Kiugmek

One who watches river

October 2005

A newsletter for Alaska river and ice observers

Please Note. . . .

Don't forget to send in your freeze-up form.

Inside This Issue…

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Eric Holloway and Ed Plumb take flow measurements from the bridge on the Middle Fork of the Koyukuk River - June 2005

Summer Field Work

APRFC staff and Service Hydrologists from the Weather Forecast Offices in Anchorage and Fairbanks had a very productive summer conducting flow measurements and slope surveys, installing new river gages, and hiring new river observers.

Flow measurements and slope surveys were conducted at the following locations this summer:

Yentna River at Lake Creek and Skwentna River at Skwentna - Ben Balk and John Papineau

Kobuk River at Ambler and Kobuk - Eric Holloway, Becky Perry, and Ed Plumb

Koyukuk River at Allakaket, Bettles, Hughes, Huslia and the Middle Fork of the Koyukuk River - Eric Holloway, Becky Perry, and Ed Plumb

Kuskokwim River at McGrath - Ben Balk and Becky Perry

Chisana River and Nabesna Rivers near Northway, and Tanana River at Tanacross - Eric Holloway and Ed Plumb

Copper River Basin:

Gulkana River, Little Nelchina River, Gulkana River at Sourdough, Maclaren River at Denali Hwy, Tazlina River, Tonsina River, Klutina River, Copper River near *continued on Page 2*

<u>Our last weekend staffing is scheduled to be October 29 - 30.</u> 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

Rachel Hanft
Koyukuk River at Bettles
May 2005

Tracy Ansell
Tazlina River at Tazlina
Klutina River
June 2005

Susie Echols
Maclaren River at Denali Hwy
June 2005

Cathy Leonard
Gulkana River at Sourdough
June 2005

Connie Scott
Glacier Creek at Girdwood
June 2005

Nel Ulrich
Little Nelchina River
June 2005

Elmer Ward
Kobuk River at Kobuk
June 2005

Sharon Yatlin
Koyukuk River at Huslia
June 2005

Julie Mishler
Copper River near Chitina
August 2005

Julie Williamson
Chistochina River
August 2005

We would like to take this opportunity to thank each of you for your river and weather observations this season. A special thanks goes out to our Gulkana and Gakona river observer Warren Ulrich for his help in recruiting new observers in the Copper Basin this summer.

Observer Spotlight: George Cebula

by Becky Perry

George Cebula's house sits at the foothills of the Wrangell-St. Elias Mountains

The town of McCarthy can be found in the heart of the Wrangell-St. Elias Mountains. Estimates put the town's permanent population somewhere around 45. George Cebula is one of those permanent residents. George retired from the National Weather Service Alaska Region Headquarters in October 1994 and moved to McCarthy shortly after. He settled in McCarthy because he "liked the area and property was available." George signed on to take daily river readings on the Kennicott River as soon as he was settled and has been taking them ever since. In addition to his daily river readings, George monitors Hidden Creek Lake - a glacier dammed lake that dumps annually and can potentially cause flooding in the McCarthy area. He shares this information with our office, the National Park Service, and the United States Geological Survey.

George arrived in Alaska in August 1965. He was stationed at Elmendorf Air Force Base where he worked in the 11th Weather Squadron. In August 1967, George departed Elmendorf AFB for a job in Shemya with the US Weather Bureau - what is now known as the National Weather Service. He remained in Shemya for nine years before transferring to the Data Acquisition Branch in the Alaska Region Headquarters located in Anchorage. His position as Cooperative Program Manager took him all over the state inspecting and installing weather stations. When asked if he encountered any problems with wildlife in the field he said, "I was chased up a wind tower by a German Shepherd in Paxson." His co-worker, Ed Misiewicz, "thought that was pretty funny."

George is known in McCarthy as the "local weatherman." He maintains records of climate data in the area and writes a weather column every other month for the Wrangell-St. Elias News. He recalls his first winter when, "temperatures didn't go above -40 for eighteen days in a row." On the plus side, he enjoys the summer when temperatures are in the 80's.

You're most likely to run into George during the summer months when he shuttles tourists from McCarthy to the Kennecott Mine for Wrangell Mountain Air. He said, "I like to drive the van because I know a lot of the people" that come to visit.

Sophie waits patiently in the Suburban on board the M/V Kennicott

For the last four years George has taken a hiatus from McCarthy during the winter months. He travels on the Alaska Marine Highway to the Lower 48 and spends at least 10 weeks on the road visiting friends and family. He averages 12,000 miles on these treks in his Suburban with his dog Sophie by his side.

George and Sophie will hit the road around Thanksgiving. They will be in our thoughts as we wish them both safe travels.

