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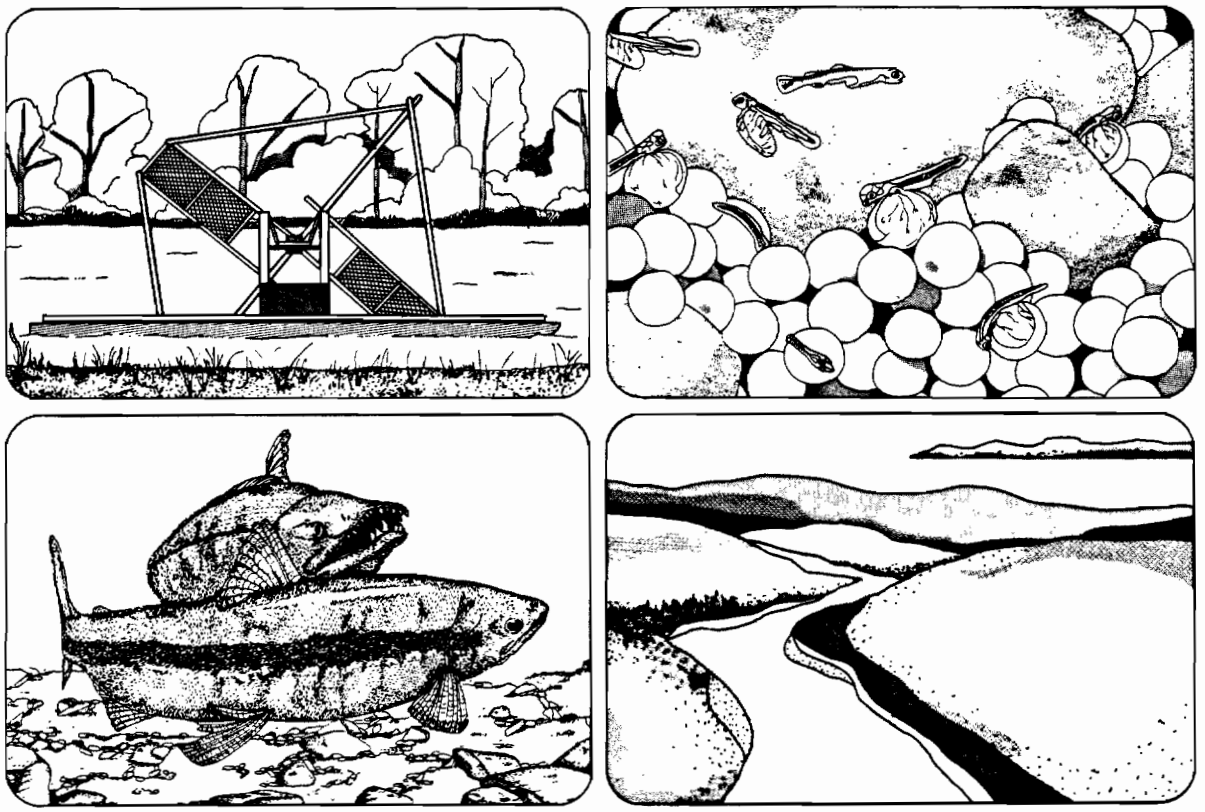

ALASKA DEPARTMENT OF FISH AND GAME
SUSITNA HYDRO AQUATIC STUDIES

REPORT NO. 3 Part I, Chapter 4

AQUATIC HABITAT AND INSTREAM FLOW INVESTIGATIONS (MAY-OCTOBER 1983)

ALASKA DEPARTMENT OF FISH AND GAME
SUSITNA HYDRO AQUATIC STUDIES REPORT SERIES

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AQUATIC HABITAT AND INSTREAM FLOW INVESTIGATIONS (MAY-OCTOBER 1983)

Edited by:

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FORWARD

Part I, "Basin-wide Hydrologic and Water Quality Investigations", is a compilation of the physical and chemical data collected by the ADF&G Su Hydro Aquatic Studies team during the FY 84 open water field season (May-October, 1983). In certain cases, the the 1983 data bases have been combined with the ADF&G 1981 and 1982 data bases, along with other data bases from other subcontractors (R&M Consultants and AEIDC) in order to present a most up to complete listing of currently available data. These data are arranged by data type for ease of use by user agencies.

Part I is divided into five chapters:

Chapter 1 Stage/discharge investigations of the Susitna River basin.

Chapter 2 Channel geometry investigations of the Susitna River basin.

Chapter 3 Continuous water temperature investigations of the Susitna River basin.

Chapter 4 Water quality ivestigations of the Susitna River basin.

Chapter 5 Dissolved gas concentration investigations of the Susitna River basin.

GLOSSARY FOR PART I OF REPORT # 3

Backwater Area - A body or accumulation of water with little or no velocity resulting from a hydraulic (e.g. mainstem discharge) or physical (e.g. beaver dam) barrier which occurs at the mouth of or within a side channel or slough.

Berm - The ledge or shelf at the head of a side slough or side channel that separates the side slough or channel from the mainstem Susitna River or other side channels.

Breaching - Any of the three conditions of overtopping of the head of a side channel or side slough (see also initial, intermediate, and controlling breaching discharges).

Controlling Breaching Discharge - The breaching condition in which mainstem discharges at Gold Creek are equal to or greater than the mainstem discharge required to directly govern the hydraulic characteristics within a side slough or side channel. This condition can be denoted as equalling the segment of the flow rating curve beginning with the point of inflection and beyond.

Cross Section Profile - A profile describing the cross sectional geometry of a channel.

Datapod - An instrument used to continuously measure and record various enviornmental variables e.g. air or water temperature, stage, and dissolved gas concentration (refer to Chapters 1, 2 and 5).

Discharge - Water volume passing a fixed location at a specific point in time. The term specifically refers to the moving water in the mainstem habitat.

DSM - Data Storage Module used in the datapod system to store data (refer to Chapters 1 and 2).

Flow - Water volume passing a specific location at a specific point in time. The term specifically refers to moving water in side channel, side slough, upland slough, tributary mouth, and tributary habitats.

Gaging Station - A station at a site which has been established for monitoring stage, flow and/or discharge.

Gradient - Rate of change in vertical elevation per unit horizontal distance.

Head - The upstream confluence or point of origin of a lotic water body.

Inflection Point - The point on a rating curve at which the line describing the data changes slope.

Initial Breaching Discharge - The mainstem discharge at Gold Creek which represents the initial point when mainstem water begins to enter the upstream head (berm) of a side slough or channel.

Intermediate Breaching Discharge - The range of mainstem discharges at Gold Creek representative of the conditions between the Initial and Controlling Breaching Discharges. This range occurs from immediately after mainstem surface water begins to overtop the upstream head (berm) of a side slough or side channel up to the point when the mainstem discharge begins to govern the hydraulic characteristics of the site.

Mainstem Habitat - Consists of those portions of the Susitna River that normally convey water throughout the year. Both single and multiple channel reaches are included in this habitat category. Groundwater and tributary inflow appear to be inconsequential contributors to the overall characteristics of mainstem habitat. Mainstem habitat is typically characterized by high water velocities and well armored streambeds. Substrates generally consist of boulder and cobble size materials with interstitial spaces filled with a grout-like mixture of small gravels and glacial sands. Suspended sediment concentrations and turbidity are high during summer due to the influence of glacial melt-water. Discharges recede in early fall and the mainstem clears appreciably in October. An ice cover forms on the river in late November or December.

Mean Daily Discharge - The computed mean discharge per 24 hour period for a gaging station. All USGS discharge data are in this format.

Monitoring Station - A station set up for the collection of a particular data base.

Mouth - The downstream confluence of one or more water bodies with another water body.

Overtopping - See breaching.

Peripheral Habitats - Aquatic habitats peripheral to the mainstem Susitna River habitat (e.g. side channel, side slough, upland slough, tributary mouth and/or tributary habitats.

Pool - A portion of a water course that is relatively deep and slow-moving in comparison to the rest of the water course.

Project Datum - A series of elevations tied to sea level that are used by project personnel to tie relative data bases together.

Rating Curve - A curve that is constructed from data representing two dependent variables (e.g. stage, flow or discharge data) that describes the relationship between the two variables at a site.

Riffle - A portion of a water course that is relatively shallow and fast-running in comparison to the rest of the water course.

Side Channel Habitat - Consists of those portions of the Susitna River that normally convey water during the open water season but become appreciably dewatered during periods of low mainstem discharge. Side channel habitat may exist either in well defined overflow channels, or in poorly defined water courses flowing through partially submerged gravel bars and islands along the margins of the mainstem river. Side channel streambed elevations are typically lower than the mean monthly water surface elevations of the mainstem Susitna River observed during June, July and August. Side channel habitats are characterized by shallower depths, lower velocities and smaller streambed materials than the adjacent habitat of the mainstem river.

Side Slough Habitat - is located in overflow channels between the edge of the floodplain and the mainstem and side channels of the Susitna River. It is usually separated from the mainstem and/or side channels by well vegetated bars. An exposed alluvial berm often separates the head of the slough from mainstem discharge or side channel flows. The controlling streambed/bank elevations at the upstream end of the side sloughs are slightly less than the water surface elevations of the mean monthly discharges of the mainstem Susitna River observed for June, July, and August. At intermediate and low-discharge periods, the side sloughs convey clear water from small tributaries and/or upwelling groundwater. These clear water inflows are essential contributors to the existence of this habitat type. The water surface elevation of the Susitna River generally causes a backwater to extend well up into the slough from its lower end. Even though this substantial

backwater exists, the sloughs function hydraulically very much like small stream systems and several hundred feet of the slough channel often conveys water independent of mainstem backwater effects. At high discharges the water surface elevations of the mainstem river is sufficient to overtop the upper end of the slough. Surface water temperatures in the side sloughs during summer months are principally a function of air temperature, solar radiation, and the temperature of the local runoff.

Staff Gage - A device used to instantaneously monitor stage at a site.

Stage - A measure of water depth which can be converted to water, surface elevation when surveyed to a benchmark at a site. It can be converted to true water surface elevation if it is tied into project datum.

Thalweg Profile - A longitudinal profile that describes the streambed elevation of the deepest portion or middle of mainstem, tributary, slough or other riverine habitats.

Tributary Habitat - consists of the full complement of hydraulic and morphologic conditions that occur in the tributaries. Their seasonal flow, sediment, and thermal regimes reflect the integration of the hydrology, geology, and climate of the tributary drainage. The physical attributes of tributary habitat are not dependent on mainstem conditions.

Tributary Mouth Habitat - extends from the uppermost point in the tributary influenced by mainstem Susitna River or slough backwater effects to the downstream extent of the tributary plume which extends into the mainstem Susitna River or slough.

Turbid - The condition of water quality at a site when water clarity is decreased by inorganic and/or organic suspended materials. Turbidity levels often exceed 50 NTU's.

Upland Slough Habitat - differs from side slough habitat in that the upstream end of the slough does not interconnect with the surface waters of the mainstem Susitna River or its side channels even at high mainstem discharges. These sloughs are characterized by the presence of beaver dams and an accumulation of silt covering the substrate resulting from the absence of mainstem scouring discharges.

Water Surface Elevation - The elevation of the water surface.

WSEL - See water surface elevation.

Water Quality Investigations of the Susitna River Basin

1984 Report No. 3, Chapter 4

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ABSTRACT

(To be written)

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1.0 INTRODUCTION AND OBJECTIVES

1.1 Introduction

The Alaska Department of Fish and Game (ADF&G) Susitna Hydroelectric Aquatic Feasibility Study Team has collected baseline water quality data throughout the Susitna River basin since 1981. Although measurements of baseline water quality have been obtained throughout the entire river basin, the emphasis of the data collection program has been largely oriented to the reach of the Susitna River extending from Talkeetna to Devil Canyon (middle river). The primary focus of the data collection program to date has been to characterize the baseline water quality conditions present within the mainstem and its peripheral habitats and to determine how these baseline water quality conditions are influenced by mainstem flows. Results of these investigations are presented in ADF&G 1981, 1982.

