LM0308: Catchment Management for Water Quality

Case Study 7: Interpolation of model outputs and data from catchment to national scales and monitored to non-monitored sites.

Lead: Jack Cosby (CEH); Bridget Emmett (CEH)

Purpose: To develop and apply tools to interpolate data (and/or model outputs) from catchment to national scales and from monitored to non-monitored catchments.

Policy driver(s)	Water Framework Directive (Good Chemical Status), Farm Payment Schemes (Countryside Stewardship, Glastir, SRDP), Climate Change Abatement Agreements, Conservation Targets, Flood Risk Mitigation
Enduser(s)	Government Agencies (DEFRA, EA, NRW), Catchment Managers, Conservation Agencies, Local Authorities, River Trusts
Pollutant(s)	Nitrate, Phosphorous, Sediment, Fecal Indicator Organisms (FIO), Flood Potential, Carbon loss (and Sequestration), Biodiversity Loss
Measures	Case study based in England and Wales, so measures are derived from Glastir and Glastir Advanced agri-environment schemes in Wales AND from the Countryside Stewardship in England.
Scenario if appropriate	N/A
Outcome / output	Determine if landscape typologies can be used to extrapolate from data-rich to data-poor areas or to interpolate regional to national scales. Typologies developed by the Landscape typology tool will be compared to measures of water quality and/or agri-environment scheme participation at national scales across England and Wales.
Scale / Location	England and Wales
Risks	Feedback from Defra / EA requested on this as Dan McGonigle specifically asked for this Case Study topic

Background / Narrative:

What is this case study about?

- We have many catchments where different management options have been tested and we have intensive data and models.
- How can we identify where similar outcomes could be expected at a national scale but where we are data poor?
- Outcomes will depend on biophysical properties as well as socio-economic characteristics

We will exploit work undertaken as part of the Defra Sustainable Intensification Platform project.

- Combined map datasets describing landscape character and management
- Identified homologous areas of agricultural potential, natural environment quality and risk.
- Provides national coverage and local output suitable for stakeholder engagement in study areas.
- Aids identification, targeting and prioritisation of land-use opportunities for sustainable intensification outcomes.

We will use the Dynamic Typology Tool developed for SIP:

- To evaluate the biophysical elements of the tool using evidence from catchment sensitive farming outcomes for water quality (England)
- To assess the value of tool to predict likely uptake of management options due to socio-economic constraints (Wales)

Basic approach:

This case study uses a Dynamic Typology Tool (DTT) to combine spatially explicit datasets describing landscape character and management and identify homologous areas of agricultural potential, natural environment quality and risk. The DTT provides national coverage and local output suitable for stakeholder engagement in study areas. Application of the tool can aid identification, targeting and prioritisation of land-use opportunities for management of water quality.

Models to be used:

- Dynamic Typology Tool (DTT)

Data to be used:

- Inputs
    - o
- Outputs
    - o
- Validation
    - o

Other requirements:

Workplan:

Milestones:

Link to Enduser Questions:

Effectiveness of measures / mechanisms
- Can I transfer these measures or approaches to other catchments? Will they be less or more effective?
- Can I transfer conclusions on how well land management works from the catchment to the national scale?