

INTERAGENCY HYDROLOGY COMMITTEE FOR ALASKA
Fall 2011 Meeting Agenda
October 26 - 27, 2011
USGS Conference Room
4230 University Drive, Anchorage
Call in Number: 877-917-2508
Participant passcode: 40576

Wednesday (Oct 26) 10:30 -5:00

Opening of Meeting

- Agency Representative Identification & Introductions
- Additions/Changes to Meeting Agenda

Secretaries Report

On-going Project/Committee Reports

- Federal Legislation/Regulation Update (Trawicki)
- State Legislation/Regulation Update (Prokosch)

Old Business

- Update from ARLIS regarding status of documents provided to be inventoried approximately 6 years ago (Trawicki)
- Alaska Surface Water Data Inventory (Johnson)

New Business (Times are approximate)

- 11:00 Alaska Precipitation Frequency Project (Sanja Perica, NOAA)
- 12:00 Alaska AKDOT&PF RWIS system and Precipitation Reporting (Jack Stickel, AKDOT)

Lunch

- 1:30 Alaska Silver Jackets Program (Link to Silver Jackets information: <http://www.nfrmp.us/state/index.cfm>) (Clarke Hemphill, COE)
- Spring 2012 IHCA meeting schedule and location (Johnson)
- Spring 2012 AWRA conference (Juneau Mar 4th-8th)
<http://state.awra.org/alaska/meeting2012.html>
- 2:00 Status of NDH/WBD stewardship and draft MOU(Koss)

- ~3:00 Begin agency reports
Agency Reports (up to 10 minutes per agency.) Highlight important issues and projects in your agency; prepare a summary prior to meeting and bring a minimum of 20 copies for distribution. Send an electronic pdf copy to the Secretary before the meeting.

FEDERAL

U.S. Army Cold Regions Research and Engineering Laboratory (John Zufelt)
U.S. Army Corps of Engineers (Crane Johnson)
U.S.D.A. Forest Service
U.S.D.A. Natural Resources Conservation Service (Rick McClure)
U.S.D.C. National Weather Service (Scott Lindsey)
U.S.D.C. National Marine Fisheries Service (Eric Rothwell)
U.S.D.I. Bureau of Indian Affairs (Keith Kahklen)
U.S.D.I. Bureau of Land Management (Lee Koss)
U.S.D.I. Fish & Wildlife Service (John Trawicki)
U.S.D.I. Geological Survey (Steve Frenzel)
U.S.D.I. National Park Service (Paul Burger)
U.S. Environmental Protection Agency

STATE

Department of Commerce, Community & Economic Development (Taunnie Boothby)
Department of Environmental Conservation (Charley Palmer)
Department of Fish & Game (Joe Klein)
Department of Military and Veterans Affairs – Division of Homeland
Security and Emergency Management or Alaska Army National Guard
Department of Natural Resources (Gary Prokosh)
Department of Transportation & Public Facilities (Mike Knapp)

UNIVERSITY

UAA/ENRI (John Zufelt)
UAF (Jessica Cherry)

Thursday (Oct 27) 8:30 -11:30

Continuation of agency reports

Announcements

Meeting Adjournment

IHCA

Fall 2011 meeting, October 26 and 27

Minutes – Jessica Cherry

Federal Legislative update from John Trawicki: budgets are the big issue. THOMAS search and Western States Water Council newsletter search.

Gary Prokosh: AK is no longer a full member of the Western States Water Council because of funding. State Legislative update using 'BASIS' system on Alaska state website. DNR is going to request a number of statutory changes this year for water. Including removal of water from a hydrologic unit and change in-instream flow requirements.

Old Business:

Trawicki update on ARLIS archive of old IHCA documents. Documents are there. Scanning has not occurred. Would like to get it posted to website. Crane will contact them.

Alaska Surface Water Data Inventory. Send links to Crane.

Sanja Perica, NOAA Presentation on Alaska Precipitation Frequency Project
Doug Kane, UAF Presentation on Alaska Precipitation Frequency Project

Jack Stickel's presentation on RWIS.

Lee's and Karen Hanson and Sheryl Boyack (last two via phone) presentation on NHD/WBD stewardship draft. Committee is comfortable with resolution. We feel the MOU should go to a higher level of management at each agency. Resolution was voted on and unanimously approved. Technical edits on the resolution are due next Friday.

Clark Hemphill, USACE, Silver Jackets program. Members suggested existing emergency response programs that should team up with Silver Jackets.

Discussion of Spring meeting schedule and coordination with AWRA. We discussed a shortened meeting in Juneau. Maybe 2-3 hours on Tuesday afternoon. Ideas for sessions are Hydropower/Hydrokinetics, Alternate Power involving water (lots of heat pump facilities are being installed in Anchorage and Juneau), Glaciers, freshwater, outburst floods

John Lane gave the USFS report.

Jon Zuefelt gave the CRREL report.

Crane Johnson gave the USACE report.

Daniel Fisher gave USDA NRCS report.

Scott Lindsey gave NOAA NWS agency report.

John Trawicki gave USFWS agency report.

Eric Rothwell gave NOAA-NMFS agency report.

Steve Frenzel gave USGS agency report.

Paul Burger gave NPS agency report.

Charley Palmer gave DEC agency report.

Joe Klein gave ADF&G agency report.

Gary Prokosh gave ADNR agency report.

Mike Knapp gave ADOT&PF agency report.

Jessica Cherry gave UAF report.

IHCA in-person attendees:

Crane Johnson (USACE)

Gary Prokosh (ADNR)

Mike Knapp (ADOT&PF)

Joe Klein (ADF&G)

Charley Palmer (DEC)

Daniel Fisher (NRCS)

Jessica Cherry (UAF)

Paul Burger (NPS)

John Trawicki (USFWS)

Jon Zufelt (CRREL)

Steve Frenzel (USGS)

Lee Koss (BLM)

Scott Lindsey (NWS)

Jack Stickel (ADOT&PF)

Clark Hemphill (USACE)

Larry Rundquist (Retired)

Phone:

Sheryl Boyack (Utah?)

Karen Hanson (Utah?)

Tim (Case?, Juneau ?)

John Lane (Forest Service, Juneau)

Sveta Stuefer, UAF

Doug Kane, UAF

Jeff Gordon ?

Sandra ?

Debbie Martin ?

Dale ?

Sanja Perica ?

Hdfc in Silver Spring

Hydromet Design Studies Center Office of Hydrological Development, NWS, NOAA

Attached are the following agency reports, the draft NHD/WBD Resolution, the draft MOU, and a NOAA rainfall record report.

-NRCS

-ADFG

-AKDOT&PF

-AKDEC

-BLM

-NWS

-CRREL

-USACE-Alaska District

-NPS

-USFS

-USGS

-UAF

Resolution of the Interagency Hydrology Committee of Alaska

Each year, issues grow concerning the use of lands and resources throughout Alaska, including water, mining, subsistence, endangered species, and recreation. Resolving these issues is complex because of the diverse needs of users and of the biota that inhabit these lands. Resolution often requires studies to determine possible impacts, and these studies are often on geographic scales as small as a few acres or as large as multiple watersheds and involve water as a key issue. Those seeking resolution of conflicting land and resource uses must accurately and consistently define watersheds or catchments.

The Watershed Boundary Dataset (WBD) for Alaska has been delineated to the 6th level at a 1:63,360 meter scale and streams have been routed as part of the National Hydrologic Dataset (NHD). Since completion, select areas of Alaska have been edited to finer resolution base reference information, if available, providing increased accuracy. Multiple State and Federal agencies are now downloading the Alaska WBD and NHD from the National site and are making significant edits. There is a need for NHD/WBD stewardship assistance to help agencies with editing and posting the edits to the National site. Proper stewardship of the dataset will help prevent the generation of multiple, differing, copies of NHD and WBD specific to individual agencies. Proper WBD stewardship will also insure that all agencies within a watershed are working with compatible datasets. Having statewide stewardship assistance provided by one NHD/WBD In-State Steward will be more cost effective than having this level of expertise in each agency, currently impractical under State and Federal budgets. This NHD/WBD In-State Steward will then work with agency data stewards and/or regional NHD/WBD technical stewards on stream and watershed boundary edits to maintain statewide river and watershed boundary datasets of consistent integrity. Until an In-State Steward can be identified, the U.S. Geological Survey, Water Science Center in West Valley City, Utah has agreed to provide Alaska with this function.

The Interagency Hydrology Committee of Alaska encourages Alaska and U.S. agencies to become a party to the attached Memorandum of Understanding and support coordinated, interagency stewardship of Alaska's NHD and WBD.



IHCA Chairman

01/04/2012



ALASKA DEPARTMENT OF FISH & GAME
IHCA AGENCY REPORT
October 26-27, 2010

- ADF&G is contributing funding for USGS to operate a stream gage on Montana Creek along the Parks Hwy and for a stream gage on Goldstream Creek in partnership with DEC to evaluate turbidity levels from past mining projects. ADF&G is operating stream gages on Fish and Meadow Creeks in Southcentral and Sitkoh, Chilkoot, and Cowee 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 Copper River, Stikine River, Old Situk, Eagle River and Taku River. ADF&G mostly recently filed reservations on Sawmill Cr nr Haines, Holgate Creek, Nuyakuk River, Nushagak River, Farragut River, Chulitna, and Tazlina River.
- Hydropower interest remains strong statewide. Larger potential projects include Susitna-Watana, Grant Lake on the Kenai Peninsula, and Cascade Creek in Thomas Bay. The interest in hydrokinetic projects (wave, tidal and river) continues a steady trend.
- The National Fish Habitat Initiative (NFHI) has a bill 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.

Alaska Department of Transportation & Public Facilities

AGENCY REPORT

Internal policy/practice:

- Stormwater management remains a focus topic for us at DOT&PF. We will be investigating how we might incorporate the new precipitation frequency estimates for Alaska into the design/permitting process.
- Initiated discussions with DF&G about revising the MOA on fish passage design. No news to report.

Research endeavors:

- Climate change and glaciated basins. I plan to (re)endorse a proposal to investigate climate change/variability effects on a large glaciated basin in Alaska.
- Foothills West/Access to Umiat. The University of Alaska (Fairbanks) is conducting hydrologic research on the rivers below. See the UAF's IHCA report for more info.
- Precipitation Frequency Estimate Updates – Near final. NOAA reports that it intends to make available to the public the finish product via its website in September 2011.

Statewide Hydraulics Programs. Potential federal funding reductions looming...

STIP ID# 12579 – Scour Monitoring and Retrofit Program

- Bridge scour monitoring program continues. Closed Bridge No. 339 Copper River.
- Current focus is on bridges with limited foundation information.

STIP ID# 6450 – USGS Flood Frequency and Analysis. We will be dropping multiple gages in FFY 2012 to help keep the USGS Small Streams Program within budget.

15581000 Hugh Rowe Creek near Council (11 yrs)
15564960 Utopia Creek at Utopia (13 yrs)
15564950 Indian River at Utopia (14 yrs)
15227500 Mineral Creek near Valdez (28 yrs)
15290200 Nancy Lake tributary near Willow (29 yrs)
15453610 Ray River tributary near Stevens Village (35 yrs)
Brushkana Creek near Cantwell (10 yrs)
Silver Bay trib near Sitka (12 yrs)
Sagavanirktok R trib near Happy Valley Camp (discontinue after Arthur Creek activation)
We will delay activation of Arthur Creek near Happy Valley and Canyon Creek near Salchaket.

In FFY 2013, the USGS has proposed that DOT&PF discontinue:

Gold Creek at Takotna (25 yrs)
Tatalina River near Takotna (24 yrs)
SuzyQ C narr pump station #10 (24 yrs).

Other gages with long periods of record that are being considered for discontinuation:

Nugget Creek near Wiseman (36 yrs),
Atigun River Tributary near pump station #4 (36 yrs)
Bonanza Creek Tributary near Prospect Camp (37 yrs)
Prospect Creek near Prospect Camp (38 yrs)
Moody Creed at Aleknagik (40 yrs)

STIP ID# 6455 – Small USGS Hydrologic Investigations

ADOT&PF-provided Training Opportunities

Training schedule available on the internet: <http://dot.alaska.ecatts.com/lmsTrainingCalendar>

GIS contacts within ADOT&PF

- Angela Parsons, Technical Engineer I (Statewide Research), (907) 269-6208, angela.parsons@alaska.gov
- Nicholas R Mastrodicasa, Digital Mapping Project Manager (Statewide Aviation), (907)266-2776, nick.mastrodicasa@alaska.gov
- Kerry S Kirkpatrick, Planner III (Statewide Program Development), (907)465-8957, kerry.kirkpatrick@alaska.gov

Interagency Hydrology Committee for Alaska (IHCA)

BLM Fall 2011 Agency Report

Anchorage District Office.

Instream Flow Data Collection for Water Rights – Twelve Mile Creek, Hungry Hollow Creek, and the Delta River at Black Rapids: Twelve Mile Creek and Hungry Hollow Creek are tributaries to the Gulkana National Wild and Scenic River. FY 2012 will be year five of data collection.

Gulkana River Stream Gage - BLM plans to continue FY2012 operation of real-time transmitter for stream gage data (stage, water temperature, air temperature, and precipitation) at the outlet of Paxson Lake. During FY2011, this site experienced problems with the pressure transducer and if funding permits, a replacement will be made to make the gage fully operational again for FY2012. Data is posted on a Weather Service web site at <http://aprfc.arh.noaa.gov/>.

Delta River Stream Gage - BLM plans to continue FY2012 operation of real-time transmitter for stream gage data (stage, water temperature, air temperature, and precipitation) on the Delta River near Garrett Creek. During FY2011, this site experienced a malfunction with the data logging equipment so there was no data collected or transmitted. If funding permits, gage data logger will be corrected and data will be posted on a Weather Service web site at <http://aprfc.arh.noaa.gov/>.

For GFO, aquatic and riparian habitat assessment were performed on five reaches in the Tonsina watershed, one reach in Twelve Mile Creek, and one reach in Garrett Creek. Water temperatures are being monitored with temperature loggers. One-time water chemistry parameters and stream discharge were measured at all sites.

Unalakeete River – For FY 2011 AFO monitored fish habitat and spawning areas utilizing YSI multi-parameter data recorder and HOBO DL's to record water temperature, DO, PH, salinity, and conductivity. If funding permits, units will be deployed again in FY2012.

Salmon River near Platinum Mine – For FY 2011 AFO monitored water temps for fish habitat. A HOBO DL was left over the winter but lost DL during ice breakup. Future DL's will be removed in the fall. If funding permits, HOBO unit will be deployed again in FY2012 as well as a YSI multi-parameter DL.

Also in FY2011, mining related water quality and aquatic samples were collected on Red Devil Creek and Cinnabar Creek to help assess metals in the aquatic environment. In addition, turbidity at the Platinum mine on the Salmon River is being closely monitored.

