

Interagency Hydrology Committee for Alaska

Spring 2010 Meeting Minutes

April 19-20, 2010

Fairbanks, Alaska

---

**Attendees:**

Mike Knapp- ADOT&PF  
Steve Frenzel – USGS  
Larry Rundquist – NWS  
Crane Johnson –USACE  
Amy Tidwell – UAF  
Jessica Cherry – UAF  
Lee Koss - BLM  
John Trawicki- USFWS  
Joe Klein - ADF&G  
Trey Simmons - NPS  
Jim Vohden - ADNR  
Eric Rothwell - NMFS  
Ed Plumb – NWS  
Mary Azelton- USACE  
Brett Nelson – NRCS  
Taunnie Boothy – DCRA  
Doug Sims – FNSB  
Charley Palmer – ADEC (Teleconference)

**Action Items:**

- Lee Koss assigned to draft a position paper for IHCA to review regarding recommended protocols and procedures for agencies to provide stewardship for the editing and maintaining the Alaska Watershed Boundary Dataset.
- John Trawicki volunteered to follow up with ARLIS regarding status of documents provided to be inventoried approximately 6 years ago.
- Joe Klein will check with Christopher Estes and Dave Meyer regarding a list of past officers.

**Legislative Updates (See attached State and Federal Legislative Updates):**

**Old Business:**

- Flood mapping update: Juneau reports should be done in June. Seward flood insurance study and maps available for review and comments; comments due middle of June. Fairbanks is looking at updating local flood regulations.
- Steve Frenzel presented new brochure on the “100-Year” flood terminology and recommended calling it the “1 percent annual exceedance probability” flood.

**New Business:**

- Next meeting: To be held at USGS in Anchorage. Doodle will be used to schedule meeting around late-October/early-November.

- Overview of Chena Lakes Project and Corps Dam Safety Review. Corps will collect LiDAR from dam through to the mouth of Chena to update inundation mapping. Discussed interim risk reduction measures. Noted calculation of Probable Maximum Precipitation was no longer provided by the National Weather Service and there was discussion whether the federal agencies/NWS? should get back involved with this task.
- Presentation of Watershed Boundary Dataset and IFSAR coverage. In regards to the National Hydrography Dataset (NHD), Lee indicate there was a need for interagency coordination, and more importantly, interagency funding, to make sure that NHD edits currently being conducted by various entities are 1) being done to NHD standards, 2) being collated and 3) actually entered into the NHD. The best solution is a funded, dedicated stewardship position. Second best would be a strong and committed interagency committee that would act as data stewards. There was some discussion that a cooperative agreement along the lines of the one NPS has with St. Mary's University might work as well. Lee also asked whether more IFSAR coverage should be pursued.
- In Sept 2011, there will be an Interagency Conference on "Research in the Watersheds" in Fairbanks.
- Overview of Dept of Interior Climate Change Science Centers. Described various agency climate related programs.
- A discussion was held on the location of the historical IHCA records. Records include outgoing Chair report, minutes, past correspondences, list of past officers. A box of past records was given to ARLIS and they were going to inventory the documents.

**Agency Reports: (See attached):**

# USGS Alaska Science Center

## Water Resources Office

### Spring 2010 Agency Report

#### New projects

A new multi-disciplinary project to understand the affects of climate warming on the productivity of the Northern Gulf of Alaska was begun recently by the USGS. The role of the USGS Alaska Science Center Water Resources Office in the study is to evaluate the freshwater discharge from the Copper River Basin and the glacier runoff component of that discharge. We will be adding a glacier runoff function to the USGS precipitation-runoff modeling system (PRMS) watershed model.

A study of mercury concentrations in Glacier Bay was begun in collaboration with the National Park Service and with the University of Alaska Southeast. Samples will be collected from different media (water, sediments, and biota) from tributary streams and analyzed by UAS.

Water-quality sampling was begun on the Chulitna River (tributary to Lake Clark) to establish a baseline for Lake Clark National Park to use to evaluate future mining impacts to the area. This will be a 3-year project.

Three new streamgages were established in the Yukon Flats area to support a multi-disciplinary climate change study that has been a major thrust for the USGS involving numerous researchers from outside of Alaska. Two of the gages are on Beaver Creek and one is on the Porcupine River. Research is generally focused on lakes in the Flats.

#### Publications (not reported in November, USGS authors in bold)

**Brabets, T.P.; Conaway, J.S.**, 2009, Application of the Multi-Dimensional Surface Water Modeling System at Bridge 339, Copper River Highway, Alaska: U.S. Geological Survey Open-File Report 2009-1237, 29 p.

**Brabets, T.P., and Conaway, J.S.**, 2009, Geomorphology and river dynamics of the lower Copper River, Alaska: U.S. Geological Survey Scientific Investigations Report 2009-5257, 42 p.

**Jones, B. M., Arp, C.D.**, Hinkel, K.M., Beck, R.A., **Schmutz, J.A.**, and Winston, B., 2009, Arctic lake physical processes and regimes with implications for winter water availability and management in the National Petroleum Reserve Alaska: Environmental Management, 43, 1071-1084.

**Neal, E.G.**, Hood, E., and Smikrud, K., 2010, Contribution of glacier runoff to freshwater discharge into the Gulf of Alaska: Geophysical Research Letters 37, LO6404.

West, M.E., Larsen, C.F., Truffer, M., **O'Neel, S.R.**, and LeBlanc, L., 2010, Glacier microseismicity: Geology v. 38, p 319-322.

## Scientific Presentations (USGS authors in bold)

**Arp, C.D.**, Whitman, M., **Jones, B.M.**, Grosse, G., 2009, "Headwater stream morphology, evolution, and feedbacks in a lake-rich, permafrost landscape of the Alaskan Arctic Coastal Plain in a changing climate" poster presented at AGU Fall meeting in San Francisco, December 2009.

**Curran, J.H.**, 2009, "Braid-plain dynamics and bank erosion along the Matanuska River, Alaska" poster presented at AGU Fall meeting in San Francisco, December 2009.

Kluskievicz, D., **O'Neel, S.R.**, Larsen, C.F., West, M., Walter, F., and Hubenthal, M., 2009, "Using Passive Seismicity to Characterize and Quantify Glacier Dynamics" poster presented at AGU Fall meeting in San Francisco, December 2009.

Larsen, C.F., Bartholomaeus, T., **O'Neel, S.R.**, West, M., Walter, F., Kluskievicz, D., 2009, "Geophysical Investigation of Yaktse Glacier, Alaska USA" presentation at AGU Fall meeting in San Francisco, December 2009.

**March, R. S., Van Beusekom, A.E., and O'Neel, S.R.**, 2009, "Assessment of Errors in Long-Term Mass Balance Records from Alaska, USA" poster presented at AGU Fall meeting in San Francisco, December 2009.

**O'Neel, S.R.**, Walter, F., Kluskievicz, D., Pfeffer, W.T., Larsen, C.F., West, M., and McNamara, D.E., 2009, "Seismic signatures of advancing and retreating tidewater glaciers" presentation at AGU Fall meeting in San Francisco, December 2009.

**Sass, L.C., O'Neel, S.R.**, Loso, M.G., MacGregor, J.A., Catania, G., and Larsen, C.F., 2009, "Contributions of climate and dynamics to mass wastage and accumulation zone thinning of Eklutna Glacier, Alaska" presentation at AGU Fall meeting in San Francisco, December 2009.

**Van Beusekom, A.E., March, R.S., and O'Neel, S.R.**, 2009, "Improving Mass Balance Modeling of Benchmark Glaciers" poster presented at AGU Fall meeting in San Francisco, December 2009.

Walter, F., **O'Neel, S.R.**, Bassis, J., Fricker, H., and Pfeffer, W.T., 2009, "Icequake Tremors During Glacier Calving" presentation at AGU Fall meeting in San Francisco, December 2009.

**Arp, C.D.**, Whitman, M., **Jones, B.M.**, Grosse, G., 2010, "Beaded stream morphology, regimes, and feedbacks in a lake-rich, permafrost landscape of the Alaskan Arctic Coastal Plain" presented at Alaska Section AWRA annual conference, Anchorage, April 2010.

**Brabets, T.P.**, 2010, "Application of the USGS multi-dimensional surface water modeling system (MD\_SWMS) at bridge 339, Copper River highway, Alaska" presented at Alaska Section AWRA annual conference, Anchorage, April 2010.

**Conaway, J.S., and Valentine, K.**, 2010, "Climate signals in streambed elevations" presented at Alaska Section AWRA annual conference, Anchorage, April 2010.

- Conaway, J.S., and Zimmerman, C.E.**, 2010, "Streamflow Hydraulics of a Sheefish Spawning Reach of the Selawik River, Alaska" presented at Alaska Section AWRA annual conference, Anchorage, April 2010.
- Curran, J.H.**, 2010, "Evidence of Paleofloods from LIDAR Imagery of the Matanuska River, Alaska" presented at Alaska Section AWRA annual conference, Anchorage, April 2010.
- Larquier, A.M.**, Loso, M.G., **Sass, L.C.**, MacGregor, J., and Larsen, C.F., 2010, "Glacial Influences on Water Resources of the Eklutna Basin, Alaska" poster presented at Alaska Section AWRA annual conference, Anchorage, April 2010.
- McTeague, M.L., and Curran, J.H.**, 2010, "Landscape level historical analysis of braided river braid plain composition, age, and formation, Matanuska River, Alaska" presented at Alaska Section AWRA annual conference, Anchorage, April 2010.
- O'Neel, S.R., Van Beusekom, A.E., and Josberger, E.**, 2010, "Climate and dynamic glacier mass balance components" poster presented at USGS Global Change Conference in Denver, March 2010, and oral presentation at Alaska Section AWRA annual conference, Anchorage, April 2010.
- Sass, L.C., O'Neel, S.R.**, Loso, M.G., MacGregor, J.A., Catania, G., and Larsen, C.F., 2010, "Dynamic controls on Eklutna Glacier Mass Loss" at Alaska Section AWRA annual conference, Anchorage, April 2010.

