



## Please Note....

Don't forget to send in your  
Freeze-up Forms.

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Alaska - Pacific

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Our last weekend staffing is scheduled to be October 27 - 28. For those of you continuing to take measurements in November or beyond, please hold your weekend measurements and give them to us on Mondays, or enter them on-line at <http://aprfc.arh.noaa.gov>. Web entry requires a password. Instructions and password can be obtained from any APRFC staff member.

## Welcome New Observers

Blunka Ishnook, Jr.  
Nushagak River at Koliganek  
June 2007

Tikchik Narrows Lodge  
Tikchik Lake  
June 2007

The Native Village of Kiana  
Kobuk River at Kiana  
June 2007

Isaac Douglas, Sr.  
Kobuk River at Ambler  
June 2007

Bruce Dickerson  
Little Nelchina River  
July 2007

Stephanie Carlton  
Tazlina and Klutina Rivers  
July 2007

Gary Hadfield  
Naknek River at Lake Camp  
August 2007

Betty Benison  
Anchor River at Anchor Point  
September 2007

The Alaska-Pacific River Forecast Center staff thanks you for your river and weather observations this season, and looks forward to working with you again next year.

## Field Work Accomplishments Summer 2007

This summer, members of the APRFC staff conducted field work with help from Weather Service Office (WSO) staff from McGrath and King Salmon. In May, Jim Coe and Becky Perry traveled to McGrath to resurvey the slope profile gage and take a flow measurement on the Kuskokwim River.



05/21/07  
Met Tech Cory Van Pelt  
at the 'C' marker

Ralph Morgan, Official-in-Charge (OIC) at the WSO in McGrath assisted by providing transportation, making arrangements for a boat and driver to be available for the flow measurement, and overseeing the flow measurement and gage survey process. Meteorological Technician (Met Tech) Cory Van Pelt spent his day off assisting Jim on the boat and participating as part of the survey crew. Our thanks go out to the staff at McGrath for their hospitality and their willingness to assist us with the work that needed to be done.

In June, Jim Coe and Dave Streubel traveled to King Salmon where they met up with Met Tech Paul Rockwood. Jim, Dave, and Paul chartered a flight to the village of Ekwok, where they

Cory Van Pelt (left) with survey rod on the banks of Kuskokwim River at McGrath



Jim Coe (foreground) and Dave Streubel survey in a slope profile gage at the Tikchik Narrows Lodge

completed a flow measurement on the Nushagak River. Peggy Perales, OIC at the WSO in King Salmon, joined Jim and Dave the following day when they flew to the village of Koliganek on the Nushagak River

*Field Work Accomplishments...cont'd from Page 1*

Nushagak River. A new slope profile gage was surveyed in and a new observer, Blunka Ishnook Jr., was brought on board. Blunka's father was the river observer during the early 1970's at Koliganek. The last day of the trip was spent at the Tikchik Narrows Lodge. This beautiful lodge is accessible by floatplane only, and caters to fishing enthusiasts. Jim, Dave, and Peggy surveyed in a slope profile gage. The staff at the lodge were then set up to enter their daily readings online through our website. Jim and Dave traveled back to King Salmon in August. Once again, Peggy accompanied Jim and Dave to the villages of Ekwok and Koliganek, where they conducted more survey work. Back in King Salmon, a new observer, Gary Hadfield, was recruited to take readings on the Naknek River. We thank the WSO King Salmon staff for all of their assistance this summer.

Weather Forecast Office (WFO) staff from Fairbanks and Anchorage also provided support during this summer's busy field work season.

Ed Plumb, Service Hydrologist from the Fairbanks WFO, teamed up with Scott Lindsey and Becky Perry for a road trip to the upper Tanana Valley and Forty-mile Country. The trip started in the village of Northway. Flow measurements were completed on both the



Ed Plumb installs a new marker at the slope profile gage on the Nabesna River near Northway

Chisana and Nabesna Rivers. Over a three day period flow measurements were taken and flood stages were evaluated for the West, Mosquito, South, and Walker Forks of the Fortymile River.

Ed and staff from the Fairbanks WFO also visited several other sites in northern Alaska this past summer. This included a trip to do maintenance and surveying at the slope profile gages in the upper Yukon River villages of Beaver, Fort Yukon and Circle City. Some work was also done on the Kobuk River. A completely new site was established in the village of Kiana and a new observer was recruited at Ambler.



