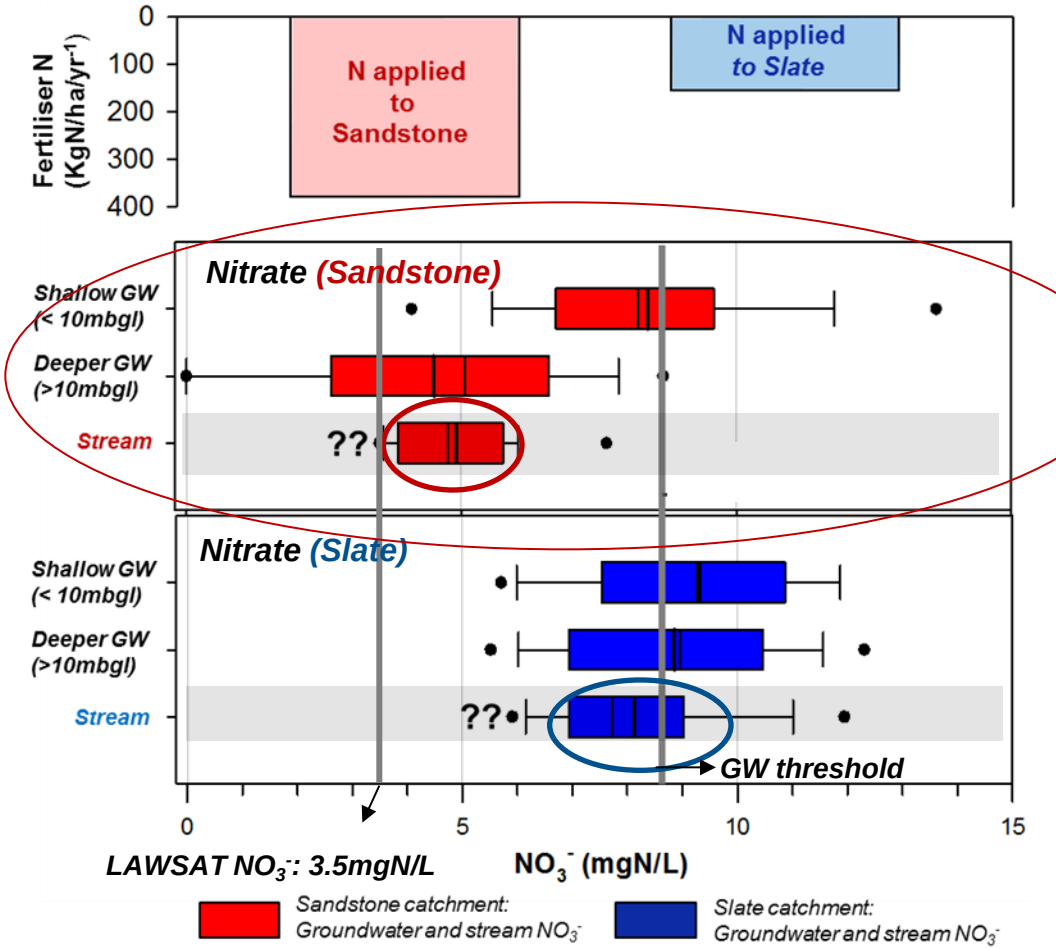

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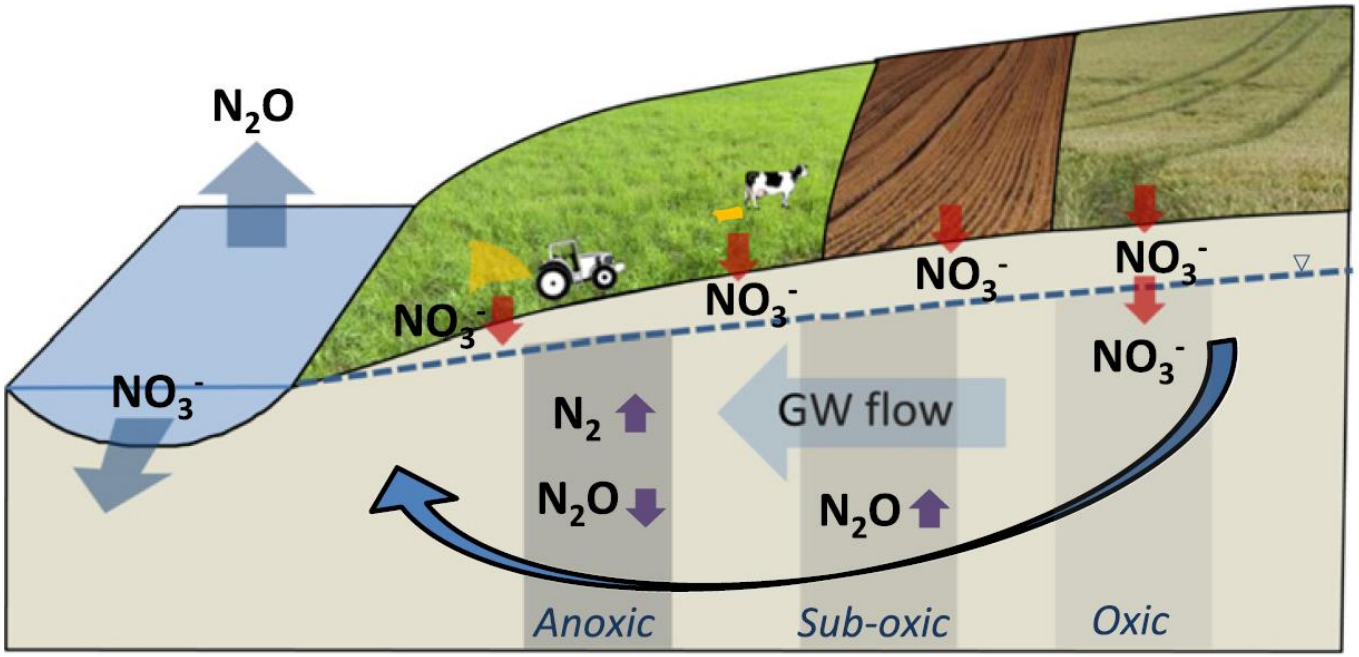
Complexity of nutrient loss



[McAleer et al., STOTEN 2017]

- **A variety of soil types**
- **N removal capacity varies highly between and within catchments**
