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A Conceptual Framework for Communicating 'Uncertainty of Scientific Model' for Emergency Management Planning

Scientists design different scientific models with an aim to support emergency management planning. Uncertainties, however, appear at many points throughout the modelling process, starting with the data and information inputs and continuing through model runs and output generation. Additionally, scientists' or modelers' values and expert judgments add another layer of uncertainty along with the underlying deep uncertainties. Effective communication of these uncertainties is not just helpful to manage the risk but also helps to inform more robust and adaptive decisions during emergencies, while also enhancing trust among emergency managers in the science itself.

Hence, based on a series of qualitative interviews with a) modelers and scientists; and b) emergency managers, this PhD research has developed a conceptual structure for communicating the uncertainties in the overall modeling process, depicting where and what should be communicated. This conceptual structure is represented by a doughnut conceptualization of the 'modelling environment' consisting of four major sections: a) input data; b) model selections and model runs; c) inference and projections; and d) subjective judgment and values of both scientists and decision-makers. Different sources are represented by flexible grid sizes within these four

major sections, according to the emergency managers' prioritization. We argue that, if improvements in emergency management planning decisions are to be realized, these prioritization needs to be communicated by the scientists. This conceptualization also considers deep uncertainty, and prioritization of scientists to giver the overall picture of the uncertainties in the scientific model.

Presentation Theme: Emergency Management Planning; Science Communication.

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