Juneau Watershed Partnership

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2009 Jordan Creek Water Quality Report

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Executive Summary

Jordan Creek, located on the eastern side of Juneau's Mendenhall Valley basin, was listed on the State of Alaska Section 303(d) list of impaired waters in 1998 due to sediment, low dissolved oxygen, and debris. The Juneau Watershed Partnership (JWP) began monitoring water quality on Jordan Creek in 2003 with the goal of maintaining and continuing a long-term data record and assessing stream water quality gains as storm water treatment, culvert replacement, riparian restoration and other stream enhancement projects are completed.

In 2009, no monitoring results were out of range for state limits on temperature, conductivity, turbidity, TSS, or pH. Residues (in-stream trash) remain ever-present in both residential and urban reaches. Dissolved oxygen was not monitored due to equipment failure (remedied for 2010 monitoring). No discharge measurements were made in 2009, though discharge is now measured concurrently with sampling at the Super 8 Motel (JC-B) sample site for the 2010 period of record. The 2009 dataset values did not deviate from long-term monitoring results.

Future JWP monitoring (including 2010 data collection) will be guided to identify areas with highest potential for water quality and habitat improvement. Water quality monitoring coupled with recent stormwater outfall mapping will identify locations where improved stormwater treatment could significantly contribute to improved water quality and overall stream health.

Project Description and Purpose

In 2009, the Juneau Watershed Partnership (JWP) continued monitoring Jordan Creek water quality, bringing the period of record to six years total. The JWP long-term monitoring program aims to characterize the water quality of Jordan Creek, compare water quality to Alaska state standards, and evaluate the effects of urbanization, restoration, and conservation projects on in-stream sediment concentrations. Urbanization and development continue to impact the stream corridor of Jordan Creek, and low-flow periods (including periods of no-flow), increased sediment loads, and declines in fish presence persist. A suite of water quality parameters were monitored bi-monthly at three representative sites on Jordan Creek between April 2009 and October 2009 to document water quality and habitat conditions (detailed discussion below).

In addition to maintaining continuity of water quality sampling from 2003 to present, the 2009 water quality dataset was also utilized to determine what impact, if any, the East Valley Reservoir Tributary Rehabilitation Project (Phases I and II) had on Jordan Creek water quality during and after in-stream construction. The EVR Tributary Rehabilitation Project was undertaken by CBJ, JWP, and USFWS, to address long-term sediment accumulation in the main stem of Jordan Creek after city water reservoir construction on the tributary in the late 1980's. In-stream work typically results in temporary increases in turbidity and suspended sediment, which may or may not persist downstream. Anticipated long-term gains of the EVR Tributary Rehabilitation include decreased sediment accumulation in the main stem of Jordan Creek and improved fish and invertebrate habitat, bank stabilization, and riparian area integrity at the Jennifer Drive restoration site.

The specific goals of this project were:

- To evaluate water quality during and after the East Valley Reservoir Tributary Rehabilitation Project
- To document existing water quality conditions in Jordan Creek and compare current conditions to historic data.

Jordan Creek Watershed: Sampling Locations and EVR Tributary Rehabilitation Site

Project Design and Methods

Adhering to protocols set in the ADEC-approved quality-assurance project plan (QAPP) for Jordan Creek, the following parameters of concern were monitored at three representative sample sites between April 2009 and October 2009: water temperature, specific conductance, pH, turbidity, and total suspended solids (TSS). All parameters, with the exception of TSS, were monitored in-situ using a YSI 556 multi-probe and HACH 2100 portable turbidimeter. Sampling events included one 1000 mL grab sample collected from each site, which was then transported to the UAS Bentwood Laboratory for Total Suspended Solids analysis.

Jordan Creek Sampling Sites: 2005-2009

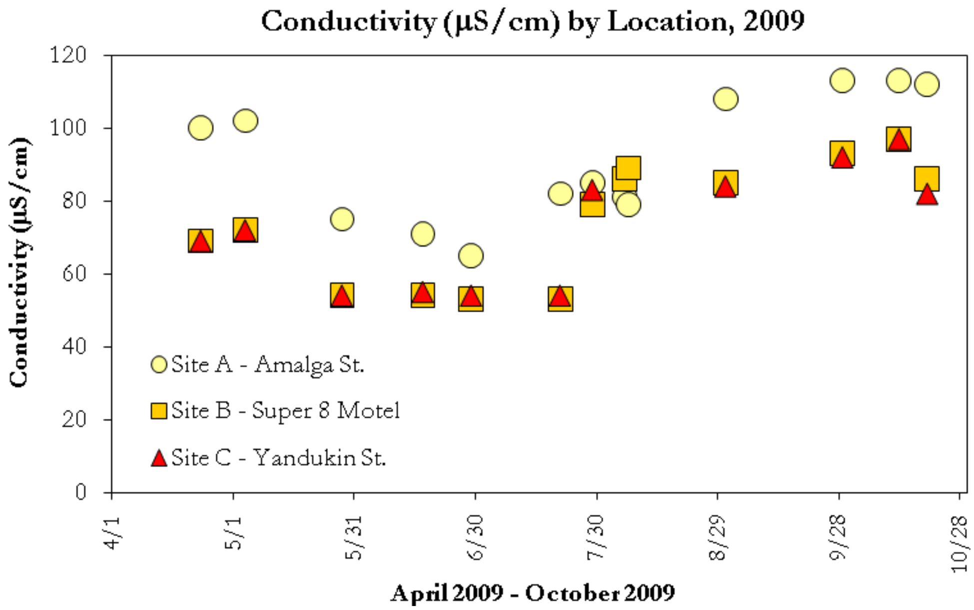
Site Name	Site Description	Lattitude	Longitude
JC-A	Jordan Ck at Amalga St. Bridge	58.38726067004	-134.56351114001
JC-B	Jordan Ck at Super 8 Motel	58.36616032005	-134.57784830000
JC-C	Jordan Ck at Yandukin St.	58.35917610005	-134.57835674000