Ron Stuvek from the WFO Fairbanks with a survey rod on the banks of the Kobuk River at Kiana

Read more about Ron on Page 4



Kelly Songster and Julie Malingowski from the WFO Fairbanks extend the slope profile on the Yukon River at Fort Yukon

In July, John Papineau, Service Hydrologist from the Anchorage WFO, partnered with Ben Balk and Eric Holloway on a road trip through the Copper Basin. This team spent nearly a week surveying, conducting flow measurements, and establishing action, minor, and moderate flood stages on the Little Nelchina, Tonsina, Klutina, Tazlina and Maclaren Rivers. The same work was done on the Gulkana River at Sourdough and Gulkana River at Richardson Highway Bridge.

Ben Balk and Scott Lindsey returned to the Copper Basin in late September to conduct another flow measurement on the Tonsina River and perform maintenance on wire weight gages in the area.

## Site Visits Needed to Maintain Rating Curves

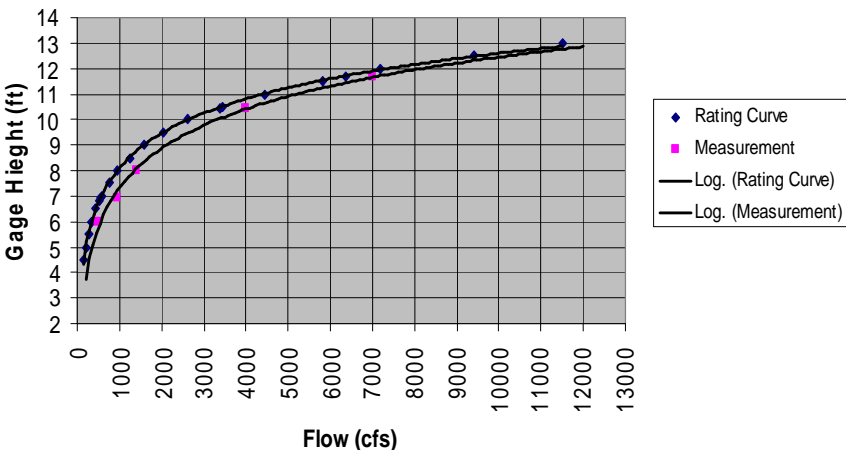
Most people who monitor a river at a specific location are familiar with what is called a stage height, in feet, for that location. They will likely be familiar with specific stage heights of interest to them. This could be a stage at which flooding begins, or a stage at which they can safely float the river, etc. Our problem at the River Forecast Center is that our hydrologic computer models calculate stream flow, not stage. The hydrologic model uses the amount of rainfall, the temperature, the soil conditions, etc. to compute the amount of water (stream flow) in a given river. The model output is in units of volume of water for a specific time period, usually expressed in units of cubic feet per second (cfs).

In order to convert the flow volume into a stage, we use what is called a **rating curve** (see Figure 1). This is simply a relationship of stream flow to gage height that is developed by measuring the flow volume at different gage heights and mathematically determining a relationship. Thus many of our visits to our gage sites will include a flow measurement as part of the work that is done at the site. The flow measurement is done by measuring the average speed of the water in a subarea of the flow to get a flow for the subarea and then summing the flows in all subareas across the channel to get the total flow. In the rating curve example in Figure 1, the "Rating Curve" points and line might represent a rating created from measurements made in a period 2 to 5 years ago. The "Measurement" points and associated line might represent measurements made in the last 2 years.

