A TRIPLE DYE TRACING EXPERIMENT AT YARRANGOBILLY

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Abstract

Rhodamine WT. leucophor HBS and fluorescein were inserted into Deep, Eagles Nest and Traverse Creeks respectively, all sinking wholly or partly into the limestone at Yarrangobilly, as part of a programme to determine the catchment area of Hollin Cave. Hollin Cave and three other major springs, together with the Yarrangobilly River above, between and below these springs, were sampled for various periods manually or by machine. Heavy rains began a day after dye insertion. Various lines of evidence and analysis, including the plotting of regression residuals between different wavebands as time series, showed that the relevant fluorescent wavebands were affected by rises in natural fluorescence in the runoff, probably of organic origin. Green was affected most, then blue, and orange only slightly. It was possible to identify a dye pulse of rhodamine at Hollin Cave, most probably representing all the dye put in. A leucophor dye pulse was also identifiable here but a load curve could not be constructed because of probably interference by changing natural fluorescence. Tracing by fluorescein became impossible. Interference between the three dyes was demonstrated. The implications for future quantititave tracing here are discussed.

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