FACTSHEET

Evacuation and traffic management

Review of model use for emergency planning

FLOODsite Task 17 has produced:

- A review and assessment of evacuation and traffic management models for use in flood emergency planning.

The document is intended for:

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

Where to find the document:

- FLOODsite report T17-07-02 'Evacuation and traffic management' by Darren Lumbroso *et al.* is available in the publications section of the FLOODsite website www.floodsite.net.

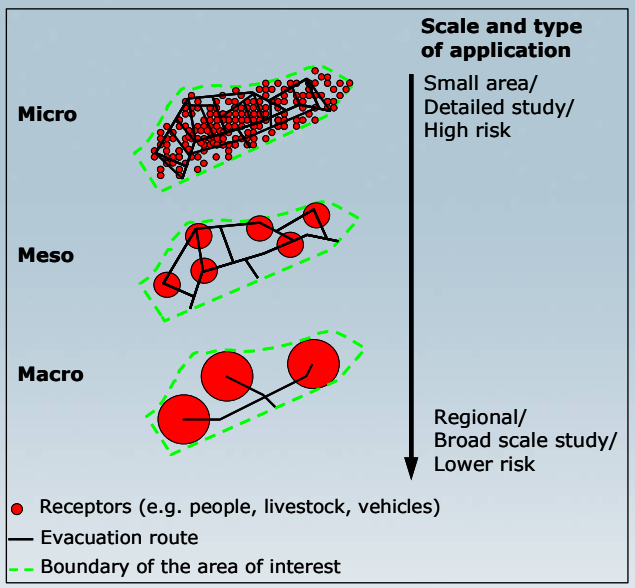

Fig. 1. Different scales of evacuation modelling

In Brief

Evacuation and traffic management are major issues for flood event managers. Evacuation, either out of the flood risk area or to safe shelters located within the area, is a possible response when flooding threatens life, health or well-being. Emergency plans allow the emergency responders to target the people most at risk, but also to evaluate the feasibility of an evacuation given the time available and to identify the most efficient and safest evacuation strategies.

In recent years, awareness has increased of the need for tools that facilitate evacuation and emergency planning. To develop emergency management plans, information is needed on the characteristics of potential floods, the current infrastructure, the capacity of the infrastructure and the vulnerability of the people at-risk.

FLOODsite Task 17 evaluated models to support evacuation planning and examined a number of aspects of evacuation and traffic management including:

- Flood event management practice in Europe;
- The requirements for evacuation planning based on end user consultation; and
- Evacuation modelling.

This led to the application and testing of evacuation and traffic management models relevant to flood event management in the Thames Estuary in the UK and the Schelde Estuary in the Netherlands.

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Key Findings

Different evacuation models were evaluated. The key findings of the review can be summarised as follows:

- Evacuation modelling for flood events falls outside the remit of flood risk managers in most EU countries. Evacuation models are rarely used at present to inform flood emergency plans developed by emergency planners in Europe.
- There are potential benefits for flood risk managers to incorporate evacuation modelling into their flood event management work. Figure 2 shows an evacuation model used to reconstruct the events in 1953 when the flood defences of Canvey Island in the UK were breached due to an extreme storm surge.

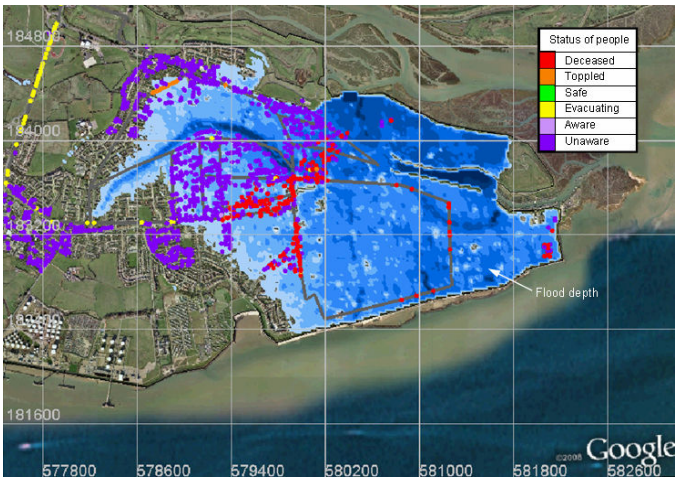

Fig. 2. Map showing evacuation modelling for the 1953 Canvey Island flood

- The split of responsibilities between flood management organisations and authorities responsible for emergency planning means that in some cases neither organisation wishes to be responsible for carrying out evacuation modelling.
- Flood risk managers and emergency planners have the potential to improve understanding and effectiveness by working more closely together.
- There are various scales at which evacuation modelling can be carried out. Macro-scale evacuation models are useful for obtaining first order estimates of evacuation times for relatively large areas. Meso- and micro-scale models are needed for detailed evacuation planning (Fig. 1).
- In some cases, for results to be useful there is a need for individual receptors (e.g. people, houses, vehicles) to be modelled and for additional information to be provided (e.g. loss of life and injury estimates, effects of different management plans) not just evacuation times.
- Micro-scale models, although more time consuming to set up than macro models, provide emergency planners and other end users with more insight into the areas at greatest risk and also provide decision makers with other risk metrics (e.g. number of collapsed buildings, loss of life, inundation of escape routes). However, to be effective such models should be applied to the whole area at risk.
- Further development of appropriate user interfaces will help encourage wider adoption and usage of evacuation models.

Related Work

Demonstrations of model application to Thames Estuary (UK) and the Schelde Estuary (The Netherlands) are available on the FLOODsite website, as part of Tasks 24 and 25 respectively.

Task 17 also produced a model to assess the risk of road inundation by flash floods. A separate fact sheet is available on the FLOODsite website describing this work.

The work carried out under Task 17 is closely related to that of Task 19. Again, further details can be found on the FLOODsite 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 Action on flood risk management.

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