IGER

Rowden Moor

The Rowden Drainage Experiment was set up in 1989 and consists of 14 hydrologically separated plots (each 1 ha), half of which are drained by mole and field drains. The field plans show the experimental treatments (in red or green), long-term reference plots (in black/white) and the current layout of the farmlets (in yellow/green), which incorporate all the field elements of grassland management systems. The plots are duplicated, with the same treatments represented in both Block A and Block B of the experimental layout.

Heritage and animal production are monitored.

Fundamental studies of soil processes

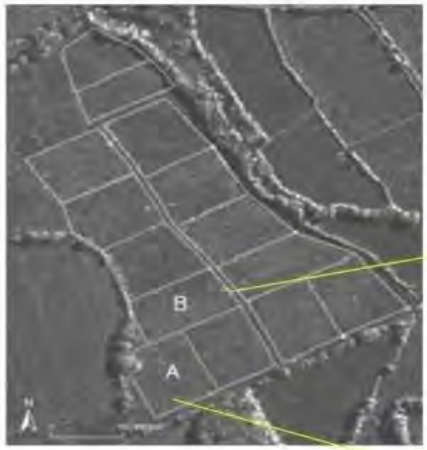
Automated equipment to measure emissions of "greenhouse" gases

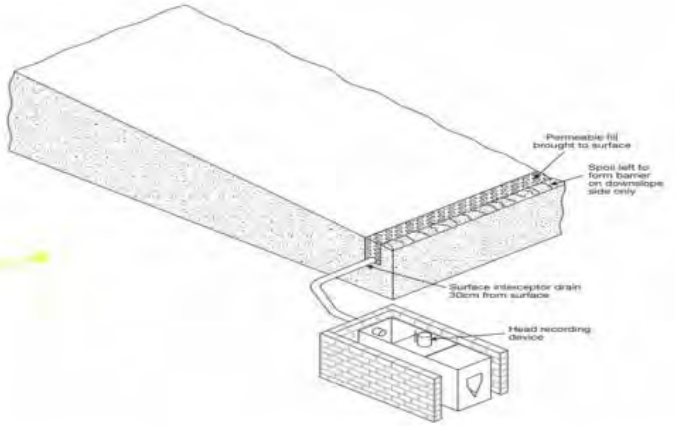
Losses of nutrients in drainage waters are monitored.

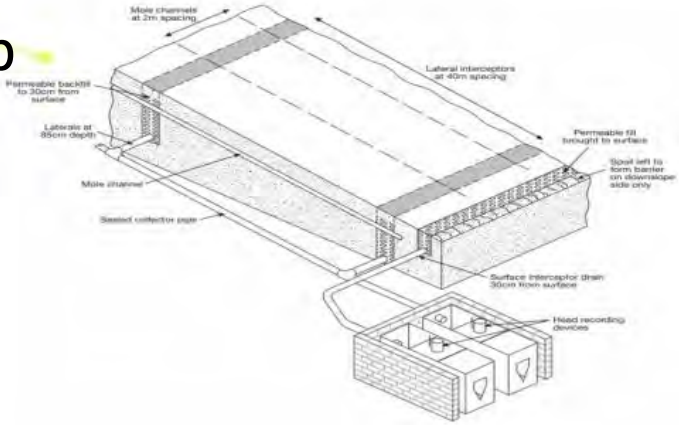
EXPERIMENTAL TREATMENTS

FARMLET LAYOUT


SUSTAINABLE SOILS
GRASP project
SUSTAINABLE SOILS







- During individual rainfall events, yield up to ~17 kg of suspended solids, with concentrations ~400 mg L^{-1}. European Freshwater Fisheries Directive (25 mg L^{-1}).
- Total P concentrations in runoff waters from these field lysimeters exceeded 800 µg L^{-1} .
- Presence of subsurface drainage reduces the yields of suspended solids and total P from grassland by as much as 50%.