1.2 Objectives

The overall objective of the FY84 open water field season (May 15 - October 15, 1983) quality investigations was to continue the monitoring of water quality conditions present in the mainstem, selected tributaries, upland and side sloughs, and side channels of the middle Susitna River system from the Parks Highway Bridge (RM 83.9) to the mouth of Devil Canyon (RM 150.1). The general water quality parameters measured included dissolved oxygen (DO), pH, water temperature, specific conductance, and turbidity.

The FY 84 open water field season water quality investigations were segregated by habitat into three distinct programs, each with its own specific objectives.

1.2.1 Mainstem Habitats

The water quality data collection program conducted in mainstem habitats during the 1983 open water field season was designed to:

1. Characterize the general baseline water quality of the middle reach of the mainstem Susitna River;

2. Determine the effect that mainstem discharge has on the water quality parameters sampled; and,

3. Support the analyses of fish habitats being conducted in mainstem habitats.

1.2.2 Side Channel and Upland and Side Slough Habitats

The water quality data collection program conducted in side channel and side and upland slough habitats during the 1983 open water field season was designed to:

1. Monitor the water temperature and turbidity levels of selected side channels and sloughs (upland and side) in the middle reach of the Susitna River system;

2. To determine the effect that mainstem discharge has on turbidity levels in these peripheral habitats; and,

3. Support the analyses of fish habitats being conducted in these peripherial habitats.

1.2.3 Tributary Habitats

The water quality data collection program conducted in tributary habitats during the 1983 open water field season was designed to:

1. Characterize the general water quality conditions of each of the major glacial tributaries in the middle reach of the Susitna River and to extend the record of turbidity measurements of one selected clearwater tributary (Indian River); and,

2. Support the analyses of fish habitats being conducted in tributary habitats.

2.0 METHODS

2.1 Site Selection

2.1.1 Mainstem Habitats

The mainstem Susitna River water quality monitoring stations were specifically chosen to evaluate the general water quality conditions present throughout the 1983 open water field season in the reach of river from Talkeetna to Devil Canyon (Table 4-1, Figure 4-1). Each water quality station was located at a site where continuous water temperature was also collected (see Chapter 3). Sampling intensity was daily at the two camp locations, whereas the remaining sites were monitored twice a month (Table 4-1).

2.1.2 Side Channels and Side and Upland Slough Habitats

The sloughs and side and upland channels selected for water quality monitoring (Table 4-2, Figure 4-1) were chosen based upon their importance as salmon spawning and rearing habitat and their ability to represent side channel and side and upland slough habitats in the Talkeetna to Devil Canyon reach.

Turbidity and water temperature was monitored at all slough and side channel stations in order to determine the effect of mainstem discharge. These water quality parameters were sampled at each slough and side channel twice monthly.

Table 4-1, FY 84 Mainstem Susitna River and tributary water quality monitoring stations.

Location	Habitat	River Mile	TRM[1]	Sample Schedule
Parks Highway Bridge	Mainstem	83.9		Twice monthly
Talkeetna River	Tributary	97.2	0.5	Twice monthly
Chulitna River	Tributary	98.6	2.0	Twice monthly
Talkeetna Fishwheel	Mainstem	103.0		Daily
LRX 24	Mainstem	120.7		Twice monthly
LRX 29	Mainstem	126.1		Twice monthly
MS above Gold Creek	Mainstem	136.8		Daily
Indian River	Tributary	158.6	1.0	Twice monthly
LRX 57	Mainstem	142.3		Twice monthly
Eddy below Devil Canyon	Mainstem	150.1		Twice monthly

[1] TRM = tributary river mile, determined from the mouth of the tributary upstream of the study site.

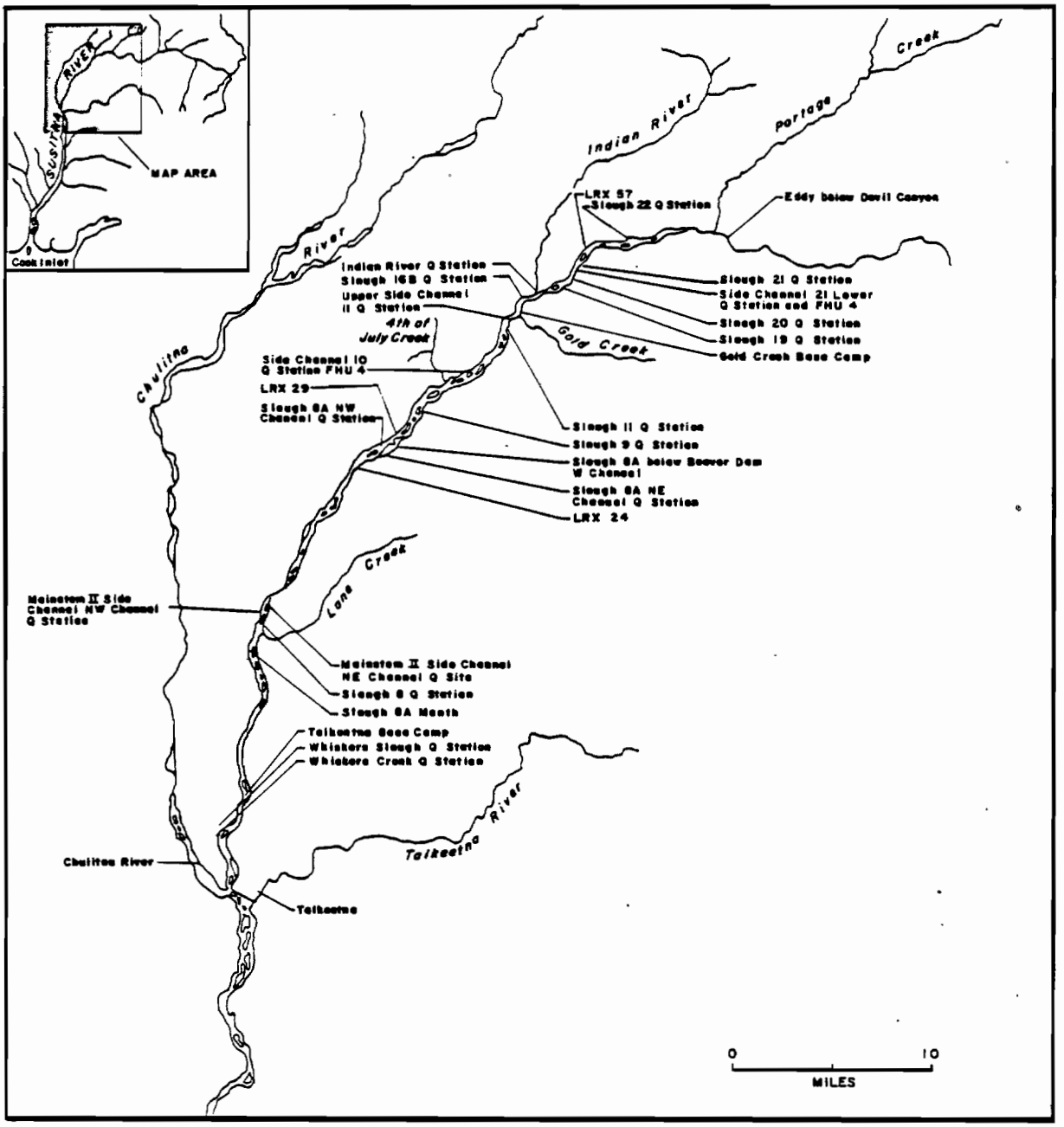

Figure 4-1 Mainstem, side channels, and upland and side slough study sites.

Table 4-2. Locations of side channel and upland and side slough water quality monitoring stations for FY 84.

Site	River Mile
Side channel	
Mainstem II Side Channel	114.4
Slough 10 Side Channel	134.2
Upper Side Channel 11	136.5
Side Channel 21	141.1
Slough	
Whiskers Creek Slough	101.4
6A	112.3
Slough 8	113.7
8A	125.5
9	128.9
11	135.7
16B	138.0
20	140.2
21	141.0

2.1.3 Tributary Habitats

Tributaries selected for water quality investigations (Table 4-1, Figure 4-1) were the Talkeetna, Chulitna, and Indian Rivers. The Talkeetna and Chulitna River water quality sites were chosen to coincide with the continuous water temperature stations located in these rivers. The water quality monitoring station for Indian River was also a discharge station.

The Talkeetna and Chulitna Rivers are major glacial tributaries to the Susitna River. Because of their effect on the Susitna River below their confluence, general water quality parameters were measured at these sites.

Turbidity data was collected in Indian River to extend the record of turbidity measurements at this site.

2.2 Field Data Collection

General water quality parameters measured during the open water 1983 field season included dissolved oxygen (DO), pH, water temperature, specific conductance and turbidity. All water quality parameters except turbidity were measured using a Hydrolab model 4041 portable multiparameter meter using procedures outlined in the FY84 ADF&G Procedures Manual (ADF&G 1984). Turbidity samples were analyzed in the field using a HF Instrument DRT-15 turbidity meter using procedures outlined in the FY84 ADF&G Procedures Manual (ADF&G 1984).

2.3 Analytical Approach

The procedures utilized for evaluating the water quality during FY84 are presented in the FY84 ADF&G Procedures Manual (ADF&G 1984).

Water quality data collected at mainstem and major tributary sites were tabulated with presentation of the statistical analysis limited to the range and the percentile ranking. Turbidity and temperature obtained at the daily monitored stations in the mainstem were plotted against mainstem discharge and time. Turbidity and discharge were also analyzed for straight line characteristics utilizing a least square regression for these two daily monitoring stations.

Turbidity data collected in side channels, upland and side sloughs, and Indian River were tabulated with corresponding water surface elevation and mainstem discharge at Gold Creek (USGS 15292000).

3.0 RESULTS

3.1 Mainstem Habitats

Instantaneous measurements of water quality (dissolved oxygen, pH, water temperature, conductivity, and turbidity) were obtained at seven mainstem Susitna River water quality monitoring stations during the 1983 open water field season. These data are tabulated in Appendix Table 4-A-1. Graphical representations of the range, mean, and median values for each water quality parameter at each station are presented in Figures 4-2 through 4-6. The nature of the sampling procedure (instantaneous measurement) among stations, precludes strict comparisons of the ranges, means, and medians between stations. Thus, these data only provide an overview of the water quality characteristics of the mainstem Susitna River at a specific station.

Percent dissolved oxygen saturation was calculated for each monitoring station using the instantaneous water temperature and dissolved oxygen data bases using a dissolved oxygen saturation nomograph (Wetzel 1975). These data are tabulated in Appendix Table 4-A-1 and graphically presented in Figure 4-3.