In FY2011, a vacancy announcement for the Anchorage District Hydrologist was posted and the position was filled by Mike Sondergaard. Mike is stationed in Glennallen and will serve both Glennallen and Anchorage Field Offices.

Fairbanks District Office.

Continue work on the following hydrology projects in 2012:

SNOW SURVEYS IN THE FORTY MILE RIVER AREA HUC# 19040104 FORTY MILE MANAGEMENT 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. The surveys are conducted two times each winter collecting snow depth, snow density, water equivalent, and air temperature. The results are published by the Natural Resources Conservation Service in a monthly Basin Outlook report during the winter and in an Annual Data Summary at the end of each year. Data are accessible to the public at <http://www.ambcs.org/>

Long-term snow survey data is used for runoff and flood predictions, fire season forecasts, culvert and bridge design, and contributes to the base of knowledge concerning global climate change. This work is also needed when obtaining permits from Alaska Fish and Game and EPA. This is a national cooperative program with NRCS.

SNOW SURVEYS WHITE MOUNTAINS NATIONAL RECREATION AREA HUC: 19040402

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. The surveys are conducted three times each winter collecting snow depth, snow density, water equivalent, and air temperature. The results are published by the Natural Resources Conservation Service in a monthly Basin Outlook report during the winter and in an Annual Data Summary at the end of each year. Data are accessible to the public at <http://www.ambcs.org/>.

Long-term snow survey data is used for runoff and flood predictions, fire season forecasts, culvert and bridge design, and contributes to the base of knowledge concerning global climate change.

INSTREAM FLOW WATER RIGHTS – Fortymile National Wild and Scenic River; Mosquito Fork Tributary HUC 19040104; NLCS: WSFM

This is an ongoing project for obtaining State of Alaska Instream Flow Water Rights for tributaries within the Fortymile National Wild and Scenic River corridor. BLM expects to submit an Instream Flow Application in FY12 for Mosquito Fork of the Fortymile River.

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. The goal is appropriation of instream flow water rights from the State of Alaska for the entire Fortymile National Wild and Scenic River corridor. Instream flow applications were filed with the State of Alaska for the main stem of the Fortymile River in FY06, the North Fork of the Fortymile River in FY07, the South Fork of the Fortymile and Walker Fork of the Fortymile River in FY09, and for the West Fork-Dennison Fork of the Fortymile River, O'Brien Creek, and Logging Cabin Creek in FY11. http://dnr.alaska.gov/mlw/mapguide/water/wr_start_tok.cfm

NOME CREEK STREAM GAGE: HUC 19040402

BLM plans to continue FY12 operation of the Nome Creek stream gage recording stage, water temperature, air temperature, and precipitation near the headwaters of Beaver Creek. Stage data is available at the following National Weather Service web site.

<http://water.weather.gov/ahps2/hydrograph.php?wfo=pafg&gage=noca2&view=1,1,1,1,1,1,1>

BIRCH CREEK STREAM GAGE: HUC 19040402

BLM plans to continue FY12 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 in near the headwaters of Birch Creek at Steese Highway mile 94. Stream gage data is available at the following USGS web site.

http://waterdata.usgs.gov/ak/nwis/uv/?site_no=15392000&PARAMeter_cd=00065.00060

UMIAT SNOW SURVEYS AND METEROLOGIC STATION HUC: 19060303, UMIAT, AK; NATIONAL PETROLEUM RESERVE – ALASKA

At least once a year a snow survey 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. Additional snow surveys will be performed as winter flights are available into Umiat. Measured snow depths from these two sites will be used to calibrate the ultrasonic snow depth sensors at both sites. The snow surveys will be part of a cooperative program with the Natural Resources Conservation Service (NRCS), as part of their nationwide interagency compilation of State and Federal snow survey work to estimate annual water availability, spring runoff, and summer streamflows. The surveys will collect snow depth, snow density, water equivalent, and air temperature. The results will be published by the Natural Resources Conservation Service in a monthly Basin Outlook report during the winter, and in an Annual Data Summary at the end of each year. Both of these observations are collected at the airport met site. A final snow survey will be performed prior to breakup to determine maximum snow depth/density for the winter season.

The Umiat airport weather station has been in operation for over 30 years, from 1949-54, 1975-2001. In 2002, a weather station was installed by BLM at the airport, primarily for real-time weather access. In 2007 the airport weather station was upgraded to a RAWS station. It currently transmits its data via radio telemetry and GOES satellite. Five webcams near the airport transmit images every hour. Webcam and weather data is available from the following website: <http://www.umiat.com>

Aiport weather is also available via:

Mesowest: (http://raws.wrh.noaa.gov/cgi-bin/roman/meso_base.cgi?stn=UMTA2&time=GMT)

Western Region Climate Center: (<http://www.wrcc.dri.edu/cgi-bin/rawMAIN.pl?akAUMI>)

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

OTUK CK NR IVOTUK: HUC 19060301 Stage (GOES) water/air temp, wind speed/direction, precipitation

Data for these gages are located at the following websites

<http://water.weather.gov/ahps2/index.php?wfo=pafg3>

<http://icewater.ine.uaf.edu/tsa/default.aspx>

<http://amazon.nws.noaa.gov/hads/charts/AK.html>

SEABEE CK AT UMIAT: HUC 19060303 Stage, water temp Data will be archived in the UAF database

PRINCE CK AB MOUTH: HUC 19060302 Stage, water temp Data will be archived in the UAF database

Agency Report – US Army CRREL
**U.S. Army Cold Regions Research and Engineering
Laboratory**

Report to the IHCA Fall Meeting, October 26-27, 2011 USGS Office Anchorage

- Eagle River Flats white phosphorous remediation work and sampling. Additional capping during February/March of previously identified contaminated areas. Only one more year of active monitoring/sampling before going into a long term monitoring phase. Waterfowl mortality surveys this fall showed continued minimal waterfowl deaths (15 with 8 positively identified as WP).
- Prepared report providing a review of the FEMA Standard: *Guidelines and Specifications for Flood Hazard Mapping Partners - Appendix F: Guidance for Ice-Jam Analyses and Mapping* which reviews the methods used by HDR Alaska to perform the backwater analysis for the Tanana River Alaska Railroad Corporation (ARRC) crossing. One size does not fit all.
- CRREL is leading a Strategic Environmental Research and Development Program (SERDP) effort looking at the effects of climate change on military training lands usage. The research is a 3-4 yr effort investigating the changes in permafrost, land cover/land use change, hydrology, and military requirements for training. Includes UAF, ABR, and other ERDC labs. CRREL also involved in another SERDP effort with USGS looking at permafrost and the impacts of climate change in the Yukon Basin.
- Conducted a study looking at the proposed Donlin Creek Mine pipeline route from tidewater (near Beluga) to the Mine (near Crooked Creek) to assess the likelihood and impact of ice jams at all stream crossings. Developed risk analysis based on available ice supply, discharge during breakup, channel type, floodplain, etc.
- Jarvis Creek aufeis flooding final report has been published as ERDC/CRREL TR-11-14.
- CRREL and USACE using HEC-HMS to model the entire Chena River Basin (see Crane's Report).
- River Ice Management Plan developed for the Gyeong-In Ara Navigation Project in South Korea. This is a new multi-modal navigation project joining Seoul (Han River) to Incheon Harbor at the West Sea. The project opened to navigation in September.
- Many projects at the CRREL Permafrost Tunnel Research Facility and the Fairbanks Permafrost Research Station (Farmers Loop Road).



Alaska Department of Environmental Conservation

Agency Briefing

DEC REPRESENTATIVES CONTACT INFORMATION:

<p>Charley Palmer, <i>Hydrologist II</i></p> <p>Alaska DEC/Division of Environmental Health Drinking Water Program Public Drinking Water Protection</p> <p>555 Cordova St. Anchorage, AK 99501</p> <p>p: 907-269-0292 e: charley.palmer@alaska.gov w: http://www.dec.state.ak.us/eh/dw/DWP/source_water.html</p>	<p>Cindy Gilder, <i>Environmental Program Manager I</i></p> <p>Alaska DEC/Division of Water Water Quality Standards, Assessment & Restoration Nonpoint Source Water Pollution Control</p> <p>555 Cordova St. Anchorage, AK 99501</p> <p>p: 907-269-3066 e: cindy.gilder@alaska.gov w: http://dec.alaska.gov/water/wnpssp/index.htm</p>
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Commissioner's Office

Commissioner: Mr. Larry Hartig

News

*New Deputy Commissioner, Lynn Kent

Lynn has over 25 years of experience in federal and state environmental and natural resource law and policy and has spent the last six years as the director of DEC's Division of Water. Previously, Lynn served as program manager for DEC's Water Quality program, Contaminated Sites program, and the Spill Prevention, Planning and Management program.

Lynn takes over for Dan Easton, who retires after serving 20 years with the department, including six years as deputy commissioner.

Division of Environmental Health

Drinking Water Program: Drinking Water Protection Management & Staff

- Kathy Kastens (Anchorage), Section Environmental Program Manager (EPM)
- Chris Miller (Anchorage), Lead Environmental Program Specialist (EPS)
- Anne Gleason (Wasilla), Environmental Program Specialist (EPS)
- Charley Palmer (Anchorage), Hydrologist

*New EPS, Lua Faverty (Anchorage), begins work November 16, 2011.

Alaska Clean Water Actions (ACWA) – Public Drinking Water Protection grant summary

- **Purpose:** To fund community water systems or projects supporting community water systems, to implement protection strategies identified in an endorsed drinking water protection plan, or to develop local regulations that explicitly protect community water systems. This funding is available statewide.
- **SFY12:** No funding available.

GIS Update

Web Maps and Services

DEC has improved access to public data via GIS web maps and services, thanks to the hard work of individual staff. There is a growing recognition within DEC of the value of making data with spatial attributes available through an easy-to-use web map interface. There is now a link on the DEC Home Page (<http://dec.alaska.gov/>) to access current DEC web maps and services (click on the “DEC Maps” thumbnail). Following are a list of available web maps:

- Division of Spill Prevention and Response (SPAR)
 - Contaminated Sites
 - Princess Kathleen Spill Response
- Division of Environmental Health (EH)
 - Public Drinking Water Protection Areas
- Division of Water
 - Impaired Waters
- Division of Air
 - Air Quality Advisories
 - "Real Time" Air Quality Monitoring Data

Statewide Digital Mapping Initiative (SDMI)

Cliff Jones (DAS) and Charley Palmer (EH) continue to represent DEC by participating in the SDMI Technical Advisory Group (TAG). The TAG provides technical advice related to current data acquisition projects (<http://www.alaskamapped.org/sdmi/>) and other collaborative mapping and planning efforts.

Alaska Surveying and Mapping Conference/GIS Jam

The 2012 conference will be held the week of February 13 - 17, 2012, at the Anchorage Hilton. Two days, usually Wednesday and Thursday, are considered the "GIS Jam." Charley Palmer (EH) participates in the GIS Jam Planning Committee.

Division of Water

Management & Staff: Cindy Gilder, Laura Eldred, Drew Grant, Kevin Hanley, Chandra McGee, Shane Serrano, Tim Stevens, and Brock Tabor

*New Division Director: Michelle Bonnet

Alaska Clean Water Actions (ACWA) Grant summary

SFY12 Grants provided for the following projects:

- Clean Boating on Big Lake (Cook Inlet Keeper)
- Goldstream Creek (UAF)
- Kenai River Water Quality Monitoring (Kenai Watershed Forum)
- Little Susitna River Conservation (Palmer Soil and Water Conservation Service)
- Mat-Su Stormwater Assessment (ARRI) – second year of project
- Pullen Creek Stormwater BMP Manual and Outreach (Taiya Inlet Watershed Council)
- Stream Temperature Monitoring Network – fourth year of data collection: Cook Inlet Keeper
- Stormwater Master Plan and Management Guidelines (City and Borough of Sitka)
- Water sampling in three water bodies (Chena River, Chena Slough, Noyes Slough) (Tanana Valley Watershed Association)

Full project descriptions are found at:

http://dec.alaska.gov/water/acwa/pdfs/fy11_ACWA_Grants_Awarded.pdf

Additional funding has been secured from Sustainable Salmon funding for a “Fuel out Fish on” campaign.

Integrated Report

Solicitation for water quality information occurred in August – September, 2011. In the process of preparing a draft report. Noyes Slough TMDL completed; TMDL for Big Lake anticipated in late 2012/early 2013.

AKMAP

SFY11 & 12 the following marine and freshwater field surveys were done:

- Chukchi Sea Coastal Impact Assistance Program (CIAP)
 - August 2010 Pt Hope to Pt Lay stations sampled.
 - September 2011 Pt Lay to Barrow stations sampled.
- EPA National Aquatic Resource survey
 - Field survey completed in National Petroleum Reserve-Alaska Summer 2011.

Additional information can be found at :

<http://www.dec.state.ak.us/water/wqsar/monitoring/AKMAP.htm>



CHENA RIVER LAKES FLOOD CONTROL PROJECT

- No flood operations in WY2011
- Lidar Mapping for FNSB Complete
 - Data available through GINA (UAF)
 - Data delivered to USGS 'CLICK' and FNSB. We are working to get the data into the NED.
- Major dam modification studies began in the Fall 2010 (2-3 year study).
 - Probable Maximum Precipitation Re-Analysis (COMPLETE)
 - Floodway 2-D AdH Hydraulic Model (COMPLETE)
 - 1-D and 2-D dam break modeling/Mapping (FALL 2011)
 - HEC-HMS Watershed Model Upgrade and PMF Re-analysis (FALL 2011)
 - Comprehensive Dam Modification Report (TBD)
- Complete Remote DCP upgrade to GOES telemetry. USACE no longer using Meteorburst communications
- Contract to have a GOES LRGS earth station installed at the District office in Fall 2011

STUDIES & PROJECTS

- **Whittier Hydropower (Complete)**
 - 5 sites investigated for small hydropower
 - No sites recommended for further evaluation
- **General Hydropower Investigation:** GIS based database now available for download at: <http://akenergyinventory.org/>. On the left side of the screen is a table of AEDI Publications. Click on HYD which links to the energy resources data page and our cooperative Hydroelectric Power datasets. USACE deliverable is the Google Earth dataset which hyperlinks back to the hydropower report; "pubs" is a hyperlinked listing of all 409 reports by type and year. Also available in shapefile format and published on the AKDNR Alaska Mapper.
- **Cook Inlet:**
 - Additional hydrodynamic modeling using recent bathymetric survey data for KABATA and USACE (Complete - Fall 2011).
 - Additional sedimentation modeling for the Port of Anchorage beginning (2011-2012)
 - Bi weekly suspended data collection ongoing since Fall of 2006 at the Port of Anchorage.