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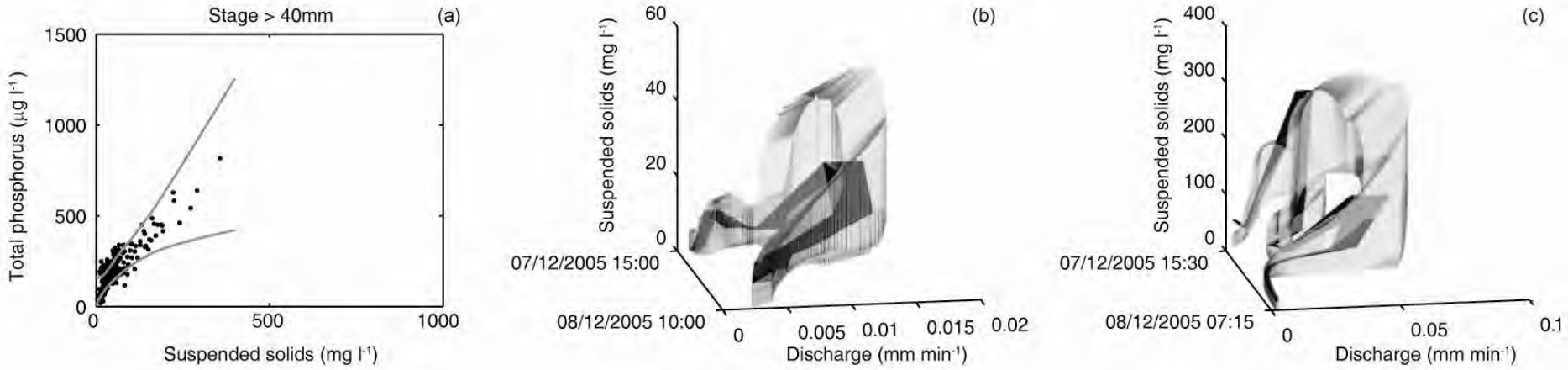
Bilotta *et al*. 2008

Modelling and learning



(a) Total phosphorus-suspended solids relationship observed at Rowden. (b) high model performance and (c) low model performance example of suspended-solids-discharge