Delivering (geoinformation about) risk

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Overview

- Who are Risk Frontiers & what we do?
- Where are the risks?
  - Address based risk rating
  - National Flood Information Database
  - Our risk & catastrophe loss models
- Disseminating the knowledge
  - Risk
  - Loss
- Web & Mobile

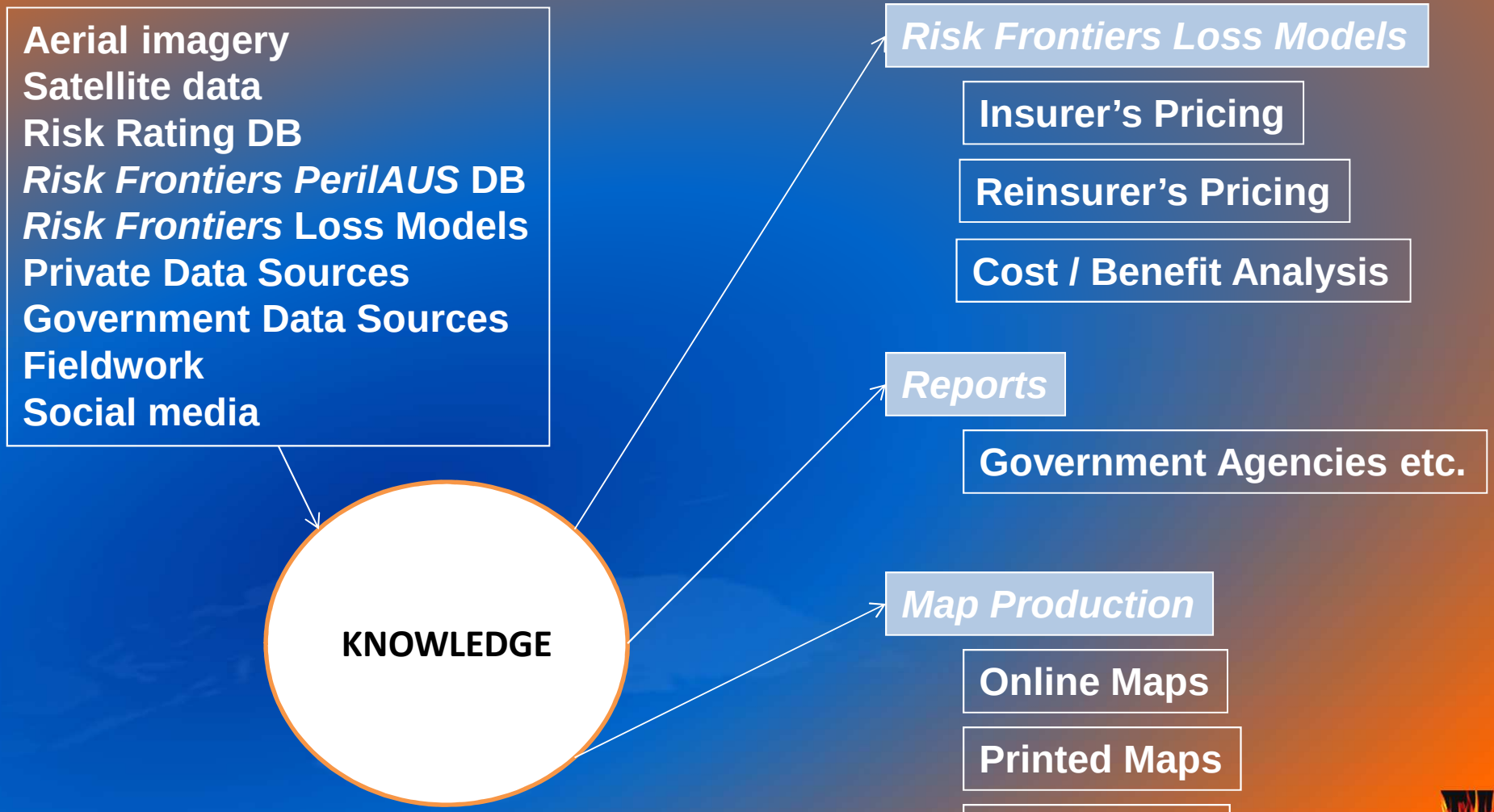
Introducing Risk Frontiers

- Help insurers and reinsurers better understand and price natural hazard risks in the Asia-Pacific region
- Develop Probabilistic Catastrophe Models
- Provide an independent view on catastrophe risks
- Undertake research in natural hazards
- Perform post-event reconnaissance
- Increase public awareness of natural perils & aid policy development

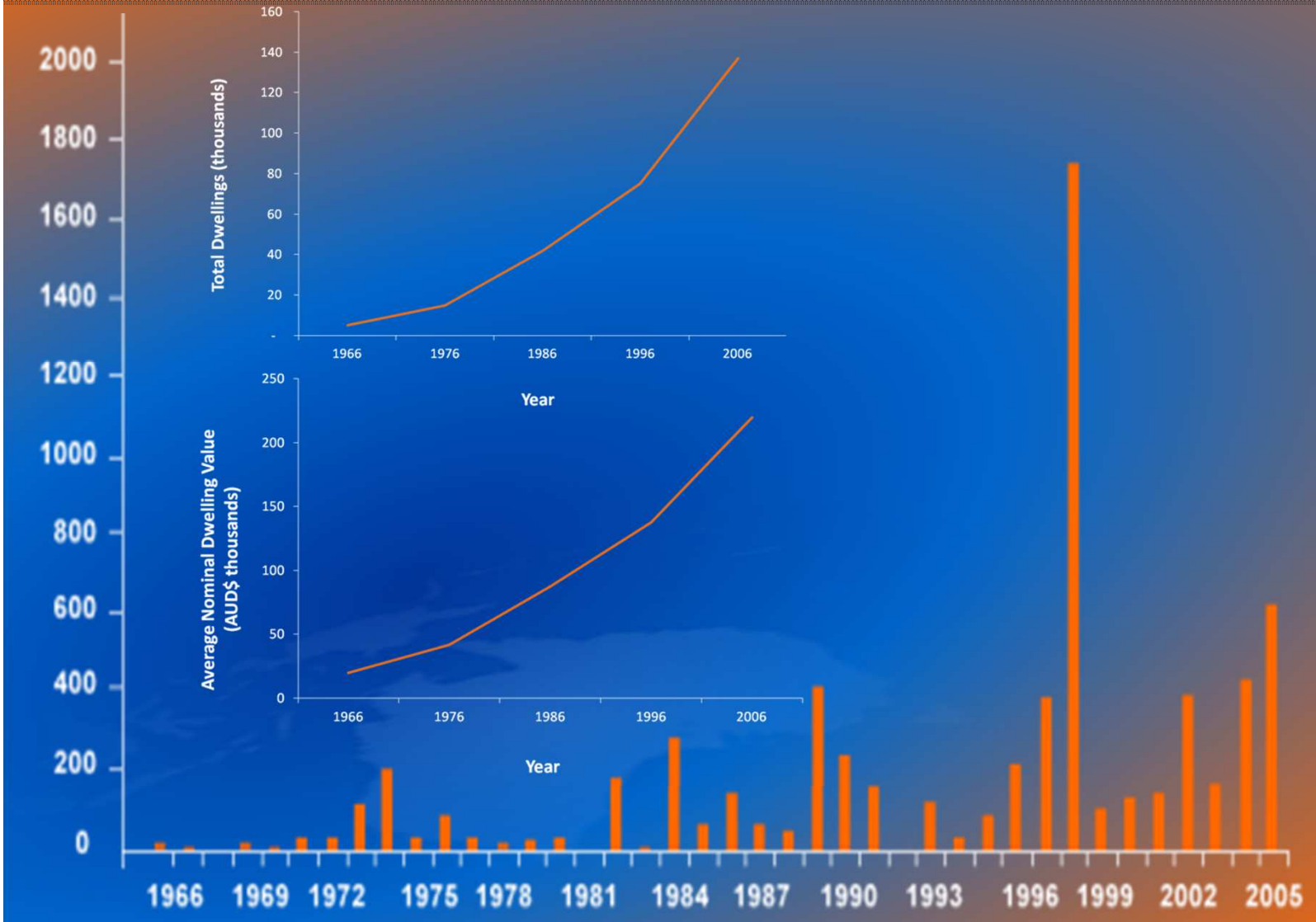
What Do We Have To Share?

