



Kuigmek: from the river

(Yup'ik, pronounced "Kwigmek")

March 2026

As we wrap up winter and move towards breakup, we are interested in river conditions. **Please let us know if there are any anomalous river events -- mid winter breakups, uncommon ice thickness, above/below average snow-pack, etc.** These observations let us better anticipate breakup issues. We can take observations through a partnership with UAF using the website Fresh Eyes on Ice (<http://fresheyesonice.org/>) or to us directly: aprfc@noaa.gov

In This Issue:

- **2025 Mendenhall River Jökulhlaup!**
- **2025 Major Hydrologic Events**
- **Meet an Observer: Jim Jolin**
- **Staffing Updates**
- **National Water Model Update**
- **Northwest AK Fall Coastal Storm Surveys**
- **Support Alaska River's from 3,000 Miles Away**

AlaskaPacific
River Forecast Center
6930 Sand Lake Road
Anchorage, AK 995021845
9072665160
18008471739
<http://weather.gov/aprfc>

Greetings from the Alaska Pacific River Forecast Center!

It was a great year at the Alaska Pacific River Forecast Center. While breakup was relatively quiet for the Yukon and Kuskokwim Rivers, the North Slope experienced significant flooding in June. Moving further into summer, the focus shifted to wet season operations: forecasting river levels for over 100 points across the state, monitoring roughly 20 glacier dammed lakes in Southeast and Southcentral Alaska. The most anticipated event of late summer was once again the Mendenhall River glacial outburst flood. Fall brought a return to wet weather for many places, to include Talkeetna and much of Southcentral. We also helped with forecasting the remnants of Typhoon Halong to round out the water year.

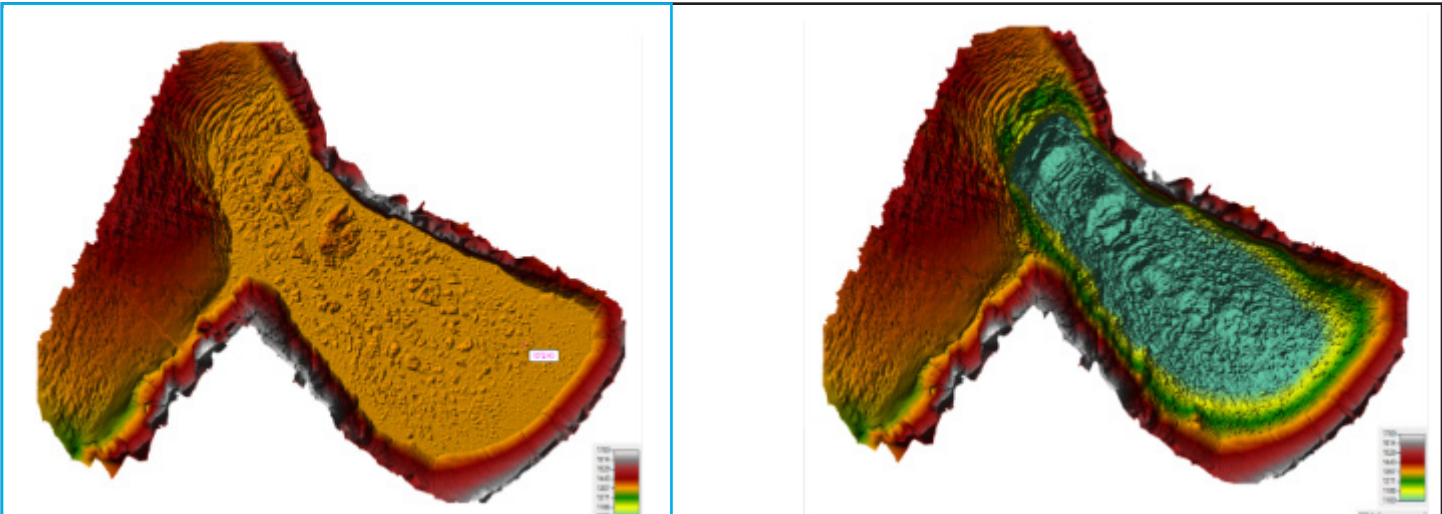
Another Record...2025 Mendenhall Glacier Outburst Flood

By Crane Johnson, Aaron Jacobs, and Johnse Ostman

On August 10, 2025, Suicide Basin reached its maximum lake elevation (~1,363 FT, gage datum) and began overtopping the Mendenhall Glacier dam (aka Jökulhlaup). As in prior years, overflow eroded the left-margin spillway prior to subglacial release. However, in 2025, concurrent heavy rainfall complicated event detection. Elevated river flow at MNDA2 masked the onset of the Glacier Lake Outburst Flood (GLOF); on August 11, 2025, MNDA2 baseflow was ~7,700 CFS (provisional and subject to change) compared with ~3,000 CFS in 2024, when the GLOF event was first detected by just a +0.1 FT rise in stage.

