

## **Mendenhall Valley Flood Fighting Inundation Maps**

**MAY 8, 2025**

The City & Borough of Juneau published updated flood fighting inundation maps for the Mendenhall Valley for glacial lake outburst floods (GLOF). The maps are the result of hydrologic and hydraulic (H&H) analysis and modeling performed by Michael Baker, International (MBI) and reviewed by relevant federal agencies, as well as the University of Alaska, Southeast. The series of maps provides visual flood inundation extents for GLOF discharge events ranging from 8ft – 20ft flood levels. The maps also demonstrate the effectiveness of the Phase 1 HESCO barrier project, as indicated on the 14ft – 18ft maps. **PDF versions of the maps are now available at [bit.ly/MendenhallFloodMaps](https://bit.ly/MendenhallFloodMaps).**

The H&H study and resulting maps will also inform Juneau residents, first responders, local businesses, governments and agencies of the potential flood inundation extents for future glacial lake outburst flood (GLOF) events, and guide mitigation and preparedness efforts.

**A [Special Topic Assembly Committee of the Whole meeting](#) with subject matter experts will be held at 12 p.m. on Monday, May 12.**

- For a more detailed and technical review of the modeling and mapping process from the experts and agencies behind the maps, visit: <https://youtu.be/-rJcRhvPZwA> (VIDEO)
- Sign up for CBJ alerts, including flood preparedness alerts and updates, [here](#).
- For questions or comments about the flood fighting inundation map project, please email [floodresponse@juneau.gov](mailto:floodresponse@juneau.gov).
- Visit [CBJ Flood Response webpage](#) for more information on CBJ's ongoing flood response efforts.
- The CBJ also strongly encourages homeowners in flood prone areas to purchase flood insurance through the National Flood Insurance Program (NFIP). Visit [FloodSmart.gov](https://FloodSmart.gov) to get a quote under the NFIP.

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## **Frequently Asked Questions**

### **Phase 1 HESCO Barrier Project**

**Do the maps show the effectiveness of the HESCO Barriers as configured?**

Yes. The model demonstrates the effectiveness of the Phase 1 HESCO barrier project in protecting property and structures from flood events comparable to that experienced in August 2024.

**The preliminary maps include modeling with the Phase 1 HESCO barrier project. Do they show that the HESCO project will cause increased flooding impacts to developed areas downstream or outside of the protected project area?**

No. The modeling did what we hoped it would do in that it provided clarity regarding the effectiveness and the proposed layout of the HESCO barriers (Phase 1). For flood levels that CBJ believes are probable in the shorter

term (16ft flood stage or slightly higher), the model and maps show that the Phase 1 HESCO barrier is effective at preventing inundation in the protected area. They also show negligible upstream and downstream effects for these flood levels. At the 18ft flood stage flood level, the maps show the likelihood of water inundating areas *beyond* the extent of the Phase 1 HESCO barrier project, and then potentially backflowing into some neighborhoods along the river. CBJ is actively evaluating mitigation solutions for this possibility.

This 18ft flood stage flood level modelling with HESCO barriers exemplifies exactly the information the CBJ needs to further inform flood fighting. With this information, the CBJ is investigating alternatives and opportunities for proposing the next deployment of HESCO barriers protect the next highest vulnerable areas from floodwater inundation.

### **What was the basis for the height of the Phase 1 HESCO installation?**

Barrier height was established to provide approximately four feet of added protection above the inundation levels seen along the river during the 2024 GLOF. This information was gleaned from observed high water marks and validated during the hydrologic and hydraulic modeling.

### **Why aren't the HESCO barriers shown on the 19 ft and 20 ft inundation maps?**

The Phase 1 HESCO barrier height was established based on data collected from the 2024 GLOF event specifically and was not designed to align with a specific lake stage flood elevation. Upon completion of the Phase 1 HESCO installation, a detailed horizontal and vertical survey of the completed Phase 1 HESCOs will be conducted and modeled at the 19 ft and 20 ft to provide much better detail and clarity to the effectiveness at these increased heights.

## **Glacial Lake Outburst Flood (GLOF) Magnitude**

### **My property shows flooding at 17ft or 18ft. Does CBJ or the National Weather Service believe we are likely to experience a flood of that height this year?**

Not necessarily. GLOF events from 2023 and 2024 indicate the possibility of annual floods with increasing magnitude. Additionally, studies of Suicide Basin point to increasing capacity within the basin. With existing mapping limited to a 16ft flood stage, CBJ and our partners believed it was in the best interest of the community to create additional maps up to a 20ft flood stage GLOF event.

### **When will we know the flood height for this year's potential GLOF? How can I stay up do date with flood predictions?**

The National Weather Service (NWS) Suicide Basin Monitoring website provides the most up-to-date tracking of lake, river and basin levels. That is also where you will find flood alerts and informational statements.

