

Introduction to the Scottish  
Governments research on  
“Methodologies to Assess Water  
Quality”

Simon Langan

Ten projects clustered around 3 modules:-

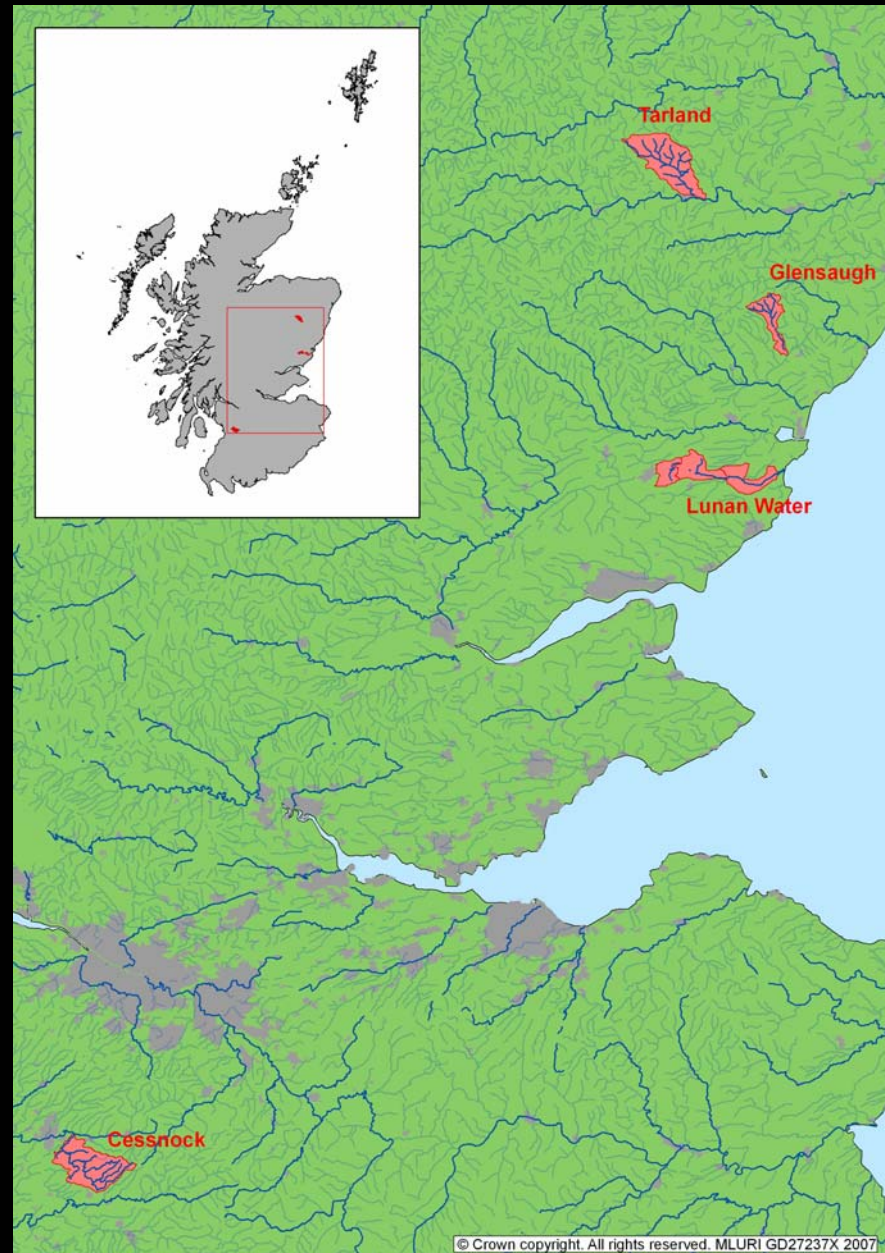
1. Development of indicators of water quality
  - EQS
  - Microbial
  - Nutrients
2. Riparian and catchment processes
  - Sources
  - Transport
3. Ecosystem resilience and recovery
  - Scenarios (Land use, Climate change)

