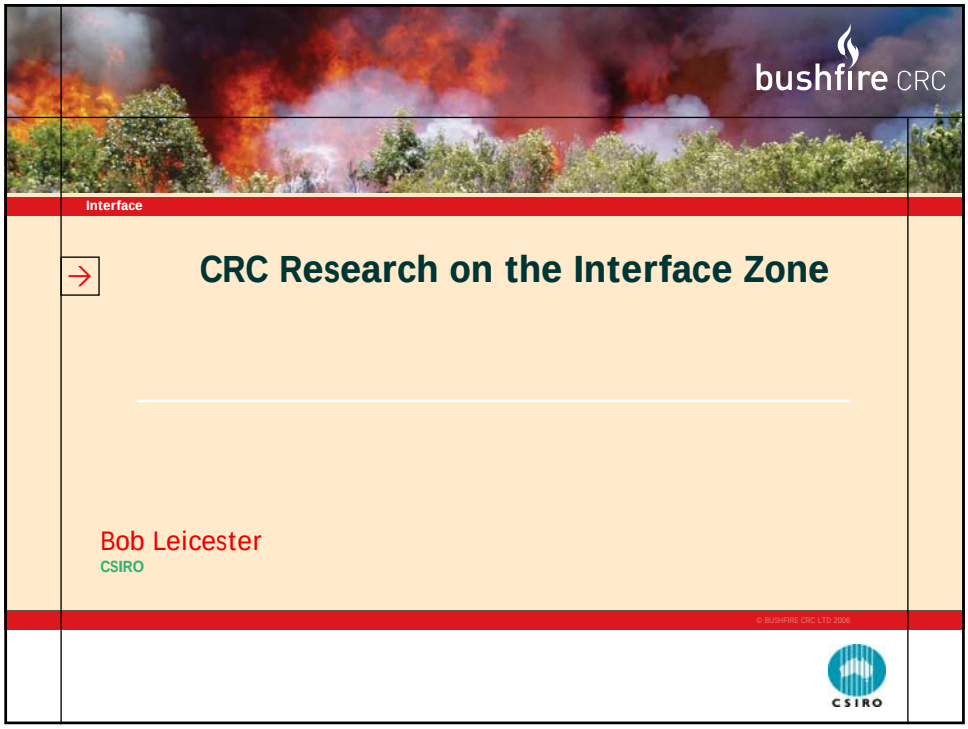
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CRC Research on the Interface Zone
Bob Leicester
CSIRO
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A Risk Model for Attack within the Interface Zone

