

23 million years ago our region was 1600km to the south





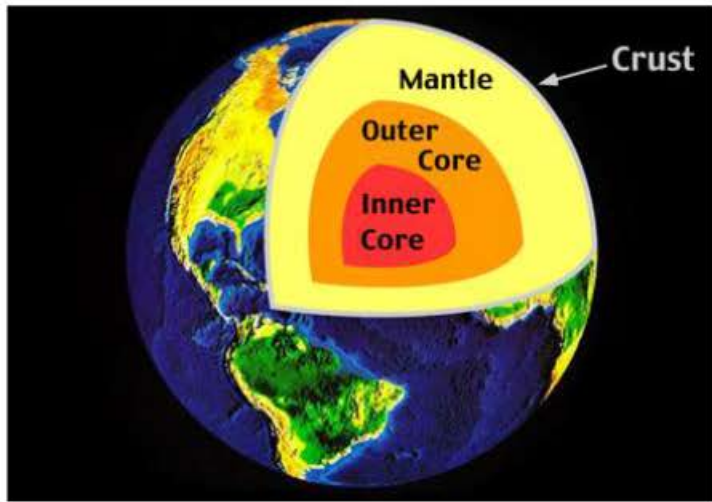
Shield volcanoes

vs

Stratovolcanoes

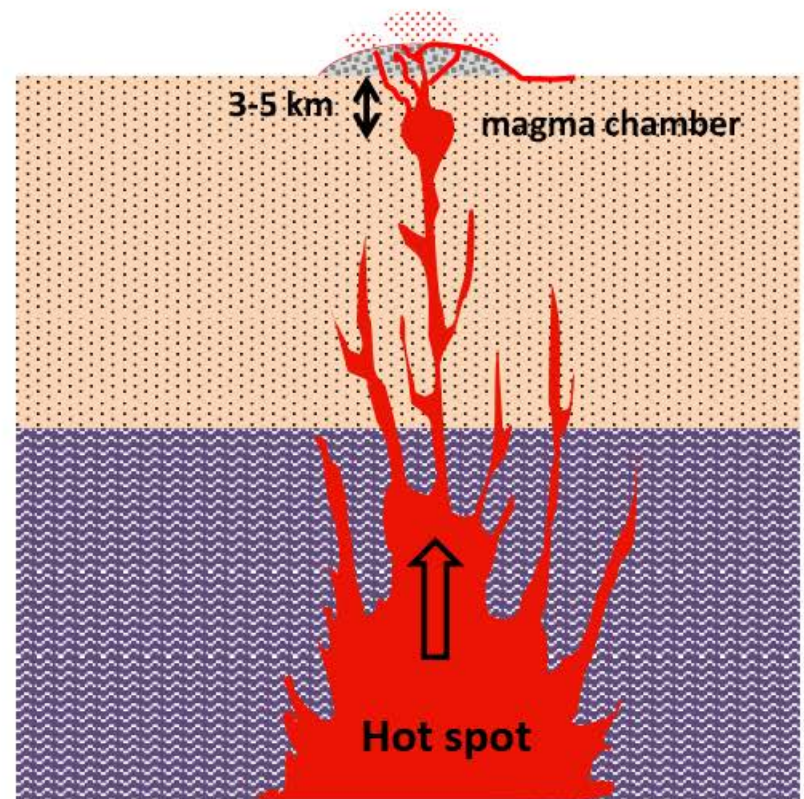


An Eastern Australian 'hot spot' shield volcano



**Continental
Crust 35km
(brittle)**

**Upper mantle -
(asthenosphere) 200km
(viscous)**

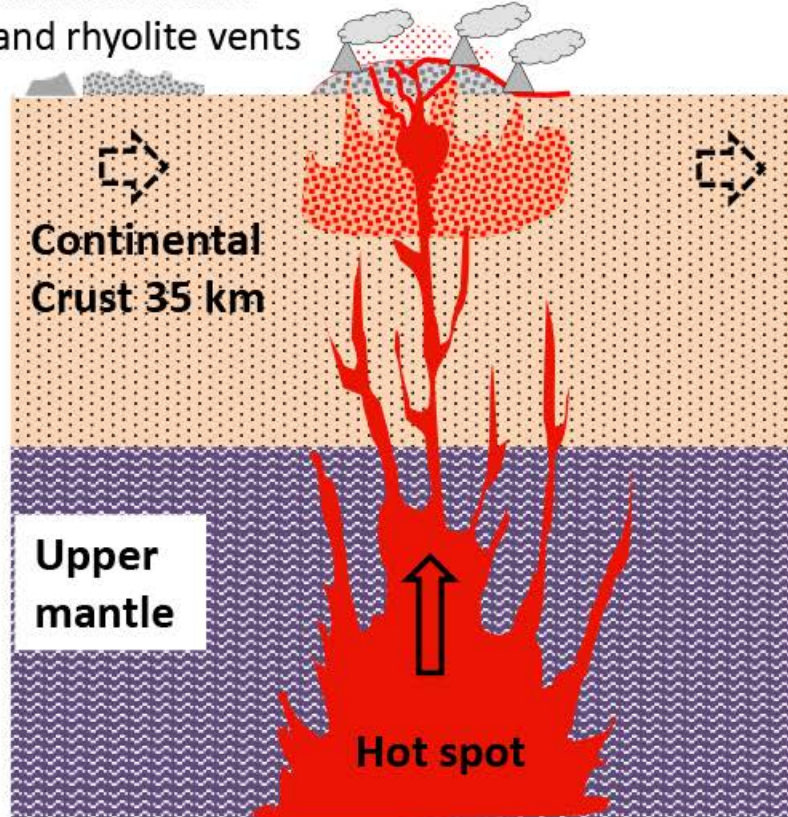


Difference between a 'continental' & 'oceanic' shield volcano

eg AGC volcanoes

The ACG's volcanoes lingered over the hot spot

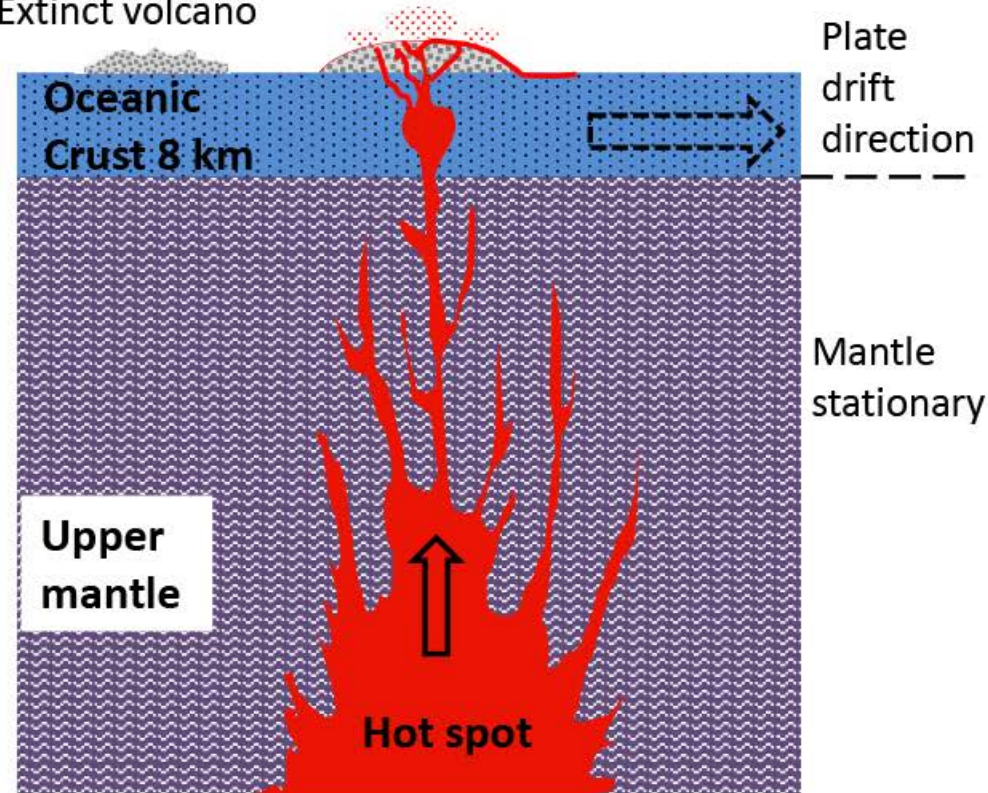
Extinct volcano
and rhyolite vents



