



SUSITNA-WATANA HYDRO

Meeting Notes Geomorphology, Ice, Water Quality, and Glacier Resources Technical Workgroup Meeting March 28, 2013

LOCATION: Loussac Library – Public Conference Room
3600 Denali Street
Anchorage AK

TIME: 8:30 am – 5:00 pm (AKST)

SUBJECT: 2012 study reports/results

Goal: To provide an overview of the 2012 study results

ATTENDEES: Steve Padula McMillen, Kathryn Peltier McMillen, Joe Klein ADF&G, Jeff Davis ARRI, Dudley Reiser R2, Jan Konigsberg AK Hydro Reform, Scott Crowther Ratepayers, Michael Lilly GWS, William Ashton DEC, Robin Beebee HDR, Stormy Haught ADF&G, Catherine Berg USFWS, Eric Rothwell NMFS, Dara Glass CIRI, Bill Fullerton Tetra Tech

ON PHONE: Bob Henszey USFWS, Chris Holmquist-Johnson USGS, Matt Love VNF, Michael Buntjer USFWS, Kevin Fetherston R2, Leanne Hanson USGS, Lyle Zevenbergen Tetra Tech, Mike Sondergaard BLM, Greg Aubel USGS, Cherise Oram Stoel Rives, Jennifer Curtis EPA, Becky Long Coalition for Susitna Dam Alternatives, Bob Mussetter Tetra Tech, Dan Healy NHC, Betsy McGregor AEA, Gabe Wolken DGGS, Rob Plotnikoff Tetra Tech, Felix ENVIRON, Lori Verbrugge USFWS, Neal Hines ENVIRON

AEA has committed to a series of quarterly meetings for the next two years of study. These meetings are to provide an updated status of the study program. Today is the last of three meetings (March 26-28, 2013) which are the first set of quarterly meetings in regards to water related resources. The following meeting notes are to capture any significant discussion/information in addition to the materials provided on the Project website (<http://www.susitna-watanahydro.org/>). The meeting agenda and materials are available under the “previous meetings” tab (link provided under the meetings tab) on the Project website.

To receive regular updates of new materials posted on the Project website, one can be added to the List Serve emailing list. Please contact Justin Crowther at jcrowther@aidea.org or subscribe using the link provided on the Project website home page.

Ice Processes Presentation – Robin Beebee

Robin Beebee presented an overview of the current Ice Processes Study status. The PowerPoint presentation provides images and details included in the Susitna River Ice Processes Study Report. This report is available on the Project website under the documents tab as a 2012 Environmental Studies licensing document.

Existing Info Review

- The Historic Susitna River Ice Events database (a compilation of all measurements and observation locations from the 1980s studies) is pending Project river mile updates and will be available after AEA has completed a final review.

- Currently, it is not possible to search the database by a range of river miles. Robin Beebee agreed that it would be a useful tool to add.

Open Lead Mapping, breakup and freeze-up

- Frazil ice is mostly created in open water leads, because the water needs contact with freezing air temperatures. This is why Devils Canyon produces a large amount of frazil ice in the Susitna River.
- Sue Walker asked if the Project effects are predicted to lead to more or less frazil ice production in Devils Canyon. The open water leads may be greater, but the water temperature may be too high. The model is intended to answer such questions.
- No wildlife or human traffic has been observed on the tidewater ice bridges during the early freeze-up period. This may be due to lack of detection rather than lack of occurrence, as there was very little snow on the ice to record tracks.
- Border ice forms at a low stage, only potentially affecting the lower elevation riparian vegetation (below Ordinary High Water). Ice shearing effects have been observed in higher elevated riparian communities due to the movement, rather than formation, of ice.
- Stage changes under ice will be modeled for the mainstem. Off channel stage changes seem to be a groundwater process, which is driven by mainstem changes. The groundwater modeling will use the ice modeling data as an input to show this relationship.
- Currently, it seems as though the connection between ice mainstem ice and side habitats is groundwater. AEA will use modeling to predict if the Project will affect this relationship and create a direct connection with mainstem ice and side channel habitat.
- 2D modeling of Focus Areas will include an ice component.
- Ice modeling will be used to understand major stage fluctuations in the winter, because they do not occur often naturally.
- The ice modeling in the 1980s predicts that post-Project mainstem water (and thus potentially frazil ice) will be present in newly inundated side habitats.
- Eric Rothwell voiced concern about the restricted study time. He requested a smaller TWG be scheduled to discuss what level of data is needed of ice to understand its effects on habitat and biota. Eric Rothwell asked that a list of specific questions regarding winter/ice data needs be provided and AEA determine what can or cannot be answered with the current study. This could be used by the agencies to decide on their recommendations.
- Focus Areas will have more detailed efforts applied and may be extrapolate to other areas of the river.
- Generally, a higher stage is associated with a lower velocity.
- Although ice modeling is not planned in the Lower River, the Middle River modeling efforts will show predicted input of ice into the Lower River.