CBJ is working with NWS to develop a comprehensive communication plan to provide clear, consistent updates before and during a GLOF event. This includes improving the timing and content of early warnings, using the CBJ

Alerts system, and coordinating public messaging across agencies to ensure that everyone has accurate information on flood timing, expected impacts, and protective measures.

### **How likely is a 19ft or 20ft flood event with impacts as shown in the 19 and 20ft maps?**

After extensive discussion with NWS, University of Alaska Southeast (UAS), US Army Corps of Engineers (USACE), and industry experts, it is believed that 19ft and 20ft flood events are unlikely to occur in the near future. To model these events, Michael Baker, International (MBI) assumed a convergence of unlikely flood contributors occurring simultaneously. For the case of a 20ft event, this included a constant 20ft tide for the duration of flooding, a 200-year rainfall event, and a Suicide Basin release over twice as large (by volume) as the 2024 GLOF.

### **Can future GLOF sizes be predicted?**

Predicting the likelihood of the size of any GLOF release more than a couple days in advance is not possible. Uncertainties regarding the mechanism of basin release, as well as the volume and configuration of Suicide Basin remain, including the amount of basin capacity hidden beneath the Mendenhall Glacier. USGS, NWS and UAS do their best to predict the timing of the GLOF release, provide advance public warning statements and attempt to estimate the size of the flood event from the data they collect that monitors Suicide Basin. The CBJ continues to support the scientists at USGS, NWS and UAS in their research to better define Suicide Basin and will continue to pass on any new information that will help.

### **How can I determine the depth of water in the inundation zone?**

UAS is developing a website that will provide interactive features for flood inundation information, including identifying depth of inundation at specific locations for different flood stage events. The underlying data for these maps is based on the modeling performed by MBI. While UAS plans to have this interactive map website available well before the next GLOF, CBJ is releasing static PDF maps in order to get the inundation information to the public as soon as possible. When the UAS website is available, CBJ will provide links on our [inundation map](#) and [flood response](#) web pages.

## **About the Inundation Maps**

### **How were the inundation maps prepared and by whom? Who reviewed them for accuracy?**

After the 2024 GLOF, and through extensive coordination with Federal, Tribal, State and other local technical experts and stakeholders, it became clear that CBJ was in the best position to facilitate the development of new maps in a timely manner (prior to the expected 2025 GLOF season). In November 2024 CBJ awarded a contract for hydrologic and hydraulic (H&H) analysis and modeling of Suicide Basin GLOF related activities in the Mendenhall Valley to Michael Baker, International (MBI), a major engineering and consulting firm with extensive H&H expertise and an Alaska presence. Over the last several months, the flood fighting maps were developed with the continued review by our expert partners (US Army Corps of Engineers, National Weather Service, US Geological Survey, University of Alaska Southeast, and more).

For a more detailed and technical review of the modeling, mapping and review process from the experts and agencies behind the maps, visit: <https://youtu.be/-rJcRhvPZwA> (VIDEO).

### **Why did CBJ publish inundation maps, as opposed to the National Weather Service (NWS) or another agency?**

The CBJ expedited the river modeling and production of the inundation maps to inform the community of the potential flooding at river stages above what occurred during the 2024 GLOF. Through the CBJ's emergency procurement processes, the river modeling hydraulic and hydrologic experts at MBI were hired to complete the inundation maps in a much faster process and timeline than the NWS would have been able to achieve. The maps were completed following the standards set for NWS Inundation Maps and have been reviewed and accepted by the NWS as new maps to update the current inundation maps from 2015.

### **Why are there differences between the new inundation maps and those published by the National Weather Service?**

The model that was developed to create the maps relied upon the most up-to-date data available from all primary sources. Although the NWS maps have proved extremely useful during the 2023 and 2024 GLOF events, the new maps incorporate changes in the topography of the river and surrounding areas.

### **Will CBJ update the maps after every major GLOF disaster?**

Although CBJ was in the best position to provide updated maps due to timing constraints in advance of a possible 2025 GLOF, it is anticipated that the NWS will retain overall responsibility for updating, creating, and publishing future inundation maps.

### **How do the new flood fighting inundation maps relate to the FEMA floodplain or flood zone designation?**

The new maps are for informational purposes only and were developed to inform emergency preparedness and both long- and short-term flood fighting and mitigation efforts. They are not an element of, nor do they replace effective FEMA regulatory maps.