Turbidity data collected on a daily basis at the Talkeetna fishwheel and the Gold Creek camp monitoring stations were plotted against time along with mean daily mainstem Susitna River discharge at Gold Creek (15292000) and mean daily temperature (Figures 4-7 and 4-8). Turbidity data collected at these mainstem Susitna River monitoring stations were

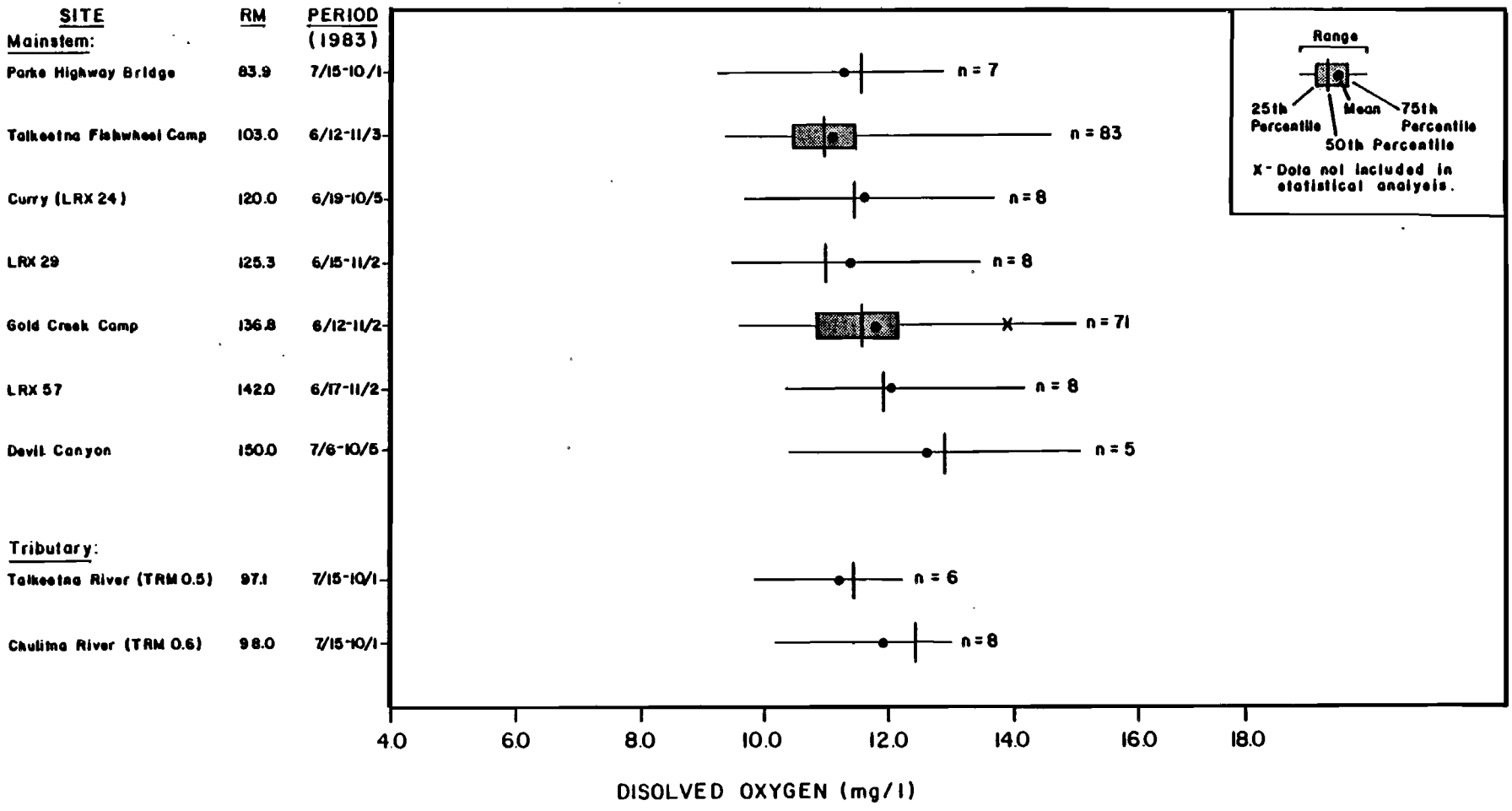

Figure 4-2. Dissolved oxygen for mainstem and tributary study sites.

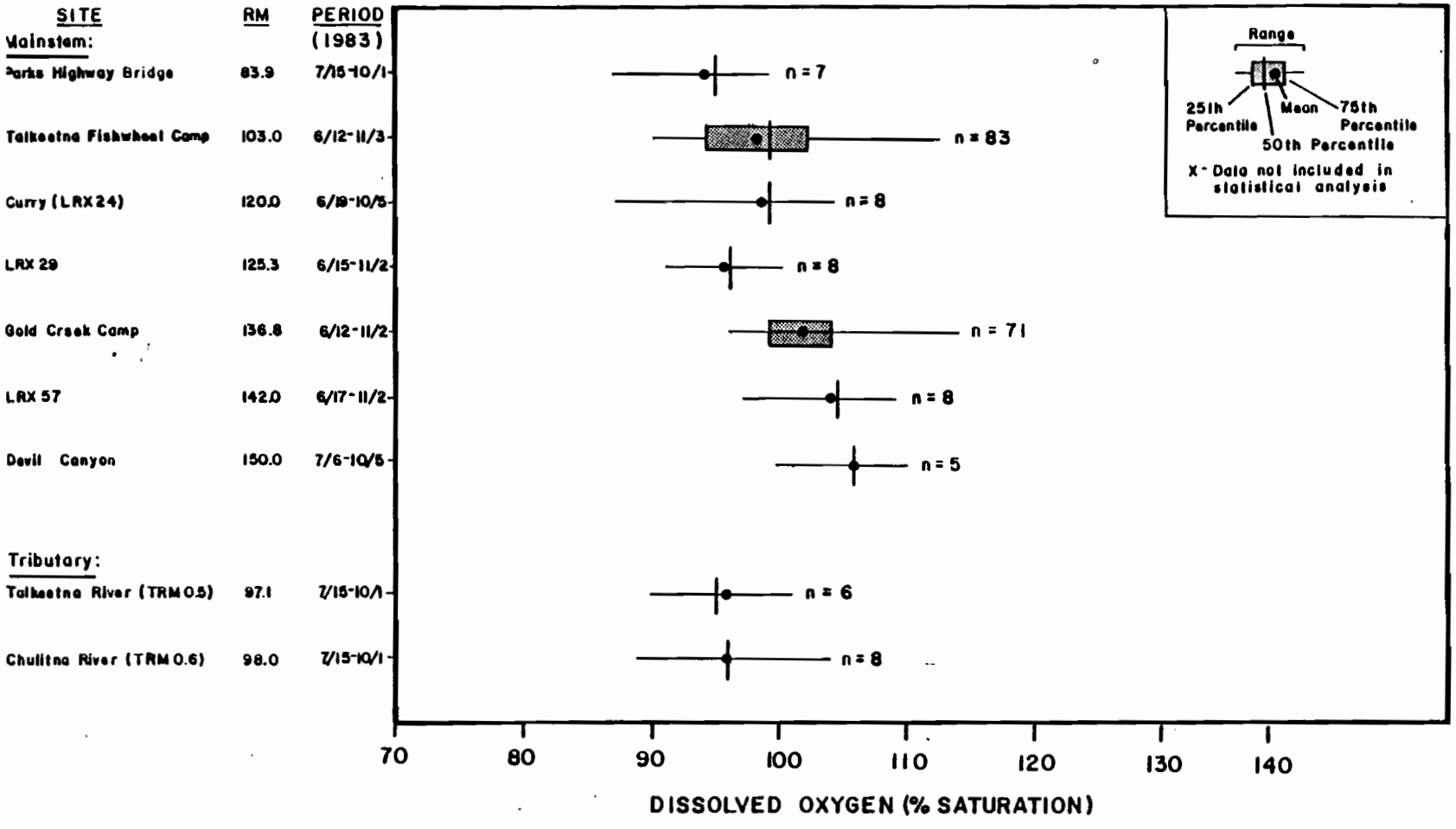

Figure 4-3. Percent dissolved oxygen saturation for mainstem and tributary study sites.

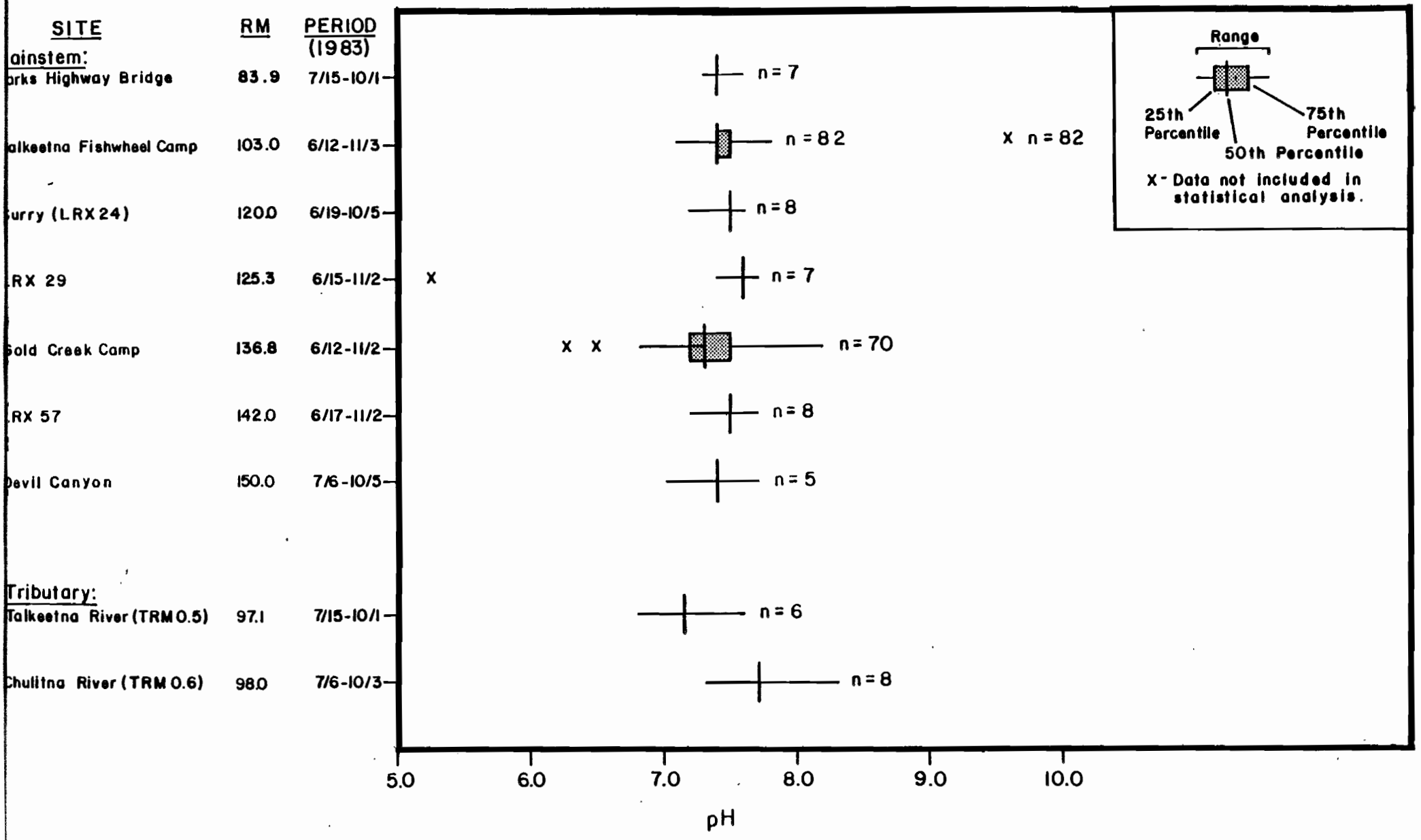

Figure 4-4. pH for mainstem and tributary study sites.

