Kuigmek

One who watches river

April 2012

A newsletter for Alaska river and ice observers

Please Note. . . .

RFC will be staffed weekends beginning April 28-29

Alaska - Pacific River Forecast Center
6930 Sand Lake Road
Anchorage, Alaska 99502-1845
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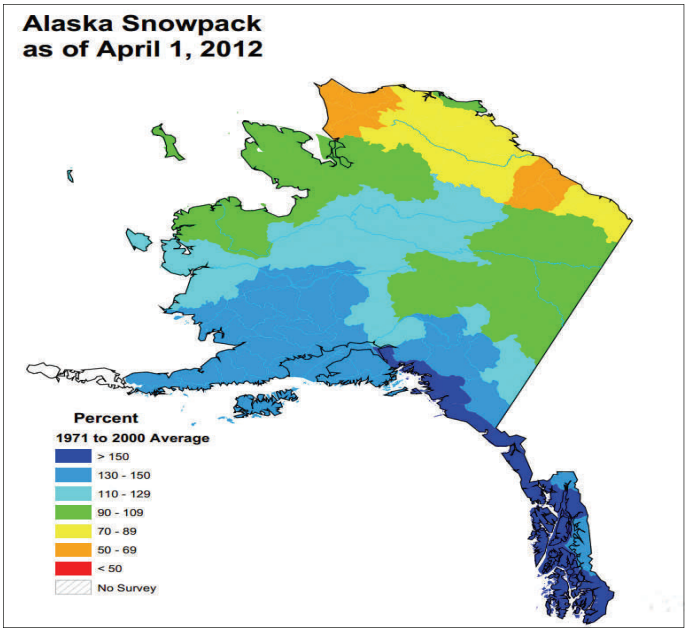
Spring Breakup Outlook for Alaska

The spring breakup flood potential throughout Alaska is currently rated as above average. This forecast is based on observed snowpack, ice thickness reports, and long range temperature forecasts.

Ice - April ice thickness data are available for a limited number of observing sites in Alaska. They indicate that ice thickness is variable across the state, and generally between 75 and 125 percent of normal. Many locations in the Tanana Basin reported slightly below normal thickness. Despite the cold temperatures mid-winter, there was enough snow cover on the ice to provide insulation and inhibit significant ice growth. Accumulated freezing degree days range from 105 to 150 percent of normal for most of mainland Alaska, with the highest percentages over the west coast.

Snow - An analysis of the April 1st snowpack by the Natural Resources Conservation Service (NRCS) indicates a much higher than normal snowpack across southern Alaska and the Panhandle, with most locations reporting 130 to 200+ percent of normal snow water equivalent. High volumes of snowmelt are expected this spring and summer across the southern coast. However, the moderating influence of the Gulf of Alaska typically causes a slow release of melt runoff which limits the potential of snowmelt flooding. A higher than normal snowpack (110 to 130 percent of normal) exists over the Koyukuk River Basin in northwest Alaska. An above normal snowpack also exists over the southern Yukon Territory. Areas with above normal snowpack may have an increased risk of breakup related flooding. The only areas of Alaska and the Yukon Territory that have near to below normal snowpack are the Tanana Basin, the North Slope, and the northern Yukon Territory. Even so, there is enough snow in these areas to produce significant snowmelt runoff peaks and potential ***Cont'd on Page 7***

Large sheets of ice break up on the Buckland River in front of the village of Buckland on May 17, 2011. View more breakup photos in our Image Gallery: http://aprfc.arh.noaa.gov/gallery2/main.php

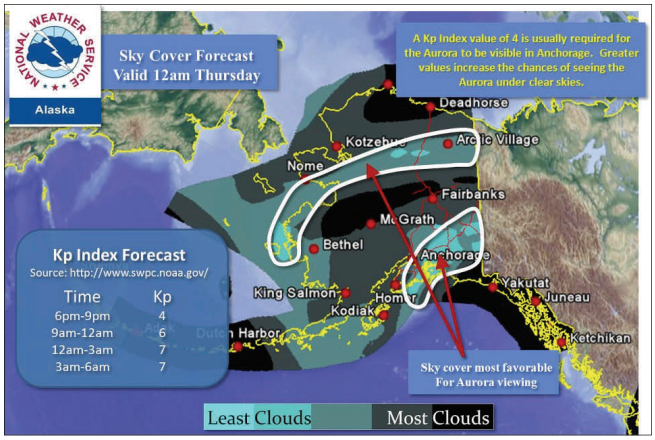


Find us on Facebook!
http://www.facebook.com/
US.NationalWeatherService.Alaska.gov

The National Weather Service (NWS) in Alaska launched its own Facebook page on January 11, 2011. Staff from the Weather Forecast Offices in Anchorage, Fairbanks, and Juneau, the Alaska Aviation Weather Unit, West Coast/Alaska Tsunami Warning Center, NWS Alaska Region Headquarters, and the Alaska-Pacific River Forecast Center post comments, photos, and graphics featuring a variety of topics, including weather-related Public Information Statements, Watches, and Warnings.

