DRAFT

AN EVALUATION OF THE INCUBATION LIFE PHASE OF CHUM SALMON IN THE MIDDLE SUSITNA RIVER

SUSITNA HYDRO AQUATIC STUDIES

WINTER AQUATIC INVESTIGATIONS:
SEPTEMBER, 1983 - MAY, 1984
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APPENDICES A-F

-by-

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8.0 APPENDICES

With the exception of Appendix B, the information presented within all appendices consists primarily of raw data tables and figures. Appendix A includes text materials presented in standard report format, with Introduction, Objectives, Methods, Results and Discussion sections. This format was selected in order to make it easier for people to use information in Appendix A for purposes other than those related to salmon incubation. Appendix B provides a complete list of all study sites used on this report and thus concludes no text or data tables. Appendices C-F primarily include tabular information, some summary figures and very little text.

Tabular data presented in Appendices C, D, E and F is organized according to study site location. Study sites are organized by river mile, ascending from a downstream to upstream direction.

A P P E N D I X A

WINTER TEMPERATURE DATA

DRAFT

Appendix A: Winter Temperature Investigations

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1.0 INTRODUCTION

1.1 Background

The Alaska Department of Fish and Game (ADF&G) Susitna Hydro Aquatic Feasibility Study Team has collected surface and intragravel water temperature data on a continuous basis at selected locations throughout the Susitna River Basin since 1981. The primary intent of the data collection program has been to characterize the seasonal intragravel and surface water temperature regimes of the mainstem Susitna River and its peripheral side channel, side slough, upland slough, tributary mouth, and tributary habitats. Results of these studies are summarized in ADF&G (1981a), ADF&G (1981b), ADF&G (1983a), ADF&G (1983b), ADF&G (1983c) and Keklak and Quane (1984). Results of these investigations have been used by project biologists to evaluate the effects of intragravel and surface water temperatures on fish and fish habitats, and by project engineers to validate or calibrate various temperature related models.

During the 1983-1984 winter study season (October 1983 to May 1984) temperature monitoring stations were located at 20 sites within the middle reach (Talkeetna to Devil Canyon) of the Susitna River.

1.2 Objectives

The objectives of the 1983-84 winter temperature study were:

1) to determine and evaluate the winter surface and intragravel water temperature regimes of the middle reach (Talkeetna to Devil Canyon) of the mainstem Susitna River,

2) to determine and evaluate the intragravel and surface water temperatures associated with chum salmon spawning/incubation areas in selected slough, side channel and tributary habitats, and,

3) to determine the winter surface water temperature regime of a tributary selected as a potential water source for possible mitigation activities.

This appendix summarizes the results of these winter temperature investigations.

2.0 METHODS

2.1 Site Selection

The locations of the temperature monitoring stations established during the 1983-84 winter study season are presented in Appendix Table A-1 and Appendix Figure A-1. The monitoring stations and the rationale for their selection are presented below according to study objective.

2.1.1 Mainstem Temperature Evaluation (Objective 1)

During the 1983-84 winter study season, intragravel and surface water temperatures were recorded in the mainstem Susitna River at three stations which had been established during the 1983 open water season. The locations included LRX 9 (RM 103.2), LRX 29 (RM 126.1), and LRX 57 (RM 142.3). The sites were located in the lower, middle, and upper portions of the Susitna River in areas considered to be representative of the mainstem.

2.1.2 Chum Salmon Spawning/Incubation Temperature Evaluation (Objective 2)

Temperature monitoring stations were installed at fourteen chum spawning/incubation sites (Appendix Table A-1, Appendix Figure A-1) located in side channel, side slough, upland slough and tributary habitats. Initially each temperature station was installed in a salmon redd

Appendix Table A-1. Continuous temperature monitoring stations located in the Susitna River basin during the 1983-84 winter season.

Site	River Mile/[a] Trib. Mile	Study Objective	Habitat	Temperature Data Type
LRX 9	103.2	mainstem temp. eval.	mainstem	surface and intragravel
LRX 29	126.1	mainstem temp. eval.	mainstem	surface intragravel
LRX 57	142.3	mainstem temp. eval.	mainstem	surface and intragravel
Slough 8A (lower portion of slough)	125.6	incubation eval. secondary spawn./	side slough	surface and intragravel
Slough 8A (upper portion of slough)	126.6	incubation eval. secondary spawn./	side slough	surface and intragravel
Slough 9	128.5	incubation eval. secondary spawn./	side slough	surface
Slough 9	128.6	incubation eval. secondary spawn./	side slough	surface and intragravel
Fourth of July Creek	131.1/ 0.0	incubation eval. primary spawn./	tributary	surface and intragravel
Side Channel 10	134.0	incubation eval. primary spawn./	side channel	surface and intragravel
Slough 10 (northeast chann.)	134.0	incubation eval. primary spawn./	upland slough	surface and intragravel
Slough 10 (northwest chann.)	134.0	incubation eval. primary spawn./	upland slough	surface and intragravel
Slough 11	135.5	incubation eval. primary spawn./	side slough	intragravel
Slough 11	135.7	incubation eval. primary spawn./	side slough	surface and intragravel
Mainstem at RM 136.1	136.1	incubation eval. primary spawn./	mainstem	surface and intragravel

[a] River mile is calculated to within 0.1 mile of temperature station.

Appendix Table A-1 (Continued).

Site	River Mile/[a] Trib. Mile	Study Objective	Habitat	Temperature Data Type
Upper Side Channel 11	136.3	incubation eval. primary spawn./	side channel	surface and intragravel
Indian River	138.6/ 0.2	incubation eval. secondary spawn./	tributary	surface and intragravel
Side Channel 21	141.0	incubation eval. primary spawn./	side channel	surface and intragravel
Slough 21 (lower portion)	141.8	incubation eval. primary spawn./	side slough	surface and intragravel
Slough 21 (upper portion)	142.0	incubation eval. secondary spawn./	side slough	surface and intragravel
Deadhorse Creek	120.9 /1.0	preliminary mitigation eval.	tributary	surface

[a] River mile is calculated to within 0.1 mile of temperature station.

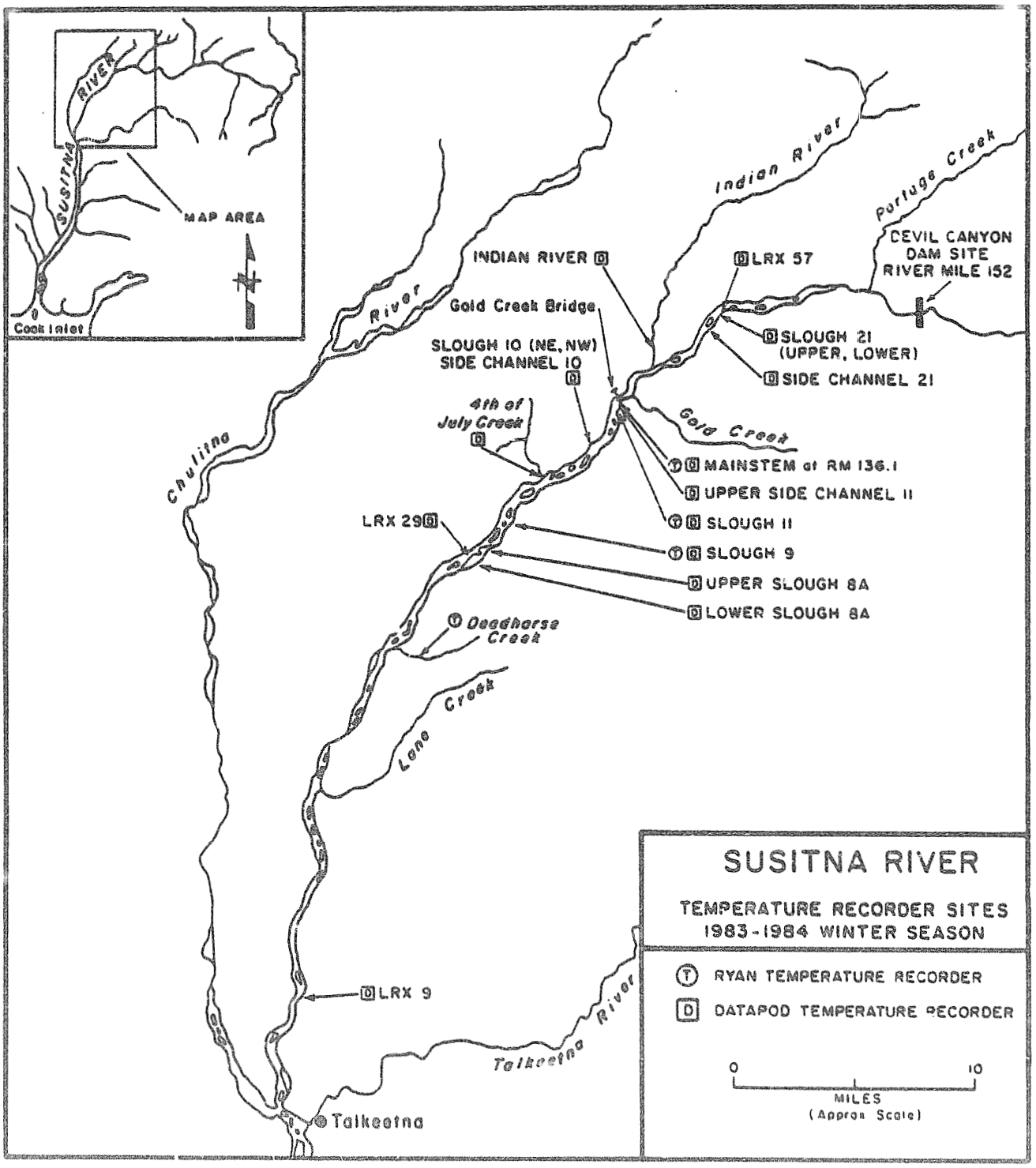

Figure A-1. Locations of temperature monitoring stations in mainstem, side channel, slough and tributary habitats of the Susitna River during the 1983-84 winter season.

whenever possible, or in a location which was considered representative of the spawning area within each study site.

Temperature stations which had been disrupted by ice movement or instrument failure were reinstalled in the same location whenever possible. Additional sites were also installed within a study location to determine variable conditions within the site, to avoid data loss, or to collect temperatures at sites which were not likely to dewater or freeze.

2.1.3 Preliminary Mitigation Evaluation (Objective 3)

Surface water temperatures were recorded in Deadhorse Creek to evaluate the feasibility of using the creek as a water source for possible mitigative activities. Continuious temperatures were collected in a pool located below a diversion dam approximately one mile from the mouth of the tributary. Instantaneous temperatures were measured above and below the diversion dam, and at an outflow pipe at Curry which is used to channel the diverted water into the Susitna River.

2.2 Field Data Collection

Water temperatures were continuously recorded using either Peabody-Ryan model J-90 temperature recorders or Omnidata two channel datapod recorders. The Peabody-Ryan temperature recorders were used to record surface water temperatures or were buried in the substrate to record intragravel

water temperatures. The two channel datapod recorders were installed at monitoring stations to simultaneously record both intragravel and surface water temperatures, or intragravel water temperature only at two locations within a study site.

2.2.1 Peabody-Ryan Temperature Recorders (Thermographs)

The Peabody-Ryan model J-90 temperature recorders (thermographs) continuously record temperatures on a 90-day strip chart. Instrument accuracy, as stated by the manufacturer, is ±0.6°C. Prior to field installation, each instrument was screened at two temperatures (0°C and between 10-16°C) using a calibrated American Society for Testing and Manufacturing (ASTM) thermometer as a standard. Following this screening process a calibration factor was applied to each instrument. Thermographs found in error by more than 2°C at either screening temperature are returned to the manufacturer for calibration.

Peabody-Ryan temperature recorders are used to monitor surface water temperatures, or to record intragravel water temperatures at a depth of approximately 12 inches. Thermographs are inspected twice each month to retrieve the charts and to detect malfunctioning instruments. Each time the thermographs are checked, an instantaneous water temperature measurement is taken using a calibrated Brooklyn thermometer (accuracy ±0.1°C). Field installation procedures are outlined in the FY 84 ADF&G Su Hydro Aquatic Studies (May, 1983 - June, 1984) Procedures Manual (ADF&G 1984).

2.2.2 Omnidata Temperature Recorders (Datapods)

Omnidata model DP2321 two channel temperature recorders (datapods) simultaneously record water temperatures using TP10V temperature probes. Instrument accuracy, as stated by the manufacturer, Omnidata International, is ±0.1°C. Temperature data are recorded on an ultraviolet, erasable electronic memory chip referred to as a data storage module (DSM). Temperatures are measured every five minutes and the mean, minimum, and maximum temperature measured during each six-hour interval are recorded on the DSM. Prior to installation each temperature probe is calibrated by Dryden and LaRue Engineers and assigned a correction factor. Intragravel temperatures are measured at a substrate depth of approximately 15 inches, whereas surface water temperatures are measured approximately two inches above the substrate.

The datapods are also examined twice each month to exchange DSM's and to detect malfunctioning units. A short display sequence is activated on the datapod which enables the field investigator to determine the operating condition of the instrument and associated probes. The following information is displayed by the instrument, and recorded by the field investigator: errors made in storage, number of storage points used, minutes until the next recording, and current temperatures. An instantaneous surface water temperature was also measured using a calibrated Brooklyn thermometer (accuracy ±0.1°C).

During the winter months, the datapod recorders and probes are periodically exposed to extreme environmental conditions which include ambient

air temperatures outside the manufacturer's (Omnidata International) stated operating range of -20°C to +60°C, ice formation, and ice movement. Extremely low air temperatures result in poor instrument performance and brittle probe connectors. Ice formation increases the difficulty of probe installation and ice movement can sever the temperature probe wires. Field installation of new probes through the ice often requires drilling through five feet of ice. During severe ice conditions it is also difficult to detect damaged probes making it necessary to rely on the short display sequence to determine the operating condition of the instrument.

Field installation procedures are outlined in the ADF&G Su Hydro Aquatic Studies (May, 1983 - June 1984) Procedures Manual (ADF&G 1983d).

2.3 Data Analysis

2.3.1 Peabody Ryan Temperature Recorders (Thermographs)

Using field notes as as guide, all Peabody-Ryan thermograph strip charts were screened for anomalous temperatures which may have resulted from instrument failure. From the strip charts, a reduced temperature data base was obtained as two hour point temperatures.

A correction value for each strip chart was determined as the difference between the temperature obtained with a calibrated Brooklyn thermometer (accuracy ±0.1°C) and the thermograph reading at the time the strip chart was removed. (A correction value is determined at the time of

strip chart removal rather than installation because response time of the recorder to actual water temperatures can vary with each installation). The correction value was then used to correct the two-hour point temperature data obtained from each strip chart. From these corrected data bases, daily, USGS water year weekly, and monthly minimum, mean, and maximum surface water temperatures were computer calculated and reported in tables and plots.

2.3.2 Omnidata Temperature Recorders (Datapods)

Water temperature data were retrieved from the datapod temperature recorders as six-hour minimum, mean, and maximum temperatures by reading the data storage module (DSM) via an Omnidata model 217 Datapod/cassette reader into a microcomputer. These six-hour data bases were edited and corrected for storage errors and anomalous data. From these corrected data bases, daily, USGS water year weekly, and monthly minimum, mean, and maximum temperatures were computer calculated and reported in tables and plots.

During the winter season, field observations indicated that several intragravel and surface water temperature sites were frozen. These resulting low temperatures were removed from the original base data file and included in a separate data base. Tables of daily, USGS water year weekly, and monthly minimum, mean, and maximum temperatures recorded at these frozen sites were developed. Daily mean temperatures of these data are also included in the temperature plots developed for each site.

3.0 RESULTS

A summary of the results of the 1983-84 winter temperature studies is presented by study objective. The applications of these temperature data to modelling, effects on biological activity, and impact analyses are addressed in the body of this report and in other reports. The 1983-84 winter season period of record for each of the stations are presented in Appendix Table A-2. Instantaneous water temperatures recorded at selected sites are listed in Appendix Tables A-3, A-4, and A-5. Site maps for each of the locations are presented in Appendix B.

3.1 Objective 1: Mainstem Temperature Evaluation

Continuous intragravel and/or surface water temperature data were recorded at three mainstem locations in the middle reach of the Susitna River: LRX 9 (RM 103.2), LRX 29 (RM 126.1), and LRX 57 (RM 142.3).

3.1.1 LRX 9 Sites 1 and 2 (RM 103.2) and Site 3 (RM 103.5)

Surface and intragravel water temperatures were collected at three LRX 9 locations using a datapod temperature recorder: Site 1, Site 2 and Site 3. Temperatures were recorded at Site 1 until September 11 when the temperature probes were moved further into the river, to Site 2 to avoid dewatering. Temperatures were recorded at Site 2 from September 11 to late December when the probes were severed by ice

movement. The Site 3 monitoring station was installed on February 8, in an open lead, to replace the Site 2 station.

Daily and monthly minimum, mean, and maximum surface and intragravel water temperatures recorded at each site are presented in Appendix Tables A-6 to A-8. Water year weekly temperatures are presented in Appendix Tables A-44 to A-46. A plot of the mean daily temperatures is presented in Figure A-2.

Overall temperatures recorded at Site 1 were decreasing from August 24 to September 11. However, surface water temperatures were generally warmer than intragravel temperatures. At Site 2 temperatures continued to decrease through October. Although surface and intragravel water temperatures recorded at Site 2 were generally similar, intragravel water temperatures were slightly warmer than surface water temperatures by late-October. Mean daily intragravel temperatures at Site 2 ranged from -0.1°C to 7.2°C, while surface temperatures varied between -0.1°C and 8.0°C. From February through mid-May, intragravel water temperatures recorded at Site 3 were much warmer than surface water temperatures. For example, the mean monthly February intragravel water temperature at Site 3 was 2.8°C while the average surface water temperature was 0.3°C. In mid-May both surface and intragravel water temperatures increased. May surface water temperatures ranged from -0.2°C to 11.5°C, while intragravel temperatures varied between 1.6°C and 4.9°C.

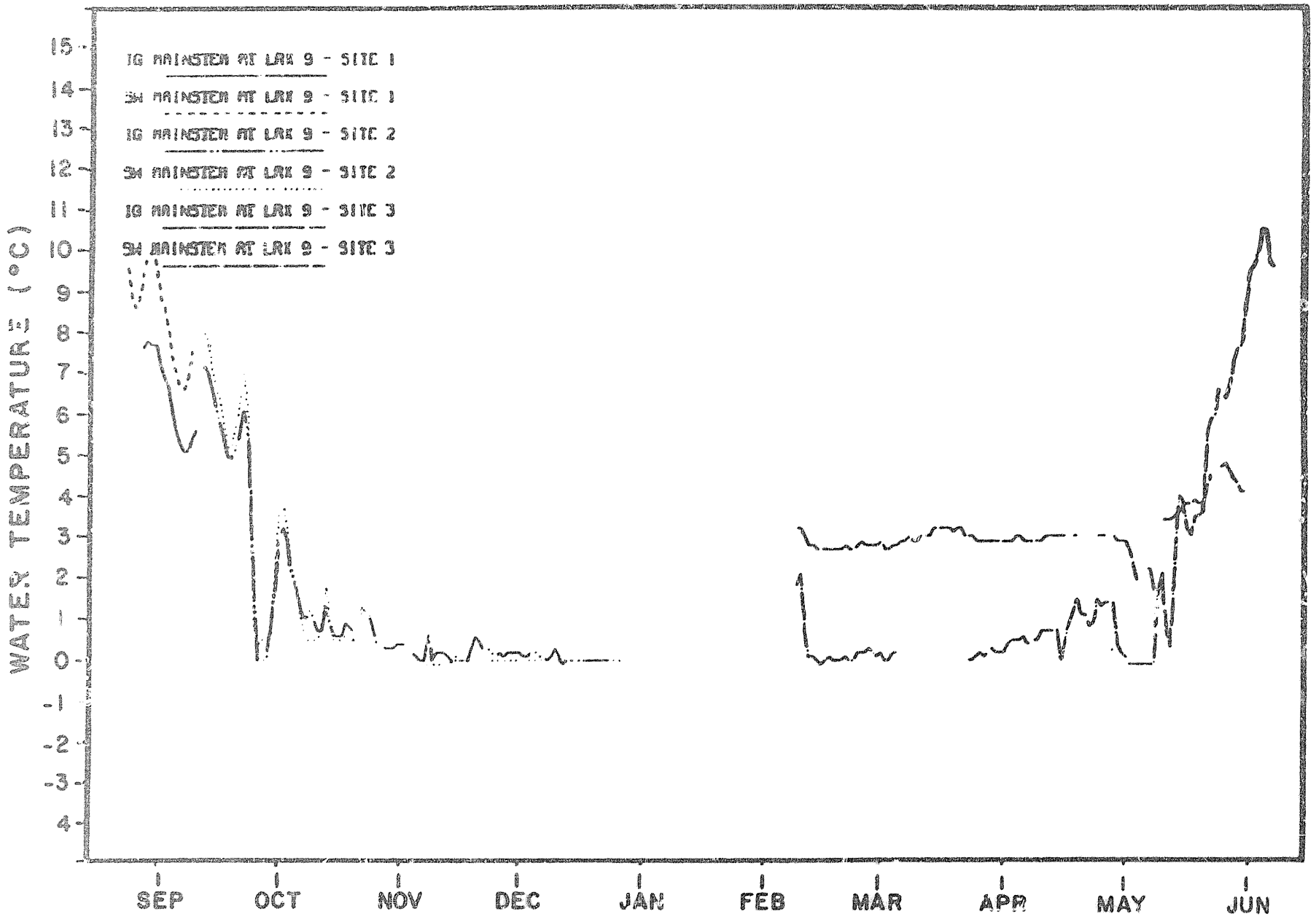

Figure A-2. Mean daily surface and intragravel water temperatures recorded at Mainstem Susitna River at LRX 9 - Sites 1 and 2 (RM 103.2) and LRX 9 - Site 3 (RM 103.5) during the 1983-84 winter season.

3.1.2 LRX 29 (RM 126.1)

At LRX 29, surface and intragravel water temperatures at were collected using datapod recorders at two locations: Site 1 and Site 2. Temperatures were obtained at Site 1 until November 2, when the temperature probes were moved further into the river, to Site 2, to avoid dewatering. Temperatures were recorded at Site 2 from November 2 until December 17 when the probes were severed by ice movement. A surface water probe was reinstalled at Site 2 on January 12, however, ice conditions and deep water prevented the installation of an intragravel probe until March 4. Both surface and intragravel water temperature were recorded at Site 2 through April 21 when both probes were severed by ice movement.

Daily and monthly minimum, mean and maximum surface and intragravel temperatures recorded at both sites are presented in Appendix Tables A-9 and A-10. Water year weekly temperatures are presented in Appendix Tables A-47 and A-48. A plot of the mean daily surface and intragravel temperatures is presented in Figure A-3.

Although temperatures at LRX 29 - Site 1 were generally declining through late September, intragravel and surface water temperatures remained similar. In late September, surface water temperatures decreased to -0.1°C, while the minimum intragravel temperature recorded was 1.0°C. Intragravel temperatures remained warmer than surface water

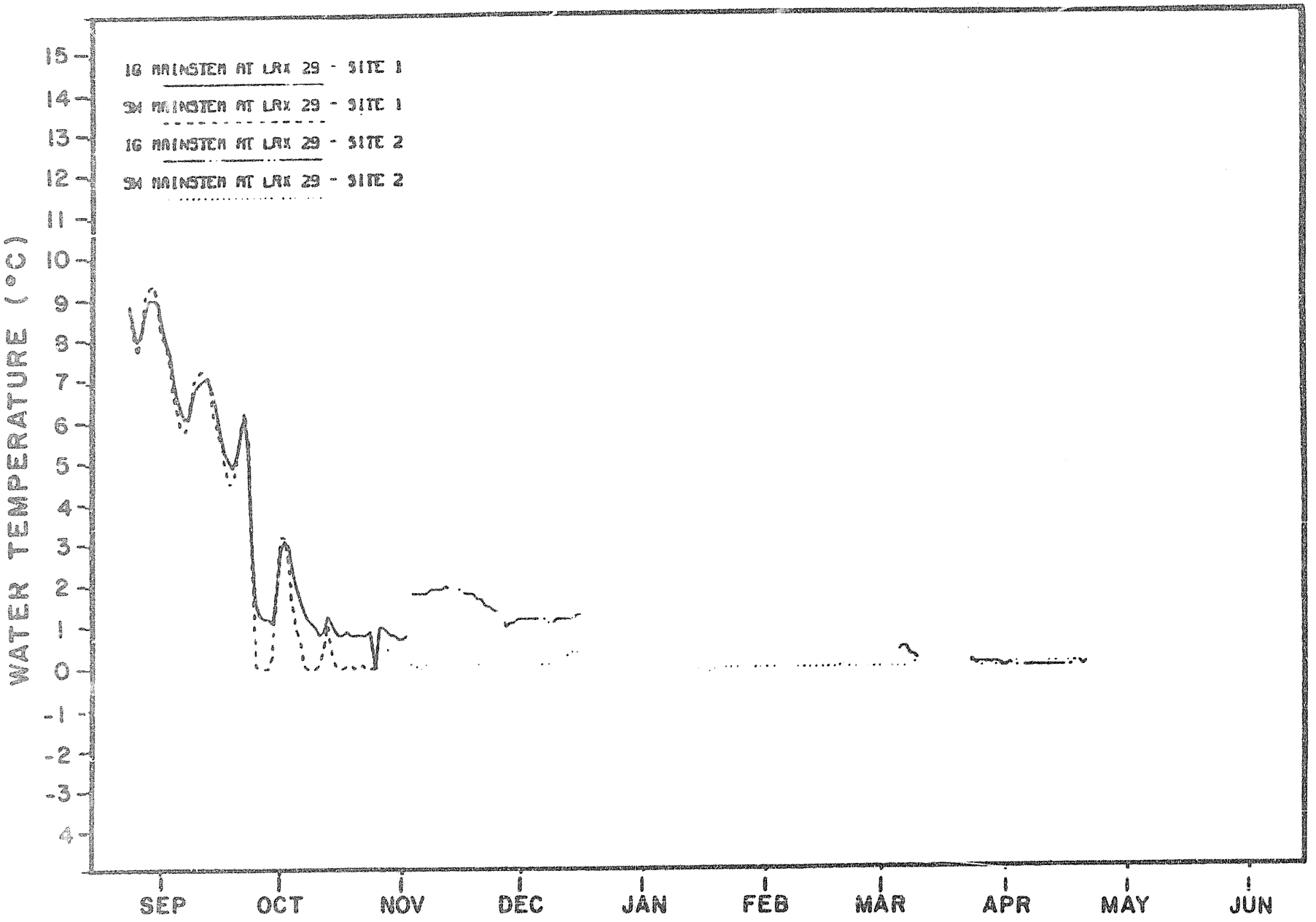

Figure A-3. Mean daily surface and intragravel water temperatures recorded at Mainstem Susitna River at LRX 29 - Sites 1 and 2 (RM 126.1) during the 1983-84 winter season.

temperatures through November 2, when the station was moved to Site 2. Mean daily intragravel temperatures at Site 1 (August 24 to November 2) varied between 0.7°C and 8.9°C, while mean daily surface temperatures ranged from 0.0°C to 9.4°C. Between November 3 and December 17, intragravel temperatures at Site 2 were warmer than surface water temperatures. During this time mean daily intragravel temperatures ranged from 1.0 to 2.0°C, while mean daily surface temperatures varied between 0.0°C and 0.4°C. From January 12 through March 4 only surface water temperatures were recorded at LRX 9. Surface water temperatures remained near 0.0°C from January through April. From March 4 to April 21, mean daily intragravel temperatures near 0.0°C were recorded.

3.1.3 LRX 57 (RM 142.3)

At LRX 57, surface and intragravel water temperatures were recorded using datapod temperature recorders at two locations: Site 1 and Site 2. Temperatures were recorded at Site 1 from August 24 to September 11 when the probes were relocated to Site 2 to prevent dewatering. Both intragravel and surface water temperatures were recorded at Site 2 until May 31. Mean daily and monthly minimum, mean and maximum temperatures recorded at both sites are presented in Appendix Tables A-13 and A-14. Water year weekly temperatures are presented in Appendix Tables A-51 and A-52. A plot of mean daily temperatures is shown in Figure A-4.

Although intragravel temperatures were warmer than surface water temperatures throughout the period of record, large differences in

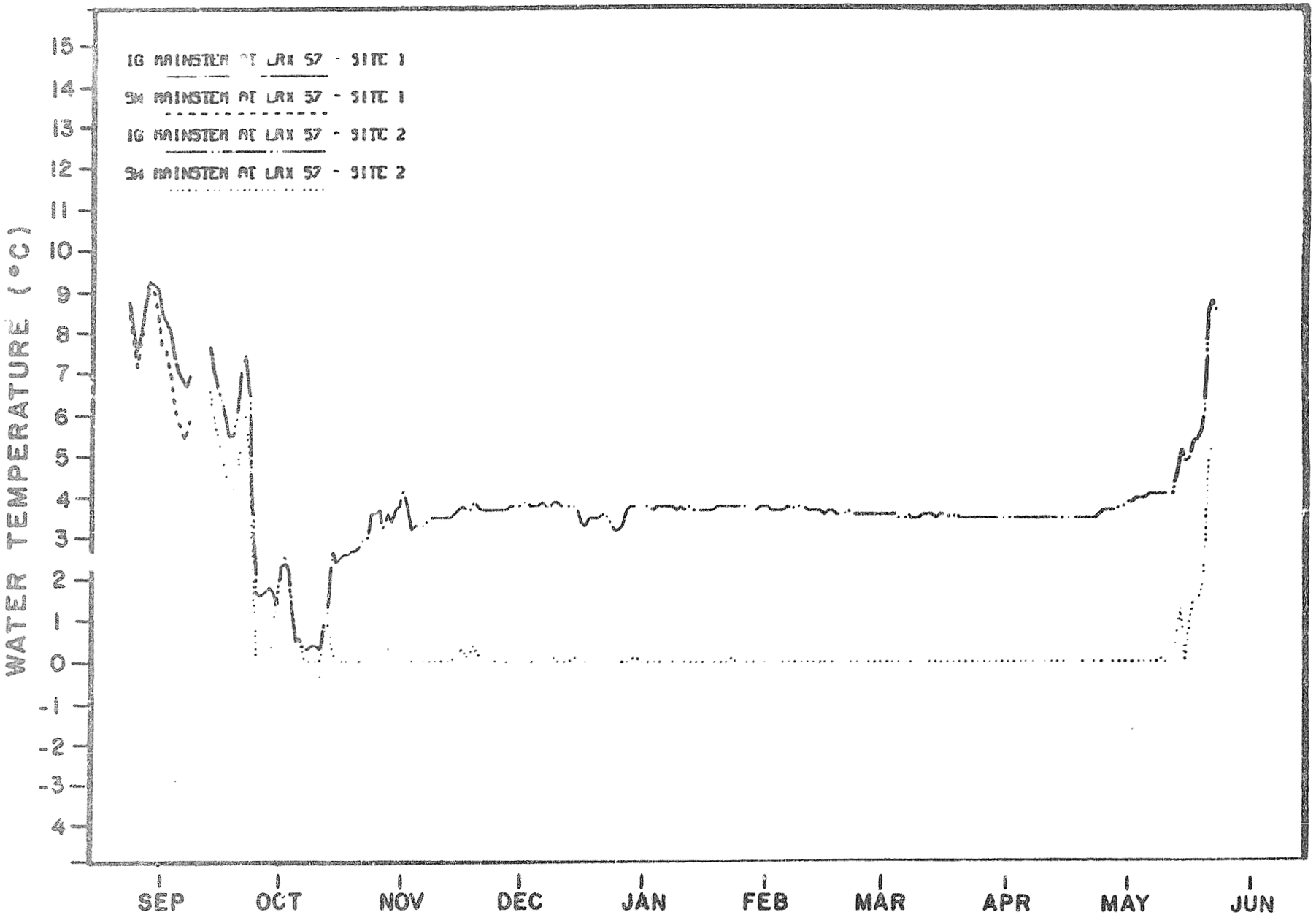

Figure A-4. Mean daily surface and intragravel water temperatures recorded at Mainstem Susitna River at LRX 57 - Sites 1 and 2 (RM 142.3) during the 1983-84 winter season.

temperature were not observed until mid-October. In early October both surface and intragravel water temperatures had declined to approximately 0.5°C. However, by late October surface water temperatures had decreased to 0.0°C, while intragravel water temperatures had increased to approximately 3.5°C. Similar surface and intragravel temperatures were recorded until mid-May when surface water temperatures increased to 6.3°C and intragravel temperatures increased to 9.4°C.

3.2 Objective 2: Chum Salmon Spawning/Incubation Temperature Evaluation

In support of Objective 2 continuous surface and intragravel water temperatures were recorded at one mainstem site, three side channel sites, eight slough sites, and two tributary locations throughout the 1983-84 winter study season. Results of these efforts are presented below by habitat type.

3.2.1 Mainstem Habitats

3.2.1.1 Mainstem Susitna River at RM 136.1

Although both surface and intragravel water temperatures were recorded at the mainstem Susitna River site at RM 136.1, surface water temperatures were not obtained until March 2.

Mean daily and monthly minimum, mean, and maximum temperatures recorded at the mainstem Susitna River at RM 136.1 are presented in Appendix

Tables A-11 and A-12. Water year weekly temperatures are presented in Appendix Tables A-49 and A-50. A plot of mean daily temperatures is shown in Figure A-5.

Intragravel temperatures were recorded with a buried Ryan temperature recorder from October 1, 1983 through January 4, 1984. At the time of installation (October 1, 1983), intragravel water temperatures as high as 3.0°C were measured. By October 7, mean daily intragravel temperatures had decreased to 0.0°C. Throughout the remainder of the recording period intragravel temperatures near 0.0°C were recorded.

Intragravel and surface water temperatures were recorded using a datapod temperature recorder from March 2 through May 3. Intragravel and surface water temperatures were similar until mid-April, with temperatures averaging near 0.0°C. In mid-April, slight increases in intragravel temperatures were observed, while larger increases in surface water temperatures were seen. April surface water temperatures ranged from 0.1°C to 2.9°C, while intragravel temperatures varied between 0.0°C and 0.8°C.

3.2.2 Side Channel Habitats

3.2.2.1 Side Channel 10 (RM 134.0)

Surface and intragravel water temperatures were collected at Side Channel 10 using a datapod temperature recorder from August 24 to May 31. Two temperature sites were established in the side channel: Site 1

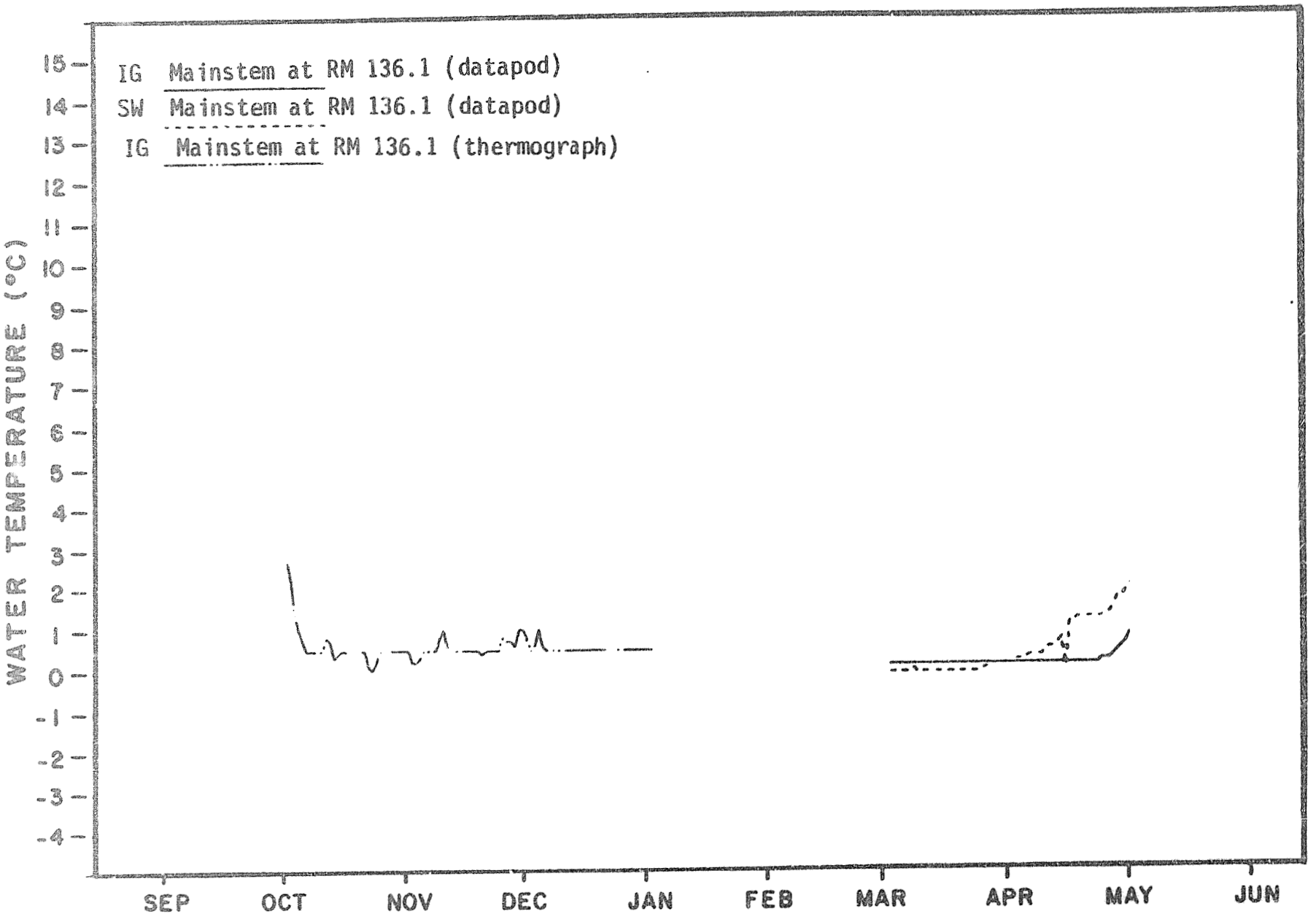

Figure A-5. Mean daily surface and intragravel water temperatures recorded at the Mainstem Susitna River at RM 136.1 during the 1983-84 winter season.

and Site 2. Mean daily and monthly minimum, mean, and maximum temperatures recorded at the sites are presented in Appendix Tables A-15 to A-18. Water year weekly temperatures are listed in Appendix Tables A-53 to A-56. Mean daily temperatures recorded at the sites are shown in Appendix Figure A-6.

The temperature station at Site 1 was operated from August 24 to November 5 when the datapod recorder malfunctioned. During this period both surface and intragravel water temperatures were decreasing. However, surface water temperatures were more variable than intragravel temperatures. Surface water temperatures were also warmer than intragravel temperatures until late October when the trend reversed. From August 24 to November 5 surface water temperatures at Site 1 ranged from 0.4°C to 10.3°C and corresponding intragravel water temperatures ranged from 2.7°C to 5.1°C.

On November 16 a new recorder was installed at Site 1, but the site was frozen, and both surface and intragravel temperatures measured below 0°C. Therefore, a new recorder and a surface probe were installed at Site 2. (Due to time constraints an intragravel probe was not installed in Site 2 at this time.) Site 1 remained frozen, and on November 30 the intragravel probe was moved to Site 2.

Site 2 was monitored through May 31, however, frozen conditions were recorded at the surface water station from December 15 to December 18. Intragravel temperatures at Site 2 were stable, while surface water

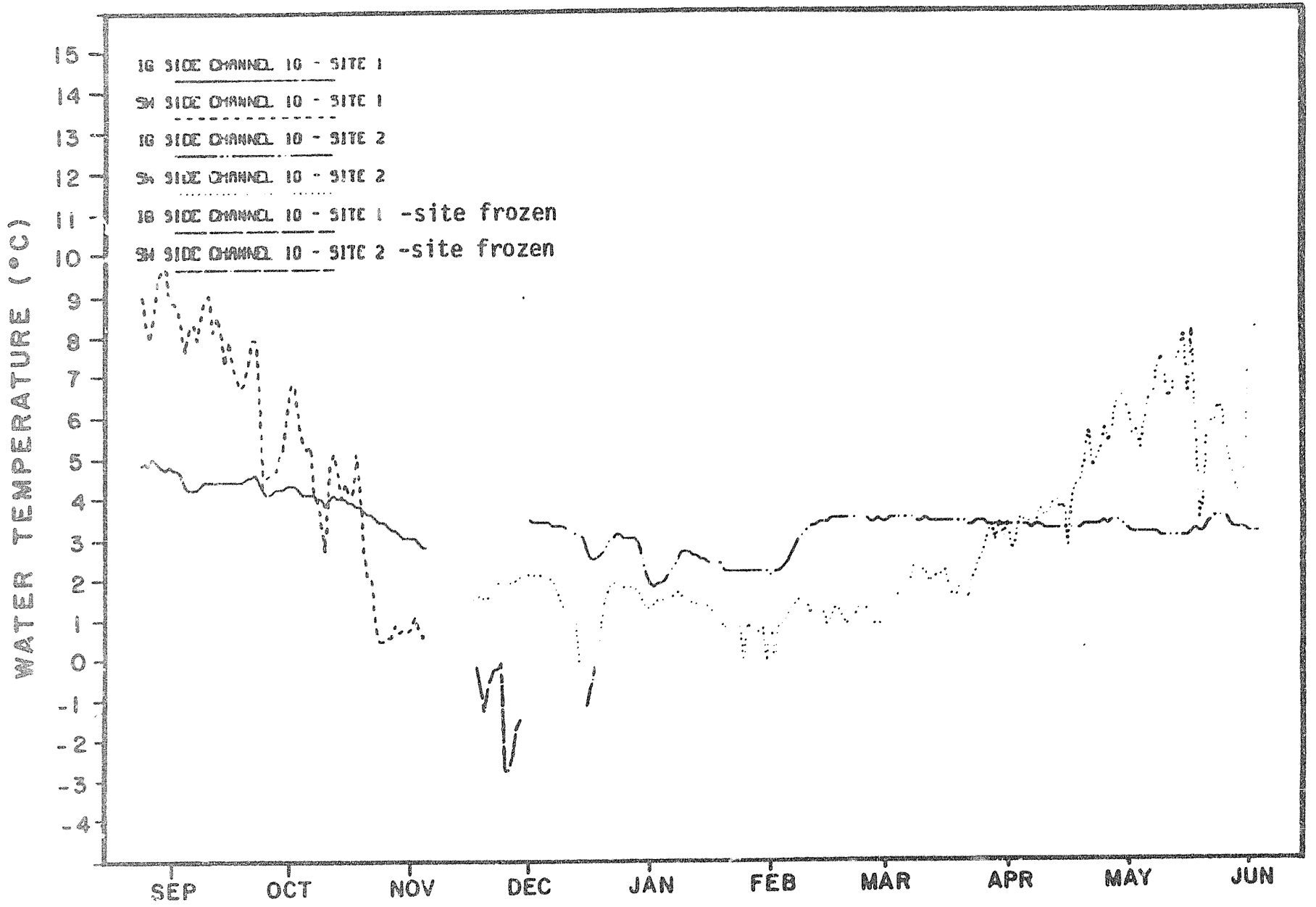

Figure A-6. Mean daily surface and intragravel water temperatures recorded at Side Channel 10 - Sites 1 and 2 (RM 134.0) during the 1983-84 winter season.

temperatures were variable. From November 16 to May 31, surface water temperatures ranged from 0.0°C to 14.7°C. Between November 30 and May 31 intragravel water temperatures varied from 1.8°C to 3.6°C.

3.2.2.2 Upper Side Channel 11 (RM 136.3)

Surface and intragravel water temperatures were recorded in Upper Side Channel 11 at three locations: Site 1, Site 2 and Site 3. Temperatures were recorded at Site 1 from August 24 to September 12 when the recorder was relocated to Site 2. The Site 2 station was monitored from September 12 to May 31. The temperature station at Site 3 was installed on January 11 to determine variations in temperatures occuring within the side channel. Temperatures were recorded at the site through May 31.

Mean daily and monthly minimum, mean, and maximum temperatures recorded at the Upper Side Channel 11 sites are reported in Appendix Tables A-19 to A-21. Water year weekly temperatures recorded are presented in Appendix Tables A-57 to A-59. Plots of mean daily surface and intragravel temperatures are shown in Appendix Figures A-7 and A-8.

Mean daily surface water temperatures recorded at Site 1 ranged from 5.6 to 9.0°C, while mean daily intragravel temperatures varied between 5.3 and 6.1°C. At Site 2, surface water temperatures were warmer than intragravel temperatures in the fall (late August and early September) and spring (April and May), and were colder than intragravel

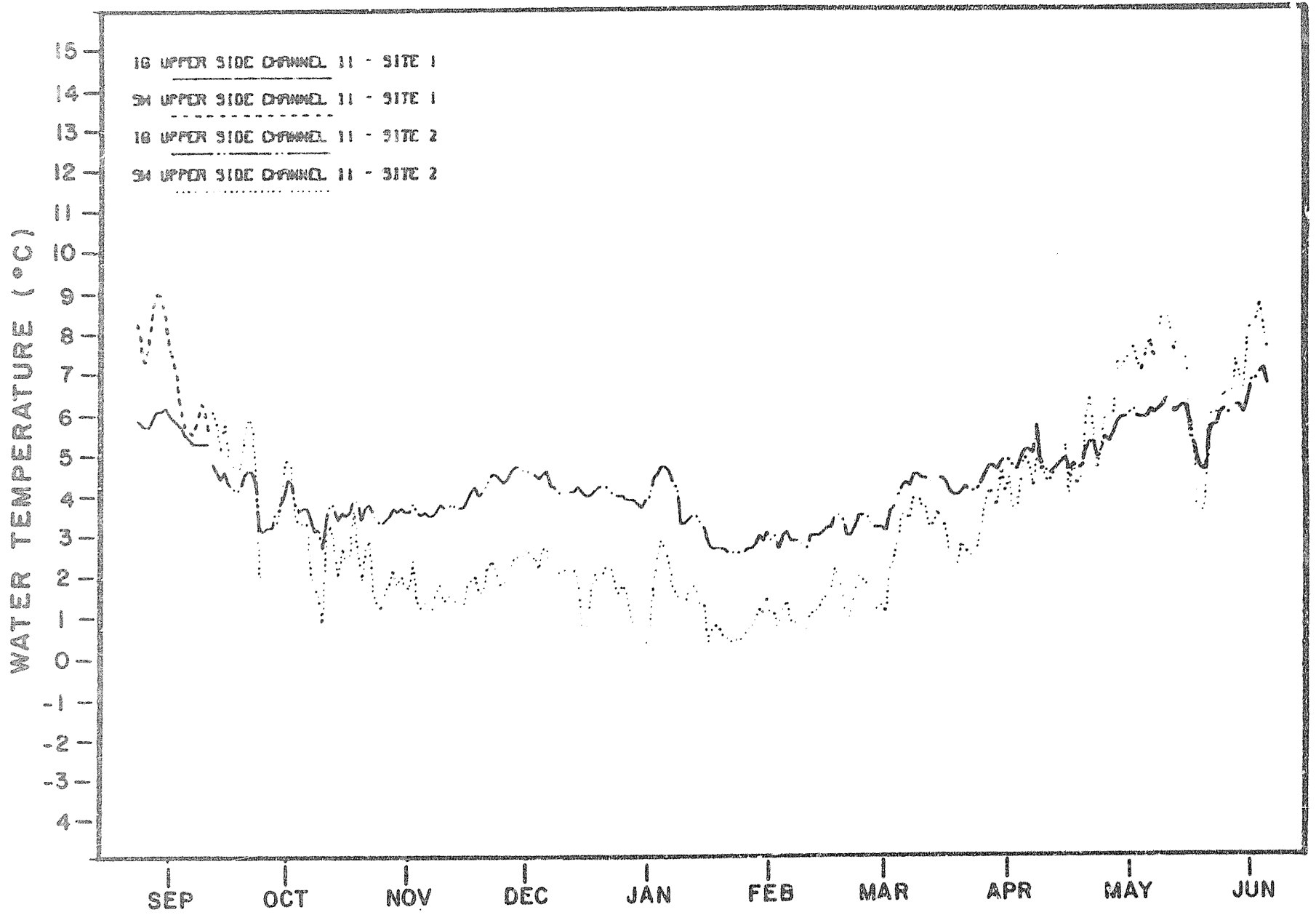

Figure A-7 Mean daily surface and intragravel water temperatures recorded at Upper Side Channel 11 - Sites 1 and 2 (RM 136.3) during the 1983-84 winter season.

