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**SUSITNA
HYDROELECTRIC PROJECT**

FEDERAL ENERGY REGULATORY COMMISSION
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**ASSESSMENT OF THE EFFECTS OF THE
PROPOSED SUSITNA HYDROELECTRIC
PROJECT ON INSTREAM TEMPERATURE
AND FISHERY RESOURCES IN THE
WATANA TO TALKEETNA REACH**

UNIVERSITY OF ALASKA
ARCTIC ENVIRONMENTAL
INFORMATION AND
DATA CENTER
UNDER CONTRACT TO

HARZA-EBASCO
SUSITNA JOINT VENTURE

VOLUME II
APPENDICES A-H

FINAL REPORT

OCTOBER 1984
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ALASKA POWER AUTHORITY

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SUSITNA HYDROELECTRIC PROJECT

ASSESSMENT OF THE EFFECTS OF THE PROPOSED
SUSITNA HYDROELECTRIC PROJECT ON INSTREAM
TEMPERATURE AND FISHERY RESOURCES IN THE WATANA
TO TALKEETNA REACH

VOLUME II
APPENDICES A-H

Report by

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Under Contract to
Harza-Ebasco Susitna Joint Venture

Prepared for
Alaska Power Authority

Final Report
October 1984

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NOTICE

**ANY QUESTIONS OR COMMENTS CONCERNING
THIS REPORT SHOULD BE DIRECTED TO
THE ALASKA POWER AUTHORITY
SUSITNA PROJECT OFFICE**

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Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, summer 1971.

Location	River Mile	Demand	Water Weeks										
			31	32	33	34	35	36	37	38	39	40	41
Watana	184.4	Natural	1.0	2.8	4.4	4.6	4.2	9.6	7.8	10.4	11.3	10.3	12.6
		1996	2.5	2.4	2.4	2.4	2.4	2.4	2.9	3.6	5.3	6.2	7.0
		2001	2.5	2.5	2.5	2.5	2.4	2.4	2.9	3.6	5.3	6.2	7.1
LRX 68	150.2	Natural	0.6	2.7	4.3	4.5	4.3	9.4	7.8	10.4	11.3	10.5	13.0
		1996	2.4	2.8	3.1	3.1	3.0	4.5	4.6	6.2	7.6	7.9	9.4
		2001	2.4	2.8	3.1	3.1	3.0	4.5	4.6	6.2	7.6	7.9	9.5
LRX 33	130.1	Natural	0.9	2.9	4.5	4.6	4.4	9.2	7.7	10.3	11.2	10.5	12.9
		1996	2.3	3.0	3.4	3.5	3.3	5.1	4.9	6.7	7.8	8.0	9.7
		2001	2.4	3.0	3.4	3.5	3.3	5.1	4.9	6.7	7.8	8.1	9.7
LRX 3	98.6	Natural	1.3	3.7	5.3	5.4	4.8	9.7	8.0	10.8	11.7	11.0	13.6
		1996	2.4	3.5	4.2	4.4	3.9	6.7	5.7	8.3	9.5	9.3	11.7
		2001	2.4	3.5	4.2	4.4	3.9	6.7	5.7	8.3	9.5	9.3	11.7
Sunshine	83.8	Natural	2.0	3.7	4.9	5.2	4.8	9.0	7.7	9.9	10.6	9.7	11.5
		1996	2.4	3.6	4.5	4.8	4.5	8.0	7.0	8.9	9.6	8.8	10.4
		2001	2.4	3.6	4.5	4.8	4.5	8.0	7.0	8.9	9.6	8.8	10.4

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, summer 1971.

Location	River Mile	Demand	Water Weeks										
			42	43	44	45	46	47	48	49	50	51	52
Watana	184.4	Natural	9.0	8.2	10.7	10.6	10.7	9.3	8.6	6.3	5.9	4.8	2.8
		1996	7.5	7.5	7.7	7.9	8.1	8.2	8.4	8.2	7.9	7.4	6.8
		2001	7.4	7.5	7.8	8.0	8.1	8.1	8.5	8.2	7.9	7.4	6.9
LRX 68	150.2	Natural	9.5	8.7	11.1	10.9	10.9	9.7	9.0	6.7	6.3	5.2	3.1
		1996	8.6	8.5	9.2	8.9	8.7	8.8	8.8	8.4	8.0	7.3	6.5
		2001	8.5	8.5	9.2	9.0	8.7	8.7	8.9	8.4	8.0	7.3	6.5
LRX 33	130.1	Natural	9.5	8.8	11.1	10.8	10.9	9.7	9.0	6.9	6.4	5.4	3.3
		1996	8.3	8.4	9.3	8.9	8.9	8.9	8.9	8.3	7.9	7.2	6.2
		2001	8.3	8.4	9.3	9.0	8.9	8.9	9.0	8.3	7.9	7.2	6.2
LRX 3	98.6	Natural	9.9	9.2	11.7	11.3	11.3	10.2	9.5	7.1	6.8	5.8	3.5
		1996	9.3	9.2	10.5	9.8	9.5	9.5	9.4	8.5	8.1	7.3	6.0
		2001	9.3	9.2	10.6	9.8	9.5	9.4	9.4	8.5	8.1	7.3	6.0
Sunshine	83.8	Natural	8.8	8.1	10.2	10.4	10.2	9.2	8.5	6.6	6.3	5.4	3.6
		1996	8.2	7.7	9.2	9.7	9.4	8.9	8.5	7.2	6.8	6.1	4.8
		2001	8.2	7.7	9.2	9.7	9.4	8.8	8.5	7.2	6.8	6.1	4.8

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, summer 1974.

Location	River Mile	Demand	Water Weeks										
			31	32	33	34	35	36	37	38	39	40	41
Watana	184.4	Natural	5.1	5.7	6.3	9.9	9.9	8.3	9.6	9.6	10.5	10.4	10.0
		1996	1.6	1.6	1.7	2.0	3.2	3.8	4.3	5.7	7.1	7.7	6.4
		2001	1.4	1.4	1.6	2.0	3.3	3.8	4.4	5.7	7.0	7.7	6.5
LRX 68	150.2	Natural	5.2	5.6	6.1	9.4	9.6	8.3	9.7	9.8	10.9	10.8	10.3
		1996	2.7	2.6	2.6	3.3	4.6	5.2	6.5	7.4	8.9	9.2	8.2
		2001	2.6	2.5	2.6	3.2	4.7	5.3	6.6	7.4	8.8	9.2	8.3
LRX 33	130.1	Natural	5.6	5.7	6.1	9.1	9.4	8.3	9.7	9.8	10.9	10.8	10.3
		1996	3.4	3.2	3.2	3.9	5.2	5.7	7.1	7.8	9.2	9.4	8.5
		2001	3.3	3.1	3.1	3.9	5.2	5.7	7.2	7.8	9.2	9.4	8.5
LRX 3	98.6	Natural	6.6	6.3	6.6	9.7	10.0	8.9	10.5	10.6	11.8	11.6	10.9
		1996	4.6	4.4	4.5	5.6	7.1	7.2	9.1	9.5	11.1	11.0	9.8
		2001	4.5	4.3	4.4	5.6	7.1	7.2	9.1	9.5	11.1	11.0	9.8
Sunshine	83.8	Natural	5.7	5.8	6.2	8.9	9.2	8.0	9.2	9.1	10.1	9.7	9.4
		1996	5.0	5.0	5.5	7.6	8.3	7.3	8.4	8.4	9.3	9.1	8.7
		2001	4.9	5.0	5.5	7.6	8.3	7.3	8.4	8.4	9.3	9.1	8.7

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, summer 1974.

Location	River Mile	Demand	Water Weeks										
			42	43	44	45	46	47	48	49	50	51	52
Watana	184.4	Natural	10.3	9.9	10.1	10.0	9.9	7.2	8.9	8.2	6.3	5.3	3.6
		1996	7.2	8.0	8.8	9.5	10.0	8.6	8.3	10.0	8.7	7.8	7.7
		2001	7.4	8.0	8.7	9.3	10.0	8.8	8.6	9.9	9.1	8.2	7.8
LRX 68	150.2	Natural	10.8	10.4	10.6	10.5	10.3	7.7	9.3	8.5	6.8	5.7	3.9
		1996	9.1	9.5	9.9	10.1	10.4	8.8	8.8	9.8	8.8	7.6	6.3
		2001	9.2	9.5	9.8	10.0	10.5	9.0	9.1	9.8	9.1	7.9	6.4
LRX 33	130.1	Natural	10.8	10.5	10.7	10.6	10.4	7.9	9.4	8.6	7.0	5.8	4.1
		1996	9.3	9.5	10.0	10.2	10.4	8.8	8.9	9.6	8.7	7.4	5.8
		2001	9.3	9.5	9.9	10.1	10.4	9.0	9.1	9.6	9.0	7.7	5.8
LRX 3	98.6	Natural	11.5	11.1	11.5	11.3	11.1	8.5	10.0	9.1	7.6	6.3	4.3
		1996	10.6	10.8	11.1	11.1	11.2	9.2	9.6	10.1	9.0	7.6	5.7
		2001	10.7	10.8	11.1	11.0	11.2	9.4	9.8	10.0	9.3	7.8	5.8
Sunshine	83.8	Natural	9.8	9.5	9.8	9.7	9.5	7.4	8.8	8.1	6.8	5.8	4.4
		1996	9.1	8.9	9.3	9.4	9.4	7.6	8.6	8.2	7.5	6.3	4.7
		2001	9.1	8.9	9.3	9.3	9.4	7.6	8.6	8.2	7.6	6.3	4.7

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, summer 1981.

Location	River Mile	Demand	Water Weeks										
			31	32	33	34	35	36	37	38	39	40	41
Watana	184.4	Natural	4.8	7.6	8.6	8.2	9.2	8.9	11.6	12.2	8.5	8.4	9.2
		1996	3.0	3.2	4.1	5.4	6.9	7.4	8.3	10.2	7.8	6.7	7.1
		2001	3.0	3.2	4.2	5.3	7.0	8.1	8.6	11.1	8.1	7.3	6.9
LRX 68	150.2	Natural	5.0	7.6	8.3	8.1	9.3	8.9	11.6	12.4	9.0	8.9	9.5
		1996	3.6	3.9	4.4	5.7	7.1	7.1	8.9	10.6	8.5	8.0	8.3
		2001	3.6	3.9	4.5	5.7	7.2	7.4	9.0	11.1	8.7	8.4	8.2
LRX 33	130.1	Natural	5.1	7.5	8.2	8.1	9.4	8.8	11.5	12.3	9.1	9.0	9.4
		1996	3.9	4.4	4.8	6.0	7.2	6.9	8.9	10.3	8.5	8.3	8.2
		2001	3.9	4.4	4.8	6.0	7.3	7.1	9.0	10.7	8.6	8.5	8.2
LRX 3	98.6	Natural	5.7	8.0	8.8	8.9	10.1	9.3	12.1	13.1	9.8	9.7	9.9
		1996	4.7	5.9	6.4	7.6	9.2	8.1	10.6	12.1	9.8	9.5	9.1
		2001	4.7	5.9	6.4	7.6	9.2	8.3	10.7	12.3	9.9	9.6	9.1
Sunshine	83.8	Natural	5.2	7.5	8.3	8.2	9.4	8.0	10.0	10.7	9.0	9.1	9.1
		1996	4.8	6.4	7.1	7.5	8.5	7.2	8.9	9.6	8.6	8.7	8.5
		2001	4.8	6.4	7.1	7.5	8.5	7.2	8.9	9.6	8.6	8.8	8.5

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, summer 1981.

Location	River Mile	Demand	Water Weeks										
			42	43	44	45	46	47	48	49	50	51	52
Watana	184.4	Natural	9.5	9.8	9.4	9.4	6.8	7.5	9.9	7.2	7.0	6.2	1.6
		1996	10.2	11.2	10.0	8.3	7.6	7.2	8.2	8.8	8.0	8.6	7.1
		2001	10.2	11.0	10.5	8.3	7.5	7.0	8.3	8.7	7.9	8.5	7.0
LRX 68	150.2	Natural	9.9	10.2	9.9	9.9	7.5	8.0	10.1	7.7	7.2	6.4	2.0
		1996	10.2	11.1	10.3	8.9	8.1	7.7	8.7	9.1	8.0	8.4	6.5
		2001	10.2	11.0	10.5	8.9	8.0	7.6	8.8	9.0	7.9	8.3	6.4
LRX 33	130.1	Natural	9.9	10.3	10.0	10.0	7.6	8.1	10.1	7.9	7.3	6.5	2.2
		1996	9.8	10.7	10.1	9.1	8.1	7.9	8.9	9.1	8.0	8.2	6.1
		2001	9.8	10.7	10.3	9.1	8.0	7.8	9.0	9.0	7.9	8.1	6.0
LRX 3	98.6	Natural	10.4	10.9	10.6	10.5	8.0	8.6	10.7	8.4	7.6	6.8	2.2
		1996	10.6	11.5	10.9	9.7	8.5	8.4	9.5	9.5	8.2	8.3	5.7
		2001	10.6	11.4	11.0	9.7	8.4	8.3	9.6	9.4	8.1	8.2	5.5
Sunshine	83.8	Natural	9.5	9.9	9.8	9.6	7.7	8.3	9.4	7.8	7.1	6.1	2.3
		1996	9.1	9.5	9.6	9.3	7.9	8.2	9.0	8.2	7.3	6.8	4.0
		2001	9.1	9.5	9.6	9.3	7.8	8.2	9.0	8.2	7.3	6.8	3.9

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, summer 1982.

Location	River Mile	Demand	Water Weeks										
			31	32	33	34	35	36	37	38	39	40	41
Watana	184.4	Natural	5.5	4.9	7.2	7.1	8.8	9.2	8.0	9.6	11.9	10.2	10.6
		1996	3.0	3.1	3.2	3.5	4.0	5.7	6.6	5.8	7.8	11.3	10.0
		2001	3.2	3.2	3.4	3.6	4.0	5.7	6.5	5.7	6.0	10.9	10.0
LRX 68	150.2	Natural	5.4	4.7	6.8	6.8	8.6	9.0	8.1	9.7	11.9	10.5	11.0
		1996	3.7	3.3	3.6	3.7	4.7	5.7	6.5	7.1	8.9	10.9	10.5
		2001	3.8	3.4	3.7	3.7	4.7	5.7	6.4	7.1	8.2	10.7	10.5
LRX 33	130.1	Natural	5.5	4.7	6.7	6.6	8.4	8.9	8.0	9.6	11.8	10.6	11.1
		1996	4.1	3.5	3.9	4.0	5.0	5.8	6.4	7.3	9.0	10.5	10.2
		2001	4.3	3.6	4.0	4.0	5.0	5.8	6.3	7.3	8.5	10.3	10.2
LRX 3	98.6	Natural	6.6	5.3	7.3	7.2	9.0	9.3	8.5	10.2	12.5	11.4	11.7
		1996	5.2	4.4	5.2	5.2	6.6	7.1	7.4	8.7	10.8	11.7	11.5
		2001	5.3	4.4	5.3	5.3	6.6	7.1	7.4	8.7	10.4	11.6	11.4
Sunshine	83.8	Natural	6.1	5.2	7.0	6.9	8.4	8.6	7.6	9.0	11.0	9.8	10.1
		1996	5.4	4.7	5.9	5.9	7.3	7.7	6.9	7.9	9.9	9.3	9.2
		2001	5.5	4.7	5.9	6.0	7.3	7.7	6.9	7.9	9.8	9.2	9.2

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, summer 1982.

Location	River Mile	Demand	Water Weeks										
			42	43	44	45	46	47	48	49	50	51	52
Watana	184.4	Natural	10.6	9.7	10.5	10.5	10.5	10.5	9.0	7.6	6.1	6.4	4.1
		1996	8.8	8.7	8.7	8.9	9.1	9.6	8.5	9.1	9.2	8.1	8.0
		2001	8.6	8.6	8.7	8.7	9.0	9.7	8.4	9.0	9.1	8.5	8.1
LRX 68	150.2	Natural	11.1	10.1	10.9	11.1	11.0	10.9	9.4	7.9	6.5	6.6	4.3
		1996	10.1	9.4	9.7	9.8	9.8	10.2	9.0	9.0	8.8	7.8	7.5
		2001	10.0	9.3	9.6	9.7	9.7	10.3	8.9	9.0	8.7	7.9	7.6
LRX 33	130.1	Natural	11.2	10.0	11.0	11.2	11.0	11.0	9.5	8.0	6.7	6.6	4.4
		1996	10.2	9.3	9.8	10.1	10.0	10.4	9.1	8.9	8.5	7.5	7.2
		2001	10.1	9.2	9.7	10.0	9.9	10.5	9.0	8.9	8.5	7.6	7.2
LRX 3	98.6	Natural	12.0	10.6	11.7	12.0	11.6	11.8	10.1	8.4	7.1	6.8	4.6
		1996	11.6	10.1	10.9	11.2	10.8	11.3	9.8	9.2	8.7	7.7	7.1
		2001	11.5	10.1	10.8	11.1	10.8	11.4	9.8	9.2	8.7	7.7	7.1
Sunshine	83.8	Natural	10.5	9.3	10.2	10.1	9.7	9.9	8.5	7.6	6.6	5.8	4.5
		1996	9.7	8.8	9.7	9.7	9.3	9.7	8.3	7.8	7.0	6.0	5.5
		2001	9.7	8.9	9.7	9.6	9.3	9.7	8.3	7.8	7.0	5.9	5.5

Appendix A. Weekly temperatures (C) at selected locations for
 Watana-only configuration, winter 1971-1972.

Location	River Mile	Demand	Water Weeks											
			49	50	51	52	1	2	3	4	5	6	7	8
Watana	184.4	Natural	6.3	5.9	4.8	2.8	1.2	0	0	0	0	0	0	0
		1996	8.2	7.9	7.4	6.9	5.6	5.0	4.6	3.7	2.6	1.0	1.0	1.1
		2001	8.2	7.9	7.4	6.9	5.5	5.0	4.6	3.6	2.5	1.1	1.0	1.1
LRX 68	150.2	Natural	6.8	6.3	5.3	3.1	1.5	0.3	0	0	0	0	0	0
		1996	8.4	8.0	7.3	6.5	5.1	4.5	3.7	2.3	1.3	0.1	0.4	0.3
		2001	8.4	8.0	7.3	6.5	5.1	4.5	3.6	2.2	1.2	0.1	0.5	0.3
LRX 33	130.1	Natural	6.9	6.4	5.4	3.3	1.7	0.5	0	0	0	0	0	0
		1996	8.3	7.9	7.2	6.2	4.8	4.2	3.2	1.5	0.4	0	0	0
		2001	8.3	7.9	7.2	6.2	4.8	4.2	3.2	1.4	0.3	0	0	0
LRX 3	98.6	Natural	7.2	6.8	5.8	3.5	1.8	0.6	0	0	0	0	0	0
		1996	8.5	8.1	7.3	6.0	4.5	3.8	2.5	0	0	0	0	0
		2001	8.5	8.1	7.3	6.0	4.5	3.8	2.4	0	0	0	0	0
Sunshine	83.8	Natural	6.7	6.3	5.4	3.6	2.4	1.8	0.5	0	0	0	0	0
		1996	7.2	6.8	6.1	4.9	3.7	3.1	1.6	0	0	0	0	0
		2001	7.2	6.8	6.1	4.8	3.7	3.1	1.6	0	0	0	0	0

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, winter 1971-1972.

Location	River Mile	Demand	Water Weeks											
			9	10	11	12	13	14	15	16	17	18	19	
Watana	184.4	Natural	0	0	0	0	0	0	0	0	0	0	0	0
		1996	2.1	2.1	2.1	2.1	1.6	1.8	0.5	0.5	0.5	1.2	2.1	
		2001	1.7	1.7	1.1	0.8	0.8	0.7	0.7	0.6	0.6	1.2	2.1	
LRX 68	150.2	Natural	0	0	0	0	0	0	0	0	0	0	0	
		1996	0.9	1.0	0.9	0.9	1.0	0.9	0	0	0	0.4	0.4	
		2001	0.5	0.6	0	0	0.3	0	0	0	0	0.5	0.3	
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0	0	0	
		1996	0	0.2	0	0	0.6	0.2	0	0	0	0	0	
		2001	0	0	0	0	0	0	0	0	0	0	0	
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	0	0	
		1996	0	0	0	0	0	0	0	0	0	0	0	
		2001	0	0	0	0	0	0	0	0	0	0	0	
Sunshine	83.8	Natural	0	0	0	0	0	0	0	0	0	0	0	
		1996	0	0	0	0	0	0	0	0	0	0	0	
		2001	0	0	0	0	0	0	0	0	0	0	0	

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, winter 1971-1972.

Location	River Mile	Demand	Water Weeks											
			20	21	22	23	24	25	26	27	28	29	30	
Watana	184.4	Natural	0	0	0	0	0	0	0	0	0	0	0.4	2.8
		1996	2.1	2.1	2.1	2.1	2.0	1.9	1.0	0.3	0.8	2.1	2.1	
		2001	2.0	2.0	1.8	1.8	1.7	1.8	0.8	0.3	1.1	2.2	2.2	
LRX 68	150.2	Natural	0	0	0	0	0	0	0	0	0	0	0	1.9
		1996	0.3	0.6	0.6	0.1	0.9	1.5	0.7	0	0.4	1.5	2.2	
		2001	0.1	0.5	0.3	0	0.6	1.4	0.5	0	0.6	1.6	2.2	
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0	0	0.1	2.2
		1996	0	0	0	0	0.2	1.3	0.5	0	0.2	1.4	2.4	
		2001	0	0	0	0	0	1.2	0.3	0	0.4	1.4	2.4	
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	0	0.1	3.0
		1996	0	0	0	0	0	0.7	0.1	0	0	1.2	2.9	
		2001	0	0	0	0	0	0.6	0	0	0	1.2	2.9	
Sunshine	83.8	Natural	0	0	0	0	0	0	0	0	0	0.1	0.9	3.3
		1996	0	0	0	0	0	0.4	0	0	0	1.3	3.1	
		2001	0	0	0	0	0	0.3	0	0	0	1.3	3.1	

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, winter 1974-1975.

Location	River Mile	Demand	Water Weeks											
			49	50	51	52	1	2	3	4	5	6	7	8
Watana	184.4	Natural	8.1	6.4	5.3	3.4	0	0	0	0	0.6	0	0	0
		1996	10.0	8.7	7.8	7.8	6.7	5.9	5.2	4.7	4.2	3.2	2.1	1.8
		2001	9.9	9.1	8.2	8.0	6.8	6.0	5.3	4.7	4.3	3.2	2.0	2.2
LRX 68	150.2	Natural	8.5	6.9	5.8	3.8	0	0.1	0	0	0.1	0	0	0
		1996	9.8	8.8	7.7	6.3	4.5	4.3	3.8	3.6	3.1	1.4	0	0
		2001	9.8	9.1	7.9	6.4	4.6	4.4	3.8	3.6	3.1	1.4	0	0
LRX 33	130.1	Natural	8.6	7.1	5.9	3.9	0.1	0.2	0	0.1	0	0	0	0
		1996	9.6	8.8	7.5	5.7	3.6	3.7	3.1	3.1	2.6	0.5	0	0
		2001	9.6	9.0	7.7	5.8	3.7	3.7	3.1	3.1	2.6	0.5	0	0
LRX 3	98.6	Natural	9.1	7.7	6.4	4.2	0	0.1	0	0	0	0	0	0
		1996	10.1	9.1	7.7	5.6	2.5	2.9	2.2	2.4	1.8	0	0	0
		2001	10.0	9.3	7.9	5.7	2.5	2.9	2.2	2.4	1.8	0	0	0
Sunshine	83.8	Natural	8.1	6.8	5.9	4.3	0.9	1.3	0.7	1.1	0.9	0	0	0
		1996	8.2	7.6	6.3	4.6	1.7	2.2	1.5	2.0	1.5	0	0	0
		2001	8.2	7.7	6.4	4.6	1.7	2.2	1.5	2.0	1.5	0	0	0

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, winter 1974-1975.

Location	River Mile	Demand	Water Weeks										
			9	10	11	12	13	14	15	16	17	18	19
Watana	184.4	Natural	0	0	0	0	0	0	0	0	0	0	0
		1996	1.8	1.7	1.6	1.6	1.5	1.4	1.3	1.3	1.2	1.1	1.2
		2001	2.0	2.0	2.2	1.8	1.9	1.8	1.7	1.6	1.5	1.5	1.4
LRX 68	150.2	Natural	0	0	0	0	0	0	0	0	0	0	0
		1996	0.5	0.2	0.4	0.5	0.2	0	0	0.4	0.6	0	0
		2001	0.7	0.5	0.8	0.7	0.6	0	0	0.7	0.9	0	0
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0	0	0
		1996	0	0	0	0	0	0	0	0	0.1	0	0
		2001	0	0	0	0	0	0	0	0.1	0.4	0	0
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	0	0
		1996	0	0	0	0	0	0	0	0	0	0	0
		2001	0	0	0	0	0	0	0	0	0	0	0
Sunshine	83.8	Natural	0	0	0	0	0	0	0	0	0	0	0
		1996	0	0	0	0	0	0	0	0	0	0	0
		2001	0	0	0	0	0	0	0	0	0	0	0

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, winter 1974-1975.

Location	River Mile	Demand	Water Weeks											
			20	21	22	23	24	25	26	27	28	29	30	
Watana	184.4	Natural	0	0	0	0	0	0	0	0	0	1.6	2.8	4.0
		1996	2.3	2.3	2.3	2.3	2.2	2.1	1.3	0.6	0.6	0.6	0.6	
		2001	2.4	2.4	2.4	2.4	2.4	2.4	2.2	1.7	1.5	1.4	1.6	
LRX 68	150.2	Natural	0	0	0	0	0	0	0	0	0	1.0	2.0	3.6
		1996	0.1	1.0	1.4	1.2	1.4	1.4	1.1	0.4	0.9	1.0	1.4	
		2001	0.2	1.1	1.5	1.3	1.6	1.6	1.9	1.4	1.7	1.7	2.2	
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0	1.2	2.3	3.9
		1996	0	0.2	0.9	0.6	1.0	0.9	1.0	0.3	1.1	1.4	2.0	
		2001	0	0.3	0.9	0.6	1.1	1.1	1.7	1.2	1.8	1.9	2.7	
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	1.8	3.1	4.9
		1996	0	0	0	0	0.1	0	0.7	0.1	1.5	2.1	3.0	
		2001	0	0	0	0	0.2	0	1.2	0.8	2.0	2.5	3.6	
Sunshine	83.8	Natural	0	0	0	0	0	0	0	0.4	0.5	2.3	3.3	4.5
		1996	0	0	0	0	0	0	0	0.6	0.2	1.8	2.6	3.5
		2001	0	0	0	0	0	0	0	1.0	0.8	2.2	2.9	3.9

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, winter 1976-1977.

Location	River Mile	Demand	Water Weeks											
			49	50	51	52	1	2	3	4	5	6	7	8
Watana	184.4	Natural	5.9	5.5	4.8	3.9	1.2	0	1.2	0	0	0	0	0
		1996	10.0	9.4	8.7	8.0	6.9	6.1	5.1	4.6	3.6	2.8	1.8	1.0
		2001	DID NOT RUN											
LRX 68	150.2	Natural	6.4	6.0	5.3	4.2	1.5	0	1.2	0	0	0	0	0
		1996	9.9	9.4	8.4	7.1	5.7	4.5	4.1	2.5	1.4	1.6	0.8	0
		2001												
LRX 33	130.1	Natural	6.6	6.2	5.5	4.4	1.7	0.1	1.3	0	0	0	0	0
		1996	9.7	9.2	8.1	6.7	5.2	3.8	3.7	1.5	0.3	1.0	0.2	0
		2001												
LRX 3	98.6	Natural	7.2	6.8	6.1	4.7	2.0	0	1.2	0	0	0	0	0
		1996	9.7	9.3	8.1	6.6	4.8	2.9	3.2	0	0	0.1	0	0
		2001												
Sunshine	83.8	Natural	6.3	6.0	5.5	4.7	2.8	1.0	2.0	0	0	0.2	0	0
		1996	7.5	7.4	6.3	5.2	3.7	1.9	2.7	0	0	0.1	0	0
		2001												

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, winter 1976-1977.

Location	River Mile	Demand	Water Weeks										
			9	10	11	12	13	14	15	16	17	18	19
Watana	184.4	Natural	0.5	0	0	0	0	0.6	0	0	1.4	1.3	0
		1996	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6
		2001											
LRX 68	150.2	Natural	0.2	0	0	0	0	0	0	0	0.8	0.9	0
		1996	0.5	0	0.2	0.2	0	0.4	0	0.1	0.5	0.5	0.4
		2001											
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0.3	0.5	0
		1996	0.3	0	0	0	0	0.2	0	0	0.3	0.4	0.2
		2001											
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	0	0
		1996	0	0	0	0	0	0	0	0	0	0.2	0
		2001											
Sunshine	83.8	Natural	0.5	0	0	0	0	0	0	0	0.4	0.4	0.2
		1996	0.3	0	0	0	0	0	0	0	0.1	0.2	0
		2001											

Appendix A. Weekly temperatures (C) at selected locations for
 Watana-only configuration, winter 1976-1977.

Location	River Mile	Demand	Water Weeks											
			20	21	22	23	24	25	26	27	28	29	30	
Watana	184.4	Natural	0	0	0	0	0	0	0	0	1.2	0	2.3	4.9
		1996	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7
		2001												
LRX 68	150.2	Natural	0	0	0	0	0	0	0	0	0.6	0	1.6	4.6
		1996	0	0.3	0	0	0	0	0.1	0.3	0.9	0.5	1.0	1.7
		2001												
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0.8	0	1.9	5.0
		1996	0	0.2	0	0	0	0	0	0.1	1.0	0.5	1.3	2.4
		2001												
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	1.3	0	2.6	6.1
		1996	0	0	0	0	0	0	0	0	1.3	0.5	1.8	3.6
		2001												
Sunshine	83.8	Natural	0	0.3	0	0	0	0	0	0	2.0	0.8	2.9	5.4
		1996	0	0	0	0	0	0	0	0	1.6	0.7	2.3	4.2
		2001												

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, winter 1981-1982.

Location	River Mile	Demand	Water Weeks											
			49	50	51	52	1	2	3	4	5	6	7	8
Watana	184.4	Natural	7.2	7.0	6.2	1.6	0.3	0.3	1.2	0.5	0	0	0	0
		1996	8.8	8.0	8.6	7.1	6.5	5.5	5.1	4.5	3.9	3.3	2.9	2.4
		2001	8.7	7.9	8.5	7.1	6.5	5.4	5.0	4.5	4.0	3.2	3.2	3.2
LRX 68	150.2	Natural	7.7	7.2	6.4	2.0	0.7	0.6	1.3	0.5	0	0	0	0
		1996	9.1	8.0	8.4	6.5	5.6	5.0	4.4	3.8	2.7	2.3	1.8	1.6
		2001	9.0	8.0	8.3	6.5	5.6	5.0	4.4	3.8	2.8	2.2	2.0	2.2
LRX 33	130.1	Natural	7.9	7.3	6.5	2.2	1.0	0.9	1.4	0.5	0	0	0	0
		1996	9.1	8.0	8.2	6.1	5.2	4.7	4.1	3.4	2.0	1.7	1.0	0.8
		2001	9.0	7.9	8.1	6.1	5.1	4.7	4.0	3.4	2.0	1.6	1.3	1.4
LRX 3	98.6	Natural	8.4	7.6	6.8	2.2	1.0	1.0	1.4	0.5	0	0	0	0
		1996	9.5	8.2	8.3	5.7	4.7	4.5	3.8	3.1	0.8	0.7	0	0
		2001	9.4	8.1	8.2	5.6	4.6	4.4	3.7	3.1	0.9	0.6	0	0
Sunshine	83.8	Natural	7.8	7.1	6.1	2.3	1.7	1.8	1.9	1.1	0	0	0	0
		1996	8.2	7.3	6.8	4.0	3.5	3.6	3.2	2.5	0.1	0.1	0	0
		2001	8.2	7.0	6.7	4.8	3.2	3.4	2.7	2.4	0.5	0	0	0

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, winter 1981-1982.

Location	River Mile	Demand	Water Weeks										
			9	10	11	12	13	14	15	16	17	18	19
Watana	184.4	Natural	0	0	0	0	0	0	0	0	0	0	0
		1996	2.7	2.7	2.7	2.6	2.6	0.8	0.7	2.5	2.8	2.8	2.8
		2001	3.2	3.2	3.2	3.0	2.6	2.5	3.1	3.2	3.2	3.2	3.2
LRX 68	150.2	Natural	0	0	0	0	0	0	0	0	0	0	0
		1996	2.1	1.6	1.8	2.0	1.3	0	0	0.8	0.8	1.7	2.3
		2001	2.5	2.0	2.2	2.4	1.3	0.9	1.3	1.4	1.1	2.0	2.6
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0	0	0
		1996	1.7	0.7	1.1	1.5	0.3	0	0	0	0	1.1	1.9
		2001	2.0	1.1	1.4	1.9	0.3	0	0.1	0	0	1.3	2.1
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	0	0
		1996	0.8	0	0	0.5	0	0	0	0	0	0.1	1.0
		2001	1.1	0	0	0.8	0	0	0	0	0	0.3	1.3
Sunshine	83.8	Natural	0	0	0	0	0	0	0	0	0	0	0
		1996	0.3	0	0	0	0	0	0	0	0	0	0.5
		2001	0.5	0	0	0.2	0	0	0	0	0	0	0.7

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, winter 1981-1982.

Location	River Mile	Demand	Water Weeks										
			20	21	22	23	24	25	26	27	28	29	30
Watana	184.4	Natural	0	0	0	0	0	0.9	0	0	1.2	4.6	5.8
		1996	2.8	2.8	2.6	2.7	1.9	1.7	2.8	2.8	2.8	2.8	2.9
		2001	3.2	2.8	2.9	1.7	1.4	3.2	3.2	3.2	3.2	3.2	3.2
LRX 68	150.2	Natural	0	0	0	0	0	0.3	0	0	0.1	4.1	5.5
		1996	0.7	0.4	1.1	1.9	1.0	1.8	2.1	2.3	2.6	3.4	3.8
		2001	1.0	0.4	1.3	1.1	0.6	3.1	2.4	2.5	2.9	3.7	4.0
LRX 33	130.1	Natural	0	0	0	0	0	0.5	0	0	0.5	4.6	5.8
		1996	0	0	0.2	1.5	0.5	1.8	1.7	1.9	2.5	3.9	4.4
		2001	0	0	0.4	0.7	0.2	3.0	1.9	2.2	2.8	4.1	4.6
LRX 3	98.6	Natural	0	0	0	0	0	0.8	0	0	1.1	6.0	7.4
		1996	0	0	0	0.6	0	1.8	1.1	1.4	2.5	4.9	5.7
		2001	0	0	0	0	0	2.8	1.3	1.6	2.7	5.0	5.9
Sunshine	83.8	Natural	0	0	0	0	0	1.4	0.1	0.4	1.8	5.5	6.7
		1996	0	0	0	0.3	0	1.9	0.8	1.2	2.5	5.0	5.9
		2001	0	0	0	0	0	2.5	1.0	1.4	2.7	4.9	5.8

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, winter 1982-1983.

Location	River Mile	Demand	Water Weeks											
			49	50	51	52	1	2	3	4	5	6	7	8
Watana	184.4	Natural	7.6	6.1	6.4	4.1	2.0	0	0	0	0	0	0	0
		1996	9.1	9.2	8.1	8.0	7.4	6.5	5.5	4.6	3.8	2.8	2.0	2.4
		2001	9.0	9.1	8.5	8.2	7.6	6.7	5.7	4.6	3.9	2.9	2.2	2.5
LRX 68	150.2	Natural	7.9	6.5	6.6	4.3	2.2	0.2	0	0	0	0	0	0
		1996	9.0	8.8	7.8	7.5	6.5	5.5	4.2	2.2	2.2	1.5	0.9	1.5
		2001	9.0	8.8	7.9	7.7	6.7	5.7	4.3	2.3	2.3	1.6	1.0	1.6
LRX 33	130.1	Natural	8.0	6.7	6.6	4.4	2.3	0.3	0	0	0	0	0	0
		1996	8.9	8.5	7.5	7.2	6.0	5.0	3.4	1.1	1.3	0.7	0.2	0.9
		2001	8.8	8.4	7.5	7.3	6.2	5.1	3.6	1.2	1.4	0.8	0.3	0.9
LRX 3	98.6	Natural	8.4	7.1	6.8	4.6	2.3	0.1	0	0	0	0	0	0
		1996	9.2	8.7	7.7	7.1	5.7	4.3	2.5	0	0	0	0	0
		2001	9.2	8.7	7.7	7.2	5.8	4.4	2.6	0	0	0	0	0
Sunshine	83.8	Natural	7.6	6.6	5.8	4.5	2.6	0.8	0	0	0	0	0	0
		1996	7.8	7.0	6.0	5.5	4.1	2.9	1.3	0	0	0	0	0
		2001	8.0	7.0	6.1	5.5	3.6	3.1	1.6	0	0	0	0	0

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, winter 1982-1983.

Location	River Mile	Demand	Water Weeks										
			9	10	11	12	13	14	15	16	17	18	19
Watana	184.4	Natural	0	0	0	0	0	0	0	0	0	0	0
		1996	2.0	1.6	1.3	1.2	2.3	2.5	2.5	2.5	2.5	2.5	2.3
		2001	2.6	1.6	1.5	2.4	2.8	2.8	2.8	2.8	2.7	2.6	2.0
LRX 68	150.2	Natural	0	0	0	0	0	0	0	0	0	0	0
		1996	1.3	0.6	0.6	0.1	1.8	1.4	0.3	1.6	1.4	1.8	1.5
		2001	1.8	0.6	0.8	1.1	2.2	1.6	0.5	1.8	1.6	1.9	1.3
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0	0	0
		1996	0.6	0	0.1	0	1.4	0.7	0	1.0	0.5	1.2	0.9
		2001	1.1	0	0.3	0.2	1.8	0.9	0	1.2	0.6	1.3	0.7
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	0	0
		1996	0	0	0	0	0.7	0	0	0	0	0.2	0
		2001	0	0	0	0	1.0	0	0	0	0	0.3	0
Sunshine	83.8	Natural	0	0	0	0	0	0	0	0	0	0	0
		1996	0	0	0	0	0.3	0	0	0	0	0	0
		2001	0	0	0	0	0.5	0	0	0	0	0	0

Appendix A. Weekly temperatures (C) at selected locations for
Watana-only configuration, winter 1982-1983.

Location	River Mile	Demand	Water Weeks										
			20	21	22	23	24	25	26	27	28	29	30
Watana	184.4	Natural	0	0	0	0	1.2	0	1.3	2.2	0.9	2.9	6.4
		1996	2.0	1.1	1.3	2.4	2.5	2.5	2.5	2.5	2.6	2.8	3.1
		2001	1.1	1.2	2.8	2.8	2.8	2.8	2.8	2.6	2.7	2.9	3.1
LRX 68	150.2	Natural	0	0	0	0	0.3	0	0.4	1.5	0.2	2.5	6.3
		1996	0.5	0.4	0.7	1.4	2.3	2.4	2.5	2.7	2.5	3.0	3.9
		2001	0	0.5	2.0	1.7	2.5	2.6	2.7	2.8	2.6	3.0	4.0
LRX 33	130.1	Natural	0	0	0	0	0.3	0	0.6	1.8	0.4	2.7	6.5
		1996	0	0	0.3	0.9	2.2	2.2	2.5	2.8	2.5	3.1	4.5
		2001	0	0	1.5	1.2	2.4	2.4	2.7	2.9	2.5	3.2	4.6
LRX 3	98.6	Natural	0	0	0	0	0.2	0	1.0	2.4	0.7	3.4	7.8
		1996	0	0	0	0	2.0	1.9	2.5	3.0	2.4	3.5	5.8
		2001	0	0	0.5	0.2	2.1	2.1	2.6	3.1	2.5	3.6	5.8
Sunshine	83.8	Natural	0	0	0	0	1.0	0.6	1.7	2.8	1.5	3.6	6.7
		1996	0	0	0	0	1.8	1.7	2.4	3.1	2.4	3.6	6.0
		2001	0	0	0	0	1.7	1.7	2.4	2.9	2.5	3.6	5.6

Appendix A. Weekly temperatures (C) at selected locations for
Watana/Devil Canyon configuration, summer 1971.

Location	River Mile	Demand	Water Weeks										
			31	32	33	34	35	36	37	38	39	40	41
Devil Canyon	150.2	Natural	0.6	2.7	4.3	4.5	4.3	9.4	7.8	10.4	11.3	10.5	13.0
		2002	2.2	2.2	2.2	2.3	2.5	3.2	3.9	4.3	6.3	6.5	7.4
		2020	2.0	2.2	2.3	2.1	2.4	3.0	3.7	4.5	6.5	6.6	7.5
LRX 33	130.1	Natural	0.9	2.9	4.5	4.6	4.4	9.2	7.7	10.3	11.2	10.5	12.9
		2002	2.2	2.5	2.8	2.9	3.0	4.2	4.4	5.4	7.0	7.1	8.3
		2020	2.1	2.5	2.8	2.8	2.9	4.2	4.4	5.6	7.2	7.2	8.5
LRX 3	98.6	Natural	1.3	3.7	5.3	5.4	4.8	9.7	8.0	10.8	11.7	11.0	13.6
		2002	2.2	3.1	3.7	4.0	3.7	6.0	5.4	7.3	9.0	8.6	10.6
		2020	2.1	3.1	3.7	3.9	3.6	6.2	5.4	7.6	9.3	8.9	10.9
Sunshine	83.8	Natural	2.0	3.7	4.9	5.2	4.8	9.0	7.7	9.9	10.6	9.7	11.5
		2002	2.3	3.4	4.3	4.7	4.5	7.8	7.0	8.8	9.5	8.7	10.3
		2020	2.3	3.4	4.3	4.6	4.5	7.9	7.0	8.8	9.6	8.8	10.3

Appendix A. Weekly temperatures (C) at selected locations for
Watana/Devil Canyon configuration, summer 1971.

Location	River Mile	Demand	Water Weeks										
			42	43	44	45	46	47	48	49	50	51	52
Devil Canyon	150.2	Natural	9.5	8.7	11.1	10.9	10.9	9.7	9.0	6.7	6.3	5.2	3.1
		2002	8.0	8.0	8.1	6.4	6.3	8.3	8.4	8.4	8.2	7.7	7.3
		2020	8.1	8.1	7.0	6.4	8.3	6.9	8.5	8.4	8.2	7.8	7.3
LRX 33	130.1	Natural	9.5	8.8	11.1	10.8	10.9	9.7	9.0	6.9	6.4	5.4	3.3
		2002	8.0	8.1	8.5	7.0	6.8	8.5	8.6	8.4	8.1	7.6	7.0
		2020	8.0	8.1	7.6	7.0	8.5	7.2	8.6	8.3	8.1	7.6	7.0
LRX 3	98.6	Natural	9.9	9.2	11.7	11.3	11.3	10.2	9.5	7.1	6.8	5.8	3.5
		2002	8.9	8.9	9.9	8.4	7.9	9.1	9.1	8.5	8.3	7.7	6.7
		2020	9.1	9.0	9.1	8.3	9.6	8.0	9.1	8.5	8.3	7.7	6.7
Sunshine	83.8	Natural	8.8	8.1	10.2	10.4	10.2	9.2	8.5	6.6	6.3	5.4	3.6
		2002	8.1	7.6	9.1	9.4	8.8	8.7	8.3	7.2	6.9	6.2	5.9
		2020	8.1	7.6	9.0	9.4	9.2	8.2	8.4	7.2	6.9	6.2	5.2

Appendix A. Weekly temperatures (C) at selected locations for
Watana/Devil Canyon configuration, summer 1974.

Location	River Mile	Demand	Water Weeks										
			31	32	33	34	35	36	37	38	39	40	41
Devil Canyon	150.2	Natural	5.2	5.6	6.1	9.4	9.6	8.3	9.7	9.8	10.9	10.8	10.3
		2002	1.8	1.5	1.9	2.3	3.4	3.9	4.8	6.0	7.2	8.1	7.3
		2020	1.8	1.8	1.9	2.2	3.3	3.8	4.7	5.8	7.2	8.0	7.4
LRX 33	130.1	Natural	5.6	5.7	6.1	9.1	9.4	8.3	9.7	9.8	10.9	10.8	10.3
		2002	2.6	2.4	2.8	3.5	4.6	4.9	6.0	6.9	8.2	8.7	7.8
		2020	2.7	2.7	2.8	3.6	4.6	4.9	6.1	6.8	8.2	8.7	7.9
LRX 3	98.6	Natural	6.6	6.3	6.6	9.7	10.0	8.9	10.5	10.6	11.8	11.6	10.9
		2002	4.1	3.8	4.1	5.4	6.7	6.5	8.2	8.7	10.3	10.5	9.4
		2020	4.1	4.0	4.3	5.7	6.9	6.7	8.4	8.8	10.5	10.6	9.6
Sunshine	83.8	Natural	5.7	5.8	6.2	8.9	9.2	8.0	9.2	9.1	10.1	9.7	9.4
		2002	4.7	4.8	5.4	7.6	8.2	7.2	8.2	8.3	9.1	9.0	8.6
		2020	4.7	4.9	5.5	7.7	8.3	7.3	8.2	8.2	9.1	9.0	8.6

Appendix A. Weekly temperatures (C) at selected locations for
Watana/Devil Canyon configuration, summer 1974.

Location	River Mile	Demand	Water Weeks										
			42	43	44	45	46	47	48	49	50	51	52
Devil Canyon	150.2	Natural	10.8	10.4	10.6	10.5	10.3	7.7	9.3	8.5	6.8	5.7	3.9
		2002	8.1	8.8	9.6	8.2	9.0	9.1	9.0	9.4	9.3	9.3	8.8
		2020	8.3	8.9	9.7	9.9	10.2	10.2	9.5	10.0	9.6	9.2	8.4
LRX 33	130.1	Natural	10.8	10.5	10.7	10.6	10.4	7.9	9.4	8.6	7.0	5.8	4.1
		2002	8.7	9.1	9.9	8.6	9.3	9.0	9.1	9.4	9.2	9.0	8.0
		2020	8.7	9.2	9.9	10.1	10.3	10.0	9.5	9.9	9.5	8.9	7.5
LRX 3	98.6	Natural	11.5	11.1	11.5	11.3	11.1	8.5	10.0	9.1	7.6	6.3	4.3
		2002	10.3	10.5	11.1	9.8	10.2	9.5	9.8	9.9	9.5	8.9	7.5
		2020	10.5	10.7	11.2	11.0	11.1	10.2	10.2	10.3	9.7	8.8	7.1
Sunshine	83.8	Natural	9.8	9.5	9.8	9.7	9.5	7.4	8.8	8.1	6.8	5.8	4.4
		2002	9.0	8.8	9.2	9.0	9.1	7.6	8.6	8.1	7.7	6.7	5.3
		2020	9.0	8.8	9.3	9.3	9.3	7.9	8.7	8.3	7.8	6.6	5.0

Appendix A. Weekly temperatures (C) at selected locations for
Watana/Devil Canyon configuration, summer 1981.

Location	River Mile	Demand	Water Weeks										
			31	32	33	34	35	36	37	38	39	40	41
Devil Canyon	150.2	Natural	5.0	7.6	8.3	8.1	9.3	8.9	11.6	12.4	9.0	8.9	9.5
		2002	2.5	3.2	3.9	4.5	4.9	6.1	7.3	7.9	7.3	7.0	6.1
		2020	2.6	3.2	4.0	4.5	5.1	6.1	7.3	8.8	7.7	7.2	6.4
LRX 33	130.1	Natural	5.1	7.5	8.2	8.1	9.4	8.8	11.5	12.3	9.1	9.0	9.4
		2002	3.0	4.0	4.7	5.4	6.0	6.5	8.0	8.7	7.8	7.6	6.7
		2020	3.1	4.1	4.9	5.5	6.2	6.5	8.1	9.4	8.1	7.8	6.9
LRX 3	98.6	Natural	5.7	8.0	8.8	8.9	10.1	9.3	12.1	13.1	9.8	9.7	9.9
		2002	4.0	5.6	6.4	7.1	8.1	7.7	9.9	10.8	9.3	9.0	8.0
		2020	4.0	5.8	6.7	7.3	8.5	7.8	10.0	11.3	9.7	9.3	8.3
Sunshine	83.8	Natural	5.2	7.5	8.3	8.2	9.4	8.0	10.0	10.7	9.0	9.1	9.1
		2002	4.5	6.3	7.1	7.3	8.3	7.2	8.8	9.4	8.5	8.6	8.3
		2020	4.5	6.4	7.2	7.3	8.4	7.2	8.8	9.5	8.5	8.6	8.3

Appendix A. Weekly temperatures (C) at selected locations for
Watana/Devil Canyon configuration, summer 1981.

Location	River Mile	Demand	Water Weeks										
			42	43	44	45	46	47	48	49	50	51	52
Devil Canyon	150.2	Natural	9.9	10.2	9.9	9.9	7.5	8.0	10.1	7.7	7.2	6.4	2.0
		2002	4.5	5.5	7.1	7.4	7.5	7.3	7.6	8.0	8.2	8.3	8.2
		2020	8.6	10.7	11.2	6.1	5.1	6.9	8.0	8.4	8.4	8.6	8.4
LRX 33	130.1	Natural	9.9	10.3	10.0	10.0	7.6	8.1	10.1	7.9	7.3	6.5	2.2
		2002	5.1	6.0	7.6	7.8	7.6	7.5	7.9	8.2	8.2	8.2	7.6
		2020	8.5	10.4	10.8	6.6	5.5	7.2	8.3	8.5	8.4	8.5	7.8
LRX 3	98.6	Natural	10.4	10.9	10.6	10.5	8.0	8.6	10.7	8.4	7.6	6.8	2.2
		2002	6.1	7.0	8.4	8.5	8.0	8.1	8.6	8.6	8.4	8.3	6.9
		2020	9.9	11.4	11.6	7.6	6.0	7.7	9.0	9.0	8.5	8.5	7.1
Sunshine	83.8	Natural	9.5	9.9	9.8	9.6	7.7	8.3	9.4	7.8	7.1	6.1	2.3
		2002	7.8	8.3	8.9	8.8	7.6	8.0	8.6	8.1	7.4	6.8	4.5
		2020	8.8	9.3	9.5	8.5	6.9	7.9	8.8	8.0	7.5	6.9	4.6

Appendix A. Weekly temperatures (C) at selected locations for
 Watana/Devil Canyon configuration, summer 1982.

Location	River Mile	Demand	Water Weeks										
			31	32	33	34	35	36	37	38	39	40	41
Devil Canyon	150.2	Natural	5.4	4.7	6.8	6.8	8.6	9.0	8.1	9.7	11.9	10.5	11.0
		2002	3.7	3.8	4.1	4.3	4.5	4.7	5.3	6.2	6.9	7.9	10.2
		2020	3.6	3.8	4.0	4.4	4.6	4.7	5.0	5.8	6.8	7.3	7.8
LRX 33	130.1	Natural	5.5	4.7	6.7	6.6	8.4	8.9	8.0	9.6	11.8	10.6	11.1
		2002	4.2	4.2	4.6	4.8	5.2	5.3	5.7	6.8	7.8	8.5	10.2
		2020	4.2	4.1	4.6	4.9	5.3	5.3	5.6	6.6	7.8	8.2	8.4
LRX 3	98.6	Natural	6.6	5.3	7.3	7.2	9.0	9.3	8.5	10.2	12.5	11.4	11.7
		2002	5.3	4.9	5.8	6.0	6.7	6.7	6.9	8.5	9.9	10.2	11.5
		2020	5.3	4.9	5.9	6.1	7.0	6.8	6.9	8.4	10.1	10.2	10.3
Sunshine	83.8	Natural	6.1	5.2	7.0	6.9	8.4	8.6	7.6	9.0	11.0	9.8	10.1
		2002	5.5	4.9	6.1	6.2	7.3	7.7	6.8	7.8	9.7	8.9	9.1
		2020	5.5	4.9	6.1	6.2	7.4	7.7	6.7	7.7	9.7	8.9	8.9

Appendix A. Weekly temperatures (C) at selected locations for
Watana/Devil Canyon configuration, summer 1982.

