

# GIS and Disasters

The last eighteen months have seen a series of disasters leading to substantial loss of life. Examples include Hurricane Katrina, the Pakistan earthquake, and bombings in cities such as London and Bali. All disasters happen somewhere. Where they happen influences the impact and our ability to respond. Scientists seeking to identify natural hazards and what can be done to mitigate them must also deal with the geography of risk. Geography is therefore central to both planning for and countering disasters. GI and GIS are increasingly at the forefront of government efforts to carry out their first duty in protecting their citizens. But such tools also help terrorists to identify areas of high opportunity.

We can think of dealing with terrorism or other national disasters as having five phases: risk assessment, preparedness, mitigation, response and recovery. Much work is being done worldwide on this matter: we will, for instance, see a major US National Research Council report published in summer 2006. Current work focuses increasingly not on the technology, vital as this is, but on the management and communication systems involved, especially where many players (e.g. NGOs, the UN and other international players and national military and civilian agencies) are involved.

The policy dimension, especially how to convince senior planners with responsibility for anticipating and taking steps to minimise disasters, is central to success. One example is illustrated below, an excerpt from a 1979 scientific paper by McCann and colleagues which highlighted (by colour) areas of the world where the seismic potential along major plate boundaries was greatest. The area of the epicentre of the December 2004 submarine earthquake was one of the five areas of greatest potential and tsunamis were predicted in the area, as shown on the map. Nothing, of course, could have been done to prevent the earthquake, and its timing could not have been accurately predicted. But the impact of various disasters on human life and welfare could have been modelled and warning systems could, in principle, have been installed.

Why this was not done over the 25 years since publication is a matter for conjecture and seems likely to have been due to multiple factors. Was it mainly because the scientists were not persuasive enough about the dangers, or because of institutional factors that led to their warnings being disregarded? Was it simply because the grinding poverty in many of the countries likely to be affected ensured that their governments had more immediate priorities? Or was it because nobody ever thought about it? Whatever the reason, it seems unlikely to have been a shortage of technology.

The conclusion is obvious: GIS can make a real contribution to anticipating, minimising and recovering from disasters. Indeed, it may now be a necessary contributor to best practice. But human factors and management issues ultimately determine how valuable is that contribution. We therefore need GIS people with the right management competence in senior management-chain positions.