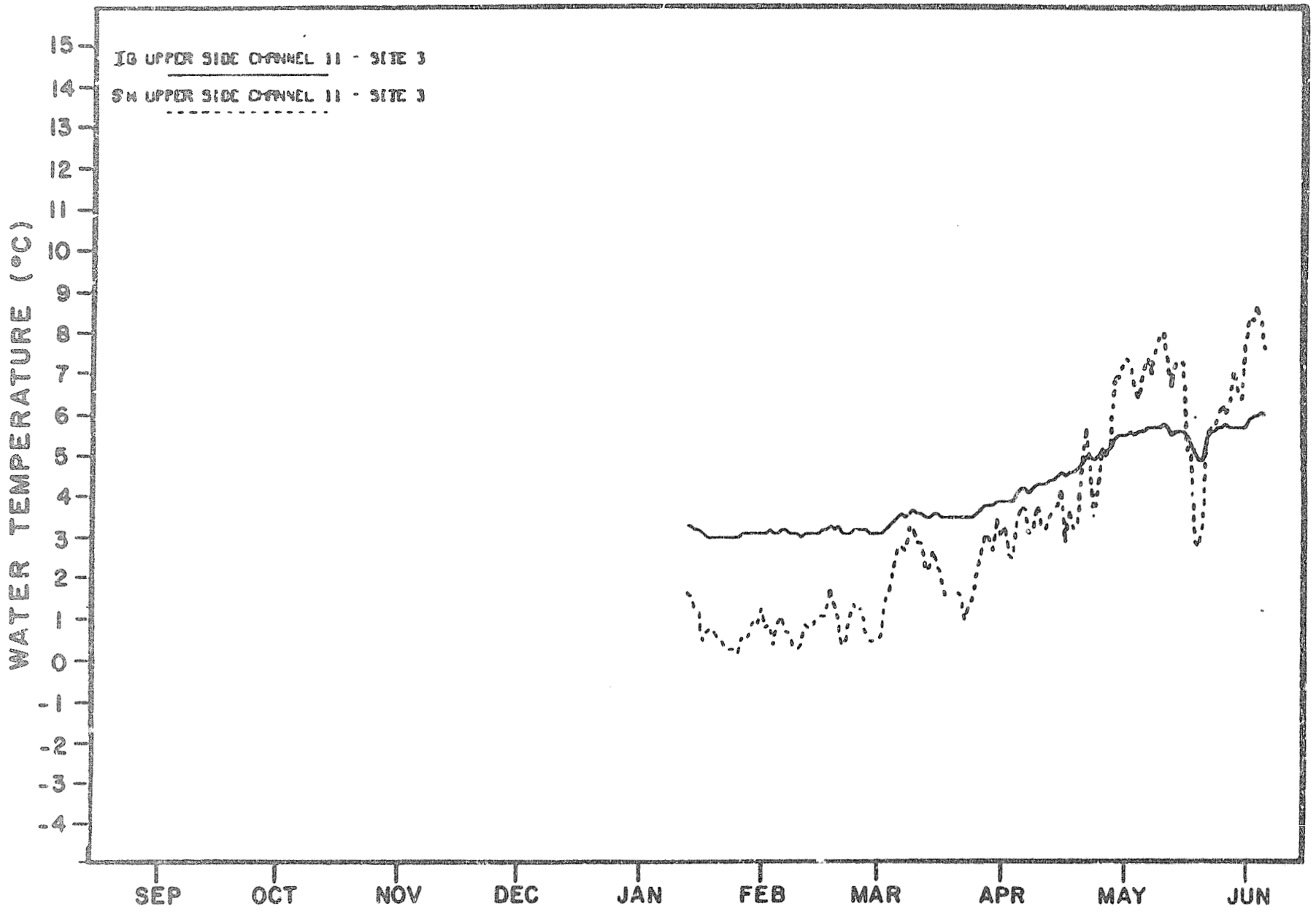

Figure A-8. Mean daily surface and intragravel water temperatures recorded at Upper Side Channel 11 - Site 3 (RM 136.3) during the 1983-84 winter season.

temperatures throughout the winter. Mean monthly surface water temperatures at Site 2 ranged from 0.4°C to 8.6°C, while mean monthly intragravel water temperatures varied from 2.6°C to 6.4°C. Surface and intragravel water temperatures recorded at Site 3 followed the same trend as the temperatures observed at Site 2. Between January 11 and May 31 mean daily surface water temperatures at Site 3 ranged from 0.2 to 8.0°C while mean daily intragravel temperatures ranged between 3.0 and 5.7°C. The similarities between temperatures recorded in Sites 2 and 3 are illustrated in Appendix Figure A-9.

3.2.2.3 Side Channel 21 (RM 141.0)

Surface and intragravel water temperatures were recorded at three locations (Sites 1, 2, and 3) in Side Channel 21. Surface and intragravel temperatures were monitored at Site 1 from August 24 to September 12 when the station was moved to Site 2. Both intragravel and surface water temperatures were recorded at Site 2 from September 12 through January 10 when the intragravel probe was severed by ice movement. From January 11 to May 22, only surface water temperatures were recorded at the Site. A monitoring station was established at Site 3 on November 30 to ensure the collection of data in the side channel. The Site 3 station was monitored through May 22.

Mean daily and monthly minimum, mean, and maximum temperatures recorded at the sites were presented in Appendix Tables A-22 to A-25. Water year weekly temperatures are listed in Appendix Tables A-60 to A-63. Mean

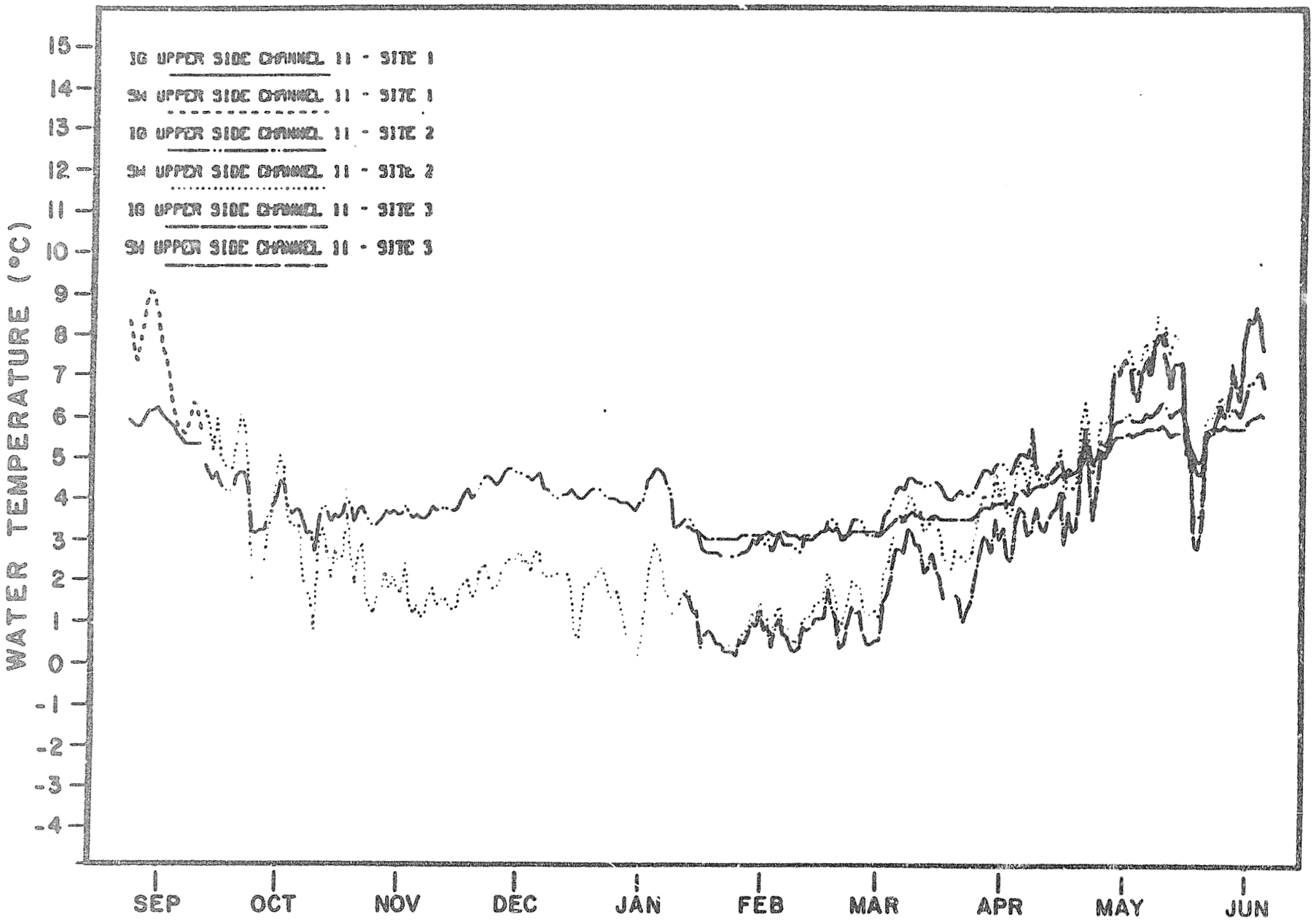

Figure A-9. Mean daily surface and intragravel water temperatures recorded at Upper Side Channel 11 - Sites 1, 2 and 3 (RM 136.1) during the 1983-84 winter season.

daily temperatures recorded at the sites are presented in Appendix Figures A-10 and A-11.

A[illegible]ough both intragravel and surface water temperatures at Site 1 were declining, surface water temperatures were warmer. Surface water temperatures ranged from 4.7°C to 9.2°C, and intragravel temperatures varied between 3.9 and 7.9°C.

Surface and intragravel water temperatures were recorded at Site 2 from September 13 to January 10 when the intragravel probe was severed by ice movement. From January 11 through May 22 only surface water temperatures were recorded at Site 2.

In September and October both surface and intragravel water temperatures were decreasing, however, intragravel water temperatures were warmer through September. Surface water temperatures were warmer than intragravel temperatures throughout October. From September 13 through October 31 surface water temperatures at Site 2 ranged from 1.6°C to 7.5°C while intragravel temperatures varied from 1.6°C to 6.3°C. In November both surface and intragravel water temperatures increased slightly. From November to January 10, intragravel water temperatures were warmer than surface water temperatures although both showed similar trends. From November until January 10 intragravel temperatures remained near 2.5°C. Except for a short period in January when surface temperatures decreased to 0.7°C, surface water temperatures remained near 1.5°C until late April when the temperatures began to increase. In May, surface water temperatures at Site 2 ranged between 2.1°C and 13.1°C.

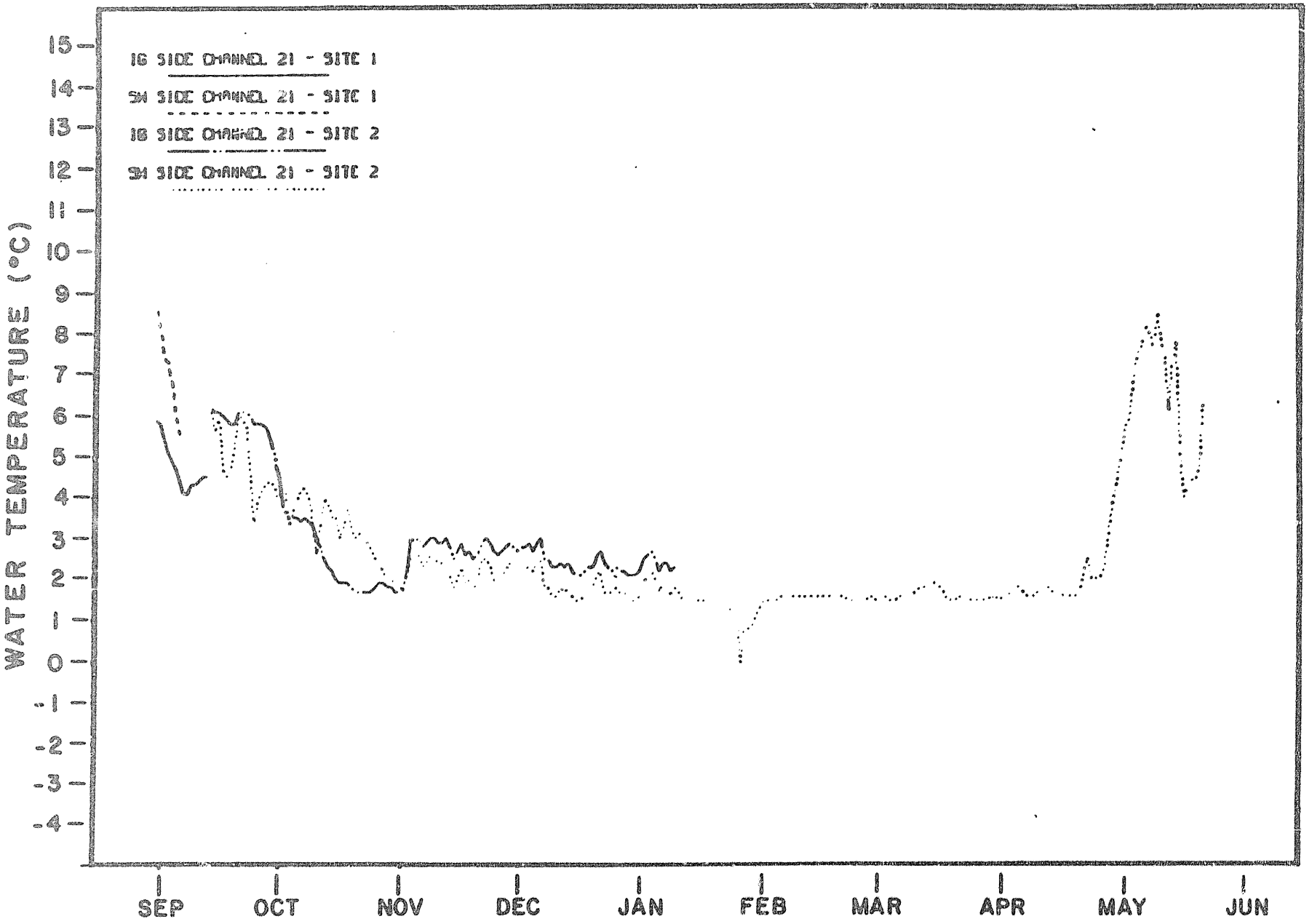

Figure A-10. Mean daily surface and intragravel water temperatures recorded at Side Channel 21 - Sites 1 and 2 (RM 141.0) during the 1983-84 winter season.

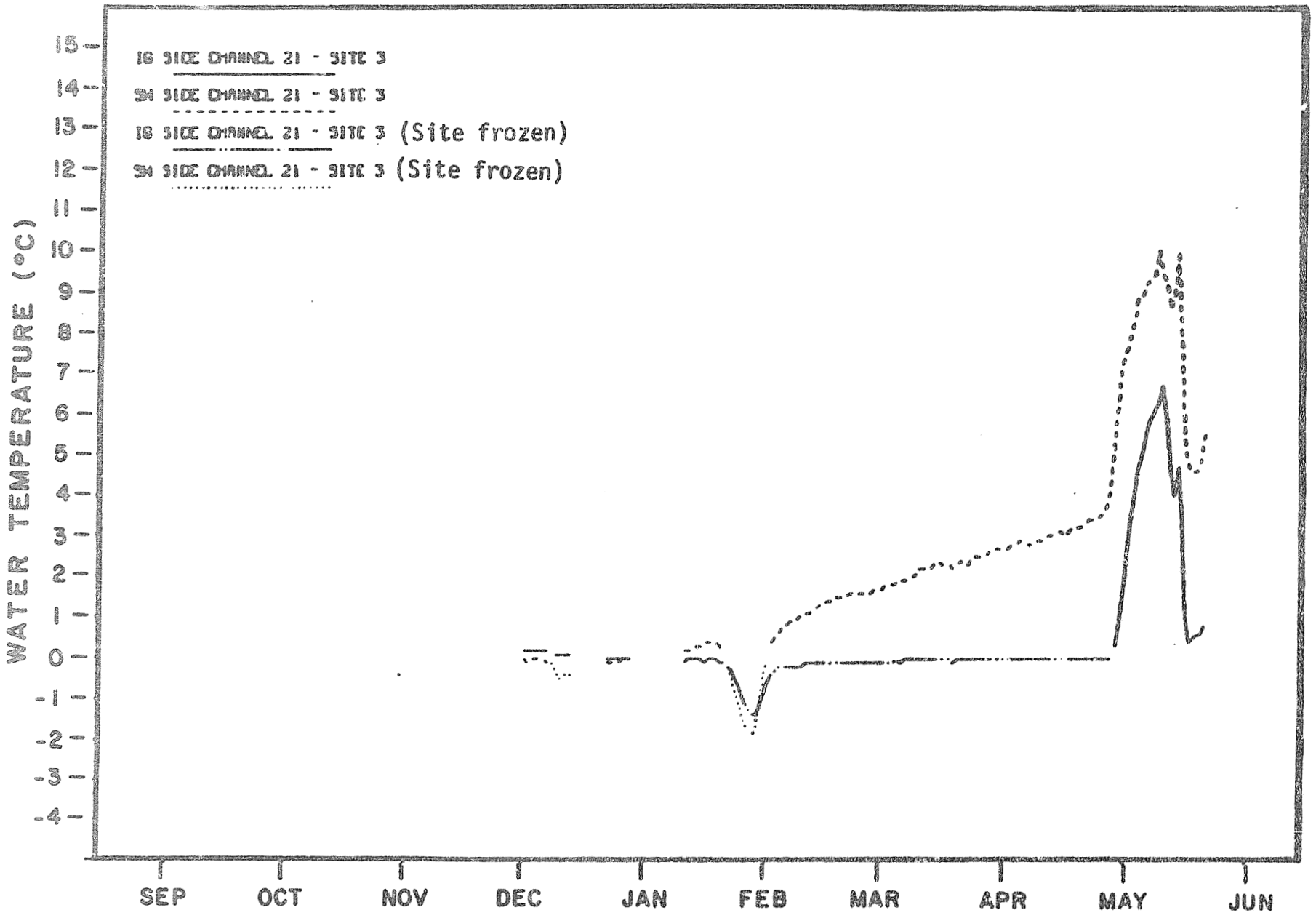

Figure A-11. Mean daily surface and intragravel water temperatures recorded at Side Channel 21 - Site 3 (RM 141.0) during the 1983-84 winter season.

Surface and intragravel water temperatures were recorded at Side Channel 21 - Site 3 from November 30 through May 22. The surface water temperature monitoring location was frozen from December 8 through December 14, and from January 22 to January 31. The actual status of the intragravel water temperature monitoring station is uncertain from January 22 to April 27. However, the low and constant temperatures indicate that the station was also frozen during this time period.

Surface water temperatures at Site 3 increased gradually from late January until late April. Mean monthly, February, March, and April surface water temperatures were 1.2, 2.2 and 3.4°C, respectively. In late April, a sharp increase in surface water temperatures occurred. Temperatures as high as 12.8°C were recorded in mid-May before temperatures decreased sharply. Temperatures measuring less than 0.5°C were recorded in late May before temperatures began to increase again.

Intragravel water temperatures at Site 3 remained near -0.1°C from February through late April, possibly due to ice conditions. A sharp increase in intragravel temperatures also occurred in late April. Intragravel water temperatures followed a temperature trend similar to the surface water temperature trend through May although intragravel temperatures were lower.

A comparison of surface water temperatures recorded within Side Channel 21 was made to determine variations on temperatures occurring within the site (Appendix Figure A-12). Because the data recorded at Site 3 prior

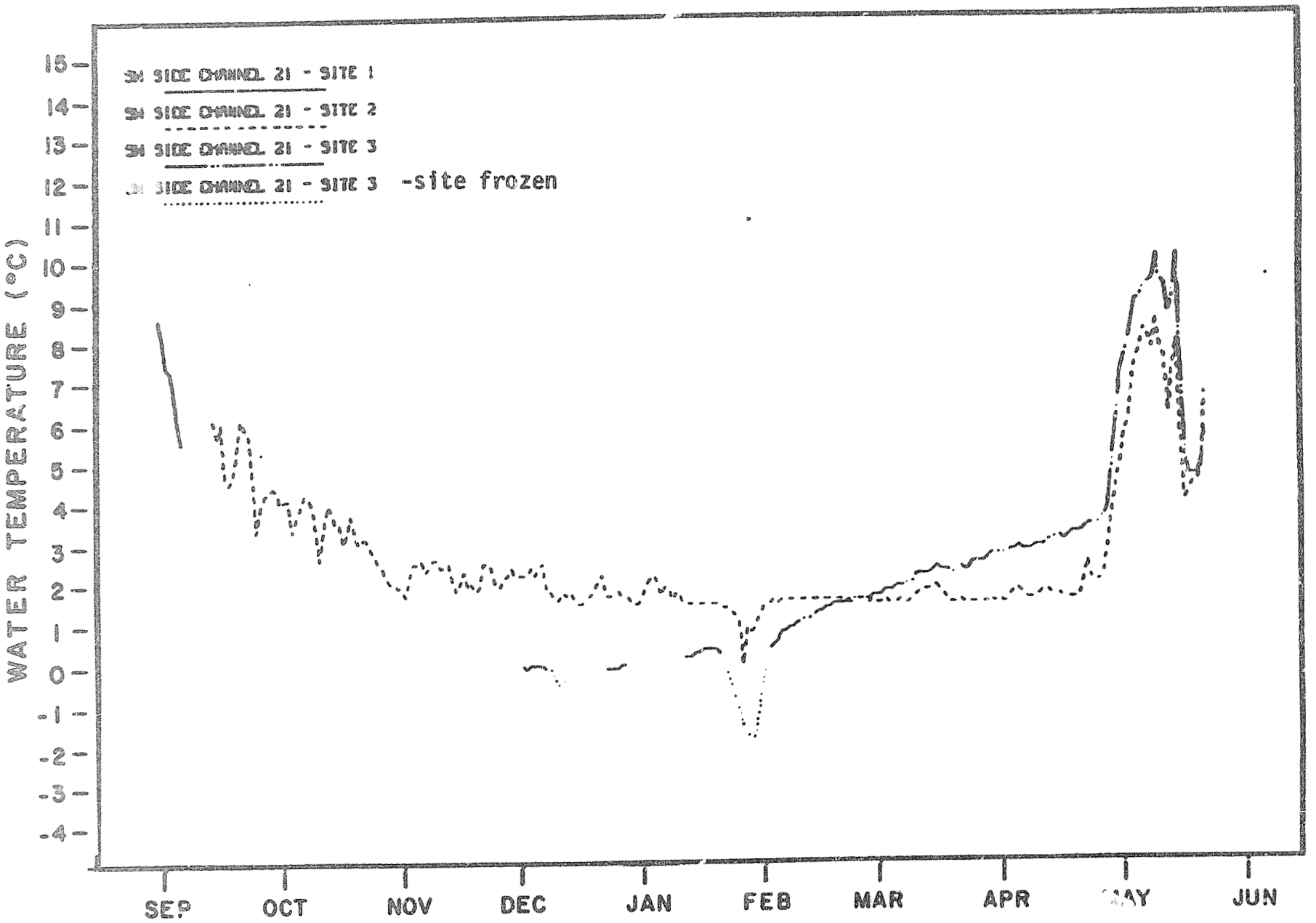

Figure A-12. Mean daily surface water temperatures recorded at Side Channel 21 - Sites 1, 2 and 3 (RM 141.0) during the 1983-84 winter season.

to January 10 is not continuous, only the periods of record from January 10 to May 22 were compared. From January 22 to January 31, the surface water temperature station at Site 3 was presumed frozen. The lowest temperature, -1.5°C, was recorded at this site on January 29. Temperatures recorded at Site 2 had also decreased at this time. The lowest temperature recorded at Site 2, 0.7°C, was also recorded on January 29. By January 31, surface water temperatures at Site 2 had increased to 1.5°C. Surface temperatures remained near 1.5°C through April and increased sharply in early May. Surface water temperatures at Site 3 increased gradually through April and also rose rapidly in early May. Although temperatures at Site 3 were generally higher, surface temperatures at Sites 2 and 3 followed similar temperature trends through May.

Because very little concurrent intragravel temperature data are available for Sites 2 and 3, a comparison of the intragravel temperatures recorded within Side Channel 21 was not made (Appendix Figure A-13).

3.2.3 Slough Habitats

3.2.3.1 Slough 8A

Surface and intragravel water temperature monitoring stations were located in both the lower and upper portions of Slough 8A.

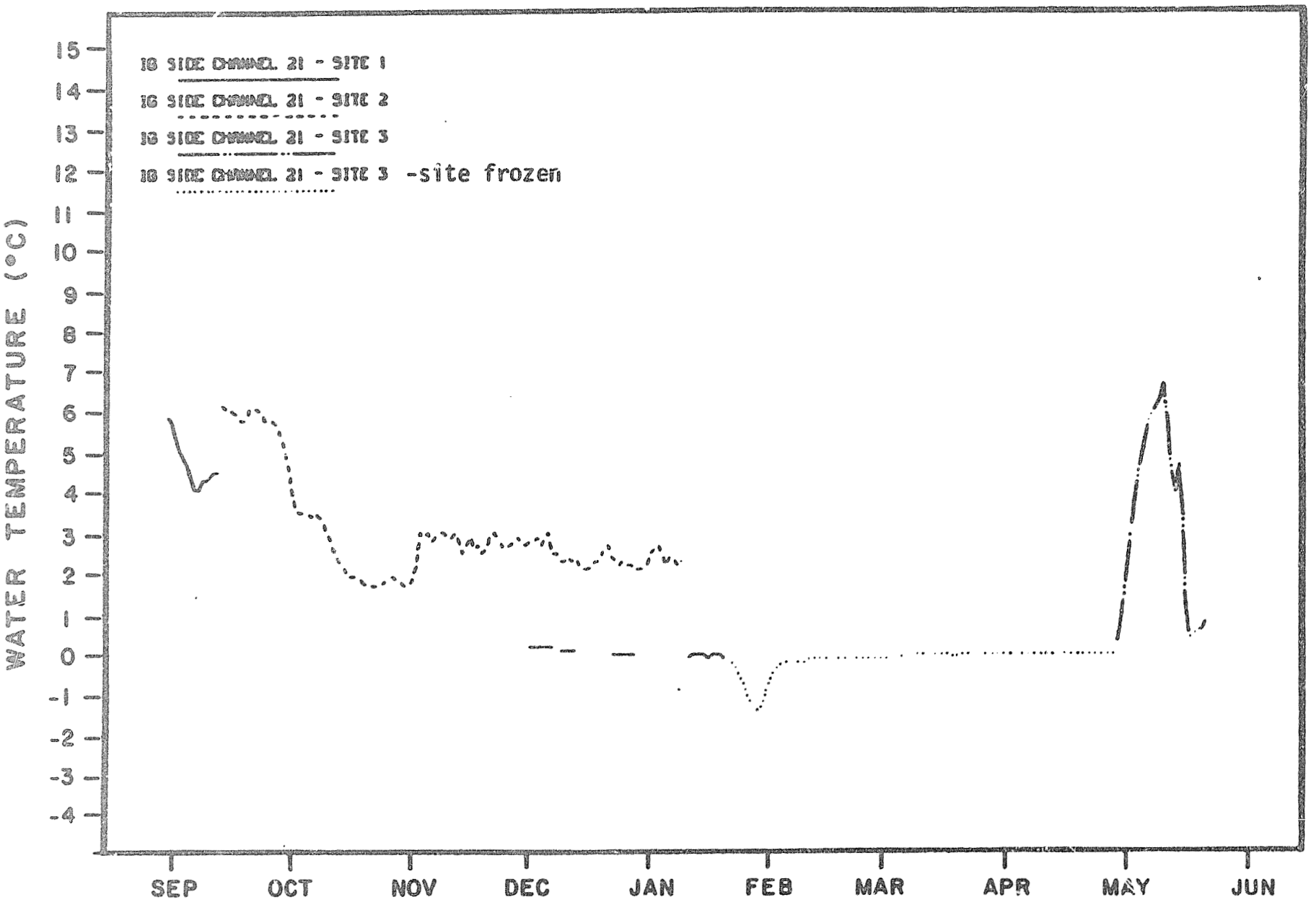

Figure A-13. Mean daily intragravel water temperatures recorded at Side Channel 21 - Sites 1, 2 and 3 (RM 141.0) during the 1983-84 winter season.

3.2.3.1.1 Lower Slough 8A (RM 125.6)

Both surface and intragravel water temperatures were recorded at the stage monitoring station in the lower portion of Slough 8A at Site 3 from August 24 through May 22. Gaps occurred in the data in November due to instrument failure. Mean daily and monthly minimum, mean, and maximum temperatures recorded at Lower Slough 8A are presented in Appendix Tables A-26 and A-27. Water year weekly temperatures are listed in Appendix Tables A-64 and A-65. A plot of the mean daily temperatures recorded at the site is shown in Figure A-14.

Except for brief periods in late August and early December, intragravel and surface water temperatures recorded at the site were relatively similar. In August, mean daily surface water temperatures were approximately 8.5°C while mean daily intragravel temperatures were approximately 5.0°C. By late October, both intragravel and surface temperatures were near 0.5°C.

From November 27 to December 18 increased intragravel temperatures of approximately 2.0°C were recorded while surface water temperatures remained near 0.5°C. Although these elevated intragravel temperatures appear to be anomalous, the instrument and probe appeared to be operating accurately during this period. On December 18 intragravel temperatures of approximately 0.5°C were again recorded. Both intragravel and surface temperatures measured approximately 0.5°C from December through early March. In March and April, surface and

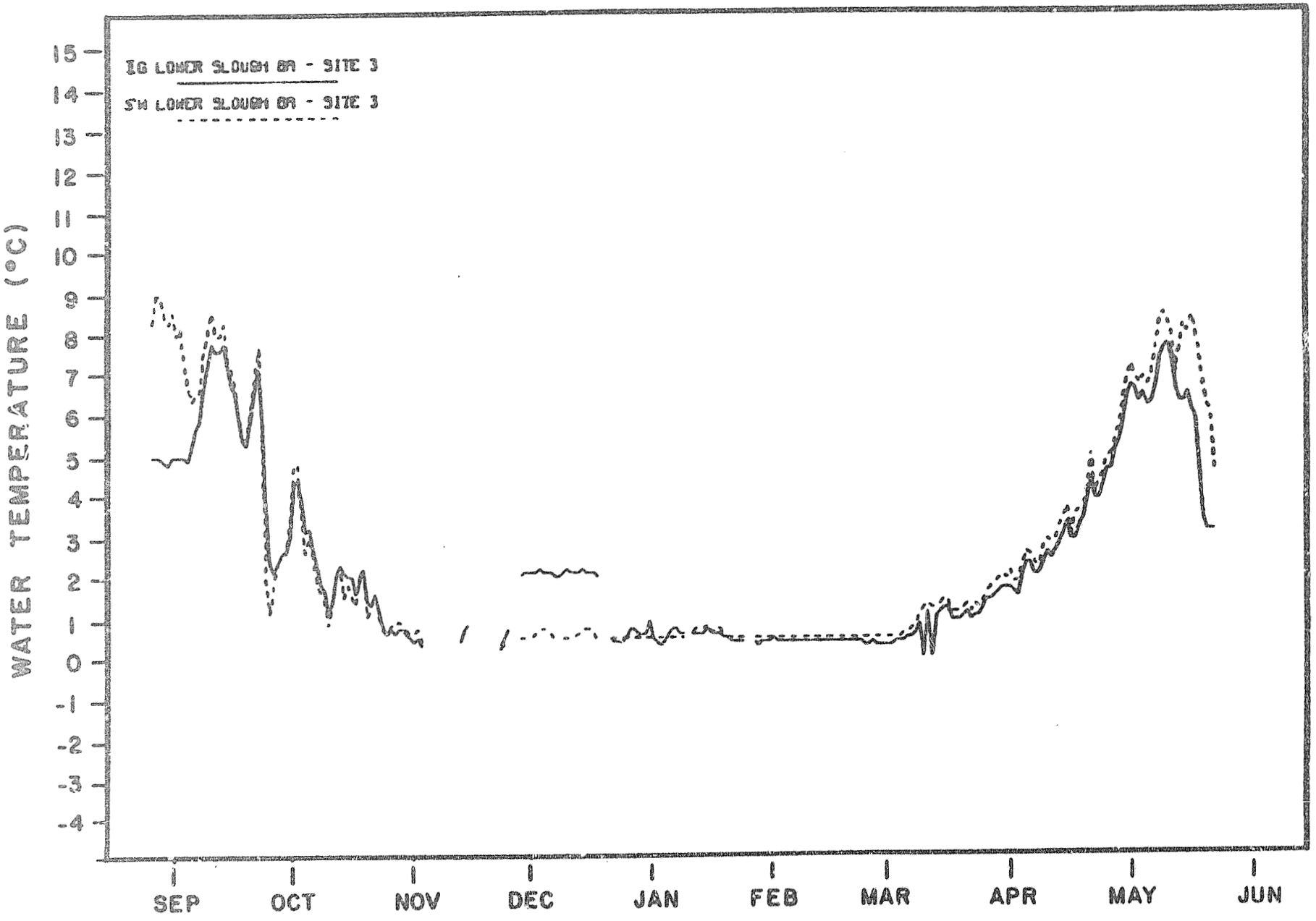

Figure A-14. Mean daily surface and intragravel water temperatures recorded at Lower Slough 8A - Site 3 (RM 125.6) during the 1983-84 winter season.

intragravel water temperatures increased. Mean monthly intragravel and surface temperatures in April were 3.3°C and 3.6°C, respectively. In May intragravel temperatures ranged from 3.0°C to 8.4°C, while surface temperatures varied between 3.5°C and 11.2°C.

3.2.3.1.2 Upper Slough 8A (RM 126.6)

Intragravel and surface water temperatures were recorded at two locations in Upper Slough 8A at Site 2 and Site 3. Mean daily and monthly minimum, mean and maximum temperatures recorded at the sites are presented in Appendix Tables A-28 to A-30. Water year weekly temperatures are listed in Appendix Tables A-66 to A-68. A plot of mean daily temperatures recorded at the sites is presented in Appendix Figure A-15.

Between October 27 and November 11 intragravel temperatures at Site 2 ranged from 0.1°C to 3.0°C, and surface water temperatures ranged from 0.0°C to 1.6°C. Both intragravel and surface water temperature stations were frozen from November 3 through December 21 when the stations were moved to an open water lead at Site 3 .

Mean daily intragravel water temperatures recorded at Site 3 remained near 2.8°C throughout the recording period. Due to a recurring probe malfunction and therefore an incomplete data record, mean daily surface water temperatures were not calculated from December 21 through March 5. During this time, however, surface water temperatures were generally

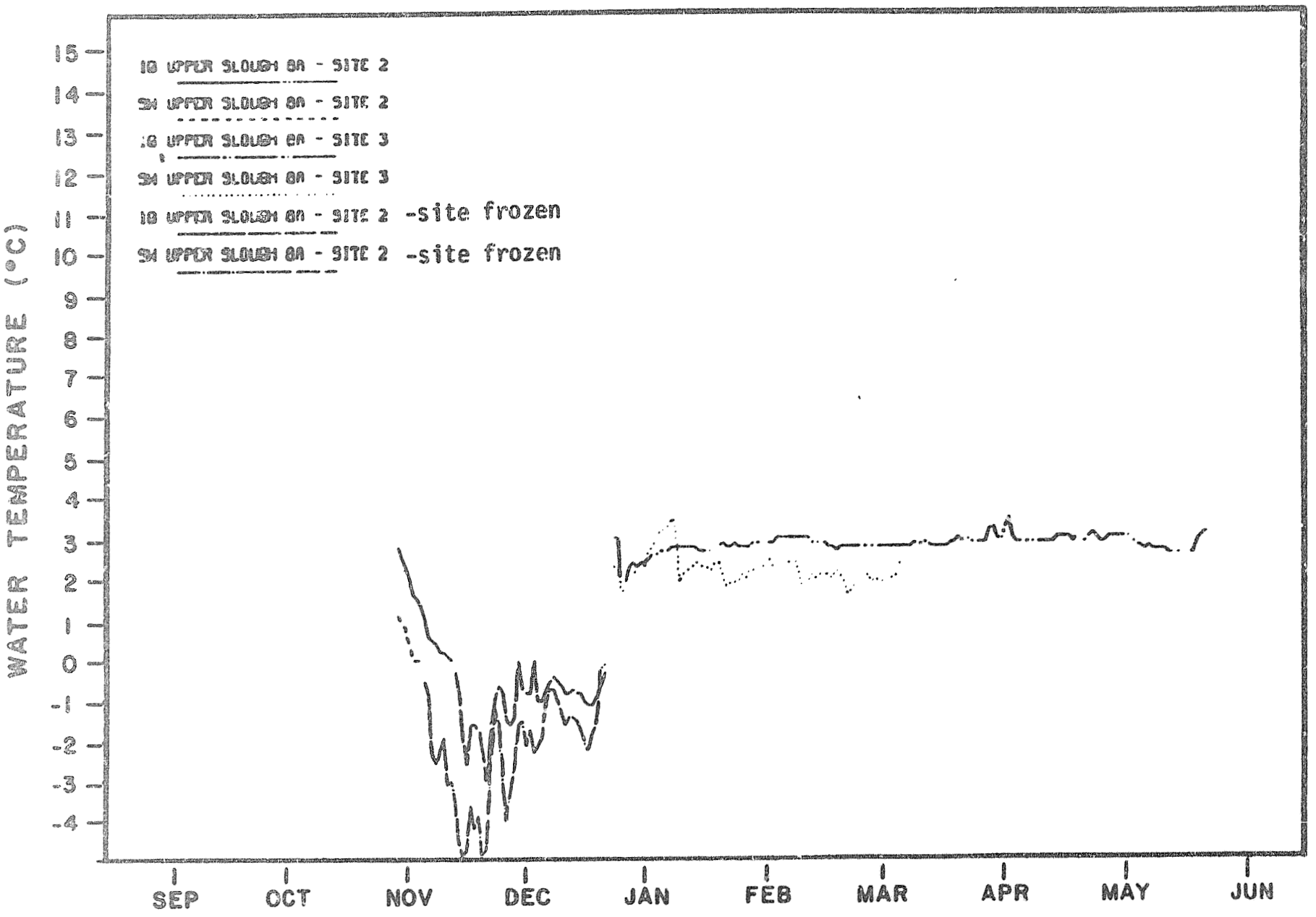

Figure A-15. Mean daily surface and intragravel water temperatures recorded at Upper Slough 8A-Sites 2 and 3 (RM 126.6) during the 1983-84 winter season.

lower than intragravel water temperatures. The limited data available indicate that surface water temperatures were generally near 2.0°C.

3.2.3.1.3 Upper Slough 8A and Lower Slough 8A

A plot of mean daily intragravel and surface water temperatures recorded in the lower and upper portions of Slough 8A was developed to determine temperature variations occurring within the Slough (Appendix Figure A-16). Due to a malfunctioning recorder and a frozen site at Upper Slough 8A, only temperatures recorded between December 21 and May 22 were compared. Between December and March warmer intragravel and surface temperatures were observed at Upper Slough 8A. The surface water temperature probe in Upper Slough 8A malfunctioned in early March, while the intragravel temperatures remained stable through May. At Lower Slough 8A, both the intragravel and surface temperatures increased sharply from March through early May.

3.2.3.2 Slough 9 (RM 128.3)

Intragravel and surface water temperatures were recorded at one location in Slough 9 at Site 3. Temperatures were collected from August 24 through May 31. A gap in the data occurring from January 10 through March 23 was due to a malfunctioning datapod recorder. Surface water temperatures were also recorded using a Ryan temperature recorder at a site referred to as the Slough 9 Incubation site from August 31 to September 2.

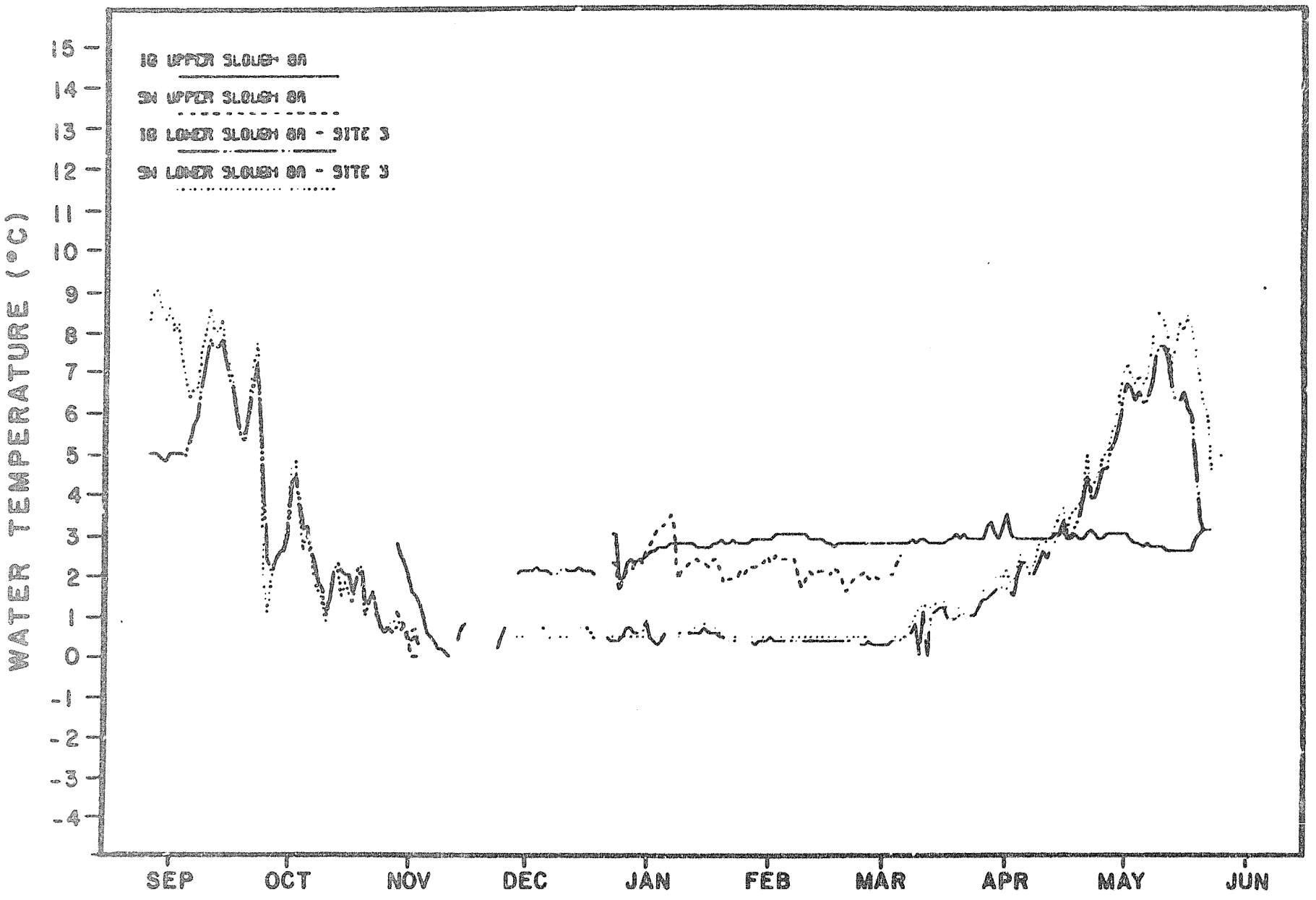

Figure A-16. Mean daily intragravel and surface water temperatures recorded at Lower Slough 8A - Site 3 (RM 125.6) and Upper Slough 8A (RM 126.6) during the 1983-84 winter season.

Mean daily and monthly minimum, mean and maximum temperatures recorded at Slough 9 are presented in Appendix Tables A-31 and A-32. Water year weekly temperatures are listed on Appendix Tables A-69 and A-70. A plot of the mean daily intragravel and surface temperatures recorded at Slough 9 - Site 3 is shown on Appendix Figure A-17.

At Slough 9 intragravel temperatures were relatively stable throughout the period of record with temperatures ranging from 3.0°C to 3.7°C. Surface water temperatures were more variable ranging from 0.1°C to 12.2°C.

3.2.3.3 Slough 10

Surface and intragravel water temperatures were recorded at both the northeast and northwest channels.

3.2.3.3.1 Slough 10 Northeast Channel (RM 134.0)

Surface and intragravel water temperatures were recorded in the northeast channel of Slough 10 from October 19 through May 22. Daily and monthly minimum, mean, and maximum temperatures recorded are presented in Appendix Table A-33. Water year weekly temperatures are listed in Appendix Table A-71. A plot of mean daily temperatures is shown in Appendix Figure A-18.

Intragravel temperatures in the northeast channel were warmer than surface water temperatures from October 19 until April 23 when the trend

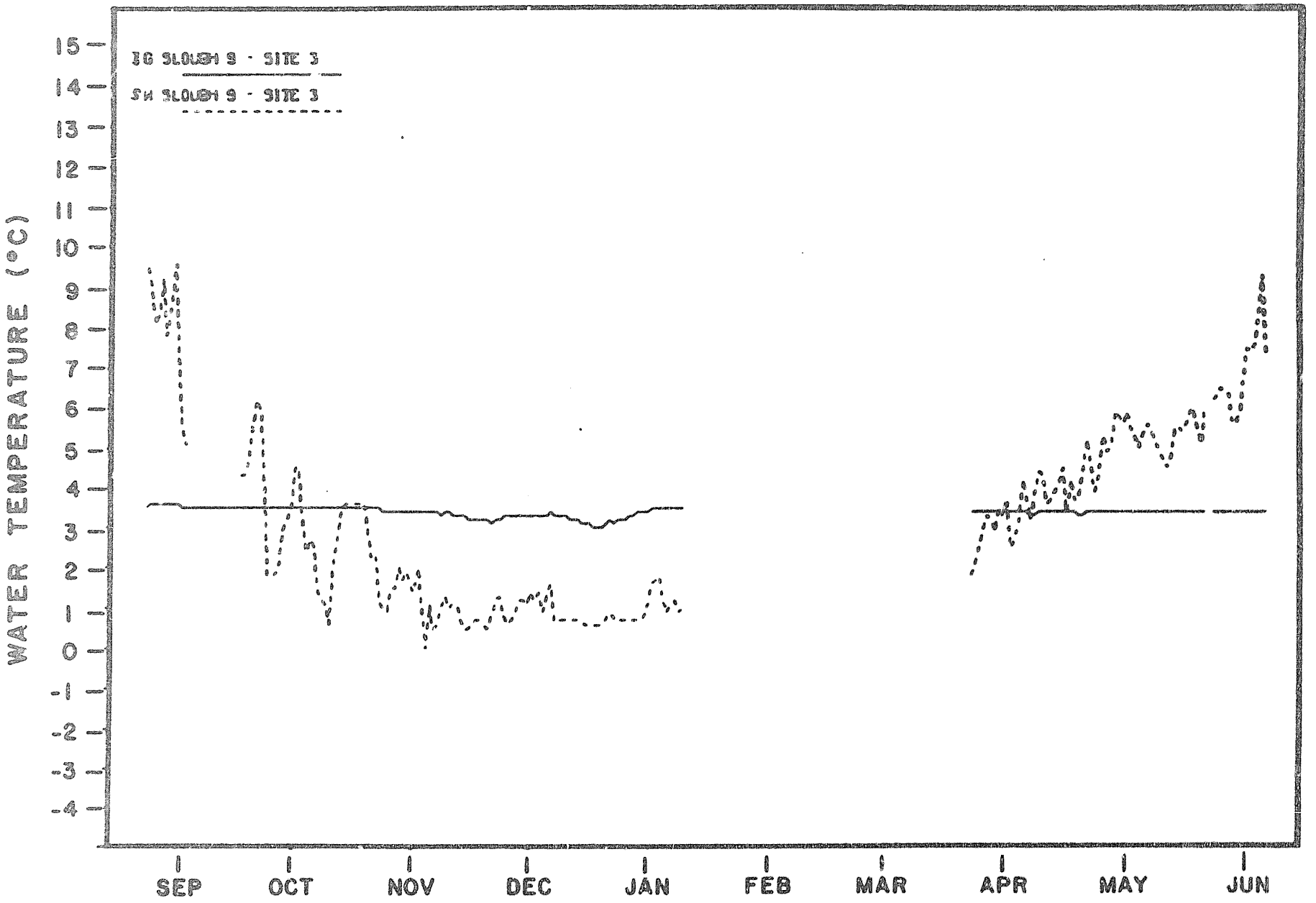

Figure A-17. Mean daily surface and intragravel water temperatures recorded at Slough 9 - Site 3 (RM 128.6) during the 1983-84 winter season.