Glacier Resources Presentation– Gabe Wolken

The Glacier & Runoff Changes Study, 2012 Review presentation provides a brief overview of the 2012 efforts and modeling approach.

2012 Study Results

- The Glacier and Runoff Study will provide calibration for the hydrologic model in the Upper Susitna River basin.
- Field measurements are critical to validate the hydrologic model and to downscale the data used in the model.
- In 2013, instrumentation in the lower part of the basin will be increased to capture permafrost data.
- The study is collecting incoming and outgoing radiation.
- Model calibration for 2012 measurements will likely be completed by May 2013.
- Special focus will be taken when simulating the September 2012 storm event.
- Time steps are generally monthly, but the study will be looking at seasonal and annual time steps as well.

- The study is not focused on studying the reservoir effects on permafrost.
- Sue Walker requested that Gabe Wolken present this Glacier Resources presentation to NMFS' climate experts in a separate smaller TWG.

Initial Sediment Balance Presentation – Bob Mussetter

The “Initial Sediment Balance for the Middle and Lower Susitna River for Existing and with Project Conditions” presentation provides a brief overview of related activities in 2012 and the first quarter of 2013. Beginning with FERC related activity, the presentation continues providing preliminary results and conclusions. These initial efforts were performed to assess the Lower River extent of Project effects. Throughout 2013 and 2014 refinements will be made and additional data will be applied to the analyses. Development of Sediment-Transport Relationships and an Initial Sediment Balance for the Middle and Lower Susitna River Segments is available on the Project website under the documents tab as one of the 2012 Environmental Studies licensing documents.

- Slide 4 may be misleading because most data was collected around river mile 107.
- Starting with USGS data and a 1987 USGS study, the dataset has been updated with mostly 1980s data, as well as some from the 1960s, 1990s and 2000s.
- The Minimum Variance Unbiased Estimator (MVUE) is a USGS recommended way to correct bias of rating curves, providing a better estimate of total load.
- Confidence intervals for regression equations are provided in the report.
- Silt/clay is currently the major sediment being transported in the Susitna River.
- In regards to slide 15, measurements at Gold Creek, Sunshine, and Susitna Station were taken in the Susitna River mainstem. Measurements at Chulitna, Talkeetna and Yentna were taken in the tributary.
- The reservoir trap efficiency assumptions applied to graphs on slides 16-25 will be refined throughout the study.
- The Chulitna, Talkeetna and Yentna graphs (slides 19-21) are the same for pre and post-Project because Project effects are 100% masked by input of upstream tributaries.
- With a combination of inundation frequency, load changes and 1-D modeling, a finer resolution of levels of aggradation may be detected.
- 1-D modeling will be looking at general bed geometry changes at a large scale.

Baseline Water Quality Presentation – Paul Dworjan

The Baseline Water Quality presentation provided a brief overview of the water quality studies' activities in 2012 and the first quarter of 2013. The presentation provides FERC-related updates and continues with study-specific updates. Paul Dworjan clarified that the water quality studies have always included the Lower River. Rob Plotnikoff explained that most water quality studies are general sampling efforts, with finer sampling conducted within Focus Areas. The 2012 Susitna River Water Temperature and Meteorological Field Study, Thermal Infrared Remote (TIR) Sensing Pilot Test, and Mercury Assessment and Potential for Bioaccumulation Results Report reports are available on the Project website under the documents tab as one of the 2012 Environmental Studies licensing documents.