Using data from previous full volume Glacier Dammed Lake (GDL) releases in 2023 and 2024, NWS APRFC estimated that this event could produce a crest of between 16.25 FT and 16.75 FT, and issued a flood warning for the Mendenhall Valley. Flood volume estimates are based on University of Alaska Southeast (UAS) LiDAR-derived digital elevation modeled GDL capacity and real-time USGS measured basin water levels.

Jökulhlaups (an Icelandic word pronounced yo-KOOL-lahp) are glacial outburst floods. They occur when a lake fed by glacial meltwater breaches its dam and drains catastrophically. Glacier lake outburst floods, which occur when water dammed by a glacier suddenly releases and floods downstream areas, happen across Alaska and in glacial landscapes around the world.



Suicide Basin Elevation Map before the GDL release on August 6, 2025 (left) and after the release on August 13 (right). LiDAR-derived digital elevation maps courtesy of the [University of Alaska SE](#).

According to the City and Borough of Juneau (CBJ), this major flood produced significant impacts upstream of the Mendenhall Loop Road bridge, along with minor impacts downstream along the Mendenhall River. Based on FEMA damage definitions, CBJ identified 35 homes as affected: 6 with major damage, and 11 with minor damage. Impacts resulting from the 2025 record full-basin release GLOF were different from the previous two years because the HESCO Barriers installed along the Mendenhall River bank protected infrastructure and residences against catastrophic flooding.

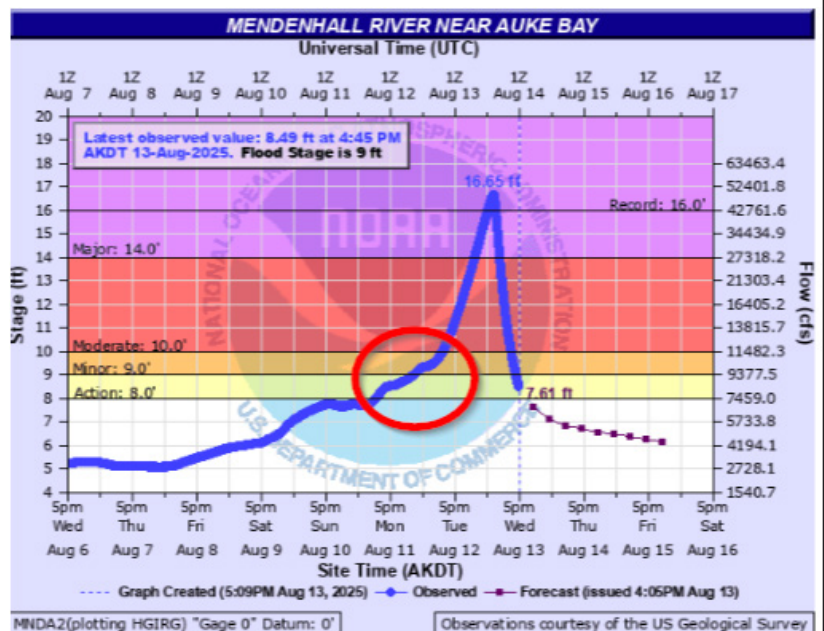
CBJ and all partners and stakeholders are already preparing for another event in 2026 with Suicide Basin GDL expected to continue its slow expansion in volume. Long-term mitigation strategy discussions began in December 2025, and the accepted solution is anticipated to be implemented on an accelerated timeline.

Links for More Info:

USACE Mendenhall River Technical Report: <https://www.poa.usace.army.mil/Missions/Civil-Works-and-Planning/Mendenhall-Valley-Technical-Report/>

City and Borough Juneau Hesco Barrier Project: <https://juneau.org/engineering-public-works/hesco-barrier-phase-1>

Juneau Flood Information: <https://juneauflood.org>



USGS Mendenhall River near Auke Bay (MND A2) glacier lake outburst flood (GLOF) hydrograph with NWS flood levels defined. Note the elevated baseflow from heavy rainfall prior to GLOF onset (red circle).

