A watershed similarity index for storm runoff due to saturation excess overland flow

B. C. Bates (1), **S. K. Aryal** (2) and E. P. Campbell (3)

(1) CSIRO Sustainable Energy and Environment, GPO Box 2697, Canberra ACT 2601
Australia (2) CSIRO Land and Water, Australia, (3) CSIRO Mathematical and Information
Sciences, Australia (Bryson.Bates@csiro.au / Fax: +612 6246 4564 / Phone: 612 62464569)

A watershed index for the determination of hydrologic similarity is proposed and demonstrated. The index is based on the steady state assumption and is applicable to small- to medium-sized watersheds where storm runoff is generated principally by the saturation excess (Dunne) mechanism. It uses variables that can be derived from measurements of streamflow and topographic, soil and climatic attributes. The method is applied to eight gauged watersheds (4.4 to 84.5 km^2) located in the state of Victoria, Australia. Comparisons of index data with estimates of the codimension of the mean of daily runoff series and groupings indicated by a peaks-over-threshold (POT) analysis of hourly runoff series show good agreement. An uncertainty analysis showed that uncertainties in baseflow separation and the estimation of net rainfall result in prediction errors for the index, as defined by the coefficient of variation, of less than 14 percent.