- **Lowell Creek Tunnel (Seward)**
USACE currently has maintenance responsibility of the Lowell Creek Tunnel. The Alaska District is currently reviewing the safety of the Lowell Creek Tunnel project. This will include a risk assessment of the project and 2D hydraulic modeling of areas downstream from Lowell Creek. (FALL 2011)
- **Seward Area Study**
The purpose of the Seward Planning Assistance to States report is to provide a holistic review and analysis of flooding issues in the Seward area. (FALL 2011)
- **Black Lake Ecosystem Restoration**
 - 2011 work:
 - Sediment coring of Black Lake with Northern Arizona University and USGS/AVO
 - Cross section and bathymetric surveying
 - USGS lake water surface elevation monitoring (Ends Fall 2012)
- **Matanuska Watershed Study:** Watershed study initiated with several ongoing initiatives.
 - Wide area Lidar coverage delayed, but still in progress. (USGS - Lead, MatSu Borough, COE and others)
 - A wetlands map has been created for the Mat-Su Watershed.
<http://CookInletWetlands.info/default.html>
 - A functional assessment is being conducted for the mapped area. This assessment will be at the watershed level tied to GIS variables and not a data sheet for on-site assessments. The first draft should be complete by the end of December, 2011.
- **Shaktoolik:** Coastal flood hazard determination, work based on the previous storm surge and wave hindcasts for western Alaska. The final technical report and maps are in the process of being published.
- **Unalakleet**
Rock revetment continuation funded to protect the spit at the river mouth. Construction expected in 2012-3.
- **Other Current Studies:** Elim (Small Boat Harbor), Golovin (Storm Damage Reduction), Savoonga (Navigation)
- **Denali Commission Mooring Points** – A total of 48 mooring points in nine communities were installed. In addition, the design for addition moorings in 18 more communities on the Kuskokwim River and other areas of the state were completed. The Corps has also been working on designs for three barge landing

improves (Eek, Nondalton, and Perryville) and two harbor improvements (Seldovia and Bethel) for communities throughout the state.

- **Potential Upcoming Projects:** Kivalina Relocation, Yakutat Watershed Study

FY11 FUNDED STREAM GAGES (14 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 Gages:

- Black Lake Stage (Funded through WY2012)

Gages Dropped for 2011: Whittier Creek (Project funded through WY2011)

2011 Alaska District Construction Projects: Port of Anchorage, Unalaska Harbor, Douglas Harbor and Akutan Harbor. Construction of Barge Moorings for Denali Commision in the Lower Yukon region (7 villages).



Cook Inlet Habitat Conservation Strategy

A Regional Initiative Supporting the NOAA Fisheries Habitat Blueprint

NOAA Fisheries' Alaska Region, Alaska Fisheries Science Center, and the Restoration Center will initiate a new strategy to conserve habitats for living marine resources in Cook Inlet. The strategy will integrate and expand upon existing efforts by the agency to conduct research in Cook Inlet, consult with regulatory agencies on potential habitat threats, and work with other government agencies and private sector partners to promote sustainable development and uses of Cook Inlet's marine resources.

Cook Inlet supports a diverse array of marine fish, anadromous fish, and marine mammals, including an endangered population of beluga whales. The inlet adjoins Alaska's largest and fastest growing human population centers: Anchorage and the Matanuska-Susitna valley. It includes Alaska's largest commercial port, substantial oil and gas development, and commercial fishing, and is linked to major recreational and subsistence fishing opportunities (especially on the Kenai Peninsula) – all of which are critical factors in Alaska's economy. Marine habitats in Cook Inlet are relatively healthy and intact, yet face mounting pressure from activities including port expansion, bridge construction, large mine development, potential hydrokinetic energy generation, and water quality effects from urban areas.

A variety of agencies and non-governmental organizations are involved in science and resource management related to Cook Inlet. Through this initiative, NOAA Fisheries will collaborate with these partners to improve the understanding and management of Cook Inlet's marine habitats in the context of continued economic development and sustainable use of marine resources. Components of the strategy will include:

- Improve scientific understanding of Cook Inlet marine resources and habitat conditions through expanded biological surveys by the Alaska Fisheries Science Center and partners and new predictive modeling to link habitat attributes to fish species or assemblages.
- Identify habitat areas and functions of greatest concern for supporting fish and marine mammals.
- Provide better coordinated consultative services to regulatory agencies and developers under the Endangered Species Act and Magnuson-Stevens Fishery Conservation and Management Act.
- Ensure that oil spill response and restoration planning fully accounts for habitats of concern.
- Increase collaboration amongst federal, state, and local agencies to address habitat threats.



- Develop a marine invasive species monitoring program focused on Cook Inlet.
- Encourage existing watershed groups and partnerships to place greater emphasis on effects to Cook Inlet and ways to support habitat conservation for Cook Inlet (e.g., Matanuska Susitna Basin Salmon Habitat Partnership, Salmon in the City, Anchorage Waterways Council, Kenai Peninsula Fish Habitat Partnership, and Southwest Alaska Salmon Habitat Partnership).
- Investigate possible new private sector partnerships to promote Cook Inlet habitat conservation.

The strategy is a new effort to coordinate and integrate NOAA Fisheries' habitat-related science and management activities. By tying these activities together and focusing on an important geographic region, NOAA Fisheries will be able to deliver a more cohesive and effective suite of products and services to promote long term habitat conservation for fish and marine mammals, adding value to related efforts being undertaken by other government agencies and the private sector. The strategy will focus on Cook Inlet itself but will also address activities in the watershed that affect living marine resources and their habitats in Cook Inlet.

NMFS Habitat Conservation Division Hydroelectric Project Consultations

FERC Consultations

HCD staff continues to provide guidance to hydropower developers to minimize adverse impacts to salmon and their habitats. Staff is actively involved in monitoring the progress of existing and new projects, mostly consisting of lake-taps or siphons diverting water from a natural lake into a penstock or tunnel. Several proposed projects entered the study plan phase in 2011, and HCD staff advised the applicants on methods to assess impacts on hydrology and stream and estuarine habitats. HCD staff also participated in the Federal Energy Regulatory Commission's (FERC) licensing process for proposed traditional dam projects and hydrokinetic energy projects. Several existing projects are submitting FERC license applications and amendments. In addition to providing guidance on new hydropower projects that are going through the FERC process we also consult with projected developers through Essential Fish Habitat consultation on non-FERC projects. Staff have made recommendations to reduced the affects that new hydroelectric projects would have on anadromous and marine habitats, Including instream environmental flow requirements, passage requirements, and alteration of project structure and operation to limit effects on anadromous fish.

HCD staff are working with state and federal agencies on pre-licensing discussions on the proposed Susitna-Watana Hydroelectric project. A notice of intent and preliminary application document is expected by the end of the year; current discussions have revolved around data gaps, pre-licensing study plans, and the licensing processes.



NOAA-Fisheries Alaska Region Habitat Conservation has a new webpage available to discuss hydroelectric project consultation, our role in the Federal Power Act, existing projects, resources, and our letters. The goal of the webpage is to help collaboration of state and federal agencies in review of proposed projects and to serve as a communication aid with NOAA-Fisheries nationally.

The screenshot shows the NOAA Fisheries Alaska Regional Office website. The header includes the NOAA logo, 'NOAA Fisheries', 'NATIONAL MARINE FISHERIES SERVICE', and 'ALASKA REGIONAL OFFICE'. A search bar is located in the top right corner. The main content area is titled 'Habitat Conservation Division - Hydropower Program' and features a sub-header 'HYDROPOWER AND HYDROKINETIC PROJECT REVIEW'. A map of Alaska is displayed, with various regions highlighted in different colors (blue, green, yellow, orange) to indicate project locations. Text on the page explains that Alaska is in a unique position relative to other regions due to its robust fish stocks and diverse marine mammals. It describes the review process involving NMFS, FERC, and the State of Alaska. A link is provided to view a larger version of the map. Below the map, there is a section titled 'PROJECTS IN ALASKA' with sub-sections for 'Traditional Hydropower' (listing 'Lake taps and dams') and 'Hydrokinetic' (listing 'Tidal, In-river and Wave').

<http://www.fakr.noaa.gov/habitat/hydro/>



Grant Creek, Kenai Peninsula, Two-Dimensional Hydraulic/Habitat Data Collection

In September and early October I was able to participate in a data collection and training on two-dimensional hydraulic/habitat modeling of Grant Creek, a tributary of the Kenai River. Grant Creek starts at Grant Lake, which recently Homer Electric Association just submitted a second preliminary application document. The field study was lead by the USGS Fort Collins Science Center Aquatic Systems team, and the training/study was funded by the U.S. Fish and Wildlife Service, additionally Alaska Department of Fish and Game staff participated in the study, a study report is expected in the next year.



Magnuson-Stevens Fishery Conservation and Management Act

Essential Fish Habitat

Most consultations done by Habitat Conservation staff in Alaska are related to the Magnuson-Stevens Fishery Conservation and Management Act. This act requires Federal agencies to consult with NMFS regarding any action they authorize, fund, or undertake that may adversely affect EFH, and NMFS must provide conservation recommendations to federal and state agencies regarding any action that would adversely affect EFH.

More information about Essential Fish Habitat can be found at: <http://www.fakr.noaa.gov/habitat/efh.htm>

Examples include mining (Chuitna Coal mine), ports, airports, roads, etc. A couple recent airport examples that may be of interest to this group include:

Nome Airport Runway Extension

The Alaska Department of Transportation and Public Facilities (ADOT&PF), in cooperation with the Federal Aviation Administration, is proposing to realign as part of the Nome Airport Runway Safety Area Expansion Project. The reach of the Snake River which ADOT &PF proposes to move is heavily impacted by historic mining. The morphology of this reach will require decades to develop and to re-establish complexity, which will primarily be accomplished from slump blocks sliding into the channel. The suggestions we made include instream features in the design of the Snake River realignment that would increase holding and rearing areas in a reach that is currently primarily a migration reach with little velocity diversity; we also suggested the use of the current channel location as an engineered slough to provide juvenile salmonid refugia.

Wasilla Seaplane Base

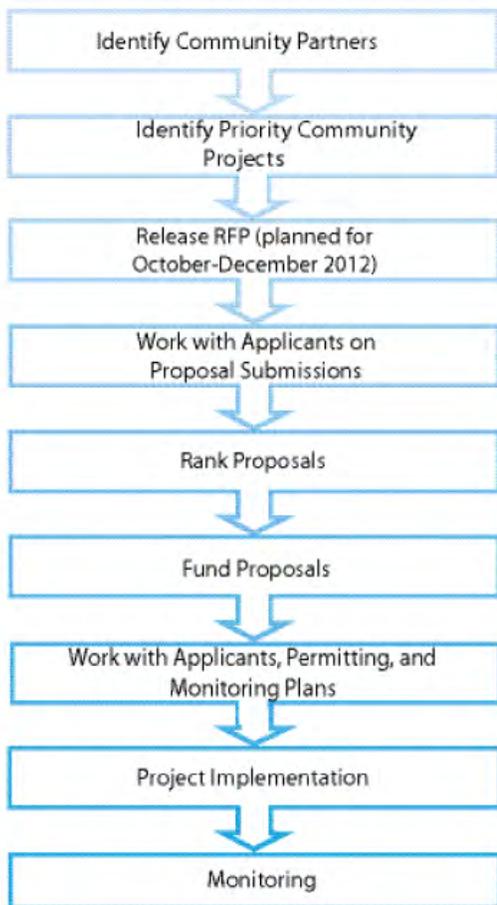
The city of Wasilla is proposing a 141-acre impoundment of Lucille Creek to create a seaplane base adjacent to the municipal airport in Wasilla. This project will require channel realignment, fish passage, and spill planning. Staff attended an initial site visit last week.



NOAA Restoration Center

Funding Opportunity for Communities Affected by Exxon Valdez Spill

The NOAA Restoration Center is working with communities to address water quality issues in the following areas: harbors, storm water, and waste water. We are researching past work and plans and will be developing a list of projects that will yield improvements in water quality for marine and freshwater systems. To do this, NOAA is looking for interested community groups, municipalities, harbors, state agencies, and other organizations to work within each community. NOAA will then work with these groups to gain an understanding of current planning and regulations.



In 2012 NOAA will release a request for proposals (RFP). Communities can apply to the RFP to obtain funding for their identified priority projects. Participation in

the initial groups is not mandatory for eligibility to apply, but ranking criteria for proposals will use priorities identified in these working groups. Thus participation early on will enable influence on the ranking criteria. Funding opportunities will be in the range of \$250,000-\$300,000 for 2013, 2014 and 2015. Communities may apply for funding in phases but funding of the first phase of a project does not guarantee funding for the following phases. Funding duration for each RFP is for two years until project completion, although monitoring may extend beyond. Applicants are free to apply for all three years of funding even if currently funded. NOAA will be available to assist in planning, proposal development, permitting, and execution of the project.

NOAA is interested to hear from the communities on what types of projects might work in their harbors and communities, examples of these programs may include but are not limited to:

- Creation of quick spill response kits for harbor dock spaces
- Bilge sock giveaway program
- Overhaul and revamp of disposal area for hazardous materials
- Clean-up of improperly disposed of batteries and debris in harbors
- Boater education program
- Harbormaster training program
- New/improved plastics recycling stations for vessel waste
- Waste transportation/recycling plans
- Improvement of storm water management plans
- Improvement of wastewater management plans
- Vegetative buffer installation
- Oily/grit separator installation
- Snow removal management
- Assistance in obtaining an industrial stormwater permit
- Home septic improvements

ARRA Project Status

Eyak Lake Restoration:

The Copper River Watershed Project (CRWP) will provide significant ecological impacts to the area, including benefits to important salmon spawning, rearing and wintering habitat by addressing several key habitats in Eyak Lake, a 2400-acre shallow lake in Cordova, AK. It will also improve water quality in Eyak Lake through implementing an oil and grit separator at the Lake's major storm water out fall as well as constructing an associated wetland. These projects will support sockeye, coho, pink salmon and cutthroat trout. The project will remove barriers to fish passage and improve spawning and rearing habitat. In this project 2,400 acres of lake habitat will be improved and 1 mile of river habitat will be opened for fish passage.



In 2011 CRWP used ARRA funds to install an oil and grit separator at Nirvana Park, the former stormwater system spilled untreated into Eyak Lake in the vicinity of rearing and historic spawning habitat for sockeye.

Klawock Lagoon, Prince of Wales Island:

During 2011 NOAA Restoration Center worked with restoration partners to conduct a beach seining study on Klawock Lagoon to assess the baseline species assemblage. During the summer of 2011 the Klawock Road, that formed a barrier to a clear passage vector, was opened with culvert installation. Soon after passage was provided juvenile coho were documented passing through the culvert.





A crescent gunnel seined from Klawock Lagoon in April 2011.

Kenai Peninsula Salmon Habitat Restoration:

The Kenai Watershed Forum restored a straightened, ditched section of Daves Creek to a functioning natural stream channel. This project includes removal of five barriers to fish passage, and will benefit Chinook, coho, pink and sockeye. The restored habitat will contribute to healthy salmon stocks, and consequently, will benefit the fishery, fishers, and the local communities on the Kenai Peninsula. The impact of this restoration will be 11 acres restored and 11 miles of river opened to fish passage for anadromous species.

