

# Integrated Environmental Modelling – What is the Vision? Is it Achievable?

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The importance of understanding the world and all the events and activities within it as a set of interconnected, interacting processes is now widely recognised. Early versions of the technology to achieve that understanding are now in place. What are lacking are the strategy, the institutional infrastructure and the resources to move that technology out of the research area into the domain of the early adopters. However, if those things could be put in place, then the opportunities that open up for finding sustainable solutions to present challenges and developing new products and services are almost beyond imagination.

In many spheres, simulation models have proved to be a highly effective method of exploring processes, encapsulating our knowledge of them and predicting their behaviour. This is true for all the physical sciences and applies to many social and economic sciences as well. To date most modelling development has taken place in relatively isolated discipline specific “islands of excellence”. There has been little communication across disciplines. Consequently, by comparison with the investment in model development, very little work has been undertaken on the complex problem of linking (or coupling) models either within or across the disciplinary boundaries; an activity which is generally referred to as 'integrated modelling'. In recent years, however, there have been a number of informal meetings among modellers who either have an immediate need to study interacting processes or who have seen the bigger picture and its opportunities. From these meetings roadmaps have begun to emerge for progressing integrated modelling. Although the various roadmaps have originated from different disciplines, they are remarkably consistent in their conclusions. They all recognise that intra- and inter-disciplinary and national collaboration will be required to bring about the necessary conditions for the required culture and technology to grow and flourish.

This keynote talk will examine the challenges and questions which have given rise to the need for Integrated Environmental Modelling (IEM) and the forces which shape it. It will explore some of the technical and scientific aspects as well as discussing the effect of current ideas and initiatives. It will set out a vision of how integrated environmental modelling could contribute to meeting the environmental challenges we face as well as exploring some of the key ingredients of such a solution.