## Five Required Outputs

1. Use of the ecosystem approach to assess ecological health (including biodiversity) and status of water and methods to assess ecological impacts of diffuse pollution
2. Linkages between chemical status and ecological status of water bodies
3. Methodologies for the characterisation of diffuse pollution
4. Methods for assessing the relative scale of present eutrophication and its past history
5. Assessment of ecological impacts of engineering

also contribute to three cross cutting themes (climate change; biodiversity and sustainability)

# RO1: Ecosystem approach

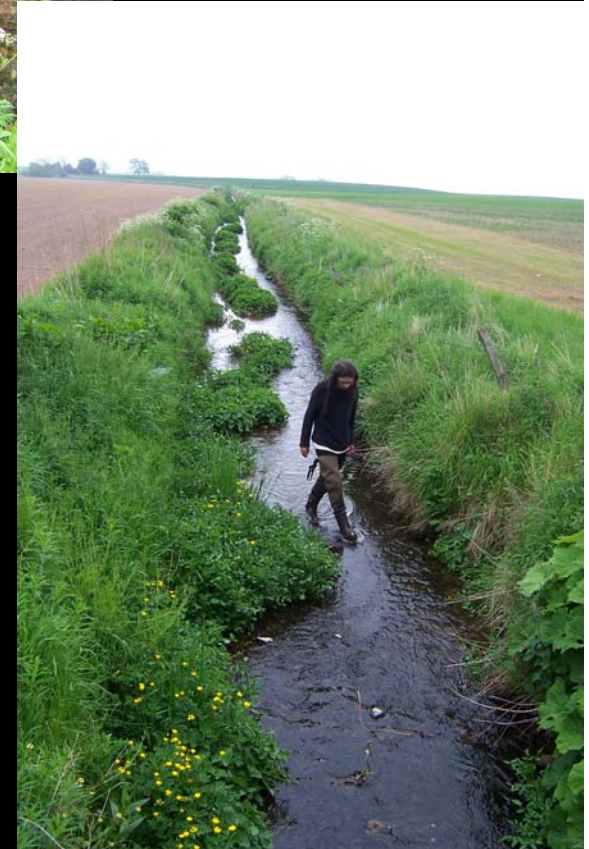




## RO 2: Chemical to ecological status, biofilms



NORTH ESK  
SITES





# RO2: Chemical to ecological status, biofilms, metabolism, invertebrates

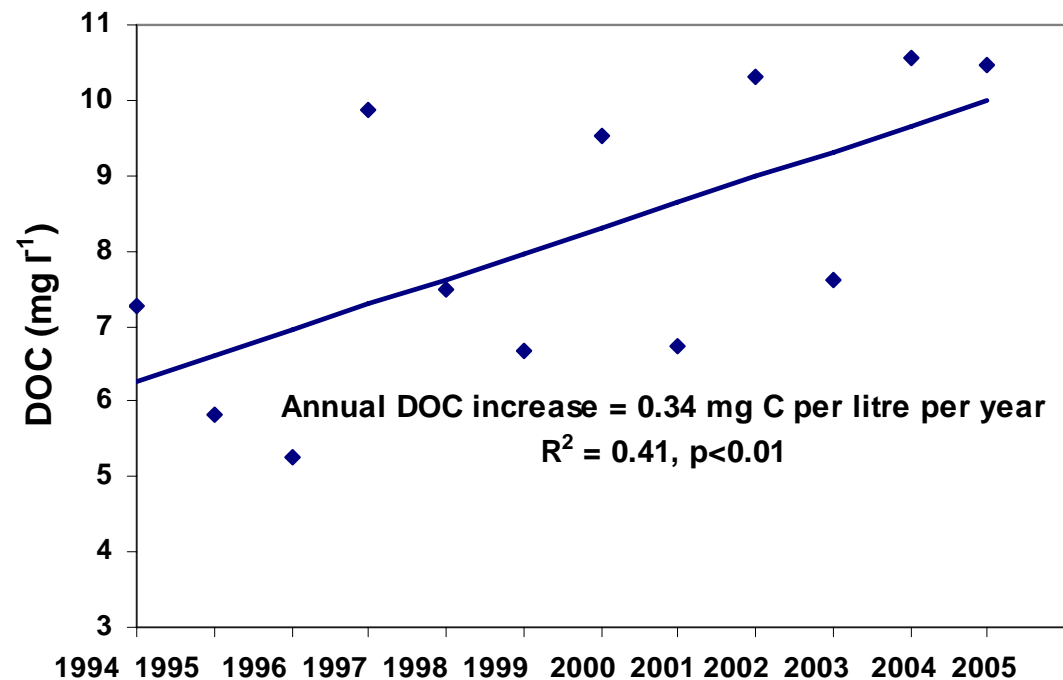
## Tarland Sewage Treatment Plant manipulation