Project D1

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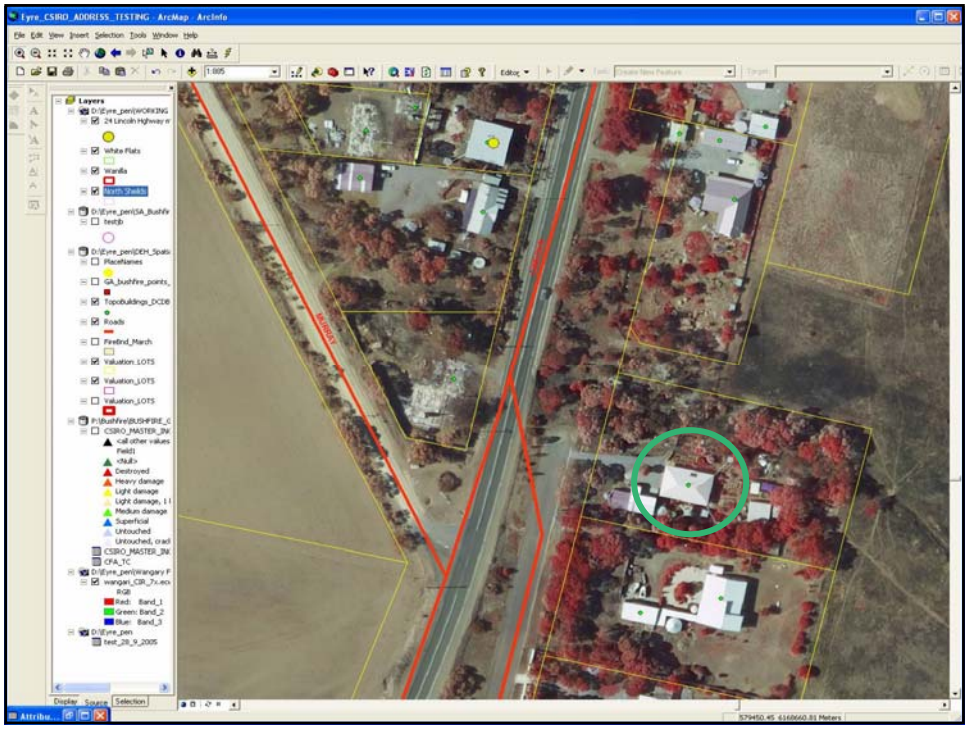
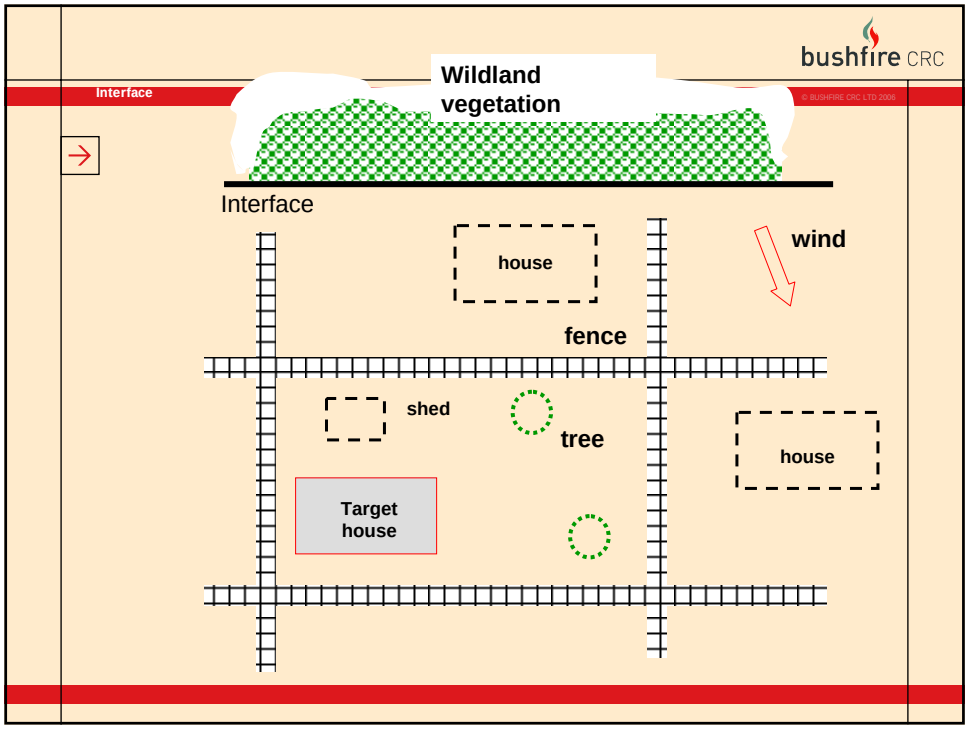
OBJECTIVE

Develop a model to predict the probability that a particular house will be destroyed by wildfire within the next 50 years

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Wildland vegetation
Interface
house
wind
fence
shed
tree
house
Target house

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Interface

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Modes of destruction (groups)