**University of Alaska Fairbanks Update**  
Interagency Hydrology Committee for Alaska, Spring 2010 Meeting  
April 19-20, 2010/Fairbanks, AK

1. Updated Precipitation Frequency Analysis for the State of Alaska: AK Department of Transportation and Public Facilities, AK University Transportation Center, National Weather Service

***Doug Kane (PI), Amy Tidwell (Co-I), Svetlana Berezovskaya (Co-I)***

Duration: 36 months

1. Data formatting
  - a. All collected datasets have been reformatted according to NWS specifications. The data are now being used with NWS routines to extract annual maximum series (AMS).
  
2. AMS review and extraction constraints
  - a. UAF has developed scripts to facilitate easy selection, plotting, and comparison of AMS for all stations and durations. The code was written in Visual Basic for Applications and is embedded in Excel.
  - b. GIS shapefiles have been generated for 15-minuted, hourly, and daily stations. These files will be used to assign climate regions to each station (after Shulski and Wendler, 2007) along with the associated “non-snow” months for further refining AMS extraction.
  - c. Climate regions and preliminary “non-snow” months are listed below. Final parameters will be determined through iterative AMS extraction and review by UAF and NWS.
    - Arctic: May -Sept
    - Interior/Copper River: April - Oct
    - West Central: April - Oct
    - SW Islands: All year
    - Bristol Bay/Cook Inlet: March - Nov
    - SE Panhandle/S Central: All year

2. Impacts of Climate Variability and Change on Flood Frequency Analysis for Transportation Design:

AK Department of Transportation and Public Facilities, AK University Transportation Center

Status: Project end date extended to July 31, 2010.

Current activities are focused on assessing the influence of climate variability on flood frequency estimation for ~ 30 sites in southcentral, AK. Cooperation with Dr. Glen Liston at Colorado State University has led to a modeling effort that will provide information about the climate and hydrologic forcing coinciding with flood events over the past 30 years. This effort brings together the North American Regional Reanalysis (NARR) dataset with a suite of physically- and quasi-physically based models that have generated such datasets as daily rainfall, snow water equivalent, snowmelt, glacier melt, and total runoff, among others.

## NORTH SLOPE PROJECTS

\*\*\*\*\* Funding Ended \*\*\*\*\*

3. Temporal Variation of Hydrology in the Alaskan Arctic: National Science Foundation  
(<http://www.uaf.edu/water/projects/NorthSlope/northslope.html>)

**Doug Kane, PI**

This project was not renewed during the recent NSF proposal cycle (AON). Funding ended April 2009. Stations are running, but data processing is on hold- currently have not performed QA/QC on 2009 summer discharge data. Unless another agency/funding source picks up funding, we'll start taking stations out in 2010.

Meteorological stations:

7 (Upper Kuparuk and Imnavait Basins) 1993-present; Imnavait since 1985

5 (Kuparuk Basin) 1993-present

Stream gaging sites:

Imnavait Creek; 1985-present

Upper Kuparuk River; 1993-present

Putuligayuk River; 1999-present

Snow survey sites:

79 survey sites (combined with ADOT&PF Foothills project)

**Note:** The Water and Environmental Research Center at UAF is working with the Fish & Wildlife Service Fairbanks Field Office to help fund gaging on the Upper Kuparuk and Putuligayuk Rivers for one more year. After this field season, no funding has been secured.

\*\*\*\*\*

4(a). Sagavanirktok River/Bullen Point Hydrology Project: AK Department of Natural Resources  
(<http://www.uaf.edu/water/projects/bullen/bullen.html>)

**Funding ends June 30, 2010. Met stations will be continued through summer, but may be removed in August.**

Meteorological stations:

8 (East of Dalton Hwy, mountains to coastal plain); Summer 2006-present;

Stream gaging sites:

none

Snow survey sites:

28 survey sites; 2006-present

4(b). Bullen Point Hydrology Extension: AK Department of Natural Resources  
**Funding ends June 30, 2010.**

Meteorological stations:

Stream gaging sites: All planned sites (listed below) were gaged this spring  
Kadleroshilik River; Spring 2009  
Shaviovik River; Spring 2009  
Unnamed Creek #1; Spring 2009

Snow survey sites:

5. Hydrologic Analysis and Support, North Slope Foothills Project: AK Department of Transportation and Public Facilities

(<http://www.uaf.edu/water/projects/foothills/foothills.html>)

**Funding ends June 30, 2010 unless the project is extended.**

Meteorological stations:

4 (Kuparuk Basin); Summer 2006-present

Stream gaging sites:

None

Snow survey sites:

79 survey sites (combined with NSF Arctic Hydrology project) \* will try to collect data on as many sites as possible this year, although NSF funding has ended.

6. Surface Water Flow Monitoring and Analysis, North Slope Umiat Corridor, Phase I: AK Department of Transportation and Public Facilities

**Funding ends June 30, 2010 unless the project is extended. May be funded for another year, depending on outcome of State budget.**

Meteorological stations:

5 (Anaktuvik Basin); Spring 2009

Stream gaging sites:

Anaktuvik River; Spring 2009- gaged this year

Staff gages on Chandler and Itkillik; (pressure transducers and staff gages installed Spring 2009.

If funded another year, all sites will be gaged in 2011.)

Snow survey sites:

20 survey sites; Spring 2009. 5 additional sites (Chandler) added Spring 2010.

7. Stream Gaging with BLM:

BLM- Richard Kemnitz

UAF- Horacio Toniolo

UAF will work with BLM to gage 5 North Slope streams, operating out of Umiat. Hydrologic data will be processed and posted on a UAF website. The project duration is 5 years.

# NOAA NWS Agency Report

Presented by

Larry Rundquist

Service Coordination Hydrologist

National Weather Service

Alaska-Pacific River Forecast Center (APRFC)

<http://aprfc.arh.noaa.gov>

April 2010

## Management and Staff

Current staffing and contacts are as follows:

Robin Radlein - Regional Hydrologist/Alaska Region & Hydrologist in Charge of APRFC

266-5151 or [robin.radlein@noaa.gov](mailto:robin.radlein@noaa.gov)

Larry Rundquist – Service Coordination Hydrologist

266-5152 or [larry.rundquist@noaa.gov](mailto:larry.rundquist@noaa.gov)

Scott Lindsey - Development and Operations Hydrologist

266-5157 or [scott.lindsey@noaa.gov](mailto:scott.lindsey@noaa.gov)

Becky Perry – Hydrologic Technician, 266-5162 or [becky.perry@noaa.gov](mailto:becky.perry@noaa.gov)

Contact all APRFC staff via email at [nws.ar.aprfc@noaa.gov](mailto:nws.ar.aprfc@noaa.gov)

### Hydrologists

Ben Balk, 266-5155

Jim Coe, 266-5159

Jamie Montesi, 266-5156

### Hydrometeorological Analysis & Support Forecasters

Jeff Perry, 266-5158

Arleen Lunsford, 266-5153

Eric Holloway, 266-5154

### Weather Forecast Office Hydrology Contacts:

Anchorage - John Papineau, Senior Service Hydrologist, 266-5165

Fairbanks - Ed Plumb, Service Hydrologist, 458-3714

Juneau - Mike Mitchell and Aaron Jacobs, Hydro Focal Points, 790-6824

## Operations/Flooding

There were very few floods this past winter.

## River/Rain Gauge Network

We plan to add a few river observers to our network this summer at locations with previous data collection and/or new locations. We hope to be able to deploy a few new automated gage stations as well. No full weather stations are planned for deployment this summer.

## Climate Reference Network

The Alaska CRN currently has sites in Barrow, Fairbanks, Port Alsworth, Sand Point, Sitka, and St. Paul. NWS has been working with partner agencies on potential locations for additional CRN sites that include Atkasuk, Glacier Bay area, Middleton Island, Galena, Talkeetna area, Alekganik area, Gulkana area, and North Slope. There are four sites scheduled for installation this coming summer at Red Dog Mine, Kenai NWR (Moose Research Center), Tetlin NWR (at a location near the Canadian border) and either Yakutat or Summit Airstrip south of Denali NP. Site surveys are planned for eight additional sites this summer.

## Climate Services

NOAA is establishing a Regional Climate Services office in Anchorage. This office will be working with DOI to coordinate climate services in Alaska. This will follow guidelines set in a DOI-NOAA MOU on Climate Services. Expected services include:

- Develop, deliver and communicate problem-focused products, information services and decision support tools
- Connect users to existing climate products and services while continuing to develop new, authoritative, reliable services
- Support decision-making by providing place-based information and assessments that advance understanding of regional climate impacts and risks in coordination with other national and regional programs
- Promote scientifically-based adaptation and mitigation support by building and integrating NOAA's climate science capabilities

## Projects

The development season this past winter was dominated by the installation and configuration of our new operating environment called Community Hydrologic Prediction System (CHPS). The CHPS environment was developed in collaboration with Deltares by porting the NWS model components into their Flood Early Warning System (Delft-FEWS) (<http://www.wldelft.nl/soft/fews/int/index.html>). This open shell operating system will allow us to access other hydrologic models and to add new models easily. We plan to operate the new system in parallel with our old system during our 2010 operational season and switch exclusively to CHPS in 2011. Other development this winter included projects on calibration of our hydrologic model, further development of techniques for producing gridded precipitation, temperature, and freezing level products, web site improvements, computer system maintenance, and staff training. We now have web access to historic data at selected NWS river gages and continue to expand the number of sites available from this web page.

