



CATASTROPHIC NATURAL EVENTS IN TASMANIA

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2005

About NATURAL hazards



- Tend to be unpredictable
 - In type
 - In scale
 - In frequency
 - In combination of factors
 - In nature of outcome
- Some are catastrophic
- They are inevitable

The matter of RISK



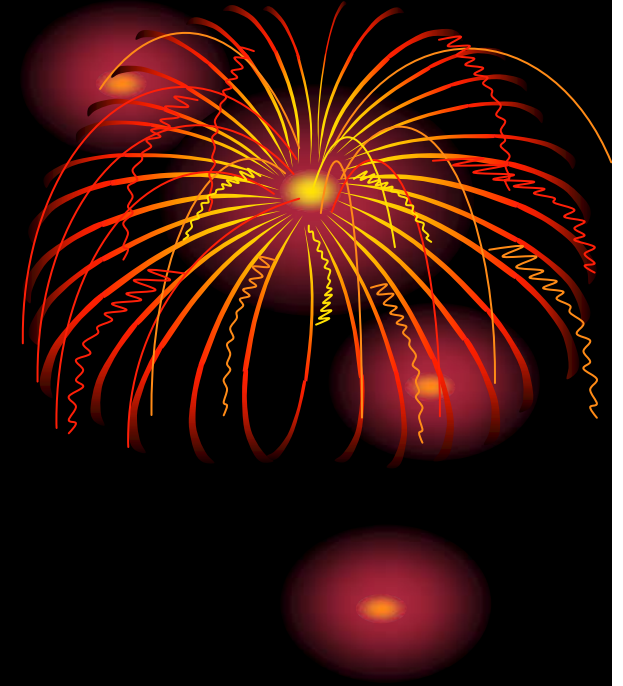
- Is there a hazard?
- How often is it likely to occur?
- How serious is it?
- Can we avoid or minimise it?
- Do we need to take a gamble?
- What do we stand to lose?
- How do we balance the chance of occurrence against the possible loss?

- TYPES OF EVENT

Earthquake

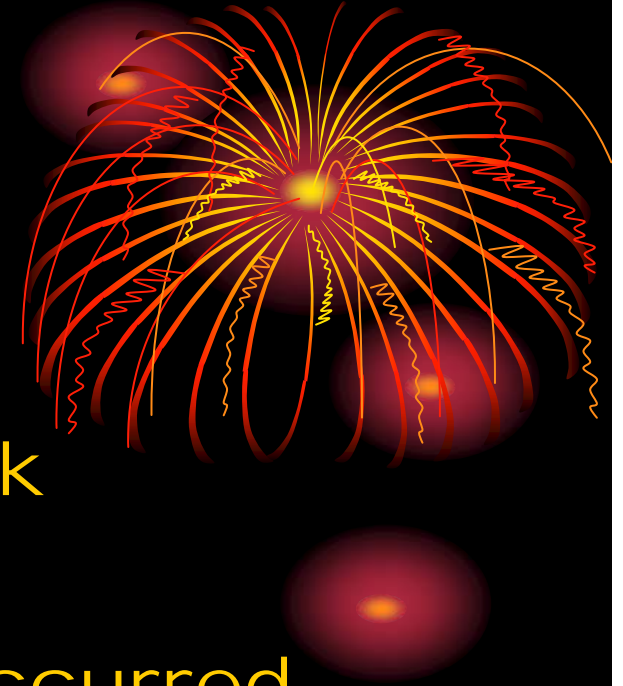
Tsunami

Giant landslide/slope failure



Earthquake

- Tasmania is not free of risk
 - There is a long history
 - Some large events have occurred
 - More are inevitable
 - Hazard is not predictable
-
- Risk is related to distance from epicentre and seismic magnitude





- Scene born in seismicity



Scene born in seismicity



- Lake Edgar Fault

DAMAGE and MERCALLI



- Damage is rated according to the Modified Mercalli Intensity Scale - MMI (as distinct from the earthquake energy scale known as the Richter Scale)
- The MMI definitions for these intensities are (VI): strong, trees sway, suspended objects swing, objects fall off shelves; (VII): very strong, mild alarm, walls crack, plaster falls; (VIII): chimneys fall and masonry fractures, poor buildings damaged.

