

Bridging the Gap: Towards an Updated Flood Risk Map for Columbus

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ABSTRACT:

Pluvial floods are increasingly becoming a major threat, particularly highlighting that urban areas, regardless of their distance from rivers or coastlines, can experience flooding due to heavy rainfall. Given the projected increase in precipitation frequency and intensity, accurate prediction and data on urban pluvial flood risk are critical for understanding vulnerability to this type of disaster, especially in the era of climate change. This study focuses on assessing and identifying potential urban pluvial flood zones in Columbus, Ohio. Utilizing the weighted overlay method and considering four major factors - elevation, slope, drainage density, and flow accumulation - we have generated an urban pluvial flood risk assessment for the study area. The results reveal that about 63.1% of buildings in Columbus have a medium urban pluvial flood risk. Additionally, 36.1% fall into the high-risk category, 0.1% are classified as very high risk, and the remaining 0.1% are deemed low risk. The assessment was validated using historical urban pluvial flood data from NOAA (2005-2022). A notable disparity emerges when these findings are compared to FEMA's flood risk map for Columbus, which predominantly addresses flood risk near water bodies while overlooking the realities of urban pluvial floods. This highlights the necessity for an updated flood risk map in Columbus and an enhanced understanding of pluvial flood risks in areas that are not directly adjacent to water bodies. The outcomes of this study can contribute to the development of early warning systems and provide crucial information for contingency and emergency planning in Columbus.

KEYWORDS: *flooding, climate change, pluvial*

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