- Multi-Peril Workbench version 3 and beyond
- Flood Exclusion Zones (FEZ™)
- National Flood Information Database (NFID)
- Earthquake and volcanic loss models for New Zealand and Japan
- Tropical cyclone loss model for South Korea
- Developing Flood models for SE Asia
- Post-Event reconnaissance of Christchurch Earthquakes, Queensland Floods, Tropical Cyclone Yasi, Tasmanian & Victorian fires
- Normalisation of ICA loss data (2011/2012)
- Invited submission to the Royal Commission on the 2009 Victorian fires
- Invited submission to the 2011 National Disaster Insurance Review

Knowledge / Data Flow

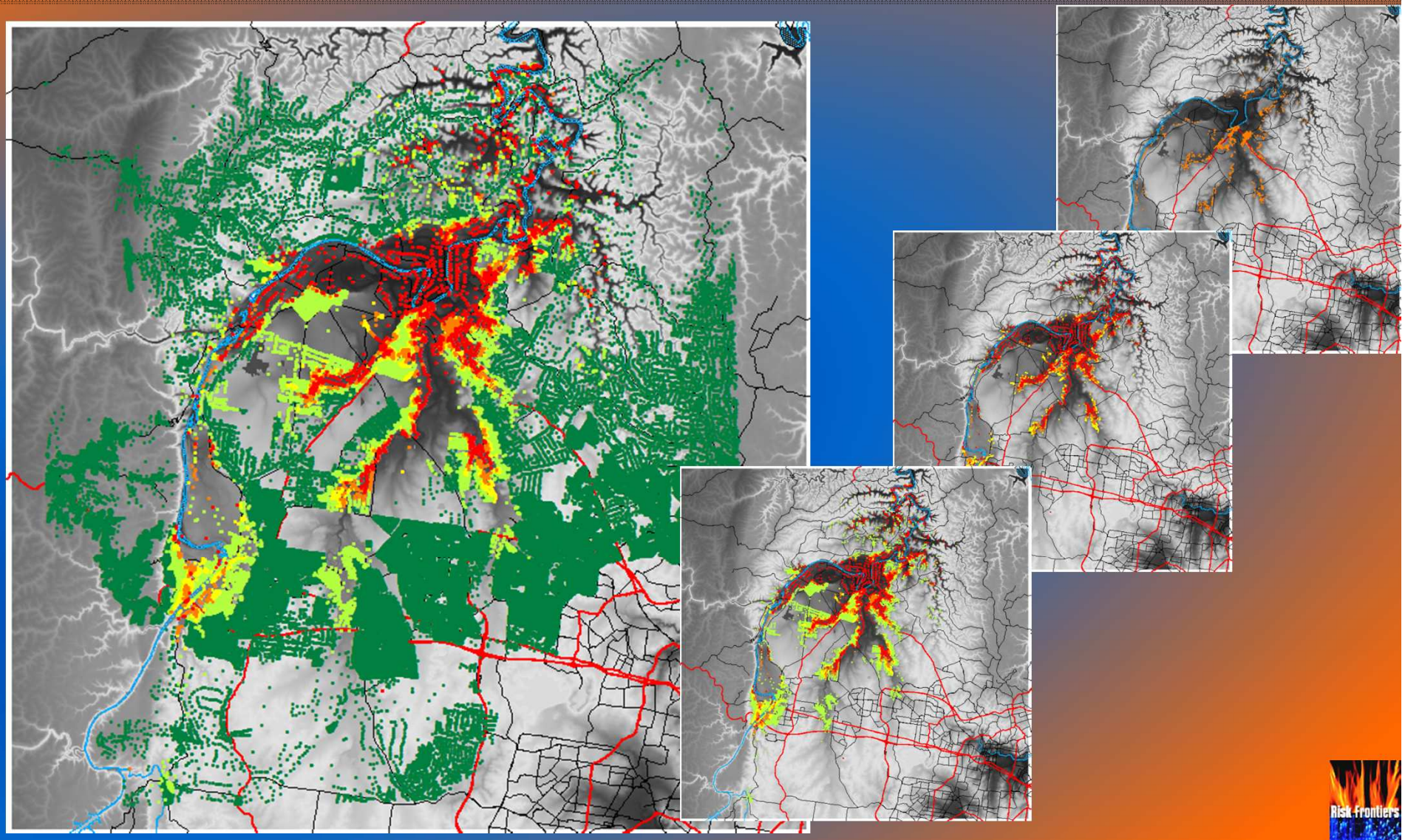


Finding the Risks : Looking Back

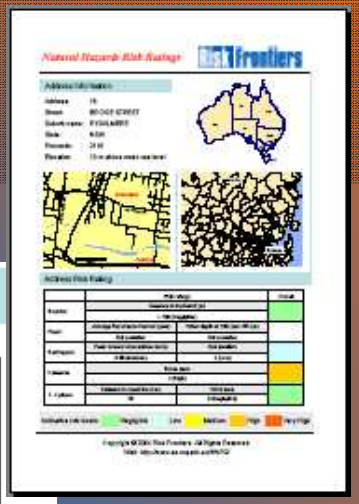


Source: PerilAUS; Crompton & McAneney, 2008. *Environ. Science & Policy)*

Finding the Risks : Looking Forward



