

Evaluating the impact of visualization for decision-making under uncertainty in a bushfire situation

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Abstract: PHOENIX Rapidfire is fire spread modeling software that uses a variety of different inputs to predict bushfire spread. As with all models, there is uncertainty associated with the output. Therefore, evaluation of different visualizations is required to determine how best to display and communicate this uncertainty. This is of particular importance in Australia, due to the need for the public to make their own informed decision of whether to vacate their home in a bushfire as there are no compulsory evacuation orders issued.

Methodology:

This research utilizes human subject experiments designed to test several visualization techniques for decision-making under uncertainty in bushfires. These techniques are:

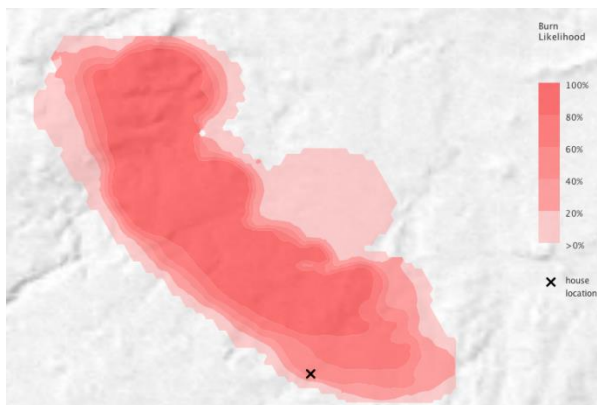
- **PHOENIX model representation:** hard line showing the highest burn likelihood, followed by a dashed line for the lowest burn likelihood
- **FS PRO model representation:** bands of color to represent burn likelihood
- **Transparency:** increasing transparency to represent decreasing burn likelihood
- **Texture:** increasing pattern coarseness to represent higher burn likelihood

- **Color Value:** with a scale of richer to weaker to represent decreasing burn likelihood
- **Textual representation:** representing burn likelihood as text instead of as an image

Aims/Outcomes:

This research will provide end users with:

- insight into whether communicating uncertainty is beneficial in terms of bushfire warnings
- a better understanding of which visualization techniques are best for representing uncertainty to assist decision-making



Color Value



FSPRO Representation