Kuigmek
One who watches river
May 2015
A newsletter for Alaska river and ice observers

Please Note. . . .

APRFC now staffed on weekends

Please Visit Us And See The Remodeled Forecast Offices!

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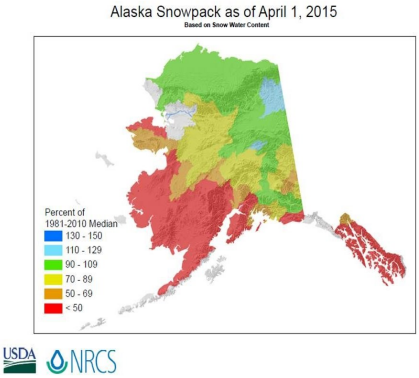
New Staff at the APRFC

We have some new faces at the Alaska Pacific River Forecast Center for those of you who haven't talked to us on the phone lately. Last winter we hired 2 new Senior Hydrologists, Crane Johnson from the US Army Corps of Engineers and Ted Moran from the US Geological Survey. Both were here in Anchorage already and familiar with various aspects of Alaska. Some more details are as follows:

Crane Johnson worked as a Hydraulic Engineer for the past eight years with the US Army Corps of Engineers Alaska District. His focus at the Corps was on flood forecasting, dam safety, open water hydraulics and flood inundation projects throughout the State of Alaska. His background includes a B.S. in Civil Engineering from the University of Alaska Fairbanks (1998) and an M.S. in Civil Engineering from the University of Calgary specializing in Avalanche Mechanics (2001). He began his professional career as a Hydrologist working for the Water and Environmental Research Center at UAF from 1997-2002 chasing hydrologic research projects across the North Slope and Seward Peninsula of Alaska. Crane is active in the Alaska water community and was Chair of the Interagency Hydrology Committee for Alaska from 2010-2012. He is a registered engineer in the State of Alaska and has worked on water resource projects throughout the state from the Northwest Arctic to Southeast Alaska. Outside of work Crane is an avid skier both in town and in the mountains around town. He is involved with the 'Friends Group' of the local avalanche forecast center and has developed and managed a network of remote

Spring Breakup Outlook for Alaska

The Spring Breakup flood potential throughout Alaska is currently rated as low to low-moderate statewide. This forecast is based on observed snowpack and ice thickness reports and medium to long range temperature and precipitation forecasts. Currently breakup at most locations is expected to be a few days earlier than normal. Although flood potential is rated as low, flooding can still occur if ice jams form downstream of a village.



Temperatures - temperatures across the state over the past few days were above normal. A warming trend is expected to occur over the week which will result in above normal temperatures across interior Alaska. These temperatures are forecast to remain above normal through the last week of April. The longer range temperature outlook for May is for above normal temperatures statewide.

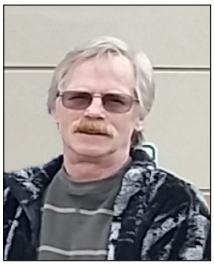
Precipitation - precipitation is not expected to be a significant factor in this year's breakup process.

Ice **-** April ice thickness data are available for a limited number of observing sites in Alaska. April 1st measurements indicate that ice is variable across the state, with locations generally between 60 and 133 percent of normal. Many locations

New Staff at APRFC cont'd

mountain top weather stations for the past 11 years. In addition, while with the Corps, Crane designed an inexpensive, compact, Iridium-based, bridge-mounted, automated river gage to help expand the observation network across the state. The NWS Alaska Region will be installing ten of these gages this year.

Ted Moran comes to the Alaska-Pacific River Forecast Center after serving nearly thirteen years with the U.S. Geological Survey's Alaska Science Center in Anchorage, Alaska, and the Columbia Environmental Research Center (CERC) in Columbia, Missouri. He graduated with his Master's degrees in Environmental Science from Alaska Pacific University, Anchorage, Alaska. His career reflects expertise in large and small scale Ground and Surface Water Interaction modeling, Geospatial Analysis including imagery and satellite data, Water Quantity and Quality data collection and analysis, GPS and Conventional Land and Bathymetric Surveying throughout Alaska and western US, and implementation and development of related Software and Computer Programs. He served as lead hydrologist developing a Precipitation-Runoff and Water-Temperature model for a Regional Climate Analysis of the Missouri River Basin from its headwaters to its confluence with the Mississippi River. He led projects that included ground and surface interaction modeling for Alaska's Saint Paul Island, Pribilof Islands, John River Basin near Anaktuvuk Pass, and the Matanuska–Susitna Valley, and worked on water quality studies of the Yukon River.