Earthquake Some Tasmanian history



• Burnie	1946	MMI max	6
• Hobart	1885		6
•	1892		6*
• Launceston	1884		7
•	1885		7
•	1892		7*
•	1946		7
• Queenstown	1908		6
•	1911		6
•			* = est.

Earthquake Recurrence patterns

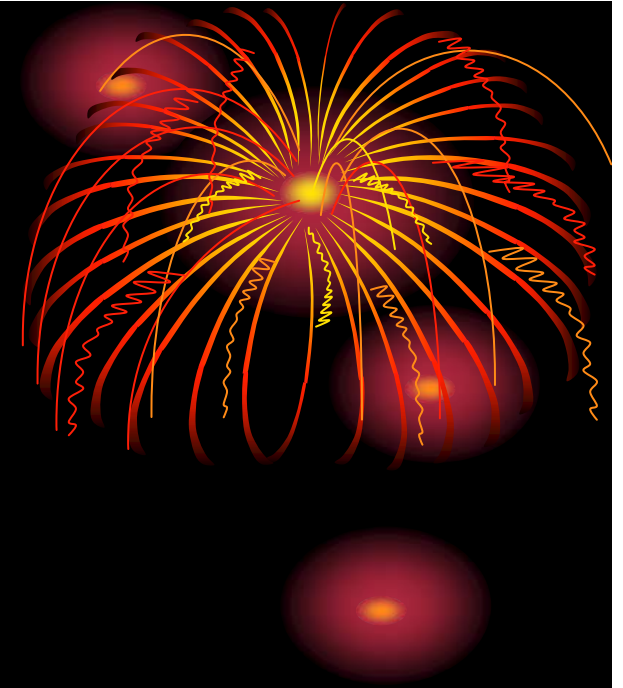
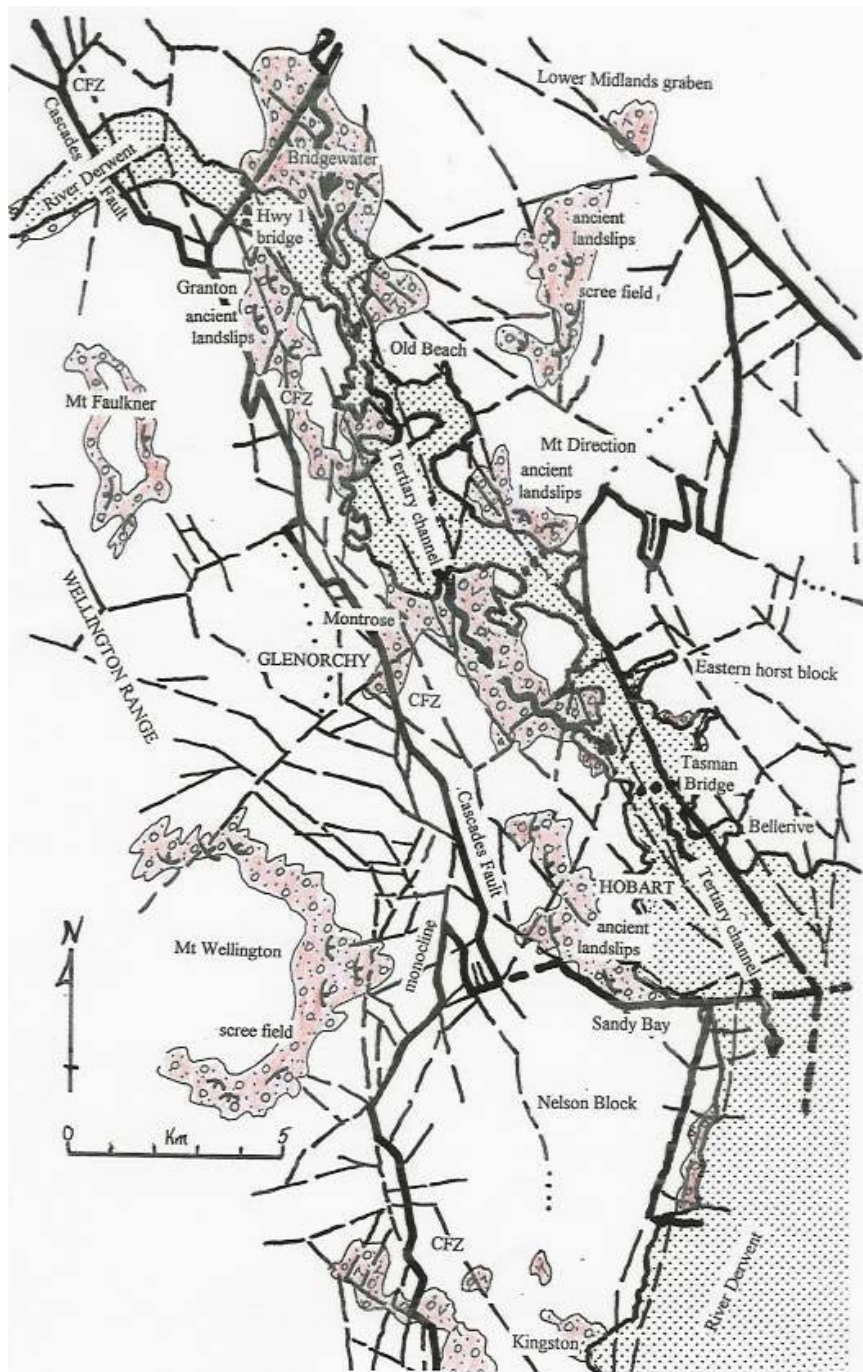