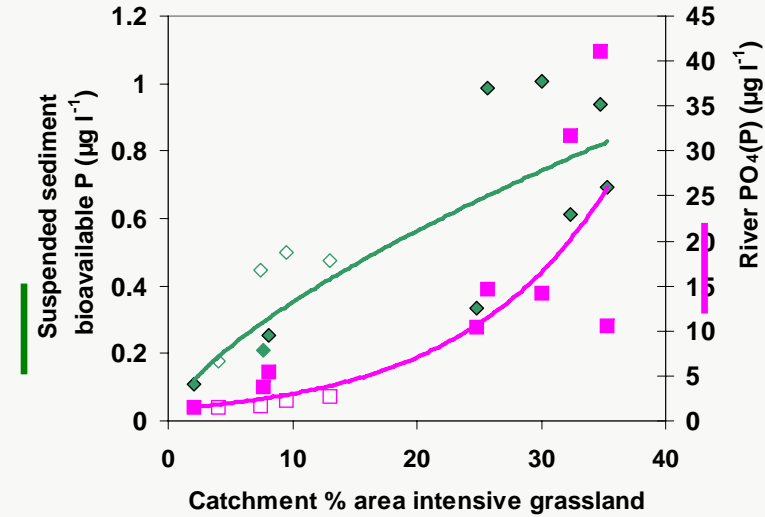
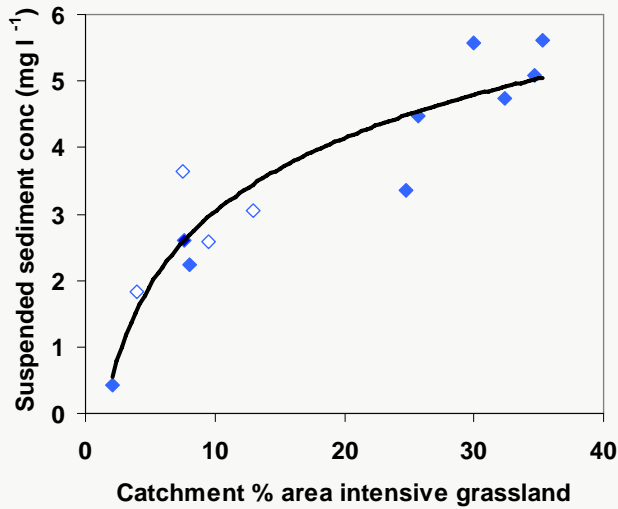
# RO 3: Methodologies to Characterise Diffuse Pollution



