EVALUATING FUTURE RISK & MITIGATION STRATEGIES: (SEMI) AUTOMATIC CALIBRATION OF DYNAMIC EXPOSURE MODELS

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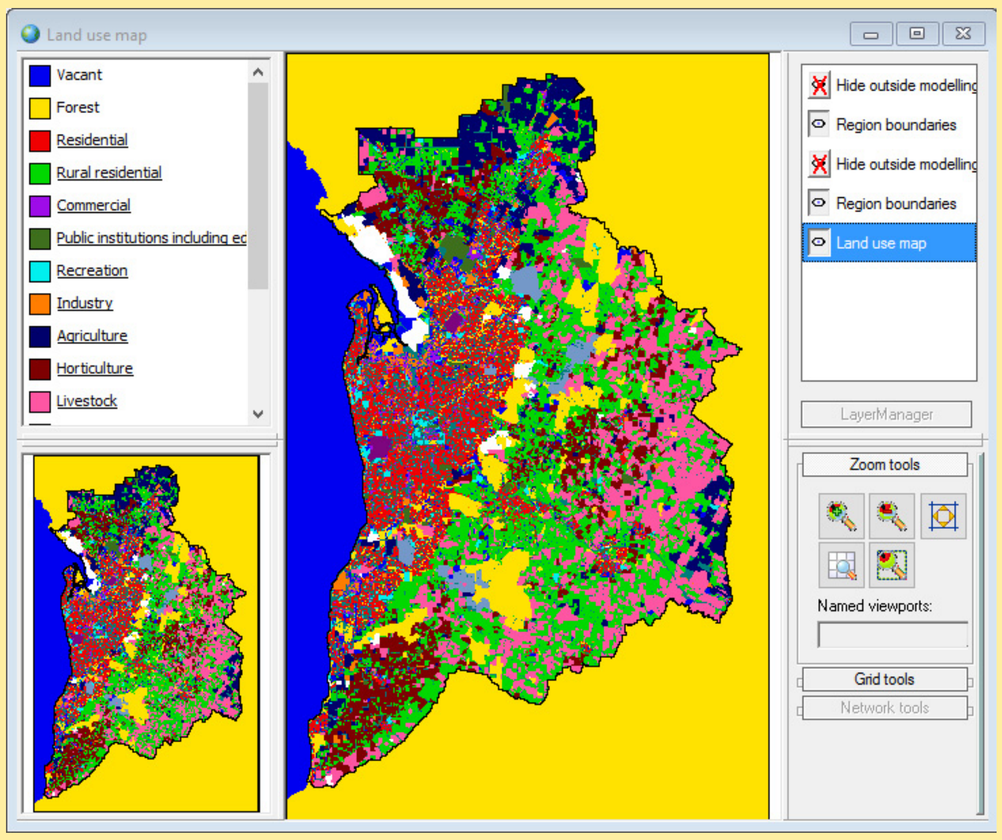
EFFECTIVE RISK MITIGATION STRATEGIES MUST BE DESIGNED FOR LONG-TERM RESILIENCY ACROSS A RANGE OF POTENTIAL FUTURE SCENARIOS. THIS REQUIRES EFFICIENT APPLICATION, PARTICULARLY BY INEXPERIENCED USERS, OF DYNAMIC EXPOSURE MODELS.

RESEARCH QUESTION

How can we (semi) automate the calibration of dynamic exposure models, to make the application more efficient, particularly for inexperienced users?

MODELLING DYNAMIC EXPOSURE

A land-use model is used to model exposure dynamically.



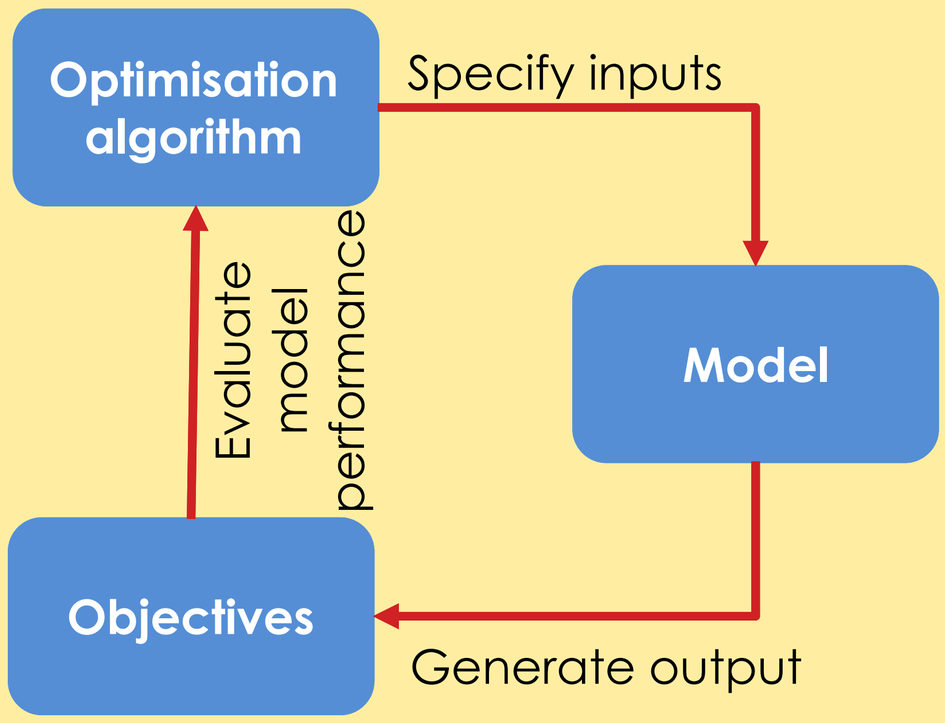
The land-use model of the Greater Adelaide region

Key advantages:

- Easily linked with models of hazard and vulnerability;
- Considers multiple factors (e.g. zoning, infrastructure, physical suitability);
- Integrates multiple social, environmental and risk indicators.

OUR APPROACH

To automate calibration, we developed a generic multi-objective optimization framework.



The generic framework used for automatic parameter tuning

Key advantages:

- Generic structure allows for substitution of different components (model, objectives, algorithm);
- Appropriate handling of model stochasticity;
- Possible implementation on parallel computing.

RESEARCH UTILISATION

This research allows for the immediate application of land-use models to dynamically model exposure. This, used as part of integrated decision support systems, provides efficient evaluation of risk mitigation strategies.