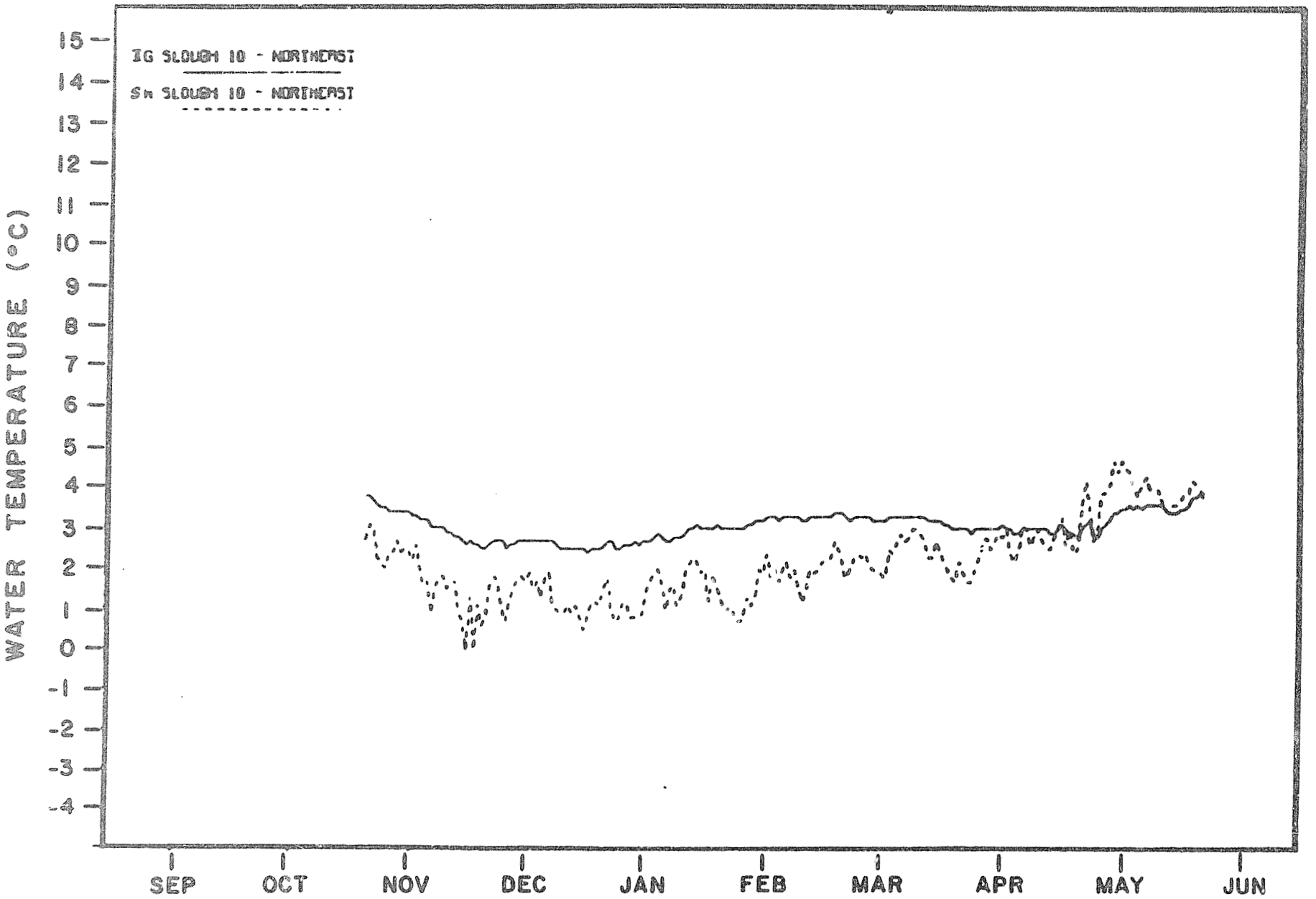

Figure A-18. Mean daily surface and intragravel water temperatures recorded at Slough 10 Northeast (RM 134.0) during the 1983-84 winter season.

reversed. In general, intragravel temperature were stable ranging from 2.4°C to 4.2°C, while surface water temperatures were more variable ranging from 0.3°C (in December) to 8.6°C (in April).

3.2.3.3.2 Slough 10 Northwest Channel (RM 134.0)

Surface and intragravel temperatures were recorded at one location in the northwest channel of Slough 10 from October 19 through May 22. A gap in the data occurring from February 5 through February 22 was caused by a malfunctioning recorder. Daily and monthly minimum, mean and maximum temperatures recorded at Slough 10 - Northwest Channel are presented in Appendix Table A-34. Water year weekly temperatures are reported in Appendix Table A-72. Mean daily temperatures are plotted in Appendix Figure A-19.

Intragravel temperatures were stable throughout the period of record with temperatures varying from 2.9°C to 3.9°C. Surface water temperatures were more variable, ranging from 1.2°C to 7.8°C. Intragravel temperatures were warmer than surface water temperatures until mid-April when the trend reversed.

3.2.3.3.3 Slough 10 Northeast and Slough 10 Northwest

A plot comparing the mean daily temperatures recorded in the Northeast and Northwest channels of Slough 10 is presented in Appendix Figure A-20. The mean daily intragravel temperatures in the Northeast and

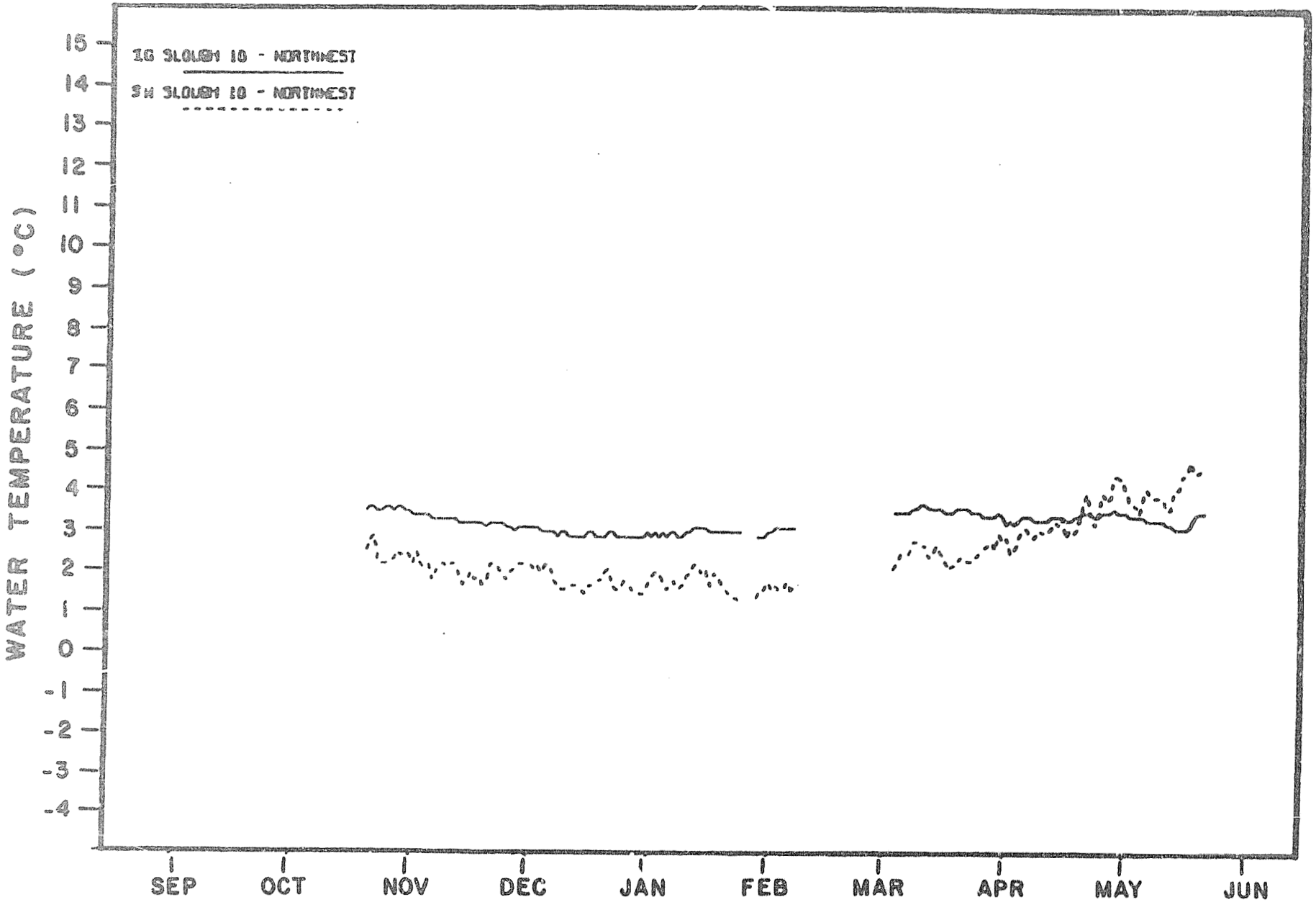

Figure A-19. Mean daily surface and intragravel water temperatures recorded at Slough 10 Northwest (RM 134.0) during the 1983-84 winter season.

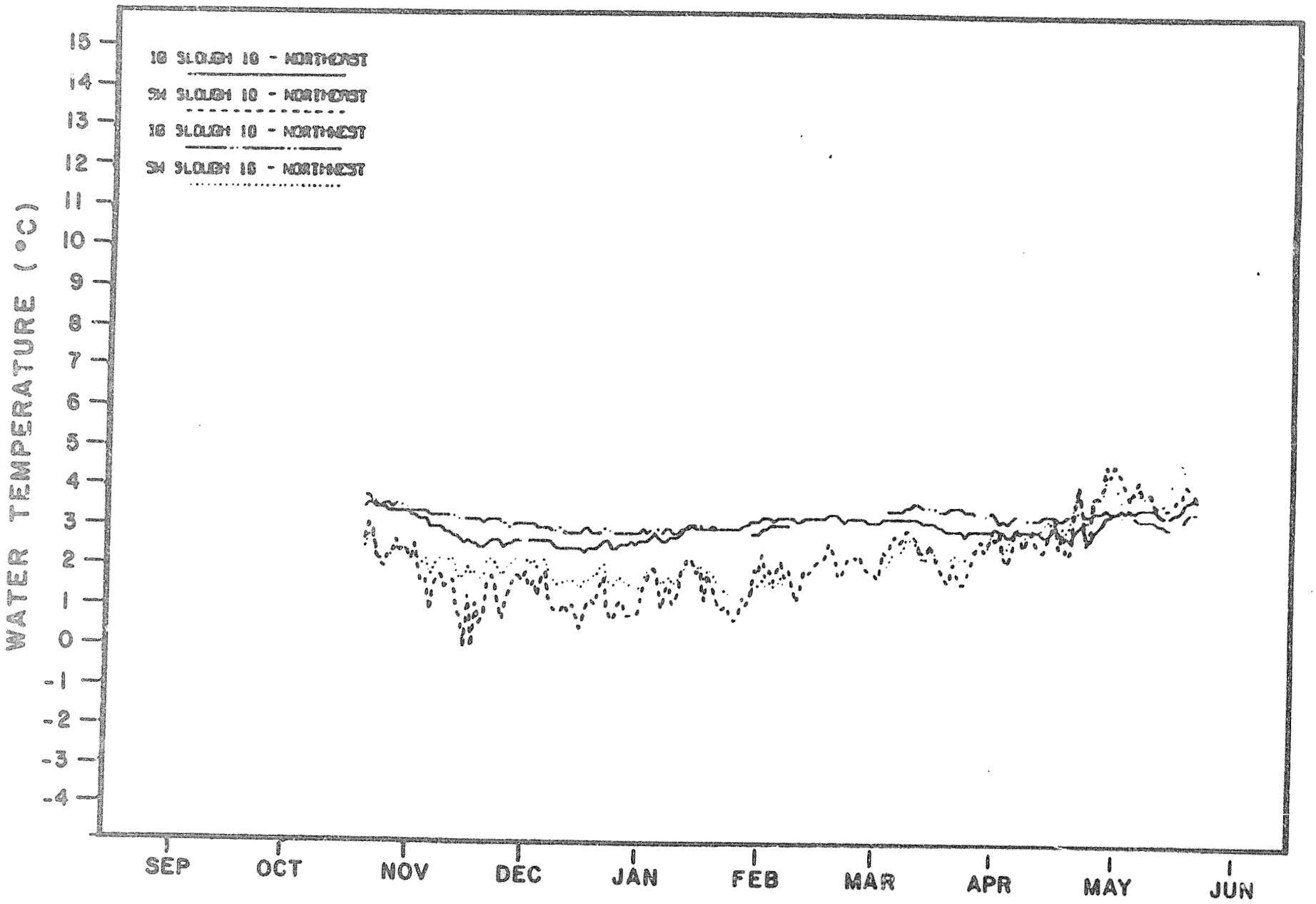

Figure A-20. Mean daily surface and intragravel water temperatures recorded at Slough 10 Northeast (RM 134.0) and Slough 10 Northwest (RM 134.0) during the 1983-84 winter season.

Northwest channels were similar and stable throughout the recording period. Surface water temperatures recorded in the Northeast and Northwest channels were also similar.

3.2.3.4 Slough 11 (RM 135.7)

Water temperatures were collected at two locations in Slough 11: Site 2 and the Slough 11 Incubation station. A datapod temperature recorder was used to collect surface and intragravel data at Site 2 from August 24 to May 22. A Ryan temperature recorder was used to collect intragravel data at the incubation site from December 30 to February 25. Daily and monthly minimum, mean, and maximum temperatures recorded at Slough 11 sites are presented in Appendix Tables A-35 and A-36. Water year weekly temperatures are listed in Appendix Tables A-73 and A-74. A plot of the mean daily temperatures recorded at Slough 11 - Site 2 is shown on Appendix Figure A-21.

Surface water temperatures were warmer than intragravel temperatures from August 24 to September 24, and from April 3 through the end of the recording period. Surface water temperatures recorded at Site 2 ranged from 0.9°C (in September) to 11.6°C (in May). Intragravel temperatures were relatively stable throughout the period of record with temperatures ranging between 3.0° (in March) and 4.4°C (in May).

Mean daily intragravel temperatures recorded at the Slough 11 Incubation site were stable and ranged from 0.5°C to 0.7°C.

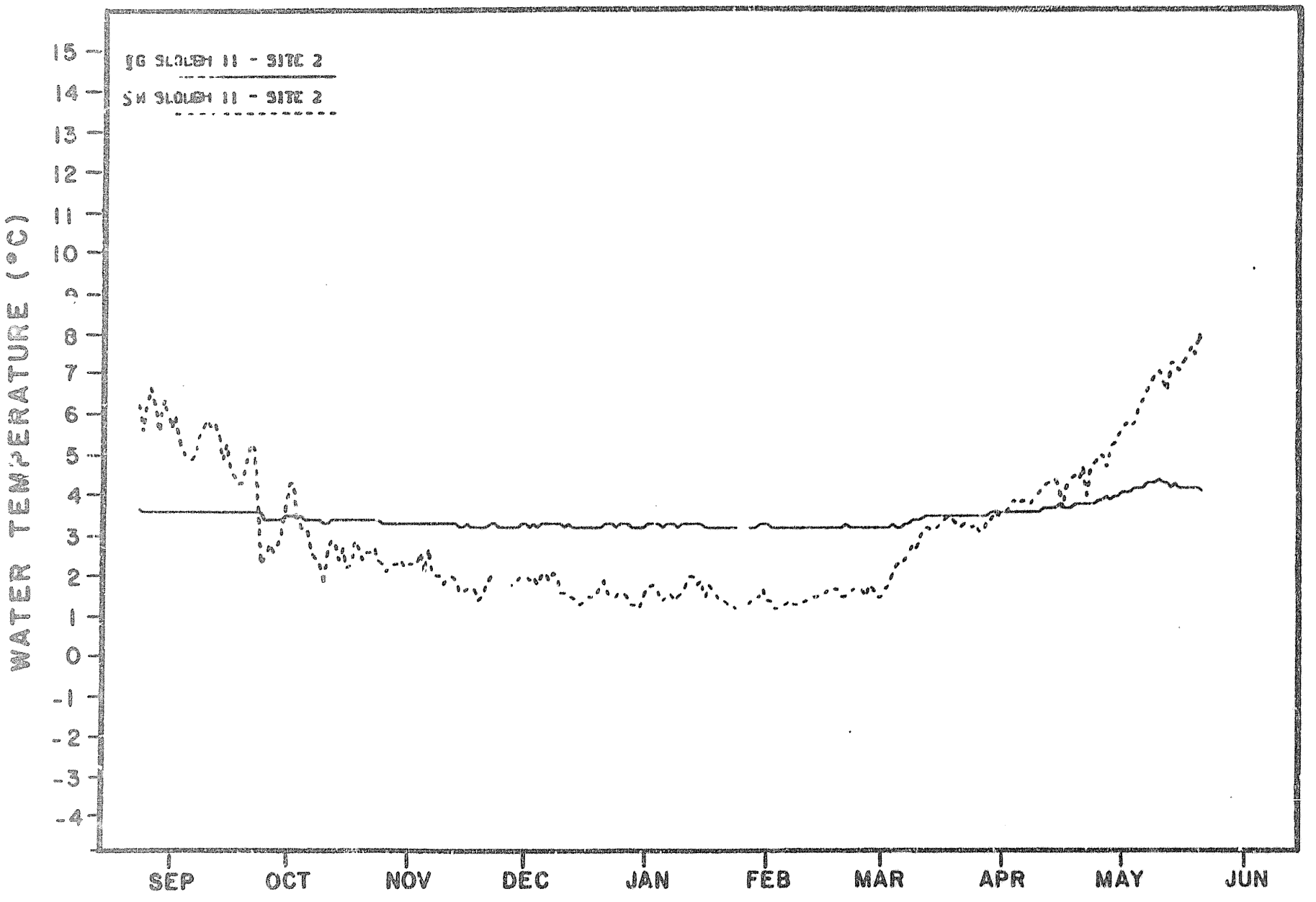

Figure A-21. Mean daily surface and intragravel water temperatures recorded at Slough 11 - Site 2 (RM 135.7) during the 1983-84 winter season.

3.2.3.5 Slough 21

Datapod temperature recorders were used to record surface and intragravel water temperatures from both the lower and upper portions of Side Slough 21.

3.2.3.5.1 Lower Slough 21 (RM 141.8)

Surface and intragravel water temperatures were recorded at one site in the lower portion of Slough 21 from August 24 through May 31. Daily and monthly minimum, mean, and maximum temperatures recorded are presented in Appendix Table A-37. Water year weekly temperatures are reported in Appendix Table A-75. A plot of mean daily temperatures recorded at the site is presented in Appendix Figure A-22.

Intragravel water temperatures recorded in Lower Slough 21 exhibited little variation throughout the recording period. Between August 24 and May 31 intragravel temperature ranged from 3.4°C to 4.3°C. However, a wide range of surface water temperatures were recorded with temperatures ranging between 0.0 and 11.6°C. Surface water temperatures were warmer than intragravel temperatures through mid-September, and from April 25 to the end of the recording season.

3.2.3.5.2 Upper Slough 21 (RM 142.0)

Surface and intragravel water temperatures were recorded at one location in the upper portion of Slough 21 at Site 1. Surface water temperatures

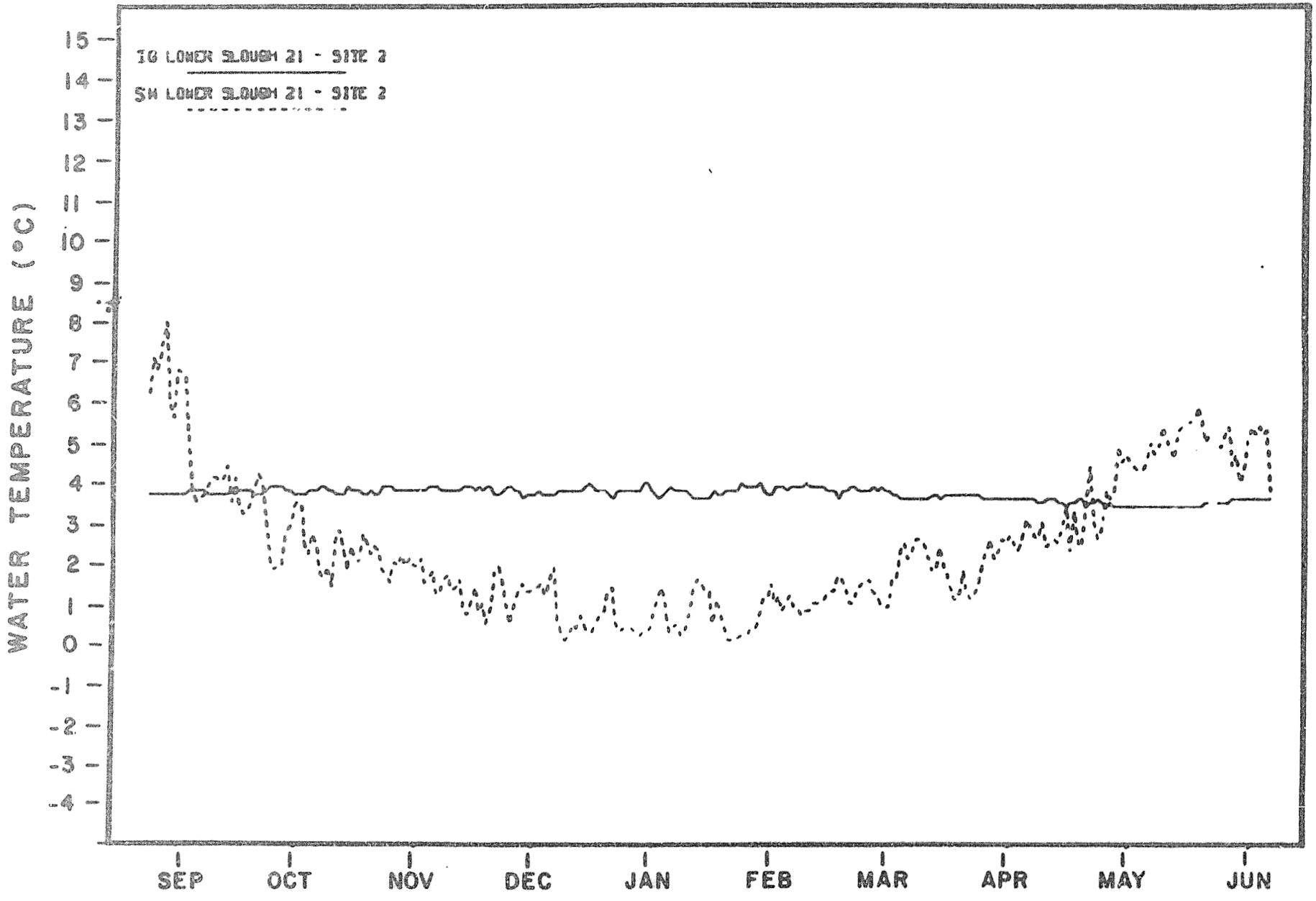

Figure A-22. Mean daily surface and intragravel water temperatures recorded at Lower Slough 21 - Site 2 (RM 141.8) during the 1983-34 winter season.

were recorded from August 24 through May 22. However, because of a malfunctioning probe intragravel water temperatures were collected only from August 24 to January 11.

Daily and monthly minimum, mean and maximum temperatures recorded at Upper Slough 21 are presented in Appendix Table A-38. Water year weekly temperatures are listed in Appendix Table A-76. A plot of surface and intragravel temperatures is presented in Appendix Figure A-23.

Surface and intragravel temperatures recorded in the upper portion of Slough 21 corresponded closely to each other. During the winter surface water temperatures ranged from 1.0°C to 9.9°C while intragravel temperatures varied between 1.8°C and 8.6°C.

3.2.3.5.3 Upper Slough 21 and Lower Slough 21

Surface and intragravel water temperatures recorded in the upper and lower portion of Slough 21 were compared to evaluate the temperature differences occurring within the slough (Appendix Figure A-24). The intragravel and surface water temperatures recorded in the upper portion of the slough and the surface water temperatures recorded at the lower slough exhibited similar temperature trends throughout the winter season. However, intragravel water temperatures recorded from the lower portion of the slough were stable from September through May.

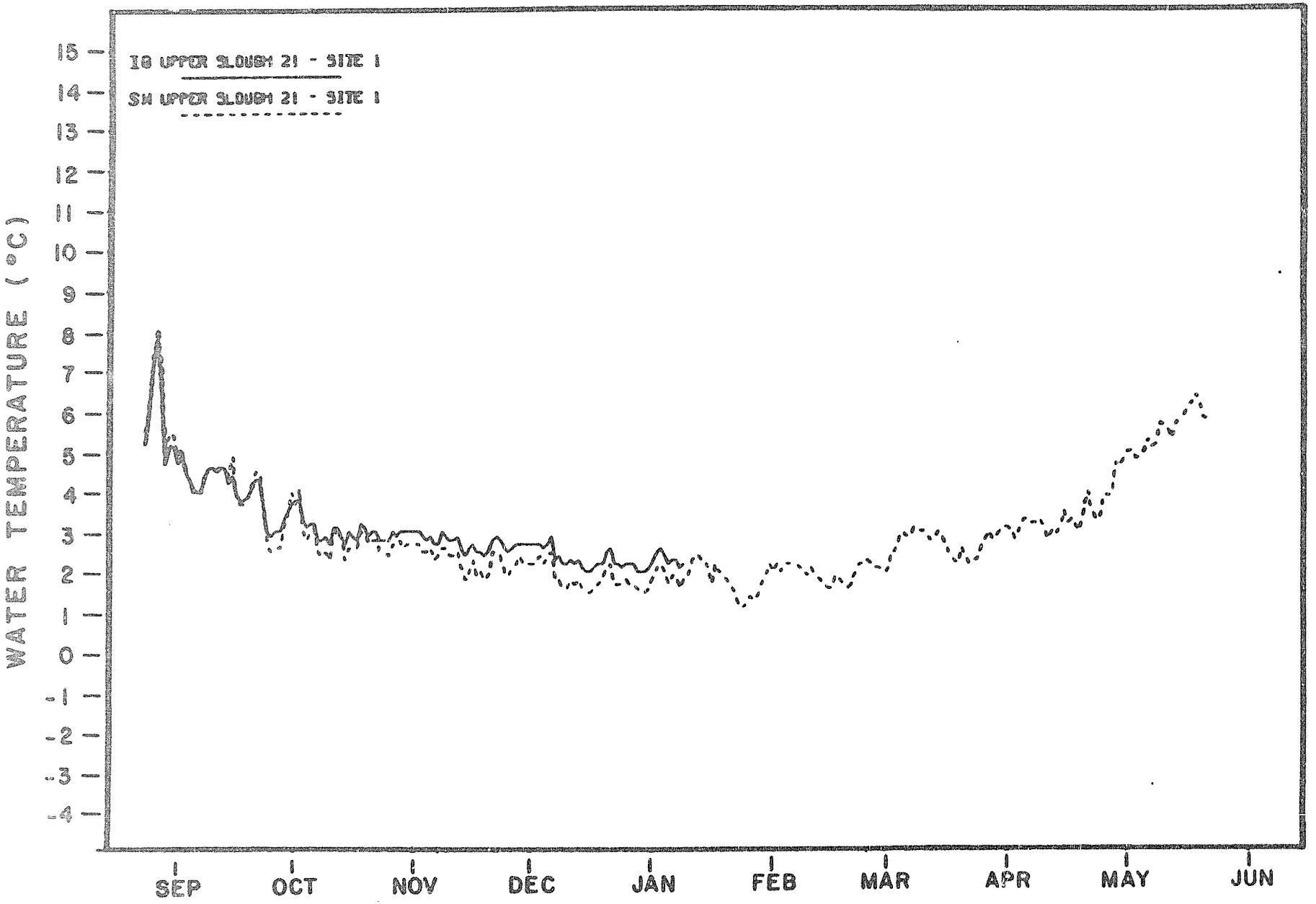

Figure A-23. Mean daily surface and intragravel water temperatures recorded at Upper Slough 21 - Site 1 (RM 142.0) during the 1983-84 winter season.

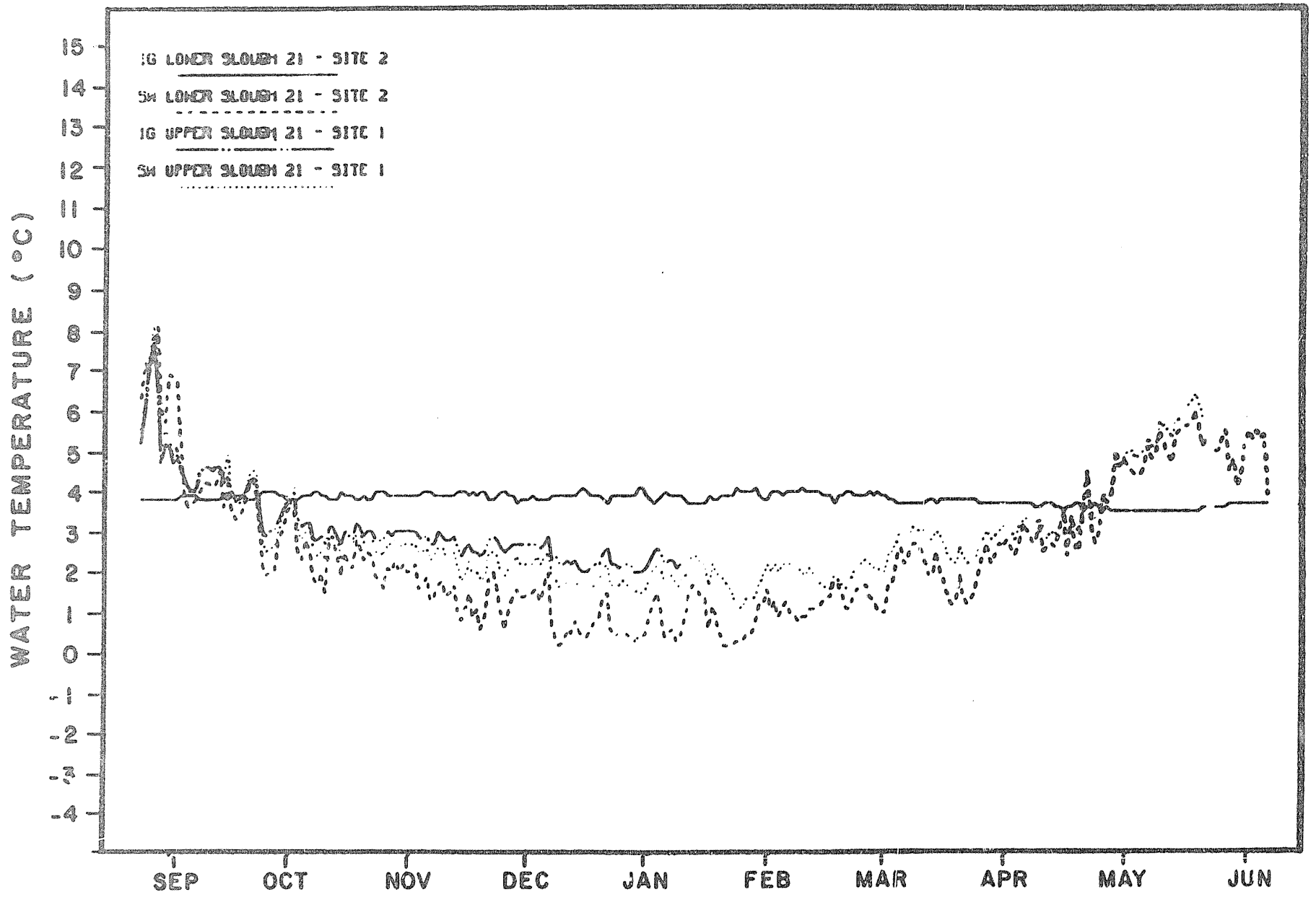

Figure A-24. Mean daily intragravel and surface water temperatures recorded at Lower Slough 21 - Site 2 (RM 141.8) and Upper Slough 21 - Site 1 (RM 142.0) during the 1983-84 winter season.

3.2.4 Tributary Habitats

3.2.4.1 Fourth of July Creek (RM 131.1; TRM 0.0)

Two datapod temperature recorder stations were installed in Fourth of July Creek at Sites 1 and 2. At Site 1 intragravel water temperatures were recorded at the mouth of the tributary and downstream of the tributary mouth in the clearwater plume. Temperatures were recorded at Site 1 from September 1 to May 31. Due to a malfunctioning recorder, data gaps occurred from January 28 to February 6, and from February 10 to March 11. Between October 27 and May 20, the temperature station located in the plume was observed frozen.

Surface and intragravel water temperatures were recorded in Fourth of July Creek at Site 2 from January 11 to May 31. This station was installed to monitor surface water temperatures in the creek, and to supplement the intragravel data from Site 1.

Daily and monthly minimum, mean and maximum temperatures recorded at Sites 1 and 2 in Fourth of July Creek are presented in Appendix Tables A-40 to A-42. Water year weekly temperatures are presented in Appendix Tables A-78 to A-80. Plots of the mean daily temperatures recorded at the sites are shown in Appendix Figures A-25 and A-26.

Intragravel temperatures recorded in the tributary and the plume were similar in September and October. However, plume temperatures appear to lag behind the creek temperatures. During this period intragravel

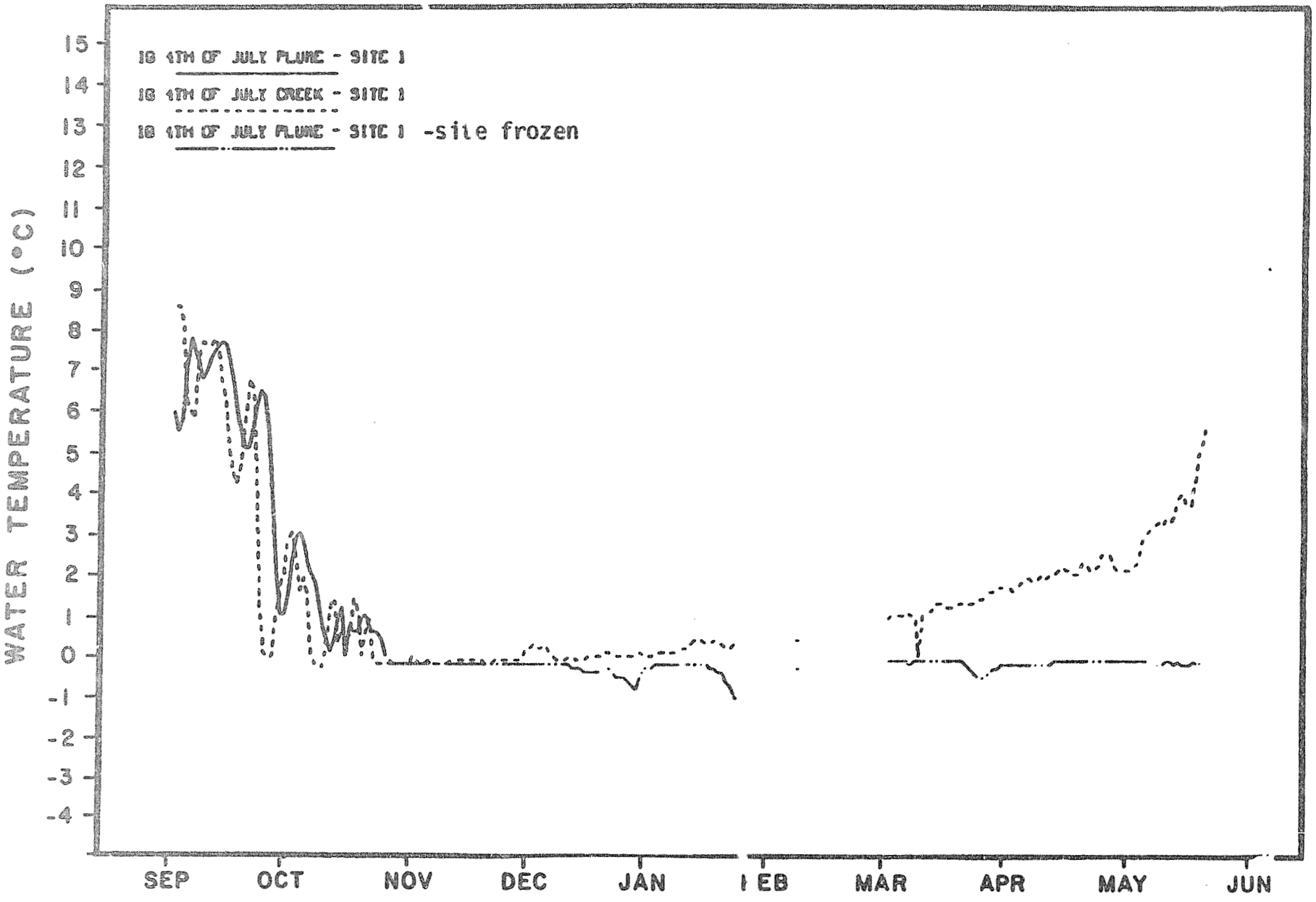

Figure A-25. Mean daily intragravel water temperatures recorded at Fourth of July Creek and Plume - Site 1 (RM 131.1) during the 1983-84 winter season.

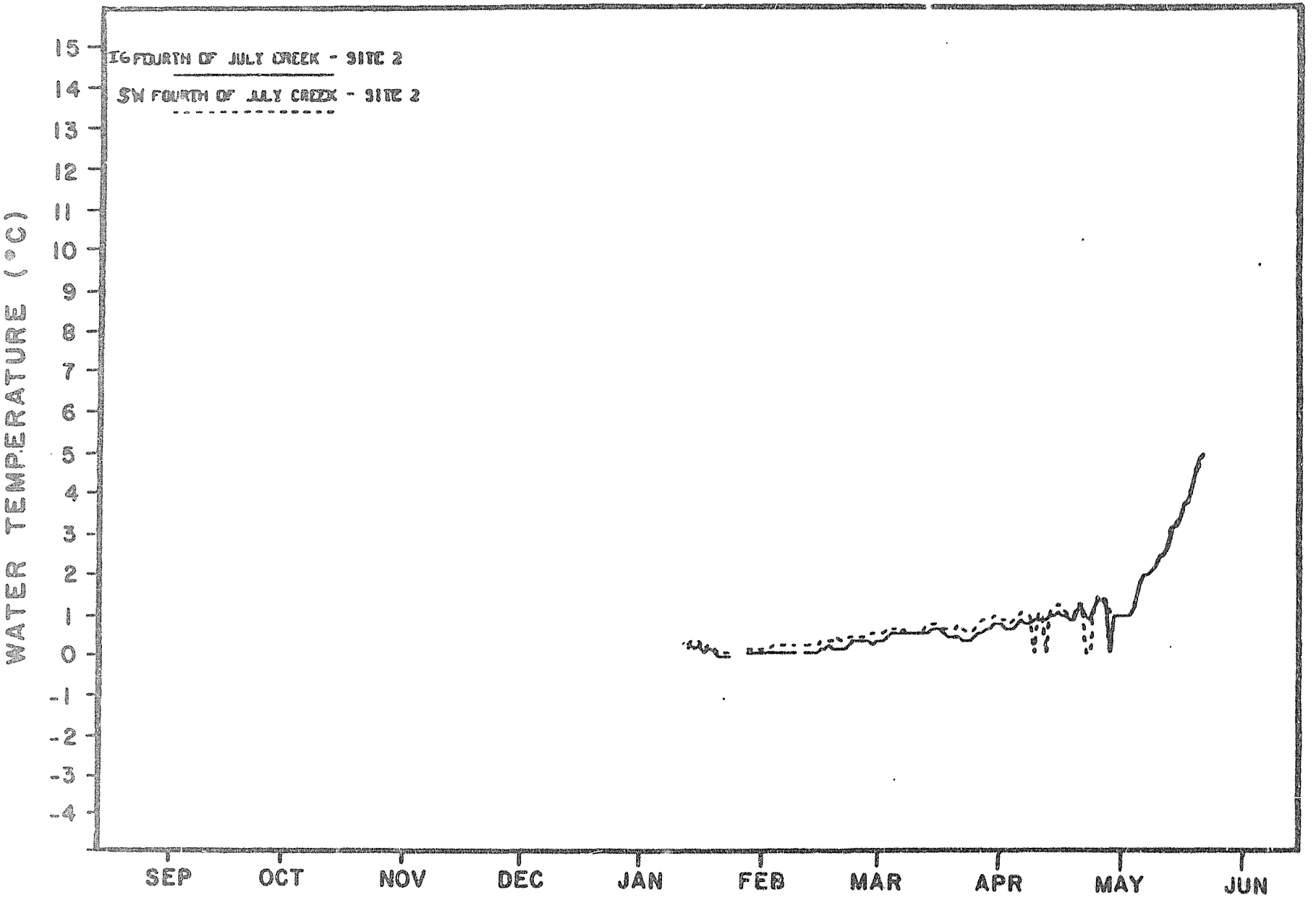

Figure A-26. Mean daily surface and intragravel water temperatures recorded at Fourth of July Creek - Site 2 (RM 131.1) during the 1983-84 winter season.

temperatures in the creek ranged from -0.3°C to 8.9°C while plume to temperatures varied from -0.2°C to 7.9°C. From October 27 to May 31 intragravel water temperatures in the creek ranged from -0.3°C to 8.9°C and intragravel temperatures in the plume ranged from -0.3°C to 6.2°C. During the period that the temperature station in the plume was frozen, temperature as low as -1.9°C were recorded.

Surface and intragravel temperatures recorded at the Site 2 station corresponded closely to each other. Surface water temperatures ranged from 0.1°C to 7.0°C and intragravel temperatures varied between -0.2°C to 6.7°C.

3.2.4.2 Indian River (RM 138.6; TRM 0.2)

Surface and intragravel water temperatures were obtained in Indian River at one location referred to as Site 3. Data were recorded from February 29 until April 25 when the recorder failed. Due to a malfunctioning probe surface water temperatures were not obtained until March 23. Daily and monthly minimum, mean and maximum temperatures recorded at Indian River are presented in Appendix Table A-43. Water year weekly temperatures are reported in Appendix Table A-81. A plot of mean daily temperatures recorded at the site is shown in Appendix Figure A-27.

Surface and intragravel temperatures at Indian River were relatively similar. Surface water temperatures ranged from -0.3°C to 4.3°C while intragravel temperatures varied between -0.2°C and 4.2°C.

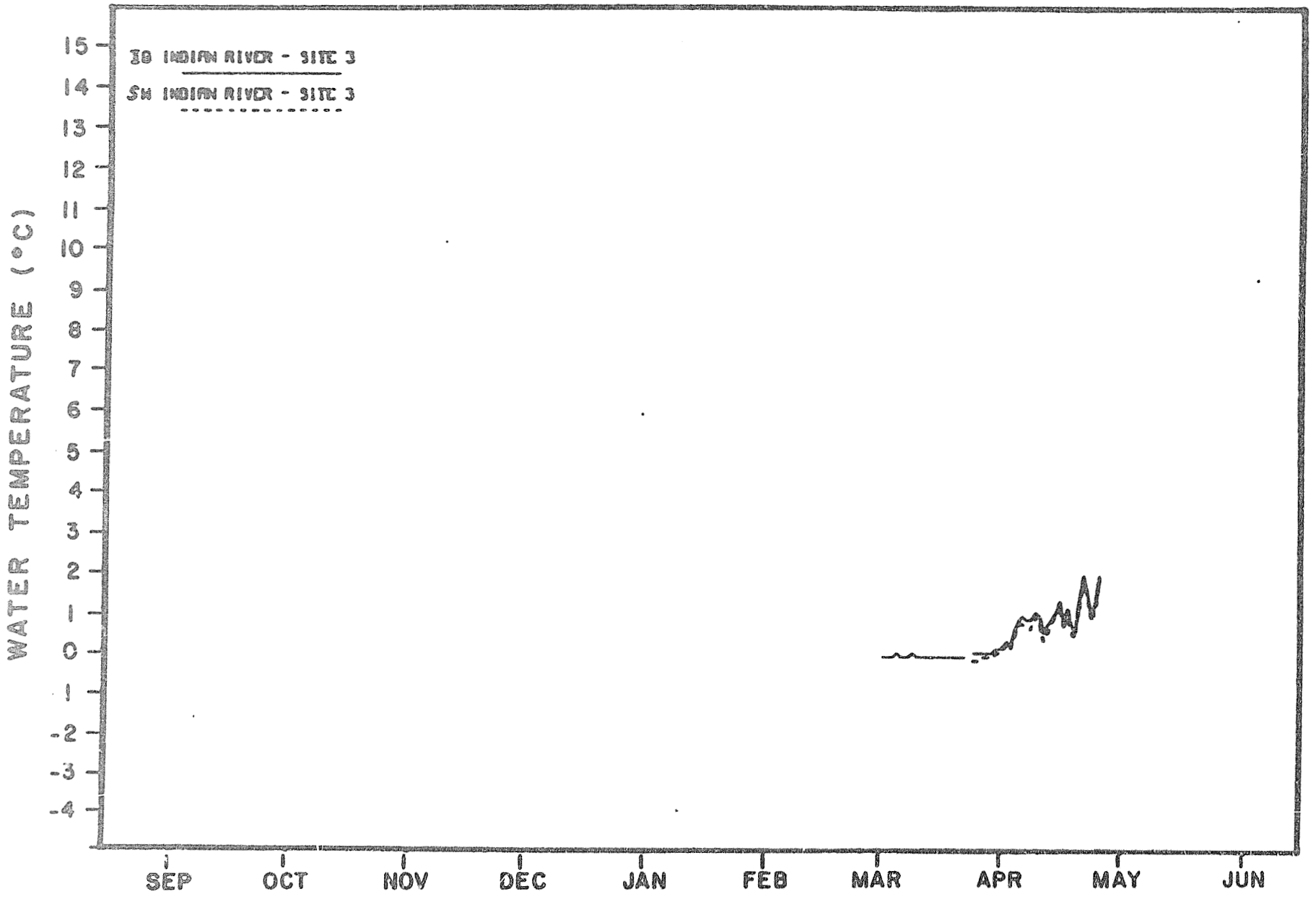

Figure A-27. Mean daily surface and intragravel water temperatures recorded at Indian River - Site 3 (RM 138.6, TRM 0.2) during the 1983-84 winter season.

3.3 Objective 3: Preliminary Mitigation Evaluation

Continuous surface water temperatures were recorded at Deadhorse Creek to evaluate the feasibility of using the tributary as a water source for possible mitigative activities.

3.3.1 Deadhorse Creek (RM 120.9; TRM 1.0)

Surface water temperatures were recorded at one location in Deadhorse Creek using a Peabody-Ryan temperature recorder from December 22 through May 31. Daily and monthly minimum, mean and maximum temperatures are presented in Appendix Table A-39. Water year weekly temperatures are listed in Appendix Table A-77. A plot of daily minimum, mean and maximum temperatures is shown in Appendix Figure A-28.

Between December 22 and March 31 surface water temperatures in Deadhorse Creek ranged from 0.0°C to 0.5°C. Daily fluctuations in surface water temperatures were not observed until mid-April corresponding to increases in temperature. Between April 1 and May 31 surface water temperatures ranged between 0.5°C to 5.5°C.

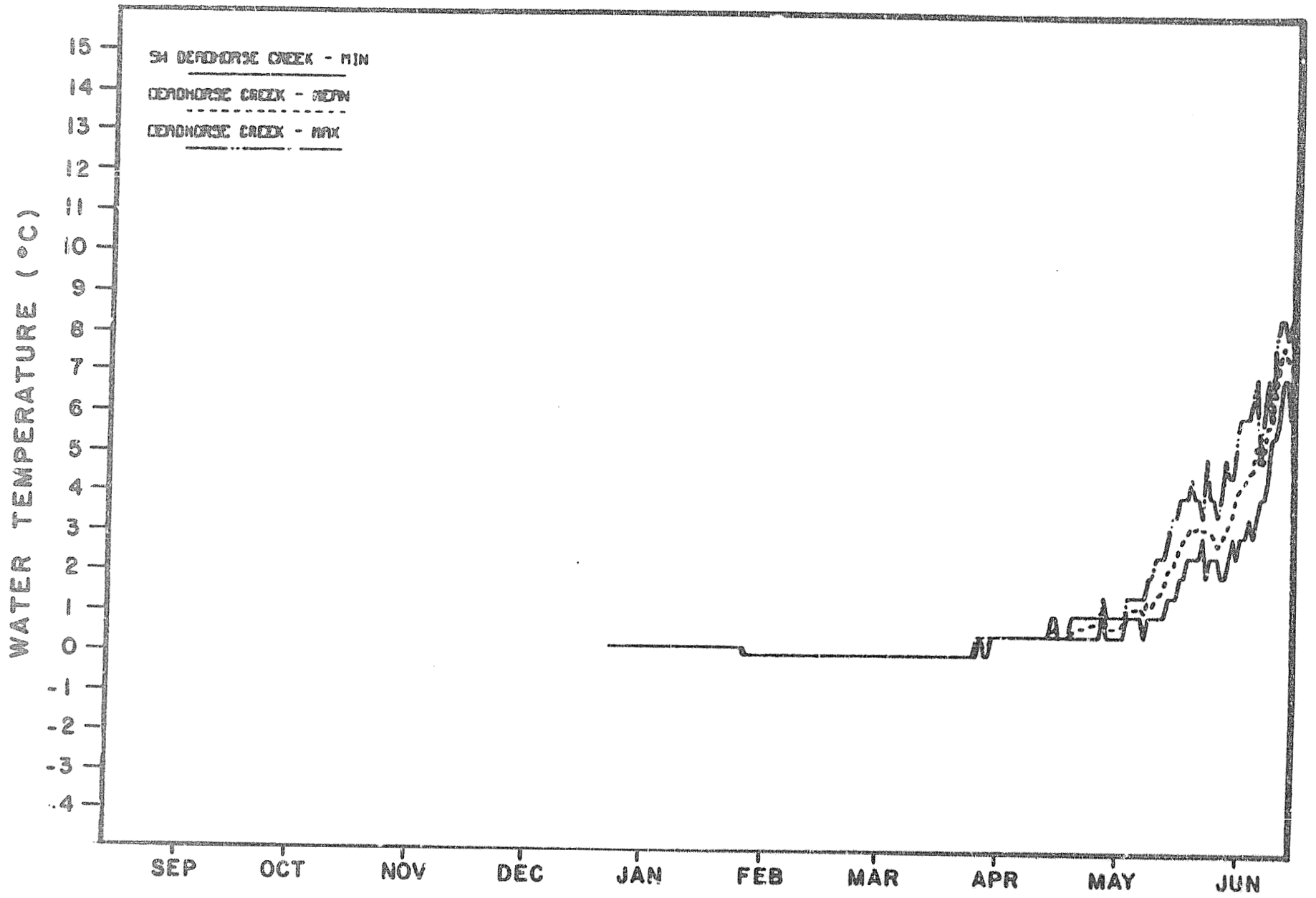

Figure A-28. Minimum, mean, and maximum daily surface water temperatures recorded at Deadhorse Creek (RM 120.9, TRM 1.0) during the 1983-84 winter season.

