



# Fire DST – a lead end user perspective

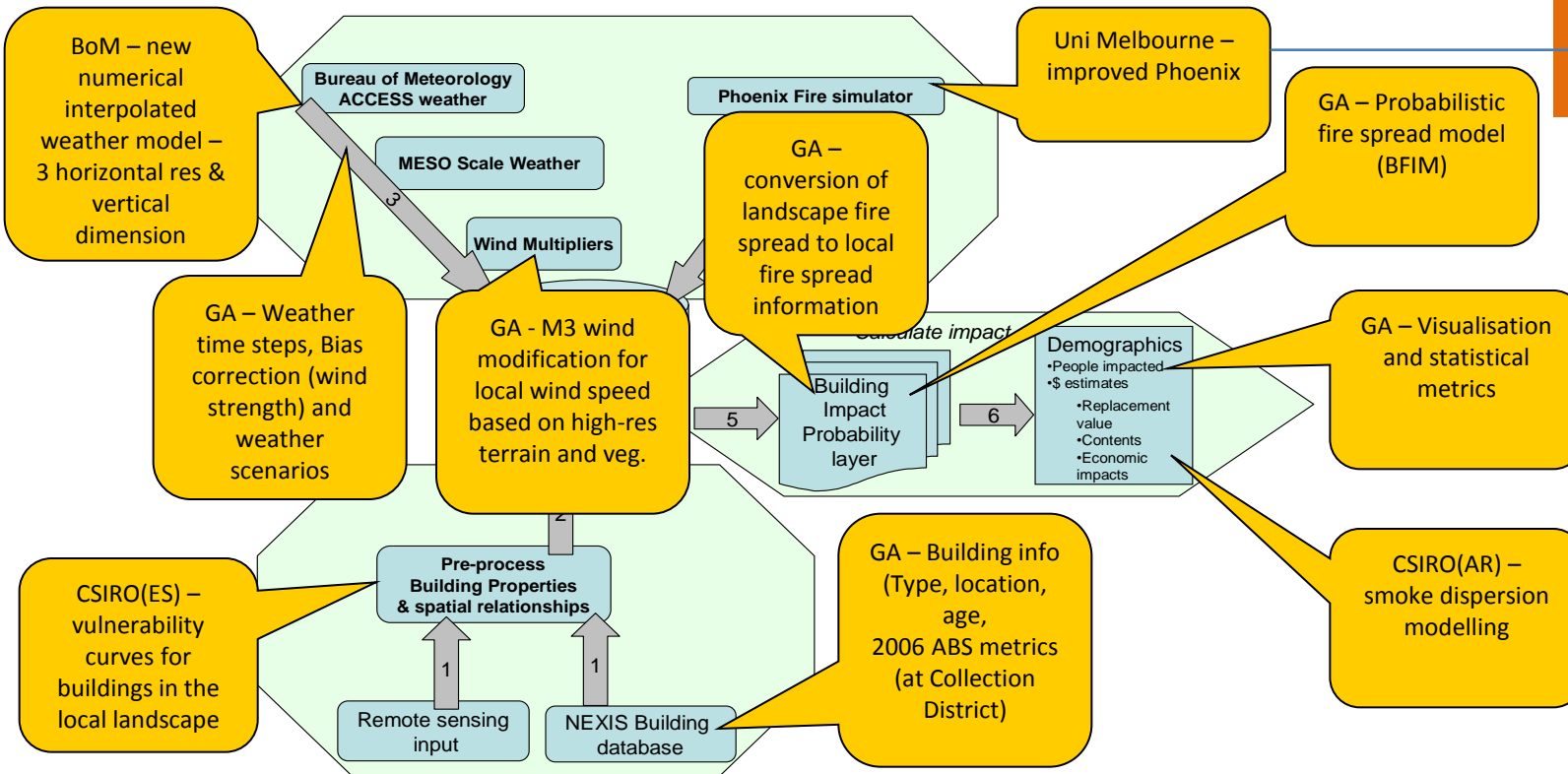
Ralph Smith (DFES) &  
David Youssef (MFB)

# FIRE-DST Data Model

## Components by participant

© BUSHFIRE CRC LTD 2012

Able to apply to  
"Australis" or other  
simulator models



# FireDST – Major learning's & leanings

## Successful “proof of concept” undertaking

© BUSHFIRE CRC LTD 2012

Impact modelling (fire context) is a complex undertaking - due to that complexity it suffers from increasing uncertainty as we move through the steps of the impact/risk framework (ignition, fuel, weather, vulnerability, cost model).