Summer Field Work cont'd

Chitina, and Chistochina River - John Papineau and Dave Streubel

Maclaren River at Denali Highway - Robin Radlein, Jim Hunter, and Jocelyn Perry conducted a site survey, hired new observers, and trained observers to take river readings using a poor man's wire weight.

A total of seven new river observation sites were established between the months of June and August. All but two of those sites are in the Copper Basin.

Depth Sensor Installed on Chilkat River Bridge
by Becky Perry

On August 26th, National Weather Service Electronics Technicians Dave White and Jocelyn Perry traveled from Anchorage to Haines to install a depth sensor on the Chilkat River Bridge. The depth sensor is made by Judd Communications and is used to measure water levels and can also be used to measure snow depth. The sensor measures the distance from the sensor to a target - in this case, the water level. The sensor works by measuring the time required for an ultrasonic pulse to travel to and from a target surface. It's an inexpensive solution for measuring water levels in remote locations.

The depth sensor will be connected to the state's Department of Transportation Road Weather Information System (RWIS). RWIS is a network of meteorological and pavement sensors located along the state highway system. RWIS sensors connect to a remote-processing unit (RPU) adjacent to the road. The RPU collects sensor measurements and transmits the information to a central server via standard communication tools (phone lines and computer network). The greater Anchorage area has the first eight operational RWIS stations. Sites are located along major highways from Kenai to Valdez to Fairbanks and in the Southeast region. The ADOT&PF plans to install additional sites through 2006. The RWIS stations are in place to provide accurate real-time road weather information and critical observations for forecasts. This and other weather information helps Alaska Department of Transportation & Public Facilities improve timeliness of maintenance actions, like when to snowplow or deposit anti-icing/de-icing chemicals on the highways.

Many RWIS stations have cameras that take still images of the roadway. The image below was taken on October 6 by a camera located near Mile 24 of the Haines Highway. For more information visit the RWIS website at:

http://www.dot.state.ak.us/iways/roadweather/rwis_geo_index.shtml

Anchorage Electronics Technicians Dave White (pictured) and Jocelyn Perry installed a depth sensor on the Chilkat River bridge to measure water levels.

A Note About Freeze-up Information:

We request your assistance in obtaining information on freeze-up on rivers and lakes in your area for the 2005 season. We would appreciate it if you would complete the enclosed River and Lake Freeze-up Information Form to the best of your knowledge and return the form to us. If you have any comments, please put them in remarks. Your help contributes to a more complete record of freeze-up data for Alaska and is greatly appreciated.

End of 2005 Open Water Season

The 2005 open water season is coming to a close and we would like to take this opportunity to thank you for your assistance in taking water level readings and ask that you stop taking readings at your location when ice actually prevents you from making an accurate reading safely.

In addition to the water level measurement, we would appreciate any information you are able to provide us on the condition of the river and the formation of river ice.

The APRFC staff thanks you for your cooperation during the past open water season and looks forward to working with you again next year.

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.

Read below for more information concerning ice and ice safety.

Tips on Measuring Ice Safely
by Eric Holloway

The National Weather Service (NWS) ice thickness program for the Alaska Region currently consists of roughly 103 active sites from around the state. Now that doesn't mean we hear from all hundred or so volunteers every month during the winter, just that we have open "files" for those locations. The greatest need for us at the NWS is to begin a campaign of recording ice thickness on a regular basis in order to develop a climatological history, which in today's world is beginning to play a significant role in climate monitoring. Furthermore, we need record of ice observations in order to use the data in monthly analysis of snow and ice in an effort to forecast breakup characteristics during the spring.

Image from the State of Alaska's Department of Public Safety
http://www.dps.state.ak.us/AST/safetybear/ColorBk/thinice.asp

We would like measurements to be taken at approximately the same location every month, starting after freeze-up when the ice is safe to walk on, and continuing until break-up or when the ice becomes unsafe. This means monthly observations as close to the end of the month as possible. The location is selected close to shore, but over a depth of water which will exceed the maximum ice thickness or deep enough to prevent drilling in mud and rock. Another consideration is that a location where the strongest currents, thus thinner ice, would be avoided. Lake ice measurements are better indicators of changes in seasonal ice thickness due to the lack of turbulent eddies found in streams and rivers which can cause significant spatial variabilities in ice thicknesses over short distances. For both rivers and lakes, warm inflows from springs may create areas of thinner ice. Also, the ice thickness near shore may be thinner due to warm groundwater inflow or the insulating effect of drifted snow or thicker due to the candle-dipping effect of variable water levels. Ice thickness is measured to the nearest inch using a government supplied manual or gasoline auger. A record of the depth of snow on top of the ice is also needed to estimate the insulating effects of snow and the resulting changes in ice thickness.

