



# Real Time Simulation on the Move: Transition from Theory to Practice

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## Background

Undergraduate courses or modules in topics such as Applied Geomorphology or Environmental Management, relating to the practical deployment of earth-science knowledge, are increasingly forming a significant element of academic content in UK Geography programmes. Students can readily acquire background knowledge of relevant processes producing alterations in the environment from lectures and from published sources. If however they are to gain practical experience of the relevant decision-making processes which real-world situations demand, then the only avenues open to them at present are likely to be some sort of placement in a company or organisation, not always appropriate for a student who may be taking the module as only a minor component of their degree programme, or a computer simulation such as a virtual field trip which 'can replace or enhance background lecturing/information transmission and so increase the time spent by students exploring specific issues in a more 'inquiry-based' manner'. This may provide them with a practical experience, but it is one which lacks realism in one critical aspect - it is the student who effectively controls the timing, if not the nature, of the events in most such simulations.

## Objectives of exercise

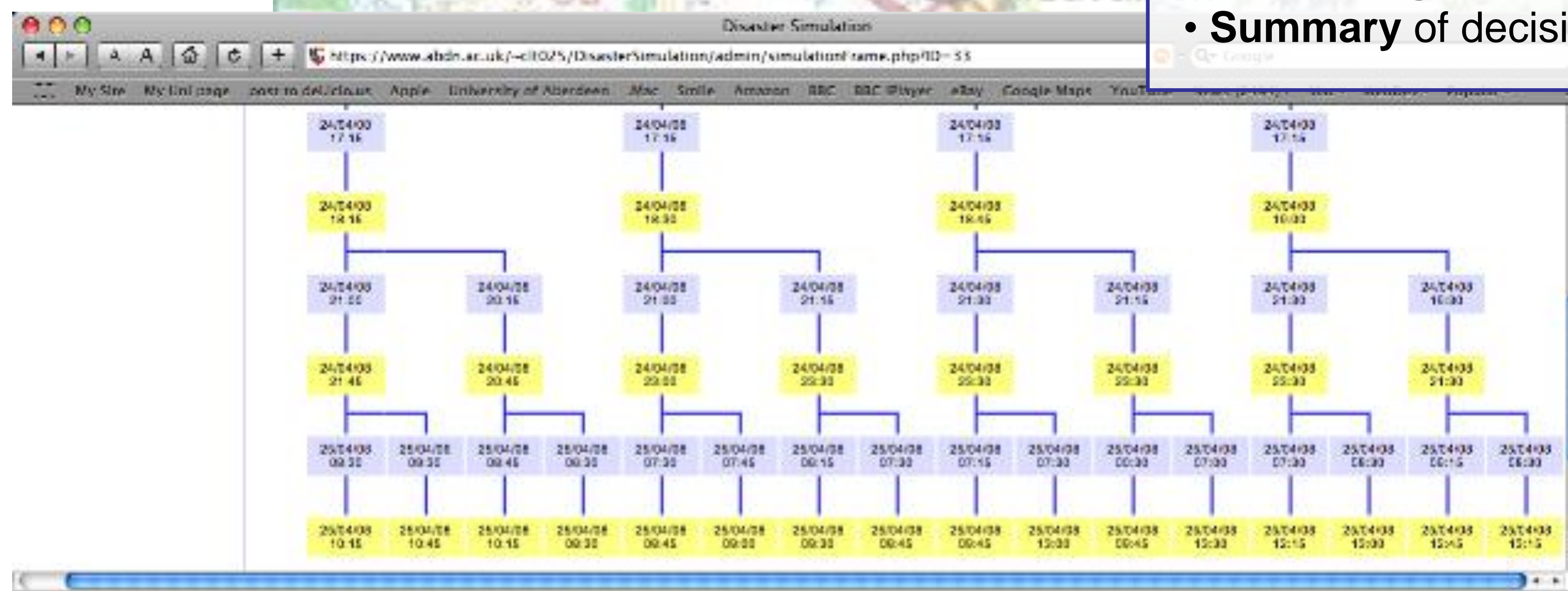
The exercise was set up to deliver three stated objectives:

1. to allow students to deploy theoretical knowledge about natural hazards to practical ends, including selection of pertinent data from a range of sources
2. to provide a real-time experience which would give the student an appreciation of the dynamics of natural hazard situations
3. to facilitate appreciation of the problems of assessing competing viewpoints as to which disaster management strategies to deploy in an evolving situation.

