UNHARMED

A flexible approach to understanding and planning risk reduction for different hazards and from different perspectives

bushfire&natural **HAZARDS** CRC

Improved decision support for natural hazard risk reduction

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The project has developed a tool for pro-active disaster risk assessment and reduction planning – UNHaRMED. It is based on two driving principles:

1. Prevention is better than cure – "It's better to build a fence at the top of a cliff, than park an ambulance at the bottom." Helen Clark. Challenges: where to build it, how high, how much does it cost…?

2. Tomorrow's risk is being built today. We must therefore move away from risk assessments that show risk at a single, present point, and move instead towards risk assessments that can guide decision makers towards a resilient future. GFDRR (2016)

The software is designed to explore risk into the future, modelling hazard, exposure and vulnerability to provide decision-relevant risk metrics. It is designed with the inputs from over 50 organisations across Australia.

The following highlights some of the applications of UNHaRMED in the last year.

All results shown are indicative.
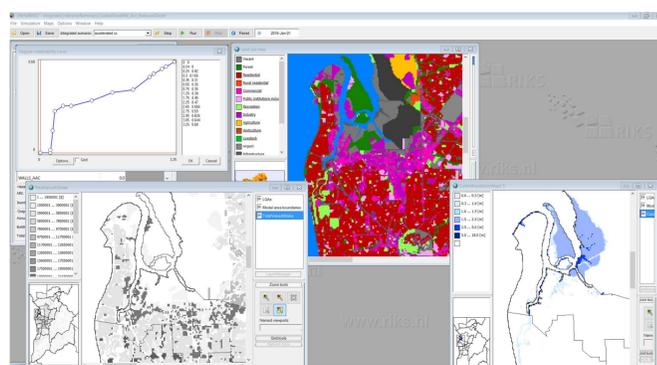
UNHaRMED User Interface showing hazard and exposure maps and vulnerability functions.

Gawler River UNHaRMED Mitigation Planning - GRUMP

Working with the Gawler River Floodplain Management Authority, its 6 constituent councils and the Department for Environment & Water's Fire and Flood team we have been assessing structural and non-structural risk reduction options against different scenarios of economic and population development in the floodplain.

The results are to be used to build the business case for investment in improved flood defences and to develop a more strategic, long-term approach to understanding and reducing flood risk in a key development area to the north of Adelaide. Risk assessment has included assessing the direct damage to buildings, roads, and agriculture, along with indirect impacts due to service disruption following flood events. Below are results for damages per return period and expected annual damage (EAD) plotted spatially and against time.

EAD 2018: $7.3 million

EAD 2040: $7.9 million

EAD 2060: $9.2 million
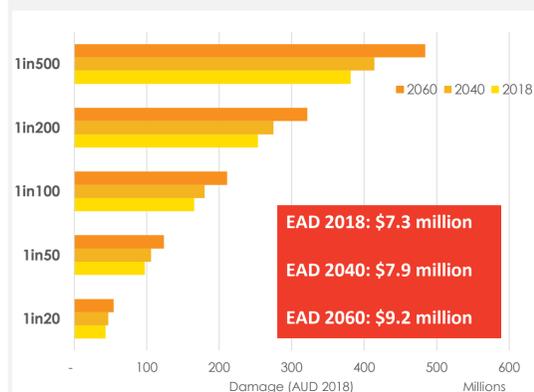
Baseline scenario of changing risk due to economic and population growth in the floodplain.

EAD 2018 - Baseline

Implementing a floodway in the circled area reduces the 1in50 year damage from $98million to $73million and the expected annual damage (EAD) from $7.3million to $6.4million

EAD 2018 - Floodway

Maps of EAD per hectare across the floodplain

Exercise ForeThought: State Strategic Mitigation Exercise – Coastal Flooding & Climate Change

A two-day exercise was run with stakeholders from across State, and Local Governments, along with private sector representatives and NGOs to better understand and plan for sea-level-rise (SLR) and coastal flooding in Port Adelaide. The discussion exercise was designed to better plan mitigation activities by taking a multi-agency perspective and exploring different scenarios of SLR, population growth and risk reduction actions.

UNHaRMED was used to model these different scenarios and help stakeholders visualise, understand and quantify the trade-offs between different actions. The first day provided a foundation for the group of 50 participants to understand how the risk was changing before day 2 demonstrated the costs and benefits of different mitigation actions.

As the project sponsor, SAFECOM is pleased to have had participants from across State and Local Government, critical infrastructure providers and NGOs contributing real-life input into the practical application of the UNHaRMED tool in the Port Adelaide coastal flooding scenario.

This collaboration facilitated complex discussions that highlighted the need for interconnected planning across agencies and sectors to achieve effective mitigation that also take into account the social acceptability of proposed solutions.

Participants agreed that the flexibility of the UNHaRMED tool allows it to be easily applied to different hazards and geographic areas, limited only by the availability of access to appropriate data.

Brenton Keen, Director Emergency Management Office, SAFECOM.

Climate change and bushfire risk - Victoria

Working the Bureau of Meteorology we explored the impact of climate change on extreme fire weather to better understand potential impacts into the future. Using the BARRA reanalysis dataset we looked at the difference in fire behaviour on the 95th percentile weather between 1990-1995 and 2010-2019. This was to better understand the change that has already happened. These are plotted below.

1990-1999

2010-2019

We also considered the difference in losses to buildings between these two scenarios.

This assessment was also used as the basis for understanding and modelling future climate projections, not shown here. These results have fed into several assessments for a range of organisations.
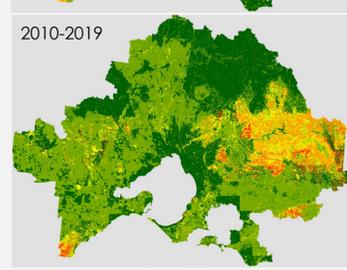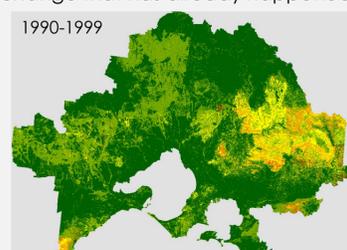
Fire behavior from 95th percentile weather

Difference in losses from 95th percentile event between 1990-1999 and 2010 - 2019

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