

Modified NRCS Abstraction Method for Flood Hydrograph Generation

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Abstract

The NRCS abstraction method is based on two assumptions. The first is that the ratio of actual water retention after ponding to maximum potential retention after ponding is equal to the ratio of actual surface runoff to potential surface runoff. The second assumption is that the initial abstraction for the watershed is twenty percent of the maximum potential retention. This study shows that both assumptions violate continuity principles and proposes a modification that renders an elementary relationship accounting for all abstraction forms by dividing them into a variable and constant components. Consequently, the surface runoff computation becomes dependent on the soil initial moisture content and implicitly influenced by the initial abstraction, while retaining the advantage of the subjective selection of curve number from extensive database from which the NRCS method has gained popularity. A new time of concentration model is also proposed to extend the computation for flood hydrograph generation.

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