One of the more popular posts, generating hundreds of comments, was the race to break Anchorage's snowiest winter record (right). Comments were received from residents in Kansas to the Netherlands.

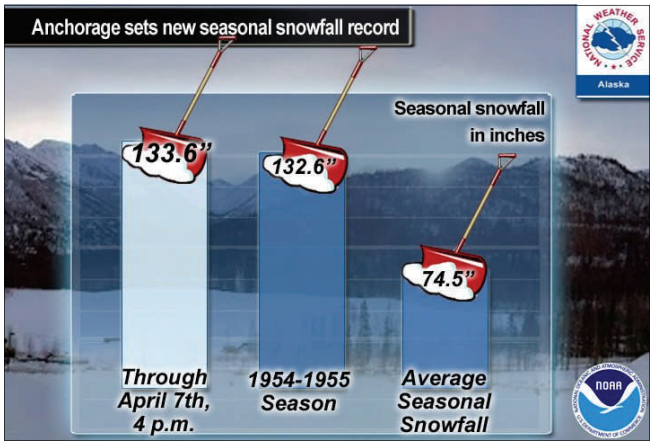
Posts with information concerning aurora activity (below), are also appreciated by those who visit our page. We ask our "fans" to post their aurora photos, and are never disappointed.



Posted on March 7th: If you missed out on seeing the Aurora last night, you may have another chance at seeing it again tonight. The National Weather Service's Space Weather Prediction Center is forecasting Kp Index values to reach as high as 7 tonight which is more than high enough for the Aurora to be visible, weather permitting, over Southern Alaska. The latest Kp Index forecast can be found here:http://www.swpc.noaa.gov/ftpdir/latest/geomag_forecast.txt.

Skies are forecast to be clear to partly cloudy over the Anchorage Bowl, Gulf Coast, and Copper River Valley overnight. Folks in Northern Alaska near Arctic Village westward to Nome may also have a chance at seeing the Aurora under partly cloudy skies. Before heading out to look for lights in the night sky, make sure you check out your latest sky cover forecast on our homepage: http://www.arh.noaa.gov/.

The aurora photo (right) was taken in Wasilla on March 8th, and posted by Scott Langley. Scott lives in Wasilla and works as an electronics technician at our West Coast/Alaska Tsunami Warning Center in Palmer. Scott's photo generated over 80 comments, with well over 300 "likes." The aurora photo on Page 3 was



Posted on April 7th: As of 4 p.m. AKDT, April 7, 3.4 inches of new snow has fallen since midnight. This makes the 2011-2012 winter season the snowiest on record with a total of 133.6 inches. The previous seasonal snowfall record was 132.6 inches set in 1954-1955. The average seasonal snowfall is 74.5 inches.

Snow continues to fall in the area. Any snow that falls at the Sand Lake Forecast Office will be added to the total through June 30. Monitor local radar trends here: http://pafc.arh.noaa.gov/home_radar.php

Posted on March 8th at 10:09 pm: Northern Lights in Wasilla - about 30 minutes ago.

posted by our river observer, Jim Helmericks, from up north on the Colville River. Jim and his wife Teena have been dedicated river and cooperative weather observers for more than fifteen years at Colville Village. Jim is no stranger to our Facebook page, in January, he shared another photo of the aurora and posted the comment, "Took this photo around 11:30 PM when we were having one of our better displays. I didn't see much after midnight here on the Colville Delta, but might have missed something if it was short lived as I just checked every half hour. Even then I didn't stay out too long due to the -54F temp with a nice breeze." Jim is also who we have to

thank for the Colville River Delta ice thickness measurements seen on the graphic below.

We recruited river and cooperative weather observers Mark and Lori Richards, after Lori posted a number of river and weather observations from her location to our Facebook page. On May 1st, 2011, Lori posted the

Posted on March 8th: NWS staff and river observers collect ice thickness data around the 1st day of each month during the winter. For early March, many rivers and lakes continue to have near or below normal ice thickness despite the unusually cold temperatures this winter. A deep and insulating blanket of snow on the ice in many locations has prevented significant ice growth. A complete summary of ice thickness data for March and archived data can be found here:
http://aprfc.arh.noaa.gov/php/icedb/ak_it_color.php

following:

"*This time of year, I too appreciate your updates as I live on a remote river in NE Interior AK. We had a good flow of water come down on top of the river ice (Kandik River) yesterday and it's flowing on top and on the sides of the river ice today. Hopefully this will start the ice rotting out as it is still fairly solid. Creeks are starting to gush too now with 50+ temps.*"

This information is valuable to us at the River Forecast Center during breakup, particularly from remote areas of the state where we otherwise have little or no information concerning current river conditions.