The continental crust is rich in silica and melts at a lower temperature than the mantle lavas. As well as the mantle derived basalts, the crust derived melts erupt (as rhyolite and explosion debris)

eg Hawaii volcanoes

Extinct volcano



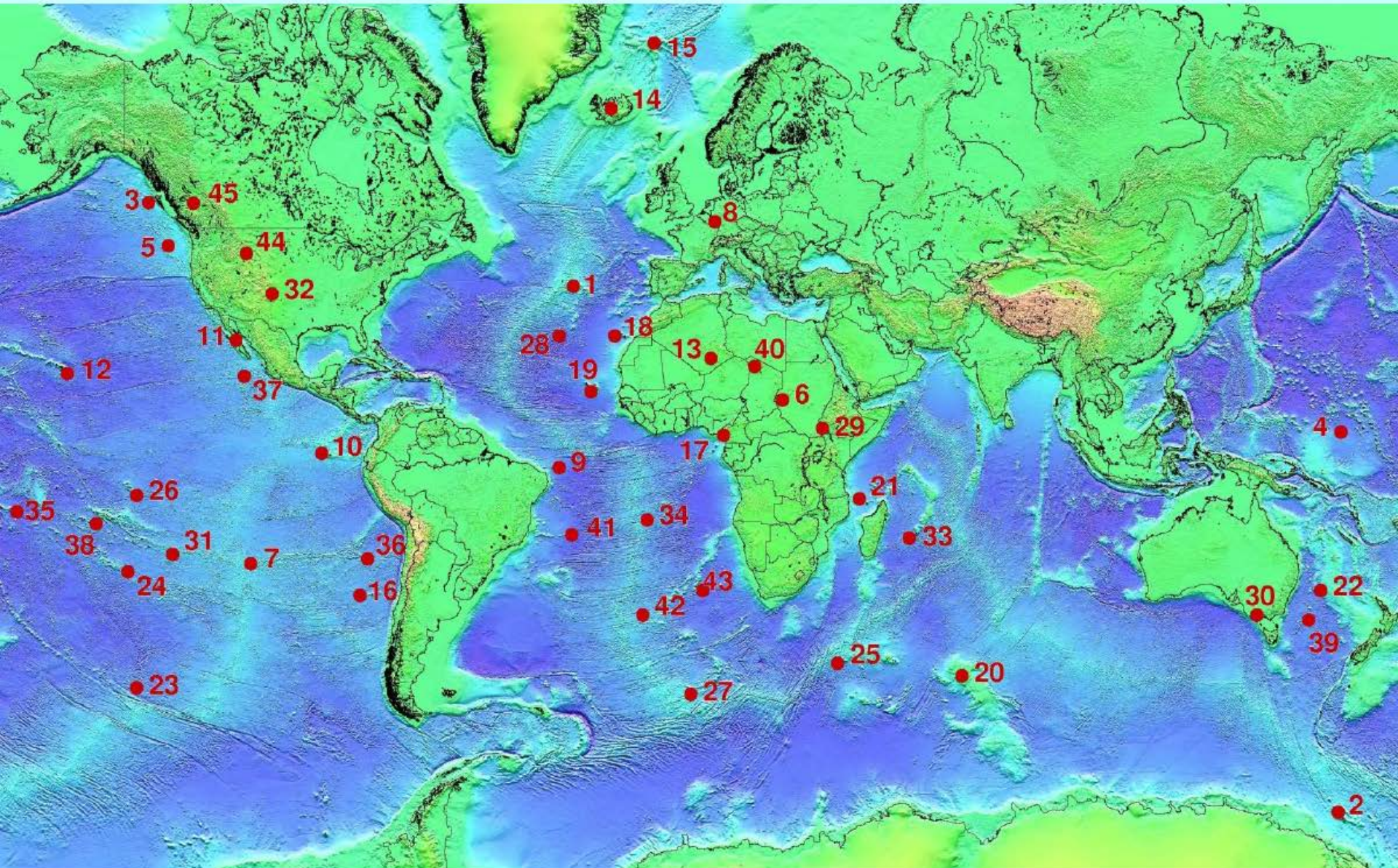
The oceanic crust is poor in silica. The lavas are basalt and almost entirely derived from the mantle hot spot

This lingering and crustal melting is why the landscape of SE Qld is dotted with rhyolite vents & intrusions (unlike the landscapes of Aust's other hot spot shield volcanoes) more on that later -



