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## **SELF-ORGANIZING MAP TO ESTIMATE SUSTAINABLE FLOOD RETENTION BASIN TYPES AND VARIABLES**

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### **Abstract**

A sustainable flood retention basin (SFRB) is an impoundment or integrated wetland, which has a pre-defined or potential role in flood defense and diffuse pollution control that can be accomplished cost effectively through best management practice in urban or remote regions. A database comprising 372 SFRB, which belong to 6 types and are characterized by 43 variables, has been developed for the central Scotland area. However, the determination of SFRB types and some characterisation variables is difficult or time consuming. To deal with these issues, the self-organizing map (SOM) model was applied to estimate the difficult-to-determine variables by using their highly related and easy-to-determine variables. Furthermore, the SOM model was used to classify the types of SFRB. The assessment of the SFRB types based on 25 key variables outperformed that based on all 43 variables, which suggests that 25 variables are significant and sufficient to classify SFRB. The results indicated that the SOM model provides an efficient approach to characterizing and classifying SFRB.

*Key words:* classification, flood storage, modeling, unsupervised learning algorithm, wetland

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