

Please Note....

Don't forget to send in your 2004 freezeup forms!

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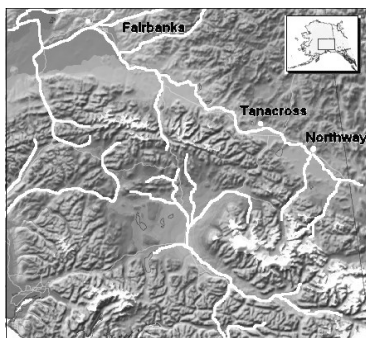
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A Summer of Field Work

Upper Tanana Valley



June was a busy month of some much needed field work for both

Summer Hire Returns to APRFC

Staff at the APRFC and observers calling in their data had an opportunity this summer to welcome back a familiar, well-regarded face. Britta Hinrichsen, our summer student in Summer 2001, rejoined the staff of the APRFC this summer. Britta graduated in the spring from Oregon State University in Corvallis, Oregon, with a double major in Environmental Science and Environmental Economics, Management and Policy with a minor in Oceanography. While Britta considers herself an Alaskan, having spent her high school years in Anchorage, her parents now live in Colorado, so this summer represented Britta's opportunity to say farewell to a state she has come to love. While at the RFC, Britta not only interacted with our observers, she also worked on a range of projects requiring planning, research, data collection, analysis, processing, and documentation. The principal project she completed was development of a unified glacier dammed lake database to collect the key information on known releases from glacier dammed lakes. Britta even pursued ways to make this new database available for forecaster interactions on the RFC intranet, a step that may eventually allow the data to be posted publicly on the internet. She had an opportunity to witness the effect of these glacier dammed lakes first hand in August when she helped



Britta assists with a field survey on the Tazlina River following the release of several of the river's contributing glacier dammed lakes.

conduct a field survey of the Tazlina River when it was near flood stage due to the release of several glacier dammed lakes. Britta has returned to school this fall to earn her law degree at the Vermont Law School with a focus on Environmental Law. Those of us that had the opportunity to work with her or to talk with her can't help but admire her intelligence, hard work, good nature, and drive, and we wish her well as she moves forward in her education and career.

APRFC staff members and Ed Plumb, Service Hydrologist at the Fairbanks Weather Forecast Office. On June 16, Senior Hydrologist Dave Streubel and Hydrologist Jim Coe drove to Delta Junction where Ed

Plumb met them. The purpose of the trip was to take discharge measurements and perform slope profile surveys on rivers in the Upper Tanana Valley. These discharge measurements will help the RFC develop

Our last weekend staffing is scheduled to be October 30-31. 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>. The password for access to web entry can be obtained from any RFC staff member.

stage-discharge relationships at these locations. Though crude, these rating curves will improve the use of hydrologic models on these river systems.

A much needed slope profile gage was established on the Nabesna River at the village of Northway, and Romania John was recruited to take gage readings on both the Nabesna and Chisana Rivers.

On June 17 discharge measurements were taken on the Chisana River, with the help of a local resident who drove his personal boat. Dave and Ed were onboard taking measurements and notes, while Jim ran the survey equipment from shore. On the final day of the trip, June 18, discharge measurements were taken on the Tanana River at Tanacross with the help of another local resident and his boat.

Koyukuk – Kobuk Rivers

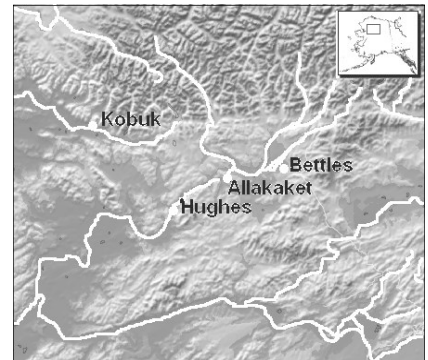
Senior Hydrologist Scott Lindsey, Hydrologic Technician Becky Perry, and Ed Plumb traveled to Bettles on June 22 to conduct survey work and take discharge measurements on the Koyukuk River at Bettles, Hughes, and Allakaket and on the Kobuk River at Kobuk.