hysteresis observed at Rowden in black (including estimated discharge uncertainty) and model uncertainty bounds.

Krueger *et al*. 2009

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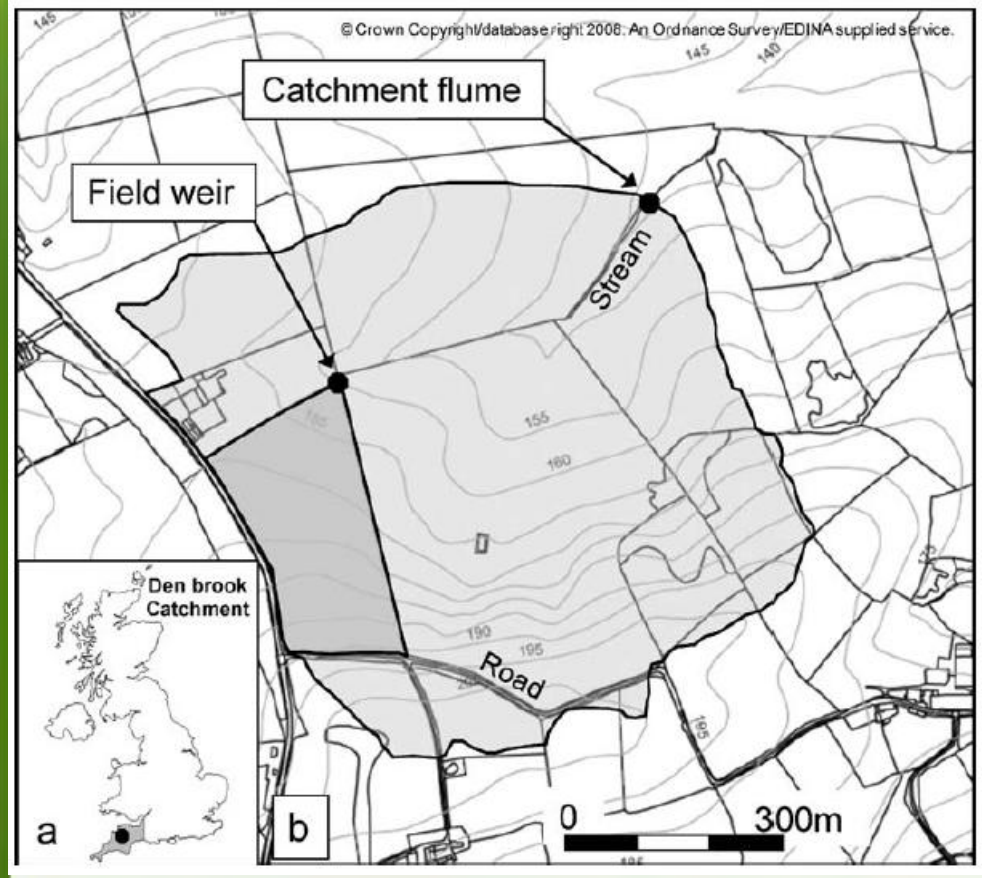
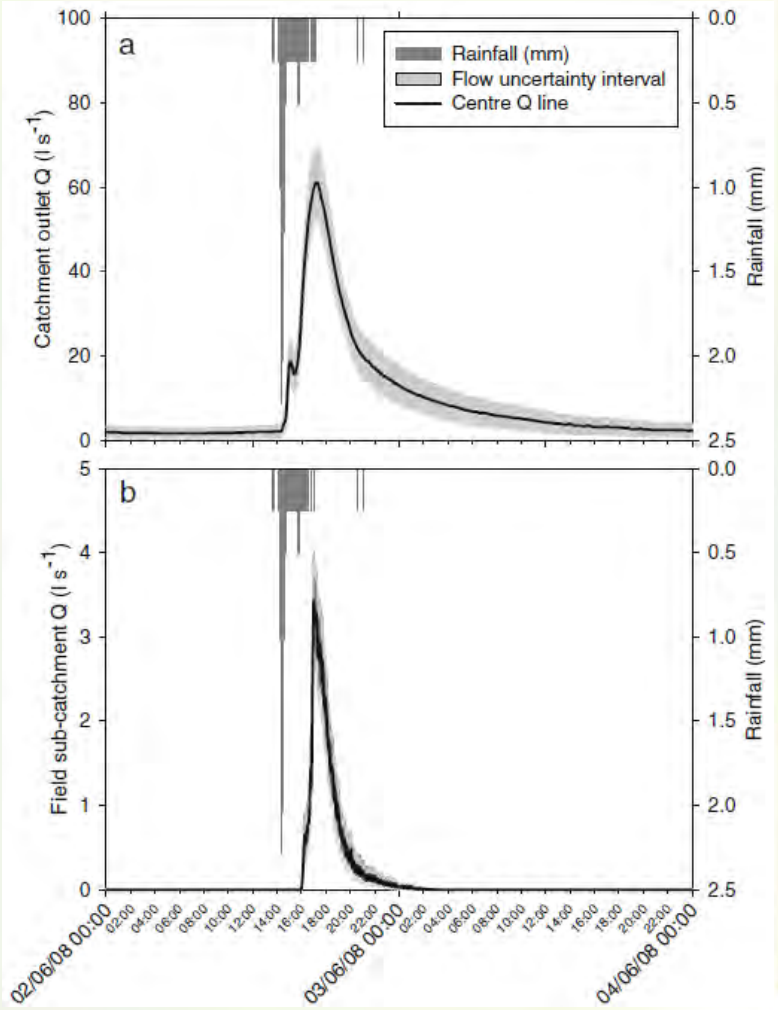
Granger *et al.* 2010





