

# **A Novel Method for Evaluation of Flood Risk Reduction Strategies: Explanation of ICPR FloRiAn GIS-Tool and Its First Application to the Rhine River Basin**

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## **Abstract**

To determine the effects of measures on flood risk, the International Commission for the Protection of the Rhine (ICPR), supported by the engineering consultant HKV has developed a method and a GIS-tool named "ICPR FloRiAn (Flood Risk Analysis)", which enables the broad-scale assessment of the effectiveness of flood risk management measures on the Rhine, but could be also applied to other rivers. The tool uses flood hazard maps and associated recurrence periods for an overall damage and risk assessment for four receptors: human health, environment, culture heritage, and economic activity. For each receptor, a method is designed to calculate the impact of flooding and the effect of measures. The tool consists of three interacting modules: damage assessment, risk assessment, and measures. Calculations using this tool show that the flood risk reduction target defined in the Action Plan on Floods of the ICPR in 1998 could be achieved with the measures already taken and those planned until 2030. Upon request, the ICPR will provide this tool and the method to other river basin organizations, national authorities, or scientific institutions. This article presents the method and GIS-tool developed by the ICPR as well as first calculation results.

## **Keywords:**

*GIS; tool; flood risk analysis; transboundary flood risk assessment; flood risk management; effects of measures; effectiveness of measures; Rhine; ICPR; International Commission for the Protection of the Rhine; ICPR FloRiAn*

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