

A spreadsheet-based technique (lotus 1-2-3) for separating tropical forest storm hydrographs using hewlett and Hibbert's slope

Abstract

The inclined line separation technique of Hewlett and Hibbert has been widely adopted to separate delayed flow from the total stream storm runoff. Presented here is the application of the technique to highly responsive storm hydrographs using a personal computer method based on a Lotus 1-2-3 spreadsheet. Using discharge measurements (in $\text{m}^3 \text{s}^{-1}$), catchment area (in km^2) and time (in Julian days), the separation slope is adjusted on the monitor screen until the precise time at which the end of quickflow as storm runoff gives way to delayed flow may be established. The application of the inclined line method is compared with other separation techniques applied to the same dataset. The annual stream quickflow runoff for the study catchment was calculated by the four different separating lines - (i) best-fit curve, (ii) N-day after peak, (iii) inclined line and (iv) horizontal line - was 250, 312, 368, and 588 mm, amounting to 33, 31, 51 and 78 per cent respectively of the annual total stream runoff. Separation of flow by computer spreadsheet methods may be consistently applied throughout a dataset and therefore have a comparative advantage over more arbitrary techniques.