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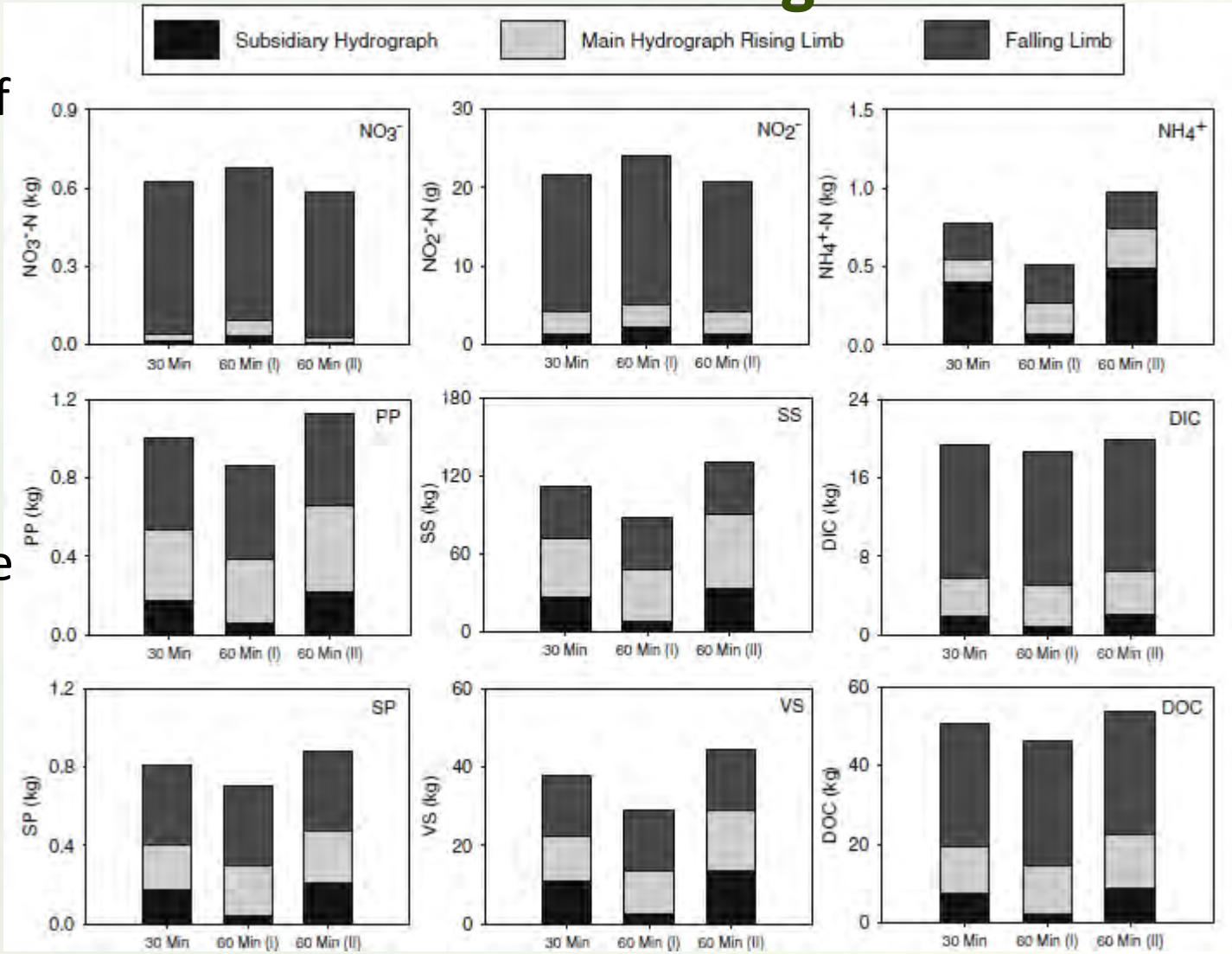
Granger *et al.* 2010