Risk Rated Address Tool

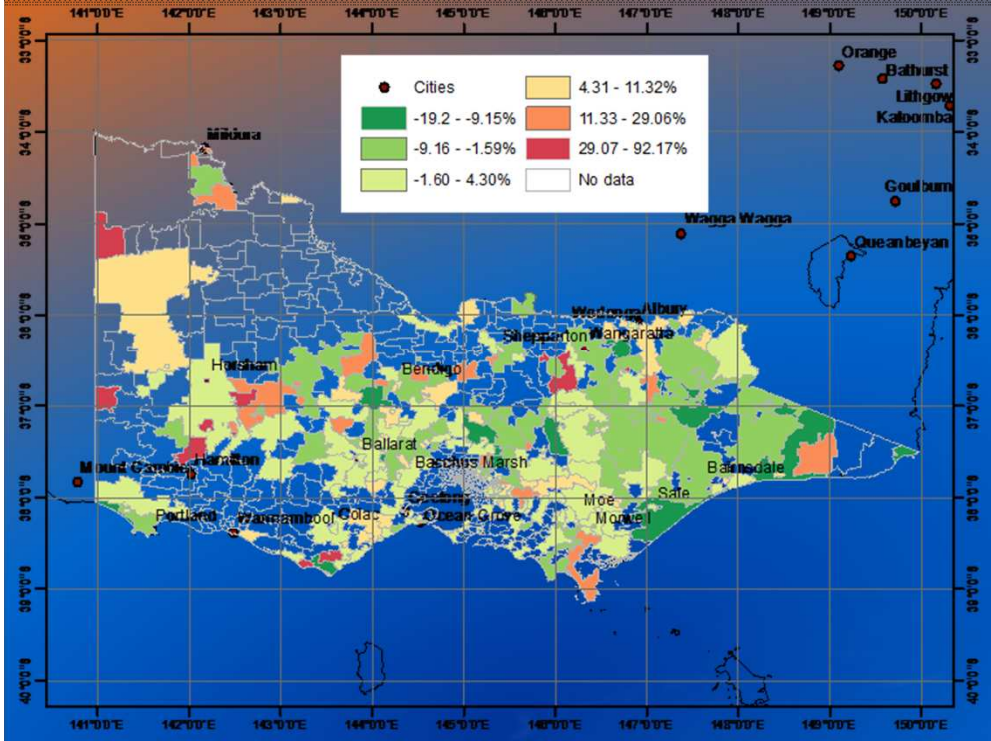


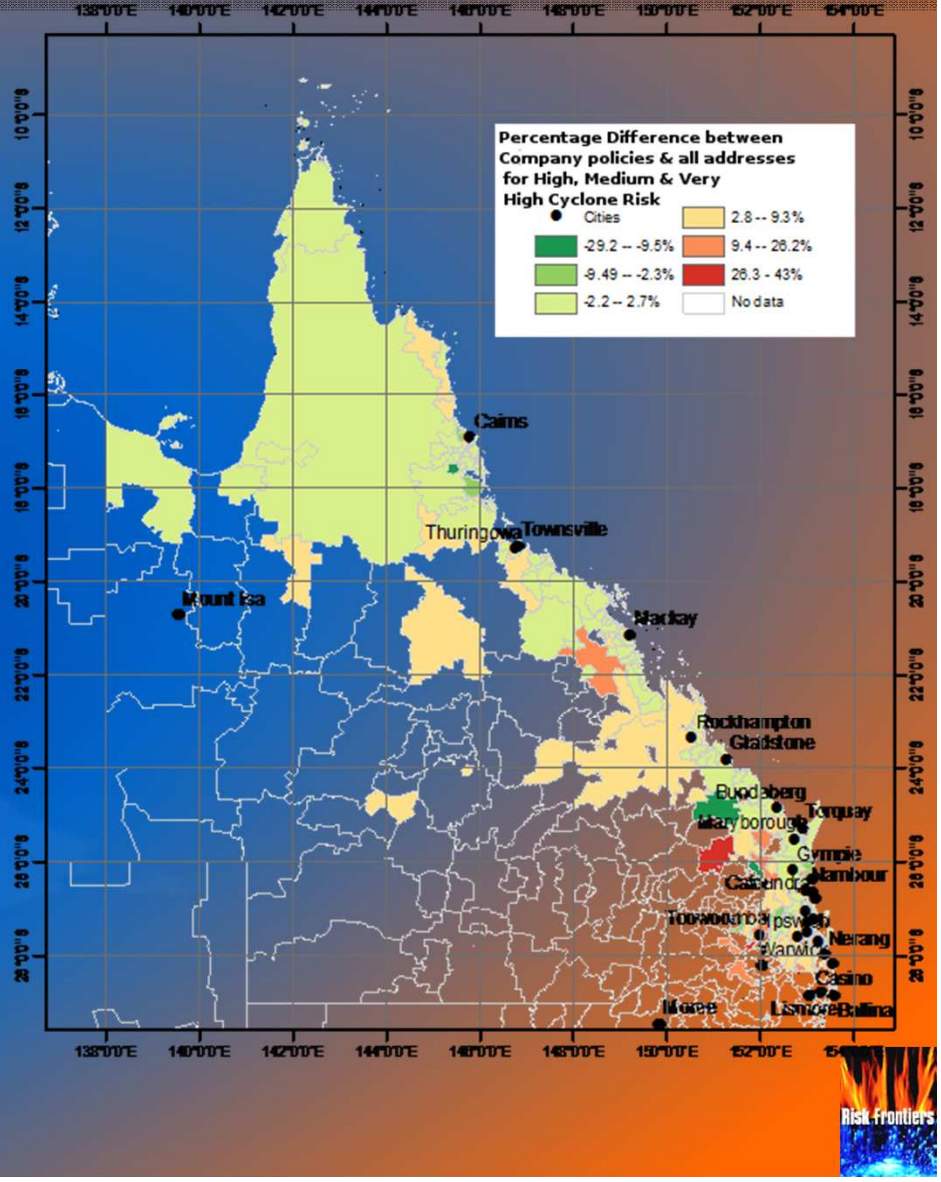
Address Risk Rating

	Risk ratings		Overall
Bushfire	Distance to bushland (m)		3
	200-400 (Medium)		
Flood	Average Recurrence Interval (year)	Water depth at 100-year ARI (m)	2
	Above 100	None	
Earthquake	Peak Ground Acceleration (m/s²)	Ground zonation	2
	0.62 (Low)	2 (Low)	
Hailstorm	Storm zone		4
	4 (High)		
T. Cyclone	Distance to coast line (km)	Wind zone	2
	30	2 (Low)	

Indicative risk levels: 1 Negligible | 2 Low | 3 Medium | 4 High | 5 Very High

Risk Rated Addresses Applied

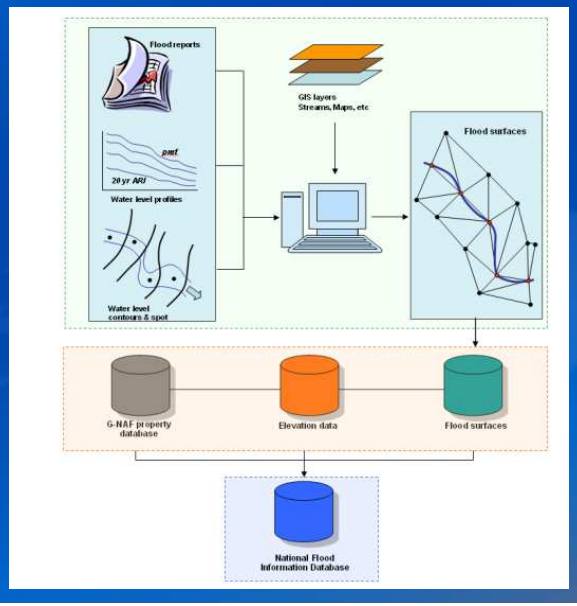


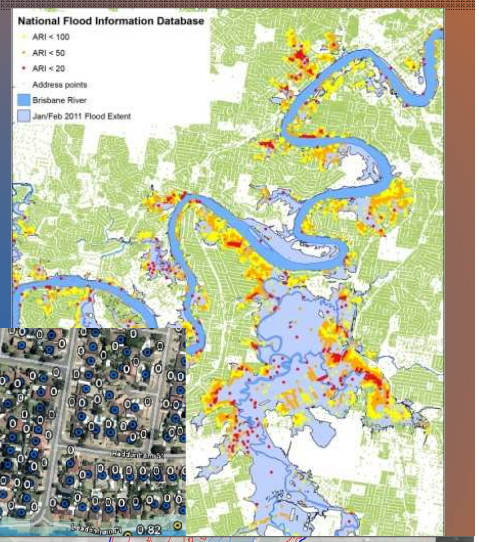


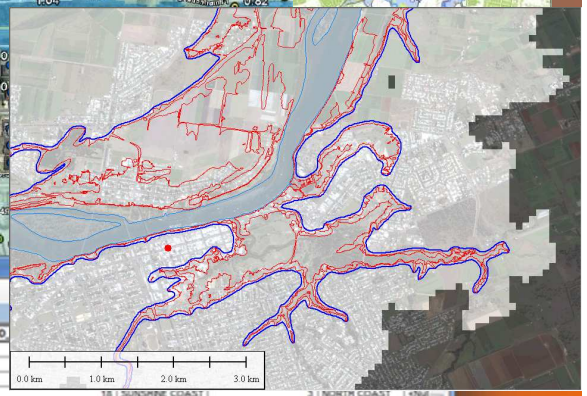
Percentage of portfolio per postcode compared to the proportion of total addresses in particular hazard categories

