



## **Using systems gaming to explore decision-making under uncertainty in natural hazard crises**

Jamie W McCaughey (1,2) and David Finnigan (3)

(1) Earth Observatory of Singapore, Nanyang Technological University, Singapore (jmccaughey@ntu.edu.sg), (2) Institute for Environmental Decisions, ETH Zürich, Switzerland, (3) Boho Interactive, Australia (info@bohointeractive.com)

Faced with uncertain scientific forecasts of a potential hazard, it is perhaps natural to wait and see. As we wait, uncertainties do decrease, but so do our options to minimise impacts of the hazard. This tradeoff is fundamental to preparing for natural hazards, yet difficult to communicate. Interactive systems gaming is one promising way forward. We are developing in-person interactive games, drawing on role-playing and other table-top scenario exercises in natural hazards, as well as on game-based modeling of complex systems. Our games model an unfolding natural hazard crisis (such as volcanic unrest or an approaching typhoon) as a complex social-physical system. Participants take on the roles of diverse stakeholder groups (including government, scientists, media, farmers, city residents, and others) with differing expertise, responsibilities, and priorities. Interactions among these groups play out in a context of decreasing scientific uncertainty and decreasing options for actions to reduce societal risk. Key design challenges are (1) to engage players without trivialising the real-world context; (2) to provide the right level of guidance for players to navigate the system; and (3) to enable players to face realistic tradeoffs and see realistic consequences of their choices, without feeling frustrated that the game is set up for them to fail. We will first prototype the games with general public and secondary-school participants, then adjust this for specialist groups working in disaster management.

We will illustrate participatory systems gaming techniques in our presentation 'A toolkit of systems gaming techniques' in the companion EGU session EOS6: 'Perform! A platform to discuss art & science projects with live presentation'.