



Strategies for the future

Why?

Public perception is that Scotland has plenty of good quality fresh and coastal water resources. However, environmental pressures on waters are growing and need to be tackled in an integrated manner including changes to land management. Changing policy can impact on a variety of geographical scales from the field through to national and global. Equally some responses will be rapid whilst others may take decades.

We will:

- Assess the impact of future land management and climate change impacts on water quality at scales appropriate to management needs
- Develop the necessary tools to utilise data and models in providing integrated solutions for catchment management for rivers running from mountains to sea
- Critically appraise and develop guidance on governance and participation or catchment management
- Evaluate the use of ecosystems services in a catchment management perspective

Outcomes

- Undertake horizon scanning for identifying future pressures on the aquatic environment
- Input to policy consultations taking account of future as well as current opportunities
- Using current analysis to provide guidance for future implementation (e.g. from the Water Framework Directive for the Floods Directive)
- Using models and scenarios to ‘test’ possible measures for efficacy and equity

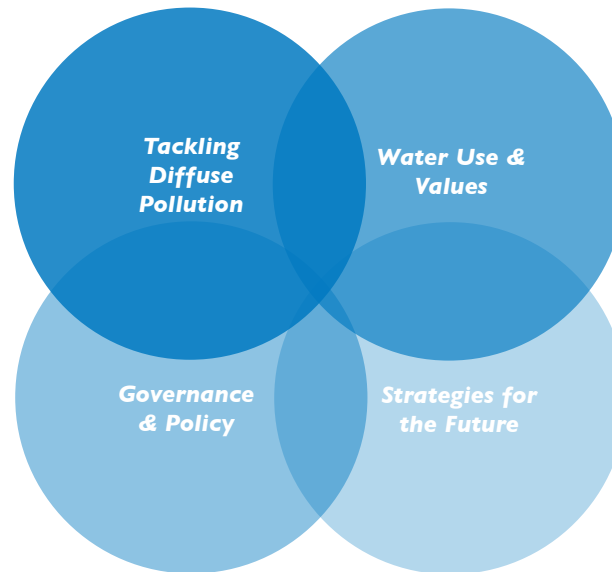
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“Environment–Land Use and Rural Stewardship” (Programme 3) will contribute to the evidence base for the Governments’ five strategic objectives of a **Healthier, Smarter, Safer & Stronger, Wealthier & Fairer**, as well as, **Greener**, Scotland. In particular, enhanced knowledge will inform policy schemes that shape and sustain rural landscapes and communities for the benefit of all Scotland’s people.

“Enhancing Water Quality” investigates these issues from a catchment perspective in which we integrate and link evidence from the physical environment with human and ecological systems.

The research is constructed around four interacting modules based upon key challenges for both policy and society.



The research theme is being tackled by teams of environmental, social and economic scientists from The Macaulay Institute and the Scottish Agricultural College.

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Tackling Diffuse Pollution



Water Use & Values



Governance & Policy



Strategies for the Future



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Tackling Diffuse Pollution

Why?

Diffuse pollution contributes to eutrophication and microbial contamination of Scotland's surface and groundwater bodies. A significant proportion of these water bodies may not meet Good Ecological Status as required by the EU Water Framework Directive unless we can reduce the impact of diffuse pollution.

We will:

- Assess different sources of pollution in Monitored Priority Catchments (Lunan Water and Cessnock Water)
- Measure the efficacy of measures to control pollution and eutrophication (e.g. buffer strips, septic tank filters, farm ponds, nutrient budgets, and precision farming)
- Undertake a cost-effectiveness analysis of measures, assessment of viability and uptake of measures with farmers and other land users

Outcomes

- Improved understanding of pollutant emissions from different land uses and community activities
- Tools for predicting the impact of diffuse pollution, climate change and health risks
- Evaluation of different catchment approaches to diffuse pollution mitigation
- Guidance on the influence of local knowledge and socio-cultural practices on the uptake of mitigation measures

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Water Use & Values

Why?

Catchments can be assessed by the ecosystem services they provide, such as water supply, food production and habitats. The resilience of these services to changes in climate, land use and management needs to be evaluated in order to guide and advise the development of evidence based policies.

We will:

- Characterise and assess integrated water uses and values
- Develop robust indicators of ecological status of waters
- Audit key features of water bodies that enhance resilience and value
- Model biophysical and socio-economic processes in catchments to explore the potential to maximise social value of water use

Outcomes

- Provision of a database on the costs, values and uses of water in Scotland
- Understanding the links between water quality, habitat, ecology and its management at the reach and catchment scale
- Assess the impacts of engineering on morphology and ecology
- Evaluation of scenarios of change on the resilience and social value of water bodies

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Governance & Policy

Why?

New policy directives require greater stakeholder input and participation. In turn, this requires new forms of governance and institutions to manage water resources. For example, voluntary actions taken by stakeholders are increasingly complementing regulation and market incentives. These processes need appraising to maximise their effectiveness and longevity.

We will:

- Characterise and assess who participates in planning and implementation of catchment & river basin planning; and if representation matters
- Develop models of collaborative governance structures and processes
- Design and evaluate stakeholder mediated modelling approaches to tackle water quality issues

Outcomes

- Policy guidance on the development and implementation of River Basin Management Plans in Scotland
- Policy guidance and review of how to combine strategic and community based planning and management approaches to engagement
- Developing good practice in the use of models and other scientific data with stakeholders
- Evaluation of good practice based on UK catchment management initiatives

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