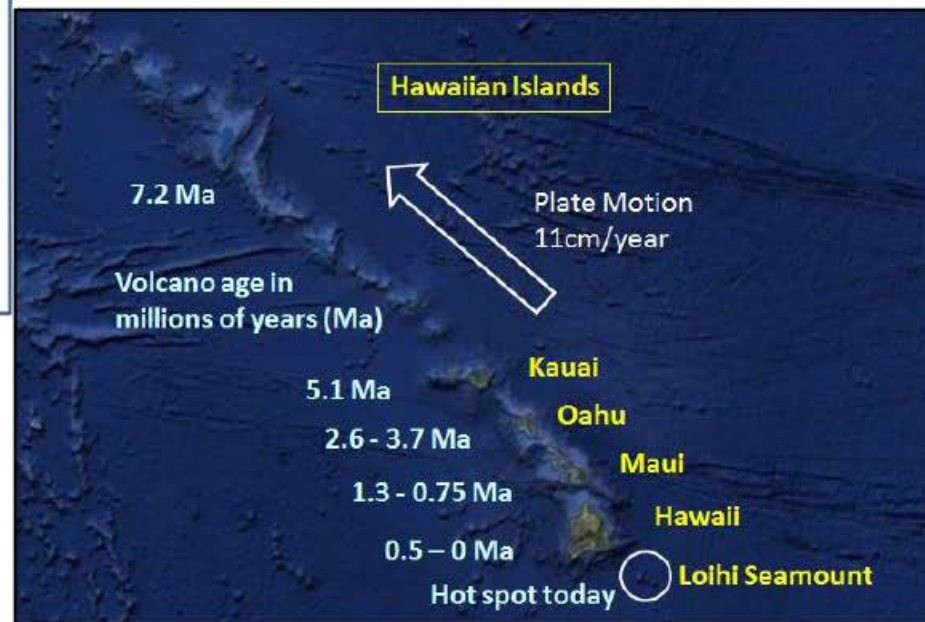
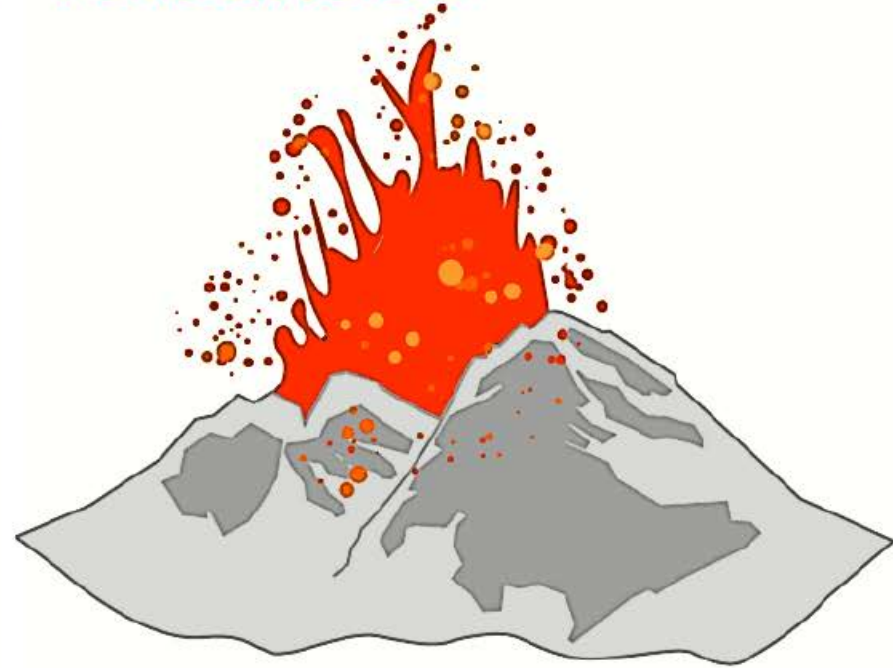
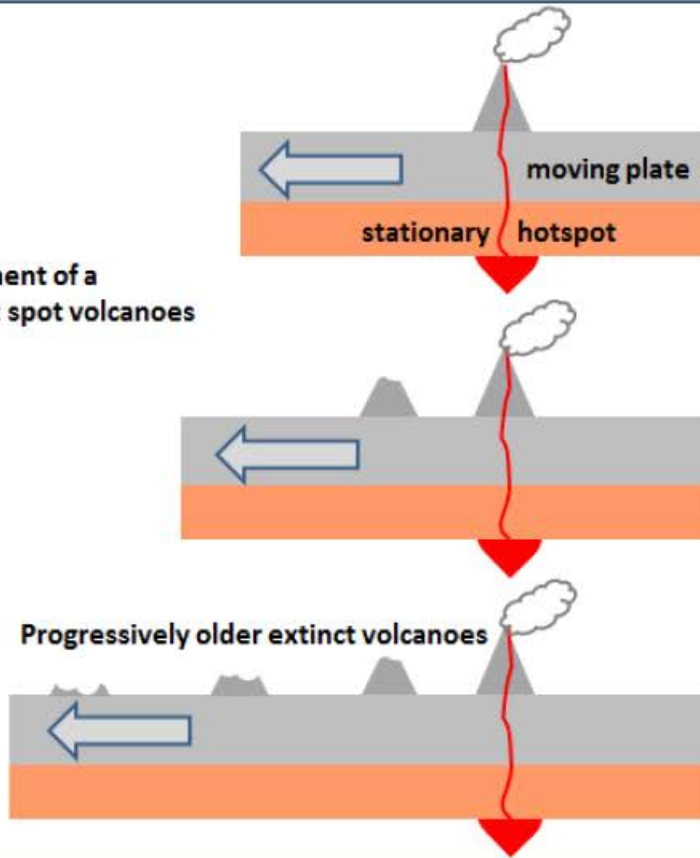
Moogerah Peaks