## NOHRSC Activities for Alaska

The airborne snow water equivalent program for 2010 was started on 9 April. Flights are expected to continue for about two weeks. A land surface modeling system is currently in operation at NOHRSC for Alaska. It is NASA's Land Information System version 6, driven by Global Data Assimilation System (GDAS) forcing data at 35 km resolution. They are running two land surface models, NOAH and CLM2, at 0.01° resolution, both of which model snowpack and soil conditions. The model is current and running operationally, after a cold start in June 2009. The NASA project under which this work is funded also calls for the future implementation of Land Information System (LIS) satellite data assimilation methods.

## Precipitation Frequency Project For Alaska

The University of Alaska, Fairbanks (UAF) is moving forward on the joint effort with NWS to update precipitation frequency estimates for Alaska. UAF continues with data collection, formatting, and quality control. UAF discussed with Alaska University Transportation Center (partial funding source) the issue of liquid and solid precipitation versus liquid only precipitation frequency estimation. It was concluded to look at rainfall precipitation only. Further details of the progress thus far will be provided by UAF.

Engineering designs are typically based on rainfall frequency estimates for durations between 15 minutes and 24 hours, although there are some applications that may require longer durations. It was decided to proceed with the analysis across all durations (5-minute to 60-day) since logistically the software is already in place, and then decide after the frequency analysis is done if any of the longer durations should be discarded.

The schedule for some tasks has slipped due to technical issues in formatting difficult datasets and revised completion dates are shown. The project is still expected to be completed on time.

- Data collection, formatting, and initial quality control [January 2010; revised to April 2010]
- Extraction of annual maximum series (AMS); additional quality control and data reliability tests (e.g., outliers, trend analysis, independence, consistency across durations, duplicate stations, candidates for merging) [February 2010; revised to July 2010]
- Regionalization and frequency analysis [September 2010, revised to November 2010]
- Initial spatial interpolation of PF estimates and consistency checks across durations [January 2011]
- Peer review [March 2011]
- Revision of PF estimates [May 2011]
- Remaining tasks (e.g., development of precipitation frequency estimates for PD series, seasonality, temporal distributions, documentation) [August 2011]
- Web publication [September 2011]

## NWSChat

The APRFC is looking into setting up a chat room in the NWSChat network that would be available to USGS, COE, and any other agencies interested in joining. The use of NWSChat has been successful during the past two snowmelt flood events on the Red River of the North.

## Flood Safety Awareness Week

The Alaska Flood Safety Awareness Week was postponed until April 26-30, 2010.

## National Park Service water resources summary April, 2010

Trey Simmons  
Aquatic Ecologist  
Central Alaska Network

In January, John Trawicki and I convened a meeting in Fairbanks to discuss cooperation and coordination between the NPS Inventory and Monitoring Program and USFWS in monitoring water resources in Alaska. About 20 people from both agencies attended and a productive discussion ensued. A second meeting is planned for October or November.

**Regional** – No changes from November: Wrangell-St. Elias NP&P has a CESU agreement with St. Mary's University to steward edits to NHD flowpaths for the park (as part of a Natural Resource Condition Assessment). The Alaska Regional Office of NPS is currently planning a similar stewardship agreement to get the NHD layers for other AK parks edited and get those edits incorporated into the NHD.

NPS is still in the process of hiring a regional hydrologist position, but it should happen soon.

**Inventory and Monitoring Networks** – All 4 I&M networks have some kind of ongoing development or implementation of water resource monitoring programs. The goals of each program differ somewhat, but generally include monitoring status and trends in surface hydrology, water quality and biodiversity in streams and lakes in network parks.

### Central Alaska Network (Denali, Wrangell-St. Elias, Yukon-Charley Rivers).

The stream and river monitoring program started in 2006, really got going in 2007. The program has sampled 80 streams in Wrangell-St. Elias and Denali through 2009. Data collection includes field and laboratory water chemistry, instantaneous discharge, species composition and density of benthic macroinvertebrate and diatom communities, fish species presence, and geomorphological measurements (substrate size distribution, channel geometry, thalweg profile, reach slope). The sampling design includes a combination of index sites and a rotating set of probabilistic monitoring sites (chosen using the GRTS survey design). 25 streams have been sampled in at least 2 years, 12 in at least 3 years, 3 in all 4 years (few streams were sampled during the first year). 5 streams have also been sampled in multiple seasons/year. Starting in 2008, continuous temperature data have been collected in 15 streams; this year some units were left in place over the winter to see how they survive. Pressure transducers were installed at Jack Creek in Wrangell-St. Elias – currently we are developing a rating curve for that site. Temperature loggers and pressure transducers will be installed at additional sites in 2010. Eventually we hope to be able to monitor discharge at multiple locations in each network park. In 2010 we will sample ~20 streams in Wrangell-St. Elias and ~20 in Denali. We will expand the program into Yukon-Charley Rivers this year with limited sampling along the Yukon corridor

(~5 sites). In addition we have generated a GRTS sample for Denali and will be evaluating and sampling some remote GRTS sites.

The shallow lake monitoring program is now in its 7<sup>th</sup> year. The program collects data from small shallow lakes, including surface area, physical morphology, water quality, macroinvertebrate species composition, wetland vegetation, and thaw depth. Monitoring data will be used to track changes in lake number and surface area, water quality, macroinvertebrate composition, and plant composition. So far 85 lakes (30 in Yukon-Charley Rivers, 30 in Denali, 30 in Wrangell-St. Elias), selected using a GRTS probabilistic survey design, have been established as long-term sites and sampled. 8 lakes are continuously monitored each season with thermistor chains and multiparameter sondes. 2010 is a “break” year for the program, with a greatly reduced field schedule to allow time for synthesis and in-depth analysis of all data collected to date.

Periodically the program will conduct lake inventories, where lakes are sampled less intensively (fewer replicates) and for a reduced suite of parameters. These data will be used to evaluate spatial coherence and develop a lake classification for the park (So far only Denali has been inventoried). Catastrophic drainage of small lakes along the Yukon River has been observed in most years. Loss of lake surface area typifies some areas of the network, but overall lake surface area dynamics are highly heterogeneous, with extensive losses in some areas (e.g., NW portion of Wrangell-St. Elias, aeolian lowlands near Lake Mincumina) and little to no change in other areas.

#### Arctic Network (Gates of the Arctic, Western Arctic Parklands).

Installed 30 monitoring sites on shallow lakes in Kobuk Valley NP in 2009. Sites were selected using a GRTS survey design. Data were collected on water chemistry, macroinvertebrates, wetland vegetation and thaw depth. Field staff noted extensive permafrost thawing. Ten lakes were documented that had drained catastrophically. Extensive lake drying was observed along the sand sheet at Kobuk sand dunes. Work began on monitoring coastal lagoons in Cape Krusenstern National Monument. 4 lagoons were sampled in 2009. No field work planned for 2010.

#### Southeast Alaska Network (Sitka, Klondike Gold Rush, Glacier Bay)

Installing recording WQ sondes in all network parks in 2010. In final stages of approving a 5-year agreement with USGS to continue to operate the Taiya River gage (Klondike Gold Rush). May start gaging the Salmon River (Glacier Bay) in 2011.

#### Southwest Alaska Network (Lake Clark, Aniakchak, Katmai, Kenai Fjords, Alagnak)

Primary focus is on large freshwater flow systems (e.g., lakes, major inflowing tribs, and outlets). So far, most work has taken place on Lake Clark. Used GRTS to select spatially-balanced set of sample points across lake basin where lake profiles are measured during a summer index period (generally, the month of August when water temps are highest). Water samples for lab analysis are collected at a subset of the GRTS locations. A moored temperature array provides continuous water temperature monitoring at one fixed location within the lake

basin. Major inflowing tribs and outlets are treated pretty much the same with monitoring during the ice-free season (approx. May - Sept). We've developed stage discharge rating curves for the lake outlets, will be developing rating curves for the inflows in the future. Periodic discharge measurements taken during summer months to improve predictive ability of rating curves. In-situ WQ and water samples for lab analysis taken during discharge measurements. Multiparameter water quality sondes used for short-term (approx. 2 week) continuous monitoring at outlets and select tribs (primary emphasis on comparing glacial to non-glacial systems).

Have attempted to install continuous WQ sonde in Exit Glacier Creek last 3 years. Difficulties with anchoring, burial. YSI is still out there from last year.

### **Individual parks –**

**Lake Clark NP** continuing a 3-year project (with USGS) to collect baseline hydrological and water quality data in the Chulitna River basin. A fixed station has been installed near the mouth of the Chulitna that will collect continuous discharge and water chemistry data. Beginning in 2010 instantaneous discharge and water quality data will also be collected from additional sites throughout the basin. This effort is tied to concerns about future mining activity upstream of the park; specifically the proposed Pebble Mine. Another emerging issue is the proposed hydropower project at Chakachamna Lake (on the NE boundary of the park).

**Denali NP** - Restoration plans have been developed and submitted for funding for Slate and Caribou Creeks (both 303(d) listed for suspended sediments; Slate also has elevated heavy metals). A major restoration effort began in 2009 on Glen Creek, including recontouring of tailings and the stream channel, removal of contaminated soil and mining equipment and riparian revegetation. Other streams are also in line for restoration if funding allows. Numerous streams in the Kantishna area have elevated metal concentrations, highly variable sediment loads and altered channels from historical placer mining.