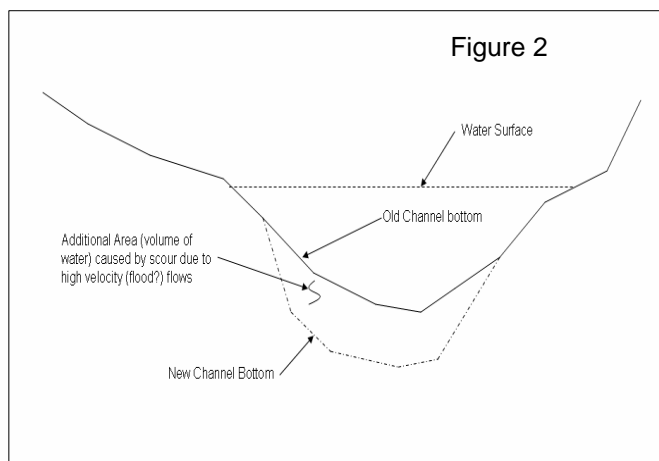
Unfortunately, this 'rating' or relationship is not a static one. Changes in the streambed configuration, caused by scour and deposition, change the amount of flow in the channel for a given height (see Figure 2). It is necessary, therefore, to continue to take flow readings at a given site not only to get more readings at different levels, but also to make sure that there hasn't been a significant change in the rating. Flooding in southcentral Alaska in 2006 caused changes in the channel and resulting rating curves at many of our gages affected by the flooding.

A common misconception associated with gage height is that this number represents a real elevation or even a real water depth. A gage height number actually represents only a value relative to an arbitrary 'zero level' or 'zero datum'. The zero level is usually chosen to be at a point well below the bottom of the streambed so that,

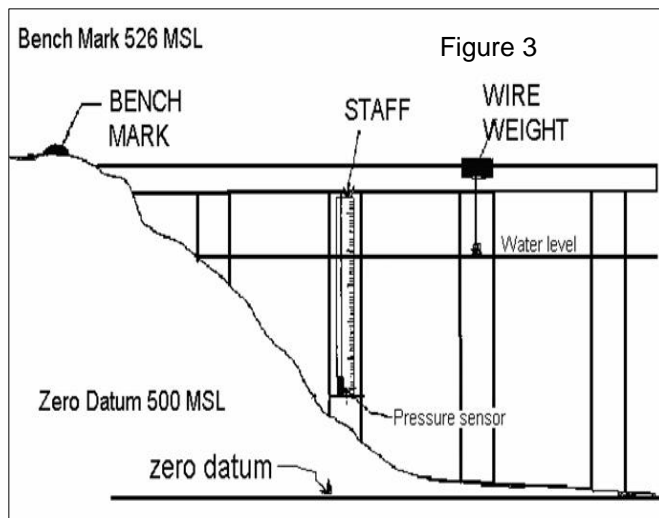
### Rating Curve



### Figure 1



### Figure 2



### Figure 3

should scour in the channel at the gage occur, negative gage values can be avoided. When possible, a survey from existing Bench Marks (survey points of known elevation) is performed to find the 'real' elevation of this 'zero' point (see Figure 3).

### **APRFC Hosts Russian Scientists by Robin Radlein**

The Alaska Pacific River Forecast Center (APRFC) played host to three scientists from Russia the week of July 23<sup>rd</sup> to 27<sup>th</sup>. Sargylana Struchova was an engineer/hydrologist with the Hydrometeorological Forecast Center in Yakutsk, Sakha Republic, in eastern Siberia. Gleb Kochergin and Anton Kozlov were post-graduate lecturers and computer specialists from the Yugra Research Institute of Information Technologies in Khanty-Mansiisk in western Siberia. They were in Anchorage the previous week at a conference on flooding in Arctic regions sponsored by the Northern Forum and featuring a group of hydrologists and other scientists from different provinces in Canada and Russia, as well as staff members from APRFC.

The three spent their week learning about the forecast operations at APRFC, covering: data acquisition, including the substantial role played by our volunteer observers in a data sparse region; meteorological analysis and prediction of precipitation; analog and digital hydrologic models; forecast products; and outreach and collaboration with our customers and partners. Scott Lindsey, Eric Holloway, Dave Streubel, Jim Coe, Ben Balk, and Robin Radlein of APRFC and John Papineau and Sam Albanese with the Anchorage Weather Forecast Office all gave presentations or demonstrated forecast techniques. After the demonstrations wrapped up, Sargylana was able to use the forecast model to make the next two-day forecast for the Eagle River gage. The course wrapped up with a close up look at some of the impact of the August and October floods in the Susitna River valley with a boat ride up the Deshka River from Susitna Landing.

