bushfire&natural HAZARDSCRC

DECISION SUPPORT SYSTEM FOR ASSESSMENT OF POLICY AND PLANNING INVESTMENT OPTIONS

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An Australian Government Initiative

CRC AUSTRALIA

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TWO DRIVING PRINCIPLES

1 – PREVENTION IS BETTER THAN CURE

"Better to build a fence at the top of a cliff, than park an ambulance at the bottom"

Helen Clark 2015 Sendai

2 – TOMORROW'S RISK IS BUILT TODAY

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

Global Facility for Disaster Reduction and Recovery (2016)

BACKGROUND

Interactive modelling platform to assist decision making

Aims:

- Improve thinking about risk into the future;
- Better manage and minimse risk;
- Position organisations and communities to best achieve this.

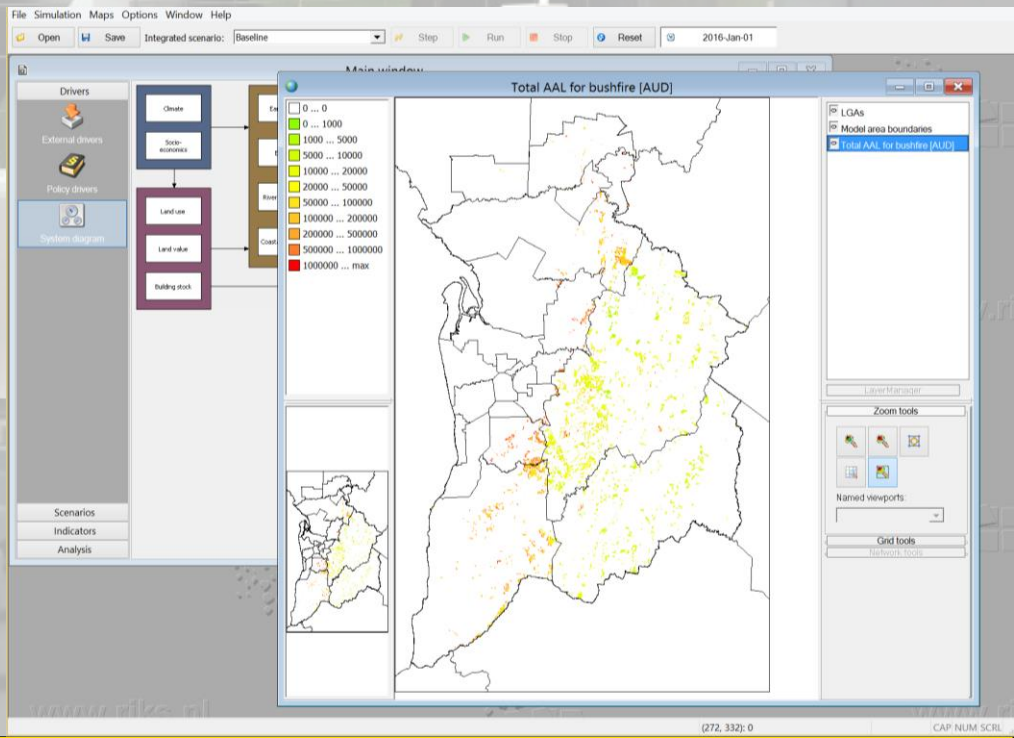
Applied in Greater Adelaide, Greater & Peri-urban Melbourne & Tasmania