Data and Results

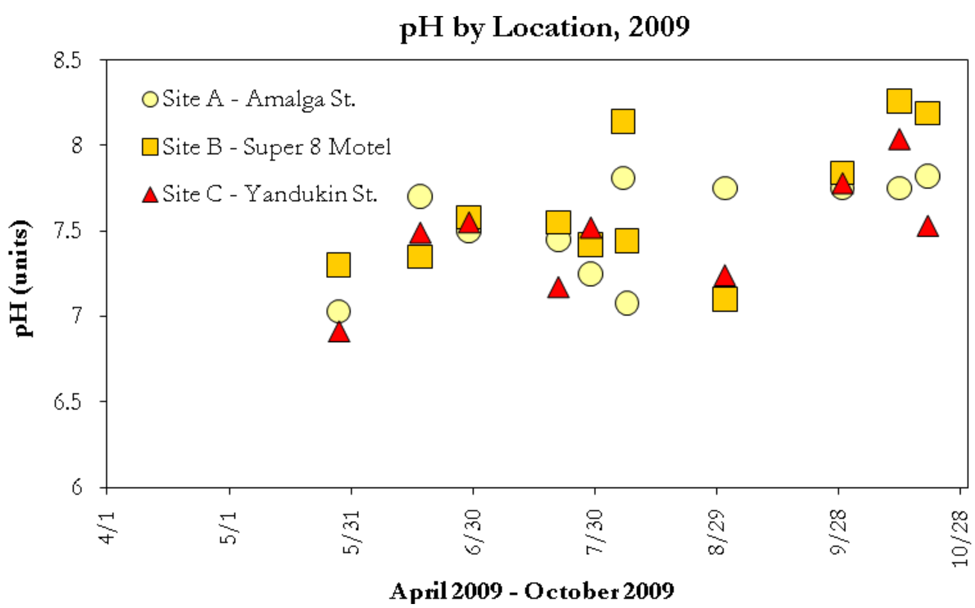
1) **Water Quantity: Discharge**
   Stream discharge was not monitored in 2009. Historic USGS discharge data from decommissioned gage #15052475 demonstrate that Jordan Creek mean monthly discharge at Egan Drive varies from less than one cubic foot per second (cfs, August) to over 23 cfs (October). High flows are associated with spring snowmelt (April and May) and fall storms (September-October). Low flows occur during winter months (November-March) and in mid-summer (June-August).

   During the 2009 period of record, some areas of Jordan Creek were dry or stagnant with low flow during the August 6^{th}-7^{th} field visits, including the Yandukin Drive sample site (JC-C).

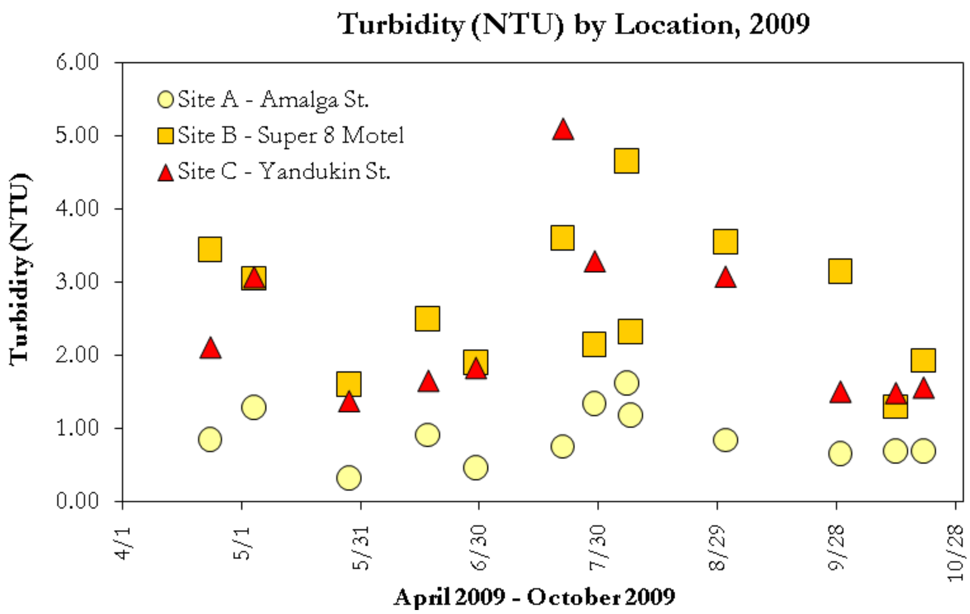
2) **Water Quality**
   a. **Dissolved Oxygen.** Dissolved Oxygen was not monitored for the period of record due to instrument failure.
   b. **Conductivity.** Conductivity is a measure of ionic content of a solution and is indicative of total dissolved inorganic solids in a water sample. This type of measurement is not ion-specific. Conductivity is monitored for background purposes; an unusually high measurement may indicate a failing septic system upstream, while an unusually low measurement may indicate an oil spill upstream. Water temperature is positively correlated to conductivity, i.e. higher water temperature results in higher conductivity.



