

Framework for flood event management Prototype Decision Support Systems



FLOODsite Task 19 has produced:

- A document detailing the development of a framework for flood event management.
- Two prototype Decision Support Systems for flood event management planning that were piloted in the UK and the Netherlands.
- A two-dimensional modelling approach for preparing flood event management plans and for selecting building locations and access routes, tested in France.

The outputs are intended for:

- Engineers and scientists involved with emergency planning for floods, flood event management and spatial planning.

Where to find the document:

- FLOODsite report T19-07-03 'Frameworks for flood event management' by Marjolein Mens et al. is available in the publications section of the website www.floodsite.net.

In Brief

During a flood emergency, the responsible authorities need to make key decisions relating to flood event management and evacuation and rescue strategies. Flood event management focuses on the short-term actions during, or just before, a flood incident. There is a clear need for flood event managers to be able to improve the coordination of their response to a flood event.

A review of existing Decision Support Systems (DSS) indicated that there are few that have been specifically developed for flood event management. Based on user requirements, a new methodological framework for flood event management DSS was developed, as shown in Figure 1.

The framework was used as a basis for developing proto-type DSS for areas of the Thames Estuary in the UK and the Schelde Estuary in the Netherlands. These were tested among end users.

Detailed two-dimensional hydraulic models were developed for two urban areas in France, providing a direct contribution to emergency management plans in these areas and for selecting building locations and access routes.

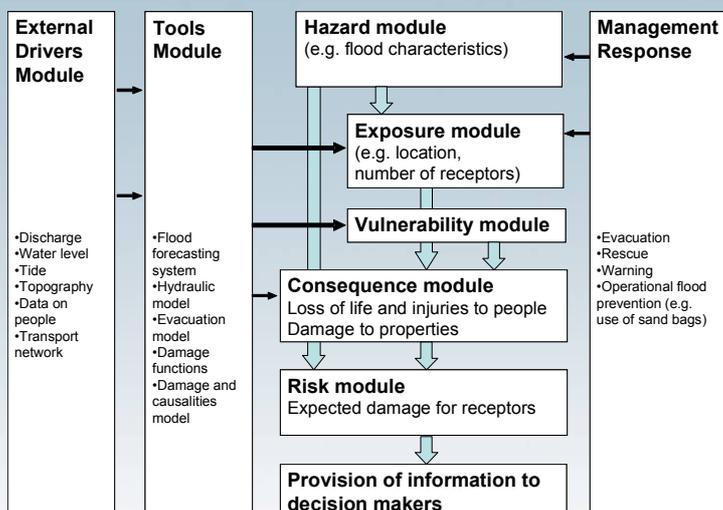


Fig. 1. Framework for flood event management

Prototype Decision Support Systems

FLOODsite Task 19 has provided prototype tools that can assist organisations to produce flood event management plans, which in turn contribute to the effective implementation of the EC Floods Directive.

A prototype support system for evacuation planning called the Evacuation Support System (ESS), was developed based on the new methodological framework and applied to the flood prone areas of Walcheren and Zuid-Beveland on the Schelde. The objectives of the ESS were to:

- Support policymakers in making evacuation plans; and
- Support decision-makers during a flood event.

The ESS utilises a Geographical Information System (GIS) that shows possible breach locations (see Fig. 2). The user can choose a breach location and see the resulting impact on the flood-prone area. For each breach scenario forecast water levels; maximum water depths and velocities; time of inundation; probabilities of building collapse are available.

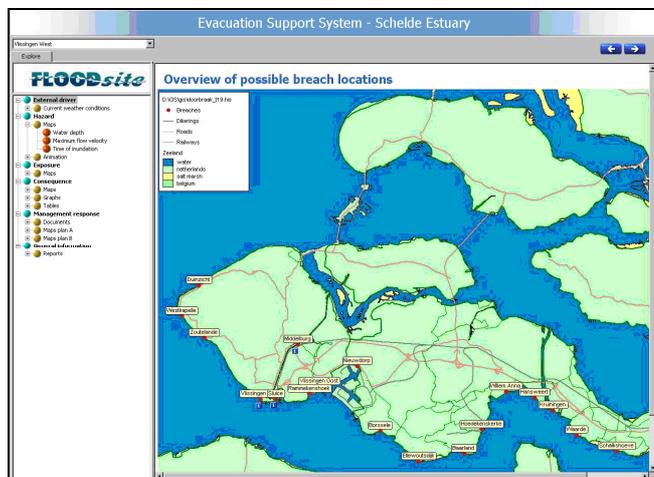


Fig. 2. Typical ESS screen showing the Schelde pilot area and possible breach locations

A prototype DSS known as the Flood Incident Tactical and Operational Framework (FLINTOF) was piloted in the Thamesmead embayment of the Thames Estuary in the UK. The key functionality of FLINTOF is assessment of: flood hazard; risks to people; evacuation times; probability of buildings collapsing;

and comparison of different flood event management scenarios (see Fig. 3).

In the French pilots it was found that the use of a detailed two-dimensional model provides useful information for the preparation of flood event management plans, allowing decisions to be taken regarding evacuation routes at a detailed scale required for flash floods in urban areas.

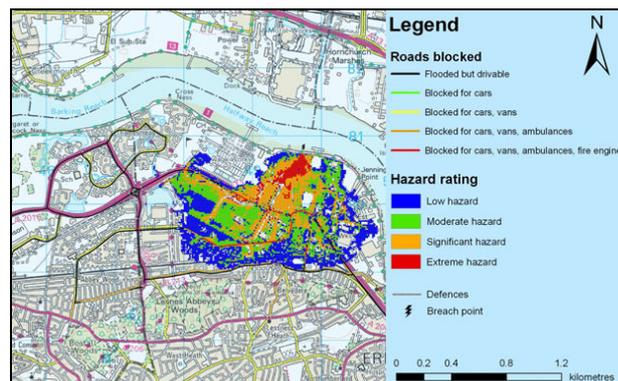


Fig. 3. Typical screen from the prototype Decision Support System FLINTOF

Related Work

Task 19 has links to a number of other FLOODsite tasks: 8, 10, 14, 17, 18, 24 and 25, details of which can be found in the main Task 19 report (T19-07-03). Task 19 has also produced report T19-07-01 'Review of flood event management Decision Support Systems' by Rob Maaten et al. Both reports are available in the publications section of the website.

The FLOODsite project

FLOODsite is an interdisciplinary project integrating expertise from physical, environmental and social sciences, as well as spatial planning and management. The project has over 30 research tasks across seven themes, including pilot applications in Belgium, the Czech Republic, France, Germany, Hungary, Italy, the Netherlands, Spain and the UK. The EC has identified FLOODsite as one of its contributions to the European Flood Action Programme.

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