This spring, we will again look to our NWS Facebook page as another source of information to go to for river and ice conditions provided by our "fans" across this vast state.

Find us on Facebook!
http://www.facebook.com/US.NationalWeatherService.Alaska.gov

Posted by Jim Helmericks on March 13th: "View of the Aurora with Venus and Jupiter low in the sky at just above Colville Village weather shelter, just before midnight ADT."

The Nenana Ice Classic - Gambling With A Changing Climate?

by Ed Plumb, NWS Fairbanks

In 1917 Alaska Railroad engineers pooled $800 in bets to guess when the Tanana River ice at the small town of Nenana would break up in the spring. These pioneers of the Nenana Ice Classic had no idea that this gambling game would become a longstanding annual tradition paying off over $11 million during the past 94 years. Not only is the Nenana Ice Classic the most popular lottery in Alaska, it has also resulted in the longest continuous historical record of spring breakup occurrence in the state.

Breakup - the often-violent disentegration of river ice, determined at Nenana by the movement of a wooden tripod set up on the ice - is a complex and dynamic process that is challenging to predict. Understanding the science of hydrology, river ice dynamics, statistics, and long-term climatic trends may improve the odds of winning the Nenana Ice Classic, but there is still a huge element of chance involved (or else the same person would be winning the lottery every year).

A number of variables contribute to the timing and severity of breakup on the Tanana River. The major factors include springtime temperatures, ice thickness, water equivalent of the basin snowpack, and, to a lesser degree, cloud cover and resulting solar insolation, depth of snow on the ice surface, dark-colored debris (silt or dirt) on the ice surface, water temperature, and locally thickened ice from freeze-up ice jams, etc. In the end though, pinpointing the exact hour and minute when the ice will shift at Nenana is still a game of chance, no matter how much science is used to make a guess.

Cont'd on Page 4

Despite the unusually cold temperatures across Alaska this winter, there was enough snow cover on rivers and lakes to provide sufficient insulation to inhibit significant ice growth. March ice measurements collected by the NWS and NWS river observers indicate that ice thickness is variable across the state with locations mainly between 75 and 125 percent of normal. Most sites in the Tanana River basin reported below normal ice thickness and were generally less than 90 percent of normal. The mid-March ice thickness of 38 inches, measured by the Nenana Ice Classic officials, is three inches below the average of 41 inches typically observed in mid-March. Weekly ice thickness measurements during the latter part of the winter on the Tanana River at Nenana began in 1989.

The analysis of the March snowpack by the NRCS indicates that the snowpack in the Tanana River basin is near to slightly above normal. This is in sharp contrast to western and southern Alaska, where many locations are reporting 150 to more than 200 percent of their normal snow-water equivalent. The amount of water held in storage in the snowpack can be a significant contributor to the timing of breakup. If the current snowpack in the Tanana River basin is subjected to a rapid warming pattern, a significant snowmelt runoff peak may initiate an accelerated and dynamic breakup with an increased risk for breakup-related flooding. On the other hand, normal temperatures in April and early May will result in a slow release of water into the river system as temperatures climb above freezing during day and fall back below freezing overnight. In this case, other variables - such as ice thickness - may have a stronger influence over the timing of breakup.

The preliminary outlook from the NWS Climate Prediction Center (CPC) for April suggests an increased chance of below-normal temperatures for Alaska. This scenario could result in a later than normal breakup for interior Alaska rivers. Dynamic breakups with a high potential of ice jam flooding typically require cooler than average temperatures for most of April followed by an abrupt transition to warm summer-like temperatures in the 60s and 70s in late April or early May.

In conclusion, there are many variables with varying weights that control when the Tanana River ice at Nenana will breakup in the spring. The CPC outlook for a cool April suggests a later than normal breakup, but a sharp spike in the temperature for several days could trigger an earlier breakup. In addition, perhaps thinner than normal ice this spring may counteract the effects of cooler temperatures forecast for April. However, in the end, the most important factor determining the timing and severity of breakup remains the weather during April and May.