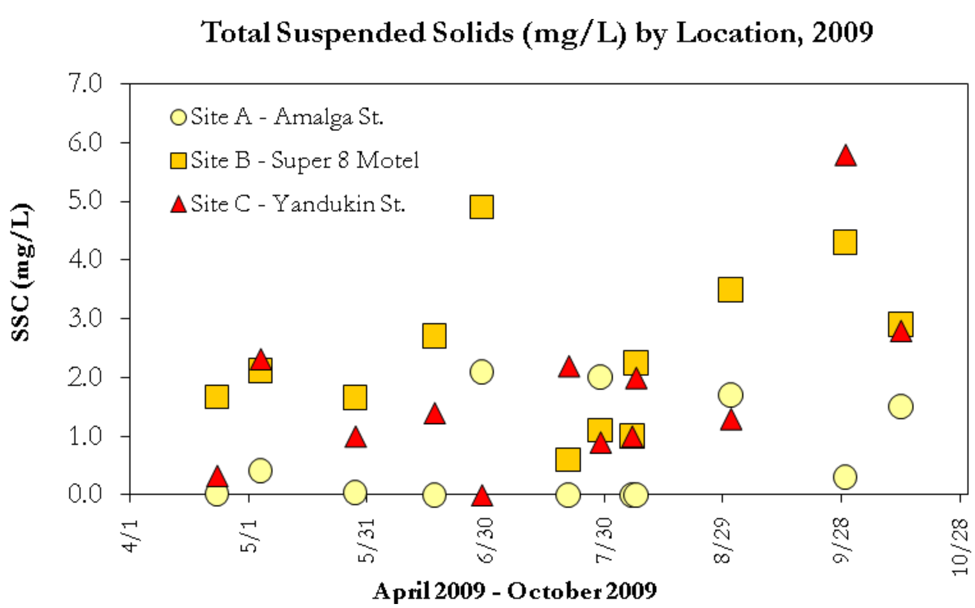
c. **pH.** pH is indicates the alkalinity or acidity of a water sample, usually in the range of 6.5 to 8.0 (essentially unitless). Acidity increases as the pH gets lower. Low pH values (less than 6.5) may be indicative of sub-optimal fish habitat and/or conditions where toxic substances become available to fish and plants and harm aquatic species diversity.



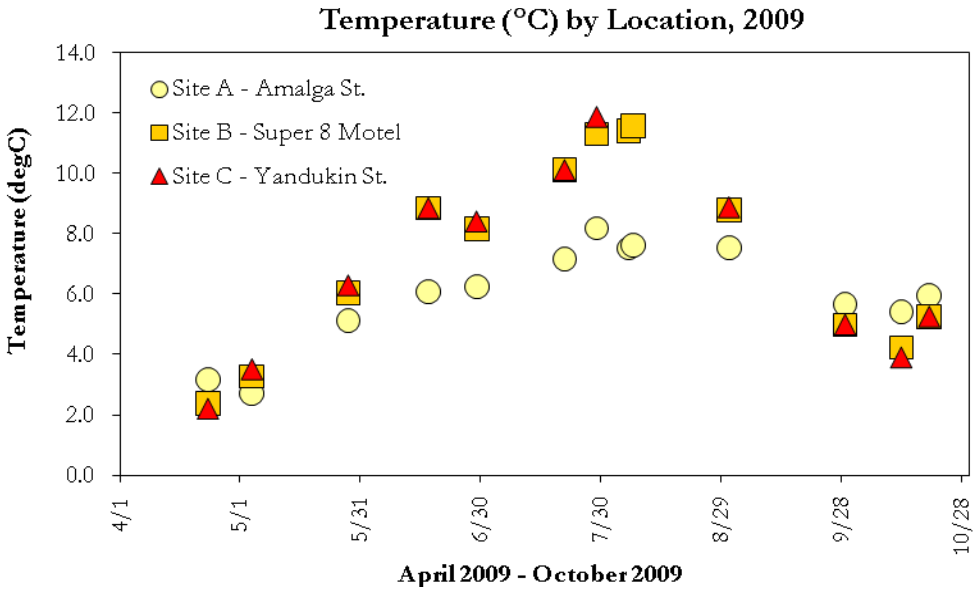
d. **Turbidity.** Turbidity measurements (measured in NTU's, or nephelometric turbidity units) are indicative of the fraction of fines, both organic and inorganic, suspended in the water column and may closely parallel suspended solids data, depending on the size distribution of suspended sediments. In-stream turbidity is usually 1-10 NTU's with some values in the 100's if measured during a runoff event in an urban watershed. High in-stream turbidity may contribute to high water temperature, low dissolved oxygen, lower photosynthesis rates in plants, to the camouflage of prey or egg burial, and decrease interstitial dissolved oxygen levels, all of which may result in low aquatic species diversity. High turbidity, common in developed watersheds where impermeable surfaces quickly transport rainfall and runoff to streams, may be indicative of erosion, construction, or poor storm water management upstream. State of Alaska water quality standards are set based on water use criteria. Turbidity standards for fish and wildlife protection (designated use) indicate that turbidity may not exceed 25 nephelometric turbidity units (NTUs) above natural background conditions.



e. Total Suspended Solids (TSS). Total Suspended Solids (measured in mg/L) refers to solids that are not dissolved in solution and can be removed by filtration (2 microns and greater diameter). Suspended solids include organic and inorganic particles and can adversely impact water clarity, conductivity, temperature and turbidity. High TSS in stream water may raise water temperature, harming aquatic life suited to lower temperatures, as well as impact cellular water balance within small aquatic organisms, affecting their hydration and buoyancy.



f. Water Temperature. Temperature (measured in degrees Celcius) determines the oxygen content of water (as temperature increases, oxygen content dwindles). Optimum habitat for aquatic species is dependent on water temperature. Water temperature naturally fluctuates throughout a surface water body depending on stream or lake width, depth, and discharge. In riparian areas, vegetation and plant cover lowers stream temperatures, as does groundwater and seep water in areas of emergence. Higher water temperatures impact photosynthesis, metabolic rates of organisms (good and bad organisms), and the mobility or uptake potential of toxic substances in water. Long-term changes in water temperature may determine the ability of non-native species to invade local water bodies.

