

## **Assessing Flood Vulnerability in the Saskatchewan River Basin: A Multi-Dimensional Approach**

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Flood vulnerability is a critical issue for communities located in river basins, as floods can cause significant damage to infrastructure, property, and human life. The Saskatchewan River Basin (SRB) is prone to flooding, which can cause significant economic and social impacts. In 2013, Alberta and Saskatchewan experienced heavy rainfall and melting snow, resulting in more than 100,000 evacuations, multiple fatalities, and damages exceeding CAD\$6 billion to infrastructure and properties. With the increasing frequency and intensity of extreme weather events due to climate change, understanding the vulnerability of communities and infrastructure to flooding is critical for adaptation planning. This study develops a Flood Vulnerability Index (FVI) for the SRB that considers both physical and social vulnerability factors. The FVI is based on the dimensions: (1) Social vulnerability, (2) Economic Vulnerability, (3) Environment vulnerability, (4) Hydrological vulnerability. These dimensions were assessed based on the 18 indicators and were assigned an equal weight after normalization. The results identifies the areas at high risks of flooding resulted from the socioeconomic and hydrological characteristics of the region. The results provide insights into how policymakers can use FVI to prioritize flood risk reduction strategies and improve community resilience to flooding.