Other project

Fish America – NOAA RC

Twelve-mile Creek , Prince of Wales Island

The National Forest Foundation was awarded a NOAA Restoration CRP –Fish America Foundation grant, to conduct riparian and instream restoration on Twelve-mile Creek. Twelve-mile Creek has been heavily impacted by logging practices. Instream and riparian work will be completed in September 2012 and additional watershed restoration opportunities can and may be phased-in over the next 1-4 years as funding for each project component becomes available.

Upcoming Funding Opportunities

2011 Funding opportunities will include Community Based Restoration partnership grants with Trout Unlimited, FishAmerica, The Nature Conservancy.

NOAA Restoration Center funding opportunities are posted on our regional website:
<http://www.fakr.noaa.gov/habitat/restoration.htm>

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Interagency Hydrology Committee for Alaska
Fall 2011 National Park Service update

The Alaska Regional Office

Will host a meeting in early November with resource professionals throughout the region to identify issues, develop priorities and brainstorm solutions to address issues they face in the field and important knowledge gaps.

Regional and park staff have been providing information, professional reviews, and other support to EPA for their assessment of the Bristol Bay watershed.

Glacier Bay

Glacier Bay is working with USGS (Chris Zimmerman) and UAF (Amanda Rosenberger) researchers to develop an approach to analyze components of Dry Bay Preserve area zero check sockeye life history using otoliths, Sr/Ca levels, and diet. We hope to fund a graduate student to analyze previously collected juvenile sockeye salmon samples from both the East Alsek River and associated estuary.

USGS hydrologist Ed Neal and UAS professor Sonia Nagorski's project evaluating the effect of wetlands in methylating Hg (PMIS#139290) is wrapping up field sampling this season. Project results will likely be available within the next year.

NPS staff are nearing completion of a first season pilot study using DIDSON sonar for enumerating coho salmon escapement on the Bartlett River. Delayed NEPA compliance, equipment purchasing and delivery, and higher than normal streamflow during August have posed some challenges. However, the project is progressing well despite these challenges and we anticipate the first of 3 full data collection seasons beginning next August.

Kenai Fjords NP

KEFJ experienced three flooding events on the road to Exit Glacier as a result of Exit Creek changing its course.

University of Iowa graduate student Susan Kilgore, under the guidance of Dr. Frank Weirich, used ground penetrating radar to map the internal hydrology of Exit Glacier. Susan also monitored in-stream flow in one of the two channels of Exit Creek flowing directly from Exit Glacier's terminus.

The park completed another season of glacial lake outburst flood monitoring on Bear Glacier under the guidance of Dr. Andrew Wilcox from the University of Montana.

Denali NP

The park evaluated restoration efforts in the Kantishna area, especially of the state-listed impaired waterway at Slate Creek. Park and regional staff examined areas where some of the restoration/mitigation measures are beginning to fail.

The park has contracted with a consulting firm to evaluate mitigation measures and recommend actions to prevent erosion and overbank flow on the Toklat River from damaging park infrastructure. They will

also be evaluating possible actions to help restore a more natural flow regime to parts of the river that have been altered by park development and that are contributing to the ongoing problems.

The Southeast Alaska I&M Network

After a pilot season in 2010, continued its Freshwater Quality monitoring program. Water quality sondes were installed from May through September in the Salmon River at Glacier Bay NP and in the Indian River at Sitka NHP. Both of these sondes recorded hourly measurements of water temperature, conductivity, pH, and dissolved oxygen. A third sonde was installed in the Taiya River at Klondike Gold Rush NHP, which, in addition to the other listed parameters, is collecting turbidity measurement and will continue to record data through October.

The Network has finished a draft of the Freshwater Water Quality Monitoring Protocol, which is currently under review.

Sitka NHP has continued monitoring streamflow in the Indian River since 2007.

This winter, SEAN will be working with collaborators at UAF and UAS to continue development of a Freshwater Contaminants monitoring protocol.

Central Alaska Network stream monitoring program

Sampling for the stream monitoring program took place at 43 sites in Wrangell-St. Elias, Denali and Yukon-Charley Rivers.

Started a project with Jill Crossman and Paul Whitehead, hydrologists at Oxford University, to develop an integrated catchment model (INCA) for the Toklat River basin in Denali. We already had data on groundwater fluxes and nutrient chemistry and this summer we collected discharge data at 3 locations on the river, and developed a rating curve at the bridge. These data will be used to parameterize the model and test the effects of various future climate scenarios on basin hydrology and nutrient fluxes.

Got the Sutron datalogger/GOES transmitter for the USFWS Nabesna River gage purchased. This will be installed in March 2012 and real-time data will be available starting then. USFWS and NPS are working on a long-term maintenance plan for the station. The main challenge at this point is securing funding for logistics (helicopter time).

We have developed a workable though preliminary RIVPACS model for biological assessment of water quality. Incorporation of more data from NPS, USGS and EPA is underway and should result in a tool that can be used to assess water quality over a broad swath of interior and southern Alaska. We're hoping to have the model up and running within a year.

NATURAL RESOURCES CONSERVATION SERVICE AGENCY UPDATE
IHCA –September 26-27,2011 Anchorage, Alaska

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Emergency Watershed Protection

- City of McGrath – This is a levee repair and riprap armoring project. Phase 2 is another 1900 feet of levee repair and riprap bank armor similar to what was done in Phase 1 last year. This design is in process but not in a rush mode as given the state of the federal budget it is unlikely we will see funding come through for this project within the next 6 months or so.
- Gwichyaa Zhee Gwich'in Tribal Government and Crowley are sponsoring an EWP project in Fort Yukon. Funding has been procured for this project. Design is complete and project out for bid. Anticipate contract award approximately mid-April. 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. Construction planned for summer and fall 2011.
- Delta Clearwater Remediation—This project is to restore the partially completed construction site of the original Delta Clearwater Watershed Project. The original watershed project was only 20% complete back in 2001 when it became obvious the design concept was not going to address the original resource concerns. Extensive reconsideration of the design and planning process didn't reveal any acceptable design alternatives that were within the realm of funding reality. Therefore, the decision was made to restore the site to original conditions to minimize the existing negative environmental effects from the partially completed project which is eroding in its current state. The project is currently out for bid and construction will occur May-September 2011 and then again May-June 2012.

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 \$250,000 annually with an additional \$135,000 plus in reimbursable funds.

The following is brief summary of the summer work the Alaska Snow Survey/Water Supply Forecasting Program (SS/WSFP) completed for fiscal year 2011.

- We installed new SNOTEL sites and upgraded six automated sites to SNOTEL. The two SNOTEL sites are Exit Glacier and American Creek (near Eagle). The six automated sites to SNOTEL are: Rhoads Creek (SE of Delta Jct.), Kelly Station (Noatak River), Bettles, Sagwon (60 miles south of Deadhorse), Prudhoe Bay, and Moore Creek (N of Skagway). The McNeil River Camp site installation was delayed due to bad weather the week it was scheduled. It is rescheduled to be installed the 1st week of June 2011.
- Fifty new Iridium telemetry modems (called Globalmodems) were installed this past year beginning October 15, 2010 with the Point MacKenzie SNOTEL site and finishing up with the Grandview SNOTEL site (located between Portage and Moose Pass on the railroad SE of Anchorage) on October

6, 2011. The switchover was originally estimated to require two years to implement so it was completed one full year ahead of schedule. The hardware for Iridium is about 1/3 the cost and the power consumption is about 1/4 the requirement of meteorburst. The annual data throughput expense will vary depending on how many sensors are at a particular site, ranging from \$300 to \$650 per site per year. In the first ten years of operation it is estimated that the upgraded communications will save NRCS \$1,000,000 in Alaska. The Meteorburst master station is scheduled to be turned off in the 2nd Quarter of FY2012 having been operational since 1977.

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 62 SNOTEL sites. The 62 SNOTEL sites in Alaska report by the following means: 50 sites reporting via Iridium, there are 9 cooperator sites (COE-6, NWS-3) on the GOES (Geostationary Operational Environmental Satellite) system and 3 cooperator sites on the Starband (private satellite communication system that supports a web camera) system. These are funded through reimbursable agreements and are on a different communication system at the direct request of the cooperator paying the bills for each site. The climate data being transmitted from the SNOTEL sites varies, but may include the following sensors: snow water content, precipitation (rain and snow), snow depth, air temperature (current, maximum, minimum and average), solar radiation, relative humidity, wind speed and direction, soil moisture/soil temperature at 3 depths (2"-5cm, 8"-20cm, 20"-50cm), and barometric pressure.

With four additional sites receiving soil probes this year, there are now 26 SNOTEL sites reporting the soil moisture/soil temperature data.

From this data, we generate 129 volume stream flow forecasts and snowmelt runoff indices.

NOAA NWS Agency Report

Presented by

Scott Lindsey

Service Coordination Hydrologist

National Weather Service

Alaska-Pacific River Forecast Center (APRFC)

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

October 2011

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Operations/Flooding

With the exception of the middle Kuskokwim, breakup was very mild with minor flooding at Kobuk and Buckland. However, as breakup progressed down the Kuskokwim, an ice jam formed that caused flooding in Red Devil and record flooding in Crooked Creek. One potential contributing factor might be an unusual heavy rainfall and warm temperature event in November that initiated the breakup process on the Kuskokwim River. This resulted in jumbled ice that refroze downstream of the village of Crooked Creek between Aniak and Napaimute. Many of the homes in the village were destroyed and some residents were evacuated by helicopter to nearby Donlin Creek Mine. A tremendous amount of afeis accumulated on the Gakona River at Gakona Junction, but the slow gradual warmup this spring along with the low snowpack in the upper Copper River basin resulted in no flooding at Gakona. During breakup, water levels on the Porcupine reached very high levels from the snowmelt peak, but the low population along the river kept damages to a minimum. A previously unknown glacier dammed lake released into the Mendenhall River near Juneau in mid-July. This led to the 2nd highest stage on record on both the Mendenhall River and on Mendenhall Lake. Heavy rainfall in early September led to the 2nd highest stage on record for the Stikine River near Wrangell.

The RFC will gain one staff member this fall as reallocation of positions in the NWS Alaska region will allow the hiring of a full-time IT position. This position will likely be open by the end of October. There will also be a Senior Service Hydrologist position at the Juneau Weather Forecast Office, which hopefully will open by the end of October.

River/Rain Gauge Network

We added river observers on the upper Kandik River and also on the Porcupine River at the mouth of the Colleen. We plan to deploy a new automated gage on Jordan Creek in collaboration with the Juneau Watershed Council. The USGS has recently installed several automated gages in the Susitna River Basin which we will try to incorporate in our hydrologic model this winter.

Climate Reference Network

The Alaska CRN currently has sites in Barrow, Fairbanks, Port Alsworth, Sand Point, Sitka, and St. Paul. Two new Alaska USCRN sites at Red Dog Mine and Kenai were installed this past summer. Two sites installed in 2009 at Port Alsworth and Sand Point became the first fully commissioned stations in the Alaska USCRN. Barrow, Fairbanks, Sitka, and St. Paul Island continue to operate as experimental USCRN sites, bringing the total of operational stations in Alaska to eight. Installation of a new CRN site 70 miles SE of Tok occurred on

the Tetlin Wildlife Refuge. Preparations for a station near Gustavus on the Gustavus Forelands Reserve proceeded, but weather prevented installation this year. A list of all USCRN stations can be found at: <http://www.ncdc.noaa.gov/isis/stationlist?networkid=1>.

The USCRN Program continues to work on permit issues for sites at Yakutat Airport and Summit Airstrip. Site surveys occurred at Annette Island, Cordova, various locations in the upper Copper River basin, Deadhorse and southwest Alaska SW of King Salmon (Becharof NWR?). Annette will likely be installed next summer with the other installation pending based on permit issues and funding.

Projects

The development season over the past 2 years has been dominated by the installation and configuration of our new operating environment called Community Hydrologic Prediction System (CHPS). The migration of our old forecast system into CHPS is complete and the RFC officially became operational on CHPS in early August. The new operating environment will allow us to access other hydrologic models and to add new models easily. The other major change in our operational hydrologic forecast process is that in the past we derived mean areal precipitation and temperature forcings from point observations. Now our forecast process begins with producing gridded observed and forecast temperature and precipitation that we then average into basin and subbasin inputs to the hydrologic model. We have begun a collaborative effort with UAF to ingest MODIS data into CHPS as a proxy for areal extent of snow cover observations. CHPS/FEWS is running on UAF's computer system enabling a PhD candidate there to test the ingest of satellite data into the system.

NOHRSC Activities for Alaska

The airborne snow water equivalent program started April 6, 2011 and collected 166 flightlines out of 294 (56%) and ended on April 27th. SWE flightline data for 2011 is available at: http://www.nohrsc.noaa.gov/snowsurvey/gamma_surveys/2011svy10.html. 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 were running two land surface models, NOAH and CLM2, at 0.01° resolution, both of which model snowpack and soil conditions. The model ran operationally this past winter, 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. The River Forecast Center is ingesting modeled snow water equivalent grids in Grib2 format into CHPS for comparison with the snow modeling from calibrated NWS models.

Precipitation Frequency Project For Alaska

This project is scheduled to be completed by the end of calendar year 2011. A presentation will be made by Sanja Perica and Geoff Bonnin from the NWS Office of Hydrologic Development as part of this year's IHCA meeting.

National Water Center

The National Water Center (NWC) continues to move forward. A bid was awarded for the construction of the building this summer, groundbreaking is planned for January 2012, and completion is estimated for the Spring of 2013. The vision is that this facility will combine operations, operational support, and research and development in water resources. The building is planned to be completed by November, 2013. The NWC will leverage the on-going Integrated Water Resources Science and Services (IWRSS) initiative to engage Federal water agencies. The USGS has committed to dedicating staff to the Center and the USACOE has also expressed interest. The primary purpose of the center will be to provide national guidance and to support the transition of our River Forecast Centers into Water Resource Centers. See powerpoint for more details.

Flood Safety Awareness Week

APRFC will be shifting the dates again this spring from March to late April. The Alaska Flood Safety Awareness Week will be April 23-27, 2012. The National Flood Safety Awareness Week webpage can be found at <http://www.weather.gov/floodsafety/>.

Weather Ready Nation

The National Weather Service is promoting the idea of a "**Weather Ready Nation**." The dialog engages stakeholders in assessing why the nation is experiencing such extreme impacts in 2011. Hurricane Irene became the tenth billion-dollar plus disaster, breaking the nation's yearly record and this year has been the

deadliest tornado year in more than 60 years. The goal of the dialog is ultimately to support the mission of the weather service by reducing risk and increasing community resilience for future extreme events.