Temperature Monitoring (Slides 5-11)

- The proposed temperature gages on slide 6 are mostly consistent with those of the 1980s studies.
- Outlier stations in slide 10's graph may be due to groundwater influence.
- Analyses in regards to optimal fish temperature ranges are not yet conducted.
- Paul Dworjan does not currently see any reasons to move any station or change methods.

MET stations (Slides 12-15)

- The stars on slide 14 represent MET stations. The three furthest downstream MET stations are existing.
- Rob Plotnikoff explained that the water quality studies are general sampling efforts, with finer sampling conducted within Focus Areas.

TIR Study (Slides 16-19)

- The TIR collection was performed in optimal conditions. With low air temperatures no ice, the temperature contrast between groundwater and surface water was at its greatest.

- Paul Dworian could see the contrast best in shallower waters, but did see obvious groundwater in the mainstem as well.
- Robin Beebee had observed groundwater influences on ice and these locations will be compared to TIR results.
- The TIR study will be repeated in the Lower River.
- Eric Rothwell proposed that the TIR imagery could help extrapolate Focus Area data. Ground study efforts could confirm TIR associations.
- Jeff Davis requested that water temperature readings be taken for all fish locations year round. Michael Lilly added that thermoclines and intergravel temperatures are important as well. Efforts proposed for the study program will result in a great understanding of the Susitna River water temperature.

Methylmercury (Slides 20-26)

- Methylmercury modeling is intended to predict methylmercury concentrations above and beyond existing conditions.
- Access to river otter pelts is limited, but mink pelts may be possible to obtain for testing.
- Analyses were conducted for both wet and dry weight to broaden the amount of historic data able to be compared to the data.
- Generally, the Susitna River has low mercury levels for Alaska, and the inundation zone has low levels for the Susitna River. This may be due to the lack of wetlands in the Upper River (a source of methylmercury).
- Piscivorous fish have higher concentrations of methylmercury than non-piscivorous fish.
- Sally Lake had the highest mercury concentration. This may be due to neighboring wetlands or that samples from Sally Lake were that of adult piscivorous fish (lake trout).
- No northern pike were collected in the Upper Susitna basin.
- Due to the low sample size, analyzing the data is not possible yet.
- Although the DEC does not report any other metals in the area, 2013 will be testing for more than mercury.
- Lori Verbrugge asked that the ADEC Level (slide 25) be checked. She feels this is incorrect.

Reconnaissance Level Assessment of Potential Channel Change - Bob Mussetter

Bob Mussetter presented the 2012 results in the Reconnaissance Level Assessment of Potential channel Change of the Lower Susitna River Segment report. The presentation provides an overview of FERC-related activity and results from 2012. The study report is available on the Project website under the documents tab as a 2012 Environmental Studies licensing document.

- The results are currently based on gaging stations which are placed at points along the river chosen for a very specific need. They are not necessarily representative areas. With data collected in 2013, the analysis can be refined to better represent the Susitna River.

General Discussion

- Smaller TWG meetings may be necessary for Instream Flow and Riparian Studies. Dudley Reiser and Kevin Fetherston asked that those with relevant expertise, please email by April 5 a list of topics to discuss and their availability to the respective lead (Dudley = IFS, Kevin = Riparian). It is crucial that attendees prepare for the meetings to not waste time.
- The TWG ran out of time; a webex will be held on April 5, 2013 at 9am (AKDT) to present the remaining presentations. These include
 - Mapping of Aquatic Macrohabitat Types from 1980s and 2012 Aerials
 - Mapping of Geomorphic Features from 1980s and 2012 Aerials
 - 1980s Lower River Habitat Synthesis

Action Items	Date	Responsible Party
Email relevant experts for an IFS subgroup TWG. Include a list of topics to be discussed.	3/28/2013	Dudley Reiser, R2
Provide Feedback to Dudley's list.	4/1/2013	Email recipients
Finalize the first subgroup TWG meeting date.	4/1/2013	Phil Hilgert