- **Transformation processes occur along the pathway from the rooting zone to surface water**
- **Poor link between N leaving the root zone and N in the stream**

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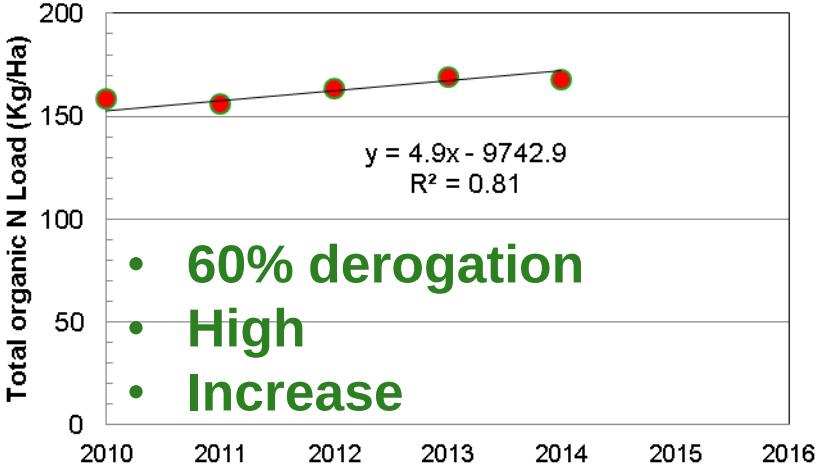
Temporal changes

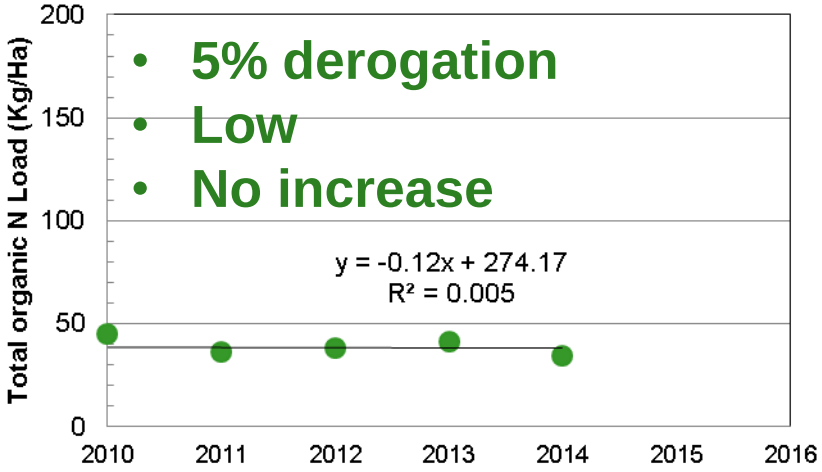
[McAleer et al., in prep]