An increase in stream water DOC concentrations, Glensaugh ECN

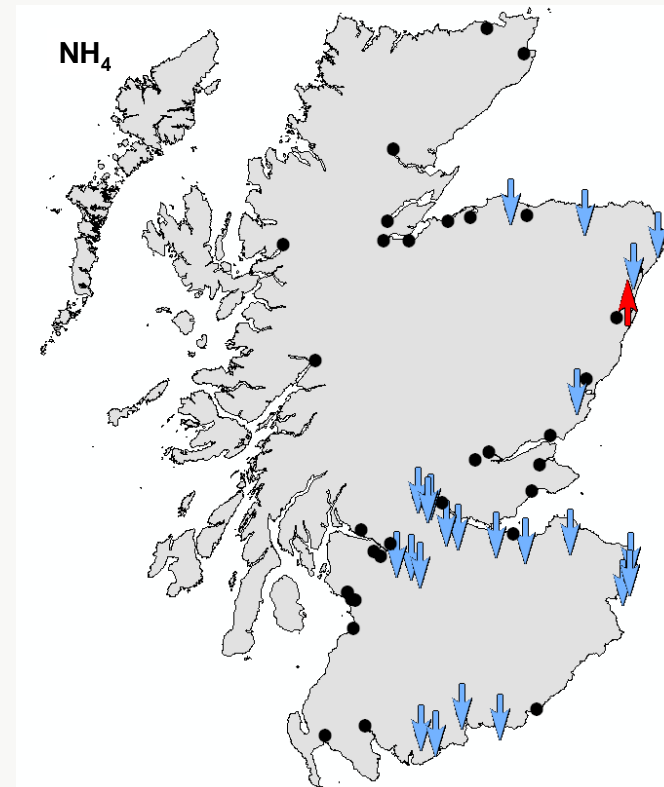
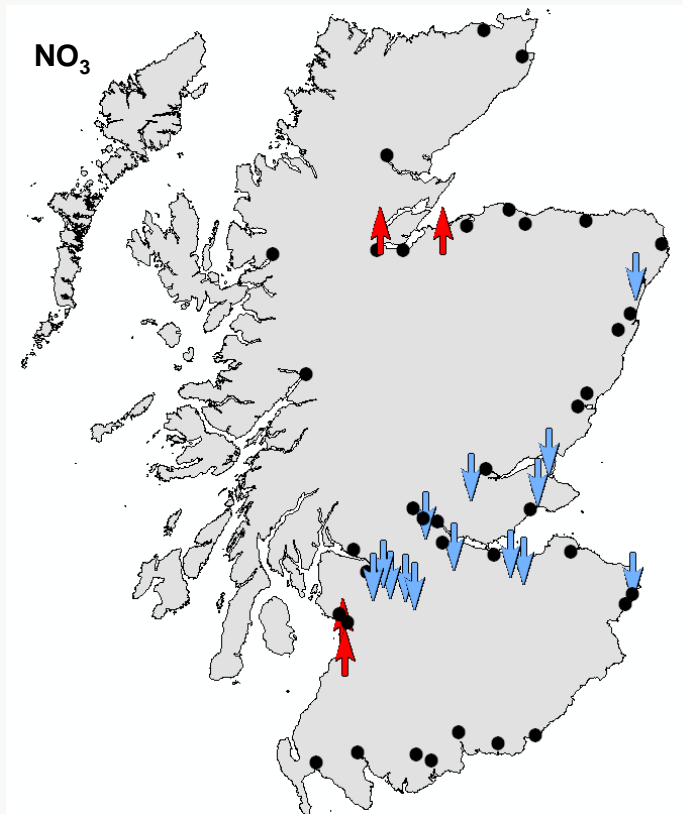