3.4 Habitat Relationships

3.4.1 Mainstem Habitat Relationships

3.4.1.1 Surface Water Temperatures at LRX 9 (RM 103.2), LRX 29 (RM 126.1) and LRX 57 (RM 142.3)

A plot of the mean daily surface water temperatures recorded at the mainstem temperature stations located at LRX 9, LRX 29, and LRX 57 is presented in Appendix Figure A-29. A comparison of data recorded during the entire winter season cannot be made due to gaps in the data. However, the available data indicate that surface water temperatures at these three stations were similar from mid-August to late-March.

During the September and October surface temperatures at all three stations generally declined to near 0.0°C. At LRX 29, surface temperatures remained near 0.0°C until April 21 when the recorder failed. Temperatures at LRX 57 did not increase until mid-May. At LRX 9, temperatures near 0.0°C were recorded until January when the recorder failed. When the new probe was installed in an open lead on February 8, surface temperatures as high as 2.4°C were recorded before the temperatures decreased to approximately 0.0°C. Temperatures at the site remained near 0.0°C through March. Temperatures as high as 4.9°C were recorded at LRX 9 in April. In early May, surface temperatures at the site again decreased to 0.0°C and then increased rapidly.

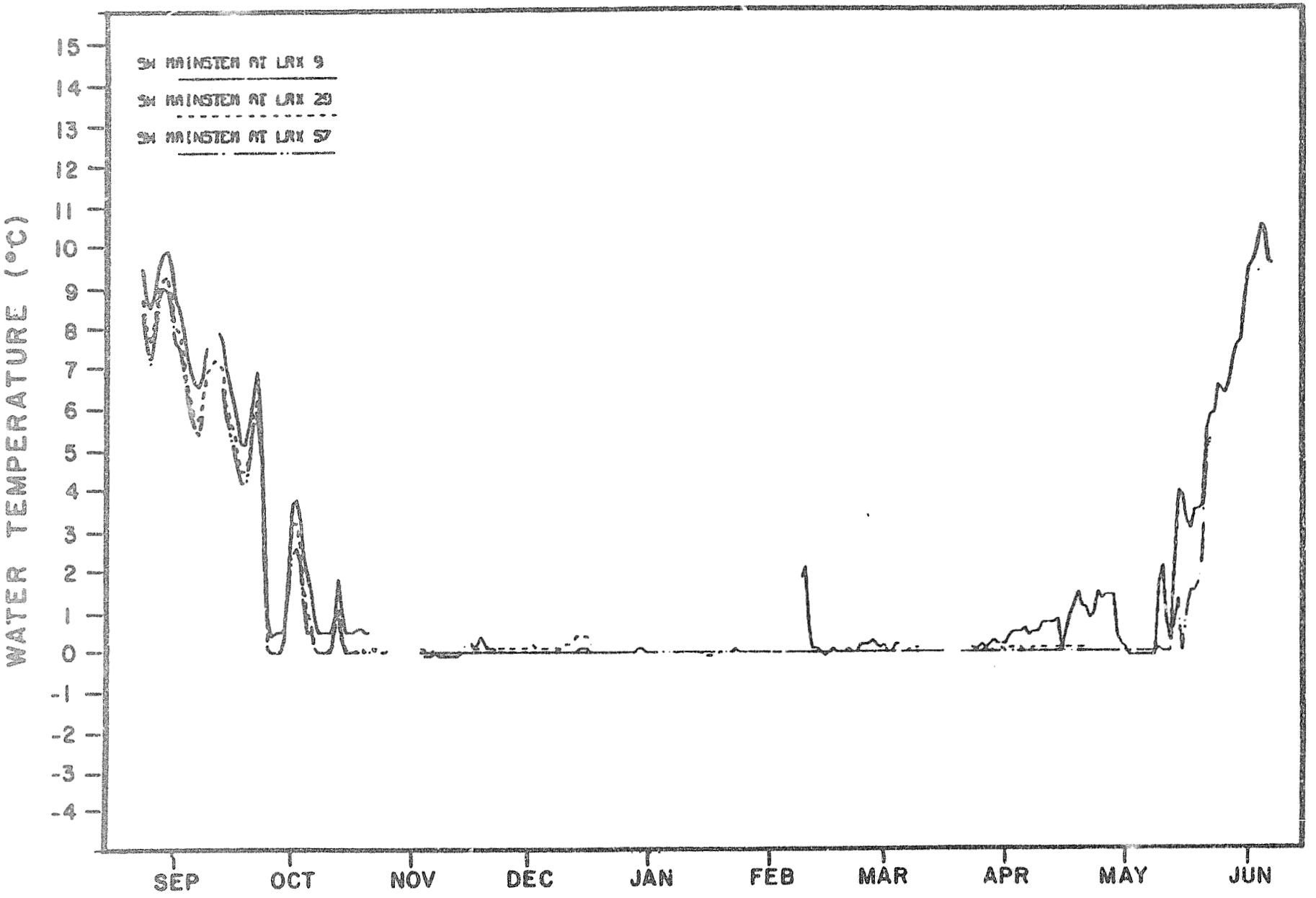

Figure A-29. Mean daily surface water temperatures recorded at Mainstem Susitna River at LRX 9 (RM 103.2), LRX 29 (RM 126.1), and LRX 57 (RM 142.3) during the 1983-84 winter season.

3.4.1.2 Intragravel Temperatures at LRX 9 (RM 103.2), LRX 29 (RM 126.1),and LRX 57 (RM 142.3)

A comparison of intragravel water temperatures recorded at LRX 9 (RM 103.2), LRX 29 (RM 126.1), and LRX 57 (RM 142.3) is illustrated in Figure A-30.

Intragravel temperatures recorded at the three sites are similar until mid-October when temperatures at LRX 57 increased from approximately 0.5°C to 3.5°C. Temperature values near 3.5°C were recorded at LRX 57 through mid-May when increased temperatures were observed. From October 1 through December 23, when the recorder failed, mean daily intragravel temperatures at LRX 9 varied between 0.0°C and 3.0°C. From February 8 through May 31 mean daily intragravel temperatures at the reinstalled LRX 9 site ranged from 2.7 to 3.6°C. Between October 1 and December 17, when the recorder failed, mean daily intragravel temperatures at LRX 29 ranged from 0.7°C to 3.1°C. Between March 5 and April 21, intragravel temperatures near 0.0°C were recorded at the LRX 29 site.

3.4.2 Side Channel Habitat Relationships

3.4.2.1 Surface Water Temperatures at Side Channels 10 (RM 134.0), Upper 11 (RM 136.3), and 21 (RM 141.0)

Mean daily surface water temperatures recorded at Side Channel 10, Upper Side Channel 11, and Side Channel 21 are shown in Appendix Figure A-31. Between late August and early November intragravel temperatures in

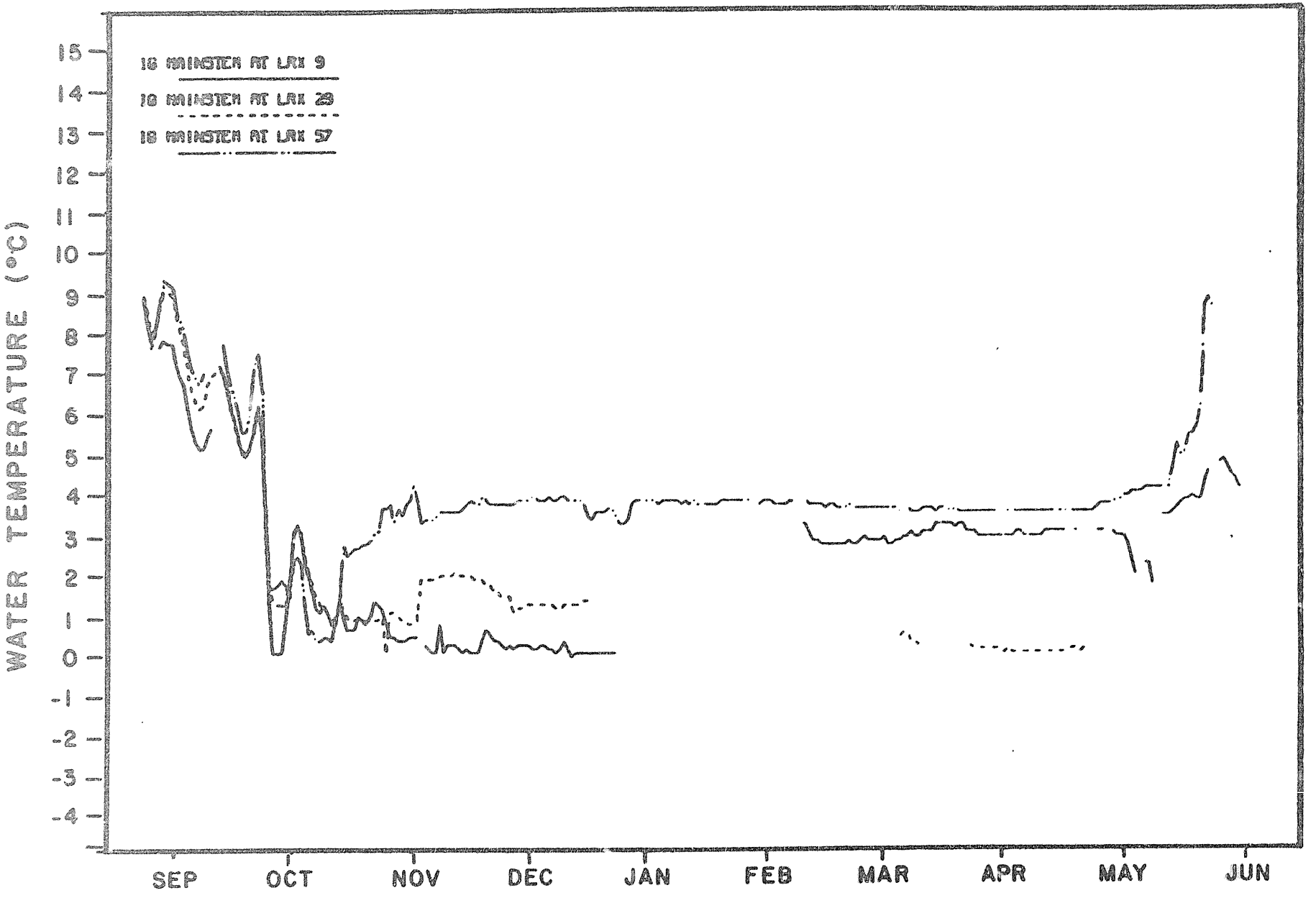

Figure A-30. Mean daily intragravel water temperatures recorded at Mainstem Susitna River at LRX 9 (RM 103.2), LRX 29 (RM 126.1) and LRX 57 (RM 142.3) during the 1983-84 winter season.

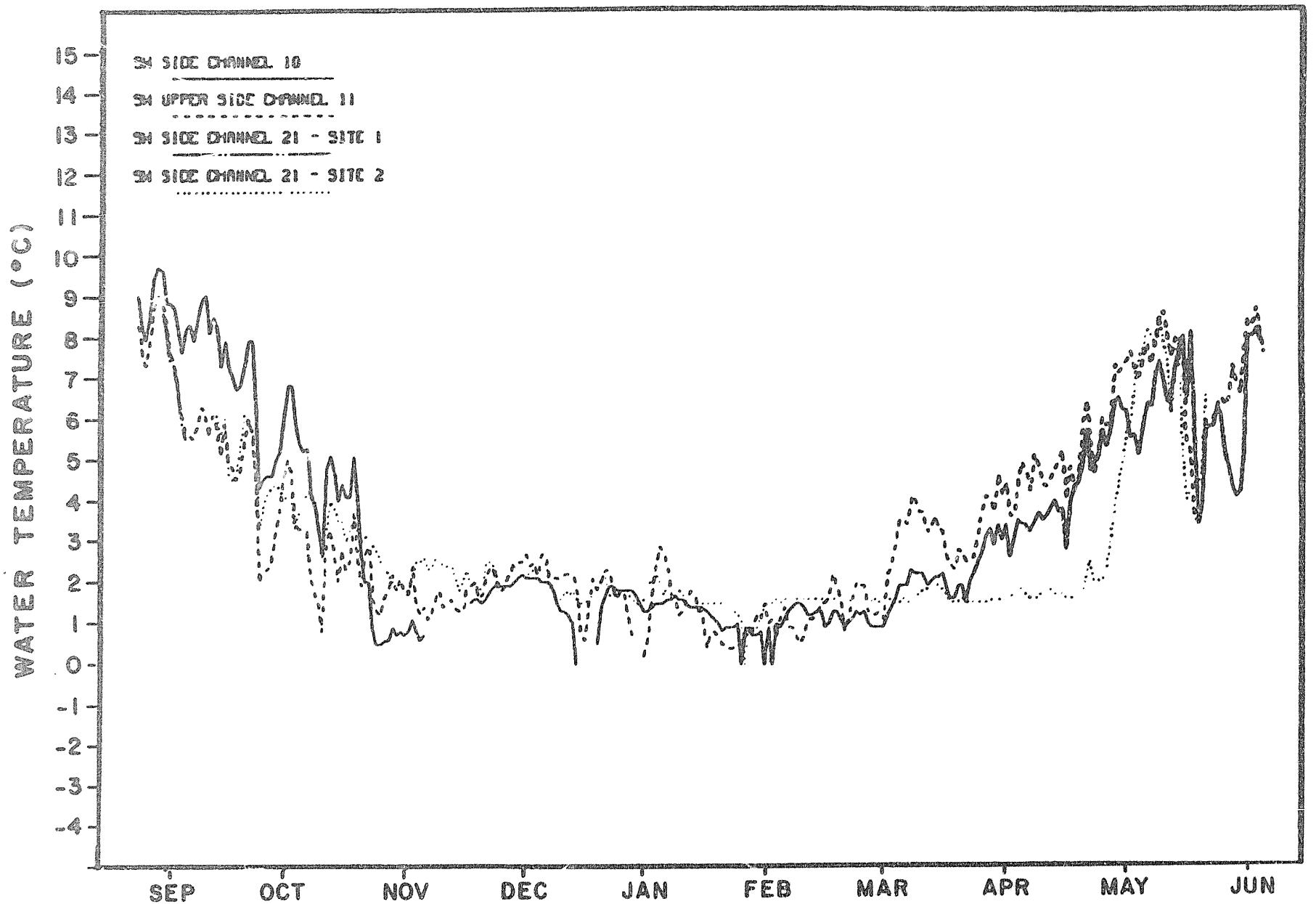

Figure A-31. Mean daily surface water temperatures recorded at Side Channel 10 (RM 134.0), Upper Side Channel 11 - Site 2 (RM 136.1), and Side Channel 21 - Sites 1 and 2 (RM 141.0) during the 1983-84 winter season.

general were decreasing at all three sites. During the time period, warmest temperatures and largest temperature fluctuations were recorded at Side Channel 10. Overall coolest temperatures were recorded at Upper Side Channel 11. Side Channel 21 exhibited the least variation in temperatures through early November.

Between November 1 and March 1, temperature variations at all three locations were minimal. However at Upper Side Channel 11, mean daily temperatures did vary between 0.4 and 2.9°C. Surface water temperatures at Side Channel 10 and Upper Side Channel 11 began to increase in March. At Side Channel 21 surface water temperatures remained near 1.5°C until late April when sharp increases were observed. Temperatures at all three sites decreased to approximately 3.5-4.0°C in late May and then increased.

3.4.2.2 Intragravel Temperatures at Side Channels 10 (RM 134.0), Upper 11 (RM 136.3), and 21 (RM 141.0)

A comparison of intragravel water temperatures recorded at Side Channels 10, Upper 11 and 21 is presented in Appendix Figure A-32. Overall temperatures at Upper Side Channel 11 were warmer and fluctuated more than those recorded at the other side channels. Temperatures at Side Channel 10 were stable especially between February and May when mean daily temperatures remained near 3.3°C. By November 3, intragravel temperatures at Side Channel 21 had increased from 1.7°C to 3.0°C temperatures remained near 2.5°C to 3.0°C through early January when the probe malfunctioned.

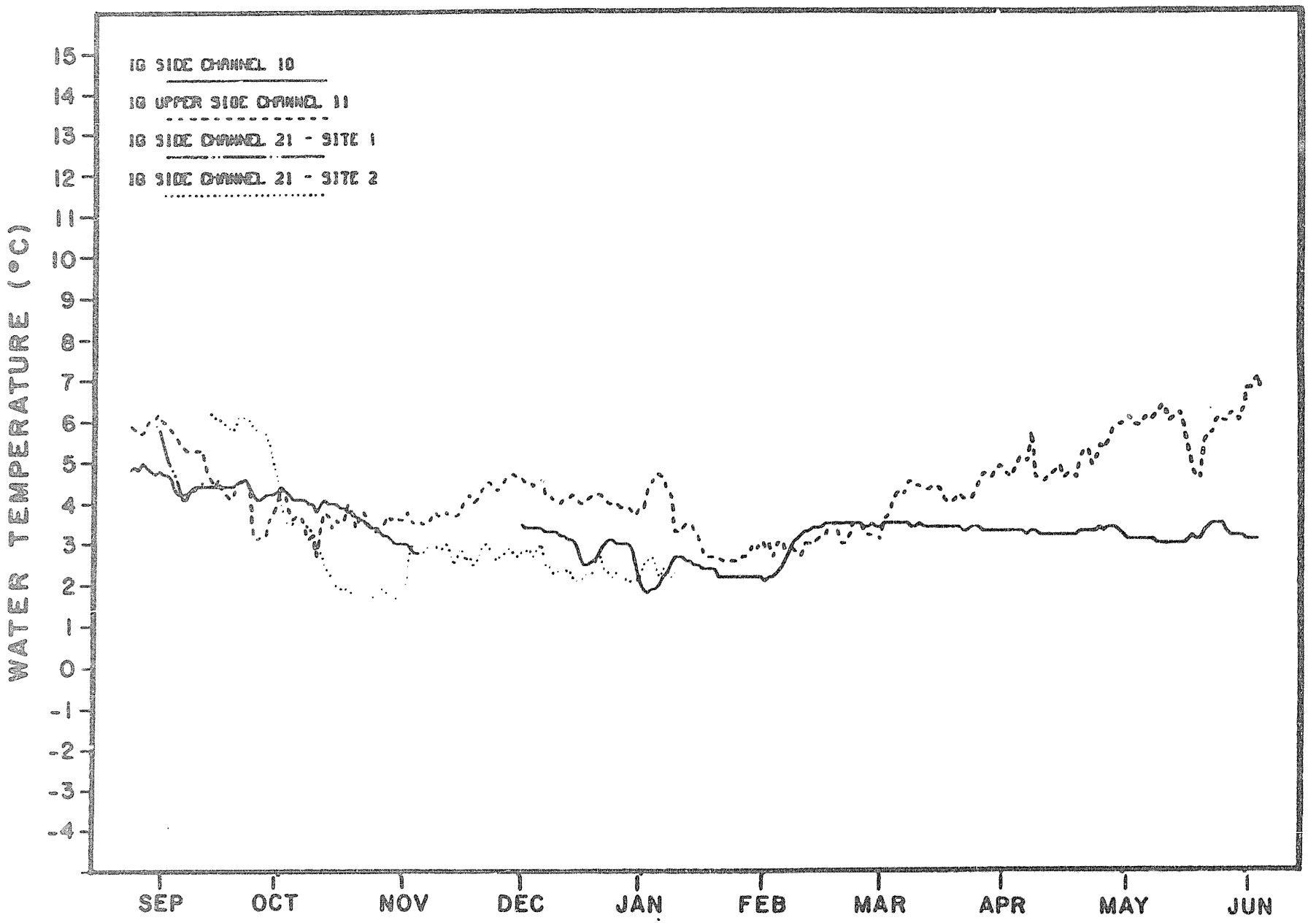

Figure A-32. Mean daily intragravel water temperatures recorded at Side Channel 10 (RM 134.0), Upper Side Channel 11 - Site 2 (RM 136.1), and Side Channel 21 - Sites 1 and 2 (RM 141.0) during the 1983-84 winter season.

3.4.3 Slough Habitat Relationships

3.4.3.1 Surface Water Temperatures at Side Sloughs 8A (RM 126.6), 9 (RM 128.3), 11 (RM 135.7), 21 (RM 142.0)

A comparison of surface water temperatures recorded at Upper Slough 8A, Slough 9, Slough 11 and Upper Slough 21 is shown in Appendix Figure A-33. Because mean daily data is available from Upper Slough 8A only between December 21 and March 5, it is difficult to compare temperatures recorded at the site to those from other locations.

Generally temperatures recorded at the sites exhibited a similar trend. By early November mean daily surface water temperatures at Sloughs 9, 11, and 21 had decreased to approximately 1.4°C, 2.0°C, and 2.3°C respectively. Similar temperatures were recorded at the monitoring stations through February. Surface water temperatures at Upper Slough 8A generally were warmer. Mean daily surface water temperatures as high as 3.5°C were recorded at Upper Slough 8A in January.

Between March 1 and May 31 temperatures increased overall. However, temperatures at Slough 11 increased more rapidly than the temperatures at other locations. By May 21 mean daily temperatures as high as 7.6°C were recorded at Slough 11 while temperatures recorded at Slough 9 and 21 were approximately 6.1°C and 5.8°C respectively.

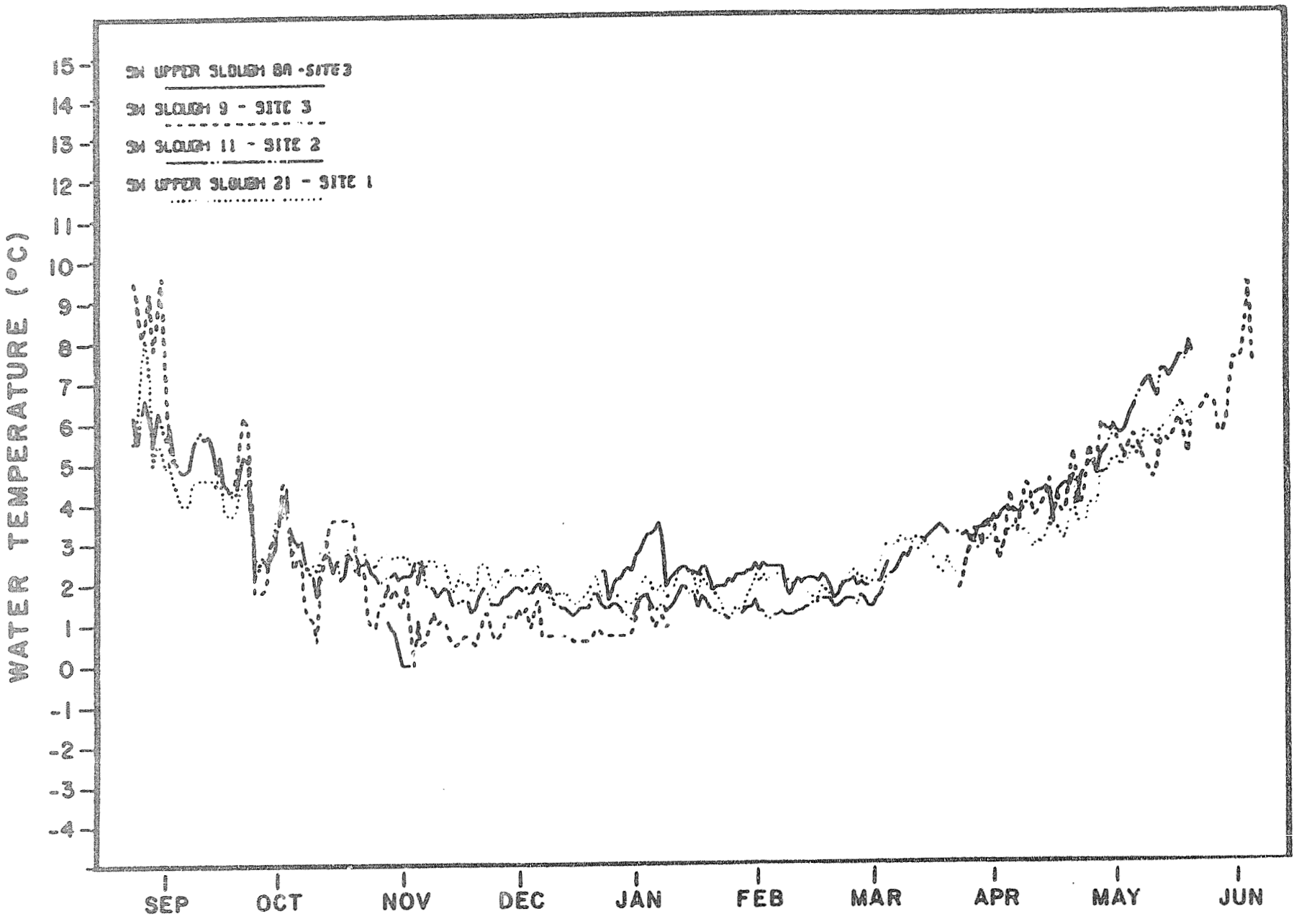

Figure A-33. Mean daily surface water temperatures recorded at Upper Slough 8A - Site 3 (RM 126.6), Slough 9 - Site 3 (RM 128.3), Slough 11 - Site 2 (RM 135.7) and Upper Slough 21 - Site 1 (RM 142.0) during the 1983-84 winter season.

3.4.3.2 Intragravel Water Temperatures at Side Sloughs 8A (RM 126.6), 9 (RM 128.3), 11 (RM 135.7) and 21 (RM 142.0)

Mean daily intragravel temperatures recorded at Upper Slough 8A (RM 126.6), Slough 9 (RM 128.6), Slough 11 (RM 135.7) and Upper Slough 21 (RM 142.0) are compared in Appendix Figure A-34. A complete data record is available for Slough 11 only making direct comparisons difficult.

The greatest variations in temperature were observed at Upper Slough 21. Between August 24 and October 1 mean daily intragravel temperatures at the site ranged from 2.0°C to 7.1°C. However between October 1 and January 9, when the probe failed, mean daily surface water temperatures varied only from 2.0°C to 3.8°C. In general the temperatures recorded at Upper Slough 8A, Slough 9 and Slough 11 were stable. Mean temperatures at Upper Slough 8A between December 21 and May 22 varied from 1.9°C to 3.5°C. From August 24 to May 31, intragravel temperatures at Slough 9 ranged from 3.1°C to 3.7°C. Mean daily intragravel temperatures recorded at Slough 11 from August 24 through May 31 ranged from 3.1°C to 4.3°C.

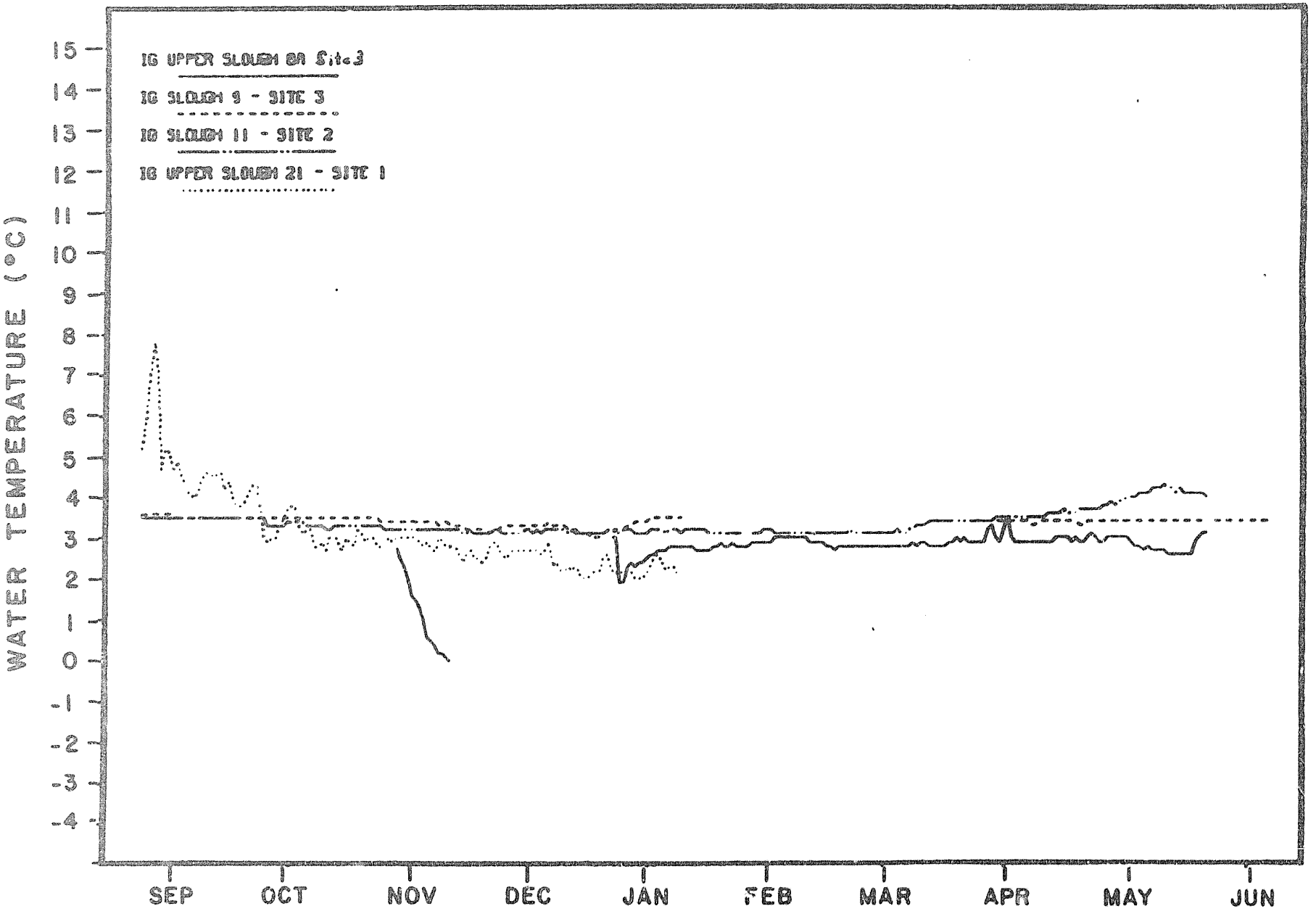

Figure A-34. Mean daily intragravel water temperatures recorded at Upper Slough 8A - Site 3 (RM 126.6), Slough 9 - Site 3 (RM 128.3), Slough 11 - Site 2 (RM 135.7) and Upper Slough 21 - Site 1 (RM 142.0) during the 1983-84 winter season.

3.4.4 Interhabitat Relationships

3.4.4.1 Slough 8A (RM 125.6, 126.6) and Susitna River at LRX 29 (RM 126.1)

Temperatures recorded at Slough 8A (upper and lower sections) and at the Susitna River at LRX 29 were compared to determine possible relationships between the habitat types (Appendix Figures A-35, A-36). Because the periods of record for each site are incomplete, direct comparisons are not possible for the entire season. In general intragravel temperatures recorded at Lower Slough 8A and mainstem Susitna River at LRX 29 were similar from September through February. In March surface temperatures in Lower Slough 8A began to increase rapidly. Mainstem surface temperatures remained near zero through mid-April when the recorder malfunctioned. The small amount of data collected in the upper portion of the slough indicate that surface temperatures at this site are not directly comparable to those recorded in the lower section of slough or in the mainstem.

Again the intragravel temperature data records for Slough 8A and mainstem Susitna River at LRX 29 are incomplete. Figure A-36 shows that between early September and late October intragravel temperatures at Lower Slough 8A and the mainstem Susitna River were similar. Throughout the rest of the winter season, no similarities were found between the intragravel data recorded in the slough and the mainstem.

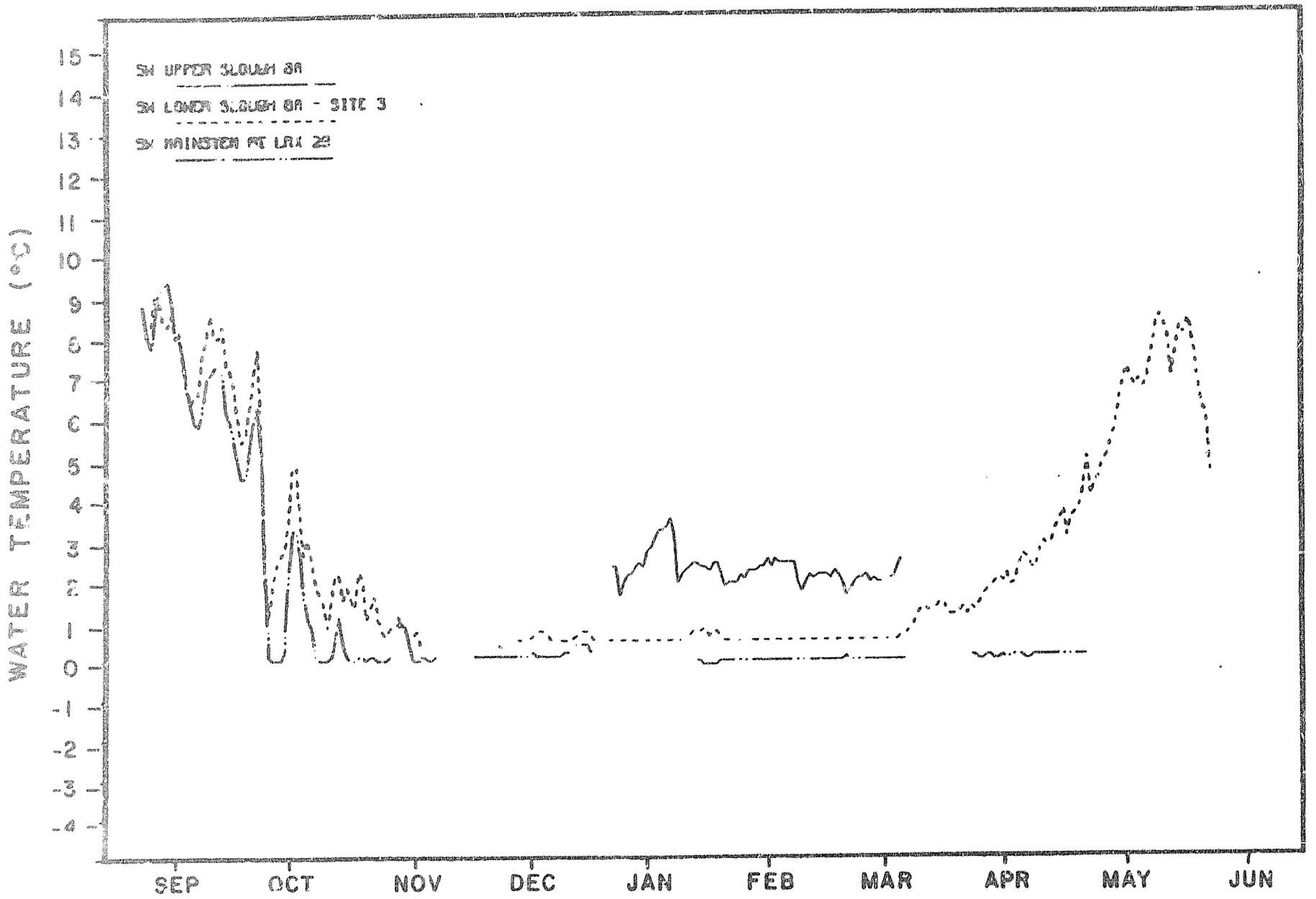

Figure A-35. Mean daily surface water temperatures recorded at Upper Slough 8A - Site 3 (RM 126.6), Lower Slough 8A - Site 3 (RM 125.6) and Mainstem Susitna River at LRX 29 Sites 1 and 2 (RM 126.1) during the 1983-84 winter season.

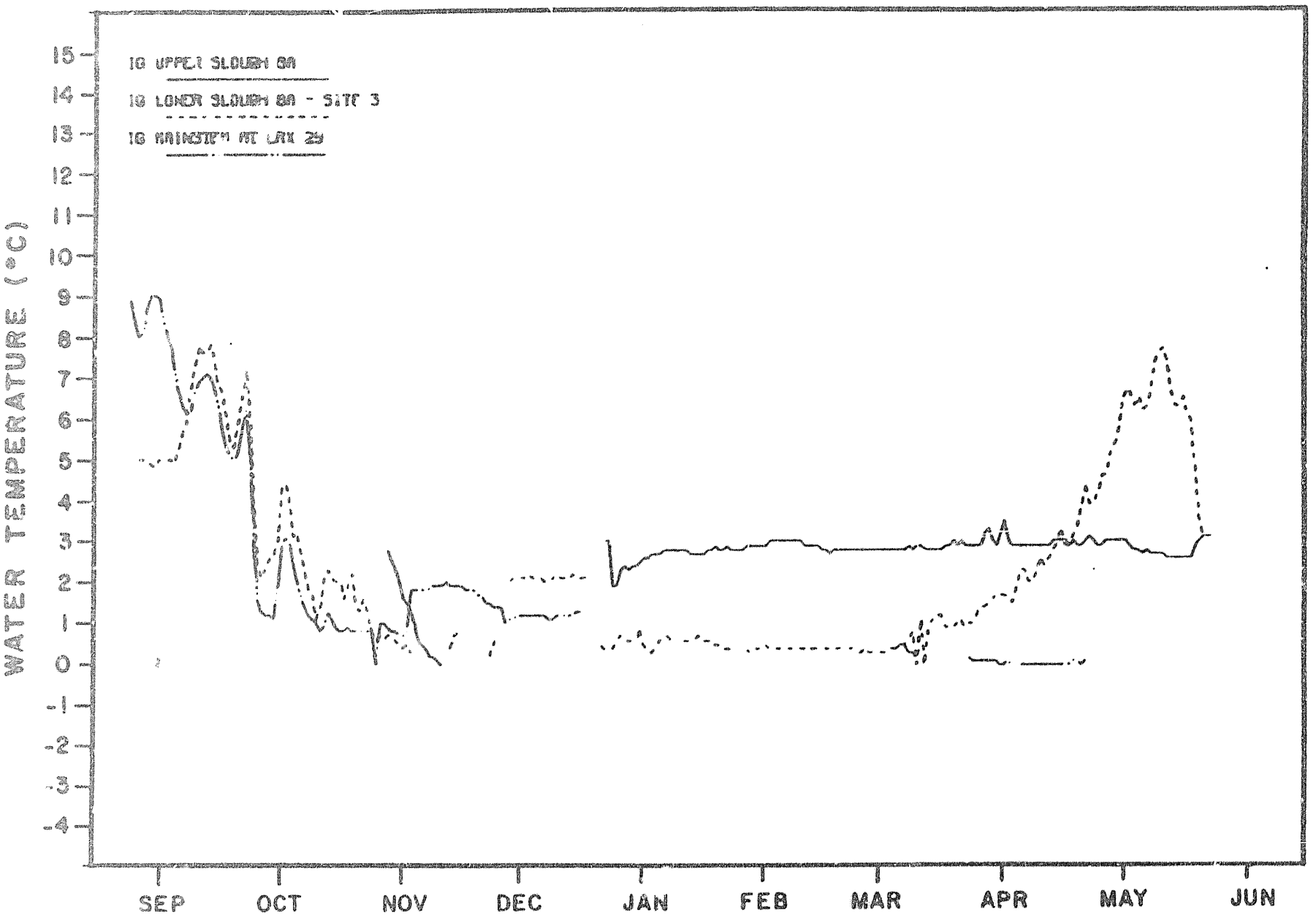

Figure A-36. Mean daily intragravel water temperatures recorded at Upper Slough 8A - Site 3 (RM 126.6), Lower Slough 9A - Site 3 (RM 125.6), and Mainstem Susitna River at LRX 29 - Sites 1 and 2 (RM 126.1) during the 1983-84 winter season.

3.4.4.2 Upper Side Channel 11 (RM 136.3) and Slough 11 (RM 135.7)

A comparison of surface and intragravel temperatures recorded in Upper Side Channel 11 and Slough 11 was made to determine similarities or differences between habitat types. The overall surface water temperature trends observed in Slough 11 and Upper Side Channel 11 are similar. However, a wider range of temperatures and greater fluctuations in temperature were shown in Upper Side Channel 11. For example, a dramatic decrease in temperatures which occurred in mid-May at Upper Side Channel 11 was not observed in Slough 11 (Appendix Figure A-37).

The mean daily intragravel water temperatures recorded at Upper Side Channel 11 and Slough 11 are shown in Appendix Figure A-38. Intragravel water temperatures at Slough 11 were stable throughout the recording period while intragravel temperatures at Upper Side Channel 11 were variable. From September through May mean daily intragravel temperatures at Slough 11 ranged from 3.1°C to 4.3°C. Mean daily intragravel temperatures at open Side Channel 11 ranged from 2.4°C to 6.3°C.

3.4.4.3 Slough 21 (RM 141.8, 142.0), Side Channel 21 (RM 141.0) and Susitna River at LRX 57 (RM 142.3)

A comparison of temperatures recorded in Slough 21, Side Channel 21, and mainstem Susitna River at LRX 57 was made to examine similarities among the temperatures occurring at the sites. Appendix Figure A-39 shows

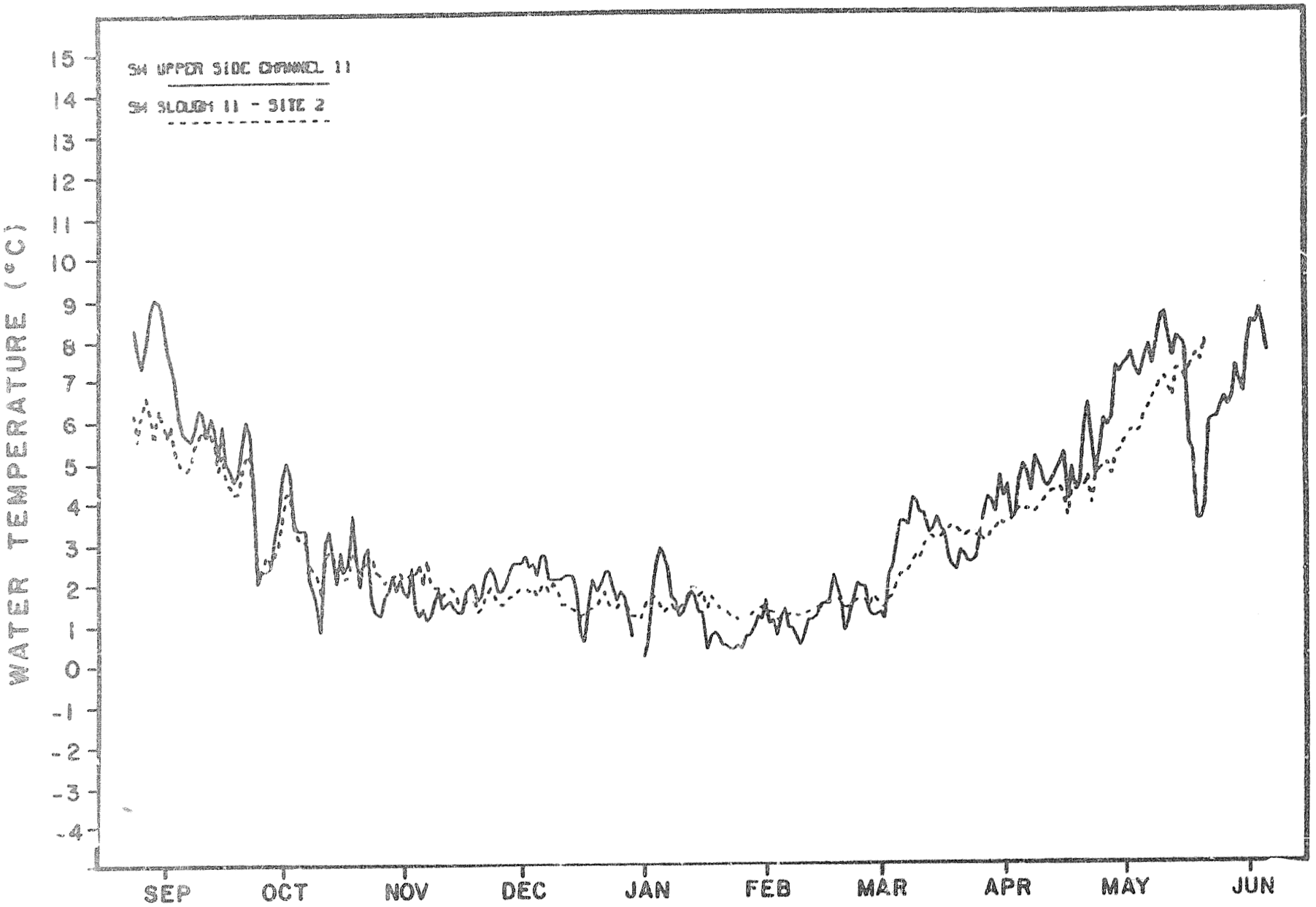

Figure A-37. Mean daily surface water temperatures recorded at Upper Side Channel 11 - Sites 1 and 2 (RM 136.3) and Slough 11 - Site 2 (RM 135.7) during the 1983-84 winter season.

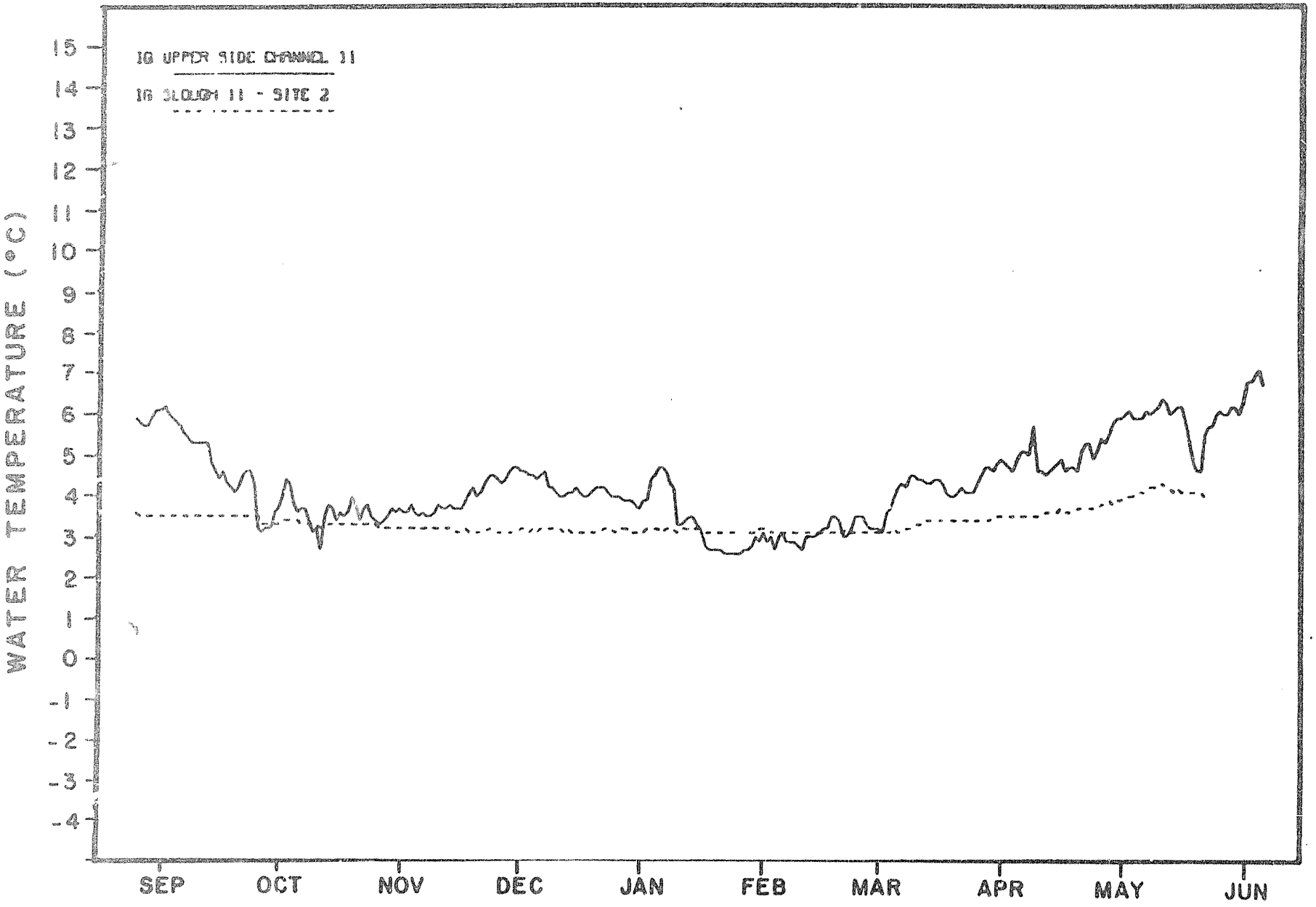

Figure A-38. Mean daily intragravel water temperatures recorded at Upper Side Channel 11 - Sites 1 and 2 (RM 136.3) and Slough 11 - Site 2 (RM 135.7) during the 1983-84 winter season.