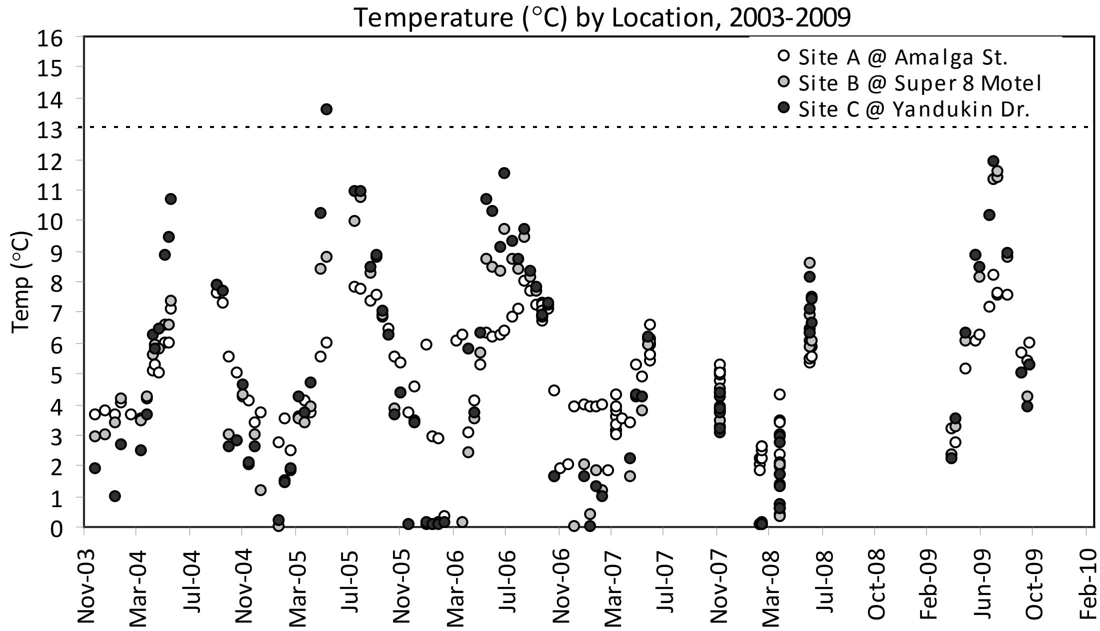


Long-Term Monitoring – Brief Summary Including 2009 Results

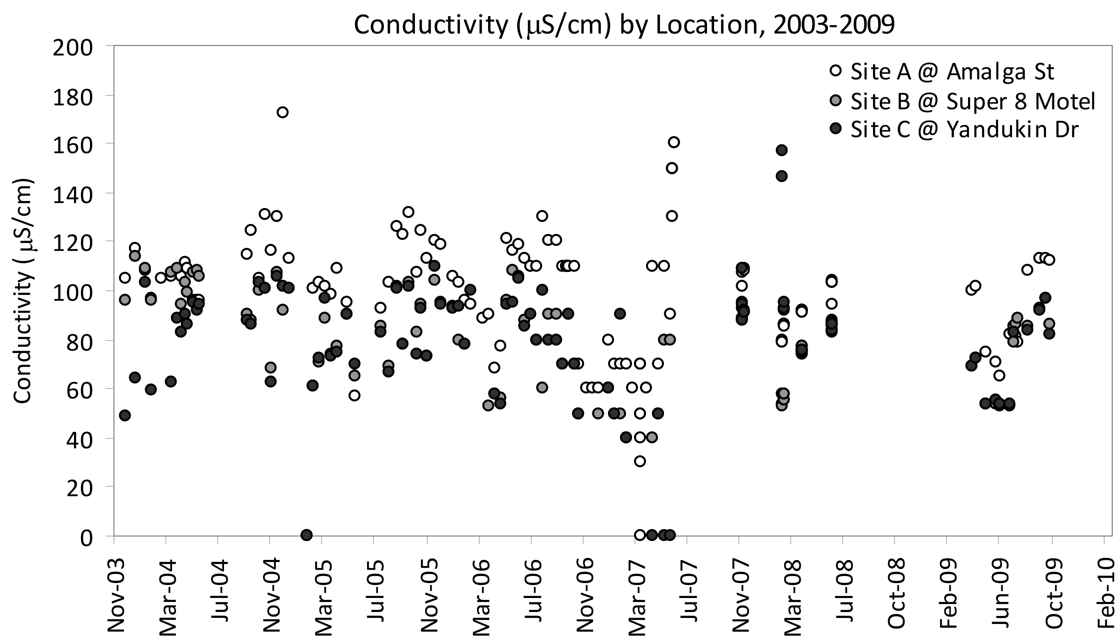
Long-term trends in temperature, pH, conductivity, turbidity, and TSS are shown in figures below. Data collected in 2009 are similar to long-term record values, though mean pH was higher than in previous years, and mean turbidity and TSS were lower, without peaks, than in years past. This is probably due to a lack of sampling in early spring and late winter in 2009, when seasonal storms and snowmelt are likely to introduce peak flows capable of delivering large volumes of sediment and pollutants. The higher apparent temperature is certainly due to a lack of early spring and late winter sampling in 2009. In the future, for long term analysis at a yearly scale to be reasonable, we must sample at least bi-monthly every month.