Multi-layer cascading “pyramid of uncertainty” means that *impact modelling* and *decision support* is best addressed through a probabilistic approach.

**Deterministic Approach** (best estimate that is current industry practice; useful but needs continuous refinement through integration of “current” field data; - *does not provide any information regarding uncertainty*)

**Probabilistic Approach** (requires industry acceptance as for many it is a new concept: attempts to define uncertainty space & develop a range of “*What If*” scenarios that can be narrowed down as event unfolds)



THE UNIVERSITY OF  
MELBOURNE



Australian Government  
Geoscience Australia



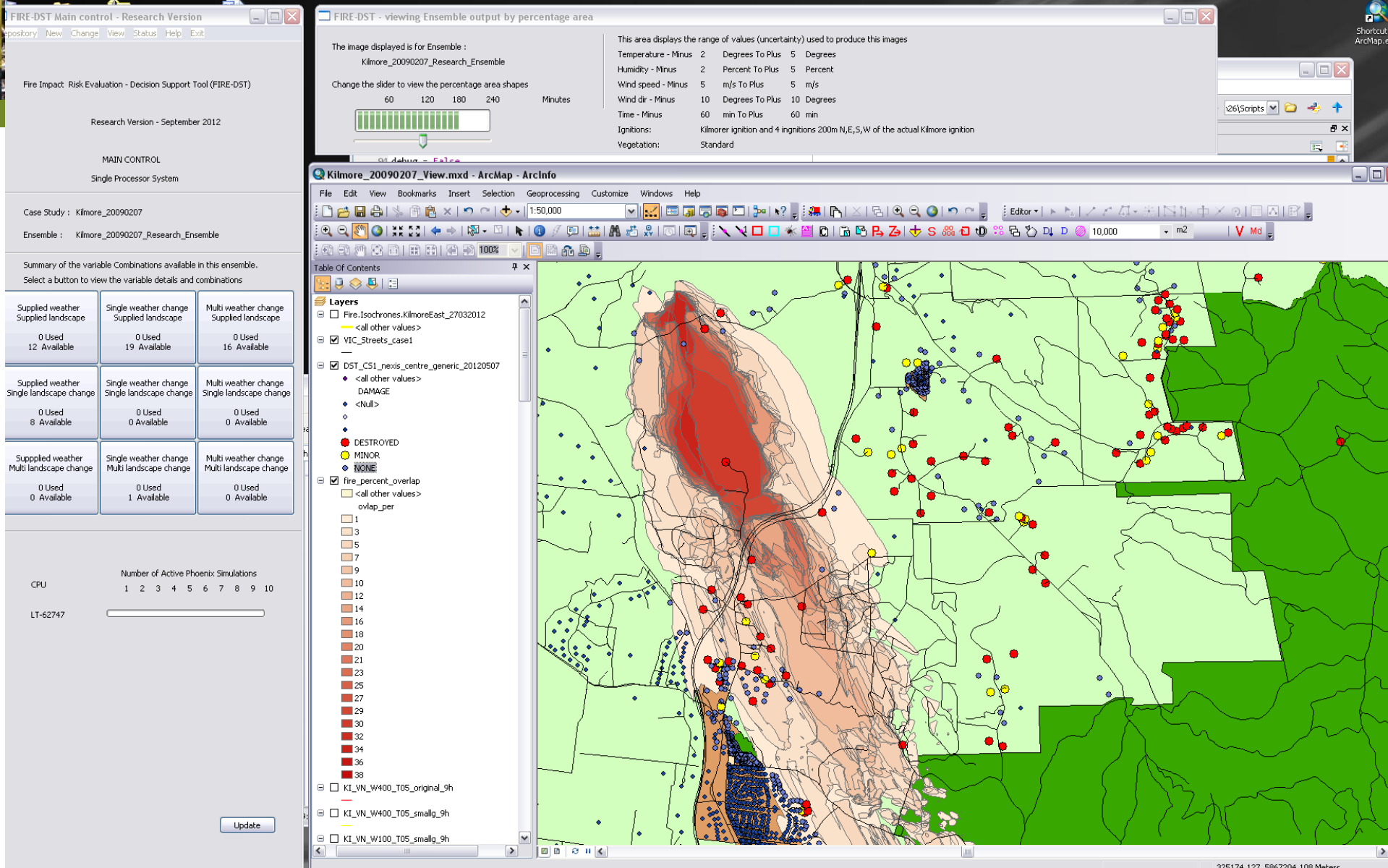
# Proof of Concept - *impact/consequence modelling*