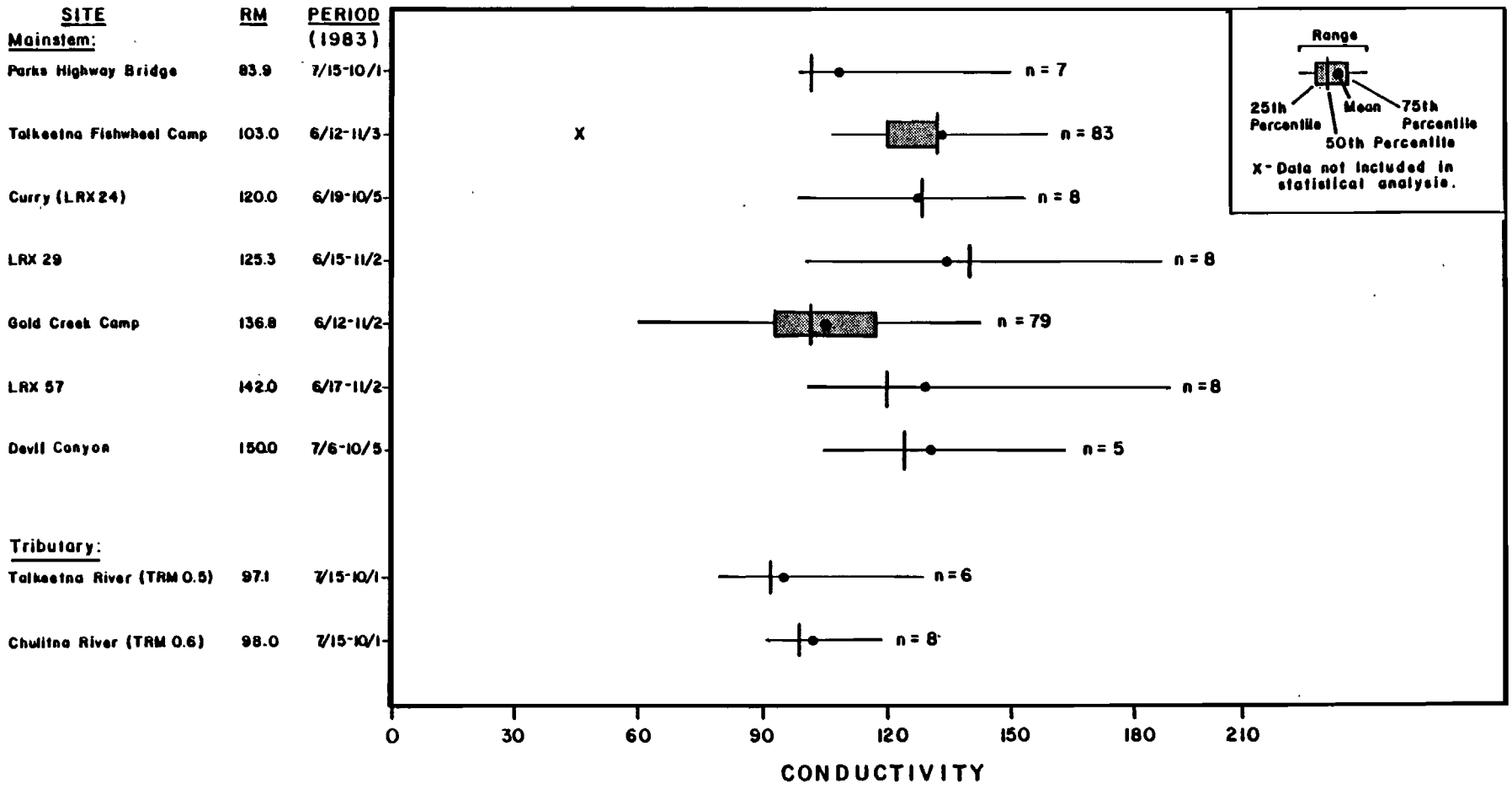

Figure 4-5. Conductivity for mainstem and tributary study sites.

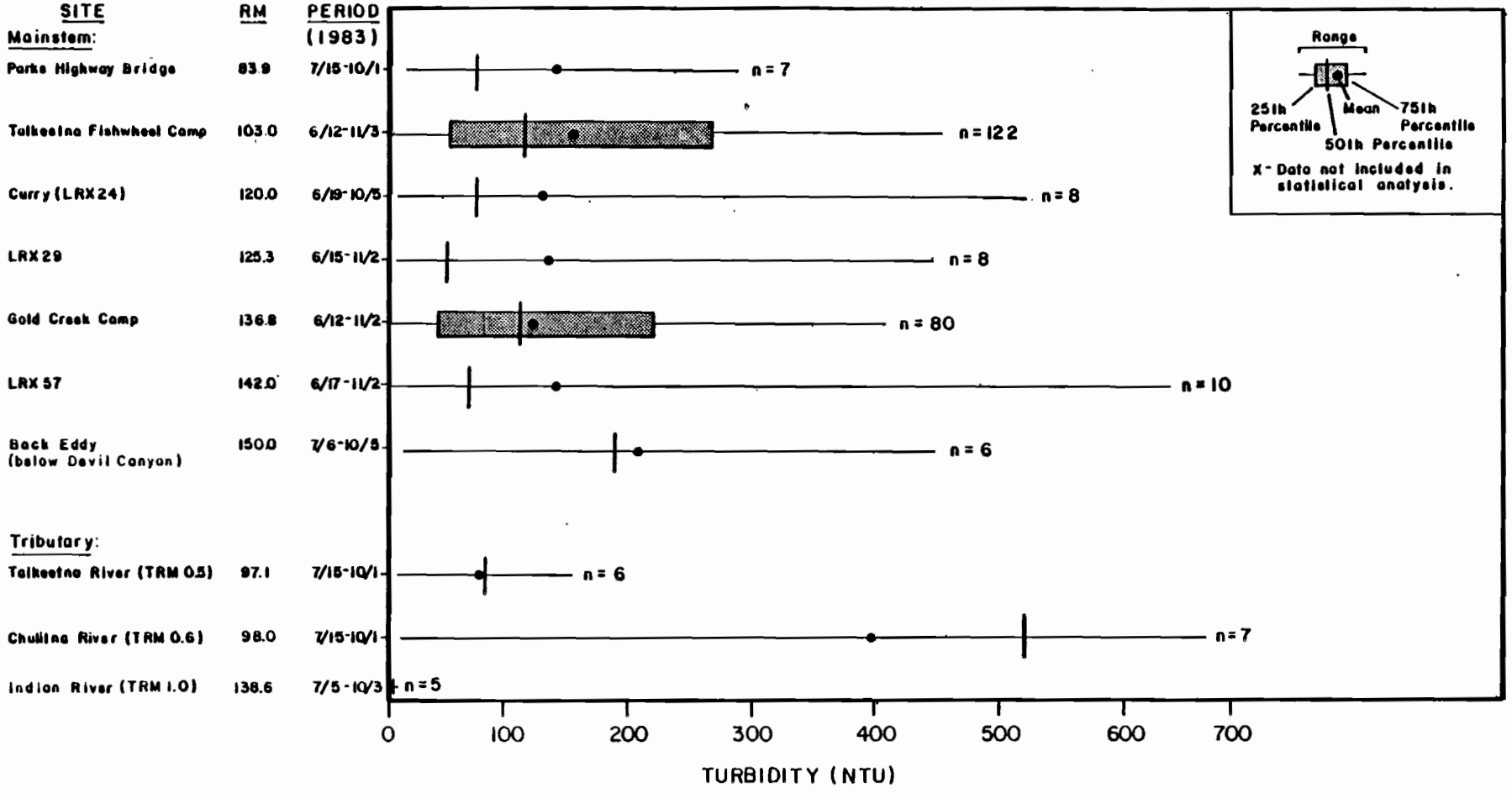

Figure 4-6. Turbidity for mainstem and tributary study sites.

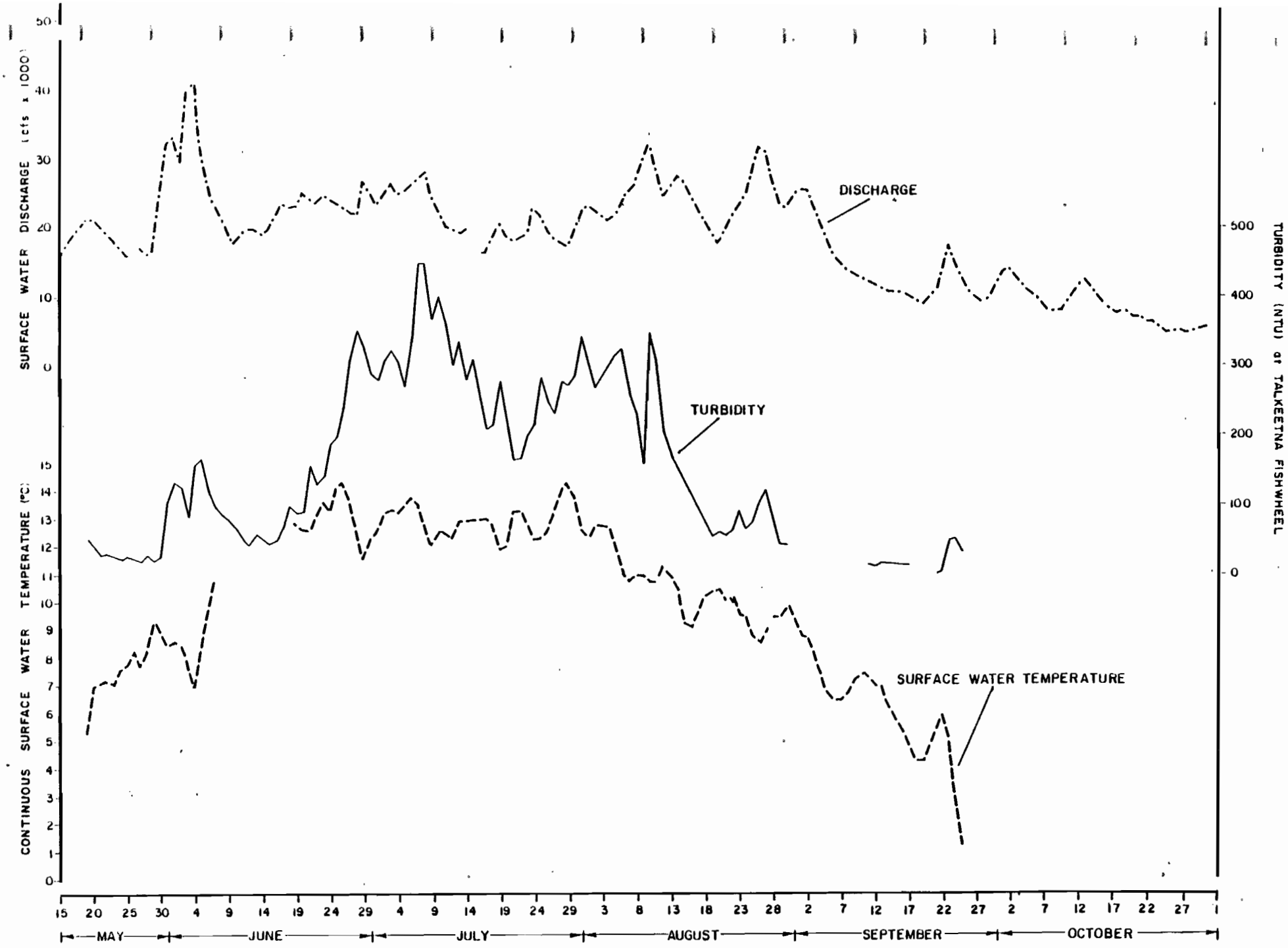

Figure 4-7. Turbidity, water temperature, and Susitna River discharge versus time at the Talkeetna fishwheel camp.