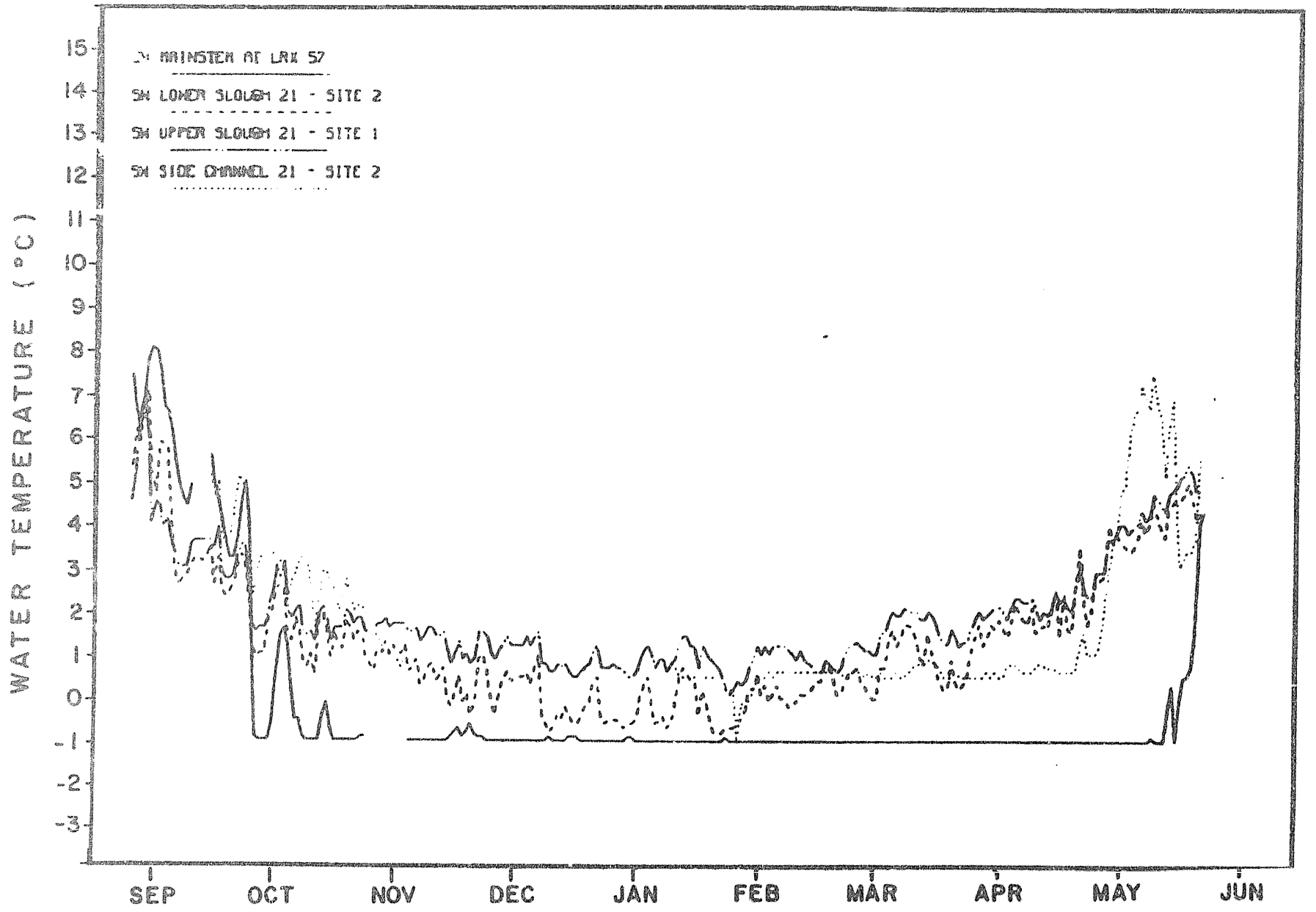

Figure A-39. Mean daily surface water temperatures recorded at the Mainstem Susitna River at LRX 57 - Sites 1 and 2 (RM 142.3), Lower Slough 21 - Site 2 (RM 141.8), Upper Slough 21 - Site 1 (RM 142.0) and Side Channel 21 - Site 2 (RM 141.0) during the 1983-84 winter season.

that in general surface water temperatures at all sites were decreasing through September. By mid-October, mainstem surface water temperatures at LRX 57 had decreased to near 0.0°C. Surface temperatures at the site (LRX 57) remained near 0.0°C through early May when sharp increases in temperature were observed. From September through May the most similar temperatures occurred in the upper and lower sections of Slough 21. However, from November to May, surface water temperatures in the lower section of the slough were cooler than those recorded in the upper section. Due to a failed recorder, temperatures in the side channel were not recorded from November to early January. From January through May surface water temperatures recorded in Side Channel 21 were not comparable to those recorded at any of the other sites.

Intragravel temperatures recorded in the slough, side channel and mainstem at LRX 57 are presented in Appendix Figure 40. Due to failed recorders, intragravel temperatures were recorded at Side Channel 21 - Site 2 and Upper Slough 21 only from September through mid-January. Intragravel temperatures recorded at Side Channel 21 - Site 3 were not plotted because the site was probably frozen until early May. In September and October, intragravel temperatures at all sites were dissimilar.

From early November to mid-January, when the recorders malfunctioned, intragravel temperatures at Upper Slough 21 and Side Channel 21 were extremely similar. From November through April, intragravel temperatures at Lower Slough 21 and the mainstem Susitna River at LRX 57

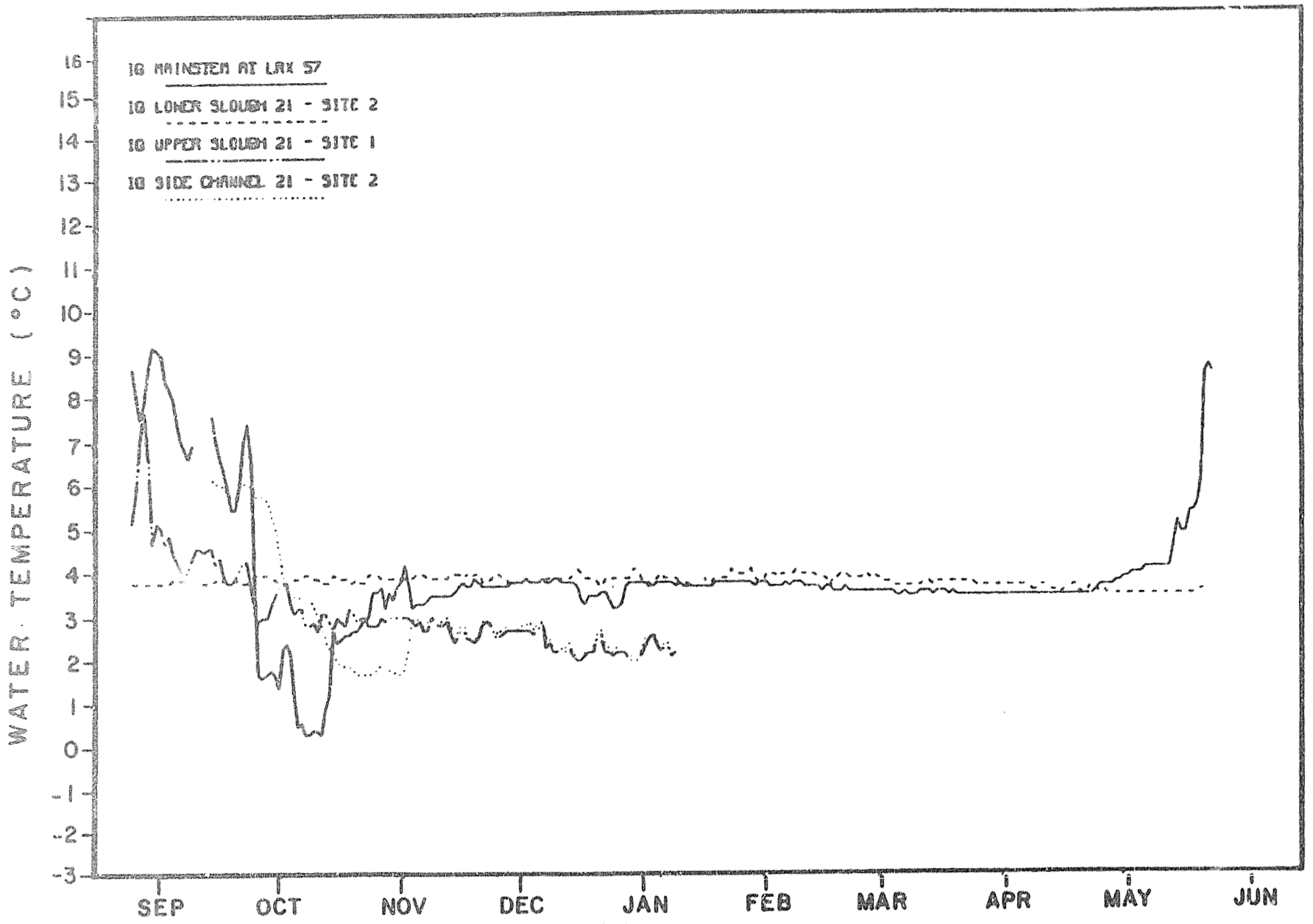

Figure A-40. Mean daily intragravel water temperatures recorded at the Mainstem Susitna River at LRX 57 - Sites 1 and 2 (RM 142.3), Lower Slough 21 - Site 2 (RM 141.8), Upper Slough 21 - Site 1 (RM 142.0) and Side Channel 21 - Site 2 (RM 141.0) during the 1983-84 winter season.

were stable and similar. Intragravel temperatures of approximately 3.5°C were recorded at both sites during this time. In early May mainstem intragravel temperatures increased sharply while temperatures on the lower portion of the slough remained near 3.5°C.

4.0 DISCUSSION

A discussion of the results of the 1983-84 winter temperature studies is presented by study objective. Discussions of the temperature data as applied to modelling, effects on biological activity, and impact analyses are addressed in the body of this report and in other reports.

4.1 Objective 1: Mainstem Temperature Evaluation

During the 1983-84 winter season surface and intragravel water temperatures were recorded at sites located at LRX 9 (RM 103.2), LRX 29 (RM 126.1) and LRX 57 (RM 142.3). Similar surface water temperature patterns were exhibited at all of the mainstem locations except LRX 9 - Site 3. Generally, surface water temperatures decreased to approximately 0°C by October, and remained near 0°C through May when temperatures increased. However, surface water temperatures near 2.0°C were recorded at LRX 9 - Site 3 for approximately two days following the installation of the intragravel and surface water probes at the site on February 8. Temperatures at the site decreased to 0°C by February 12, and remained stable through March. Beginning in April temperatures recorded at the site were again warmer and more variable than the surface temperatures recorded at the LRX 29 and LRX 57 locations. The warmer surface temperatures occurring at LRX 9 - Site 3 may be the result of groundwater upwelling which was also reflected in the increased intragravel temperatures which were recorded at the site.

From August through early October, intragravel temperatures recorded at the mainstem sites at LRX 9, LRX 29, and LRX 57 are similar. However, from mid-October through May intragravel temperatures at the stations were dissimilar. Often temperature differences were observed within the habitat location when a new probe (or site) was installed within a monitoring location. The temperature differences can probably be attributed to the variable groundwater influences and the effects of mainstem discharge.

The high intragravel temperatures recorded at LRX 9 were observed at Site 3 when the intragravel probe was installed in an open-lead upwelling area. Increased intragravel temperatures were also recorded at LRX 29 - Site 2 from November 11 to December 17 when the intragravel probe was damaged by ice movement. The warm temperatures observed may be due to the influence of groundwater from the upper portion of Slough 8A. However, no data are available from Upper Slough 8A at this time because the temperature station was frozen from November until mid-December.

Variations in intragravel temperature were also seen at LRX 57 when the site was moved from Site 1 to Site 2 in September. Warm intragravel temperatures of approximately 3.5°C were recorded at LRX 57 - Site 2 from mid-October to early May. The temperatures recorded during this time corresponded directly to the intragravel temperatures recorded in the lower portion of Slough 21. Stable temperatures were no longer observed at the mainstem site beginning in mid-May possibly due to the effects of increased mainstem discharge.

4.2 Objective 2: Chum salmon spawning/Incubation Temperature Evaluation

Mainstem Habitats

In support of Objective 2, intragravel water temperatures were recorded only at one mainstem monitoring station established at RM 136.1. Temperatures were monitored from October 1 to January 4, and from March 2 through May 3. Intragravel temperatures at the site averaging near 0.0°C were recorded until mid-April when temperatures began to increase. Surface water temperatures recorded from March 2 to May 3 ranged from -0.1°C to 2.0°C. Intragravel water temperatures recorded at this site did not reflect the influence of groundwater upwelling.

Side Channel Habitats

Variable intragravel and surface water temperatures were recorded at Side Channel 10 (RM 134.0), Upper Side Channel 11 (RM 136.3) and Side Channel 21 (RM 142.3) throughout the 1983-84 winter season. Temperatures recorded within a habitat location were also often dissimilar, reflecting the influences of various groundwater sources. Within a location one site was often observed frozen for various periods of time while others remained free flowing. No clear pattern of freezing was observed within the side channel habitats. Although data is not available to define the relationship, the freezing and thawing are probably influenced by mainstem stage. Increased stage caused by ice jams can

increase side channel (and slough) discharge either by overtopping or by increasing groundwater flow. When overtopping occurs side channel or slough temperatures often decrease, whereas groundwater changes generally thaw previously frozen areas.

At Side Channel 10, both the intragravel and surface water stations at Site 1 were frozen from November to mid-February, while the surface water station at Site 2 was observed frozen only for a short period in December. Throughout the winter the intragravel station at Site 2 never fell below 0.7°C.

The monitoring station at Upper Side Channel 11 were not observed frozen throughout the period of record. Temperatures recorded at both sites within the side channel were similar indicating a common water source.

At Upper Side Channel 21 variable temperatures were recorded at all of the sites indicating the influences of groundwater upwelling and various water sources charging the sites. Variable temperatures were observed in the side channel when the station was moved from Site 1 to Site 2. Also temperature differences were observed at Sites 2 and 3 throughout the winter. At Site 3, the surface water temperature site was frozen in December and January only, while the intragravel site was frozen from December through April. Although surface temperatures at Site 2 decreased to 0°C the site was not observed frozen throughout the period of record. The freezing at Site 3 in January 1 was concurrent with extremely low ambient temperatures.

Slough Habitats

Although the actual temperatures varied, surface water temperatures recorded at all side slough habitats except Lower Slough 8A, generally followed similar trends. Surface water temperatures recorded at the Lower Slough 8A site were similar to mainstem surface water temperatures. Surface water temperatures at the other side slough sites (Upper 8A, 9, 11, 21) were generally warmer than mainstem temperatures. Surface temperatures at these sites ranged from approximately 1° to 2°C.

Surface water temperatures recorded in the Northeast and Northwest channels of upland Slough 10 were also similar to the general slough temperature trends. However, temperatures at the sites did not increase as sharply as the surface water temperatures at the side slough sites.

The only slough station which was observed frozen was the site located in the upper portion of Slough 8A. The surface and intragravel station at Upper Slough 8A - Site 2 was observed frozen from November to mid-December when mainstem discharges increased.

Intragravel temperatures recorded at the sites in Upper Slough 8A, Slough 9, and Slough 11 were similar throughout the winter season averaging between 2.5 and 3.5°C. The monitoring stations were probably located in areas of groundwater upwelling.

Variability in intragravel temperatures within sloughs was observed in Slough 8A, Slough 11 and Slough 21. The intragravel temperatures

recorded at the Lower Slough 8A site were similar to mainstem temperatures. In Upper Slough 21 intragravel temperatures varied throughout the winter and were generally similar to temperatures recorded at the monitoring station at Side Channel 21 - Site 2. Intragravel temperatures recorded at Lower Slough 21 were stable throughout the winter, however, the temperatures were generally warmer than those recorded at the other slough monitoring stations. Intragravel temperatures recorded at Upper Slough 21 corresponded directly to those recorded at the mainstem monitoring station at LRX 57 indicating a possible common water source. In Slough 11 the intragravel temperatures recorded at the incubation site were much lower than those recorded at the Slough 11 - Site 2 station indicating the variability within the site.

Tributaries

In support of Objective 2, temperatures were recorded at Fourth of July Creek and Indian River. At Fourth of July Creek the intragravel water station located in the plume was frozen from mid-October to May. Intragravel and surface water temperatures recorded within the creek at Site 2 were similar. Intragravel temperatures were also recorded in the creek at Site 1. However, although intragravel temperatures recorded at Site 1 were similar to those recorded at Site 2, the actual temperatures are warmer. It is difficult to explain the variability between these two sites. It is possible, however, that the intragravel probe located at Site 1 was damaged from mid-March to mid-May possibly due to the cold

temperatures. Throughout the winter season, intragravel and surface temperatures recorded at Fourth of July Creek (Site 2) followed a trend similar to the surface water temperatures recorded in the mainstem. Temperature remained near 0°C through March and increased in April and May. Daily fluctuations were minimal until mid-May when temperatures varied as much as 4°C per day.

At Indian River very little data were collected due to malfunctioning recorders. However, during the short period of record no differences between intragravel and surface temperatures were observed. Temperatures recorded at Indian River also followed a trend similar to mainstem temperatures. Daily fluctuations of up to 3.5°C were observed at the site beginning in mid-April.

4.2 Objective 3: Preliminary Mitigation Evaluation

Temperatures recorded at Deadhorse Creek in support of Objective 3 remained near 0.0°C through March when temperatures began to increase and daily fluctuations were observed.

Table A-2. ADF&G Susitna River mainstem, side channel, sloughs, and tributary winter temperature index, 1983-1984.

Location	Instrument/ Temperature Type	Record
Susitna River at LRX 9	Datapod	
Site #1 RM 103.2	Surface	08/24/83-08/26/83
S27N05W26DAA	Intra/Surface	08/27/83-09/10/83
	Intragravel	09/10/83-09/11/83
Susitna River at LRX 9	Datapod	
Site #2 RM 103.2	Intra/Surface	09/12/83-10/22/83
S27N05W26DAA	Intragravel	10/23/83-10/31/83
	Intragravel	11/01/83-11/03/83
	Intra/Surface	11/04/83-12/23/83
	Surface	12/24/83-12/29/83
Susitna River at LRX 9	Datapod	
Site #3 RM 103.5	Intra/Surface	02/08/84-03/06/84
S27N05W26ADD	Intragravel	03/07/84-03/22/84
	Intra/Surface	03/23/84-05/31/84
Deadhorse Creek	Thermograph	
RM 120.9 TRM 1.0	Surface	12/22/83-05/31/84
S29N04W14BCB		
Lower Slough 8A	Datapod	
Site #3 RM 125.6	Intra/Surface	08/25/83-11/04/83
S30N03W30BDB	Intra/Surface	11/12/83-11/13/83
	Intra/Surface	11/14/83-11/15/83
	Intragravel	11/25/83-11/26/83
	Intra/Surface	11/27/83-05/22/84
Susitna River at LRX 29	Datapod	
Site #1 RM 126.1	Intra/Surface	08/24/83-10/26/83
S30N03W19DCA	Intragravel	10/27/83-11/02/83
Susitna River at LRX 29	Datapod	
Site #2 RM 126.1	Intra/Surface	11/03/83-11/08/83
S30N03W19DCA	Intragravel	11/09/83-11/15/83
	Intra/Surface	11/16/83-12/17/83
	Surface	01/12/84-03/04/84
	Intra/Surface	03/05/84-04/21/84
Upper Slough 8A	Datapod	
Site #2 RM 126.6	Intra/Surface	10/27/83-12/21/84
S30N03W20CCA		

Location	Instrument/ Temperature Type	Record
Upper Slough 8A Site #3 RM 126.6 S30N03W20CCA	Datapod Intra/Surface Intragravel Intra/Surface Intragravel	 12/21/83-03/12/84 03/13/84-03/22/84 03/23/84-05/15/84 05/16/84-05/22/84
Slough 9 Incubation site RM 128.5 S30N03W16CBC	Thermograph Surface	 08/31/83-09/21/83
Slough 9 Site #3 RM 128.6 S30N03W16BDC	Datapod Intra/Surface Intragravel Intra/Surface Intragravel Intra/Surface Intra/Surface	 08/24/83-09/04/83 09/05/83-09/16/83 09/17/83-10/10/83 10/11/83-10/20/83 10/21/83-01/10/84 03/23/84-05/31/84
Fourth of July Creek Site #1 RM 131.1 Plume and Creek S30N03W03DAC	Datapod Intragravel Intragravel Intragravel	 09/01/83-01/27/84 02/07/84-02/10/84 03/01/84-05/20/84
Fourth of July Creek Site #2 RM 131.1 S30N03W03DAC	Datapod Intra/Surface	 01/11/84-05/22/84
Side Channel 10 Site #1 RM 134.0 S31N03W31BBB	Datapod Intra/Surface Intragravel	 08/24/83-11/05/83 11/16/83-11/30/83
Side Channel 10 Site #2 RM 134.0 S31N03W31B8B	Datapod Surface Intra/Surface	 11/16/83-11/29/83 11/30/83-05/31/84
Slough 10 Northwest RM 134.0 S31N03W36AAA	Datapod Intra/Surface	 10/19/83-05/22/84
Slough 10 Northeast RM 134.0 S31N03W36AAA	Datapod Intra/Surface	 10/19/83-05/22/84
Slough 11 Incubation site RM 135.5 S31N02W19DDD	Thermograph Intragravel	 12/30/83-02/25/84

Location	Instrument/ Temperature Type	Record
Slough 11	Datapod	
Site #2 RM 135.7	Intra/Surface	08/24/83-05/22/84
S31N02W19DAD		
Susitna River at RM 136.1	Thermograph	
RM 136.1	Intragravel	10/01/83-01/04/84
S31N02W19ADB	Datapod	
	Intra/Surface	03/02/84-05/03/84
Upper Side Channel 11	Datapod	
Site #1 RM 136.3	Intra/Surface	08/24/83-09/11/83
S31N02W20BBD		
Upper Side Channel 11	Datapod	
Site #2 RM 136.3	Intra/Surface	09/12/83-12/29/83
S31N02W20BBD	Intragravel	12/29/83-12/30/83
	Intra/Surface	12/31/83-05/31/83
Upper Side Channel 11	Datapod	
Site #3 RM 136.3	Intra/Surface	01/11/84-03/17/84
S31N02W20BBD	Intragravel	03/18/84-03/19/84
	Intra/Surface	03/20/84-05/31/84
Indian River	Datapod	
Site #3 RM 138.6 TRM 0.2	Intra/Surface	03/01/84-03/03/84
S31N02W09CAB	Intragravel	03/04/84/03/22/84
	Intra/Surface	03/28/84-04/25/84
Side Channel 21	Datapod	
Site #1 RM 141.0	Intra/Surface	08/29/83-09/05/83
S31N02W02CAA	Intragravel	09/06/83-09/12/83
Side Channel 21	Datapod	
Site #2 RM 141.0	Intra/Surface	09/13/83-01/10/84
S31N02W02CAA	Surface	01/11/84-05/22/84
Side Channel 21	Datapod	
Site #3 RM 141.0	Intra/Surface	12/01/83-12/28/83
S31N02W02CAA	Intra/Surface	01/10/84-05/22/84
Lower Slough 21	Datapod	
Site #2 RM 141.8	Intra/Surface	08/24/83-05/31/84
S31N02W02AAB		
Upper Slough 21	Datapod	
Site #1 RM 142.0	Intra/Surface	08/24/83-01/10/84
S32N02W36CCC	Surface	01/11/84-05/22/84

Location	Instrument/ Temperature Type	Record
Susitna River at LRX 57 Site #1 RM 142.3 S32N02W36CBA	Datapod Intra/Surface	08/24/83-09/09/83
Susitna River at LRX 57 Site #2 RM 142.3 S32N02W36CBA	Datapod Intra/Surface Intragravel Intra/Surface Intragravel	09/13/83-10/24/83 10/24/83-11/02/83 11/03/83-05/22/84 05/22/84-05/23/84

Appendix Table A-3. Instantaneous water temperatures recorded at sites in the Susitna River basin during the 1983-84 ice-covered season.

Location	Site Number	Date	Time	Water Temp°C	Data Type	Instrument
Upper Slough 8A RM 126.6	2	831221	1303	-0.1[a]	surface	datapod recorder
	2	831221	1303	-0.2[b]	intragravel	datapod recorder
	2	840110	1350	2.1	surface	datapod recorder
	2	840110	1350	2.8	intragravel	datapod recorder
	2	840126	1346	1.0	surface	mercury thermometer
	2	840126	1346	2.7	intragravel	datapod recorder
	2	840207	1538	1.4	surface	mercury thermometer
	2	840207	1538	3.0	intragravel	datapod recorder
	2	840301	1100	4.0	surface	mercury thermometer
	2	840301	1100	2.9	intragravel	datapod recorder
	2	840322	1526	3.4	surface	mercury themometer
	2	840522	1600	3.4	surface	mercury themometer
4th of July Creek RM 131.1	2	831201	1046	0.4	surface	datapod recorder
	2	831201	1046	0.3	intragravel	datapod recorder
	2	831206	1445	0.3	surface	datapod recorder
	2	831206	1445	0.2	intragravel	datapod recorder
	2	831221	1234	0.0	surface	mercury themometer
	2	831221	1234	0.1	intragravel	datapod recorder
Side Channel 10 RM 134.0	3[c]	831130	1440	1.4	surface	mercury themometer
	3[c]	831130	1440	2.7	intragravel	datapod recorder
	1	831206	1329	0.1	intragravel	datapod recorder
	3[c]	831206	1319	1.3	surface	mercury themometer

[a] Water was observed flowing over the temperature probe.

[b] Anchor ice was observed adjacent to the temperature probe.

[c] Instantaneous measurements only were taken at this site.

Appendix Table A-3 (Continued).

Location	Site Number	Date	Time	Water Temp°C	Data Type	Instrument
Side Channel 10 RM 134.0 (Continued)	3[a]	831206	1319	2.7	intragravel	datapod recorder
	3[a]	831207	1125	1.6	surface	datapod recorder
	3[a]	831207	1125	2.7	intragravel	datapod recorder
	1	831221	1149	-0.2	surface	datapod recorder
	1	831221	1149	-0.1	surface	datapod recorder
	1	840111	1206	-0.1	intragravel	datapod recorder
	3[a]	840111	1200	0.0[b]	surface	datapod recorder
	3[a]	840111	1200	0.0	intragravel	datapod recorder
	3[a]	840127	1232	0.5	surface	datapod recorder
	3[a]	840127	1232	1.5	intragravel	datapod recorder
	1	840127	1230	-1.2[b]	intragravel	datapod recorder
	1	840208	1124	-0.1	intragravel	datapod recorder
	3[a]	840208	1115	0.6	surface	mercury themometer
	3[a]	840208	1115	2.5	intragravel	datapod recorder
	1	840302	1115	1.8	surface	mercury themometer
	1	840302	1115	3.0	intragravel	datapod recorder
	3[a]	840302	1100	2.0	surface	datapod recorder
	3[a]	840302	1100	3.4	intragravel	datapod recorder
	3[a]	840322	1324	3.4	surface	mercury themometer
	3[a]	840322	1324	3.5	intragravel	datapod recorder
	1	840322	1329	2.6	surface	mercury themometer
	1	840322	1329	2.5	intragravel	datapod recorder
	1	840522	1302	5.2	surface	mercury themometer
	1	840522	1302	3.6	intragravel	datapod recorder
	3[a]	840522	1318	5.2	surface	mercury themometer
	3[a]	840522	1318	3.9	intragravel	datapod recorder

[a] Instantaneous measurements only were taken at this site.

[b] Surface water was observed frozen to the substrate.

Appendix Table A-3 (Continued).

Location	Site Number	Date	Time	Water Temp°C	Data Type	Instrument
Side Channel 21 RM 141.0	4[a]	831130	1300	0.1	surface	mercury themometer
	4[a]	831130	1300	0.3	intragravel	datapod recorder
	4[a]	831206	1234	0.5	surface	datapod recorder
	4[a]	831206	1234	0.7	intragravel	datapod recorder
	4[a]	831221	1042	-0.1	surface	datapod recorder
	4[a]	831221	1042	-0.1	intragravel	datapod recorder
	4[a]	840110	1118	-0.1	surface	datapod recorder
	4[a]	840127	1121	-0.1	surface	datapod recorder
	5[a]	840228	1247	0.3	surface	mercury themometer
	5[a]	840228	1246	0.5	intragravel	datapod recorder
LRX 57 RM 142.3	2	831116	1020	0.4	surface	datapod recorder
	2	831116	1020	0.3	surface	mercury thermometer
	2	831116	1020	3.7	intragravel	datapod recorder
	2	831206	1207	0.0	surface	datapod recorder
	2	831206	1207	3.9	intragravel	datapod recorder
	2	931221	1020	0.0	surface	datapod recorder
	2	831221	1020	3.6	intragravel	datapod recorder
	2	840110	1024	0.0	surface	datapod recorder
	2	840110	1024	3.7	intragravel	datapod recorder
	2	840126	1004	0.0	surface	datapod recorder
	2	840126	1004	-0.1	surface	mercury thermometer
	2	840126	1004	3.4	intragravel	datapod recorder
	2	840127	1127	0.0	surface	datapod recorder
	2	840127	1127	3.8	intragravel	datapod recorder
	2	840207	1001	0.0	surface	datapod recorder

[a] Instantaneous measurements only were taken at this site.

Appendix Table A-3 (Continued).

Location	Site Number	Date	Time	Water Temp°C	Data Type	Instrument
LRX 57 (Continued)	2	840207	1001	3.7	intragravel	datapod recorder
	2	840229	1500	-0.1	surface	mercury thermometer
	2	840322	910	1.3	surface	mercury thermometer
	2	840322	910	3.5	intragravel	datapod recorder
	3[a]	831206	1207	0.0	surface	datapod recorder
	3[a]	831221	1020	0.0	surface	datapod recorder
	3[a]	840110	1024	0.0	surface	datapod recorder
	3[a]	840322	910	1.6	surface	datapod recorder
	4[a]	840229	1500	-0.1	intragravel	datapod recorder
	4[a]	840302	844	-0.2	intragravel	datapod recorder
	4[a]	840322	910	0.1	intragravel	datapod recorder

[a] Instantaneous measurements only were taken at this site.

Appendix Table A-4. Water quality data collected at Deadhorse Creek reservoir during the 1983-84 winter season.

Date	Time	Temperature (°C)			pH	DO (mg/l)	Conductivity (umhos/cm)
		Air	Water				
			Below Dam	Above Dam			
831222	1113	--	0.2	0.2	--	15.3	117
840110	1437	-0.8	0.2	0.0	7.6	14.0	--
840126	1515	--	0.2	0.4	6.9	14.9	131
840207	1430	1.8	0.0	0.1	7.5	15.3	121
840302	1002	-4.0	0.0	0.3	7.1	12.4	119
840322	1630	4.0	0.2	0.1	7.2	12.5	115
840522	1647	10.5	3.4	3.4	7.3	13.5	--

Appendix Table A-5. Water quality data collected at Curry outflow pipe during the 1983-84 winter season.

Date	Time	Temperature (°C)		pH	DO (mg/l)	Conductivity (umhos/cm)
		Air	Water			
831222	1226	--	0.2	--	15.7	124
840110	1518	-0.8	0.1	7.2	14.6	--
840126	1536	--	0.1	7.5	15.6	131
840207	1455	1.8	0.1	7.6	15.0	119
840302	1032	-2.5	0.1	7.3	13.1	122
840322	1710	6.5	0.1	7.2	13.3	118
840522	1713	12.5	2.8	7.3	13.8	--

Appendix Table A-6. Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Mainstem Susitna River at LRX 9 - Site 1, RM 103.2, GC S27N05W26DAA.

August 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
830824	-----	-----	-----	9.2	9.6	10.1
830825	-----	-----	-----	8.4	8.8	9.4
830826	-----	-----	-----	8.1	8.6	9.1
830827	7.4	-----	7.7	8.2	8.9	9.8
830828	7.3	7.6	8.1	8.9	9.6	10.4
830829	7.6	7.8	8.1	9.5	9.9	10.3
830830	7.5	7.7	8.0	9.6	10.0	10.6
830831	7.5	7.7	8.0	9.2	9.6	10.2
Monthly Value	7.3	-----	8.1	8.1	-----	10.6

----- Data not available.

Appendix Table A-6 (continued).

September 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
830901	7.0	7.2	7.6	8.5	8.8	9.2
830902	6.6	6.9	7.3	7.9	8.6	9.3
830903	6.4	6.7	7.2	7.7	8.1	8.8
830904	5.8	6.1	6.7	6.8	7.4	8.0
830905	5.2	5.6	6.1	6.0	7.0	8.1
830906	4.7	5.3	5.7	5.3	6.7	8.4
830907	4.5	5.0	5.6	5.2	6.6	8.6
830908	4.7	5.1	5.6	5.8	6.9	8.9
830909	5.0	5.4	6.0	6.6	7.6	9.8
830910	5.3	5.6	6.0	6.0	-----	8.1
830911	5.1	-----	5.8	-----	-----	-----
Monthly Value	4.5	-----	7.6	5.2	-----	9.8

----- Data not available.

Appendix Table A-7 Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Mainstem Susitna River at LRX 9 - Site 2, RM 103.2, GC S27N05W26DAA.

September 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
830912	6.6	7.2	7.8	7.1	8.0	8.8
830913	6.7	7.0	7.4	7.2	7.8	8.5
830914	6.2	6.6	7.2	6.6	7.1	8.0
830915	5.6	6.1	6.6	5.9	6.7	7.6
830916	5.1	5.8	6.3	5.1	6.3	7.4
830917	4.6	5.4	5.9	4.5	5.8	6.8
830918	4.5	5.0	5.5	4.2	5.2	6.0
830919	4.6	4.9	5.2	4.6	5.2	5.7
830920	5.0	5.2	5.3	5.4	5.7	6.1
830921	5.2	5.5	6.0	5.7	6.3	7.2
830922	5.8	6.1	6.4	6.7	7.0	7.2
830923	4.9	5.5	6.3	5.2	6.1	7.1
830924	2.4	3.5	4.9	2.0	3.3	5.2
830925	.9	1.3	2.4	.4	.8	2.0
830926	.9	1.0	1.1	.4	.5	.5
830927	.8	1.0	1.0	.4	.5	.5
830928	.9	1.0	1.0	.4	.5	.6
830929	.8	.9	1.1	.4	.6	1.1
830930	1.1	1.7	2.6	1.1	2.2	3.5
Monthly Value	.8	-----	7.8	.4	-----	8.8

----- Data not available.

Appendix Table A-7 (continued).

October 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831001	2.6	3.0	3.2	3.4	3.7	4.0
831002	2.9	3.2	3.5	3.5	3.8	4.3
831003	2.5	2.9	3.4	2.7	3.3	4.0
831004	1.8	2.2	2.8	1.8	2.4	3.1
831005	1.6	1.8	2.2	1.6	1.9	2.4
831006	1.1	1.5	1.8	.6	1.5	2.3
831007	.8	1.1	1.6	.4	.8	1.6
831008	.9	1.0	1.1	.4	.5	.9
831009	1.1	1.2	1.2	.5	.5	.6
831010	.8	1.0	1.2	.4	.5	.6
831011	.5	.7	.8	.4	.5	.6
831012	.5	.7	1.1	.4	.8	1.5
831013	1.0	1.3	1.6	1.4	1.8	2.2
831014	.6	.9	1.2	.7	1.0	1.4
831015	.5	.6	.8	.4	.5	.9
831016	.5	.6	.6	.4	.5	.6
831017	.6	.7	.8	.4	.5	.9
831018	.7	.9	1.1	.4	.6	.9
831019	.7	.8	1.0	.4	.6	1.1
831020	.7	.7	.8	.3	.5	.6
831021	.8	.9	1.1	.4	.5	.6
831022	1.1	1.3	1.4	.4	-----	.5
831023	1.1	1.2	1.3	-----	-----	-----
831024	1.0	1.1	1.2	-----	-----	-----
831025	.5	.7	1.1	-----	-----	-----
831026	.3	.4	.5	-----	-----	-----
831027	.3	.4	.5	-----	-----	-----
831028	.2	.3	.4	-----	-----	-----
831029	.3	.3	.4	-----	-----	-----
831030	.3	.3	.4	-----	-----	-----
831031	.4	.4	.5	-----	-----	-----
Monthly Value	.2	1.1	3.5	.3	1.3	4.3

----- Data not available.

Appendix Table A-7 (continued).

November 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831101	.4	.4	.5	-----	-----	-----
831102	.4	.4	.5	-----	-----	-----
831103	.4	-----	.5	-----	-----	-----
831104	-.1	.2	.4	-.1	-.1	0.0
831105	0.0	.1	.2	-.2	-.1	0.0
831106	-.1	.0	.4	-.1	-.1	0.0
831107	-.1	.0	.5	-.1	-.0	0.0
831108	.2	.7	.9	-.1	-.1	0.0
831109	-.1	.0	.4	-.1	-.1	0.0
831110	-.1	.2	.3	-.1	-.1	0.0
831111	0.0	.2	.3	-.1	-.1	0.0
831112	.1	.2	.3	-.1	-.1	0.0
831113	0.0	.1	.3	-.1	-.1	0.0
831114	-.1	.0	.2	-.1	-.0	0.0
831115	-.1	.1	.3	-.1	-.0	0.0
831116	-.1	.0	.3	-.1	0.0	0.0
831117	-.1	-.0	.2	-.1	-.0	0.0
831118	-.1	-.0	.1	-.1	0.0	0.0
831119	0.0	.3	.4	-.1	0.0	.1
831120	.1	.6	.9	0.0	.0	.1
831121	.4	.5	.9	0.0	.0	.1
831122	0.0	.3	.4	-.1	-.0	0.0
831123	.1	.3	.4	-.1	0.0	0.0
831124	.1	.2	.3	-.1	0.0	0.0
831125	.1	.1	.3	-.1	0.0	.1
831126	.1	.2	.3	0.0	0.0	0.0
831127	0.0	.1	.3	0.0	0.0	0.0
831128	0.0	.2	.3	0.0	.0	.1
831129	.1	.2	.3	0.0	0.0	.1
831130	.1	.2	.3	0.0	0.0	.1
Monthly Value	-.1	.2	.9	-.2	-.0	.1

----- Data not available.

Appendix Table A-7 (continued).

December 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831201	.1	.2	.3	0.0	0.0	.1
831202	0.0	.1	.3	0.0	0.0	.1
831203	0.0	.1	.3	0.0	.0	.1
831204	.1	.2	.3	0.0	0.0	0.0
831205	0.0	.2	.3	0.0	.0	.1
831206	0.0	.1	.2	0.0	.0	.1
831207	-.1	.1	.2	-.1	0.0	.1
831208	-.1	.0	.2	0.0	0.0	0.0
831209	0.0	.1	.2	0.0	.0	.1
831210	0.0	.3	.7	0.0	.0	.2
831211	-.1	.1	.5	-.1	0.0	.1
831212	-.1	-.1	0.0	-.1	0.0	0.0
831213	-.1	-.0	0.0	-.1	0.0	0.0
831214	-.1	0.0	.1	-.1	0.0	.1
831215	-.1	0.0	.1	-.1	.0	.1
831216	-.1	.0	.1	-.1	.0	.1
831217	-.1	0.0	.1	-.1	0.0	.1
831218	0.0	.0	.1	-.1	0.0	0.0
831219	0.0	0.0	.1	0.0	0.0	0.0
831220	0.0	0.0	.1	0.0	0.0	0.0
831221	0.0	0.0	.1	0.0	.0	.1
831222	-.1	0.0	.1	0.0	0.0	.1
831223	0.0	0.0	.1	0.0	.0	.1
831224	-----	-----	-----	0.0	.0	.1
831225	-----	-----	-----	0.0	0.0	.1
831226	-----	-----	-----	0.0	.0	.1
831227	-----	-----	-----	0.0	0.0	.1
831228	-----	-----	-----	0.0	.0	.1
831229	-----	-----	-----	0.0	-----	.1
Monthly Value	-.1	.1	.7	-.1	.0	.2

----- Data not available.

Appendix Table A-8 Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Mainstem Susitna River at LRX 9 - Site 3, RM 103.5, GC S27N05W26ADD.

February 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840208	2.9	-----	3.0	.1	-----	.5
840209	3.0	3.2	3.3	.5	1.8	2.1
840210	3.1	3.2	3.3	1.7	2.1	2.4
840211	2.8	3.0	3.2	0.0	.8	2.4
840212	2.7	2.8	2.9	-.1	.1	.4
840213	2.7	2.8	2.9	-.1	.1	.4
840214	2.7	2.7	2.8	-.1	.0	.4
840215	2.6	2.7	2.8	-.1	-.1	.1
840216	2.7	2.7	2.7	-.1	0.0	.2
840217	2.7	2.7	2.7	-.1	.1	.2
840218	2.6	2.7	2.7	-.1	-.0	0.0
840219	2.6	2.7	2.7	-.1	-.0	0.0
840220	2.6	2.7	2.7	-.1	-.0	.1
840221	2.7	2.8	2.9	-.1	.1	.4
840222	2.7	2.7	2.9	-.1	.0	.2
840223	2.7	2.7	2.8	-.1	0.0	.1
840224	2.7	2.8	2.9	0.0	.2	.3
840225	2.8	2.9	2.9	.1	.2	.3
840226	2.7	2.8	2.9	0.0	.2	.5
840227	2.8	2.8	2.9	.1	.3	.5
840228	2.7	2.8	2.9	0.0	.2	.5
840229	2.7	2.8	2.9	0.0	.1	.4
Monthly Value	2.6	2.8	3.3	-.1	.3	2.4

----- Data not available.

Appendix Table A-8 (continued).

March 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840301	2.7	2.9	3.1	0.0	.2	1.5
840302	2.7	2.7	2.9	-.1	0.0	.3
840303	2.7	2.7	2.8	-.1	.0	.2
840304	2.7	2.8	2.9	.1	.2	.4
840305	2.7	2.8	2.9	0.0	.2	.9
840306	2.8	2.9	3.0	.1	-----	.5
840307	2.8	2.9	3.0	-----	-----	-----
840308	2.9	3.0	3.2	-----	-----	-----
840309	2.8	2.9	3.0	-----	-----	-----
840310	2.8	2.9	3.0	-----	-----	-----
840311	2.9	3.0	3.2	-----	-----	-----
840312	2.8	3.0	3.2	-----	-----	-----
840313	2.9	3.0	3.2	-----	-----	-----
840314	3.1	3.2	3.3	-----	-----	-----
840315	3.1	3.2	3.4	-----	-----	-----
840316	3.1	3.2	3.4	-----	-----	-----
840317	3.0	3.2	3.4	-----	-----	-----
840318	3.0	3.2	3.4	-----	-----	-----
840319	3.0	3.2	3.4	-----	-----	-----
840320	3.0	3.2	3.4	-----	-----	-----
840321	3.0	3.2	3.4	-----	-----	-----
840322	2.9	3.0	3.3	-----	-----	-----
840323	2.3	3.0	3.1	-.1	.0	.3
840324	2.9	3.0	3.0	-.1	.0	.3
840325	2.9	2.9	3.0	-.1	.1	.6
840326	2.8	2.9	3.0	0.0	.2	.5
840327	2.9	2.9	3.0	0.0	.1	.4
840328	2.8	2.9	3.0	0.0	.2	.7
840329	2.8	2.9	3.0	0.0	.3	.8
840330	2.8	2.9	3.0	0.0	.2	.8
840331	2.9	2.9	3.0	0.0	.2	.4
Monthly Value	2.3	3.0	3.4	-.1	-----	1.5

----- Data not available.

Appendix Table A-8 (continued).

April 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840401	2.8	2.9	3.3	0.0	.2	.8
840402	2.8	2.9	3.0	0.0	.4	1.1
840403	2.9	2.9	3.0	-.1	.5	1.7
840404	2.9	3.0	3.0	-.1	.5	1.5
840405	2.9	3.0	3.0	.2	.5	1.1
840406	2.9	2.9	3.0	0.0	.6	2.2
840407	2.9	2.9	3.0	-.1	.4	1.2
840408	2.9	2.9	3.0	-.1	.5	1.6
840409	2.9	2.9	3.0	0.0	.5	1.5
840410	2.9	2.9	3.0	0.0	.7	2.1
840411	2.9	3.0	3.0	0.0	.7	2.0
840412	2.9	3.0	3.1	-.1	.7	2.1
840413	2.9	3.0	3.0	0.0	.7	1.8
840414	2.9	3.0	7.6	.1	.8	2.4
840415	2.9	3.0	3.2	.3	1.0	2.6
840416	2.9	3.0	3.0	0.0	.5	1.2
840417	2.9	-----	3.0	.2	.9	2.6
840418	2.9	3.0	3.0	0.0	1.2	4.3
840419	2.9	3.0	3.1	0.0	1.5	4.9
840420	3.0	-----	3.1	.2	1.1	2.3
840421	2.9	3.0	3.0	.4	1.1	2.8
840422	2.9	-----	3.0	0.0	.8	2.6
840423	2.9	-----	3.0	-.1	.9	3.0
840424	2.9	3.0	3.0	0.0	1.5	4.2
840425	2.9	3.0	3.1	.2	1.3	3.4
840426	2.9	3.0	3.1	.1	1.4	3.6
840427	2.9	-----	3.0	.5	1.4	3.6
840428	2.9	3.0	3.1	.3	1.4	4.3
840429	2.8	2.9	3.0	0.0	.4	1.3
840430	2.8	2.9	3.0	0.0	.2	.7
Monthly Value	2.8	3.0	7.6	-.1	.8	4.9

----- Data not available.

Appendix Table A-8 (continued).

May 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840501	2.8	2.9	3.0	-.1	.1	.5
840502	2.5	2.7	2.9	-.1	-.1	.2
840503	1.9	2.3	2.5	-.1	-.1	0.0
840504	1.9	1.9	2.0	-.1	-.1	-.1
840505	2.1	-----	2.2	-.1	-.1	0.0
840506	2.0	2.2	2.4	-.2	-.1	-.1
840507	2.1	2.2	3.4	-.1	-.1	-.1
840508	1.6	1.7	2.1	-.2	-.1	.2
840509	2.0	-----	3.4	-.1	1.7	2.4
840510	3.3	3.4	3.5	.2	2.1	2.7
840511	3.3	3.4	3.5	0.0	.7	2.8
840512	3.3	3.4	3.5	0.0	.3	.8
840513	3.4	3.5	3.6	.1	2.2	5.5
840514	3.6	3.6	3.8	1.8	4.0	6.9
840515	3.6	3.7	3.9	1.8	3.9	6.2
840516	3.7	3.8	3.9	1.8	3.2	5.1
840517	3.6	3.8	4.0	.6	3.0	5.1
840518	3.7	3.9	4.0	1.9	3.5	4.6
840519	3.7	3.8	4.1	2.8	3.5	4.3
840520	3.6	3.8	4.0	2.4	3.6	5.0
840521	4.0	4.2	4.7	4.3	5.5	6.8
840522	4.4	4.5	4.6	5.4	5.9	6.4
840523	4.4	-----	4.6	4.8	5.9	7.1
840524	4.6	4.7	4.7	6.0	6.6	7.2
840525	4.6	4.7	4.9	5.9	6.5	7.4
840526	4.7	4.8	4.9	5.9	6.4	6.9
840527	4.5	4.6	4.7	5.9	6.7	7.7
840528	4.3	4.4	4.6	6.0	7.3	8.9
840529	4.2	4.3	4.5	6.4	7.6	9.1
840530	4.1	4.1	4.3	6.7	7.7	8.8
840531	4.0	4.1	4.2	6.6	8.7	11.5
Monthly Value	1.6	3.6	4.9	-.2	3.4	11.5

----- Data not available.

Appendix Table A-9 Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Mainstem Susitna River at LRX 29 - Site 1, RM 126.1, GC S30N03W19DCA.

August 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
830824	8.7	8.9	9.1	8.4	8.8	9.4
830825	8.1	8.4	8.8	7.5	8.1	8.8
830826	7.7	8.0	8.4	7.2	7.7	8.5
830827	7.9	8.1	8.6	7.7	8.3	9.3
830828	8.4	8.7	9.2	8.5	9.1	10.2
830829	8.9	9.0	9.1	9.0	9.3	9.5
830830	8.9	9.0	9.4	9.0	9.4	10.2
830831	8.7	8.9	9.3	8.5	8.9	9.4
Monthly Value	7.7	-----	9.4	7.2	-----	10.2

----- Data not available.