Year 2009 and Long Term (2003-2009) Mean Parameter Values

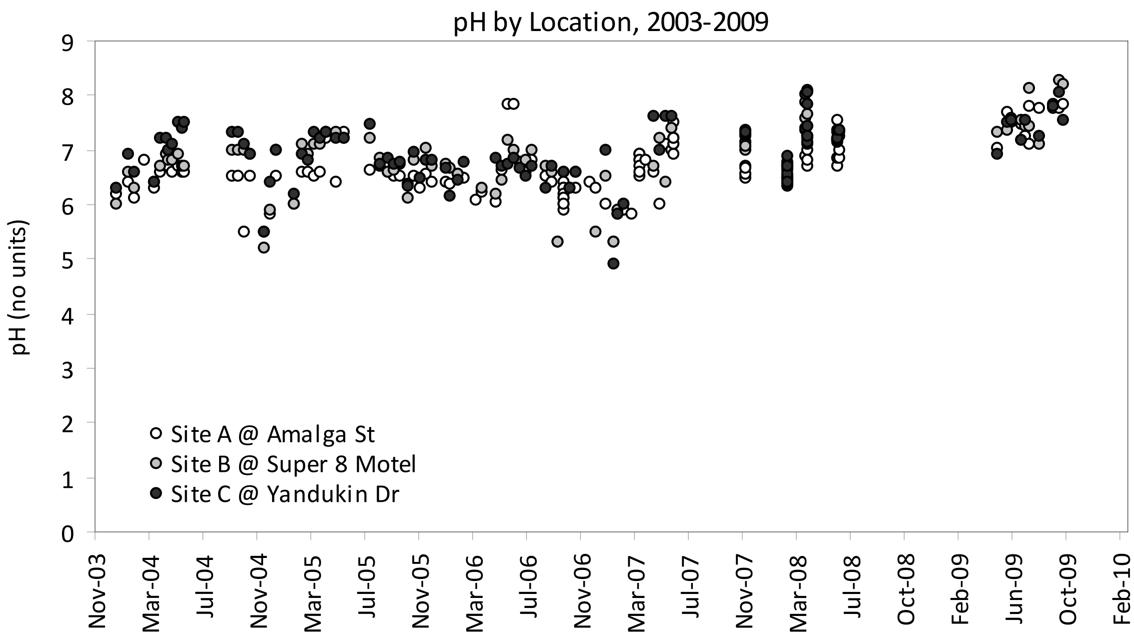
	2009 Mean	2003-2009 Mean
Temperature (°C)	6.73	4.71
Conductivity (µS/cm)	80	86
pH	7.6	6.8
Dissolved Oxygen (mg/L)	n/a	11.7
Turbidity (NTU)	1.6	2.6
TSS (mg/L)	2.0	2.7



Temperature (°C) by Location, 2003-2009
Temp (°C)
Site A @ Amalga St.
Site B @ Super 8 Motel
Site C @ Yandukin Dr.
Nov-03
Mar-04
Jul-04
Nov-04
Mar-05
Jul-05
Nov-05
Mar-06
Jul-06
Nov-06
Mar-07
Jul-07
Nov-07
Mar-08
Jul-08
Oct-08
Feb-09
Jun-09
Oct-09
Feb-10



Conductivity (μS/cm) by Location, 2003-2009
Conductivity (μS/cm)
Site A @ Amalga St
Site B @ Super 8 Motel
Site C @ Yandukin Dr
Nov-03
Mar-04
Jul-04
Nov-04
Mar-05
Jul-05
Nov-05
Mar-06
Jul-06
Nov-06
Mar-07
Jul-07
Nov-07
Mar-08
Jul-08
Oct-08
Feb-09
Jun-09
Oct-09
Feb-10


pH by Location, 2003-2009
pH (no units)
0
1
2
3
4
5
6
7
8
9
Site A @ Amalga St
Site B @ Super 8 Motel
Site C @ Yandukin Dr
Nov-03
Mar-04
Jul-04
Nov-04
Mar-05
Jul-05
Nov-05
Mar-06
Jul-06
Nov-06
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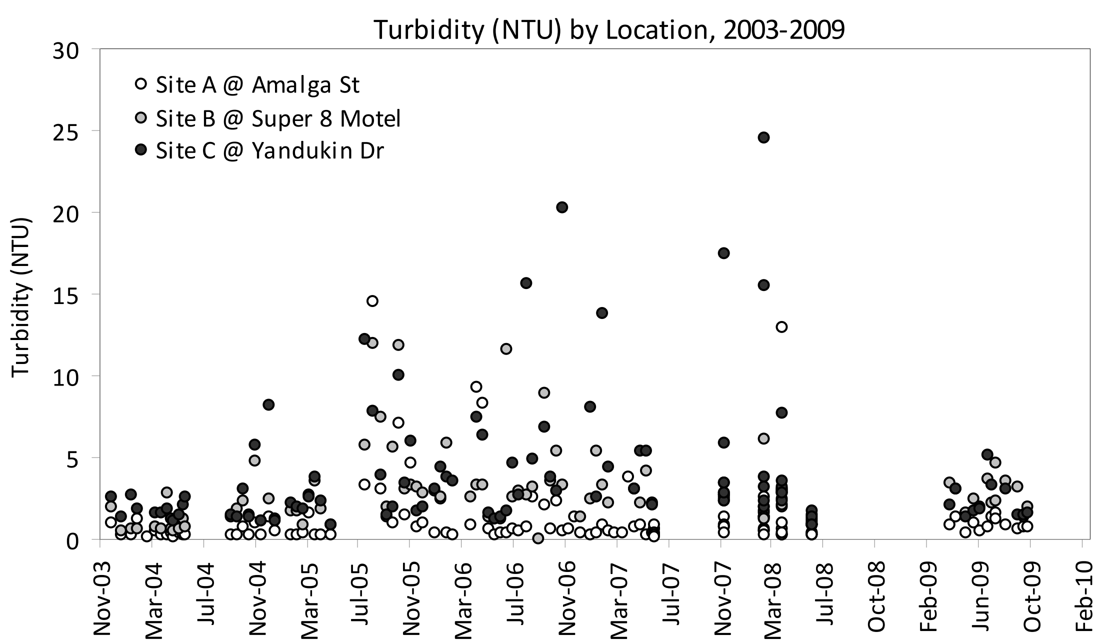
Jun-09
Oct-09
Feb-10