From Breakup to Freeze-Up: A Summary of Alaska's Major Hydrologic Events in 2025

By Kyle Van Peurse

2025 proved to be another active year for hydrologic impacts and flooding. The 2024–2025 winter was among the warmest on record statewide with above-average precipitation. This resulted in very low snowpack across much of the southern mainland and Panhandle, with the main exception being portions of the Interior and North Slope, where conditions remained cold enough to support an above-average snowpack.

A notable winter event occurred in late January when a strong low pressure system and associated atmospheric river brought several inches of rain to Southcentral Alaska, in some areas up to 3000 ft elevation. This event triggered mid-winter breakup on several rivers, including the Anchor River near Homer, where a persistent ice jam near the Old Sterling Highway bridge repeatedly caused minor flooding before late-January rainfall and snowmelt increased runoff enough to produce moderate flooding before finally flushing the jam out to sea.

Heading into spring breakup, low snowpack and thin river ice kept flood concerns relatively low across most of the state. Breakup progressed with few issues, aside from a couple of persistent ice jams on the Kuskokwim River that caused several days of minor flooding in Aniak and Akiak. South of the Brooks Range, no other significant breakup flooding occurred.



Flooding at the Anchor River Campground at the end of January 2025. Image courtesy of AKDOT



MP 315 washout on the Dalton Highway on June 14th. Image courtesy of AKDOT

During the second and third weeks of June 2025, the North Slope of Alaska experienced significant flooding as a result of rapid snowmelt. The region underwent one of its latest seasonal breakups on record, driven by persistently below-average to record-low temperatures throughout May and into early June, accompanied by continued snowfall through the first week of June. This prolonged cold period preserved several feet of snow across portions of the North Slope into early June. When temperatures abruptly surged into the 60s and 70s, much of this remaining snowpack melted out within only a few days, producing exceptional runoff and flooding between June 12 and 16.

The resulting flooding caused widespread regional impacts. The upper Sagavanirktok (Sag) River began to break up on June 12, with water reported over the Dalton Highway near MP 323 and flooding and erosion along multiple highway segments. As meltwater increased, a major washout at MP

315 on June 14 forced a four-day closure. Near the Kuparuk River mouth, floodwaters inundated oil-field infrastructure and access roads. Record flooding on the Colville River at Umiat submerged Umiat Camp and its airstrip, with additional downstream flooding affecting infrastructure and transportation routes.

Late August brought a significant pattern shift that ended an otherwise quiet summer across Alaska. From August 25 to 31, a series of storms delivered widespread heavy rainfall of 4 to 6 inches across parts of Northwest Alaska and the Northern Susitna Valley, with localized totals exceeding 8 inches



High water near the confluence of the Talkeetna and Susitna Rivers on August 29th. Image courtesy of Katie Writer

in higher terrain. These amounts were well above normal and produced widespread flooding, with the most severe impacts in the northern Susitna Valley and the Koyukuk River Basin. Flash flooding washed out portions of Petersville Road, and the Yentna River at Lake Creek reached a record crest of 22.54 ft on August 29, remaining above flood stage for more than four days and inundating lodges and cabins. In Talkeetna, the Talkeetna River crested at 14.93 ft, ranking among the top three crests on record, with floodwaters surrounding nearby cabins and dislodging at least one structure from its foundation.

Across Northwest Alaska, the Koyukuk and Kobuk River basins experienced significant flooding. Rainfall of 4–6” pushed Slate Creek near Coldfoot into major flood stage and the Middle Koyukuk River near Wiseman into moderate flood stage, resulting in overbank flooding and road closures. Farther downstream, the Koyukuk River caused prolonged moderate to major flooding at Allakaket from August 28–31, inundating much of the lower community, Old Town, and the former runway.

Multiple roads, including Main Street and the airport access road, were washed out, temporarily isolating the community from the runway. The river crested slowly on August 31, reaching the second-highest level on record at Allakaket, though still more than 6 ft below the 1994 flood of record.

Rainfall from the same event also drained into the Kobuk River basin, producing prolonged flooding in several upper-river communities. In Kobuk, floodwaters inundated the town for nearly a week.

The open-water season ended as ex-Typhoon Halong impacted coastal Southwest Alaska. While the most severe and destructive impacts occurred along the Kuskokwim Bay coast, the storm also produced substantial riverine flooding upstream along the lower Kuskokwim River. Storm surge combined with prolonged onshore flow caused the river to back up, resulting in minor to major flooding in Bethel, Napakiak, Napaskiak, and Tuntutuliak. In Napakiak, longtime residents reported water levels higher than any previously observed during past flood events.