Total loads of exported from the catchment and the contribution of different phases of the hydrograph calculated



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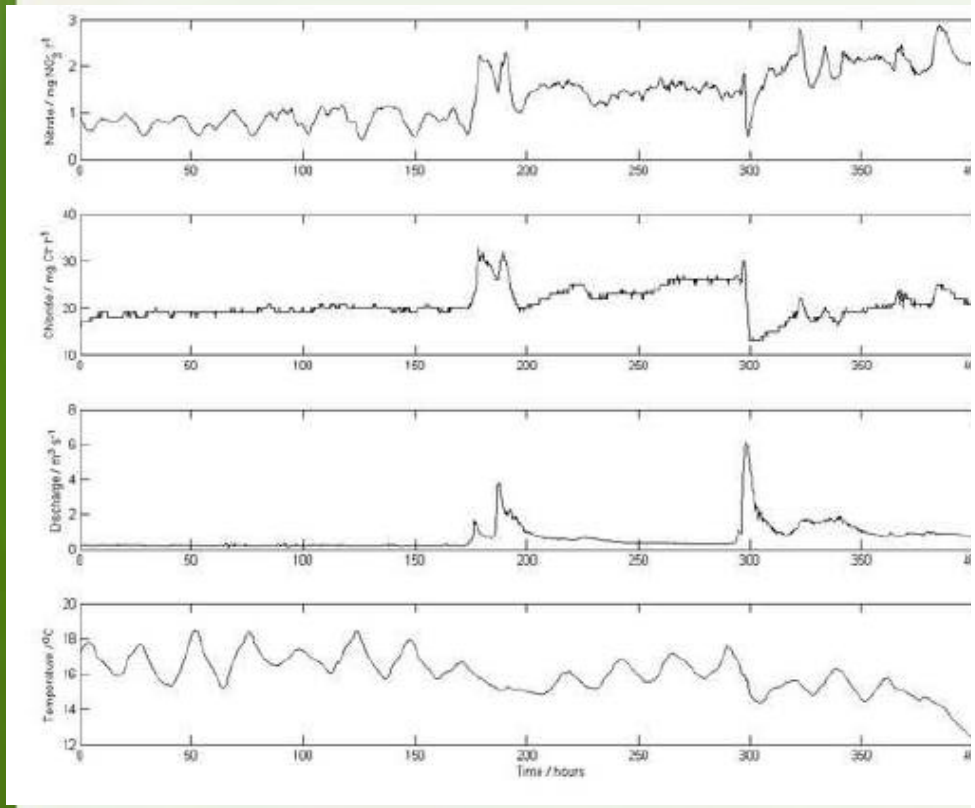
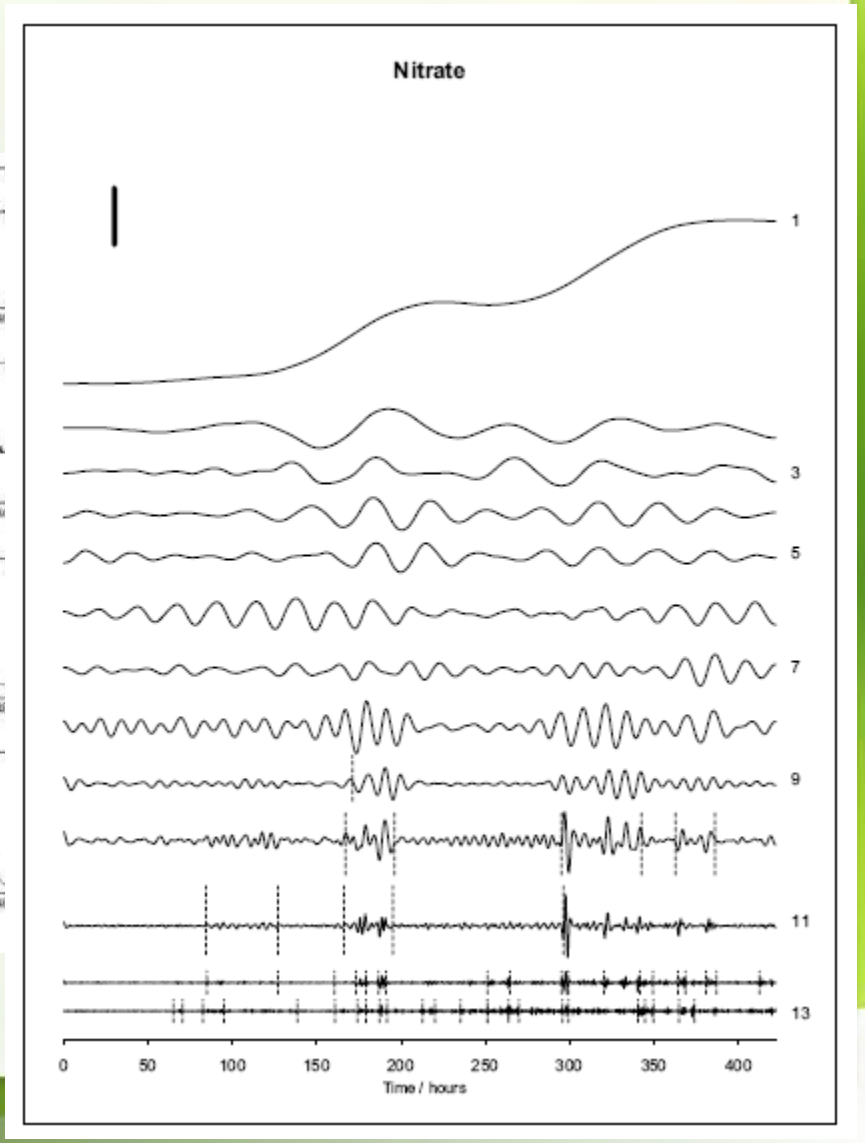
Milne, Macleod *et al.* 2009