Rob Oslund was hired as the Information Technology Officer and joined the RFC in December of 2014. He has been working for/with the federal government for over 30 years. After serving in the US Air Force for 21 years, Rob continued working for USAF as a contractor and then a government civilian. He lived in Germany for 10 years before joining the NWS in 2013 as an ITO at WFO Glasgow, MT.

In October of 2014, Robin Radlein retired as the Regional Hydrologist for the Alaska Region and Hydrologist-in-Charge of the Alaska Pacific River Forecast Center after 38 years of service in the federal government. **Scott Lindsey** was promoted to that position in January of 2015 after having worked in various capacities at the RFC over the past 21 years. Scott originally came to Alaska from National Weather Service headquarters in Silver Spring, Maryland.

Spring Breakup Outlook cont'd

In the Tanana Basin reported below normal thickness. Ice thickness in southwestern, southcentral, western, and interior Alaska are below normal. Ice thickness likely is below normal in the lower Yukon, normal in the middle Yukon, and normal to above normal in the upper Yukon Basin. Accumulated freezing degree days are well below normal over most of Alaska.

Snow - The April 1st snowpack analysis showed well below average conditions in the western and southcentral Alaska, with less than 50% of normal in the Kuskokwim Basin and the lower Yukon. The Fairbanks area up to the Brooks Range was near normal, while normal to above normal snowpack was observed in most of the Canadian Yukon. Warmer the normal April temperatures have caused the snowpack around to state to ripen and begin to and begin to melt.

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

Breakup - Normally spring breakup is dynamic and moves from the headwaters of a river downstream in a linear fashion. The combination of low snowfall in western Alaska, combined with the warm March and April temperatures, along with the forecast of above normal statewide temperatures over the next 4 to 6 weeks will likely result in a thermal breakup for rivers in southcentral and southwest Alaska. A thermal breakup occurs when there is not enough snowmelt to push ice downstream and temperatures generally warm up slowly. In a thermal breakup. Even though ice strength deteriorates significantly, breakup can occur later than normal. No coherent breakup front develops in this scenario, and multiple locations may begin to see ice movement simultaneously. Ice jam flooding from a thermal breakup is rarely serious, but still possible. Timing of breakup during a thermal breakup might range from several day earlier to several days later than normal and can be inconsistent up and down the river.

The outlook for significant precipitation is low and unlikely to influence breakup this year. Even with thin ice and low snowpack, a faster than expected rise in temperatures or a significant rain event could produce rapid melt and higher than expected flows, resulting in ice jams forming, and increased risk of flooding.

Breakup is expected to be thermal in southern, southwest, western, and interior areas of the state, with thermal to dynamic breakup northwestern areas, specifically in the upper Yukon area, and dynamic on the

North Slope. Flood potential from ice jams will be low for most of the state, with the upper Yukon being the primary area with a normal flood potential for the stretch from Eagle to Fort Yukon.

Areas of concern - Locations in the state that will be watched closely include the upper Yukon River from Eagle to Fort Yukon, Kobuk on the Kobuk River, Buckland on the Buckland River, Kalskag on the Kuskokwim River upstream of the jumbled ice from the fall breakup, and the Dalton Highway near Mile 400, where the Sagavanirktok River has been out of bank near Deadhorse. Breakup flooding is possible in other areas as well, but the combination of snowpack, ice thickness, and susceptibility cause these locations to be the most likely to see flooding this season.

The following table gives estimates for flood potential, basin runoff volumes, basin runoff volumes, average breakup dates (1980 - 2014) and an initial range for spring breakup estimates for various locations and basins throughout the state.

