



A flash flood risk assessment of the Colorado Front Range region using GIS

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Between 1983 and 2003, in the United States, flash floods caused nearly \$4.5 Billion in damage and 98 deaths. Along the Front Range of Colorado's Rocky Mountains, variable precipitation, steep terrain, and a growing population combine to enhance flash flood risk. Although significant research has been performed on impacts and mitigation of flash flood events, a methodology for assessing societal vulnerability and risk in the Colorado Front Range region has not been fully developed. Because accurate risk assessments can aid in determining appropriate flood control, mitigation, and response strategies, this project explored the environmental-social links in flash flood hazards and developed a GIS-based model that combines hydrometeorological information with social data. Integrating data from disciplines such as meteorology, geography, and sociology enhances the understanding of flood risk and vulnerability. This project expanded upon this integration, and explored the potential applications specifically for meteorological forecasters. This method allowed for radar-derived precipitation data to be integrated in a GIS analysis to map key areas at risk for flash flooding. The 1997 precipitation event, that caused a flood disaster in Fort Collins, Colorado, was used as a model event to assess potential flood risk in two metropolitan areas in the Front Range region: Fort Collins and Denver. The results provide a framework for a more in-depth study of flood risk utilizing near-real time precipitation data, hydrological models and more detailed socio-economic geographic data.