The Wavelet Packet transform





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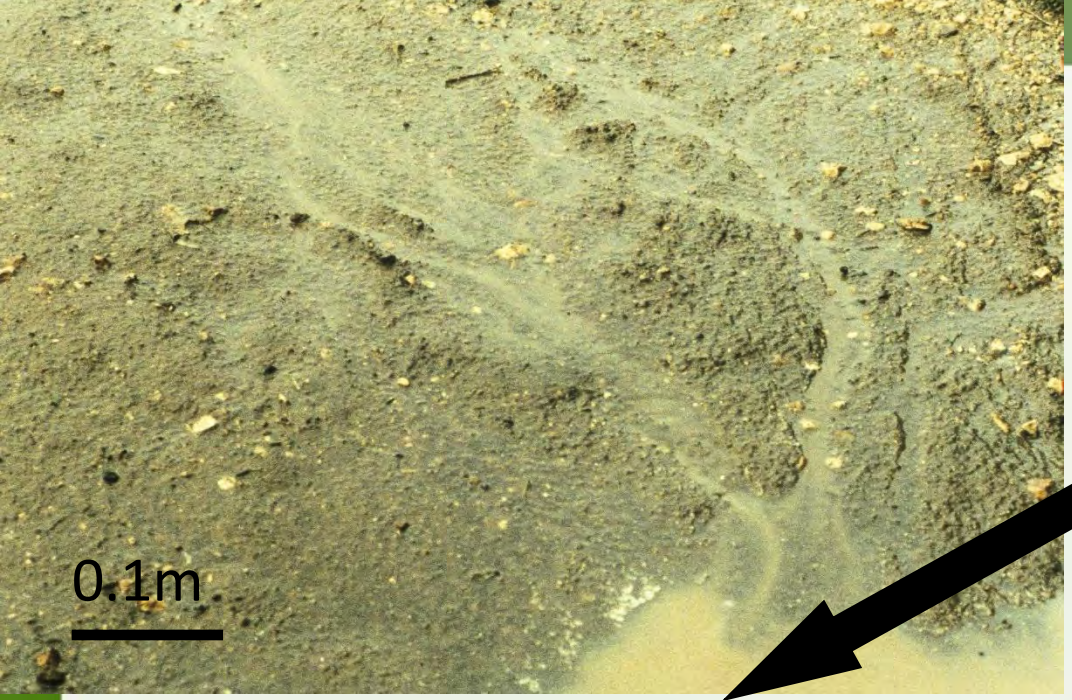
Effects of climate change on the mobilization of diffuse substances from agricultural systems

Macleod C.J.A.(Kit)[1], Falloon P.D.[2], Evans R.[3], and Haygarth P.M.[4]

[1]North Wyke Research, Okehampton, Devon, UK.
[2]Met Office Hadley Centre, Fitzroy Road, Exeter, UK.
[3]Anglia Ruskin University, Cambridge, UK.
[4]Centre for Sustainable Water Management, Lancaster University, Lancaster, UK.