- Probabilistic multi-scenario driven front-end that allows a picture to be developed of the “relative risk” associated with an event (provides % likelihood of the fire affecting the region ranging from 10% to 90% likelihood).
- Focus on extreme events where “cascading uncertainty” principle becomes very large.
- FireDST probabilistic approach not useful for ALL fire events – focus on major events (rule set)



# FireDST

## Impact Estimate: Potential House Impact



# FireDST

**Impact Estimate:** people, people over 65, under 5 and in need of assistance

Kilmore\_20090207\_View.mxd - ArcMap - ArcInfo

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

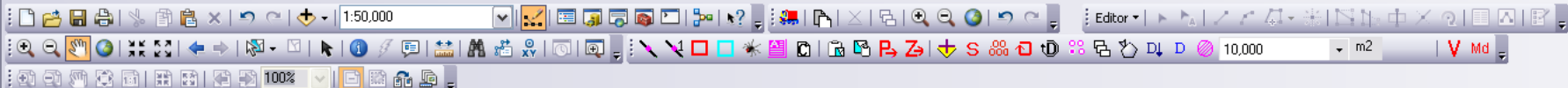
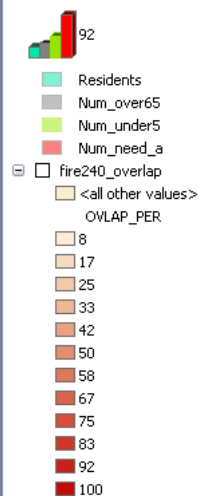


