Institution:
University of Oxford

Unit of Assessment:
17B Geography

Title of case study:
Engaging communities in flood risk science and management

1. Summary of the impact

This research has demonstrated the effectiveness of an experimental method of public engagement - Competency Groups (CGs) - in situations in which the expertise involved in managing flood risk is called into question by the communities living with such risk. Working in two test areas (Ryedale, Yorkshire and the Uck catchment, Sussex) it has enabled novel research collaborations between scientists and concerned citizens that have generated bespoke flood models and new flood management options. The work of the *Ryedale CG* and the 'upstream storage' proposals that it generated were incorporated into a successful multi-agency bid to a national competition launched by Defra for a project to test new flood management solutions for Pickering, and are now under construction in the catchment. Having become a national exemplar, the reach of the Competency Group approach in tackling public controversies about environmental expertise continues to extend beyond these two areas, within the UK and also abroad.

2. Underpinning research

Flood risk management relies on the scientific practice of modelling the likely frequency and severity of future flood events. However, the uncertainties and provisos that necessarily attach to such model-based flood risk estimations tend to become obscured in their public policy applications and local people can be very suspicious of them. Devastating events, like flooding, can move those affected by them to intensify public scrutiny of the expert knowledge underpinning flood risk management and to subject it to political contestation. Typically, such environmental knowledge controversies have been seen in scientific and policy communities as troublesome problems to be avoided. In contrast, the '*Understanding Environmental Knowledge Controversies*' project investigated how knowledge controversies might play a generative role in developing the capacity of democratic societies to handle scientific uncertainties more effectively **[Section 3; R1; R2]**. The project was co-ordinated at Oxford, with Whatmore leading the development of the theoretical and methodological innovations necessary to approach local knowledge controversies as opportunities in which research could make a positive difference to the production and understanding of flood risk management expertise **[R3]**. It did so by designing and testing an experimental methodology – Competency Groups (CGs) - to exercise the concerns of communities living with flooding by engaging them in the practice of flood risk modelling and, thereby, to improve the quality of the evidence base, policy options and accountability of flood risk management **[R4]**.

The CGs facilitated new forms of collaborative environmental research in which the natural and social scientists in the project team (5-6 'research' members) and volunteer residents with experience of flooding (5-8 'local' members) worked closely together over a sustained period. The CGs focused on two localities, Ryedale in Yorkshire and the Uck catchment in Sussex in which flood risk management was already the subject of public dispute. The project had three goals: (i) to interrogate the expert knowledge claims and practices that inform existing flood management policies; (ii) to enable those affected by flooding to try out alternative ways of considering and ameliorating local flooding problems; and (iii) to involve the local members in the production of bespoke flood models and new flood management options and, by putting these into the public domain, influence local flood management debate and practice. This way of working demands a commitment from all CG members to negotiate the different modes of reasoning of fellow participants and to appreciate the different kinds of expertise brought to the co-production of knowledge **[R5]**.

The research was funded under the Rural Environment and Land Use (RELU) Programme and ran from March 2007 to June 2010. It was led by Professor Sarah Whatmore (Oxford, since 2004) working with Landström (Oxford, March 2007 – June 2010). Co-investigators were Lane (then Durham, now Lausanne - responsible for hydrological modelling) and Ward (then Newcastle, now UEA - responsible for the recruitment and management of local research volunteers).

3. References to the research

Key academic publications (selected from > 25 produced)

R1: WHATMORE S., 2009. Mapping knowledge controversies: environmental science, democracy and the redistribution of expertise. Progress in Human Geography, 33/5: 587-599

R2: WHATMORE S., 2013 Earthly powers: an ontological politics of flood risk. Special issue on 'Naturecultures' Theory, Culture and Society, doi 10.1177/0263276413480949

R3: WHATMORE S., 2013. Between natural and social science? Reflections on an experiment in geographical practice. In Barry A. and G. Borne (eds), Interdisciplinarity: reconfiguring the social and natural sciences: 160-177. Routledge, London.

R4: WHATMORE S. and C. LANDSTROM, 2011. Flood apprentices: an exercise in making things public. Economy and Society, 40/4: 582-619.

R5: LANDSTROM C., S, WHATMORE and S, LANE, 2013. Learning through computer improvisations. Science, Technology and Human Values, 38/4: 678-700.