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 the period 1980 through 2014 and are calculated for locations with at least 5 years of data.**

A Note About Breakup Information:

We request your assistance in obtaining information on breakup on rivers and lakes in your area for the 2015 season. We would appreciate it if you would complete our 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

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

River - Reach	Snowmelt Runoff Volume	Flood Potential	* Average Breakup Date	No. of Years Record	Forecast Breakup Date
Southeast	Below				
Kenai River	Below				
Anchor River	Below		04/14	10	
Matanuska River	Below		04/30	7	04/18-04/24
Susitna River Gold Creek Sunshine	Below	 Low Low	 05/03 05/03	 6 21	 04/27-05/03 04/27-05/03
Yentna River Lake Creek	Below	 Low	 05/02	 21	 04/26-05/02
Skwentna River Skwentna	Below	 Low	 05/01	 17	 04/25-05/02
Copper River Basin Gakona River@Hwy Gulkana River @ Hwy	Average	 Low Low	 05/02 05/01	 25 24	
Chena River Chena Lakes Project Fairbanks	Average	 Low Low	 04/26	 25	 04/21-04/26
Tanana Northway Salcha Fairbanks	Average	 Low Low Low	 04/26 04/30	 26 13	 04/22** 04/24-04/30

River - Reach	Snowmelt Runoff Volume	Flood Potential	* Average Breakup Date	No. of Years Record	Forecast Breakup Date
Tanana (cont'd)					
Nenana		Low	05/01	38	04/25-04/29
Manley		Low	05/04	20	04/29-05/05
Kuskokwim River	Below				
Nikolai		Low	04/24	27	04/15**
McGrath		Low	05/07	38	04/26-05/03
Stony River		Low	05/06	24	04/28-05/04
Sleetmute		Low	05/06	23	04/28-05/05
Red Devil		Low	05/07	26	04/30-05/06
Crooked Creek		Low	05/07	26	04/30-05/06
Aniak		Low	05/08	29	04/30-05/06
Kalskag		Low	05/08	23	04/30-05/06
Tuluksak		Low	05/10	20	05/02-05/08
Akiak		Low	05/11	26	05/03-05/09
Kwethluk		Low			
Bethel		Low	05/12	18	05/03-05/09
Napakiak		Low	05/12	41	05/05-05/11
Yukon River (Upper)	Average				
Dawson, YT		Low	05/05	41	04/30-05/06
Eagle		Low	05/05	32	04/30-05/06
Circle		Low-Mod	0510	30	05/03-05/09
Fort Yukon		Low	05/11	29	05/04-05/10
Beaver		Low	05/11	17	05/04-05/10
Stevens Village		Low	05/12	17	05/05/05/11
Rampart		Low	05/12	17	05/05-05/11
Yukon River (Middle)	Below				
Tanana		Low	05/10	25	05/01-05/07
Ruby		Low	05/12	27	05/03-05/09
Galena		Low	05/13	21	05/04-0510
Nulato		Low	05/13	15	05/05-0511
Kaltag		Low	05/14	25	05/06-05/12
Anvik		Low	05/17	27	05/07-05/13
Yukon River (Lower)	Below				
Holy Cross		Low	05/16	25	05/05-05/11
Russian Mission		Low	05/16	27	05/05-05/11
Marshall		Low	05/16	21	05/05-05/11
Pilot Station		Low	05/17	15	05/06-05/12
Mountain Village		Low	05/19	25	05/08-05/14
Alaknuk/Emmonak		Low	05/23	27	05/12-05/18
Koyukuk River	Average				
Bettles		Low	05/10	30	05/01-05/07
Allakaket		Low	05/11	25	05/02-05/08
Hughes		Low	05/11	24	05/03-05/09
Seward Peninsula	Below				
Buckland River	Below				
Buckland		Low-Mod	05/18	17	05/13-05/19
Kobuk River	Below				
Kobuk		Low-Mod	05/17	32	05/05-05/11
Shungnak		Low	05/18	22	05/06-05/12
Ambler		Low	05/19	29	05/07-05/13

River - Reach	Snowmelt Runoff Volume	Flood Potential	* Average Breakup Date	No. of Years Record	Forecast Breakup Date
Noatak River Noatak	Average	Low	05/20	17	05/17-05/23
Brooks Range - North Colville at Umiat Colville at Colville Sagavanirktok near Prudhoe	Average	Low Low High^	05/24 06/02 05/25	12 15 19	05/21-05/27 05/30-06/05 05/21-05/29

^ NWS has no record of ice jam related floods for the Sagavanirktok River, considering current flooding conditions caused by aufeis, a high flood potential exists for more flooding during the snowmelt and river ice breakup process.