Location	River Mile	Demand	Water Weeks										
			42	43	44	45	46	47	48	49	50	51	52
Devil Canyon	150.2	Natural	11.1	10.1	10.9	11.1	11.0	10.9	9.4	7.9	6.5	6.6	4.3
		2002	6.0	5.1	5.5	6.7	7.9	8.5	8.5	8.6	8.6	8.4	8.4
		2020	8.9	8.7	7.6	7.8	10.2	7.3	7.4	9.1	9.0	8.1	7.2
LRX 33	130.1	Natural	11.2	10.0	11.0	11.2	11.0	11.0	9.5	8.0	6.7	6.6	4.4
		2002	6.9	5.6	6.2	7.4	8.3	9.0	8.7	8.6	8.5	8.3	8.0
		2020	9.4	8.6	8.2	8.4	10.3	7.8	7.8	9.0	8.8	7.6	6.9
LRX 3	98.6	Natural	12.0	10.6	11.7	12.0	11.6	11.8	10.1	8.4	7.1	6.8	4.6
		2002	8.5	6.7	7.4	8.7	9.3	10.0	9.4	8.9	8.7	8.4	7.7
		2020	11.3	10.1	10.0	9.8	11.1	9.1	8.7	9.3	8.9	7.7	6.7
Sunshine	83.8	Natural	10.5	9.3	10.2	10.1	9.7	9.9	8.5	7.6	6.6	5.8	4.5
		2002	9.1	8.0	8.8	9.0	8.9	9.3	8.2	7.8	7.2	6.3	5.6
		2020	9.5	8.6	9.3	9.3	9.4	9.0	7.9	7.8	7.0	5.7	5.1

Appendix A. Weekly temperatures (C) at selected locations for
 Watana/Devil Canyon configuration, winter 1971-1972.

Location	River Mile	Demand	Water Weeks											
			49	50	51	52	1	2	3	4	5	6	7	8
Devil Canyon	150.2	Natural	6.8	6.3	5.3	3.1	1.5	0.3	0	0	0	0	0	0
		2002	8.4	8.2	7.7	7.3	6.4	5.4	4.7	3.1	2.0	1.1	1.3	1.3
		2020	8.4	8.2	7.8	7.3	6.4	5.4	4.7	3.1	2.1	1.1	1.4	1.4
LRX 33	130.1	Natural	6.9	6.4	5.4	3.3	1.7	0.5	0	0	0	0	0	0
		2002	8.4	8.1	7.6	7.0	5.9	4.9	4.0	2.0	0.9	0.3	0.6	0.3
		2020	8.3	8.1	7.6	7.0	6.0	5.1	4.2	2.4	1.4	0.6	0.9	0.7
LRX 3	98.6	Natural	7.2	6.8	5.8	3.5	1.8	0.6	0	0	0	0	0	0
		2002	8.5	8.2	7.6	6.8	5.6	4.5	3.3	0.9	0	0	0	0
		2020	8.5	8.3	7.7	6.7	5.6	4.6	3.5	1.1	0	0	0	0
Sunshine	83.8	Natural	6.7	6.3	5.4	3.6	2.4	1.8	0.5	0	0	0	0	0
		2002	7.2	6.9	6.2	5.2	3.9	3.1	1.8	0	0	0	0	0
		2020	7.2	6.9	6.2	5.2	4.2	3.4	2.2	0.2	0	0	0	0

Appendix A. Weekly temperatures (C) at selected locations for
 Watana/Devil Canyon configuration, winter 1971-1972.

Location	River Mile	Demand	Water Weeks											
			9	10	11	12	13	14	15	16	17	18	19	
Devil Canyon	150.2	Natural	0	0	0	0	0	0	0	0	0	0	0	0
		2002	1.3	1.3	1.2	1.2	1.2	1.1	1.1	1.0	1.0	1.0	0.9	
		2020	1.3	1.3	1.2	1.2	1.1	1.1	0.9	1.3	1.3	1.6	1.8	
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0	0	0	0
		2002	0	0.2	0	0	0.5	0.2	0	0	0	0.4	0	
		2020	0.4	0.5	0.4	0.4	0.7	0.5	0	0	0	1.1	0.7	
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	0	0	0
		2002	0	0	0	0	0	0	0	0	0	0	0	
		2020	0	0	0	0	0	0	0	0	0	0.2	0	
Sunshine	83.8	Natural	0	0	0	0	0	0	0	0	0	0	0	0
		2002	0	0	0	0	0	0	0	0	0	0	0	
		2020	0	0	0	0	0	0	0	0	0	0	0	

Appendix A. Weekly temperatures (C) at selected locations for
 Watana/Devil Canyon configuration, winter 1971-1972.

Location	River Mile	Demand	Water Weeks											
			20	21	22	23	24	25	26	27	28	29	30	
Devil Canyon	150.2	Natural	0	0	0	0	0	0	0	0	0	0	0	1.9
		2002	0.9	0.9	0.9	0.8	0.8	0.7	0.8	1.2	1.3	0.7	0.8	
		2020	1.7	1.2	0.7	0.6	0.6	1.8	1.9	1.9	2.0	1.9	1.9	
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0	0	0.1	2.2
		2002	0	0	0	0	0	0.4	0.5	0.7	0.9	0.7	1.1	
		2020	0.8	0.4	0	0	0	1.5	1.6	1.5	1.7	1.7	2.2	
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	0	0.1	3.0
		2002	0	0	0	0	0	0	0	0	0.4	0.7	1.8	
		2020	0	0	0	0	0	0.8	1.1	0.9	1.2	1.5	2.7	
Sunshine	83.8	Natural	0	0	0	0	0	0	0	0	0	0	0.9	3.3
		2002	0	0	0	0	0	0	0	0	0.3	0.9	2.3	
		2020	0	0	0	0	0	0.5	0.8	0.5	0.9	1.6	3.0	

Appendix A. Weekly temperatures (C) at selected locations for
 Watana/Devil Canyon configuration, winter 1974-1975.

Location	River Mile	Demand	Water Weeks											
			49	50	51	52	1	2	3	4	5	6	7	8
Devil Canyon	150.2	Natural	8.5	6.9	5.8	3.8	0	0.1	0	0	0.1	0	0	0
		2002	9.4	9.3	9.3	8.7	7.3	6.3	5.1	4.1	3.3	2.2	1.2	1.2
		2020	10.0	9.6	9.2	8.4	6.8	5.9	4.7	3.7	3.0	2.0	1.3	1.3
LRX 33	130.1	Natural	8.6	7.1	5.9	3.9	0.1	0.2	0	0.1	0	0	0	0
		2002	9.4	9.2	9.0	8.0	6.1	5.6	4.5	3.7	2.9	1.4	0.2	0.1
		2020	9.9	9.5	8.9	7.5	5.4	5.0	4.0	3.2	2.4	1.0	0	0
LRX 3	98.6	Natural	9.1	7.7	6.4	4.2	0	0.1	0	0	0	0	0	0
		2002	9.9	9.5	8.9	7.4	4.5	4.5	3.4	3.0	2.2	0	0	0
		2020	10.3	9.7	8.9	7.0	3.7	3.8	2.8	2.5	1.7	0	0	0
Sunshine	83.8	Natural	8.1	6.8	5.9	4.3	0.9	1.3	0.7	1.1	0.9	0	0	0
		2002	8.1	7.7	6.7	5.2	2.5	2.9	2.2	2.4	1.8	0	0	0
		2020	8.3	7.8	6.7	4.9	2.1	2.5	1.8	2.0	1.4	0	0	0

Appendix A. Weekly temperatures (C) at selected locations for
 Watana/Devil Canyon configuration, winter 1974-1975.

Location	River Mile	Demand	Water Weeks										
			9	10	11	12	13	14	15	16	17	18	19
Devil Canyon	150.2	Natural	0	0	0	0	0	0	0	0	0	0	0
		2002	1.2	1.2	1.3	1.3	1.3	1.2	1.2	1.3	1.3	1.2	1.3
		2020	1.4	1.1	0.9	0.9	0.8	0.8	1.0	1.3	1.6	1.7	2.0
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0	0	0
		2002	0.7	0.6	0.3	0.3	0.1	0	0	0.5	0.7	0	0
		2020	0.6	0.3	0	0.1	0	0	0	0.7	1.1	0.1	1.1
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	0	0
		2002	0	0	0	0	0	0	0	0	0	0	0
		2020	0	0	0	0	0	0	0	0	0.2	0	0
Sunshine	83.8	Natural	0	0	0	0	0	0	0	0	0	0	0
		2002	0	0	0	0	0	0	0	0	0	0	0
		2020	0	0	0	0	0	0	0	0	0	0	0

Appendix A. Weekly temperatures (C) at selected locations for
 Watana/Devil Canyon configuration, winter 1974-1975.

Location	River Mile	Demand	Water Weeks											
			20	21	22	23	24	25	26	27	28	29	30	
Devil Canyon	150.2	Natural	0	0	0	0	0	0	0	0	0	1.0	2.0	3.6
		2002	1.3	1.3	1.5	1.8	1.9	2.1	2.2	2.2	2.3	2.3	2.3	2.3
		2020	2.1	1.8	1.9	0.9	0.5	2.0	2.2	2.3	2.3	2.3	2.4	2.5
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0	1.2	2.3	3.9
		2002	0	0.3	0.8	0.9	1.2	1.2	1.8	1.8	2.4	2.5	2.7	2.7
		2020	0.9	1.0	1.3	0.3	0.1	1.3	1.9	2.0	2.4	2.6	2.6	2.9
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	1.8	3.1	4.9
		2002	0	0	0	0	0.2	0	1.2	1.2	2.5	3.0	3.5	3.5
		2020	0	0	0.2	0	0	0.1	1.4	1.6	2.6	3.0	3.0	3.8
Sunshine	83.8	Natural	0	0	0	0	0	0	0	0.4	0.5	2.3	3.3	4.5
		2002	0	0	0	0	0	0	0	1.0	1.0	2.6	3.2	3.9
		2020	0	0	0	0	0	0	0	1.2	1.4	2.6	3.1	4.0

Appendix A. Weekly temperatures (C) at selected locations for
 Watana/Devil Canyon configuration, winter 1976-1977.

Location	River Mile	Demand	Water Weeks											
			49	50	51	52	1	2	3	4	5	6	7	8
Devil Canyon	150.2	Natural	6.4	6.0	5.3	4.2	1.5	0	1.2	0	0	0	0	0
		2002	9.8	9.4	9.0	8.3	7.5	6.4	5.5	4.5	2.5	1.4	0.5	0.5
		2020	10.0	9.2	8.6	7.9	7.1	6.1	5.2	4.3	2.4	1.2	0.3	0.3
LRX 33	130.1	Natural	6.6	6.2	5.5	4.4	1.7	0.1	1.3	0	0	0	0	0
		2002	9.7	9.3	8.7	7.7	7.0	5.7	5.0	3.4	1.5	1.0	0.1	0
		2020	9.8	9.1	8.4	7.4	6.4	5.2	4.7	3.0	1.2	0.7	0	0
LRX 3	98.6	Natural	7.2	6.8	6.1	4.7	2.0	0	1.2	0	0	0	0	0
		2002	9.7	9.4	8.6	7.5	6.4	4.7	4.3	1.7	0	0.3	0	0
		2020	9.8	9.2	8.3	7.2	5.7	3.9	4.0	1.1	0	0	0	0
Sunshine	83.8	Natural	6.3	6.0	5.5	4.7	2.8	1.0	2.0	0	0	0.2	0	0
		2002	7.5	7.4	6.5	5.4	4.5	2.8	3.2	0.4	0	0.2	0	0
		2020	7.6	7.3	6.4	5.4	4.0	2.3	3.0	0.1	0	0.1	0	0

Appendix A. Weekly temperatures (C) at selected locations for
 Watana/Devil Canyon configuration, winter 1976-1977.

Location	River Mile	Demand	Water Weeks											
			9	10	11	12	13	14	15	16	17	18	19	
Devil Canyon	150.2	Natural	0.2	0	0	0	0	0	0	0	0	0.8	0.9	0
		2002	0.7	0.7	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8
		2020	0.4	0.5	0.6	0.6	0.5	0.4	0.5	0.6	0.6	0.6	0.6	0.6
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0	0.3	0.5	0
		2002	0.5	0	0.2	0.2	0	0.5	0.2	0.3	0.7	0.7	0.6	
		2020	0.3	0	0.1	0.1	0	0.2	0	0.2	0.3	0.6	0.5	
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	0	0	0
		2002	0.1	0	0	0	0	0	0	0	0	0.2	0.4	0.1
		2020	0.1	0	0	0	0	0	0	0	0	0	0.4	0.2
Sunshine	83.8	Natural	0.5	0	0	0	0	0	0	0	0	0.4	0.4	0.2
		2002	0.3	0	0	0	0	0	0	0	0	0.3	0.4	0.1
		2020	0.3	0	0	0	0	0	0	0	0	0.1	0.4	0.2

Appendix A. Weekly temperatures (C) at selected locations for
 Watana/Devil Canyon configuration, winter 1976-1977.

Location	River Mile	Demand	Water Weeks											
			20	21	22	23	24	25	26	27	28	29	30	
Devil Canyon	150.2	Natural	0	0	0	0	0	0	0	0	0.6	0	1.6	4.6
		2002	0.9	0.8	0.7	0.4	0.6	0.8	0.9	0.9	0.9	0.9	0.9	1.0
		2020	0.6	0.6	0.6	0.4	0.2	0.6	0.6	0.6	0.6	0.6	0.6	0.6
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0.8	0	1.9	5.0
		2002	0.3	0.6	0.2	0	0	0.3	0.5	1.1	0.8	1.2	1.7	
		2020	0.2	0.4	0.2	0	0	0.1	0.4	0.8	0.6	1.0	1.4	
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	1.3	0	2.6	6.1
		2002	0	0.2	0	0	0	0	0	0	1.4	0.7	1.8	2.9
		2020	0	0.1	0	0	0	0	0	0	1.1	0.6	1.6	2.8
Sunshine	83.8	Natural	0	0.3	0	0	0	0	0	0	2.0	0.8	2.9	5.4
		2002	0	0.2	0	0	0	0	0	0	1.7	0.9	2.2	3.7
		2020	0	0.1	0	0	0	0	0	0	1.4	0.7	2.1	3.7

Appendix A. Weekly temperatures (C) at selected locations for
 Watana/Devil Canyon configuration, winter 1981-1982.

Location	River Mile	Demand	Water Weeks											
			49	50	51	52	1	2	3	4	5	6	7	8
Devil Canyon	150.2	Natural	7.7	7.2	6.4	2.0	0.7	0.6	1.3	0.5	0	0	0	0
		2002	8.0	8.2	8.3	8.2	7.6	7.2	6.8	6.3	5.6	4.9	3.8	1.8
		2020	8.4	8.4	8.6	8.4	7.6	7.2	6.8	6.3	5.5	4.6	3.1	1.8
LRX 33	130.1	Natural	7.9	7.3	6.5	2.2	1.0	0.9	1.4	0.5	0	0	0	0
		2002	8.2	8.2	8.2	7.6	6.8	6.5	6.1	5.4	4.4	3.8	2.6	0.6
		2020	8.5	8.4	8.5	7.8	7.0	6.8	6.3	5.7	4.6	3.9	2.3	1.0
LRX 3	98.6	Natural	8.4	7.6	6.8	2.2	1.0	1.0	1.4	0.5	0	0	0	0
		2002	8.6	8.4	8.3	6.9	5.8	5.8	5.2	4.5	2.5	2.2	0.6	0
		2020	9.0	8.5	8.5	7.1	6.2	6.2	5.7	5.0	3.2	2.8	0.9	0
Sunshine	83.8	Natural	7.8	7.1	6.1	2.3	1.7	1.8	1.9	1.1	0	0	0	0
		2002	8.1	7.4	6.8	4.5	3.9	4.0	3.7	3.0	0.9	1.0	0	0
		2020	8.0	7.5	6.9	4.6	4.3	4.6	4.2	3.5	1.7	1.5	0	0

Appendix A. Weekly temperatures (C) at selected locations for
 Watana/Devil Canyon configuration, winter 1981-1982.

Location	River Mile	Demand	Water Weeks										
			9	10	11	12	13	14	15	16	17	18	19
Devil Canyon	150.2	Natural	0	0	0	0	0	0	0	0	0	0	0
		2002	1.8	2.5	2.6	2.6	2.7	2.7	2.7	2.7	2.7	2.8	2.8
		2020	2.0	2.7	2.7	2.7	2.4	0.8	2.6	2.7	2.6	2.8	2.8
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0	0	0
		2002	1.2	1.2	1.5	1.8	1.2	0.9	1.1	0.9	0.7	2.0	2.2
		2020	1.6	1.9	2.0	2.2	1.4	0	1.5	1.5	0.2	2.2	2.4
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	0	0
		2002	0.1	0	0	0.5	0	0	0	0	0	0.7	1.0
		2020	0.8	0.1	0.7	1.2	0	0	0	0	0	1.2	1.6
Sunshine	83.8	Natural	0	0	0	0	0	0	0	0	0	0	0
		2002	0	0	0	0	0	0	0	0	0	0.2	0.5
		2020	0.3	0	0	0.6	0	0	0	0	0	0.6	1.1

Appendix A. Weekly temperatures (C) at selected locations for
 Watana/Devil Canyon configuration, winter 1982-1983.

Location	River Mile	Demand	Water Weeks											
			49	50	51	52	1	2	3	4	5	6	7	8
Devil Canyon	150.2	Natural	7.9	6.5	6.6	4.3	2.2	0.2	0	0	0	0	0	0
		2002	8.6	8.6	8.4	8.4	8.3	8.0	7.3	6.3	5.3	4.4	3.9	0.9
		2020	9.1	9.0	8.1	7.2	7.7	7.0	6.1	4.6	2.9	1.1	0.6	1.1
LRX 33	130.1	Natural	8.0	6.7	6.6	4.4	2.3	0.3	0	0	0	0	0	0
		2002	8.6	8.5	8.3	8.0	7.6	6.9	5.9	4.3	3.8	3.2	1.8	0
		2020	9.0	8.7	7.6	6.9	7.2	6.3	5.3	3.4	2.1	0.6	0	0.5
LRX 3	98.6	Natural	8.4	7.1	6.8	4.6	2.3	0.1	0	0	0	0	0	0
		2002	8.9	8.7	8.4	7.7	6.9	5.6	4.1	1.5	1.5	1.2	0	0
		2020	9.3	8.9	7.7	6.7	6.6	5.4	4.0	1.4	0.7	0	0	0
Sunshine	83.8	Natural	7.6	6.6	5.8	4.5	2.6	0.8	0	0	0	0	0	0
		2002	7.9	7.2	6.5	5.6	3.8	3.4	2.2	0.8	0.8	0.1	0	0
		2020	8.0	7.0	5.8	5.1	3.7	3.5	2.4	0.7	0.3	0	0	0

Appendix A. Weekly temperatures (C) at selected locations for
 Watana/Devil Canyon configuration, winter 1982-1983.

Location	River Mile	Demand	Water Weeks										
			9	10	11	12	13	14	15	16	17	18	19
Devil Canyon	150.2	Natural	0	0	0	0	0	0	0	0	0	0	0
		2002	1.0	1.4	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9	1.9
		2020	1.3	1.4	1.4	1.4	1.4	1.3	1.6	2.0	3.5	1.9	1.9
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0	0	0
		2002	0	0.4	1.0	0.6	1.4	0.8	0	1.1	0.7	1.2	1.1
		2020	0.7	0.7	0.9	0.5	1.1	0.6	0.3	1.5	1.9	1.5	1.4
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	0	0
		2002	0	0	0	0	0.5	0	0	0	0	0	0
		2020	0	0	0	0	0.5	0	0	0.4	0	0.7	0.4
Sunshine	83.8	Natural	0	0	0	0	0	0	0	0	0	0	0
		2002	0	0	0	0	0.1	0	0	0	0	0	0
		2020	0	0	0	0	0.1	0	0	0	0	0.2	0

Appendix A. Weekly temperatures (C) at selected locations for
 Watana/Devil Canyon configuration, winter 1982-1983.

Location	River Mile	Demand	Water Weeks										
			20	21	22	23	24	25	26	27	28	29	30
Devil Canyon	150.2	Natural	0	0	0	0	0.3	0	0.4	1.5	0.2	2.5	6.3
		2002	1.9	1.8	1.4	1.4	1.6	1.9	2.2	2.4	2.6	2.8	3.1
		2020	2.2	2.6	1.4	1.4	1.6	1.9	2.1	2.3	2.5	2.6	2.9
LRX 33	130.1	Natural	0	0	0	0	0.3	0	0.6	1.8	0.4	2.7	6.5
		2002	0.8	1.1	0.7	0.7	1.5	1.7	2.2	2.6	2.6	3.0	3.8
		2020	1.4	2.1	0.9	0.9	1.6	1.8	2.2	2.5	2.5	2.9	3.7
LRX 3	98.6	Natural	0	0	0	0	0.2	0	1.0	2.4	0.7	3.4	7.8
		2002	0	0	0	0	1.3	1.3	2.1	2.8	2.4	3.4	5.1
		2020	0	1.1	0	0	1.5	1.4	2.2	2.7	2.5	3.3	5.1
Sunshine	83.8	Natural	0	0	0	0	1.0	0.6	1.7	2.8	1.5	3.6	6.7
		2002	0	0	0	0	1.1	0.9	2.0	2.7	2.5	3.5	5.2
		2020	0	0.5	0	0	1.2	1.1	2.1	2.7	2.5	3.5	5.2

Appendix A. Weekly temperatures (C) at selected locations for
Watana filling, summer 1971.

Location	River Mile	Demand	Water Weeks										
			31	32	33	34	35	36	37	38	39	40	41
Watana	184.4	Natural	1.0	2.8	4.4	4.6	4.2	9.6	7.8	10.4	11.3	10.3	12.6
		1992 Filling	1.8	1.8	1.8	1.8	1.8	2.1	3.3	3.4	4.1	4.1	4.1
LRX 68	150.2	Natural	0.6	2.7	4.3	4.5	4.3	9.4	7.8	10.4	11.3	10.5	13.0
		1992 Filling	1.5	2.2	2.5	2.7	2.6	4.7	5.1	6.6	8.4	7.4	8.1
LRX 33	130.1	Natural	0.9	2.9	4.5	4.6	4.4	9.2	7.7	10.3	11.2	10.5	12.9
		1992 Filling	1.5	2.5	3.0	3.1	3.0	5.2	5.1	6.9	8.1	7.7	8.8
LRX 3	98.6	Natural	1.3	3.7	5.3	5.4	4.8	9.7	8.0	10.8	11.7	11.0	13.6
		1992 Filling	1.7	3.1	3.9	4.2	3.7	6.9	6.0	8.6	9.9	9.2	11.1
Sunshine	83.8	Natural	2.0	3.7	4.9	5.2	4.8	9.0	7.7	9.9	10.6	9.7	11.5
		1992 Filling	2.1	3.4	4.4	4.8	4.5	8.0	7.1	9.0	9.6	8.8	10.3

Appendix A. Weekly temperatures (C) at selected locations for
Watana filling, summer 1971.

Location	River Mile	Demand	Water Weeks										
			42	43	44	45	46	47	48	49	50	51	52
Watana	184.4	Natural	9.0	8.2	10.7	10.6	10.7	9.3	8.6	6.3	5.9	4.8	2.8
		1992 Filling	4.2	4.2	4.2	4.2	4.2	5.6	9.0	8.7	8.4	7.9	7.4
LRX 68	150.2	Natural	9.5	8.7	11.1	10.9	10.9	9.7	9.0	6.7	6.3	5.2	3.1
		1992 Filling	6.7	6.3	6.0	7.1	6.3	6.8	9.3	8.5	8.3	7.4	6.1
LRX 33	130.1	Natural	9.5	8.8	11.1	10.8	10.9	9.7	9.0	6.9	6.4	5.4	3.3
		1992 Filling	7.1	6.9	6.8	7.6	7.0	7.3	9.2	8.2	8.1	7.1	5.6
LRX 3	98.6	Natural	9.9	9.2	11.7	11.3	11.3	10.2	9.5	7.1	6.8	5.8	3.5
		1992 Filling	8.3	7.9	8.1	8.8	8.1	8.2	9.7	8.3	8.2	7.2	5.2
Sunshine	83.8	Natural	8.8	8.1	10.2	10.4	10.2	9.2	8.5	6.6	6.3	5.4	3.6
		1992 Filling	8.0	7.5	8.8	9.5	8.9	8.2	8.4	6.8	6.7	5.9	4.3

Appendix A. Weekly temperatures (C) at selected locations for
Watana filling, summer 1981.

Location	River Mile	Demand	Water Weeks										
			31	32	33	34	35	36	37	38	39	40	41
Watana	184.4	Natural	4.8	7.6	8.6	8.2	9.2	8.9	11.6	12.2	8.5	8.4	9.2
		1992 Filling	3.3	3.4	3.8	3.7	4.0	4.1	4.1	4.1	4.1	4.1	4.1
LRX 68	150.2	Natural	5.0	7.6	8.3	8.1	9.3	8.9	11.6	12.4	9.0	8.9	9.5
		1992 Filling	3.8	4.0	4.2	4.8	5.7	5.4	6.5	7.0	7.0	6.9	7.4
LRX 33	130.1	Natural	5.1	7.5	8.2	8.1	9.4	8.8	11.5	12.3	9.1	9.0	9.4
		1992 Filling	4.2	4.5	4.6	5.3	6.3	5.8	7.3	7.9	7.5	7.5	7.7
LRX 3	98.6	Natural	5.7	8.0	8.8	8.9	10.1	9.3	12.1	13.1	9.8	9.7	9.8
		1992 Filling	5.0	6.0	6.4	7.1	8.4	7.2	9.3	10.1	9.1	9.0	8.6
Sunshine	83.8	Natural	5.2	7.5	8.3	8.2	9.4	8.0	10.0	10.7	9.0	9.1	9.1
		1992 Filling	4.9	6.4	7.1	7.3	8.4	7.1	8.7	9.3	8.5	8.6	8.4

Appendix A. Weekly temperatures (C) at selected locations for
Watana filling, summer 1981.

Location	River Mile	Demand	Water Weeks										
			42	43	44	45	46	47	48	49	50	51	52
Watana	184.4	Natural	9.5	9.8	9.4	9.4	6.8	7.5	9.9	7.2	7.0	6.2	1.6
		1992 Filling	4.1	4.1	4.1	8.2	10.9	10.4	10.4	10.6	10.0	9.1	8.3
LRX 68	150.2	Natural	9.9	10.2	9.9	9.9	7.5	8.0	10.1	7.7	7.2	6.4	2.0
		1992 Filling	6.2	6.7	6.3	8.9	10.6	10.3	10.5	10.4	9.5	8.4	6.2
LRX 33	130.1	Natural	9.9	10.3	10.0	10.0	7.6	8.1	10.1	7.9	7.3	6.5	2.2
		1992 Filling	6.9	7.4	7.0	9.1	10.1	10.1	10.4	10.2	9.2	8.0	5.5
LRX 3	98.6	Natural	10.4	10.9	10.6	10.5	8.0	8.6	10.7	8.4	7.6	6.8	2.2
		1992 Filling	7.9	8.7	8.1	9.8	10.3	10.4	11.0	10.5	9.3	8.1	4.8
Sunshine	83.8	Natural	9.5	9.9	9.8	9.6	7.7	8.3	9.4	7.8	7.1	6.1	2.3
		1992 Filling	8.5	8.9	8.8	9.2	8.4	9.0	9.4	8.5	7.8	6.5	3.2

Appendix A. Weekly temperatures (C) at selected locations for
Watana filling, summer 1982.

Location	River Mile	Demand	Water Weeks										
			31	32	33	34	35	36	37	38	39	40	41
Watana	184.4	Natural	5.5	4.9	7.2	7.1	8.8	9.2	8.0	9.6	11.9	10.2	10.6
		1993 Filling	2.3	2.4	2.7	3.1	3.6	4.1	4.7	5.3	5.7	5.6	6.9
LRX 68	150.2	Natural	5.4	4.7	6.8	6.8	8.6	9.0	8.1	9.7	11.9	10.5	11.0
		1993 Filling	3.3	2.8	3.3	3.4	4.5	5.0	5.5	6.4	7.0	7.0	8.1
LRX 33	130.1	Natural	5.5	4.7	6.7	6.6	8.4	8.9	8.0	9.6	11.8	10.6	11.1
		1993 Filling	3.9	3.2	3.7	3.8	4.9	5.3	5.7	6.8	7.6	7.6	8.5
LRX 3	98.6	Natural	6.6	5.3	7.3	7.2	9.0	9.3	8.5	10.2	12.5	11.4	11.7
		1993 Filling	5.4	4.1	5.1	5.2	6.5	6.5	6.6	8.0	9.0	8.8	9.6
Sunshine	83.8	Natural	6.1	5.2	7.0	6.9	8.4	8.6	7.6	9.0	11.0	9.8	10.1
		1993 Filling	5.5	4.6	5.9	6.0	7.3	7.6	6.7	7.8	9.6	8.8	9.1

Appendix A. Weekly temperatures (C) at selected locations for
Watana filling, summer 1982.

Location	River Mile	Demand	Water Weeks										
			42	43	44	45	46	47	48	49	50	51	52
Watana	184.4	Natural	10.6	9.7	10.5	10.5	10.5	10.5	9.0	7.6	6.1	6.4	4.1
		1993 Filling	8.7	8.6	8.8	8.9	8.5	8.9	9.0	9.4	9.6	8.7	7.7
LRX 68	150.2	Natural	11.1	10.1	10.9	11.1	11.0	10.9	9.4	7.9	6.5	6.6	4.3
		1993 Filling	9.6	9.3	9.6	9.8	9.2	9.6	9.4	9.2	9.0	6.4	5.4
LRX 33	130.1	Natural	11.2	10.0	11.0	11.2	11.0	11.0	9.5	8.0	6.7	6.6	4.4
		1993 Filling	9.9	9.3	9.7	10.1	9.5	9.9	9.5	9.0	8.7	6.1	5.0
LRX 3	98.6	Natural	12.0	10.6	11.7	12.0	11.6	11.8	10.1	8.4	7.1	6.8	4.6
		1993 Filling	10.9	10.0	10.7	11.1	10.3	10.7	10.1	9.3	8.9	6.5	5.0
Sunshine	83.8	Natural	10.5	9.3	10.2	10.1	9.7	9.9	8.5	7.6	6.6	5.8	4.5
		1993 Filling	9.9	8.9	9.8	9.7	9.3	9.7	8.4	7.9	7.0	5.4	4.5

Appendix A. Weekly temperatures (C) at selected locations for
Watana filling, winter 1971-1972.

Location	River Mile	Demand	Water Weeks											
			49	50	51	52	1	2	3	4	5	6	7	8
Watana	184.4	Natural	6.3	5.9	4.8	2.8	1.2	0	0	0	0	0	0	0
		1992-93 Filling	8.7	8.4	7.9	7.4	6.2	5.6	5.1	4.3	3.1	1.6	1.4	1.3
LRX 68	150.2	Natural	6.8	6.3	5.3	3.1	1.5	0.3	0	0	0	0	0	0
		1992-93 Filling	8.5	8.3	7.4	6.1	2.5	1.7	0.3	0	0	0	0	0
LRX 33	130.1	Natural	6.9	6.4	5.4	3.3	1.7	0.5	0	0	0	0	0	0
		1992-93 Filling	8.2	8.1	7.1	5.6	2.4	1.5	0	0	0	0	0	0
LRX 3	98.6	Natural	7.2	6.8	5.8	3.5	1.8	0.6	0	0	0	0	0	0
		1992-93 Filling	8.3	8.2	7.2	5.3	2.2	1.1	0	0	0	0	0	0
Sunshine	83.8	Natural	6.7	6.3	5.4	3.6	2.4	1.8	0.5	0	0	0	0	0
		1992-93 Filling	6.8	6.7	5.9	4.3	2.7	2.3	0.8	0	0	0	0	0

Appendix A. Weekly temperatures (C) at selected locations for
 Watana filling, winter 1971-1972.

Location	River Mile	Demand	Water Weeks										
			9	10	11	12	13	14	15	16	17	18	19
Watana	184.4	Natural	0	0	0	0	0	0	0	0	0	0	0
		1992-93 Filling	1.2	1.2	1.1	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.7
LRX 68	150.2	Natural	0	0	0	0	0	0	0	0	0	0	0
		1992-93 Filling	0	0	0	0	0	0	0	0	0	0	0
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0	0	0
		1992-93 Filling	0	0	0	0	0	0	0	0	0	0	0
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	0	0
		1992-93 Filling	0	0	0	0	0	0	0	0	0	0	0
Sunshine	83.8	Natural	0	0	0	0	0	0	0	0	0	0	0
		1992-93 Filling	0	0	0	0	0	0	0	0	0	0	0

Appendix A. Weekly temperatures (C) at selected locations for
Watana filling, winter 1971-1972.

Location	River Mile	Demand	Water Weeks											
			20	21	22	23	24	25	26	27	28	29	30	
Watana	184.4	Natural	0	0	0	0	0	0	0	0	0	0	0.4	2.8
		1992-93 Filling	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5
LRX 68	150.2	Natural	0	0	0	0	0	0	0	0	0	0	0	1.9
		1992-93 Filling	0	0	0	0	0	0	0	0	0	0	0	0.8
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0	0	0.1	2.2
		1992-93 Filling	0	0	0	0	0	0	0	0	0	0	0.1	1.4
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	0	0.1	3.0
		1992-93 Filling	0	0	0	0	0	0	0	0	0	0	0.1	2.6
Sunshine	83.8	Natural	0	0	0	0	0	0	0	0	0	0.1	0.9	3.3
		1992-93 Filling	0	0	0	0	0	0	0	0	0	0.1	0.9	3.1

Appendix A. Weekly temperatures (C) at selected locations for
Watana filling, winter 1981-1982.

Location	River Mile	Demand	Water Weeks											
			49	50	51	52	1	2	3	4	5	6	7	8
Watana	184.4	Natural	7.2	7.0	6.2	1.6	0.3	0.3	1.2	0.5	0	0	0	0
		1992-93 Filling	10.6	10.0	9.1	8.3	6.9	6.1	5.6	5.0	4.5	3.9	3.3	2.2
LRX 68	150.2	Natural	7.7	7.2	6.4	2.0	0.7	0.6	1.3	0.5	0	0	0	0
		1992-93 Filling	10.4	9.5	8.4	6.4	1.4	1.6	0	0	0.2	0.8	0	0**
LRX 33	130.1	Natural	7.9	7.3	6.5	2.2	1.0	0.9	1.4	0.5	0	0	0	0
		1992-93 Filling	10.2	9.2	8.0	5.6	1.6	1.6	0.4	0.1	0	0	0	0**
LRX 3	98.6	Natural	8.4	7.6	6.8	2.2	1.0	1.0	1.4	0.5	0	0	0	0
		1992-93 Filling	10.5	9.3	8.1	4.9	1.3	1.5	0.5	0	0	0	0	0
Sunshine	83.8	Natural	7.8	7.1	6.1	2.3	1.7	1.8	1.9	1.1	0	0	0	0
		1992-93 Filling	8.5	7.8	6.5	3.3	2.1	2.3	1.9	1.3	0	0	0	0

Appendix A. Weekly temperatures (C) at selected locations for
Watana filling, winter 1981-1982.

Location	River Mile	Demand	Water Weeks											
			9	10	11	12	13	14	15	16	17	18	19	
Watana	184.4	Natural	0	0	0	0	0	0	0	0	0	0	0	0
		1992-93 Filling	1.6	1.5	1.5	1.7	1.8	1.8	1.8	1.8	1.5	1.3	1.4	
LRX 68	150.2	Natural	0	0	0	0	0	0	0	0	0	0	0	0
		1992-93 Filling	0	0	0	0	0	0	0	0	0	0	0	0
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0	0	0	0
		1992-93 Filling	0	0	0	0	0	0	0	0	0	0	0	0
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	0	0	0
		1992-93 Filling	0	0	0	0	0	0	0	0	0	0	0	0
Sunshine	83.8	Natural	0	0	0	0	0	0	0	0	0	0	0	0
		1992-93 Filling	0	0	0	0	0	0	0	0	0	0	0	0

Appendix A. Weekly temperatures (C) at selected locations for
Watana filling, winter 1981-1982.

Location	River Mile	Demand	Water Weeks										
			20	21	22	23	24	25	26	27	28	29	30
Watana	184.4	Natural	0	0	0	0	0	0.9	0	0	1.2	4.6	5.8
		1992-93 Filling	1.4	1.4	1.4	1.4	1.6	1.6	1.6	1.7	1.8	2.0	2.1
LRX 68	150.2	Natural	0	0	0	0	0	0.3	0	0	0.1	4.1	5.5
		1992-93 Filling	0	0	0	0	0	0.4	0	0	0.3	3.2	3.9
LRX 33	130.1	Natural	0	0	0	0	0	0.5	0	0	0.5	4.6	5.8
		1992-93 Filling	0	0	0	0	0	0.5	0	0	0.6	4.0	4.7
LRX 3	98.6	Natural	0	0	0	0	0	0.8	0	0	1.1	6.0	7.4
		1992-93 Filling	0	0	0	0	0	0.8	0	0	1.2	5.7	6.7
Sunshine	83.8	Natural	0	0	0	0	0	1.4	0.1	0.4	1.8	5.5	6.7
		1992-93 Filling	0	0	0	0	0	1.4	0.1	0.4	1.9	5.3	6.4

Appendix A. Weekly temperatures (C) at selected locations for
Watana filling, winter 1982-1983.

Location	River Mile	Demand	Water Weeks											
			49	50	51	52	1	2	3	4	5	6	7	8
Watana	184.4	Natural	7.6	6.1	6.4	4.1	2.0	0	0	0	0	0	0	0
		1991-92 Filling	9.3	8.8	7.9	6.4	5.0	4.9	4.9	4.8	3.8	3.7	3.7	3.7
LRX 68	150.2	Natural	7.9	6.5	6.6	4.3	2.2	0.2	0	0	0	0	0	0
		1991-92 Filling	9.3	8.5	6.2	4.9	2.2	0.9	0	0	0	0	0	0
LRX 33	130.1	Natural	8.0	6.7	6.6	4.4	2.3	0.3	0	0	0	0	0	0
		1991-92 Filling	9.1	8.2	5.9	4.6	2.4	0.8	0	0	0	0	0	0
LRX 3	98.6	Natural	8.4	7.1	6.8	4.6	2.3	0.1	0	0	0	0	0	0
		1991-92 Filling	9.4	8.5	6.3	4.7	2.2	0.2	0	0	0	0	0	0
Sunshine	83.8	Natural	7.6	6.6	5.8	4.5	2.6	0.8	0	0	0	0	0	0
		1991-92 Filling	8.1	6.9	5.6	4.4	1.8	1.5	0.6	0.3	0.2	0	0	0

Appendix A. Weekly temperatures (C) at selected locations for
 Watana filling, winter 1982-1983.

Location	River Mile	Demand	Water Weeks											
			9	10	11	12	13	14	15	16	17	18	19	
Watana	184.4	Natural	0	0	0	0	0	0	0	0	0	0	0	0
		1991-92 Filling	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
LRX 68	150.2	Natural	0	0	0	0	0	0	0	0	0	0	0	0
		1991-92 Filling	0	0	0	0	0.3	0	0	0	0	0	0	0
LRX 33	130.1	Natural	0	0	0	0	0	0	0	0	0	0	0	0
		1991-92 Filling	0	0	0	0	0	0	0	0	0	0	0	0
LRX 3	98.6	Natural	0	0	0	0	0	0	0	0	0	0	0	0
		1991-92 Filling	0	0	0	0	0	0	0	0	0	0	0	0
Sunshine	83.8	Natural	0	0	0	0	0	0	0	0	0	0	0	0
		1991-92 Filling	0	0	0	0	0	0	0	0	0	0	0	0

Appendix A. Weekly temperatures (C) at selected locations for
Watana filling, winter 1982-1983.

Location	River Mile	Demand	Water Weeks										
			20	21	22	23	24	25	26	27	28	29	30
Watana	184.4	Natural	0	0	0	0	1.2	0	1.3	2.2	0.9	2.9	6.4
		1991-92 Filling	3.7	3.6	3.5	3.5	3.5	3.5	3.5	3.4	3.1	3.0	2.9
LRX 68	150.2	Natural	0	0	0	0	0.3	0	0.4	1.5	0.2	2.5	6.3
		1991-92 Filling	0	0	0	0	0.9	0.7	1.2	2.1	1.3	2.6	4.1
LRX 33	130.1	Natural	0	0	0	0	0.3	0	0.6	1.8	0.4	2.7	6.5
		1991-92 Filling	0	0	0	0	0.5	0.2	1.0	2.3	1.2	2.8	4.9
LRX 3	98.6	Natural	0	0	0	0	0.2	0	1.0	2.4	0.7	3.4	7.8
		1991-92 Filling	0	0	0	0	0.3	0	1.3	2.8	1.2	3.5	6.6
Sunshine	83.8	Natural	0	0	0	0	1.0	0.6	1.7	2.8	1.5	3.6	6.7
		1991-92 Filling	0	0	0	0	0.2	0	1.3	2.2	2.0	3.6	5.7

APPENDIX B

Isotherm plots of temperature simulation results for the middle Susitna River for Watana only, Watana/Devil Canyon and Watana filling scenarios. Ice front locations calculated by Harza-Ebasco's ICECAL model are included on the plots.

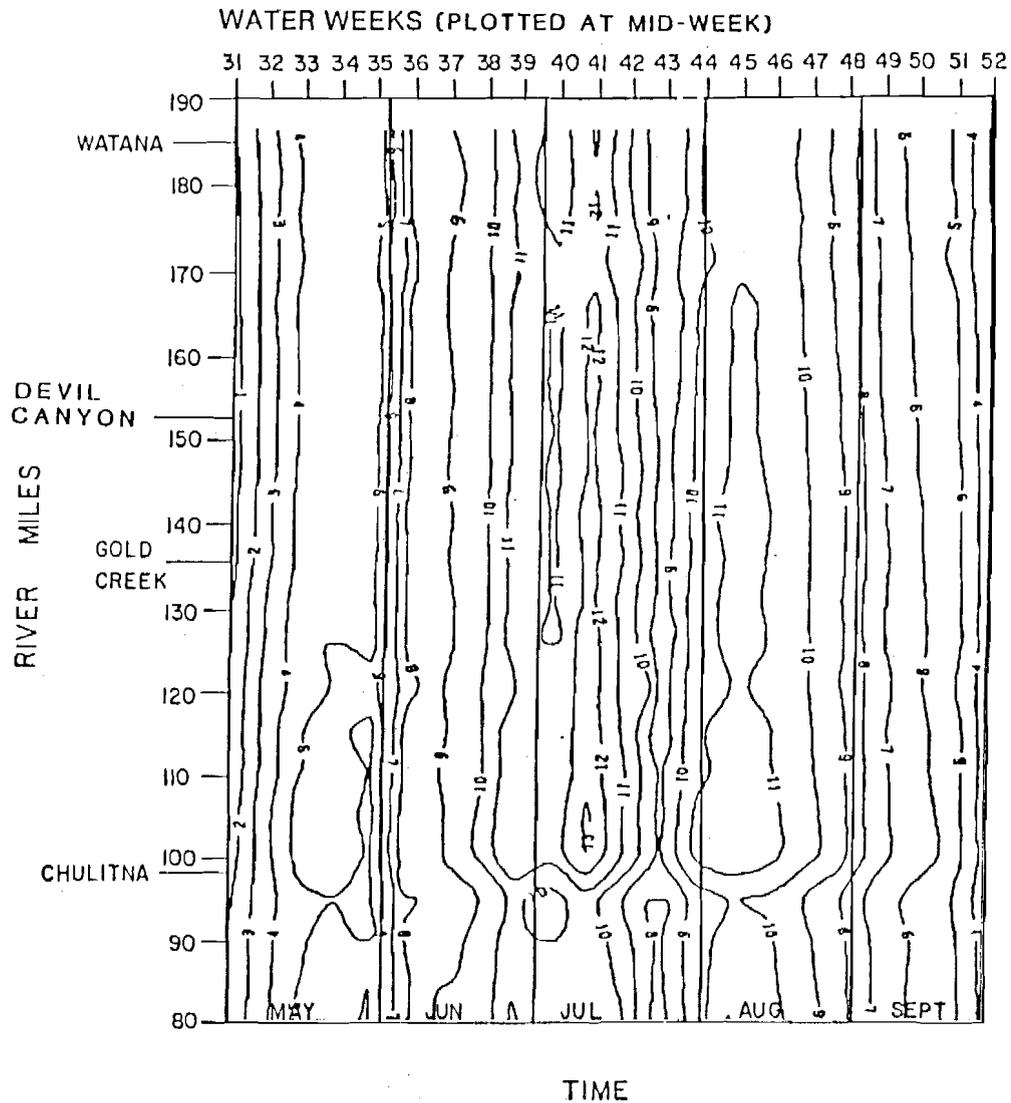
Note that plotting was done using a resolution of five miles in the y-dimension. Additionally, smoothing techniques used in the plotting program mask sharp temperature discontinuities. This is most notable in the area where the Chulitna and Talkeetna rivers converge with the Susitna River (river miles 97-99).