Timoleague

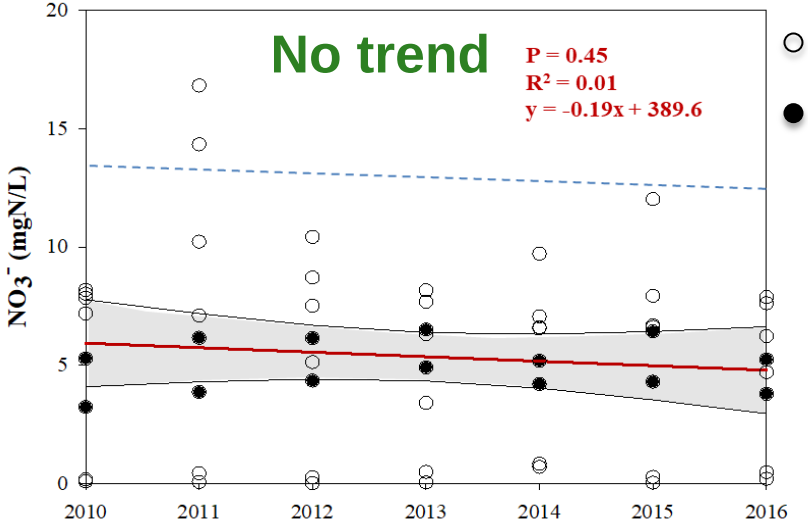


- 60% derogation
- High
- Increase

Castledockerell

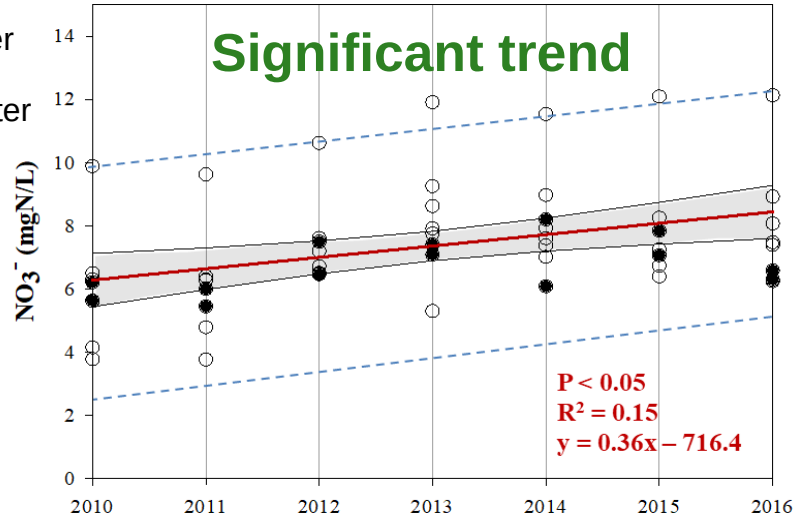


- 5% derogation
- Low