The dialogue will kick off with a partner workshop/symposium scheduled for December 2011, in Norman, Okla. The participants will identify, prioritize, and set in motion actions to improve the nation's resiliency against severe weather, especially tornadoes. The participants will suggest and evaluate opportunities for improving four key areas:

- User-Driven Impact-Based Forecasts/Warnings;
- Linkages between Science and Service;
- Weather Enterprise (government, media, and commercial forecasters) Service Delivery (to emergency managers, businesses, farmers, etc.);
- Community Planning and Impacts Mitigation.

This is just the beginning. Weather-Ready Nation is a strategic alignment that starts with a vision and ends with actions by individuals and communities to save lives and livelihoods. The path, although conceptually clear, is not free of obstacles. Evolving NWS into an age of instant, transactional communication while managing budgets, growing a culture of innovation and sustaining high-impact services is an ambitious vision.

What does it mean to be Weather Ready in Alaska?

Being **Weather Ready** in Alaska means being prepared for weather and other environmental events that can happen both in and outside Alaska. The National Weather Service issues forecasts and warnings for weather, tsunami and volcanic ash events to inform the public and provide critical decision support services to emergency managers. It also means providing information to climate scientists who determine the effects of weather over time and the impacts of climate change.



Figure 1: Rendition of the National Water Center

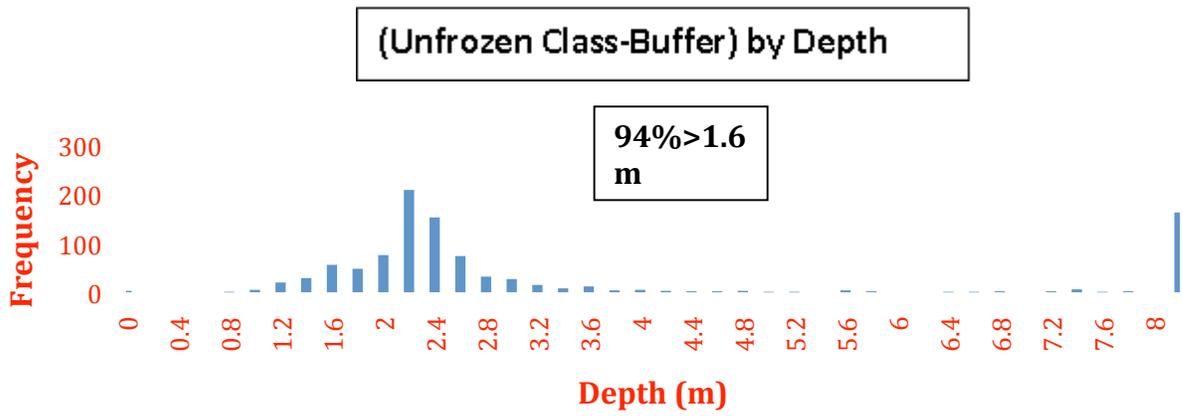
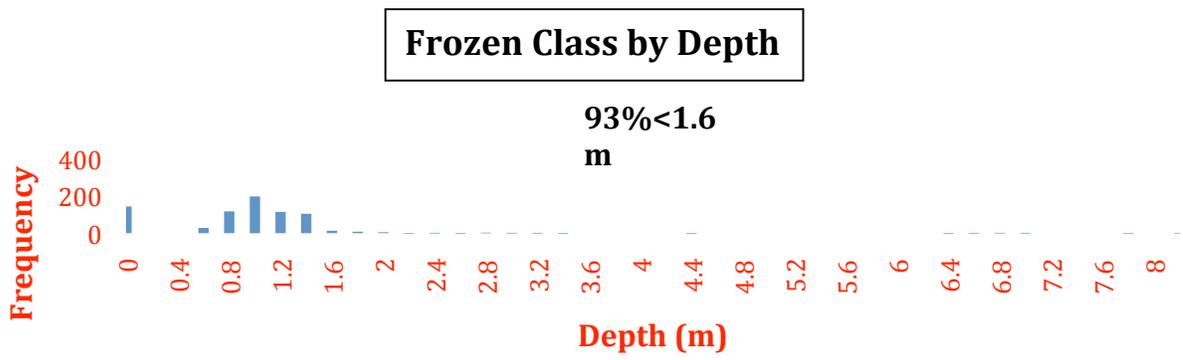
Interagency Hydrology Committee for Alaska Report
University of Alaska Fairbanks: Compiled and Presented by Jessica Cherry
26 October, 2011

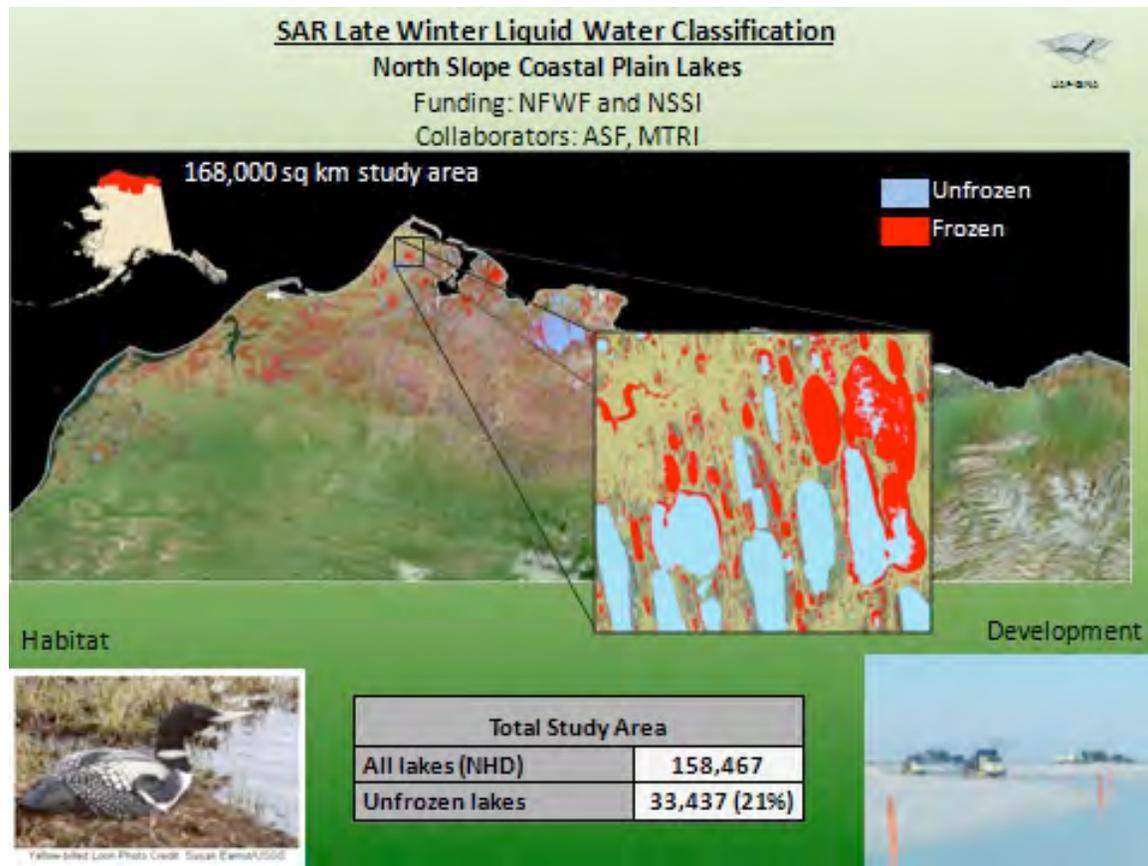
Next Generation Ecosystems Experiment (NGEE) – UAF (Hinzman, Romanovsky, Bolton, Cable, Liljedahl, Busey, Cherry, et al.) and multiple DOE labs

The new decade-long NGEE project will quantify the complex physical, chemical, and biological behavior of terrestrial ecosystems in Alaska. The project will focus on interactions that drive ecosystem-climate feedbacks through greenhouse gas fluxes and changes in surface energy balance associated with thawing permafrost and threshold-dominated permafrost degradation and thermokarst formation, and the many processes that arise as a result of these landscape dynamics. Research sites will be located along a bio-climatic gradient that spans tundra and shrub-tundra transition zones on the North Slope and Seward Peninsula. The ultimate deliverable of the NGEE project is a high-resolution terrestrial system model that is able to simulate coupled thermal, hydrological, geomorphic, biogeochemical, and vegetation processes as needed to predict the evolution of a warming Arctic landscape and its feedback to the global climate system. This vision includes field observations; laboratory experiments; modeling of critical and interrelated water, nitrogen, carbon, energy dynamics; and important interactions from the molecular to the landscape scale that drive feedbacks to the climate system.

North Slope Lakes SAR – Jess Grunblatt, GINA, NSSI

The North Slope coastal plain represents a unique landscape that is characterized by permafrost and an immense number of freshwater lakes of varying sizes and depths. During winter, lakes on the coastal plain typically freeze to a depth of about 2m. Synthetic aperture radar (SAR) has been used in a wide variety of local studies to identify liquid water beneath lake ice however no regional assessment of winter lakes had been performed for the North Slope. A total of 158,467 lakes were classified using SAR data for the 168,000 sq km North Slope coastal plain study area. Of these 33,437 (21%) contained some unfrozen area while 27,393 had greater than 20% of their total surface area classified as unfrozen. Bathymetric profile data were used for 2397 sample locations. Of the 752 locations that were classified as frozen, 93% of those locations were <1.6m and 96% were < 2m in depth. The unfrozen area of lakes was buffered inward 50m to account for potential unfrozen sediments, mixing and/or misregistration. The resulting unfrozen locations were classified 94% and 83% correctly for >1.6m and >2m depths.





Research at McCall Glacier, Arctic Alaska -- Matt Nolan

Research at McCall Glacier is aimed at understanding glacier-climate interactions and glacier-ecology interactions in Arctic Alaska. Research began here in 1957 and has been led by WERC faculty since 2002, creating the longest time-series of glacier observations of any glacier in the US Arctic. The site currently hosts about 40 mass balance and ice velocity stakes and 12 weather stations. In 2008, we extracted an ice core to bedrock, which we are analyzing to create a 300 year record of paleoclimate and atmospheric pollutant transport on an annual basis, using about 40 chemical proxies as well as pollen and other biological markers. McCall Glacier has been shrinking continuously over the past 130 years, at a rate that is accelerating with time. Analysis of digital elevation models we have created over the past 10 years of nearly all other US Arctic glaciers indicates that volume change at McCall Glacier is representative of trends throughout Arctic Alaska. In the eastern Arctic, where McCall Glacier is located, glacier meltwater and sediment production likely has a major influence on downstream ecology, and the loss of these glaciers, likely in the next 50 years if trends continue, may have significant influences on these ecosystems. For example, the mudflats on the deltas of these glaciated watersheds are larger in area than the mudflats of non-glaciated watersheds that are much larger but lacking in glaciers. These mudflats are composed of glacier silt and are rich in freshwater invertebrates, unlike unglaciated watersheds where most

mudflat invertebrates are salt-water species that get stranded during storm surges. Thus tens of thousands of migratory shorebirds use these glaciated deltas as feeding grounds each summer. When the glaciers disappear, so will the silt and freshwater that supports these invertebrates, potentially changing bird feeding-strategies. Similar scenarios exist for marine food-webs, fish ecology, and floodplain shrub ecology and herbivory in these watersheds. Our research at McCall Glacier now incorporates study of all of these elements.

Efforts related to Hydrokinetics, Hydraulics, and Sediment Transport

Toniolo, H., Duvoy, P., Vanlesberg, S. and Johnson, J. "Modeling and field measurements in support of the hydrokinetics resource assessment for the Tanana river at Nenana, Alaska". *Journal of Power and Energy*, Vol. 224 Issue A8 (2010), 1127 – 1140. – The article provides a comprehensive approach for resource assessment.

Johnson, J., Toniolo, H. and Seitz, A. "Hydrokinetics: the Alaskan way". *International Water Power & Dam Construction*, July issue (2011), 38 – 41. – It is a summary of current research efforts and issues related to hydrokinetics in Alaska.

Duvoy, P. and Toniolo, H. "HYDROKAL: A module for in-stream resource assessment". *Computers & Geosciences* (2011) DOI: 10.1016/j.cageo.2011.06.016. -- The article describes a new numerical module capable of calculating power density and the location of maximum velocity and specific discharge along a river reach.

Walsh, C., Fochesatto, J. and Toniolo, H. "The importance of flow and turbulence characteristics for hydrokinetic energy development on the Tanana river at Nenana, Alaska". *Journal of Power and Energy* (2011) DOI: 10.1177/0957650911424025 -- The article is focused on the kinetic and turbulent energy partition.

Toniolo, H., Derry, J., Irving, K. and Schnabel, W. "Hydraulic and sedimentological characterization of a reach on the Anaktuvuk River, Alaska". *Journal of Hydraulic Engineering*, Vol. 136, No 11 (2010), 935 – 939. – The article provides a preliminary rating curve as well as a description of friction factors and sediment.

Impact of Groundwater Flow on Permafrost Degradation and Transportation Infrastructure Stability -- Margaret Darrow, Daniel Fortier, Ronald Daanen

The overall goal of this research is to develop a relationship among groundwater flow, permafrost degradation, and embankment stability. In particular we ask the question; does groundwater flow contribute to permafrost degradation? This project will focus on the development of the most basic computer model components to answer the question stated above for the Alaska Highway test

section where this research will be verified. The model we will develop is the cornerstone to understanding similar groundwater flow permafrost interactions elsewhere. This research will therefore yield a research tool that, with future positive testing results elsewhere, can be used to aid in highway embankment design strategies.

Fish Creek Watershed Hydrology -- Chris Arp, Matthew Whitman, Mark Wipfli, Ben Jones, Guido Grosse

This project is focused on collecting baseline hydrologic data for the Fish Creek watershed in the National Petroleum Reserve Alaska (NPR) in order to 1) evaluate future development lower in the watershed with respect to fish habitat and migration, and 2) understand hydrologic processes and interactions with lakes and permafrost in the context of climate change in the Arctic Coastal Plain. Thus, we have collected three years of streamflow, temperature, and water quality data at a set of catchments with varying levels of projected development from roads with drilling pads to no activity, including corresponding studies of fish communities and forage resources (Whitman et al. 2011 USGS-SIR). Analysis of the entire watershed encompasses mapping and classification of hydrographic features and comparison with basin runoff characteristics. Future work will continue this monitoring and seek to understand patterns of interannual variability (Arp et al. in review Arctic, Antarctic, and Alpine Research).

Funding: BLM, USFWS

Western and Arctic Alaska Lake Monitoring -- Chris Arp, Ben Jones, Guido Grosse, Ken Hinkel, Richard Beck, John Lenters, Simon Hook, Karen Frey, and several others

Ongoing work on monitoring lake temperature and water levels are providing much needed process understanding of lake physical behavior in the context of climate change and variability (Jones et al. 2009 Environmental Management, Arp et al. 2010 J. American Water Resources Assoc., Arp et al. 2011 Hydrological Processes). Two recently funded projects focused on lake monitoring in Arctic and Western Alaska will initiate in 2012 to provide more comprehensive data collection by coupling in situ lake monitoring with remote sensing analysis.