A proposal to study the effects of runoff of calcium chloride (applied to sections of the park road as a dust palliative) on adjacent water bodies has been submitted for funding.

The WACAP study of airborne contaminants found elevated levels of mercury in fish from Wonder Lake – followup research is planned.

Numerous aquifers in the Denali frontcountry area are contaminated and are being monitored. The wastewater treatment plant is out of compliance with Alaska DEC standards – planning and design for replacing the plant are in progress.

BLM and NPS are evaluating navigability for parts of the Kantishna River in response to a request for navigability determinations.

NPS currently mines approximately 11,000 cubic yards of gravel from the Toklat River floodplain on an annual basis for road maintenance material. A major study began in 2009 to

evaluate the effects of this activity on fluvial processes in the Toklat River, as well as the effects of other management impacts, including the installation of riprap (2009) to protect the rest area, and the long causeway blocking most of the channel.

Other issues of concern to the park are potential coalbed methane development outside the park, herbicide use by the Alaska Railroad, the potential north access road to Kantishna and the introduction of exotic species.

**Glacier Bay NP** started continuously monitoring discharge and temperature in the Bartlett River in 2009. This site will eventually become the principal long-term water quality monitoring site for the Southeast Alaska I&M Network. They are planning to install a DIDSON sonar to monitor escapement starting in 2011.

A new run-of-the-river hydropower project on Falls Creek (just downstream of the park boundary) went on line last July. Park is currently monitoring Dolly Varden in Falls Creek using PIT tags – goal is to correlate fish movement with temperature and discharge (monitored by the hydropower project). Some concern over the effect of the intake reservoir.

New project starting in 2010 to look at mercury dynamics in Glacier Bay streams. Will be looking at Hg levels in sediments, water, resident fish and macroinvertebrates in 3 streams with contrasting watershed types along the deglaciation chronosequence (young, no salmon runs; medium age, developing forestlands, established salmon runs; old, substantial peat coverage).

**Klondike Gold Rush NHP** – The main concern for the park is the hydrology of the Taiya River. Seasonal flooding provides important western toad breeding habitat, and the natural hydrological regime is probably important for other species as well. The USGS operated a gage on the Taiya in the 1970's. In 2004 the park and USGS reopened the gage. Preliminary analyses of this incomplete record (St. Mary's University) suggest that fractional flows for May/June may be increasing and those for July/August may be decreasing. Also some indication of an earlier onset for spring runoff. The park is looking for help interpreting the data.

The Taiya River bridge, which is inside the park on a State ROW, was de-rated last year (weight limit reduced from 10 to 5 tons). Built in the late 40's, it is considered a major factor in altering channel migration, erosion patterns, and impacting NPS cultural resources. The bridge is now scheduled for rehabilitation. DOT will be soliciting bids in June.

The park will be installing a continuously recording WQ sonde (including a turbidity sensor) in the Taiya River this year.

**Kenai Fjords NP** paid for a GOES telemetry upgrade to the APRFC gage on the Resurrection River at the bridge, now have real-time discharge data. High water now reaches the bottom of the bridge periodically. Appears to be a result of the bridge effectively impeding flow and increasing aggradation. Mike Marshal (NPS Water Resources Division) consulted and suggested waiting

until there are physical problems since bridge is “the responsibility of the Federal Highway Administration” [? I assume they mean AKDOT]. Looking for insight/suggestions.

Plans to initiate (in conjunction with Alaska SeaLife Center) a study of coho recruitment, movement, etc. in Resurrection River. Currently little or nothing is known, even though Resurrection Bay is one of the state’s largest recreational fisheries.

Starting up a study with U of Montana to evaluate glacial outburst flood hazard of Bear Glacier. There are several documented instances of glacial lake outburst floods causing hazardous conditions in Bear Glacier Lake, a popular sea kayaking spot.

The main issue for **Sitka NHP** is suburban development in the Indian River Basin upstream of the park, including extensive water diversions. In 2007 the park (in conjunction with ADF&G and the city of Sitka) began operating 2 gages on the river, above and below the development (replacing discontinued USGS gages). Discharge data have shown that extraction substantially impacts river flow during salmon spawning. The park is also conducting a 3-year bioassessment of water quality using macroinvertebrate and diatom indices developed by ENRI.

**Yukon-Charley Rivers National Preserve** – main issue currently is the discovery a couple of years ago of juvenile chinook in lower Coal Creek – this is an altered channel (extensively dredged drainage) prone to evulsion, etc. Plan is to stabilize the channel to preserve rearing habitat. Not enough \$\$ (estimate \$30,000 needed) to do it this year.

**Wrangell-St. Elias NP** – Stream gage installed on Bonanza Creek (Kennicott) in 2006, currently operated jointly by NPS and USGS. Collection of baseline water quality data (USGS) along the McCarthy road occurred in 2008-2009. An EIS is in progress regarding the impacts of ATV use along the Nabesna Road. Mapping and assessment of all stream crossings began in 2008. Studies of the impacts of ATV use on wetland hydrology and water quality are ongoing (USGS and the Central Alaska Network).

**NATURAL RESOURCES CONSERVATION SERVICE AGENCY UPDATE**  
**IHCA – April 19-20 Fairbanks, Alaska**

Staff Contacts:

Brett Nelson - NRCS State Conservation Engineer  
761-7717 [brett.nelson@ak.usda.gov](mailto:brett.nelson@ak.usda.gov)  
Rick McClure – Snow Survey DCO  
271-2424x113 [richard.mcclure@ak.usda.gov](mailto:richard.mcclure@ak.usda.gov)  
Daniel Fisher – Snow Survey Hydrologist  
271-2424x117 [daniel.fisher@ak.usda.gov](mailto:daniel.fisher@ak.usda.gov)  
Dan Kenney – Snow Survey Hydro-tech  
271-2424x112 [dan.kenney@ak.usda.gov](mailto:dan.kenney@ak.usda.gov)

Snow Survey Office Address: 510 L Street Suite 270, Anchorage, Alaska 99501

**Emergency Watershed Protection**

- City of McGrath – This is a levee repair and riprap armoring project (approx. 1100 feet). Contract awarded in August 2008. Riprap bank protection completed. Levee placement/compaction hampered due to wet conditions in September/October. Levee work will be completed in spring 2010. An additional 1900 feet of bank protection has been submitted for funding but currently no funds are available for this extension of the work.
- Gwichyaa Zhee Gwich'in Tribal Government and Crowley are sponsoring an EWP project in Fort Yukon. Funding has been procured for this project. Design, site selection, and NEPA are currently in progress for this project. The project is to relocate the 650,000 gallon fuel tank farm away from the eroding bank of the Yukon River to prevent a catastrophic spill during a large erosion event like break-up in 2009.

**SNOW SURVEY ACTIVITIES**

NRCS Snow Survey appreciates the In-Kind Services provided annually to the Snow Survey Program from each of the agencies and private companies. The In-Kind contributions for personal, equipment and air charter are in excess of \$300,000 annually.

The following is brief summary of anticipated work for Alaska Snow Survey/Water Supply Forecasting Program (SS/WSFP) for fiscal year 2010.

- For the Interior of Alaska we are looking to install telemetry equipment at 6 automated sites: Mission Creek at Eagle which will be moved to near Eagle BLM Campground, Kelly Station on the Noatak, Sagwon, Prudhoe Bay, Bettles, and Fairbanks T.S. Two SNOTEL sites will receive retrofits, Little Chena Ridge and Mt. Ryan. On the Kenai Peninsula, Exit Glacier will be converted from a snow course to a SNOTEL site. In Southeast Alaska, the automated site Moore Creek Bridge will be converted to SNOTEL.
- BLM/NRCS are continuing to look to upgrade the Alaska Meteor Burst Communication System (AMBCS) master station.
- This summer, we will be doing a pilot project where some of the new sites will be receiving Iridium transmit radios.

The Alaska Snow Survey Program data records are on the National Water and Climate Center web site <http://www.wcc.nrcs.usda.gov/>. Many products are now available to use at this National web site.

The Alaska staff currently consists of a Hydrologist, Hydro-tech and Data Collection Officer (DCO). The staff oversees and QC's the collection of the data from 53 SNOTEL sites, 8 additional sites with on site data loggers recording daily data, and 232 snow courses that have monthly readings throughout the winter. From this data, we generate 129 volume stream flow forecasts and snowmelt runoff indices.



**US Army Corps  
of Engineers, Alaska District**  
IHCA Agency Report  
April 19-20, 2010



---

## **CHENA RIVER LAKES FLOOD CONTROL PROJECT**

- **USACE Dam Safety Cadre Evaluated Moose Creek Dam, September 2009**
  - Dam given a DSAC I rating and requires 'Urgent and Compelling' action.
  - Interim Risk Reduction Measures Plan Completed Fall 2009.
  - Alaska District begins implementation of risk reduction measures prior to 2010 flood season.
  - USACE will acquire Lidar mapping for areas downstream from the dam and update the existing dam break inundation mapping. Lidar data will be publically available (Delivery expected August 2010).
  - Additional Tanana River (backwater) stage gage installed at the floodway control sill.
  - Major dam modification study to begin in the Summer 2010 (2-3 year study).
- Continue to upgrade remote data collection platforms with NRCS.

