

## Climate trends do not fully explain recent low water levels in Thirlmere Lakes

An independent study into the water levels in Thirlmere Lakes was released today.

The study has found that critical water levels in the World Heritage listed Thirlmere Lakes cannot be fully explained by climate. Recent declines in water levels also correspond with longwall mining in the region.

Dr Philip Pells, who over the last 30 years has provided expert advice for both mining companies and environmental groups, embarked on the study motivated by a scientific interest in the lakes.

The report from Pells Consulting compiles records of historical water levels at the lakes, and combines mathematical modelling with a review of regional geology, groundwater data and mine subsidence.

“Hydrologic modelling undertaken for the study suggests that climatic variables do not fully explain the current low water levels ... the lakes are currently 1.5 to 2.5 m lower in level than predicted by our models” said Steven Pells, a hydrologist, who contributed to the study.

The report contains an extensive review of photographs, archives and anecdotal records extending back to 1860.

A comparison of lake water levels against rainfall data records over this period shows that lake levels have indeed fluctuated with drought patterns. However, lake levels have continued to decline (with current conditions believed to be the lowest on record) and the most recent drought in 2006 was less severe than previous droughts on record. The data suggests that Lake Nerrigorang has declined earlier and more severely than other lakes, something that has not occurred in the past.

The study concludes it unlikely that mine-induced subsidence and geological fracturing would extend to the lakes. However, regional lowering of aquifer water levels has been observed, due to mine dewatering processes. Groundwater analyses presented in the report show that mine dewatering is likely to have impacted on groundwater flow patterns adjacent to the lakes, including lowering of baseflow to the lakes. Based on the available data, it was hypothesised that the valley beneath Lake Nerrigorang is eroded through the Bald Hill Claystone, a geological layer previously thought to be providing a barrier to downward flow.

Under this hypothesis, mining impacts may be exacerbating the lowering of lake levels. Such mining impacts do not preclude the possibility of the lakes refilling again following large rainfall events or extended wet periods, but would impact on the duration and persistence of lake water levels.

Dr Philip Pells said the study, undertaken over a period of a year, was motivated by scientific interests alone. “The study was completely self-funded and has not been commissioned by any group. It came out of a personal desire to understand the lakes and the findings, therefore, are independent of any groups’ particular interest”, he said.

The writers assert that the findings are consistent with an objective and scientific appraisal of the available data. Information from further studies is welcomed.