



Museum Fire Flood Projects



FLOOD CONTROL DISTRICT

May 18, 2022

Welcome to the City of Flagstaff's Museum Fire Flood Projects eNews. Please email info@museumfloodprojects.com with any

questions. These eNews will be released regularly to provide updates on all the City's Museum Fire Flood Projects.

BACKGROUND

On July 21, 2019, the Museum Fire broke out in the Dry Lake Hills area just north of Flagstaff within the Coconino National Forest. The fire ultimately charred 1,961 acres, including a significant portion of the Spruce Wash Watershed. Flood modeling subsequently showed potential flood risk to neighborhoods in Coconino County and the City of Flagstaff. Both the City of Flagstaff and Coconino County Flood Control District immediately took extensive measures and precautions to mitigate damage from flood events.

Throughout the summer of 2021, unprecedented rain events impacted the Museum Fire burn scar and caused multiple rounds of flash flooding in Flagstaff neighborhoods. The City of Flagstaff continues to collaborate with both the public and private partners to lessen the impact of flooding in the affected Flagstaff neighborhoods.

MUSEUM FIRE POST-FIRE FLOOD RISK ANALYSIS

The Museum Fire Post-Fire Flood Risk Analysis was conducted in the fall of 2021 to provide an updated and detailed snapshot of the current hydrologic and hydraulic conditions of the Spruce Wash, which was impacted by the 2019 Museum Fire. The fall 2021 analysis reaffirmed that the threat of flooding is real, and that, due to the fire, flooding can result from even moderate-sized rain events. Conducting regular flood risk analyses of the area impacted by Museum Fire post fire flooding is necessary to gauge changes in the watershed's hydrologic and hydraulic conditions from the previous monsoon season. This information is used to refine both emergency response protocols and the functionality of flood mitigation measures.

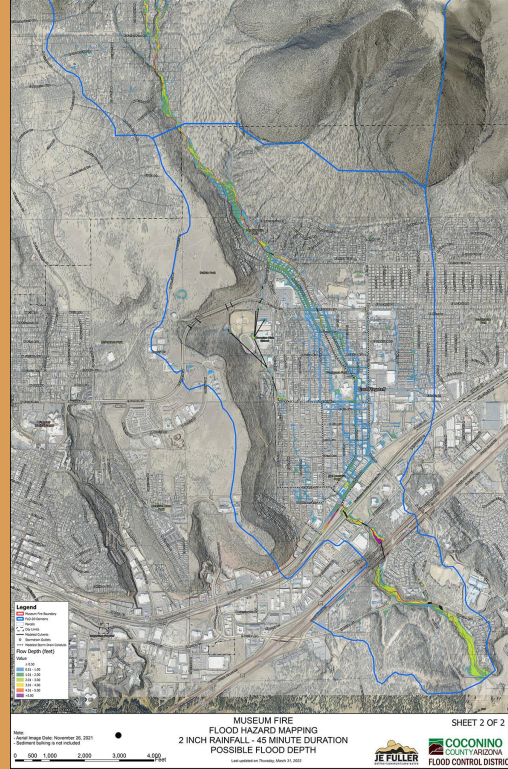
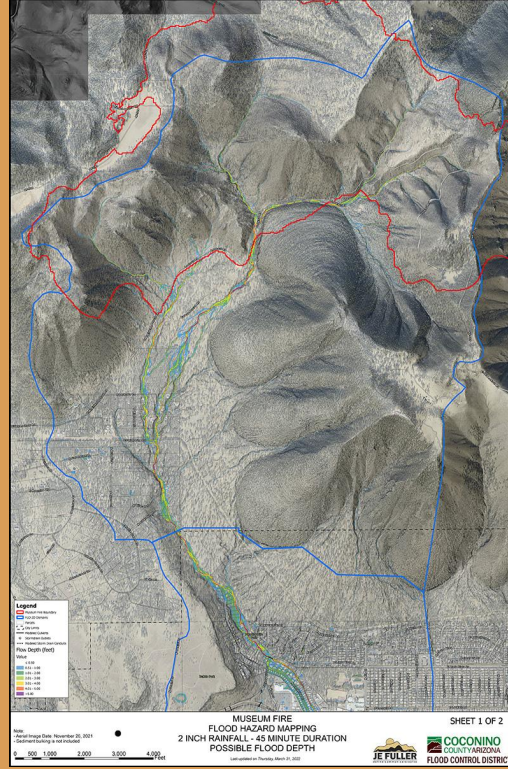
The model used for the fall 2021 analysis makes several assumptions. First, a uniform rainfall is assumed throughout the watershed. Realtime events will vary in rainfall distribution, but the modeled rainfall provides an analysis that can be used to evaluate flooding potential for a given storm precipitation total. Second, the model assumes a 'normal' soil saturation level. During a monsoon season, soils may or may not be more saturated. If soil becomes more saturated later in the monsoon season, then the watershed could be more responsive and could result in higher flows. Third, sediment reduction or mitigation projects and emergency measures, such as sandbags and concrete barriers, are not included in the modeling.