A swollen Koyukuk River flooding lower portions of Allakaket on August 30th. Image courtesy of Paul Caurmeran

In total, 2025 featured a wide range of hydrologic extremes across Alaska, from delayed breakup and rapid snowmelt flooding to intense late-summer rainfall and storm-driven riverine impacts.

Jim Jolin: A Lifetime Along the Kenai

By Michelle McAuley and Mike Ottenweller

For Jim Jolin, the Kenai River isn't just a scenic backdrop, it's been part of his daily life for more than five decades. Since 2009, Jim has served as a river observer, helping provide the observations that support river forecasting and flood awareness for the community. But his connection to the river and the region goes back much further.

Jim first came to Alaska more than 55 years ago. Originally from Coeur d'Alene, Idaho, he initially traveled north to hunt moose after his parents moved to the state. Like many who make that first trip north, he quickly fell in love with Alaska's landscape and way of life. "I fell in love with Alaska." Jim and his wife Patti eventually settled near Sterling along the Kenai River. Patti's Alaska roots run even deeper—she arrived in 1954 and attended school when textbooks still read "Territory of Alaska." Her family first spent a winter on the Homer Spit, long before the area developed into the bustling destination it is today.

Over the decades, Jim has watched the Kenai Peninsula change dramatically. "When I first moved here there were no stoplights, no big box stores," he said. "Just small businesses and a couple gas stations." Jim himself played a role in that community growth, serving on the local hospital board for about ten years as it expanded from a small facility into a full-service hospital serving the peninsula.

Despite the changes, the natural beauty of the area remains what Jim loves most. "The beauty of it, the peace, and the animals," he said. Wolves, coyotes, lynx, moose, caribou, and bears all pass through the area. Sometimes a little closer than expected. While taking a river observation one day, Jim was reviewing the measurement tapes when he unknowingly walked right up behind a brown bear. "I came around the corner and kned the bear in the butt," he laughed. "He ran away, growled at me, and wandered off."

Encounters like that are just part of life along the river. Jim became a river observer in 2009 after a nearby observer passed away and the community needed someone to continue the observations. "So I volunteered," he said. Since then, Jim has faithfully collected river data, sometimes with help from Patti or friends who step in if he's away. The work helps support river forecasts and flood monitoring for the Kenai River basin.

One event that stands out most in his memory is the major flood of 1995, when high water covered the Kenai Keys area and reached all the way up to the hillside. "I had an ocean boat on a trailer parked here and it started floating," Jim said. "We had to tie it to trees to keep it from floating away." The flood happened before local floodplain regulations required homes to be built above a designated base flood elevation. Today, those regulations help reduce flood risk for newer development. Jim has also witnessed changes along the river itself. Boat traffic has increased dramatically over the years. "You used to be able to fish all day and not see another person," he said. "Now there are a lot more boats running up and down the river."

Still, the river remains central to daily life. One of Jim's favorite pastimes is simply walking out his



**Jim and Patti Jolin,
Kenai River Observers**

front door and fly fishing for rainbow trout. “That’s my favorite fish to fish for,” he said. While summers bring heavy activity, winter remains Jim’s favorite season in the neighborhood. Of the more than 100 properties in the subdivision, only about a dozen families stay year-round. “It’s peaceful,” he said.

For Jim, serving as a river observer is about more than taking measurements—it’s about staying connected to the river and the people who depend on it. “My favorite part is getting to know so many people at the River Forecast Center,” he said. Jim’s dedication reflects the important role that volunteer observers play in supporting river forecasting and community safety. The Alaska-Pacific River Forecast Center would like to extend a sincere thank you to Jim and to all of our river observers, whose time and commitment help us monitor rivers across Alaska and keep communities informed and safe.

Staffing Updates



We are pleased to announce that **Michael Brown** has been selected as the new **Senior Service Hydrologist (SSH)** for the Weather Forecast Office (WFO) in Anchorage. He has been at the Anchorage WFO since the spring of 2023 and now he will be switching into the role of SSH. Michael has proven to be an invaluable asset to the team, bringing a deep-seated passion for hydrology to every project he touches. He has served the office as “acting” SSH since June of 2025 and has already led a major quality control overhaul of our hydrologic database, resolving long-standing metadata issues and restoring inactive sites. Prior to arriving in Alaska, he worked at NWS offices in Little Rock, AR and Pittsburgh, PA.

