

Vale: Dr David Leaman (1943–2018)



Dr David Leaman

Tasmanian geoscience has lost one of its leading lights with the death of Dr David Leaman on 18 January 2018. A great champion of geophysics and its application to community concerns, he was also an assured geologist of remarkably broad expertise and interests.

Born in 1943, David grew up in humble circumstances in the northern Hobart suburb of Glenorchy – as he later recounted, on the rock that was to dominate his life's work: dolerite. The combination of mental acuity with extreme productivity and hard work that was to characterise his career saw him obtain scholarships without which he would not have been able to pursue higher education and his childhood ambitions of becoming a scientist. In February 1966, after graduating with Honours from the University of Tasmania, David was appointed as Groundwater and Engineering Geologist with the Geological Survey of Tasmania. His Honours thesis, titled 'Geophysics – Cygnet area including geological implications of the geophysical interpretation', marked the beginning of David's dedication to using geophysics to further geological knowledge. At the Geological Survey the projects he worked on included hydrogeology, basin studies, structural geology, engineering geology and geological mapping, with David applying geophysics in all these fields. During this period David also undertook and interpreted some of the first large area gravity surveys in the State to provide three-dimensional structural

information for solving specific geological problems.

At this time David developed his life-long research interests in Jurassic dolerite, the relationship of water resources and land use, and the application of gravity and magnetic methods to solve geological problems. These interests were combined when David completed a PhD thesis on the mechanism of dolerite intrusions, titled 'Dolerite intrusion, Hobart district, Tasmania', under the supervision of Professor S Warren Carey AO. The thesis was undertaken whilst mapping for the Hobart 1:50 000 geology sheet and the interpretation was used to produce a perspex three-dimensional geological model of the greater Hobart area.

David also started an educational role which included groups as diverse as university students, exploration companies and mature-age groups, across equally diverse topics including tectonics, applied geophysics and geology for engineers. He held a part-time teaching and research role at the University of Tasmania from 1972 until 2001, supervising multiple generations of Honours and postgraduate students who have gone on to apply his methods and philosophy throughout the geoscientific world.

David was appointed to the newly created position of Principal Geophysicist with the Geological Survey in 1973. In addition to a wide variety of geophysical surveys for solving specific geological and technical problems, David started a programme of gravity data acquisition in key areas of the State to add detail to the

7 km- spaced 1973 Bureau of Mineral Resources state-wide gravity survey. Detailed three-dimensional interpretation of many of these surveys provided guidance for future Department of Mines drilling but remained isolated interpretations. In 1980 this work culminated in production of the first state-wide residual gravity anomaly maps, maps where the anomalies from large bodies, such as many of the granitoids, were clearly visible rather than obscured in the Bouguer Anomaly map by combination with anomalies from other sources. This regional-residual separation was progressively refined until the 1988 release of the Mantle88 Moho and water model that allowed quantitative interpretation of gravity data after removing a regional gravity field that was not data dependent. David recognised the crucial importance of the terrain correction for gravity observations in Tasmania, and undertook the mammoth task of calculating this for most of the stations in the State database.

David held his carefully-formed views very passionately and would not be swayed by political imperatives, which did not endear him to officialdom. In 1981, frustrated by bureaucratic controls and convinced that he had no future in the State Service, he resigned from the Survey to found Leaman Geophysics, however he continued to make major contributions to understanding of Tasmanian geology via geophysical methods in his new capacity. As an independent consultant he focused on undertaking challenging evaluations of geological structures using gravity and magnetic methods, undertaking assignments for mineral and hydrocarbon exploration companies in Tasmania, Bass Strait, the Mount Isa region and PNG. During the Department of Mines Mount Read Volcanics Project (1985–1988), David's modelling showed that there were Cambrian granite bodies embedded in the Mt Read Volcanics and concluded that these may well be associated with mineralisation. Other innovative Tasmanian crustal interpretations since 1981 have included a model of the major Tasmanian granitoids, recognition of major structures and pre-Carboniferous geology throughout Tasmania, interpretation of the magnetic and gravity data from the Western Tasmanian Regional Minerals Program (2001–2003), interpretation of the form of the King Island and eastern Tasmania granitoids,

and assessment of features from the 2007 aeromagnetic surveys of northeast Tasmania.

David has left behind an impressive compendium of his work and insights. He is senior or sole author of 10 geological maps and explanatory reports, sole author of 192 Geological Survey publications and records, and co-author of 38 other Survey publications and records. David is also sole author of 102 reports lodged with Mineral Resources Tasmania by exploration companies that are now open-file, and is author or co-author of 70 refereed papers. Among these are significant contributions to understanding the three dimensional architecture of the metallogenically prolific Mount Isa-McArthur Basin terranes of northern Australia. He was also the author and publisher of five books (one in its third edition) discussing Tasmanian geology or hydrology and interpreting Tasmanian geology for bushwalkers, as well as the extraordinary part scientific memoir, part treatise *The Rock Which Makes Tasmania*. These were a natural companion to his work bringing geology

to the public through Adult Education, University of the Third Age, the Hobart Walking Club, history groups and community excursions. In recent years David applied geophysical and physical techniques to assessment and management of Tasmania's water resources, and consequently his advice was widely sought by community groups, farmers and land managers on matters of forestry, irrigation and land stability of subdivisions.

David Leaman was a member of several scientific societies including the ASEG, and twice president of the Royal Society of Tasmania. In 2015 he was awarded the Geological Society of Australia's Twelvetrees Medal 'for his exceptional contributions in the use of geophysics, with geological constraints, to elucidate the three-dimensional structure of the Tasmanian crust and also for his ongoing commitment to geoscience education.'

David Leaman was an enormously productive contributor to Tasmanian geology and geophysics over 50 years, with major contributions in modelling geological domains using gravity and

magnetic surveys, determining the three-dimensional form of Tasmanian granitoids, clarifying Jurassic dolerite structure and deep crustal structures across Tasmania, the nature of groundwater aquifers, the management of our water resources, and many more. His approach was fearless and sometimes controversial, but stimulated geological discussion and challenged accepted dogmas to the betterment of our understanding. As such he was a mighty proponent of the great intellectual tradition originally established by his mentor Prof Carey in the Geology Department at the University of Tasmania. His legacy of educating and informing students, explorationists and the general public in the fields of geology, geophysics and the rocks of Tasmania will continue to loom large for many decades after his passing.

He is survived by former wife Diana, their daughters Sarah and Jenny and three grandchildren, and also by Marcia, his partner for his last 23 years.

Bob Richardson, Keith Corbett, David Duncan and Mark Duffett

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