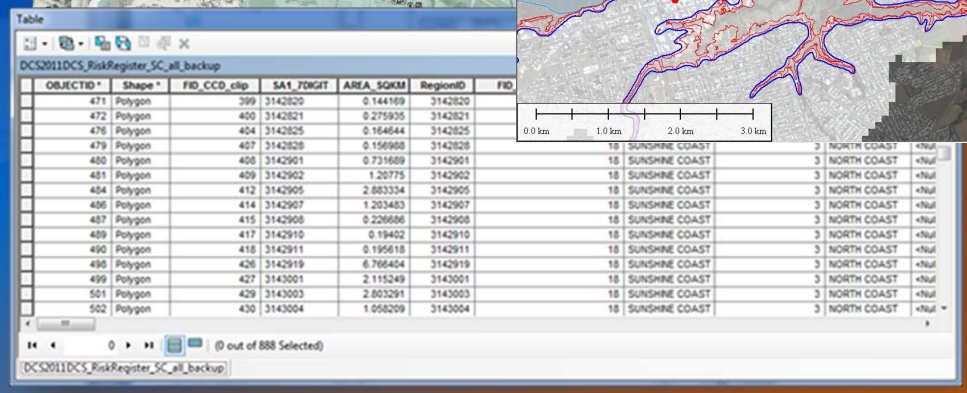
National Flood Information DB

- 12M addresses
- Aggregation of inconsistent data into a common format
- 60+ study areas
- 1-5 flood surfaces / flood extents
- Metadata & QA checks





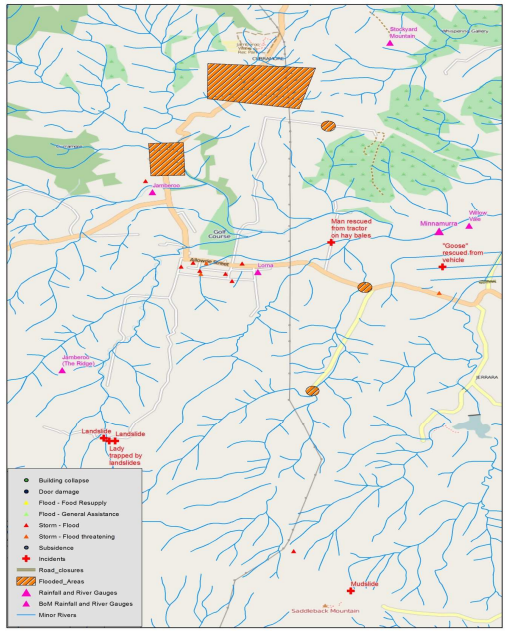


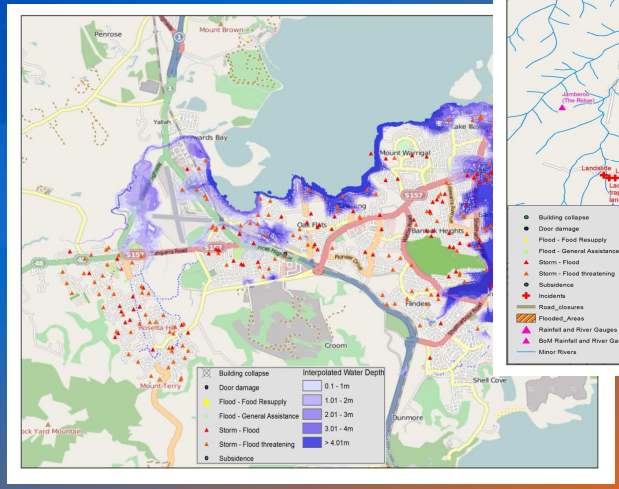


Risk Communication : Flood Intelligence

State Emergency Service required a review of flooding in a region

- Flood depth / extent data collection
- Examine behavioural factors
- Review Flood Response Plans
- Develop mobile apps for first responders

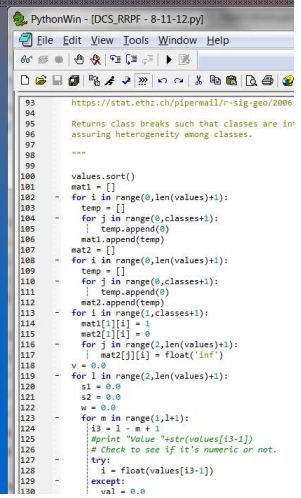


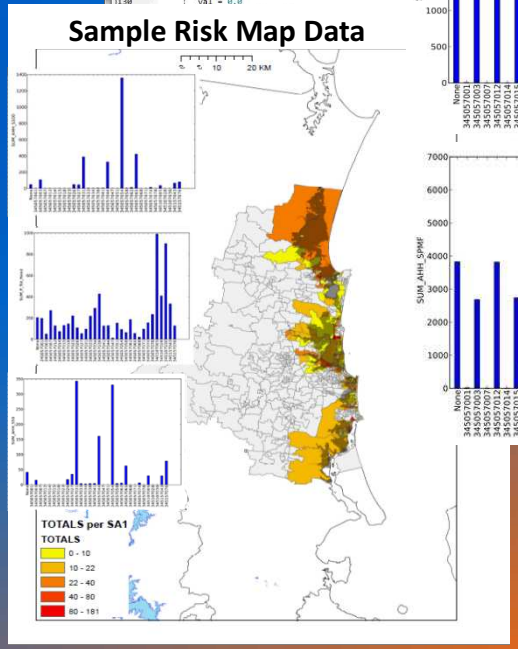


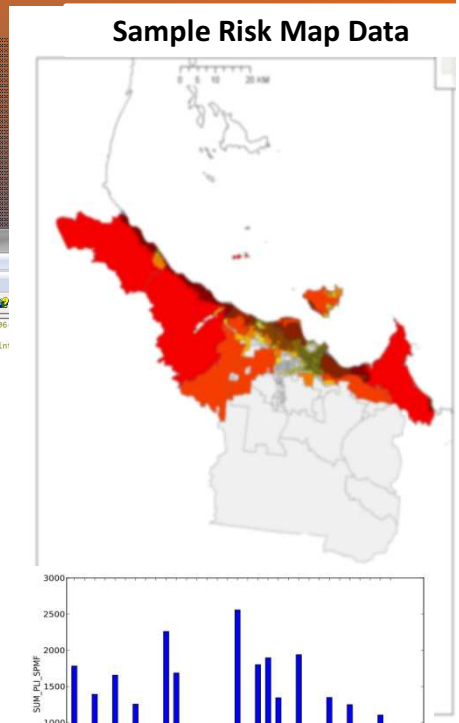
Mapping Risk On the Fly

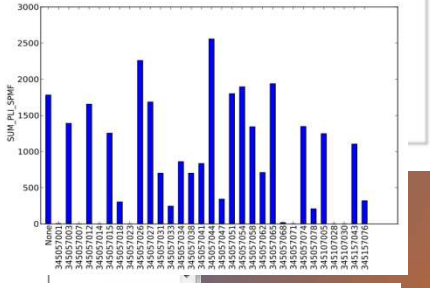
Process a collection of data to rapidly produce regional risk assessments

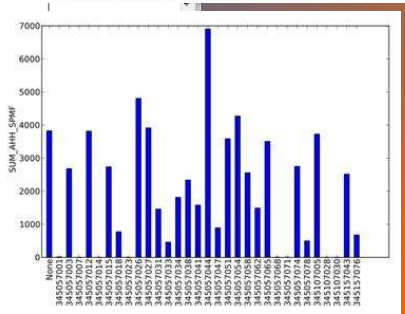
- Inconsistent (but regularly updated) data sets (e.g. updated flood modeling, changing population or infrastructure data)
- Variable client reporting requirements
- Need for summary statistics by regions
- Easily updated / modified
- Easily run by non-experts
- Minimal process supervision required
- Reproducible analysis
- 1 map/min
- Publishable to mobile & web