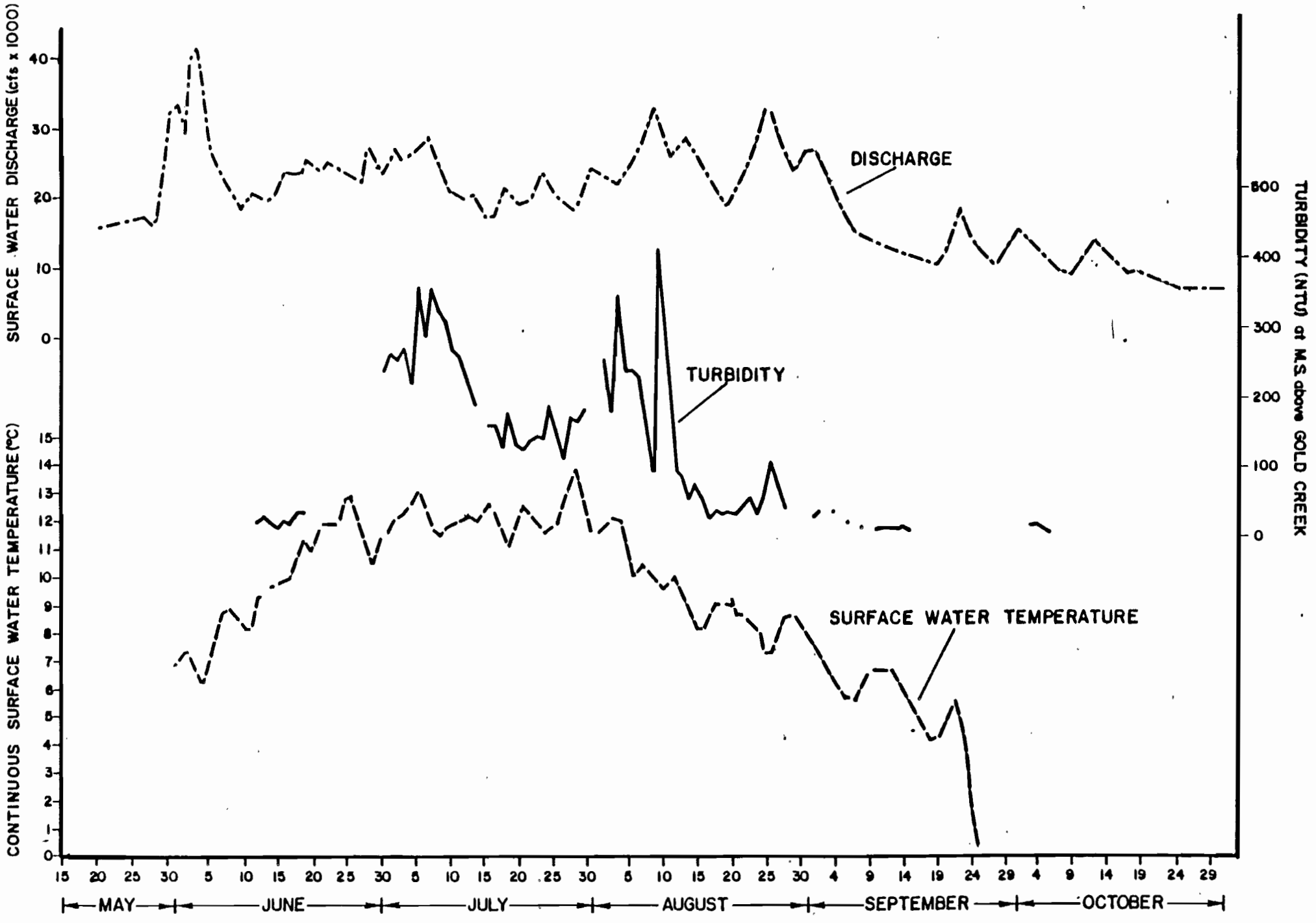

Figure 4-8. Turbidity, water temperature, and Susitna River discharge versus time at the Gold Creek camp.

also plotted against mainstem Susitna River discharge at Gold Creek (15292000) (Figures 4-9 and 4-10). A time dependent trend became evident as turbidity data was plotted against mainstem Susitna River discharge. The trends are given as four periods of measurements:

1. Early period and late period (5/18/83 to 6/20/83 and 8/15/83 through 10/6/83);

2. Early transitional period (6/21/83 through 6/25/83);

3. Middle period (6/26/83 through 8/6/83);

4. Late transitional period (8/7/83 through 8/14/83).

Large changes in turbidity levels (100 NTUs) for comparable discharges defined the transitional periods. Transitional periods defined the early, late, and middle periods. Transitional period turbidity data were not used in the calibration of the relationships between mainstem turbidity and mean daily mainstem discharge at Gold Creek.

3.2 Side Channels and Side and Upland Slough Habitats

Limited water quality (instantaneous water temperature and turbidity) measurements were obtained at 5 sites within 5 side channel habitats and at 13 sites within 11 side and upland slough habitats in the Talkeetna to Devil Canyon reach of the Susitna River. These data along with corresponding site water surface elevation (see Chapter 1) and mainstem Susitna River discharge at Gold Creek (15292000) are presented in Appendix Table 4-A-2.

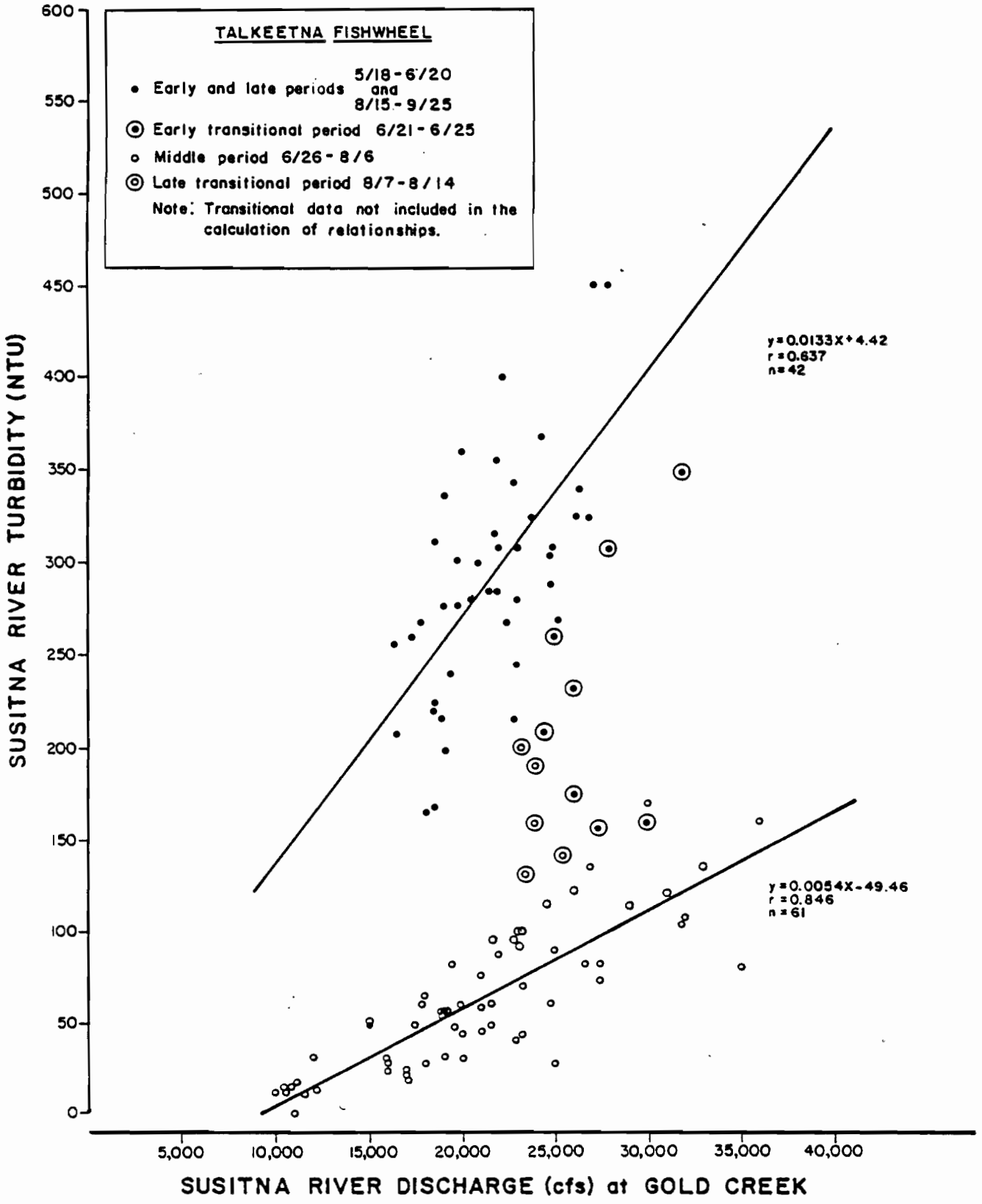

Figure 4-9. Turbidity versus Susitna River discharge at the Talkeetna fishwheel camp.

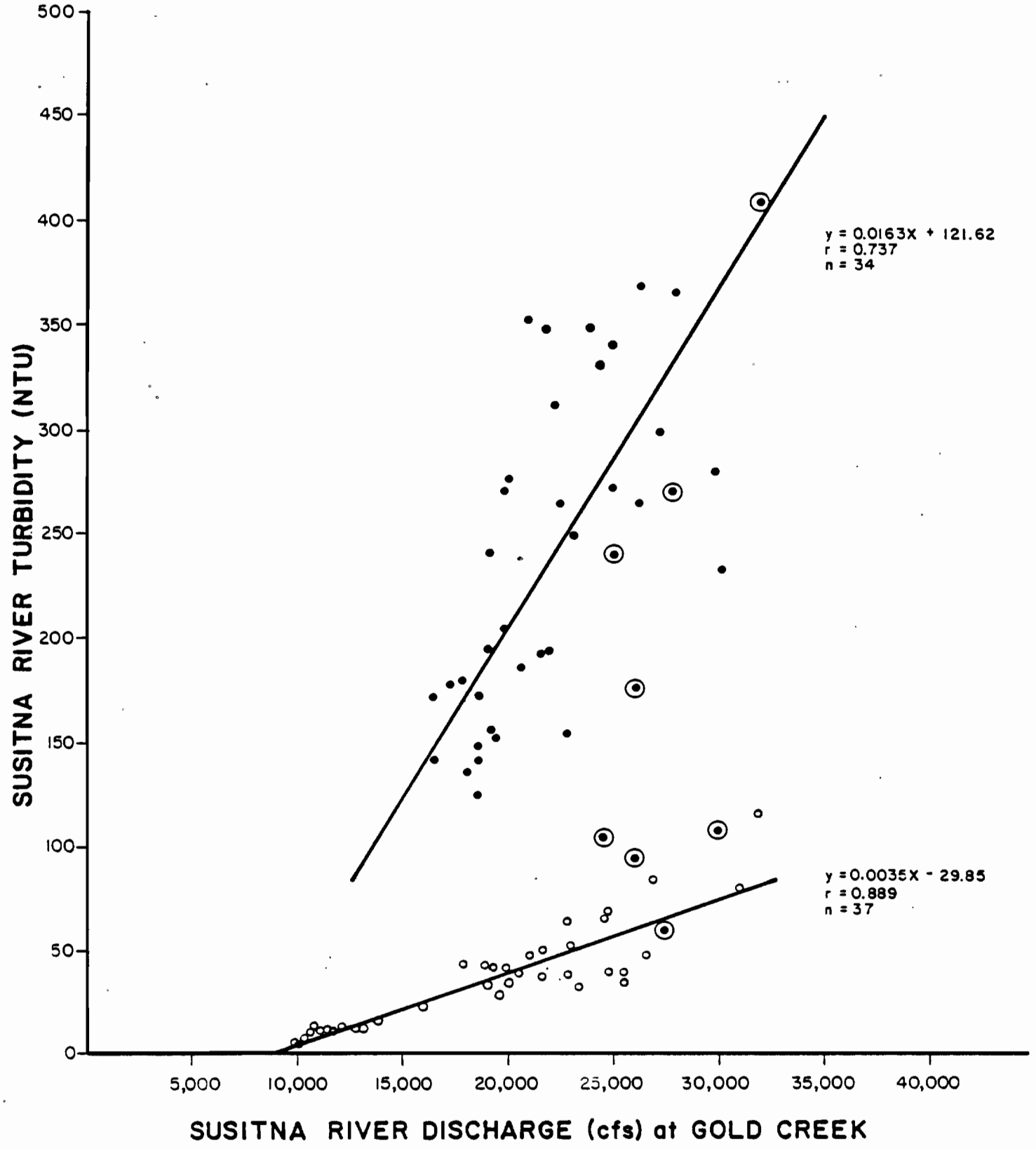

Figure 4-10. Turbidity versus Susitna River discharge at the Gold Creek fishwheel camp.

3.3 Tributary Habitats

Instantaneous measurements of water quality (dissolved oxygen, pH, water temperature, specific conductance, and turbidity) were obtained twice a month during the 1983 open water field season at the Talkeetna (RM 97.1, TRM 0.5) and Chulitna (RM 98.0, TRM 0.6) Rivers monitoring stations. Percent DO saturation was also calculated for each monitoring station using the instantaneous water temperature and dissolved oxygen data bases using a dissolved oxygen saturation nomograph (Wetzel 1975). These data are tabulated in Appendix Table 4-A-3 and graphically presented in Figures 4-2 through 4-6.

Limited water quality measurements, instantaneous water temperature, and turbidity were obtained at 2 tributary habitats in the Talkeetna to Devil Canyon reach of the Susitna River (Whiskers Creek and Indian River). These data are presented in Appendix Table 4-A-4.

4.0 DISCUSSION

Mainstem conductivity and pH

The general water quality parameters of pH and conductivity varied little between water quality monitoring stations along the middle Susitna River reach. The Chulitna River appeared to be slightly more alkaline than the Talkeetna and Susitna Rivers but little tributary influence was detected on the Susitna River below the confluence of the tributaries, (Tables 4-4 and 4-5).