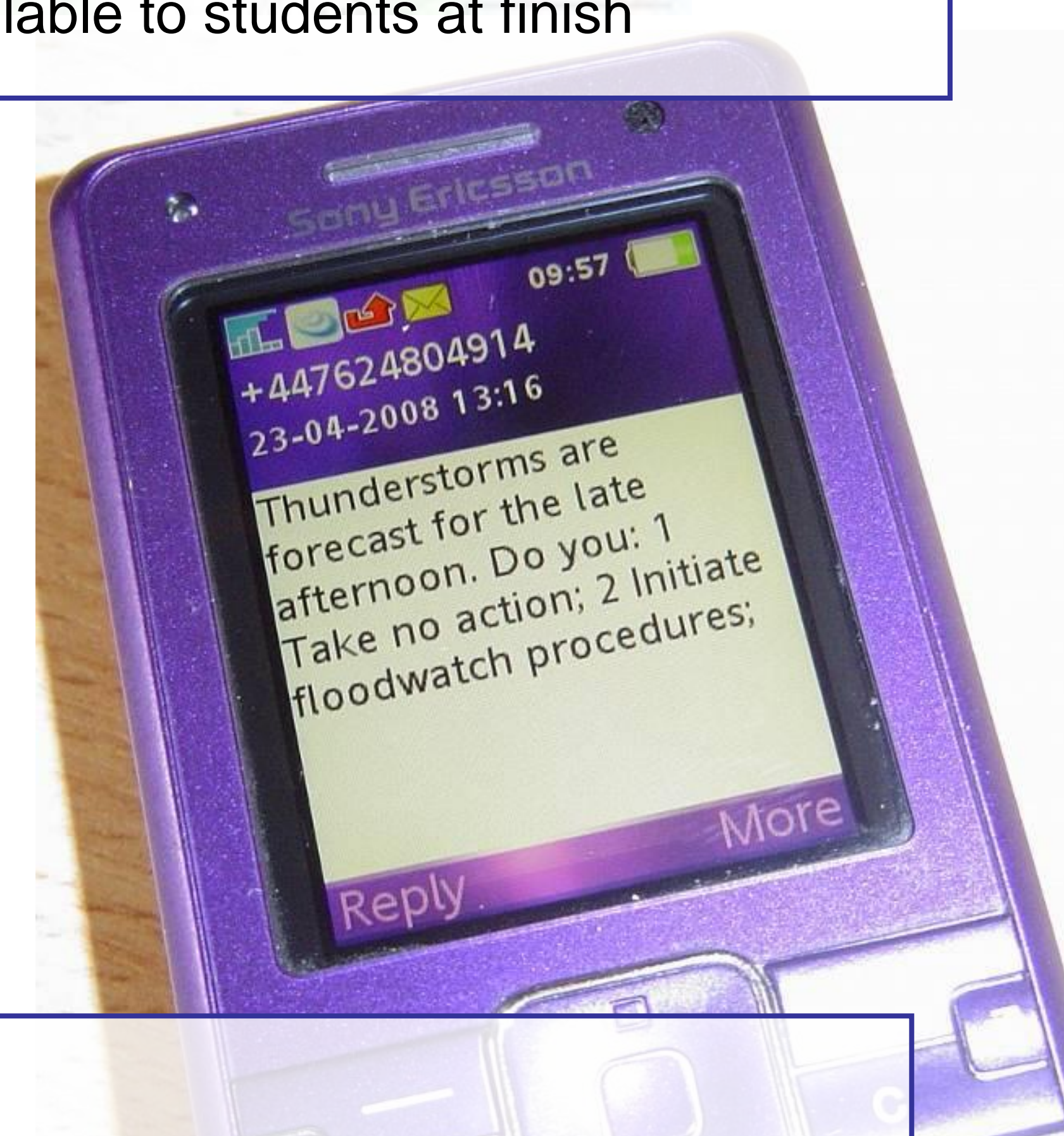
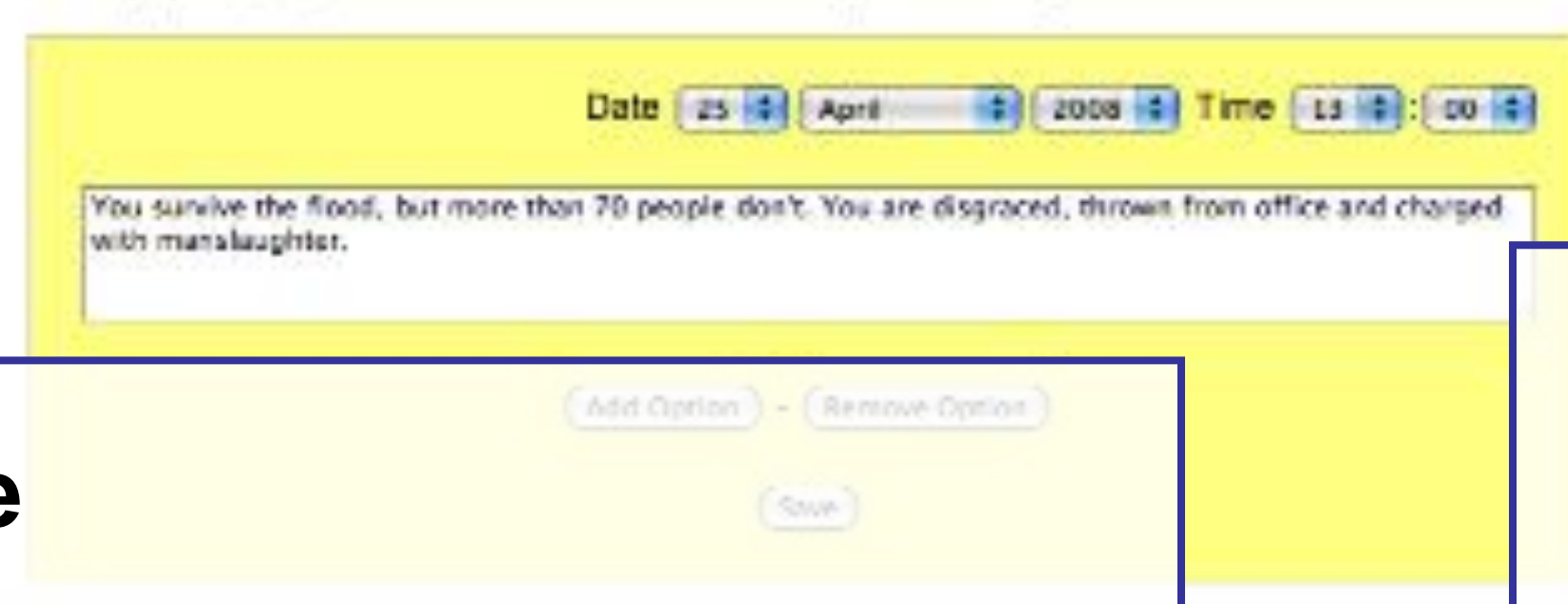
## Solution