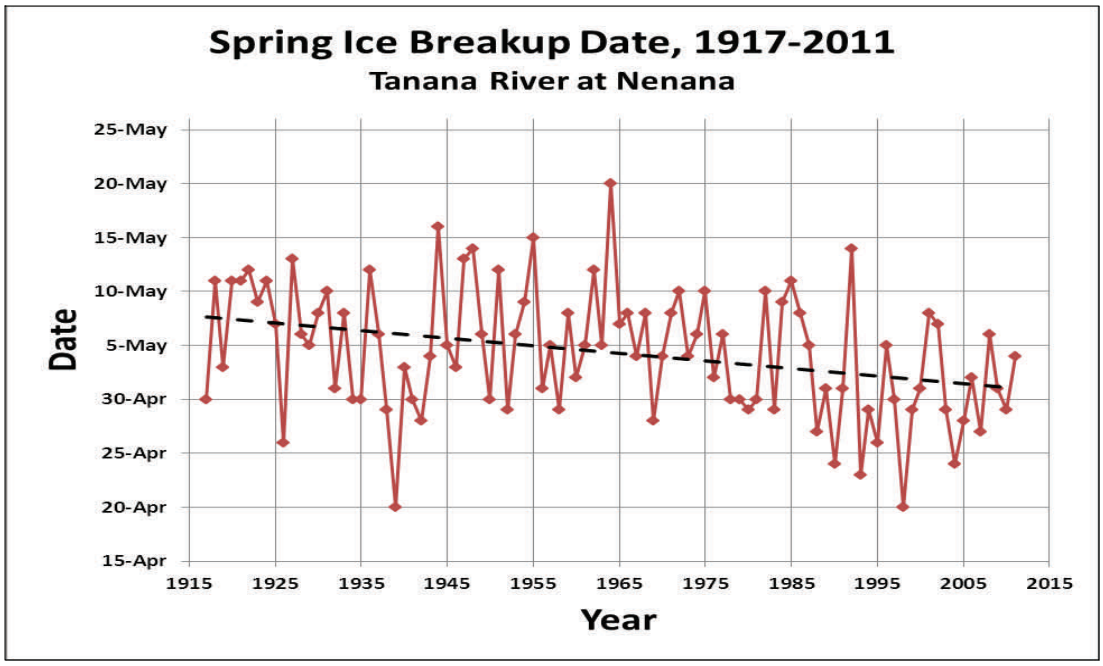


Figure 1. *Timing of spring ice breakup date on the Tanana River at Nenana between 1917-2011. The overall trend of the data as indicated by the least squares regression fit (dashed black line) is toward earlier breakups in the spring. For the period of record, breakup date has shifted by roughly a week, from May 8th to May 1st. Breakup has occurred after May 10th only twice since 1965. (data courtesy of Nenana Ice Classic)*

January 2012 - A Record or Near Record Cold Month for Much of Alaska
by Corey Bogel and Richard Thoman, NWS Fairbanks

All of northern Alaska was under the influence of a very cold air mass for nearly the entire month of January. The greatest departure from normal occurred across the western Interior, where the sky was more persistently clear, allowing strong inversions to form and keeping temperatures very low for a prolonged period of time. Many communities along the West Coast and across the western Interior had the coldest, or one of the top few coldest, months on record. The duration of the cold weather was more notable than the absolute minimums, as relatively few daily record low temperatures were set at locations with more than 50 years of weather observations.

At Bettles, this past January was their coldest on record. The average temperature of -35.6 degrees surpassed the old average record of -34.0 degrees set in January 1971. The low temperature for the month was 61 below on the 31st. Three of the last 4 days of the month had a low temperature of 60 below, and all three were new daily temperature records. These were the first 60 below temperatures recorded at Bettles since February 1999. Weather records at Bettles date back to 1951.

Nome also experienced its coldest January on record. The average temperature of -16.6 degrees easily exceeded the old record of -15.2 degrees that occurred in 1989. For comparison, the normal temperature for Nome during January is 5.2 degrees above zero. The lowest temperature observed during January was 40 below on the 5th. This was the first 40 below reading at Nome since 1999. Temperature records at Nome date back to 1907.

January 2012 goes down as Galena's coldest on record. The average temperature of -32.6 degrees surpassed the average -31.4 degrees recorded in 1971. The lowest temperature observed this past January was 65 below on the 29th. Not only was this a daily record low, but it was the third lowest temperature ever recorded at Galena. The all-time low was 70 below back in January 1989. There were also four consecutive days with a low temperature of 60 below or colder on the 28th through the 31st of the month. This was only outdone once, in 1989, when there were six consecutive 60 below days recorded. Weather observations at Galena date back to 1942.

At McGrath, the average temperature of -28.5 degrees is the coldest month of record. The previous record was -27.5 degrees in January 1989. The lowest temperature this past January was 55 below, recorded on the 4th. Weather observations have been taken at McGrath since 1939.

Bethel also set a new January average temperature of -17.2, easily breaking the previous record of -12.9 set in January 1989. The coldest temperature recorded in January 2012 was 34 below on the 27th. Not only did this set a new standard for January, it was the coldest of any month on record since 1945.

See table below for additional January 2012 average and low temperatures recorded at airports and cooperative stations around the Interior.