# RO 3: Methodologies to Characterise Diffuse Pollution





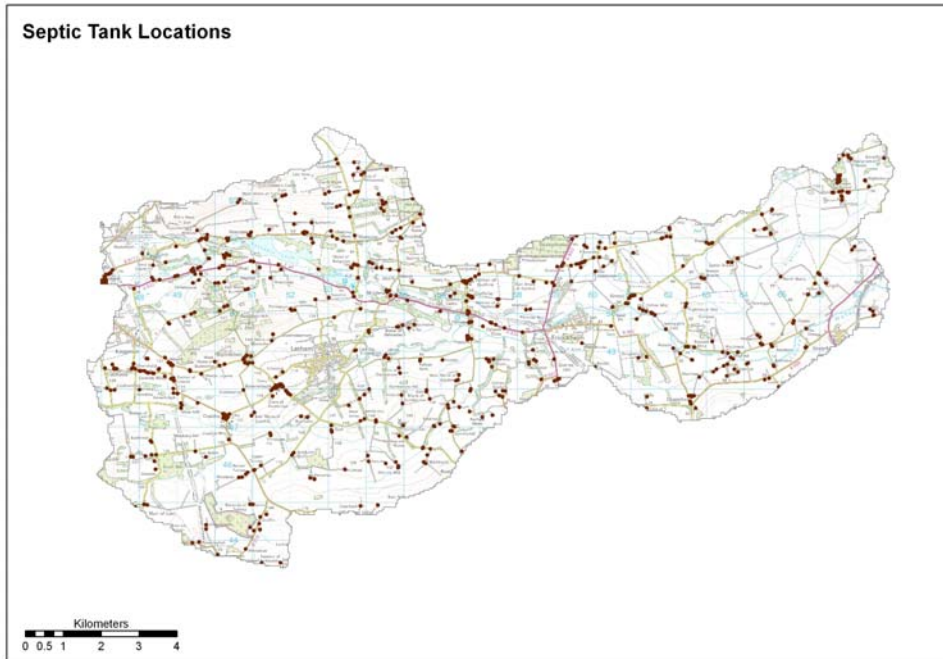
## RO 4: Past and present eutrophication, riverine N



- In collaboration with BIOS
- Development and application of new time series methodologies