Tina Stall is the newly-minted **Senior Service Hydrologist** at WFO Honolulu. A proud graduate of THE Ohio State University Atmospheric Services program, her career began as a SCEP student with WFO Tucson while working on a master’s degree at the University of Arizona. She then spent the remainder of the first 18 years of her career with NWS as an operational forecaster in the San Diego, and Honolulu WFOs, where she uncovered an interest in hydrology. Following the retirement of the long-time hydrologist at WFO Honolulu, she decided to take a leap of faith and take on a new career challenge, while still fitting in some operational forecasting. Tina is excited to continue working with the HFO team and its partners in this new capacity. In her spare time, Tina enjoys dancing hula and learning about the rich culture of her Hawaiian home, as well as getting outside to take in all the natural beauty of the islands, before coming home to her mischievous (yet lazy) cat, Loki.



APRFC welcomes **Kyle Van Peurse** as SCH. We are pleased to announce that Kyle Van Peurse will step into the role of **Service Coordination Hydrologist (SCH)**. He has been with APRFC since 2019 as the Senior Hydrologic Analysis and Support (HAS) forecaster. Kyle’s impressive career spans service as a U.S. Air Force Weather Officer and seasonal avalanche forecasting for the National Park Service. With a Master’s in Snow Science and a proven track record of leadership—most notably driving the 2025 River Watch program—Kyle has been instrumental in bridging the gap between the NWS, tribal partners, and state officials. Internally, he has been part of a national modernization effort to move Multisensor Precipitation Estimator (MPE), one of our core forecasting processes, into the cloud. This move will allow APRFC to operate with increased flexibility and efficiency; enhancing our ability to serve the American People. His commitment to both internal modernization projects and external public service ensures the APRFC is well-positioned for the future.



Farewells

The National Weather Service (NWS) bids a warm farewell to **Kevin Kodama**, former Senior Service Hydrologist at the Honolulu Weather Forecast Office. Kevin retired on April 30, 2025, concluding a remarkable 31-year career with the Honolulu Forecast Office. His dedication was recently recognized with the Dr. Arthur N.L. Chiu Award for Excellence in Hurricane Preparedness, which he was awarded this past May.

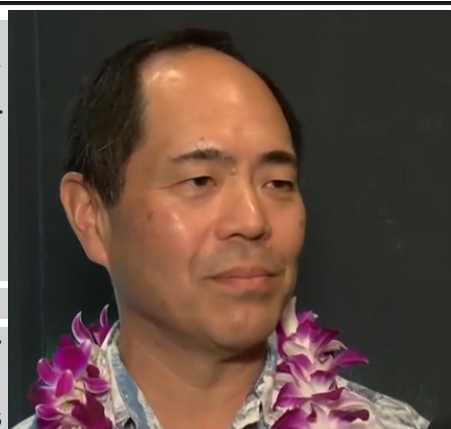


photo courtesy of Hawaii News Now

Kevin's profound impact on public safety is best captured by the partners he served. Don Aweau, Executive Officer of the Hawaii Emergency Management Agency, noted: "Kevin's tireless efforts and years of dedication have helped protect lives and inform communities."

Furthermore, as quoted in the NWS 2033 Transformation Roadmap, Hiro Toiya, then director of the Honolulu Department of Emergency Management, said, "I couldn't ask for a better hydrologist partner than Kevin Kodama. I know his work has saved many lives in the state of Hawaii and the City and County of Honolulu."

At the Alaska-Pacific River Forecast Center (APRFC), we were honored to work with him. We were constantly impressed by his deep knowledge of Hawaii and hydrology and his unparalleled commitment to his community.



Jessie Cherry, Bob, Celine Van Breukelen

After two and a half years of dedicated service with the National Weather Service's Alaska-Pacific River Forecast Center (APRFC), **Bob Busey** is retiring, capping off a remarkable career spent advancing hydrologic science and supporting Alaskan communities through research, fieldwork, and forecasting.

Bob's connection to Alaska runs deep. He was raised in Sitka before heading north to Fairbanks, where he earned an engineering degree from the University of Alaska Fairbanks (UAF). Bob would go on to spend the bulk of his career at UAF as a staff engineer, supporting hydrologic and meteorological research through field measurement and modeling. His work spanned the Water and Environmental Research Center and the International Arctic Research Center, where he contributed to projects ranging from small watersheds on the Seward Peninsula to expansive Arctic basins like the Anaktuvuk and Itkillik.

In 2022, Bob joined the APRFC, bringing with him a wealth of field experience and technical skill. His work in river forecasting was critical to helping Alaskans prepare for spring break-up and flooding—an extension of his long-standing commitment to public safety and environmental understanding. His enthusiastic attitude, deep institutional knowledge, and love of satellites were invaluable during breakup and high-water events.