- direct radiation
- ember entry
- ember burn-through

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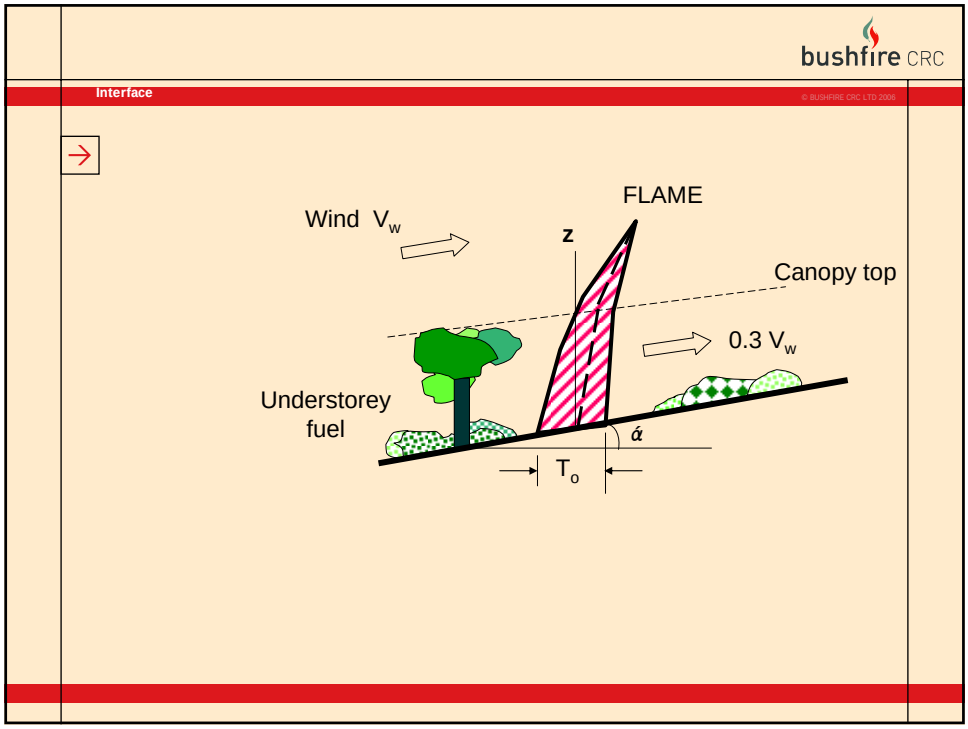
Radiation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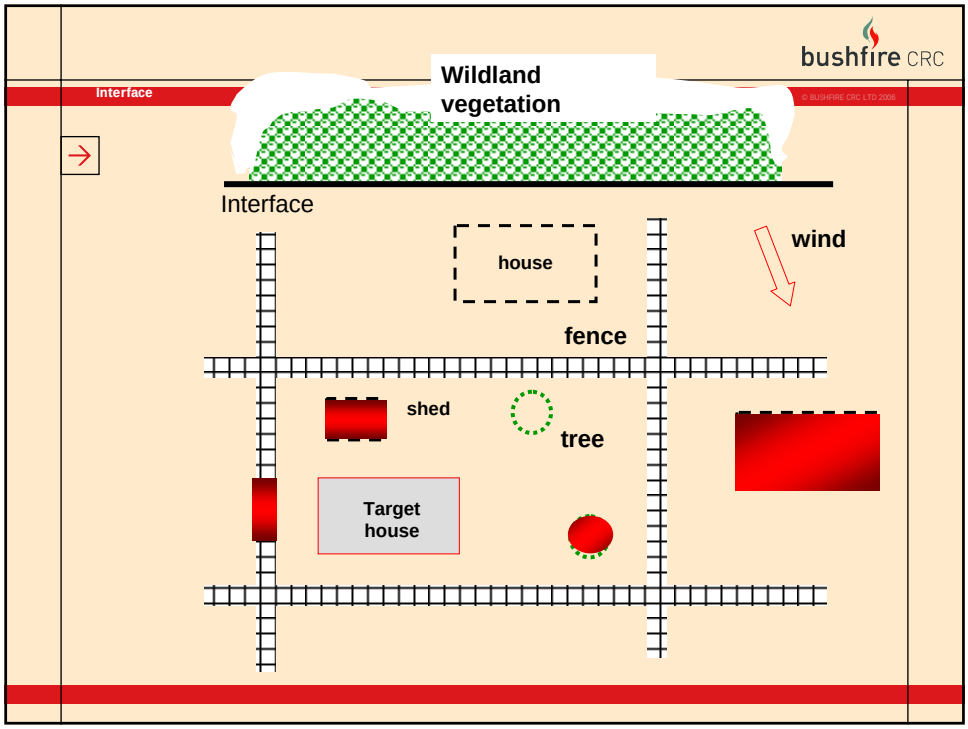
FLAME
Wind V_w
z
Canopy top
0.3 V_w
Understorey fuel
α
T_o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Target house