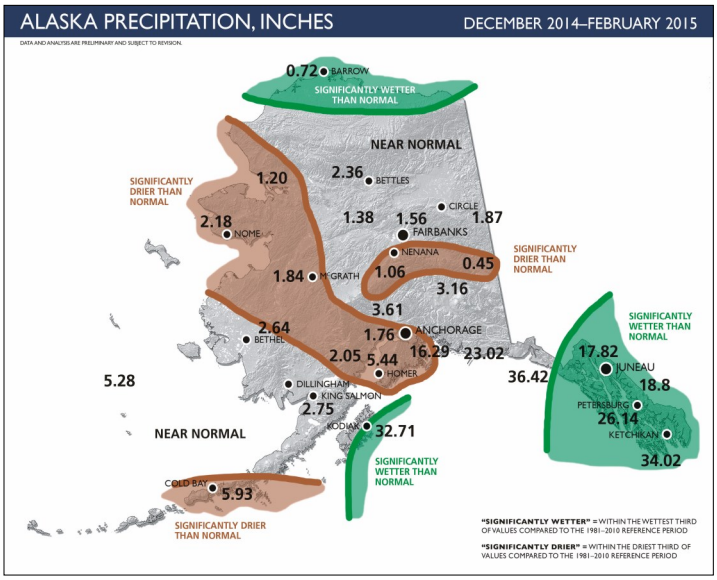
** Actual breakup date.

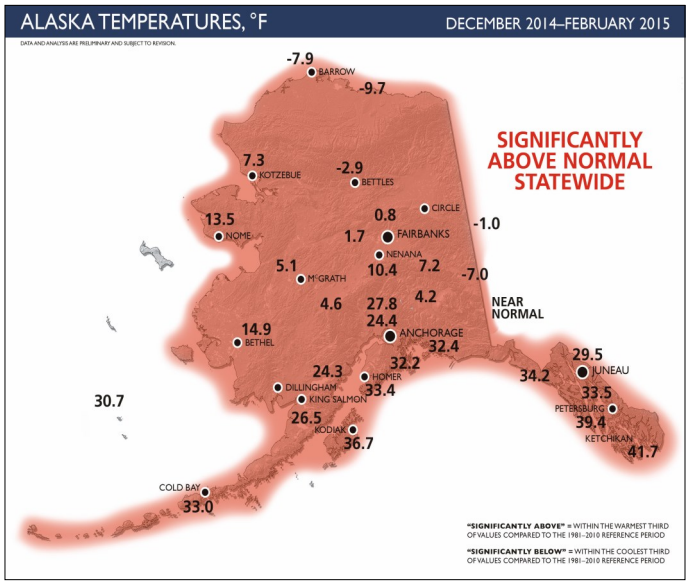
Climate Summary Winter 2014-15:
The Little Winter That Couldn't

Rick Thoman
Climate Science and Services Manager
NWS Alaska Region

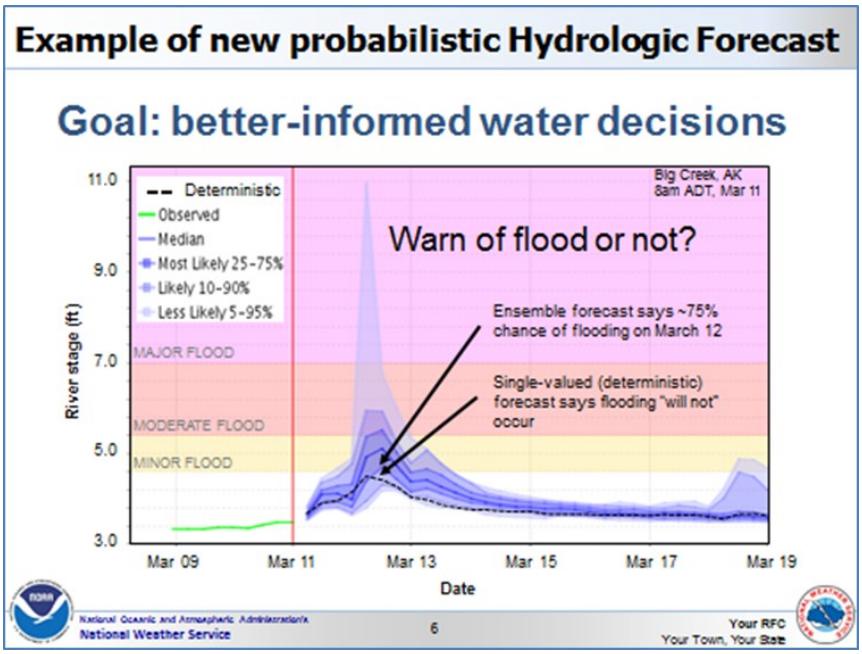
The winter of 2014-15 was unusually mild across all of Alaska. It was especially so along the Gulf Coast and in northwest Alaska. Kodiak recorded the warmest mid-winter (December through February) of record and Yakutat and Homer the second warmest. In northwest Alaska, both Kotzebue and Barrow both recorded the third warmest mid-winter of record. For the full cold season (October through March), for the state as a whole, based on the National Centers for Environmental Information new Alaska climate divisions data, this was the third warmest of record, behind only the 2000-01 and 2002-03 seasons.

