EFFECTIVE COMMUNICATION OF HOUSEHOLD BUSHFIRE RISK THROUGH WEB-BASED GEOVISUALISATION

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Context

Post-disaster studies of Australian severe fire events (e.g. McLennan and Elliot 2011, Whittaker et al. 2009, Dunlop et al. 2011) have identified that the absence of clear and household relevant risk information is one of the critical factors that undermines householders' decision-making during the onset of a fire threat.

Based on predefined fire danger ratings and household conditions, a WebGIS based model can be used to present household specific risk information and corresponding action advices efficiently and effectively during a bushfire event. This proposed *personalised risk communication model* will:

- allow users to directly perceive their own risk more timely and accurately;
- promote the choice of appropriate actions under stress; and
- provide early triggers for safe actions before the fire strikes.

Research Questions

1. What factors are necessary in measuring household-specific risk on a bushfire danger day?
2. What are the important risk indicators to be communicated to individuals, affecting their understanding of risk and timely decision-making during a bushfire event?
3. How can each element be spatially visualised to effectively enhance the accuracy of residents' risk perception and facilitate proper responses to the danger?
4. Is it necessary to communicate bushfire risk to different user groups using separate visualisation designs for better risk perception?
5. How can effective spatial representations of risk be implemented using a web-based geovisualisation tool to achieve easy acceptance and manipulation for non-expert user groups?

Methodologies

We will adopt a user-centred design and evaluation workflow to cater to user needs and preferences regarding communication effectiveness and system usability, whilst satisfying relevant emergency management requirements and policies:

1. Design the *personalised risk communication model:*
   a. Identify *Fire Threat* indicators;
   b. Evaluate and clarify current knowledge on *Household Preparedness* and *Action Advice* via survey of fire experts;
   c. Design household centred geovisualisation methods to spatially represent the risk indicators.
2. Verify and evaluate the risk indicators and representation methods with fire experts.
3. Assess with residents of fire prone areas to understand what risk indicators are important, and which representations are effective in respect to their understandability, users' risk perception and subjective preference.
4. Prototype the WebGIS based risk communication system.
5. Evaluate the system with end-users for the communication effectiveness and system usability.

Current Phase

Currently phase 1.b is nearly complete in an attempt to define the required levels of household preparedness by relating a range of preparedness actions to their associated Fire Danger Ratings. Relevant experts are all invited to participate. If you have any interest in the survey or the overall project, please feel free to contact Yinghui (Cathy) Cao at caoy02@student.uwa.edu.au.