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Environmental Risk Imposed by Diverted Flood Waters on Water and Soils in Emergency Retention Basins

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ABSTRACT

Emergency retention basins (ERB) are diked enclosures alongside rivers into which water from the main river channel is diverted during extreme floods. If the basins are operated during extreme flooding, two negative environmental impacts may occur: 1) contamination of the soils due to their transport by suspended sediments to the basin and 2) depletion of dissolved oxygen in the basin water. A computer-based methodology is presented which was used to assess the environmental risk exhibited by the operation of an ERB system proposed for the Elbe River in Germany. The August 2002 extreme flood event was used as a test case. For such a flood, the results showed that there is a 77% risk that dissolved oxygen levels fall below 2 mg/L in the water and a 48% chance of exceeding the inspection value of 500 mg zinc/kg in the soil.

KEYWORDS

Environmental Risk, Inundation, Retention Basins, Water Quality, Contaminated Soils, Quasi-2D Model

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