

NATIONAL TECHNICAL ADVISORY GROUP ON FLOODING ISSUES
SCOTTISH EXECUTIVE RESEARCH PROGRAMME

Purpose

1. This paper describes ongoing and planned research, procured and managed within the Scottish Executive's Air, Climate and Engineering Division and other relevant research studies in which the Executive is involved. Two discrete research projects, undertaken by the Scottish Executive's Environment Group Research Programme, are also described.

Research Projects

Natural Flood Storage and Extreme Flood Events

2. This research project seeks to investigate and quantify the potential of natural flood storage within river systems to cater for extreme rainfall events and therefore increased river flows. Such storage is considered a useful complement to the more conventional barrier defences and allows for environmentally sustainable methods of flood management. This work is desk based research and will consider Scottish river systems as case studies. It is anticipated to be tendered in February 2004 with completion in the summer of 2004.

Asset Register and Condition Assessment of Flood and Coastal Defences

3. The Scottish Executive "Climate Change Scottish Implications Scoping Study" was published in 1999, with associated work presented in 2001: "Climate Change: Review of Levels of Protection Offered by Flood Prevention Schemes" based on the UKCIP 98 scenario. This latter study's recommendations confirmed the Executive's view that, due to the limited amount of information readily available about such schemes, further research should be carried out to compile an asset register of flood and coastal defences and record, by detailed survey, the condition of these assets. An extension beyond this recommendation also requires investigation, this being that the defended properties, businesses and infrastructure also be identified. This research project seeks to compile an asset register of river and coastal flood prevention schemes constructed in Scotland since 1961, survey these to ascertain the present level of protection they offer at today's standards and identify, using a GIS assessment of digital flood plain mapping the existing infrastructure that they protect. In terms of scope and scale it is not considered necessary to replicate the England and Wales "National Flood and Coastal Defence Database" currently being completed by the Environment Agency. The 2001 research report "Climate Change: Review of Levels of Protection Offered by Flood Prevention Schemes" which has been updated following UKCIP 2002 will be published in February and made available to members.

4. It is anticipated that this work commences in the spring of 2004 and will be of 12 months duration.

Scoping Study for Flood Risk Maps

5. In advance of SEPA commissioning the production of second generation indicative flood risk maps this work investigated and outlined the mechanisms and methods available to provide improved flood risk maps in Scotland and explore the data sources upon which new

maps would be based; it considered the options available to produce these, including reflections on costs. It is explicit in highlighting the need for clear and unambiguous delineation of potential flood zones to ensure that further information is obtained to establish the actual level of risk in an individual area. The report concludes that the production of second generation indicative flood risk maps would present a step change in flood management in Scotland, ensuring that developments with inappropriate levels of flood risk do not proceed. This research work was completed in December 2003 and it is intended to publish in early 2004, copies will be distributed to members.

Flood Warning Dissemination Scoping Study

6. An additional *ad hoc* piece of work is also being undertaken for Air Climate and Engineering Unit; **Flood Warning Dissemination: Improving Communication.**

7. This work will positively contribute to strengthening the efficiency and speed by which flood warnings can be issued and as such it fulfils an objective of the National Flooding Framework to ensure authorities and the public are better informed of flood risk. It will review methods of issuing flood warnings and support development of proposals to better disseminate these warnings to people at risk, particularly considering the use of Advanced Voice Messaging and Automatic Messaging Services.

8. Air Climate and Engineering Division is also part-funding research work for which DEFRA/Environment Agency is the lead client. There are currently 3 projects (see paragraphs 9 to 13 below), which contain a Scottish component that it would not have been viable to pursue for Scotland alone but are going ahead in collaboration with DEFRA and the Environment Agency. These will make a positive contribution to the enhanced technical understanding of flooding and flood flows within rivers as a component of the Scottish Executive National Flooding Framework.

Reducing Uncertainty in River Flood Conveyance, Phase 2

9. This project aims to improve the confidence and accuracy with which flow capacities in rivers and on flood plains are estimated. The final output comprises a guidance manual and software to provide these estimates; this will be made available free of charge to researchers and those who provide commercial software incorporating such estimates. SEPA and Babcie are the designated Scottish pilot testers and are having 5 professional staff formally trained by the consultants HR Wallingford. This will assist the subsequent understanding and use of the software. Improvements and amendments as a result of testing will be incorporated within the version which will be launched in late Spring 2004 and it is intended that the Scottish testers make presentations on this major revision of conveyance estimation to their colleagues and professional associations ensuring widespread knowledge and understanding within Scotland.

10. Further information on this project can be found at <http://www.river-conveyance.net/index.html>

Flood Frequency Estimation and Revitalisation of the Flood Estimation Handbook Runoff Method

11. These two projects are closely linked and have been ongoing in England and Wales as research which commenced in 2001. They will report in full, including the addition of Scottish components, during early 2005. Flood frequency estimation seeks to increase and improve the confidence and accuracy with which river flow and rainfall volumes are modelled, with the result that the frequency at which floods occur can be estimated more robustly.

12. The revitalisation of the Flood Estimation Handbook Runoff Method seeks to update the FEH with consideration of rainfall runoff into rivers and how different ground and seasonal characteristics affect this. Such an update would enable improvement of the flood event records to include more recent and extensive data from a typical range of Scottish catchments. The influence of melting snow, the effects of mountainous terrain and seasonal variations, which do not exist within the England and Wales component of the project, will be considered, as these are of particular importance when considering flooding within Scotland and are issues which at the current time there is limited understanding.

13. Both projects are being undertaken by the Centre for Ecology and Hydrology at Wallingford and Scottish Executive resources ensures that Scottish catchments will be fully considered and included within each of these studies.

Other research

Foresight programme

14. The Executive is also working with the Office of Science and Technology Foresight programme, which is currently carrying out a futures project to produce a challenging and long-term vision for the future of flood and coastal defence. The project takes account of the many uncertainties, is robust, and can be used as a basis to inform policy and its delivery.

15. The project manager within the Air Climate and Engineering Division for the above projects is:

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Conclusions

16. Members are invited to note the above.

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