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DATA

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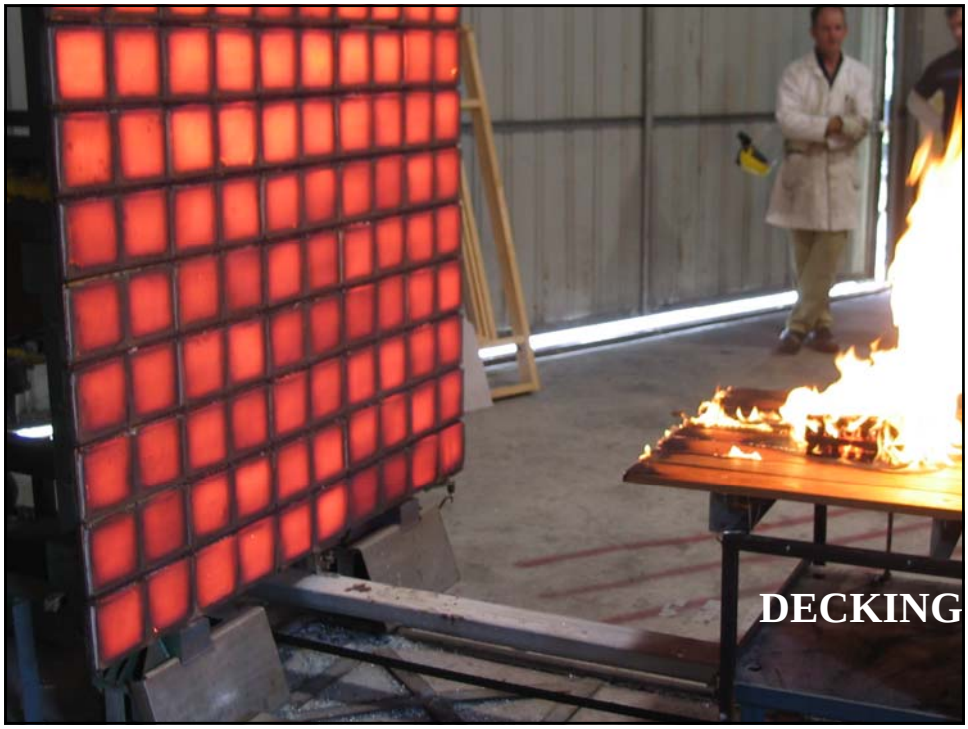
FAILURE OF GLAZING SYSTEMS

q_{crit} = 10 – 50 kw/m^2

Depends on:

- glass used
- frame material
- sealant



Fence tests, Mogo

WATER TANKS

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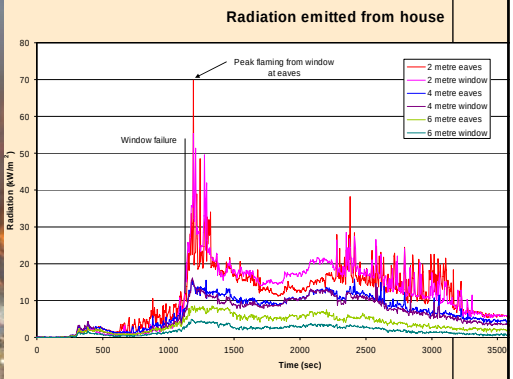
House to house fire spread