Turbidity (NTU) by Location, 2003-2009
Turbidity (NTU)
0
5
10
15
20
25
30
Site A @ Amalga St
Site B @ Super 8 Motel
Site C @ Yandukin Dr
Nov-03
Mar-04
Jul-04
Nov-04
Mar-05
Jul-05
Nov-05
Mar-06
Jul-06
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Nov-07
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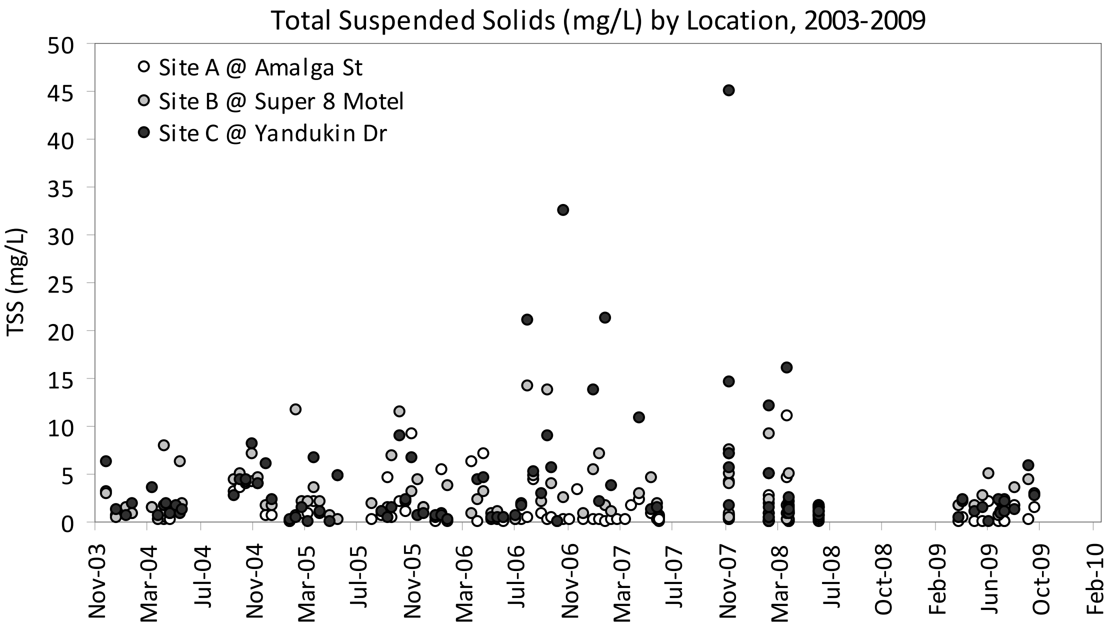
Feb-09
Jun-09
Oct-09
Feb-10



East Valley Reservoir Tributary Rehabilitation Project Construction Activity

The East Valley Reservoir (EVR) is a large municipal water supply tower located near a tributary to Jordan Creek at the base of Thunder Mountain. Erosion and culverts associated with the water tower construction and maintenance have impacted Jordan Creek. The tributary transports 0.1 mm to 4.0 mm range sediments in excess of Jordan Creek carrying capacity, resulting in extreme deposition and bed aggradation in the Jordan Creek mainstem downstream of the EVR Tributary confluence. Partnering with USFWS and JWP, CBJ replaced two large culverts and restored a portion of Jordan Creek in an attempt to alleviate the sediment deposition problem.

In a very general assessment of water quality during construction, water samples were taken intermittently, and were not necessarily linked to specific in-stream activity during construction. Sample dates were essentially selected at random. The Amalga Street sample site (control) is located upstream of the EVR tributary confluence, and the Super 8 Motel sample site is located near Egan Drive, roughly 1.5 miles downstream of the EVR tributary confluence.

Phase I Construction commenced June 1, 2009, including in-stream work. While turbidity and TSS levels increased slightly between Amalga Street and Super 8 Motel, no samples exceeded any state water quality limits during the period of June 1 to June 30, 2009 (Two sample series). The highest turbidity level was 2.5 NTU at Super 8 Motel on June 17. The highest TSS level was 4.9 mg/L at Super 8 Motel on June 29.

Phase II Construction commenced July 1, 2009, including in-stream work. Sampled turbidity and TSS levels were in compliance with state water quality limits for the period of July 1 to July 30, 2009 (Two sample series). The highest turbidity level was 5.1 NTU at Yandukin Street on July 21. The highest TSS level was 2.2 mg/L at Yandukin Street on July 21.

The infrequency of sampling dates/times and distance between the worksite and downstream sampling site were not ideal for detection of construction impact on water quality, however, no samples or data collected during construction detected any exceedence of state parameters based on data collected previous water quality monitoring projections. Ideally, this is indicative of excellent project site management and stormwater control or treatment during construction. In the future, sampling during construction could be improved by having samples frequently collected within a few hundred yards of the construction site as well as at downstream sample sites while in-stream work is occurring.

Conclusion and Recommendations

Water Quality in Jordan Creek met state water quality criteria at JWP sample sites for the dates/times sampled in 2009. While this seems indicative of Jordan Creek meeting TMDL guidelines, the 2009 dataset lacks sampling at cruicial peak flows in Spring and Fall, when stormwater runoff impacts are most likely to contribute to poor in-stream water quality.

No monitored water quality parameters exceeded state limits for samples collected during the EVR Tributary construction work. If CBJ and other involved partners want to evaluate the success of recent EVR Tributary Rehabilitation work, it is recommended that JWP (or another party) design and implement a monitoring approach to periodically survey and compare cross-sectional profiles and fine sediment composition of gravel bars to baseline data from 1 to 10 years post-rehabilitation.

While 2009 monitoring activities contributed another year to the continuous Jordan Creek water quality dataset, future study in Jordan Creek would benefit from a more scientific approach adopting specific questions answerable by monitoring. Jordan Creek habitat and water quality are excellent in many reaches upstream of Egan Drive. While periods of low flow, freezing, and stormwater runoff occasionally compromise Jordan Creek habitat and water quality, results of 2009 monitoring add little to our understanding of hydrologic response to rainfall and impacts of stormwater on water quality and habitat. These concepts are thoroughly explored in the 2009 TMDL for Sediment and Interstitial Dissovled Oxygen report by ADEC. In contrast, we anticipate 2010 sampling will be directed toward filling specific data gaps in the Jordan Creek knowledge base.

For example, re-establishing a discharge record will aid in future studies of stream capacity and pollutant loading. Mapping stormwater inputs (outfalls, swale and ditch "tributaries," surface sheet flow into riparian areas) and monitoring end-of-pipe water quality during several storms has potential to demonstrate whether or not a stormwater retrofit or BMP plan specific to Jordan Creek watershed is necessary or needs consideration in locations where stream water quality may be compromised. JWP is interested in expanding monitoring and mapping efforts within the Jordan Creek Watershed and welcomes CBJ input on project scope and partnership opportunities in the future.

