

How can flood effects be best mitigated in the Southwest?



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Flood Effect Mitigation

Relying solely on traditional floodproofing measures such as dikes, levees, and dams leaves cities vulnerable to catastrophic failures when flooding strikes. Mitigating flood effects in addition to these measures increases resilience, especially when best practices are applied.



Flash flooding near Marana, AZ.



Animas River flooding in Williamsburg, NM.



Flooding in Jamestown, CO.

Review of Best Practices

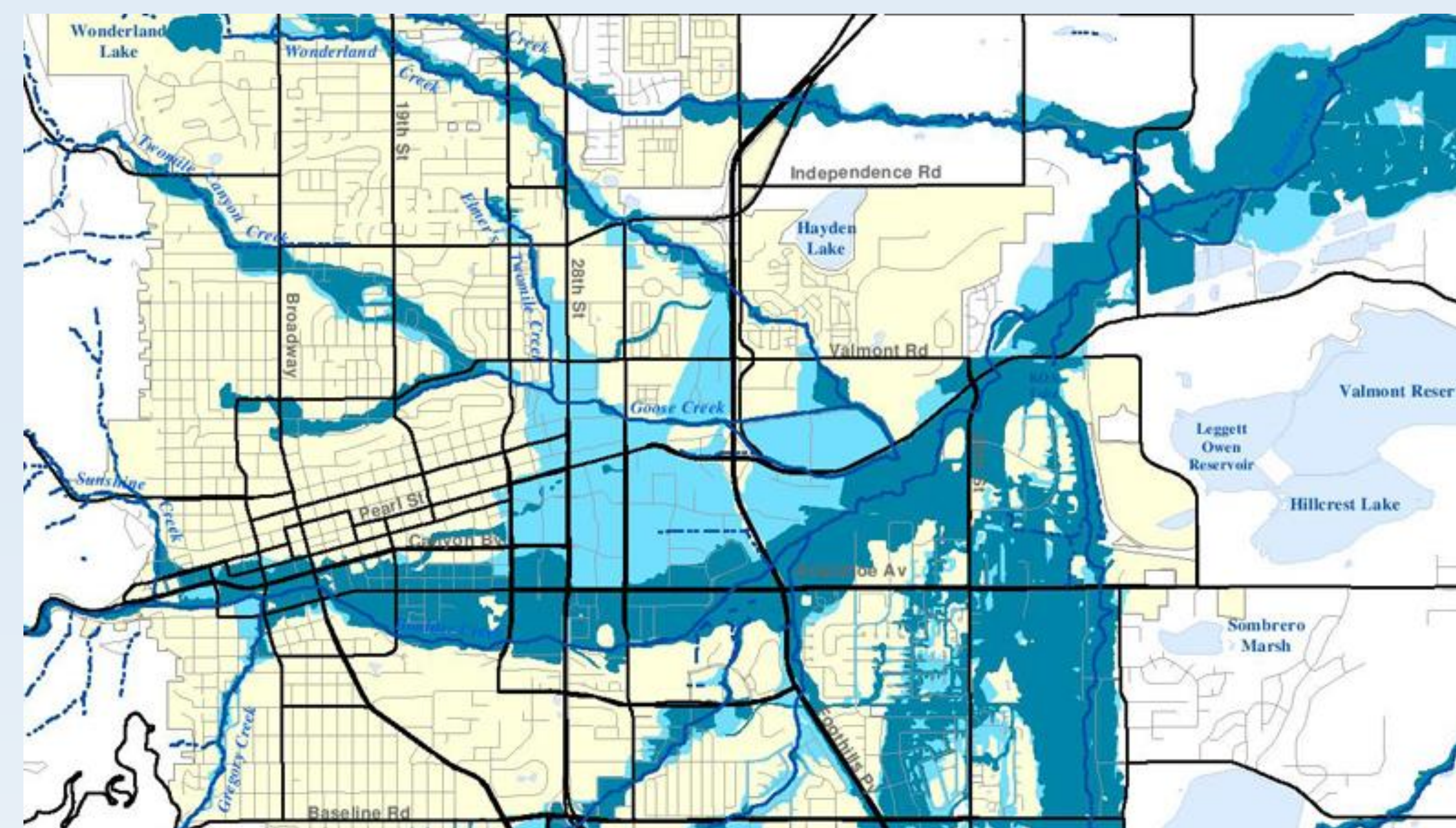
Best practices for flood effect mitigation were determined through literature and case study review with emphasis on the 2013 floods in Boulder, CO and the green infrastructure utilized in Tucson, AZ. Case studies and strategies from across America and the globe were assessed. FEMA standards and scholarly recommended flood mitigation practices were additionally used to assess effectiveness.

Comparative Case Study

In September 2013, Boulder County received 12.3” of precipitation over 3 days, resulting in a flood that far surpassed even the all-time monthly precipitation record. The contrast between flood preparation and mitigation methods of the city of Boulder and the town of Lyons demonstrates the importance of flood effect mitigation and the dangers of relying on floodproofing.

Boulder	Lyons
Philosophy of developing in sync with nature since 1900	Development at expense of environment
Strong communication and emergency response system	Unable to communicate or rescue affected residents
Flood infrastructure integrated into city and built from natural environment	Infrastructure limited to floodproofing

A year after the floods, some Lyons families still lived in a FEMA emergency shelter. By contrast, due to Boulder’s investment in flood effect mitigation some utilities were able to remain operational during the flood.



Floodplain map of Boulder, CO.

Recommendations

Green infrastructure including pervious surfaces and retention basins, has been successful in Tucson, AZ. Other methods, including zoning, construction requirements, and participation in the (program) have been shown to drastically reduce flood losses.



Flood diversion near Boulder, CO.



Runoff capture basin in Tucson, AZ.

Further Study

In order to best utilize these methods, studies specific to each municipality are essential. The role of climate change needs further assessment, and recent flooding in the Southwest provides additional case studies.

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