Kobuk River observer Minnie Wood with Ed Plumb

The four-day trip began in Bettles where the river observer, Byron Thorne, and his parents, Rich and Paula met Scott, Becky, and Ed and provided transportation from the Bettles Lodge to the location where Byron takes daily measurements. Evansville Tribal Administrator Phil Anderson drove the boat used to take the discharge measurements.

The Thorne's were extremely helpful during the survey process.



Koyukuk River at Bettles observer Byron Thorne points out a reference mark

The following day Scott, Becky, and Ed went to the village of Kobuk on the Kobuk River. They traveled by floatplane, and were met at the river's edge by long-time observer Minnie Wood. Survey work was completed and new markers were established. The flow measurements were taken with the help of Minnie's husband Alex and his boat.

On Thursday the group went to Hughes on the Koyukuk River. Jack Ambrose, the river observer at Hughes, provided ATV transportation for the gear and also provided his boat to take flow measurements.

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The following and final day of the trip took Scott, Becky, and Ed to the Koyukuk River at Allakaket. They were met at the airstrip by the river observer Fred Ned. Fred also provided ATV transportation and his boat. The trip was a success due to the cooperation and assistance provided by the river observers at each location.

Scott Lindsey explains how flow measurements are taken to Koyukuk River at Allakaket observer Fred Ned



Koyukuk River at Hughes observer Jack Ambrose (right) with Scott Lindsey



Becky Perry and Ed Plumb take a break from surveying to share lunch with the children of Kobuk

Welcome New Observers

The APRFC staff would like to thank the following observers for coming on board in 2004:

Eric Tremblay
January 2004
Fort Yukon Ice Thickness

Angela Wolfe
January 2004
Manley Hot Springs
Ice Thickness

Christin Spangler
May 2004
Tazlina River at Tazlina

Craig Shaw
May 2004
Glacier Creek at Girdwood

Romania John
June 2004
Chisana River at Northway
Nabesna River at Northway

Margie Youngman
August 2004
Anchor River at Anchor Point

Kevin Hauze
August 2004
Salmon Creek at Nash Road
Seward

Matanuska River near Palmer

Jim Coe and John Papineau, Senior Service Hydrologist at the Anchorage Weather Forecast Office, conducted a flood survey of the Matanuska River near Palmer on June 22. On June 18 the river began experiencing diurnal rises to just above flood stage as high temperatures and freezing levels increased the snowmelt and glacier melt contributions to the river. The survey allowed the forecasters to evaluate the accuracy of the designation of minor and moderate flood stage. As part of the evaluation, the forecasters met with officials from the Matanuska-Susitna Borough to discuss the impact of high water on community services and operations. The initial survey indicated that flood stage could be raised based on stages at which inundation of roads or houses could be expected to occur. Subsequent discussions with residents of the area identified potential impacts to the community associated with changing the flood stage. As a result, additional meetings will be held with impacted users during the winter prior to making any final changes to the published flood stage.

Seward Area

John Papineau, Dave Streubel, and Britta Hinrichsen drove to Seward on August 11 to replace a wire weight gauge on Glacier Creek at Bruno Road. The gauge had been removed for maintenance and to replace a broken counter. After installing the wire weight, John, Dave, and Britta cleared brush from the co-located USGS gauge house.

Hydrologist Ben Balk and Hydrometeorological Analysis and Support (HAS) Forecaster Eric Holloway drove to Seward on August 20 to visit Seward area gauges and to establish a poor man's wire weight site on Salmon Creek. A poor man's wire weight is a 100' tape measure with a 1' section of rebar attached to the end for weight. An observer was recruited and trained to take readings from the bridge on Salmon Creek.

Ben and Eric also took a wire weight river reading on the Resurrection River to compare to the pressure transducer and the new acoustic sensor. They then toured the Glacier Creek/Bear Lake area to gain a better understanding of the stream network in that part of the valley.

Britta Hinrichsen and John Papineau check the wire weight gauge on the Resurrection River at Seward



Tazlina River near Glennallen

Jim Coe, Becky Perry, and Britta Hinrichsen conducted a field survey of the Tazlina River near Glennallen on August 9 to determine the validity of the published flood stage. The river had risen sharply to above flood stage early in August as a result of releases from two to four of the river's contributing glacier dammed lakes, but public feedback indicated there was no flooding. The survey identified that changes in the river channel and other factors have made the published flood stage obsolete, so coordination will begin on redefining an action or flood stage for the river reach.