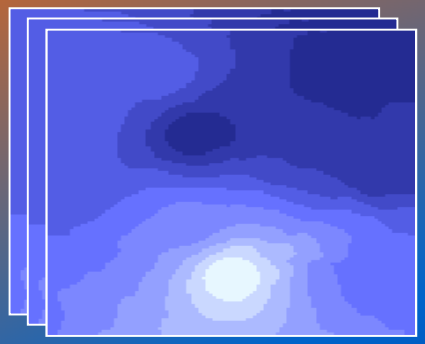




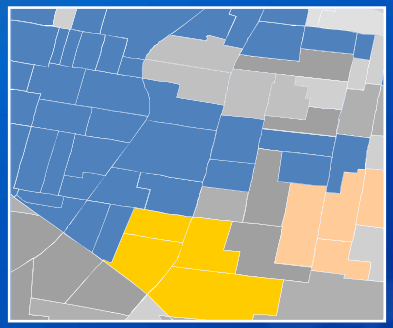
Risk Frontiers Multi-Peril Workbench

- Suite of Catastrophe loss models for Australia & selected Asia-Pacific countries
- Calculates exceedance probability curves for all major Australian catastrophe risks
- Varying Input resolutions: address, postcode or larger
- Combines curves of different perils, flexible reinsurance modelling

General Model Framework

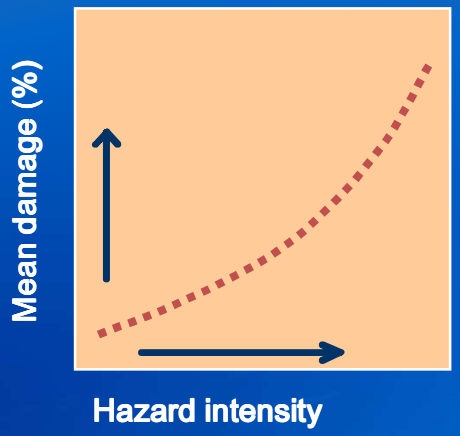


Hazard

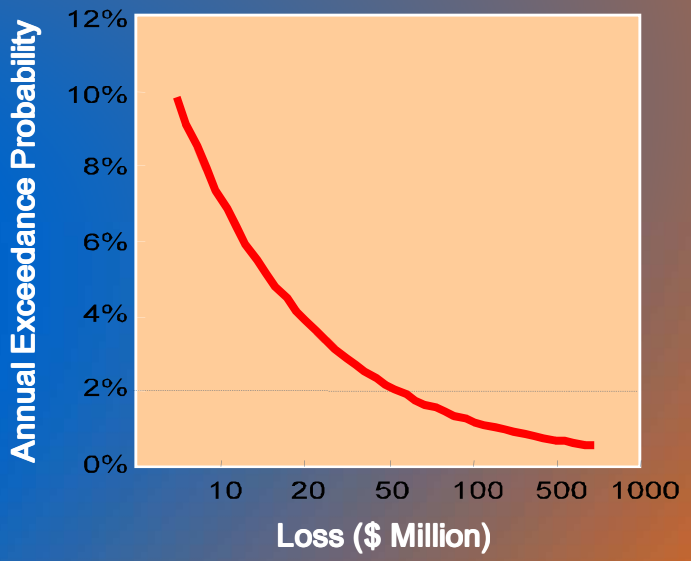


Exposure

Risk = *f* (Hazard, Exposure, Vulnerability)