Appendix B. Isotherm plots for all simulations

<u>Scenario</u>	<u>Page</u>
Summer 1971, Natural conditions	B1
Summer 1971, Watana only, 1996 demand	B2
Summer 1971, Watana only, 2001 demand	B3
Summer 1971, Watana/Devil Canyon, 2002 demand	B4
Summer 1971, Watana/Devil Canyon, 2020 demand	B5
Summer 1974, Natural conditions	B6
Summer 1974, Watana only, 1996 demand	B7
Summer 1974, Watana only, 2001 demand	B8
Summer 1974, Watana/Devil Canyon, 2002 demand	B9
Summer 1974, Watana/Devil Canyon, 2020 demand	B10
Summer 1981, Natural conditions	B11
Summer 1981, Watana filling, 1992 forecast	B12
Summer 1981, Watana only, 1996 demand	B13
Summer 1981, Watana only, 2001 demand	B14
Summer 1981, Watana/Devil Canyon, 2002 demand	B15
Summer 1981, Watana/Devil Canyon, 2020 demand	B16
Summer 1982, Natural conditions	B17
Summer 1982, Watana filling, 1993 forecast	B18
Summer 1982, Watana only, 1996 demand	B19
Summer 1982, Watana only, 2001 demand	B20
Summer 1982, Watana/Devil Canyon, 2002 demand	B21
Summer 1982, Watana/Devil Canyon, 2020 demand	B22

Winter 1971-72, Natural conditions	B23
Winter 1971-72, Watana only, 1996 demand	B24
Winter 1971-72, Watana only, 2001 demand	B25
Winter 1971-72, Watana/Devil Canyon, 2002 demand	B26
Winter 1971-72, Watana/Devil Canyon, 2020 demand	B27
Winter 1974-75, Natural conditions	B28
Winter 1974-75, Watana only, 1996 demand	B29
Winter 1974-75, Watana only, 2001 demand	B30
Winter 1974-75, Watana/Devil Canyon, 2002 demand	B31
Winter 1974-75, Watana/Devil Canyon, 2020 demand	B32
Winter 1976-77, Natural Conditions	B33
Winter 1976-77, Watana only, 1996 demand	B34
Winter 1976-77, Watana/Devil Canyon, 2002 demand	B35
Winter 1976-77, Watana/Devil Canyon, 2020 demand	B36
Winter 1981-82, Natural conditions	B37
Winter 1981-82, Watana filling 1992-93 forecast	B38
Winter 1981-82, Watana only, 1996 demand	B39
Winter 1981-82, Watana only, 2001 demand	B40
Winter 1981-82, Watana/Devil Canyon, 2002 demand	B41
Winter 1981-82, Watana/Devil Canyon, 2020 demand	B42
Winter 1982-83, Natural conditions	B43
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Winter 1982-83, Watana/Devil Canyon, 2002 demand	B47
Winter 1982-83, Watana/Devil Canyon, 2020 demand	B48

MIDDLE SUSITNA RIVER - ISOTHERMS



NOTES :

1. TEMPERATURES IN °C.

NATURAL CONDITIONS
SUMMER 1971 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

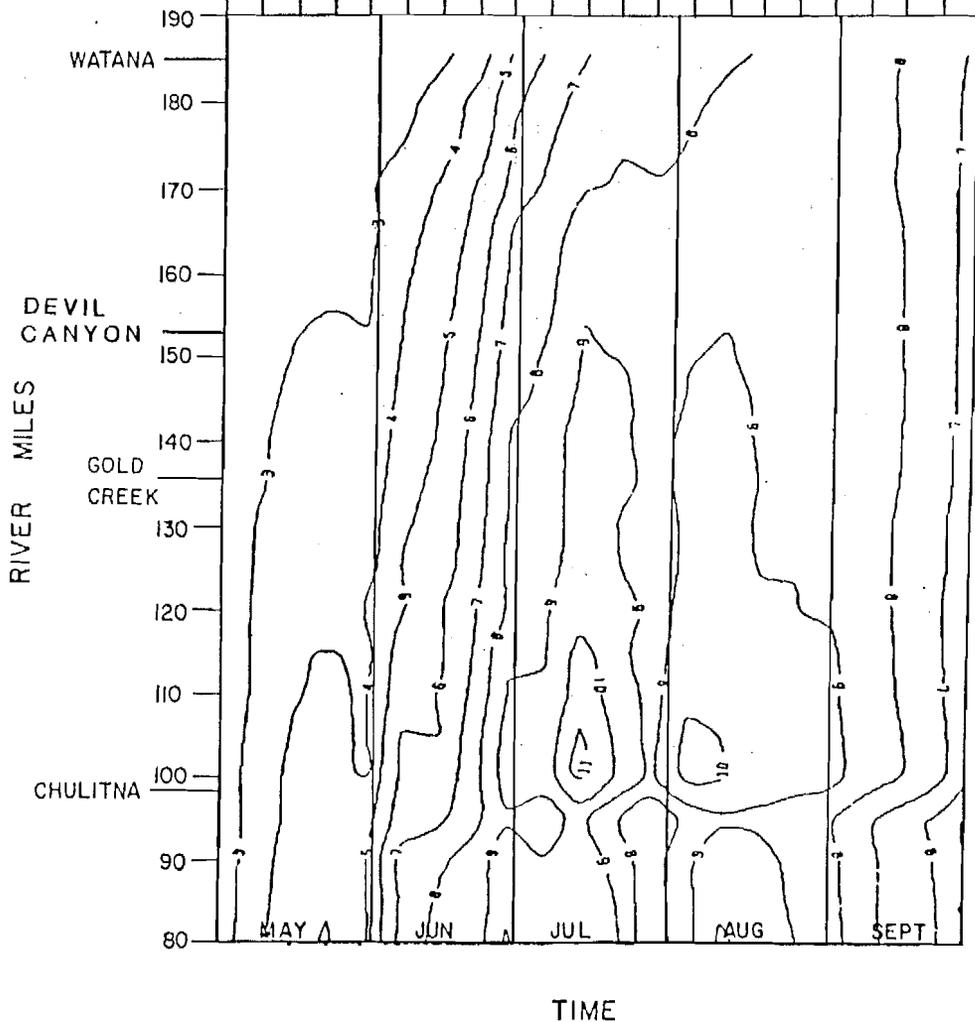
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INFORMATION AND DATA
CENTER

HARZA-EBASCO
SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



NOTES :

1. TEMPERATURES IN °C.

B2

WATANA ONLY, 1996 ENERGY DEMAND

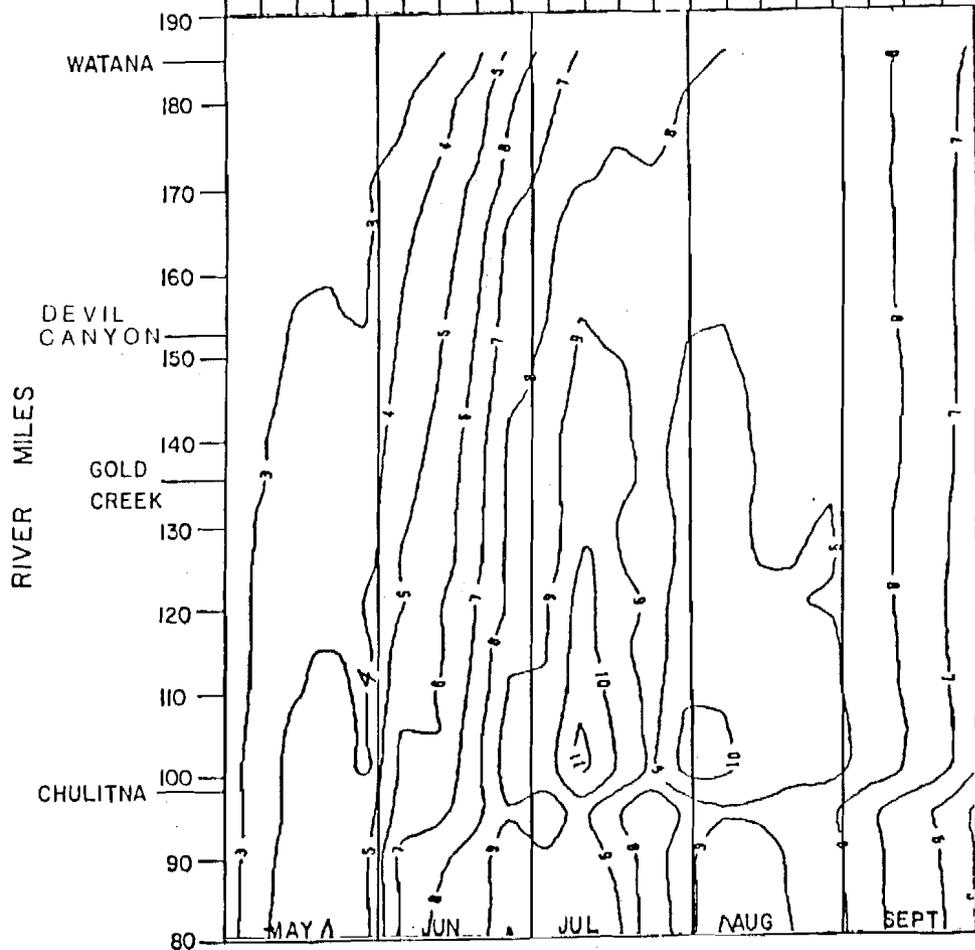
SUMMER 1971 CLIMATE DATA

ALASKA POWER AUTHORITY SUSITNA HYDROELECTRIC PROJECT	
ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER	MARZA-EBASCO SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



NOTES :

1. TEMPERATURES IN °C.

TIME

WATANA ONLY, 2001 ENERGY DEMAND

SUMMER 1971 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

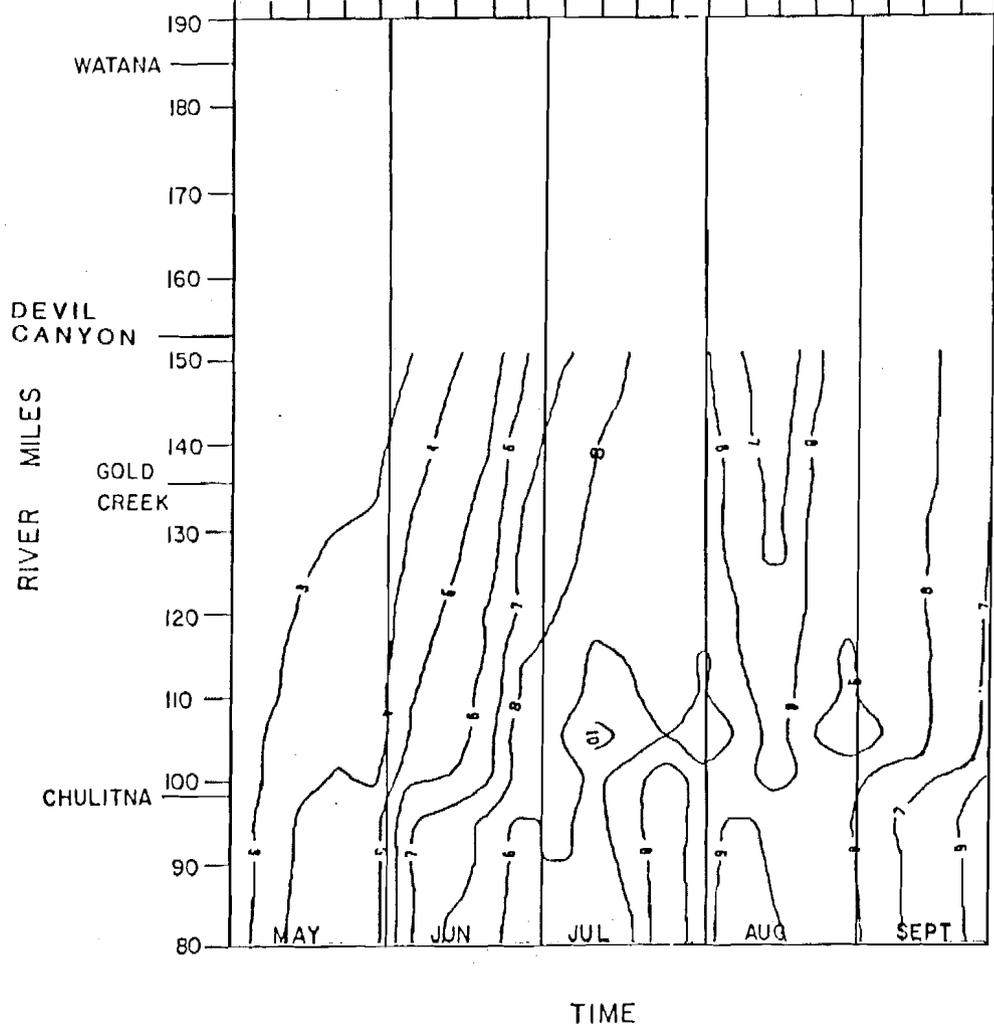
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 SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



NOTES :

1. TEMPERATURES IN. °C.

B4

WATANA/DEVIL CANYON, 2002 ENERGY DEMAND

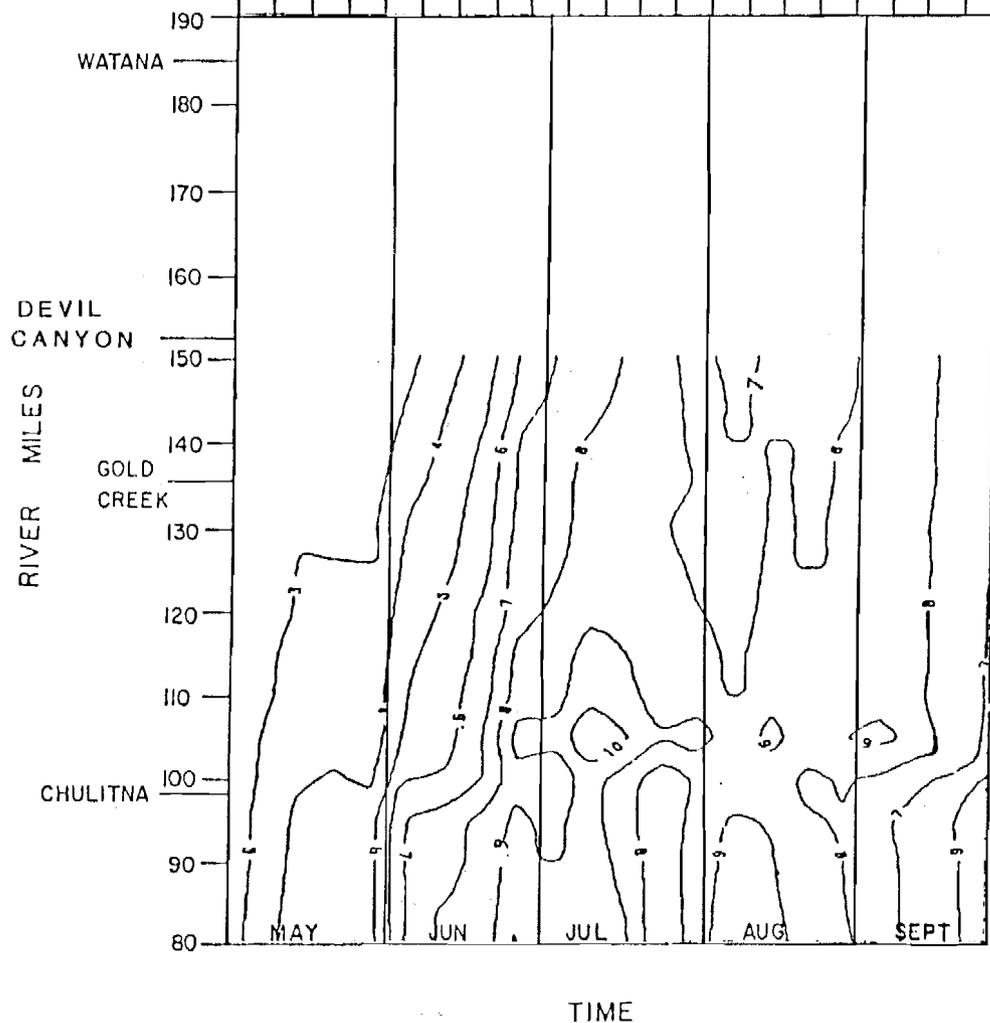
SUMMER 1971 CLIMATE DATA

ALASKA POWER AUTHORITY SUSITNA HYDROELECTRIC PROJECT	
ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER	HARZA-EBASCO SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



NOTES :

1. TEMPERATURES IN °C.

WATANA/DEVIL CANYON, 2020 ENERGY DEMAND

SUMMER 1971 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

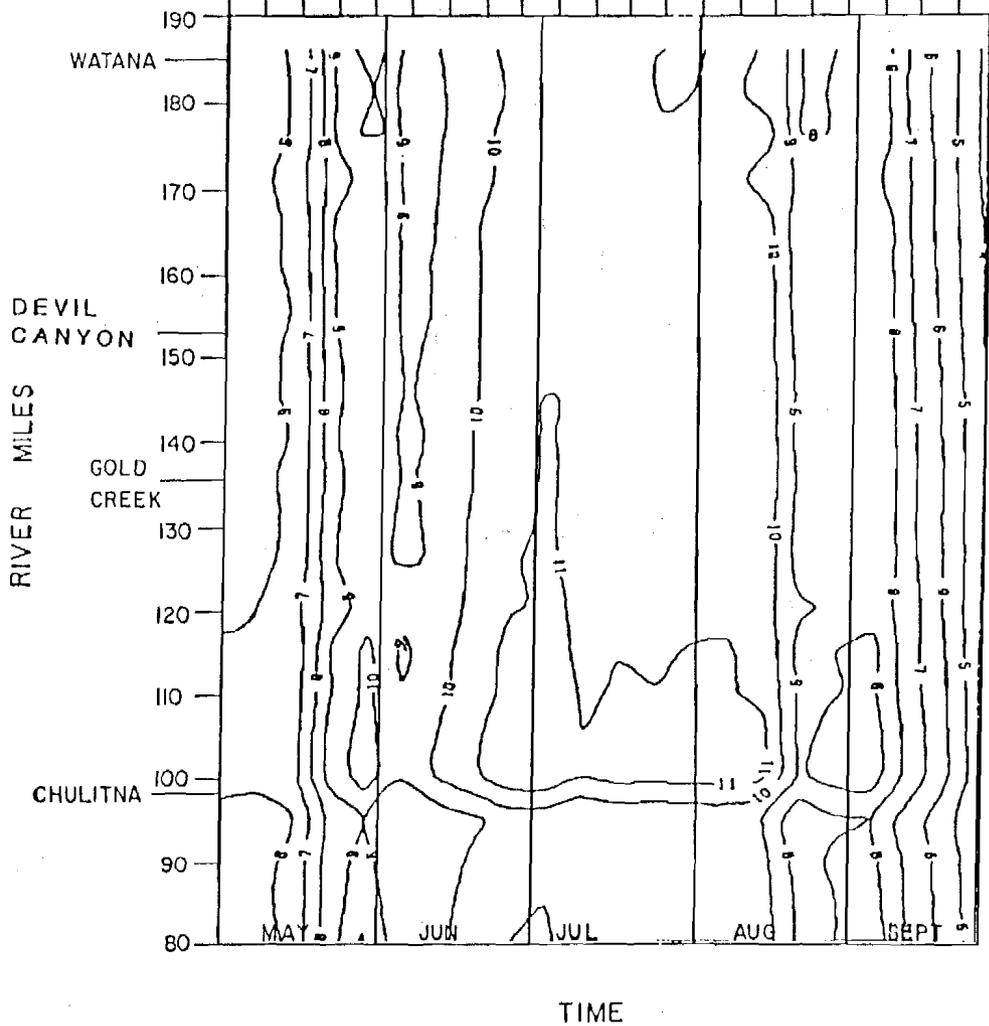
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SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



NOTES :

1. TEMPERATURES IN °C.

NATURAL CONDITIONS
SUMMER 1974 CLIMATE DATA

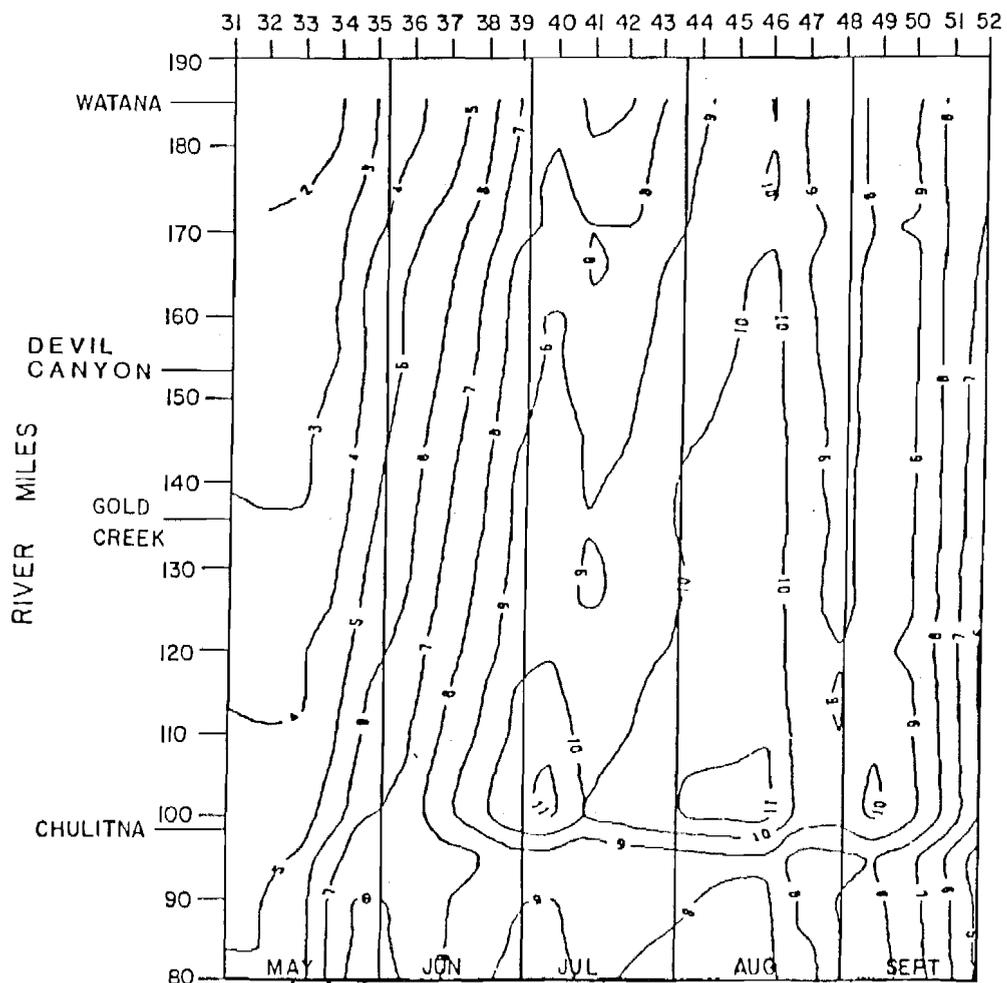
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SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)



NOTES :

1. TEMPERATURES IN °C.

TIME

WATANA ONLY, 1996 ENERGY DEMAND

SUMMER 1974 CLIMATE DATA

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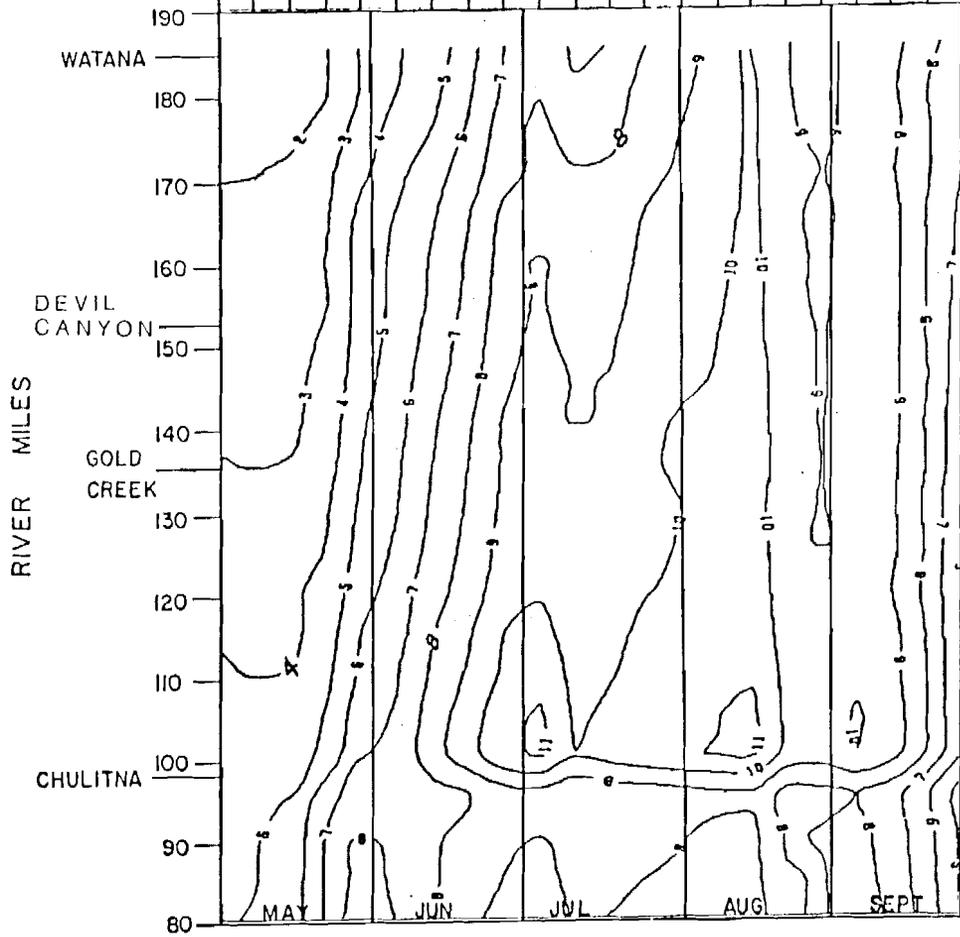
HARZA-EBASCO
SUSITNA JOINT VENTURE

B7

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



TIME

WATANA ONLY, 2001 ENERGY DEMAND

SUMMER 1974 CLIMATE DATA

NOTES :

1. TEMPERATURES, IN °C.

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

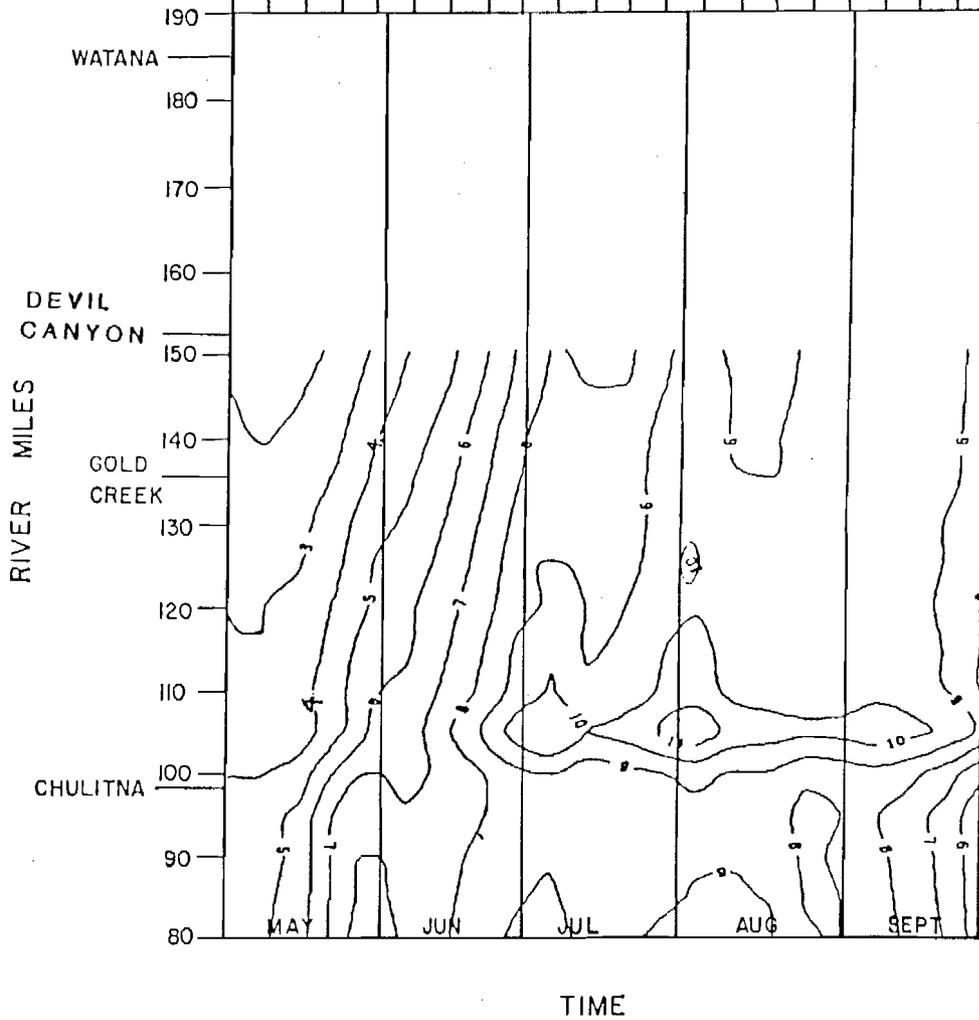
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INFORMATION AND DATA
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HARZA-EBASCO
SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



NOTES :

1. TEMPERATURES IN °C.

WATANA/DEVIL CANYON, 2002 ENERGY DEMAND

SUMMER 1974 CLIMATE D

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

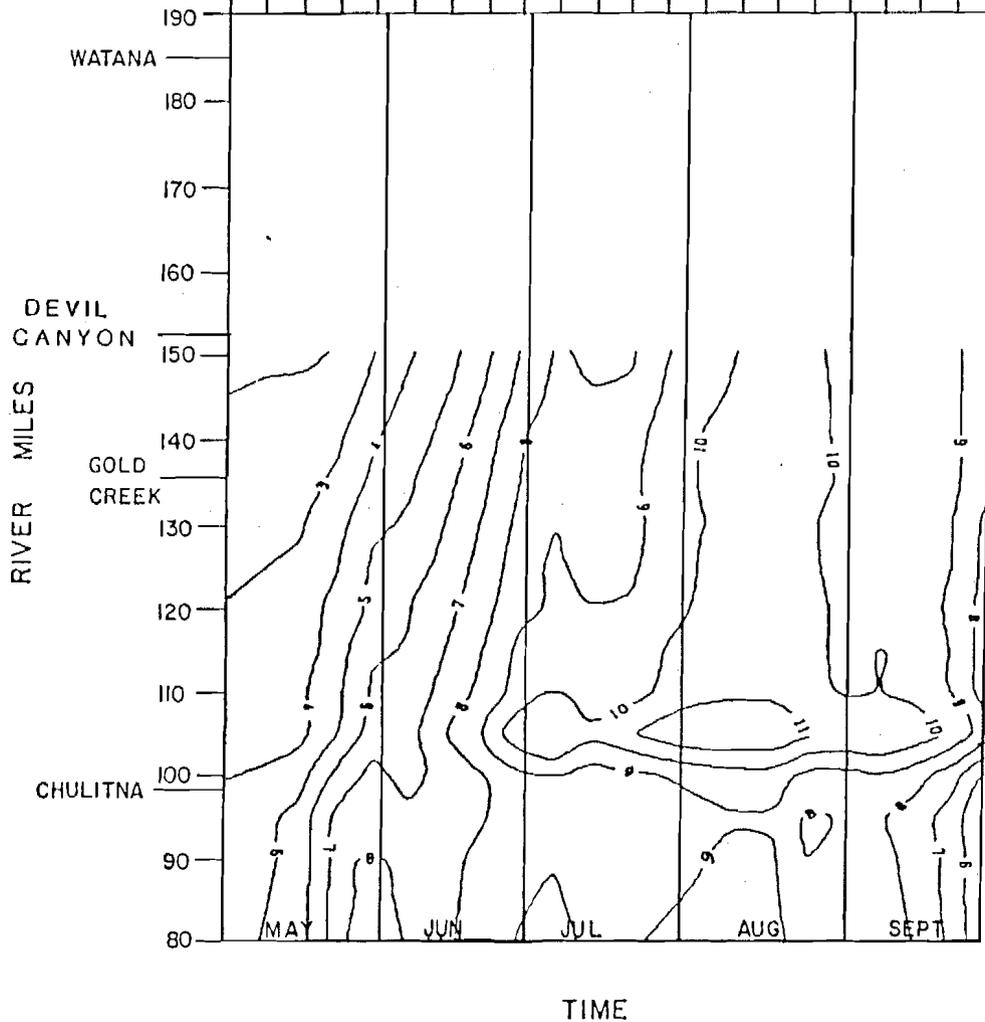
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MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



NOTES :

1. TEMPERATURES IN °C.

WATANA/DEVIL CANYON, 2020 ENERGY DEMAND

SUMMER 1974 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

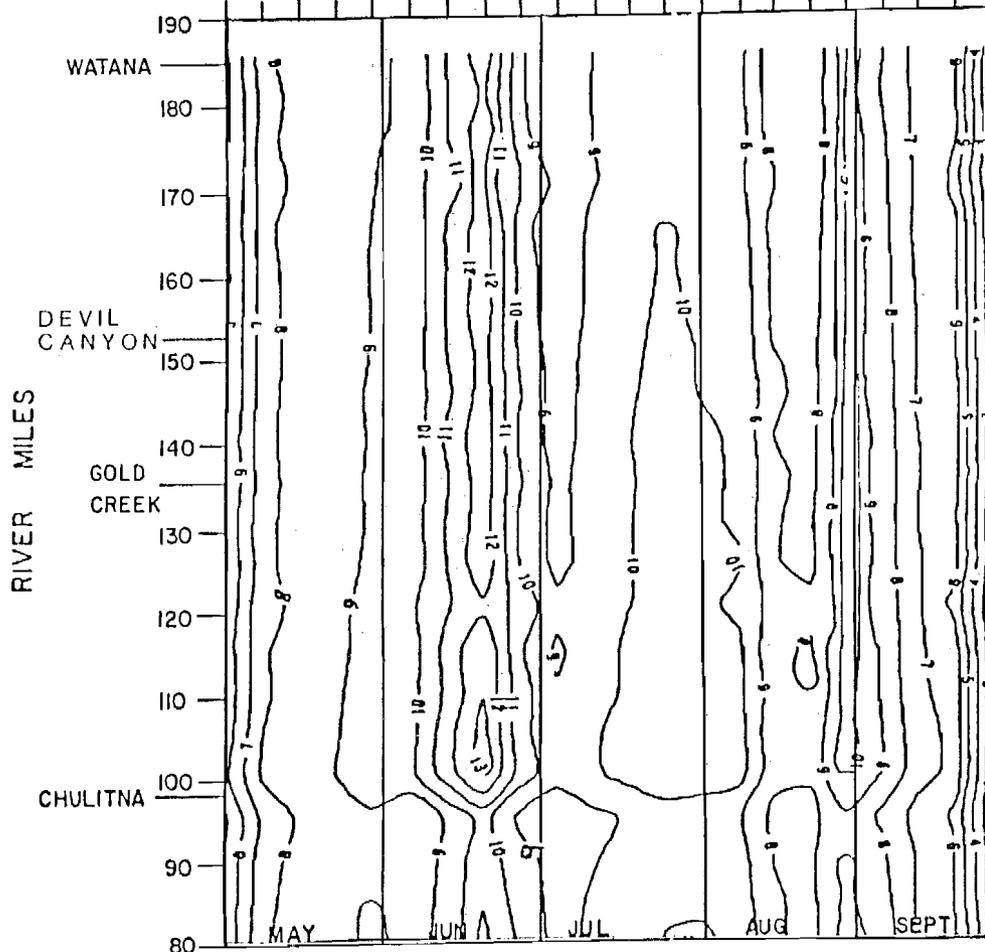
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SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



TIME

NATURAL CONDITIONS

SUMMER 1981 CLIMATE DATA

NOTES :

1. TEMPERATURES IN °C.

B11

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

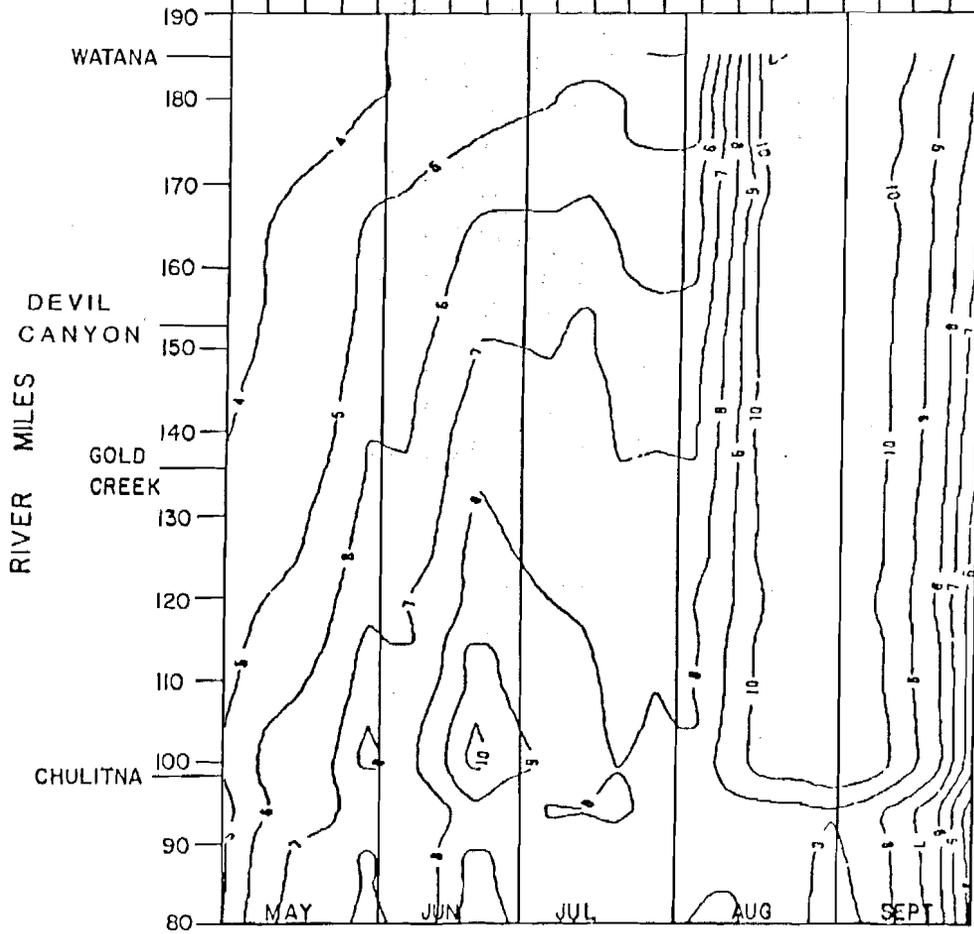
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SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



NOTES :

1. TEMPERATURES IN °C.

B12

TIME

WATANA FILLING, 1992
2nd SUMMER

SUMMER 1981 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

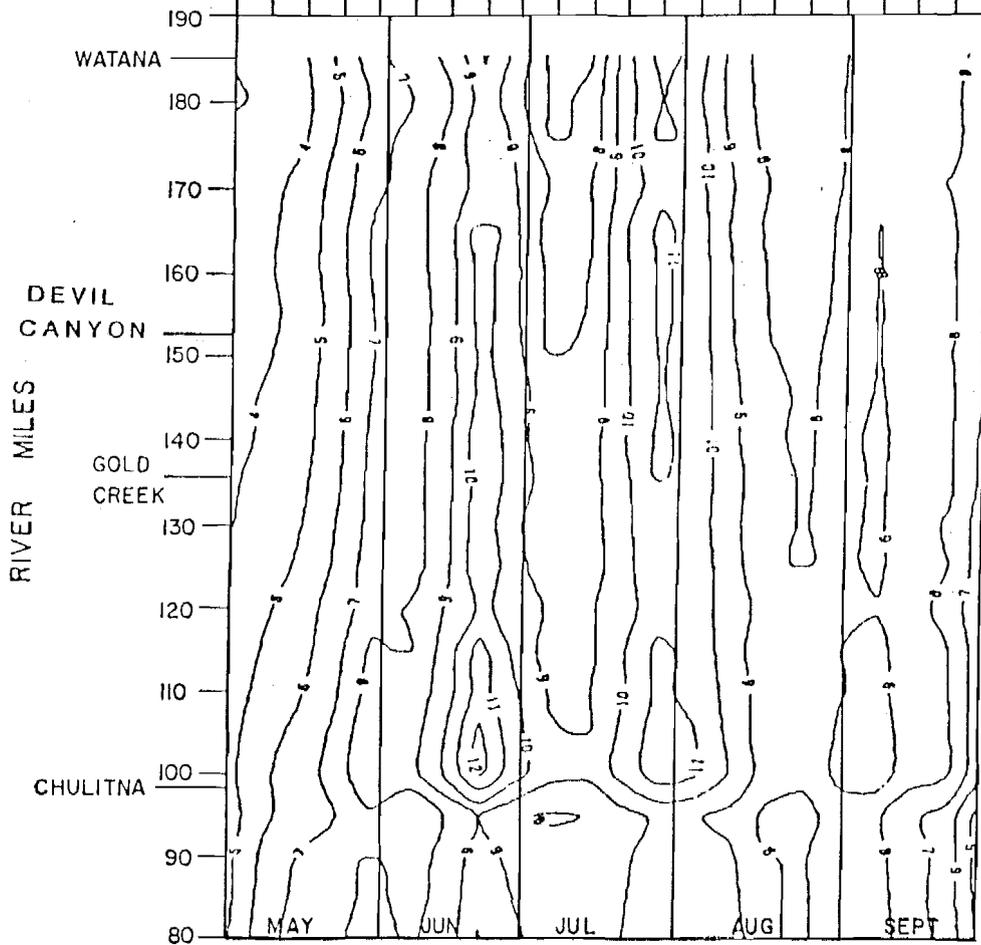
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SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



TIME

WATANA ONLY, 1996 ENERGY DEMAND

SUMMER 1981 CLIMATE DATA

NOTES :

1. TEMPERATURES, IN °C.

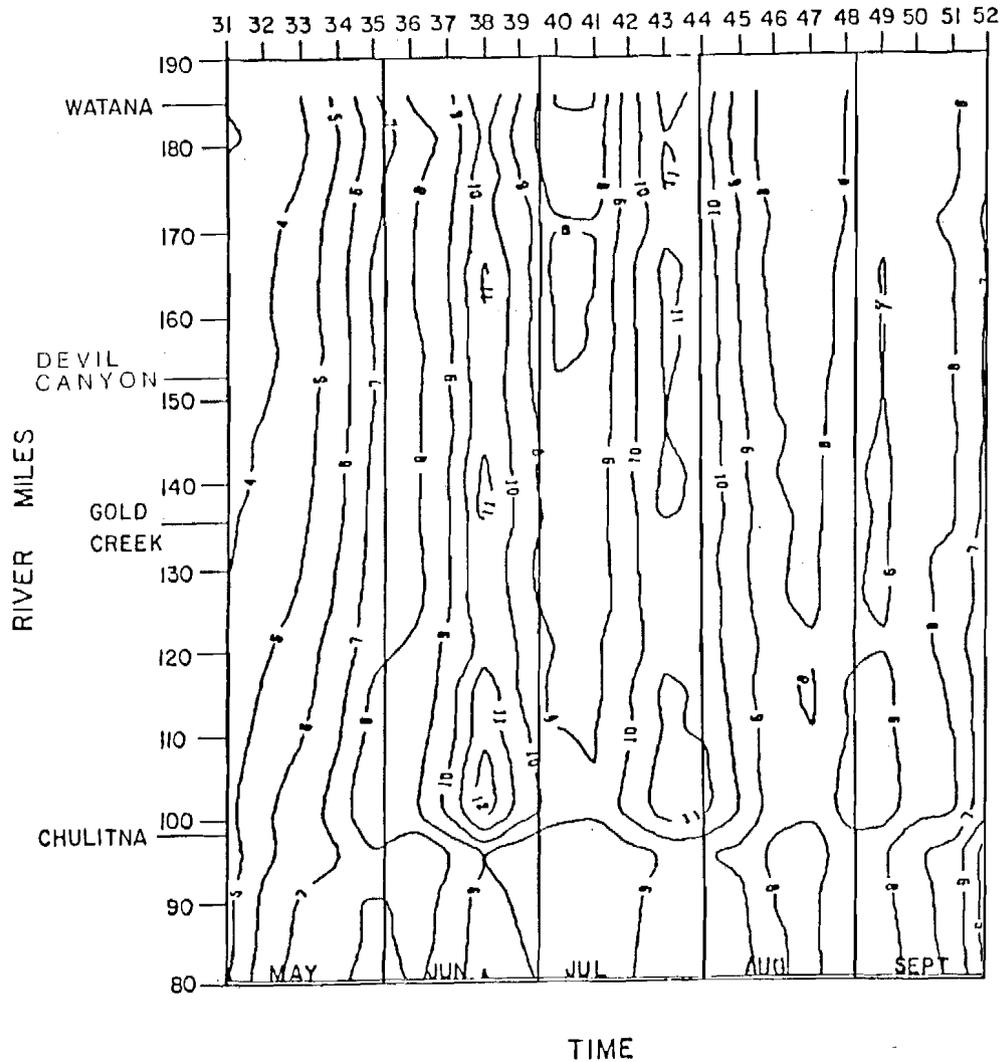
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SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)



NOTES :
1. TEMPERATURES IN °C.

B14

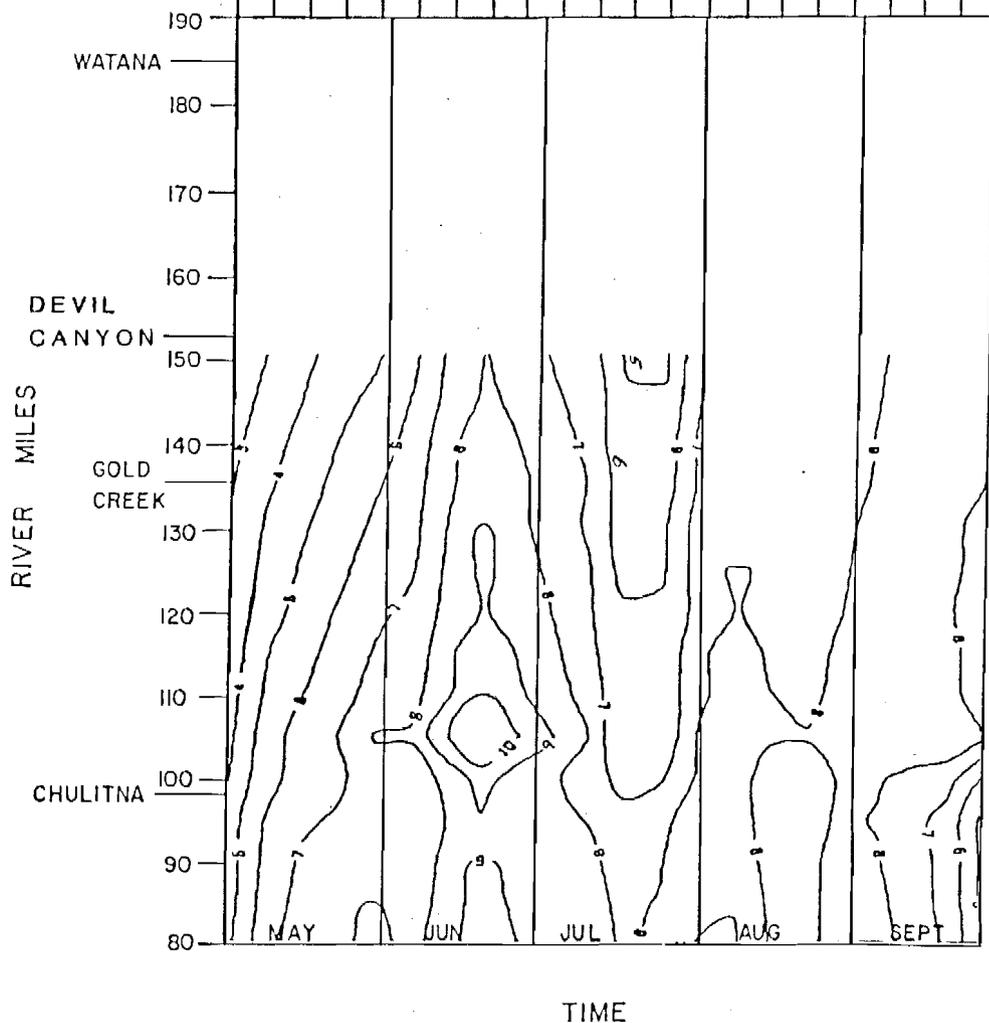
WATANA ONLY, 2001 ENERGY DEMAND
SUMMER 1981 CLIMATE DATA

ALASKA POWER AUTHORITY SUSITNA HYDROELECTRIC PROJECT	
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MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



NOTES :

1. TEMPERATURES IN °C.

WATANA/DEVIL CANYON, 2002 ENERGY DEMAND

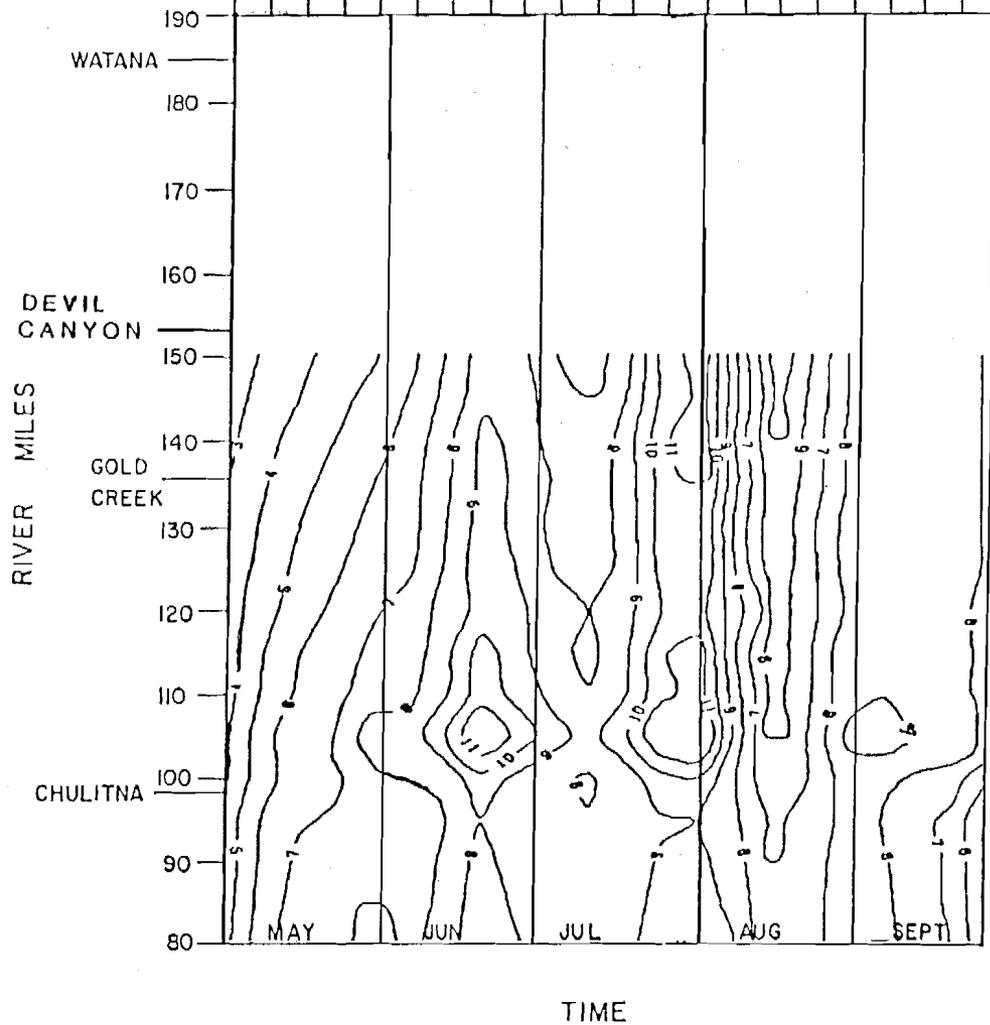
SUMMER 1981 CLIMATE DATA

ALASKA POWER AUTHORITY SUSITNA HYDROELECTRIC PROJECT	
ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER	HARZA-EBASCO SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



NOTES :

1. TEMPERATURES IN °C.

WATANA/DEVIL CANYON, 2020 ENERGY DEMAND

SUMMER 1981 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

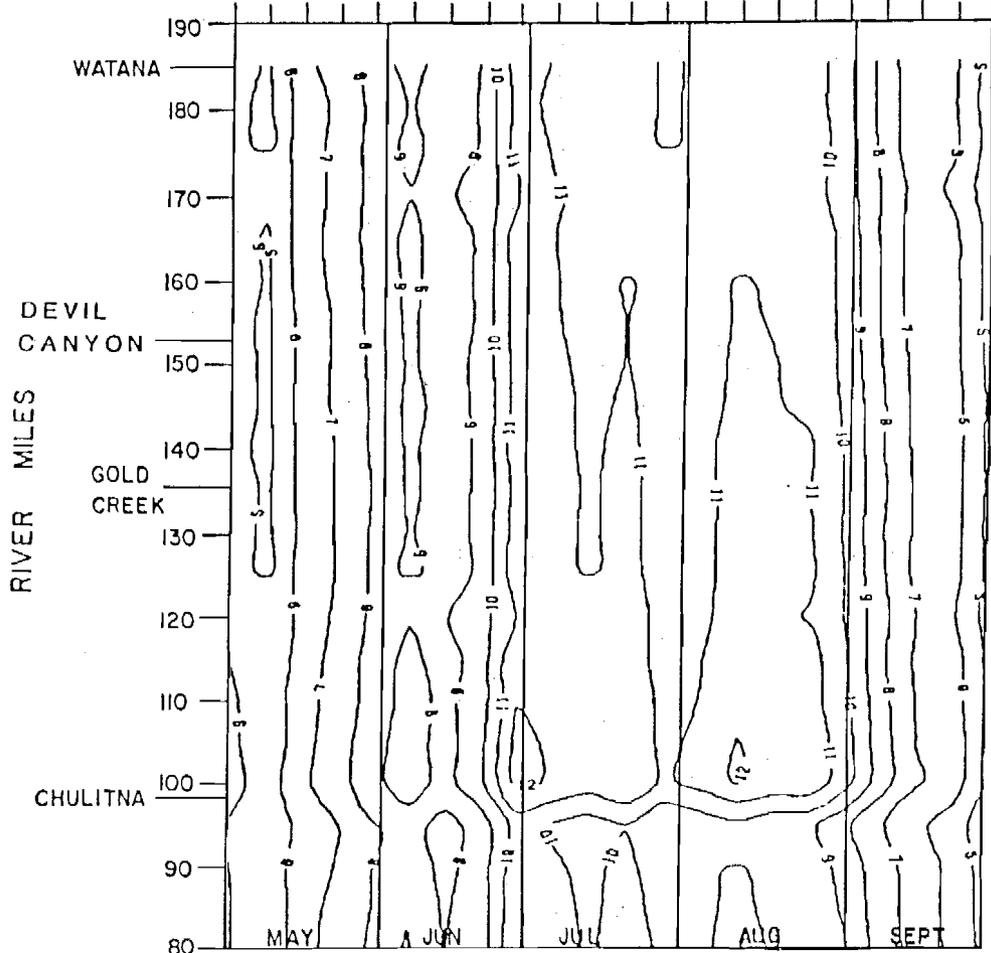
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MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



TIME

NATURAL CONDITIONS

SUMMER 1982 CLIMATE DATA

NOTES :

1. TEMPERATURES IN °C.

B17

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

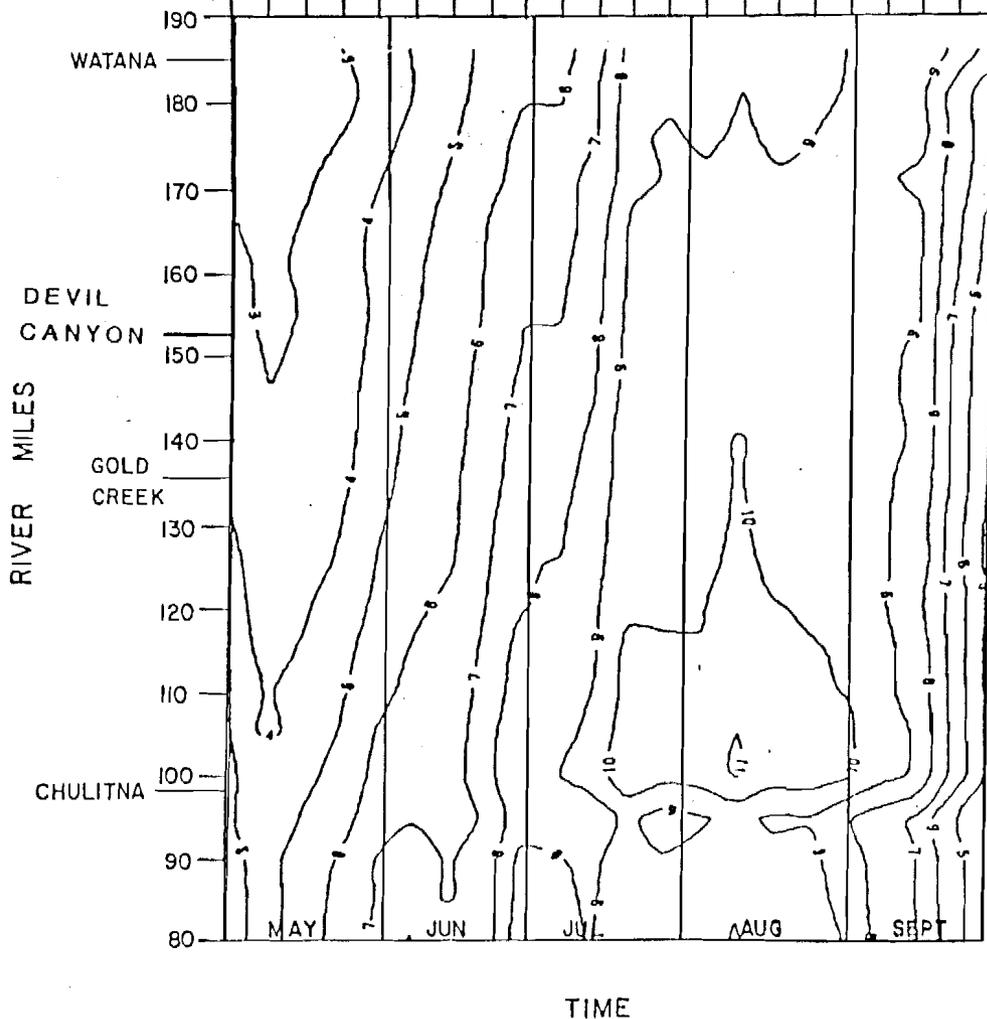
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INFORMATION AND DATA
CENTER

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SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



NOTES :

