# The young volcanic province of Southeastern Australia: volcanic risk evaluation and the community


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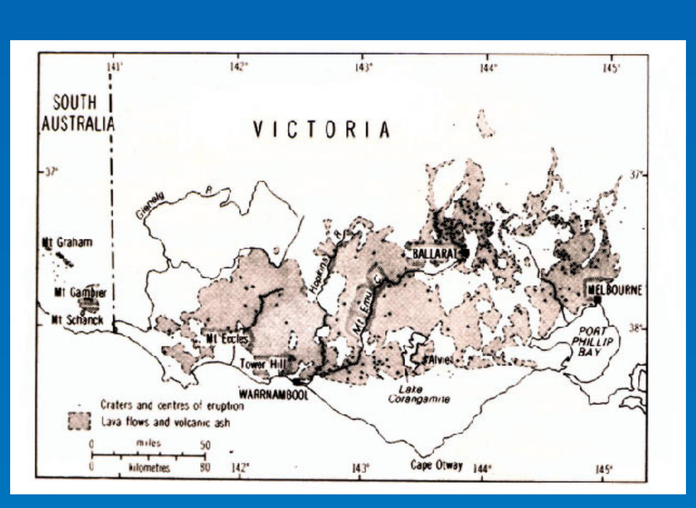
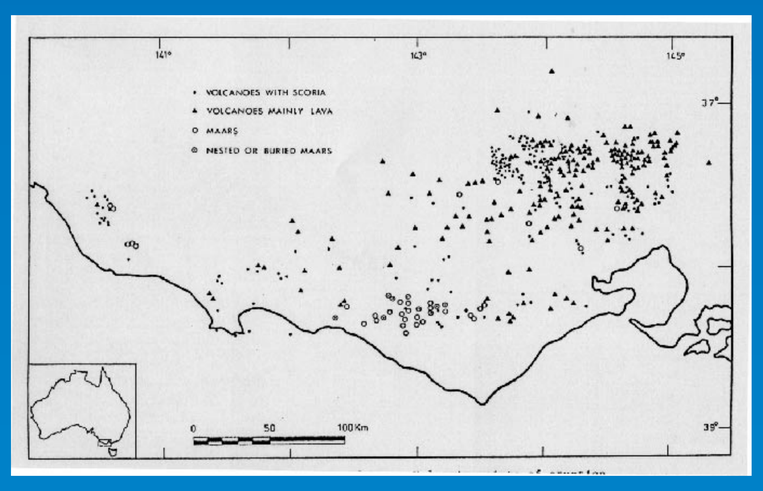
## Introduction

Volcanism has been a feature of the landscape of Western Victoria and Southeastern Australia over the past five million years, with Mt Gambier the youngest dated eruption at about 4,300 BP.




Nearly 400 monogenetic basalt volcanoes have been catalogued, mostly magmatic Strombolian/Hawaiian scoria cones with extensive basaltic lava flows, but also including nearly 40 phreatomagmatic maar craters with tuff ring and ash deposits.

The Newer Volcanic province is a closely settled agricultural area with several major towns and the two large cities of Geelong and Melbourne.

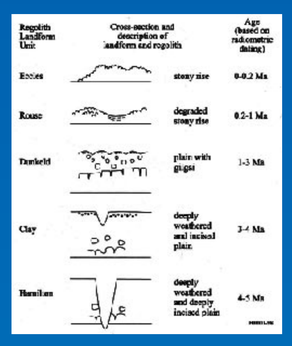
Many K/Ar dates and some radiocarbon dates are available. If activity had been regularly spaced, over the past 5 Ma, there would have been an eruption every 12,500 years.

