

DETERMINING DH/DT OVER LAW DOME USING 40 YEARS OF TERRESTRIAL GRAVITY DATA

P. J. Morgan¹, B. Bailey², R. Coleman³, N. W. Young⁴

¹*University of Canberra, Canberra, ACT, Australia,* ²*Macquarie University, Sydney, New South Wales, Australia,* ³*University of Tasmania, Hobart, Tasmania, Australia,* ⁴*Antarctic Division, Kingston, Tasmania, Australia*

Glaciological and over snow programs were the only possible avenues available for determining dh/dt and mass balance in the 1960s. Law Dome in East Antarctica was extensively traversed with several methodologies including gravity during the 1960s and into the 1970s.

We revisited segments of these old traverses in Nov 2004 and recollected gravity and other data paying particular attention to the maintenance of the Wilkes-Casey gravity base stations and to the reproducibility of gravity over the network. We also observed geodetic data, GPS, which will allow us to recompute some of the traverse data in WGS84 coordinates. This will provide the necessary transformations between the reference systems used in the early period and the current GPS reference systems. Our preliminary analysis of gravity data over the summit region of Law Dome indicates that the surface is rising by about 0.12m/yr. This result is substantiated by surface elevation changes which are currently more problematic due to the different reference systems that were used. In a region to the north-west of the summit, where snow accumulation is known to be significantly lower, the preliminary result is a lowering of the snow surface. These results are expected to be validated and extended over Law Dome thereby providing us with a medium term estimate of the response of the surface of Law Dome to current climate signals.