

# UNHARMED

## Unified Natural Hazard Risk Mitigation Exploratory Decision Support System



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### UNHARMED IS A SPATIAL DECISION SUPPORT SYSTEM (DSS) FOR PLANNERS AND POLICY MAKERS TO ASSIST IN THE REDUCTION OF RISK FROM MULTIPLE NATURAL HAZARDS, TRANSFORMING PLANNING RISK REDUCTION IN AUSTRALIA

UNHARMED explores how natural hazard risk changes, driven by climatic, economic, demographic and policy factors using a modelling approach. It simulates the effect of different risk-reduction options, enabling transparent and robust mitigation decision making. We use participatory approaches to customise and use the DSS, building strategic capacity in understanding and managing risk within end-user organisations.

Policy interface allows selection of mitigation options, development of future scenarios, simulation and visualisation, guiding user through modelling process

Risk reduction options include structural measures, building codes, retrofitting, land-use planning, and land management

Scenarios handle the complexities and uncertainties that impact risk-reduction planning through coherent projections of future social, economic and environmental conditions

A suite of hazard and loss models included for earthquake, bushfire, and flooding

The screenshot displays the UNHARMED software interface with several key components:

- Main window:** A central flowchart showing the process from Drivers (Climate, Socio-economics, Land use, Land value, Building stock) through hazards (Earthquake, Bushfire, Riverine flooding, Coastal inundation) to Average Annual Loss, Cost benefit analysis, and Social/Environmental indicators.
- TotalAALMap:** A map showing Average Annual Loss (AAL) with a legend ranging from 0.27 to 1.00.
- Land use map:** A detailed map of land use types including Vacant, Forest, Residential, Rural residential, Commercial, Public institutions, Recreation, Industry, Agriculture, Horticulture, Livestock, Airport, and Infrastructure.
- Land use model:** A panel for configuring land use parameters, including Land use type (Vacant), Input (Initial land use map, Land use changes), Time (2010-Jan-01), and Parameters (Random coefficient: 0.5, Random seed: Variable).
- EQAnnualLossBlock:** A panel for configuring earthquake loss models, including Vulnerability (Residential: BRICK VENEER, Commercial: CONCRETE FRAME, Industrial: WALLS FIBRO), Input (Hazard frequency: 1, Scaling factor: 1), and Mitigation (Retrofitting cost table).

Calculation of key decision criteria, developed with end-users, such as benefit-cost ratios

Year-by-year exposure dynamics simulated using land use and building stock models

Visualisation of simulation results through maps, tables and charts

Modeller's interface allows access to model block parameters, data sources, and simulation settings



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