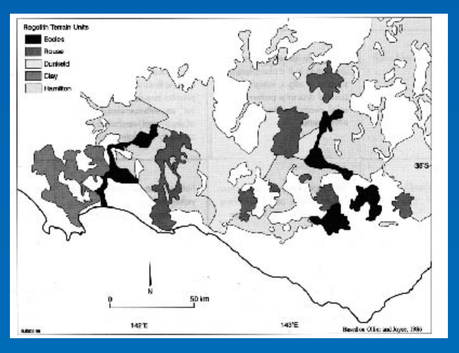
| | |
|---|---|
| Mt Gambier | 4,300 yrs B.P |
| East Basin | >5,200 |
| Red Rock | >7,800 & <15,200 |
| Lake Gnotuk | >9,200 |
| West Basin | >10,000 |
| Lake Bullenmerri | >16,800 |
| Mt Schank | 18,100 |
| Mt Leura | >21,100 & <25,300 |
| Mt Eccles | >27,500 & <19,300 |
| Lake Keilambete | >29,100 |
| Mt Napier | ~32,000 & >7,200 |
| Tower Hill | 33,000 & >23,000 |
| Lake Wangoom | >200,000 |
| Lake Terang | >350,000 |
| Mt Rouse | 300,000 |
| Mt Porndon | 300,000 or ~59,000 |
| Mt Franklin | 470,000 |
| The Sisters | 570,000 |
| Mt Warrnambool | >570,000 |
| Mt Fraser or Hayes Hill | 810,000 |
| Pejark Marsh | >980,000 |
| Mt Warrenheip | ~1,000,000 |
| Anakie volcanoes | ~1,500,000 |

***Estimates of eruption age for some Newer Volcanic volcanoes using radiocarbon, K/Ar, Cosmogenic Chlorine-36 and fission track dating.***

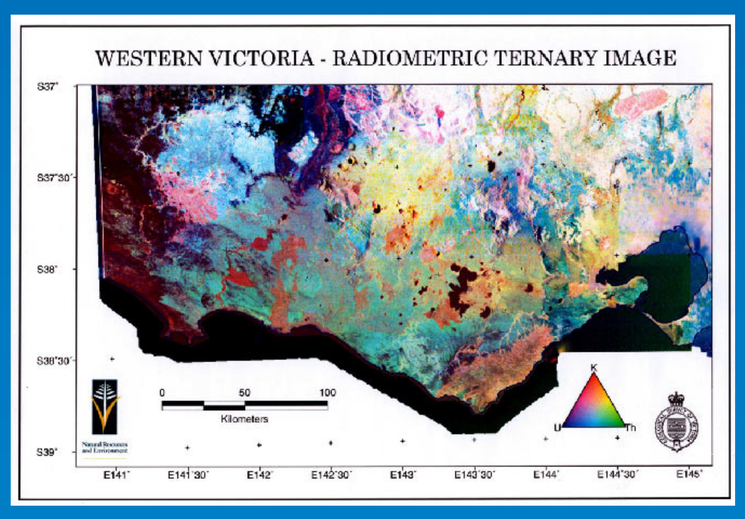
***Spheroidal weathering in basalt flow - Clay Regolith Landform Unit, 3-4 Ma.***