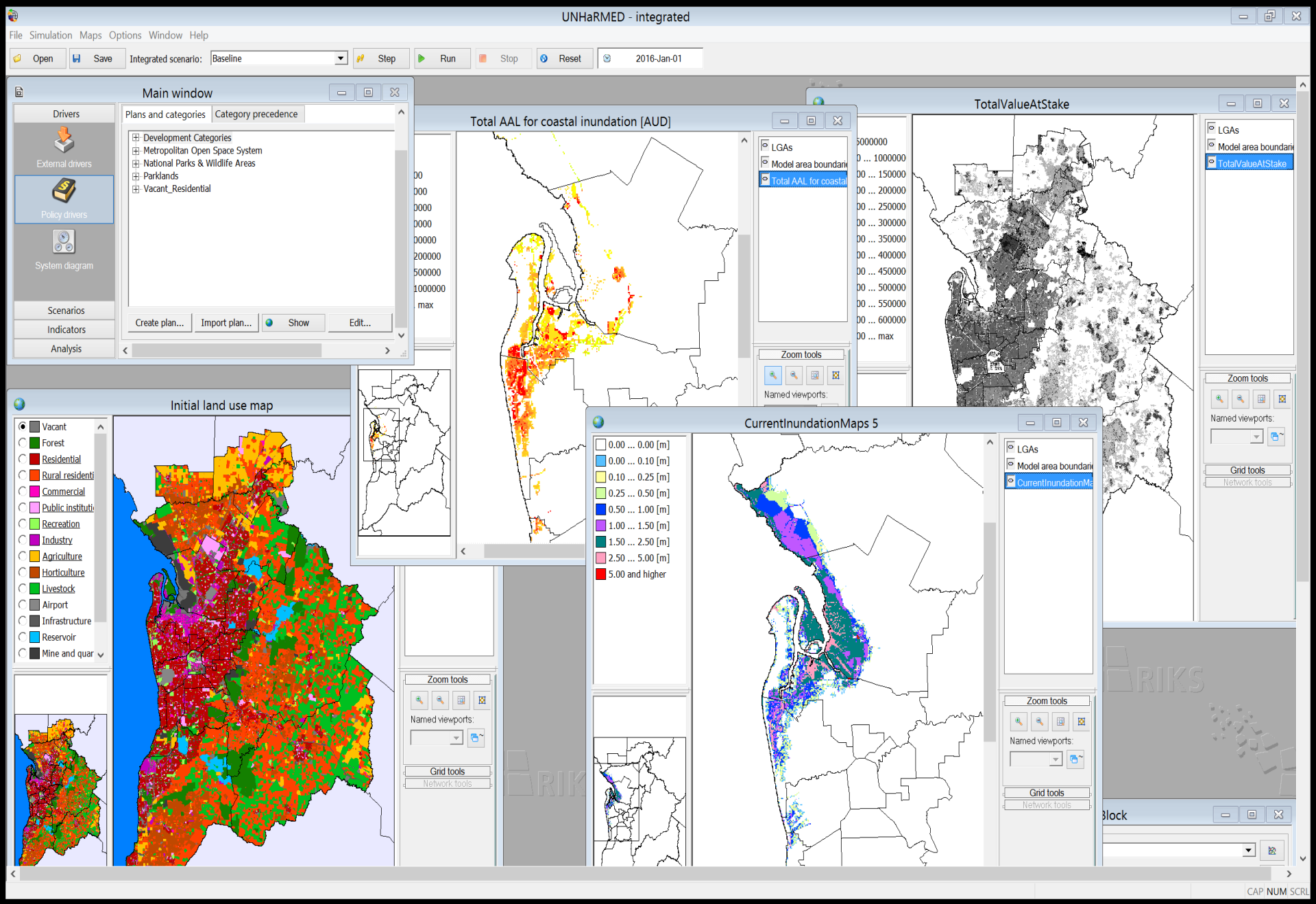
And now WA – Perth metro (extended) region

Framework & DSS for understanding and reducing disaster risk

Considers:

- Long term dynamics & uncertainties
- Exposure
- Hazard intensity and likelihood
- Building vulnerability
- Multi-hazard
  - Riverine flooding
  - Earthquake
  - Coastal inundation
  - Bushfire
- Risk reduction options
  - Land Use planning
  - Structural Measures
  - Land Management
  - Education & Awareness
  - Building Codes




UNHaRMED - integrated
File Simulation Maps Options Window Help
Open Save Integrated scenario: Baseline Step Run Stop Reset 2016-Jan-01
Main window
Drivers
External drivers
Policy drivers
System diagram
Scenarios
Indicators
Analysis
Plans and categories
Category precedence
Development Categories
Metropolitan Open Space System
National Parks & Wildlife Areas
Parklands
Vacant_Residential
Create plan...
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2016 – Flooding that accompanied the storm

ADELAIDE PLAINS

BAROSSA

GAWLER

PLAYFORD

Legend

Probability of urbanisation (2016 - 2030)

- Existing urban
- 0
- 0 - 0.25
- 0.25 - 0.75
- 0.75 - 1

Flood Depth (m)

- 0.0 - 0.1
- 0.10 - 0.25
- 0.25 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.50
- 2.50 - 5.00
- 5.00 and higher