- SIZE (M)
- Richter Magnitude
- years
- 3
- 3.5
- 4
- 4.5
- 5
- 5.5
- 6
- 6.5
- 7
- 8

WESTERN TASMANIA

EASTERN TASMANIA

3.5	3.9
4.9	4.2
6.7	4.2
12.5	10.1
25	12.6
125	33.7
?	50.5
?	50.5
?	150
?	?



Cascades Fault System

Hobart area

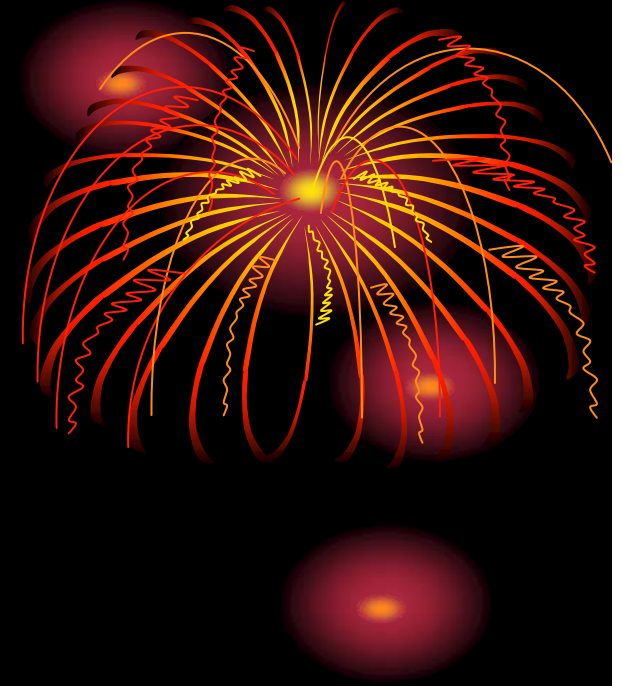
Areas subject to failure shown



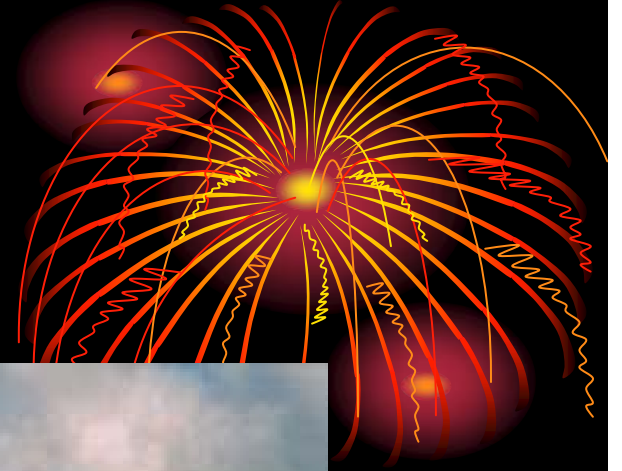
Heart of Cascades Fault Zone McRobies Gully

Earthquake Ramifications

- Avoid sensitive areas
- Design for sensitivity
 - Drainage
 - Compaction
 - Foundations
- Codes of practice
- Importance of infrastructure



Earthquake: What if?