Hotspots

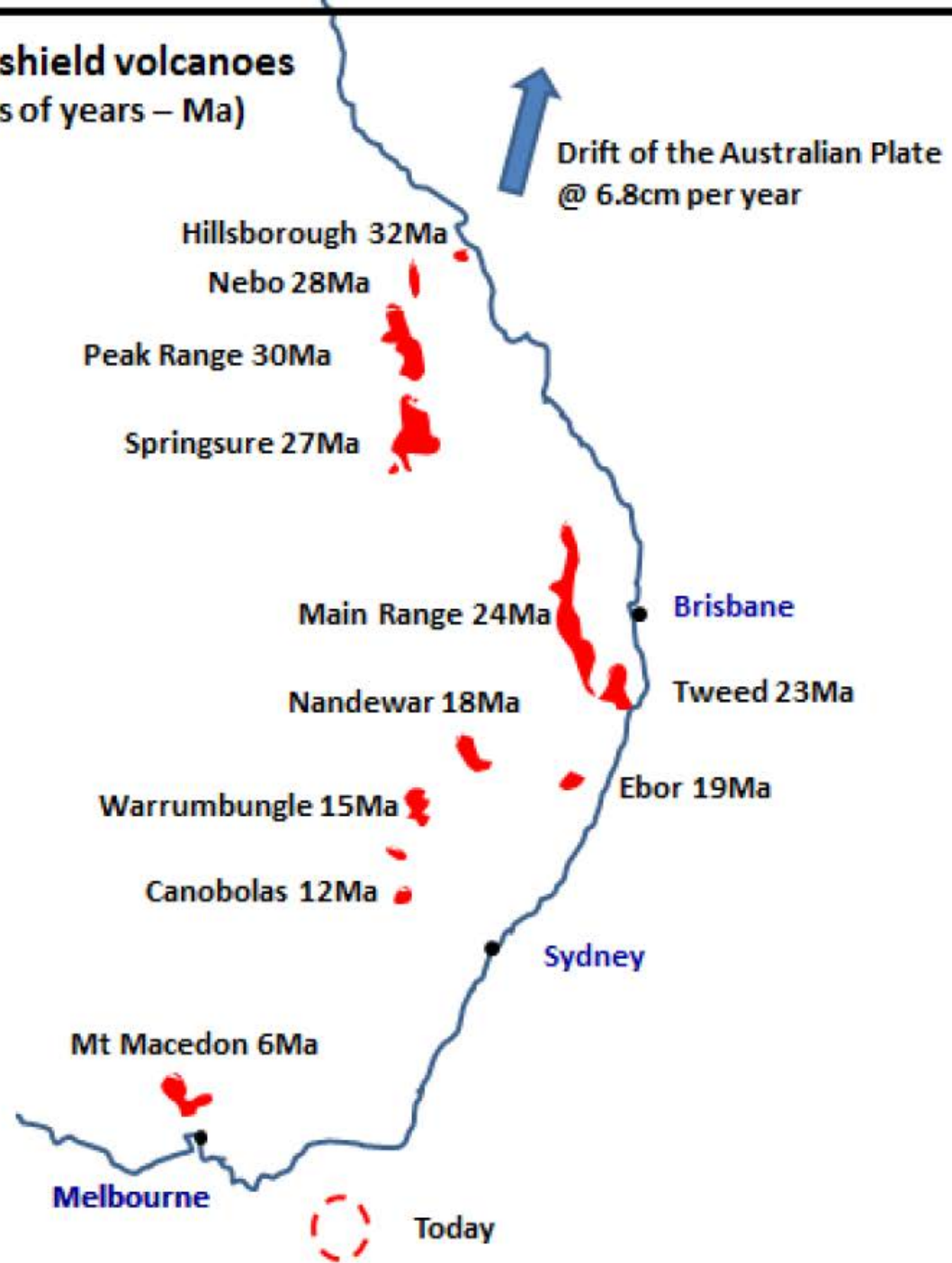


A chain of volcanoes

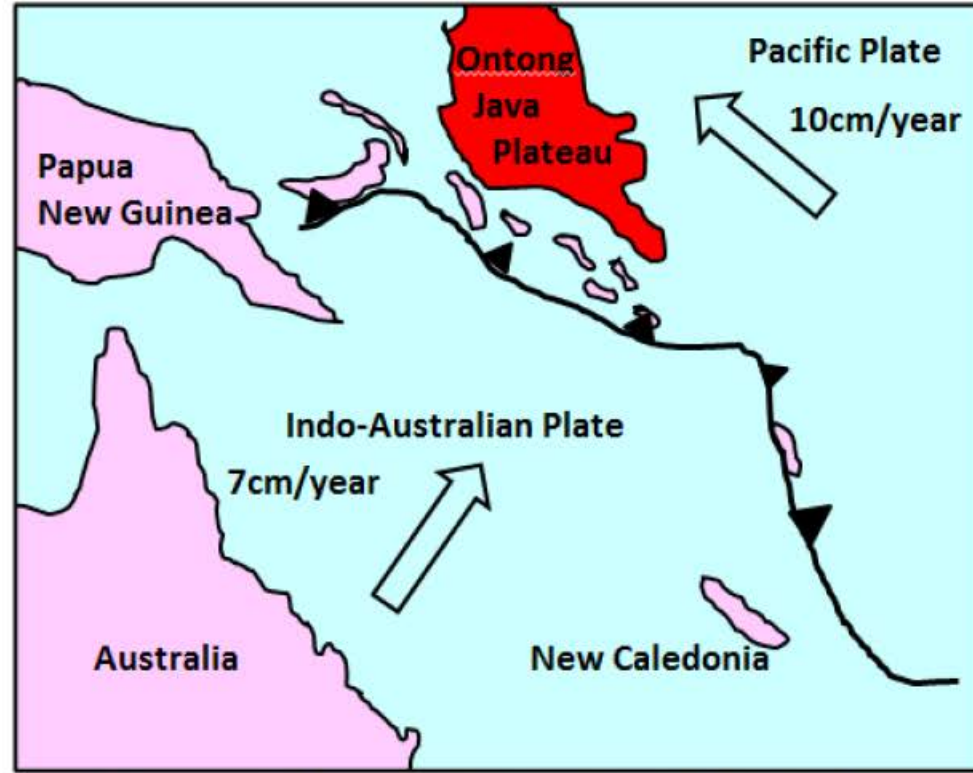
Development of a line of hot spot volcanoes



'Hot Spot' shield volcanoes
(age millions of years – Ma)

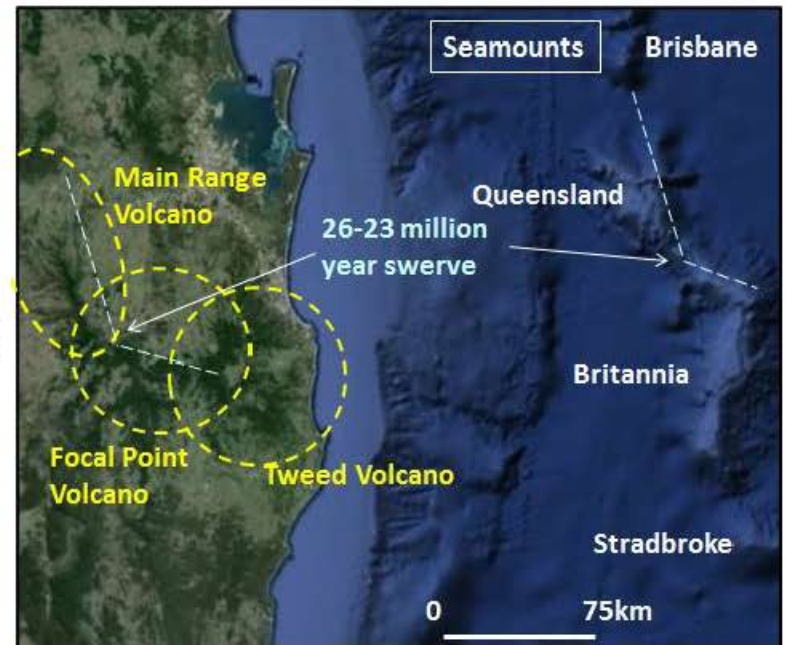


26 million years ago the Australian plate crunched into the OJP and skidded sideways

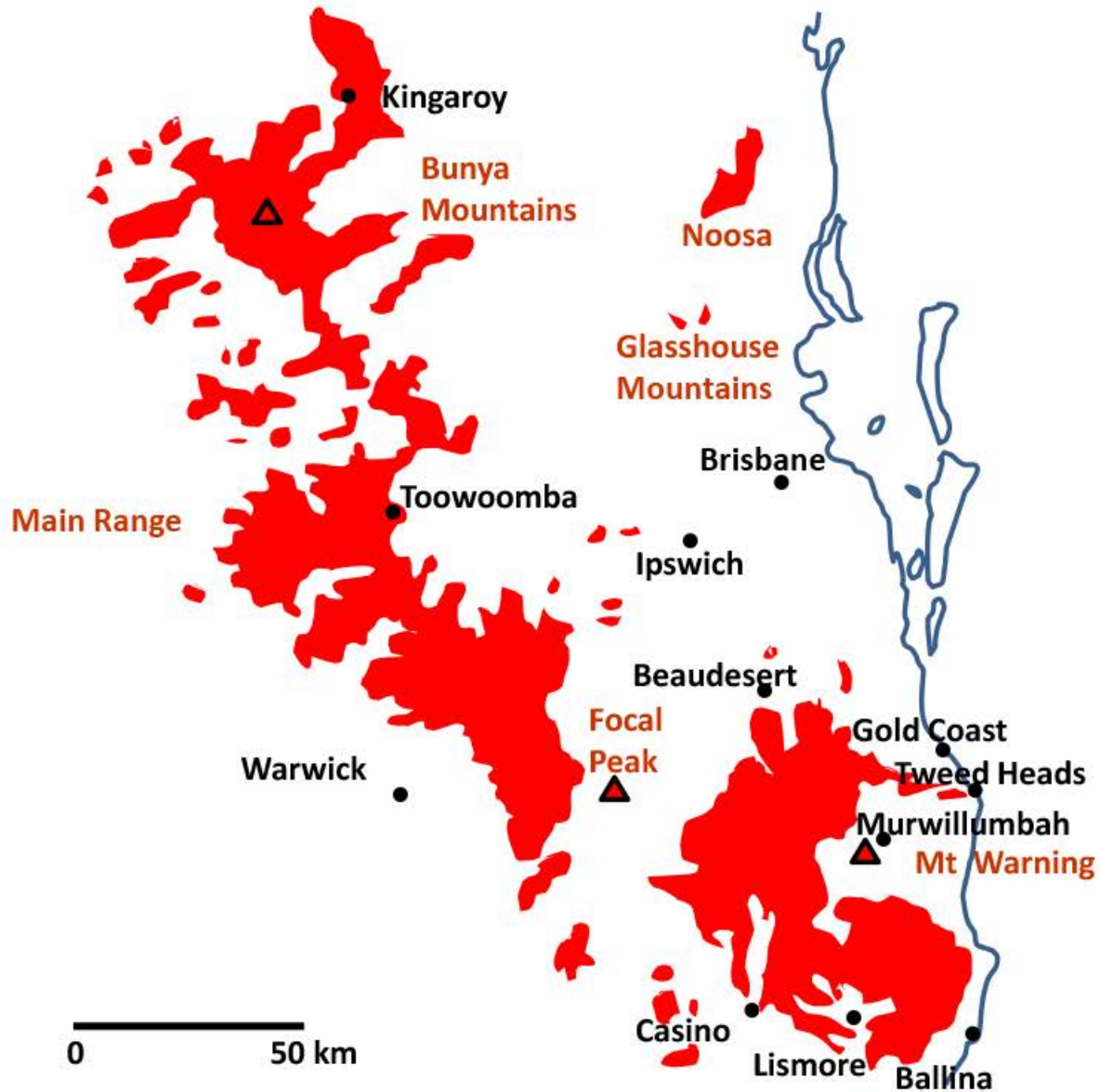


The plate lurched westwards and slowed, the region lingered over the hotspot:

- Huge amounts of lava (cf other Aust 'shields')
- As well as mantle lava (basalts) the crust melted, producing explosion volcanic debris and silica lava in sheets (rhyolite)



Current distribution of volcanics



Stages in the 1 million year life of the Tweed Volcano

1st

**Lava (basalt)
(95%+ of the life)**

multiple flows
of runny lava building
up the volcano



Multiple lava flows make up
the *erosion caldera* wall

2nd

**Silicic (rhyolite)
(latter period -
<5% of the life)**

sticky lava forming
sheets above the basalt



Note scale – forested ridges in foreground



Canyon Lookout
Springbrook

rhyolite sheet
above basalt



Mount Lindesay

rhyolite
remnant

3rd

post-shield stage

**Late last eruption (basalt)
(<1% of the life)**



Mount Hobwee
basalt above
rhyolite sheet



There can be many tens of thousands of years between eruptions. Earlier flows erode, break down into soils and forests invade the landscape....



....to be covered up in the next eruption.

Carbonised tree trunk smothered by volcanic debris, Binna Burra

First eruption phase Focal Peak Volcano

Volcano
main vent



Rathdowney

Springbrook

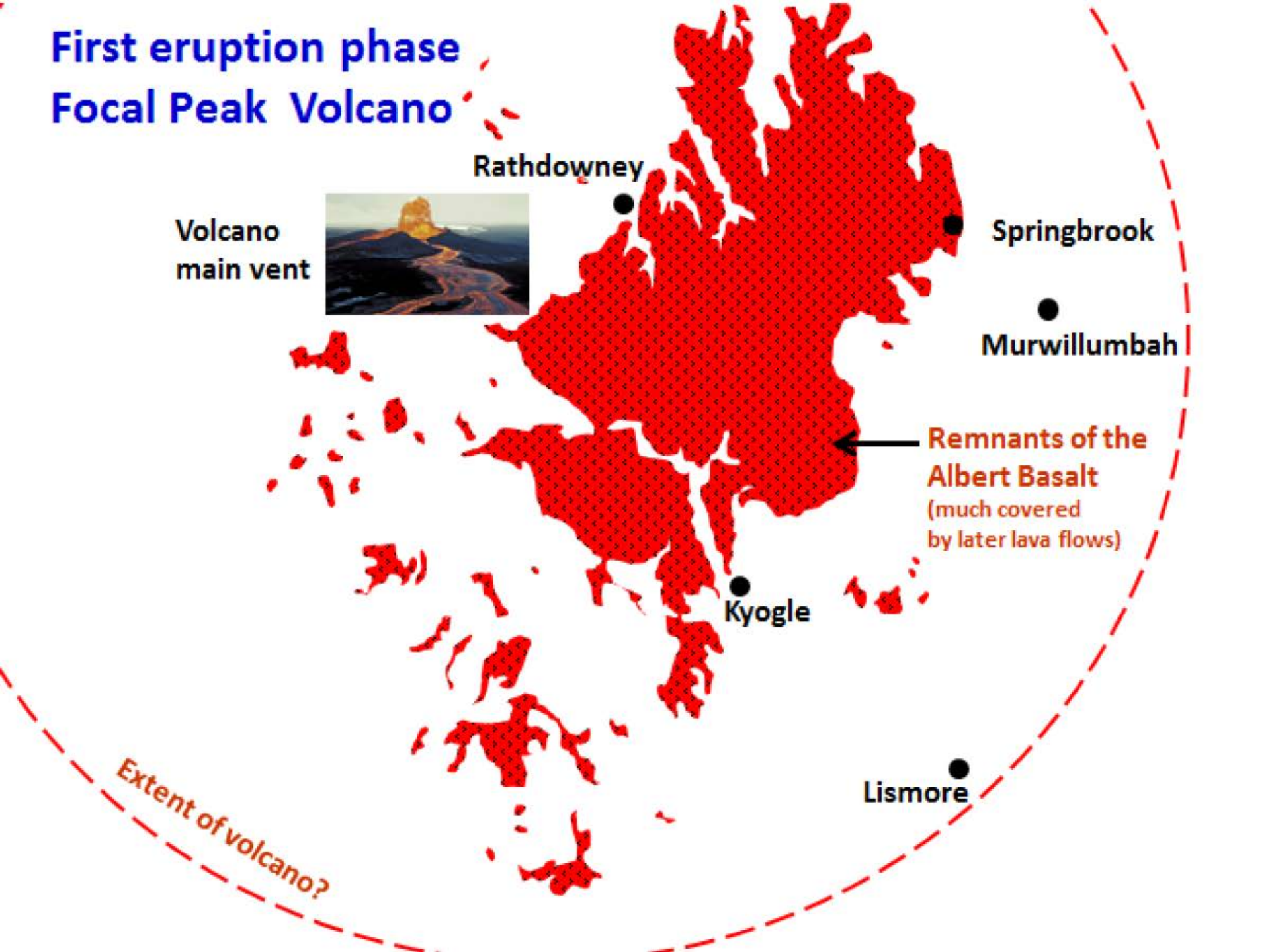
Murwillumbah

Remnants of the
Albert Basalt
(much covered
by later lava flows)