Our hope here at the APRFC is that we will find ice thickness a necessary piece of information that will be helpful in evaluating the timing and potential severity of ice breakup. As is usually the case, the more data we have, the better we can evaluate the influence of ice thickness on breakup. It is also our concern that you as observers use the utmost care when evaluating the safe ice conditions necessary to carry out our mission. Be cautious! Never go out on an unknown ice sheet alone, always probe ahead of yourself and consider wearing a personal floatation device.

The US Army Corps of Engineers, Cold Regions Research and Engineering Laboratory has put together the following safety tips for working or playing on the frozen surface of a river or lake. Since it cannot cover every ice condition you may encounter, your judgement is critical. Remember: ***Only you are responsible for your own safety and knowing how to stay safe will be a matter of life or death…*** *cont'd on Page 5*

PREPARATION

There are four things to focus on when planning an outing on the ice: your physical condition, your clothing, your equipment, and your procedures.

Physical condition

Anyone who goes out on the ice should be in reasonably good condition and be able to sustain periods of intense exertion if an emergency arises—either falling through the ice themselves or rescuing someone who does. Being able to swim, or at least being comfortable staying afloat, is important in an emergency and can reduce the chances for panic.

Clothing

Naturally you should choose clothing that provides protection from low air temperatures, wind, and precipitation while at the same time allowing you mobility. But in addition, when you select clothing, keep in mind the possibility of falling through the ice. Clothing that would severely restrict your ability to swim or to stay afloat is not a good choice. Hip boots or waders should never be worn, as they can fill with water and restrict movement while adding weight. A personal flotation device (PFD) should be worn.

Equipment

Include items for testing and measuring the ice thickness, as well as items for rescue or self-rescue. In the first category are a heavy ice chisel, an ice drill or auger (manual or powered), a measuring tape or stick that can be hooked under the bottom edge of the ice in an auger hole, and possibly a perforated ladle for cleaning ice out of the auger holes. In addition to the PFD, bring a rope or rescue throw bag containing a rope that floats. Ice rescue picks sold for ice fishermen are an excellent idea. They thread through your jacket sleeves like children's mittens and are immediately available in an emergency for pulling yourself out of the water onto the ice.

Procedures

Never go out on an ice cover alone, and never go out on the ice if there is any question of its safety.

- While you are planning the outing, obtain the record of air temperature for the past several days and continue observing air temperatures while the ice will be used to support loads.

- Always let someone know of your plans and when you will return.

- When you arrive at the water's edge, visually survey the ice. Look for open water areas, and look for signs of recent changes in water levels: ice sloping down from the bank because the water dropped, or wet areas on the ice because the water rose and flooded areas of the ice that couldn't float because it was frozen to the bottom or the banks. (If the ice is snow-covered, look for wet areas in the snow.)

- Listen for loud cracks or booms coming from the ice. In a river this can mean the ice is about to break up or move; on a lake larger than several acres such noises may be harmless responses to thermal expansion and contraction.

- Look for an easy point of access to the ice, free of cracks or piled, broken ice.

- If you are taking a vehicle or other equipment on the ice, go out on foot first. Vigorously probe ahead of yourself with the ice chisel. If the chisel ever goes through, carefully turn around and retrace your steps back to shore, and try again some other day.

- Near shore, listen for hollow sounds while probing. Ice sloping down from the bank may have air space underneath. This is *not* safe; ice must be floating on the water to support loads.

- After getting on the ice, others in the group should follow in the leader's steps, but stay at least 10 feet apart.

- Only after you have learned the characteristics of the ice cover should any vehicle be taken on the ice.

WHAT YOU NEED TO KNOW ABOUT THE ICE

Once on the ice it is time to begin more systematic observations of the ice sheet you want to use to support a load. There may be many variations in the structure, thickness, temperature, and strength of a floating freshwater ice sheet.

How thick is the ice?

This is determined by drilling holes with the drill or ice auger. The technique is to drill a hole and check the ice thickness every 150 feet or so along the intended path. This should be done more frequently if the ice thickness is quite variable. Note whether the ice in each hole is clear (sometimes called black ice) or white (due to air bubbles—sometimes called snow ice). Measure the thickness of both kinds.

On rivers the ice thickness and quality can change a lot in a short distance; be particularly alert to variations in ice thickness due to bends, riffles or shallows, junctions with tributaries, etc. For both rivers and lakes, warm inflows from springs can create areas of thinner ice. The ice near shores can either be thinner (due to warm groundwater inflow or the insulating effect of drifted snow) or thicker (due to the candle-dipping effect of variable water levels).

Measure the snow cover thickness on the ice cover; significant variations in thickness may mean highly variable ice thicknesses.