January 2012		
Location	**Average Temperature**	**Low Temperature**
Chicken	**-30.9 degrees**	**-59 on 29th**
Circle Hot Springs	**-27.9 degrees**	**-58 on 29th**
Eagle	**-24.2 degrees**	**-58 on 30th**
Fort Greely	**-21.2 degrees**	**-50 on 29th**
Fort Yukon	**-31.5 degrees**	**-66 on 31st**
Northway	**-24.3 degrees**	**-51 on 21st**
Tok	**-25.2 degrees**	**-50 on 29th**

What is LiDAR?
by Celine Van Breukelen

This February, I attended the 46th Annual Alaska Surveying and Mapping Conference held in Anchorage. I took a day-long seminar on LiDAR, given by Dr. Keith Cunningham, a UAF professor and a member of SNAP, The Scenarios Network for Alaska and Arctic Planning, research group. The seminar focused on methodology and applications of LiDAR data. The bottom line from the seminar is that LiDAR has (and is) drastically changing the geomatics field.

What is LiDAR? LiDAR stands for "Light Detection and Ranging" and it is a remote sensing technology which senses distance. It provides extremely accurate survey measurements, both in applications which are historically surveyed (architecture, engineering and construction) and ones which are emerging (archeology, natural resource management). Depending on the application, LiDAR can be space-based, airborne, ground-based or atmospheric.

LiDAR works on the same principles as RADAR (Radio Detection and Ranging). The sensor sends a signal, which bounces off an object, and a portion of the signal is reflected back to the sensor. Based on the time of travel and the angle of return of the signal, the sensor can determine the distance and position of the object. The difference between RADAR and LiDAR is the frequency of the transmission waves. RADAR uses lower energy radio waves, with frequencies of ~10^9 nm and LiDAR uses higher energy visible, ultraviolet or near infrared waves, with frequencies of ~500-1000 nm. The higher energy of LiDAR can sense smaller objects and provide a higher level of detail than was historically available from RADAR.

LiDAR can be used in several different platforms. The platform that is most beneficial to the River Forecast Center (RFC) is LiDAR flown from aircraft, usually on a borough-wide scale. As the airplane flies, the laser sweeps the ground perpendicular to the flight line, creating a swath of data (Figure 1).

During analysis, the swaths are quilted together to create one seamless image (Figure 2.)

The sensor records the first return beam which it receives, whether it is a building, road, tree, swimming pool or bare earth. This sort of return is called a digital surface model (DSM). If all of the structures are taken out of the image during processing, the product becomes a digital elevation model (DEM) or bare-earth model (Figure 3, following page). These DEMs and DSMs are incredibly useful to the RFC in mapping watersheds. Dr. Cunningham is researching ways to use DSM's to estimate biomass stored in trees. LiDAR presents a way to do very precise, large scale survey measurements at relatively low cost.

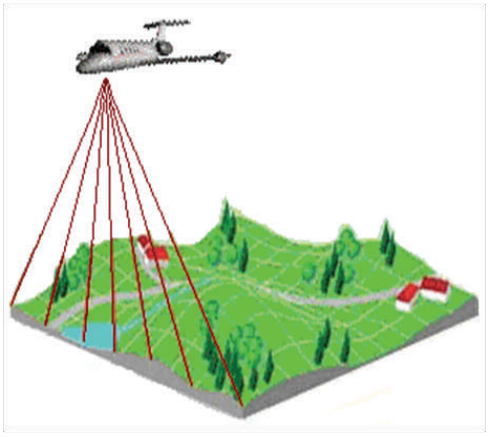


Figure 1: Creating a swath of data from a sensor mounted on an airplane. Credit: K. Cunningham.

LiDAR can also be mounted to a tripod on the ground to do a static terrestrial model. This is generally used to survey a small area, such as a railroad intersection, bridge, or ship. In these cases, LiDAR is taken from a variety of angles and then stitched together during processing. This creates a 3D model with accuracies in the range of millimeters. Interesting applications of static terrestrial modeling include observing the change in deflection of beams in cathedrals, accident reconstruction, or measuring earthquake damage to a road.

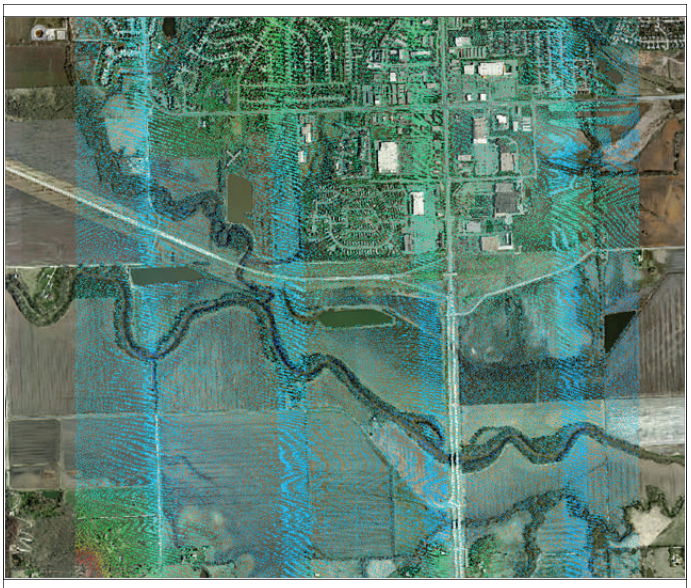


Figure 2: Swaths of airborne LiDAR imagery quilted together. Credit: K. Cunningham.