Parts of southern Alaska experienced one of lowest snowfall winters of record. In the Anchorage area, only 20.7" of snow fell at the Airport from October through March, the lowest six month total in the modern era. Snowfall was not much better at higher elevations around Anchorage. The Glen Alps cooperative station at 2200' MSL , with only about 60 inches for the six months, which is less than half of normal. Snowfall also extremely low on the western Kenai Peninsula and lower Mat-Su valleys and over much of Southwest. In Southeast Alaska precipitation was near to above normal but snow levels were generally much higher than average. Overwinter precipitations was generally near normal to slightly above normal over the North Slope and central and northeast Interior, while below normal over most of western Interior .





Hydrologic Forecast Uncertainty Products to be produced for Alaska



The APRFC is introducing a new short term forecast product that provides a measure of uncertainty in our water level forecasts. Our effort is part of a national project by the NWS to provide better information about a range of possible forecast outcomes and their probabilities. Feedback from hydrologic forecast users indicate this is needed for decision makers to better understand the forecast uncertainty inherent in hydrologic forecasts and to reduce the subjective interpretation of skill and accuracy that stakeholders are forced to make. The system the APRFC is implementing generates hydrologic forecast uncertainty by incorporating many plausible precipitation and temperature forecasts and past hydrologic model performance to generate an ensemble of forecasts that represent the hydrologic forecast uncertainty in the future. An example of the new APRFC product can be seen here. In the example, the dashed line shows our deterministic single value forecast every 6 hours going into the future. The blue shading shows the ensemble forecast and the associated probability of a particular water level occurring. The APRFC implementation of this product is in the early phases. Over the next couple of years most forecast points will have some product similar to this to help users better understand hydrologic forecast uncertainty and help quantify risk of flooding.

Please Visit Us And See The Remodeled Forecast Offices!

There have been some big changes at the forecast building this winter. A restructuring of the Anchorage Forecast Building is underway; the Regional Operations Center (ROC) and the Arctic Testbed will be joining the River Forecast Center (RFC), Anchorage Weather Forecast Office (WFO), Anchorage Aviation Weather Unit (AAWU), Sea Ice Desk, TV Desk, and the Electrical Maintenance Unit (EMU) already housed in the building. The addition of these new groups required a major modification to the interior layout of our building. Last December we packed up our cubicles and forecast area, and moved to temporary work locations. Some of our staff relocated to Regional Headquarters in downtown Anchorage, while other staff moved into the conference room and Robin's office, and even occasionally teleworked. The WFO, AAWU, Ice desk, TV desk staff also packed up and moved to temporary locations in the EMU side of the building (after the EMU group had packed up and temporarily moved out of that space). During January and February contractors took down all of the old cubicles and forecast areas in the east end of the building, then built new cubicles and workspaces. During the last week in February all of the forecast offices and RFC staff moved from their temporary locations into the new cubicles and forecast areas. With that move completed, the contractors proceeded to tear down the old EMU cubicles and built new cubicles for the EMU, the computer support personnel, and for the new Arctic Testbed during March. The entrance foyer wasn't spared during this remodel; in late March and early April the Administrative Assistant areas were also broken down and rebuilt, and two additional offices were added.

Now that we have settled into our new cubicles and forecast area, we invite you to stop by and say hello when you come to Anchorage. Many of you may recall that the Anchorage forecast offices have held a spring open house in past years. This year the open house will be held in the fall, please watch for further information on our website and on the National Weather Service Alaska Facebook page.