Drained glacier dammed lake that forms at Tazlina Glacier
Photo by Joe Junker



Nushagak River at Ekwok

Ben Balk flew to King Salmon on September 10 to meet up with Meteorological Technician Randy Calloway from the Weather Service Office (WSO) at King Salmon. Ben and Randy chartered a flight to the village of Ekwok in Southwest Alaska, where they were met by the Nushagak river observer, Richard Stermer. Richard showed Ben and Randy the gage site (slope profile) and the old USGS gage site and USGS Reference Mark (RM) #8. During last year's site visit, Larry Rundquist tied the slope profile elevations to the USGS datum and then established new reference markers at the NWS gage site. The old USGS gage site is a few hundred yards downstream of the new NWS slope profile.

During breakup, Richard lost his 'A' marker and had established a temporary marker a few feet uphill. Ben and Randy installed a new section of rebar to replace the temporary marker. Another marker was set up further uphill to be used during breakup. The decision was made to call this the 'F' marker...for flood. Richard expects the 'F' marker will be needed only during breakup flooding. The 'A', 'B', and 'F' markers were surveyed as well as RM#1, RM#2, and RM#3. The reference marks had to be tied back in with the USGS datum because of a possible survey error the previous year.

Chelatna Lake

Located approximately fifty miles northwest of Talkeetna in the western Susitna Valley is the remote Chelatna Lake and Chelatna Lake Lodge. The caretaker of the lodge reports daily lake level readings in addition to temperature, precipitation, and snowfall in the winter.

Dave Streubel and Ben Balk took a charter to Chelatna Lake on September 17 to conduct discharge measurements on Lake Creek and survey the channel cross-section up to riverbank level.

Lake and river levels in the area were extremely low. The pilot reported the lowest lake level he has seen in his 25 years of flying.



The Alaska Range overlooks Chelatna Lake

Yentna River at Lake Creek and Skwentna River at Skwentna

Dave Streubel and Ben Balk flew to the Yentna River at Lake Creek on September 24. The purpose of the trip was to provide the observer with a laser level and stadia rod to take river readings instead of using the slope profile along his highly erosive bank. The river observer, Gary Leeds, drove his boat while Dave and Ben took discharge measurements.

Gary took the pair upriver to Skwentna for another discharge measurement. While there, Dave and Ben resurveyed the entire slope profile. The river observer, Joe Delia, said the Skwentna river was the lowest he has seen at this time of year in his 50-plus years in Skwentna.



APRFC Welcomes Newest Addition

Dave Streubel and his wife Julie are the proud parents of a healthy baby girl born on August 25. Clara Jane Streubel was born at Providence Hospital in Anchorage. She came into the world with a bang as Anchorage experienced a rare thunder and lightning storm, torrential rain, and an urban flood advisory - was it a sign? A sure sign little Clara will grow up to be a mover and a shaker.



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 that 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 immediately. Be sure to include the date and location on the form. A phone call to our 800 number with the ice observation 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. Please note the location on the form. Before drilling the hole in 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. We will be working with the University of Alaska Fairbanks professors this winter to coordinate our ice thickness program with a program they have been conducting.

End of 2004 Open Water Season

The 2004 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 may be able to provide us on the condition of the river and the formation of river ice.

We would also appreciate your efforts in documenting freezeup at your location by filling out the enclosed form and returning it in one of our self-addressed, stamped envelopes.

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

HSA REPORTS



Anchorage Hydrologic Service Area by John Papineau

The summer of 2004 was warm and dry across most of Alaska, including Southcentral. These conditions were a result of persistent high pressure over the Bering Sea and Alaska. Near record warmth produced copious amounts of snowmelt in June and early July. Northern Cook Inlet received moderate to heavy rain the third week of August, producing localized urban flooding in Anchorage as storm drains could not handle the volume. Although smoke was nowhere near the problem it was north of the Alaska range, there were a number of days in August where the air quality was poor due to the transport of smoke from the fires that were burning in the Interior.



Juneau Hydrologic Service Area by Michael Mitchell

The summer of 2004 has become the summer that all future summers will be compared to. Memories of cloud free skies, persistent 80 and sometimes 90 degree heat, echoing thunder, blazing red sunsets, torrential downpours, or pictures of a Great White Shark snacking on a fisherman's catch, will linger in minds of Southeast Alaska residents for years to come.

