



Environmental competency groups: the case of flood risk modelling

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Much of the U.K., especially England and Wales, has experienced a transition to a 'flood rich' period over the last 10 years. This initially began with the 1998 'Easter floods' of central England, and was then followed by major flood events in 1999, 2000, 2001, 2003, 2004 and 2007, a clustering not seen since possibly the 1940s and 1950s and, before that, the 1870s and 1880s. The current 'flood rich' period, unlike those that went before, is providing fundamental challenges to the ways in which hydrologists operate. First, the development of spatially-explicit modeling is producing maps that allow the identification of the locations in the landscape most likely to be producing flood water as well as individual properties at risk from events with different return periods. Following from the recommendations of the investigation into the 1998 floods, such maps are now available digitally, on-line, driven by a searchable database. Second, there has been renewed interest in the extent to which upstream land management can be used to reduce downstream flood risk. This is a particularly challenging problem for the hydrological modeler as it is the models that are needed to bridge the spatial separation of land management upstream from the potential beneficiaries located downstream. Taken together, significant aspects of personal property management (e.g. buying and selling houses, flood insurance) are being materially affected by the activities of flood risk scientists, including the labeling of upstream land uses as 'bad', the recommendation of extensive upstream land management changes to reduce downstream flood risk, and significant uncertainty for downstream floodplain residents as to the reliability of these kinds of upstream land use changes. As models

and modelers have become central to demonstrating this upstream-downstream link, and with their growing digitally dissemination, flood risk models and modelers are being increasingly exposed to scrutiny and, in some situations, controversy. As part of a team of natural and social scientists, we are currently investigating how we can move on from such controversies. There are two conventional modes of dealing with such controversies: (1) developing the 'public understanding of science'; and (2) public consultation. Unfortunately, both of these appear to be lacking because they are applied post hoc, once the science has been done and the predictions have been generated. Where these don't fit with local understanding (of either the land managers or floodplain dwellers), the necessary public trust in both models and modelers becomes broken, often before these conventional modes even begin. We are currently exploring a much more radical approach to these issues based around what we call 'environmental competency groups'. In this approach, both local people living with flooding (non-certified hydrological 'experts') and us, as scientists (certified!) are brought together throughout the flood modeling work. This modeling work has been explicitly addressing the question of whether or not upstream land use management can be used to deliver downstream flood risk reductions. All members of the group are engaged in collecting data, running models and discussing results. Our initial findings from this work show that significant hydrological knowledge is held by non-certified hydrological experts, and that this kind of knowledge can not only assist the flood risk modeling process, but lead to a much deeper engagement with the inherent limits to modeling and managing extreme flood events.