### **The new 16 ft inundation maps are inconsistent with what happened at my property during the August 2024 glacial lake outburst flooding. Why is that the case?**

The new 16ft maps are intended to reflect the likely outcome of a 16ft flood stage GLOF event if it were to happen now, not the inundation associated with historical events. These maps were calibrated for consistency to match up with confirmed high-water marks from the 2024 GLOF event. The 16ft model was also run with an extreme high tide of 20 ft as a constant, creating more water inundation than during the cyclic ~16.5ft tide peaking at 2:45 AM August 6. However, even with the latest data available, due to the changes that occurred within the river during the 2024 GLOF, as well as the significant number of variables that impact the overall flood extent across such a large area, there are locations that will not match up exactly with what was seen during the 2024 event.

### **How were other flooding factors (tides, rainfall events) considered in the flood models?**

All flood scenarios included tidal and rainfall factors. For each scenario, the model was run at a constant tide of 20ft. This is 3.7ft above Mean Higher-High Water (MHHW). This also ensures compliance with NWS's 2015 Mendenhall River Inundation Study.

Rainfall events were considered when developing the model, up to a 200-year event. Given the uncertainty in predicting the large volume of flood water coming from Suicide Basin, any rainfall event would be minor compared to the volume and intensity of the GLOF release.

### **Flood Preparedness**

#### **How is CBJ planning to use the maps and what does it mean for the community?**

Sharing these maps publicly puts information in the hands of private citizens, local businesses, first responders, and government agencies for flood preparedness, response, and mitigation purposes. Additionally, existing maps were limited to a 16ft flood stage, and this initiative allowed for the creation of additional maps up to a 20ft flood stage GLOF event.

#### **How is CBJ preparing for flooding outside of the Phase 1 HESCO project area?**

CBJ is taking a coordinated multi agency approach to flood preparedness and fighting beyond the Phase 1 HESCO barrier project area. In partnership with Tlingit & Haida, National Weather Service (NWS) and State of Alaska, CBJ is refining evacuation and operation plans, ensuring emergency shelters are well prepared and supported, and identifying strategic staging areas for materials like sandbags.

CBJ is working with NWS to develop a comprehensive communication plan to provide clear, consistent updates before and during a GLOF event. This includes improving the timing and content of early warnings, utilizing the CBJ Alerts system ([sign up here](#)), and coordinating public messaging across agencies to ensure that everyone has accurate information on flood timing, expected impacts, and protective measures.

The CBJ also strongly encourages homeowners in flood prone areas to purchase flood insurance through the National Flood Insurance Program (NFIP). Visit [[FloodSmart.gov](#)] to get a quote under the NFIP.

In addition to the emergency preparedness above, the CBJ is using the modeling and inundation mapping to inform the prioritization for the next HESCO barrier deployments. The valuable information provided by the mapping and modeling will be presented to the US Army Corps of Engineers (USACE) and other funding agencies to validate the need to continue flood fighting with HESCO barriers.

#### **How is CBJ preparing for a 17 ft or higher flood event?**

CBJ's first and best flood fighting tool for reducing flood impacts is the Phase 1 HESCO barrier project. However, in the event of GLOF of a similar or greater scale to years past, additional preparations are necessary. CBJ is working with the National Weather Service, CCTHIA (Tlingit & Haida) and the State of Alaska to strengthen emergency operation and response plans, ensure emergency resources are well prepared and staged, and

coordinating with partner agencies to protect infrastructure and direct response efforts where they are needed most.

In addition to the emergency preparedness above, the CBJ is using the modeling and inundation mapping to inform the prioritization for the next HESCO barrier deployments. The valuable information provided by the mapping and modeling will be presented to the USACE and other funding agencies to validate the need to continue flood fighting with HESCO barriers.

### **How can I prepare for a 17 ft or higher flood event?**

The most important step a homeowner can take to prepare for the next GLOF is to purchase flood insurance through the National Flood Insurance Program (NFIP). CBJ also encourages residents to [sign up for CBJ Alerts](#) to receive real time notifications and stay informed through official sources. For homeowners interested in sandbagging their properties, the CBJ will be providing sandbags available for public use this spring. The CBJ Alert system is the best way to stay informed on this and other emergency preparedness efforts.

In addition to purchasing coverage through NFIP at FloodSmart.gov, residents of the affected area should develop a personal emergency plan, be familiar with evacuation routes, and assemble a go bag any essential supplies.

### **How do the maps support a long-term mitigation solution?**

These maps and the model that generated them have been shared with the US Army Corps of Engineers (USACE) as a part of their efforts to study the GLOF problem and identify long-term solutions. CBJ is working closely with USACE to ensure the maps and model streamlines the efforts to get to the long-term solution.

### **Who can I contact if I have questions about the maps?**

Questions can be directed questions to [floodresponse@juneau.gov](mailto:floodresponse@juneau.gov). Our team will direct your question to the most appropriate subject matter expert.

Residents are also welcome to send questions to [Assembly member\(s\)](#) ahead of the Special Topic Assembly Committee of the Whole meeting scheduled for Monday, May 12 at 12pm ([See meeting details](#)).