R6: LANE S., C. LANDSTRÖM and S. WHATMORE, 2011. Imagining flooding futures: risk assessment and management in practice. Philosophical Transactions of the Royal Society A, 369: 1784-1806.

This project was funded under the rural Environment and Land Use (RELU) programme (with monies from ESRC, BBSRC, NERC, Defra and the Scottish Government). In June 2011 - the project's End of Award report was graded *outstanding* by academic and policy assessors. In November 2011 - the project was awarded the *RELU Programme prize* for 'best example of interdisciplinary methodology and scientific innovation'. www.relu.ac.uk/majorevents/ In addition, the quality of the project's outputs bringing together research and impact has been recognised by several other accolades, including:-

Academy of Social Sciences 2010. Project selected as one of the case studies promoting social impact and policy relevance of social science research in the publication '*Making the case for the social sciences: sustainability, the environment and climate change*'. www.acss.org.uk/docs
Research Councils United Kingdom 2010. PI (Whatmore) selected as one of the case study academics in the RCUK publication *'Demonstrating the benefits of public engagement for researchers'*. www.rcuk.ac.uk/per
The University Beacons of Public Engagement 2010. Project selected as case study for the website www.publicengagement.ac.uk

4. Details of the impact (indicative maximum 750 words)

The experimental method of public engagement using Competency Groups (CGs) has had significant impact in two local communities (Ryedale and Uck). The research approach to the theory and practice of co-producing environmental knowledge, in which researchers actively engage and collaborate with local residents affected by flood risk, has led to deep and sustained impacts in localities in which public confidence in flood risk management expertise had been lost, resulting in a policy impasse. The broader lessons from these interventions in terms of the utility of

the CG methodology elsewhere continue to spread as the Ryedale case is held up as a national exemplar of effective 'public engagement' in situations of policy dispute that, in turn, has attracted international interest.

The greatest impact, thus far, has resulted from the activities of the CG in Ryedale (Sept. 2007 – Oct. 2008), which came to call itself the Ryedale Flood Research Group (RFRG). In the case of the RFRG, the research collaboration (September 2007 – October 2008) took place in the context of a policy stalemate in a community that had lost confidence in the local Environment Agency (EA) and come to distrust the expert models upon which it relied, as the provision of local flood defences repeatedly stalled. The co-produced modelling work of the RFRG led the Group to propose 'upstream storage' as a means of reducing flood risk in Pickering. This proposal involved placing a series of mini-dams (or bunds) in the upper catchment using vernacular materials in keeping with the (designated) landscape. Such an intervention had been previously dismissed by the consultants advising the flood management policy of the local EA. The clear impact of the CG approach in this case has been to empower local people to become involved in producing alternative flood risk management strategies. The RFRG presented its working methods, bespoke modelling work and 'upstream storage' proposal at a public exhibition in the Civic Hall in Pickering in October 2008 **[Section 5: C1]**, and in a report - '*Making space for people'* **[C2]**. This event attracted over 200 visitors, including representatives of the local EA, and gained extensive coverage in the local media which, in turn, produced a sequence of further research impacts.

Four months later, the Group's 'upstream storage' proposal was incorporated into a successful multi-agency bid to a national competition launched by Defra to fund pilot projects that could demonstrate the potential of land management measures to reducing flood risk. The Pickering project was one of three to be funded (£700,000). It ran for two years from April 2009 and included a local member of the RFRG on its Project Delivery Group. These 'upstream storage' proposals have since received District Council funding and are now under construction in the catchment **[R6]**. The role of the RFRG's work in this successful multi-agency funded project in demonstrating the potential of land management techniques (in this case 'upstream storage') was acknowledged in the EA's publicity about the project both locally and nationally. The Catchment Manager for the EA described its influence in the following terms: '*The RELU Project was very much a catalyst for our bid to Defra for the Pitt review Project "slowing the Flow". The RFRG study provided background information, technical support and public support which helped progress the upstream storage element of the Slowing the Flow Project. The production of the model by the RFRG and the identification of the key bund locations from this initial large scale modelling provided significant cost savings to the Slowing the Flow project. The work completed by the RFRG within Pickering once again highlighted Pickering's flood risk and provided a large amount of background material that was used to inform the tender for the Defra demonstration project. This also provided key links with the communities and an opportunity for knowledge share across the projects. The final point to make is that this work enabled us to improve our relationship with the community in Pickering and one that will hopefully lead to a successful outcome for all*.' **[C3]**.