## **STUDIES & PROJECTS**

- **Seward Area Study**

The Corps has recently received several requests to help address erosion and flooding issues near Seward. To provide immediate assistance while awaiting project funding, the Corps is working with the Kenai Peninsula Borough, City of Seward, and Seward/Bear Creek Flood Service Area on a study to identify the most urgent flood and erosion problems in the Seward area and develop a comprehensive strategy to address them. The effort is being performed through the Corps' Section 22 Planning Assistance to States Program.
- **Black Lake Ecosystem Restoration**
  - Currently scoping the project. Possible 2010 work may include:
    - Sediment coring of Black Lake with Northern Arizona Univeristy and USGS/AVO
    - Lake thermal modeling, University of Washington
    - Cross section and bathymetric surveying
    - Installation of climate and lake monitoring station
- **Alaska Barge Landing System Design** – Working for Denali Commission to plan, design and construct barge and boat facilities throughout Alaska.
- **General Hydropower Investigation:** The Alaska Energy Agency (AEA) has entered into a multi-year Planning Assistance to States (PAS) agreement to investigate potential hydropower projects. The initial task will be to create a GIS database. This GIS product will allow users to access digitized reports that are

currently available only in hard copy. A draft list of all hydropower reports is available now. Report scanning complete.

- **Matanuska Watershed Study:** Watershed study initiated with several ongoing initiatives.
  - A data gap analysis summary report was conducted for the Mat-Su Watershed study and recommended leveraging existing efforts, delivering public education, resolving institutional gaps, expanding research and extending mapping efforts. The specific findings to develop scopes of work are found in the report. If interested in an electronic copy, please email Lisa Rabbe, Mat-Su Watershed Study Manager at [lisa.a.rabbe@usace.army.mil](mailto:lisa.a.rabbe@usace.army.mil).
  - Wide area Lidar coverage (USGS - Lead, MatSu Borough, COE and others) 2011???
  - A wetlands map has been created for the Mat-Su Watershed. A functional assessment will be performed on these wetlands. The map can be accessed by going to: <http://CookInletWetlands.info/default.html>
  - Wetland Functional Assessment beginning in 2010.
  - Assisting Mat-Su Borough Planning Group.
- **Flood Plain Information Reports:** Public meetings this summer to present results from Kenai Peninsula Studies. The Ninilchik River study extends from the river mouth to just upstream of the Sterling Highway. The Anchor River study extends from the mouth upstream of the Sterling Highway on both the North and the South Forks. The Kenai River study extends from Kenai Lake downstream past development in Cooper Landing. Kenai River and Ninilchik River studies to be completed this Spring/Summer.
- **Port of Anchorage:** Numerical and physical modeling of Upper Cook Inlet hydrodynamics complete. Sedimentation numerical modeling complete. Physical model available for outside use.

#### **FY10 FUNDED STREAM GAGES (15 Total)**

Chena River Lakes Project (Moose Creek Dam):

- Chena River MP40
- Chena River near Hunts Creek
- Chena River Below Moose Creek Dam
- Chena River Downtown Fairbanks
- Little Chena River
- Tanana River at Fairbanks
- Tanana River at the Floodway Control Sill (stage only)
- Tanana River at Big Delta (w/NWS)

USACE Cooperative Stream Gaging Program (Sites cost shared with USGS):

- Kenai River, near Soldotna
- Kuskokwim River, near Crooked Creek
- Yukon River, near Stevens Village

- Tanana River, near Nenana
- Kuskokwim River at Liskeys Crossing

Project Funded Gages:

- Whittier Creek (Start up October of 2009) – Funded for two years
- Buskin River – Funded for two years

## **COASTAL EROSION AND RELOCATION PROJECTS**

- **Kivalina:** Construction of 1600' of coastal revetment complete. Final 400' to be completed in 2010.
- **Unalakleet:** Construction contract awarded in the Spring 2009 for 3400' of coastal revetment. Construction will be complete in 2010.
- **Newtok:** IRT construction of access road to begin in 2010.
- **Western Alaska Storm Surge Modeling:** Study complete, results to be available on the internet shortly. Website address:  
<http://www.poa.usace.army.mil/en/cw/index.htm>
- **Western Alaska Wave Hindcast:** This study is complete. Website with study results:  
[http://frf.usace.army.mil/wis/ak/ak\\_main.html](http://frf.usace.army.mil/wis/ak/ak_main.html)

**2010 Alaska District construction projects: Port of Anchorage, Kivalina, Unalakleet, Unalaska Harbor, St. Paul Harbor, Akutan Harbor, Cordova Harbor, Chevak and Chignik Harbor.**

- DNR/Water budget:
  - status quo although no increments passed.
- Mat-Su groundwater project was re-funded.
  - DNR working on issues dealing with gravel pit ponds in Palmer area
  - USGS doing majority of project
- Awarded StreamStats grant through MMS, however its not *funded* yet.  
StreamStats is a web-based tool that allows users to obtain streamflow statistics, drainage basin characteristics, and other information for user-selected sites on streams.
- DNR is being sued by Nunumta Aulukestai re:Pebble Project
- Southeast items:
  - Navigability determinations
  - Sustainable Salmon Fund projects
- Southcentral:
  - WELTS database
  - Other
- Northern:
  - Large mine projects
  - Geochemical sampling
  - Harding Lake
- Staffing:
  - Gary still here for a while!
  - Kellie Westphall leaving ~1June
  - NRS3 position filled in-house, now we have to hire NRS2
  - Interviewing for NRS3 job in Fbks-water rights
  - Southeast manager's position (John Dunker's job) offered
  - Vacant groundwater hydrologist in Anc

**Alaska Department of Natural Resources**

**16 April 2010**

Current Legislation – water related issues

Alaska State Legislature: <http://w3.legis.state.ak.us/index.php>

**BILL:** HB 134

**SHORT TITLE:** CRUISE SHIP WASTEWATER  
DISCHARGE PERMITS

**BILL VERSION:** SCS CSHB 134(FIN)

**CURRENT STATUS:** CHAPTER 53 SLA 09

**STATUS DATE:** 07/09/09

**SPONSOR(s):** REPRESENTATIVE(s) HARRIS, Kelly, Millett, Johansen, R.Foster, Keller, Chenault, Coghill, Johnson, P.Wilson, Munoz, Hawker, Dahlstrom

**TITLE:** "An Act relating to the terms and conditions of commercial passenger vessel permits for the discharge of graywater, treated sewage, and other wastewater; establishing a science advisory panel on wastewater treatment and effluent quality in the Department of Environmental Conservation; and providing for an effective date."

Signed into law on 5Aug09

---

**BILL:** HJR 28

**SHORT TITLE:** OPPOSE RESTRICTIONS ON  
OIL/GAS ACTIVITIES

**BILL VERSION:** SCS CSHJR 28(RES)

**CURRENT STATUS:** LEGIS RESOLVE 29

**STATUS DATE:** 07/22/09

**SPONSOR(s):** REPRESENTATIVE(s) JOHNSON, Millett, P.Wilson, Neuman, Keller, Lynn, Johansen, Dahlstrom

**TITLE:** Urging the President of the United States and the United States Congress not to adopt any policy, rule, or administrative action or enact legislation that would restrict energy exploration, development, and production in federal and state waters around Alaska, the outer continental shelf within 200 miles of shore, and elsewhere in the continental United States; urging the President of the United States and the United States Congress to encourage and promote continued exploration, development, and production of domestic oil and gas resources.

Permanently filed 5Aug09

---

**BILL:** SJR 16

**SHORT TITLE:** OFFSHORE OIL & GAS  
REVENUE

**BILL VERSION:** CSSJR 16(RES)

**CURRENT STATUS:** LEGIS RESOLVE 16

**STATUS DATE:** 07/23/09

**SPONSOR(s):** SENATOR(S) WIELECHOWSKI, Dyson, Wagoner, Thomas, Olson, Davis, Ellis, Paskvan, Menard, Stevens  
REPRESENTATIVE(S)Guttenberg, Tuck, Johnson, Kawasaki, Crawford

**TITLE:** Expressing support for responsible development of the oil and gas resources in

federal waters offshore of Alaska's coast as a means to ensure energy independence, security for the nation, and jobs for Alaskans; and urging the United States Congress to provide a means for consistently sharing with all coastal energy-producing states, on an ongoing basis, revenue generated from oil and gas development on the outer continental shelf, to ensure that those states develop, support, and maintain necessary infrastructure and preserve environmental integrity.

Permanently filed 5Aug09

---

**BILL:** HJR 25

**SHORT TITLE:** HYDROELECTRIC POWER;  
RENEWABLE ENERGY

**BILL VERSION:** CSHJR 25(ENE) AM

**CURRENT STATUS:** LEGIS RESOLVE 27

**STATUS DATE:** 07/22/09

**SPONSOR(s):** REPRESENTATIVE(s) THOMAS, Johansen, Edgmon, Millett, Austerman, Kerttula, Munoz, P.Wilson, Johnson, Dahlstrom, Gruenberg, Crawford, Gardner, Tuck, Lynn, Gara, Guttenberg, Olson, Gatto, Petersen, Chenault, Holmes  
**SENATOR(s)** McGuire, Stedman, Meyer, Ellis, Paskvan, Wielechowski, Menard, Kookesh, French, Davis, Thomas, Therriault, Wagoner, Stevens

**TITLE:** Urging the United States Congress to classify hydroelectric power as a renewable and alternative energy source.

