

## KEYNOTE SPEAKER

**MARE Conference People & the Sea V**  
*Thursday 11th July 2009, 11:00 – 12:15*

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#### **WHAT PRICE THE PROTECTION OF LONDON FROM THE SEA?**

##### *SUMMARY*

Sea level rise poses a significant threat to London, despite the construction of the Thames Barrier in the 1970s/1980s. Not only might the barrier be insufficient to protect London from severe storms, but also the associated sea walls and other structures will be nearing the end of their lives by the 2030s/50s. This issue has been investigated by the UK Environment Agency in a £16 million project to determine when and what could be done to forestall the risk of flooding, whilst developing sustainable solutions for the management of water levels in the Estuary.

This paper analyses the risk of flooding to the year 2170 using official forecasts of sea level rise, and examines the costs of benefits of different strategic options. One of the conclusions from this analysis is that we can wait to make some decisions about major new engineering works, but that we must in the meantime strive to reduce the increase in flood risk that the development of London and its economy is generating.

The Thames Estuary 2100 project (TE2100) was established by the UK's Environment Agency in 2002 with the aim of developing a strategic flood risk management plan for London and the Thames estuary through to the end of the century. The key driver for the project was to consider how tidal flood risk was likely to change in response to future changes in climate and people and property in the floodplain. Additional to this there was an understanding that many of the existing flood walls, embankments and barriers were getting older and would need to be raised or replaced to manage rising water levels. The Agency considered that it was time to plan for the future and make recommendations on what actions were needed to adapt to a changing estuary.

To help make decisions on which are the best flood risk management options and policies for the estuary communities and environment the TE2100 project has used a number of assessment and appraisal methodologies (Environment Agency, 2009). These are designed to:

- Assess what strategic flood management approach, or policy, can be justified in each local area;
- Assess the impacts any individual future flood management option might have, both locally and estuary-wide;



- Appraise different options compare.

*Photo: Thames barrier*

The assessment and appraisal of flood management options used the following methods:

- Cost-benefit analysis to estimate the costs and benefits to society (the nation) of options, using monetary terms;
- Strategic Environmental Assessment (SEA) to gauge the environmental and social impacts of flood management options and how they conform to environmental legislation.

The resulting TE2100 Plan brings the two processes together to determine the best course of action, based on current information.

In terms of testing the economic worthwhileness of protecting London from the sea, cost-benefit analysis is the accepted best practice within UK flood risk management planning, and the approach is consistent with Defra's *Flood and Coastal Defence Project Appraisal Guidance* series and the *Policy Statement on Appraisal* (July 2008) issued as a result of the *Making Space for Water* strategy (Environment Agency, 2009). A key aspect of this approach is the need for greater consideration of social and environmental impacts within appraisal. TE2100 has been at the cutting edge of emerging new methods (using Multi-Criteria Analysis) to factor in society and the environment in flood risk management appraisal, in addition to the traditional focus on protecting against property damage from flooding.

As such, although called "economic appraisal", the TE2100 approach also seeks to place value on the environmental and social impacts and benefits of our flood risk management options. It remains an economic approach however to the extent that these wider impacts are expressed in terms of money values – the "worth to society" as expressed in monetary terms. In addition to the estimated costs of an option the types of impacts assessed as part of the economic appraisal are as follows:

- Factoring in social and environmental outcomes can change the view of which options have the largest benefits compared to the more traditional cost-benefit analysis.
  - Assessing the ratio of benefits to costs for all of the options considered in this stage of the Plan led to two "front runners" being determined: ...
1. Optimised maintenance and enhancement of the existing system with modifications made to the Thames Barrier by 2070, and further adapting the structure to become a barrier with locks or "open" barrage after 2135.
  2. Optimised maintenance and enhancement of the existing system to 2070 and building a new barrier at Long Reach by 2070 (converting to a barrier with locks or "open" barrage after 2135).

For the period up to 2070, maintaining and enhancing the current system is strongly preferred, regardless of the "end-of century" approach selected thereafter. Uncertainty in the assessment post-2070, and the absence of an immediate need to decide on the preferred strategy beyond that point, mean that a single preferred "end of century" option is not being promoted by the TE2100 project.

### Reference

Environment Agency (2009). TE2100 Plan, *Consultation Document*. London, Environment Agency.

*BIOGRAPHY*

Edmund Penning-Rowsell is Pro Vice-Chancellor for Research at Middlesex University and is also Head of the Flood Hazard Research Centre. He was Chair of the Defra/Environment Agency Advisory Group on Flood and Coastal Defence Research and Development (2004/5), and is currently a member of the Defra/ Environment Agency Research Programme Board. He is also the Editor of the journal *Environmental Hazards* (Elsevier). He was awarded the O.B.E. by the Queen for services to flood risk management in May 2006. Edmund specialises in natural hazard assessment and policy, with special reference to water planning. He has published several books and many papers on his research, and acted as consultant to numerous national and international environmental agencies.