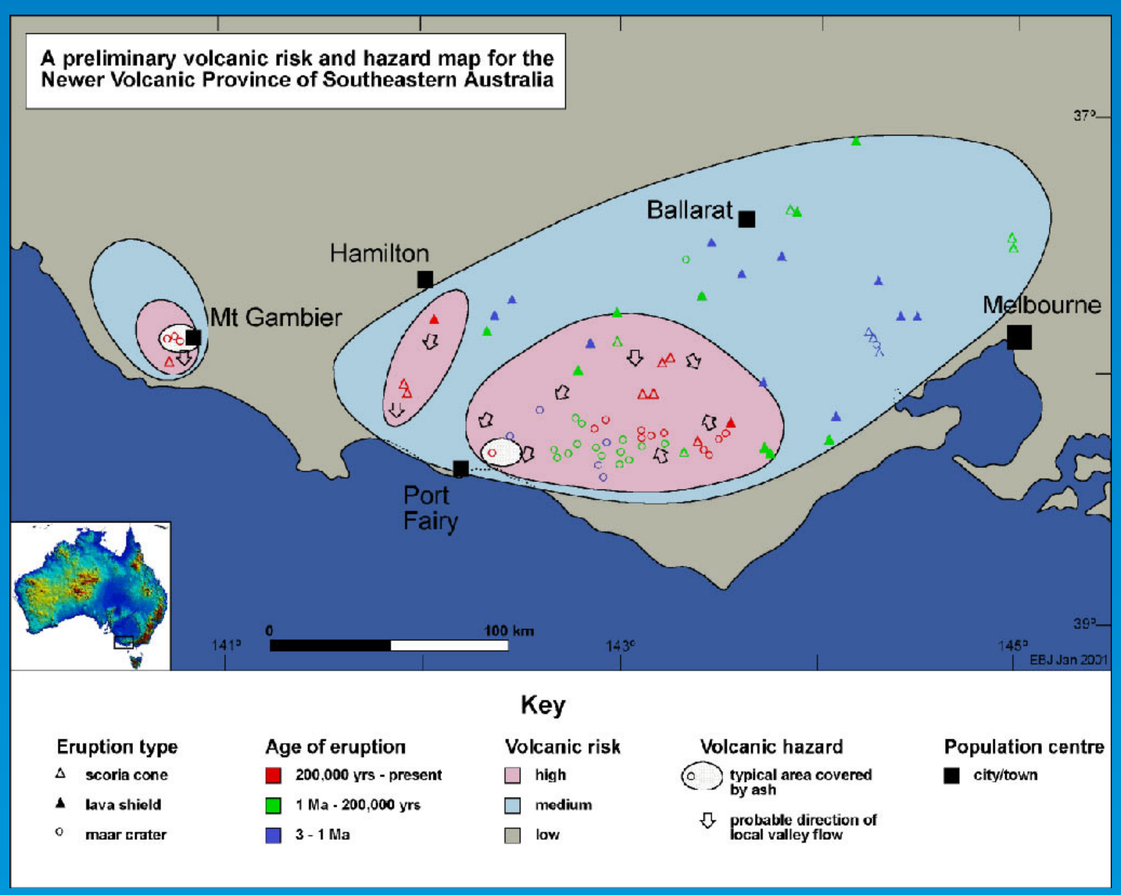
***Well-developed columnar jointing, Organ Pipes National Park, north of Melbourne.***

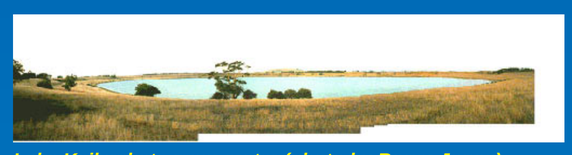



However, recent work using soil and regolith landform mapping, and radiometric imagery, has been able to assign ages to otherwise undated flows, and also helped distinguish cycles of activity through time, notably a period of more concentrated activity in the late Quaternary in far Western Victoria.



***Lake Keilambete maar crater (photo by Roger Jones).***

***Stony rise lava flows and Lake Corangamite.***

It is now generally agreed amongst Australian volcanologists that further eruption is likely, and may well be overdue. Eruptions to be expected are maar crater formation with ash falls for several kilometres downwind i.e. to the east, and cinder/scoria cone formation by fire-fountaining with associated long valley flows.

Maar activity would provide particular problems if upwind of a town or either of the two cities of Geelong and Melbourne. Lava flows would follow the general southerly slope and extend down pre-existing valleys towards the present coastline.

***Ash deposits at Tower Hill maar, northeast of Port Fairy.***

## Conclusions

Some likely problems arising from any future volcanic eruption in Southeastern Australia include:

- evacuation planning,
- effects on farm animals and crops,
- water pollution,
- stream derangement,
- diversion or control of lava flows,
- effects on roads and railways, and
- coping with grassland and woodland fires.

This new assessment of volcanic risk suggests the need for a program of community preparedness. Local residents and students in schools, and planners and emergency managers within local and state government, should be made aware of possible risks and hazards.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