Permanently filed 5Aug09

---

**BILL:** HCR 10

**SHORT TITLE:** OPPOSE FED. CONTROL OF  
STATE LAND & WATER

**BILL VERSION:** CSHCR 10(RES)

**CURRENT STATUS:** (S) CALENDAR 4/14

**STATUS DATE:** 04/13/10

**SPONSOR(s):** REPRESENTATIVE(s) HAWKER, Stoltze, Lynn, Coghill, Kelly, Millett, Neuman, Olson, Johnson, P.Wilson

**TITLE:** Urging the Governor to exercise all available legal options to restrain the United States Department of the Interior, National Park Service, from intruding on the sovereign right of the state to exercise jurisdiction over navigable water and submerged land and urging the Governor to allocate sufficient resources to the Department of Law, the Department of Natural Resources, and the Department of Fish and Game to defend the state's right to manage the public use of its navigable water.

Awaiting transmittal to Governor 15Apr10

---

**BILL:** HCR 22  
**BILL VERSION:** CSHCR 22(FIN)  
**CURRENT STATUS:** (S) FIN  
**SPONSOR(s):** COMMUNITY & REGIONAL AFFAIRS

**SHORT TITLE:** ALASKA NORTHERN  
WATERS TASK FORCE  
**STATUS DATE:** 04/11/10

**TITLE:** Establishing and relating to the Alaska Northern Waters Task Force.

Referred to Rules 16Apr10

---

**BILL:** SCR 17  
**BILL VERSION:**  
**CURRENT STATUS:** (S) FIN  
**SPONSOR(s):** COMMUNITY & REGIONAL AFFAIRS

**SHORT TITLE:** ALASKA NORTHERN  
WATERS TASK FORCE  
**STATUS DATE:** 03/31/10

**TITLE:** Establishing and relating to the Alaska Northern Waters Task Force.

Referred to Finance 31Mar10

---

**BILL:** HB 318  
**BILL VERSION:**  
**CURRENT STATUS:** (H) CRA  
THEN RES

**SHORT TITLE:** UNREGULATED POTABLE  
WATER SYSTEMS  
**STATUS DATE:** 01/29/10

**SPONSOR(s):** REPRESENTATIVE(s) HARRIS, T.Wilson, Johnson, Munoz, P.Wilson, Seaton, Keller

**TITLE:** "An Act relating to public use of unregulated water systems."

Read and referred to Community & Regional Affairs and Resources Committees 29Jan10

---

**BILL:** HB 200  
**BILL VERSION:**  
**CURRENT STATUS:** (H) RES  
THEN FIN  
**SPONSOR(s):** REPRESENTATIVE(s) SEATON

**SHORT TITLE:** CLEAN WATER  
FUND:LINKED DEPOSITS  
**STATUS DATE:** 03/23/09

**TITLE:** "An Act relating to the Alaska clean water fund."

Referred to Resources 23Mar09

---

**BILL:** SCR 3

**BILL VERSION:**

**CURRENT STATUS:** (S) RES

THEN JUD

**SPONSOR(s):** SENATOR(S) BUNDE, Therriault

**SHORT TITLE:** OPPOSE FED. CONTROL OF  
STATE LAND & WATER

**STATUS DATE:** 02/04/09

**TITLE:** Urging the Governor to file an action to restrain the United States Department of the Interior, National Park Service, from intruding on the sovereign right of the state to exercise jurisdiction over navigable water and submerged land and urging the Governor to allocate sufficient resources to the Department of Law, the Department of Natural Resources, and the Department of Fish and Game to defend the state's right to manage the public use of its navigable water.

Referred to Resources 4Feb09

---

**BILL:** SB 164

**BILL VERSION:**

**CURRENT STATUS:** (S) CRA

THEN RES

**SPONSOR(s):** SENATOR(S) STEDMAN

**SHORT TITLE:** WATER ACCESS EASEMENT  
WIDTH/NOTICE

**STATUS DATE:** 03/25/09

**TITLE:** "An Act relating to an easement or right-of-way necessary to provide access to navigable or public water."

Referred to Community & Regional Affairs 25Mar09

---

**BILL:** HB 46

**BILL VERSION:**

**CURRENT STATUS:** (H) FSH

THEN RES

**SPONSOR(s):** REPRESENTATIVE(S) SEATON, Gara

**SHORT TITLE:** MIXING ZONES/SEWAGE  
SYSTEMS

**STATUS DATE:** 01/20/09

**TITLE:** "An Act requiring the Department of Environmental Conservation to collect and make available to the public certain information relating to water pollution; prohibiting certain mixing zones in freshwater spawning waters; and requiring a public comment period for certain sewage system or treatment works modifications."

Referred to Fisheries 20Jan09

---

**BILL:** HCR 15

**BILL VERSION:**

**CURRENT STATUS:** (H) FSH

THEN RES, FIN

**SPONSOR(s):** REPRESENTATIVE(s) AUSTERMAN, Edgmon

**SHORT TITLE:** BRISTOL BAY MINING  
STUDY

**STATUS DATE:** 04/10/09

**TITLE:** Directing the Legislative Council to contract for an assessment of environmental and socioeconomic consequences of large-scale mineral extraction in the Bristol Bay area watershed.

Referred to Fisheries 10Apr09

---

**BILL:** HB 242

**BILL VERSION:**

**CURRENT STATUS:** (H) FSH

THEN RES

**SPONSOR(s):** FISHERIES

**SHORT TITLE:** BRISTOL BAY: FISHERIES;  
MINING

**STATUS DATE:** 04/18/09

**TITLE:** "An Act relating to the protection of wild salmon, wildlife, water, and other resources in or near the Bristol Bay Fisheries Reserve and to large-scale mining in the headwaters of the Reserve."

Referred to Fisheries 18Apr09

---

**BILL:** SCR 6

**BILL VERSION:**

**CURRENT STATUS:** (S) RES

THEN FIN

**SPONSOR(s):** RESOURCES

**SHORT TITLE:** BRISTOL BAY MINING  
STUDY

**STATUS DATE:** 04/10/09

**TITLE:** Directing the Legislative Council to contract for an assessment of environmental and socioeconomic consequences of large-scale mineral extraction in the Bristol Bay area watershed.

Referred to Resources 10Apr09

---

**BILL:** HB 179

**BILL VERSION:**

**CURRENT STATUS:** (H) RES

**SPONSOR(s):** REPRESENTATIVE(s) SEATON

**SHORT TITLE:** EXPANDING KENAI RIVER  
SPECIAL MGMT AREA

**STATUS DATE:** 03/12/09

**TITLE:** "An Act adding certain state-owned land and water to the Kenai River Special Management Area."

Referred to Resources 12Mar09

---

**BILL:** SJR 14

**BILL VERSION:**

**CURRENT STATUS:** (S) RES

**SPONSOR(s):** SENATOR(S) THERRIAULT, Wagoner, Dyson, Bunde, Menard

**SHORT TITLE:** EXEMPTION FOR  
HYDRAULIC FRACTURING

**STATUS DATE:** 03/13/09

**TITLE:** Urging Congress not to remove the exemption for hydraulic fracturing from the provisions of the Safe Drinking Water Act.

Referred to Resources 13Mar09

---

**BILL:** HB 390

**BILL VERSION:**

**CURRENT STATUS:** (H) ENE

THEN RES, FIN

**SPONSOR(s):** REPRESENTATIVE(s) CRAWFORD

**SHORT TITLE:** ENERGY AUTHORITY/  
HYDROELECTRIC PROJECTS

**STATUS DATE:** 02/23/10

**TITLE:** "An Act relating to power projects of the Alaska Energy Authority; and establishing and relating to the power project development fund."

Referred to Energy 23Feb10

---



---

## Alaska Department of Environmental Conservation

*Interagency Hydrology Committee for Alaska (IHCA), Spring 2010, Fairbanks*  
<http://ak.water.usgs.gov/ihca/>

### Agency Drinking Water Program Project Briefing Report

#### DEC REPRESENTATIVE CONTACT INFO:

Charley Palmer, *Hydrologist II*

Alaska DEC-Division of Environmental Health, Drinking Water Program, Drinking Water Protection Group  
Anchorage, AK

p: 907/269-0292

e: [charley.palmer@alaska.gov](mailto:charley.palmer@alaska.gov)

w: [http://www.dec.state.ak.us/eh/dw/DWP/source\\_water.html](http://www.dec.state.ak.us/eh/dw/DWP/source_water.html)

#### Statement of Intent

This agency project briefing report is coming from the perspective of the Drinking Water (DW) Program, within the Division of Environmental Health (EH). The intent of this briefing is to present projects and available resources of which the DEC contact for this report is aware. This briefing does not imply priority or preference. The report may include projects outside of the EH/DW Program that are of interest or related to EH/DW Program activities.

#### Data Resources

##### *SPAR/Contaminated Sites Program GIS Web Mapping Application*

The Contaminated Sites Program (CS), within the Division of Spill Prevention and Response (SPAR), has recently published a public-facing GIS web mapping application that displays contaminated sites throughout the state of Alaska. It has the capability to filter by the site status (Open, Cleanup Complete with Institutional Controls, and Cleanup Complete) to search for sites based on the site name, site ID, file number, address, city or zip code, and provides basic information for each of the sites with a link to the cleanup chronology report for each selected site. The SPAR/CS web mapping application can be accessed at <http://www.dec.state.ak.us/spar/csp/web-map/>. The EH/DW Program has given the SPAR/CS Program permission to include Drinking Water Protection Areas for public water systems on this mapping application; however, the person who developed the mapping application has recently left, so this may be delayed until the position is filled.



---

### *EH/DW Program GIS Web Mapping Application*

The Drinking Water Protection (DWP) group within the EH/DW Program has recently developed an internal-DEC GIS web mapping application. In the near future, the DWP Map may have a secure connection to the data through a web mapping service (WMS). The DWP Map displays DEC-Regulated Public Drinking Water Sources, Drinking Water Protection Areas and Potential Sources of Contamination throughout the state of Alaska. The data displayed in this Map is derived from data used to complete Source Water Assessments for Community and Non-Community water systems in Alaska. The dataset does not include the location of private wells and private surface water intakes.