Table Of Contents

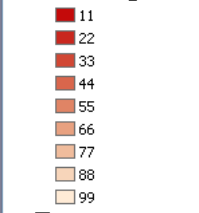
☒ meshbackground



☐ fire240\_overlap

<all other values>

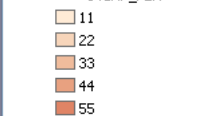
OV LAP\_PER



☐ fire120\_overlap

<all other values>

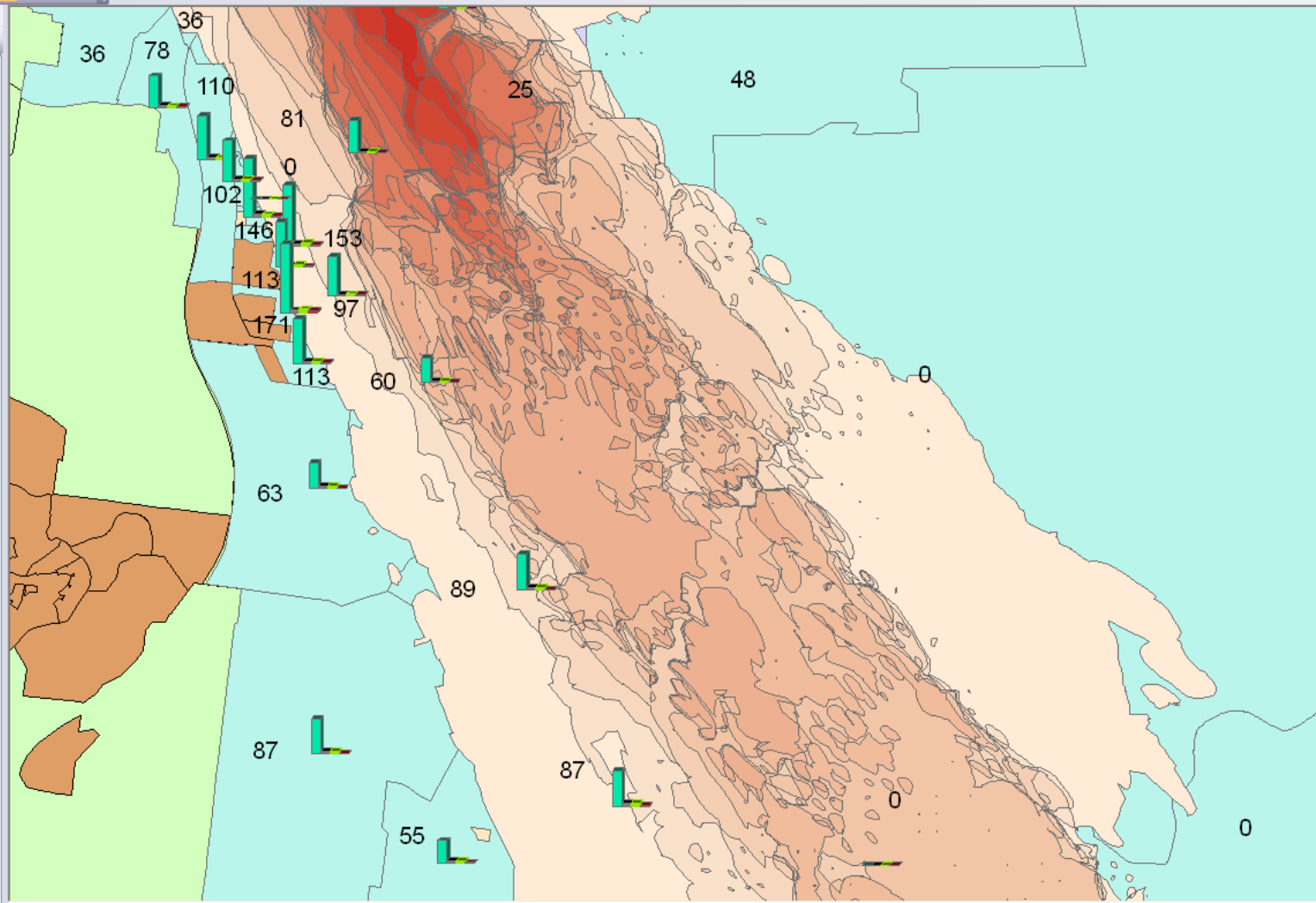
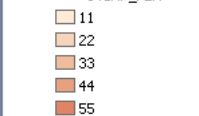
OV LAP\_PER



☐ fire60\_overlap

<all other values>

OV LAP\_PER





# **“Proof of concept” (POC)**

## **- *system update***

- Risk Assessment Framework (published)
- Data model (components populated – initial understanding)
- “End-to-end” simulations of wildfire impacts now possible
  - ✓ New ACCESS high-res meteorology
  - ✓ Use of high-res wind multipliers in fire spread simulation
  - ✓ New version of Phoenix Rapidfire (considers 3 dimensions)  
Use of vertical winds in fire spread simulation (ember transport)
  - ✓ BFIM (building fire impact model)
  - ✓ *Impact* - comparison with Bushfire Attack Level (BAL: AS3959 – Method 1)
- Fire impacts on houses (radiation and embers)
- Smoke impacts on people
- Sensitivity analysis results
- FireDST: What remains to be done to complete POC?  
Project concentrating on delivery/write-up of case-studies over next 6 months