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Ember Entry

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EMBER ENTRY

Hazard parameters

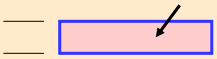
- embers
- people
- zone of house
- gap-factors

G = *gap factor*

$= \Sigma A_g(w_g - 2)^{0.5}$

A_g = *gap area*

w_g = *gap width*



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Ember Burn-through

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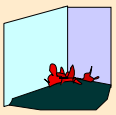
EMBER BURN THROUGH

Hazard parameters

- embers
- radiation
- people
- construction

Construction factor = *fn{* geometry, material *}*

Examples: *reentrant corners, ledges of windows and doors*



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REFERENCE HOUSE

(50m from wildland edge, hot fire)

Probability of destruction

- *from radiation = 0.05*
- *from ember burn through = 0.10*
- *from ember entry = 0.30*

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Present	Proportion of reference houses saved
No one	0.30
Occupant or neighbour only	0.90
Fire brigade only	0.80

*Probability that someone will defend house = **0.60***

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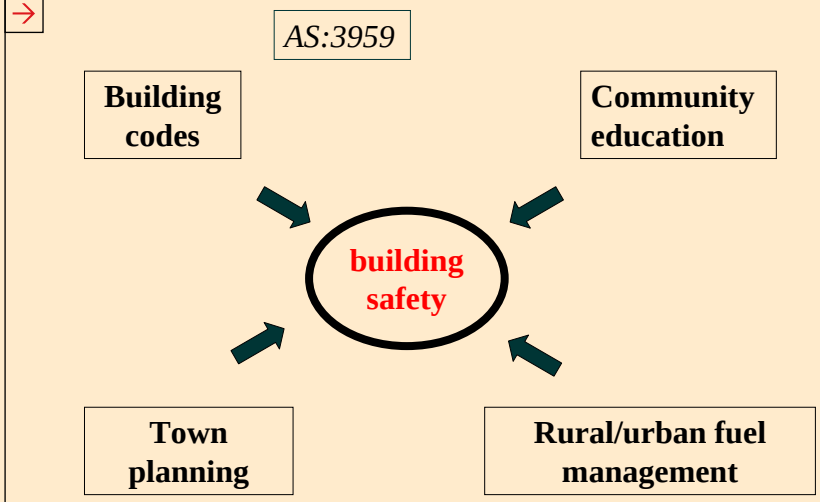

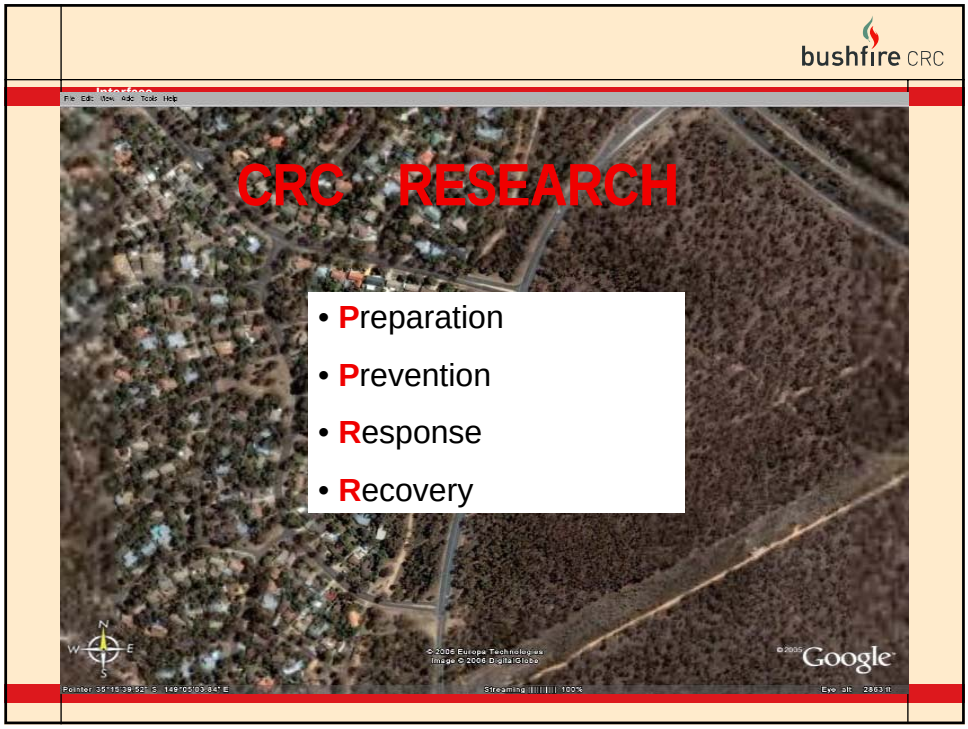
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A1.3 Fuel Classification