Mainstem dissolved oxygen saturation

Means and mediums of dissolved oxygen saturation data collected at mainstem water quality monitoring stations along the middle Susitna River generally tended to decrease from the Bank Eddy station (RM 150.1) located immediately below the mouth of Devil Canyon to the Parks Highway Bridge station (RM 83.9) located below the confluence of the Talkeetna and Chulitna Rivers (Table 4-2). In a separate ADF&G Su/Hydro study (ADF&G 1982) total gas supersaturation of the Susitna River was found to form below the lower Devil Canyon rapids located a short distance above the Back Eddy water quality monitoring station. This gas supersaturation of river water was found to decrease downstream. Also, in the same study, dissolved oxygen saturation levels were found to parallel total dissolved gas saturation.

Dissolved oxygen saturation values (mean and mediums) observed at the Talkeetna and Chulitna Rivers' water quality monitoring station were similar to values observed at the Parks Highway Bridge Susitna River station.

Since Susitna River DO saturation levels were higher above the confluence of the Talkeetna and Chulitna River with the Susitna River, it appears that these tributaries may be influencing the DO water saturation of the Susitna River below the confluences. However, all DO and DO saturation values observed at all water quality monitoring stations were well above the minimum requirement to sustain aquatic life.

Mainstem Turbidity

The periodic positive correlations between Susitna River turbidity and corresponding discharge during 1983 were most likely dependent in part upon the amount of suspended sediment contributed to the mainstem Susitna River by the Susitna and Maclearn glaciers. During the period, which includes the early and late open water field season characterized by relatively low turbidity, the contribution of suspended material from the glaciers via glacial melt water was probably small because of the frozen condition of the glaciers. Most of the turbidity associated with this period probably originated from the resuspension of glacial sediments which settled out from the water column during prior periods of decreasing discharge and receding water levels.

The middle turbidity period, characterized by relatively high turbidity, most likely corresponded to the melting period of the glaciers. During this period changes in the suspended sediment load of the mainstem can probably be related to increases in glacial melt water. The turbidity/discharge relationship of this period was more dynamic and variable than the relationship of the early and late period, most likely because of periodic variations of the volume of glacial melt water and the continuing deposition and resuspension of riverine glacial sediments.

Overall, increases in mainstem turbidity during the middle period may not have been strictly correlated to the amount of suspended sediment present, but may also depend, in part, on the size distribution of the suspended sediment. Because of the large surface area to volume ratio of the finer particles, these particle may contribute more per unit weight to mainstem turbidity levels than larger particles.

These smaller particles remain suspended in the water column longer than larger particles. Once the glacial melt stops and the input of additional sediment ceases, the remaining suspended finer particles tend to wash out of the system. The reduced mainstem turbidity/discharge relationship of the early and late period may be partially due to the absence or reduced levels of these very fine particles (Table 4-6).

Slough and Side Channel Turbidity

Turbidity in sloughs and side channels of the middle Susitna River reach remained very low until a breaching event occurred. Turbidity levels of breached sloughs and side channels elevated rapidly and, from field observations, were found to remain elevated for a period after the breaching event ceased. This residual turbidity decays as a function of the settling rate of the suspended sediment and the ground water and surface runoff flushing rate of the habitat.

Turbidity of sloughs and side channels during breaching events which initially overtopped the head were usually lower than mainstem turbidities because of a diluting effect with ground water or surface water runoff. As mainstem discharge increased, however, the dilution of the mainstem turbid water decreased as more mainstem water entered the head. Slough or side channel turbidity levels may occasionally exceed mainstem turbidities because of the resuspension of previously deposited glacial sediments by the increasing velocities of the mainstem water within the slough.

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8.0 APPENDICES

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Table 4-A-1 Water quality data collected at selected Susitna mainstem locations.

Location	Date	Time	Temperature Air (C)	Temperature Water (C)	pH	Dissolved Oxygen (mg/l)	Percent Saturation	Conductivity (micromoles/cm)	Turbidity (NTU)
PARKS HIGHWAY EAST	830715	1730	022.3	13.3	7.3	09.3	089	114	288
River Mile 083.9	830723	1548	015.0	12.4	7.4	09.8	092	111	252
	830810	1255	015.0	10.2	7.5	11.0	098	098	288
	830821	1330	012.5	09.0	7.4	11.7	099	111	78
	830911	1330	012.8	07.7	7.6	11.6	097	137	43
	830927	1434	002.2	-0.2	7.3	12.9	087	150	13
	831001	1215	008.6	04.1	7.4	12.5	095	108	16

Table 4-A-1 Continued

Location	Date	Time	Temperature Air (C)	Temperature Water (C)	pH	Dissolved Oxygen (mg/l)	Percent Saturation	Conductivity (micromoles/cm)	Turbidity (NTU)
TALKEETNA FISHWHEEL CAMP	830518	1600		05.0					
River Mile 103.0	830519	1000	010.0	04.2					58
	830520	1245	014.0	06.1					46
	830521	1000	011.0	07.0					31
	830522	1000	010.0	06.7					32
	830523	0800	008.0	06.5					28
	830524	0800	010.0	06.5					24
	830525	0830	008.0	06.5					29
	830526	0830	009.0	07.1					24
	830527	0830	007.8	06.9					22
	830528	0830	011.0	07.0					30
	830529	0830	012.0	07.9					21
	830530	0830	017.0	09.1					27
	830531	0830	010.0	08.0					108

Table 4-A-1

Location	Date	Time	Temperature Air (C)	Temperature Water (C)	pH	Dissolved Oxygen (mg/l)	Percent Saturation	Conductivity (micromoles/cm)	Turbidity (NTU)
TALKEETNA FISHWHEEL CAMP	830601	0800	010.0	07.8					136
River Mile 103.0	830602	0810	010.0	07.8					114
	830603	0830	009.0	08.0					81
	830604	0900	008.0	07.5					160
	830605	0900	009.0	07.3					170
	830606	0900	013.0	08.9					122
	830607	0800	012.0	09.4					100
	830608	0830	009.5	09.4					88
	830609	0800	010.0	09.4					82
	830610	0830	012.0	09.4					65
	830611	0900	011.0	09.5					54
	830612	0900	012.4	09.4	7.4	11.1	098	117	44
	830613	0900	011.0	09.3	7.4	11.2	099	118	60
	830614	0915	014.8	09.9	7.4	11.0	097	117	55
	830615	0930	012.0	10.2	7.4	10.8	100	118	47
	830616	0900	014.0	10.3	7.4	10.8	100	117	49
	830617	0920	016.4	10.1	7.5	10.8	100	109	71
	830618	0900	013.8	10.7	7.5	10.7	100	114	100
	830619	0830	011.6	11.6	7.4	10.5	099	112	92
	830620	0900	012.0	11.7	7.4	11.1	104	094	90
	830621	0900	014.0	11.4	7.3	10.9	102	108	158
	830622	0800	013.0	12.3	7.4	11.1	104	116	132
	830623	0820	012.0	12.7	7.4	10.9	100	122	142
	830624	0825	013.0	12.1	7.3	10.9	104	120	190
	830625	0830	015.0	12.8	7.3	10.8	103	131	200
	830626	0800	015.0	13.5	7.4	10.5	102	135	245
	830627	0800	013.0	13.1	7.4	11.2	108	142	308
	830628	0800	014.0	12.0	7.1	10.8	100	146	356
	830629	0900	012.0	11.1	7.6	11.3	105	130	324
	830630	0800	012.0	11.5	7.1	11.1	103	137	288

Table 4-A-1 Continued

Location	Date	Time	Temperature Air (C)	Temperature Water (C)	pH	Dissolved Oxygen (mg/l)	Percent Saturation	Conductivity (micromoles/cm)	Turbidity (NTU)
TALKEETNA FISHWHEEL CAMP	830701	1200	013.0	12.7	7.2	11.5	110	138	280
River Mile 103.0	830702	1000	014.0	12.6	7.2	11.1	102	140	308
	830703	1000	016.0	12.8	7.2	11.8	110	132	324
	830704	0900	017.0	13.1	7.1	11.8	112	132	304
	830705	1000	018.0	12.9	7.2	11.4	110	134	268
	830706	1100	015.0						340
	830707	0900	015.0	14.0	7.4	09.5	094	120	450
	830708	1200	014.0	12.6	7.3	09.6	094	117	450
	830709	1000	016.0						368
	830710	1000	014.0						400
	830711	1000	014.0						360
	830712	1000	013.0						300
	830713	1000	014.0						336
	830714	1000	015.0	12.5	7.7	10.3	099	146	278
	830715	1000	016.0	12.4	7.6	10.4	098	143	312
	830716	1950	016.0	12.6	7.1	09.9	094	135	256
	830717	0900	016.0	13.1	7.5	10.8	104	162	208
	830718	0900	015.0	12.4	7.4	10.2	097	154	216
	830719	0900	015.0	10.9	7.5	10.8	098	151	280
	830720	0900	017.0	12.7	7.3	10.7	101	145	224
	830721	0930	013.8	12.4	7.5	09.6	095	140	166
	830722	0900	011.8	12.1	7.3	09.6	090	139	168
	830723	1030	013.8	13.2	7.4	09.4	090	133	198
	830724	1010	014.0	12.1	7.5	10.2	095	160	216
	830725	0915	013.0	11.9	7.5	09.9	093	157	284
	830726	0910	016.0	12.5	7.5	09.9	094	164	240
	830727	0915	016.0	12.8	7.5	09.8	094	173	220
	830728	0920	016.0	13.2	7.5	09.6	093	168	268
	830729	0925	016.0	13.7	7.5	09.7	095	173	260
	830730	0840	016.0	14.1	7.6	09.4	092	180	276
	830731	1110	017.0	12.6	7.5	09.8	094	167	344

Table 4-A-1 Continued

Location	Date	Time	Temperature Air (C)	Temperature Water (C)	pH	Dissolved Oxygen (mg/l)	Percent Saturation	Conductivity (micromoles/cm)	Turbidity (NTU)
TALKEETNA FISHWHEEL CAMP	830801	0855	015.0	11.8	7.7	09.9	093	170	308
River Mile 103.0	830802	0910	015.0	12.2	7.6	09.7	090	168	268
	830803	0930	017.0	12.1	7.6	10.9	104	131	284
	830804	2010	014.0	12.7	7.6	10.5	100	129	300
	830805	0950	015.0	12.0	7.6	10.4	098	129	316
	830806	0920	013.0	10.8	7.4	11.0	100	127	324
	830807	0920	013.0	10.5	7.4	10.9	100	127	260
	830808	0905	011.0	10.7	7.3	11.1	102	124	232
	830809	0950	016.0	10.7	7.4	11.0	100	109	160
	830810	0910	009.0	09.9	7.6	11.1	100	114	348
	830811	0850	012.0	10.2	7.4	11.3	102	117	308
	830812	0820	012.0	10.9	7.5	10.9	100	124	208
	830813	0745	010.0	10.2	7.4	11.0	100	125	176
	830814			10.2					156
	830815			10.1					136
	830816			09.9					116
	830817	1005	011.0	09.2	7.4	11.5	102	130	96
	830818	1005	013.0	09.2	7.4	11.5	102	130	76
	830819	0910	011.0	08.9	7.4	11.0	097	131	56
	830820	0855	010.0	09.8	7.4	11.0	099	137	61
	830821	0915	010.0	09.3	7.4	11.5	102	134	56
	830822	0910	012.0	09.4	7.3	11.4	102	128	62
	830823	0835	009.0	08.6	7.3	11.4	099	135	92
	830824	0815	008.0	08.6	7.3	11.2	098	132	62
	830825	0835	004.0	07.6	7.3	11.7	100	127	74
	830826	0815	008.0	07.4	7.4	11.8	100	120	104
	830827	0710	006.0	07.5	7.4	12.0	102	114	122
	830828	0925	009.6	08.8	7.4	11.8	102	108	88
	830829	1715	012.0	09.8					44
	830830	1140	012.0	09.5					42