What does this mean to the RFC? LiDAR technology is quickly becoming more powerful and affordable. In 1998 a 15 kHz sensor cost $1,000,000. Today, a 450 kHz sensor costs $500,000. No, the RFC is not going to be buying a sensor anytime soon. However, the increased availability of the hardware has resulted in detailed terrestrial mapping of parts of Alaska. Currently,

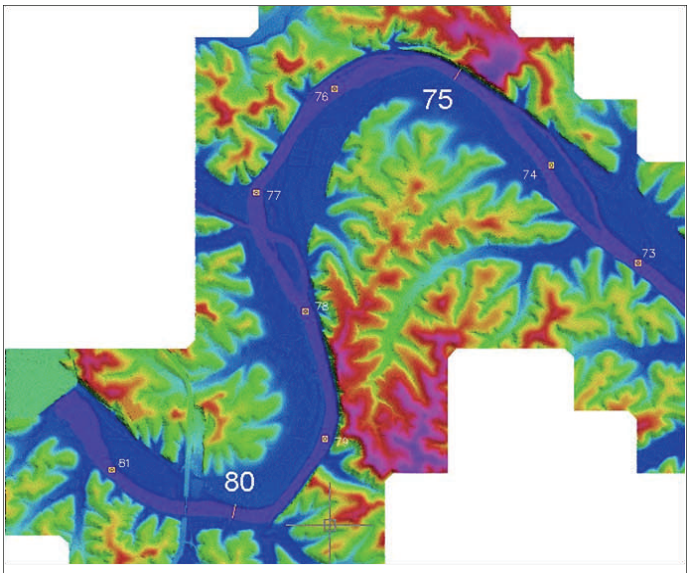


Figure 3: Infrared LiDAR of a river and surrounding area. Credit: K. Cunningham.

digital elevation models with a pixel size of 30 meters by 30 meters are common over the state. The recently released LiDAR mapping of the Kenai Peninsula has a pixel size of 1.2 meters by 1.2 meters and a vertical accuracy of ~6 inches. This new data can be used to help the RFC in many ways, particularly in modeling hydraulics and flood inundation. HEC-RAS is a hydraulics model which can be used in our flood prediction software, Community Hydrologic Prediction System (CHPS). Detailed cross sections of major rivers can be extracted from the LiDAR data and used as inputs to HEC-RAS. HEC-RAS can model dynamic flows, such as tides, storm surges, and dam breaks, which could then be put into CHPS. This new information could allow the RFC to not only publish river stage and discharge information, but also basic flood inundation mapping – helping users see what the forecast means for their home or business. The accessibility of LiDAR will have an enormous impact all over the state in research, engineering, hydrology, natural resource management and geography.

The closing note of the seminar was that the LiDAR hardware is 10 years ahead of its software equivalent. It will be interesting to see what discoveries will be made in the next 10 years!

Additional Breakup links:
View the Spring Breakup Outlook,
Spring Flood Potential Map for Alaska,
and more:
http://aprfc.arh.noaa.gov/products/productmenu.php

Search our River Notes database for
breakup information on rivers and lakes:
http://aprfc.arh.noaa.gov/php/rivnotes/searchnotes.php

Cont'd from Page 1

flooding if subjected to a rapid warming pattern.

Weather - The most important factor determining the severity of breakup remains the weather during April and May. The outlook for April suggests in increased chance of below normal temperatures for the month for southern Alaska. The 90-day outlook for the months of April, May, and June indicates a slight chance of below normal temperatures continuing over the southern half of Alaska. Dynamic breakup with a high potential of ice jam flooding typically requires cooler than average temperatures for most of April, followed by an abrupt transition to warm, summer-like temperatures in the 60's and 70's in late April or early May. If a significant snow cover is retained through April, then an abrupt warm up could send a surge of snowmelt runoff into rivers that still have intact and relatively strong ice.

With the current snow and ice conditions in Alaska, and even with the projected mild first half of April, if a marked warm up occurs in late April or early May, then there would be a high likelihood of ice jam flooding.

For more details on the snowpack, please refer to the various snow graph options on the APRFC website at: http://aprfc.arh.noaa.gov or on the NRCS website at: http://www.ak.nrcs.usda.gov/snow/data/current.html

For more information on the outlooks for this spring, please refer to the Climate Prediction Center website at: http://www.cpc.ncep.noaa.gov/index.php

See Breakup Outlook Table on the next page.

A Note About Breakup Information:

We request your assistance in obtaining information on breakup on rivers and lakes in your area for the 2012 season. We would appreciate it if you would complete the River and Lake Breakup Information Form to the best of your knowledge and return the form to us. If you have any comments, please include them in the remarks area. The information we receive from you helps contribute to a more complete record of breakup data for Alaska and is greatly appreciated.