Real time SMS txt message based simulation

- **Authoring interface** for academic to input information about scenario, decision points and timetable
- **Model** – simple matrix with 5 'event horizons' over 72 hours – no recursion possible (simplification of reality)
- **Email** and **SMS** used for inclusion and cost reasons
- Student **registration** required
- **Summary** of decisions available to students at finish



The flood rises for the next hour. Cars wash away, people panic and abandon homes, only to be caught in the torrent.



## The Experience

**Respondents valued the innovative approach, especially to assessment**  
*'it was not another boring essay'*

**Technical problems which led to delays were 'annoying' but accepted as 'just one of those things'**

they may even have helped (by providing practice and improving confidence)

**It was perceived as a realistic experience**  
60% of questionnaire respondents agreed or strongly agreed that it was a realistic experience of disaster management

**Emotional involvement**  
enjoyment, involvement, excitement, frustration all reported. It was something a bit different which encouraged a different perspective on course content.

## Conclusion

- Simulation achieved objectives
- Structure easily adapted
- In present form gives experience rather than precise training
- SMS limits amount of information used
- Lack of highly detailed information a positive aspect
- *more scope for thought and originality*
- Student reaction highly positive

Date	Time	Situation report	Options (action highlighted in bold)
23/04/08	11.30	<ul style="list-style-type: none"> <li>The storm has passed</li> <li>Falls of up to 25mm rain reported from parts of upper basin</li> <li>River level in Laval rose 1.3m (!) but is now reducing again</li> </ul>	
23/04/08	13.15	<ul style="list-style-type: none"> <li>Thunderstorms are forecast for late afternoon</li> </ul>	<ol style="list-style-type: none"> <li>1. Take no action</li> <li>2. <b>Initiate flood watch procedures</b></li> </ol>

The report that up to 25mm of rainfall in the upper basin had been followed by a major rise in river level at Laval indicated that the watershed soils upstream from Laval had probably become saturated and consequently promoted a large and rapid runoff into the Ouvèze. Thus the forecast for a thunderstorm was of serious concern as most flash flooding of this river occurs after storms and there would be a shorter time between precipitation and runoff due to saturated soils (Carsell et al, 2004). Therefore the decision was made to initiate flood watch procedures, in order to be better prepared to respond to any flood threats and maximise mitigation time (Carsell et al, 2004).