1. TEMPERATURES IN °C.

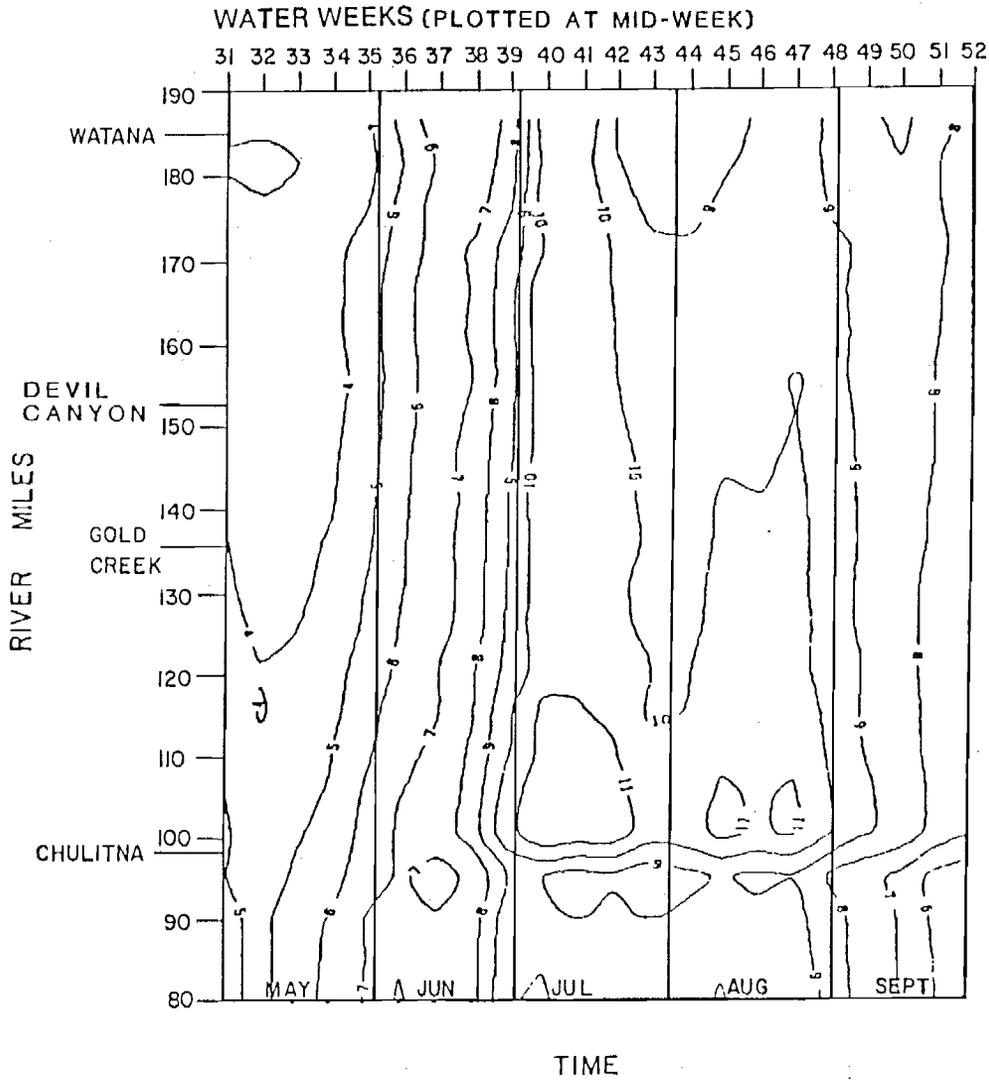
WATANA FILLING, 1993
 3rd SUMMER
 SUMMER 1982 CLIMATE DATA

ALASKA POWER AUTHORITY
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ARCTIC ENVIRONMENTAL
 INFORMATION AND DATA
 CENTER

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 SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS



NOTES :

1. TEMPERATURES IN °C.

WATANA ONLY, 1996 ENERGY DEMAND

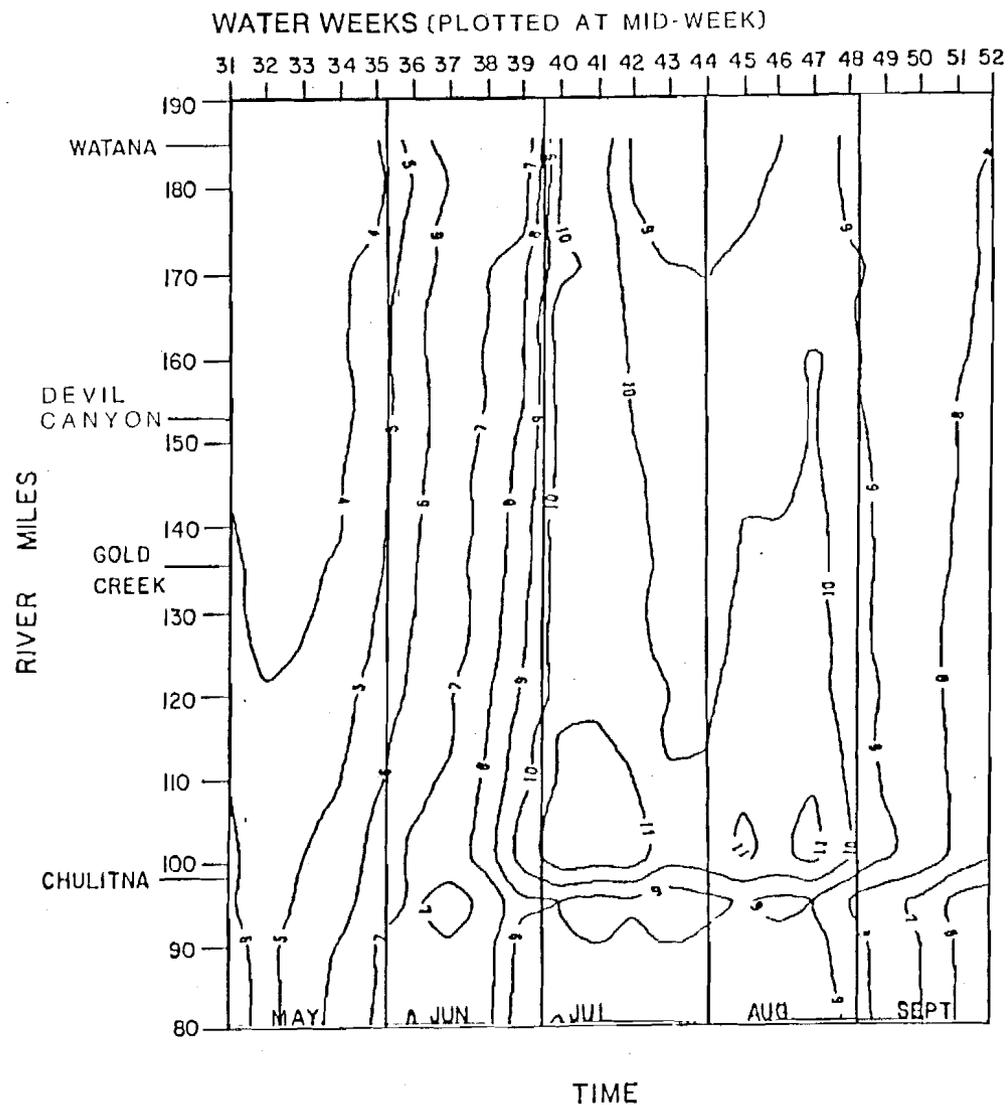
SUMMER 1982 CLIMATE DATA

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SUSITNA HYDROELECTRIC PROJECT

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CENTER

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SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS



NOTES :

1. TEMPERATURES IN °C.

WATANA ONLY, 2001 ENERGY DEMAND

SUMMER 1982 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

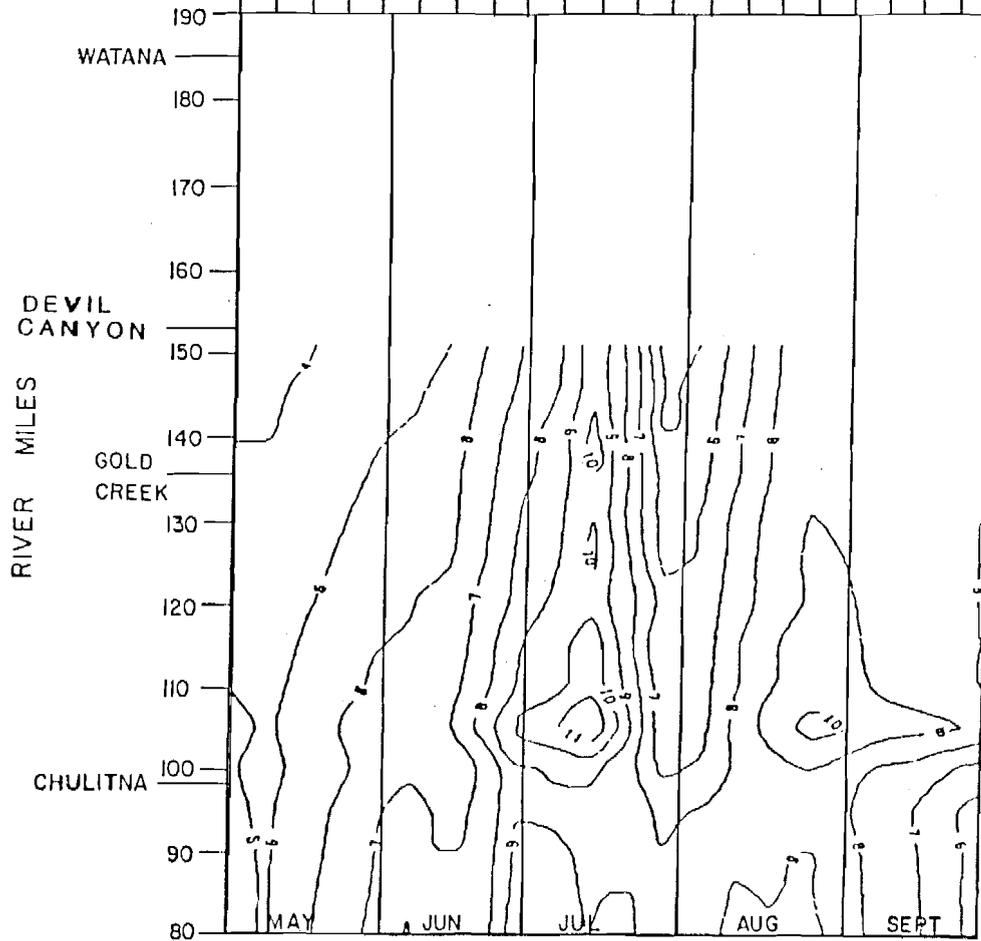
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 INFORMATION AND DATA
 CENTER

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 SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



TIME

WATANA/DEVIL CANYON, 2002 ENERGY DEMAND

SUMMER 1982 CLIMATE DATA

NOTES :

1. TEMPERATURES IN °C.

B21

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

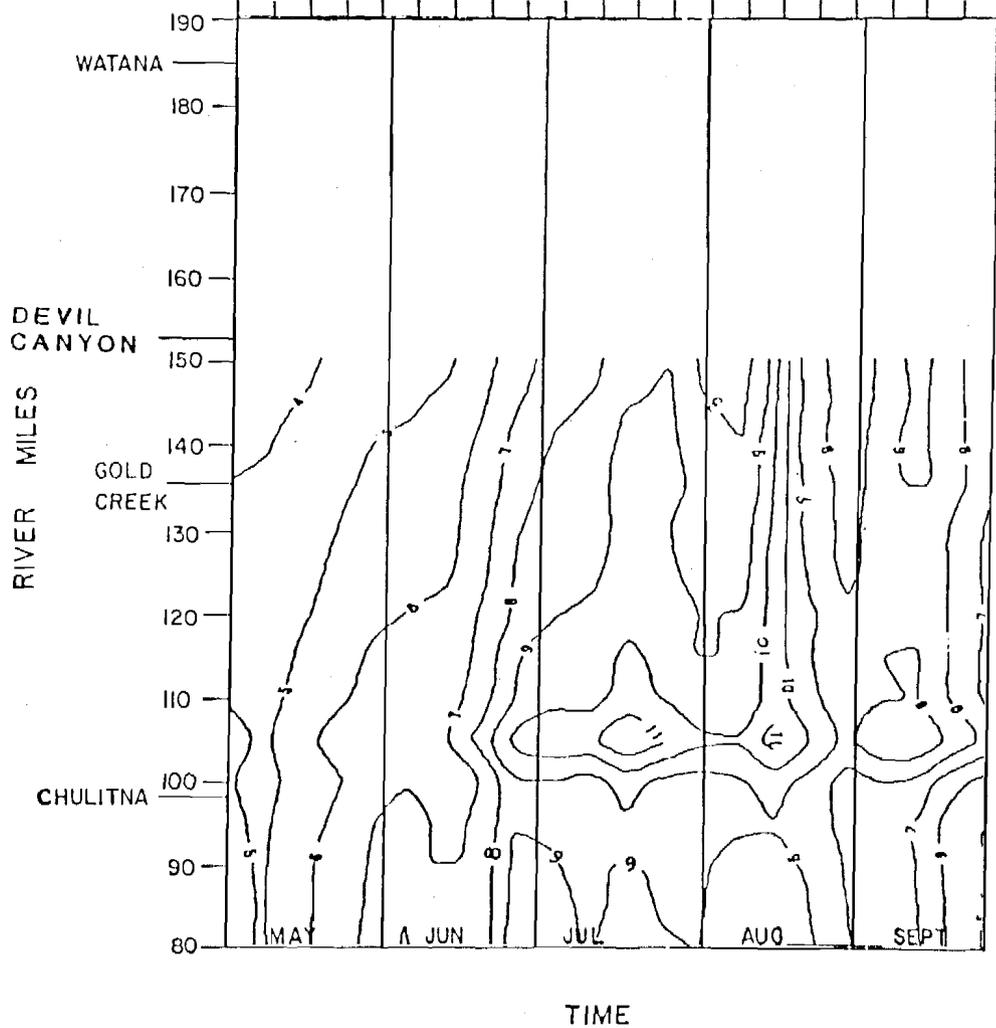
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SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52



NOTES :

1. TEMPERATURES IN °C

B22

WATANA/DEVIL CANYON, 2020 ENERGY DEMAND

SUMMER 1982 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

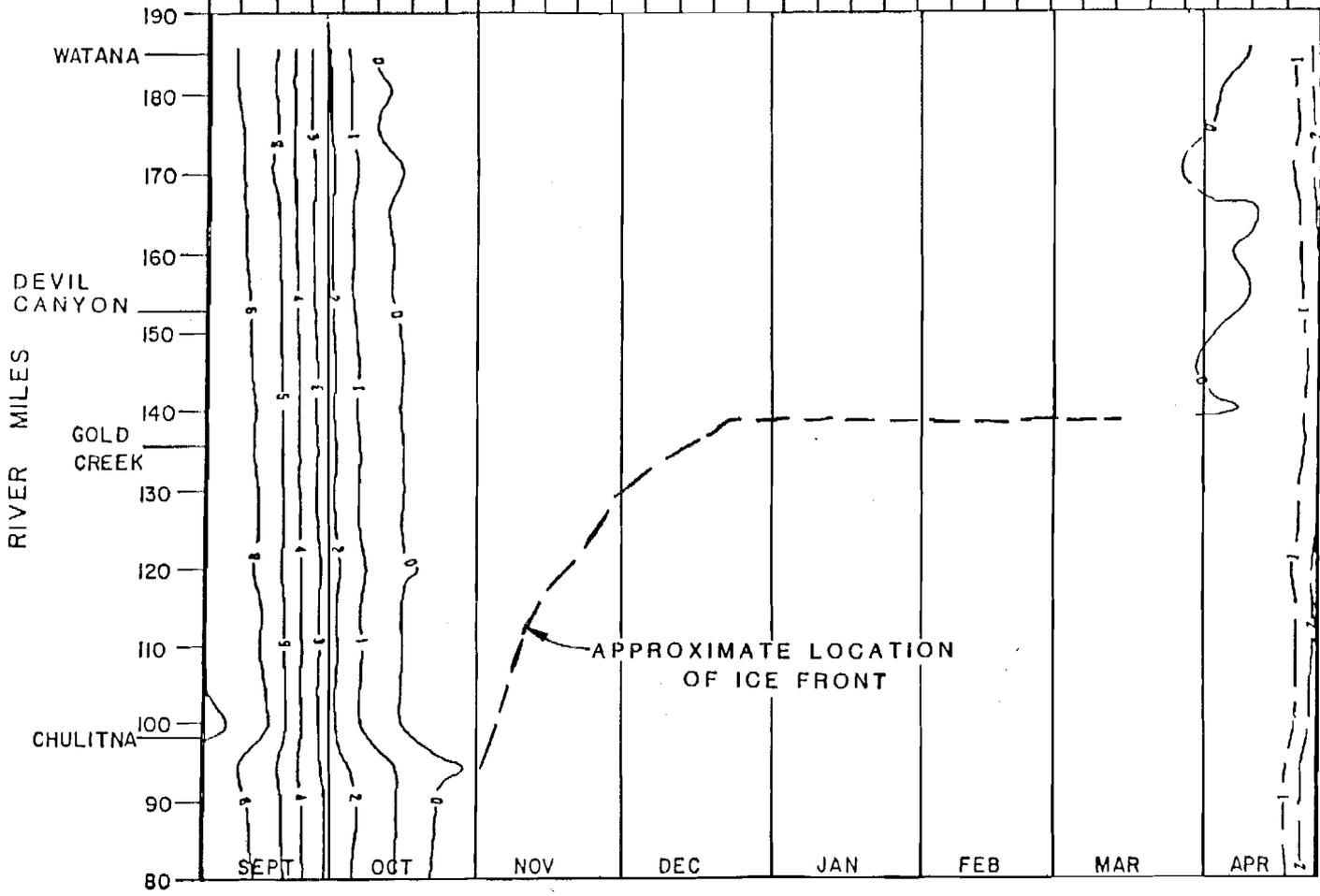
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CENTER

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SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



NOTES :

1. TEMPERATURES IN °C.
2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS. SIMULATED TEMPERATURES FOR MARCH AND APRIL SHOULD NOT BE USED.
3. ICE FRONT PROGRESSION UPSTREAM OF RIVER MILE 139 NOT MODELED FOR NATURAL CONDITIONS

TIME

NATURAL CONDITIONS

WINTER 1971-1972 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

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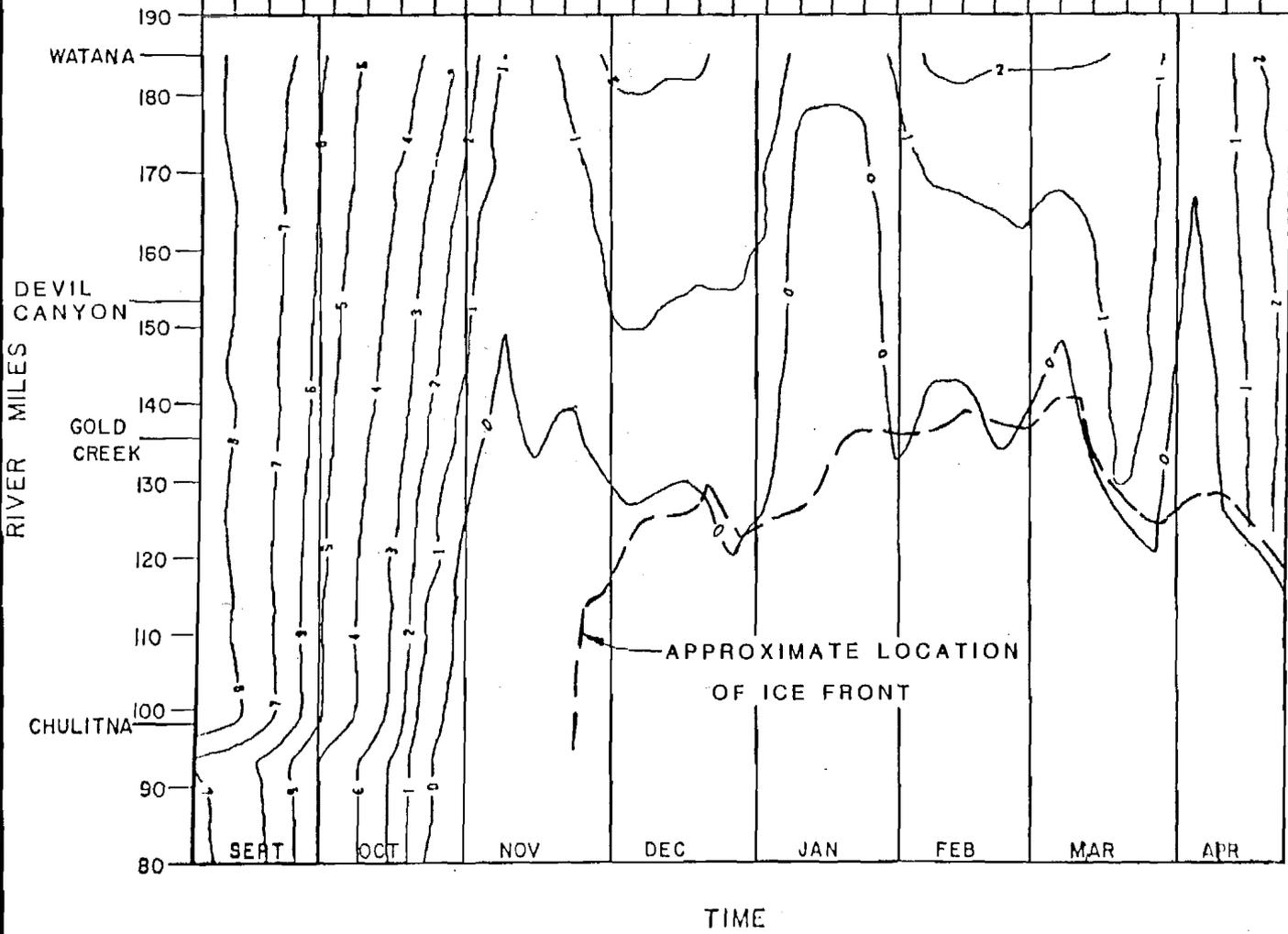
HARZA-EBASCO
SUSITNA JOINT VENTURE

B23

MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



NOTES :

1. TEMPERATURES IN °C.
2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS.

B24

WATANA ONLY, 1996 ENERGY DEMAND

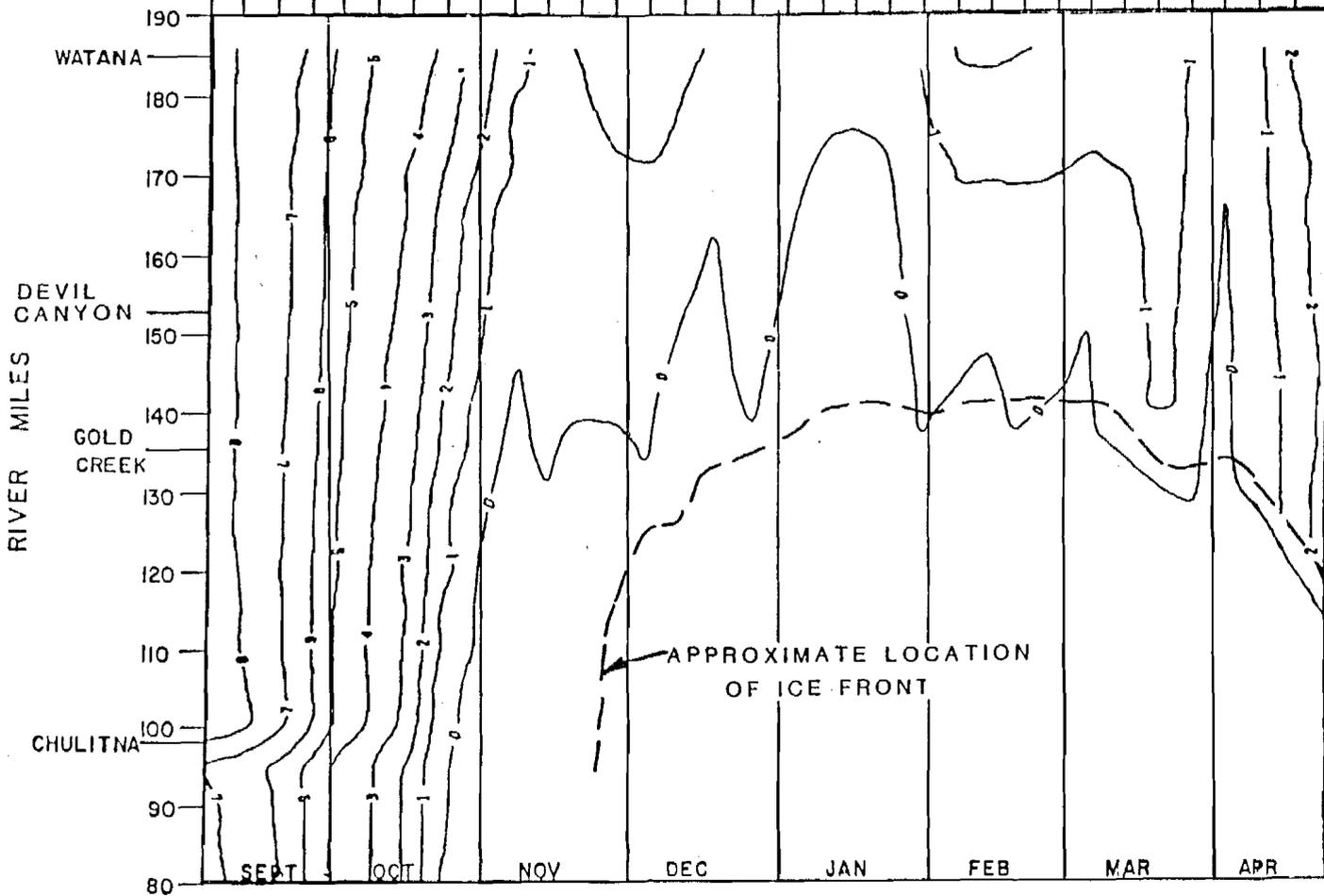
WINTER 1971-1972 CLIMATE DATA

ALASKA POWER AUTHORITY SUSITNA HYDROELECTRIC PROJECT	
ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER	HARZA-EBASCO SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



NOTES :

1. TEMPERATURES IN °C.
2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS.

TIME

WATANA ONLY, 2001 ENERGY DEMAND

WINTER 1971-1972 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

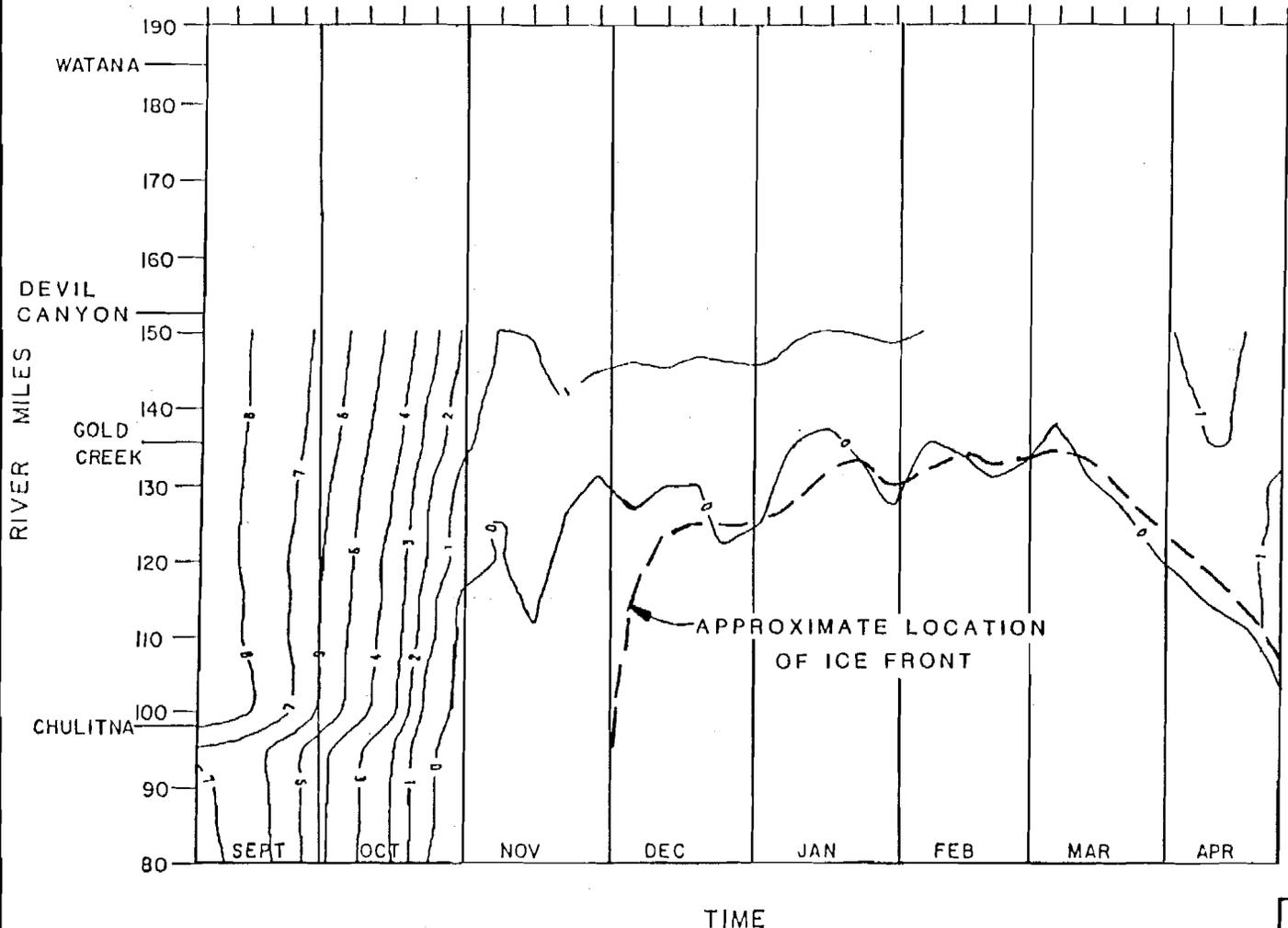
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MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



- NOTES :
1. TEMPERATURES IN °C.
 2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS.

B26

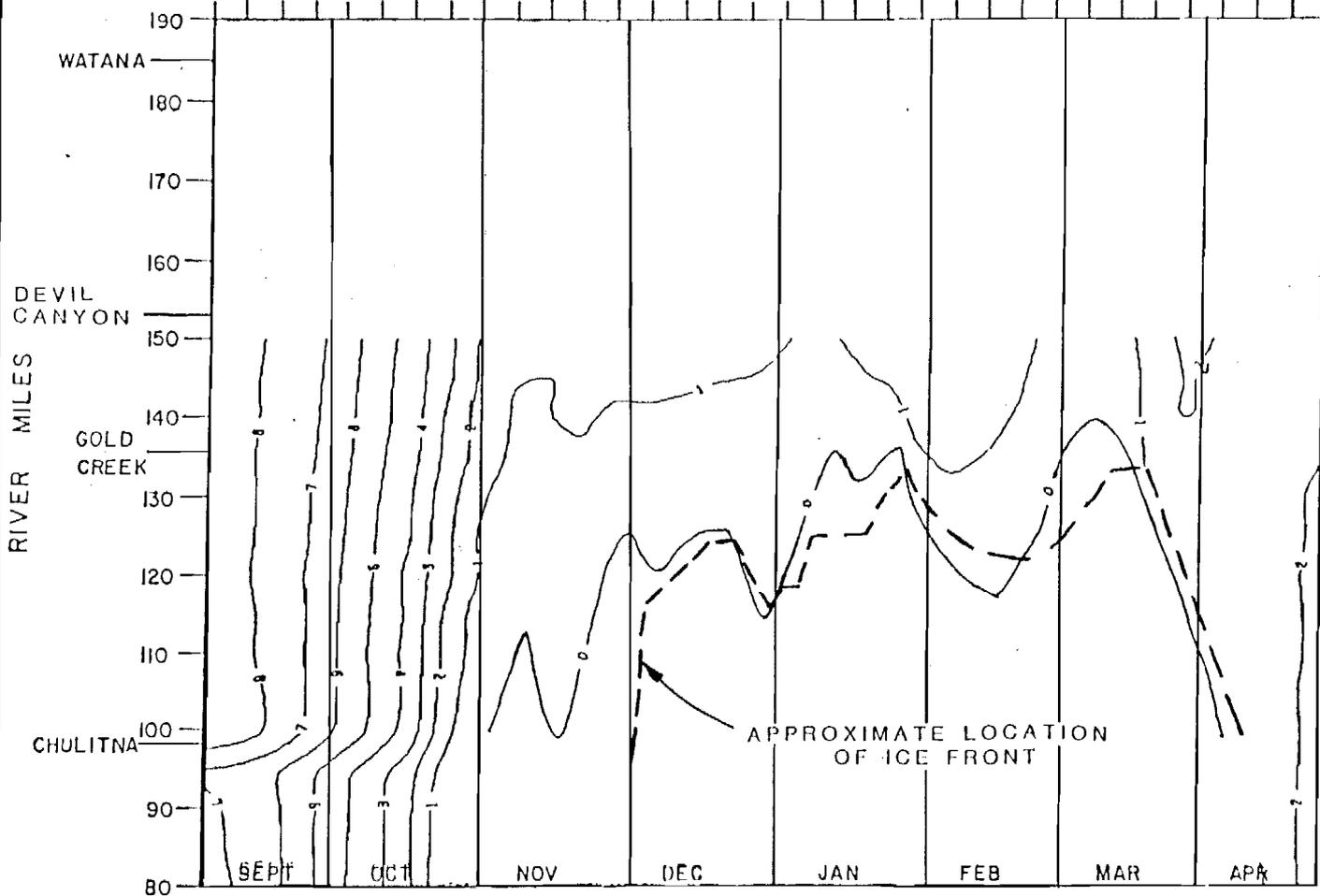
WATANA/DEVIL CANYON, 2002 ENERGY DEMAND
WINTER 1971-1972 CLIMATE DATA

ALASKA POWER AUTHORITY SUSITNA HYDROELECTRIC PROJECT	
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MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



- NOTES :
1. TEMPERATURES IN °C.
 2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS.

TIME

WATANA/DEVIL CANYON, 2020 ENERGY DEMAND

WINTER 1971-1972 CLIMATE DATA

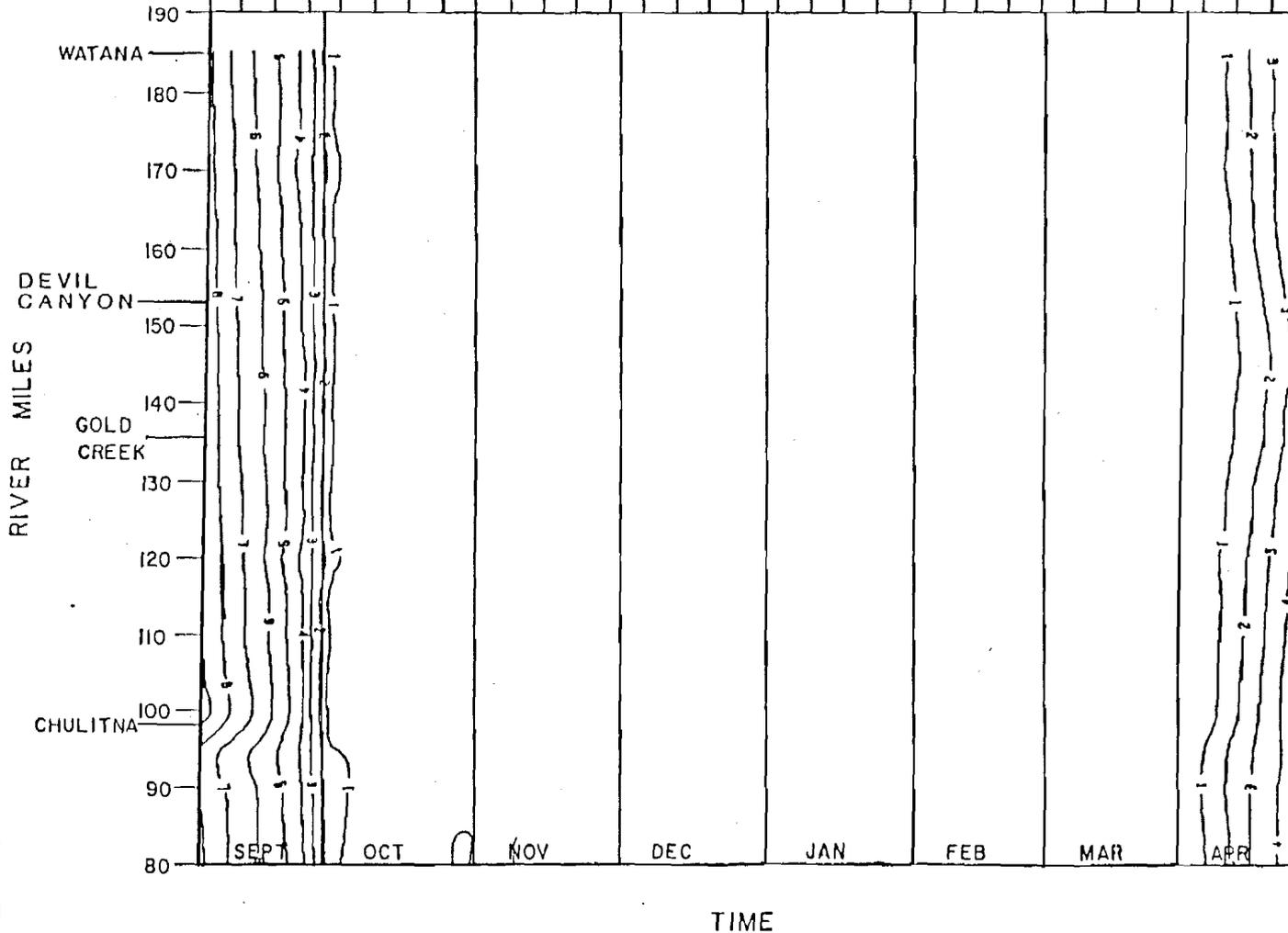
ALASKA POWER AUTHORITY SUSITNA HYDROELECTRIC PROJECT	
ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER	MARZA-EBASCO SUSITNA PROJECT VENTURE

B27

MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



NOTES :

1. TEMPERATURES IN °C.
2. ICE SIMULATION NOT MADE FOR THIS CASE. TEMPERATURES FROM NOVEMBER THROUGH APRIL SHOULD NOT BE USED. NOTE SIMILARITY TO NATURAL CONDITIONS FOR 1971-1972 WINTER.

B28

NATURAL CONDITIONS
WINTER 1974-1975 CLIMATE DATA

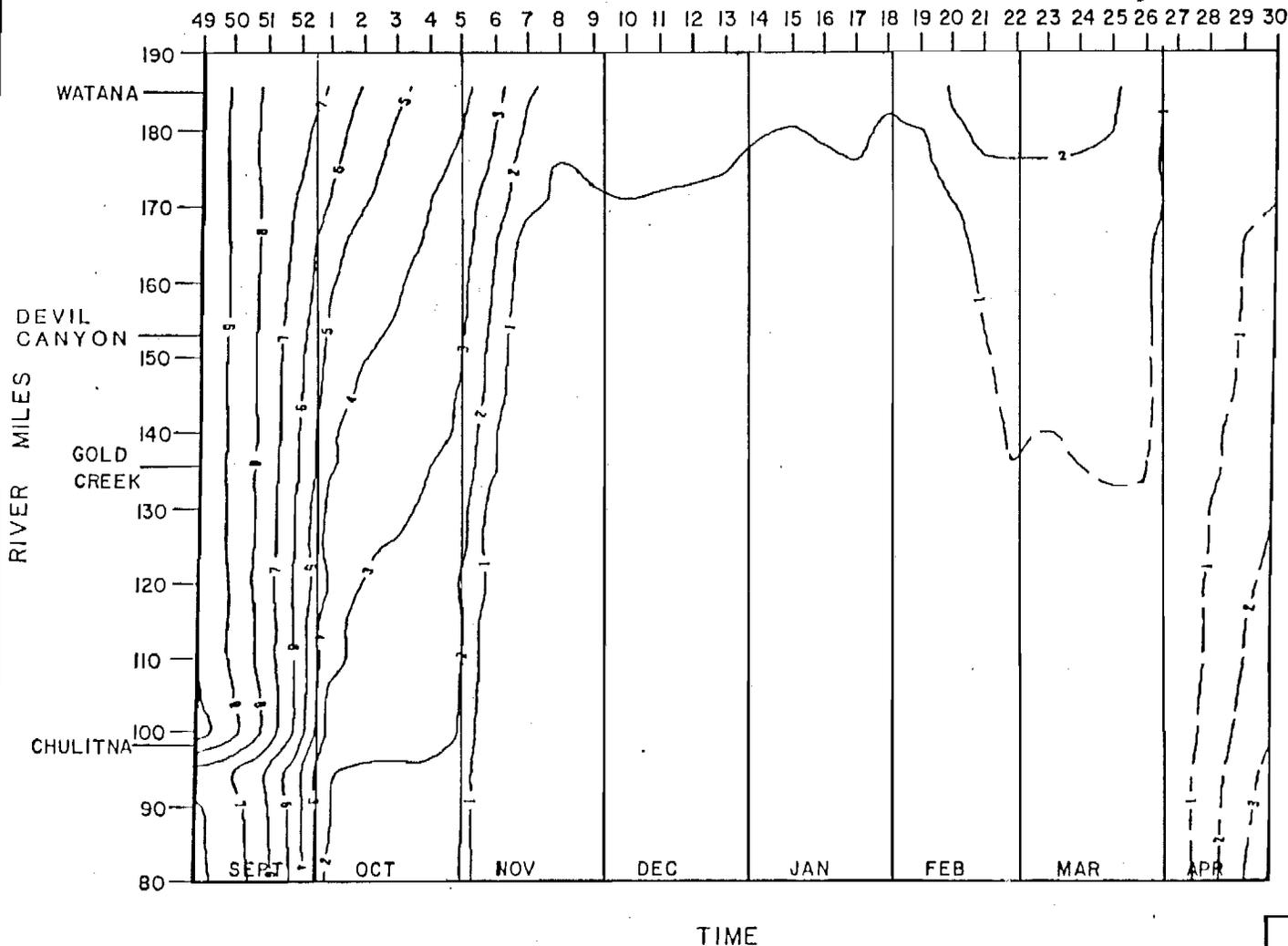
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SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)



NOTES :

1. TEMPERATURES IN °C.
2. ICE SIMULATION NOT MADE FOR THIS CASE. TEMPERATURES FROM NOVEMBER THROUGH APRIL SHOULD NOT BE USED. NOTE SIMILARITY OF THIS CASE TO WINTER OF 1971-1972 FOR 1996 ENERGY DEMAND.

B29

WATANA ONLY, 1996 ENERGY DEMAND

WINTER 1974-1975 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

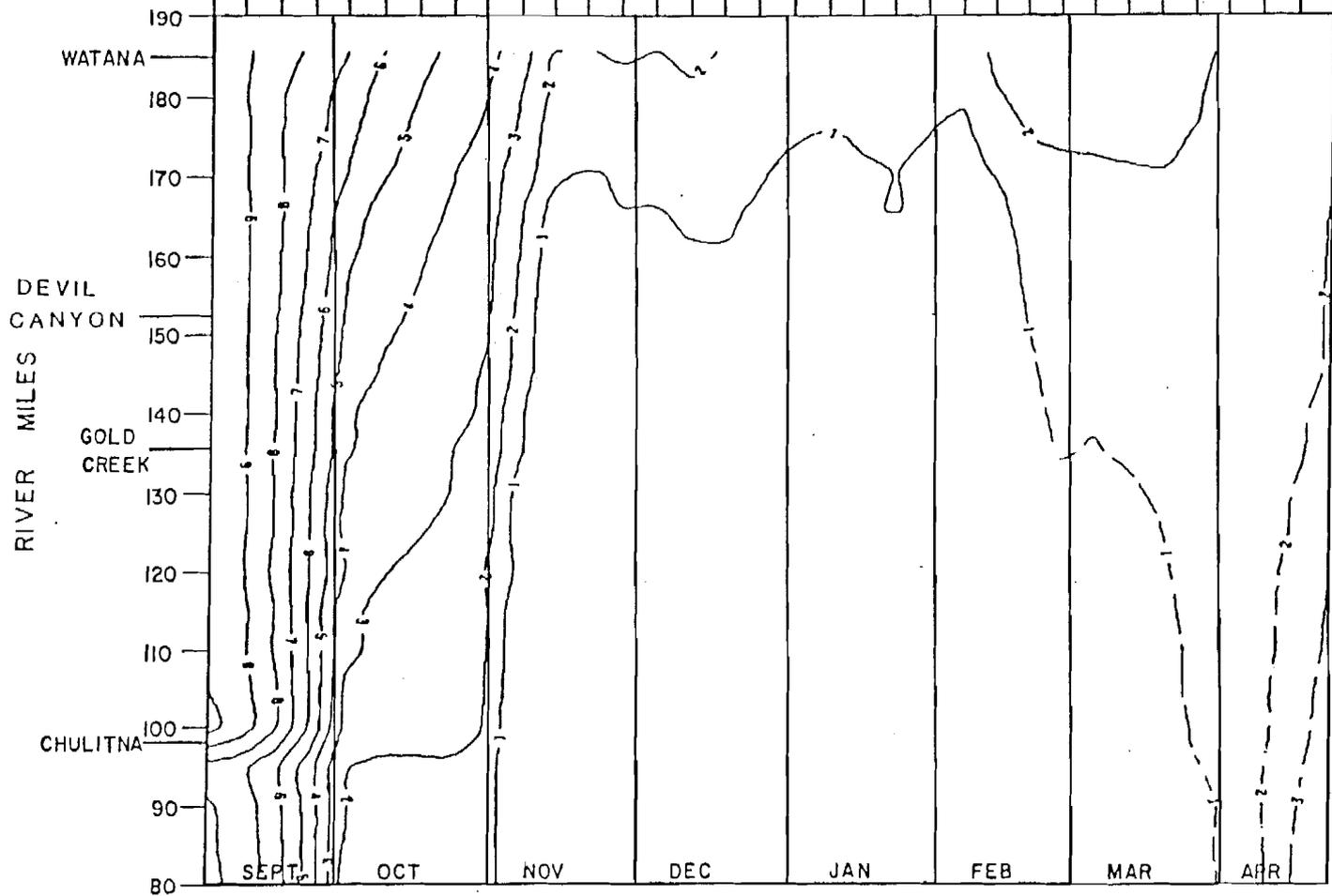
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SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



- NOTES :
1. TEMPERATURES IN °C.
 2. ICE SIMULATION NOT MADE FOR THIS CASE. TEMPERATURES FROM NOVEMBER THROUGH APRIL SHOULD NOT BE USED. NOTE SIMILARITY OF THIS CASE TO WINTER OF 1971-1972 FOR 1996 ENERGY DEMAND.

B30

TIME

WATANA ONLY, 2001 ENERGY DEMAND

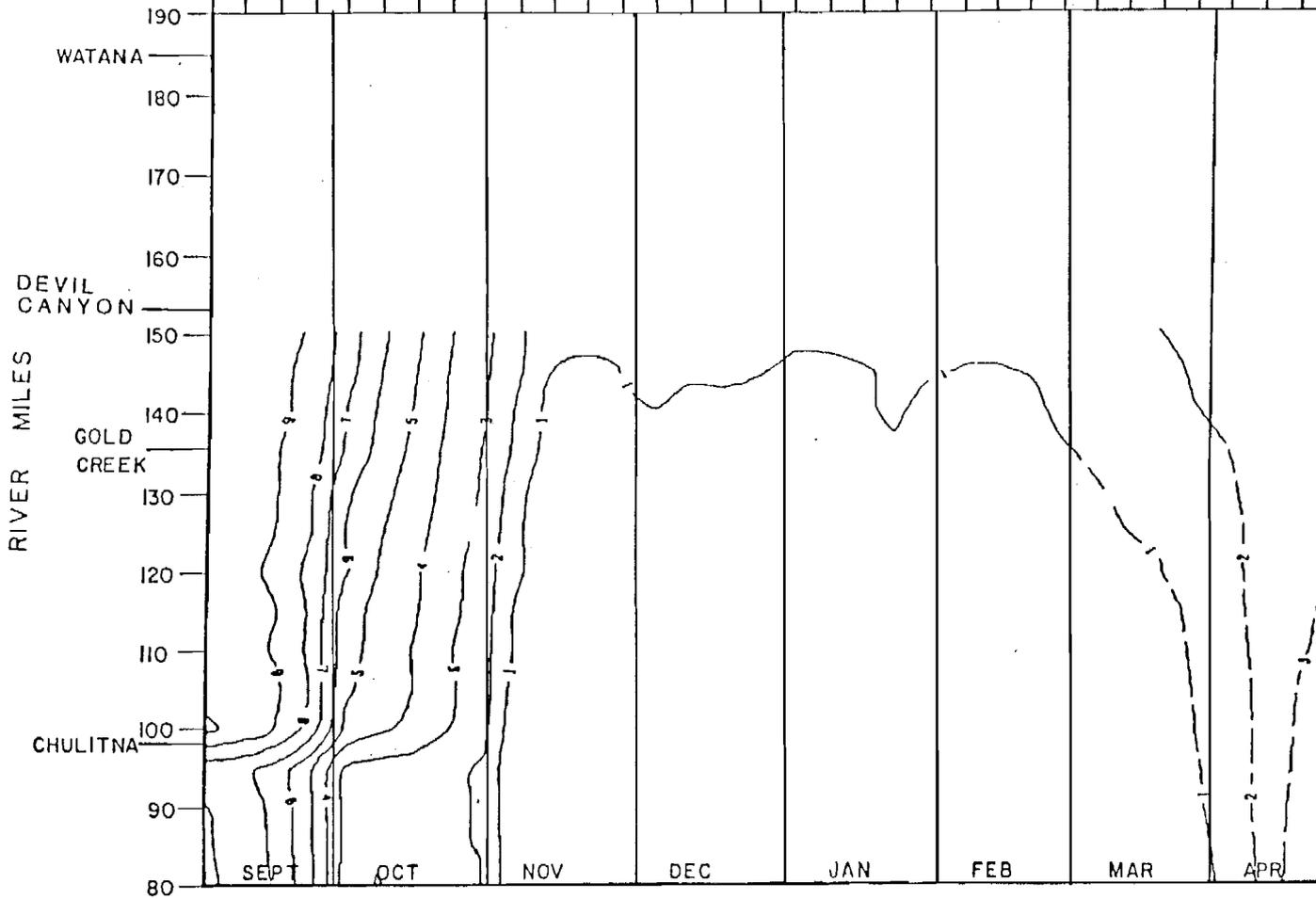
WINTER 1974-1975 CLIMATE DATA

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MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



NOTES :

1. TEMPERATURES IN °C.
2. ICE SIMULATION NOT MADE FOR THIS CASE. TEMPERATURES FOR NOVEMBER THROUGH MARCH SHOULD NOT BE USED.

TIME

WATANA/DEVIL CANYON, 2002 ENERGY DEMAND

WINTER 1974-1975 CLIMATE DATA

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HARZA-EBASCO
SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



NOTES :

1. TEMPERATURES IN °C.
2. WINTER ICE SIMULATION NOT MADE FOR THIS CASE. TEMPERATURES FROM NOVEMBER THROUGH APRIL SHOULD NOT BE USED.