Use the link below to view the progress of breakup on rivers across Alaska. The breakup map will be updated as information becomes available.

http://aprfc.arh.noaa.gov/data/maps/brkup_map.html

Spring Breakup Outlook Table

The following table gives an estimate of flood potential and basin runoff volumes for various locations around the state. The table was created from our Spring Breakup Outlook dated April 10. Check our web site for the most current product. The potential for minor flooding is not reflected in the table.

Snowmelt Runoff Volume...expected water volume from snowmelt during the melt season.

Flood Potential...the likelihood of flooding from snowmelt and/or ice jams.

Average Breakup Dates are for 1970 through 2011, and are calculated for locations with at least five years of data.

RIVER - REACH	SNOWMELT RUNOFF VOLUME	FLOOD POTENTIAL	AVERAGE BREAKUP DATE	NO. OF YEARS RECORD	FORECAST BREAKUP DATE
Southeast Panhandle	Above				
Kenai River	Average				
Anchor River	Above		04/13	10	
Matanuska River	Above		04/30	7	
Susitna River	Above				
Gold Creek		Low-Mod	05/02	6	
Sunshine		Low	05/03	21	04/28-05/05
Yentna River	Above				
Lake Creek		Low-Mod	05/01	21	04/27-05/03
Skwentna River	Above				
Skwentna		Low-Mod	04/30	17	04/27-05/03
Copper River Basin	Above	Low-Mod	04/30	25	04/25-05/05
Gakona River		Low	04/30	24	04/25-05/03
Gulkana River					
Chena River	Average				
Chena Lakes		Low			
Project		Low	04/26	25	04/23-04/30
Fairbanks					
Tanana River	Average				
Northway		Low	04/23	26	04/18-04/25
Salcha		Mod			
Fairbanks		Low	04/29	13	04/26-05/01
Nenana		Low	05/02	38	04/29-05/03
Manley		Low	05/03	20	04/27-05/08
Kuskokwim R	Average				
Nikolai		Low	04/23	23	04/20-04/26
McGrath		Low-Mod	05/07	34	05/04-05/11
Stony River		Low	05/06	20	05/02-05/10
Sleetmute		Low-Mod	05/05	19	05/01-05/08
Red Devil		Low-Mod	05/06	22	05/02-05/09
Crooked Creek		Low-Mod	05/07	22	05/03-05/10
Aniak		Low-Mod	05/07	25	05/03-05/10
Kalskag		Low	05/07	19	05/03-05/11
Tuluksak		Low	05/09	16	05/05-05/13
Akiak		Low	05/10	22	05/06-05/14
Kwethluk		Low-Mod			
Bethel		Low	05/12	37	05/09-05/16

Table continues on next page.

RIVER - REACH	SNOWMELT RUNOFF VOLUME	FLOOD POTENTIAL	AVERAGE BREAKUP DATE	NO. OF YEARS RECORD	FORECAST BREAKUP DATE
Yukon River (Upr)	Below				
Eagle		Low	05/08	31	05/02-05/08
Circle		Low-Mod	05/12	29	05/06-05/12
Fort Yukon		Low	05/13	28	05/07-05/13
Beaver		Low	05/13	16	05/08-05/14
Stevens Village		Low	05/13	15	05/09-05/15
Rampart		Low	05/13	14	05/10-05/16
Yukon R (Mid)	Above				
Tanana		Low-Mod	05/10	27	05/07-05/13
Ruby		Low	05/12	28	05/09-05/15
Galena		Low-Mod	05/12	29	05/09-05/15
Koyukuk		Mod			
Nulato		Mod	05/12	16	05/09-05/15
Kaltag		Low	05/14	36	05/11-05/17
Anvik		Low	05/16	25	05/13-05/19
Yukon R (Lwr)	Above				
Holy Cross		Low	05/16	25	05/12-05/18
Russian Mission		Low-Mod	05/15	27	05/12-05/18
Marshall		Mod	05/15	21	05/12-05/18
Pilot Station		Low-Mod	05/17	15	05/14-05/21
Mountain Village		Low	05/18	24	05/15-05/22
Alakanuk/Emmonak		Mod	05/23	27	05/19-05/26
Koyukuk River	Above				
Bettles		Low	05/10	30	05/07-05/14
Allakaket		Low	05/10	25	05/08-05/14
Hughes		Low-Mod	05/11	24	05/08-05/14
Buckland River	Above	Mod	05/18	21	05/14-05/22
Kobuk River	Above				
Kobuk		Mod	05/16	32	05/13-05/19
Shungnak		Low	05/18	22	05/15-05/21
Ambler		Low	05/18	29	05/15-05/21
Noatak River	Above	Low	05/20	17	05/17-05/23
N Brooks Range	Average				
Colville River					
at Umiat		Low	05/24	12	05/21-05/28
at Colville		Low	06/01	15	05/28-06/04