Kyogle

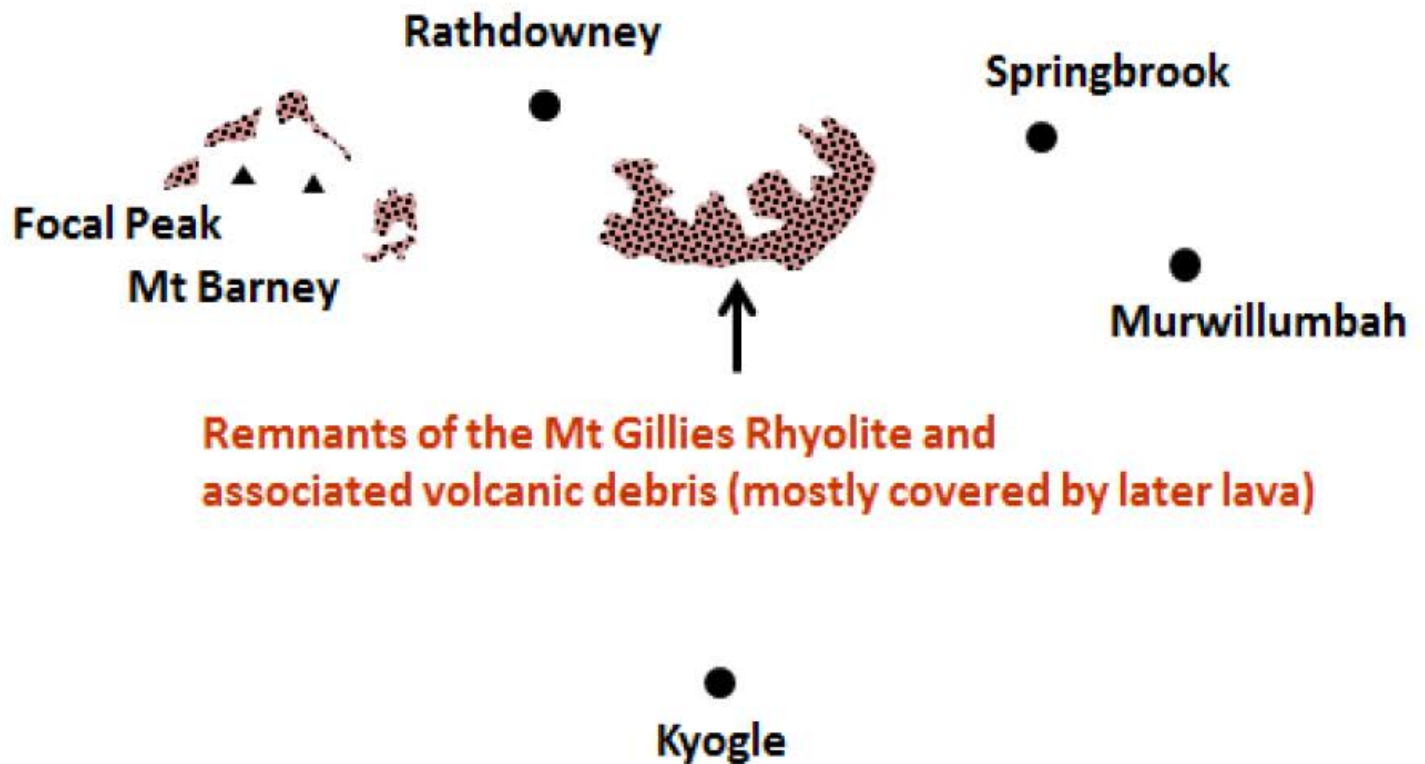
Lismore

Extent of volcano?

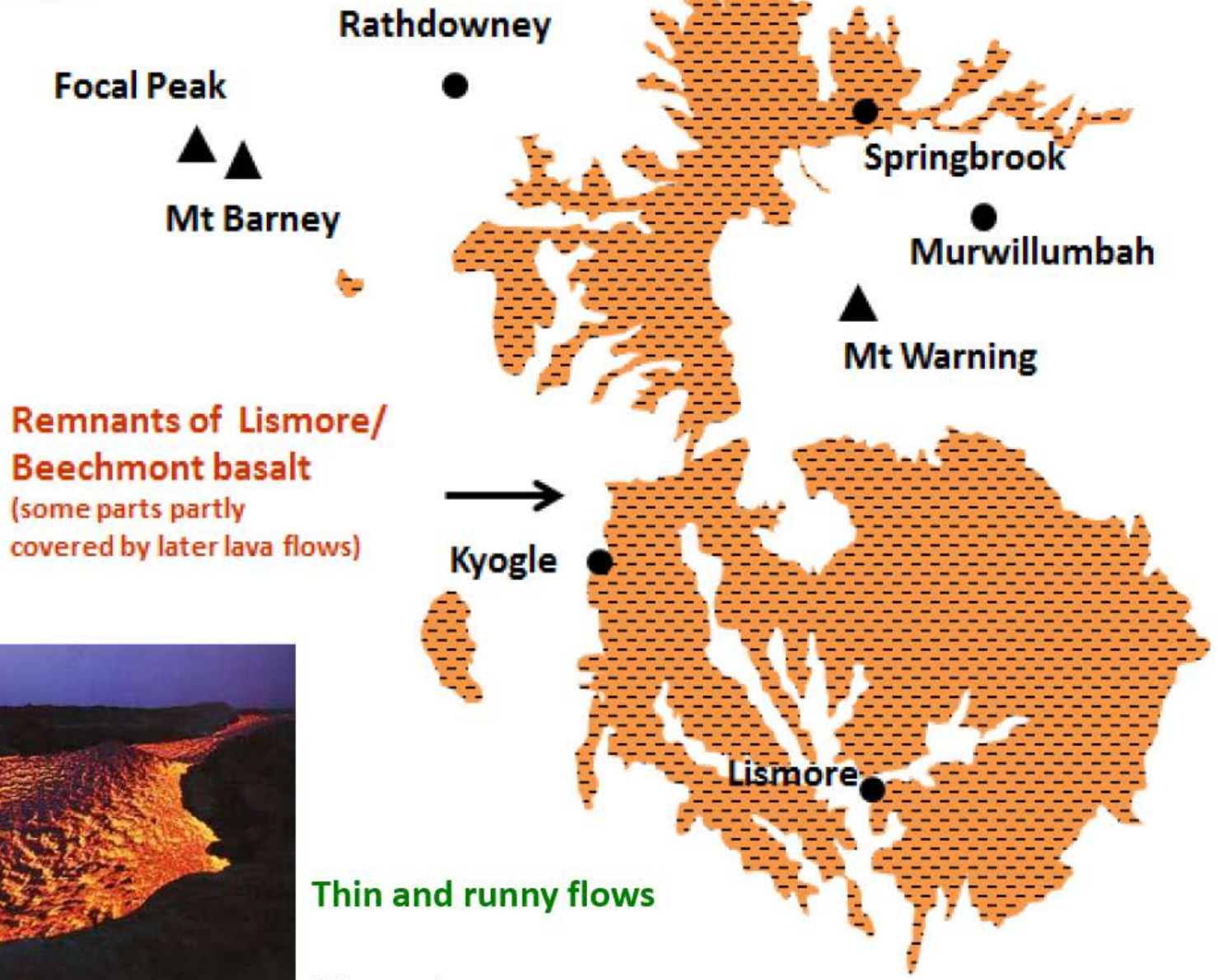


Second eruption phase

Focal Peak Volcano



First eruption phase Tweed Volcano



Focal Peak
▲ ▲
Mt Barney

Rathdowney ●

Springbrook ●

Murwillumbah ●

▲
Mt Warning

Remnants of Lismore/
Beechmont basalt
(some parts partly
covered by later lava flows)