Appendix Table A-9 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
September 1983						
830901	8.1	8.4	8.8	7.7	8.1	8.5
830902	7.7	8.0	8.3	7.4	8.0	8.8
830903	7.4	7.7	8.2	7.0	7.5	8.1
830904	6.8	7.1	7.7	6.1	6.7	7.4
830905	6.2	6.6	7.0	5.5	6.3	7.3
830906	5.9	6.3	6.8	5.1	5.9	7.1
830907	5.7	6.1	6.6	5.1	5.8	7.0
830908	5.9	6.2	6.7	5.5	6.2	7.2
830909	6.4	6.7	7.2	6.4	7.0	8.3
830910	6.7	6.9	7.3	6.6	7.1	8.3
830911	6.7	7.0	7.5	6.5	7.3	8.4
830912	6.7	7.1	7.4	6.4	7.2	8.2
830913	6.7	7.0	7.3	6.5	7.1	8.1
830914	6.4	6.7	7.2	5.5	6.2	7.2
830915	5.9	6.3	6.7	5.2	5.9	7.1
830916	5.2	5.7	6.3	4.5	5.5	6.7
830917	4.8	5.3	5.8	4.0	5.0	6.3
830918	4.6	5.1	5.6	3.6	4.5	5.5
830919	4.6	4.9	5.3	3.6	4.5	5.4
830920	5.0	5.2	5.3	4.7	5.1	5.4
830921	5.3	5.7	6.2	5.3	5.9	6.7
830922	6.0	6.2	6.6	6.0	6.3	6.8
830923	4.4	5.3	6.1	3.8	5.3	6.0
830924	2.2	2.9	4.3	.8	2.2	3.8
830925	1.3	1.6	2.3	0.0	.1	.8
830926	1.2	1.3	1.4	-.1	.0	.1
830927	1.1	1.2	1.3	-.1	.0	.1
830928	1.1	1.2	1.2	0.0	.0	.1
830929	1.0	1.1	1.4	0.0	.3	.9
830930	1.4	1.9	2.6	.9	2.0	3.3
Monthly Value	1.0	5.3	8.8	-.1	5.0	8.8

Appendix Table A-9 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
October 1983						
831001	2.6	2.9	3.2	2.9	3.2	3.6
831002	2.9	3.1	3.4	2.7	3.2	3.9
831003	2.7	3.0	3.3	2.1	2.6	3.2
831004	2.1	2.4	2.9	1.1	1.6	2.2
831005	1.8	2.0	2.4	.4	1.0	1.5
831006	1.5	1.6	1.9	.1	.8	1.8
831007	1.2	1.4	1.9	-.1	.1	.9
831008	1.1	1.1	1.3	-.1	.0	.2
831009	1.0	1.1	1.2	0.0	0.0	0.0
831010	.9	1.0	1.1	0.0	0.0	0.0
831011	.8	.8	.9	0.0	.1	.3
831012	.7	.9	1.2	0.0	.5	1.2
831013	1.2	1.3	1.5	.7	1.0	1.3
831014	.9	1.1	1.4	0.0	.5	1.0
831015	.7	.9	1.0	0.0	.1	.5
831016	.7	.8	.9	0.0	.0	.2
831017	.7	.8	.9	0.0	0.0	.1
831018	.8	.9	1.0	0.0	.1	.3
831019	.7	.8	.9	0.0	.1	.4
831020	.7	.8	.9	0.0	.0	.2
831021	.7	.8	.9	0.0	.1	.3
831022	.7	.8	.9	-.1	.1	.2
831023	.7	.8	.9	-.1	.0	.2
831024	.7	.9	1.0	-.1	.0	.2
831025	.9	1.0	1.1	0.0	.0	.3
831026	.9	1.0	1.1	0.0	.1	.3
831027	.9	1.0	1.1	0.0	-----	.1
831028	.8	.9	1.0	-----	-----	-----
831029	.7	.8	.9	-----	-----	-----
831030	.7	.8	.8	-----	-----	-----
831031	.7	.7	.8	-----	-----	-----
Monthly Value	.7	1.2	3.4	-.1	.6	3.9

----- Data not available.

Appendix Table A-9 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
November 1983						
831101	.7	.7	.8	-----	-----	-----
831102	.7	.8	.8	-----	-----	-----
Monthly Value	.7	-----	.8	-----	-----	-----

----- Data not available.

Appendix Table A-10 Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Mainstem Susitna River at LRX 29 - Site 2, RM 126.1, GC S30N03W19DCA.

November 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831103	1.6	1.8	1.9	0.0	.1	.1
831104	1.7	1.8	1.9	0.0	.1	.1
831105	1.7	1.8	1.9	0.0	.0	.1
831106	1.7	1.8	1.8	0.0	.0	.1
831107	1.7	1.8	1.9	0.0	.1	.2
831108	1.8	1.9	1.9	0.0	-----	.2
831109	1.8	1.9	2.0	-----	-----	-----
831110	1.8	1.9	2.0	-----	-----	-----
831111	1.9	1.9	2.0	-----	-----	-----
831112	1.9	2.0	2.0	-----	-----	-----
831113	1.9	1.9	2.0	-----	-----	-----
831114	1.9	1.9	2.0	-----	-----	-----
831115	1.9	1.9	2.0	-----	-----	-----
831116	1.8	1.9	2.0	0.0	-----	.1
831117	1.8	1.8	1.9	0.0	.1	.1
831118	1.8	1.8	1.9	0.0	.1	.2
831119	1.7	1.8	1.9	0.0	.1	.2
831120	1.7	1.7	1.8	0.0	.1	.2
831121	1.6	1.7	1.7	.1	.1	.3
831122	0.0	1.5	1.7	.1	.1	.3
831123	1.4	1.5	1.6	.1	.1	.2
831124	1.3	1.4	1.5	0.0	.1	.2
831125	1.3	1.4	1.5	0.0	.1	.2
831126	1.2	1.4	1.5	0.0	.1	.2
831127	-.1	1.0	1.3	.1	.1	.2
831128	.8	1.1	1.2	.1	.1	.2
831129	1.1	1.2	1.3	.1	.1	.2
831130	1.2	1.2	1.3	.1	.1	.2
Monthly Value	-.1	1.7	2.0	0.0	-----	.3

----- Data not available.

Appendix Table A-10 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
December 1983						
831201	1.2	1.2	1.3	.1	.1	.2
831202	1.2	1.2	1.3	.1	.2	.3
831203	1.1	1.2	1.3	.1	.1	.3
831204	1.1	1.2	1.3	.1	.1	.3
831205	1.2	1.2	1.3	.1	.1	.2
831206	1.1	1.2	1.3	.1	.1	.2
831207	1.1	1.2	1.2	.1	.1	.2
831208	1.1	1.1	1.2	.1	.1	.2
831209	1.0	1.1	1.2	0.0	.1	.4
831210	1.1	1.2	1.2	.1	.3	.4
831211	1.1	1.2	1.2	.1	.2	.5
831212	1.1	1.2	1.2	.1	.2	.4
831213	1.1	1.2	1.3	.2	.4	.5
831214	1.2	1.2	1.3	.2	.3	.5
831215	1.2	1.3	1.3	.3	.4	.6
831216	1.2	1.3	1.4	.3	.4	.6
831217	.1	-----	1.3	0.0	.2	.6
Monthly Value	.1	-----	1.4	0.0	-----	.6

----- Data not available.

Appendix Table A-10 (continued).

January 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840112	-----	-----	-----	0.0	-----	0.0
840113	-----	-----	-----	-.1	-.0	0.0
840114	-----	-----	-----	-.1	-.0	0.0
840115	-----	-----	-----	-.1	-.1	0.0
840116	-----	-----	-----	-.1	-.1	0.0
840117	-----	-----	-----	-.1	-.1	0.0
840118	-----	-----	-----	-.1	-.1	0.0
840119	-----	-----	-----	-.1	-.0	0.0
840120	-----	-----	-----	-.1	-.0	0.0
840121	-----	-----	-----	-.1	-.0	0.0
840122	-----	-----	-----	-.1	-.0	0.0
840123	-----	-----	-----	-.1	0.0	.1
840124	-----	-----	-----	-.1	0.0	.1
840125	-----	-----	-----	-.1	0.0	.1
840126	-----	-----	-----	-.1	0.0	0.0
840127	-----	-----	-----	-.1	0.0	0.0
840128	-----	-----	-----	-.1	0.0	0.0
840129	-----	-----	-----	-.1	0.0	0.0
840130	-----	-----	-----	-.1	0.0	0.0
840131	-----	-----	-----	-.1	0.0	0.0
Monthly Value	-----	-----	-----	-.1	-----	.1

----- Data not available.

Appendix Table A-10 (continued).

February 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840201	-----	-----	-----	-.1	0.0	.1
840202	-----	-----	-----	0.0	0.0	0.0
840203	-----	-----	-----	0.0	0.0	.1
840204	-----	-----	-----	-.1	0.0	0.0
840205	-----	-----	-----	0.0	0.0	0.0
840206	-----	-----	-----	0.0	0.0	.1
840207	-----	-----	-----	0.0	0.0	.1
840208	-----	-----	-----	0.0	0.0	.1
840209	-----	-----	-----	0.0	.0	.1
840210	-----	-----	-----	0.0	.0	.1
840211	-----	-----	-----	0.0	.0	.1
840212	-----	-----	-----	0.0	0.0	.1
840213	-----	-----	-----	0.0	0.0	.1
840214	-----	-----	-----	0.0	0.0	.1
840215	-----	-----	-----	0.0	0.0	.1
840216	-----	-----	-----	0.0	.0	.1
840217	-----	-----	-----	0.0	0.0	.1
840218	-----	-----	-----	0.0	0.0	.1
840219	-----	-----	-----	0.0	0.0	.1
840220	-----	-----	-----	0.0	.1	.1
840221	-----	-----	-----	0.0	0.0	.1
840222	-----	-----	-----	0.0	.0	.1
840223	-----	-----	-----	0.0	0.0	.1
840224	-----	-----	-----	0.0	0.0	.1
840225	-----	-----	-----	0.0	0.0	.1
840226	-----	-----	-----	0.0	.0	.1
840227	-----	-----	-----	0.0	0.0	.1
840228	-----	-----	-----	0.0	.0	.1
840229	-----	-----	-----	0.0	.0	.1
Monthly Value	-----	-----	-----	-.1	.0	.1

----- Data not available.

Appendix Table A-10 (continued).

March 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840301	-----	-----	-----	0.0	.0	.1
840302	-----	-----	-----	0.0	0.0	.1
840303	-----	-----	-----	0.0	.0	.1
840304	-----	-----	-----	0.0	0.0	.1
840305	.3	.4	.5	0.0	.0	.1
840306	.4	.5	.6	0.0	.0	.1
840307	.4	.5	.6	0.0	0.0	.1
840308	.2	.3	.6	0.0	.1	.1
840309	.2	.3	.5	0.0	.1	.1
840310	.1	.2	.3	0.0	.1	.1
840311	.2	-----	.4	0.0	-----	.1
840323	0.0	.2	.4	0.0	.1	.1
840324	.1	.1	.3	0.0	.1	.1
840325	0.0	.1	.3	0.0	.0	.1
840326	0.0	.1	.2	0.0	.0	.1
840327	0.0	.1	.2	0.0	.1	.1
840328	0.0	.1	.2	0.0	.1	.1
840329	0.0	.1	.2	0.0	0.0	.1
840330	0.0	.1	.1	0.0	.0	.1
840331	0.0	.0	.1	0.0	.1	.1
Monthly Value	0.0	-----	.6	0.0	-----	.1

----- Data not available.

Appendix Table A-10 (continued).

April 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840401	0.0	0.0	.1	0.0	.0	.1
840402	0.0	.1	.1	0.0	.1	.1
840403	-.1	.0	.2	0.0	.1	.1
840404	0.0	.0	.1	0.0	.1	.1
840405	-.1	0.0	.1	0.0	.1	.1
840406	0.0	.0	.2	0.0	.0	.1
840407	-.1	0.0	.1	0.0	.0	.1
840408	-.1	0.0	.1	0.0	.1	.1
840409	-.1	0.0	.1	0.0	.1	.1
840410	-.1	0.0	.1	0.0	.1	.1
840411	-.1	0.0	.1	0.0	.1	.1
840412	-.1	0.0	.1	0.0	.1	.1
840413	-.1	0.0	.1	0.0	.1	.1
840414	0.0	0.0	.1	0.0	.1	.1
840415	0.0	.0	.1	0.0	.1	.1
840416	0.0	.0	.1	0.0	.1	.1
840417	0.0	.0	.1	0.0	.1	.1
840418	0.0	.1	.2	0.0	.1	.2
840419	-.1	.1	.2	0.0	.1	.2
840420	0.0	.0	.1	0.0	.1	.2
840421	0.0	.1	.2	0.0	.1	.2
Monthly Value	-.1	.0	.2	0.0	.1	.2

Appendix Table A-11 Ryan temperature data summary: intragravel water temperatures (C) recorded at Mainstem Susitna River at RM 136.1, GC S31N02W19ADB.

October 1983			
DATE	Intragravel Water Temperature (C)		
	Min	Mean	Max
831001	2.0	———	3.0
831002	2.0	2.2	2.5
831003	1.0	1.7	2.0
831004	.5	.9	1.0
831005	0.0	.5	1.0
831006	0.0	.3	1.0
831007	0.0	0.0	0.0
831008	0.0	0.0	0.0
831009	0.0	0.0	0.0
831010	0.0	0.0	0.0
831011	0.0	0.0	0.0
831012	0.0	.3	.5
831013	0.0	.2	.5
831014	0.0	0.0	0.0
831015	0.0	0.0	0.0
831016	0.0	0.0	0.0
831017	0.0	0.0	0.0
831018	0.0	0.0	0.0
831019	0.0	0.0	0.0
831020	0.0	0.0	0.0
831021	0.0	0.0	0.0
831022	0.0	0.0	0.0
831023	0.0	0.0	0.0
831024	0.0	0.0	0.0
831025	0.0	0.0	0.0
831026	0.0	0.0	0.0
831027	0.0	0.0	0.0
831028	0.0	0.0	0.0
831029	0.0	0.0	0.0
831030	0.0	0.0	0.0
831031	0.0	0.0	0.0
Monthly Value	0.0	.2	3.0

——— Data not available.

Appendix Table A-11 (continued).

Date	November 1983		
	Intragravel Water Temperature (C)		
	Min	Mean	Max
831101	0.0	0.0	0.0
831102	0.0	0.0	0.0
831103	0.0	0.0	0.0
831104	0.0	0.0	0.0
831105	0.0	0.0	0.0
831106	0.0	0.0	0.0
831107	0.0	0.0	0.0
831108	0.0	0.0	0.0
831109	0.0	0.0	0.0
831110	0.0	.3	.5
831111	.5	.5	.5
831112	0.0	.0	.5
831113	0.0	.0	.5
831114	0.0	.0	.5
831115	0.0	0.0	0.0
831116	0.0	0.0	0.0
831117	0.0	0.0	0.0
831118	0.0	0.0	0.0
831119	0.0	0.0	0.0
831120	0.0	0.0	0.0
831121	0.0	0.0	0.0
831122	0.0	0.0	0.0
831123	0.0	0.0	0.0
831124	0.0	0.0	0.0
831125	0.0	0.0	0.0
831126	0.0	.3	.5
831127	0.0	.2	.5
831128	0.0	.2	.5
831129	0.0	.1	.5
831130	.5	.5	.5
Monthly Value	0.0	.1	.5

Appendix Table A-11 (continued).

DATE	December 1983 Intragravel Water Temperature (C)		
	Min	Mean	Max
831201	.5	.5	.5
831202	0.0	.3	.5
831203	0.0	0.0	0.0
831204	0.0	.0	.5
831205	.5	.5	.5
831206	0.0	.1	.5
831207	0.0	0.0	0.0
831208	0.0	0.0	0.0
831209	0.0	0.0	0.0
831210	0.0	0.0	0.0
831211	0.0	0.0	0.0
831212	0.0	0.0	0.0
831213	0.0	0.0	0.0
831214	0.0	0.0	0.0
831215	0.0	0.0	0.0
831216	0.0	0.0	0.0
831217	0.0	0.0	0.0
831218	0.0	0.0	0.0
831219	0.0	0.0	0.0
831220	0.0	0.0	0.0
831221	0.0	0.0	0.0
831222	0.0	0.0	0.0
831223	0.0	0.0	0.0
831224	0.0	0.0	0.0
831225	0.0	0.0	0.0
831226	0.0	0.0	0.0
831227	0.0	0.0	0.0
831228	0.0	0.0	0.0
831229	0.0	0.0	0.0
831230	0.0	0.0	0.0
831231	0.0	0.0	0.0
Monthly Value	0.0	.0	.5

Appendix Table A-11 (continued).

DATE	January 1984 Intragravel Water Temperature (C)		
	Min	Mean	Max
840101	0.0	0.0	0.0
840102	0.0	0.0	0.0
840103	0.0	0.0	0.0
840104	0.0	-----	0.0
Monthly Value	0.0	-----	0.0

----- Data not available.

Appendix Table A-12 Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Mainstem Susitna River at RM 136.1, GC S31N02W19ADB.

March 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840302	0.0	———	.1	-.1	———	0.0
840303	0.0	.1	.1	-.1	-.1	0.0
840304	0.0	.1	.1	-.1	-.1	0.0
840305	0.0	.1	.1	-.1	-.1	0.0
840306	0.0	.1	.1	-.1	-.1	0.0
840307	0.0	.1	.1	-.1	-.1	0.0
840308	0.0	.1	.1	-.1	-.1	0.0
840309	0.0	.1	.1	-.1	-.0	0.0
840310	0.0	.1	.1	-.1	-.1	0.0
840311	0.0	.1	.1	-.1	-.1	0.0
840312	0.0	.1	.1	-.2	-.1	0.0
840313	0.0	.1	.2	-.1	-.1	0.0
840314	0.0	.1	.1	-.1	-.1	0.0
840315	0.0	.1	.2	-.1	-.1	0.0
840316	0.0	.1	.1	-.1	-.1	0.0
840317	0.0	.1	.2	-.1	-.1	0.0
840318	0.0	.1	.2	-.2	-.1	0.0
840319	0.0	.1	.1	-.2	-.1	0.0
840320	0.0	.1	.1	-.2	-.1	0.0
840321	0.0	.1	.1	-.1	-.1	0.0
840322	0.0	.1	.1	-.1	-.1	0.0
840323	0.0	.1	.1	-.1	-.1	0.0
840324	0.0	.1	.1	-.1	-.1	0.0
840325	0.0	.1	.2	-.1	-.1	0.0
840326	0.0	.1	.2	-.1	-.1	0.0
840327	0.0	.1	.2	-.1	-.0	0.0
840328	0.0	.1	.2	0.0	.0	.1
840329	0.0	.1	.1	0.0	.1	.2
840330	0.0	.1	.2	0.0	.1	.2
840331	0.0	.1	.1	.1	.1	.2
Monthly Value	0.0	.1	.2	-.2	-.1	.2

——— Data not available.

Appendix Table A-12 (continued).

April 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840401	0.0	.1	.1	.1	.1	.2
840402	0.0	.1	.1	.1	.1	.2
840403	0.0	.1	.2	.1	.1	.2
840404	0.0	.1	.2	.1	.2	.3
840405	0.0	.1	.1	.1	.2	.3
840406	0.0	.1	.1	.2	.2	.3
840407	0.0	.1	.1	.2	.2	.3
840408	0.0	.1	.1	.2	.2	.3
840409	0.0	.1	.2	.2	.2	.4
840410	0.0	.1	.1	.2	.3	.4
840411	0.0	.1	.2	.3	.4	.5
840412	0.0	.1	.2	.3	.5	.6
840413	0.0	.1	.2	.4	.5	.6
840414	0.0	.1	.2	.5	.7	.7
840415	0.0	.1	.2	.6	.7	.9
840416	.1	.1	.1	.8	1.0	1.0
840417	0.0	.1	.2	1.0	1.1	1.2
840418	.1	.1	.2	1.0	1.2	1.3
840419	.1	.1	.2	1.1	1.2	1.3
840420	.1	.1	.2	1.1	1.2	1.4
840421	0.0	.1	.2	1.1	1.2	1.4
840422	.1	.1	.2	1.1	1.2	1.3
840423	.1	.1	.2	1.1	1.2	1.4
840424	.1	.1	.2	1.0	1.2	1.4
840425	.1	.2	.3	1.1	1.2	1.5
840426	.1	.2	.3	1.0	1.3	1.6
840427	.1	.2	.3	1.1	1.3	1.7
840428	.2	.3	.5	1.1	1.5	2.4
840429	.3	.5	.8	1.1	1.7	2.9
840430	.4	.5	.7	1.2	1.7	2.5
Monthly Value	0.0	.1	.8	.1	.8	2.9

Appendix Table A-12 (continued).

May 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840501	.4	.6	.9	1.1	1.9	3.1
840502	.5	.7	1.0	1.4	2.0	3.2
840503	.5	-----	.9	1.1	-----	1.9
Monthly Value	.4	-----	1.0	1.1	-----	3.2

----- Data not available.

Appendix Table A-13 Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Mainstem Susitna River at LRX 57 - Site 1, RM 142.3, GC S32N02W36CBA.

August 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
830824	8.5	8.8	9.0	8.2	8.5	8.8
830825	7.9	8.2	8.6	7.4	7.7	8.4
830826	7.2	7.6	8.0	6.6	7.2	7.8
830827	7.8	8.0	8.5	7.4	7.8	8.7
830828	8.5	8.7	9.1	8.2	8.8	9.4
830829	9.1	9.3	9.4	8.9	9.1	9.6
830830	9.2	9.2	9.3	8.8	9.0	9.1
830831	8.8	9.1	9.4	8.1	8.5	9.0
Monthly Value	7.2	-----	9.4	6.6	-----	9.6

----- Data not available.

Appendix Table A-13 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
			September 1983			
830901	8.2	8.5	8.8	7.3	7.7	8.1
830902	8.2	8.3	8.4	7.4	7.6	7.9
830903	7.7	8.1	8.5	6.7	7.1	7.8
830904	7.2	7.5	7.8	5.8	6.4	6.8
830905	6.9	7.1	7.3	5.6	5.9	6.3
830906	6.7	6.9	7.0	5.2	5.6	5.9
830907	6.6	6.7	6.9	5.2	5.4	5.6
830908	6.7	7.0	7.5	5.2	5.9	6.4
830909	7.4	-----	7.5	6.3	-----	6.4
Monthly Value	6.6	-----	8.8	5.2	-----	8.1

----- Data not available.

Appendix Table A-14. Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Mainstem Susitna River at LRX 57 - Site 2, RM 142.3, GC S32N02W36CBA.

September 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
830913	7.6	7.8	8.0	6.5	6.6	6.8
830914	6.6	7.1	7.7	5.4	5.9	6.6
830915	6.4	6.7	7.1	5.2	5.5	5.9
830916	6.0	6.4	6.9	4.7	5.1	5.7
830917	5.7	6.0	6.2	4.4	4.6	4.9
830918	5.3	5.5	5.8	3.9	4.2	4.5
830919	5.2	5.5	6.0	3.8	4.2	4.6
830920	5.8	6.1	6.7	4.4	4.7	5.3
830921	6.7	7.1	7.5	5.2	5.6	6.0
830922	7.3	7.5	7.6	5.8	6.0	6.1
830923	5.3	6.6	7.5	3.7	5.0	5.9
830924	2.3	3.7	5.4	.6	2.1	3.7
830925	1.6	1.7	2.4	-.1	.1	.6
830926	1.6	1.6	1.7	-.1	-.0	0.0
830927	1.7	1.7	1.8	-.1	0.0	0.0
830928	1.7	1.8	1.8	0.0	0.0	0.0
830929	.5	1.7	2.5	-.1	.4	1.1
830930	.9	1.4	2.1	1.0	1.6	2.3
Monthly Value	.5	-----	8.0	-.1	-----	6.8

----- Data not available.

Appendix Table A-14 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
October 1983						
831001	2.0	2.3	2.5	2.3	2.5	2.7
831002	2.2	2.4	2.7	2.4	2.6	2.8
831003	1.8	2.2	2.7	1.9	2.2	2.8
831004	.7	1.2	1.8	.7	1.2	1.9
831005	.2	.5	.7	.1	.5	.7
831006	.2	.6	.9	.1	.5	.9
831007	.1	.3	.6	-.1	.1	.6
831008	.2	.3	.4	-.1	0.0	.1
831009	.3	.4	.4	0.0	.0	.1
831010	.3	.4	.4	-.1	0.0	.1
831011	.3	.3	.4	-.1	0.0	0.0
831012	.4	.9	1.5	0.0	.6	1.2
831013	.5	1.2	1.5	.1	.9	1.2
831014	2.4	2.7	3.4	-.1	.3	1.0
831015	2.4	2.4	2.5	-.1	0.0	.1
831016	2.4	2.5	2.6	-.1	0.0	.1
831017	2.5	2.6	2.8	-.1	0.0	.1
831018	2.6	2.6	2.8	-.1	0.0	0.0
831019	2.6	2.7	2.9	-.1	.0	.2
831020	2.6	2.7	2.8	-.1	.0	.1
831021	2.7	2.8	3.0	0.0	.0	.1
831022	2.9	3.0	3.0	0.0	.1	.2
831023	2.9	3.0	3.2	0.0	.1	.3
831024	3.2	3.6	3.9	.1	-----	.4
831025	3.2	3.6	3.9	-----	-----	-----
831026	3.5	3.7	4.0	-----	-----	-----
831027	2.8	3.2	3.8	-----	-----	-----
831028	3.3	3.6	4.0	-----	-----	-----
831029	3.0	3.4	4.0	-----	-----	-----
831030	3.5	3.7	3.9	-----	-----	-----
831031	3.7	3.8	4.1	-----	-----	-----
Monthly Value	.1	2.2	4.1	-.1	.5	2.8

----- Data not available.

Appendix Table A-14 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
	November 1983					
831101	4.0	4.2	4.5	-----	-----	-----
831102	3.2	3.8	4.2	-.1	-----	.1
831103	3.1	3.2	3.3	0.0	0.0	.1
831104	3.2	3.3	3.3	0.0	0.0	.1
831105	3.2	3.3	3.4	0.0	0.0	.1
831106	3.3	3.3	3.4	0.0	0.0	0.0
831107	3.3	3.4	3.5	0.0	.0	.1
831108	3.4	3.5	3.5	0.0	0.0	.1
831109	3.4	3.5	3.6	0.0	0.0	.2
831110	3.4	3.5	3.5	0.0	0.0	.1
831111	3.5	3.5	3.5	0.0	.0	.1
831112	3.5	3.5	3.6	0.0	.0	.1
831113	3.5	3.5	3.6	0.0	.0	.1
831114	3.6	3.6	3.7	0.0	.1	.3
831115	3.6	3.7	3.9	.1	.2	.5
831116	3.6	3.8	4.0	0.0	.3	.6
831117	3.6	3.7	3.7	0.0	.1	.2
831118	3.6	3.7	3.9	0.0	.2	.4
831119	3.8	3.9	3.9	.3	.4	.4
831120	3.7	3.8	3.8	.2	.2	.4
831121	3.6	3.7	3.8	0.0	.1	.2
831122	3.7	3.7	3.7	0.0	.1	.1
831123	3.6	3.7	3.8	0.0	.0	.1
831124	3.6	3.7	3.8	0.0	.0	.1
831125	3.7	3.7	3.8	0.0	0.0	.1
831126	3.7	3.7	3.8	0.0	0.0	.1
831127	3.7	3.7	3.9	0.0	0.0	.1
831128	3.8	3.8	3.9	0.0	.0	.1
831129	3.8	3.8	3.9	0.0	0.0	.1
831130	3.8	3.8	3.9	0.0	0.0	.1
Monthly Value	3.1	3.6	4.5	-.1	.1	.6

----- Data not available.

Appendix Table A-14 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
December 1983						
831201	3.8	3.8	3.9	0.0	0.0	.1
831202	3.8	3.9	3.9	0.0	.0	.1
831203	3.8	3.8	3.9	0.0	.0	.1
831204	3.8	3.8	3.9	0.0	.0	.1
831205	3.8	3.8	3.9	0.0	0.0	.1
831206	3.8	3.9	3.9	0.0	0.0	.1
831207	3.8	3.8	3.9	0.0	0.0	.1
831208	3.8	3.8	3.9	0.0	.0	.1
831209	3.8	3.9	3.9	0.0	.1	.1
831210	3.8	3.9	3.9	0.0	.0	.1
831211	3.8	3.8	3.9	0.0	0.0	.1
831212	3.8	3.8	3.9	0.0	.0	.1
831213	3.8	3.8	3.9	0.0	.0	.1
831214	3.8	3.8	3.9	0.0	.1	.1
831215	3.5	3.7	3.9	0.0	.1	.1
831216	3.3	3.4	3.5	0.0	.1	.1
831217	3.3	3.3	3.4	0.0	.0	.1
831218	3.3	3.5	3.5	0.0	0.0	.1
831219	3.4	3.5	3.5	0.0	0.0	.1
831220	3.4	3.5	3.6	0.0	0.0	.1
831221	3.3	3.6	3.7	0.0	0.0	.1
831222	3.5	3.6	3.7	0.0	.0	.1
831223	3.3	3.4	3.5	0.0	.0	.1
831224	3.2	3.2	3.3	0.0	.0	.1
831225	3.1	3.2	3.3	0.0	0.0	.1
831226	3.1	3.3	3.6	0.0	0.0	.1
831227	3.5	3.7	3.8	0.0	.0	.1
831228	3.7	3.8	3.8	0.0	.0	.1
831229	3.7	3.8	3.8	0.0	.1	.1
831230	3.7	3.8	3.8	0.0	.1	.2
831231	3.7	3.8	3.8	0.0	.0	.1
Monthly Value	3.1	3.7	3.9	0.0	.0	.2

Appendix Table A-14 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
	January 1984					
840101	3.7	3.8	3.8	0.0	0.0	.1
840102	3.7	3.8	3.8	0.0	0.0	0.0
840103	3.7	3.7	3.8	0.0	0.0	.1
840104	3.7	3.8	3.8	0.0	0.0	.1
840105	3.8	3.8	3.9	0.0	.0	.1
840106	3.7	3.8	3.8	0.0	.0	.1
840107	3.7	3.8	3.8	0.0	0.0	.1
840108	3.7	3.8	3.8	0.0	0.0	.1
840109	3.7	3.7	3.8	0.0	0.0	.1
840110	3.1	3.8	3.8	0.0	0.0	.1
840111	3.1	3.7	3.8	0.0	0.0	0.0
840112	3.1	3.8	3.8	0.0	0.0	0.0
840113	3.1	3.7	3.8	0.0	0.0	.1
840114	3.1	3.7	3.8	0.0	0.0	.1
840115	3.1	3.7	3.8	0.0	0.0	.1
840116	3.2	3.7	3.8	0.0	0.0	.1
840117	3.1	3.7	3.8	0.0	0.0	.1
840118	3.1	3.7	3.8	0.0	0.0	0.0
840119	3.2	3.8	3.8	0.0	0.0	.1
840120	3.2	3.8	3.8	0.0	.0	.1
840121	3.2	3.8	3.8	0.0	.0	.1
840122	3.2	3.8	3.8	0.0	.0	.1
840123	3.2	3.8	3.8	0.0	.1	.1
840124	3.1	3.8	3.9	0.0	0.0	.1
840125	3.2	3.8	3.8	0.0	.0	.1
840126	3.2	3.8	3.8	0.0	0.0	.1
840127	3.2	3.8	3.9	0.0	.0	.1
840128	3.2	3.8	3.8	0.0	.0	.1
840129	3.2	3.7	3.8	0.0	0.0	.1
840130	3.3	3.8	3.8	0.0	0.0	0.0
840131	3.3	3.8	3.8	0.0	0.0	.1
Monthly Value	3.1	3.8	3.9	0.0	.0	.1

Appendix Table A-14 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
February 1984						
840201	3.2	3.8	3.8	0.0	0.0	.1
840202	3.2	3.7	3.8	0.0	.0	.1
840203	3.2	3.7	3.9	0.0	.0	.1
840204	3.3	3.7	3.8	0.0	0.0	.1
840205	3.2	3.7	3.8	0.0	0.0	0.0
840206	3.2	3.8	3.8	0.0	0.0	.1
840207	3.2	3.7	3.8	0.0	0.0	.1
840208	3.2	3.8	3.8	0.0	.0	.1
840209	3.3	3.8	3.8	0.0	.0	.1
840210	3.2	3.8	3.8	0.0	.0	.1
840211	3.2	3.7	3.8	0.0	.0	.1
840212	3.2	3.7	3.8	0.0	0.0	.1
840213	3.2	3.7	3.8	0.0	.0	.1
840214	3.2	3.7	3.7	0.0	0.0	.1
840215	3.2	3.7	3.7	0.0	0.0	.1
840216	3.2	3.7	3.7	0.0	0.0	.1
840217	3.2	3.7	3.7	0.0	0.0	.1
840218	3.2	3.6	3.7	0.0	0.0	.1
840219	3.2	3.6	3.7	-.1	0.0	.1
840220	3.2	3.7	3.7	0.0	0.0	.1
840221	3.1	3.6	3.7	0.0	.0	.1
840222	3.2	3.6	3.7	0.0	0.0	.1
840223	3.2	3.6	3.7	0.0	0.0	.1
840224	3.1	3.6	3.7	0.0	0.0	.1
840225	3.1	3.6	3.7	0.0	0.0	.1
840226	3.2	3.6	3.7	0.0	0.0	.1
840227	3.2	3.6	3.7	0.0	.0	.1
840228	3.2	3.6	3.7	0.0	0.0	.1
840229	3.4	3.6	3.7	0.0	0.0	.1
Monthly Value	3.1	3.7	3.9	-.1	.0	.1

Appendix Table A-14 (continued).

Date	March 1984					
	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840301	3.4	3.6	3.7	0.0	.0	.1
840302	3.4	3.6	3.7	0.0	0.0	.1
840303	3.4	3.6	3.7	0.0	.0	.1
840304	3.4	3.6	3.7	0.0	0.0	.1
840305	3.4	3.5	3.6	0.0	0.0	.1
840306	3.4	3.5	3.6	0.0	0.0	.1
840307	3.4	3.6	3.6	0.0	0.0	.1
840308	3.4	3.5	3.6	0.0	0.0	.1
840309	3.4	3.5	3.6	0.0	0.0	.1
840310	3.4	3.5	3.6	0.0	0.0	.1
840311	3.4	3.6	3.6	0.0	0.0	.1
840312	3.4	3.6	3.6	0.0	0.0	.1
840313	3.4	3.6	3.6	0.0	0.0	.1
840314	3.4	3.5	3.6	0.0	0.0	.1
840315	3.4	3.6	3.6	0.0	0.0	.1
840316	3.4	3.6	3.6	0.0	0.0	.1
840317	3.4	3.6	3.6	0.0	0.0	.1
840318	3.4	3.5	3.6	0.0	0.0	.1
840319	3.4	3.6	3.6	0.0	0.0	.1
840320	3.4	3.5	3.6	0.0	0.0	.1
840321	3.4	3.5	3.6	0.0	0 0	.1
840322	3.4	3.5	3.6	0.0	0.0	.1
840323	3.4	3.5	3.6	0.0	0.0	.1
840324	3.3	3.5	3.6	0.0	0.0	.1
840325	3.4	3.5	3.6	0.0	0.0	.1
840326	3.4	3.5	3.6	0.0	0.0	.1
840327	3.4	3.5	3.6	0.0	0.0	.1
840328	3.4	3.5	3.6	0.0	0.0	.1
840329	3.4	3.5	3.6	0.0	0.0	.1
840330	3.4	3.5	3.6	0.0	0.0	.1
840331	3.4	3.5	3.6	0.0	0.0	.1
Monthly Value	3.3	3.6	3.7	0.0	.0	.1

Appendix Table A-14 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
			April 1984			
840401	3.4	3.5	3.6	0.0	0.0	.1
840402	3.4	3.5	3.6	0.0	0.0	.1
840403	3.4	3.5	3.6	0.0	0.0	.1
840404	3.2	3.5	3.6	-.1	0.0	.1
840405	3.4	3.5	3.6	0.0	0.0	.1
840406	3.4	3.5	3.6	0.0	0.0	.1
840407	3.3	3.5	3.6	0.0	0.0	.1
840408	3.4	3.5	3.6	0.0	0.0	.1
840409	3.4	3.5	3.6	0.0	.0	.1
840410	3.4	3.5	3.6	0.0	.0	.1
840411	3.3	3.5	3.6	0.0	0.0	.1
840412	3.3	3.5	3.5	0.0	0.0	.1
840413	3.3	3.5	3.6	0.0	.0	.1
840414	3.3	3.5	3.6	0.0	.0	.1
840415	3.3	3.5	3.6	0.0	.0	.1
840416	3.4	3.5	3.5	0.0	0.0	.1
840417	3.3	3.5	3.5	0.0	0.0	.1
840418	3.4	3.5	3.6	0.0	.0	.1
840419	3.4	3.5	3.6	0.0	0.0	.1
840420	3.4	3.5	3.6	0.0	0.0	.1
840421	3.3	3.5	3.6	-.1	0.0	.1
840422	3.3	3.5	3.6	0.0	0.0	.1
840423	3.4	3.5	3.6	0.0	0.0	.1
840424	3.4	3.6	3.7	0.0	0.0	.1
840425	3.5	3.6	3.7	0.0	0.0	.1
840426	3.5	3.7	3.7	0.0	0.0	.1
840427	3.5	3.7	3.8	0.0	0.0	.1
840428	3.5	3.7	3.8	0.0	0.0	.1
840429	3.5	3.8	3.9	-.1	0.0	.1
840430	3.5	3.8	3.9	0.0	0.0	.1
Monthly Value	3.2	3.6	3.9	-.1	.0	.1

Appendix Table A-14 (continued).

May 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840501	3.5	3.9	3.9	0.0	0.0	.1
840502	3.5	3.9	4.0	0.0	0.0	.1
840503	3.5	4.0	4.0	0.0	0.0	.1
840504	3.5	4.0	4.1	0.0	0.0	.1
840505	3.6	4.1	4.1	0.0	0.0	.1
840506	3.6	4.1	4.1	-.1	0.0	.1
840507	3.6	4.1	4.1	0.0	0.0	.1
840508	3.6	4.1	4.1	0.0	0.0	.1
840509	3.6	4.2	4.5	0.0	.1	.5
840510	3.6	4.1	4.2	-.1	0.0	.1
840511	3.6	4.1	4.4	0.0	.0	.3
840512	3.6	4.1	4.3	0.0	.0	.3
840513	3.7	4.6	5.7	.1	.7	1.9
840514	4.1	5.2	6.5	.2	1.3	2.6
840515	3.9	4.9	5.9	.2	1.0	2.1
840516	3.9	4.9	6.1	-.1	.9	2.3
840517	4.2	5.4	6.6	.5	1.5	2.8
840518	4.5	5.4	6.4	.5	1.5	2.6
840519	4.6	5.6	6.6	.8	1.7	2.8
840520	4.8	6.2	8.3	.9	2.5	4.6
840521	7.9	8.6	9.0	4.6	5.0	5.5
840522	8.5	8.8	9.4	4.9	5.3	6.3
840523	8.1	8.6	9.1	-----	-----	-----
Monthly Value	3.5	5.0	9.4	-.1	.9	6.3

----- Data not available.

Appendix Table A-15. Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Side Channel 10 - Site 1, RM 134.0, GC S31N03W31BBB.

August 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
830824	4.7	4.8	5.0	8.7	9.0	9.3
830825	4.7	4.9	5.0	8.0	8.3	8.8
830826	4.7	4.8	5.0	7.3	7.9	8.3
830827	4.9	5.0	5.1	8.0	8.5	9.2
830828	4.7	4.9	5.0	8.8	9.4	9.9
830829	4.7	4.8	4.9	9.4	9.7	10.0
830830	4.6	4.7	4.8	9.4	9.6	10.3
830831	4.7	4.8	4.8	8.5	8.8	9.4
Monthly Value	4.6	-----	5.1	7.3	-----	10.3

----- Data not available.

Appendix Table A-15. (continued).

September 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
830901	4.6	4.7	4.8	8.6	8.8	9.1
830902	4.6	4.7	4.7	8.4	8.7	9.1
830903	4.4	4.6	4.7	7.8	8.2	8.7
830904	4.2	4.3	4.5	7.2	7.6	8.2
830905	4.0	4.2	4.5	5.9	8.2	12.1
830906	3.9	4.2	4.6	5.2	8.3	12.8
830907	4.0	4.2	4.5	5.6	7.9	11.8
830908	4.2	4.3	4.4	7.4	8.5	9.8
830909	4.2	4.4	4.6	7.5	8.9	12.6
830910	4.2	4.4	4.7	7.5	9.0	13.2
830911	4.3	4.4	4.6	7.1	8.1	10.2
830912	4.2	4.4	4.5	7.2	8.5	10.9
830913	4.2	4.4	4.5	7.1	8.2	10.5
830914	4.2	4.4	4.5	6.5	7.3	8.1
830915	4.2	4.4	4.6	6.4	7.9	11.8
830916	4.1	4.4	4.7	4.9	7.3	11.5
830917	4.1	4.4	4.7	4.7	7.0	11.2
830918	4.1	4.4	4.6	4.7	6.7	10.4
830919	4.2	4.4	4.6	5.1	6.8	9.0
830920	4.4	4.5	4.5	6.8	7.3	8.2
830921	4.5	4.5	4.7	7.1	7.9	9.7
830922	4.5	4.6	4.6	6.8	7.9	9.3
830923	4.3	4.4	4.6	4.7	6.4	8.7
830924	4.1	4.2	4.4	3.2	4.3	5.7
830925	4.0	4.1	4.3	3.2	4.5	7.4
830926	4.0	4.1	4.3	3.1	4.6	7.6
830927	4.0	4.2	4.3	3.1	4.6	7.0
830928	4.1	4.2	4.3	4.1	5.0	6.0
830929	4.2	4.2	4.3	4.5	5.2	5.7
830930	4.2	4.3	4.4	5.2	6.1	8.0
Monthly Value	3.9	4.3	4.8	3.1	7.2	13.2

Appendix Table A-15 (continued).

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October 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831001	4.2	4.3	4.4	6.1	6.8	8.5
831002	4.2	4.3	4.3	6.0	6.8	8.8
831003	4.1	4.2	4.3	4.6	5.9	8.3
831004	4.0	4.1	4.3	4.0	5.4	8.3
831005	4.0	4.1	4.2	3.6	5.2	6.3
831006	4.0	4.1	4.3	3.6	5.3	8.3
831007	3.9	4.1	4.2	3.2	4.1	6.8
831008	3.9	4.0	4.2	2.6	3.9	6.4
831009	3.9	4.0	4.0	2.2	3.3	4.3
831010	3.7	3.8	3.9	1.9	2.7	4.0
831011	3.8	4.0	4.1	4.0	4.8	6.5
831012	4.0	4.1	4.1	4.7	5.1	5.9
831013	3.9	4.0	4.1	2.3	4.7	6.2
831014	3.9	4.0	4.1	3.3	4.0	5.7
831015	3.9	4.0	4.0	3.5	4.4	5.5
831016	3.8	3.9	4.0	3.0	4.1	5.7
831017	3.8	3.9	4.0	3.1	4.1	6.0
831018	3.8	3.9	4.0	4.0	5.1	7.9
831019	3.7	3.8	3.9	2.6	4.1	5.1
831020	3.6	3.6	3.7	.8	2.7	3.5
831021	3.6	3.6	3.7	.9	2.0	3.5
831022	3.5	3.6	3.7	.9	2.0	3.6
831023	3.4	3.5	3.6	.2	.9	2.3
831024	3.3	3.4	3.5	.2	.5	1.4
831025	3.2	3.4	3.4	.2	.5	1.1
831026	3.2	3.3	3.3	.2	.6	1.9
831027	3.1	3.2	3.3	.3	.6	1.4
831028	3.1	3.1	3.2	.4	.9	1.6
831029	3.0	3.1	3.2	.3	.7	1.1
831030	3.0	3.0	3.1	.5	.8	1.4
831031	3.0	3.0	3.1	.3	.7	1.0
Monthly Value	3.0	3.7	4.4	.2	3.3	8.8

Appendix Table A-15 (continued).

November 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831101	2.9	3.0	3.0	.4	.7	1.4
831102	2.9	3.0	3.0	.7	1.1	1.9
831103	2.8	2.9	3.0	.5	.8	1.6
831104	2.8	2.8	2.9	.4	.6	.8
831105	2.7	2.8	2.8	.4	.7	1.0
831116	.4	-----	.4	-----	-----	-----
831117	-.1	.2	.4	-----	-----	-----
831118	*****	*****	*****	-----	-----	-----
831119	*****	*****	*****	-----	-----	-----
831120	*****	*****	*****	-----	-----	-----
831121	*****	*****	*****	-----	-----	-----
831122	*****	*****	*****	-----	-----	-----
831123	*****	*****	*****	-----	-----	-----
831124	*****	*****	*****	-----	-----	-----
831125	*****	*****	*****	-----	-----	-----
831126	*****	*****	*****	-----	-----	-----
831127	*****	*****	*****	-----	-----	-----
831128	*****	*****	*****	-----	-----	-----
831129	*****	*****	*****	-----	-----	-----
831130	*****	*****	*****	-----	-----	-----
Monthly Value	-.1	-----	3.0	.4	-----	1.9

----- Data not available.
***** Data available; site frozen.

Appendix Table A-16 Datapod temperature recorder data summary: intragravel water temperatures (C) recorded at Side Channel 10 - Site 1 when the site was frozen, RM 134.0, GC S31N03W31BBB.

November 1983 (Site frozen)

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831118	-.2	-.1	0.0	-----	-----	-----
831119	-1.0	-.6	-.2	-----	-----	-----
831120	-1.4	-1.2	-.9	-----	-----	-----
831121	-.9	-.6	-.3	-----	-----	-----
831122	-.3	-.2	-.1	-----	-----	-----
831123	-.3	-.2	-.1	-----	-----	-----
831124	-1.9	-.0	-.3	-----	-----	-----
831126	-3.0	-2.7	-2.4	-----	-----	-----
831127	-2.5	-2.3	-1.9	-----	-----	-----
831130	-1.7	-----	-1.4	-----	-----	-----
Monthly Value	-3.0	-----	0.0	-----	-----	-----

----- Data not available.

Appendix Table A-17. Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Side Channel 10 - Site 2, RM 134.0, GC S31N03W31BBB.

November 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831116	-----	-----	-----	1.1	-----	1.3
831117	-----	-----	-----	1.2	1.5	1.6
831118	-----	-----	-----	1.4	1.6	1.7
831119	-----	-----	-----	1.4	1.6	1.7
831120	-----	-----	-----	1.3	1.5	1.6
831121	-----	-----	-----	1.5	1.6	1.7
831122	-----	-----	-----	1.6	1.8	1.9
831123	-----	-----	-----	1.7	1.9	2.1
831124	-----	-----	-----	1.8	1.9	2.0
831125	-----	-----	-----	1.7	1.9	2.0
831126	-----	-----	-----	1.7	1.9	2.0
831127	-----	-----	-----	1.8	1.9	2.0
831128	-----	-----	-----	1.8	2.0	2.1
831129	-----	-----	-----	1.9	2.1	2.2
831130	3.4	-----	3.5	1.9	2.2	2.3
Monthly Value	3.4	-----	3.5	1.1	-----	2.3

----- Data not available.

Appendix Table A-17 (continued).

December 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831201	3.4	3.5	3.5	2.0	2.2	2.3
831202	3.4	3.4	3.5	1.9	2.2	2.3
831203	3.4	3.4	3.5	1.9	2.2	2.2
831204	3.4	3.4	3.5	1.9	2.1	2.2
831205	3.4	3.4	3.4	1.8	2.0	2.1
831206	3.3	3.4	3.4	1.7	2.0	2.1
831207	3.3	3.3	3.4	1.7	2.0	2.0
831208	3.3	3.3	3.4	1.5	1.8	2.0
831209	3.2	3.3	3.4	1.3	1.5	1.7
831210	3.2	3.3	3.3	1.2	1.3	1.4
831211	3.2	3.2	3.3	1.2	1.3	1.4
831212	3.1	3.2	3.3	.8	1.2	1.5
831213	3.1	3.1	3.2	.8	1.0	1.1
831214	3.0	3.1	3.2	.7	1.0	1.2
831215	2.9	3.0	3.1	.1	-----	.7
831216	2.6	2.7	2.9	*****	*****	*****
831217	2.5	2.5	2.6	*****	*****	*****
831218	2.5	2.5	2.6	0.0	*****	.2
831219	2.5	2.6	2.7	.1	.5	1.2
831220	2.6	2.7	2.8	1.1	1.4	1.7
831221	2.8	2.9	3.0	1.6	1.7	1.9
831222	2.9	3.0	3.1	1.7	1.9	1.9
831223	3.0	3.1	3.1	1.7	1.9	1.9
831224	3.0	3.1	3.1	1.7	1.8	1.9
831225	2.9	3.0	3.1	1.7	1.8	1.9
831226	2.9	3.0	3.0	1.7	1.8	1.9
831227	2.9	3.0	3.0	1.7	1.8	1.9
831228	2.9	3.0	3.0	1.7	1.8	1.9
831229	2.7	2.9	2.9	1.6	1.7	1.8
831230	2.4	2.5	2.7	1.2	1.5	1.7
831231	2.0	2.2	2.4	1.0	1.3	1.4
Monthly Value	2.0	3.0	3.5	0.0	1.6	2.3

----- Data not available.
***** Data available; site frozen.

Appendix Table A-17 (continued).