As Bob steps away from professional life, we celebrate his outstanding contributions to Alaska's scientific and forecasting communities and wish him calm waters and great fishing ahead. We will miss all the crazy snacks he would bring in and his infectious laughter throughout Sand Lake.



National Water Model Update for Southcentral AK

By Celine Van Breukelen

The National Water Model (NWM) and Flood Inundation Mapping (FIM) are now live for Southcentral Alaska! Think of the NWM as a “weather model” for water: it forecasts flow levels for millions of river reaches nationwide. By overlaying these forecasts onto terrain data, the system creates FIMs that predict exactly where flooding is likely to occur.

How to Access the Maps

You can find these tools at water.noaa.gov or weather.gov/aprfc. To view the maps, go to the **Layers** menu on the right-hand side and enable **Flood Inundation**.

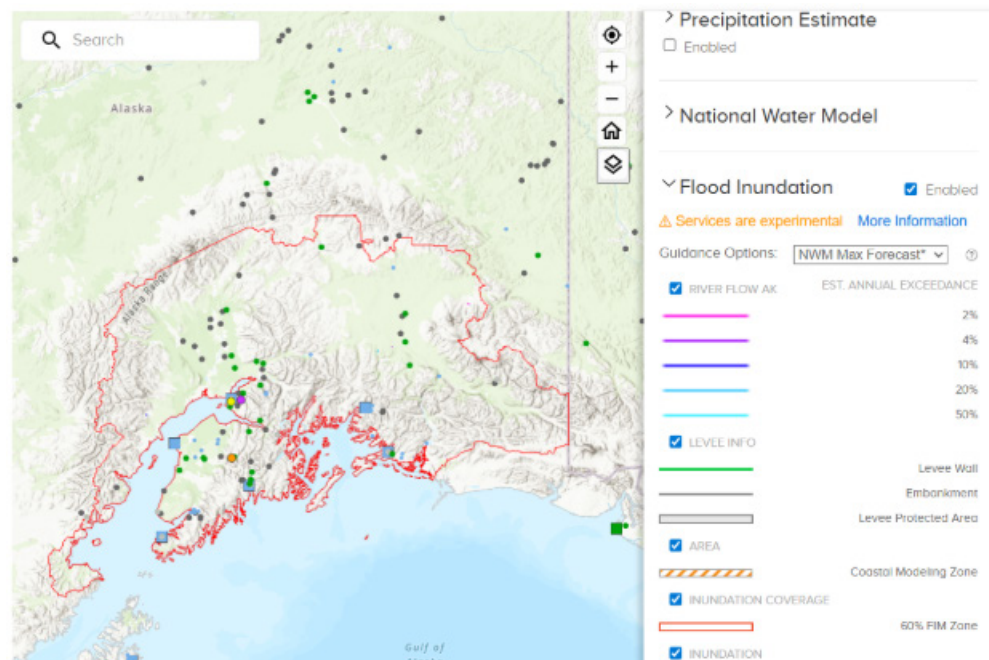
Choosing Your Data Layer

Users can select from three different drivers based on their needs:

- **RFC 5-Day Max Forecast:** Uses data reviewed by hydrologists to show the maximum expected flooding over the next five days. This is typically the most accurate option where available.
- **NWM 5-Day Forecast:** Based entirely on automated model data. While it lacks human oversight, it covers a much wider geographic area than the RFC version.
- **NWM Latest Analysis:** Provides a real-time “snapshot” of current water conditions.

Important Considerations

- **Summer Use Only:** These models do not currently simulate frozen conditions; bookmark this tool for use during the open-water season.
- **Experimental Status:** This output is still experimental. The Alaska-Pacific River Forecast Center (APRFC) is working with developers this season to refine and improve the model’s accuracy.
- **Availability:** These data layers are only available for Southcentral Alaska - Cook Inlet and Copper River Drainages. It is the area outlined in red in the attached figure.



Screenshot from <https://www.weather.gov/aprfc> showing the National Water Model extent. This image was taken in December, we'll see more action from this page during the upcoming open water season.

Northwest Alaska Coastal Storm Surveys, October 26 - November 2, 2025

By Jonathan Chriest and Johnse Ostman

Johnse Ostman, Senior Hydrologist at the APRFC and Jonathan Chriest, Lead Meteorologist at WFO Fairbanks visited 5 northwest Alaska communities to survey high water marks from the October storm cycle, including the remnants of Typhoon Halong, and to collect coastal profiles. We met with officials and elders in Kotzebue, Kivalina, Nome, Shishmaref, and Deering to gather specific information about the impacts of these two events. This will help improve the communication of specific and actionable forecasted impacts for future storms.