FINDINGS

The fall 2021 analysis utilized FLO-2D modeling with four times the resolution of the 2019 study (the resolution changed from a 20'x20' grid to a 5'x5' grid). The increased resolution of the fall 2021 analysis resulted in slightly revised areas impacted by flooding due to better definition of the channels, curb lines, and other topographic features in the updated analysis.

The analysis showed that there was a change in the peak flow rate timing for water flowing over the burn scar. Modeled peak flow rates above E Linda Vista Dr. are approximately 6% higher than previously shown in the 2019 modeling. The model used in the analysis assumes a rainstorm over the entire watershed and the timing of peak flow rates can vary greatly depending on the actual rainfall patterns of a storm.

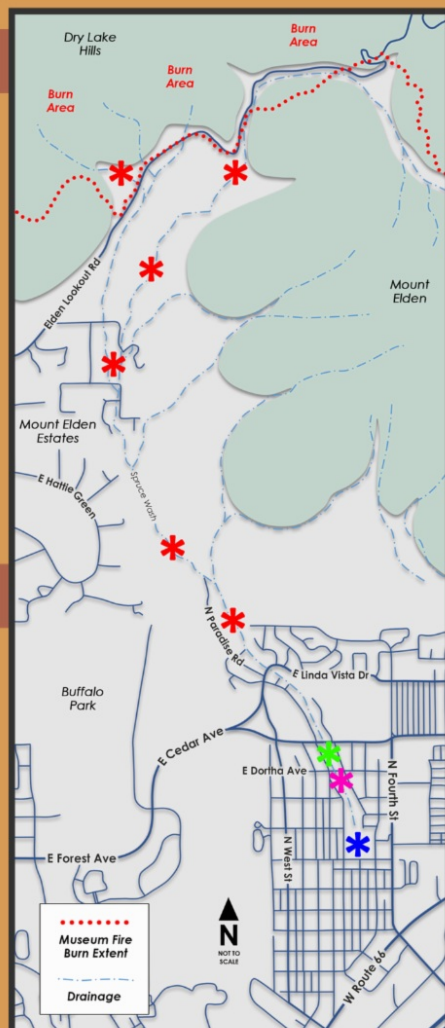
Lastly, the analysis showed that there are channel geometry changes that occurred during flood events within and below the burn scar from scour (erosion) and aggradation (build-up of sediment and debris). These changes to the channel geometry produced some noticeable differences in velocities (the speed of the water) and depths in the incised channels in and around the burn scar, changes in the timing of peak flow rates, and slight changes to flow patterns above Mount Elden Estates due to sediment and debris aggradation. It is important to remember that flood channel geometry can change even after small rain events. Eroded and incised areas of an impaired watershed can become deeper or wider, which will affect floodwater velocities. The Spruce Wash watershed will continue to change and evolve during future flood events and those changes are not reflected in the analysis.



Revised 2-inch rainfall flood hazard mapping based on the results of the fall 2021 analysis (click to view a larger version).

The City of Flagstaff and the Coconino County Flood Control District will continue to use the results of the fall 2021 Museum Fire Post-Fire Flood Risk Analysis to help understand the current flood risk and to assess the implementation of flood mitigation measures. Based on the results of the analysis, no major changes to existing emergency sandbag or barrier mitigation, apart from regular maintenance, are recommended at this time.

To read the full report, please [click here](#).



Stay Connected

Electronic Newsletters

The City will send out electronic newsletters (such as these) on a regular basis as these projects progress.

To receive eNewsletters, as well as notifications of Museum Flood Project updates scheduled at City Council meetings, send a request to: info@museumfloodprojects.com.

Additional questions?

Please email: info@museumfloodprojects.com

Sarah Langley
Public Affairs Director
(928) 853-5596
City of Flagstaff

Key Flood Projects

Key projects are identified by the corresponding colored asterisk on the map to the left:

- * Alluvial Fan Restoration and Sediment Reduction (Led by the Coconino County Flood Control District)
- * Spruce Wash Channel Improvements Project (Cedar Avenue to Dornha Avenue)
- * Spruce Wash Channel Improvements Project (Dornha Avenue Inlet)
- * Killip School Regional Detention Basins Project

[Click here to view a larger version of this map.](#)



For more information on these projects and important resources, visit museumfloodprojects.com