Acknowledgements

JWP wishes to thank the City and Borough of Juneau for ongoing project and financial support that made this work possible. Eran Hood and Sonia Nagorski, at the University of Alaska Southeast, provided much-appreciated guidance, laboratory space, monitoring equipment, and advice to get this sampling effort underway. The GIS software used to prepare project maps was provided by the ESRI Conservation Grant program.

Related Documents

Alaska Department of Environmental Conservation, 2009. 18 AAC 70 Water Quality Standards amended September 19, 2009. http://www.dec.state.ak.us/water/wqsar/wqs/pdfs/18_AAC_70%20_Amended_September_19_2009.pdf

ADEC (Alaska Department of Enviromental Conservarion), 2009. Total Maximum Daily Load (TMDL) to Address the Sediment and Interstitial Dissolved Oxygen Impairments in Jordan Creek, Alaska.

U.S. Environmental Protection Agency, 2006. Water Quality Criteria: http://www.epa.gov/waterscience/criteria/.

Hood, E. L. Hoferkamp, J. Hudson, 2005. Duck and Jordan Creek Protection and Recovery: FY 2005 Final Report to the ADEC. Project #ACWA 05-010.

Nagorski, S., E. Hood, L. Hoferkamp, E. Neal, J. Hudson, 2006. Watershed Protection and Recovery for Jordan Creek, Juneau, AK. Prepared for the Alaska Department of Enviornmental Conservation.

Nagorski, S., L. Hoferkamp, 2007. Watershed Protection and Recovery for Jordan Creek, Juneau, AK. Prepared for the Alaska Department of Environmental Conservation.

Nagorski, S., 2008. Watershed Protection and Recovery for Jordan Creek, Juneau, AK. Prepared for the Alaska Department of Environmental Conservation.

Appendix A: State Water Quality Criteria for Designated Uses

Temperature	
Water Recreation: Contact	May not exceed 30° C
Growth and Propagation of Fish, Shellfish, Other Aquatic Life and Wildlife	May not exceed 20° C at any time. The following maximum temperatures may not be exceeded, where applicable: Migration routes 15° C Spawning areas 13° C Rearing areas 15° C Egg & fry incubation 13° C For all other waters, the weekly average temperature may not exceed site-specific requirements needed to preserve normal species diversity or to prevent appearance of nuisance organisms.
Turbidity	
Water Recreation: Contact	May not exceed 5 NTU above natural conditions when the natural turbidity is 50 NTU or less, and may not have more than 10% increase in turbidity when the natural turbidity is more than 50 NTU, not to exceed a maximum increase of 15 NTU. May not exceed 5 NTU above natural turbidity for all lake waters.
Water recreation: Secondary	May not exceed 10 NTU above natural conditions when natural turbidity is 50 NTU or less, and may not have more than 20% increase in turbidity when the natural turbidity is greater than 50 NTU, not to exceed a maximum increase of 15 NTU. For all lake waters, turbidity may not exceed 5 NTU above natural turbidity.
Growth and Propagation of Fish, Shellfish, Other Aquatic Life and Wildlife	May not exceed 25 NTU above natural conditions. For all lake waters, may not exceed 5 NTU above natural conditions.
pH	
Water Recreation: Contact	May not be less than 6.5 or greater than 8.5. If the natural condition pH is outside this range, substances may not be added that cause an increase in the buffering capacity of the water.
Growth and Propagation of Fish, Shellfish, Other Aquatic Life and Wildlife	May not be less than 6.5 or greater than 8.5. May not vary more than 0.5 pH unit from natural conditions.
Sediment	
Water Recreation: Contact	No measurable increase in concentration of settleable solids above natural conditions, as

	measured by the volumetric Imhoff cone method (see note 11).
Growth and Propagation of Fish, Shellfish, Other Aquatic Life and Wildlife	The percent accumulation of fine sediment in the range of 0.1 mm to 4.0 mm in the gravel bed of waters used by anadromous or resident fish for spawning may not be increased more than 5% by weight above natural conditions (as shown from grain size accumulation graph). In no case may the 0.1 mm to 4.0 mm fine sediment range in those gravel beds exceed a maximum of 30% by weight (see notes 3 and 4). In all other surface waters no sediment loads (suspended or deposited) that can cause adverse effects on aquatic animal or plant life, their reproduction or habitat may be present.

3. Wherever criteria for fine sediments are provided in this chapter, fine sediments must be sampled by the method described in *An Improved Technique for Freeze Sampling Streambed Sediments*, by William J. Walkotten, United States Department of Agriculture, United States Forest Service, Forest Service Research Note PNW-281, October 1976, adopted by reference, or by the technique found in *Success of Pink Salmon Spawning Relative to Size of Spawning Bed Materials*, by William J. McNeil and W.H. Ahnell, United States Department of the Interior, United States Fish and Wildlife Service, Special Scientific Report - Fisheries No. 469, January 1964, pages 1 - 3, adopted by reference.

4. Wherever criteria for fine sediments are provided in this chapter, percent accumulation of fine sediments will be measured by the technique found in the *Manual on Test Sieving Methods*, *Guidelines for Establishing Sieve Analysis Procedures*, by the American Society for Testing and Materials (ASTM), STP 447A, 1972 edition,

11. Volumetric measurements of settleable solids must be determined according to the following procedure: first, an Imhoff cone must be filled to the one-liter mark with thoroughly mixed sample; second, the sample must settle for 45 minutes; third, the sides of the cone must be gently stirred with a rod or by spinning; fourth, the sample must settle 15 minutes longer, and the volume of settleable matter in the cone must be recorded as milliliters per liter; fifth, if the settled matter contains pockets of liquid between large settled particles, the volume of these pockets must be estimated and subtracted from the volume of settled matter