Breakup Forecast Roundtable Held in Anchorage

Because of the record snowfall in Anchorage, and the visibility of near-record snowpacks in most of Southcentral Alaska, concern about spring breakup flooding has been very high. In response to that concern, Senator Lisa Murkowski held a Breakup Forecast Roundtable on April 5, 2012 on the University of Alaska Anchorage campus. Invited speakers were Scott Lindsey, Service Coordination Hydrologist from the Alaska Pacific River Forecast Center of the National Weather Service in Anchorage, Michael O'Hare, Deputy Director of the Division of Homeland Security and Emergency Management (DHS&EM) for the State of Alaska, and Robert Forgit, Alaska Area Office Manager, Region 10 Federal Emergency Management Agency (FEMA). The entire presentation can be found at:

http://www.murkowski.senate.gov/public/index.cfm?p=break-up-roundtable-discussion

The initial portion of the discussion dealt with Dr. Lindsey presenting information about breakup flooding and the current risks.

In Southcentral, and especially in the Anchorage area, record snowfall has many citizens concerned about flooding. For the urban areas, there will be drainage issues, but a number of factors will mitigate the risk of stream flooding. Breakup has begun in Southcentral in a very orderly fashion with several weeks of high temperatures in the upper 30s and 40s and freezing temperatures at night. This freeze-thaw cycle is ideal for prolonging the melt period and

reducing the flood risk. Also, the heavy snow insulated the soil, thus frost depth in Anchorage is significantly less than normal. One frost depth gage in East Anchorage was only 12.5 inches on March 20th, when normal values are 55 inches or greater. This will allow much of the snowmelt to infiltrate into the groundwater aquifers with a much slower response in the local streams.

Temperatures in Southcentral are also moderated by the ocean and very warm temperatures in April and early May are rare. The amount of snow cover will also moderate the temperatures as the albedo of the snow causes some of the sun's radiation to be reflected back into the atmosphere. Areas where drainage is problematic and residents who normally have water in their crawl spaces will likely have water issues this spring. Also, a sudden warm-up in temperatures or a significant warm wet weather system could result in a far greater risk of flooding. Still, flood risk in Southcentral is currently considered to be low in the urban areas, although larger rivers such as the Yentna and Skwentna in the western Susitna drainage and other parts of the Susitna system have a much different risk as ice jam and snowmelt flooding are much more likely on the larger rivers. Flood risk from breakup ice jams over the interior of the state is above normal because of the factors listed previously and if the snowpack persists without significant change through the end of April, the risk for moderate to major flooding will increase. Of special concern at this time is the Kuskokwim River, because of the large snowpack and indications that April will be cooler than normal. For more information see the Spring Flood Potential map at: http://aprfc.arh.noaa.gov/data/maps/flood_pot.php

Mr. O'Hare gave a presentation on the services that DHS&EM provides to help communities prepare for all types of disasters, aid in recovery when disaster strikes, and mitigate future issues. He also talked about the Riverwatch program, which is a joint venture between the state of Alaska and the APRFC. Hydrologists from the River Forecast Center accompany emergency response specialists from DHS&EM and fly on the Yukon and Kuskokwim rivers monitoring the breakup and communicating flood risks to affected communities when ice jams occur. This partnership has been in place for over 30 years and has been extremely effective. Riverwatch teams make reports on community radio stations and also give reports directly from the planes as they fly over communities where many households have VHF radios in their home (primarily on the Kuskokwim River). The state has invited emergency response personnel from the communities to fly in the planes as well, and these folks have had the ability to give those reports and observations from the aircraft in Yupik, which is the primary language on the lower Kuskokwim River.

As the FEMA representative, Mr. Forgit talked about the partnership between the state and FEMA when disaster strikes. He discussed the need for individuals to be prepared to take care of themselves. When individuals are unable to do that, they turn to their communities. When the communities are overwhelmed, they turn to the State, which then goes to FEMA when a disaster is widespread or extreme. In both 2009 on the Yukon River and May of 2011 when Crooked Creek on the Kuskokwim River was devastated by an ice jam flood, the state DHS&EM has worked in conjunction with FEMA to get folks back on their feet in the short time frame before winter hits.

At the end of the presentations, Senator Murkowski asked several questions and then offered some time for questions from the audience. Overall, it was an excellent opportunity to disseminate information about what the NWS in Alaska does, communicate the threat of spring breakup flooding, and to publicize the excellent partnerships that involve the state DHS&EM and FEMA.

Scott Lindsey, APRFC Service Coordination Hydrologist

Left to right, Scott Lindsey (NWS),
Senator Lisa Murkowski, Michael O'Hare (DHS&EM),
and Robert Forgit (FEMA)