Table 4-A-1 Continued

Location	Date	Time	Temperature Air (C)	Temperature Water (C)	pH	Dissolved Oxygen (mg/l)	Percent Saturation	Conductivity (micromoles/cm)	Turbidity (NTU)
TALKEETNA FISHWHEEL CAMP	830911	0835	006.2	06.4	7.5	12.7	104	148	13
River Mile 103.0	830912	0845	007.2	06.6	7.5	12.4	102	151	11
	830913	1030	009.0	06.8					17
	830914	0845	008.0	06.5					14
	830915	0935	006.7	05.6	7.6	12.4	100	152	14
	830916	0955	003.0	05.0					13
	830917	0820	000.2	04.0	7.6	13.0	100	156	12
	830921	1549	013.4	06.4	7.7	12.7	105	158	1
	830922	0858	008.8	06.1	7.6	11.8	097	158	4
	830923	0900	002.8	04.9	7.6	12.3	098	152	49
	830924	0830	-02.1	02.0	7.6	13.1	096	138	50
	830925	0915	000.0	01.0					31
	830927	0944	-02.0	-0.4	7.3	13.3	090	046	16
	831002	0841	004.7	03.0	7.5	12.6	095	131	2
	831003	1140	004.9	02.5	7.8	13.3	098	134	4
	831004	1010	001.8	01.3	7.5	13.6	097	134	4
	831005	0940	003.8	01.1	7.7	13.7	097	137	2
	831103	1245	002.8	00.0	9.6	14.6	100	101	3

Table 4-A-1 Continued

Location	Date	Time	Temperature Air (C)	Temperature Water (C)	pH	Dissolved Oxygen (mg/l)	Percent Saturation	Conductivity (micromoles/cm)	Turbidity (NTU)
CURRY (LRX24)	830619	1300		12.6	7.4	11.0	104	099	74
River Mile 120.0	830706	1220		13.1	7.5	09.7	087	117	512
	830716	1615	018.0	13.8	7.2	10.0	097	132	234
	830807	1255	012.6	10.8	7.6	11.0	100	125	224
	830824	1230	011.8	08.8	7.6	11.9	104	114	60
	830915	1645	010.8	06.8	7.4	12.2	100	154	10
	830924	1653	-01.2	01.5	7.6	13.7	098	136	36
	831004	1230		01.6					16
	831005	1315	003.3	01.3	7.5	13.7	098	141	2

Table 4-A-1 Continued

Location	Date	Time	Temperature Air (C)	Temperature Water (C)	pH	Dissolved Oxygen (mg/l)	Percent Saturation	Conductivity (micromoles/cm)	Turbidity (NTU)
LRX29	830615	1509		12.2	7.4	10.5	091	111	38
River Mile 125.3	830706	1200	014.0	13.2	7.5	09.9	095	125	448
	830716	1930	016.2	13.6	7.4	09.5	093	140	204
	830805	1130	013.6	12.1	7.6	10.5	100	140	266
	830823	1000	009.6	08.8	7.6	11.4	098	126	72
	830914	1715	006.4	06.0	7.6	12.2	097	157	11
	830924	1348	-00.2	01.5	7.7	13.5	097	140	42
	831102	1600	003.6	00.1	5.3	13.4	094	187	2

Table 4-A-1 Continued

Location	Date	Time	Temperature Air (C)	Temperature Water (C)	pH	Dissolved Oxygen (mg/l)	Percent Saturation	Conductivity (micromoles/cm)	Turbidity (NTU)
GOLD CREEK CAMP	830612	0930		08.2	6.8	12.0	105	086	34
River Mile 136.8	830613	0907		08.1	6.8	12.1	114	084	42
	830614	0838		08.6	6.9	11.9	102	086	34
	830615	0842		08.8	6.8	11.6	108	081	29
	830616	0855		08.7	7.2	11.7	102	078	37
	830617	1055		09.3	7.3	11.2	099	077	33
	830618	0900		09.4	7.1	11.6	102	083	52
	830619	0925		10.0	7.2	11.4	102	076	50
	830629	1855	012.8	10.8	7.4	09.8	090	094	
	830630	0900	013.8	10.2	7.4	10.2	093	106	
	830701	0920	012.2	11.0	7.4	10.1	093	108	248
	830702	0855	012.8	11.2	7.3	10.1	093	106	272
	830703	1226	023.2	11.8	7.2	10.2	095	104	264
	830704	1107	023.0	12.2	7.2	10.1	095	097	280
	830705	0958	017.8	11.4	7.4	10.2	096	105	232
	830706	1000	013.8	12.7	7.4	09.8	093	102	368
	830707	1100	016.5	12.5	7.3	10.2	097	112	298
	830708	0930		11.0	7.2	10.7	098	114	365
	830709	0930		10.7	7.5	10.5	096	123	330
	830710	0930		11.0	7.4	10.9	100	123	312

Table 4-A-1 Continued

Location	Date	Time	Temperature Air (C)	Temperature Water (C)	pH	Dissolved Oxygen (mg/l)	Percent Saturation	Conductivity (micromoles/cm)	Turbidity (NTU)
GOLD CREEK CAMP	830711	0915		11.3	7.4	11.1	103	123	276
River Mile 136.8	830712	0930		11.2	7.4	12.1	110	132	270
	830713	1000		11.5	7.4	13.9	129	126	240
	830714	1030		11.7	7.3			125	204
	830716	1120	022.0	12.3	8.0	10.9	102	098	172
	830717	0856	016.8	12.4	7.7	10.8	102	104	172
	830718	0912	011.8	11.0	7.6	11.3	105	105	142
	830719	0930	015.2	10.0	7.6	11.5	102	107	186
	830720	1815	018.0	13.1	7.4	10.8	104	101	142
	830721	0950	015.6	12.2	7.5	11.2	105	114	136
	830722	1054	016.2	11.7	7.5	11.3	106	107	148
	830723	0945		12.1	7.6	11.0	104	121	156
	830724	0915		12.6	8.8	10.6	101	122	154
	830725	0945		11.6	7.5	11.1	102	111	194
	830726	0915		11.6	7.5	10.9	101	112	152
	830727	0915		12.7	7.5	10.5	102	117	124
	830728	0800		12.5	7.5	10.7	102	117	180
	830729	1800	009.5						178
	830730	1215	012.0						194

Table 4-A-1 Continued

Location	Date	Time	Temperature Air (C)	Temperature Water (C)	pH	Dissolved Oxygen (mg/l)	Percent Saturation	Conductivity (micromoles/cm)	Turbidity (NTU)
GOLD CREEK CAMP	830802	1922	020.4	12.9	8.2	10.8	102	105	264
River Mile 136.8	830803	0915	017.0	11.4	7.8	11.2	104	111	192
	830804	0826	013.8	12.1	7.8	11.0	103	110	352
	830805	0930	013.4	11.5	7.4	11.3	105	094	248
	830806	0932	012.8	09.9	7.6	11.6	104	093	248
	830807	1145	015.0	10.5	7.2	11.4	103	099	240
	830808	1135	012.6	10.2	7.0	11.0	100	083	176
	830809	0937	011.4	09.8	7.3	11.2	098	061	108
	830810	0750	008.5	08.4	7.6	12.3	106	088	408
	830811	0700	010.5	09.2	7.7	11.4	106	094	270
	830812								104
	830813								94
	830814								60
	830815	1320	009.9	07.6	7.2	08.4	073	099	84
	830816	0900	008.0	07.0	7.1	08.4	070	101	66
	830817	0930	008.7	07.7	7.3	08.3	071	107	38
	830818	1630	016.2	09.9	7.2			108	48
	830819	1100	014.4	08.7	7.2	08.6	075	114	42
	830820	1215	010.2	09.0	7.0	08.3	074	119	44
	830821	1220	010.4	08.6	7.6	11.6	102	104	42
	830822	0909	010.6	08.6	7.2	12.2	105	087	50
	830823	0916	010.6	08.1	7.4	12.2	103	082	64
	830824	0927	007.0	07.7	6.9	12.3	105	090	40
	830825	1629	010.6	08.0	7.3	12.5	108	085	68
	830826	0956	010.4	06.9	6.9	12.6	104	092	116
	830827	1000	010.2	07.3	6.5	13.0	108	092	80
	830828	0947	009.7	07.9	7.0	12.9	110	105	48
	830831	1120	010.0	07.8		11.6	100	081	

Table 4-A-1 Continued

Location	Date	Time	Temperature Air (C)	Temperature Water (C)	pH	Dissolved Oxygen (mg/l)	Percent Saturation	Conductivity (micromoles/cm)	Turbidity (NTU)
GOLD CREEK CAMP	830901	0905	009.1	07.4		11.6	099	095	35
River Mile 136.8	830902	1212	011.6	07.4		11.6	098	076	40
	830904	1259	012.0	06.2		12.2	100	095	40
	830906	1733	010.8	06.5		12.2	099	107	23
	830908	1216	010.8	06.4		12.0	098	113	17
	830910	1011	007.8	06.4	7.3	12.7	108	111	13
	830911	0917	006.8	06.5	7.3	12.2	100	118	14
	830912	0918	007.7	06.4	7.1	12.6	103	120	13
	830913	1147	008.2	06.6	7.2	12.6	102	121	12
	830914	0854	006.6	05.6	7.2	12.8	104	124	14
	830915	1045	008.4	05.7	7.2	12.7	102	122	11
	830916	1100	008.6	05.0	7.3	13.1	102	115	

Table 4-A-1 Continued

Location	Date	Time	Temperature Air (C)	Temperature Water (C)	pH	Dissolved Oxygen (mg/l)	Percent Saturation	Conductivity (micromoles/cm)	Turbidity (NTU)
GOLD CREEK CAMP	831003	1400	003.0	02.5	7.7	13.3	100	141	12
River Mile 136.8	831004	1645		02.3	7.5	14.3	106	142	12
	831005	1948		00.5	7.1	14.3	101	134	7
	831006	1000		01.0	7.5	13.9	100	132	6
	831102	1330	005.2	00.1	6.3	15.0	105	125	1

Table 4-A-1 Continued

Location	Date	Time	Temperature Air (C)	Temperature Water (C)	pH	Dissolved Oxygen (mg/l)	Percent Saturation	Conductivity (micromoles/cm)	Turbidity (NTU)
LRX57	830617	1148		10.4	7.5	11.8	107	102	69
River Mile 142.0	830630			11.2					200
	830706	0928		13.0	7.5	10.4	100	123	448
	830721	1417	012.6	13.3	7.2	10.8	104	111	168
	830804	0856	013.8	12.2	7.7	11.5	109	118	288
	830822	1033	011.8	08.5	7.5	12.1	105	113	72
	830912	1906	008.4	06.8	7.3	12.6	104	150	20
	831102	1050	002.8	00.2	7.6	13.7	097	188	2
	831003	1000	001.0	02.1	7.6	14.2	105	137	12

Table 4-A-1 Continued

Location	Date	Time	Temperature Air (C)	Temperature Water (C)	pH	Dissolved Oxygen (mg/l)	Percent Saturation	Conductivity (micromoles/cm)	Turbidity (NTU)
BACK EDDY	830704								392
River Mile 150.1	830706	0915	014.4	13.4	7.5	10.4	100	124	448
	830805	1155	013.2	11.0	7.7	11.5	106	113	320
	830828	1041	009.7	07.9	7.0	12.9	110	105	58
	830915	1600	008.8	05.7	7.2	13.5	109	153	10
	831005	1100		00.1	7.4	15.1	105	163	13

Appendix Table 4-A-2. Comparisons of periodic water quality (temperature and turbidity), and water surface elevations (WSEL) collected at selected non-mainstem locations upstream of Talkeetna with mean daily mainstem discharge at Gold Creek (15292000)[1]