Appendix B: 2009 Jordan Creek Water Quality Data

Collected by Beverly Schoonover, JWP jwp@alaska.net

Turbidity

	Site A - Amalga St.		***Site B – Super 8 Motel***		***Site C - Yandukin St.***	
Date	**Time**	**Turbidity (NTU)**	**Time**	**Turbidity (NTU)**	**Time**	**Turbidity (NTU)**
4/23/2009	9:11	0.85	12:30	3.45	12:45	2.12
5/4/2009	3:20	1.29	3:35	3.06	3:40	3.08
5/28/2009	11:30	0.33	12:00	1.61	12:30	1.38
6/17/2009	3:00	0.92	4:00	2.50	3:45	1.66
6/29/2009	3:30	0.47	2:30	1.91	4:15	1.84
7/21/2009	1:17	0.76	4:00	3.60	3:00	5.10
7/29/2009	3:40	1.34	4:00	2.15	4:01	3.29
8/6/2009	9:45	1.63	9:30	4.66	9:40	*
8/7/2009	10:30	1.19	10:10	2.32	10:00	*
8/31/2009	2:21	0.85	2:30	3.55	2:50	3.08
9/29/2009	10:00	0.66	10:35	3.15	10:40	1.51
10/13/2009	10:00	0.70	1:30	1.30	1:40	1.49
10/20/2009	2:00	0.70	3:00	1.93	3:40	1.57

Temperature

	Site A - Amalga St.		***Site B - Super 8 Motel***		***Site C - Yandukin St.***	
Date	**Time**	**Temp (°C)**	**Time**	**Temp (°C)**	**Time**	**Temp (°C)**
4/23/2009	9:11	3.2	12:30	2.4	12:45	2.2
5/4/2009	3:20	2.7	3:35	3.3	3:40	3.5
5/28/2009	11:30	5.1	12:00	6.1	12:30	6.3
6/17/2009	3:00	6.1	4:00	8.9	3:45	8.9
6/29/2009	3:30	6.3	2:30	8.2	4:15	8.4
7/21/2009	1:17	7.2	4:00	10.1	3:00	10.1
7/29/2009	3:40	8.2	4:00	11.3	4:01	11.9
8/6/2009	9:45	7.5	9:30	11.4	9:40	*
8/7/2009	10:30	7.6	10:10	11.6	10:00	*
8/31/2009	2:21	7.5	2:30	8.8	2:50	8.9
9/29/2009	10:00	5.7	10:35	5.0	10:40	5.0
10/13/2009	10:00	5.4	1:30	4.2	1:40	3.9
10/20/2009	2:00	6.0	3:00	5.3	3:40	5.3

Conductivity (specific conductance)

	Site A - Amalga St.		***Site B - Super 8 Motel***		***Site C - Yandukin St.***	
Date	**Time**	**Conductivity (µS/cm)**	**Time**	**Conductivity (µS/cm)**	**Time**	**Conductivity (µS/cm)**
4/23/2009	9:11	100	12:30	69	12:45	69
5/4/2009	3:20	102	3:35	72	3:40	72
5/28/2009	11:30	75	12:00	54	12:30	54
6/17/2009	3:00	71	4:00	54	3:45	55
6/29/2009	3:30	65	2:30	53	4:15	54
7/21/2009	1:17	82	4:00	53	3:00	54
7/29/2009	3:40	85	4:00	79	4:01	83
8/6/2009	9:45	81	9:30	86	9:40	*
8/7/2009	10:30	79	10:10	89	10:00	*
8/31/2009	2:21	108	2:30	85	2:50	84

9/29/2009	10:00	113	10:35	93	10:40	92
10/13/2009	10:00	113	1:30	97	1:40	97
10/20/2009	2:00	112	3:00	86	3:40	82

pH

	Site A - Amalga St.		***Site B - Super 8 Motel***		***Site C - Yandukin St.***	
Date	**Time**	**pH**	**Time**	**pH**	**Time**	**pH**
4/23/2009	9:11	4.32	12:30	4.32	12:45	3.91
5/4/2009	3:20	1.77	3:35	1.65	3:40	3.04
5/28/2009	11:30	7.03	12:00	7.3	12:30	6.91
6/17/2009	3:00	7.7	4:00	7.35	3:45	7.49
6/29/2009	3:30	7.5	2:30	7.58	4:15	7.55
7/21/2009	1:17	7.45	4:00	7.55	3:00	7.17
7/29/2009	3:40	7.25	4:00	7.42	4:01	7.52
8/6/2009	9:45	7.81	9:30	8.14	9:40	*
8/7/2009	10:30	7.08	10:10	7.44	10:00	*
8/31/2009	2:21	7.75	2:30	7.1	2:50	7.24
9/29/2009	10:00	7.75	10:35	7.84	10:40	7.78
10/13/2009	10:00	7.75	1:30	8.26	1:40	8.04
10/20/2009	2:00	7.82	3:00	8.19	3:40	7.53

TSS / SSC

	Site A - Amalga St.		***Site B - Super 8 Motel***		***Site C - Yandukin St.***	
Date	**Time**	**SSC (mg/L)**	**Time**	**SSC (mg/L)**	**Time**	**SSC (mg/L)**
4/23/2009	9:11	0.0	12:30	1.7	12:45	0.3
5/4/2009	3:20	0.4	3:35	2.1	3:40	2.3
5/28/2009	11:30	0.0	12:00	1.7	12:30	1.0
6/17/2009	3:00	0.0	4:00	2.7	3:45	1.4
6/29/2009	3:30	2.1	2:30	4.9	4:15	0.0
7/21/2009	1:17	0.0	4:00	0.6	3:00	2.2
7/29/2009	3:40	2.0	4:00	1.1	4:01	0.9
8/6/2009	9:45	0.0	9:30	1.0	9:40	1.0
8/7/2009	10:30	0.0	10:10	2.2	10:00	2.0
8/31/2009	2:21	1.7	2:30	3.5	2:50	1.3
9/29/2009	10:00	0.3	10:35	4.3	10:40	5.8
10/13/2009	10:00	1.5	1:30	2.9	1:40	2.8

Note: No flow 8/6-8/7 at Yandukin Site.