B32

TIME

WATANA/DEVIL CANYON, 2020 ENERGY DEMAND

WINTER 1974-1975 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

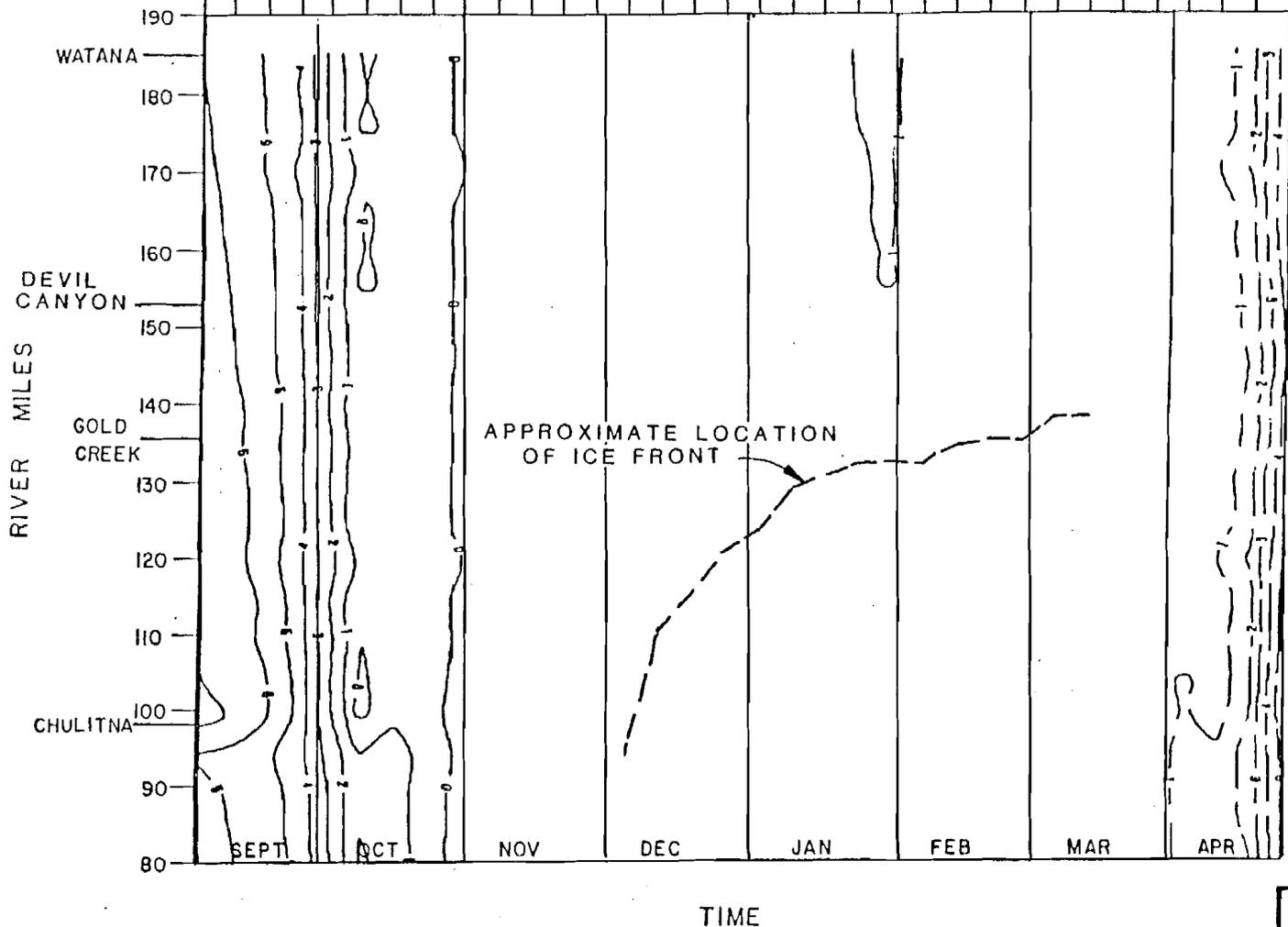
ARCTIC ENVIRONMENTAL
INFORMATION AND DATA
CENTER

HARZA-EBASCO
SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



NOTES :

1. TEMPERATURES IN °C.
2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS.
3. ICE FRONT PROGRESSION UPSTREAM OF RIVER MILE 139 NOT MODELED FOR NATURAL CONDITIONS

NATURAL CONDITIONS
WINTER 1976-1977 CLIMATE DATA

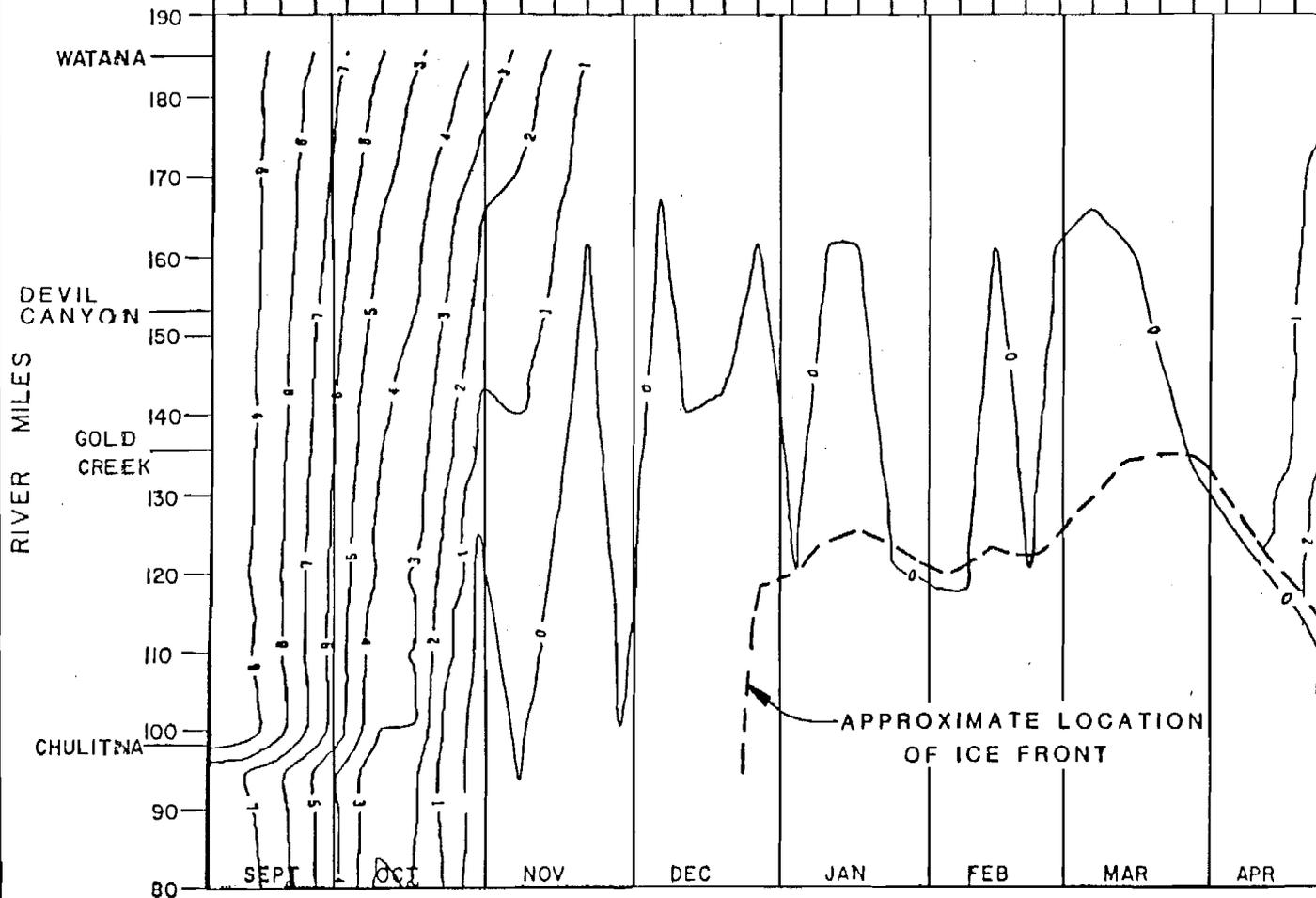
ALASKA POWER AUTHORITY SUSITNA HYDROELECTRIC PROJECT	
ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER	HARZA-EBASCO SUSITNA JOINT VENTURE

B33

MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



NOTES :

1. TEMPERATURES IN °C.
2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS.

TIME

WATANA ONLY, 1996 ENERGY DEMAND

WINTER 1976-1977 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

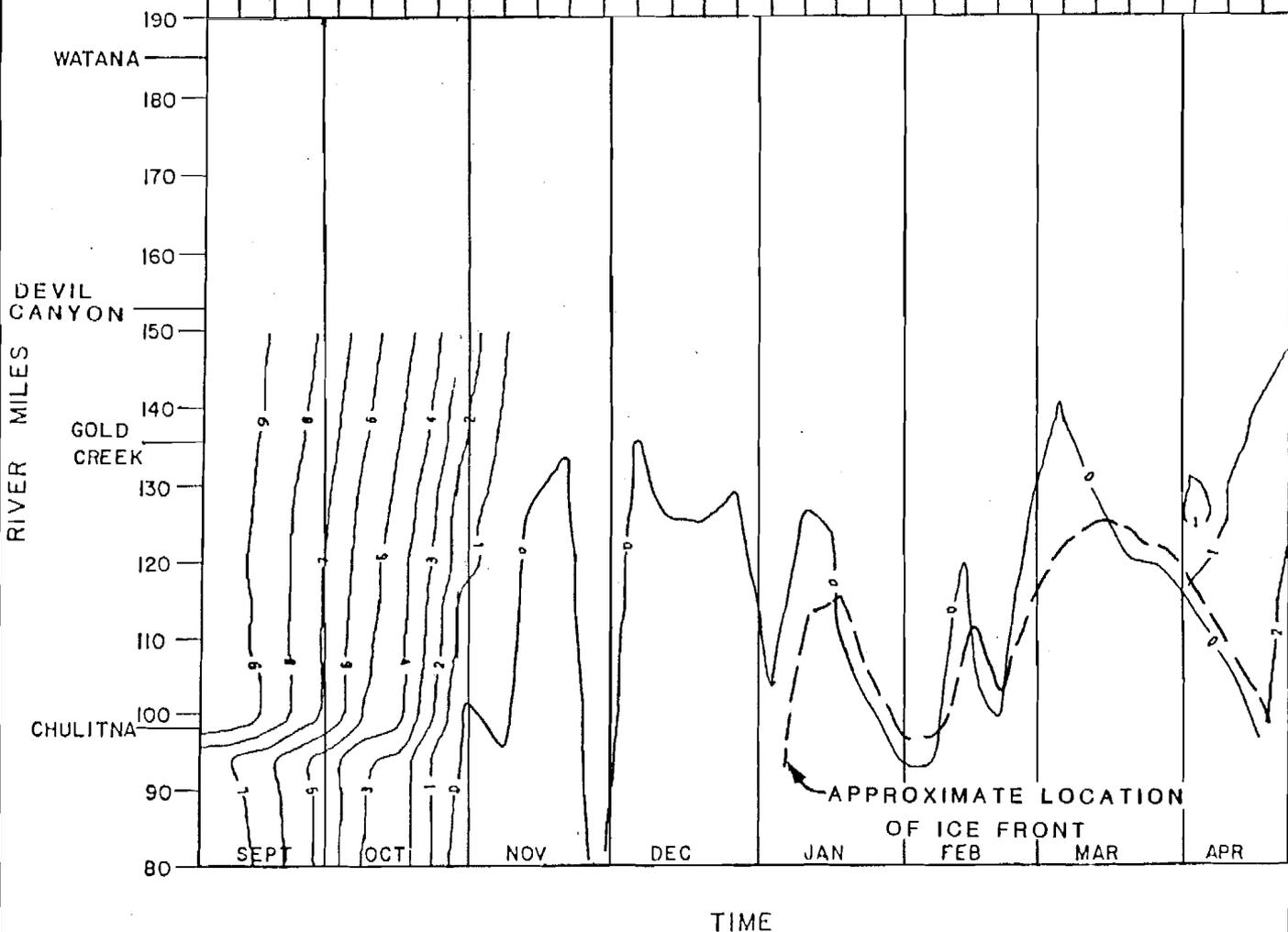
ARCTIC ENVIRONMENTAL
INFORMATION AND DATA
CENTER

HARZA-EBASCO
SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



- NOTES :
1. TEMPERATURES IN °C.
 2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS.

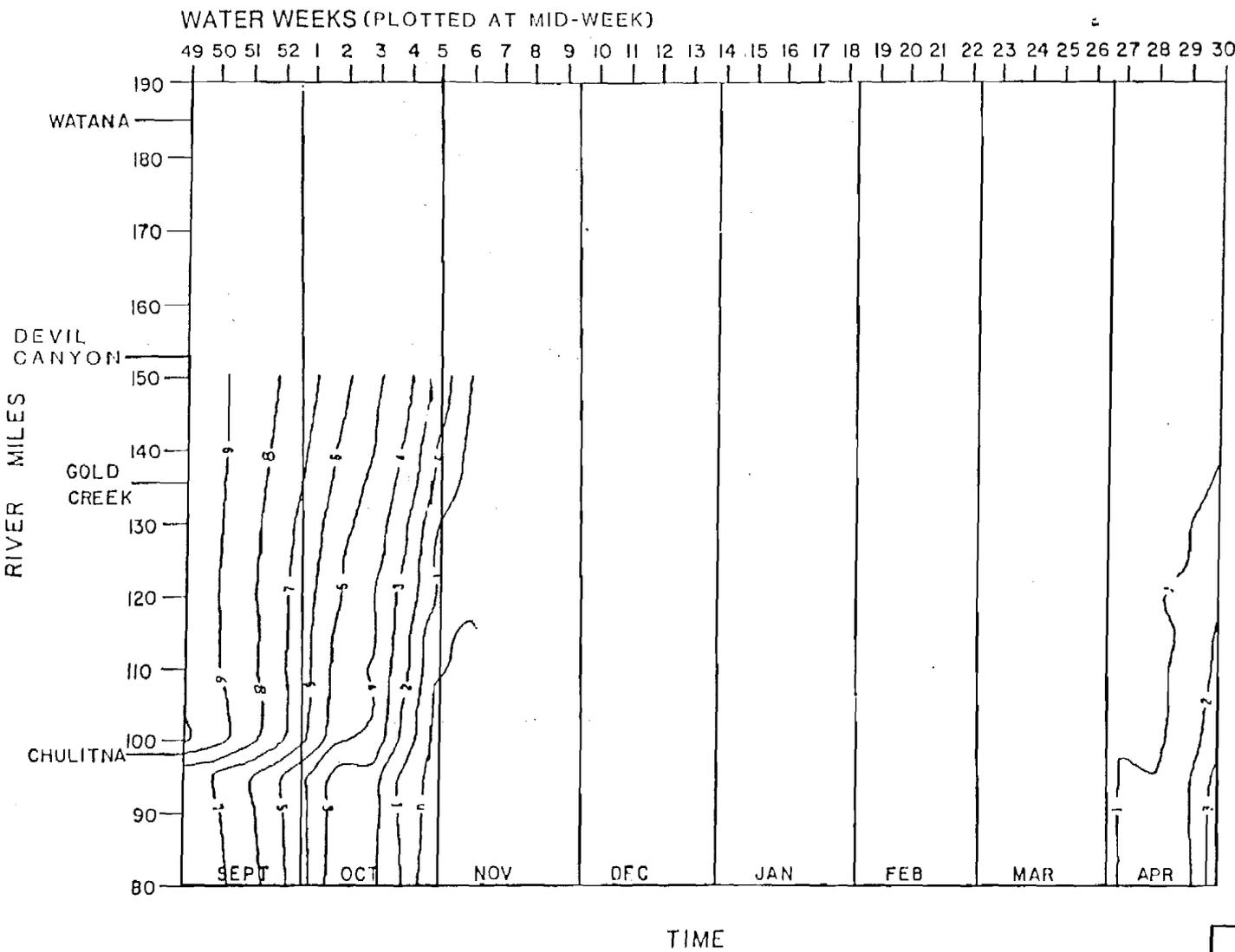
B35

WATANA/DEVIL CANYON, 2002 ENERGY DEMAND

WINTER 1976-1977 CLIMATE DATA

ALASKA POWER AUTHORITY SUSITNA HYDROELECTRIC PROJECT	
ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER	HARZA-EBASCO SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER-ISOTHERMS



- NOTES :
1. TEMPERATURES IN °C.
 2. ICE SIMULATION NOT MADE FOR THIS CASE. TEMPERATURES FROM NOVEMBER THROUGH APRIL SHOULD NOT BE USED.

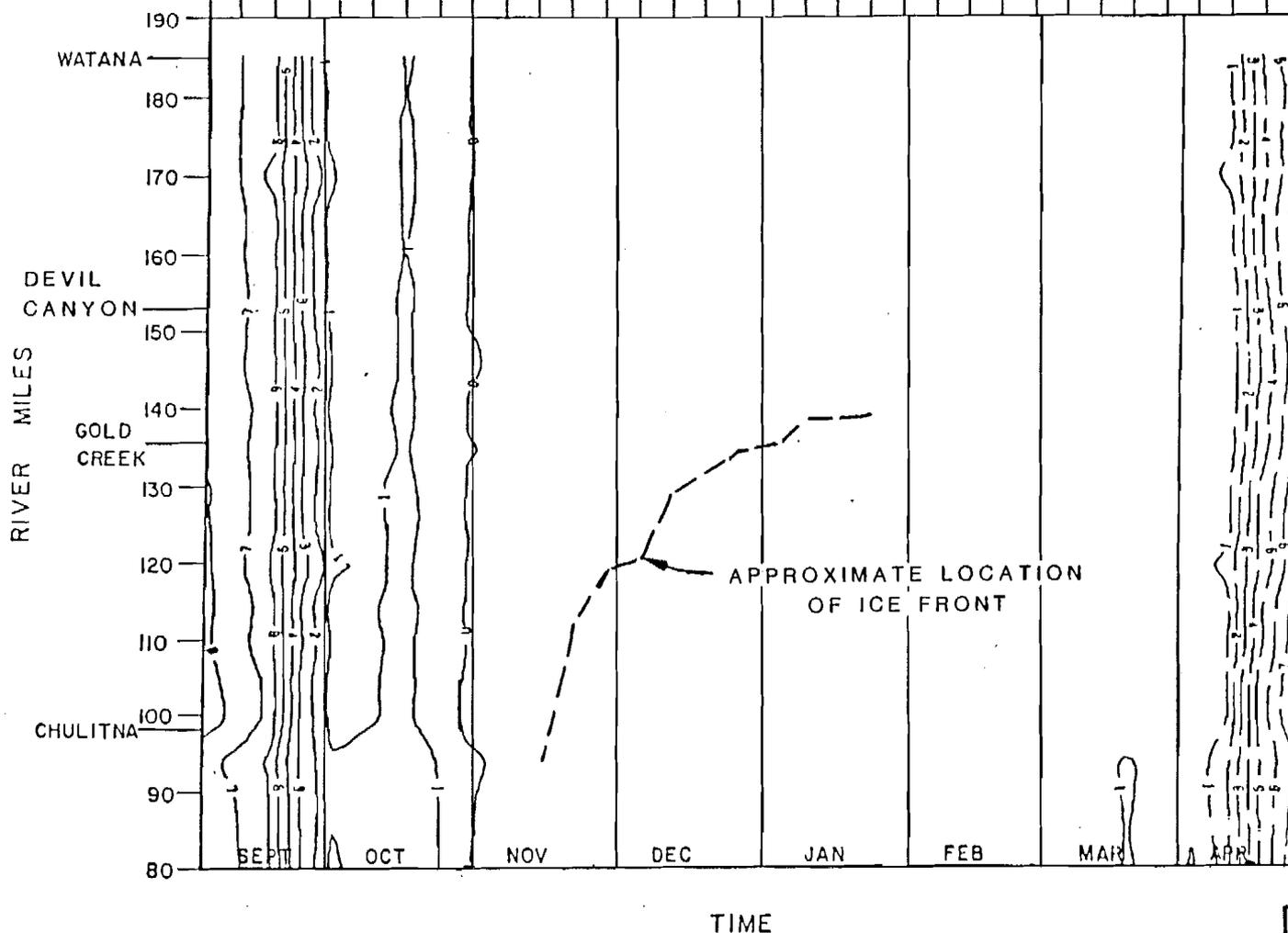
WATANA/DEVIL CANYON, 2020 ENERGY DEMAND
 WINTER 1976-1977 CLIMATE DATA

ALASKA POWER AUTHORITY SUSITNA HYDROELECTRIC PROJECT	
ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER	HARZA-EBASCO SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



NOTES :

1. TEMPERATURES IN °C.
2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS.
3. ICE FRONT PROGRESSION UPSTREAM OF RIVER MILE 139 NOT MODELED FOR NATURAL CONDITIONS

B37

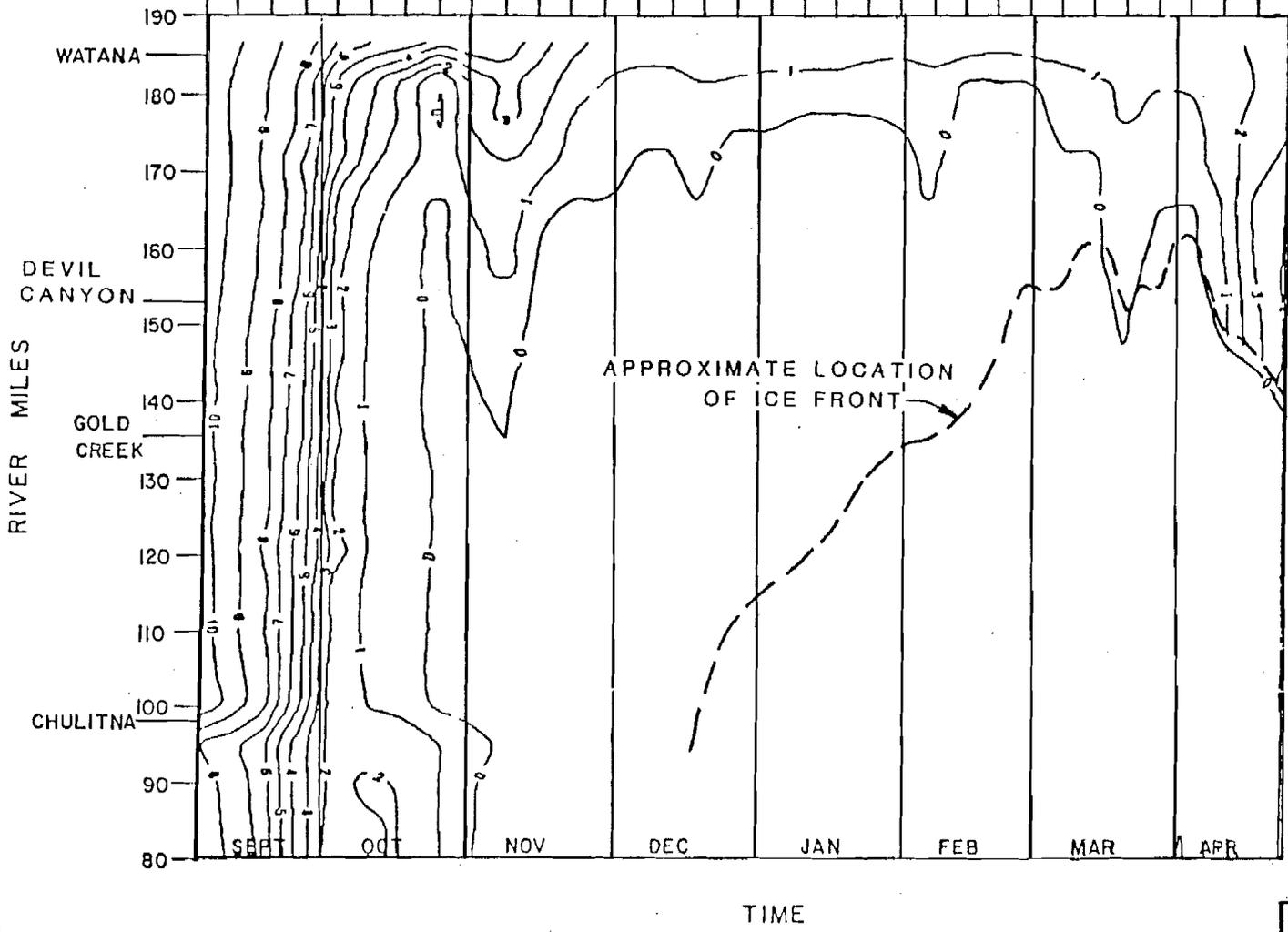
ALASKA POWER AUTHORITY SUSITNA HYDROELECTRIC PROJECT	
ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER	HARZA-EBASCO SUSITNA JOINT VENTURE

NATURAL CONDITIONS
WINTER 1981-1982 CLIMATE DATA

MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



- NOTES :
1. TEMPERATURES IN °C.
 2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS.
 3. ICE FRONT PROGRESSION UPSTREAM OF RIVER MILE 140 NOT CONSIDERED ACCURATE FOR FILLING CASE

B38

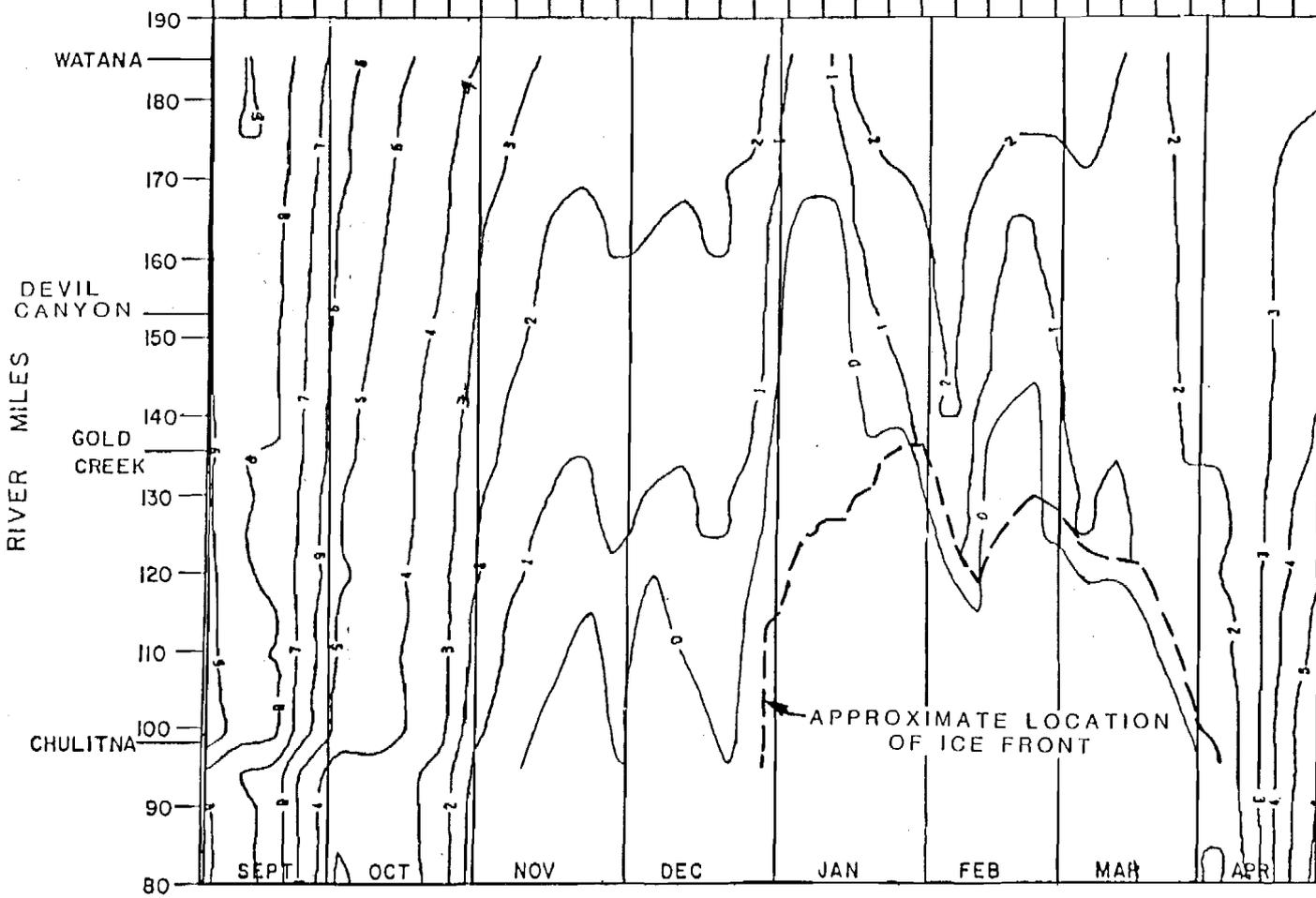
WATANA FILLING, 1992-1993
 2nd WINTER
 WINTER 1981-1982 CLIMATE DATA

ALASKA POWER AUTHORITY SUSITNA HYDROELECTRIC PROJECT	
ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER	HARZA-EBASCO SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



NOTES :

1. TEMPERATURES IN °C.
2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS.

APPROXIMATE LOCATION OF ICE FRONT

TIME

WATANA ONLY, 1996 ENERGY DEMAND

WINTER 1981-1982 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

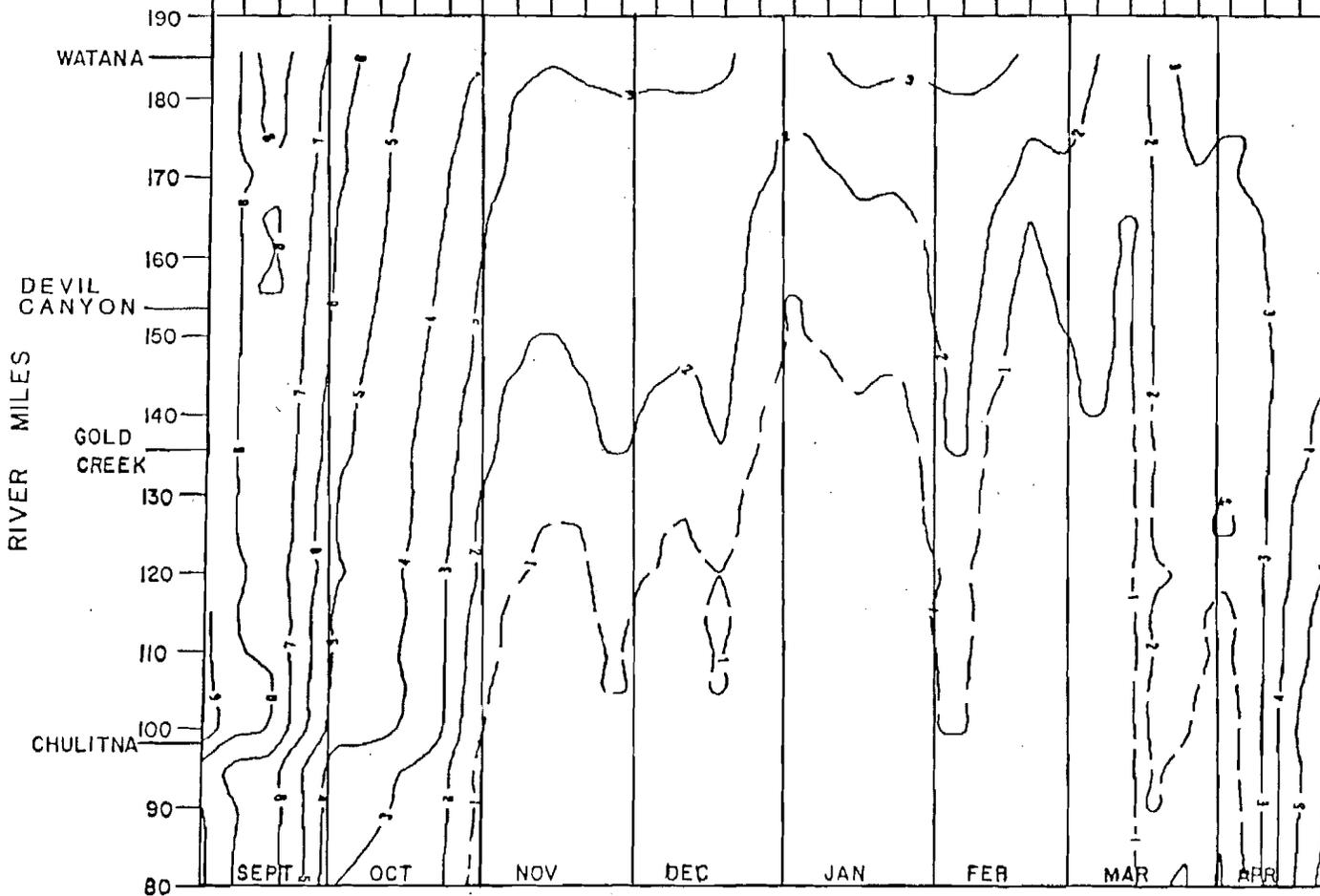
ARCTIC ENVIRONMENTAL
INFORMATION AND DATA
CENTER

HARZA-EBASCO
SUSITNA VENTURE

MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 | 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



NOTES :

1. TEMPERATURES IN °C.
2. ICE SIMULATION NOT MADE FOR THIS CASE. TEMPERATURES FOR NOVEMBER THROUGH MARCH SHOULD NOT BE USED.

TIME

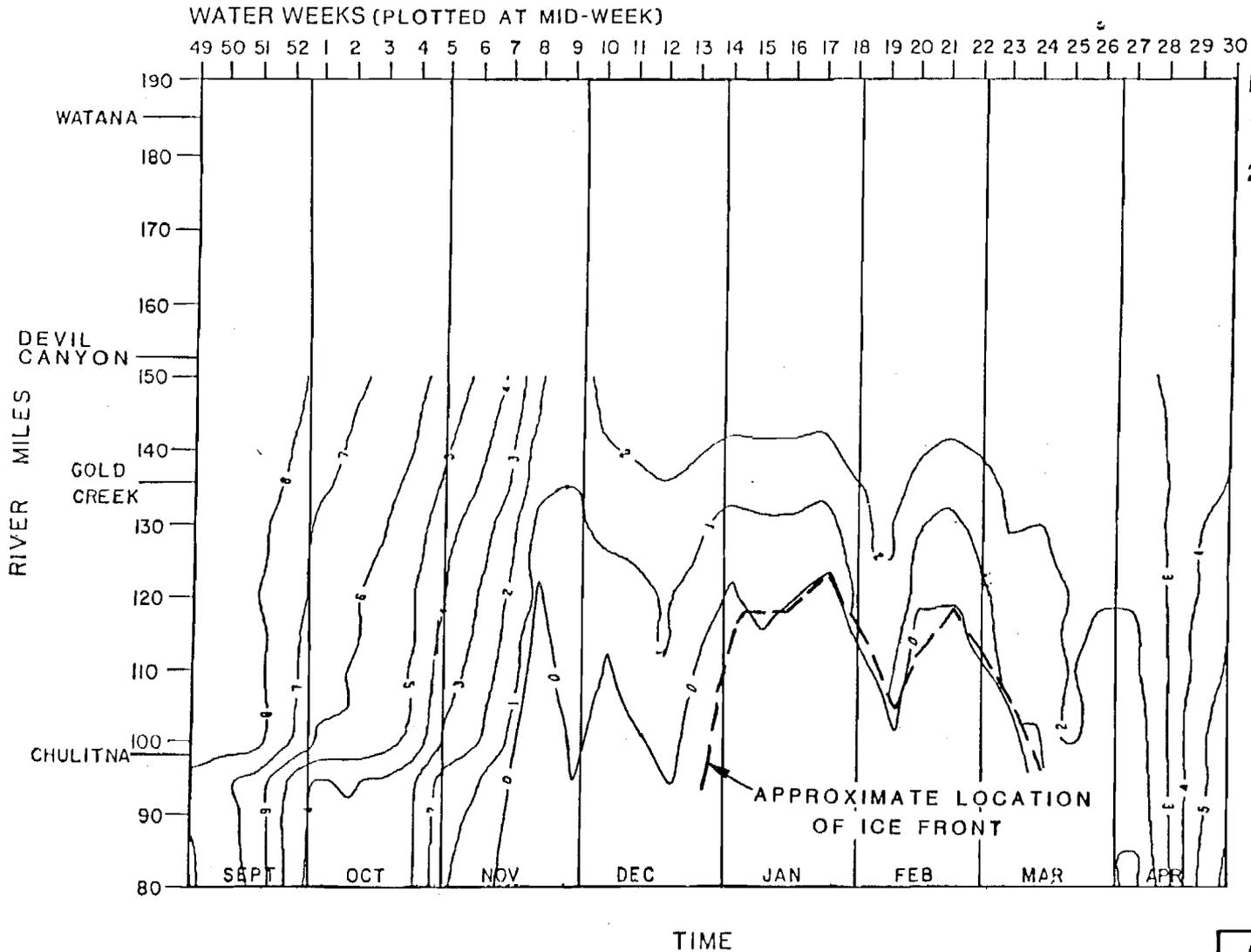
WATANA ONLY, 2001 ENERGY DEMAND

WINTER 1981-1982 CLIMATE DATA

ALASKA POWER AUTHORITY SUSITNA HYDROELECTRIC PROJECT	
ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER	HARZA-EBASCO SUSITNA JOINT VENTURE

B41

MIDDLE SUSITNA RIVER - ISOTHERMS



NOTES :

1. TEMPERATURES IN °C.
2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS.

WATANA/DEVIL CANYON, 2002 ENERGY DEMAND

WINTER 1981-1982 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

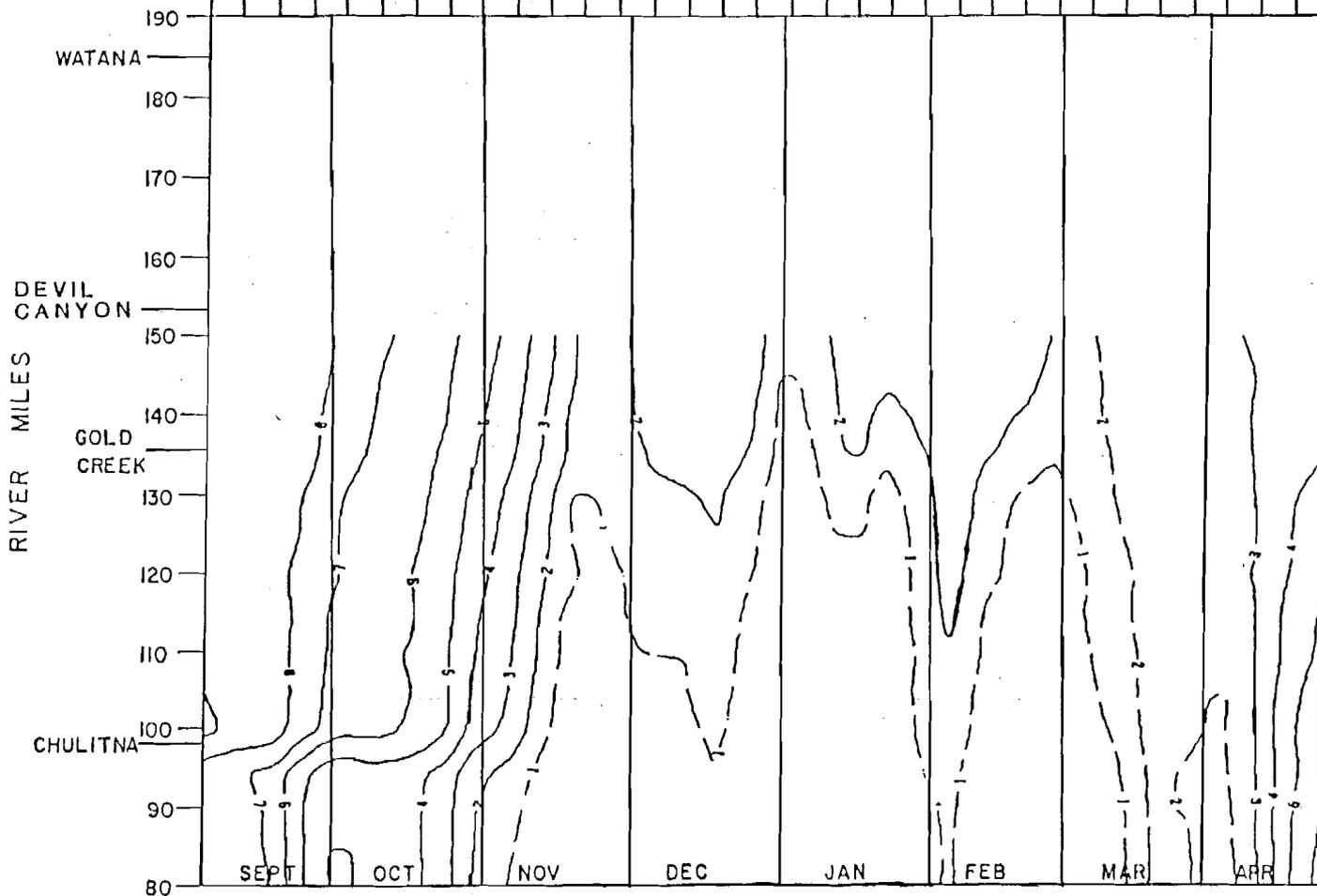
ARCTIC ENVIRONMENTAL
 INFORMATION AND DATA
 CENTER

HARZA-EBASCO
 SUSITNA RIVER VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



NOTES :

1. TEMPERATURES IN °C.

2. ICE SIMULATION NOT MADE FOR THIS CASE. TEMPERATURES FOR NOVEMBER THROUGH MARCH SHOULD NOT BE USED.

NOTE SIMILARITY TO WATANA/DEVIL CANYON, 2002 WINTER 1981-1982.

B42

TIME

WATANA/DEVIL CANYON, 2020 ENERGY DEMAND

WINTER 1981-1982 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

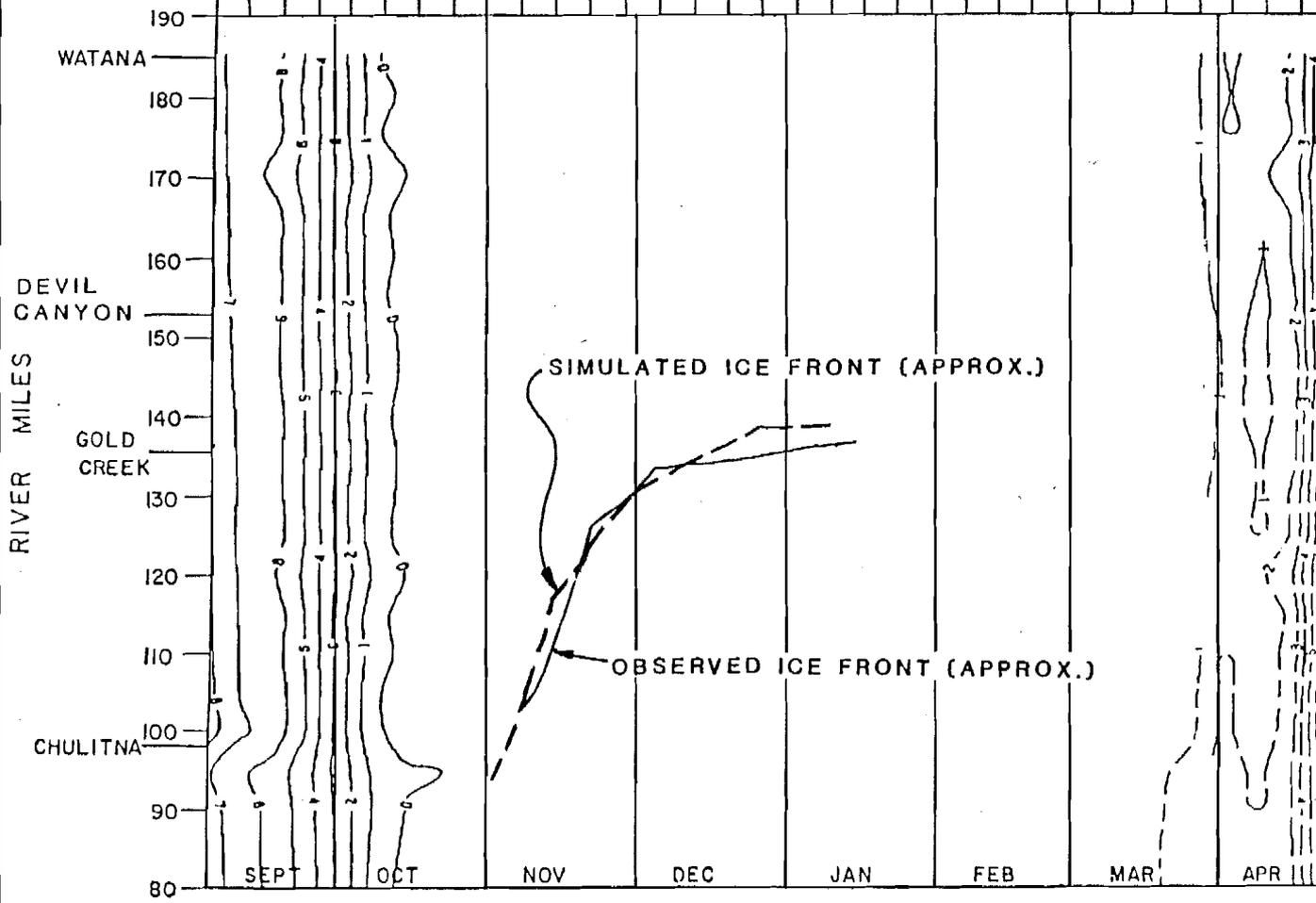
ARCTIC ENVIRONMENTAL
INFORMATION AND DATA
CENTER

HARZA-EBASCO
SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



NOTES :

1. TEMPERATURES IN °C.
2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS. SIMULATED TEMPERATURES FOR MARCH AND APRIL SHOULD NOT BE USED.
3. ICE FRONT PROGRESSION UPSTREAM OF RIVER MILE 139 NOT MODELED FOR NATURAL CONDITIONS

TIME

NATURAL CONDITIONS

WINTER 1982-1983 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

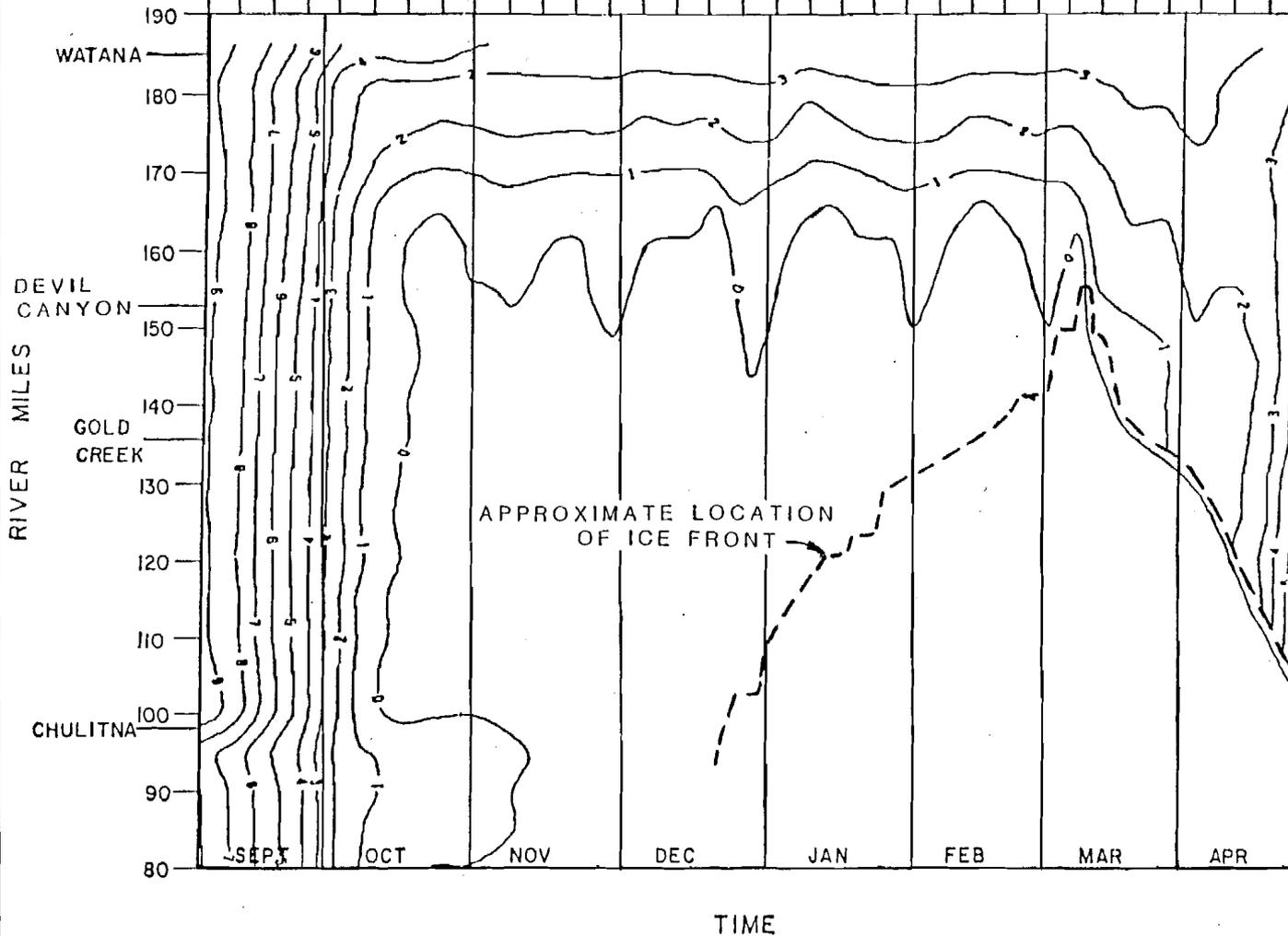
ARCTIC ENVIRONMENTAL
INFORMATION AND DATA
CENTER

HARZA-EBASCO
SUSITNA J/ VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



NOTES :

1. TEMPERATURES IN °C.
2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS.
3. ICE FRONT PROGRESSION UPSTREAM OF RIVER MILE 140 NOT CONSIDERED ACCURATE FOR FILLING CASE

WATANA FILLING, 1991-1992
 1st WINTER
 WINTER 1982-1983 CLIMATE DATA

ALASKA POWER AUTHORITY
 SUSITNA HYDROELECTRIC PROJECT

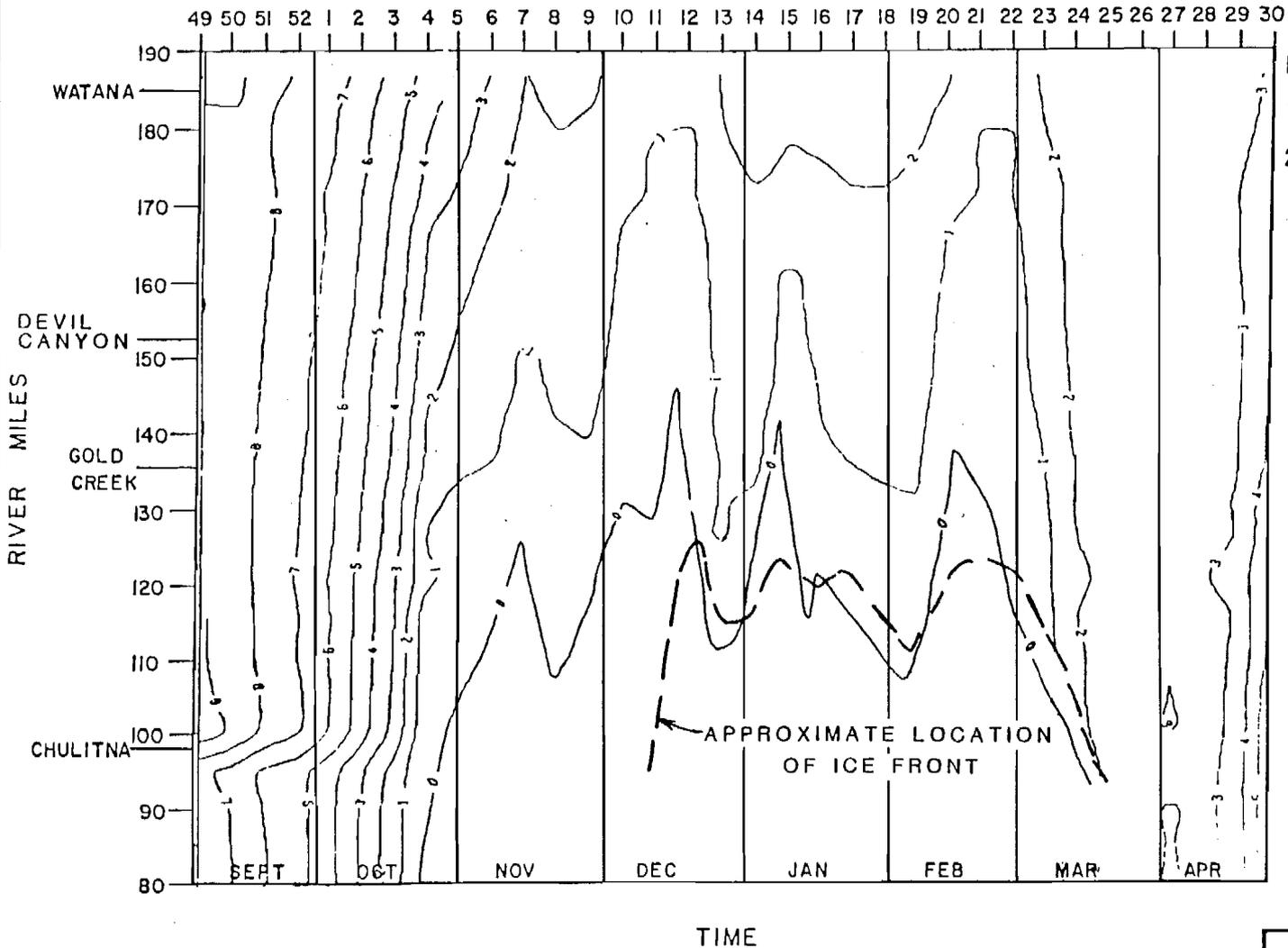
ARCTIC ENVIRONMENTAL
 INFORMATION AND DATA
 CENTER

HARZA-EBASCO
 SUSITNA JOINT VENTURE

B44

MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)



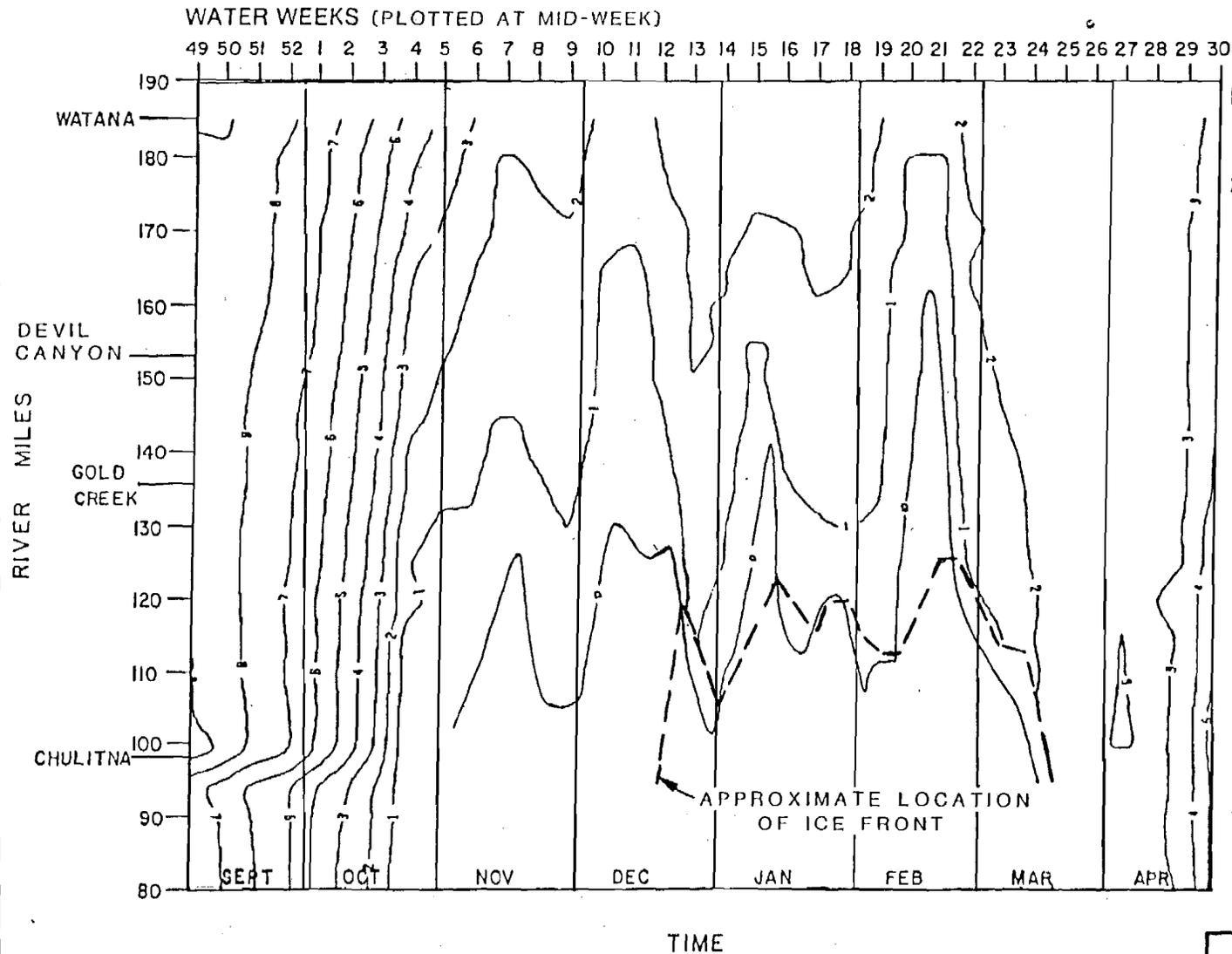
- NOTES :
1. TEMPERATURES IN °C.
 2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS.