Funding: NSF, USFWS

Anupma Prakash & Doug Kane & Javier Fochesatto

The most relevant work for the Hydrology community is our NASA EPSCoR project on ET mapping. All details are provided at <http://www.et.alaska.edu/>

This October we have installed two 85 ft tall flux towers (1) in the UAF north campus and (2) in Caribou Poker Creek.

The unique thing about the UAF tower is that it is accompanied by another set of towers that have a Large Aperture Scintillometer (LAS) units mounted on them that measure area averaged flux for about a 1km footprint.

The Caribou Creek flux towers do not have a LAS measurement accompanying them, but they I believe are the only flux towers in interior Alaska that are placed in Birch-aspen setting.

Umiat Corridor Monitoring Activities – Bill Schnabel, Doug Kane, and others

WERC continues to manage a monitoring program associated with ADOT&PF's Foothills West transportation corridor design. Activities include stream gauge and discharge measurements on the Anaktuvuk, Chandler, and Itkillik rivers, as well as meteorological monitoring, snow surveys, etc., within those watersheds. Data reports, real-time monitoring data, and project images are located at:

<http://ine.uaf.edu/werc/projects/foothills/foothills.html>



Figure 1: Measuring discharge on the Itkillik River, May 2011

Water Quality at Community Solids Waste Sites – Bill Schnabel

WERC is collaborating with the EPA Regional Applied Research Effort (RARE) program and the Rural Alaska Community Action Program (RurAL CAP) to evaluate water quality proximal to solid waste sites in five rural Alaska communities. Samples have been collected during the ice-free season over a three-year period and analyzed for fecal indicator bacteria, metals, and a suite of organic constituents including hydrocarbons and pharmaceuticals. Field work is now completed, sample analysis is underway, and results are anticipated in 2012.

The North Slope Decision Support System – Bill Schnabel, Amy Tidwell

The NSDSS is a cyberinfrastructure project intended to support water use decisions associated with ice road planning, is nearing completion. This DOE-funded project has held three stakeholder workshops, and has produced a working model of the decision support tool. Project participants are now completing a case study based upon the results of the last workshop. A project overview is presented at the following url: <http://nsdss.ine.uaf.edu/index.html>. The tool itself, viewable via Microsoft Silverlight, is available at <http://nsdss.net/>

Micro Hydro Prototype and Feasibility – Jessica Cherry and Rui Han

Han, R. (Electrical Engineering Masters Thesis), 2011. “Design Of a Micro-Hydrokinetic System In Distributed Power Generation.”



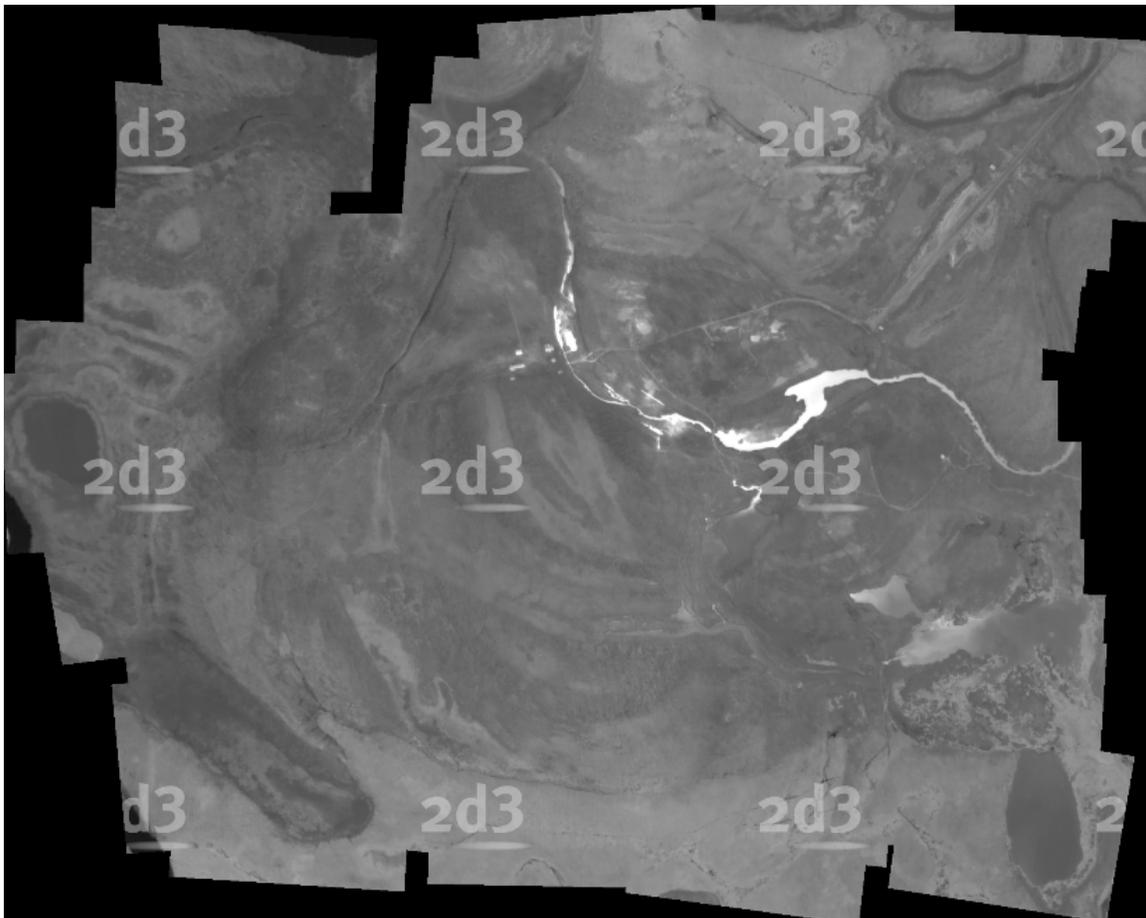
Data Rescue and Inventory of Hydrology-Related Data in Arctic Alaska – Jessica Cherry and Amy Jacobs

This project, funded by the Arctic Landscape Conservation Cooperative (LCC), has focused on gathering and performing an inventory and network analysis on hydrometeorological and related data from the Arctic LCC domain. Current project

status: winding down initial data collection and populating database. Working with LCC management to determine long-term stewardship of database. Beginning network analysis and recommendations report.

Development of airborne remote sensing packages for cold regions hydrologic research – Jessica Cherry, Anupma Prakash, Greg Walker, Tom Heinrichs, Buck Sharpton

Our group has developed packages for a small aircraft to sample water vapor isotopes and biogeochemical fluxes as well as optical photogrammetry, Synthetic Aperture Radar, Infrared, hyperspectral, and lidar. The following is an example of a mosaic of FLIR imaging of Pilgrim Hot Springs on the Seward Peninsula during the cold season and an oblique photo taken on the same flight. DOE is scoping hydropower development in this area near Nome.





Maintenance of long-term hydrometeorological stations – Jessica Cherry, Doug Kane and Bill Schnabel

North Slope and Seward Peninsula. Maintenance for funding continues to be ad hoc.

Total Precipitation Gauge (‘Hot Plate’) Experimental Network – Jessica Cherry

Network now includes Gilmore Trail/Fairbanks, Toolik, Atqasuk, Barrow. Funding is ad hoc and includes DOE and JAMSTEC. Co-installed sensors include Geonor precip gauge with double fence (NOAA CRN stations), snow particle counters, and snow depth sensors, as well as conventional weather stations.

Impacts of Climate Variability and Change on Hydropower in Alaska – Jessica Cherry, Sarah Trainor, Sue Walker

Report on Southeast Alaska is complete. Response from end users was very positive. We hope to repeat a similar analysis for the proposed Susitna-Wantana facility.

GOES-R Proving Ground – Jessica Cherry, Tom Heinrichs, Katrina Bennett, Gary Hufford, Scott Lindsey

The ‘hydrological’ portion of this project is developing new satellite-derived snow products. These are currently being generated using MODIS as a proxy for the next generation of geostationary and polar orbiting sensors. These products are then being used to drive hydrologic models. The effort is NESDIS funded.

USGS Alaska Science Center

Water Resources Office

2011 Fall Report

Streamgages

Currently we are operating 132 continuous record streamgages and 49 crest stage gages. Data for nearly all (126) streamgages are served on the web in near real time. Two streamgages were recently added: Susitna River at Sunshine (15292780) and Susitna River above Tsusena Creek near Chulitna (15291700). Water temperature records are being published for 23 sites with continuous record.

The following streamgages may be discontinued pending a final USGS budget:

15389100 Porcupine River 9.5 mi above mouth near Fort Yukon, AK
15452100 Beaver Creek above Victoria Creek near Beaver, AK
15452300 Beaver Creek near Michel Lake near Beaver, AK
15457800 Hess Creek near Livengood, AK

These streamgages were funded through a program targeted for elimination by Congress. Another program may pick up the funding for some or all of those streamgages.

On-going projects

Monitoring streambed scour at Alaska bridges: In cooperation with the Alaska Department of Transportation and Public Facilities (ADOT&PF), the USGS monitors streambed scour in real time at 19 bridges in Alaska. Bridge 339 on the Copper River continued to experience extraordinary scour this past summer and forced the closure of the Copper River Highway. A report (<http://pubs.usgs.gov/pp/1784/c/pp1784c.pdf>) on Bridge 339 was published in October 2011.

Describing water-quality conditions in National Parks: Water-quality data were collected from sites in Denali, Glacier Bay, and Lake Clark National Parks. In Denali National Park, sampling was focused on streams in historically mined drainages in the Kantishna Hills area of the Park. The report for this project has been completed but has not been posted online as of October. New work on the Toklat River in Denali National Park will examine the geomorphic aspects of the river in a reach where park infrastructure is threatened by erosion. In Wrangell-St. Elias National Park, streams along the McCarthy Road were examined for their physical, chemical, and biological characteristics that define baseline water-quality conditions. The final report for this study has been complete, but has not been posted online as of October. A study of mercury concentrations in water, sediment, and biological tissues from streams in Glacier Bay National Park was begun in 2010. A final report will be prepared in 2012.

Understanding groundwater availability and movement in the Matanuska-Susitna Valley: Field work continued in 2011 with additional work on water budgets including gaining a better understanding of evaporation from free water surfaces. Water quality sampling also was done this year to help gain an understanding of water sources. A preliminary groundwater flow model was constructed from water level data obtained in 2010.

Investigating affects of climate change on productivity in the Gulf of Alaska: The USGS watershed model, PRMS (Precipitation and Runoff Modeling System), was modified to account for changing glacier mass as part of this project. The model will now be run for the Copper River basin. The report dealing with the runoff, including glacier runoff, for the basin will be published in 2012.

Glaciers and climate in Alaska: The USGS Benchmark Glacier Monitoring Program continued collection of mass balance data at Gulkana and Wolverine Glaciers in 2011. Work at these glaciers allows additional research to be conducted with academic colleagues. Several papers on glaciology were coauthored this year and focused primarily on tidewater glaciers. Additionally, a USGS report (<http://pubs.usgs.gov/sir/2011/5046/>) on the mass balance of Gulkana Glacier was published this year.

StreamStats: StreamStats (<http://water.usgs.gov/osw/streamstats/>) is a web-based application that provides users with streamflow statistics and basin characteristics through a GIS. The application uses existing regression equations for determining streamflow statistics at ungaged sites. Our project, in conjunction with the Alaska Department of Natural Resources, is a pilot effort on the Cook Inlet Basin, rather than a statewide effort. As part of this 3-year project, new regression equations will be developed for this region.

Synthesizing hydrographs and streamflow statistics for the Susitna River: The Alaska Energy Authority is pursuing a hydroelectric project on the Susitna River and has expressed the need to understand historical flow conditions in the vicinity of the proposed project. To address this concern the USGS will estimate missing daily values and long-term summary streamflow statistics for streamgages in the Susitna River Basin with incomplete record over the period 1949 to 2010. Regression equations derived from overlapping streamflow records with index streamgages will be used to estimate daily hydrographs for continuous-record streamgages in the Susitna River Basin over this period, and summary statistics will be provided as for USGS Annual Water Data Reports. This project will be completed early in 2012.

Cooperative Water Program

The Cooperative Water Program (<http://water.usgs.gov/coop/>) is the largest single program within the USGS. Nationally, cooperators provide about 2.5 dollars for every dollar of Cooperative Water Program money. Beginning in federal fiscal year 2013 the program's funding model will be changed significantly. The current model distributes nearly all the funds to water science centers for matching with cooperators. After an agreement has been signed, the program takes back what is called the administrative matching funds or about 27 percent of the USGS funding to support the technical offices at headquarters. The new funding model will keep the administrative matching funds at headquarters rather than initially distributing them to the centers. As a consequence, there will be fewer USGS dollars available for matching with cooperators. Given the anticipated budget cuts, this will likely result in at least 30 percent fewer dollars (on the order of \$350,000) for matching with Alaska cooperators.

Water Workshop

In April 2011, a workshop was held to address the USGS needs for addressing hydrologic issues in Alaska, with a focus on the Arctic. Nearly 30 people attended with slightly less than half representing the USGS. Over the course of 2 days, the discussion addressed the gaps in our understanding of response of hydrologic systems in Alaska to climate change. All participants felt it was critical to maintain and preferably to expand the long-term monitoring of streamflow and glacier mass balance. The work conducted by the USGS National Research Program in the Yukon River Basin was endorsed for continued support. This work has been focused on the fate of carbon and water in landscapes where discontinuous permafrost appears to be thawing. The potential for post-doc positions for addressing specific short-term needs was discussed. Some areas that seem suitable for a post-doc include developing an approach to use remote sensing for estimating flows in ungaged basins and to better understand the groundwater flow in regions of discontinuous permafrost.

4. Within the limits of annual funding, seek to provide up to \$10,000 (Federal agencies) or \$7,500 (State agencies with matching funds) to USGS for completion of items 1-5 listed above.

The USGS will:

1. Provide an individual capable of providing assistance to Alaska and U.S. agencies for the editing the NHD and WBD
2. Ensure edits meet criteria as outlined in the Federal Standards and Procedures for the National WBD and NHD.
3. Incorporate all work into the National WBD and NHD.
4. Identify flags for updating the NHD and WBD.
5. Provide an annual report summarizing the process, statistics and results of the work.

III. Scope of Project:

Each year issues grow concerning the use of lands and resources throughout Alaska, including water, mining, subsistence, endangered species, and recreation. Resolving these issues is complex because of the diverse needs of users and of the biota that inhabit these lands. Resolution often requires studies to determine possible impacts, and these studies are often on geographic scales as small as a few acres to multiple watersheds and involve water as a key issue. Those seeking resolution of conflicting land and resource uses must accurately and consistently define watersheds or catchments.

