

**NATIONAL TECHNICAL ADVISORY GROUP ON FLOODING ISSUES
MAPPING AND HYDROMETRIC ISSUES SUB-GROUP**

THE SECOND GENERATION FLOOD MAP FOR SCOTLAND

A. Background

1. Information on flood risk is central to all aspects of flood management. Key activities such as effective flood warning, flood prevention and development control depend on reliable information on the probability of flooding and the impact of flooding should it occur. Flood maps are an effective way of assimilating and communicating flood risk to a wide range of users.

2. In 1999 SEPA commissioned the Centre for Ecology and Hydrology (CEH) to extend the 100yr floodplain maps of England and Wales to cover Scotland (generally known as the IoH 130 map). These were modeled flood plain outlines, showing the 100yr floodplain for all catchments with an area greater than 10km² and for river reaches upstream of the tidal limit.

3. Both hard copies and digital copies can be purchased from CEH (who own the copyright). In 1999, SEPA supplied all local authorities with a hardcopy of the relevant part of the map. The majority of Local Authorities have subsequently purchased the digital version of the map.

4. The accuracy of this map is variable and is generally poor in urbanized areas where floodplains have been modified by flood defenses, transport infrastructure and buildings. SEPA have therefore collated additional information from flood event surveys, reports on flooding and flood risk assessments. The shortcomings in the map's reliability were highlighted by the Scottish Executive report "Climate Change: Flooding Occurrences Review" (Central Research Unit, 2002). The report recommended that SEPA "*produce high resolution flood hazard maps showing the 200 year return period and higher (e.g. 500 year) return period events, after taking into account climate change up to the year 2050 or beyond.*"

5. The Scottish Executive published in March 2002 the National Flooding Framework (Annex 1). This framework comprised a statement of commitments to reduce the risks and impacts of flooding.

6. Four of these commitments directly relate to flood mapping:

- Preparation of second generation flood risk maps that will be available to the public via the internet.
- Identification of coastal flood risk.

- Establishment of a national archive of flood risk information and flood defense database.
- Revision of national planning policy to provide a clearer basis for decision making through a risk framework.

B. Objectives

7. The development of revised flood maps will ensure that SEPA continues to give authoritative advice to Local Planning authorities, developers and the public that reflects best practice and available information.

8. Specifically, the maps will have the following attributes:

- Coverage of all mainland and island catchments with an area greater than 3km² and upstream of the tidal limit
- Show a range of fluvial flood probabilities (100, 200 and 1000 year floodplains)
- Show the location of Flood Prevention Schemes
- Floodplains will be consistent with information available from past flood events
- Maps will be zoomable up to 1:50 000 scale.
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9. In addition, SEPA will establish a mechanism for updating the flood maps as new information and methods become available.

10. This map will not provide new information on coastal flood risk. The development of a methodology and its application to Scotland will be the subject of a separate project promoted under the National Flooding Framework.

11. Access to the maps will be as follows:

- SEPA/Flood Appraisal Group/ Planning Authority access to all maps and underlying data
- Public access to maps via the internet
- Caveats will be displayed with all maps to inform users of intended purpose, assumptions, limitations and any known shortcomings.
- SEPA will continue to provide information on flood risk via its offices as it is bound to do under the Environment Information Regulations 1992.

C. Scope

12. This project includes all resources required to produce and maintain a flood plain map of Scotland (mainland and islands) and to make it available via the internet.

13. The project includes:

- The collection of all flood event data held by SEPA at present.

SEPA currently holds digitized flood event data sourced from post-event surveys carried out by SEPA and digitized maps and photographs surveyed by third parties. This data has been collated by SEPA and can be accessed locally via GIS and nationally via the GIS intranet site.

- The collection of data on flood prevention schemes held by the Scottish Executive.

As a part of the National Flooding Framework the Scottish Executive have made a commitment to establish a national flood defence database by December 2004. This database will comprise details of all flood prevention schemes that have received grant-aid under the Flood Prevention (Scotland) 1961 act. SEPA acknowledge that there are a significant number of defenses constructed by riparian owners and an unknown number of defenses constructed by Local Authorities under other legislation). However, from a strategic basis, reliable information on design and maintenance standards will only be available for flood prevention schemes. It is likely that significant defenses not included in this database will become evident as flood event and high-resolution digital terrain data are analysed. If this is the case then provided design and maintenance standards are known then these defenses could be added at a later date.

- The generation of flood extent and depth maps for all catchments with an area of greater than 3 km² and reaches upstream of the tidal limit.

Flood Estimation Handbook methodologies together with a high-resolution data terrain model for Scotland (the InterMap dataset) make it possible to improve the IoH 130 map. The improved method will lead to improved accuracy but will not address the problem in built-up areas. It is likely that the high-resolution DTM will reveal small scale topographic features such as flood embankments and linear features such as flood walls. However, the quality of this data is untested.

- The assimilation of flood event, flood defence and flood extent data.

Flood event data generally gives a more accurate representation of flooded extent and the impact of any features that influence water movement on the floodplain. However, there can often be significant uncertainty concerning the probability of an event. Combining event data with flooded extent and depth maps can increase confidence in the flood map for where both data types exist. Flood defenses will be geo-referenced and overlaid on flood maps. The impact of flood defenses will have to be assessed based on the design standard, degree of maintenance and mode of operation.

- The production of flood maps for selected probabilities.

The map products will be developed using appropriate GIS-based tools. It is probable that a number of products will be produced depending on intended user (e.g. national floodplain map of selected probabilities, flood defenses and their impact and flood event data). All maps will need to be presented on an appropriate background and at an appropriate scale.

- The establishment of a mechanism for the collection of new data and the updating of flood maps

Flood maps represent a static picture of flood risk. The maps will be maintained through an annually review. SEPA has planned for a 5 year support and maintenance programme which will include planned annual revisions, unplanned urgent revisions and a 5 year review.

- The provision and support of the software and hardware required to develop the maps and to make them available via the internet.
- Access to legal advice on the risk that the maps may pose to SEPA. This advice will be important in determining the nature of the information made available via the internet.
- Public relations support for consultation during the development of the maps, at their launch and any follow-up events. Given the sensitive and complex nature of flood risk information Public Relations will be an important part of this project.

14. The project does not include:

- The collection of data types not currently held by SEPA or included in the Scottish Executive Database of Flood Prevention Schemes.
- The collection of information on flood defenses beyond that held by the Scottish Executive.
- The collection of information on coastal flood risk (this is the subject of a separate project under the National Flooding Framework).

D. Progress To Date

15. In order to achieve the very demanding time scale for the production of a flood map (September 04) SEPA had to advertise the pre-qualification notice in the Ordinary Journal of the European Union (OJEU) prior to finalising the Statement of Requirements (SoR). The advert was placed in December 2003 and the SoR was circulated to a short-list of 8 suppliers in February 2004 (one has subsequently withdrawn). Submissions must reach SEPA by the end of March and the contract will be awarded in early April.

16. SEPA has made presentations to a number of Flood Appraisal Groups and plans to continue to use FAGs as a means of communicating progress to key stakeholders. In addition, a communication strategy is being developed .

17. The indicative project plan is given in Annex 1. This plan is purely indicative at this stage and will be finalised following the appointment of a contractor.

Tim Jolley, SEPA
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