While the immediate purpose of this training session was to expose our Russia colleagues to some of our forecast techniques, the larger purpose of our collaborative efforts is to learn from each other. These Arctic Canadian and Russian scientists live and work in the regions that most closely resemble the hydrology of Alaska and that most nearly face similar hydroclimatological challenges. While some of the techniques we use may someday improve forecasts on the Porcupine, Lena, or Ob Rivers, there is also the hope that what we learn from them may also help improve our forecasts here.



Bridge over the Ob River  
in western Siberia

### **Long Time Cooperative Observer Program Manager Retires**

The Fairbanks WFO and the APRFC staff would like to bid farewell to longtime employee Ron Stuvek. Ron retired on September 1st. In recent years, Ron has been in charge of the Cooperative Observer Program for northern Alaska. Ron was responsible for maintaining equipment for all of the volunteer weather observers in northern Alaska. Ron also assisted Ed Plumb, Service Hydrologist from the Fairbanks WFO, with surveying and a variety of other field work at NWS slope profile and wire weight river gage sites. Ron worked for the NWS for 36 years and spent most of this time in Fairbanks. Ron had a knack for solving problems and improvising while out in the field. His confidence and dedication to the job will be missed by all the staff at the Fairbanks office. Many of you in northern Alaska will begin seeing a new face out in the field this year. Brad Sipperly, also from Fairbanks, is replacing Ron in this position.



Ron Stuvek servicing a Fischer Porter.  
One of many Ron maintained during his 36 years  
at the Fairbanks WFO

### **End of 2007 Open Water Season**

The 2007 open water season is coming to a close and we would like to thank you for your assistance in taking water level readings and ask that you stop taking readings when ice actually prevents you from making an accurate reading safely.

We would appreciate any information on the condition of the river and the formation of river ice. Please complete the enclosed Freeze-up Form and return to us. Your help contributes to a more complete record of freeze-up data for Alaska and is greatly appreciated.

## Cooperative Observer Receives Thomas Jefferson Award

John Borg, the cooperative observer in Eagle, Alaska received the **Thomas Jefferson Award** from the National Weather Service in September of 2007. The **Thomas Jefferson Award** is the highest and most prestigious award bestowed on Cooperative Weather Observers. It is named for our third President, who kept an almost unbroken series of weather records from 1776 to 1816. This award is given to very few observers each year, usually not more than five, for outstanding and unusual achievements.



Laura Furgione, Regional Director for the NWS Alaska Region presents the Thomas Jefferson Award to John Borg

John Borg began his duties as a Cooperative Observer as a backup to the existing observer in 1969. Upon assumption of duties as the primary observer in 1971, John established a "network" of backups to ensure continuity of data records in the event of absences. This alone is an impressive characteristic and a Herculean feat not easily achieved in a village with a population of less than 100 people.

John Borg has demonstrated his commitment to the NWS data acquisition process. He consistently calls the WFO day or night, to keep forecasters informed of extreme or changing weather conditions. His discussions are detailed and have on numerous occasions resulted in immediate issuance of warnings, watches, or advisories that have undoubtedly prevented loss of life and property damage. Over the past 38 years of taking weather observations, he has witnessed and reported many extremes including temperatures ranging from -72F to 96F, a rare late December thunderstorm, harsh wind chills, and blizzard conditions of winter. He pays particular attention to the ice conditions on the Yukon River. He notes the beginning of the river's freeze-up, mid-winter periods of overflow, and the start of breakup.

John has consistently provided the NWS with observations of exceptional quality. He customarily appends additional remarks and information on his B-91 forms, providing the most complete weather pictures possible. His B-91 forms

and punch tapes from the Fischer & Porter precipitation gage are consistently neat, accurate, and received on time.

John has frequently posted his daily weather reports and monthly summaries in areas frequented by the public. John has voluntarily and enthusiastically provided unofficial aviation weather reports to the Federal Aviation Administration, charter aircraft operators, and the local community, enabling charter flights and the continued transport of mail, goods, and people during the long winter months. He provides detailed historical discussions to scientists, geologists, climatologists, and foresters embarking on research and data gathering excursions through the vast wilderness area that is the Yukon-Charley Rivers National Preserve.

The remoteness of Eagle causes unreliable communications. Nevertheless, John has always found a way to communicate with the meteorologists and hydrologists in Fairbanks and Anchorage. On numerous occasions, John has been tasked to install or repair the equipment he uses to prepare his observations, often in the harsh weather conditions that frequent Eagle.

