Student Name: Graeme Riddell

Project Title: Methods to Develop Long Term, Efficacious Risk Reduction Policies

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PHD PROGRESS REPORT 2016

Forecasting social, economic and ecological systems over extended planning horizons are a significant source of uncertainty which can completely alter the effectiveness and efficacy of any policy. When this is coupled with decision making around the minimisation of risk from natural hazards the implications can be severe. The aim of this PhD research is to look at methods to develop long term, efficacious policies through policy relevant models, indicators and scenario planning methods to, allow decision makers to gain a greater understanding of the systems they attempt to influence, along with making their intervention as effective as possible across multiple objectives.

The first half of the 2015/2016 financial year was focussed on the stakeholder engagement processes that underpin the participatory scenario development of my PhD. This initially involved the design of the overarching engagement process, including workshop design and instructions to facilitators and organisation. Two workshops were arranged for the Greater Adelaide case study to develop the initial qualitative scenarios and then a second that presented the detailed and quantified scenario's outputs. These workshops proved to be highly enjoyable aspects of my PhD and allowed stakeholders to gain a broader perspective of the complexities of future risk and how modelling coupled with participatory scenarios can assist in gaining insights into the challenges and opportunities.

Five scenarios for developments in Greater Adelaide were detailed in a subsequent report, "Visions Greater Adelaide 2050: An exploration of disaster risk and the future", and will be further detailed in a subsequent report including risk modelling provided to all participants. This report is currently being reworked as a journal article to be submitted in the coming month. This paper will highlight the novelties in scenario design for exploring policy relevant developments and better engaging with a diverse set of stakeholders. A second journal paper is also being developed that looks at integrated modelling using the exploratory scenarios and how these can be used to assist decision makers understanding long term risk and the influence of current actions on future risk profiles.

A journal article for which I am a co-author has also recently been published in Environmental Modelling and Software titled, "An uncertain future, deep uncertainty, scenarios, robustness and adaptation: How do they fit together?"[1]. The paper looks to place often confused terminology in context of the literature and how they can be applied to environmental modelling and decision making. I am also involved in authoring a large review paper on decision support systems for natural hazard mitigation planning with co-authors at the University of Adelaide, Research Insitute for Knowledge Systems, and Karlsruhe Institute of Technology. Plans are also being made to publish a review/synthesis titled, "Complexity in Risk Decision Making – Integration of dimensions and scales in modelling ", with authors from Research Insitute for Knowledge Systems, and Amsterdam University's Institute for Environmental Studies. This paper will look at the challenges of integrating risk across space, time and domains into modelling and decision making.

The next 6-12 months have a particular focus on article writing and completion of the thesis. This is expected to be submitted early-mid 2017 with some slight delays due to stakeholder engagement process timing. The overarching Universty of Adelaide project will also repeat the stakeholder processes for Greater & Peri-Urban Melbourne which will allow the developed process to be refined and adapted for a new group of stakeholders. This will occur during October and November 2016, with the next months planning updates to the process and publishing on the previous process applied to Greater Adelaide. Early 2017 will look to finalise all publications and synthesise for my thesis submission.

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[1] Maier, H.R., Guillaume, J.H.A., Van Delden, H., Riddell, G.A., Haasnoot, M., Kwakkel, J.H., 2016. An uncertain future, deep uncertainty, scenarios, robustness and adaptation: How do they fit together? Environmental Modelling and Software, 81: 154-164 (doi:10.1016/j.envsoft.2016.03.014).