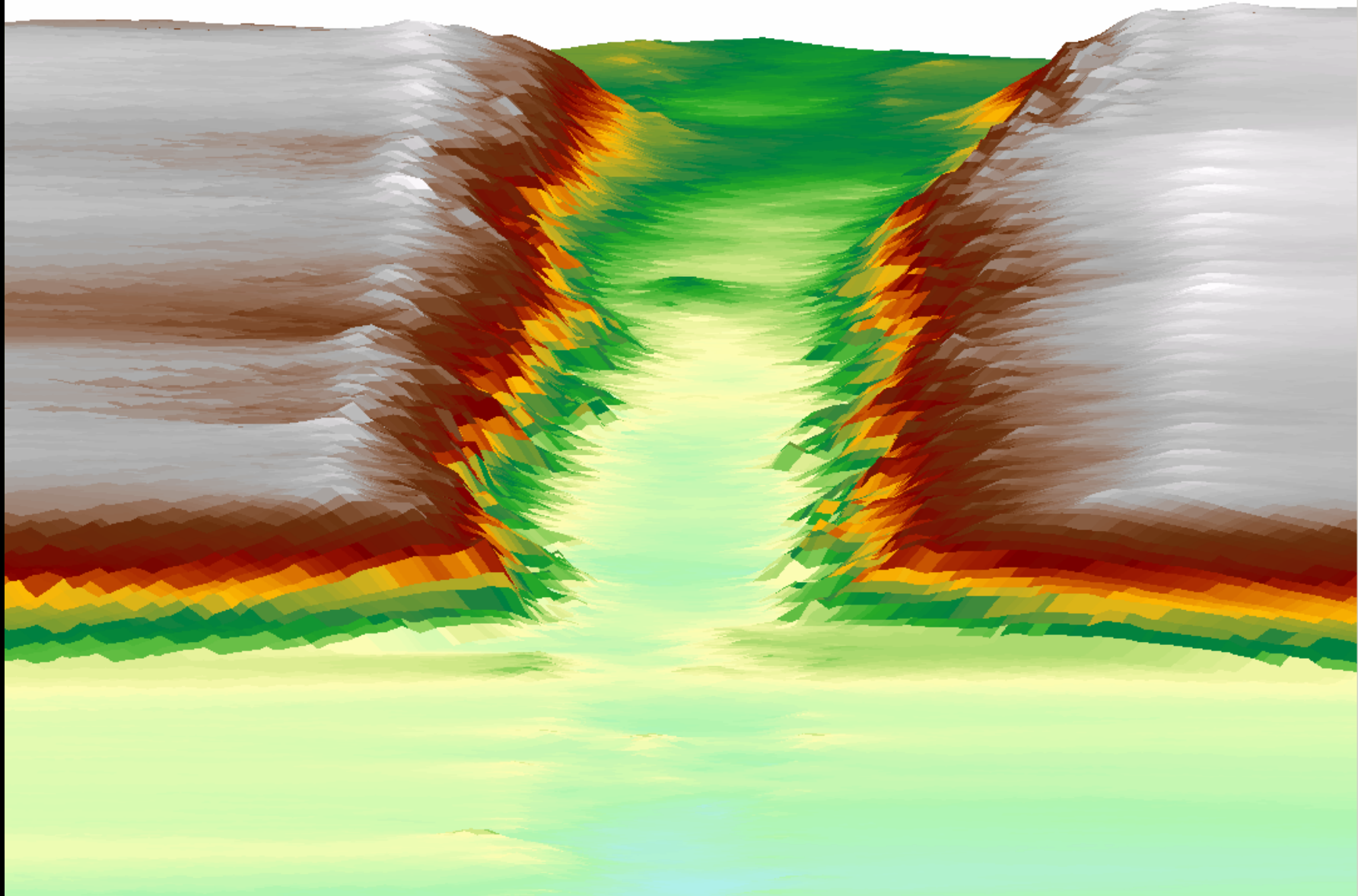
# P Source Apportionment

Septic Tank Locations

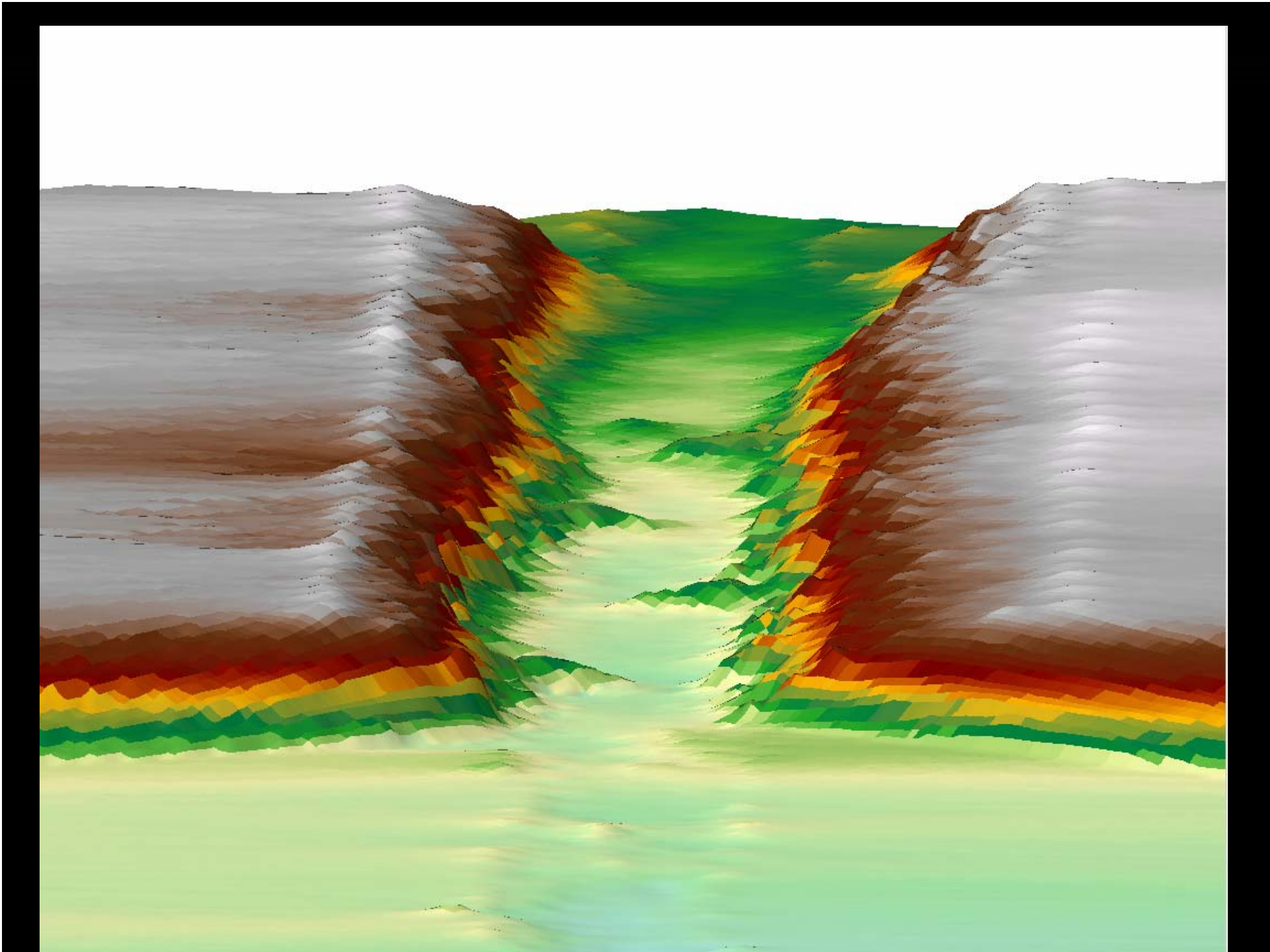