John has been a resident of Eagle since 1966 and has worn many hats in the community over the years. As proprietor of the Eagle Roadhouse, he and his wife provided room and board to visiting geologists and seasonal employees of the Division of Forestry battling the ever-threatening wild fires in Alaska's interior. He served as a US Customs agent, postmaster, mayor, and regional Selective Service registrar. Although now retired, he still serves on the board of the Eagle Historical Society and Museum, in addition to providing daily climate reports to the National Weather Service.



Breakup on the Yukon River at Eagle  
Photo taken May 9, 2006

## Start of Ice Thickness Measurements

Those of you who measured ice thickness last year are requested to do so again this year. Please let us know if you need more forms or envelopes for this season. For those of you who have measured in the past but do not intend to this year, please contact us to get instructions on sending the valuable equipment back to us so that we can use it at another location.

We will enter your data into a database and use the data in a monthly analysis of snow and ice for forecasting breakup characteristics next spring. We would like you to make the measurement as close to the last day of each month as possible and mail the results to us. Be sure to include the date and location on the form. A phone call to our 800 number would also aid in the analysis process, or use the NWS Observers form on the Forms menu on the APRFC website to enter the information at: <http://aprfc.arh.noaa.gov>. The ice thickness measurements should be made in the same locations as in the past, preferably far enough from the shore line to prevent drilling in mud and not so far as to encounter strong currents. Before drilling the ice, measure the depth of the snow on top of the ice at that point and record the snow depth in inches. It is preferable to drill a new hole each time rather than use the previously drilled hole. Inaccuracies due to differences in heat transfer can occur at previously drilled holes.



Kelly Songster (pictured above) is a meteorologist at the Weather Forecast Office in Fairbanks. Photo taken at Birch Lake State Recreation Site

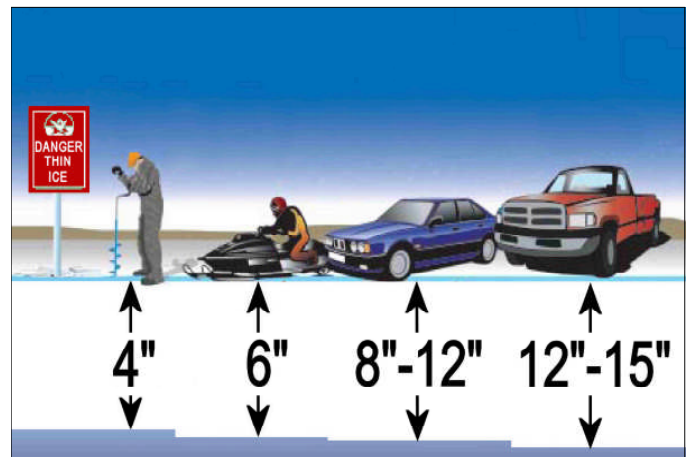
## Safety on Ice

Before going onto a frozen lake, pond or river, it's important to take safety precautions to reduce the risk of falling through the ice.

Knowing how to judge ice conditions will also help you make more informed decisions while enjoying your outing. Look for clear blue ice. New ice is stronger than old ice. Remember you take a risk any time you go onto the ice. Ice thickness is not consistent. Beware of ice around partially submerged objects such as trees, brush, embankments or structures. Ice will not form as quickly where water is shallow or where objects may absorb sunlight.

River ice thickness is much more variable than lake ice. Additional safety consideration is needed when venturing out onto river ice.

Beware of ice covered with snow. Snow acts much like a blanket, insulating thin ice and preventing the formation of clear, blue ice. Snow can also hide cracked, weak and open water. Daily changes in temperature cause ice to expand and contract, creating cracks and possibly pressure ridges which can affect ice strength.



The general rule of thumb for ice:

- 2 inches or less - **STAY OFF**
- 4 inches of good ice for a walking individual
- 6 inches of good ice for a snowmobile or ATV
- 8-12 inches of good ice for a car or small pickup
- 12-15 inches of good ice for a medium pickup truck.

For this and additional information on ice safety, visit:  
<http://gf.nd.gov/education/ice-brochure.html>

**Your safety on ice is important to us.**