- No increase



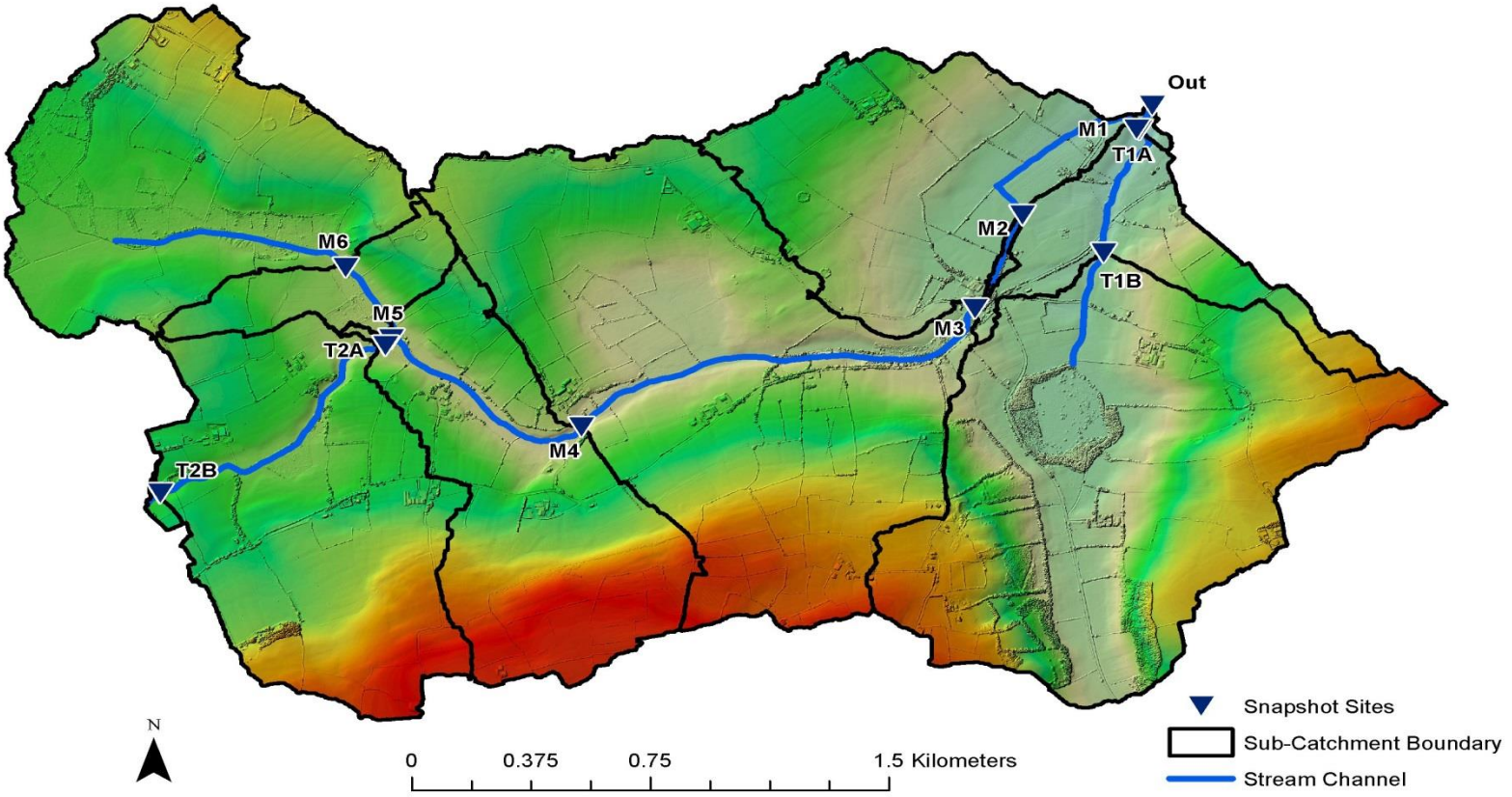
Groundwater

Surface water



- **No correlation to changes in organic loading**
- **Correlation to changes in weather**