B45

WATANA ONLY, 1996 ENERGY DEMAND
 WINTER 1982-1983 CLIMATE DATA

ALASKA POWER AUTHORITY SUSITNA HYDROELECTRIC PROJECT	
ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER	HARZA-EBASCO SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER - ISOTHERMS



NOTES :

1. TEMPERATURES IN °C.
2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS.

B46

WATANA ONLY, 2001 ENERGY DEMAND

WINTER 1982-1983 CLIMATE DATA

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT

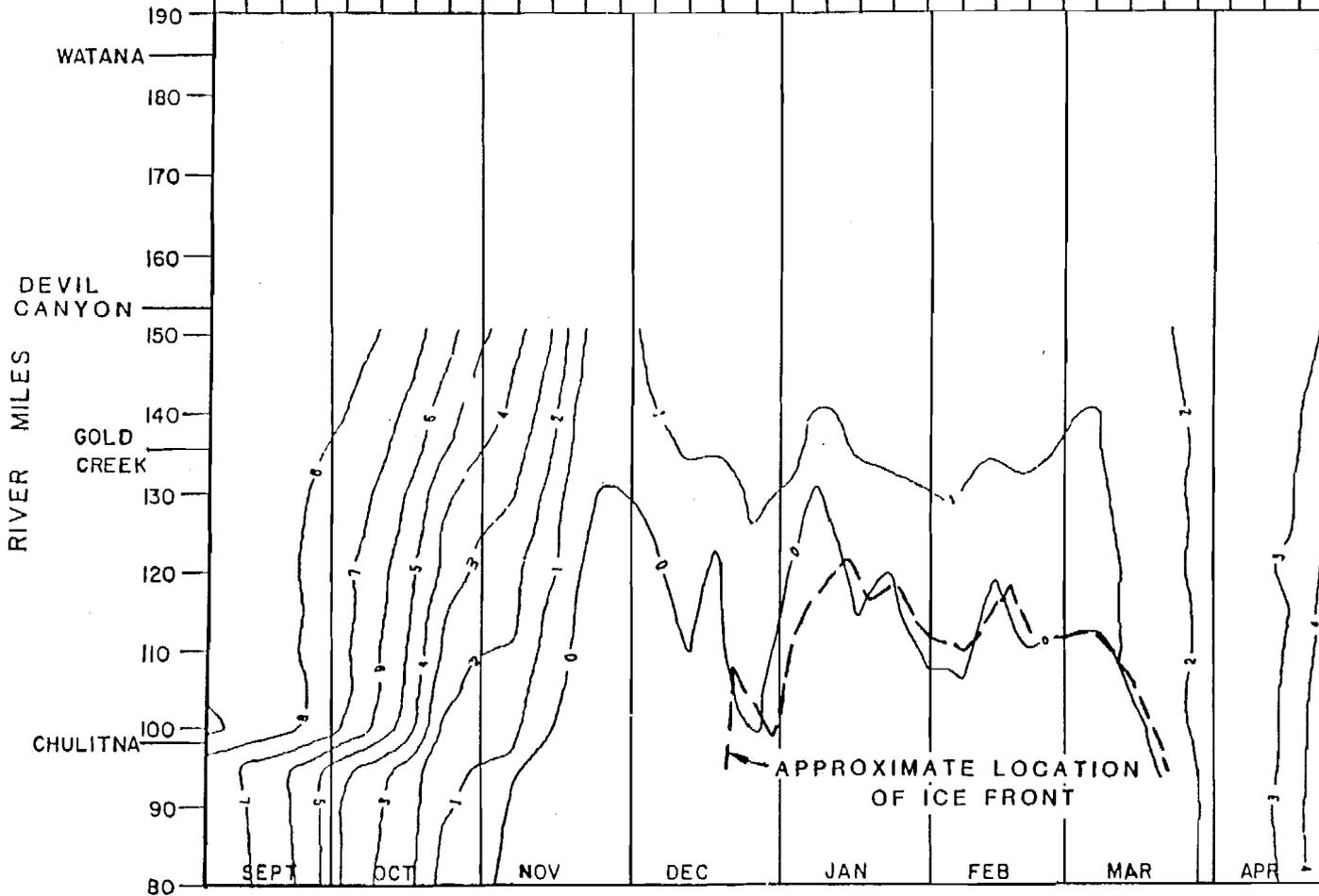
ARCTIC ENVIRONMENTAL
INFORMATION AND DATA
CENTER

HARZA-EBASCO
SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



- NOTES :
1. TEMPERATURES IN °C.
 2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS.

B47

WATANA/DEVIL CANYON, 2002 ENERGY DEMAND

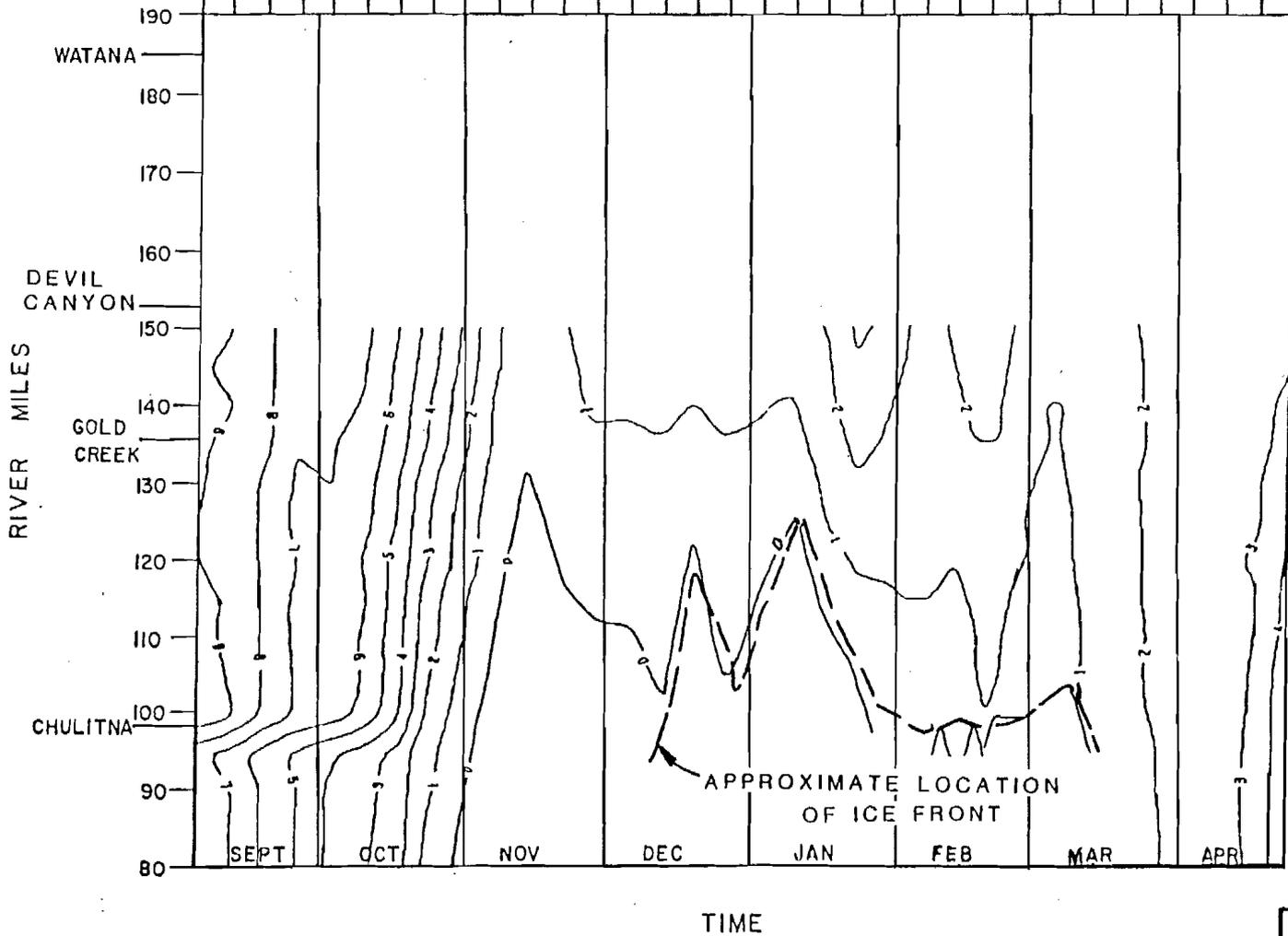
WINTER 1982-1983 CLIMATE DATA

ALASKA POWER AUTHORITY SUSITNA HYDROELECTRIC PROJECT	
ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER	HARZA-EBASCO SUSITNA JOINT VENTURE

MIDDLE SUSITNA RIVER-ISOTHERMS

WATER WEEKS (PLOTTED AT MID-WEEK)

49 50 51 52 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30



- NOTES :
1. TEMPERATURES IN °C.
 2. APPROXIMATE LOCATION OF ICE FRONT FROM RIVER ICE SIMULATION PLOTS.

B48

WATANA/DEVIL CANYON, 2020 ENERGY DEMAND
 WINTER 1982-1983 CLIMATE DATA

ALASKA POWER AUTHORITY SUSITNA HYDROELECTRIC PROJECT	
ARCTIC ENVIRONMENTAL INFORMATION AND DATA CENTER	HARZA-EBASCO SUSITNA JOINT VENTURE

APPENDIX C

Susitna, Chulitna and Talkeetna
stream width functions.

Appendix C. Susitna, Chulitna, and Talkeetna Stream Width Functions.
 Width(meters) = a * Flow(cms) ** b.

Location	Susitna River Kilometer	a	b
Watana dam site	296.8	10.878	0.3533
URX 106	296.7	37.776	0.1946
URX 107	296.4	30.057	0.1564
URX 108	295.7	47.302	0.1319
URX 109	294.1	153.677	0.0233
URX 110	293.6	40.746	0.2744
URX 111	293.0	55.320	0.1485
URX 112	292.5	8.006	0.3613
URX 113	291.2	103.522	0.0398
URX 114	289.7	40.382	0.3155
URX 115	287.7	10.776	0.4136
URX 116	284.3	9.046	0.4196
URX 117	283.2	41.173	0.2231
URX 118	280.0	18.509	0.3574
URX 119	278.5	105.559	0.0523
URX 120	268.7	91.630	0.0851
URX 121	260.8	52.917	0.1001
Devil Creek	259.5	85.000	0.0000
Chinook Confluence	248.8	108.500	0.0000
LRX 68	241.7	71.643	0.0526
LRX 67	241.0	113.764	0.0109
LRX 66	240.6	25.268	0.2923
LRX 65	240.5		

Appendix C. (Continued) Susitna, Chulitna, and Talkeetna Stream Width Functions. $Width(meters) = a * Flow(cms) ** b$.

Location	Susitna River Kilometer	a	b
LRX 65	240.5	2.820	0.5887
LRX 64	240.3	71.673	0.0473
LRX 63	240.0	60.074	0.0630
LRX 62	239.6	77.780	0.0334
LRX 61	239.3	61.343	0.0620
LRX 60	237.4	48.581	0.1288
LRX 59	233.0	34.000	0.2823
LRX 58	230.4	32.714	0.2840
LRX 57	229.0	117.343	0.0558
LRX 56	228.7	30.601	0.2743
LRX 55	227.7	11.214	0.4866
LRX 54	226.6	8.525	0.4994
LRX 53	225.5	87.139	0.0960
LRX 52	224.4	28.307	0.4333
LRX 51	223.5	148.259	0.0454
LRX 50	222.8	50.641	0.1717
LRX 49	222.4	24.954	0.3441
LRX 48	221.1	3.312	0.6789
LRX 47	220.7	1.167	0.7812
LRX 46	220.4	2.970	0.6400
LRX 45	219.9	40.703	0.1680
LRX 44	219.5	4.209	0.6132
LRX 43	218.4		

Appendix C. (Continued) Susitna, Chulitna, and Talkeetna Stream Width Functions. Width(meters) = a * Flow(cms) ** b.

Location	Susitna River Kilometer	a	b
LRX 43	218.4	3.932	0.5704
LRX 42	217.8	269.900	0.0905
LRX 41	216.8	2.108	0.7594
LRX 40	216.1	149.464	0.0343
LRX 39	214.5	105.709	0.1548
LRX 38	213.8	12.497	0.4541
LRX 37	212.1	9.042	0.4902
LRX 36	211.1	6.768	0.5805
LRX 35	210.6	54.553	0.1148
LRX 34	209.9	9.088	0.4952
LRX 33	209.4	13.226	0.5510
LRX 32	208.6	3.600	0.6620
LRX 31	207.0	150.968	0.0615
LRX 30	205.1	13.680	0.5630
LRX 29	202.9	116.096	0.0651
LRX 28	200.2	34.025	0.3469
LRX 27	198.4	77.661	0.0932
LRX 26	197.2	77.661	0.0932
LRX 25	195.7	4.489	0.6720
LRX 24	194.1	63.219	0.1179
LRX 23	193.5	108.387	0.1260
LRX 22	192.0	46.912	0.2310
LRX 21	191.7		

Appendix C. (Continued) Susitna, Chulitna, and Talkeetna Stream Width
 Functions. Width(meters) = a * Flow(cms) ** b.

Location	Susitna River Kilometer	a	b
LRX 21	191.7	5.235	0.5707
LRX 20	188.6	3.812	0.7019
LRX 19	187.4	76.728	0.1176
LRX 18	181.8	130.537	0.0508
LRX 17	181.3	94.245	0.1845
LRX 16	180.8	48.248	0.2905
LRX 15	179.9	78.550	0.1955
LRX 14	178.4	43.742	0.3086
LRX 13	177.6	12.288	0.4169
LRX 12	174.4	30.236	0.2505
LRX 11	171.6	175.296	0.0358
LRX 10	168.5	130.727	0.1112
LRX 9	166.1	6.313	0.3922
LRX 8	164.7	34.848	0.2973
LRX 7	163.3	72.890	0.2664
LRX 6	162.4	41.108	0.3476
LRX 5	161.5	60.970	0.3241
LRX 4	160.2	4.183	0.7030
LRX 3	158.6	0.080	1.3196
Chulitna confluence	158.1	1.006	0.9124
Talkeetna confluence	156.1	0.997	0.9485
Section 0.8	154.8	0.989	0.9501
Section 0.6	153.5		

Appendix C. (Continued) Susitna, Chulitna, and Talkeetna Stream Width Functions. $\text{Width(meters)} = a * \text{Flow(cms)} ** b.$

Location	Susitna River Kilometer	a	b
Section 0.6	153.5	1.329	0.9610
Section 0.3	151.7	1.031	0.9282
Trapper confluence	146.7	1.134	0.9671
Section 0.04	144.6	1.057	0.9077
Section 0.03	141.9	0.981	0.9212
Section 0.02	139.7	0.977	0.8633
Section 0.01	136.6	0.944	0.8765
Parks Highway bridge	134.8		
Chulitna River	-----	38.917	0.2086
Talkeetna River	-----	55.906	0.1761

note: miles = 0.62 * kilometers

feet = 0.305 * meters

width(feet) = $a' * \text{flow(cfs)} ** b$, $a' = 3.281 * a * (0.0283 ** b)$

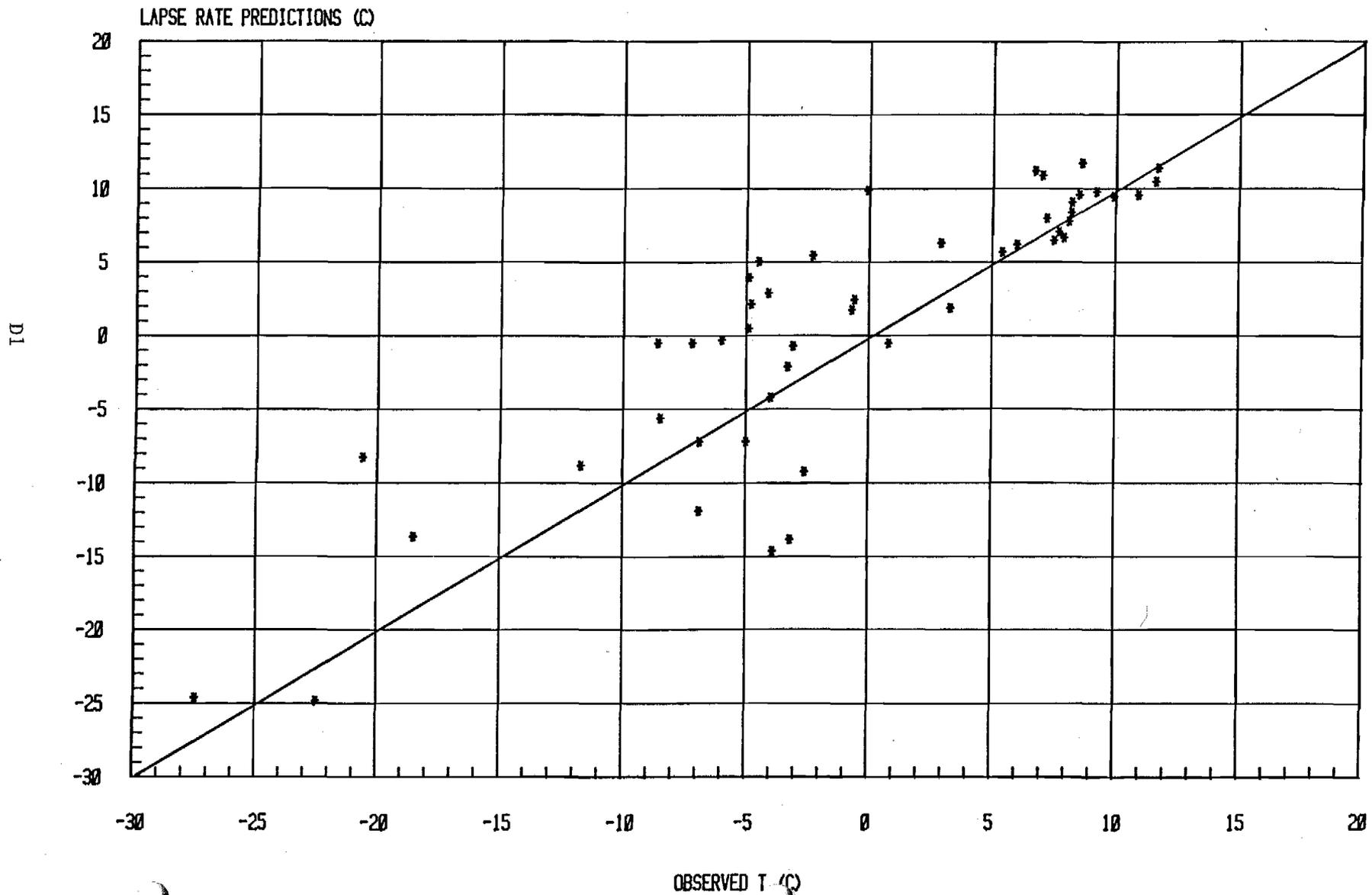
APPENDIX D

Observed versus predicted air temperatures for water years 1981-1983.

The observed air temperatures (independent variable) are plotted against the predicted air temperatures (dependent variable) for each of the three water years at Watana and Devil Canyon, and at Sherman for water year 1983. Predicted temperatures that match observed values fall on the diagonal line provided on the graph; over-predicted values fall above this line while under-predicted values fall below it. The predicted temperatures, calculated using a lapse rate function, generally show a good fit for temperatures greater than 0 C, but tend towards overprediction when air temperatures fall below 0 C.

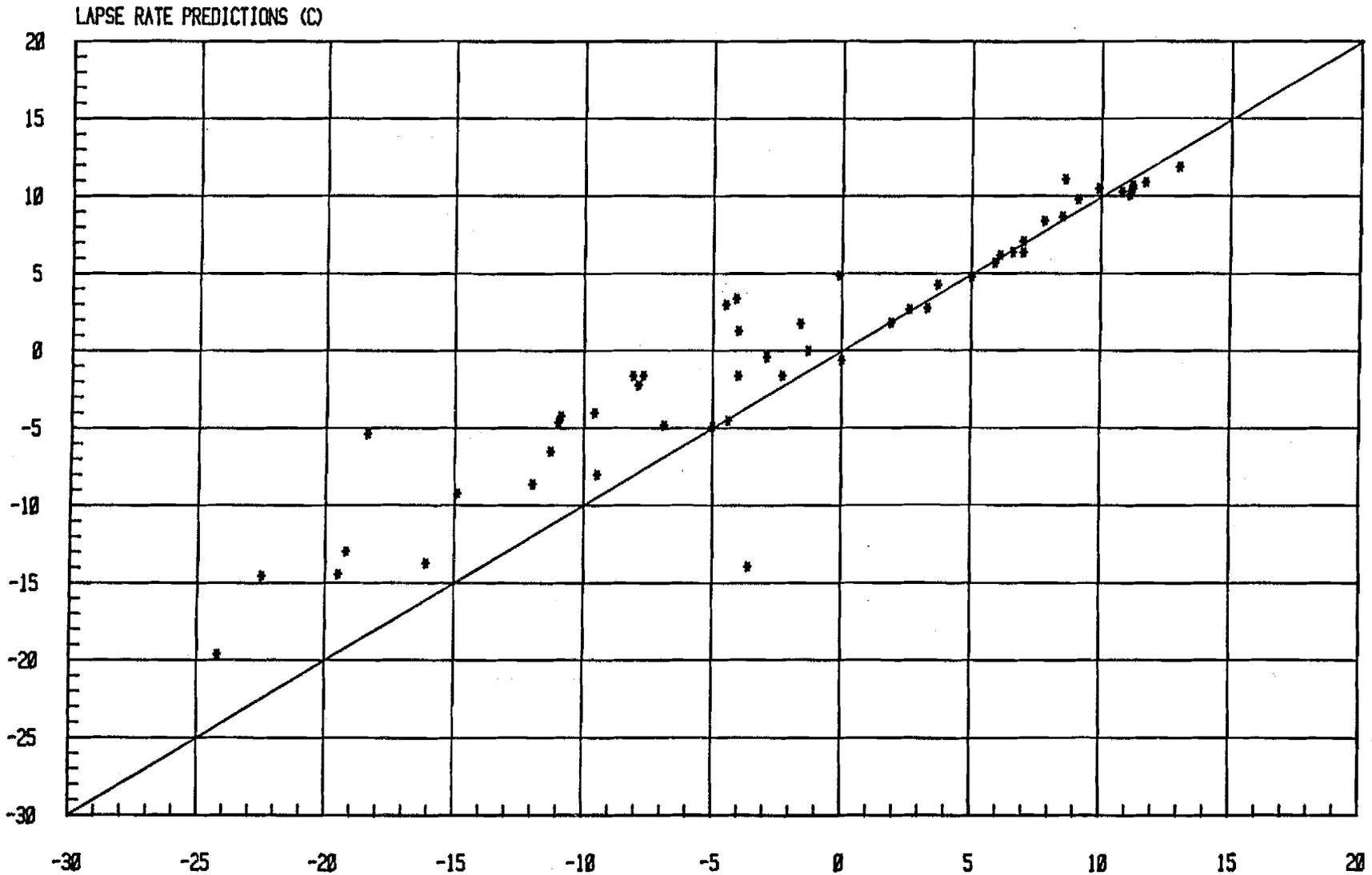
WATANA WEEKLY AIR TEMPERATURES

WATER YEAR 1981 OBSERVED VS PREDICTED



WATANA WEEKLY AIR TEMPERATURES

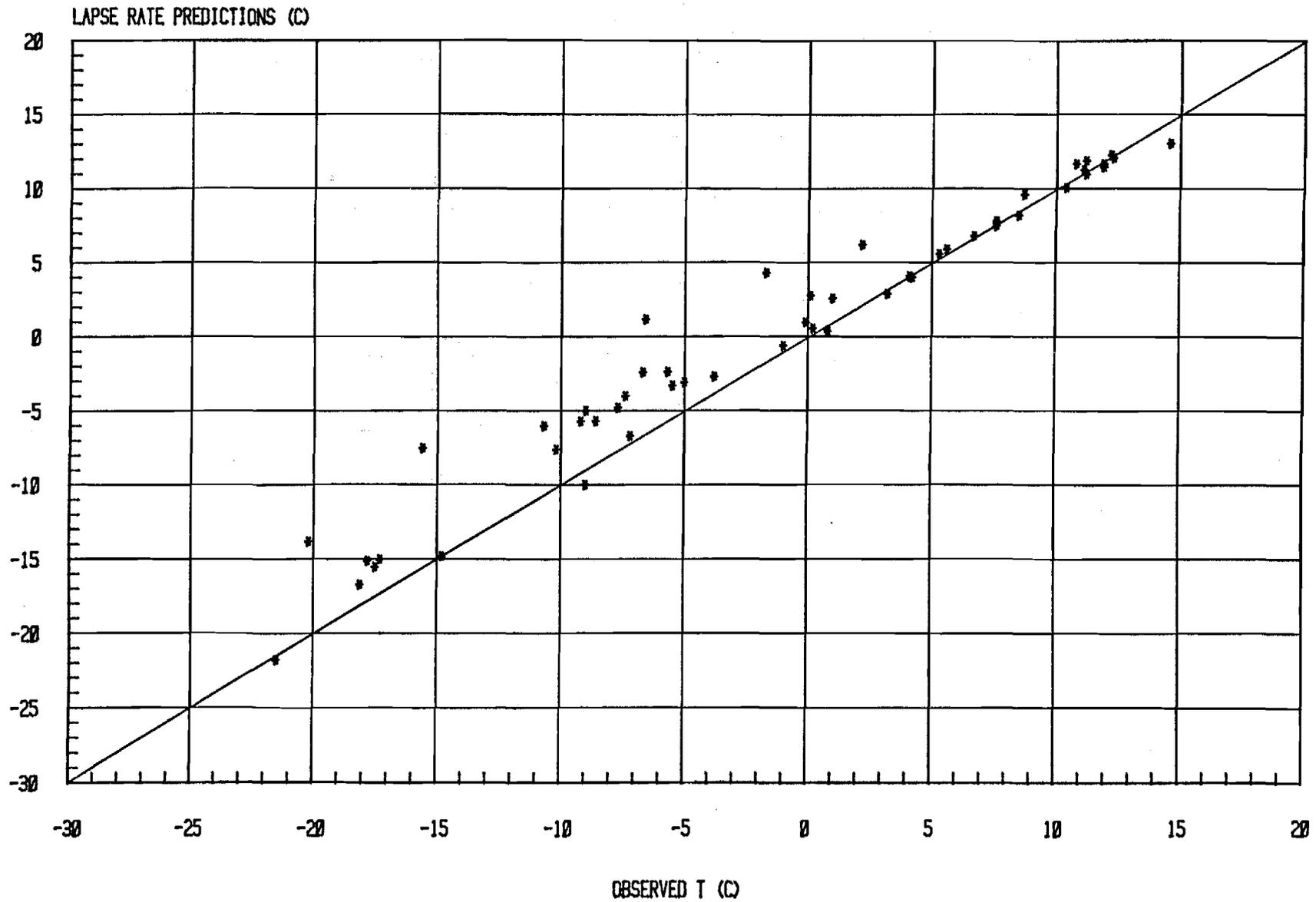
WATER YEAR 1982 OBSERVED VS PREDICTED



DEVIL CANYON WEEKLY AIR TEMPERATURES

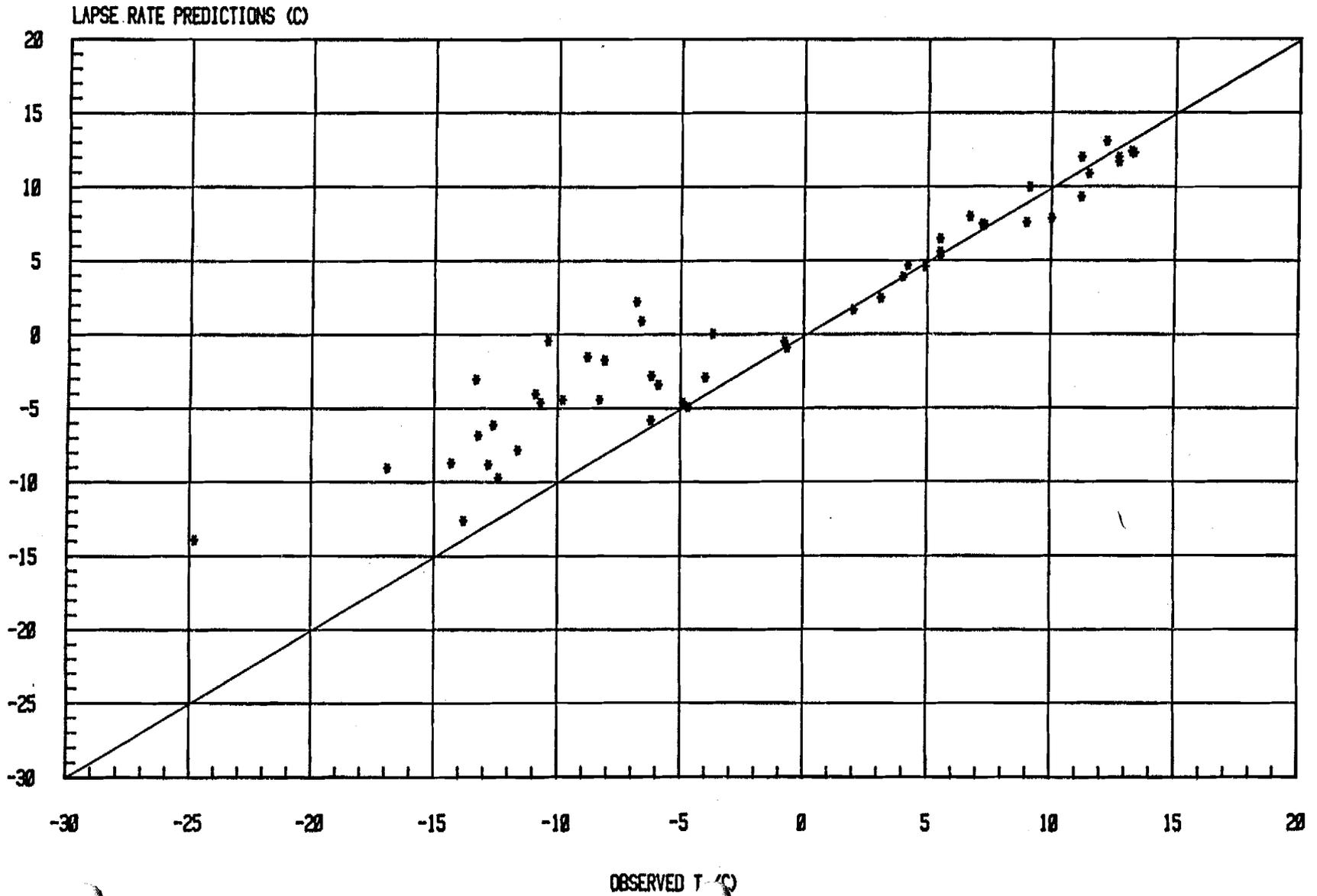
WATER YEAR 1982 OBSERVED VS PREDICTED

D4



WATANA WEEKLY AIR TEMPERATURES

WATER YEAR 1983 OBSERVED VS PREDICTED

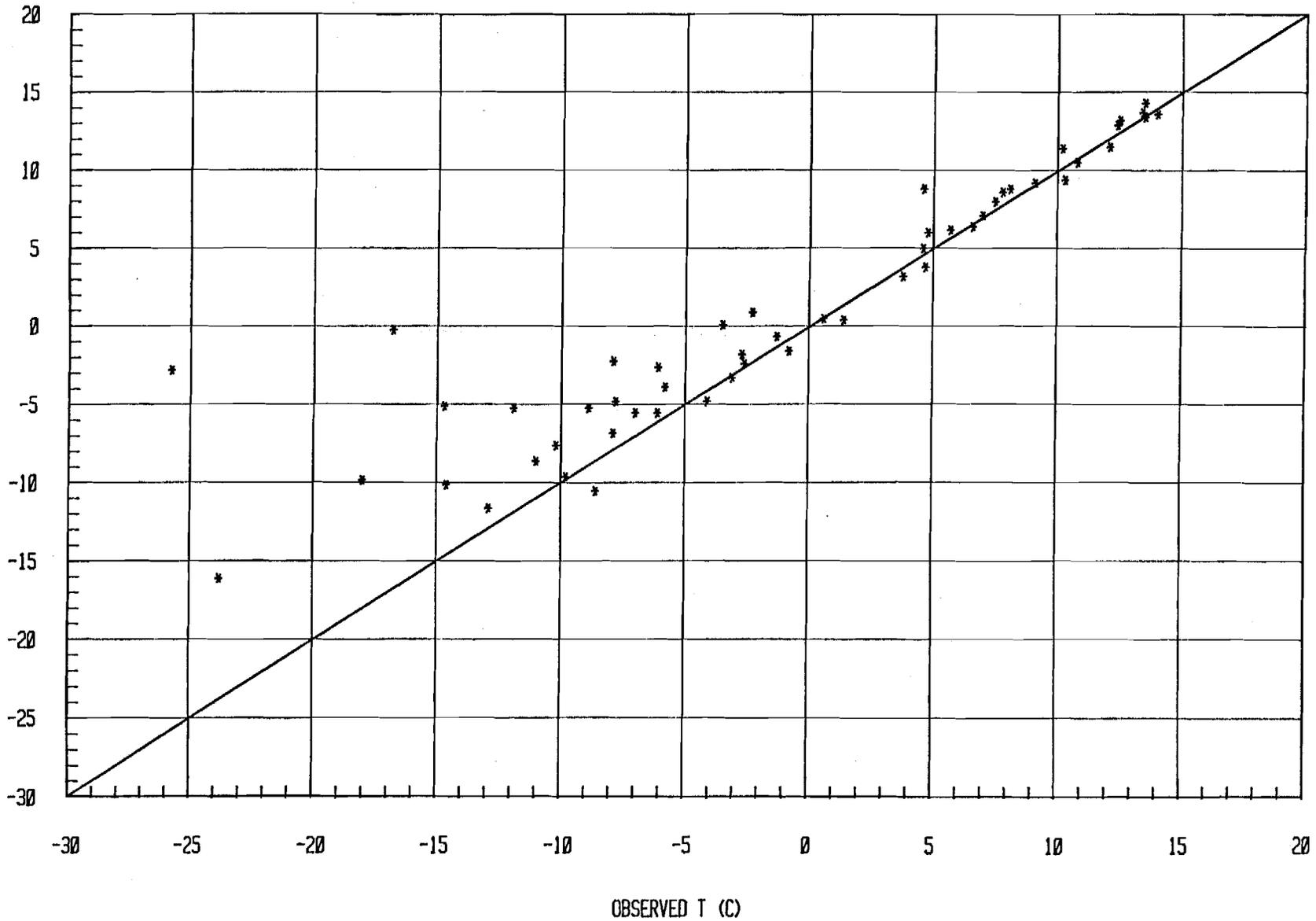


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DEVIL CANYON WEEKLY AIR TEMPERATURES

WATER YEAR 1983 OBSERVED VS PREDICTED

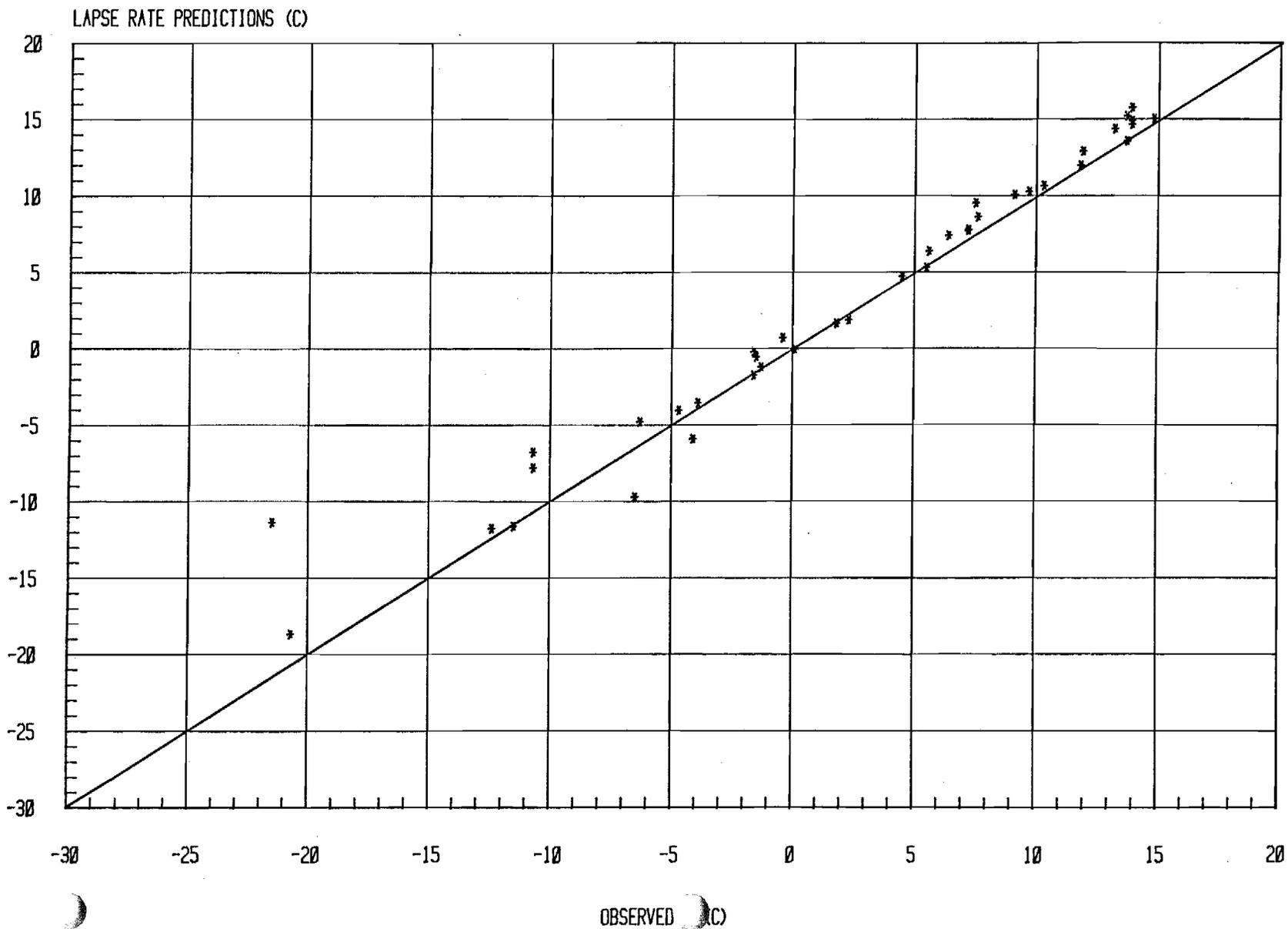
LAPSE RATE PREDICTIONS (C)



SHERMAN WEEKLY AIR TEMPERATURES

WATER YEAR 1983 OBSERVED VS PREDICTED

D7



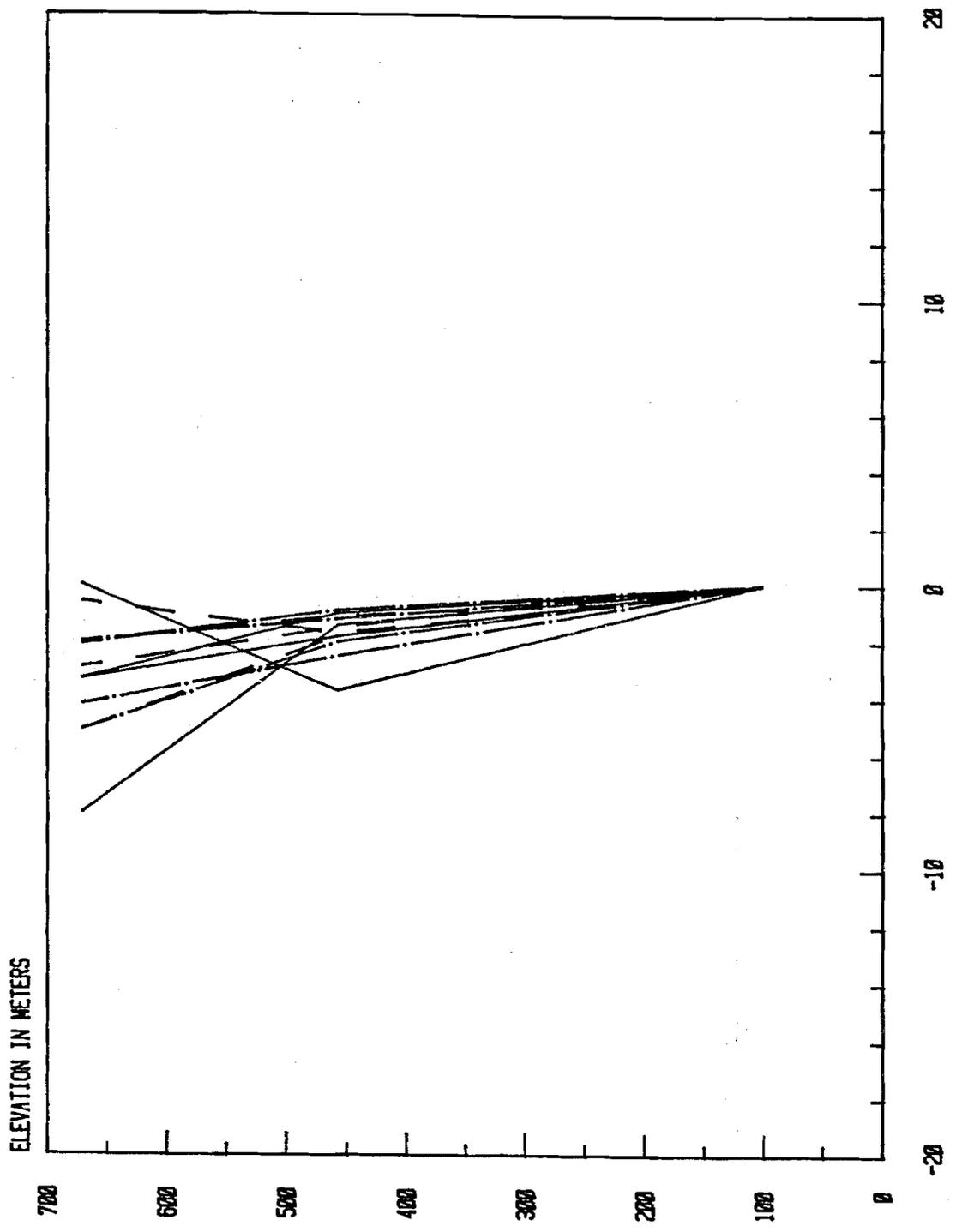
APPENDIX E

Observed vertical air temperature profiles

The graphs contained in this appendix illustrate the departures in mean weekly air temperatures at various stations from those at Talkeetna as a function of station elevation. Data are displayed by individual months on twelve graphs. Data are used from stations at Watana (elevation 670 m), Devil Canyon (elevation 460 m) and Sherman (elevation 200 m) when available for 1981 through 1983. If the mean weekly temperature at all stations were equal to the temperature at Talkeetna for a given week, the graphed line would be vertical at the 0 C location.