January 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840101	1.8	1.9	2.0	1.2	1.3	1.4
840102	1.8	1.8	1.9	1.3	1.4	1.5
840103	1.8	1.9	1.9	1.3	1.5	1.6
840104	1.8	1.9	2.0	1.4	1.5	1.6
840105	1.9	2.0	2.1	1.4	1.5	1.6
840106	2.1	2.2	2.2	1.5	1.6	1.7
840107	2.2	2.3	2.4	1.5	1.6	1.7
840108	2.4	2.5	2.6	1.6	1.7	1.7
840109	2.6	2.7	2.7	1.6	1.6	1.7
840110	2.7	2.7	2.8	1.5	1.6	1.7
840111	2.6	2.7	2.8	1.3	1.5	1.6
840112	2.5	2.6	2.6	1.3	1.4	1.5
840113	2.5	2.6	2.6	1.3	1.4	1.5
840114	2.4	2.5	2.5	1.3	1.4	1.4
840115	2.4	2.5	2.5	1.3	1.4	1.4
840116	2.4	2.4	2.4	1.2	1.3	1.3
840117	2.3	2.4	2.4	1.1	1.2	1.3
840118	2.3	2.4	2.4	1.0	1.1	1.2
840119	2.3	2.4	2.4	.7	1.0	1.2
840120	2.2	2.2	2.3	.7	.8	.9
840121	2.1	2.2	2.3	.8	.9	1.0
840122	2.1	2.2	2.2	.8	.9	1.0
840123	2.1	2.2	2.3	.8	.9	1.0
840124	2.2	2.2	2.3	.8	1.0	1.0
840125	2.2	2.2	2.3	.8	1.0	1.0
840126	2.2	2.2	2.3	.7	.9	1.0
840127	2.1	2.2	2.3	.7	.8	1.0
840128	2.2	2.2	2.3	.6	.7	.9
840129	2.2	2.2	2.3	.6	.7	.8
840130	2.2	2.2	2.3	.7	.8	.9
840131	2.1	2.2	2.2	.9	1.0	1.0
Monthly Value	1.8	2.3	2.8	.6	1.2	1.7

February 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840201	2.1	2.1	2.2	.7	.9	1.1
840202	2.2	2.2	2.3	.8	1.0	1.1
840203	2.2	2.2	2.3	.9	1.0	1.1
840204	2.2	2.4	2.5	.7	.9	1.1
840205	2.4	2.4	2.5	.9	1.1	1.3
840206	2.5	2.6	2.7	1.2	1.3	1.5
840207	2.7	2.8	2.9	1.2	1.4	1.5
840208	2.9	3.0	3.0	1.4	1.5	1.5
840209	3.0	3.1	3.2	1.4	1.5	1.5
840210	3.1	3.2	3.2	1.2	1.4	1.5
840211	3.2	3.3	3.4	1.1	1.2	1.4
840212	3.3	3.3	3.4	1.1	1.2	1.5
840213	3.3	3.4	3.4	1.1	1.3	1.5
840214	3.4	3.4	3.5	.9	1.3	1.6
840215	3.4	3.4	3.5	.7	.9	1.1
840216	3.4	3.5	3.5	.8	1.0	1.4
840217	3.4	3.5	3.5	1.0	1.3	1.6
840218	3.4	3.5	3.5	.9	1.3	1.7
840219	3.4	3.5	3.5	.7	1.1	1.8
840220	3.4	3.5	3.5	.7	.9	1.3
840221	3.4	3.5	3.5	.8	1.0	1.6
840222	3.4	3.5	3.5	.8	1.1	1.6
840223	3.4	3.5	3.5	.9	1.3	1.8
840224	3.4	3.5	3.5	.9	1.2	1.7
840225	3.4	3.5	3.5	.9	1.3	2.0
840226	3.4	3.4	3.5	.6	1.0	1.9
840227	3.4	3.4	3.5	.4	.9	1.7
840228	3.4	3.5	3.5	.4	.9	1.8
840229	3.4	3.4	3.5	.4	.9	1.9
Monthly Value	2.1	3.1	3.5	.4	1.1	2.0

Appendix Table A-17 (continued).

March 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840301	3.4	3.4	3.5	.4	.9	1.9
840302	3.4	3.5	3.5	.7	1.2	2.1
840303	3.4	3.5	3.5	.7	1.4	2.6
840304	3.4	3.5	3.5	.8	1.6	3.3
840305	3.4	3.5	3.5	1.3	1.9	3.1
840306	3.4	3.5	3.5	1.0	1.9	3.8
840307	3.4	3.5	3.5	1.1	1.9	3.6
840308	3.4	3.5	3.5	1.6	2.3	4.1
840309	3.4	3.4	3.5	1.4	2.2	3.8
840310	3.4	3.4	3.5	1.3	2.2	3.9
840311	3.4	3.5	3.5	.9	2.2	4.9
840312	3.4	3.4	3.5	.7	1.9	4.8
840313	3.4	3.4	3.5	.7	2.0	5.0
840314	3.4	3.4	3.5	1.0	2.1	4.2
840315	3.4	3.4	3.5	.8	2.1	5.1
840316	3.3	3.4	3.5	.8	2.2	5.3
840317	3.3	3.4	3.5	.7	1.8	4.7
840318	3.3	3.4	3.5	.7	1.7	4.1
840319	3.3	3.4	3.5	.7	1.6	3.8
840320	3.3	3.4	3.5	.8	1.9	4.0
840321	3.3	3.4	3.5	.8	1.9	4.6
840322	3.3	3.3	3.5	.8	1.5	4.7
840323	3.3	3.3	3.5	.9	2.0	4.7
840324	3.2	3.4	3.5	1.0	2.2	4.6
840325	3.3	3.4	3.5	1.2	2.5	5.1
840326	3.3	3.4	3.5	1.6	2.7	5.8
840327	3.3	3.3	3.5	1.6	3.0	5.9
840328	3.2	3.3	3.4	1.2	3.3	7.4
840329	3.3	3.3	3.4	1.6	2.9	5.2
840330	3.2	3.3	3.5	1.5	3.4	6.5
840331	3.2	3.3	3.4	2.0	3.0	4.6
Monthly Value	3.	3.4	3.5	.4	2.1	7.4

Appendix Table A-17 (continued).

April 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840401	3.2	3.3	3.4	1.7	3.4	6.2
840402	3.2	3.3	3.4	1.3	2.6	5.7
840403	3.2	3.3	3.4	1.2	3.1	6.6
840404	3.1	3.3	3.4	.9	3.5	8.3
840405	3.2	3.3	3.4	1.8	3.4	6.7
840406	3.2	3.3	3.4	1.4	3.4	7.5
840407	3.2	3.2	3.4	1.4	3.2	7.1
840408	3.2	3.3	3.4	1.7	3.4	6.5
840409	3.1	3.3	3.4	1.0	3.7	8.4
840410	3.1	3.2	3.4	1.3	3.5	7.1
840411	3.1	3.2	3.4	1.1	3.5	8.0
840412	3.1	3.2	3.4	.9	3.8	8.4
840413	3.1	3.2	3.4	1.0	4.0	8.4
840414	3.1	3.2	3.4	1.0	3.7	7.5
840415	3.1	3.2	3.3	2.3	3.8	7.5
840416	3.1	3.2	3.3	1.0	2.8	4.4
840417	3.1	3.2	3.4	1.7	4.0	8.4
840418	3.0	3.2	3.4	1.0	4.3	9.1
840419	3.0	3.2	3.5	1.3	4.4	10.2
840420	3.1	3.2	3.5	1.9	4.9	9.8
840421	3.1	3.3	3.5	1.9	5.7	12.1
840422	3.0	3.3	3.5	.7	4.7	11.2
840423	3.0	3.3	3.5	1.7	4.9	9.8
340424	3.0	3.3	3.5	1.7	5.1	10.6
840425	3.1	3.3	3.6	1.6	5.7	12.4
840426	3.1	3.3	3.6	1.9	5.3	10.7
840427	3.1	3.4	3.6	2.1	5.7	10.4
840428	3.2	3.4	3.6	3.7	6.4	11.3
840429	3.1	3.4	3.5	2.1	6.5	13.1
840430	3.1	3.2	3.5	3.2	6.2	12.1
Monthly Value	3.0	3.3	3.6	.7	4.3	13.1

Appendix Table A-17 (continued).

May 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840501	3.0	3.2	3.4	1.8	6.2	10.9
840502	3.0	3.1	3.3	3.2	5.5	9.0
840503	3.0	3.1	3.4	1.9	5.5	11.4
840504	3.0	3.1	3.3	2.1	5.1	9.6
840505	3.0	3.1	3.3	2.9	5.9	12.0
840506	3.0	3.1	3.3	2.3	6.4	11.9
840507	2.9	3.1	3.3	1.7	6.3	12.3
840508	2.9	3.1	3.2	2.3	7.1	13.5
840509	2.9	3.0	3.1	2.7	7.4	14.2
840510	2.9	3.0	3.1	2.9	6.9	13.6
840511	2.9	3.0	3.1	3.2	6.4	11.3
840512	2.9	3.0	3.1	2.6	6.6	12.1
840513	2.9	3.0	3.1	3.8	7.3	12.6
840514	2.9	3.0	3.1	3.7	7.6	12.4
840515	2.9	3.0	3.1	4.3	8.0	13.2
840516	3.0	3.0	3.2	2.1	6.6	13.2
840517	2.9	3.1	3.3	3.2	8.1	14.7
840518	3.0	3.2	3.4	3.6	5.8	10.8
840519	2.9	3.1	3.3	2.1	3.4	4.8
840520	2.9	3.1	3.2	2.0	3.9	6.0
840521	3.2	3.3	3.4	5.2	5.7	6.5
840522	3.3	3.4	3.5	5.4	5.8	6.2
840523	3.3	3.5	3.5	5.1	5.8	6.9
840524	3.4	3.5	3.5	5.9	6.2	6.7
840525	3.4	3.5	3.6	4.9	6.1	6.8
840526	3.3	3.5	3.6	4.9	5.2	6.6
840527	3.2	3.3	3.4	4.4	4.8	5.5
840528	3.1	3.2	3.3	3.8	4.3	4.7
840529	3.1	3.2	3.3	3.9	4.1	4.4
840530	3.1	3.2	3.2	3.9	4.2	4.5
840531	3.1	3.2	3.2	3.9	5.2	11.5
Monthly Value	2.9	3.2	3.6	1.7	5.9	14.7

Appendix Table A-18. Datapod temperature recorder data summary: surface water temperatures (C) recorded at Side Channel 10 - Site 2 when the site was frozen, RM 134.0, GC S31N03W31BBB.

December 1983 (Site frozen)

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831215	+++++	+++++	+++++	-1.0	-----	.1
831216	+++++	+++++	+++++	-1.2	-1.1	-1.0
831217	+++++	+++++	+++++	-1.1	-.6	-.1
831218	+++++	+++++	+++++	-.2	-.1	0.0
Monthly Value	+++++	+++++	+++++	-1.2	-----	.1

----- Data not available.
+++++ Data available; site not frozen.

Appendix Table A-19. Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Upper Side Channel 11 - Site 1, RM 136.3, GC S31N02W20BBD.

August 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
830824	5.8	5.9	6.0	8.0	8.3	8.6
830825	5.7	5.8	5.9	7.2	7.6	8.2
830826	5.5	5.7	5.8	6.7	7.3	7.8
830827	5.5	5.7	5.8	7.3	7.9	8.6
830828	5.7	5.9	6.1	8.3	8.7	9.4
830829	6.0	6.1	6.2	8.7	9.0	9.1
830830	6.0	6.1	6.2	8.7	8.9	9.4
830831	6.0	6.2	6.2	8.0	8.4	8.9
Monthly Value	5.5	----	6.2	6.7	----	9.4

---- Data not available.

Appendix Table A-19 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
September 1983						
830901	5.8	6.0	6.1	7.4	7.7	8.0
830902	5.7	5.9	5.9	6.9	7.4	7.9
830903	5.7	5.8	5.9	6.5	6.9	7.3
830904	5.5	5.7	5.8	5.8	6.1	6.5
830905	5.4	5.5	5.6	5.0	5.7	6.7
830906	5.2	5.4	5.5	4.2	5.6	8.0
830907	5.2	5.3	5.5	3.3	5.5	9.3
830908	5.2	5.3	5.4	4.8	5.8	7.5
830909	5.2	5.3	5.4	4.8	6.3	10.0
830910	5.2	5.3	5.4	4.8	6.2	9.4
830911	5.2	5.3	5.4	4.5	5.6	8.9
Monthly Value	5.2	-----	6.1	3.3	-----	10.0

----- Data not available.

Appendix Table A-20. Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Upper Side Channel 11 - Site 2, RM 136.3, GC S31N02W20BBD.

September 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
830912	4.2	4.8	5.5	4.6	6.1	9.3
830913	4.2	4.6	5.1	4.5	5.8	8.1
830914	4.0	4.4	4.9	3.9	5.1	6.2
830915	4.1	4.6	5.4	4.4	5.9	9.5
830916	3.4	4.3	5.3	2.2	5.0	9.1
830917	3.3	4.2	5.2	2.1	4.8	8.8
830918	3.3	4.1	5.0	2.1	4.5	8.2
830919	3.6	4.2	4.8	2.8	4.7	7.2
830920	4.2	4.5	4.7	4.8	5.4	6.3
830921	4.3	4.6	5.2	4.9	6.0	8.0
830922	4.4	4.6	4.9	4.8	5.7	7.2
830923	3.8	4.3	4.7	2.8	4.5	5.2
830924	2.9	3.2	3.8	1.0	2.0	3.1
830925	2.7	3.1	3.8	.6	2.3	4.9
830926	2.7	3.2	3.8	.8	2.3	4.9
830927	2.7	3.2	3.8	.8	2.4	4.7
830928	3.3	3.6	3.9	2.2	3.2	4.3
830929	3.6	3.7	3.9	3.0	3.6	4.3
830930	3.8	4.1	4.5	3.7	4.6	6.2
Monthly Value	2.7	-----	5.5	.6	-----	9.5

----- Data not available.

Appendix Table A-20 (continued).

October 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831001	4.1	4.4	4.7	4.3	5.0	6.6
831002	3.9	4.3	4.8	3.6	4.7	7.0
831003	3.4	3.9	4.3	2.2	3.5	5.9
831004	3.2	3.7	4.3	1.7	3.3	6.2
831005	3.6	3.7	4.0	1.9	3.3	4.6
831006	3.2	3.7	4.4	1.7	3.3	6.5
831007	3.0	3.4	3.9	1.0	2.1	4.5
831008	2.7	3.1	3.6	.4	1.8	4.0
831009	2.7	3.2	3.5	.5	1.5	2.5
831010	2.6	2.7	3.0	.2	.8	2.0
831011	3.0	3.5	4.0	2.0	3.0	4.8
831012	3.6	3.8	4.0	2.9	3.3	4.3
831013	3.2	3.7	3.8	.3	2.7	4.0
831014	3.0	3.4	3.8	.9	2.0	4.1
831015	3.4	3.6	4.0	1.7	2.9	4.3
831016	3.1	3.5	3.8	.9	2.3	4.1
831017	3.3	3.6	4.0	1.4	2.5	4.5
831018	3.7	4.0	4.6	2.4	3.7	6.2
831019	3.6	3.8	4.3	1.4	2.6	3.5
831020	3.3	3.4	3.6	1.2	1.9	2.6
831021	3.4	3.7	4.0	1.1	2.7	4.1
831022	3.5	3.8	4.2	1.6	2.9	4.7
831023	3.1	3.5	4.0	.7	1.7	3.1
831024	3.1	3.3	3.6	.7	1.3	2.8
831025	3.0	3.2	3.5	.6	1.2	2.2
831026	3.2	3.4	3.7	1.1	1.8	3.0
831027	3.2	3.5	3.8	.7	1.8	3.1
831028	3.6	3.7	3.9	1.6	2.2	3.4
831029	3.4	3.6	3.8	1.0	1.8	2.6
831030	3.5	3.7	3.9	1.4	2.1	3.1
831031	3.5	3.6	3.8	.8	1.8	2.2
Monthly Value	2.6	3.6	4.8	.2	2.5	7.0

Appendix Table A-20 (continued).

November 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831101	3.4	3.6	3.8	1.0	1.7	2.7
831102	3.6	3.8	4.1	1.6	2.4	3.5
831103	3.2	3.7	3.9	.8	1.4	2.3
831104	3.1	3.5	3.6	.8	1.2	1.8
831105	3.3	3.6	3.7	.8	1.4	1.9
831106	3.1	3.5	3.6	.8	1.1	1.3
831107	3.2	3.5	3.6	.9	1.2	1.5
831108	3.3	3.6	3.8	1.0	1.5	1.9
831109	3.5	3.8	3.9	1.2	1.8	2.2
831110	3.4	3.7	3.9	1.0	1.4	2.0
831111	3.4	3.7	3.9	1.1	1.5	1.9
831112	3.4	3.8	4.0	1.1	1.7	2.1
831113	3.4	3.8	3.9	1.0	1.4	1.8
831114	3.4	3.7	3.8	1.0	1.3	1.4
831115	3.4	3.7	3.8	1.1	1.3	1.5
831116	3.5	3.9	4.1	1.2	1.8	2.0
831117	3.6	4.1	4.1	1.4	1.9	2.0
831118	3.7	4.2	4.3	1.6	2.0	2.2
831119	3.6	4.0	4.1	1.3	1.6	1.7
831120	3.6	4.1	4.2	1.2	1.7	2.0
831121	3.8	4.3	4.5	1.8	2.2	2.5
831122	4.1	4.5	4.6	2.1	2.4	2.6
831123	4.1	4.5	4.6	1.8	2.2	2.6
831124	3.8	4.4	4.5	1.3	1.9	2.3
831125	3.8	4.3	4.3	1.4	1.8	1.9
831126	3.9	4.4	4.5	1.6	2.0	2.2
831127	4.0	4.6	4.7	1.8	2.3	2.5
831128	4.2	4.7	4.8	2.1	2.5	2.8
831129	4.2	4.6	4.7	2.0	2.5	2.9
831130	4.2	4.6	4.7	1.8	2.5	3.0
Monthly Value	3.1	4.0	4.8	.8	1.8	3.5

December 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831201	4.1	4.6	4.7	2.0	2.7	3.0
831202	4.0	4.5	4.7	1.7	2.4	2.8
831203	4.0	4.5	4.6	2.1	2.5	2.8
831204	4.0	4.4	4.5	1.8	2.2	2.5
831205	3.9	4.5	4.5	2.1	2.7	2.9
831206	4.1	4.6	4.6	2.1	2.7	3.1
831207	3.7	4.2	4.4	1.7	2.1	2.3
831208	3.6	4.2	4.3	1.7	2.1	2.2
831209	3.6	4.1	4.1	1.8	2.1	2.2
831210	3.6	4.0	4.1	1.7	2.1	2.2
831211	3.6	4.0	4.1	1.8	2.2	2.3
831212	3.6	4.1	4.2	1.9	2.2	2.4
831213	3.6	4.2	4.2	1.8	2.2	2.4
831214	3.6	4.2	4.3	1.2	1.8	2.1
831215	3.6	4.1	4.2	0.0	.8	1.5
831216	3.4	4.0	4.1	.1	.6	.8
831217	3.5	4.0	4.2	.4	1.5	2.2
831218	3.5	4.1	4.2	1.8	2.1	2.3
831219	3.6	4.2	4.2	1.2	1.8	2.0
831220	3.7	4.2	4.3	1.6	2.0	2.1
831221	3.6	4.2	4.2	1.7	2.3	2.3
831222	3.5	4.1	4.2	1.9	2.3	2.3
831223	3.5	4.0	4.0	1.5	1.9	2.2
831224	3.4	4.0	4.0	1.1	1.6	1.8
831225	3.4	4.0	4.1	1.4	1.8	1.9
831226	3.5	3.9	4.0	1.2	1.7	1.9
831227	3.3	3.9	4.0	.7	1.2	1.5
831228	3.3	3.9	3.9	.1	.7	1.0
831229	3.3	3.8	3.8	0.0	-----	.5
831230	3.1	3.6	3.8	-----	-----	-----
831231	3.2	3.8	4.0	-----	-----	-----
Monthly Value	3.1	4.1	4.7	0.0	1.9	3.1

----- Data not available.

Appendix Table A-20 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
			January 1984			
840101	3.3	3.9	4.2	-.2	.6	1.6
840102	3.6	4.4	4.5	.9	1.7	2.7
840103	3.9	4.5	4.7	1.6	2.5	2.9
840104	4.1	4.7	4.7	2.3	2.9	3.2
840105	4.1	4.7	4.8	2.2	2.7	3.2
840106	4.0	4.6	4.7	1.4	2.4	2.9
840107	3.7	4.3	4.4	1.2	1.7	2.5
840108	3.6	4.2	4.3	.9	1.6	2.4
840109	2.7	3.3	3.5	.7	1.2	2.0
840110	2.8	3.3	3.4	.8	1.3	1.5
840111	2.8	3.4	3.5	1.0	1.6	1.8
840112	3.0	3.5	3.6	1.1	1.8	2.1
840113	3.0	3.5	3.6	1.1	1.7	2.2
840114	2.6	3.3	3.5	.6	1.3	1.8
840115	2.7	3.2	3.3	.4	1.3	1.8
840116	2.1	2.8	3.1	-.2	.4	.9
840117	2.1	2.7	2.8	0.0	.7	.9
840118	2.2	2.7	2.9	.3	.8	1.0
840119	2.1	2.7	2.8	-.1	.7	1.2
840120	2.1	2.7	2.8	-.1	.5	.7
840121	1.9	2.6	2.7	-.2	.5	.8
840122	2.0	2.6	2.7	-.2	.4	.7
840123	1.9	2.6	2.7	-.2	.4	.5
840124	2.0	2.6	2.7	-.1	.5	.7
840125	1.9	2.6	2.7	-.3	.4	.6
840126	2.0	2.7	2.9	0.0	.7	1.0
840127	2.0	2.7	2.9	-.1	.7	1.1
840128	2.2	2.8	2.9	.2	.9	1.3
840129	2.3	3.0	3.1	.7	1.2	1.6
840130	2.3	2.9	3.1	.1	1.1	1.6
840131	2.5	3.1	3.2	.9	1.5	1.9
Monthly Value	1.9	3.3	4.8	-.3	1.2	3.2

Appendix Table A-20 (continued).

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Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
			February 1984			
840201	2.2	2.9	3.2	.1	1.0	1.5
840202	2.4	3.0	3.1	.3	1.1	1.7
840203	2.2	2.7	2.9	-.1	.7	1.2
840204	2.3	3.0	3.1	.2	1.2	1.5
840205	2.5	3.1	3.2	.8	1.4	1.8
840206	2.3	2.9	3.1	.2	.9	1.4
840207	2.2	2.9	3.1	.2	.9	1.5
840208	2.2	2.9	3.0	0.0	.7	1.1
840209	2.1	2.8	2.8	-.1	.5	.7
840210	2.0	2.7	2.9	-.1	.7	1.0
840211	2.2	3.0	3.2	.4	1.1	1.7
840212	2.3	3.0	3.2	.3	1.1	1.7
840213	2.4	3.0	3.2	.4	1.2	1.8
840214	2.4	3.1	3.4	.5	1.5	2.0
840215	2.5	3.2	3.4	.8	1.5	2.0
840216	2.6	3.2	3.4	.7	1.6	2.3
840217	2.7	3.5	3.8	1.3	2.2	3.2
840218	2.7	3.5	3.8	.8	1.9	3.1
840219	2.6	3.4	3.6	.3	1.6	2.6
840220	2.4	3.0	3.3	.2	.8	1.1
840221	2.4	3.0	3.3	.2	1.1	1.9
840222	2.5	3.2	3.5	.5	1.6	2.3
840223	2.7	3.5	3.7	1.2	2.0	2.8
840224	2.7	3.5	3.7	.8	1.9	2.7
840225	2.7	3.5	3.8	1.0	1.9	3.1
840226	2.5	3.3	3.6	.3	1.3	2.5
840227	2.4	3.2	3.4	.3	1.2	2.1
840228	2.4	3.2	3.4	.3	1.2	2.0
840229	2.5	3.2	3.6	.4	1.3	2.6
Monthly Value	2.0	3.1	3.8	-.1	1.3	3.2

Appendix Table A-20 (continued).

March 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840301	2.5	3.1	3.4	.3	1.1	2.7
840302	3.1	3.6	4.0	1.2	2.2	3.7
840303	3.3	3.7	4.1	1.2	2.4	4.1
840304	3.4	4.0	4.5	1.5	3.0	5.3
840305	3.8	4.2	4.7	2.4	3.5	5.5
840306	3.8	4.3	4.8	1.8	3.5	5.9
840307	3.7	4.2	4.9	2.0	3.4	5.8
840308	3.9	4.5	5.1	2.8	4.1	6.4
840309	3.9	4.5	5.1	2.7	4.0	6.0
840310	3.8	4.4	5.1	2.3	3.7	6.3
840311	3.8	4.4	5.2	1.8	3.7	7.0
840312	3.5	4.3	5.0	1.3	3.2	6.3
840313	3.6	4.3	5.0	1.3	3.3	6.2
840314	3.8	4.4	5.1	2.1	3.6	6.1
840315	3.7	4.4	5.0	1.8	3.3	6.2
840316	3.6	4.3	5.0	1.4	3.2	6.0
840317	3.5	4.1	4.7	1.1	2.6	5.5
840318	3.4	4.0	4.6	1.0	2.4	5.1
840319	3.4	4.0	4.6	1.0	2.4	5.1
840320	3.6	4.1	4.8	1.2	2.8	5.6
840321	3.6	4.2	4.8	1.1	2.7	5.6
840322	3.5	4.1	4.7	1.1	2.5	5.3
840323	3.6	4.1	4.7	1.1	2.5	5.0
840324	3.5	4.1	4.7	1.1	2.6	5.2
840325	3.6	4.3	5.2	1.4	3.2	6.5
840326	3.8	4.5	5.3	1.8	3.7	7.0
840327	3.9	4.7	5.4	2.2	4.1	7.2
840328	3.8	4.7	5.5	1.6	4.0	7.4
840329	3.9	4.6	5.2	2.0	3.7	6.3
840330	3.9	4.8	5.7	2.1	4.5	8.2
840331	4.2	4.9	5.5	3.0	4.1	6.2
Monthly Value	2.5	4.3	5.7	.3	3.2	8.2

Appendix Table A-20 (continued).

April 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840401	4.0	4.8	5.6	2.3	4.4	7.5
840402	3.9	4.7	5.4	1.6	3.6	7.5
840403	3.7	4.6	5.5	1.3	3.6	7.2
840404	3.9	4.9	5.9	1.6	4.5	8.7
840405	4.4	5.1	5.9	2.9	4.9	8.4
840406	4.3	5.1	5.8	2.7	4.7	8.5
840407	4.0	5.0	5.7	1.5	4.1	8.3
840408	4.0	5.7	8.9	1.6	5.1	10.9
840409	3.6	4.6	5.7	2.2	4.8	9.1
840410	3.6	4.6	5.4	1.7	4.4	7.9
840411	3.5	4.5	5.6	1.4	4.3	9.1
840412	3.5	4.6	5.7	1.5	4.5	9.4
840413	3.6	4.7	5.8	1.7	4.7	9.6
840414	3.7	4.8	5.7	2.0	4.9	8.6
840415	4.1	4.9	5.7	2.4	5.2	8.7
840416	3.9	4.6	5.3	2.7	4.0	5.6
840417	3.8	4.7	5.7	2.2	4.8	8.4
840418	3.7	4.7	5.7	1.5	4.2	8.6
840419	3.7	4.6	5.8	1.5	4.4	9.1
840420	4.2	5.1	6.1	3.0	5.8	9.8
840421	4.4	5.3	6.5	3.1	6.4	11.0
840422	4.1	5.3	6.3	2.3	5.5	9.4
840423	4.0	4.9	5.9	1.6	4.6	8.7
840424	4.1	5.1	6.1	1.8	5.2	9.9
840425	4.3	5.4	6.4	3.0	6.0	10.1
840426	4.3	5.3	6.2	2.7	5.8	9.9
840427	4.5	5.5	6.3	3.0	6.0	9.4
840428	4.9	5.8	6.6	4.8	7.3	11.3
840429	4.8	5.9	6.7	3.5	7.1	10.8
840430	5.0	5.9	6.6	4.6	7.3	10.4
Monthly Value	3.5	5.0	8.9	1.3	5.1	11.3

Appendix Table A-20 (continued).

May 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840501	5.0	6.0	6.7	4.0	7.4	11.2
840502	5.2	6.1	6.8	5.2	7.6	11.1
840503	4.9	5.9	6.9	3.6	7.2	11.7
840504	4.9	5.9	6.7	3.9	7.0	11.3
840505	5.0	5.9	6.9	4.4	7.5	12.6
840506	5.0	6.1	7.1	3.9	7.8	13.5
840507	4.8	6.0	7.0	2.9	7.3	12.4
840508	5.0	6.1	7.0	3.7	7.9	12.8
840509	5.1	6.2	7.6	3.9	8.5	14.1
840510	5.2	6.4	7.7	4.0	8.6	14.3
840511	5.2	6.3	7.4	4.1	8.0	12.9
840512	4.7	6.0	7.3	3.1	7.5	13.0
840513	5.0	6.1	7.4	4.1	8.0	12.8
840514	4.9	6.2	7.5	3.5	7.9	13.3
840515	4.9	6.2	7.6	3.8	7.8	13.2
840516	5.2	5.8	7.2	2.1	5.4	11.0
840517	4.3	5.3	6.2	2.1	5.2	10.3
840518	4.3	4.8	5.7	2.3	3.5	5.0
840519	4.1	4.6	5.0	2.3	3.5	4.8
840520	4.0	4.6	5.2	2.1	3.9	5.7
840521	5.1	5.5	6.0	5.0	5.9	6.9
840522	5.2	5.7	5.9	5.4	6.0	6.1
840523	4.8	5.7	6.2	4.6	6.0	7.2
840524	5.2	6.0	6.2	5.2	6.3	6.9
840525	5.3	6.1	6.4	5.7	6.5	7.1
840526	5.2	6.0	6.2	5.2	6.3	7.0
840527	5.1	6.0	6.3	5.3	6.5	7.5
840528	5.1	6.2	6.9	5.3	7.3	9.7
840529	4.9	6.2	6.9	4.4	6.9	9.0
840530	4.8	6.0	6.7	4.3	6.6	9.7
840531	4.5	6.3	7.9	3.4	7.8	13.0
Monthly Value	4.0	5.9	7.9	2.1	6.8	14.3

Appendix Table A-21. Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Upper Side Channel 11 - Site 3, RM 136.3, GC S31N02W20BBD.

January 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840111	3.3	-----	3.3	1.3	-----	1.9
840112	3.3	3.3	3.3	1.3	1.7	2.0
840113	3.2	3.3	3.3	1.0	1.5	1.9
840114	3.2	3.2	3.3	.7	1.3	1.8
840115	3.1	3.2	3.3	.5	1.2	1.8
840116	3.0	3.1	3.2	.3	.5	.7
840117	3.0	3.0	3.1	.5	.7	.9
840118	3.0	3.0	3.1	.5	.8	1.0
840119	3.0	3.0	3.1	.3	.7	1.1
840120	3.0	3.0	3.1	.3	.5	.6
840121	2.9	3.0	3.1	.2	.5	.8
840122	3.0	3.0	3.1	.2	.4	.7
840123	2.9	3.0	3.1	.2	.3	.4
840124	2.9	3.0	3.1	.3	.3	.5
840125	2.9	3.0	3.1	0.0	.2	.3
840126	3.0	3.1	3.2	.2	.6	.9
840127	3.0	3.1	3.2	.3	.5	.8
840128	3.0	3.1	3.2	.5	.7	1.1
840129	3.1	3.1	3.2	.7	1.0	1.4
840130	3.0	3.1	3.1	.2	.9	1.3
840131	3.1	3.2	3.2	.9	1.3	1.7
Monthly Value	2.9	3.1	3.3	0.0	.8	2.0

----- Data not available.

Appendix Table A-21. (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
			February 1984			
840201	3.0	3.1	3.3	.2	.8	1.3
840202	3.1	3.2	3.3	.1	.9	1.4
840203	3.0	3.1	3.1	.2	.4	.9
840204	3.1	3.1	3.2	.3	.9	1.3
840205	3.1	3.2	3.3	.9	1.2	1.5
840206	3.1	3.2	3.3	.1	.7	1.2
840207	3.1	3.1	3.2	.2	.7	1.2
840208	3.0	3.1	3.2	.2	.4	.8
840209	3.0	3.1	3.1	.1	.2	.4
840210	3.0	3.0	3.1	.2	.4	.8
840211	3.0	3.1	3.2	.5	.9	1.3
840212	3.1	3.1	3.2	.5	.8	1.4
840213	3.1	3.1	3.2	.5	.9	1.4
840214	3.1	3.2	3.2	.6	1.1	1.6
840215	3.1	3.2	3.3	.4	1.1	1.7
840216	3.1	3.2	3.3	.6	1.1	1.9
840217	3.2	3.3	3.4	1.3	1.8	2.8
840218	3.2	3.2	3.4	.6	1.4	2.5
840219	3.1	3.3	3.4	.3	1.1	2.1
840220	3.0	3.1	3.3	.2	.4	.6
840221	3.0	3.1	3.2	.2	.5	1.2
840222	3.1	3.2	3.2	.3	1.0	1.7
840223	3.2	3.2	3.4	.8	1.4	2.3
840224	3.1	3.2	3.3	.7	1.2	2.1
840225	3.2	3.2	3.4	.8	1.3	2.6
840226	3.1	3.2	3.3	.2	.7	1.8
840227	3.0	3.1	3.2	.1	.5	1.3
840228	3.0	3.1	3.2	.1	.5	1.3
840229	3.0	3.1	3.2	.1	.6	1.8
Monthly Value	3.0	3.2	3.4	.1	.9	2.8

Appendix Table A-21. (continued).

March 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840301	3.0	3.1	3.2	.1	.6	1.8
840302	3.1	3.2	3.4	.6	1.5	2.9
840303	3.2	3.3	3.5	.7	1.7	3.4
840304	3.2	3.4	3.6	.9	2.3	4.7
840305	3.4	3.5	3.7	1.7	2.8	4.8
840306	3.4	3.6	3.7	1.3	2.8	5.1
840307	3.3	3.5	3.8	1.4	2.7	5.1
840308	3.5	3.6	3.9	2.1	3.3	5.7
840309	3.5	3.7	3.9	1.8	3.2	5.4
840310	3.4	3.6	3.8	1.6	2.9	5.7
840311	3.4	3.6	3.9	1.0	2.9	6.2
840312	3.3	3.5	3.8	.3	2.2	5.4
840313	3.3	3.6	3.8	.3	2.3	5.3
840314	3.4	3.6	3.9	1.2	2.7	5.4
840315	3.4	3.6	3.8	.8	2.3	5.4
840316	3.4	3.6	3.8	.3	2.1	5.1
840317	3.3	3.5	3.7	.2	1.6	4.4
840318	3.3	3.5	3.6	-----	-----	-----
840319	3.3	3.5	3.6	-----	-----	-----
840320	3.3	3.5	3.7	.1	1.7	4.7
840321	3.3	3.5	3.7	.2	1.6	4.6
840322	3.4	3.5	3.7	0.0	1.0	4.3
840323	3.3	3.5	3.7	.2	1.3	4.0
840324	3.3	3.5	3.7	.2	1.5	4.2
840325	3.4	3.6	4.0	.2	2.1	5.6
840326	3.5	3.7	4.0	.8	2.6	6.2
840327	3.6	3.8	4.0	1.0	3.0	6.4
840328	3.6	3.8	4.1	.4	3.0	6.4
840329	3.6	3.8	4.0	.9	2.7	5.4
840330	3.6	3.9	4.3	.9	3.5	7.3
840331	3.7	3.9	4.2	1.9	3.0	5.4
Monthly Value	3.0	3.6	4.3	0.0	2.3	7.3

----- Data not available.

Appendix Table A-21 (continued).

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April 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840401	3.7	3.9	4.3	1.3	3.3	6.7
840402	3.6	3.9	4.2	.1	2.5	6.8
840403	3.6	3.9	4.3	.3	2.5	6.3
840404	3.7	4.1	4.5	.3	3.4	7.8
840405	3.9	4.2	4.5	1.8	3.8	7.6
840406	3.9	4.2	4.5	1.4	3.7	7.6
840407	3.8	4.1	4.4	.1	3.1	7.4
840408	3.8	4.2	4.6	.3	3.2	7.2
840409	3.9	4.3	4.7	.9	3.8	8.3
840410	3.9	4.3	4.7	.6	3.3	7.1
840411	3.9	4.3	4.7	.3	3.2	8.5
840412	4.0	4.4	4.8	.3	3.5	8.6
840413	4.0	4.4	4.9	.4	3.7	8.9
840414	4.1	4.5	4.9	.7	3.8	7.9
840415	4.3	4.6	4.9	1.2	4.2	8.0
840416	4.2	4.5	4.8	1.5	2.9	4.6
840417	4.2	4.6	5.0	1.0	3.7	7.8
840418	4.2	4.6	5.0	.3	3.2	8.1
840419	4.3	4.7	5.1	.4	3.3	8.5
840420	4.5	4.8	5.3	1.7	4.9	9.2
840421	4.6	5.0	5.5	2.2	5.7	10.9
840422	4.6	5.0	5.5	1.0	4.6	8.8
840423	4.5	4.9	5.4	.3	3.5	8.3
840424	4.6	5.0	5.5	.4	4.2	9.8
840425	4.7	5.2	5.6	1.6	5.1	9.6
840426	4.7	5.1	5.6	1.5	5.0	9.6
840427	4.8	5.2	5.6	1.8	5.3	9.3
840428	5.0	5.4	5.8	3.8	7.0	11.4
840429	5.0	5.5	5.9	2.3	6.9	11.7
840430	5.1	5.5	5.8	3.7	7.2	11.7
Monthly Value	3.6	4.6	5.9	.1	4.1	11.7

Appendix Table A-21 (continued).

Date	May 1984					
	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840501	5.1	5.5	5.9	3.0	7.4	11.7
840502	5.2	5.6	5.9	4.3	7.2	10.9
840503	5.1	5.5	6.0	2.5	6.6	12.6
840504	5.2	5.6	6.0	2.9	6.4	11.3
840505	5.1	5.6	6.1	3.5	7.1	13.1
840506	5.2	5.7	6.2	2.9	7.4	14.4
840507	5.1	5.7	6.2	1.9	7.0	12.9
840508	5.2	5.7	6.2	2.6	7.6	13.6
840509	5.2	5.7	6.3	2.8	8.0	14.1
840510	5.2	5.8	6.2	3.0	8.0	13.8
840511	5.2	5.7	6.1	3.4	7.3	12.5
840512	5.0	5.6	6.0	2.1	6.7	12.8
840513	5.2	5.6	6.0	3.2	7.3	12.6
840514	5.1	5.6	6.0	2.5	7.3	13.1
840515	5.2	5.6	6.2	2.8	7.3	13.4
840516	5.3	5.6	6.1	1.4	5.1	11.1
840517	4.9	5.3	5.7	1.6	5.1	10.9
840518	4.9	5.1	5.6	1.6	2.9	4.7
840519	4.7	4.9	5.1	1.6	2.8	4.2
840520	4.7	4.9	5.3	1.6	3.4	5.3
840521	5.2	5.4	5.6	4.8	5.5	6.7
840522	5.5	5.6	5.7	5.5	5.7	5.8
840523	5.4	5.6	5.7	4.7	5.7	7.0
840524	5.6	5.7	5.8	5.5	6.0	6.6
840525	5.7	5.7	5.9	6.0	6.3	6.9
840526	5.6	5.7	5.9	5.4	6.0	6.8
840527	5.6	5.7	5.8	5.4	6.3	7.4
840528	5.5	5.7	6.0	4.9	7.1	10.3
840529	5.4	5.7	6.0	4.2	6.6	8.9
840530	5.4	5.7	5.9	4.2	6.4	9.8
840531	5.3	5.7	6.3	3.2	7.7	13.3
Monthly Value	4.7	5.6	6.3	1.4	6.4	14.4

Appendix Table A-22 Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Side Channel 21 - Site 1, RM 141.0, GC S31N02W02CAA.

August 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
830829	5.9	-----	6.0	8.2	-----	8.5
830830	5.8	5.9	6.0	8.2	8.6	9.2
830831	5.6	5.8	6.1	7.7	8.1	8.7
Monthly Value	5.6	-----	6.1	7.7	-----	9.2

----- Data not available.

Appendix Table A-22 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
			September 1983			
830901	5.2	5.4	5.6	7.1	7.4	7.7
830902	4.9	5.1	5.2	6.8	7.3	8.2
830903	4.7	4.9	5.2	6.4	6.8	7.3
830904	4.5	4.7	4.9	5.5	6.0	6.6
830905	4.2	4.4	4.6	4.7	5.5	6.5
830906	3.9	4.2	4.4	-----	-----	-----
830907	3.9	4.1	4.4	-----	-----	-----
830908	4.1	4.3	4.5	-----	-----	-----
830909	4.1	4.3	4.7	-----	-----	-----
830910	4.2	4.4	4.8	-----	-----	-----
830911	4.2	4.5	4.8	-----	-----	-----
830912	4.3	4.5	4.8	-----	-----	-----
Monthly Value	3.9	-----	5.6	4.7	-----	8.2

----- Data not available.

Appendix Table A-23 Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Side Channel 21 - Site 2, RM 141.0, GC S31N02W02CAA.

September 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
830913	6.1	6.2	6.2	5.3	6.1	7.5
830914	6.0	6.1	6.2	4.5	5.6	6.5
830915	6.0	6.1	6.2	5.1	6.0	7.3
830916	5.8	6.0	6.2	3.1	4.7	6.8
830917	5.7	5.9	6.0	2.9	4.5	6.7
830918	5.6	5.7	5.9	3.2	4.7	6.5
830919	5.7	5.8	5.9	3.8	5.3	7.1
830920	6.0	6.1	6.1	5.7	6.1	6.7
830921	6.1	6.1	6.2	5.3	5.9	6.6
830922	6.1	6.1	6.2	4.9	5.8	6.7
830923	5.9	6.0	6.2	3.3	4.6	5.0
830924	5.8	5.9	6.0	2.4	3.3	4.0
830925	5.7	5.8	5.8	3.1	3.9	4.9
830926	5.7	5.7	5.8	3.6	4.2	4.9
830927	5.5	5.7	5.7	3.5	4.3	4.8
830928	5.2	5.4	5.5	3.4	4.4	4.9
830929	4.9	5.1	5.3	3.8	4.3	4.8
830930	4.3	4.6	4.9	3.2	4.0	4.6
Monthly Value	4.3	-----	6.2	2.4	-----	7.5

----- Data not available.

Appendix Table A-23 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
			October 1983			
831001	3.8	4.0	4.3	3.6	4.1	4.7
831002	3.6	3.6	3.8	3.5	4.1	4.6
831003	3.4	3.5	3.6	2.5	3.3	4.2
831004	3.4	3.4	3.5	2.4	3.7	4.7
831005	3.4	3.5	3.5	3.3	3.9	4.6
831006	3.4	3.4	3.5	3.5	4.1	4.6
831007	3.4	3.5	3.6	3.8	4.2	4.4
831008	3.3	3.5	3.5	3.5	4.0	4.3
831009	3.1	3.3	3.4	2.7	3.4	3.7
831010	2.9	3.0	3.2	1.9	2.6	3.2
831011	2.6	2.8	2.9	2.6	3.3	4.2
831012	2.4	2.5	2.7	3.5	4.0	4.4
831013	2.2	2.3	2.4	3.0	3.8	4.5
831014	2.1	2.2	2.3	3.1	3.5	3.9
831015	1.9	2.0	2.2	3.2	3.5	4.2
831016	1.9	1.9	2.0	2.6	3.0	3.6
831017	1.8	1.9	1.9	2.7	3.3	3.9
831018	1.8	1.9	1.9	3.2	3.7	4.5
831019	1.7	1.8	1.9	2.7	3.2	3.6
831020	1.7	1.7	1.8	2.5	3.0	3.4
831021	1.7	1.7	1.7	2.7	3.1	3.9
831022	1.7	1.7	1.7	2.8	3.1	3.7
831023	1.6	1.7	1.7	2.7	2.9	3.2
831024	1.6	1.7	1.8	2.4	2.7	3.2
831025	1.7	1.8	1.9	2.2	2.5	2.9
831026	1.8	1.9	1.9	2.1	2.4	2.8
831027	1.8	1.9	2.0	1.9	2.2	2.5
831028	1.8	1.8	1.9	1.8	2.0	2.2
831029	1.7	1.8	1.9	1.9	2.0	2.1
831030	1.7	1.7	1.8	1.6	1.9	2.0
831031	1.7	1.7	1.8	1.8	1.9	2.0
Monthly Value	1.6	2.4	4.3	1.6	3.2	4.7

Appendix Table A-23 (continued).

November 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831101	1.7	1.8	1.8	1.7	1.7	1.9
831102	1.7	2.2	3.4	1.7	2.1	3.1
831103	2.8	3.0	3.2	2.2	2.5	2.8
831104	2.7	2.9	3.2	2.2	2.5	2.8
831105	2.7	3.0	3.2	2.2	2.6	2.8
831106	2.7	2.8	3.1	2.0	2.3	2.6
831107	2.7	2.9	3.0	2.2	2.4	2.6
831108	2.8	3.1	3.3	2.3	2.6	2.8
831109	2.8	3.0	3.2	2.2	2.6	2.8
831110	2.7	2.9	3.2	2.0	2.4	2.7
831111	2.7	2.9	3.2	2.2	2.4	2.7
831112	2.7	3.0	3.2	2.0	2.5	2.7
831113	2.5	2.7	3.1	1.7	2.1	2.7
831114	2.4	2.5	2.8	1.6	1.8	2.2
831115	2.4	2.7	3.0	1.6	2.0	2.6
831116	2.7	2.9	3.0	2.0	2.3	2.6
831117	2.3	2.6	2.9	1.5	1.9	2.4
831118	2.2	2.7	2.9	1.3	2.0	2.4
831119	2.3	2.5	2.7	1.4	1.8	2.1
831120	2.3	2.6	2.8	1.5	1.9	2.3
831121	2.7	2.9	3.1	2.1	2.5	2.6
831122	2.9	3.0	3.1	2.3	2.5	2.7
831123	2.7	2.9	3.1	2.0	2.4	2.6
831124	2.4	2.7	2.9	1.6	2.0	2.5
831125	2.5	2.6	2.7	1.7	1.9	2.2
631126	2.5	2.7	2.8	1.8	2.1	2.4
831127	2.6	2.8	3.0	1.8	2.2	2.5
831128	2.7	2.9	3.0	2.0	2.4	2.6
831129	2.7	2.8	3.0	2.0	2.2	2.5
831130	2.6	2.7	3.0	1.9	2.2	2.6
Monthly Value	1.7	2.8	3.4	1.3	2.2	3.1

Appendix Table A-23 (continued).

December 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831201	2.6	2.8	3.0	1.8	2.2	2.6
831202	2.5	2.8	2.9	1.8	2.2	2.5
831203	2.7	2.9	3.0	2.1	2.4	2.6
831204	2.5	2.7	2.9	1.8	2.2	2.5
831205	2.8	2.9	3.0	2.2	2.4	2.6
831206	2.5	3.0	3.1	1.7	2.5	2.7
831207	2.2	2.5	2.7	1.3	1.8	2.1
831208	2.3	2.5	2.6	1.6	1.8	2.1
831209	2.2	2.3	2.4	1.4	1.6	1.8
831210	2.2	2.3	2.5	1.4	1.6	1.9
831211	2.2	2.4	2.6	1.6	1.8	2.0
831212	2.2	2.3	2.5	1.6	1.7	2.0
831213	2.3	2.4	2.5	1.6	1.8	2.0
831214	2.1	2.2	2.4	1.3	1.6	1.9
831215	2.0	2.1	2.2	1.3	1.5	1.6
831216	2.0	2.1	2.2	1.3	1.5	1.6
831217	2.0	2.2	2.4	1.4	1.6	1.8
831218	2.1	2.3	2.4	1.4	1.7	1.9
831219	2.1	2.4	2.5	1.4	1.8	2.0
831220	2.5	2.6	2.7	1.9	2.1	2.3
831221	2.5	2.7	2.8	1.9	2.2	2.4
831222	2.1	2.3	2.7	1.3	1.7	2.2
831223	2.1	2.3	2.4	1.5	1.7	1.9
831224	2.1	2.2	2.4	1.4	1.7	1.9
831225	2.2	2.3	2.5	1.7	1.8	2.0
831226	2.0	2.2	2.4	1.4	1.7	1.9
831227	2.1	2.2	2.4	1.5	1.7	1.8
831228	2.1	2.2	2.3	1.4	1.6	1.7
831229	2.0	2.1	2.2	1.4	1.5	1.7
831230	2.0	2.1	2.2	1.3	1.5	1.6
831231	2.0	2.2	2.4	1.4	1.6	1.8
Monthly Value	2.0	2.4	3.1	1.3	1.8	2.7

Appendix Table A-23 (continued).

January 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840101	2.1	2.5	2.7	1.5	1.9	2.2
840102	2.3	2.6	2.7	1.7	2.1	2.3
840103	2.5	2.7	2.8	1.9	2.2	2.4
840104	2.2	2.5	2.8	1.6	2.0	2.4
840105	2.1	2.2	2.5	1.5	1.7	1.9
840106	2.3	2.4	2.5	1.7	1.9	2.0
840107	2.0	2.4	2.6	1.3	1.9	2.1
840108	1.9	2.2	2.4	1.2	1.6	1.8
840109	2.1	2.3	2.5	1.6	1.8	2.1
840110	2.3	-----	2.5	1.5	1.7	2.0
840111	-----	-----	-----	1.4	1.4	1.5
840112	-----	-----	-----	1.4	1.5	1.5
840113	-----	-----	-----	1.4	1.5	1.5
840114	-----	-----	-----	1.4	1.5	1.5
840115	-----	-----	-----	1.4	1.5	1.5
840116	-----	-----	-----	1.4	1.5	1.6
840117	-----	-----	-----	1.5	1.5	1.5
840118	-----	-----	-----	1.5	1.5	1.5
840119	-----	-----	-----	1.5	1.5	1.5
840120	-----	-----	-----	1.4	1.5	1.5
840121	-----	-----	-----	1.3	1.4	1.5
840122	-----	-----	-----	1.3	1.4	1.4
840123	-----	-----	-----	1.2	1.3	1.4
840124	-----	-----	-----	1.1	1.2	1.3
840125	-----	-----	-----	1.0	1.1	1.2
840126	-----	-----	-----	.8	1.0	1.1
840127	-----	-----	-----	.8	.9	.9
840128	-----	-----	-----	.8	.8	.9
840129	-----	-----	-----	.7	.9	1.1
840130	-----	-----	-----	1.0	1.2	1.4
840131	-----	-----	-----	1.4	1.4	1.5
Monthly Value	1.9	-----	2.8	.7	1.5	2.4

----- Data not available.