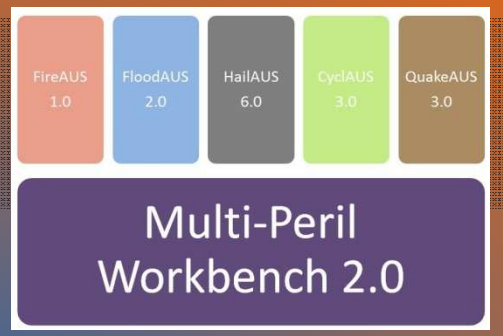


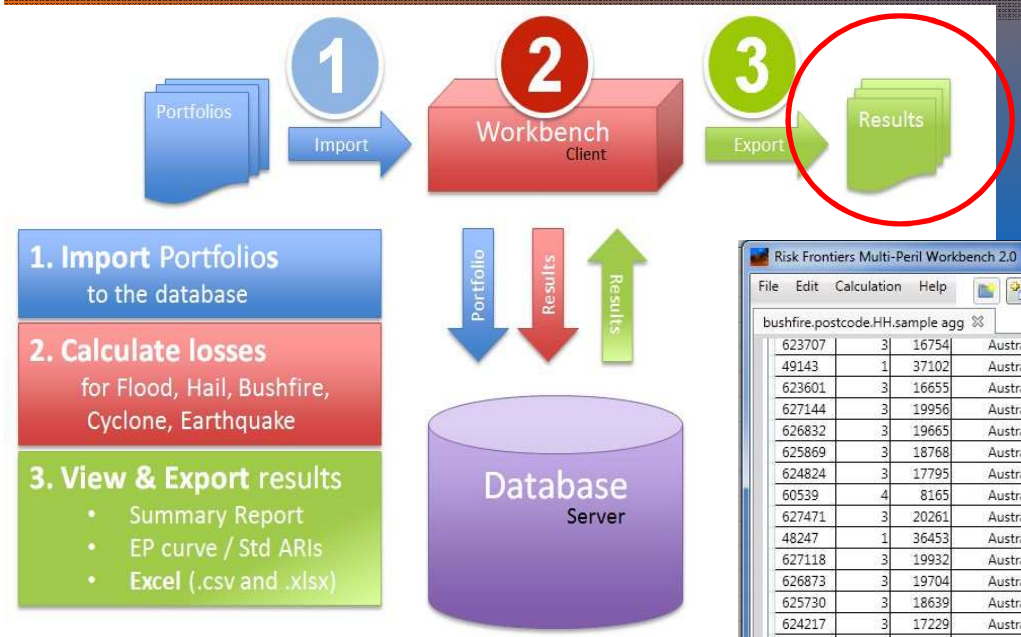
Vulnerability

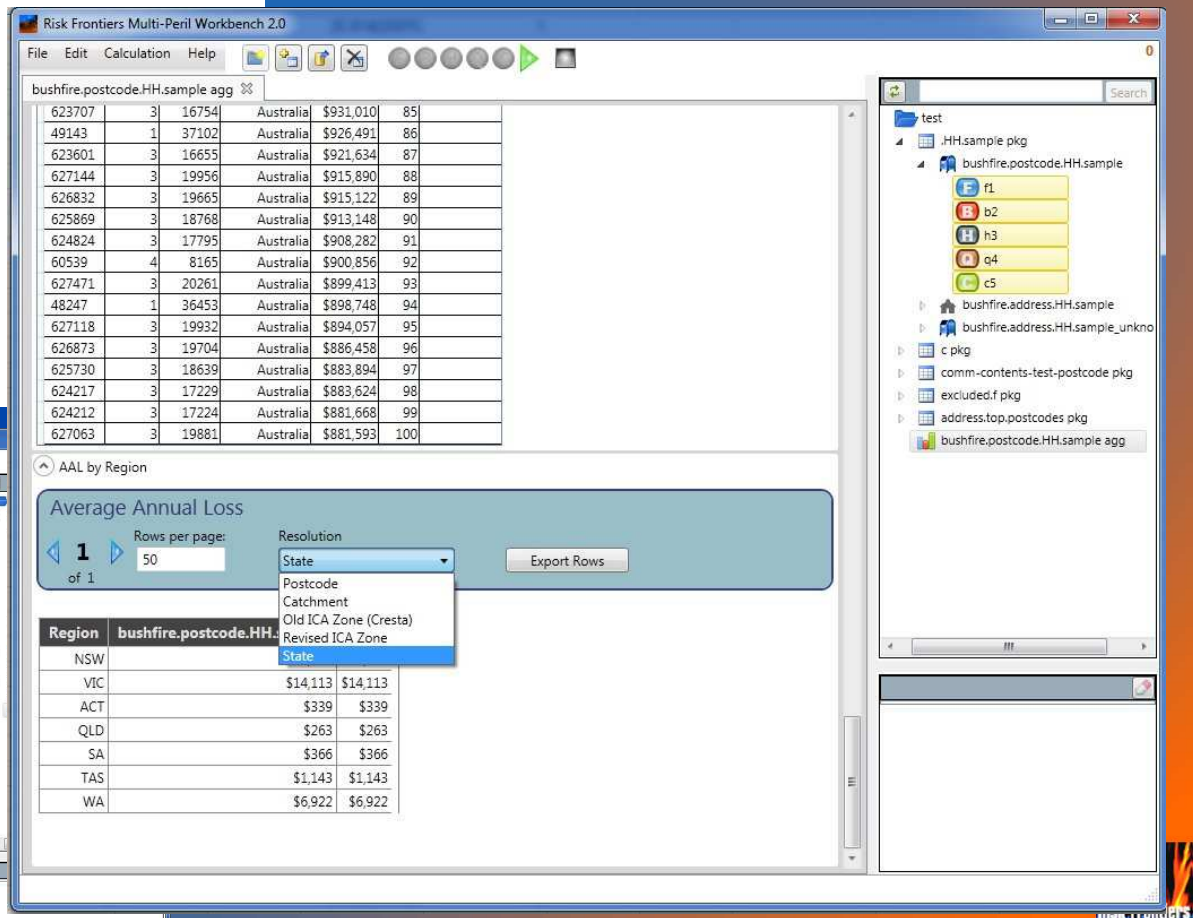


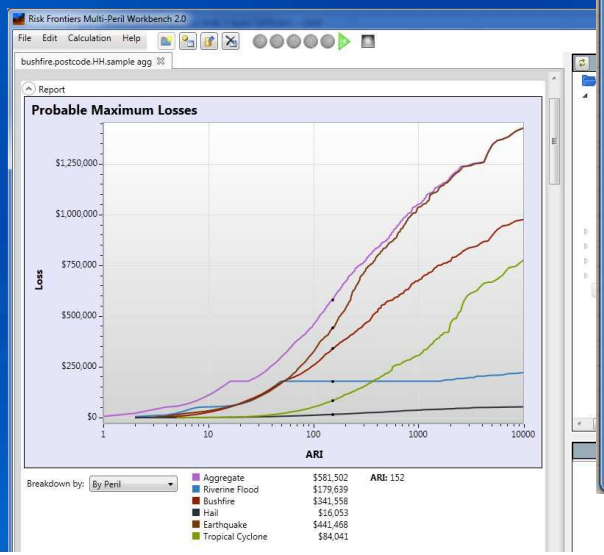
Impact

Catastrophe Loss Models



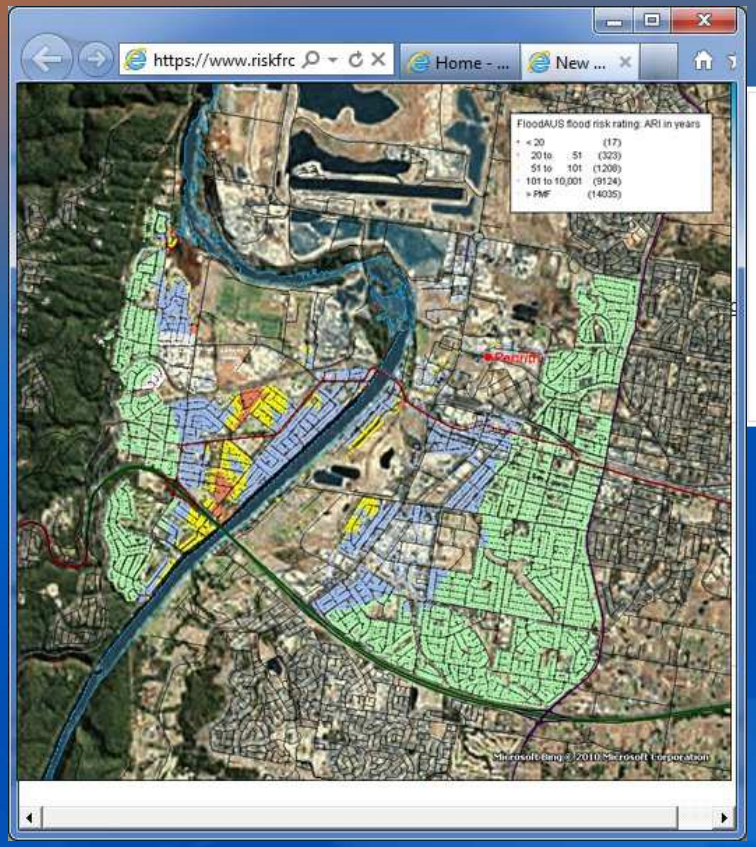




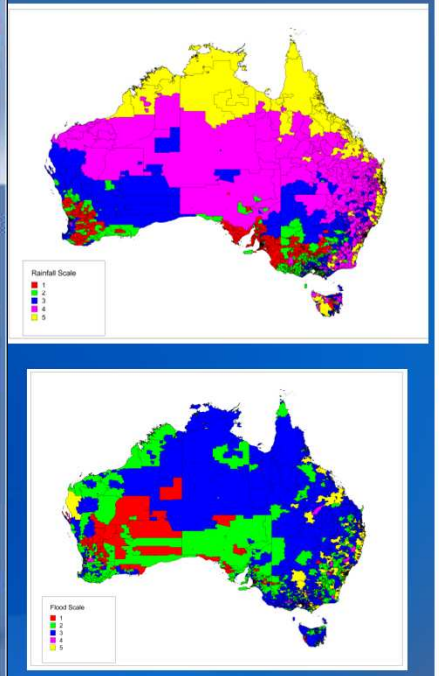


Loss Visualisation : Google Earth

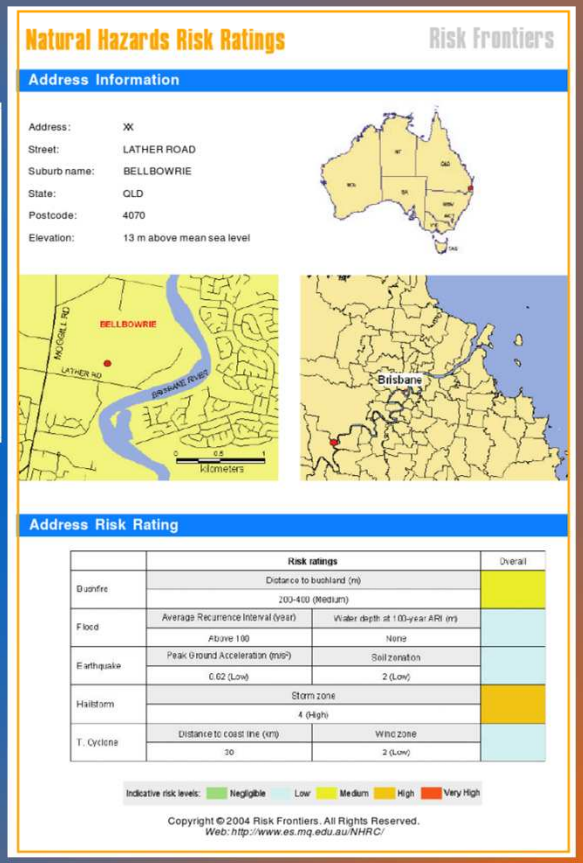
What About The Web?