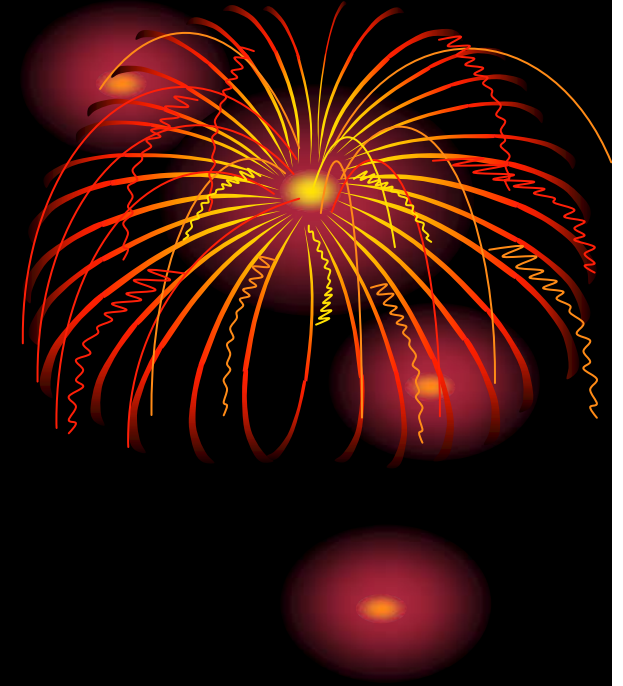
The Tasman Bridge? How resistant?

Tsunami



Tsunami

- Have occurred
- Risk unknown
- Scale of impacts unknown
 - Up to 2 m (?) relief - waves
- Source: New Zealand
- local continental shelf?
- Risk mainly low areas E Tas



Giant landslide

- Particular class of slope deposit
- Particular circumstance
 - weather factor
 - or human interference
- May be relatively common
- May clog streams