VERTICAL TEMPERATURE PROFILES: OCTOBER

DEPARTURE FROM TALKEETNA



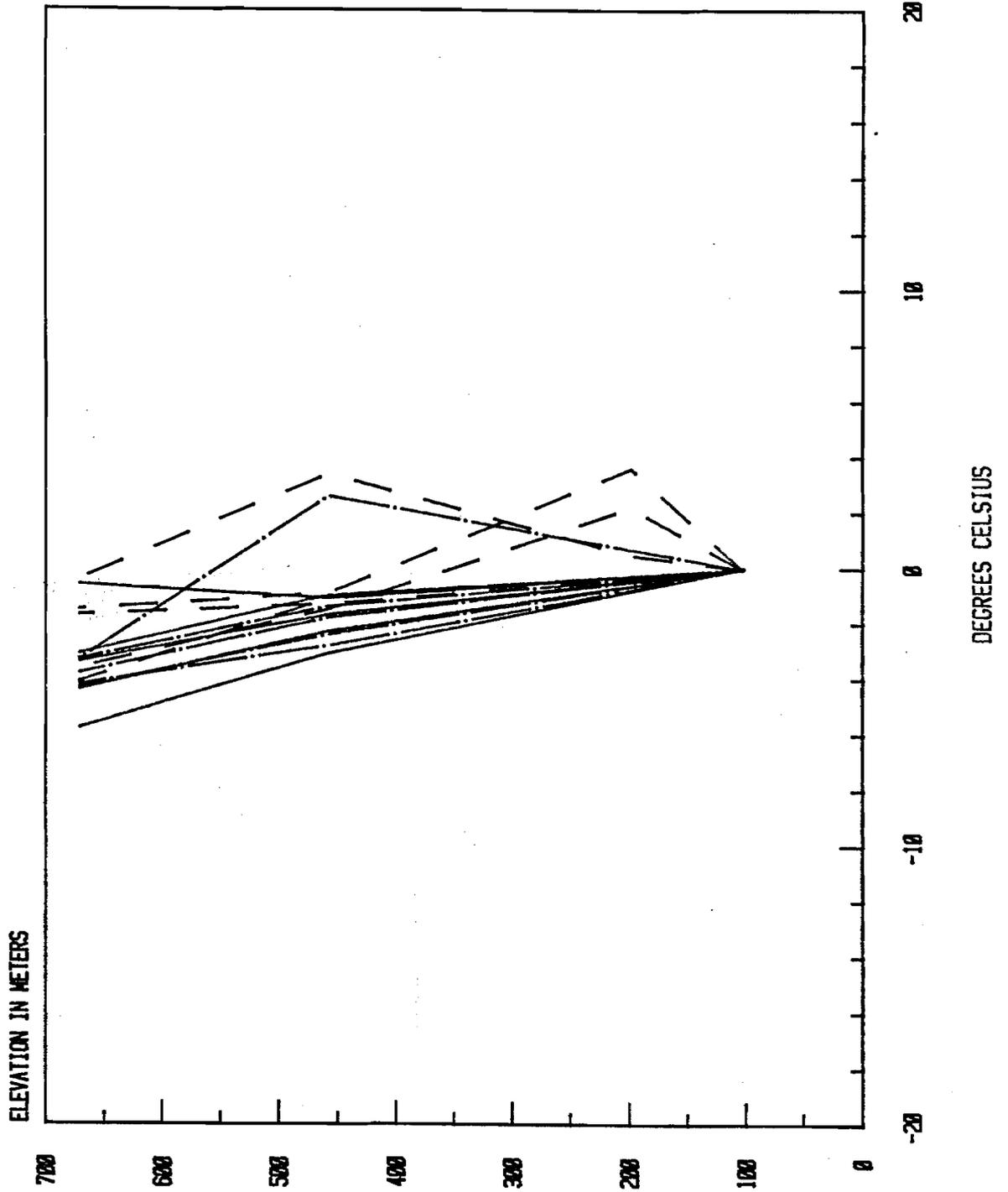
1981

1982

1983

VERTICAL TEMPERATURE PROFILES: NOVEMBER

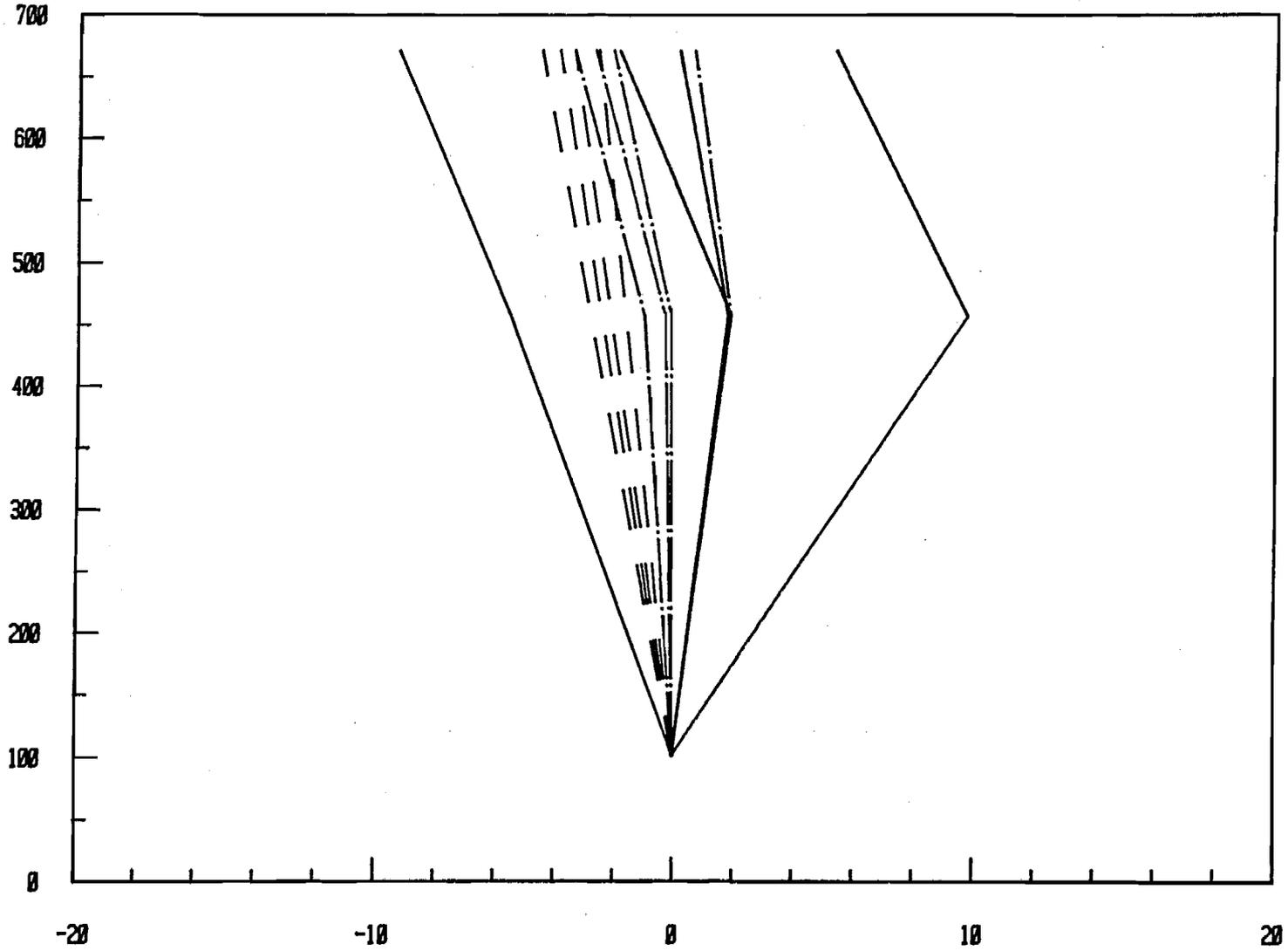
DEPARTURE FROM TAIKHEETNA



VERTICAL TEMPERATURE PROFILES: DECEMBER

DEPARTURE FROM TALKEETNA

ELEVATION IN METERS



E3

DEGREES CELSIUS

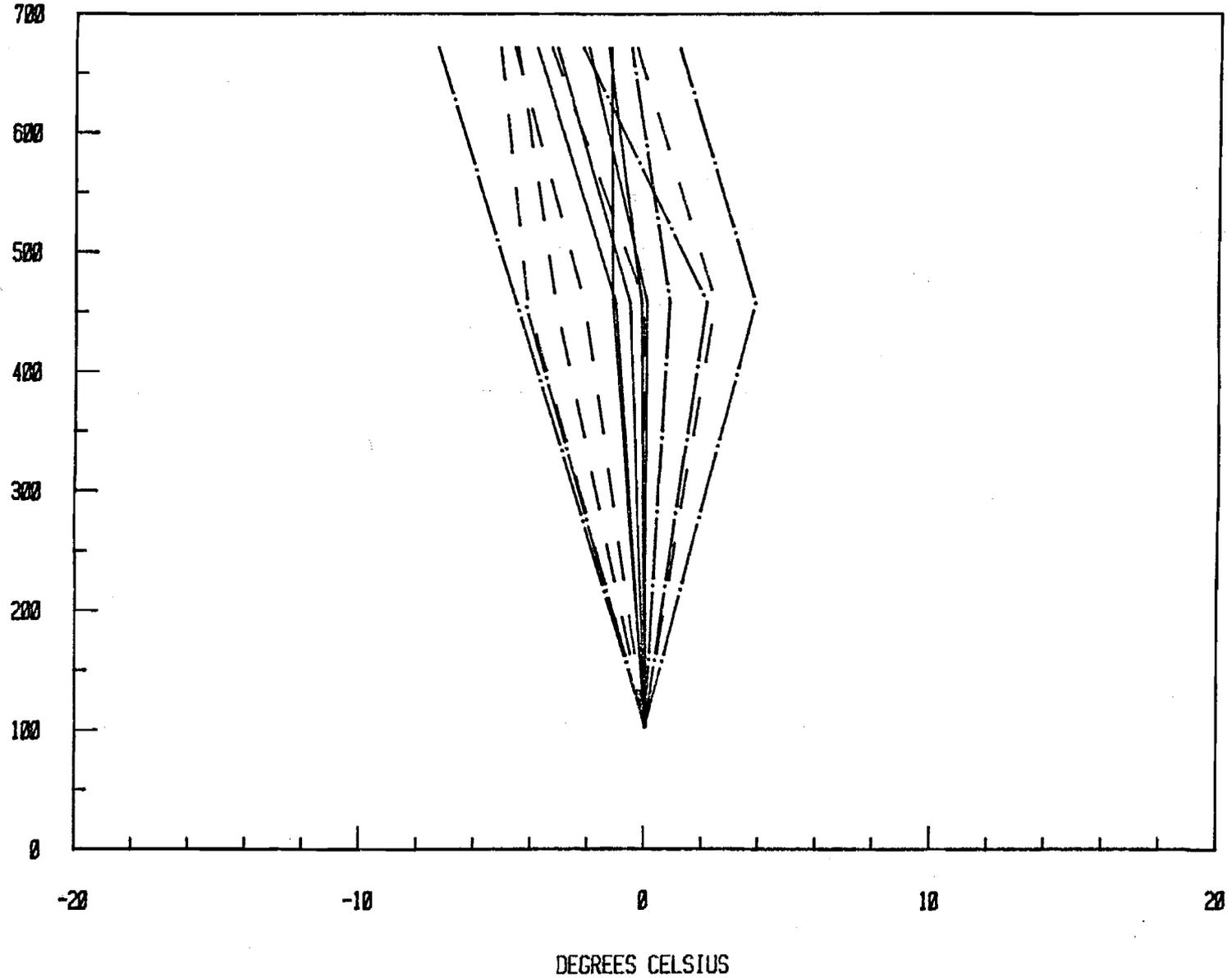
VERTICAL TEMPERATURE PROFILES: JANUARY

DEPARTURE FROM TALKEETNA

ELEVATION IN METERS



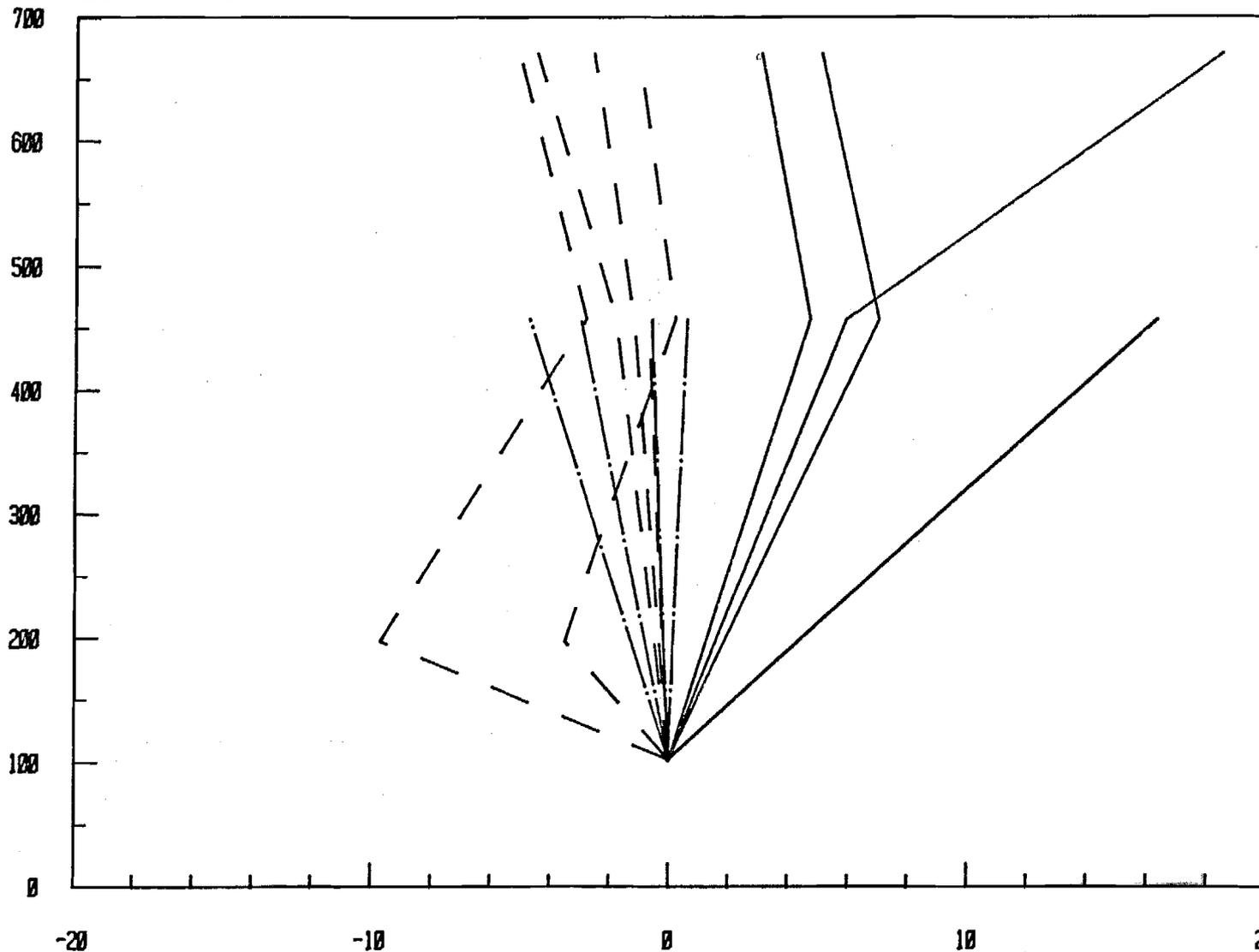
E4



VERTICAL TEMPERATURE PROFILES: FEBRUARY

DEPARTURE FROM TALKEETNA

ELEVATION IN METERS



1981

1982

1983

ES

DEGREES CELSIUS

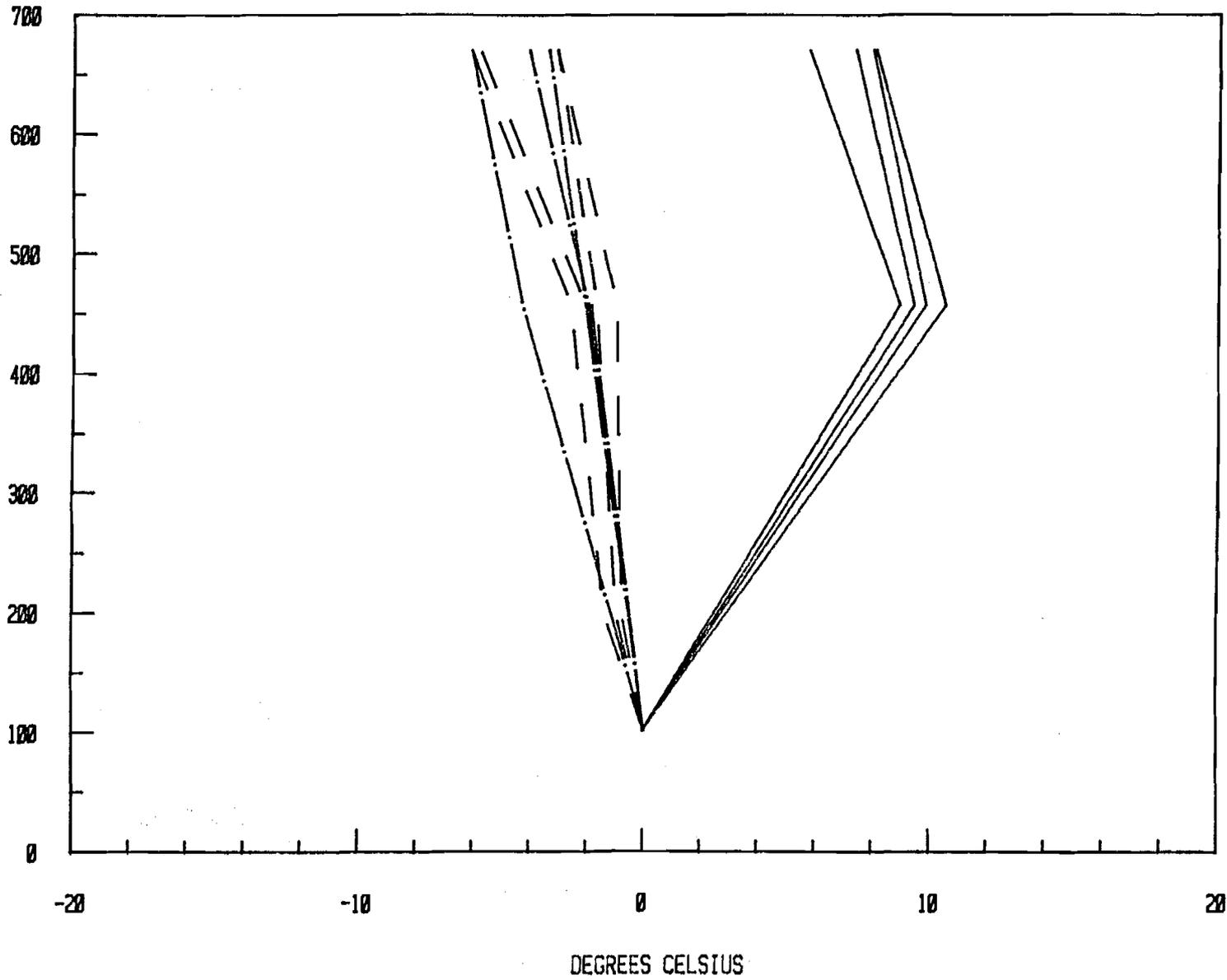
VERTICAL TEMPERATURE PROFILES: MARCH

DEPARTURE FROM TALKEETNA

ELEVATION IN METERS

1981
1982
1983

E6



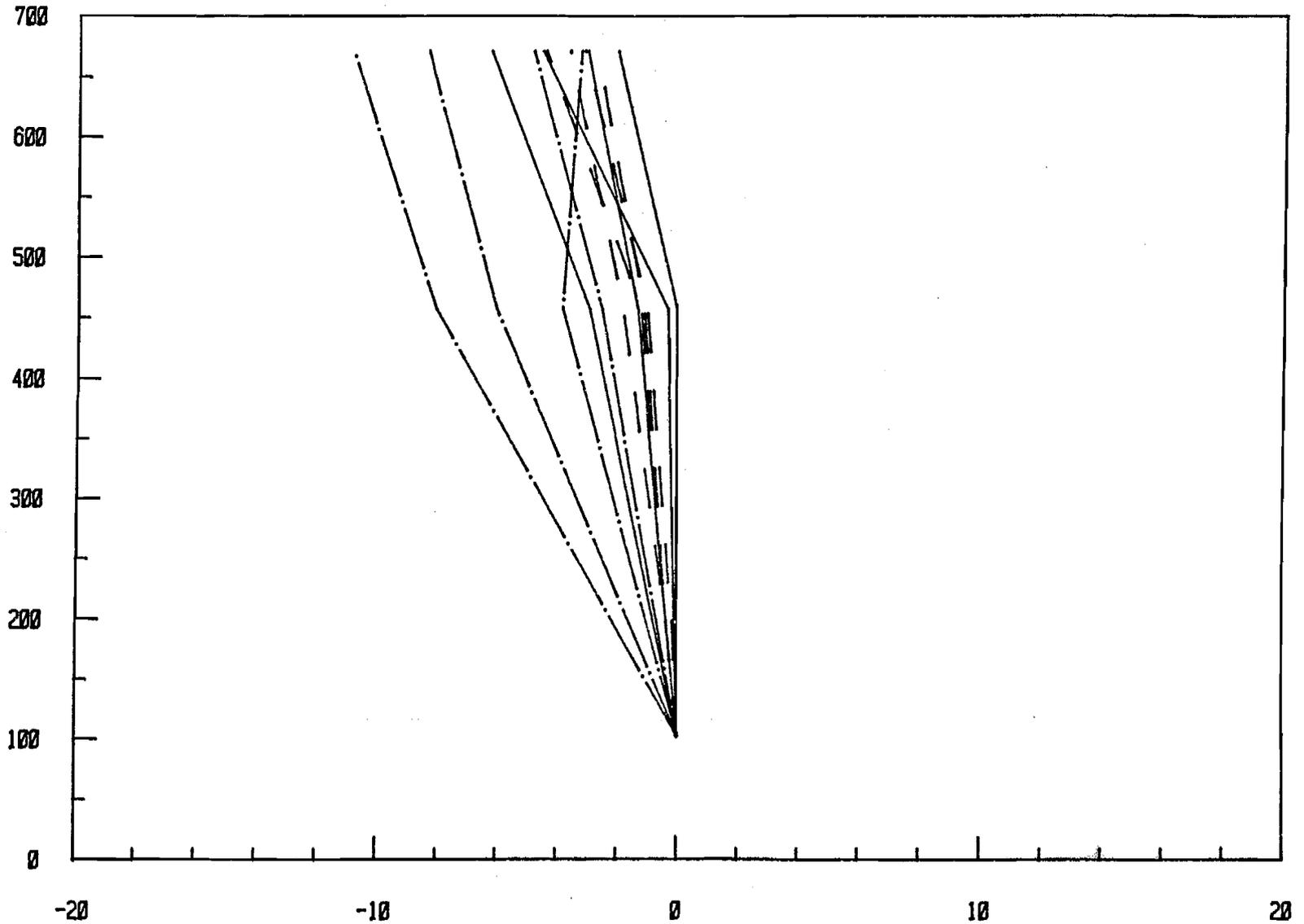
VERTICAL TEMPERATURE PROFILES: APRIL

DEPARTURE FROM TALKEETNA

ELEVATION IN METERS

1981
1982
1983

E7



DEGREES CELSIUS

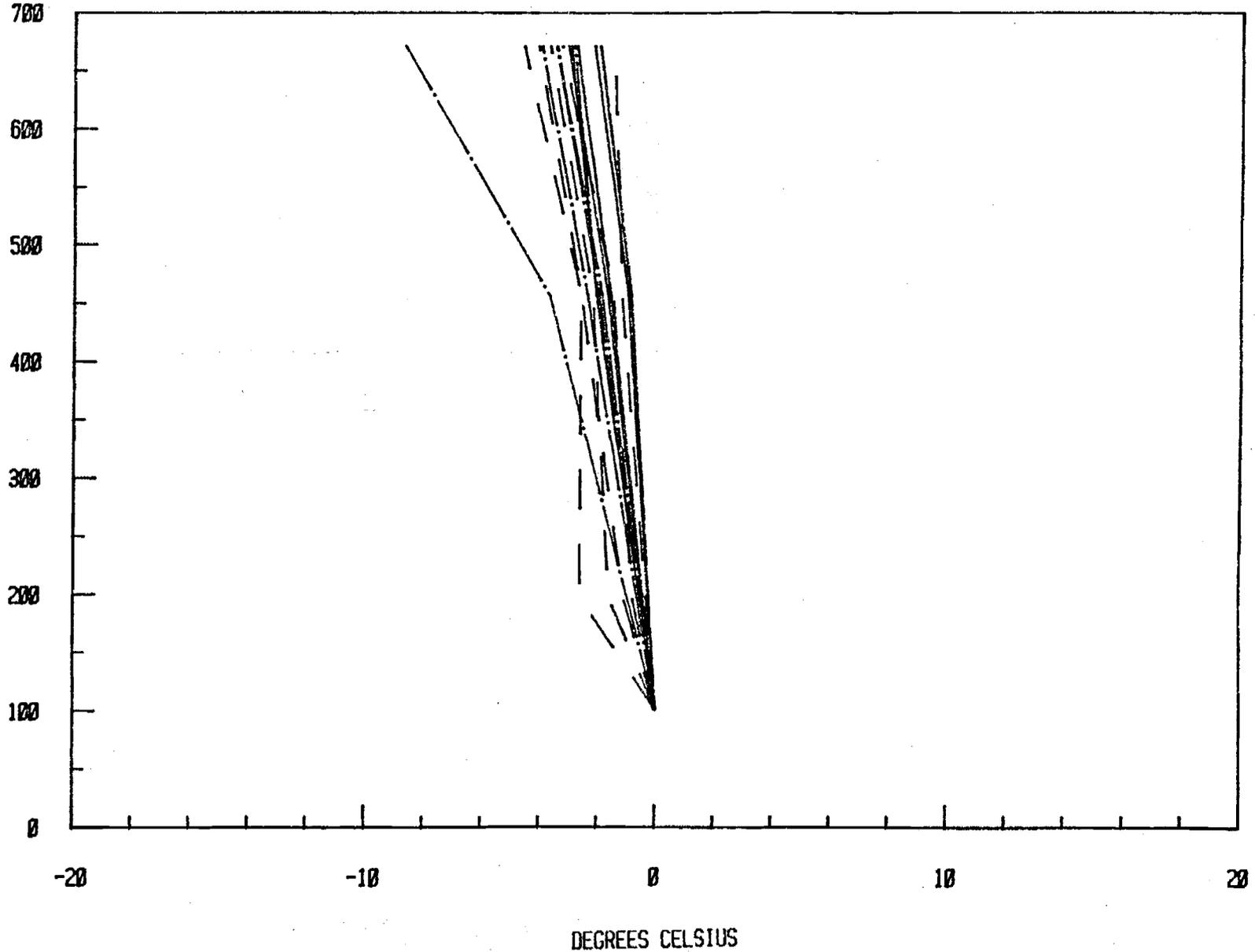
VERTICAL TEMPERATURE PROFILES: MAY

DEPARTURE FROM TALKEETNA

ELEVATION IN METERS

1981
1982
1983

ES



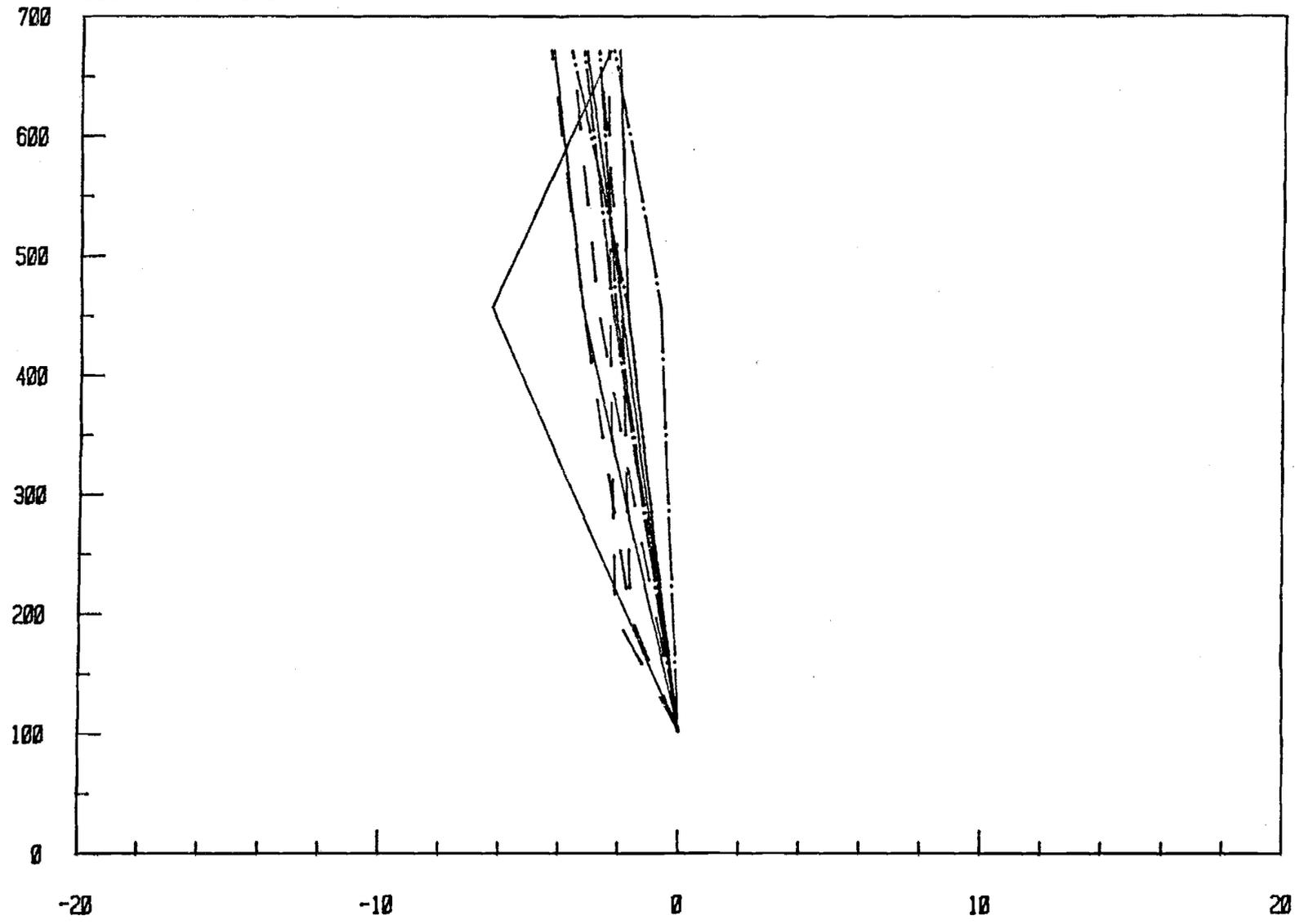
VERTICAL TEMPERATURE PROFILES: JUNE

DEPARTURE FROM TALKEETNA

ELEVATION IN METERS

1981
1982
1983

E9



DEGREES CELSIUS

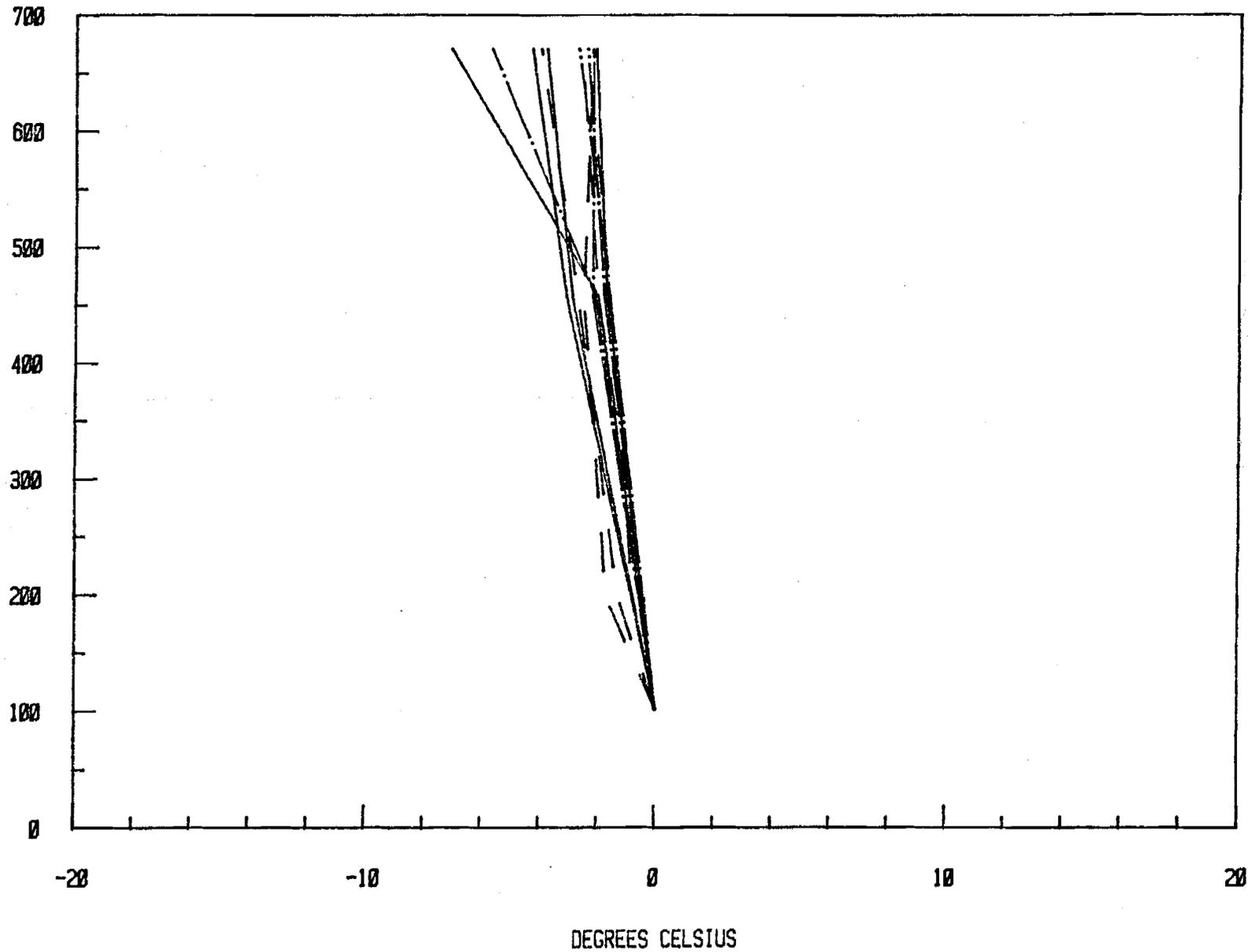
VERTICAL TEMPERATURE PROFILES: JULY

DEPARTURE FROM TALKEETNA

ELEVATION IN METERS

1981
1982
1983

E10



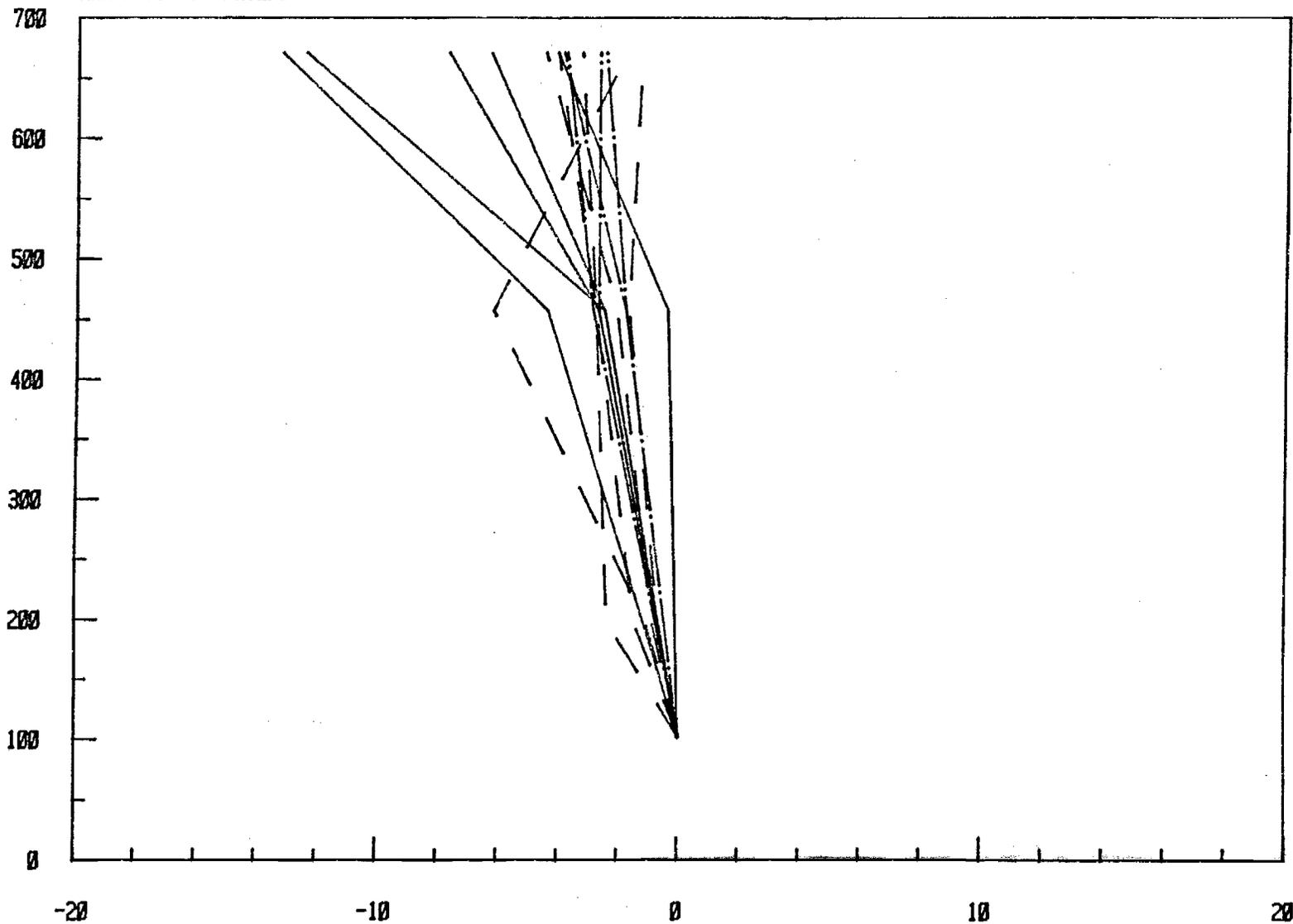
VERTICAL TEMPERATURE PROFILES: AUGUST

DEPARTURE FROM TALKEETNA

ELEVATION IN METERS

1981
1982
1983

E11



DEGREES CELSIUS

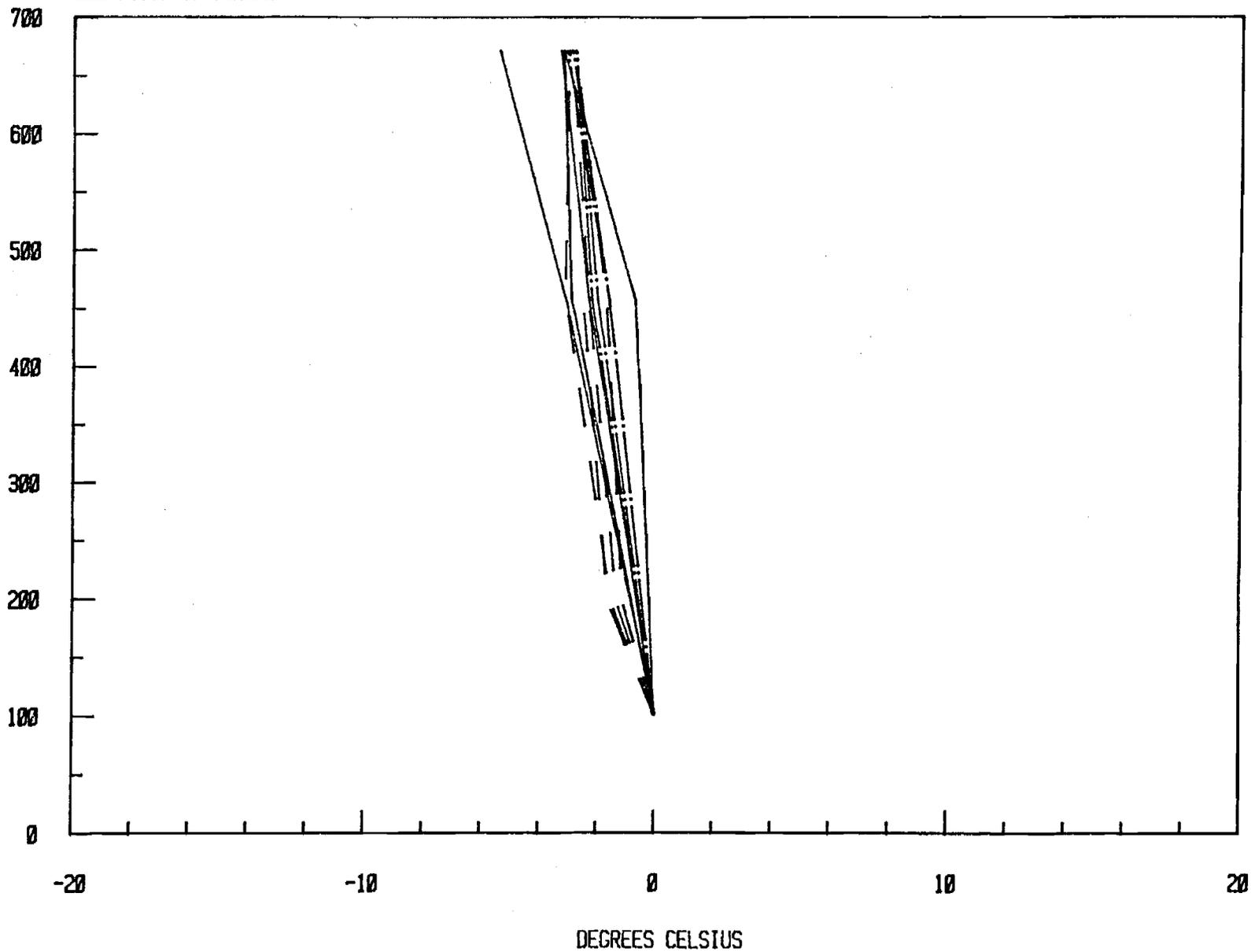
VERTICAL TEMPERATURE PROFILES: SEPTEMBER

DEPARTURE FROM TALKEETNA

ELEVATION IN METERS

1981
1982
1983

E12

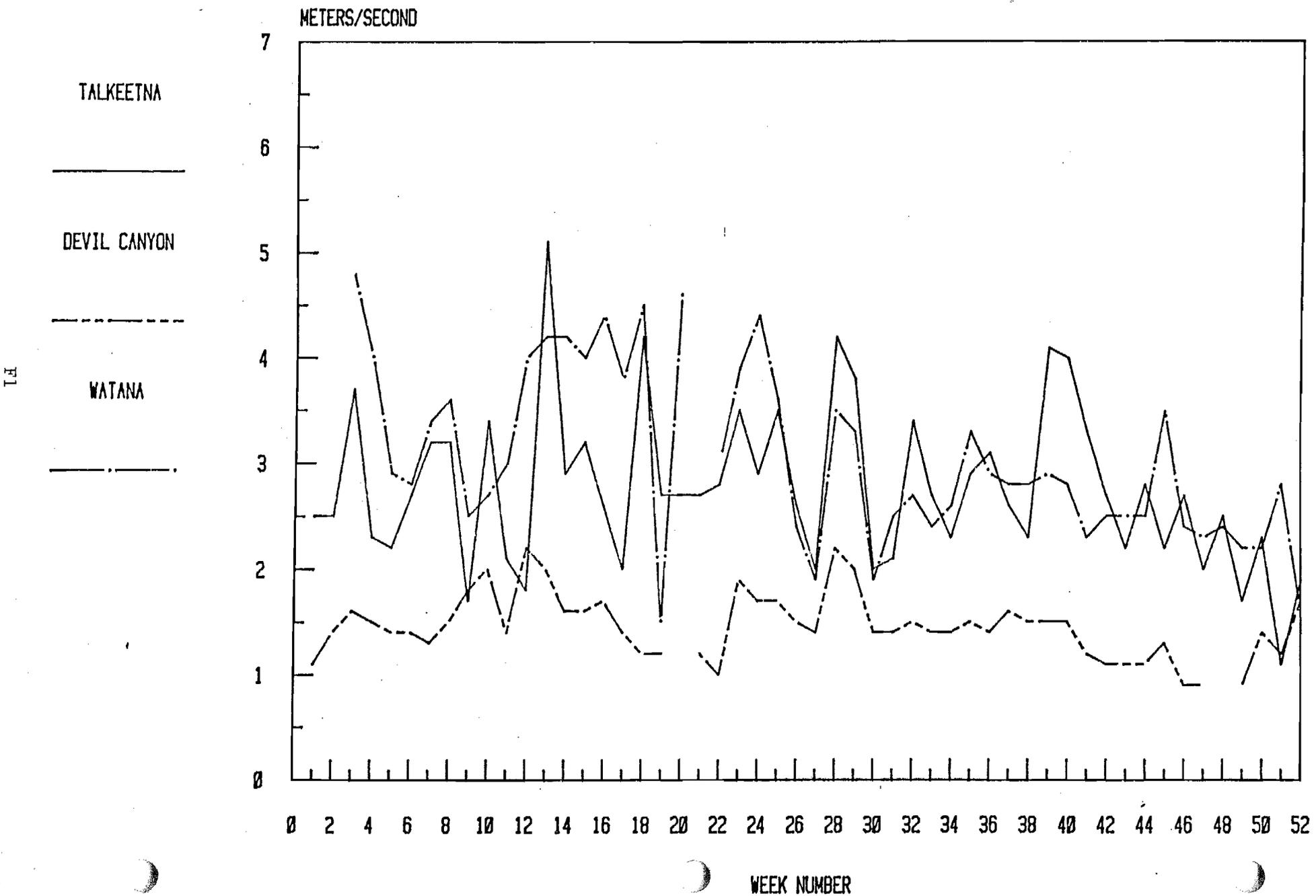


APPENDIX F

Basin weekly wind speeds

AVERAGE WEEKLY WIND SPEEDS

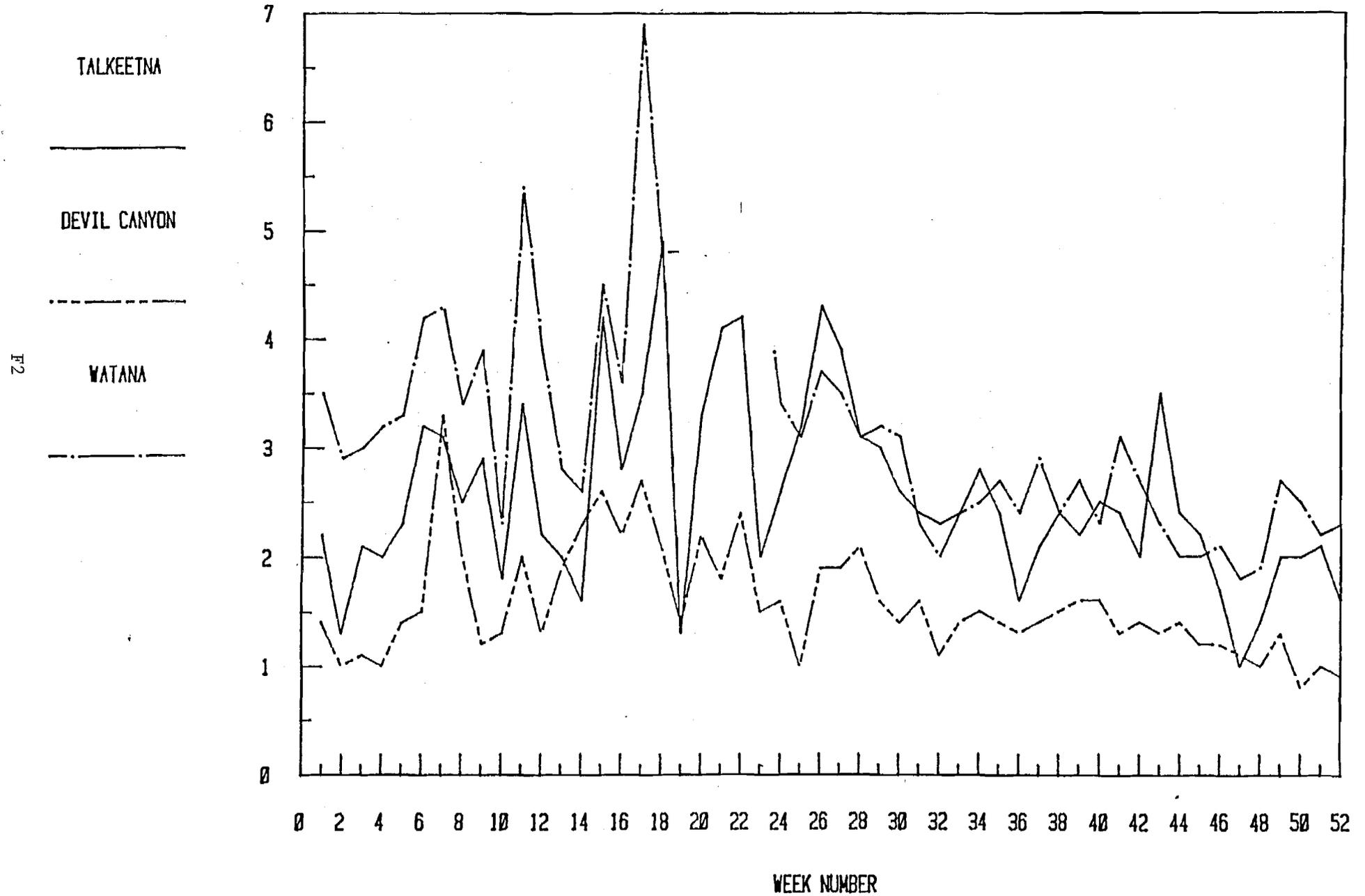
WATER YEAR 1981



AVERAGE WEEKLY WIND SPEEDS

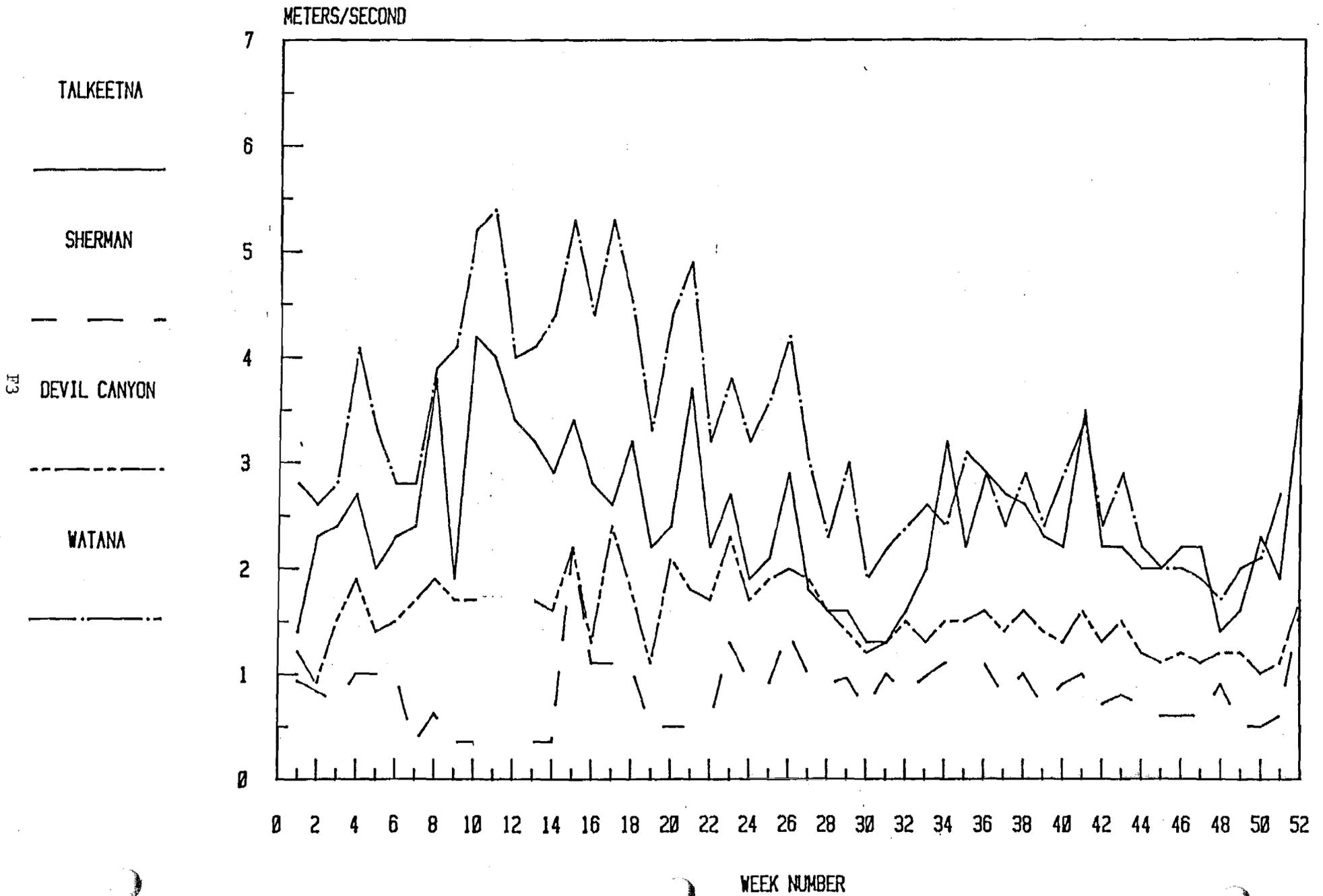
WATER YEAR 1982

METERS/SECOND



AVERAGE WEEKLY WIND SPEEDS

WATER YEAR 1983

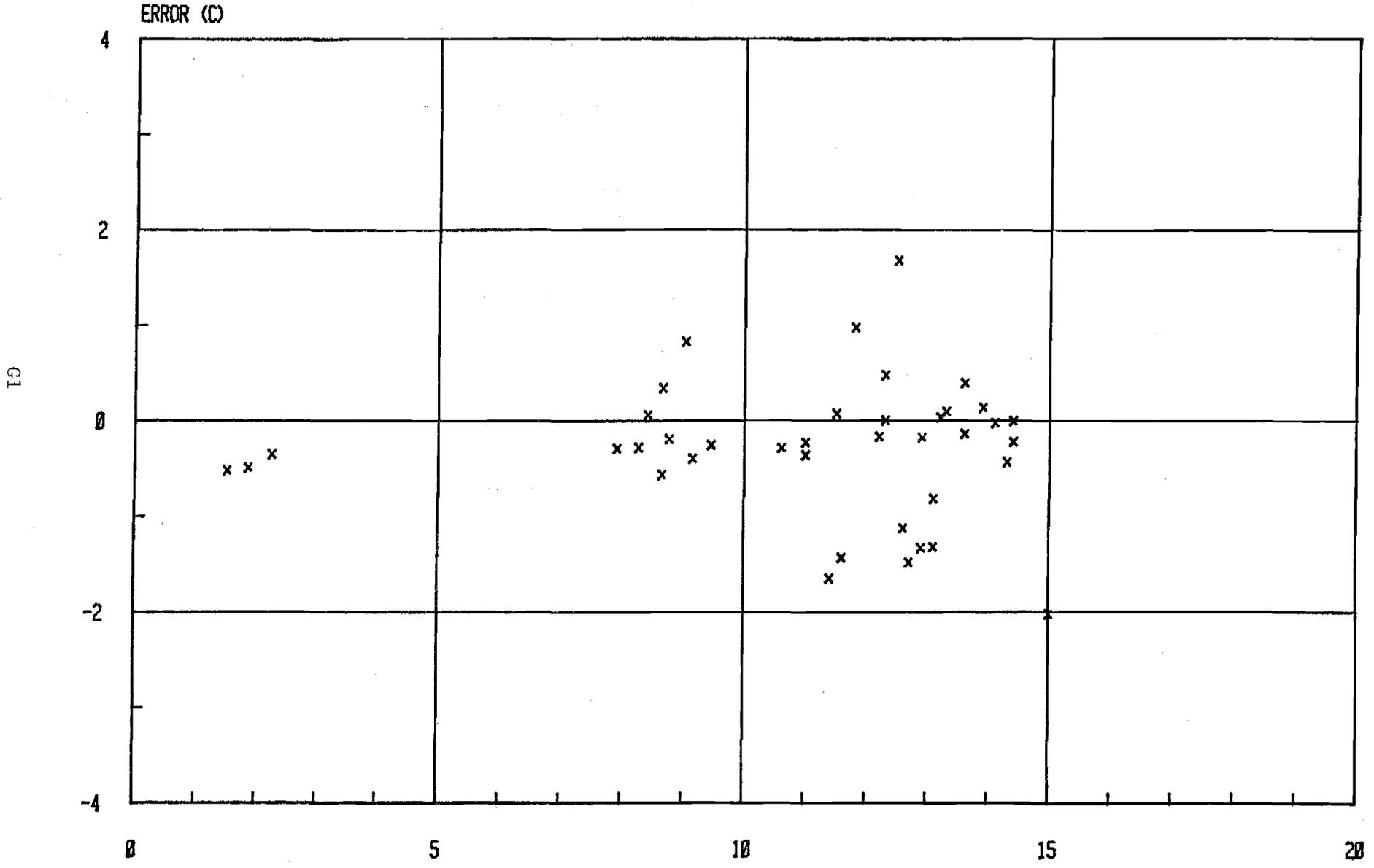


APPENDIX G

Residual errors as functions of air temperature,
humidity, possible sunshine and wind speed.