Location	Date	Time	Temperature (°C) Water	Temperature (°C) Air	Turbidity NTU	WSEL (ft.)	Susitna River Discharge (cfs)
Whiskers Slough Q site gage no. 101.2S3 RM 101.4	830911	0945	7.1	9.0	2	365.70	12200
	831001	1520	4.8	9.3	1	365.82	13200
	830716	1130	10.8	18.8	2	365.70	16400
	830722	1840	16.4	21.6	2	365.72	18600
	830822	1255	7.4	14.6	2	365.75	21600
	830618	1225	14.6	NA	68	365.95	22900
Slough 6A Mouth gage no. 112.3W1 RM 112.3	831004	1110	2.1	3.5	2	455.92	11400
	830912	1145	7.2	12.2	3	455.80	11600
	830716	1400	12.2	20.2	29	456.52	16400
	830722	1720	16.0	19.2	80	456.86	18600
	830822	1655	10.0	14.2	4	457.22	21600
	830805	1510	12.8	14.2	140	457.20	21700
	830826	1530	10.0	16.4	16	458.13	31700
Slough 8 Q site gage no. 113.6S2 RM 113.7	831004	1230	4.2	5.8	1	468.01	11400
	830912	1600	7.4	12.7	1	467.94	11600
	830716	1430	9.2	19.2	1	467.98	16400
	830722	1730	10.2	22.2	1	468.15	18600
	830805	1450	8.2	14.4	1	468.70	21700
	830825	1710	7.4	12.4	2	470.58	27400
	830809	1815	11.8	15.8	140	470.36	29900
	830826	1610	8.9	18.6	60	470.58	31700

[1] USGS provisional data, 1983

Appendix Table 4-A-2 (Continued)

Location	Date	Time	Temperature (°C) Water	Air	Turbidity NTU	WSEL (ft.)	Susitna River Discharge (cfs)
Mainstem 2 Side Channel	830917	1025	3.0	3.9	1	478.84	10000
NW Channel Q site	831004	1340	3.9	8.2	2	479.10	11400
gage no. 114.4S5	830722	1405	13.8	20.4	220	480.64	18600
RM 115.4	830611	1830	9.9	15.6	53	480.66	19000
	830805	1315	12.3	14.1	294	481.31	21700
	830806	1730	11.1	18.8	280	481.60	23800
	830808	1440	11.3	13.4	192	481.89	26000
	830825	1300	8.4	13.4	84	481.97	27400
Mainstem 2 Side Channel	830917	1040	3.9	5.2	1	480.41	10000
NE Channel Q site	831004	1450	3.2	8.1	1	480.38	11400
gage no. 114.4S8	830721	2000	15.0	16.2	2	480.44	18100
RM 115.5	830805	1335	14.0	13.8	3	480.46	21700
	830806	1900	14.8	14.4	156	480.57	23800
	830808	1530	11.4	14.2	168	481.28	26000
	830825	1605	9.3	12.4	76	481.31	27400
	830826	1925	8.2	12.6	184	482.88	31700
Slough 8A	830915	1515	9.4	10.2	2	566.01	10600
NW Channel Q site	831003	1350	6.2	7.8	2	566.10	13000
gage no. 125.3S3	830924	1246	2.4	0.2	1	566.08	15200
RM 125.3	830716	1800	14.0	18.0	1	566.11	16400
	830721	1150	13.4	18.5	1	566.00	18100
	830804	1130	9.4	13.2	1	566.03	20900
	830823	1340	9.0	11.4	1	566.05	22700
	830809	1245	11.7	15.9	126	566.44	29900
	830827	1320	9.3	19.0	75	566.80	31000

Appendix Table 4-A-2 (Continued)

Location	Date	Time	Temperature (°C) Water	Air	Turbidity NTU	WSEL (ft.)	Susitna River Discharge (cfs)
Slough 8A	830915	1505	9.8	10.6	1	567.22	10600
NE Channel Q site	830924	1315	0.6	1.0	1	567.29	15200
gage no. 125.3S1	830716	1820	15.4	18.0	1	566.20	16400
RM 125.8	830721	1250	15.6	18.7	1	566.33	18100
	830615	1615	NA	NA	1	566.09	19600
	830804	1220	11.2	13.8	1	566.60	20900
	830823	1210	9.2	18.4	2	566.97	22700
	830630	1404	NA	NA	1	566.08	24700
	830809	1130	11.6	16.2	1	566.91	29900
	830827	1125	9.6	15.2	1	567.07	31000
Slough 8A	831003	1310	6.2	3.0	2	563.68	13000
B/L Beaver Dam	830924	1224	1.4	0.2	1	563.60	15200
W. Channel	830721	1430	6.2	17.2	1	563.51	18100
gage no. 125.3S4	830804	1320	NA	13.2	1	563.57	20900
RM 125.7	830823	1400	10.2	14.0	1	563.66	22700
	830827	1427	11.0	18.8	78	564.14	31000
Slough 9 Q site	830914	0955	5.8	9.9	1	593.27	10700
gage no. 128.3S1	831003	1515	4.2	6.6	1	593.50	13000
RM 128.9	830924	1550	2.6	1.0	2	593.33	15200
	830716	2200	11.0	14.6	3	593.27	16400
	830721	1745	16.0	15.4	54	593.36	18100
	830805	0900	NA	NA	126	NA	18200
	830618	1450	NA	NA	64	NA	22900
	830630	1030	12.1	NA	200	594.00	24700
	830824	1135	9.0	8.6	64	594.05	24700
	830809	1540	11.9	17.2	224	595.11	29900

Appendix Table 4-A-2 (Continued)

Location	Date	Time	Temperature (°C) Water	Air	Turbidity NTU	WSEL (ft.)	Susitna River Discharge (cfs)
Side Channel 10	830911	1115	8.4	12.6	1	654.27	12200
Q site FHU 4	831003	1225	6.4	7.0	2	654.30	13000
gage no. 133.8S3	830717	1100	8.2	17.2	2	654.30	16500
RM 134.2	830803	1703	13.6	NA	304	655.18	21600
	830823	1330	8.8	12.6	64	655.54	22700
	830618	1600	NA	NA	89	NA	22900
	830808	1310	10.2	NA	184	656.27	26000
	830629	1610	10.3	NA	200	656.09	26800
	830826	1713	7.8	12.3	152	657.97	31700
	830810	1233	9.5	NA	440	658.26	31900
Slough 11 Q site	830915	1751	6.7	8.8	2	670.67	10600
gage no. 135.3S6	831004	1340	2.0	4.8	2	670.67	11400
RM 135.7	830721	1110	8.8	17.8	1	670.72	18100
	830718	1040	7.8	17.2	12	670.72	18900
	830823	1524	6.8	12.7	1	670.73	22700
	830618	1530	NA	NA	3	NA	22900
	830806	1155	7.8	13.8	1	670.73	23800
	830629	950	8.0	NA	1	670.76	26800
Upper Side Channel 11	830911	1745	7.9	14.1	2	680.63	12200
Q site	830720	0940	11.6	16.2	104	681.34	18600
gage no. 136.2S1	830806	1345	10.5	NA	248	681.95	23800
RM 136.5	830808	1450	10.4	12.4	184	682.24	26000
	830629	1255	10.9	--	200	682.13	26800
	830826	1835	7.8	12.4	152	682.93	31700
	830810	1438	10.5	--	368	682.87	31900

Appendix Table 4-A-2 (Continued)

Location	Date	Time	Temperature (°C) Water	Temperature (°C) Air	Turbidity NTU	WSEL (ft.)	Susitna River Discharge (cfs)
Slough 16B Q site gage no. 138.0S5 RM 138.0	830703	NA	11.2	NA	96	NA	26200
Slough 19 Q site gage no. 140.0S4 RM 139.9	830914	1110	4.6	7.8	2	720.04	10700
	831003	1120	3.2	1.4	1	NA	13000
	830721	1833	8.1	16.6	1	720.29	18100
	830804	1532	6.1	13.8	1	720.80	20900
	830616	1555	8.4	NA	1	NA	21600
	830823	1806	NA	11.0	2	720.97	22700
	830629	1635	6.0	NA	3	721.39	26800
	830809	1632	10.8	17.8	1	722.25	29900
Slough 20 Q site gage no. 140.1S5 RM 140.2	830913	1915	6.2	8.4	2	726.75	11100
	831003	1100	1.8	3.8	1	727.00	13000
	830721	1804	11.8	16.6	3	726.64	18100
	830804	1511	9.4	13.8	2	726.69	20900
	830701	1212	8.0	NA	2	726.77	23100
	830824	1258	7.6	17.0	14	726.93	24700
	830606	1515	8.0	NA	1	NA	26000
	830809	1606	10.6	17.8	168	727.65	29900

Appendix Table 4-A-2 (Continued)

Location	Date	Time	Temperature (°C) Water	Air	Turbidity NTU	WSEL (ft.)	Susitna River Discharge (cfs)
Side Channel 21 Lower	830912	1524	9.2	14.4	12	736.11	12200
Q site and FHU 4	830721	1735	13.2	16.6	176	737.02	18100
gage no. 140.6S4	830804	1339	12.6	13.8	288	737.20	20900
RM 141.1	830616	1330	11.7	NA	41	NA	21600
	830822	1707	9.0	16.4	30	737.29	21600
	830630	1430	12.6	NA	200	737.36	24700
	830809	1150	10.2	17.8	232	737.73	29900
Slough 21 Q site	830913	1634	6.0	9.8	2	745.02	11100
gage no. 142.0S6	831003	1030	2.8	0.2	1	745.02	13000
RM 142.0	830721	1525	11.2	16.6	3	744.99	18100
	830804	1113	5.4	13.8	2	745.00	20900
	830616	1245	8.4	NA	1	NA	21600
	830822	1352	6.0	14.4	3	745.07	21600
	830630	1115	8.1	NA	1	745.03	24700
	830809	1510	10.8	17.8	204	746.03	29900
Slough 22 Q site	830702	1632	12.8	NA	288	784.04	24900
gage no. 144.3S6							
RM 144.6							

1 USGS provisional data, 1983

2 data not available

Table 4-A-3 Water quality data collected at selected Tributary locations.

Location	Date	Time	Temperature Air (C)	Temperature Water (C)	pH	Dissolved Oxygen (mg/l)	Percent Saturation	Conductivity (micromoles/cm)	Turbidity (NTU)
TALKEETNA RIVER	830715	1630	023.5	11.7	6.8	09.9	090	092	120
River Mile 097.1	830722	1930	019.0	11.9	7.2	10.0	093	092	125
TRM 0.5	830810	1110	015.5	09.1	7.2	11.4	100	081	154
	830822	1115	011.4	08.8	7.4	11.5	101	094	17
	830917	1255	010.6	05.2	7.6	12.2	096	128	3
	831001	1430	009.1	04.6	7.3	12.2	094	085	3

Table 4-A-3 Continued

Location	Date	Time	Temperature Air (C)	Temperature Water (C)	pH	Dissolved Oxygen (mg/l)	Percent Saturation	Conductivity (micromoles/cm)	Turbidity (NTU)
CHULITNA RIVER	830706	1430		06.8	7.8	10.6	089	092	
River Mile 098.0	830715	1450	020.2	07.4	7.3	11.5	095	108	624
TRM 0.6	830722	1915	018.2	10.0	7.8	10.2	091	106	590
	830723	1318		06.5	7.7	12.7	101	092	671
	830810	1150	015.5	05.9	8.3	12.3	100	097	520
	830822	1030	011.4	06.1	7.6	12.9	104	098	264
	830913	1545	013.0	06.2	7.4	12.2	097	118	120
	831003	1000	004.6	01.8	7.7	13.0	094	102	24

Appendix Table 4-A-4. Comparisons of periodic water quality (temperature and turbidity), and water surface elevations (WSEL) collected at selected tributary locations upstream of Talkeetna with mean daily mainstem discharge at Gold Creek (15292001)[1].

Location	Date	Time	Temperature (°C) Water	Air	Turbidity NTU	WSEL (ft.)	Susitna River Discharge (cfs)
Indian River Q site gage no. 138.6T2 RM 138.6	830913	0946	6.2	8.0	1	847.30	11100
	831003	1615	3.4	4.8	1	847.68	13000
	830721	1255	12.6	18.2	7	847.10	18100
	830705	1140	9.9	NA	2	847.49	25100
	830827	1326	8.8	18.3	1	847.49	31000
Whiskers Creek Q site gage no. 101.2T2 RM 101.4	830618	1225	13.4	NA[2]	1	366.06	22900

[1] USGS provisional data, 1983

[2] data not available