The Defra demonstration project involved testing the RFRG's 'upstream storage' proposition and extending the Group's modelling work to look at additional catchment interventions, such as debris dams, that might also contribute to this method of flood risk reduction in Pickering. The project received much interest and approval with the local 'Gazette and Herald', for example, reporting on the benefits of the project on 29th August 2012, and noting that *'… the select committee on Environment, Food and Rural Affairs concluded that projects like Pickering 'slow the flow' are class leaders of their type, and that they should also qualify going forward for payments for eco-system services.*' **[C4].** This project has become a national exemplar in various national agencies' advocacy of 'natural' or 'whole catchment' techniques of flood risk management, as seen on the Defra website **[C5]**. Hansard reports show that the Pickering case has been discussed in the UK Parliament (House of Commons) on four occasions (4/11/2010; 23/06/2011; 06/07/2011 & 08/09/2011) and has been the subject of written questions on two occasions (06/07/2011 and 11/07/2011) **[C6]**, thus demonstrating the wider UK policy impacts of the CG approach.

In July 2010, Ryedale District Council approved £800,000 funding to construct 'an upstream

storage scheme', building on the approaches stimulated by the RFRG's work **[C7]**. The first phase of this scheme (woody debris dams) led by the Forestry Commission is now in situ in the catchment. In March 2013, the District Council announced a further tranche of funding to support a second phase of construction (an earth bund) led by the EA. Thus, the CG approach, pioneered by Whatmore and her team, has contributed materially to changing flood risk management practice in the Ryedale catchment.

International interest in the application of the CG methodology to knowledge controversies associated with flood risk management is now developing, as evidenced in the expressions of interest by public authorities and consultancies advising on flood risk management in Queensland, Australia. The Leading Floodplain Management Consultant, BMT WBM Pty Ltd, for example, emailed Prof Whatmore saying: *'Once again I would like to thank you for your presentation on Thursday night. I found it incredibly informative and useful, both as a catch up on where the Pickering scheme was and in understanding the methodologies and techniques and most importantly the outcomes your team achieved. I emailed Rebecca Ralph requesting a copy of your presentation and/or paper if that is possible as I am very keen on implementing similar approaches here in Queensland and seeking to influence the local authorities on understanding the benefits of true community engagement on often controversial ideas and schemes.'* **[C8]**.

5. Sources to corroborate the impact

C1: RYEDALE FLOOD RESEARCH GROUP. Pubic Exhibition Living with floods in Pickering. Civic Centre, Pickering (October, 2008)

C2: RYEDALE FLOOD RESEARCH GROUP, 2008. Making space for people. RELU project, Competency Group 1 report.

Available at http://knowledge-controversies.ouce.ox.ac.uk/news/Making_Space_for_People.pdf

C3: Catchment Manager for the Environment Agency (held on file) confirms that the RFRG work materially affected the Defra bid for the 'slowing the flow' project.

C4: Example of local publicity about the national status of Pickering's innovative 'upstream storage' flood risk management scheme.
http://www.gazetteherald.co.uk/features/columnists/9899119.Pickering____natural____flood_defence_pilot_attracts_national_attention/

C5: Examples of use of RFRG case study of 'natural' or land management based catchment management in national policy development on DEFRA website:

http://webarchive.nationalarchives.gov.uk/20130123162956/http:/www.defra.gov.uk/environment/flooding/information-for-practitioners/land-management/

http://www.defra.gov.uk/news/2011/05/19/natural-flood-protection-funding/

http://www.forestry.gov.uk/fr/INFD-7ZUCL6

C6: http://www.parliament.uk/business/publications/hansard/

C7: News items reporting on Ryedale District Council funding for upstream storage approved
http://www.bbc.co.uk/news/uk-11763530
http://www.bbc.co.uk/iplayer/episode/b00w5563/The_Politics_Show_North_East_and_Cumbria_21_11_2010/

C8: Email from Leading Floodplain Management Consultant, BMT WBM Pty Ltd to Sarah Whatmore (held on file) corroborates the interest in the CG methodology in Queensland, Australia.