### *EH/DW Program GIS and Microsoft Access Data*

Another option for accessing Drinking Water Protection data is to acquire the data in GIS format. This requires signing a Data Usage Agreement that is valid for one-year increments. The DWP group also maintains an MS Access database that can be acquired using this method. The MS Access database includes interpreted well log information for public water systems that is tied to the location data. Alternatively, a summary of the well log information can be found through Drinking Water Watch, <http://map.dec.state.ak.us:8080/dww/>, under the Source Water Assessment link.

### *EH/DW Program Source Water Assessment Reports*

The DWP group also completes Source Water Assessment (SWA) reports for all regulated public water systems in Alaska (~1,600 systems, and ~2,300 sources). The SWA reports assign a vulnerability rating to the PWS for regulated drinking water contaminants. The rating is based on aquifer and wellhead characteristics for wells, as well as identified existing and potential sources of contamination. Copies of the SWA reports are stored at the Alaska Resources Library and Information Services (ARLIS) located on the University of Alaska Anchorage campus. A summary of the results can also be found through Drinking Water Watch, <http://map.dec.state.ak.us:8080/dww/>, under the Source Water Assessment link.

## **Projects**

### *Statewide Digital Mapping Initiative (SDMI) Statewide GIS Grant*

The DEC EH/DW Program has been a recent participant in the SDMI Technical Advisory Group (TAG), which includes participants from several state agencies. In line with the SDMI mission, the Department of Transportation (DOT) has recently acquired grant money to have an outside evaluation of the state of GIS use in Alaska, and make recommendations for heading toward a statewide enterprise GIS system. TAG participants will have input on developing a draft RFP.



---

### *Well Driller Certification*

Alaska is one of the few states that do not require well driller certification. Currently, only the Municipality of Anchorage has a certification requirement. The EH/DW Program has pursued a certification requirement for drilling public wells in the past (about 10 years ago) and was not successful. With the recent influx of well drillers to Alaska that has impacted local well drilling businesses, the EH/DW Program is again trying to gain support for requiring well driller certification for public water systems. If you support this endeavor, please write a formal letter of support to the EH/DW Program, or contact the Program directly.

### *Updating Well Construction/Decommissioning Standards*

In an effort to ensure safe drinking water for well users and customers, and to ensure that the state can provide adequate guidance in these matters, the EH/DW Program has been working towards updating its well construction and decommissioning standards. This may come in the form of guidance documents and/or changes to drinking water regulations, 18 AAC 80.020.

### **Other**

#### *Status of DNR's On-Line Well Log Tracking System, WELTS*

As Roy Ireland with DNR, had mentioned at the fall 2009 IHCA meeting, there is a real concern for the future of WELTS. I know that many, if not all of us, rely on WELTS for well log information for various types of projects. The DEC EH/DW Program also relies on WELTS, and is working on a formal letter of support to maintain and to update the technology behind WELTS. The EH/DW Program asks that you please also provide a letter of support to DNR.

## **Alaska Department of Transportation & Public Facilities**

### **AGENCY REPORT**

#### Storm water management endeavors:

- Adaptation within DOT to comply with the Construction General Permit and other new stormwater regulations.
- Coordination with the Municipality of Anchorage and the Fairbanks North Star Borough on MS4 permit requirements
- Revisions to the Standard Specifications (Section 641), Alaska Highway Drainage Manual (Chapter 16), and Preconstruction Manual are currently underway to reflect new regulatory requirements.

#### Research endeavors:

- River bend erosion protection – UAF is conducting research to evaluate two projects to control lateral channel migration.
  - ADOT&PF's Sagavanirktok River, Dalton Highway
  - Alyeska's Hess Creek, Trans-Alaska Pipeline.
- Foothills West Project – UAF is conducting hydrologic research for ADOT&PF on the following rivers:
  - Toolik River
  - Kuparuk River
  - Itkillik River
  - Anaktuvuk River
  - Chandler River
- Bridge deck drainage study – An ongoing research project with UAF on the subject of stormwater management on bridge decks in cold climates.
- Precipitation Frequency Estimate Updates – ADOT&PF is continuing to help fund the PFE update, collaboration between UAF & NOAA.
- Climate change/variability in South-Central AK – The department is continuing to fund a project to assess the effects of climate change/variability on flood frequency.

#### Hydraulics Squad Programs (Statewide D&ES Division, Bridge Section):

##### STIP ID# 12579 – Scour Monitoring and Retrofit Program

- ADOT&PF is continuing its bridge scour monitoring efforts with the assistance of the USGS.
- The assessment of bridges in the tidal environment and bridges for which the foundations are unknown remains a top priority.

##### STIP ID# 6450 – USGS Flood Frequency and Analysis

- This project helps to fund the Small Streams Program for the USGS.
- ADOT&PF is looking for collaboration opportunities, gage sites that might meet multiple objectives.

STIP ID# 6455 – Small USGS Hydrologic Investigations

Alaska Highway Drainage Manual (AHDM) – ADOT&PF is pursuing a number of chapter updates to this manual.

- Chapter 17 - Bank Protection guidelines. Funding secured.
- Chapter 16 - Erosion and Sediment Control Plans.
- Chapter 13 - Storm Sewer System.

ADOT Training (through the Statewide Research, Development, and Technology Transfer Section):

The following National Highway Institute (NHI) courses are being considered:

- 135067 – Practical Highway Hydrology
- 135027 – Urban Drainage Design
- 135065 – Introduction to Highway Hydraulics
- 135056 – Culvert Design
- 135071 – Surface Water Modeling System with FESWMS and SMS
- 135048 – Countermeasure Design for Bridge Scour and Stream Instability

The following non-NHI courses have been discussed with other state departments and federal agencies:

- Ordinary High Water – Delineation and overview
- Fish passage design – HEC 26 or other



## ALASKA DEPARTMENT OF FISH & GAME IHCA AGENCY REPORT April 19-20, 2010

- ADF&G is contributing funding for USGS to operate Montana Cr (Mat-Su), Wasilla Cr, Moose Cr (Mat-Su), Situk and Ophir gages and with the NPS for the Indian River (Sitka) gage. ADF&G is operating stream gages on Sheep Cr, Fish and Meadow Creeks in Southcentral and Sitkoh, Chilkoot, Cowee, and the Lost River in Southeast.
- ADF&G and DNR continue to cooperate on instream flow and water resource related issues and actions per a 2002 MOU. Recent activities include issuance of Certificates for the Kenai R, Situk R, Kuparuk R and Klehini R. ADF&G mostly recently filed reservations on WF Situk, Cowee Creek, Lost River, and Wasilla Creek in December 2009.
- Hydropower interest remains strong statewide. Larger potential projects include Grant Lake on the Kenai Peninsula, Chakachamna across the inlet, Thomas Bay projects in Southeast and Susitna. The numbers of potential hydrokinetic projects (wave, tidal and river) have shown a decline but a few projects remain active including Cook Inlet (Fire Island, Nenana, and Eagle and Ruby (Yukon)).
- ADF&G is recruiting for a hydropower/instream flow coordinator (Fisheries Biologist IV, PCN 11-4208) – see <http://workplace.alaska.gov> or contact Joe Klein at 267-2148 for more information.
- The National Fish Habitat Initiative (NFHI) was rolled out last year and a bill is in congress to provide additional funding. NFHI is a nationwide strategy to address fish habitat protection, restoration and enhancement through development of new partnerships. There are 3 partnerships in Alaska: Mat-Su, Southwest and Salmon in the City (Anchorage). For further information go to [www.fishhabitat.org](http://www.fishhabitat.org) or contact Christopher Estes at 267-2142.
- The Division of Sport Fish strategic plan was finalized last year and is available at <http://www.sf.adfg.state.ak.us/StratPlan/>
- ADG&G is hosting the 2010 Summer Meeting of the Western Association of Fish and Wildlife Agencies (WAFWA) July 16-21 at the Captain Cook in Anchorage (see <http://www.adfg.state.ak.us/special/wafwa/index.php>). WAFWA represents 23 western states Canadian provinces and advocates for states and provincial management of fish and wildlife.

## BLM AGENCY REPORT: SPRING IHCA MEETING

### Alaska State Office:

Once the Watershed Boundary Dataset (WBD) for all areas in Alaska had been completed to the 5<sup>th</sup> and 6<sup>th</sup> Hydrologic Unit Codes, BLM initiated a project to update the areas within NPR-A that had been flown with IFSAR to this more detailed coverage. This work is being done by the BLM State Office GIS Branch and USGS WRD in Salt Lake City, Utah. USGS is flying Lidar coverage on a 3 mile width of NPR-A shoreline this summer and this will be considered in this update also.

BLM and NPS are co-sponsoring the Interagency Conference on Research in the Watersheds to be held in Fairbanks in September 2011.

Contact Lee Koss, 907-271-4411, [lkoss@blm.gov](mailto:lkoss@blm.gov) for information.