The coastal profiles collected are repeat profiles that have previously been collected by the State of [Alaska Division of Geophysical and Geological Surveys](#) (DGGS). The goal with collecting these again was to determine how the coastline has changed over time and where there has been erosion versus where there has been accretion and deposition of sand and rock. Both the profiles and the high water marks will be used to verify and to help improve the coastal flood maps produced by DGGS, and to determine the actual height above the normal high tide line that the water reached in each community, including those without tide gauges. The process involved following the linear profiles or paths and capturing very small changes in elevation by collecting a point where the changes occur using GNSS survey gear. This is a highly accurate and precise GPS that is calibrated to a base station placed at a known survey point or “shared solution” identified by the National Geodetic Survey (NGS).



Slope Profile, Kivalina, AK

Collecting a point involves setting the “rover” down on the ground, where the receiver is calibrated to the base station and 2 meters above the ground. With 7 to 16 profiles per community, hundreds if not thousands of data points were collected. The photo below shows the last point on a profile at Kivalina.

The second part of the survey was to collect high water marks. We visited with people in each community who described their impacts and directed us toward or took us to areas where water reached or impacted. We were able to find these high water marks by identifying grass lines pushed inland from the shore, often stranded on fencelines, dogsleds, snowmachines, or just the ground. Some buildings also had marks on the wood from where water reached. Some also had either staining or stranded grass or mud. Again, the elevation and location was captured using the rover and often a tape measure to “measure up” to the level. We also collected hundreds of these. Below is an example of a high water mark that was found on the Alaska Technical Center in Kotzebue, complete with the tidal staff gauge placed there by USGS.



**High Water Mark
Kotzebue, AK**

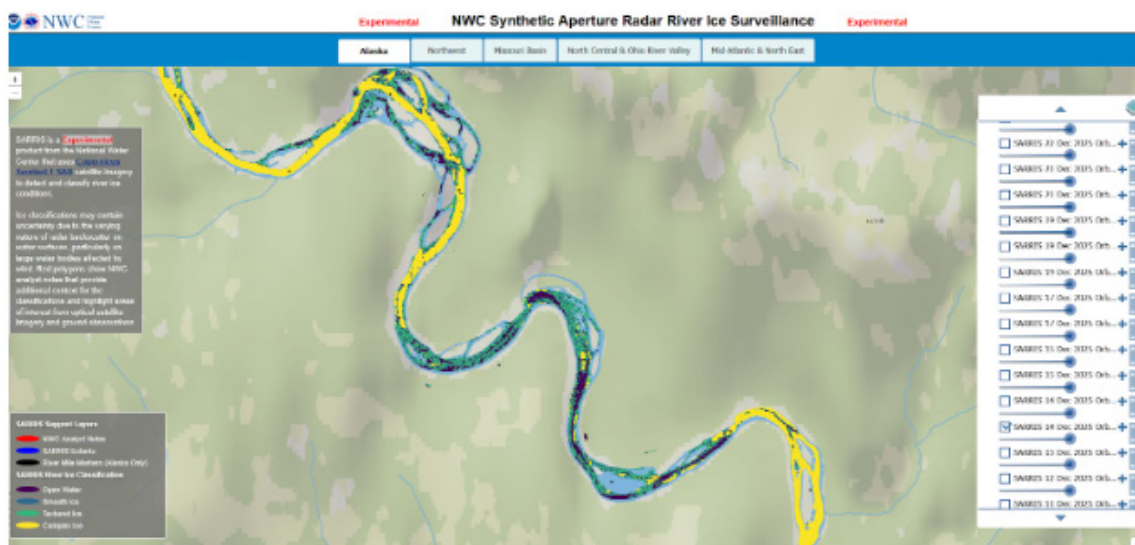
We are thankful for everyone who offered us information on storm impacts, brought or directed us to notable high water marks or damage, allowed us to survey points on their property, and who took the time to discuss both the storm and the history of storms in the community with us. Thanks to these folks, the trip was highly successful.

Supporting Alaska River Forecasting from 3,000 Miles Away

By Shawn Carter and KC Curry, National Water Center Winter Hydrology and Remote Sensing Desk

When ice begins forming on Alaska's rivers each fall and then breaks up in the spring, APRFC forecasters need to know how thick it might be, when it might break up and which communities might be impacted by ice-jam flooding. That's where the Winter Hydrology and Remote Sensing Desk at the National Water Center comes in. The National Water Center is the NOAA's newest National Center and is located on the campus of the University of Alabama in Tuscaloosa, Alabama. Our team develops specialized monitoring and forecast guidance tools specifically for Alaska's unique challenges. Many of our winter tools would have never left the ground without the collaboration and cooperation with forecasters in Alaska - both at the River Forecast Center and the Local Forecast Offices.