Timoleague Catchment Snapshot Sites



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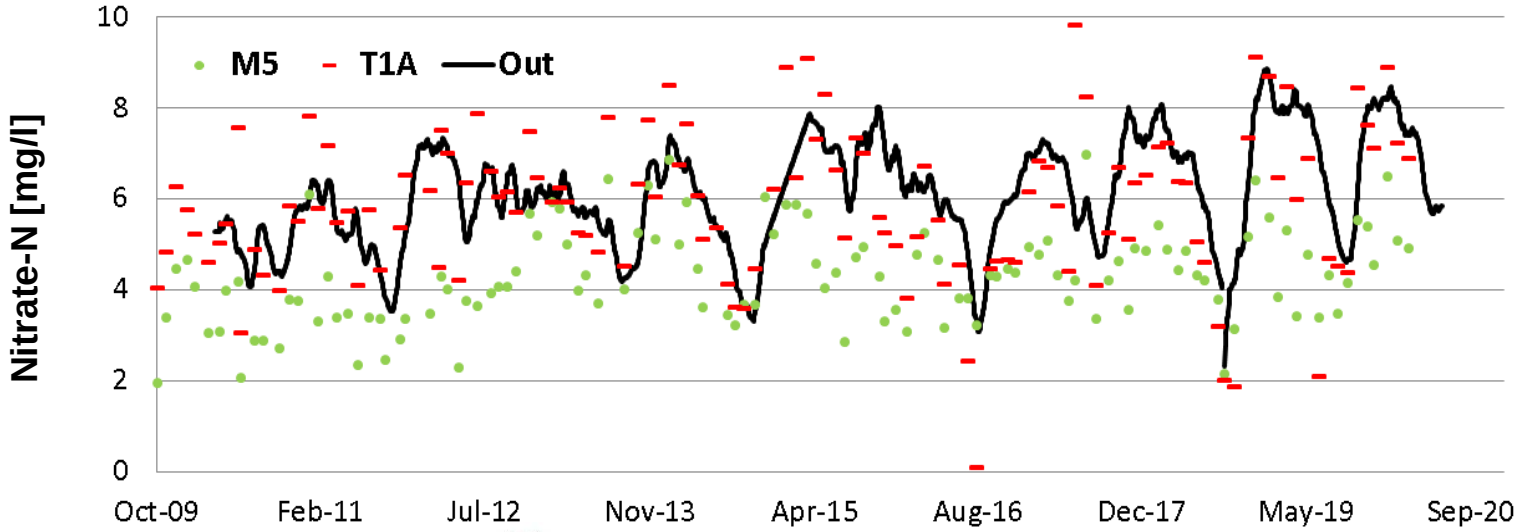
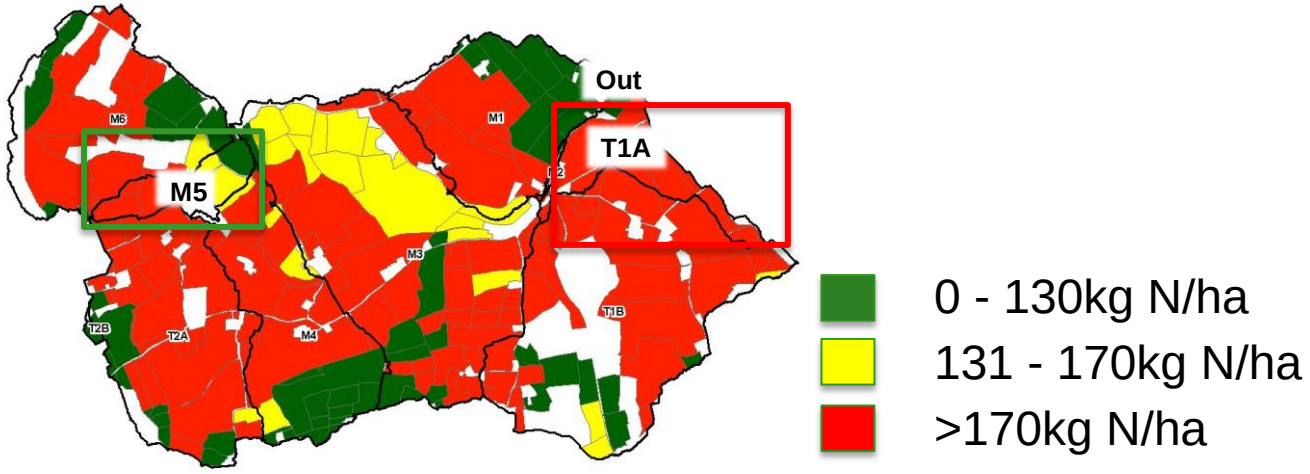
Sub-catchment approach