The Watershed Boundary Dataset (WBD) for Alaska has been delineated to the 6th level at a 1:63,360 meter scale and selected areas of Alaska have been edited to finer resolution base reference information, if available, providing increased accuracy. Routed stream data for Alaska is complete and is available in the National Hydrologic Dataset (NHD). State and Federal agencies are downloading the NHD and WBD from the National websites and are making significant edits. There is a need for NHD/WBD stewardship assistance to help agencies with editing and posting the edits to the National websites. Proper stewardship of the datasets will help prevent the generation of multiple, differing copies of the datasets which would be specific to individual agencies and would be incompatible with datasets of neighboring agencies in the same watershed. Having statewide stewardship assistance provided by one statewide NHD/WBD Steward will be more cost effective than having this level of expertise in each agency, currently impractical under State and Federal budgets. This statewide NHD/WBD Steward will then work with agency representatives, agency stewards, and/or regional NHD/WBD technical stewards knowledgeable about WBD and NHD datasets to maintain statewide datasets of consistent integrity.

The U.S. Geological Survey (USGS) mission includes providing the nation with hydrologic information that can be used to better manage the nation's lands. Assistance to resource protection and management agencies relates directly to this goal. In addition, the stewardship assistance will maintain the integrity of the considerable investment recently expended by the Alaska and the United States Government to develop Alaska's NHD and WBD. This database will continue to house consistent and accurate attributes for watersheds all over the nation and will provide a basis for regional assessments of State and National water resources for the foreseeable future.

IV. Project Schedule and Milestones

Alaska State and Federal agency representatives are encouraged to sign this MOU prior to March 31, 2012

Agencies will seek to the necessary funding for an Alaska WBD/NHD Steward as soon as possible but no later than September 30, 2012.

USGS will work those agencies providing funding through individual or joint Interagency Agreements.

The maximum term for this MOU is for a 5-year period. It shall be affirmatively reviewed annually by the parties through an exchange of correspondence and coordination until the purposes of the MOU are jointly agreed upon.

Any amendments, revisions, addendums, extensions, or reaffirmations of the MOU must be in writing, approved and signed by all parties.

Modifications within the scope of this MOU shall be made by mutual consent of the participating agencies and the USGS by the issuance of a written modification, signed and dated by all parties, prior to any changes being performed.

An annual progress report will be provided by USGS detailing work accomplished.

The ability of the parties to carry out their responsibilities under this MOU is subject to their respective funding procedures and the availability of appropriated funds. Should parties encounter budgetary problems in the course of its respective internal procedures which may affect the activities to be carried out under this MOU, those parties will notify the other parties, in writing, in a timely manner.

An agency's involvement in this MOU may be terminated by signed parties upon 30 days written notice.

V. Authorities

This Interagency Agreement is entered into and under the authority of the Economy Act of June 30, 1932, as amended (47 Stat. 417; 31 U.S.C. 1535) and title 48 of the CFR; the Department of the Interior Appropriations Act, fiscal year 1981 (P.L. 96-514); and the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 *et seq.*) except sections 202 and 603 which are not applicable.

VI. Names and Phone Numbers of Contacts for Agencies Included in the MOU

(Agency)

Contact Name
Title
Address
_____, Alaska Phone: (907)
Fax:
Email:

(Agency)

Contact Name
Title
Address
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Fax:
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(Agency)

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(Agency)

Contact Name
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Email:

The USGS designates the following person as the Project Manager:

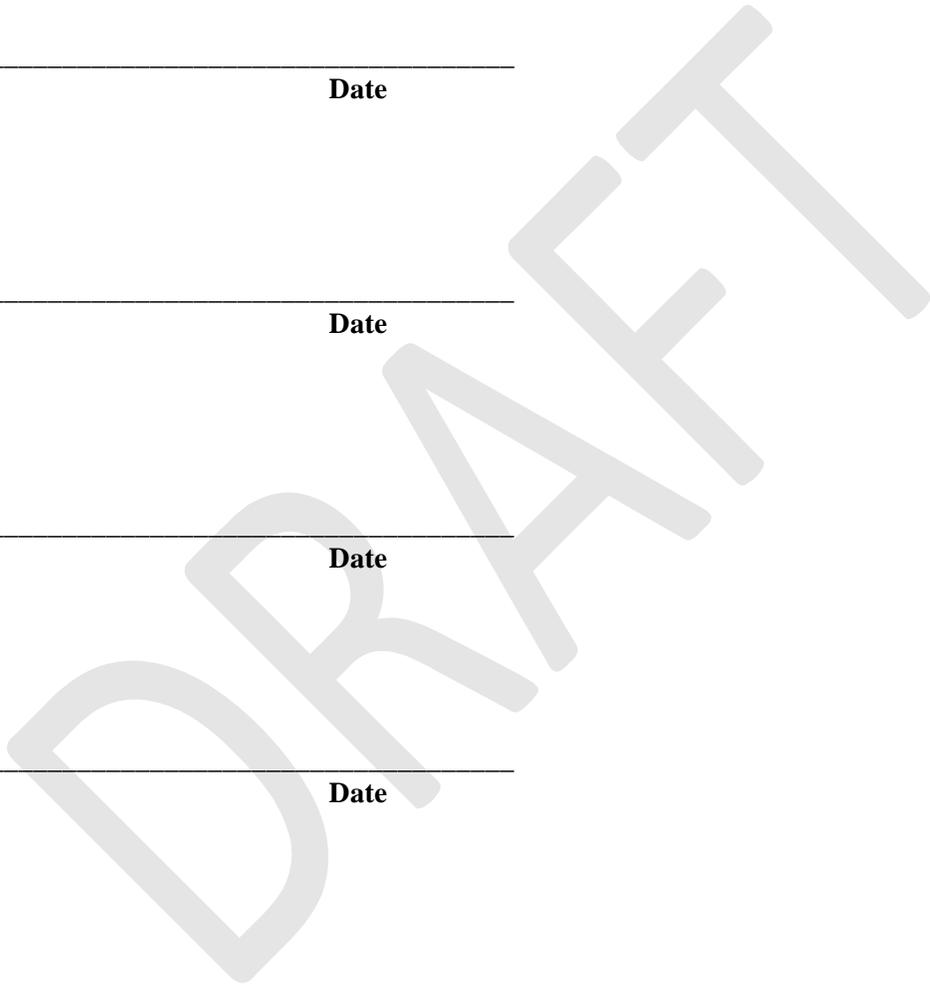
Karen Hanson (or Sheryl Boyack)
Physical Scientist
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The USGS designates the following person as the Contracting Contact for Interagency Agreements:

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Fax: 801-908-5001
E-mail: rjmiles@usgs.gov

VIII. Authorized Signatures

Agency **Date**



10/24/2011

All-Time Climate Extremes for AK

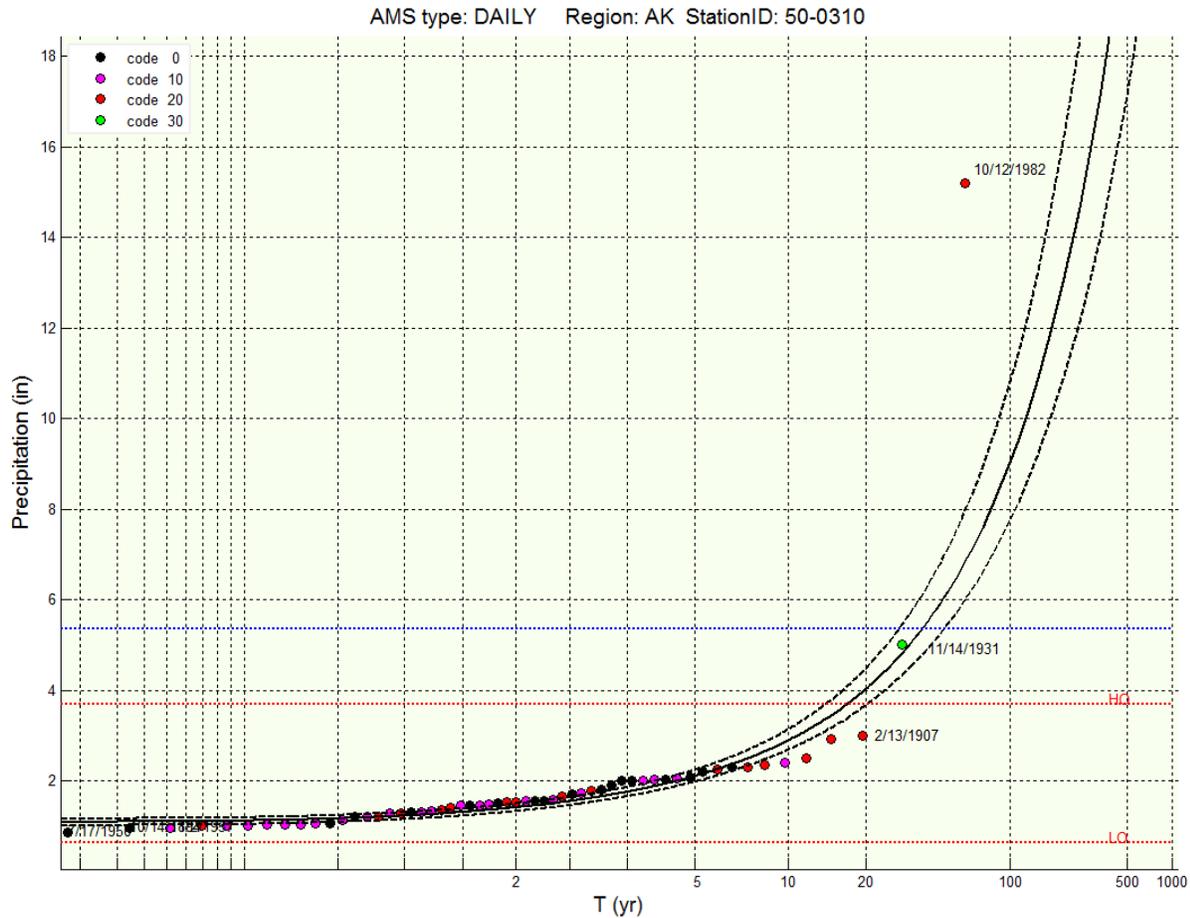


Variable	Location	Value	Date	Station ID	Status
24-hr Precipitation	Angoon	15.20 in.	October 12, 1982	500310	E
24-hr Snow Fall	Mile 47 Camp	78.0 in.	February 9, 1963	505878	N
Snow Depth	Valdez Municipal Airport	192 in.	March 7 & April 11, 2008	509685	N1
Maximum Temperature	Fort Yukon	100 °F	June 27, 1915	503175	E
Minimum Temperature	Prospect Creek Camp	-80 °F	January 23, 1971	507778	E
Special Notes for AK state climate records					
None.					

(Source: NCDC)

The 15.20 inch event noted to have occurred at Angoon on October 12, 1982 is the official and commonly documented 24-hr precipitation record for Alaska. This event is commonly mentioned in published works, such as in *Alaska's Weather, Volume 18, The Alaska Almanac: Facts about Alaska*, and *Climate of Alaska*. While a storm of this magnitude is possible in certain parts of Alaska, the location of where it did occur at Angoon makes this event highly improbable.

The magnitude of this event significantly departs from the overall trend of the data for this station, with the second highest event in the 1-day annual maximum series being only 3 inches. While the event occurred in 1982, there is no information about the storm itself or effects of flooding in the Angoon area from this event. It will be shown that this event can easily be disproved and explained due to a common data quality problem that often plagues cooperative data in Alaska. The rightful owner of the 24-hr precipitation record belongs to Seward, AK with 15.05 inches observed on October 10, 1986.



(Distribution of 1-day Annual Maximum Series for Angoon)

The major concern with the 15.20 event is how significantly it departs from the overall trend of the data and the large difference between it and first legitimate event (The 5.00 inches on 11/14/1931 is also an incorrect 1-day value). The value is significantly skewing the distribution such that the 100-year precipitation frequency is estimated to be 9 inches. This is drastically different than the 100-year frequency estimate from Hydrometeorological Report No. 36 (U.S. Weather Bureau, 1961) of 3.53 inches, shown in Table 12 from Hydrometeorological Report No. 34 (1983) and requires further investigation into this event.

Table 12.—Stations used to develop recurrence interval versus probable maximum precipitation relations

Station Index No.	Station	Lat.		Long.		Elev. ft. m	Length of record yrs.	100-yr 24-hr precip.		Mean annual
		(°)	(')	(°)	(')			in.	mm	precip.
1	Angoon	57	30	134	35	35 11	29	3.53	90	38 965

Angoon is located in Southeast Alaska, on the north-central portion of the Alexander Archipelago. The environment here is a moist maritime climate with mild winters and cool summers. However, Angoon has receives much less rainfall than most locations in Southeast Alaska. According to Table 15 from Hydrometeorological Report No. 34, the mean annual precipitation is only 38 inches while the majority of other stations receive at least twice as much rain annually.

Furthermore the greatest daily maximum for Angoon through 1972 was only 2.71 inches according to the same report, from 29 years of data. By comparison, Juneau City receives 93 inches precipitation annually and their highest 1-day was 5.64 inches. The only station in the region that has observed similar significant events around 15 inches is Little Port Walter which has a daily maximum total of 14.84 inches, but is in a much more wet microclimate as they receive a remarkable 222 inches annually.