### Alaska Field Office (AFO):

- Mike Sondergaard, former GFO hydrologist, accepted a job in NV and left in December. The plan is to replace him with a hydrologist with joint duties in the AFO and the GFO.
- Planned continuation of real-time transmitters for stream gage data (stage, water temp., air temp., and precip.) at the outlet of Paxson Lake and on the Delta River near Garrett Creek. Mike Sondergaard (former GFO hydrologist) will be in AK in early June to train a new person on the operation of instruments.
- Planned continued operation of gages on the Delta River near Black Rapids and two tributaries to the Gulkana River (Hungry Hollow and Twelve Mile Creek). Gages to be replaced in June.
- Applications for water reservations were submitted to the state of Alaska for water rights for two reaches of the Delta River.
- Stream and Riparian Proper Functioning Condition survey completed on the South Fork of Campbell Creek.
- New river gauge installed on the Salmon River in Platinum in partnership with the FWS.
- Continuing dialog with partners and the operator of the XS Platinum Mine on the re-establishment of fish passage and future reclamation actions at the mine site. Two survey trips occurred in 2009 and winter meetings are planned to coordinate strategies.
- Tim Sundlov, AFO fisheries biologist, has transferred to the Glennallen Field Office to manage the fisheries program.
- Chuck Denton, AFO hydrologist, has been transferred to the USFS in Phoenix.
- AFO will be filling behind both the fisheries biologist and hydrologist positions ASAP.
- Two restoration projects were completed on the South Fork of Campbell Creek adjacent to the Campbell Creek Science Center. Removable metal stairs were installed to facilitate student access and willow shoots were planted to re-establish streamside vegetation.
- Social trail removal and re-vegetation actions were implemented along the length of the Salmon Run Trail along Campbell Creek.
- Biomass assessments were completed on the South Fork of Campbell Creek and Little Campbell Creek utilizing volunteers.
- Water Discovery Days educational activities presented by the Campbell Creek Science Center and partners reached over 1000 local students.
- Tim Sundlov and ADF&G partners conducted field work that resulted in significant contributions to the Anadromous Waters Catalog in the Bay and BSWI planning areas.
- Basic hydrology education programs were presented to 1800 students during Outdoor Week activities presented by the Campbell Creek Science Center.
- Utilizing ARRA trail materials and Job Corps work-based learning students, the recreation staff resurfaced 1000' of trail adjacent to the South Fork of Campbell Creek.

- Plans are being developed for the use of the SAGA Trail crew to perform additional riparian restoration the South Fork of Campbell Creek and Little Campbell Creek during the summer of 2010. -Water Discovery Days and Outdoor week activities are being planned for 2010.
- ADF&G, the Native Village of Unalakleet, and BLM will be partnering in the installation of a weir on the Unalakleet River to begin data collection on the health of king salmon runs in 2010.
- Continued operation of real-time transmitters for stream gage data (stage, water temp., air temp., and precip.) at the outlet of Paxson Lake and on the Delta River near Garrett Creek.
- Continued operation of gages on the Delta River near Black Rapids and two tributaries to the Gulkana River (Hungry Hollow and Twelve Mile Creek)
- Continued monitoring for fecal coliform on the Gulkana River.
- PFC assessments in the Delta WSR corridor (80 miles of tributaries and 500 acres of wetland).

## **Fairbanks District Office (FDO)**

**SNOW SURVEYS IN THE FORTYMILE RIVER AREA** This is an ongoing annual project to monitor winter snowpack in the Fortymile River Area. The Fairbanks District Office monitors four snow courses (Boundary, Chicken Airstrip, Lost Chicken Hill, and Mt. Fairplay) in the Fortymile Area in a cooperative program with the Natural Resources Conservation Service, as part of their nationwide interagency compilation of State and Federal snow survey work. Snow pack for winter 09/10 was about half of normal.

**SNOW SURVEY WHITE MOUNTAINS NATIONAL RECREATION AREA** This is an ongoing annual project to monitor winter snowpack in the White Mountains National Recreation Area (WMNRA). The Fairbanks District Office monitors four WMNRA snow courses (Fossil Cr., Borealis, Wolf Run, Windy Gap) in a cooperative program with the Natural Resources Conservation Service, as part of their nationwide interagency compilation of State and Federal snow survey work. Snow pack for winter 09/10 was about half of normal.

**INSTREAM FLOW WATER RIGHTS – WEST FORK FORTYMILE R. AND O’BRIEN CREEK** This is an ongoing project for obtaining State of Alaska Instream Flow Water Rights for the West Fork-Dennison Fork of Fortymile River and O’Brien Creek tributary to the Fortymile National Wild and Scenic River. BLM expects to submit Instream flow applications in FY10 or FY11. In cooperation with the USGS, BLM has collected streamflow data for the main stem of the Fortymile River as well as several tributaries within the Wild and Scenic River corridor. Processing archived stream gage data for Mosquito Fork during 2010.

**INSTREAM FLOW WATER RIGHTS FOR SOUTH FORK KOYUKUK R.** This is an ongoing project to complete an Instream Flow Application for the South Fork Koyukuk River, near mile 157 of the Dalton Highway. The goal of this project is State of Alaska Water Rights on three rivers in the Dalton Highway Corridor: Jim River, Kanuti River, and the South Fork Koyukuk River. An application for Instream Flow water rights for Jim River was filed with the State of Alaska in FY07. Stream flow and water quality samples planned for 2010.

**NOME CREEK STREAM GAGE:** BLM plans to continue FY10 operation of real-time transmitter for stream gage data (stage, water temperature, air temperature, and precipitation) at the Nome Creek Admin site near the headwaters of Beaver Creek. Data is posted on a Weather Service web site at <http://aprfc.arh.noaa.gov/>.

**BIRCH CREEK STREAM GAGE:** BLM plans to continue FY10 funding for USGS operation of the Birch Creek above 12 Mile Creek stream gage recording (stage, water temperature, air temperature, and

precipitation). The stream gage is near the headwaters of Birch Creek at Steese Highway mile 94. Data is posted on a USGS web site at [http://waterdata.usgs.gov/ak/nwis/uv/?site\\_no=15392000&PARAMeter\\_cd=00065,00060](http://waterdata.usgs.gov/ak/nwis/uv/?site_no=15392000&PARAMeter_cd=00065,00060).

**TOZITNA RIVER STREAM GAGE:** Five years of flow record have been collected at this station and data supporting the State of Alaska instream flow reservation is being finalized. It is anticipated that the water rights application will be submitted to ADNR early in 2011. The funding and equipment used for the Tozitna River project will be shifted to support other gaging projects in FY11.

**CLEAR CREEK GAGE (Hogatza River)** will continue to be operated through 2012 in conjunction with a non-telemetry based recorder on neighboring Caribou Creek. The goal of these projects is to obtain instream flow reservations from the State of Alaska for these two important salmon streams. The instream flow application for Clear Creek was submitted in 2009 and it is anticipated the application for Caribou Creek will be completed in 2013. Data from the real-time gaging station on Clear Creek including air temp, water temp, battery voltage, stage, and precipitation can be accessed at: <http://amazon.nws.noaa.gov/hads/charts/AK.html> and selecting NWS Location ID: CLEA2

#### FY2009 Work Completed:

Continued monitoring stage/discharge & continuous water quality (Temp, turbidity, Spec Cond, pH, DO) in 5 small (1st order) Arctic tundra streams.

Monitoring water level and temperature in 5 Arctic lakes within the 5 tundra stream watersheds that are being gaged.

Conducted water resources inventory work (bathymetry, water quality) in 15 Arctic lakes (Yellow-billed loon breeding lakes)

#### FY2010 Plans

Pending funding, BLM in Alaska intends to accomplish the following in NPRA: Continue all FY 2009 work described above plus the following:

**UMIAT SNOW SURVEYS AND METEOROLOGIC STATION** At least once a year snow surveys will be performed near the Umiat Airport tower and one at the USGS Global Terrestrial Network for Permafrost (GTN-P) site located on the hillside two miles north of the airport. BLM is operating the Umiat Airport RAWs station. It currently transmits its data via radio telemetry and GOES satellite. Two webcams near the airport (oriented north and south) transmit images every 10min. Webcam and weather data is available from the following website: [http://www.colville-watershed.org/stations/Umiat\\_Air/Umiat\\_Air.shtml](http://www.colville-watershed.org/stations/Umiat_Air/Umiat_Air.shtml)

BLM is also operating a radio telemetry node in Umiat which can be used to access numerous weather stations in NPR-A NE. Access to these stations can be found at <http://www.colville-watershed.org/stations/colville-diag.html>

#### NPR-A RIVER GAGES

**JUDY CK NR NUIQSUT:** HUC 19060205 Stage (GOES), water/air temp, precipitation

**UBLUTUOCH R NR NUIQSUT:** HUC 19060205 Stage (GOES), water/air temp, precipitation

**FISH CK NR NUIQSUT:** HUC 19060205 Stage (GOES) water/air temp, wind speed/direction, precipitation

**IKPIKPUK R BL FRY CK:** HUC 19060204 Stage, (GOES) water/air temp, wind speed/direction, precipitation

MEADE R AT ATQASUK: HUC 19060203 Stage (GOES), water/air temp, precipitation

BLM discontinued funding the USGS to operate the gages in NPR-A listed above. Real time data will continue to be available at the NWS website: <http://aprfc.arh.noaa.gov/> Historical data is posted on a USGS web site at <http://waterdata.usgs.gov/ak/nwis/>

OTUK CK NR IVOTUK: HUC 19060301 Stage (GOES) water/air temp, wind speed/direction, precipitation <http://aprfc.arh.noaa.gov/> and at <http://amazon.nws.noaa.gov/hads/charts/AK.html>

SEABEE CK AT UMIAT: HUC 19060303 Stage, water temp. Data will be archived in the BLM Water Resource Catalog

PRINCE CK AB MOUTH: HUC 19060302 Stage, water/air temp Data will be archived in the BLM Water Resource Catalog.