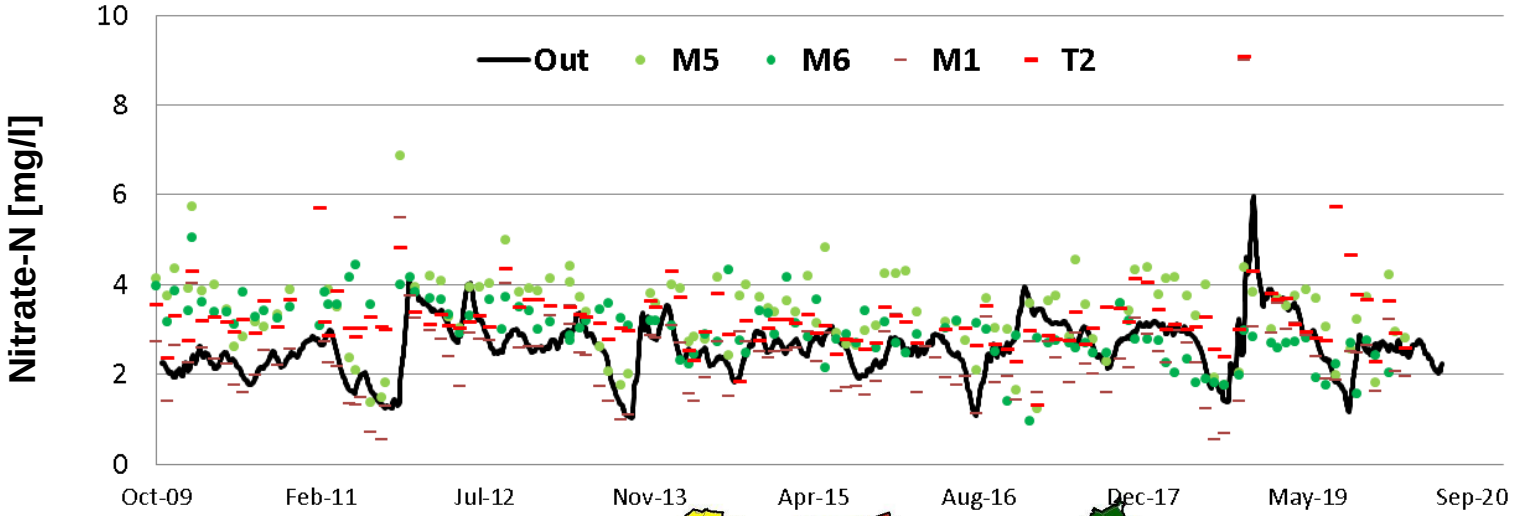


Timoleague

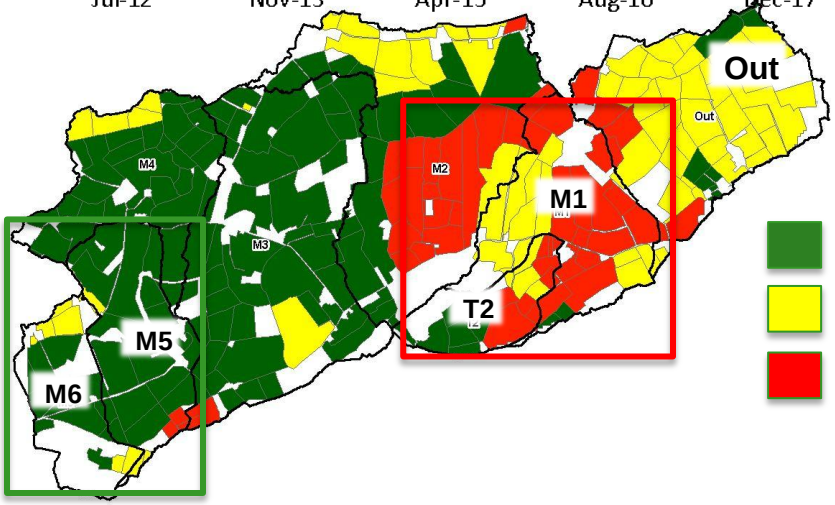


	Out	M5	T1A
Nitrate-N [mg/l]	6.14	4.27	5.81
Derogation [%]	60	46	85

Sub-catchment approach



Ballycanew



0 - 130kg N/ha
131 - 170kg N/ha
>170kg N/ha

	Out	M5	M6	M1	T2
Nitrate-N [mg/l]	2.60	3.39	3.05	2.38	3.26
Derogation [%]	16	2	0	49	34

Derogation Impact in the ACP

- Nitrate loss is complex
- Nutrient source, Soil, Geology and the Weather all have significant and integrated influence
- Mitigating actions must be cognisant of all factors

- Social factors influencing uptake of mitigation actions
  - Dr Michele McCormack, ACP Teagasc, 6th November