A2.1 Fire Weather

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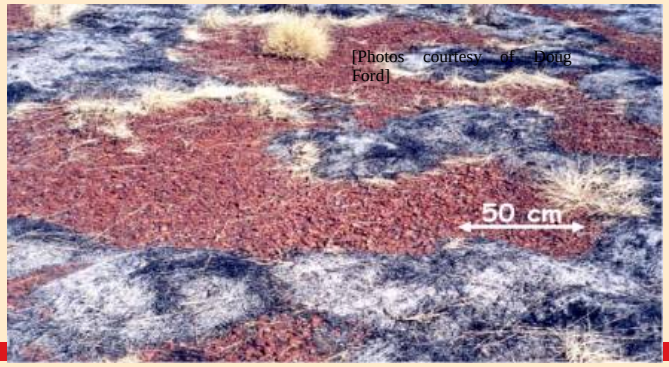
B3.1, B3.2 Biodiversity



[Photos courtesy of Doug Ford]

B2.1 smoke movement
B2.1 Smoke composition

D2.2 Smoke toxicity

C1.1, C7.1 Community education

D1 Building construction

D3 Volunteerism

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C3.1 Arson

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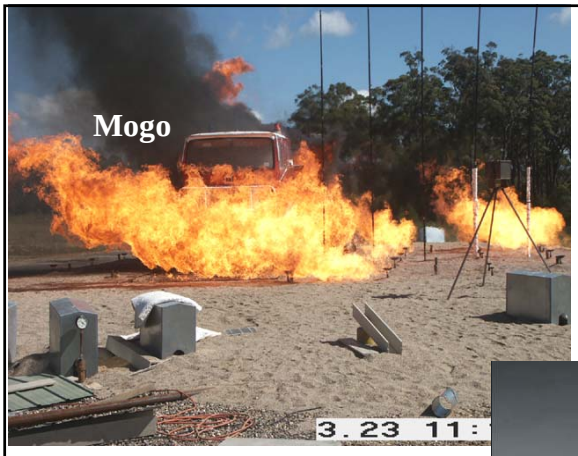
A3.1 Suppression techniques

A1.1 monitoring progress



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D2.4 Equipment

D4 Respiratory health

D2.1 Physiological factors

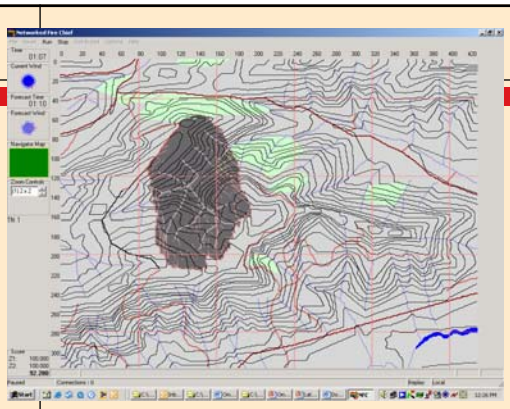
LifeShirt®

Heart Rate

Breath Rate

Trunk movt.

Skin Temp



D2.3 Safe decisions

D5 IMT communications

C4.1 Risk communication

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Data Collection
Assist Coronial Enquiries

Fire scenario

Community response

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Building response

THANK YOU