Portfolio risk visualisation

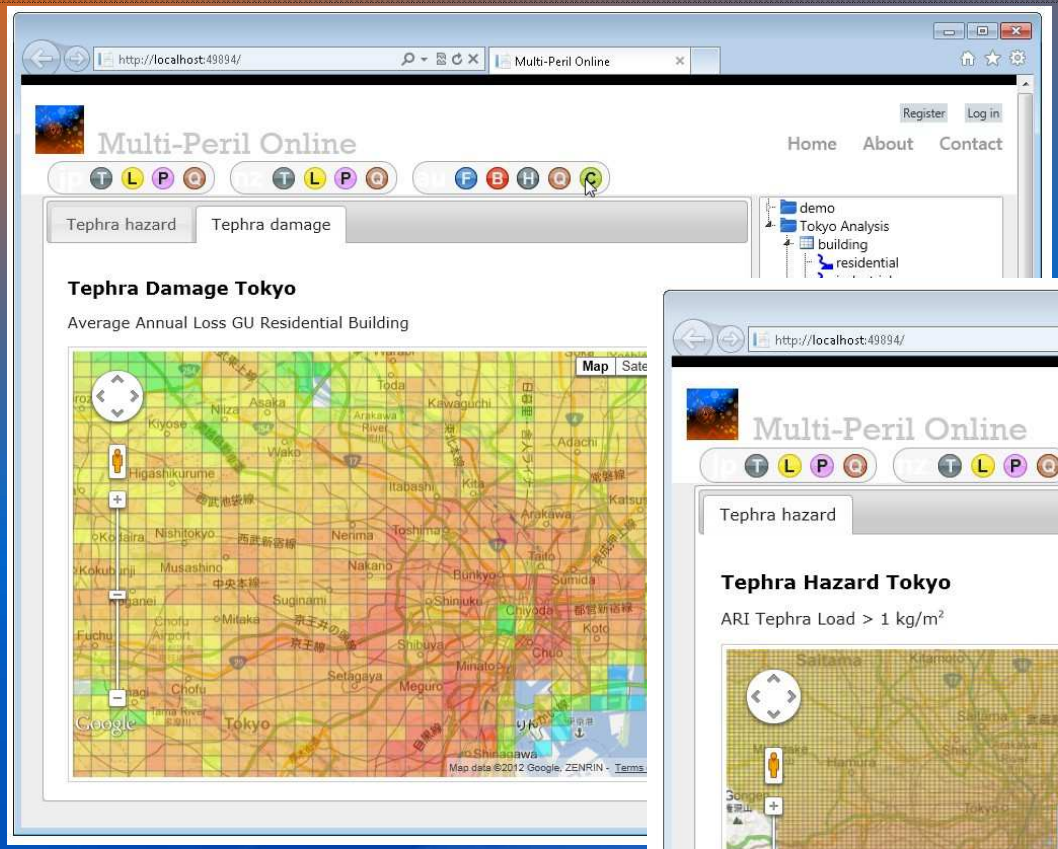


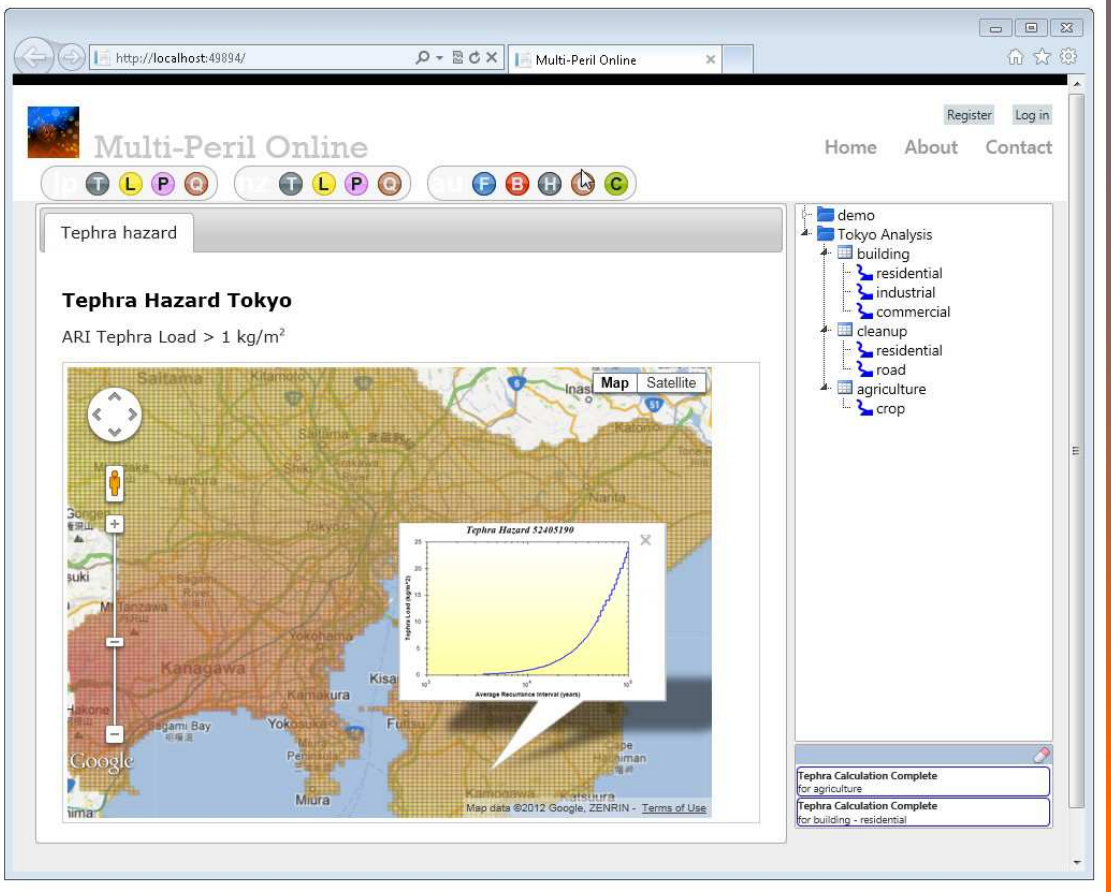
Hazard / Risk / Exposure Maps



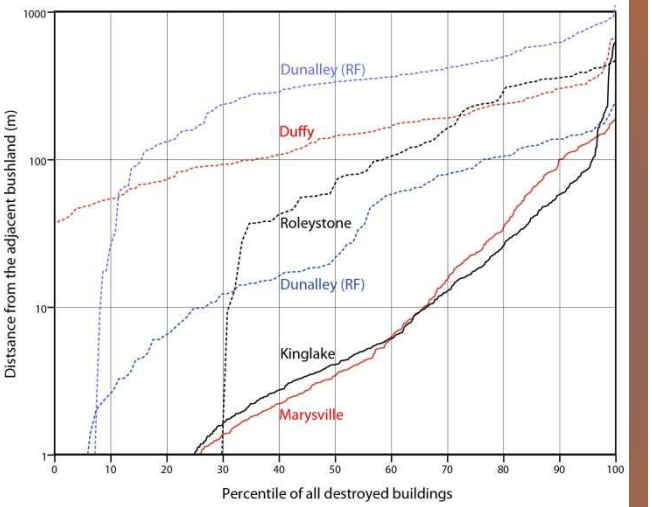
Automated Reporting

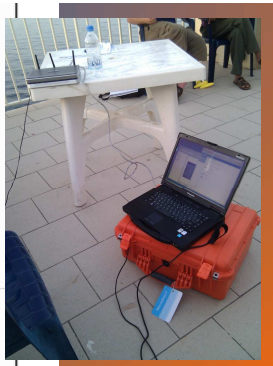
What About The Web?