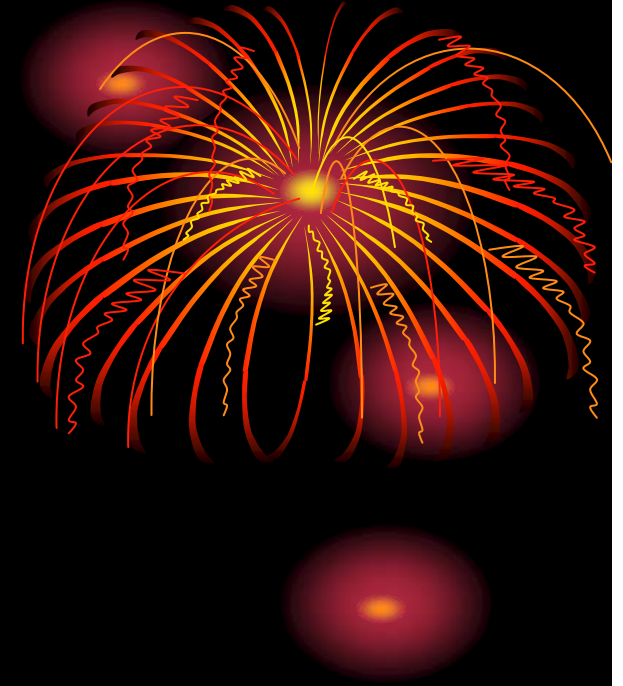
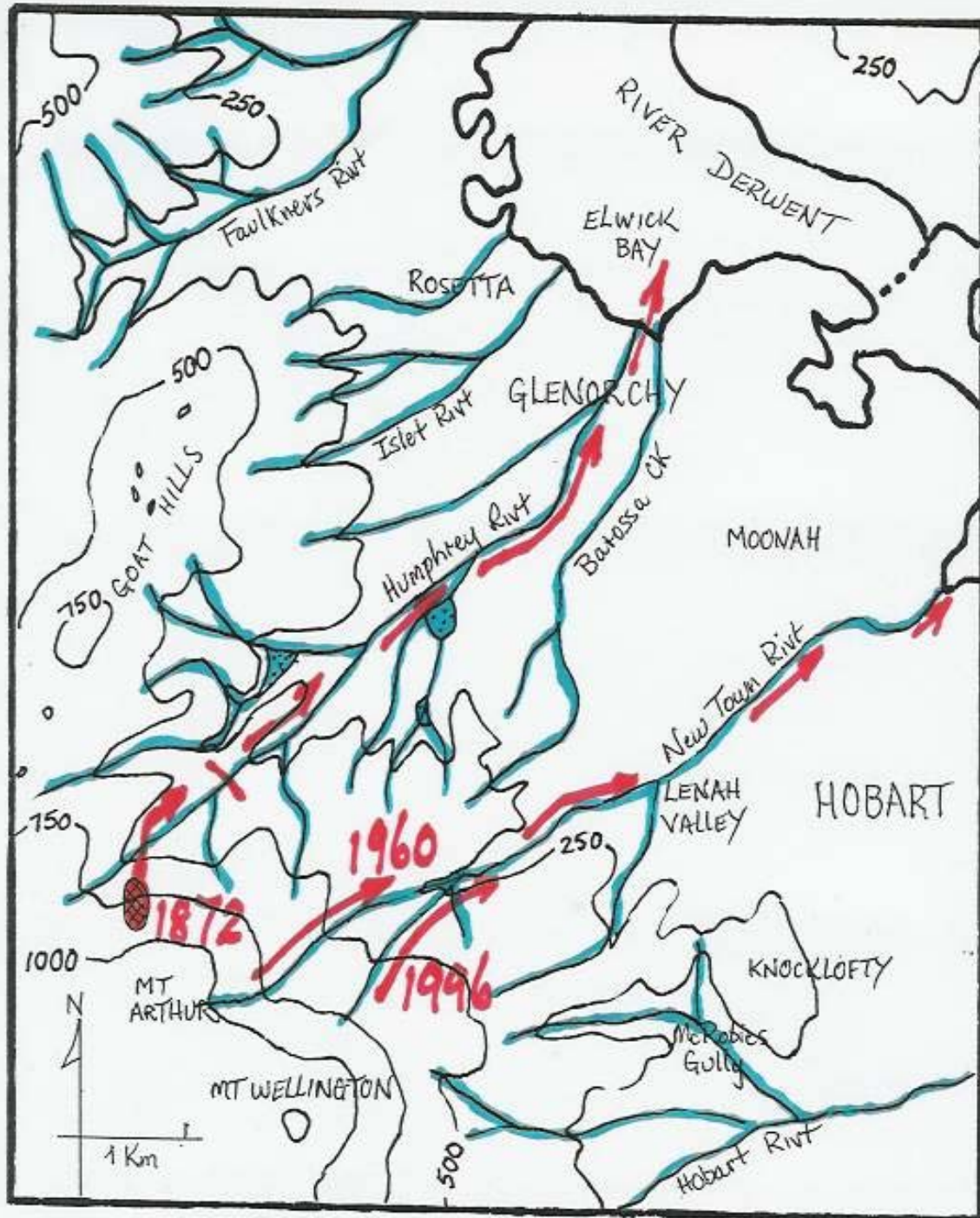




Landslide: Glenorchy 1872



Upper Humphrey Rivulet 1872



Paths of failures
or slurries



Future scope for failure – nature of materials
(west Mt Wellington)



Stream accumulation
(New Town Rivulet tributary 1996)



The engineering clean up
(Strickland Avenue 1996)

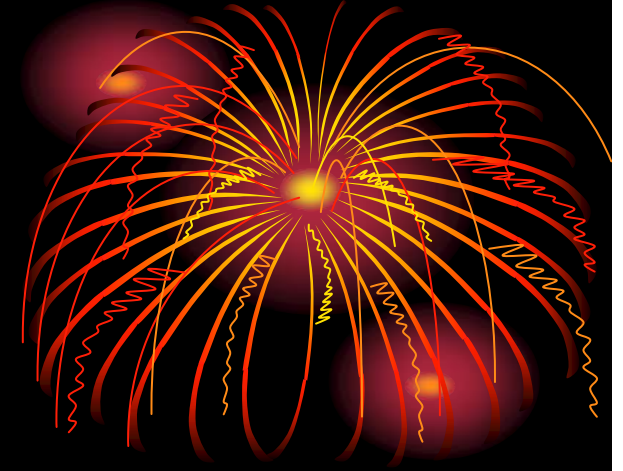
Giant landslides



- Will occur
- May generate from specific foci
- Need to retain flood plains
- Avoid restrictions on stream channels/culverts/drains

CONCLUSION

- requirements



- **ISSUE OF PLANNING**
 - Definition of hazardous geology including data accumulation
 - Local development planning with respect to that geology
 - How to react *WHEN* the event occurs – for various scenarios and locations