A split jet stream, with the northern branch running up the west coast of Alaska and the southern branch staying south of the Gulf of Alaska prevailed this summer. This allowed an unrelenting dome of high pressure to remain parked across the Southern Alaska Interior and Northwest Canada and kept a prevailing down slope easterly wind over Southeast Alaska. The cool and moist Gulf of Alaska air was suppressed into the far southern Gulf of Alaska and North Pacific for nearly the entire summer. As a result, sea surface temperatures along the Eastern Gulf Coast reached an unprecedented 65 degrees.

The summer of 2004 will go down as the warmest summer in the past half century. Haines, Juneau, Sitka and Annette all recorded their warmest summer on record while many others had their second warmest. Average temperatures were around 4 degrees above normal for the four month period May through August, with daily high temperatures reaching 20 degrees above normal on numerous occasions. June 18th to the 26th was probably the hottest week in Southeast

history, with 65 temperature records set, including an all time high of 93 degrees in Annette and a somewhat plausible unofficial 103 degrees reading at the Thorne River RAWS. Two months later this feat would be repeated when temperatures reached an all time high of 89 degrees in Sitka and 88 degrees in Yakutat. Juneau logged 42 days when the high temperature exceeded 70 degrees and a record 12 days of 80 degree heat.

With the abundant sunshine, precipitation totals fell well short of normal values and even reached drought status across the Northern Inner Channels during late June through early August. Both Haines Customs and Juneau had their driest summer on record with most other stations recording the summer as one the their driest. The 1.91 inches of rain that fell at the Haines Customs station between May and August totaled only 30 percent of the normal, and included only 1 day when more than one quarter of an inch fell. Most other locations received 40 to 70 percent of normal rainfall. Even Ketchikan, typically the wettest Southeast location, was relatively dry with its May through August rainfall totaling 19.82 inches, or 56 percent of the 35.52 inches expected in a normal summer.

Thunderstorms, normally quite rare across Southeast Alaska, flourished in the unusual heat, and occurred on at least 14 days. A thunderstorm moving across the Juneau area on the morning of August 24th dumped 1.85 inches in one hour, an unofficial state record, on an automated rain gauge near Tee Harbor. Hours later, another downpour of 0.80 inches in less than one hour over downtown Juneau, produced a gully washer that flooded parking lots and buried a hiking trail with 10 feet of rock. Lightning from this same thunderstorm struck the State Office Building and knocked out the phone system for several days.

In spite of the dry conditions, glacial rivers spent most of the summer at well above normal levels due to extensive snow and glacier melt. Moderate flooding, resulting from the annual release of a glacial dammed lake on the Tulsequah River in Western British Columbia, occurred on Southeast Alaska's Taku River between June 23rd and June 26th. During this period the Taku River rose 7 feet from an unusually high base flow of 38 feet to its all time highest crest of 44.96 feet. This produced damage to many of the homes and cabins along the river. Not only was this the largest glacial outburst on record, it occurred 1 to 2 months earlier than normal. At the same time, rain and snowmelt fed streams, like Jordan and Staney Creeks, ran dry leaving fish fry to wallow in 75 degree puddles. By mid August, Tyee Reservoir near Wrangell had shrunk to a one month supply of water for the community.



Summer across most of northern Alaska will go down in the record books as the warmest and one of the driest on record. Persistent high pressure remained anchored over the state for most of the summer. This prevented any Bering Sea or north Pacific weather systems from moving inland and providing periods of rain. The summer long drought over the interior went on unabated into September. Rainfall for the entire summer was less than 50 percent of normal across the central and eastern interior. By the end of the summer, Fairbanks had its third driest summer and experienced the driest August in 101 years of record. Rainfall across western Alaska was also below normal, but conditions were not as extreme as farther east.

The duration of heat during the summer of 2004 was very impressive. There were several episodes when temperatures across the interior climbed into the 80's over a wide area, and into the 90's in the upper Tanana and Yukon River valleys. These hot temperatures resulted in the warmest summer on record for much of the interior. Although the heat was long-lived, Fairbanks failed to break any daily record high temperatures

through the entire summer.