ROADS

- ARTERIAL
- BUS
- COLLECTOR
- FREEWAY
- HIGHWAY
- LOCAL ROAD
- SUB - ARTERIAL

0 1 2 4 Kilometers

Gawler River
Urban Land Use Change (2016 - 2050)
1 in 200 ARI Flood Inundation

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Future Use Options

Consider strategic needs – requirements, tools, capabilities for meeting agency and community expectations

- SWOT analysis of organisation
- TCFD Physical Risk Assessment

Modelling to inform long-term resource needs, vulnerabilities, opportunities

Modelling to inform future 'hotspots' or areas of concern

- Test opportunities to reduce these
- Areas/factors that agencies have limited control over

Future Use Options – How would you like to use the software?

Highlight inter-connections (risk, demographics, LU) *DELWP*

Prioritise mitigation options based on effectiveness – evidence based *CFA*

To benchmark, monitor, model effectiveness of hazard mitigation, strategic mitigation planning and implementation *EMV*

To articulate how stakeholders contribute and collaborate to implement diverse mixes of treatment for best value *EMV*

Provide advice to Government regarding future operational and mitigation needs *TFS*

NEW RESEARCH DIRECTIONS

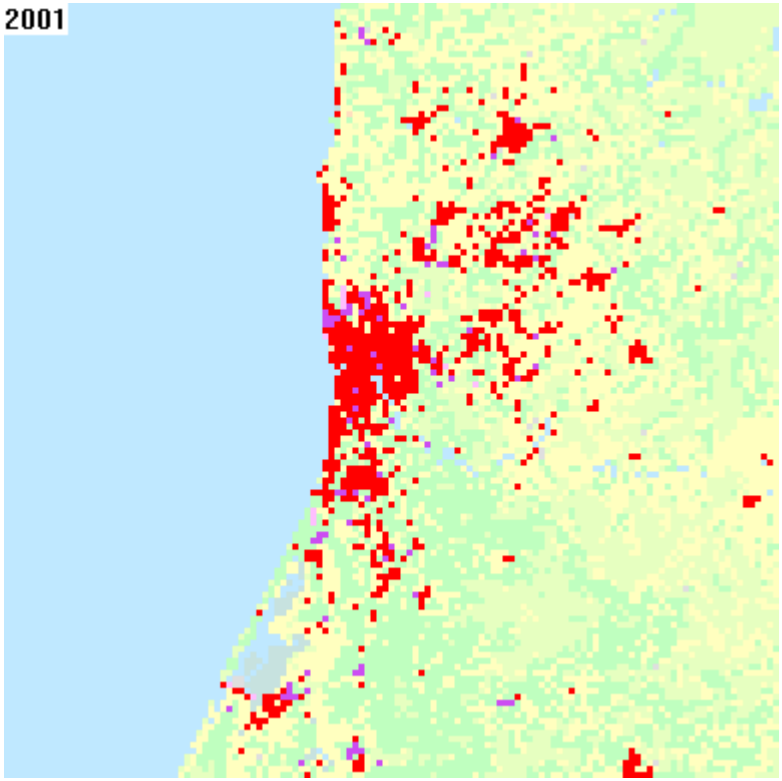
Activity-Based Modelling

Improved consideration of vulnerabilities of a range of societal groups

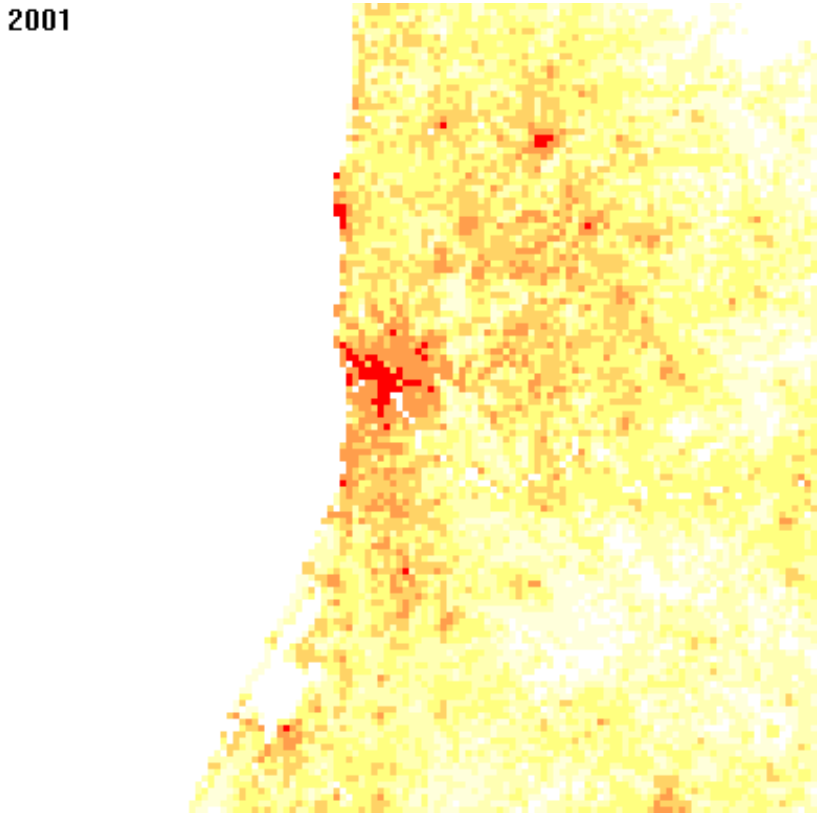
Instead of assuming a uniform population with a uniform behaviour and risk profile

Via modelling the spatial and temporal dynamics of specific demographics groups' locational choices.