Kyogle ●

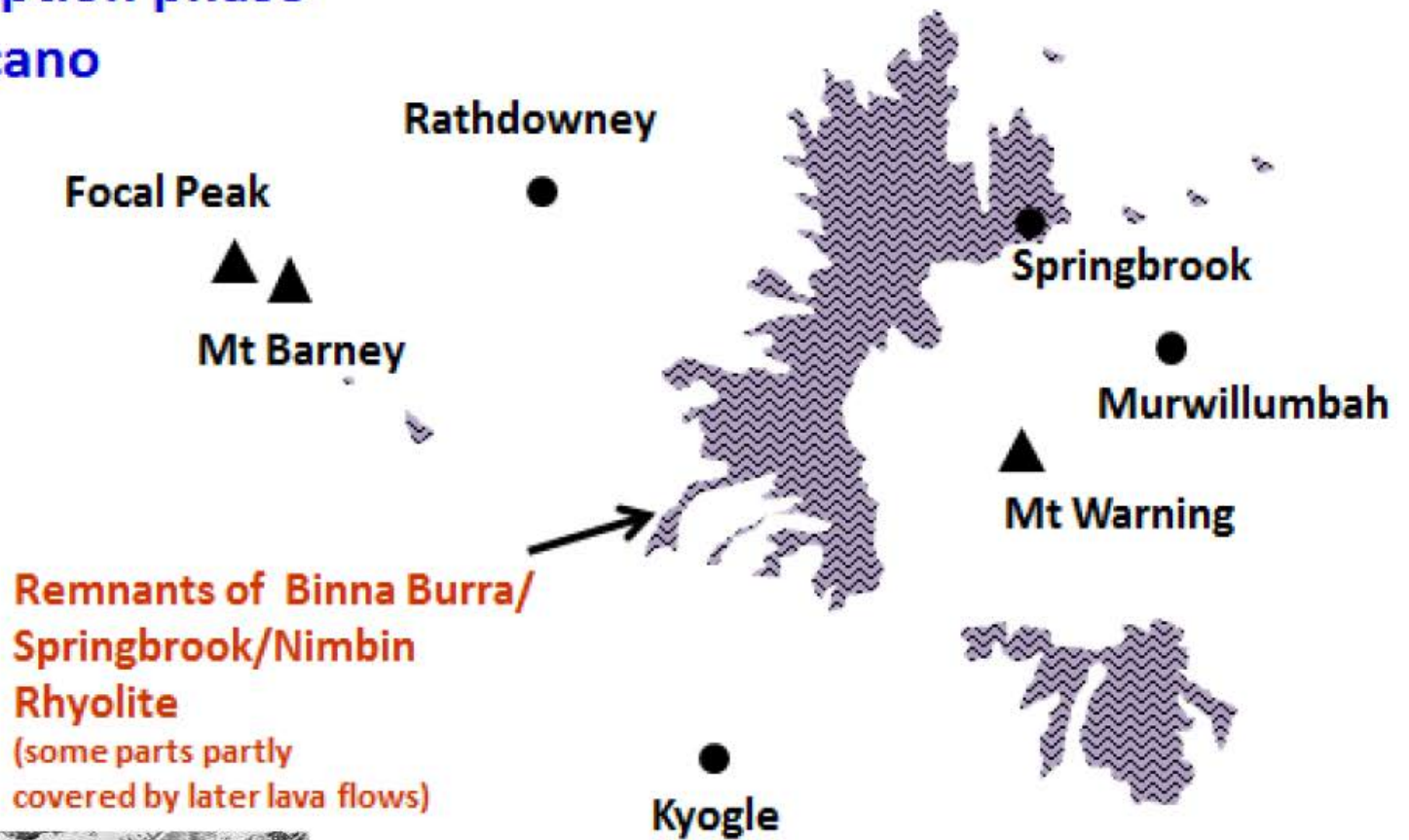
Lismore ●

Thin and runny flows



Mauna Loa

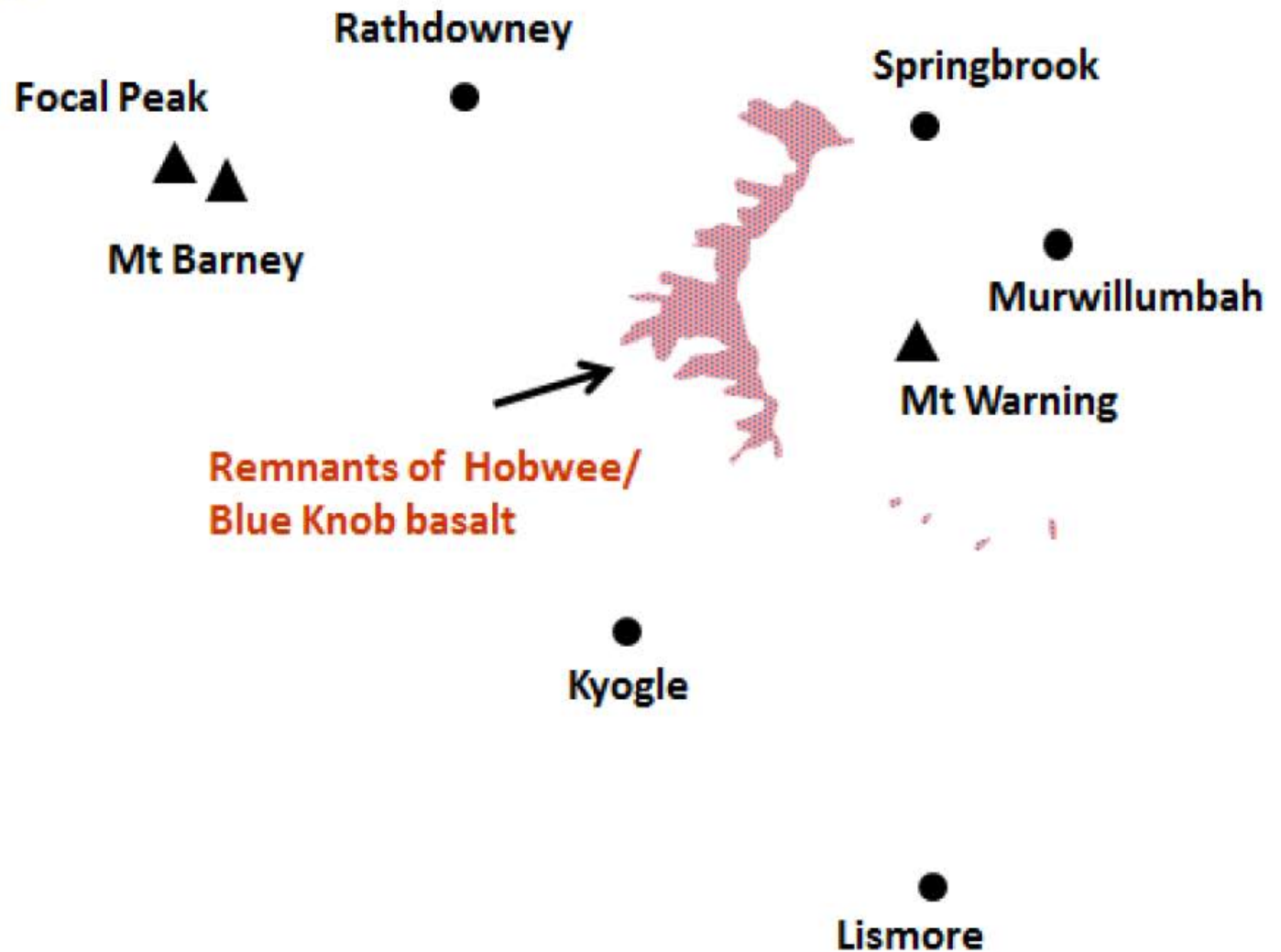
Second eruption phase Tweed Volcano



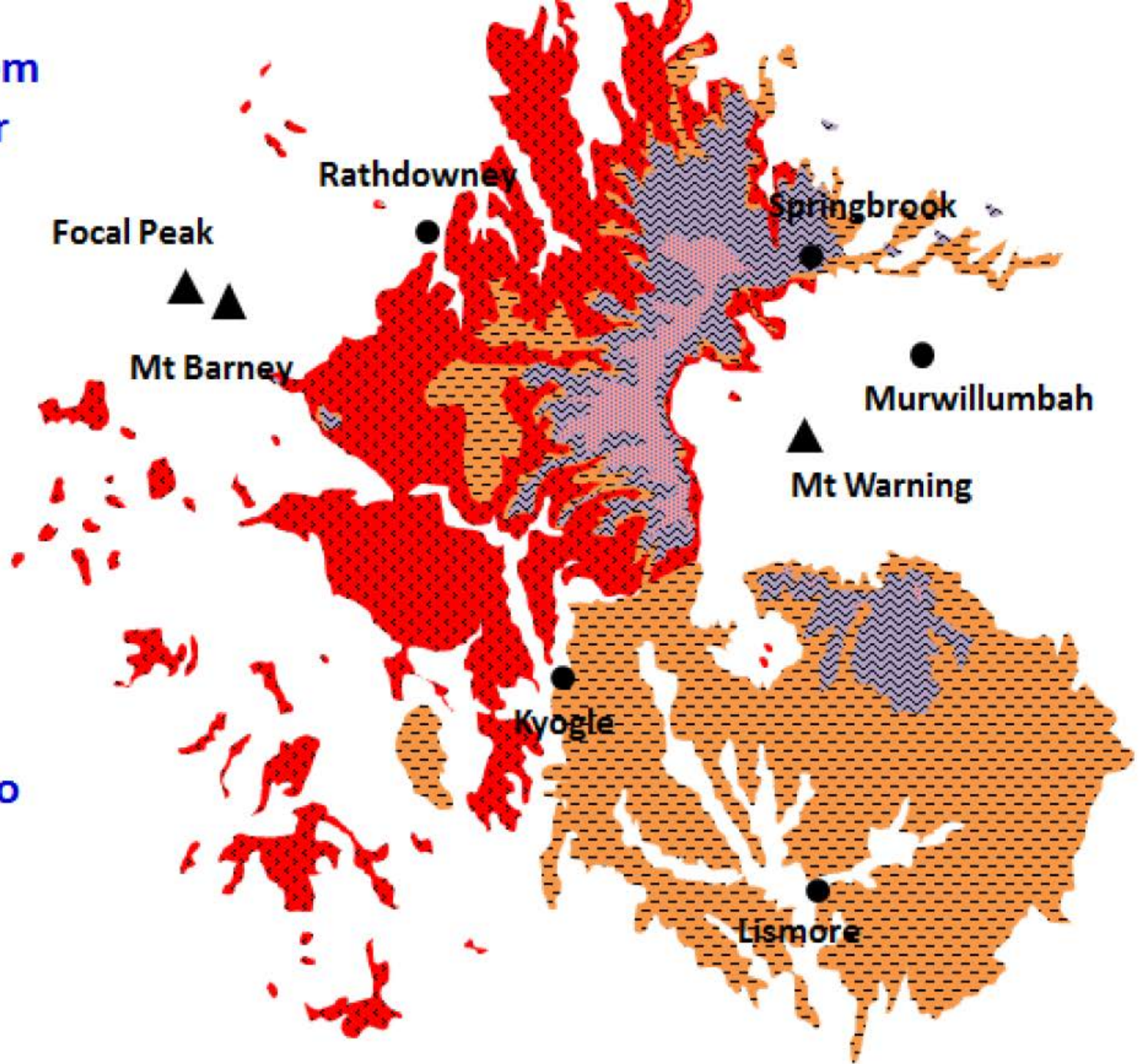
