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THINNING A SMALL JARRAH FOREST CATCHMENT: STREAMFLOW AND
GROUNDWATER RESPONSE AFTER 2 YEARS

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The following is a summary of a paper presented recently at:

Hydrology and water Resources Symposium 1986,
Griffith University, Brisbane 25-27 November 1986, p
2.

Early in 1983 a small jarrah forest catchment (Yarragil 4L) was thinned, resulting in a two thirds reduction in forest density. The thinning was to test the hypothesis that a reduction in forest density will increase the production of both high quality water and timber, without increasing the spread or impact of jarrah dieback. In the first year following the thinning there was not a significant increase in streamflow, and in the second year a small increase of $3.1\text{mm} \pm 0.9\text{mm}$ was evident. After two years groundwater levels had risen about two metres in each of the two boreholes. In the midslope borehole the response was immediate and steady, whereas in the valley borehole the response was delayed with a jump following a fire which killed nearly all leaves in this valley area. The lack of a streamflow response is in marked contrast to other similar catchment experiments reported in the literature and the difference is attributed to the large soil water storage capacity of the deep lateritic soil profiles. It is argued that evapotranspiration has been reduced considerably and that soil water storage has increased markedly. The groundwater rise observed supports this argument. A time

lag of several years between thinning and peak streamflow response is expected. The groundwater rise of 1 m yr^{-1} is about 70% of that reported for complete clearing in a catchment with similar rainfall in the northern jarrah forest, and has the potential to cause stream pollution in forest which has substantial accumulation of salt in the soil.

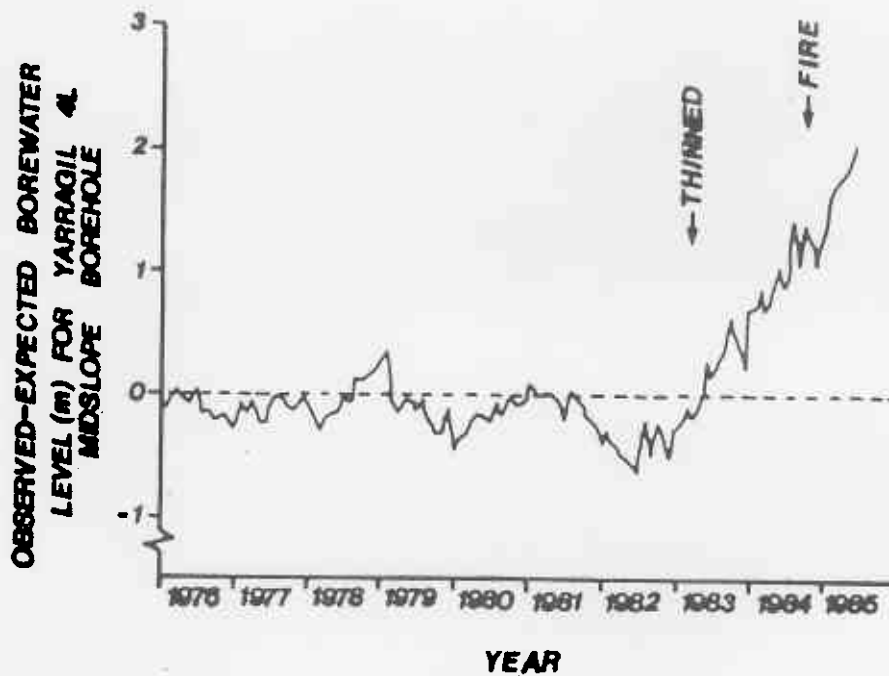


Figure Observed-expected groundwater level (m) for the Yarragil 4L midslope borehole