Smoke from a record number of fires blanketed the interior for much of the summer. In Fairbanks, smoke restricted the visibility below 7 miles on 42 days during the summer, and this included several periods where the visibility was below 1 mile. Smoky conditions were actually worse to the north and east of Fairbanks in the vicinity of the fires. Some of smoke even worked its way westward into the Bering Sea and north to the Arctic coast. The smoke layer was more than 12 thousand feet thick on some days and this acted to keep the temperatures from climbing to record levels.

As a result of the warm dry conditions, rivers fed primarily by rainfall and groundwater fell to near record low levels at some locations. Some popular recreation rivers, such as the Salcha River near Fairbanks, were difficult for boaters to navigate because of the lack of water. On the other hand, glacially fed rivers ran high for much of the summer. Warm temperatures and ample amounts of sunshine resulted in a significant amount of glacial runoff from the Alaska Range. By mid-September several river observers reported that water levels were approaching the lowest level ever seen in recent history.

Special Reports

Near Washout Along the Dalton Highway May 2004

by Ed Plumb

Significant overflow icing developed through the winter on the Sagavanirktok River adjacent to the Dalton Highway near Pump Station 3 on the north side of the Brooks Range. The overflow ice came out of the river channel for nearly 15 miles north of Pump Station 3, and resulted in over 2 feet of ice on the surrounding tundra. The Department of Transportation (DOT) spent many hours in the latter half of the winter trying to keep the ice from overtaking the Dalton Highway. Temperatures well above freezing in mid-May brought rapid snowmelt and runoff into the Sagavanirktok drainage. With the river channel and surrounding tundra clogged with ice, water spread out over a large area and began to inundate the highway. Fortunately DOT was able to cut multiple channels in the ice to divert the water, as well as construct a series of dikes from snow and ice in order to prevent the water from washing out the only road to the north slope oil fields.



DOT built a snow dike to keep runoff from washing out the Dalton Hwy.

DOT frantically digs a channel in the overflow ice to keep spring runoff from the Dalton Hwy.



Worst Flooding in Over 40 Years Inundates Delta Junction

by Ed Plumb

An unusually heavy rain event (more than 1 inch) in early May, combined with temperatures well above freezing high up in the Alaska Range, resulted in the worst flooding in 40 years in the community of Delta Junction. The rain on snow produced a significant surge of water in Jarvis Creek, which drains north from the Alaska Range. Water was forced overbank from Jarvis Creek about 15 miles south of Delta Junction, where a large area of overflow ice buildup from the winter was blocking the entire channel. The diverted water flowed into an old channel of Jarvis Creek, which passes right through portions of Delta Junction. The flooding was exacerbated by raised roads with inadequate culverts throughout the area that served as dikes and backed up the water. The Department of Transportation (DOT) had to breach one road in 3 places in order to relieve the flood waters. Dozens of families were displaced by the flooding and many homes experienced flood damage.



Some Delta residents could only reach their homes by canoe for several days.



One of the three breaches DOT cut in order to relieve the flood waters.

Severe Weather Rolls through the Interior

by Ed Plumb

A round of unusually strong thunderstorms developed across interior Alaska over the Memorial Day weekend. These storms produced heavy rain, hail, thousands of lightning strikes, and strong winds. It is likely that some of the brief, heavy rain resulted in flash flooding on some small streams in the Tanana Yukon Uplands. Some of the lightning strikes started small fires which eventually flared up into massive fire complexes several weeks later as hot and dry weather settled in over the state.

Thunderstorms were observed in the Fairbanks area for 5 days in a row, with some isolated storms reaching severe status on the 30th. These storms produced very large hail for interior Alaska. Hail with a diameter up to one inch was observed in Goldstream Valley just north of Fairbanks, and a report of golf ball size hail came in from the Elliot Highway about 20 miles farther north. Storms on the 31st blew many trees down and resulted in several power outages around Fairbanks. Other

unusual weather was seen descending from several convective cells the previous week, when meteorologists at the Weather Forecast Office in Fairbanks, some University of Alaska personnel, and the news media reported several apparent funnel clouds over Fairbanks.



1" diameter hailstones caused some minor damage to this truck in Fairbanks.

Hail stones up to 1 inch in diameter were reported in Fairbanks on May 30th.