Thick and sticky flows

Africa Rift Valley

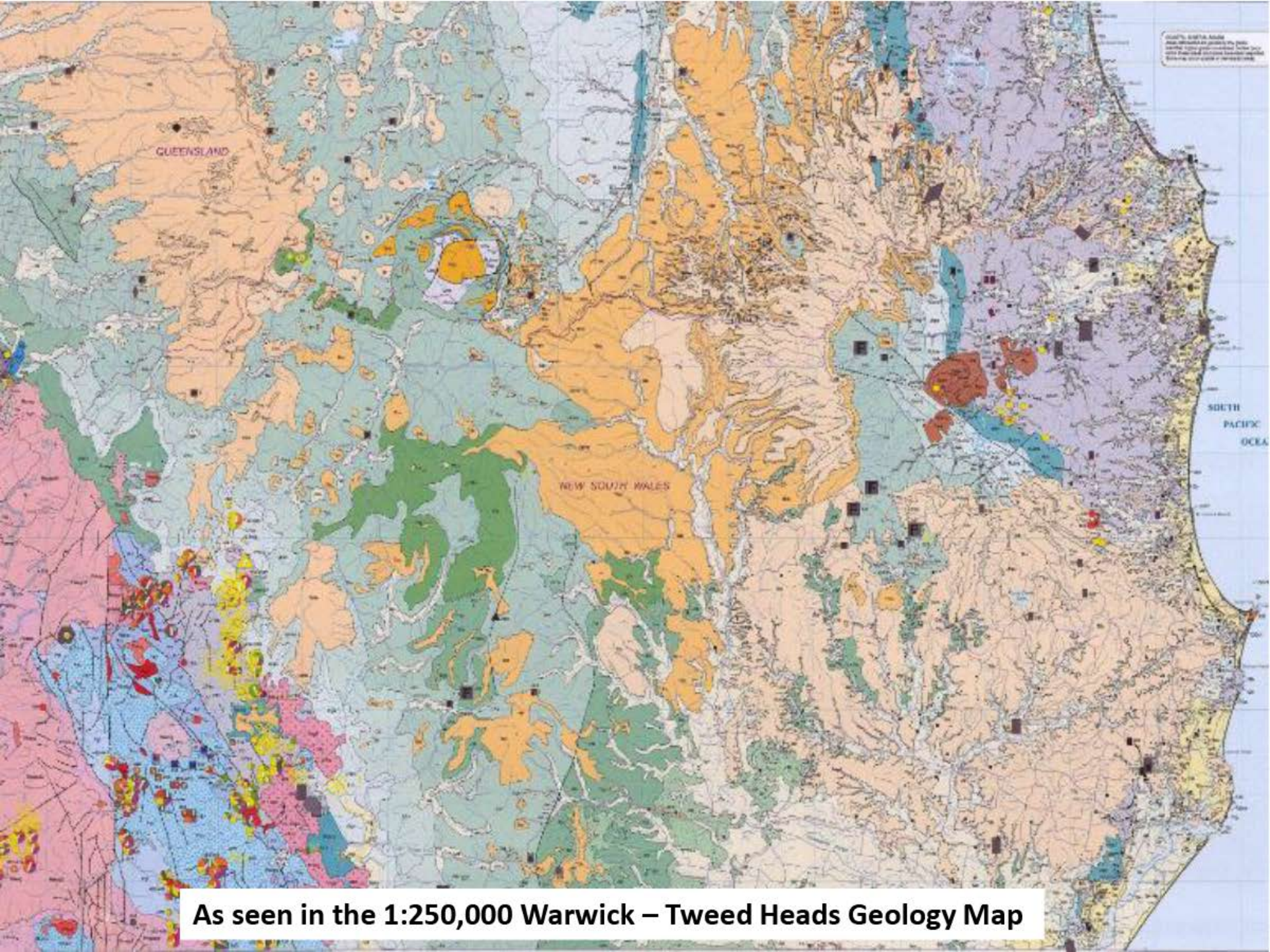
Third eruption phase Tweed Volcano



Putting them
all together



The Volcano
Story



As seen in the 1:250,000 Warwick – Tweed Heads Geology Map