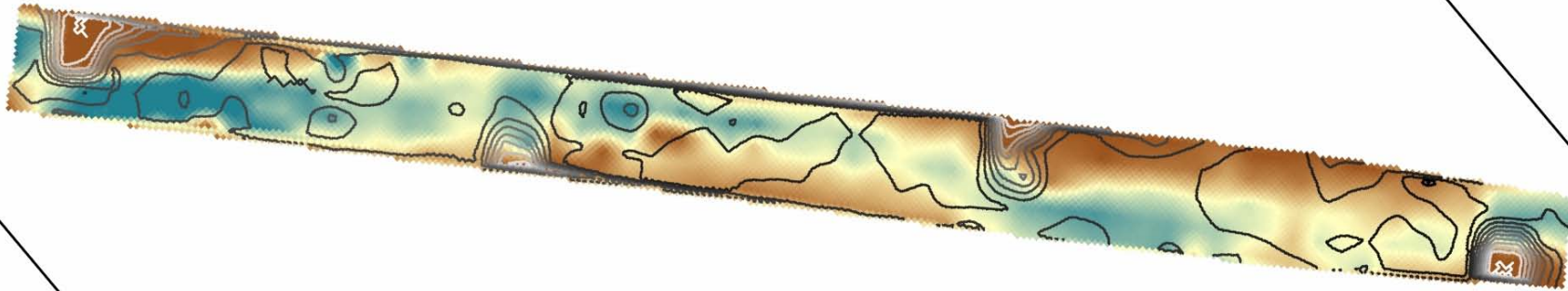
Source	Input (kg/yr)	Output (kg/yr)
Kirkton Mill		2500
Septics	250-1000	
Lochs	350	
Agriculture (by difference)	1150-1900	

