

Geomorphology of the Glenelg Hopkins region

The Glenelg Hopkins region of south-west Victoria covers approximately 2 500 000 hectares extending from Ballarat in the east, to the South Australian border in the west, and from the upland towns of Ararat and Harrow to the coast of western Bass Strait.

In broad physiographic terms the Glenelg Hopkins region lies at the foot of the Great Diving Range of Eastern Australia. Compared to the continuous relief of the highlands further east, the range has diminished to a low subdued watershed, punctuated only by several remnant-striking landforms such as the Grampian Ranges. Numerous low passes, such as the low basaltic plateau separating the headwaters of the Mt Emu Creek and Avoca River separate such landforms

South of the divide, the Glenelg Hopkins region is dominated by generally flat volcanic plains that extend to the coast and comprise approximately two-thirds of the region. The divide finally culminates as the low undulating upland of the Dundas Tablelands, west of which the landscape flattens into extensive aeolian and alluvial deposits.

Drainage across the basalt plains is chiefly served by the south flowing Hopkins River and Mt. Emu Creek. This is complimented by the Glenelg and Wannon river systems that receive tributary drainage and snake around either side of the Dundas Tablelands and Grampians Ranges. The intense dendritic deep profile drainage developed on the Dundas Tablelands is distinct. As is the deep incision of the Stokes River and deep 'V' profile tributaries through the Merino Tablelands. There are pronounced 'U' profile incisions of the major drainage systems across the basalt plains.

Poor and ill-defined drainage in landscapes of low relief which lead to terminal discharge into depressions is characteristic of parts of the basalt plains, northern alluvial districts (east of the Grampians), and in dune swales of the far west. The most prominent of these lake or swamp systems are developed at Willaura, Woorndoo-Lake Bolac, east of Hamilton and south of Dorodong.

Consistent with the geological contrast across the Glenelg Hopkins region, landform is similarly diverse. Significant upland relief is comprised by the north-south strike ridges of the sandstone Grampians Ranges, steep sided granitic monoliths of Mt Cole, Mt Buangor and Mt Langhi Ghiran, and the weathered sedimentary slopes of the divide north of Beaufort. Moderate relief is provided by the gentle and steeply dissected plateaux of the Dundas and Merino tablelands respectively. Domal uplift (Joyce 1992) that formed the Dundas Tablelands in fact marked the shores of the Murray inland sea in the Late Tertiary period.

Most of the Glenelg Hopkins region is covered in basalt landforms. These landforms are extensively described by Joyce (1992, 1998) and range from young stony rise flows and older weathered stony barriers, to Late Tertiary period lava plains with greater or lesser elevation and dissection depending upon age. Volcanic cones (generally with short-lived activity) such as Mt Rouse and Mt Sharwell are relatively scattered, and produced extensive but thin flows across the Tertiary landscape. The youngest volcanic activity is represented by scoria cones such as Mt Napier and Mt Eccles.

In the far west of the Glenelg Hopkins region there is evidence of the final retreat of the Murray Sea. The well-defined line of relief offered by the Kanawinka Fault (north-west of Casterton) for a substantial period of time marked the northern coastline. Further retreat of the sea to its current position has left a series of calcareous dunes. However, more often the surface morphology is dominated by aeolian dunes and sandsheets or alluvial deposits. Along the coast, Tertiary period sea movements resulted in the deposition of limestone, with associated landforms expressed at the surface especially to the east of Portland and east of Warrnambool.

A feature of the Glenelg Hopkins landscape are the remnants of lateritic type weathering that occurred in the Late Tertiary period. This was representative of a warmer climate that produced deep weathered profiles often with iron enrichment in the near surface. Such profiles are observed extensively across the Dundas Tablelands and other exposed Palaeozoic surfaces such as the Merino Tablelands and Stavely Hills. Deeper weathered profiles have also developed over the earliest of the Late Tertiary basalt extrusions.

It should be noted that further work to develop a revised geomorphic framework and map is being undertaken by the Geomorphology Reference Group. The current geomorphic framework has been entailed as part of the land unit descriptions for the Glenelg Hopkins region. This work will be accessible in the future through the Glenelg Hopkins VRO website. It is anticipated that with further revisions to this framework that the land units and their descriptions provided as part of this project will constitute a large underpinning component of this structure.