Activity-based Modelling



Land use



Population

Agent-Based Modelling

Improved consideration of the impact of behavioural choices, experiences and risk reduction options on bushfire risk

Help to better understand the impact of social characteristics on bushfire vulnerability;

- the experience people have with bushfires and
- the time they have spent residing in the country or urban environments

Will also aim to enhance the understanding of various risk reduction options

Agent-Based Modelling

THANK YOU

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AND NOW TIM…

BREAKOUT SESSION – 13:20

Government of Western Australia
Department of Fire & Emergency Services
Office of Bushfire Risk Management

DFES
Department of Fire & Emergency Services

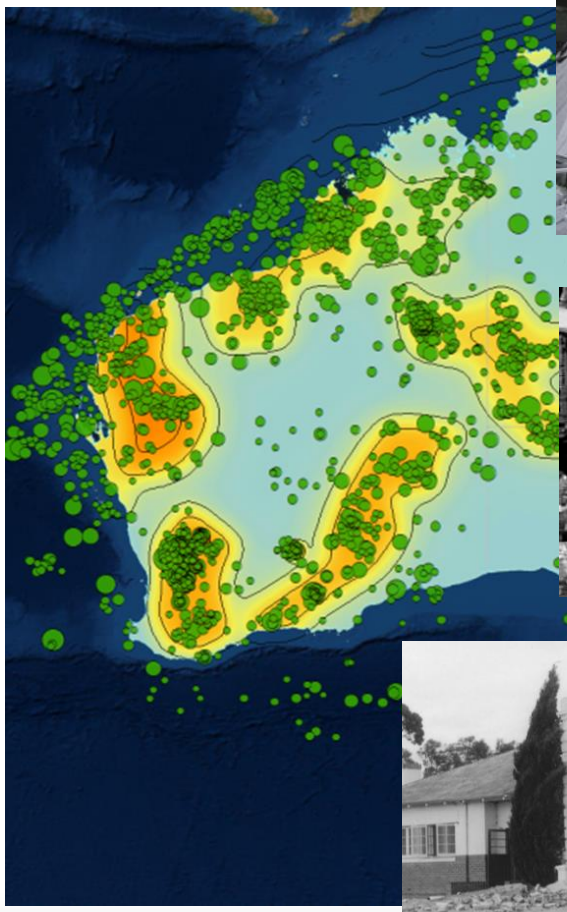
WA DECISION SUPPORT SYSTEM – AN END USER PERSPECTIVE

Tim McNaught
BNHCRC RAF
13 April 2018

WHY ARE WE INTERESTED?

1) Build on cross-agency/government collaboration from bushfire reform (common issues, collective solutions)
2) Supporting policy development and integration of science into policy
3) Better informed decisions/longer-term investment decisions
4) More efficient spending of limited funds

EARTHQUAKE – POTENTIAL ACTIVITY IN SW WA



COASTAL INUNDATION

1) Changing climate, rising sea level
2) Increased frequency and severity of tropical cyclones

- Increased likelihood and severity of storm surges and coastal inundation

BUSHFIRE – INCREASING RISK

WA CASE STUDY AREA