Table 15.—Station precipitation data for southeast Alaska

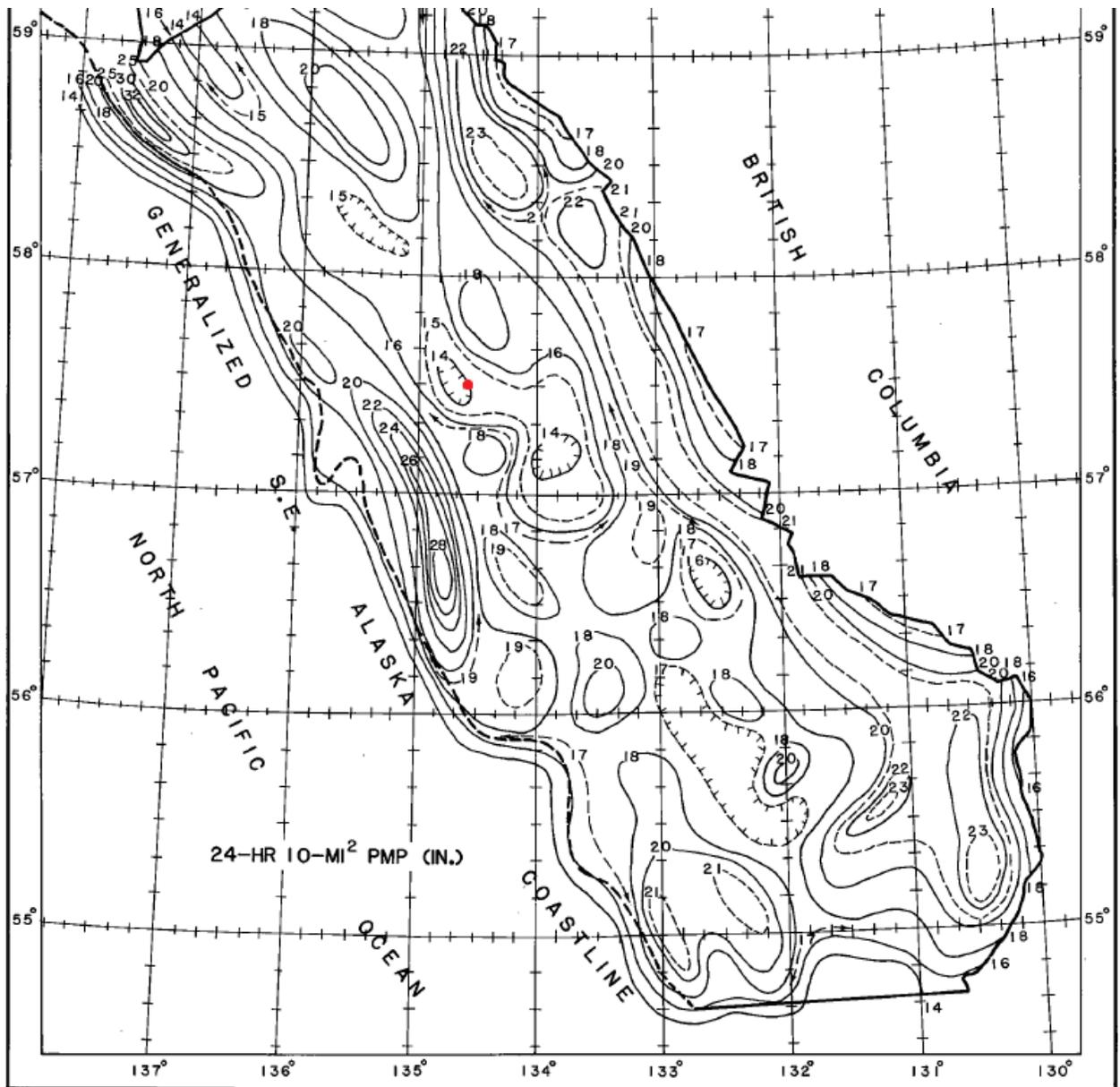
Index no.	Station	Lat.		Long.		Elevation		Daily maximum		1.13 X daily maximum		Date	Length of record (yrs)*	Mean annual precipitation	
		(°)	(')	(°)	(')	(ft.)	(m)	(in.)	(mm)	(in.)	(mm)			(in.)	(mm)
1	Angoon	57	30	134	35	35	11	2.40	61	2.71	69	9/19/42	29	38	965
2	Annette (R)	55	02	131	34	110	34	7.59	193	-	-	10/20-21/58	29	114	2896
3	Annex Creek	58	19	134	06	24	7	6.05	154	6.84	174	10/13/45	53	114	2896
4	Auke Bay	58	23	134	38	42	13	2.87	73	3.24	82	9/29/70	8	62	1575
5	Baranof	57	05	134	50	20	6	5.98	152	6.76	172	10/14/42	24	147	3734
6	Beaver Falls	55	23	131	28	35	11	6.70	170	7.57	192	9/23/67	24	151	3835
7	Bell Island	55	55	131	35	10	3	4.60	117	5.20	132	10/2/30	21	109	2769
8	Calder	56	10	132	27	20	6	4.54	115	5.13	130	1/13/22	13	112	2845
9	Canyon Island	58	33	133	41	85	26	3.98	101	4.50	114	2/24/38	9	61	1549
10	Cape Decision	56	00	134	08	39	12	4.66	118	-	-	10/25-26/44	27	77	1956
11	Cape Spencer	58	12	136	38	81	25	8.60	218	-	-	10/21-22/48	34	105	2667
12	Chicagof	57	40	136	05	10	3	4.78	121	5.40	137	9/13/52	6	130	3302
13	Craig	55	29	133	09	15	5	5.15	131	5.82	148	10/5-6/46	17	111	2819
14	Eldred Rock	58	58	135	13	55	17	7.03	179	7.94	202	10/24/47	26	46	1168
15	Five Finger Light Sta.	57	16	133	37	70	21	3.55	90	4.01	102	8/10/69	28	56	1422
16	Fortmann Hatchery	55	36	131	25	132	40	5.10	130	5.76	146	8/10/15	13	150	3810
17	Glacier Bay	58	27	135	53	50	15	3.63	92	4.10	104	8/23/66	5	81	2057
18	Guard Island	55	27	131	53	20	6	4.47	114	5.05	128	11/16/43	22	66	1676
19	Gull Cove	58	12	136	09	18	5	6.50	165	-	-	10/9-10/46	12	99	2515
20	Gustavus FAA	58	25	135	42	22	7	3.69	94	4.17	106	10/6/43	31	54	1372
21	Haines I S	59	14	135	26	100	30	5.64	143	-	-	10/9-10/44	32	61	1549
22	Haines Terminal	59	16	135	27	175	53	3.76	96	4.25	108	12/5/64	17	50	1270
23	Hollis	55	28	132	40	15	5	5.06	129	5.72	145	10/14/61	10	103	2616
24	Hydaburg (Sulzer)	55	12	132	49	25	8	6.07	154	6.86	174	11/14/17	5	142	3607
25	Juneau City #2	58	18	134	24	25	8	5.64	143	-	-	9/25-26/18	54	93	2362
26	Juneau WBAP (R)	58	22	134	35	12	4	4.66	118	-	-	10/9-10/46	28	54	1372
27	Kake	56	59	133	57	8	2	3.84	98	4.34	110	10/29/30	11	56	1422
28	Kasaan	55	38	132	34	28	9	3.53	90	3.99	101	12/17/19	15	86	2184
29	Ketchikan	55	21	131	39	15	5	8.07	205	9.12	232	8/5/20	54	162	4115
30	Lincoln Rock L.S.	56	03	132	46	25	8	4.30	109	-	-	2/20-21/47	22	64	1626

Table 15.—Station precipitation data for southeast Alaska (continued)

Index no.	Station	Lat.		Long.		Elevation		Daily maximum		1.13 X daily maximum		Date	Length of record (yrs)*	Mean annual precipitation	
		(°)	(')	(°)	(')	(ft.)	(m)	(in.)	(mm)	(in.)	(mm)			(in.)	(mm)
31	Linger Longer	59	26	136	17	700	213	2.80	71	3.16	80	11/25/63	7	34	864
32	Little Port Walter	56	23	134	39	14	4	14.84	377	16.77	426	12/6/64	34	222	5639
33	Moose Valley	59	25	136	03	400	122	4.75	121	5.37	136	10/29/49	12	31	787
34	Perserverance Camp	58	18	134	20	1400	427	7.40	188	8.36	212	9/26/18	4	155	3937
35	Petersburg	56	49	132	57	50	15	5.70	145	6.44	164	10/21/37	40	106	2692
36	Point Retreat Light	58	25	134	57	20	6	5.65	144	6.38	162	12/28/56	23	71	1803
37	Port Alexander	56	15	134	39	18	5	7.62	194	8.61	219	7/7/52	14	176	4470
38	Radioville	57	36	136	09	15	5	6.81	173	7.70	196	10/13/39	15	100	2540
39	Seclusion Harbor	56	33	134	03	20	6	5.24	133	5.92	150	11/30/36	9	115	2921
40	Shelter Island	58	23	134	52	10	3	2.88	73	3.25	82	2/9/30	15	55	1397
41	Sitka FAA	57	04	135	21	15	5	5.37	136	6.07	154	9/20/54	23	89	2261
42	Sitka Magnetic	57	03	135	20	67	20	6.42	163	7.25	184	9/9/48	73	96	2438
43	Skagway	59	27	135	19	18	5	5.25	133	-	-	10/9-10/44	29	27	686
44	Speel River	58	08	134	44	15	5	8.86	225	10.01	254	9/26/18	9	139	3531
45	Tenakee	57	47	135	12	19	6	4.17	106	4.71	120	10/30/49	8	64	1626
46	Treepoint Light Sta.	54	48	130	56	36	11	4.50	114	5.09	129	9/23/67	37	98	2489
47	View Cove	55	04	133	04	13	4	5.51	140	6.23	158	12/15/36	15	165	4191
48	Wrangell	56	28	132	23	37	11	4.51	115	5.10	130	1/30/62	50	80	2032
49	Yakutat WBAP (R)	59	31	139	40	28	9	7.13	181	-	-	11/27-28/56	49	132	3353

- Recorder (not adjusted by 1.13)

* Data through 1972

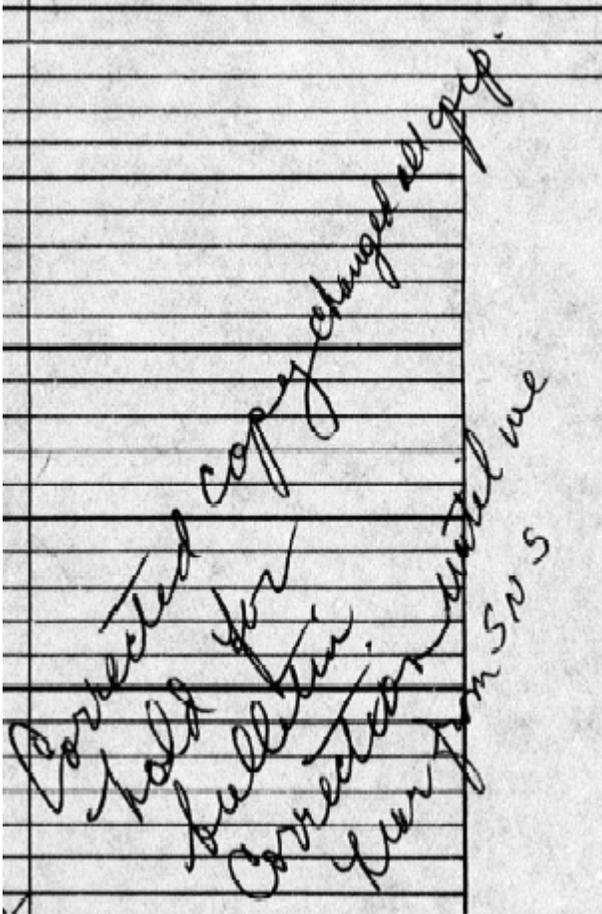


(Red dot is the location of Angoon)

This amount of rain is not physically possible for the location. Hydrometeorological Report No. 36 confirms that the at-station 24-hr PMP for this location is approximately 14 inches. The 15.20 daily maximum x 1.13 would make the unconstrained daily total 17.2 inches, which far exceeds this value.

Since the value is above the limit of rainfall to occur in 24-hr for this location, we know with a high degree of confidence that this was not a real event. To better understand what exactly happened we need to look at the raw data.

This case was noticed by the observer or COOP manager because in the remarks section of the form for July 1982 there is message that states that there was a corrected copy that changed all precipitation values, which explains why the digitized data looks good because NCDC likely transcribed the corrected copy and not the incorrect one. However for October 1982, this same problem was never corrected and all the values over an inch are an order of magnitude too high, particularly the 15.20 value, which is in fact 1.52 inches.



Corrected copy changed all precip.
Hold for
bulletin
Correction until we
hear from SWS

STATION (Climatological)		(River Station, if different)		MONTH	19	WS FORM E-13 (10-77)																								
ANIGOOK				OCT	82																									
RIVER		TYPE OF RIVER GAGE		COUNTY																										
TIME (local) OF OBSERVATION		TEMPERATURE	PRECIPITATION	STANDARD TIME IN USE																										
		16:30	16:30	PST																										
STATE	ELEVATION OF RIVER GAGE ZERO	FLOOD STAGE	NORMAL POOL STAGE																											
ALASKA																														
DATE	CONDITION	GAGE READING AT A.M.	TENDENCY	TEMPERATURE °F.		PRECIPITATION														24-H Rains, melted snow, etc. (ins. & frs.)	24-H Snow, ice pellets, hail (ins. & tenths)	At Ob. Snow, ice pellets, hail, ice on ground (ins.)								
				AT OBSERVATION		Draw a straight line (—) through hours precipitation was observed, and a wavy line (~~~~) through hours precipitation probably occurred unobserved.																								
				MAX.	MIN.	A.M.			NOON			P.M.																		
						1	2	3	4	5	6	7	8	9	10	11	1	2	3	4	5	6	7	8	9	10	11			
1				57	50	51																						2.80		0
2				53	51	53																						1.30		
3				53	48	49																						—		
4				49	47	48																						1.50		
5				53	48	55																						2.40		
6				55	48	54																						.58		
7				54	49	49																						—		
8				50	49	50																						.07		
9				55	50	55																						4.00		
10				56	55	56																						.04		
11				56	44	45																						1.20		
12				52	45	52																						15.20		
13				52	47	49																						.06		
14				49	46	49																						—		
15				47	45	47																						—		
16				49	47	49																						—		
17				49	41	42																						.01		
18				45	42	45																						.05		
19				45	44	45																						.03		
20				45	44	45																						2.20		
21				45	43	42																						1.30		
22				43	42	43																						1.20		
23				45	43	45																						1.20		
24				45	43	44																						1.90		
25				44	43	44																						1.10		
26				44	38	39																						1.90		
27				39	38	39																						.08		
28				39	36	37																						.02		
29				44	37	44																						4.60		
30				44	40	42																						5.50		
31				43	42	43																						.04		
SUM				43	42	43																						47.38	0	
CHECK BAR (For wire-weight)		NORMAL CK. BAR		CONDITION OF RIVER AT GAGE														SUM												
READING		DATE		A. Obstructed by rough ice. B. Frozen, but open at gage. C. Upper surface of smooth ice D. Ice above gage.														Greatest												

This form has the same problem as that of July 1982, but this time for the observations where the decimal is in the wrong location (values above one inch) a zero was added to the right of the value. These values appear to have been added in after the fact, potentially not even by the original observer. If you take away the awkward looking zeroes that were look as though

they were squeezed into the block, the formatting and handwriting of the precipitation values is nearly identical to the form of July 1982. It is very evident that a different person wrote in the zero than the first two digits for all precipitation values over an inch. From this, it is proven that the 15.20 inches should be 1.52 inches instead.

Conclusion

This will hopefully bring to light one of the data quality issues with NCDC COOP data in Alaska. While this case was fairly obvious because the station was not even capable of receiving 15.20 inches in 24-hr because it was above the probable maximum precipitation value most cases are not this apparent, however. More effort should be put into verifying the accurateness of significant events, particularly individual state records. For the work done by NOAA's Hydrometeorological Design Studies Center, record events are crucial for our analysis. It is easy for anyone to blindly assume and accept an event as being accurate if it has already been verified as an official state record.