Any recent large snowstorm creates a new load on the ice. If the new snow is heavy enough, the ice sheet will sag and its top surface will be submerged below the water level. Then water will flood the top of the ice sheet through cracks, saturating the lower layers of the snow. Until this slush is completely

Dave Streubel prepares to take an ice thickness measurement on Lake Hood

frozen, *stay off* the ice sheet. When the saturated snow becomes frozen, it is an added thickness of white ice.

Contrary to what you would expect, a rapid, large air temperature drop makes an ice sheet *brittle,* and the ice *may not be safe* to use for 24 hours or more.

You are likely to encounter cracks in the ice. Cracks are either wet or dry. If they are dry, they do not penetrate the ice sheet and are not a concern.

SAFE OPERATIONS ON THE ICE COVER

If using an enclosed vehicle, *always* drive with the windows or a door open for quick escape. If you drive across wet cracks, your path should be as close to perpendicular to them as possible, instead of parallel to them.

A load deflects the ice slightly into a bowl shape. When you drive on floating ice, this moving bowl generates waves in the water. If the speed of the waves equals the vehicle speed, the ice-sheet deflection is *increased* and the ice is much more likely to break. The problem is more serious for thin ice and shallow water. In general you avoid this danger by driving below 15 mph.

When there are two loads on the ice, the safe distance between them is about 100 times the ice thickness at the required minimum thickness. This is shown in the third column of the table available online at the CCREL website at:http://www.crrel.usace.army.mil/. When the two loads are different, choose the spacing shown for the larger load. At ice thicknesses greater than the required minimum, this spacing can be reduced.
A loaded ice sheet will creep, or deform, over a long period of time, *without any additional load.* If an ice sheet has to be loaded for a long period, drill a hole near the load. If the water begins to flood the ice through the hole, move the load *immediately.* Remember this if your vehicle ever becomes disabled: if left for a few days, it may break through the ice as a result of long-term creep.

IN CONCLUSION...

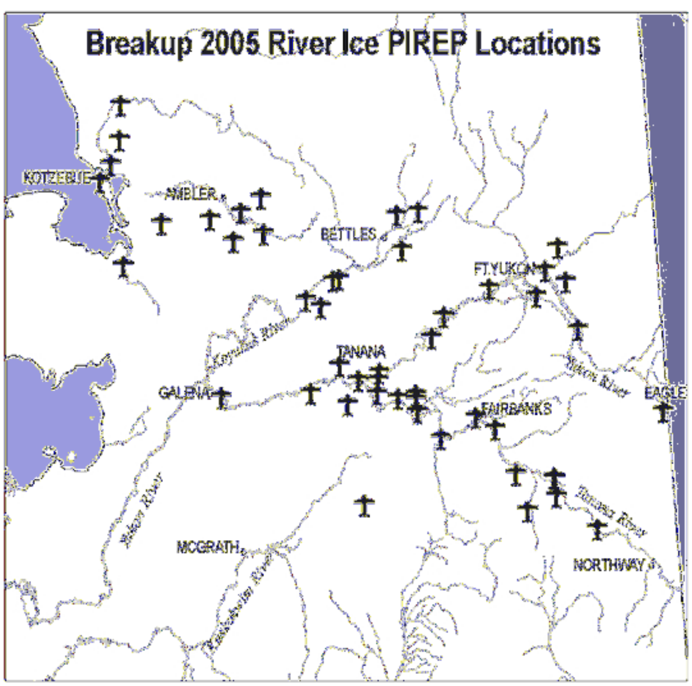
Be sure you understand this information. Don't hesitate to seek the advice of others whose experience you trust. Be safe out on the ice!

Most of the information given here can be found at the US Army Corps of Engineers, Cold Regions Research and Engineering Laboratory at:

http://www.crrel.usace.army.mil/

Lastly, an interesting video on just what to do if you happen to fall in the ice can be seen at:

http://www.exn.ca/video/?Video=exn20020325-icewater.asx



Interior Air Taxis Provide Ice Observations
by Ed Plumb

Interior Alaska air taxi services are now providing the National Weather Service with observations of river ice conditions during breakup. Staff from the Weather Forecast Office in Fairbanks provided ice observation training last April to pilots from a handful of air taxis based in Fairbanks. The pilots were taught how to identify and report different stages of breakup using a standard terminology. They were also requested to report any ice jams or flooding they observed while flying between villages. The observations radioed in to the nearest FAA Flight Service Station through a pilot report (PIREP). PIREPS are typically used by pilots to report in-flight weather conditions. These ice observations are extremely important for forecasting river breakup dates and for determining the potential for ice jam flooding. The National Weather Service plans to train additional pilots in southwest and southcentral Alaska during spring 2006 in order to expand the aerial ice observation network. The APRFC appreciates the efforts of all of those involved in this joint effort.