Tasmanian Fires – Aerial Photography & Field Survey





Conclusions

- Access to high quality data is important
- Must be able to communicate the knowledge
- Web & mobile significant growth areas
- Maturing APIs make deployment faster & easier

Thank you

www.riskfrontiers.com.au

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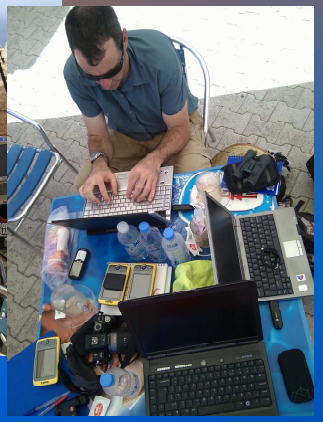
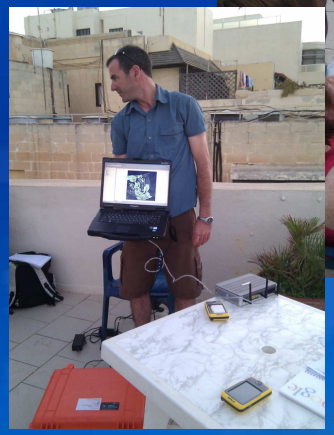
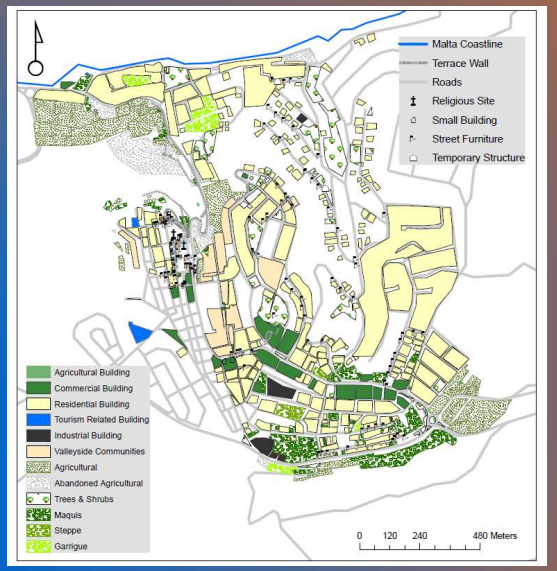
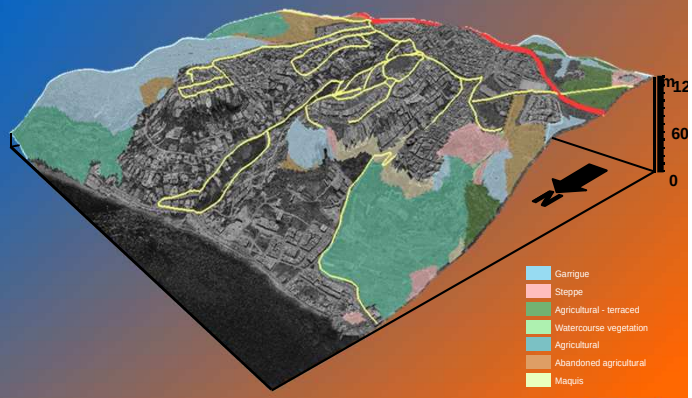
Mobile Mapping & Dissemination





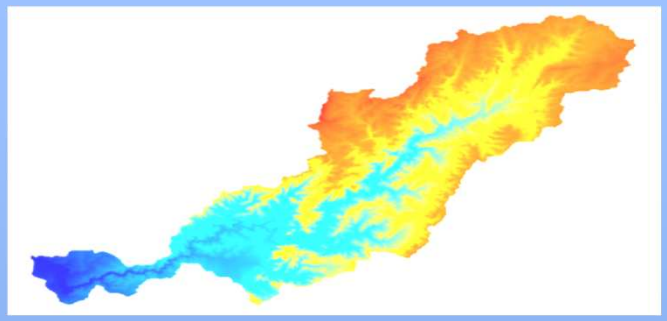




Risk Frontiers

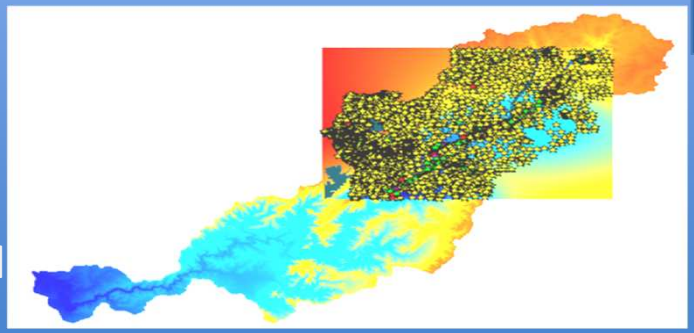
FloodAUS Loss Model – Beyond NFID

Catchment



Addresses

Combined



NFID

Water Depth, Return Intervals

ARI,Loss ($)

Historical Data

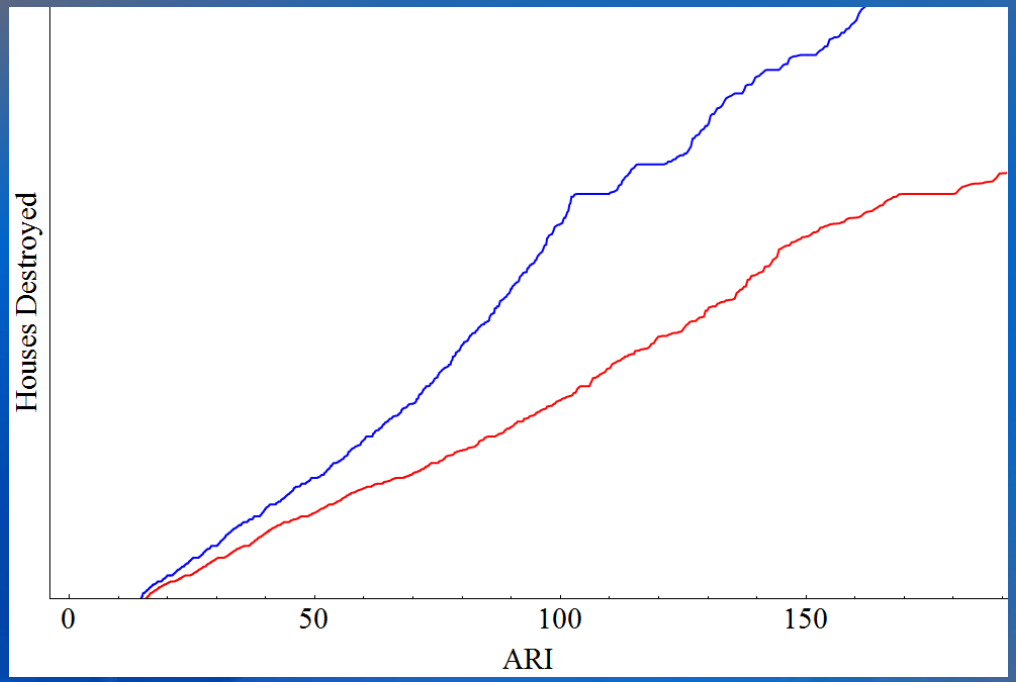
Vulnerability

Exposures (Addresses)

Company Data

Application – Risk Selection Effect on EP-Curve

Original portfolio



Removed high risk addresses

Blue: Market-distributed portfolio EP-Curve
Red: Removed properties less than 100m of the bush