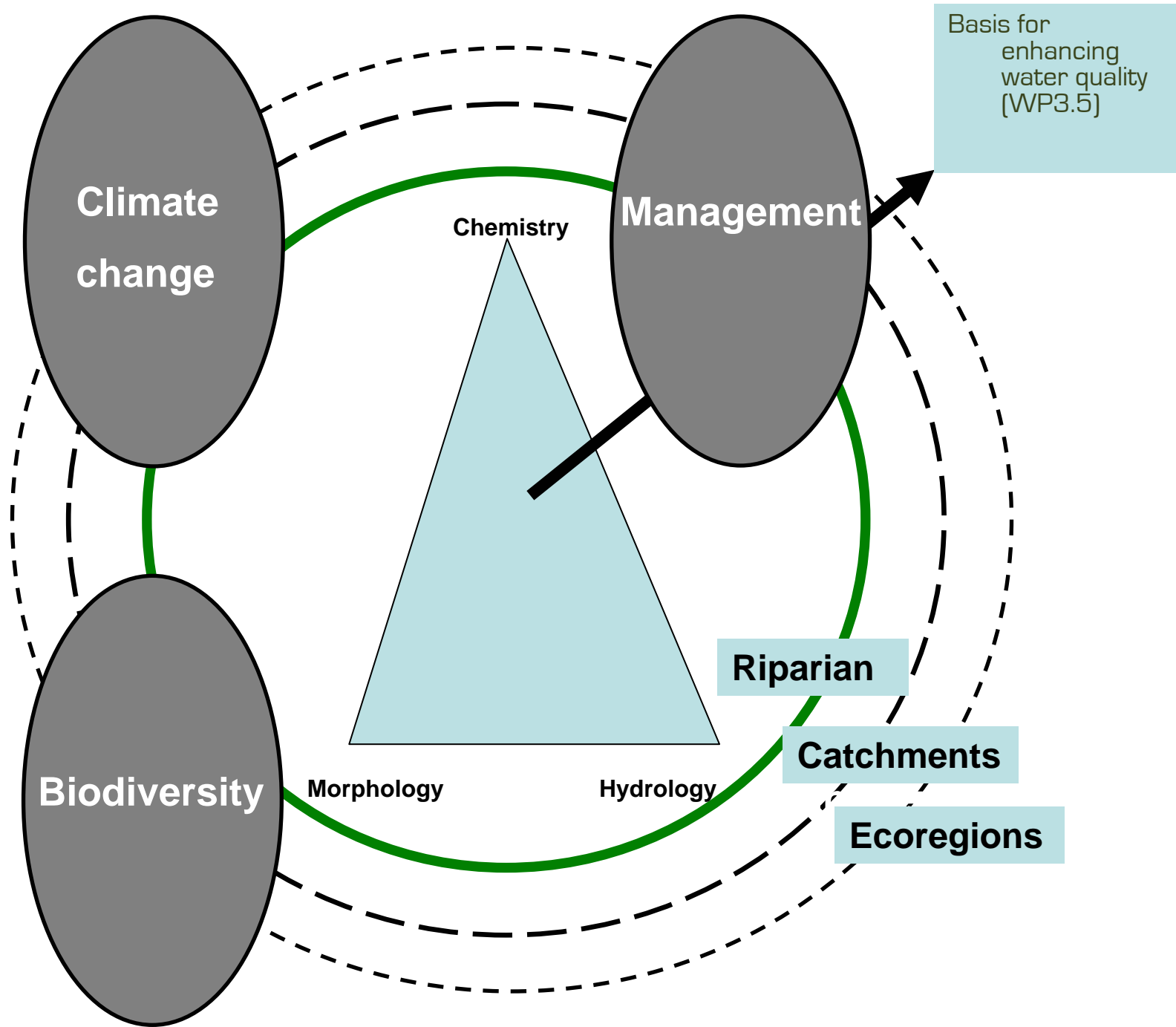
RO5: Ecological impacts of Engineering – pre restoration













- 1) Increased focus on controls on ecology
- 2) develop research on hydromorphology-ecological interactions
- 3) continue development of catchment scale ecological goods and services through Hydrological Observatories
- 4) examine changes in water resources, quality and riparian function as a result of changes in climate and land management
- 5) critically appraise sustainable flood management and other related policy/ Directives (Habitat, Soils)