SARRIS - our Synthetic Aperture Radar River Ice Surveillance - uses special satellite imagery to map ice coverage across the vast network of Alaska's rivers through the dark of winter and the thickest clouds of springtime. SARRIS allows us to show APRFC forecasters where the rivers remain covered in ice, where the ice fronts are and when there's no ice left upstream. This season, SARRIS has become an official NWS Experimental Product, providing daily intelligence on ice conditions that would be impossible to observe from the ground across such enormous distances. You can view the SARRIS product at the following link: <https://www.nohrsc.noaa.gov/special/sarris>.



Screenshot of the SARRIS product showing a reach of weak ice and an open lead on the Yukon River above the International Border on 14 December, 2025.

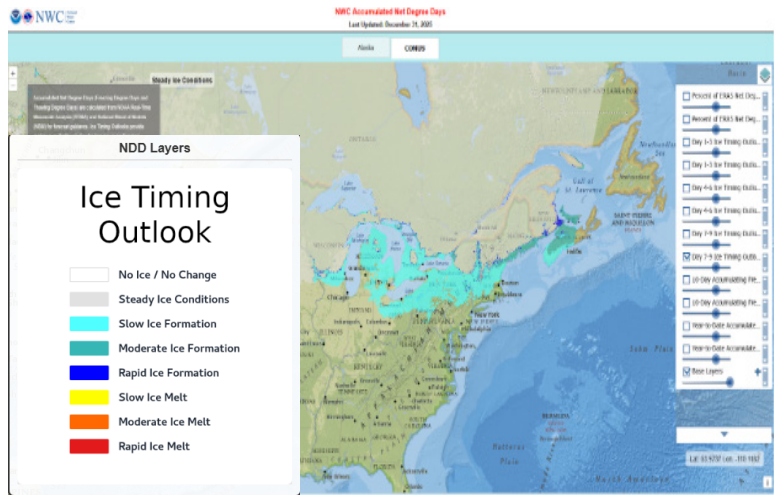
This year, we are also excited about our Ice Timing Outlook and Net Degree Day products. The Net Degree Day product is the only temperature guidance that not only accounts for the seasonal depth of winter (Freezing Degree Days) but also changes in thermal mass caused by recent heating conditions (Thawing Degree Days). This assists APRFC forecasters to better estimate ice-depth. This product is accompanied by our Ice Timing Outlook which provides guidance on when freeze-up and break-up periods are likely and is based on forecast temperatures, cloud cover, snow cover, humidity and other meteorological factors. You can view the Net Degree Day and Ice Timing Outlook products at the following link: [nohrsc.noaa.gov/special/afdd](https://www.nohrsc.noaa.gov/special/afdd).

And finally, no summary of our support could be complete without mentioning the Airborne Gamma Snow Survey. Every year we fly one of our Snow Survey Aircraft across Alaska with specialized sensors that can measure the water content in the State's snowpack. This data often represents the only snow water equivalent measurements the APFRC forecasters will have to determine flood forecasting

in many portions of the interior of the state. This mission has been flown now for more than twenty years, and the statistics we're building are becoming climatologically meaningful and represents a unique method of providing information needed for river and flood forecasting. If you want to see the results of last year's survey, visit: https://www.nohrsc.noaa.gov/special/leaflet/2025/April_2025_Snow_Survey_Alaska/index.html.



Airborne Gamma Snow Survey, 2025.



Screenshot of the Ice Timing Outlook providing guidance on slow ice formation is likely in the Day 7-9 range across the northern Ohio Valley and Mid-Atlantic.

As we move into 2026's breakup season, we extend our sincere thanks to all of our partners, observers, and collaborators across Alaska and the Pacific. Your continued support, local knowledge, and timely observations are critical to our ability to provide accurate and actionable river forecasts. We could not accomplish our mission of protecting life and property without your help. We value these partnerships and look forward to working together in the months ahead to keeping our communities informed and safe. Our friends at Fresh Eyes on Ice have made it simple to submit your reports (see below).



We can accept photos 3 ways:

<p>WEBSITE</p>  <p>Fresh Eyes on Ice online photo portal</p>	<p>MOBILE APP</p>  <p>NASA GLOBE Observer mobile app</p>	<p>FACEBOOK*</p>  <p>Fresh Eyes on Ice Facebook group</p>
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