Appendix Table A-23 (continued).

February 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840201	-----	-----	-----	1.4	1.5	1.6
840202	-----	-----	-----	1.5	1.5	1.6
840203	-----	-----	-----	1.5	1.6	1.6
840204	-----	-----	-----	1.5	1.5	1.6
840205	-----	-----	-----	1.5	1.6	1.6
840206	-----	-----	-----	1.6	1.6	1.7
840207	-----	-----	-----	1.6	1.6	1.7
840208	-----	-----	-----	1.5	1.6	1.7
840209	-----	-----	-----	1.6	1.6	1.7
840210	-----	-----	-----	1.6	1.6	1.7
840211	-----	-----	-----	1.6	1.6	1.6
840212	-----	-----	-----	1.6	1.6	1.7
840213	-----	-----	-----	1.6	1.6	1.6
840214	-----	-----	-----	1.5	1.6	1.6
840215	-----	-----	-----	1.5	1.6	1.6
840216	-----	-----	-----	1.5	1.6	1.6
840217	-----	-----	-----	1.5	1.6	1.6
840218	-----	-----	-----	1.5	1.6	1.6
840219	-----	-----	-----	1.5	1.6	1.6
840220	-----	-----	-----	1.5	1.6	1.6
840221	-----	-----	-----	1.5	1.6	1.6
840222	-----	-----	-----	1.5	1.5	1.6
840223	-----	-----	-----	1.5	1.5	1.6
840224	-----	-----	-----	1.5	1.6	1.6
840225	-----	-----	-----	1.5	1.6	1.6
840226	-----	-----	-----	1.5	1.6	1.6
840227	-----	-----	-----	1.5	1.5	1.6
840228	-----	-----	-----	1.5	1.6	1.6
840229	-----	-----	-----	1.5	1.5	1.6
Monthly Value	-----	-----	-----	1.4	1.6	1.7

----- Data not available.

Appendix Table A-23 (continued).

March 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840301	-----	-----	-----	1.5	1.5	1.6
840302	-----	-----	-----	1.5	1.6	1.6
840303	-----	-----	-----	1.5	1.6	1.6
840304	-----	-----	-----	1.5	1.5	1.6
840305	-----	-----	-----	1.5	1.5	1.6
840306	-----	-----	-----	1.5	1.6	1.6
840307	-----	-----	-----	1.5	1.5	1.6
840308	-----	-----	-----	1.5	1.5	1.6
840309	-----	-----	-----	1.5	1.6	1.6
840310	-----	-----	-----	1.5	1.7	2.3
840311	-----	-----	-----	1.7	1.8	2.2
840312	-----	-----	-----	1.6	1.8	2.3
840313	-----	-----	-----	1.6	1.8	2.4
840314	-----	-----	-----	1.7	1.9	2.3
840315	-----	-----	-----	1.6	1.9	2.4
840316	-----	-----	-----	1.4	1.8	2.4
840317	-----	-----	-----	1.5	1.6	2.2
840318	-----	-----	-----	1.5	1.5	1.7
840319	-----	-----	-----	1.5	1.5	1.6
840320	-----	-----	-----	1.5	1.5	1.6
840321	-----	-----	-----	1.5	1.5	1.7
840322	-----	-----	-----	1.5	1.5	1.7
840323	-----	-----	-----	1.5	1.5	1.6
840324	-----	-----	-----	1.5	1.5	1.6
840325	-----	-----	-----	1.5	1.5	1.7
840326	-----	-----	-----	1.5	1.6	1.6
840327	-----	-----	-----	1.5	1.5	1.6
840328	-----	-----	-----	1.5	1.5	1.7
840329	-----	-----	-----	1.5	1.6	1.6
840330	-----	-----	-----	1.5	1.6	1.7
840331	-----	-----	-----	1.5	1.6	1.7
Monthly Value	-----	-----	-----	1.4	1.6	2.4

----- Data not available.

Appendix Table A-23 (continued).

April 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840401	-----	-----	-----	1.5	1.6	1.7
840402	-----	-----	-----	1.5	1.6	1.6
840403	-----	-----	-----	1.5	1.7	2.3
840404	-----	-----	-----	1.6	1.8	2.3
840405	-----	-----	-----	1.6	1.8	2.1
840406	-----	-----	-----	1.6	1.7	2.0
840407	-----	-----	-----	1.6	1.6	1.9
840408	-----	-----	-----	1.5	1.6	1.7
840409	-----	-----	-----	1.5	1.6	1.7
840410	-----	-----	-----	1.6	1.7	2.1
840411	-----	-----	-----	1.6	1.8	2.0
840412	-----	-----	-----	1.6	1.8	1.9
840413	-----	-----	-----	1.6	1.7	1.8
840414	-----	-----	-----	1.6	1.7	1.9
840415	-----	-----	-----	1.5	1.6	2.1
840416	-----	-----	-----	1.6	1.6	1.8
840417	-----	-----	-----	1.5	1.6	1.7
840418	-----	-----	-----	1.5	1.6	1.7
840419	-----	-----	-----	1.5	1.6	1.8
840420	-----	-----	-----	1.5	1.6	1.9
840421	-----	-----	-----	1.5	2.1	4.2
840422	-----	-----	-----	2.0	2.5	4.0
840423	-----	-----	-----	1.8	2.0	2.4
840424	-----	-----	-----	1.8	2.0	2.3
840425	-----	-----	-----	1.7	2.0	2.5
840426	-----	-----	-----	1.8	2.2	3.1
840427	-----	-----	-----	2.0	2.9	4.9
840428	-----	-----	-----	2.6	3.9	5.7
840429	-----	-----	-----	3.0	4.4	6.1
840430	-----	-----	-----	3.3	4.9	7.6
Monthly Value	-----	-----	-----	1.5	2.1	7.6

----- Data not available.

Appendix Table A-23 (continued).

May 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840501	-----	-----	-----	4.1	5.7	8.2
840502	-----	-----	-----	4.2	5.9	8.2
840503	-----	-----	-----	5.6	6.9	9.7
840504	-----	-----	-----	5.5	7.5	11.1
840505	-----	-----	-----	5.4	7.7	11.2
840506	-----	-----	-----	5.5	8.2	12.5
840507	-----	-----	-----	5.6	8.0	11.3
840508	-----	-----	-----	4.6	7.7	11.5
840509	-----	-----	-----	5.7	8.5	12.7
840510	-----	-----	-----	3.6	7.8	11.2
840511	-----	-----	-----	5.1	7.6	11.2
840512	-----	-----	-----	3.2	6.1	10.5
840513	-----	-----	-----	4.3	7.3	13.1
840514	-----	-----	-----	4.9	7.9	12.2
840515	-----	-----	-----	3.9	5.2	10.2
840516	-----	-----	-----	2.1	4.0	7.4
840517	-----	-----	-----	2.4	4.1	6.4
840518	-----	-----	-----	3.2	4.4	6.6
840519	-----	-----	-----	3.1	4.4	5.9
840520	-----	-----	-----	3.0	4.7	6.8
840521	-----	-----	-----	5.2	6.6	8.2
840522	-----	-----	-----	6.1	-----	7.0
Monthly Value	-----	-----	-----	2.1	6.5	13.1

----- Data not available.

Appendix Table A-24 Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Side Channel 21 - Site 3, RM 141.0, GC S31N02W02CAA.

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
November 1983						
831130	.1	-----	.2	-.1	-----	0.0
Monthly Value	.1	-----	.2	-.1	-----	0.0

----- Data not available.

Appendix Table A-24 (continued).

December 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831201	.1	.2	.2	-.1	-.0	0.0
831202	.1	.2	.2	-.1	-.1	0.0
831203	.2	.2	.2	-.1	-.0	0.0
831204	.2	.2	.2	-.1	0.0	0.0
831205	.2	.2	.2	0.0	0.0	0.0
831206	.2	.2	.2	0.0	0.0	0.0
831207	.1	.2	.2	-.1	-.1	0.0
831209	.1	.1	.2	*****	*****	*****
831210	.1	.1	.2	*****	*****	*****
831211	.1	.1	.1	*****	*****	*****
831212	0.0	.1	.1	*****	*****	*****
831213	0.0	.1	.1	*****	*****	*****
831214	0.0	-----	.1	*****	*****	*****
831221	0.0	-----	0.0	-.1	-----	0.0
831222	0.0	0.0	0.0	-.1	-.1	0.0
831223	-.1	0.0	0.0	-.1	-.1	0.0
831224	-.1	0.0	0.0	-.2	-.1	-.1
831225	0.0	0.0	0.0	-.1	-.1	0.0
831226	0.0	0.0	0.0	-.1	0.0	0.0
831227	-.1	-.0	0.0	-.1	-.0	0.0
831228	-.1	0.0	0.0	-.1	-----	0.0
Monthly Value	-.1	-----	.2	-.2	-----	0.0

----- Data not available.
***** Data available; site frozen.

Appendix Table A-24 (continued).

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January 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840110	-.1	-----	0.0	.1	-----	.2
840111	-.1	-.1	0.0	.1	.2	.3
840112	-.1	-.0	0.0	.2	.2	.3
840113	-.1	-.0	0.0	.2	.2	.3
840114	-.1	-.0	0.0	.2	.3	.3
840115	-.1	-.0	0.0	.2	.3	.4
840116	-.1	-.1	0.0	.3	.4	.4
840117	-.1	0.0	0.0	.4	.4	.5
840118	-.1	-.0	0.0	.4	.4	.5
840119	-.1	-.0	0.0	.4	.4	.5
840120	-.2	-.1	0.0	.2	.3	.5
840121	-.2	-.1	0.0	0.0	.2	.3
840122	*****	*****	*****	*****	*****	*****
840123	*****	*****	*****	*****	*****	*****
840124	*****	*****	*****	*****	*****	*****
840125	*****	*****	*****	*****	*****	*****
840126	*****	*****	*****	*****	*****	*****
840127	*****	*****	*****	*****	*****	*****
840128	*****	*****	*****	*****	*****	*****
840129	*****	*****	*****	*****	*****	*****
840130	*****	*****	*****	*****	*****	*****
840131	*****	*****	*****	*****	*****	*****
Monthly Value	-.2	-----	0.0	0.0	-----	.5

----- Data not available.
***** Data available; site frozen.

Appendix Table A-24 (continued).

February 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840202	*****	*****	*****	.2	.	.5
840203	*****	*****	*****	.4	.5	.6
840204	*****	*****	*****	.6	.7	.8
840205	*****	*****	*****	.7	.8	.8
840206	*****	*****	*****	.7	.8	.9
840207	*****	*****	*****	.8	.9	1.0
840208	*****	*****	*****	.9	.9	1.0
840209	*****	*****	*****	.9	1.0	1.1
840210	*****	*****	*****	.9	1.1	1.1
840211	*****	*****	*****	1.0	1.1	1.2
840212	*****	*****	*****	1.1	1.2	1.2
840213	*****	*****	*****	1.1	1.2	1.3
840214	*****	*****	*****	1.2	1.3	1.4
840215	*****	*****	*****	1.3	1.3	1.4
840216	*****	*****	*****	1.3	1.4	1.5
840217	*****	*****	*****	1.4	1.4	1.5
840218	*****	*****	*****	1.4	1.5	1.5
840219	*****	*****	*****	1.4	1.5	1.5
840220	*****	*****	*****	1.4	1.5	1.6
840221	*****	*****	*****	1.5	1.5	1.6
840222	*****	*****	*****	1.5	1.6	1.6
840223	*****	*****	*****	1.5	1.6	1.6
840224	*****	*****	*****	1.5	1.6	1.6
840225	*****	*****	*****	1.6	1.6	1.7
840226	*****	*****	*****	1.6	1.6	1.7
840227	*****	*****	*****	1.6	1.6	1.7
840228	*****	*****	*****	1.6	1.7	1.8
840229	*****	*****	*****	1.6	1.7	1.8
Monthly Value	*****	*****	*****	.2	1.2	1.8

***** Data available; site frozen.

Appendix Table A-24 (continued).

March 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840301	*****	*****	*****	1.6	1.7	1.8
840302	*****	*****	*****	1.7	1.8	1.8
840303	*****	*****	*****	1.7	1.8	1.8
840304	*****	*****	*****	1.7	1.8	1.9
840305	*****	*****	*****	1.8	1.9	1.9
840306	*****	*****	*****	1.8	1.9	1.9
840307	*****	*****	*****	1.8	1.9	2.0
840308	*****	*****	*****	1.9	2.0	2.1
840309	*****	*****	*****	2.0	2.0	2.2
840310	*****	*****	*****	2.0	2.2	2.4
840311	*****	*****	*****	2.1	2.2	2.4
840312	*****	*****	*****	2.0	2.2	2.5
840313	*****	*****	*****	2.0	2.2	2.6
840314	*****	*****	*****	2.2	2.3	2.6
840315	*****	*****	*****	2.2	2.4	2.7
840316	*****	*****	*****	2.1	2.3	2.7
840317	*****	*****	*****	2.1	2.3	2.6
840318	*****	*****	*****	2.1	2.3	3.0
840319	*****	*****	*****	2.2	2.2	2.4
840320	*****	*****	*****	2.2	2.4	2.7
840321	*****	*****	*****	2.2	2.4	2.6
840322	*****	*****	*****	2.2	2.3	2.5
840323	*****	*****	*****	2.3	2.4	2.5
840324	*****	*****	*****	2.3	2.5	2.6
840325	*****	*****	*****	2.3	2.5	2.8
840326	*****	*****	*****	2.4	2.5	2.8
840327	*****	*****	*****	2.4	2.5	2.8
840328	*****	*****	*****	2.4	2.6	2.9
840329	*****	*****	*****	2.5	2.7	2.9
840330	*****	*****	*****	2.5	2.7	3.1
840331	*****	*****	*****	2.5	2.7	3.0
Monthly Value	*****	*****	*****	1.6	2.2	3.1

***** Data available; site frozen.

Appendix Table A-24 (continued).

April 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840401	*****	*****	*****	2.6	2.7	3.0
840402	*****	*****	*****	2.6	2.7	3.0
840403	*****	*****	*****	2.6	2.8	3.4
840404	*****	*****	*****	2.6	2.8	3.3
840405	*****	*****	*****	2.6	2.9	3.3
840406	*****	*****	*****	2.7	2.8	3.0
840407	*****	*****	*****	2.7	2.8	2.9
840408	*****	*****	*****	2.7	2.8	2.9
840409	*****	*****	*****	2.7	2.9	3.0
840410	*****	*****	*****	2.8	2.9	3.0
840411	*****	*****	*****	2.8	2.9	3.1
840412	*****	*****	*****	2.8	3.0	3.2
840413	*****	*****	*****	2.9	3.0	3.3
840414	*****	*****	*****	2.9	3.1	3.4
840415	*****	*****	*****	2.9	3.1	3.4
840416	*****	*****	*****	3.0	3.0	3.1
840417	*****	*****	*****	3.0	3.1	3.2
840418	*****	*****	*****	3.0	3.2	3.3
840419	*****	*****	*****	3.0	3.2	3.4
840420	*****	*****	*****	3.1	3.2	3.4
840421	*****	*****	*****	3.1	3.3	3.8
840422	*****	*****	*****	3.1	3.4	3.7
840423	*****	*****	*****	3.1	3.4	3.7
840424	*****	*****	*****	3.1	3.4	3.9
840425	*****	*****	*****	3.2	3.5	4.1
840426	*****	*****	*****	3.2	3.6	4.3
840427	*****	*****	*****	3.3	3.9	5.0
840428	.1	-----	.2	3.4	5.0	6.9
840429	.1	.3	.8	4.4	6.0	7.9
840430	.7	1.0	2.0	5.2	7.1	9.8
Monthly Value	.1	-----	2.0	2.6	3.4	9.8

----- Data not available.
***** Data available; site frozen.

Appendix Table A-24 (continued).

May 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840501	1.5	1.9	3.1	5.9	7.5	9.5
840502	2.6	3.0	3.7	6.7	7.9	9.7
840503	3.5	3.8	4.5	7.2	8.3	10.0
840504	4.3	4.6	5.4	7.5	8.9	11.8
840505	4.7	5.1	5.8	7.3	8.9	11.7
840506	5.1	5.6	6.2	7.5	9.2	12.6
840507	5.4	5.9	6.3	7.8	9.3	11.6
840508	5.5	6.1	6.6	7.8	9.4	11.7
840509	5.8	6.3	6.9	8.1	10.0	12.8
840510	5.9	6.7	7.2	6.3	9.4	11.8
840511	5.5	5.9	6.2	8.3	9.3	10.2
840512	4.0	4.6	5.5	7.4	8.6	9.9
840513	3.8	4.0	4.8	7.5	8.9	12.2
840514	4.3	4.7	5.0	8.6	10.0	11.8
840515	2.0	3.3	4.7	5.8	7.4	10.7
840516	.5	1.1	2.0	4.4	5.1	6.6
840517	.3	.4	.6	4.0	4.6	5.2
840518	.3	.5	.6	4.2	4.6	5.0
840519	.5	.6	.7	4.3	4.6	5.0
840520	.6	.7	.8	4.4	4.9	5.4
840521	.7	.8	.8	5.2	5.6	6.1
840522	.8	-----	.8	5.7	-----	5.9
Monthly Value	.3	3.5	7.2	4.0	7.7	12.8

----- Data not available.

Appendix Table A-25 Datapod temperature recorder data summary: intragravel and surface water tempertures (C) recorded at Side Channel 21 - Site 3 when the site was frozen, RM 141.0, GC S31N02W02CAA.

December 1983 (Site frozen)

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831208	+++++	+++++	+++++	-.2	-.1	-.1
831209	+++++	+++++	+++++	-.4	-.2	-.2
831210	+++++	+++++	+++++	-.5	-.4	-.4
831211	+++++	+++++	+++++	-.4	-.4	-.4
831212	+++++	+++++	+++++	-.4	-.4	-.4
831213	+++++	+++++	+++++	-.5	-.4	-.4
831214	+++++	+++++	+++++	-.4	-----	-.4
Monthly Value	-----	-----	-----	-.5	-----	-.1

----- Data not available.
+++++ Data available; site not frozen.

Appendix Table A-25 (continued).

January 1984 (Site frozen)

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840122	-.3	-.2	-.1	-.4	-.2	.1
840123	-.4	-.3	-.2	-.6	-.5	-.3
840124	-.7	-.5	-.4	-1.0	-.8	-.6
840125	-.9	-.7	-.6	-1.4	-1.1	-.9
840126	-1.1	-1.0	-.8	-1.7	-1.5	-1.3
840127	-1.3	-1.2	-1.1	-1.8	-1.7	-1.6
840128	-1.4	-1.3	-1.2	-1.9	-1.8	-1.8
840129	-1.5	-1.4	-1.3	-1.9	-1.9	-1.6
840130	-1.4	-1.2	-1.1	-1.7	-1.2	-.8
840131	-1.1	-.9	-.7	-.8	-.4	-.2
Monthly Value	-1.5	-----	-.1	-1.9	-----	.1

----- Data not available.

Appendix Table A-25 (continued).

February 1984 (Site frozen)

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840201	-.8	-.6	-.5	-.2	.0	.2
840202	-.5	-.5	-.3	+++++	+++++	+++++
840203	-.4	-.3	-.3	+++++	+++++	+++++
840204	-.3	-.2	-.2	+++++	+++++	+++++
840205	-.2	-.2	-.2	+++++	+++++	+++++
840206	-.2	-.2	-.1	+++++	+++++	+++++
840209	-.2	-.2	-.1	+++++	+++++	+++++
840210	-.2	-.2	-.1	+++++	+++++	+++++
840211	-.2	-.1	-.1	+++++	+++++	+++++
840212	-.2	-.1	-.1	+++++	+++++	+++++
840213	-.2	-.1	-.1	+++++	+++++	+++++
840214	-.2	-.1	0.0	+++++	+++++	+++++
840215	-.2	-.1	-.1	+++++	+++++	+++++
840216	-.2	-.1	0.0	+++++	+++++	+++++
840217	-.1	-.1	0.0	+++++	+++++	+++++
840218	-.2	-.1	0.0	+++++	+++++	+++++
840219	-.2	-.1	0.0	+++++	+++++	+++++
840222	-.1	-.1	0.0	+++++	+++++	+++++
840223	-.1	-.1	0.0	+++++	+++++	+++++
840226	-.1	-.1	0.0	+++++	+++++	+++++
840227	-.2	-.1	0.0	+++++	+++++	+++++
840228	-.2	-.1	0.0	+++++	+++++	+++++
840229	-.1	-.1	0.0	+++++	+++++	+++++
Monthly Value	-.8	-.2	0.0	-.2	+++++	.2

+++++ Data available; site not frozen.

March 1984 (Site frozen)

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840301	-.1	-.1	0.0	+++++	+++++	+++++
840302	-.1	-.1	0.0	+++++	+++++	+++++
840303	-.1	-.1	0.0	+++++	+++++	+++++
840304	-.1	-.1	0.0	+++++	+++++	+++++
840305	-.1	-.0	0.0	+++++	+++++	+++++
840306	-.1	-.1	0.0	+++++	+++++	+++++
840307	-.1	-.0	0.0	+++++	+++++	+++++
840308	-.1	-.0	0.0	+++++	+++++	+++++
840309	-.1	-.0	0.0	+++++	+++++	+++++
840310	-.1	-.0	0.0	+++++	+++++	+++++
840311	-.1	-.0	0.0	+++++	+++++	+++++
840312	-.1	-.0	0.0	+++++	+++++	+++++
840313	-.1	-.0	0.0	+++++	+++++	+++++
840314	-.1	-.0	0.0	+++++	+++++	+++++
840315	-.1	0.0	0.0	+++++	+++++	+++++
840316	-.1	0.0	0.0	+++++	+++++	+++++
840317	-.1	-.0	0.0	+++++	+++++	+++++
840318	-.1	-.0	0.0	+++++	+++++	+++++
840319	-.1	-.1	0.0	+++++	+++++	+++++
840320	-.1	-.0	0.0	+++++	+++++	+++++
840321	-.1	-.0	0.0	+++++	+++++	+++++
840322	-.1	-.0	0.0	+++++	+++++	+++++
840323	-.1	-.0	0.0	+++++	+++++	+++++
840324	-.1	-.0	0.0	+++++	+++++	+++++
840325	-.1	0.0	0.0	+++++	+++++	+++++
840326	-.1	0.0	0.0	+++++	+++++	+++++
840327	-.1	0.0	0.0	+++++	+++++	+++++
840328	-.1	0.0	0.0	+++++	+++++	+++++
840329	-.1	0.0	0.0	+++++	+++++	+++++
840330	-.1	0.0	0.0	+++++	+++++	+++++
840331	-.1	0.0	0.0	+++++	+++++	+++++
Monthly Value	-.1	-.0	0.0	+++++	+++++	+++++

+++++ Data available; site not frozen.

Appendix Table A-25 (continued).

April 1984 (Site frozen)

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840401	-.1	0.0	0.0	+++++	+++++	+++++
840402	-.1	0.0	0.0	+++++	+++++	+++++
840403	-.1	0.0	0.0	+++++	+++++	+++++
840404	-.1	0.0	0.0	+++++	+++++	+++++
840405	-.1	0.0	0.0	+++++	+++++	+++++
840406	-.1	0.0	0.0	+++++	+++++	+++++
840407	-.1	0.0	0.0	+++++	+++++	+++++
840408	-.1	0.0	0.0	+++++	+++++	+++++
840409	-.1	0.0	.1	+++++	+++++	+++++
840410	-.1	0.0	0.0	+++++	+++++	+++++
840411	-.1	0.0	.1	+++++	+++++	+++++
840412	-.1	0.0	.1	+++++	+++++	+++++
840413	-.1	0.0	.1	+++++	+++++	+++++
840414	-.1	0.0	.1	+++++	+++++	+++++
840415	-.1	0.0	.1	+++++	+++++	+++++
840416	-.1	-.0	0.0	+++++	+++++	+++++
840417	-.1	0.0	.1	+++++	+++++	+++++
840418	-.1	0.0	.1	+++++	+++++	+++++
840419	-.1	0.0	.1	+++++	+++++	+++++
840420	-.1	0.0	.1	+++++	+++++	+++++
840421	-.1	0.0	.1	+++++	+++++	+++++
840422	-.1	0.0	.1	+++++	+++++	+++++
840423	-.1	0.0	.1	+++++	+++++	+++++
840424	-.1	0.0	.1	+++++	+++++	+++++
840425	-.1	0.0	.1	+++++	+++++	+++++
840426	-.1	0.0	.1	+++++	+++++	+++++
840427	-.1	0.0	.1	+++++	+++++	+++++
840428	-.1	0.0	.1	+++++	+++++	+++++
Monthly Value	-.1	-.0	.1	+++++	+++++	+++++

+++++ Data available; site not frozen.

Appendix Table A-26 Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Lower Slough 8A - Site 2, RM 125.6, GC S30N03W30BDB.

August 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
830824	4.5	4.5	4.6	7.1	8.4	9.6
830825	4.5	-----	4.6	6.2	-----	8.7
Monthly Value	4.5	-----	4.6	6.2	-----	9.6

----- Data not available.

Appendix Table A-27 Datapod tempertaure recorder data summary: intragravel and surface water temperatures (C) recorded at Lower Slough 8A - Site 3, RM 125.6, GC S30N03W30BDB.

August 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
830825	4.9	-----	4.9	8.3	-----	9.2
830826	4.9	5.0	5.1	6.9	8.4	9.2
830827	4.9	5.0	5.1	7.9	9.0	11.1
830828	4.9	5.0	5.1	7.2	9.0	11.1
830829	4.8	4.9	5.1	7.4	8.5	11.0
830830	4.7	4.8	4.9	7.7	8.3	9.6
830831	4.9	5.0	5.1	8.0	8.6	9.3
Monthly Value	4.7	-----	5.1	6.9	-----	11.1

----- Data not available.

Appendix Table A-27 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
September 1983						
830901	5.0	5.0	5.1	7.3	8.0	8.6
830902	5.0	5.0	5.1	6.8	8.2	9.9
830903	4.9	5.0	5.1	6.0	7.3	9.1
830904	4.8	4.9	5.1	5.4	6.8	8.1
830905	4.8	5.3	6.0	4.7	6.4	7.7
830906	4.7	5.7	6.5	4.6	6.6	8.0
830907	5.1	5.9	6.6	5.1	6.6	7.8
830908	6.3	6.7	7.1	6.8	7.6	8.1
830909	6.8	7.3	8.0	7.2	8.1	9.5
830910	7.3	7.8	8.6	7.8	8.6	10.0
830911	6.9	7.6	8.3	7.1	8.0	9.1
830912	7.1	7.6	8.2	7.3	8.0	9.2
830913	7.3	7.8	8.6	7.6	8.3	9.5
830914	6.8	7.3	8.2	6.6	7.3	8.1
830915	6.1	6.8	8.1	6.2	7.2	9.3
830916	5.7	6.7	7.7	5.5	6.8	8.6
830917	5.1	6.0	7.2	4.8	6.0	7.8
830918	4.6	5.4	6.4	4.4	5.4	7.0
830919	4.6	5.3	6.1	4.5	5.5	6.8
830920	5.6	5.9	6.3	5.8	6.3	6.7
830921	6.2	6.6	7.4	6.5	7.1	8.3
830922	7.0	7.2	7.4	6.8	7.7	8.3
830923	5.4	6.0	7.1	4.0	5.3	6.7
830924	2.9	3.9	5.4	.6	1.9	3.9
830925	1.6	2.4	2.9	.5	1.1	1.8
830926	1.8	2.1	2.7	1.2	1.9	3.0
830927	2.1	2.4	2.8	1.8	2.4	3.2
830928	2.5	2.6	2.7	2.3	2.6	2.9
830929	2.5	2.6	2.8	2.5	2.7	3.0
830930	2.7	3.0	3.9	2.6	3.4	5.0
Monthly Value	1.6	5.5	8.6	.5	6.0	10.0

Appendix Table A-27 (contined).

October 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	max
831001	3.9	4.3	4.7	4.4	4.8	5.4
831002	4.0	4.4	4.9	4.1	4.8	5.6
831003	3.2	3.9	4.9	2.6	3.5	4.8
831004	2.6	3.1	3.8	1.8	2.6	3.4
831005	3.1	3.2	3.3	2.5	3.0	3.4
831006	2.5	2.7	3.1	2.0	2.5	3.3
831007	1.9	2.3	3.0	1.2	1.9	2.7
831008	1.5	1.8	2.1	1.0	1.6	2.2
831009	1.2	1.7	2.1	.8	1.4	2.0
831010	.7	1.1	1.3	.3	.8	1.2
831011	1.1	1.4	1.8	1.1	1.4	1.9
831012	1.8	2.1	2.5	1.8	2.1	2.5
831013	2.1	2.3	2.6	1.3	2.1	2.5
831014	1.7	2.1	2.6	1.0	1.5	2.2
831015	1.8	2.0	2.3	1.4	1.8	2.4
831016	1.6	2.0	2.4	.9	1.5	2.4
831017	1.4	1.6	1.8	1.0	1.3	1.6
831018	1.6	1.9	2.5	1.5	2.2	3.0
831019	1.9	2.2	2.4	1.3	2.0	2.6
831020	1.0	1.4	1.9	.4	1.0	1.6
831021	1.1	1.3	1.7	.7	1.3	1.9
831022	1.4	1.6	1.8	1.1	1.6	2.1
831023	.8	1.2	1.7	.6	1.0	1.5
831024	.6	.8	1.2	.4	.8	1.4
831025	.4	.6	.9	.3	.6	1.0
831026	.6	.7	.9	.4	.8	1.5
831027	.4	.6	1.0	.3	.8	1.5
831028	.6	.7	1.0	.6	.9	1.4
831029	.4	.6	.9	.3	.8	1.3
831030	.4	.6	.8	.3	.7	1.2
831031	.3	.5	.6	.3	.6	.8
Monthly Value	.3	1.8	4.9	.3	1.7	5.6

Appendix Table A-27(continued).

November 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831101	.3	.4	.6	.3	.6	1.1
831102	.4	.5	.8	.4	.7	1.2
831103	.2	.3	.6	.3	.4	.7
831104	.2	-----	.4	.3	-----	.4
831112	.2	-----	.3	.5	-----	.6
831113	.2	.4	.6	.2	.4	.5
831114	.6	.7	.9	-----	-----	-----
831115	.8	.8	.9	-----	-----	-----
831123	.2	.2	.3	-.1	.4	.6
831124	.3	.5	.7	-.1	.2	.4
831125	.7	.7	.9	-----	-----	-----
831126	.8	-----	.9	-----	-----	-----
831127	1.9	-----	2.0	.4	-----	.5
831128	2.0	2.0	2.1	.5	.5	.5
831129	2.1	2.1	2.2	.5	.5	.6
831130	2.1	2.2	2.2	.5	.5	.6
Monthly Value	.2	-----	2.2	-.1	-----	1.2

----- Data not available.

Appendix Table A-27 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
December 1983						
831201	2.1	2.1	2.2	.5	.5	.6
831202	2.1	2.1	2.2	.5	.6	.7
831203	2.1	2.2	2.2	.6	.7	.7
831204	2.1	2.1	2.2	.7	.7	.8
831205	2.1	2.1	2.2	.7	.7	.8
831206	2.1	2.1	2.2	.5	.6	.8
831207	1.9	2.0	2.2	.3	.4	.5
831208	2.0	2.0	2.1	.5	----	.6
831209	2.0	2.1	2.2	.5	.5	.6
831210	2.1	2.2	2.2	.5	.5	.6
831211	2.1	2.1	2.2	.5	.5	.6
831212	2.1	2.1	2.2	.5	.5	.6
831213	2.1	2.1	2.2	.5	.6	.7
831214	2.1	2.2	2.2	.6	.7	.7
831215	2.1	2.1	2.2	.7	.7	.8
831216	2.1	2.1	2.2	.7	.7	.8
831217	2.0	2.1	2.2	.4	.6	.7
831218	1.9	2.0	2.1	.3	.4	.6
831219	1.2	----	2.1	.5	----	.5
831220	.7	----	1.0	.5	----	.5
831221	.4	.5	.7	.5	.5	.5
831222	.3	.4	.4	.5	.5	.5
831223	.3	.3	.4	.5	.5	.5
831224	.3	.4	.5	.5	.5	.5
831225	.4	.5	.6	.5	.5	.6
831226	.6	.7	.7	.5	.5	.6
831227	.6	.7	.8	.5	.5	.6
831228	.6	.6	.7	.5	.5	.6
831229	.6	.6	.7	.5	.5	.6
831230	.6	.6	.6	.5	.5	.6
831231	.6	.9	1.1	.5	.5	.5
Monthly Value	.3	1.5	2.2	.3	.6	.8

---- Data not available.

Appendix Table A-27 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
			January 1984			
840101	.4	.5	.6	.5	.5	.5
840102	.3	.4	.4	.5	.5	.5
840103	.3	.3	.5	.5	.5	.5
840104	.3	.4	.5	.5	.5	.5
840105	.4	.6	.7	.5	.5	.6
840106	.6	.7	.8	.5	.5	.6
840107	.6	.7	.7	.5	.5	.6
840108	.6	.6	.7	.5	.5	.6
840109	.6	.6	.7	.5	.5	.6
840110	.5	----	.6	.5	----	.7
840111	.5	.6	.6	.5	.6	.7
840112	.5	.6	.7	.5	.6	.8
840113	.6	.7	.7	.6	.7	.9
840114	.6	.6	.7	.6	.7	.9
840115	.6	.7	.8	.6	.8	.9
840116	.5	.6	.7	.5	.6	.7
840117	.6	.6	.6	.6	.7	.8
840118	.5	.6	.6	.6	.7	.8
840119	.5	.5	.6	.5	.6	.7
840120	.4	.5	.6	.5	.5	.6
840121	.4	.4	.5	.5	.5	.6
840122	.3	.4	.5	.5	.5	.6
840123	.3	.4	.5	.5	.5	.6
840124	.3	.4	.4	.5	.5	.6
840126	.3	----	.5	.5	----	.6
840127	.3	.4	.4	.5	.5	.5
840128	.3	.3	.4	.5	.5	.5
840129	.3	.4	.4	.5	.5	.6
840130	.4	.4	.5	.5	.5	.5
840131	.4	.4	.5	.5	.5	.6
Monthly Value	.3	.5	.8	.5	.6	.9

---- Data not available.

Appendix Table A-27 (continued).

February 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840201	.4	.5	.5	.5	.5	.6
840202	.4	.4	.5	.5	.5	.6
840203	.4	.4	.5	.5	.5	.6
840204	.4	.4	.5	.4	.5	.5
840205	.4	.4	.4	.5	.5	.5
840206	.4	.4	.5	.5	.5	.6
840207	.3	.4	.5	.5	.5	.6
840208	.3	.4	.5	.5	.5	.6
840209	.3	.4	.4	.5	.5	.6
840210	.3	.4	.4	.5	.5	.6
840211	.3	.4	.4	.5	.5	.5
840212	.3	.4	.4	.5	.5	.5
840213	.3	.4	.4	.5	.5	.5
840214	.3	.4	.5	.5	.5	.6
840215	.3	.4	.5	.5	.5	.6
840216	.3	.4	.5	.5	.5	.6
840217	.3	.4	.5	.5	.5	.6
840218	.3	.4	.5	.5	.5	.6
840219	.4	.4	.5	.5	.5	.6
840220	.3	.4	.5	.5	.5	.6
840221	.3	.4	.4	.5	.5	.6
840222	.3	.4	.4	.5	.5	.6
840223	.3	.4	.4	.5	.5	.6
840224	.3	.3	.4	.4	.5	.5
840225	.3	.3	.4	.4	.5	.5
840226	.3	.4	.4	.4	.5	.5
840227	.3	.3	.4	.4	.5	.5
840228	.3	.3	.4	.4	.5	.6
840229	.3	.4	.4	.5	.5	.6
Monthly Value	.3	.4	.5	.4	.5	.6

Appendix Table A-27 (continued).

March 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840301	.3	.3	.4	.5	.5	.6
840302	.3	.3	.4	.5	.5	.6
840303	.3	.4	.4	.5	.5	.6
840304	.3	.4	.5	.5	.5	.7
840305	.4	.4	.5	.5	.6	.7
840306	.4	.5	.6	.5	.7	1.0
840307	.5	.5	.7	.6	.7	1.1
840308	.5	.6	.7	.5	.8	1.0
840309	.6	.8	1.0	.7	1.1	1.4
840310	.8	1.0	1.2	.9	1.2	1.6
840311	.8	1.0	1.3	.8	1.3	1.8
840312	.6	1.0	1.3	.7	1.2	1.8
840313	.7	1.0	1.4	.8	1.2	1.8
840314	.9	1.1	1.4	1.0	1.3	1.8
840315	.9	1.2	1.6	1.0	1.4	2.1
840316	.8	1.1	1.5	.9	1.4	2.1
840317	.6	1.0	1.4	.7	1.1	1.9
840318	.6	.9	1.4	.5	1.1	2.0
840319	.5	.9	1.4	.6	1.1	2.0
840320	.7	1.0	1.4	.8	1.2	1.9
840321	.8	1.1	1.6	.8	1.3	2.3
840322	.6	.9	1.3	.5	1.1	2.2
840323	.6	1.0	1.6	.6	1.3	2.3
840324	.6	1.0	1.6	.6	1.2	2.2
840325	.8	1.2	1.8	.8	1.5	2.[illegible]
840326	1.1	1.4	1.8	1.2	1.6	2.7
840327	1.2	1.4	1.8	1.3	1.6	2.5
840328	.9	1.5	2.4	1.0	1.8	3.3
840329	1.3	1.6	2.1	1.2	1.9	3.0
840330	1.2	1.7	2.4	1.3	2.0	3.3
840331	1.5	1.7	2.1	1.0	1.9	2.6
Monthly Value	.3	1.0	2.4	.5	1.2	3.3

Appendix Table A-27 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
			April 1984			
840401	1.4	1.7	2.4	1.5	2.1	3.4
840402	1.2	1.6	2.3	1.1	1.8	3.4
840403	.6	1.5	3.0	.5	1.9	4.2
840404	1.0	2.0	3.4	1.1	2.3	4.6
840405	1.8	2.3	3.2	1.8	2.6	4.7
840406	1.8	2.3	2.9	1.9	2.5	4.2
840407	1.4	2.0	2.7	.8	2.3	4.1
840408	1.2	2.0	2.9	.4	2.2	3.9
840409	1.6	2.3	3.5	1.6	2.7	4.7
840410	1.8	2.6	3.7	1.9	2.9	4.8
840411	1.5	2.4	3.8	1.4	2.8	5.0
840412	1.4	2.6	4.3	1.3	2.9	5.7
840413	1.7	2.8	4.4	1.5	3.2	5.8
840414	1.9	3.0	4.4	1.9	3.4	5.9
840415	2.7	3.4	4.5	2.5	3.7	5.8
840416	2.3	2.9	4.1	1.9	3.0	4.2
840417	1.8	2.9	5.0	1.7	3.5	6.9
840418	1.6	3.2	5.6	1.3	3.6	7.4
840419	1.7	3.4	5.5	1.4	3.7	7.5
840420	2.8	3.9	5.5	2.8	4.2	6.9
840421	3.0	4.4	7.0	2.9	5.0	9.1
840422	1.9	3.9	6.4	.7	4.0	7.7
840423	2.0	3.9	6.3	1.7	4.3	8.2
840424	2.4	4.2	6.2	1.9	4.5	7.9
840425	3.0	4.6	6.6	2.6	4.9	8.6
840426	3.0	4.6	6.8	2.5	5.0	8.7
840427	3.3	5.1	7.0	3.0	5.4	8.8
840428	4.2	5.3	6.6	4.2	5.7	8.1
840429	4.1	5.7	7.8	3.7	6.4	10.1
840430	5.4	6.4	7.8	5.3	6.9	10.0
Monthly Value	.6	3.3	7.8	.4	3.6	10.1

Appendix Table A-27 (continued).

May 1984

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
840501	5.7	6.7	7.5	5.6	7.2	8.9
840502	6.1	6.6	7.5	5.8	6.9	8.1
840503	5.7	6.3	6.9	5.6	6.7	8.2
840504	6.0	6.5	6.9	5.7	6.9	8.5
840505	5.8	6.2	6.7	5.9	6.7	8.5
840506	5.7	6.3	7.0	5.8	6.9	8.5
840507	5.8	6.7	7.8	5.5	7.5	9.8
840508	6.7	7.4	8.2	6.6	8.1	10.1
840509	7.0	7.6	8.2	6.6	8.5	10.6
840510	7.1	7.7	8.4	6.4	8.3	10.1
840511	6.8	7.4	7.9	5.9	8.0	9.9
840512	6.0	6.6	7.3	4.5	7.0	9.5
840513	5.8	6.3	6.8	5.3	7.6	10.1
840514	5.9	6.3	6.7	5.7	8.2	10.5
840515	6.0	6.5	6.9	5.6	8.0	10.2
840516	4.7	6.2	6.8	5.8	8.4	11.2
840517	5.3	5.9	6.5	5.2	8.1	11.2
840518	4.0	4.7	6.0	4.8	7.5	10.1
840519	3.2	3.4	4.0	4.0	6.7	9.6
840520	3.0	3.1	3.3	3.6	6.2	8.5
840521	3.0	3.1	3.1	3.9	6.0	8.1
840522	3.0	3.1	3.1	3.5	4.5	6.6
Monthly Value	3.0	6.0	8.4	3.5	7.3	11.2

Appendix Table A-28 Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Upper Slough 8A - Site 2, RM 126.6, GC S30N03W20CCA.

August 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
830824	3.5	3.6	3.7	4.2	4.7	6.0
830825	3.5	-----	3.7	3.6	-----	4.4
Monthly Value	3.5	-----	3.7	3.6	-----	6.0

----- Data not available.

Appendix Table A-28 (continued).

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
			October 1983			
831027	2.9	-----	3.0	1.2	-----	1.6
831028	2.7	2.8	2.9	.7	1.1	1.4
831029	2.4	2.5	2.7	.6	.9	1.2
831030	2.1	2.3	2.5	.5	.8	1.0
831031	1.7	2.0	2.2	0.0	.4	.6
Monthly Value	1.7	-----	3.0	0.0	-----	1.6

----- Data not available.

Appendix Table A-28 (continued).

November 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831101	1.5	1.6	1.8	0.0	.0	.1
831102	1.4	1.5	1.6	0.0	.0	.3
831103	1.1	1.3	1.5	-.1	.0	.1
831104	.8	1.0	1.2	*****	*****	*****
831105	.5	.6	.8	*****	*****	*****
831106	.5	.5	.5	*****	*****	*****
831107	.3	.4	.5	*****	*****	*****
831108	.2	.2	.4	*****	*****	*****
831109	.1	.2	.2	*****	*****	*****
831110	.1	.1	.2	*****	*****	*****
831111	-.1	.0	.1	*****	*****	*****
831112	*****	*****	*****	*****	*****	*****
831113	*****	*****	*****	*****	*****	*****
831114	*****	*****	*****	*****	*****	*****
831115	*****	*****	*****	*****	*****	*****
831116	*****	*****	*****	*****	*****	*****
831117	*****	*****	*****	*****	*****	*****
831118	*****	*****	*****	*****	*****	*****
831119	*****	*****	*****	*****	*****	*****
831120	*****	*****	*****	*****	*****	*****
831121	*****	*****	*****	*****	*****	*****
831122	*****	*****	*****	*****	*****	*****
831123	*****	*****	*****	*****	*****	*****
831124	*****	*****	*****	*****	*****	*****
831125	*****	*****	*****	*****	*****	*****
831126	*****	*****	*****	*****	*****	*****
831127	*****	*****	*****	*****	*****	*****
831128	*****	*****	*****	*****	*****	*****
831129	*****	*****	*****	*****	*****	*****
831130	*****	*****	*****	*****	*****	*****
Monthly Value	-.1	-----	1.8	-.1	-----	.3

----- Data not available.
***** Data available; site frozen.

Appendix Table A-29 Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Upper Slough 8A - Site 2 when the site was frozen, RM 126.6, GC S30N03W20CCA.

November 1983 (Site frozen)

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831104	+++++	+++++	+++++	-.8	-.4	-.1
831105	+++++	+++++	+++++	-1.5	-.8	-.3
831106	+++++	+++++	+++++	-3.3	-2.3	-1.5
831107	+++++	+++++	+++++	-3.3	-2.6	-1.7
831108	+++++	+++++	+++++	-3.4	-2.2	-1.2
831109	+++++	+++++	+++++	-3.5	-1.9	-1.2
831110	+++++	+++++	+++++	-4.0	-3.1	-1.7
831111	+++++	+++++	+++++	-4.4	-3.0	-2.1
831112	-.4	-.3	-.1	-4.9	-3.5	-1.9
831113	-1.4	-.8	-.3	-4.9	-4.5	-2.8
831114	-2.4	-2.0	-1.4	-4.9	-4.9	-4.9
831115	-2.8	-2.6	-2.1	-4.9	-4.8	-4.3
831116	-2.1	-1.6	-1.4	-4.4	-3.6	-3.1
831117	-1.8	-1.6	-1.4	-4.7	-4.2	-3.4
831118	-1.8	-1.7	-1.5	-4.9	-3.9	-3.3
831119	-2.7	-2.2	-1.6	-4.9	-4.9	-4.9
831120	-3.2	-3.0	-2.6	-4.9	-4.8	-4.2
831121	-2.6	-1.9	-1.3	-4.2	-2.8	-1.6
831122	-1.3	-.9	-.6	-1.6	-1.2	-1.0
831123	-.7	-.6	-.5	-2.1	-1.5	-1.2
831124	-1.1	-.8	-.6	-4.0	-2.7	-1.9
831125	-1.7	-1.5	-1.1	-4.4	-4.0	-3.7
831126	-1.7	-1.6	-1.5	-3.8	-3.3	-2.8
831127	-1.5	-1.4	-1.2	-3.3	-2.6	-1.9
831128	-1.2	-1.0	-.8	-2.0	-1.6	-1.2
831129	-.8	-.7	-.7	-1.8	-1.5	-1.3
831130	-1.0	-.8	-.7	-2.7	-2.1	-1.5
Monthly Value	-3.2	-----	-.1	-4.9	-2.9	-.1

----- Data not available.
+++++ Data available; site not frozen.

Appendix Table A-29 (continued).

December 1983 (Site frozen)

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831201	-.9	-.8	-.8	-2.0	-1.7	-1.5
831202	-1.1	-1.0	-.8	-2.9	-2.3	-1.5
831203	-1.1	-1.0	-1.0	-2.4	-2.1	-1.9
831204	-1.1	-1.0	-.9	-2.6	-1.9	-1.3
831205	-.9	-.8	-.6	-1.4	-1.0	-.8
831206	-.6	-.5	-.4	-.8	-.7	-.5
831207	-.5	-.4	-.4	-.9	-.7	-.5
831208	-.6	-.5	-.4	-1.2	-1.1	-.9
831209	-.7	-.6	-.5	-1.6	-1.3	-1.2
831210	-.9	-.8	-.7	-1.6	-1.5	-1.5
831211	-.8	-.8	-.7	-1.5	-1.4	-1.3
831212	-.8	-.7	-.6	-1.6	-1.4	-1.3
831213	-.8	-.8	-.7	-1.6	-1.5	-1.3
831214	-.9	-.8	-.7	-1.9	-1.7	-1.3
831215	-1.1	-1.0	-.8	-2.3	-2.1	-1.8
831216	-1.2	-1.2	-1.0	-2.4	-2.2	-2.1
831217	-1.2	-1.1	-1.0	-2.1	-1.8	-1.6
831218	-1.0	-.9	-.8	-1.6	-1.5	-1.4
831219	-.8	-.6	-.3	-1.4	-.2	-.1
831220	-.4	-.3	-.2	-.2	-.1	0.0
831221	-.2	-----	-.1	-.1	-----	0.0
Monthly Value	-1.2	-.8	-.1	-2.9	-1.4	0.0

----- Data not available.

Appendix Table A-30 Datapod temperature recorder data summary: intragravel and surface water temperatures (C) recorded at Upper Slough 8A - Site 3, RM 126.6, GC S30N03W20CCA.

December 1983

Date	Intragravel			Surface Water		
	Min	Mean	Max	Min	Mean	Max
831221	3.0	-----	3.1	2.0	-----	2.9
831222	3.0	3.0	3.1	2.0	2.3	2.6
831223	2.8	3.0	3.1	1.8	2.3	2.5
831224	1.5	1.9	2.8	1.2	1.6	2.4
831225	1.5	1.9	2.3	1.5	1.9	2.2
831226	2.2	2.3	2.4	1.9	2.1	2.3
831227	2.3	2.4	2.4	1.9	2.1	2.4
831228	2.3	2.3	2.4	2.0	2.3	2.5
831229	2.3	2.4	2.5	2.1	2.4	2.6
831230	2.4	2.4	2.5	2.0	2.3	2.6
831231	2.4	2.5	2.6	2.4	2.7	2.8
Monthly Value	1.5	-----	3.1	1.2	-----	2.9

----- Data not available.