

Understanding the Impact of Flood and Coastal Erosion Risk Management on the Causes of Climate Change

Technical Summary: FD2622

Joint Defra / EA Flood and Coastal Erosion Risk Management R&D programme

Background to R&D project

Current flood and coastal erosion risk management (FCERM) policy in England recognises the need to address the challenges and pressures from climate change. The majority of effort is focused on adapting to the main impacts of climate change on flood and coastal erosion risk. However, there is also scope for FCERM to contribute to mitigation of climate change by developing policies and strategies that avoid an increase of, or lead to a reduction in, greenhouse gas (GHG) emissions.

The purpose of this project is to improve understanding of the climate change impact of FCERM policy; in effect, to provide an assessment of its 'carbon footprint'. Establishing how FCERM contributes to emissions of GHGs is critical to facilitating effective policy responses for reducing future emissions. In addition, mitigating the drivers of climate change now can reduce the potential costs of adaptation in the future.

The project sets out a framework for policy-makers to weigh up and present evidence of the positive and negative effects of FCERM policy on climate change. It also reviews the currently available evidence base for estimating the FCERM carbon footprint, identifying gaps and opportunities for addressing them.

The project specifies a set of policy scenarios to carry out to assess GHG implications of current and future policy options. These scenarios are: business as usual (BAU), increased investment in river and coastal flooding (BAU plus), addressing surface water flooding (SWF) and no active FCERM intervention (Policy-off).

Results of R&D project

The project estimates a carbon footprint of approximately 2.41 Mt CO₂e per year for the BAU scenario, 2.36 Mt CO₂e per year for the BAU-plus scenario, 2.18 Mt CO₂e per year for the SWF scenario and 2.89 Mt CO₂e per year for the policy-off scenario. These carbon footprint estimates include emissions associated with FCERM activities (asset construction and maintenance only) and emissions associated with flood and coastal erosion damages. Emissions associated with adaptation measures, development control, mapping and modelling, emergency planning and



response, flood storage, managed realignment and land use management are not currently taken into account, due to data limitations. The estimates should be interpreted with caution, representing indications of order of magnitude rather than precise estimates.

The research reveals that relevant evidence has to be drawn from a wide variety of sources, where, in virtually all cases, the intended use of the data is not to facilitate a high level assessment of the FCERM carbon footprint. In addition there are significant gaps in data for key areas. It is recommended that the estimate of the FCERM carbon footprint be reviewed and revised as more data becomes available.

R&D Outputs and their Use

The research represents a 'starting point' for developing assessments of the climate change implications of potential FCERM options, both at a strategic policy and individual project level. Requirements for further research are significant but the conceptual framework provides a basis for developing the required evidence base further in a systematic and coherent manner.

The research also establishes opportunities within the remit of FCERM policy for reducing GHG emissions. This includes 'positive' effect of flood alleviation measures that reduce economic damages from flooding and consequential GHG emissions, as well as potential to enhance sequestration of GHG emissions via land use management (for example via managed realignment activities and changes in land use to allow flood storage). Here also there is a need to build on the initial assessments presented in the research, which cover a broad spectrum of subject areas including technical and engineering aspects of FCERM and scientific understanding of the measurement of GHG emissions, particularly in relation to carbon sequestration from land use management, as well as more generally developing methods and approaches to carbon footprinting.

This R&D Technical Summary relates to R&D Project FD2622 and the following R&D output:

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The above outputs may be downloaded from the Defra/EA Joint R&D FCERM Programme website (www.defra.gov.uk/environ/fcd/research). Copies are also available via the Environment Agency's science publications



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