

Pond ecosystem services: How to assess the potential for flood control

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Storm water management through the implementation of small waterbodies is rarely a goal for private landowners. Retention ponds are realised in order to handle the discharged non-polluted water by infiltration / retention. Such small ponds are most often created for ecological, landscape, recreational or ornamental purposes. They have nevertheless a potential for buffering the water flow, especially if considered collectively. Besides the precipitations, they may be supplied by a small stream, a drainage system or even the public fresh water network. The water balance takes form by evaporation and evapotranspiration while the water level is also controlled by a secondary outlet. Pond substratum is often impervious in order to avoid water loss. The design of a flood control pond puts forward technical solutions and may neglect the ecological potential of the site. The pond can be supplied by a stream or the public storm-water network. The downstream flood protection is achieved for a specific return-period storm. The outflow limitation criteria is achieved by a specific hydraulic work yielding retention within the pond for both inflow volume and peak discharge. The pond bed is pervious when infiltration is a goal. We illustrate here this framework of water budget and flood control with an example of a multi-services pond created in the Swiss Jura integrating also ecological issues. Furthermore, our new research project “CONFORTO” aims to assess the flood control potential of existing urban ponds in Geneva enclosing various ecosystem services, we will present here through several examples.

Keywords: hydrology, flood control, retention pond, ecosystem services

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Warning: The professor Vecsernyes sends his apologies for not being available on Tuesday owing to his professional obligations