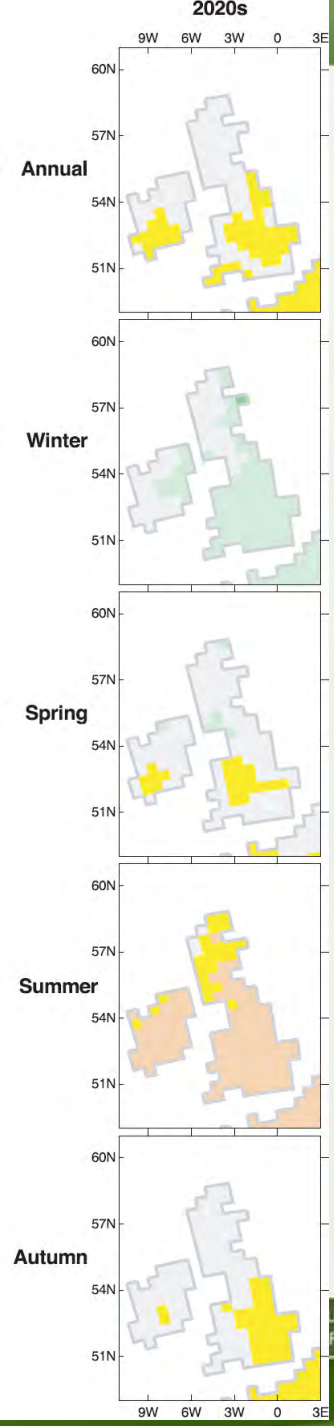


Mobilization

Solubilization

Detachment

UKCIP 2020



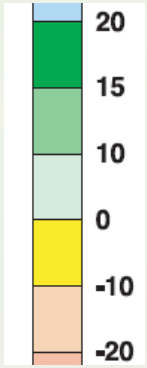
Higher year-round temperatures

Warmer, wetter winters

Hotter, drier summers

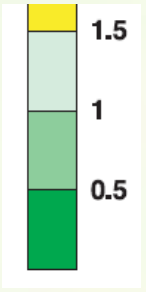
Increase in intense rainfall events

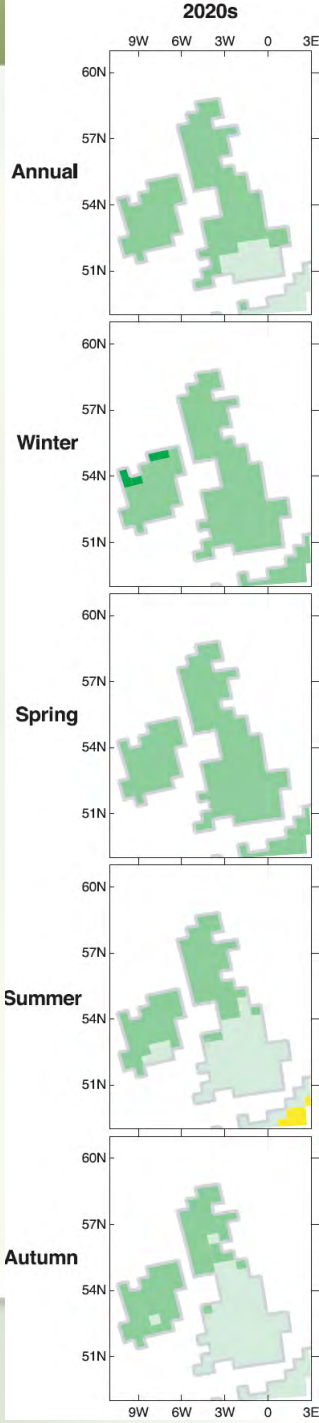
Increase in number of very hot days



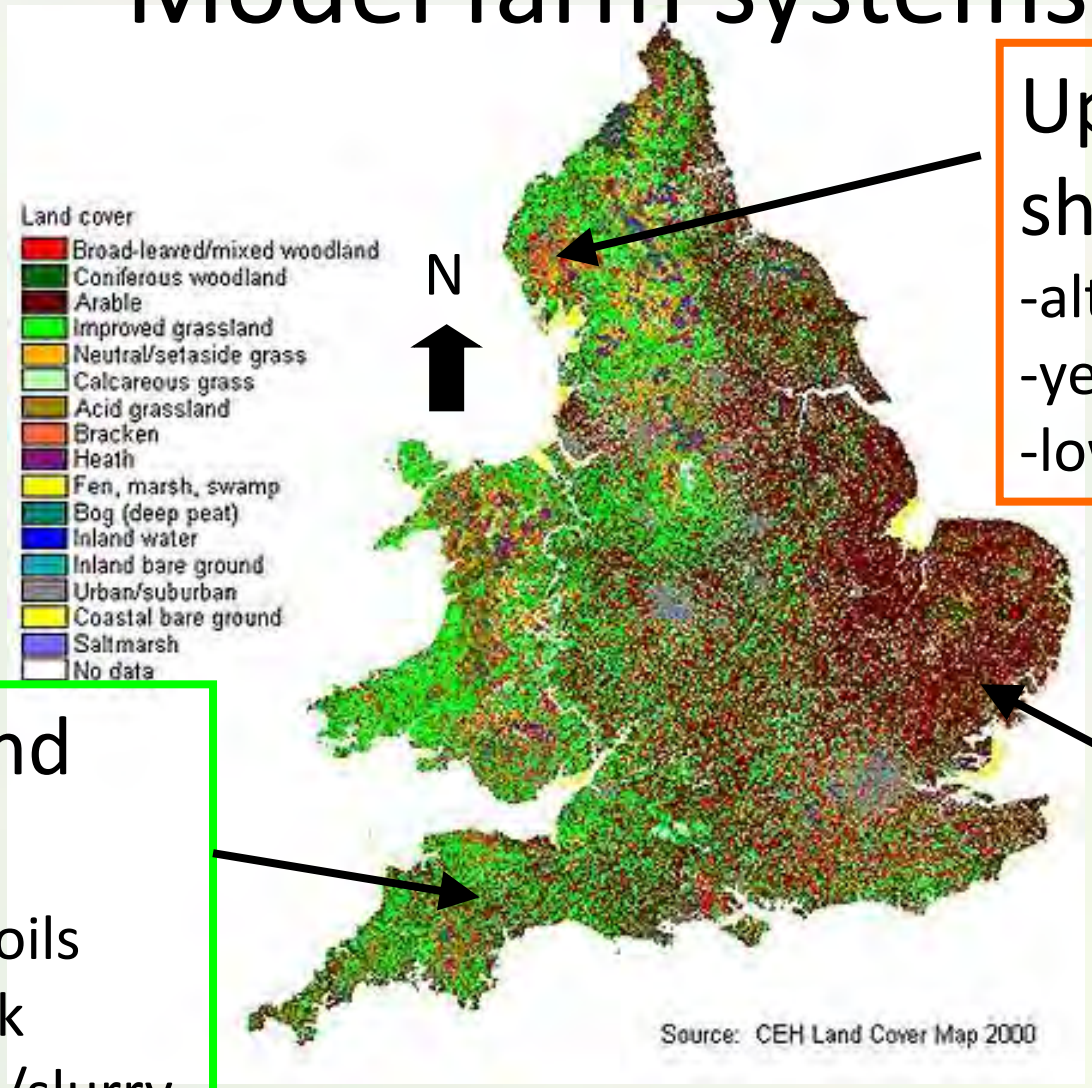
Precipitation change (%)

Mean temperature change (ºC)





Model farm systems



Upland sheep
-altitude
-year round
-low input

Lowland dairy
-heavy soils
-livestock
-manure/slurry

Arable
-good Q
-rotation
-PPP

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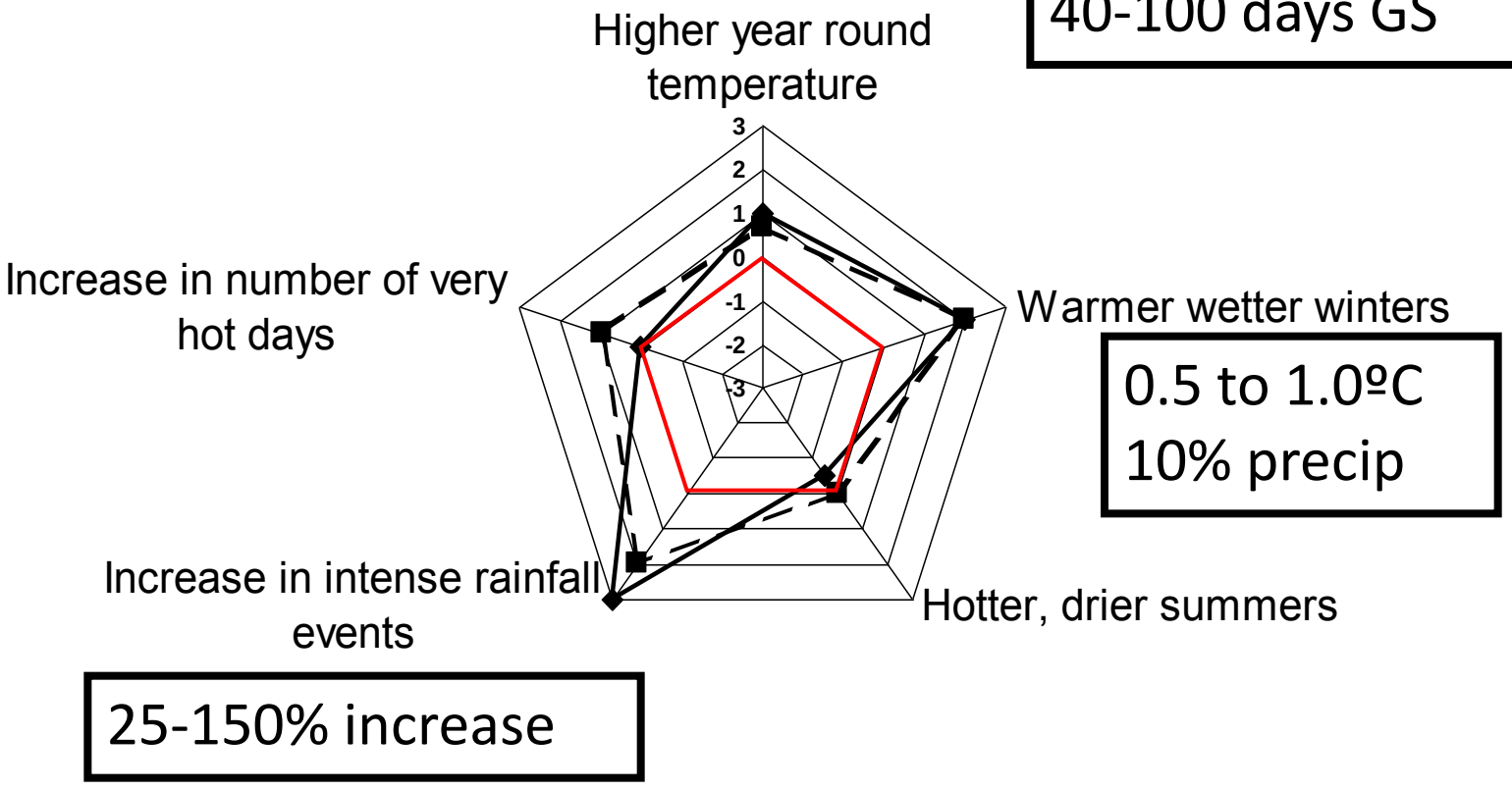
Systemic assessment

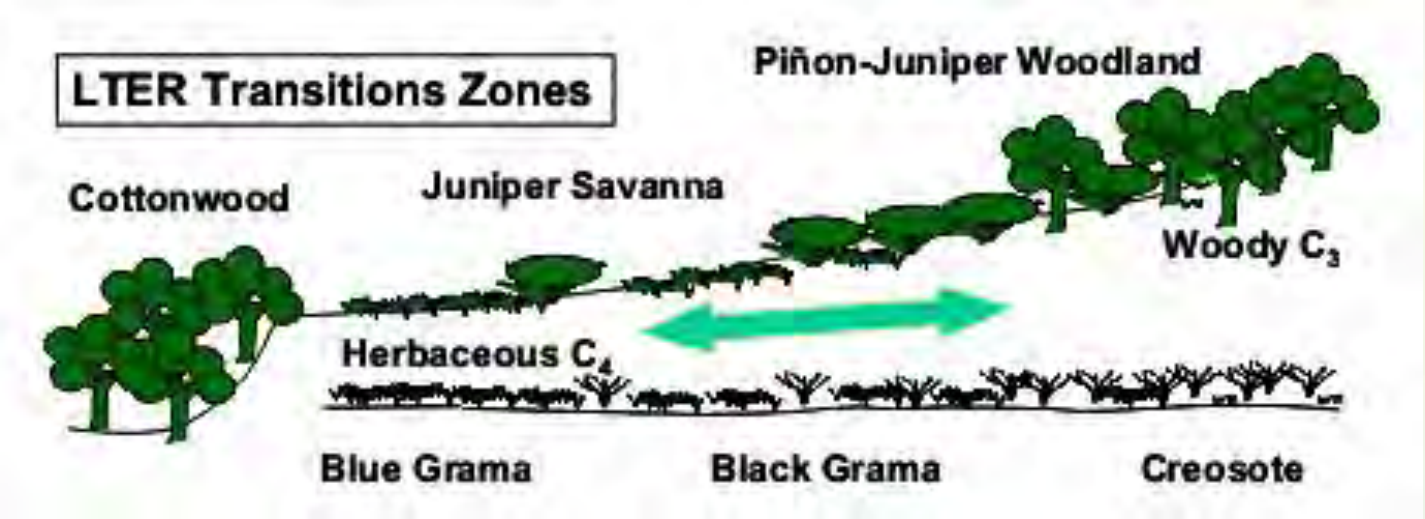
Lowland dairy

0.5 to 1.0ºC
40-100 days GS



0.5 to 1.0ºC
10% precip

25-150% increase



Our primary research goal is:
"To understand how abiotic drivers and constraints affect dynamics and stability in an aridland ecosystem."

http://sev.lternet.edu/

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