STREAM TEMPERATURE RESIDUALS

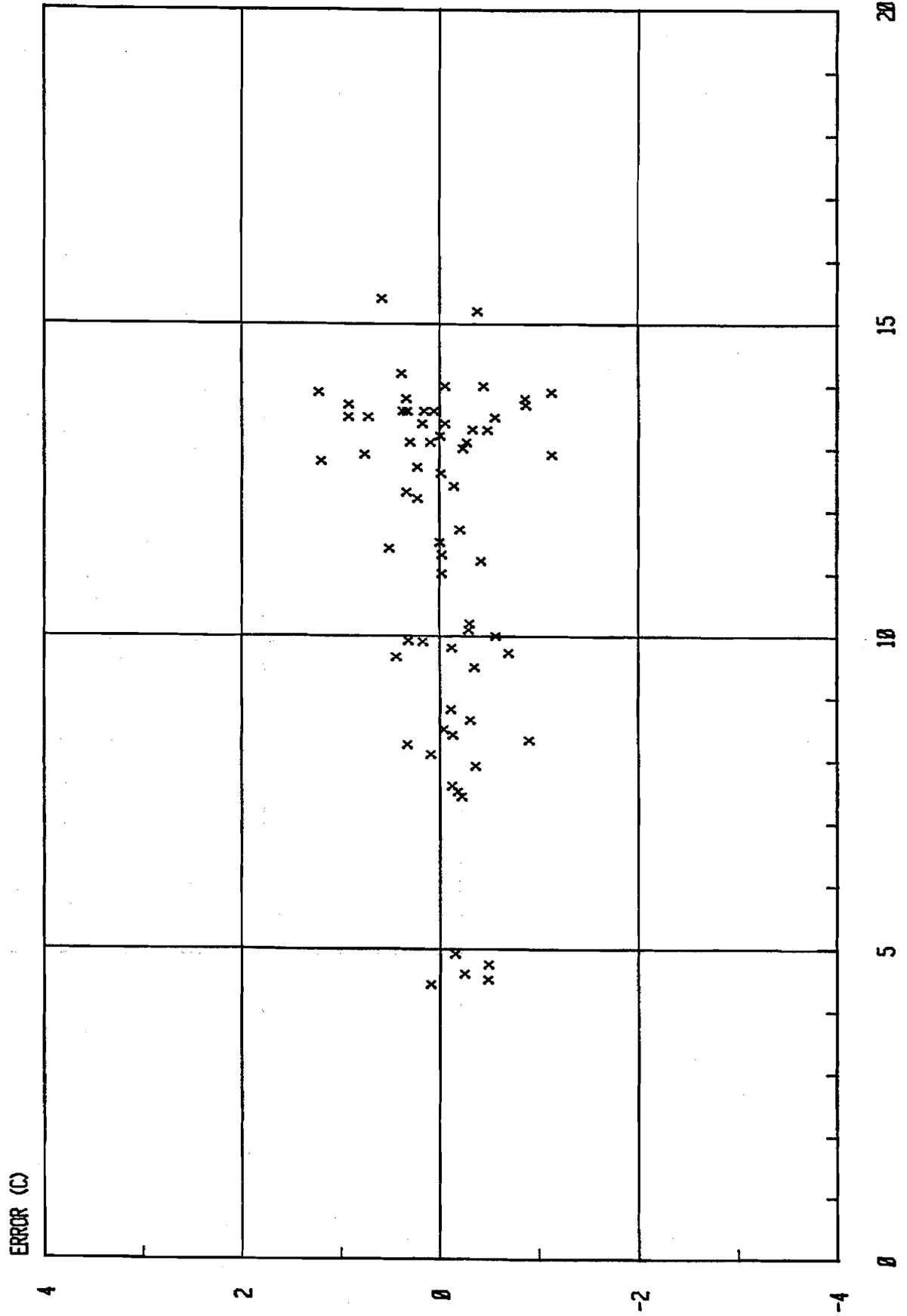
AIR TEMPERATURE 1981



CELCIUS

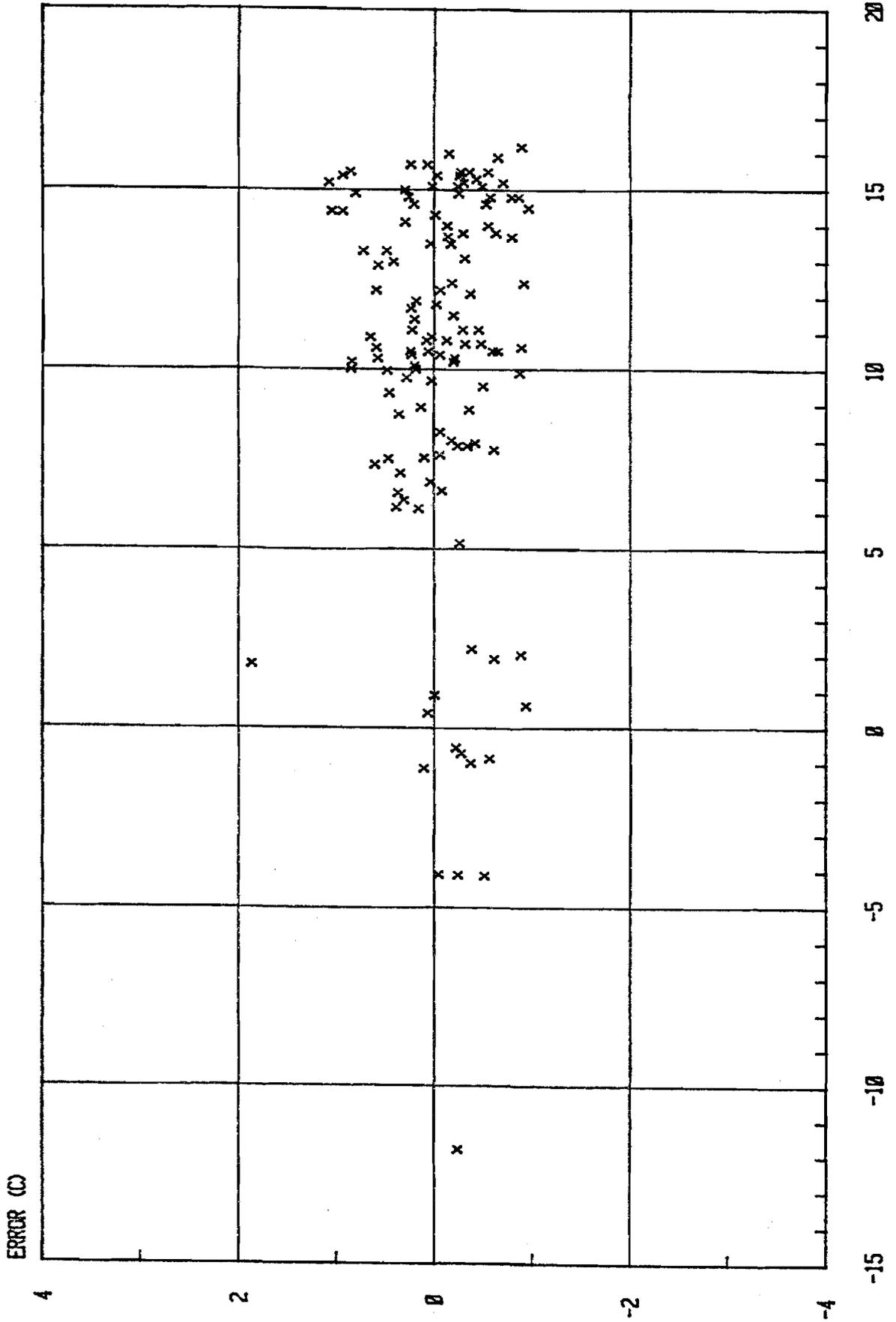
STREAM TEMPERATURE RESIDUALS

AIR TEMPERATURE 1982



STREAM TEMPERATURE RESIDUALS

AIR TEMPERATURE 1983

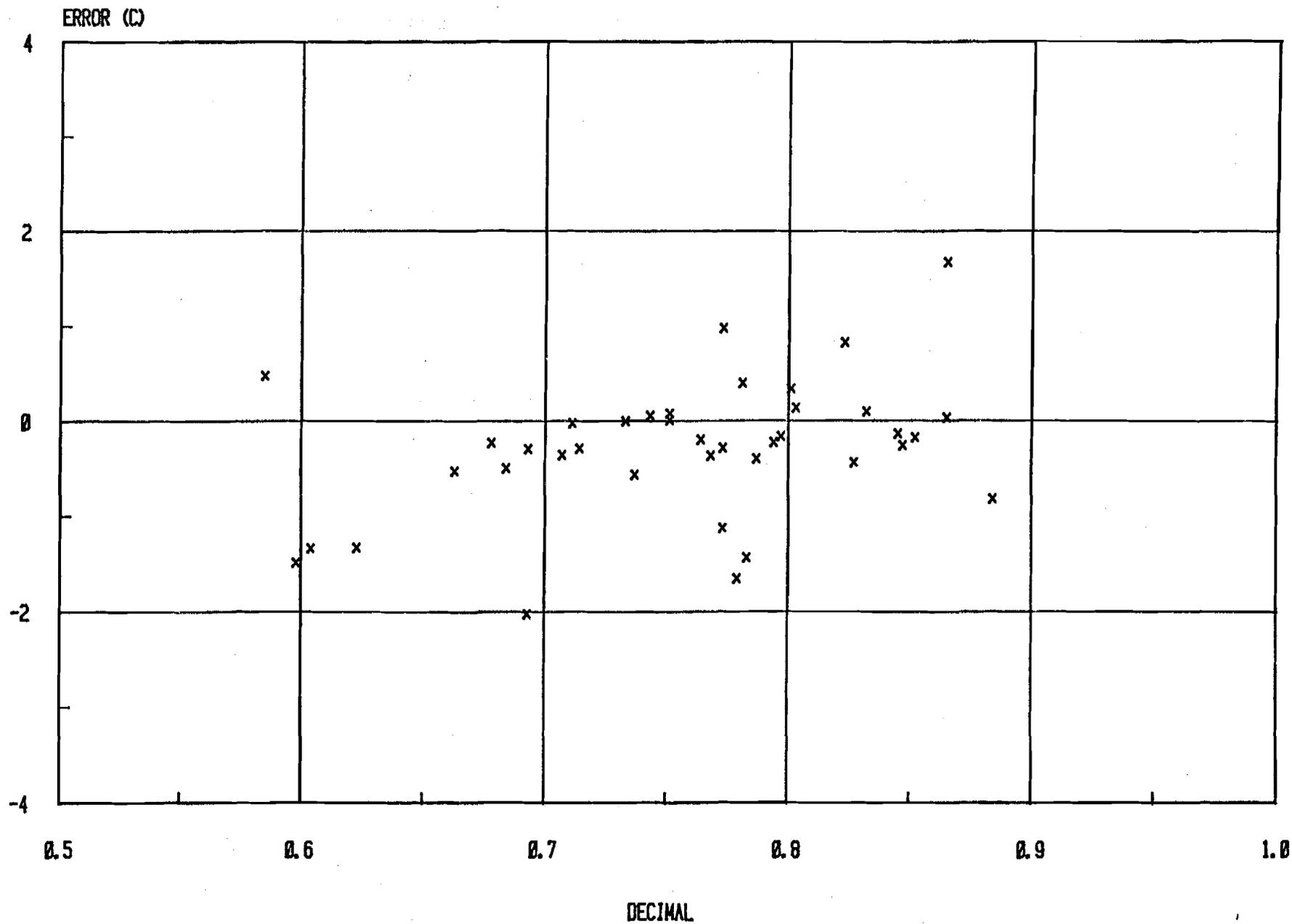


CELSIUS

STREAM TEMPERATURE RESIDUALS

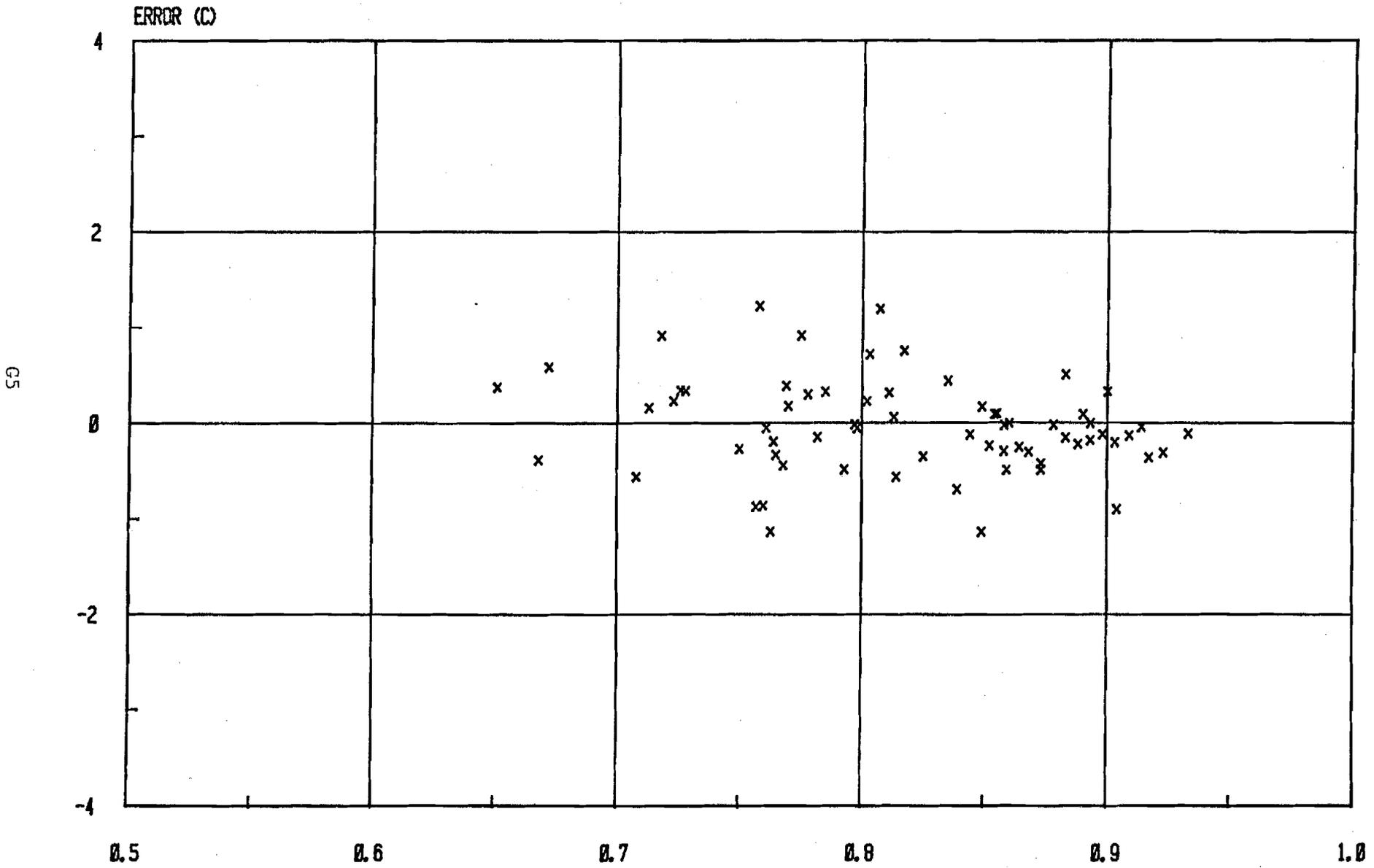
RELATIVE HUMIDITY 1981

G4



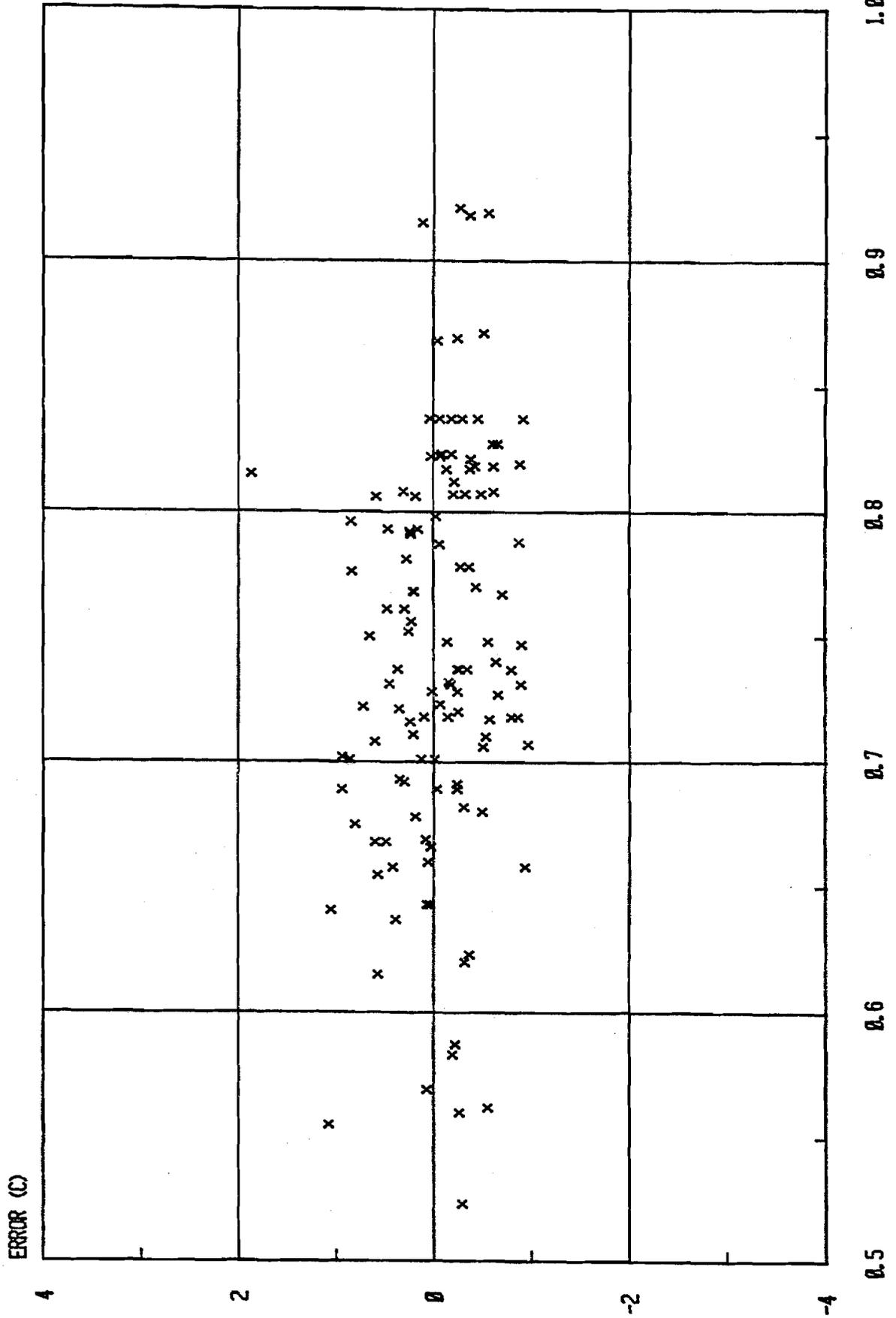
STREAM TEMPERATURE RESIDUALS

RELATIVE HUMIDITY 1982



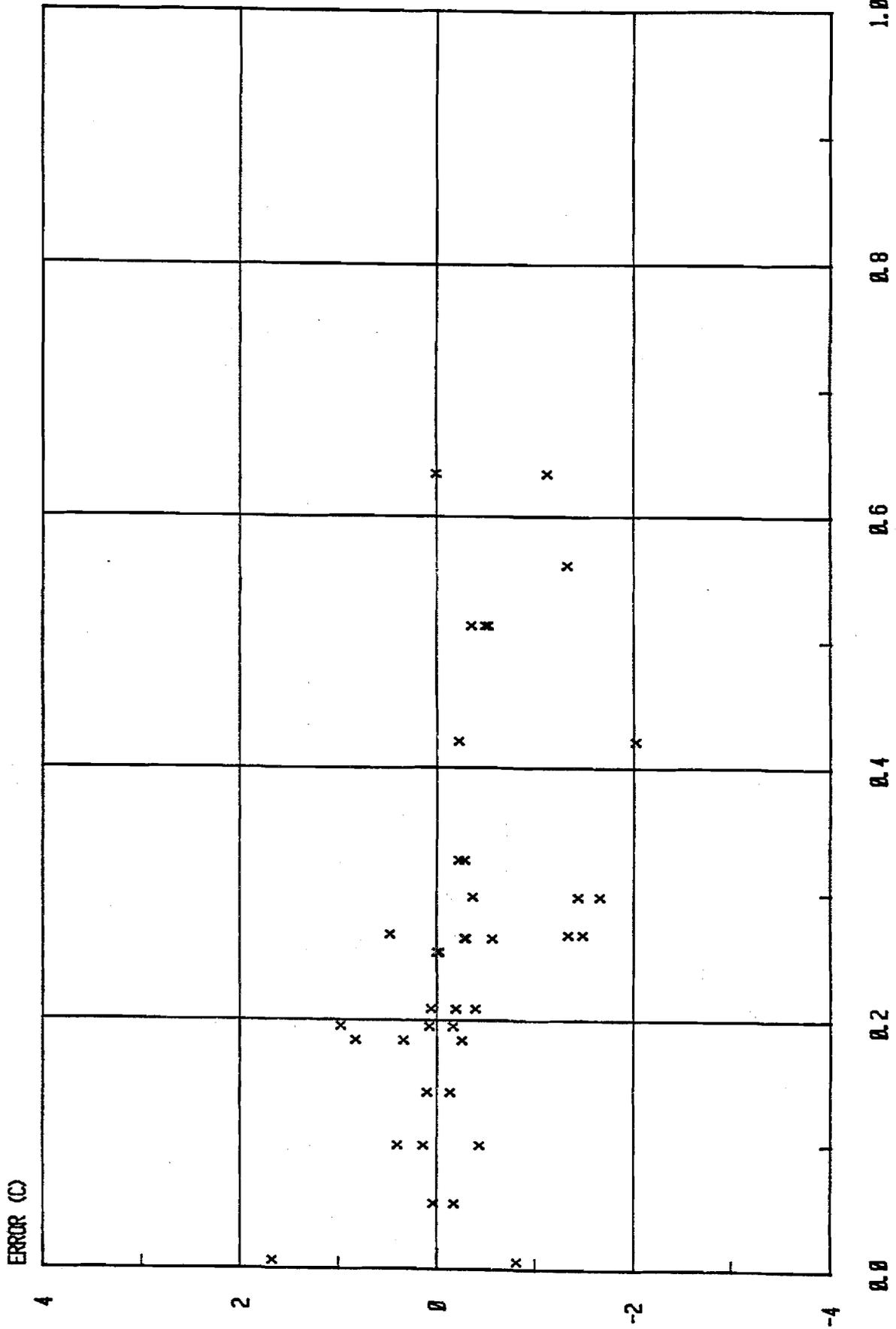
STREAM TEMPERATURE RESIDUALS

RELATIVE HUMIDITY 1963



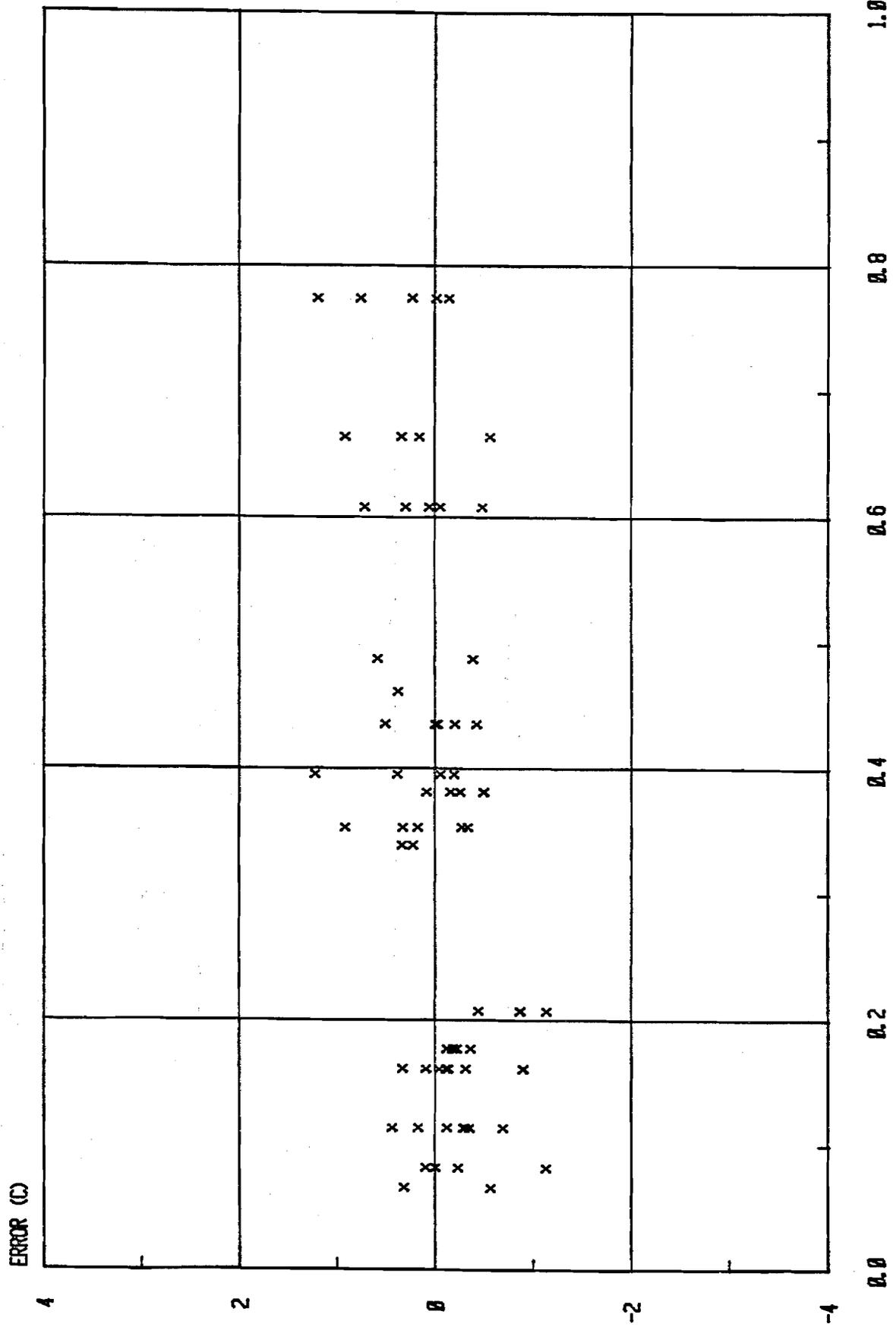
STREAM TEMPERATURE RESIDUALS

POSSIBLE SUNSHINE 1981



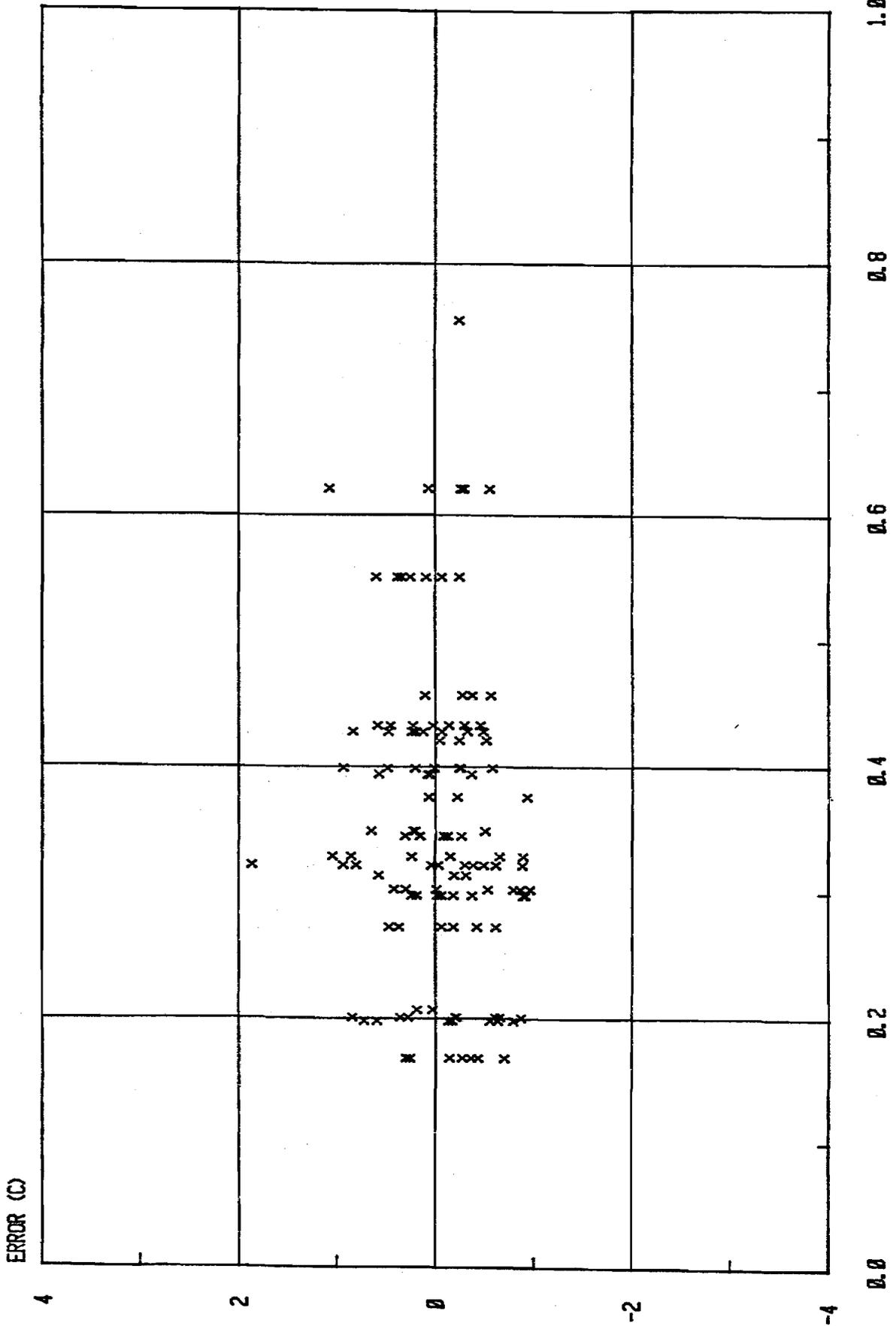
STREAM TEMPERATURE RESIDUALS

POSSIBLE SUNSHINE 1982



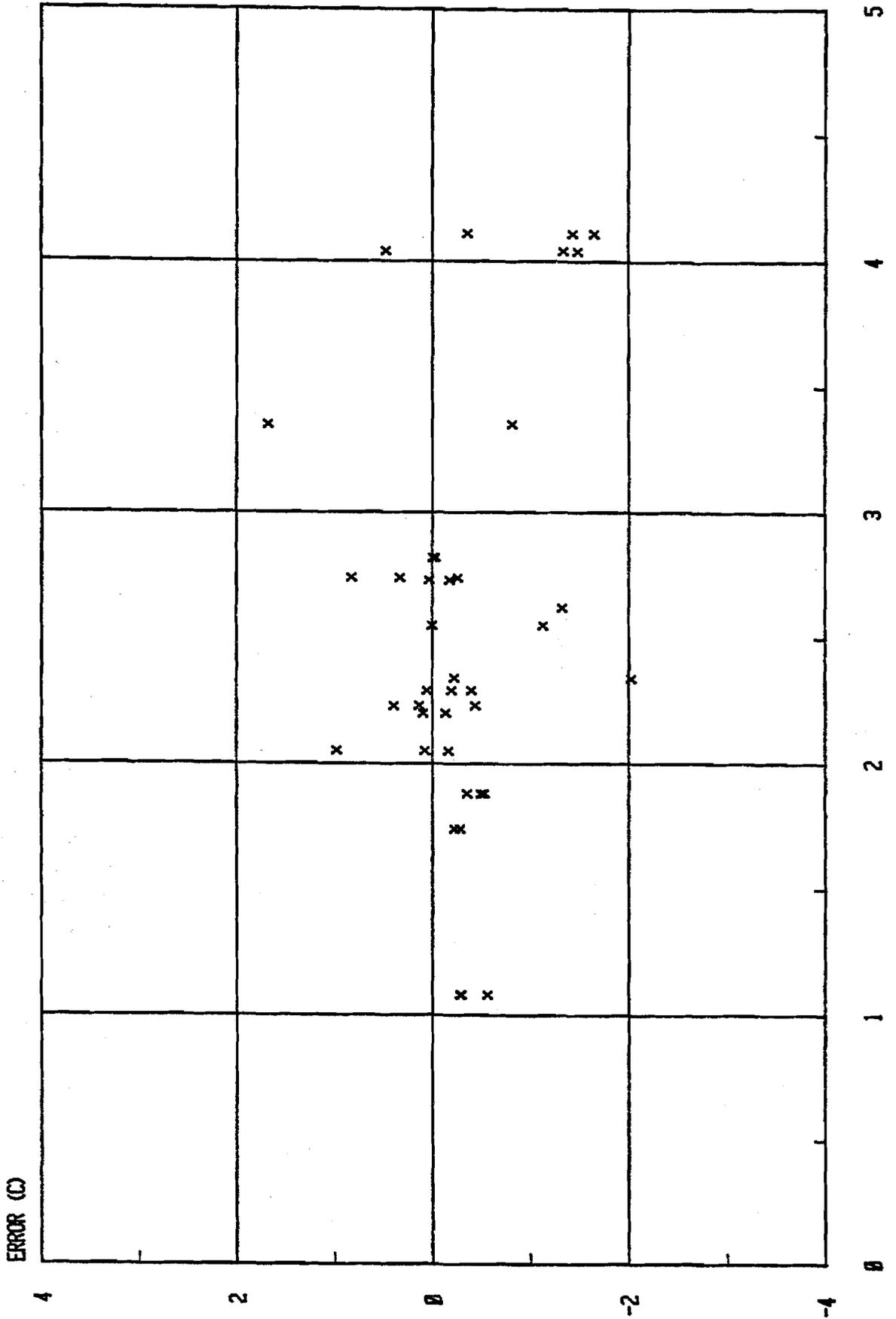
STREAM TEMPERATURE RESIDUALS

POSSIBLE SUNSHINE 1983



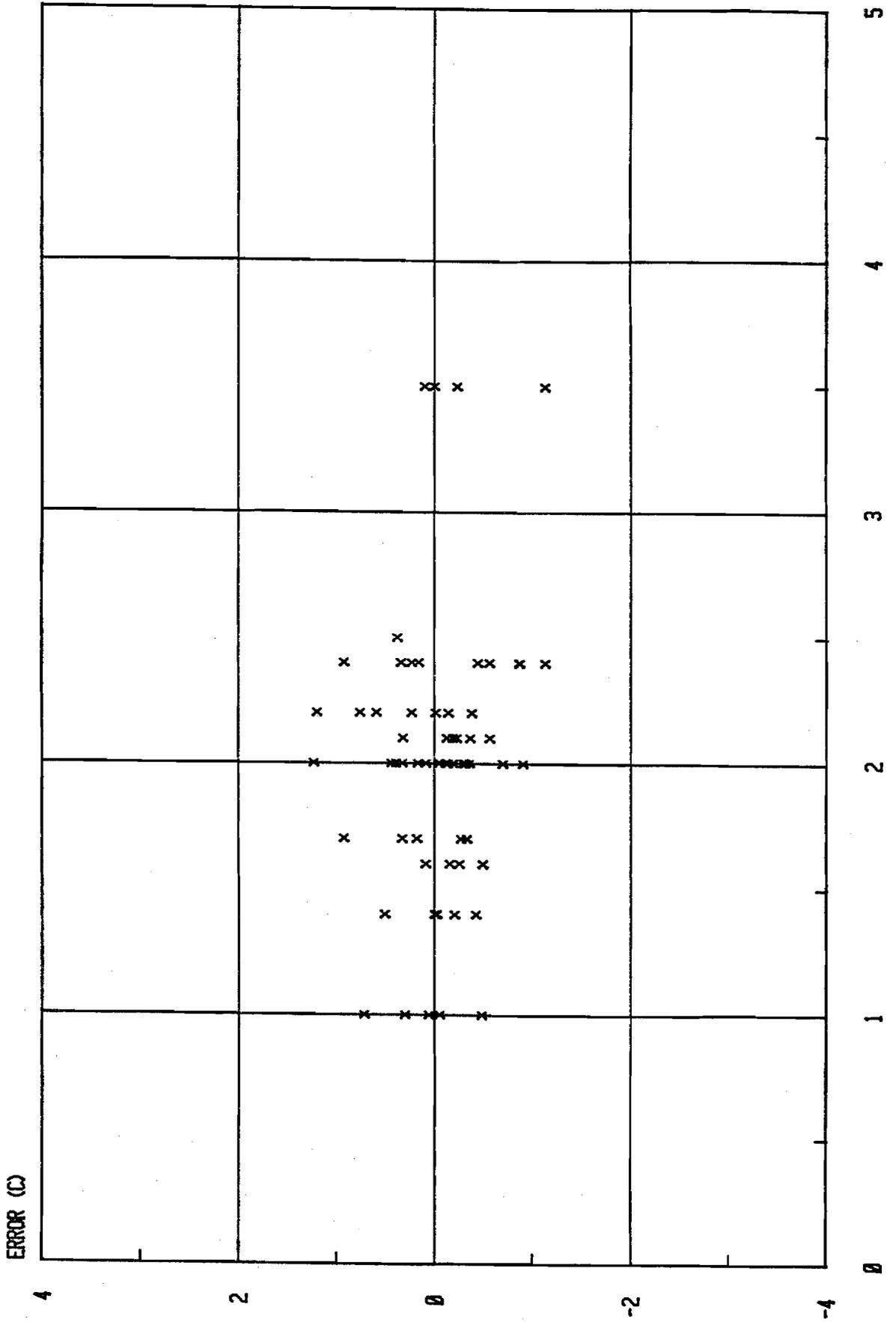
STREAM TEMPERATURE RESIDUALS

WIND SPEED 1981



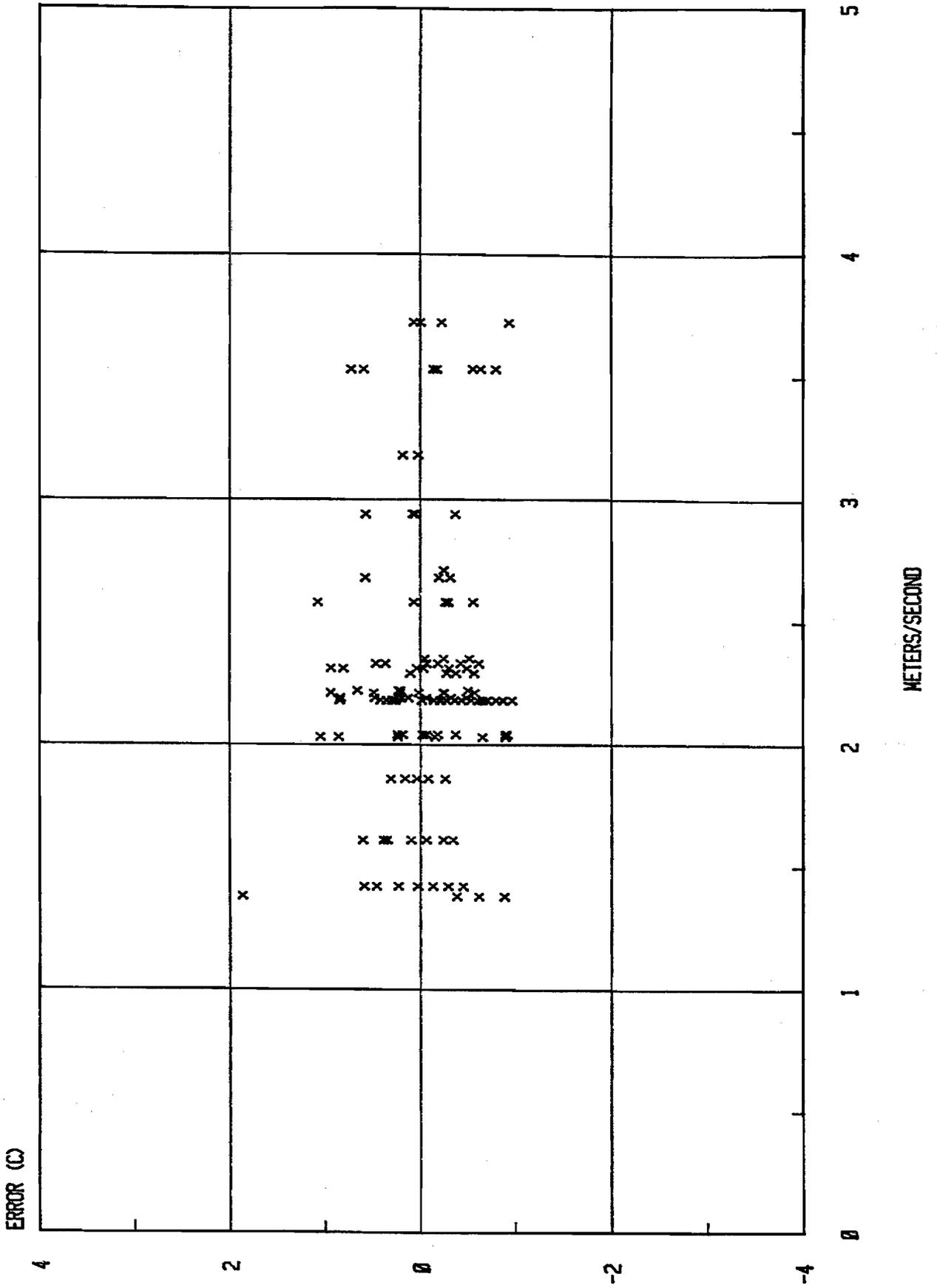
STREAM TEMPERATURE RESIDUALS

WIND SPEED 1982



STREAM TEMPERATURE RESIDUALS

WIND SPEED 1983



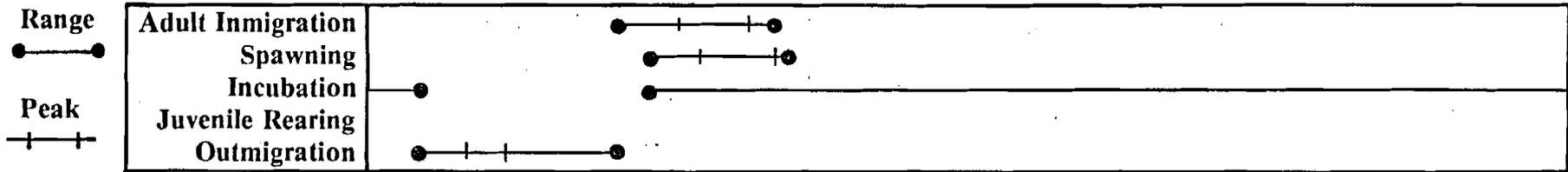
APPENDIX H

Temperature histories for river miles 100, 130 and 150 in relation to the five Pacific salmon life phase activities for natural, Watana filling, Watana-only and Watana/Devil Canyon operational scenarios.

Appendix H. Temperature history plots for
river miles 150, 130 and 100

<u>Salmon species and scenarios</u>	<u>Pages</u>
Pink salmon - operating project	H1 - H12
Pink salmon - Watana filling	H13 - H21
Coho salmon - operating project	H22- H33
Coho salmon - Watana filling	H34 - H42
Sockeye salmon - operating project	H43 - H54
Sockeye salmon - Watana filling	H55 - H63
Chum salmon - operating project	H64 - H75
Chum salmon - Watana filling	H76 - H84
Chinook salmon - operating project	H85 - H96
Chinook salmon - Watana filling	H97 - H105

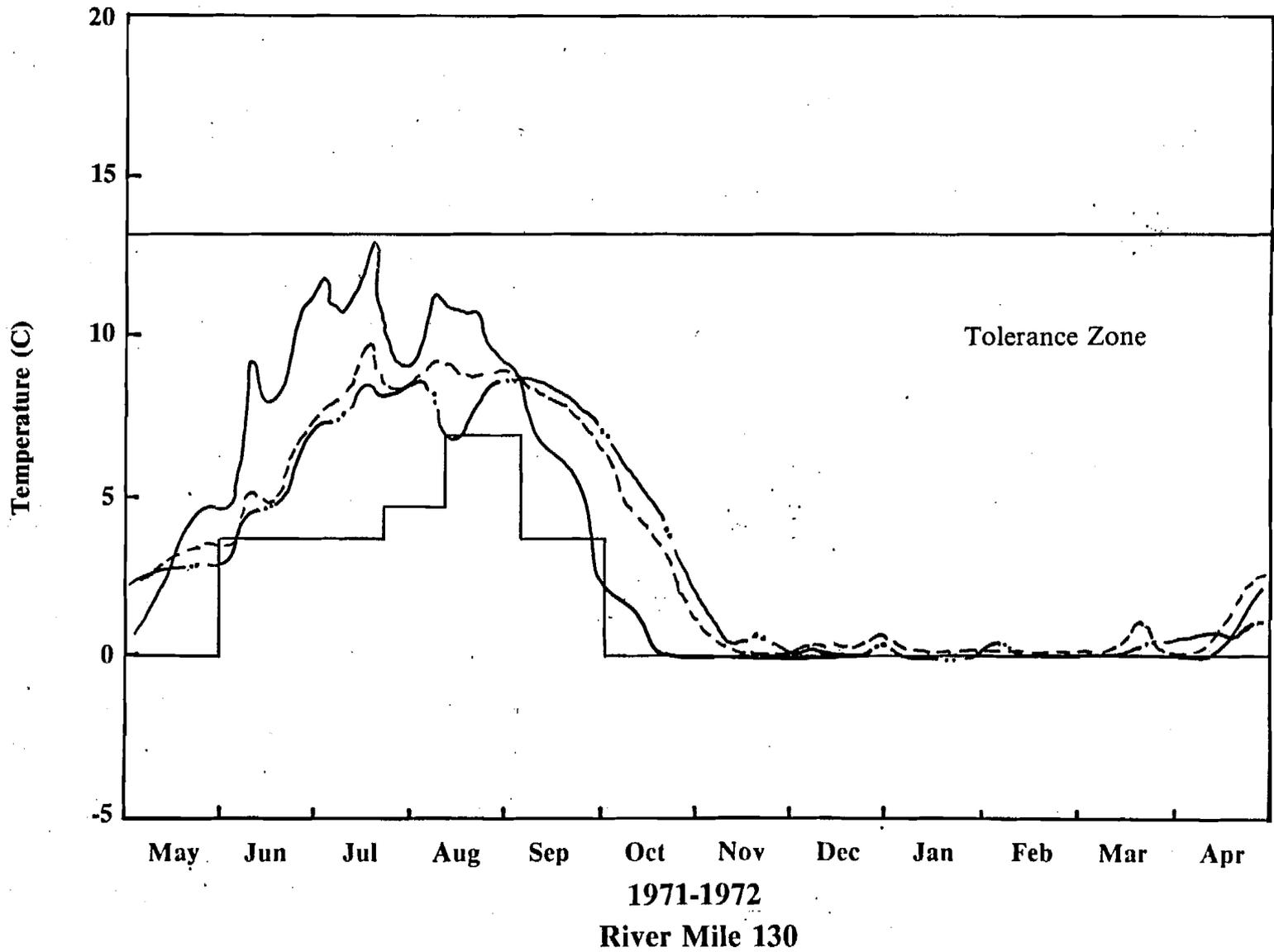
PINK SALMON



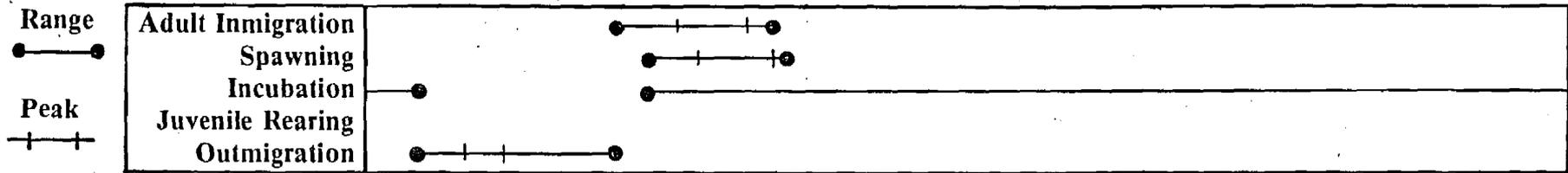
H2
Devil Canyon
2002

Watana
1996

Natural



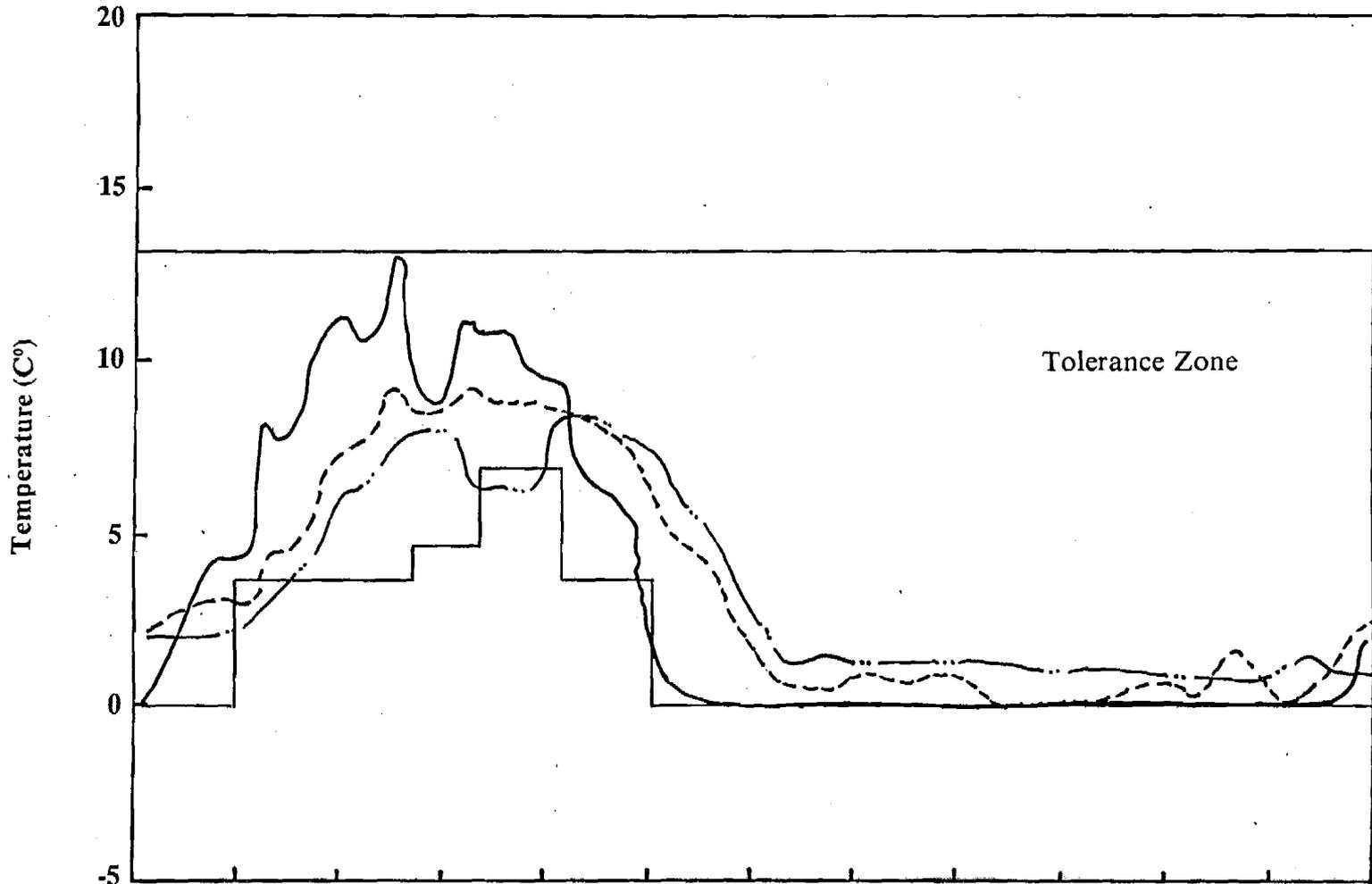
PINK SALMON



H3
Devil's Canyon
2002

Watana
1996

Natural

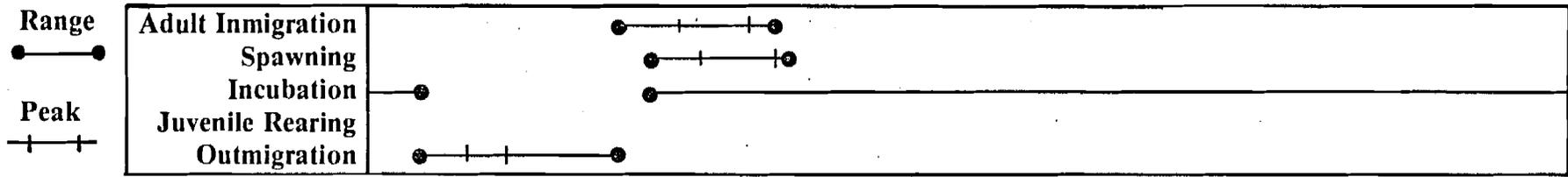


May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr

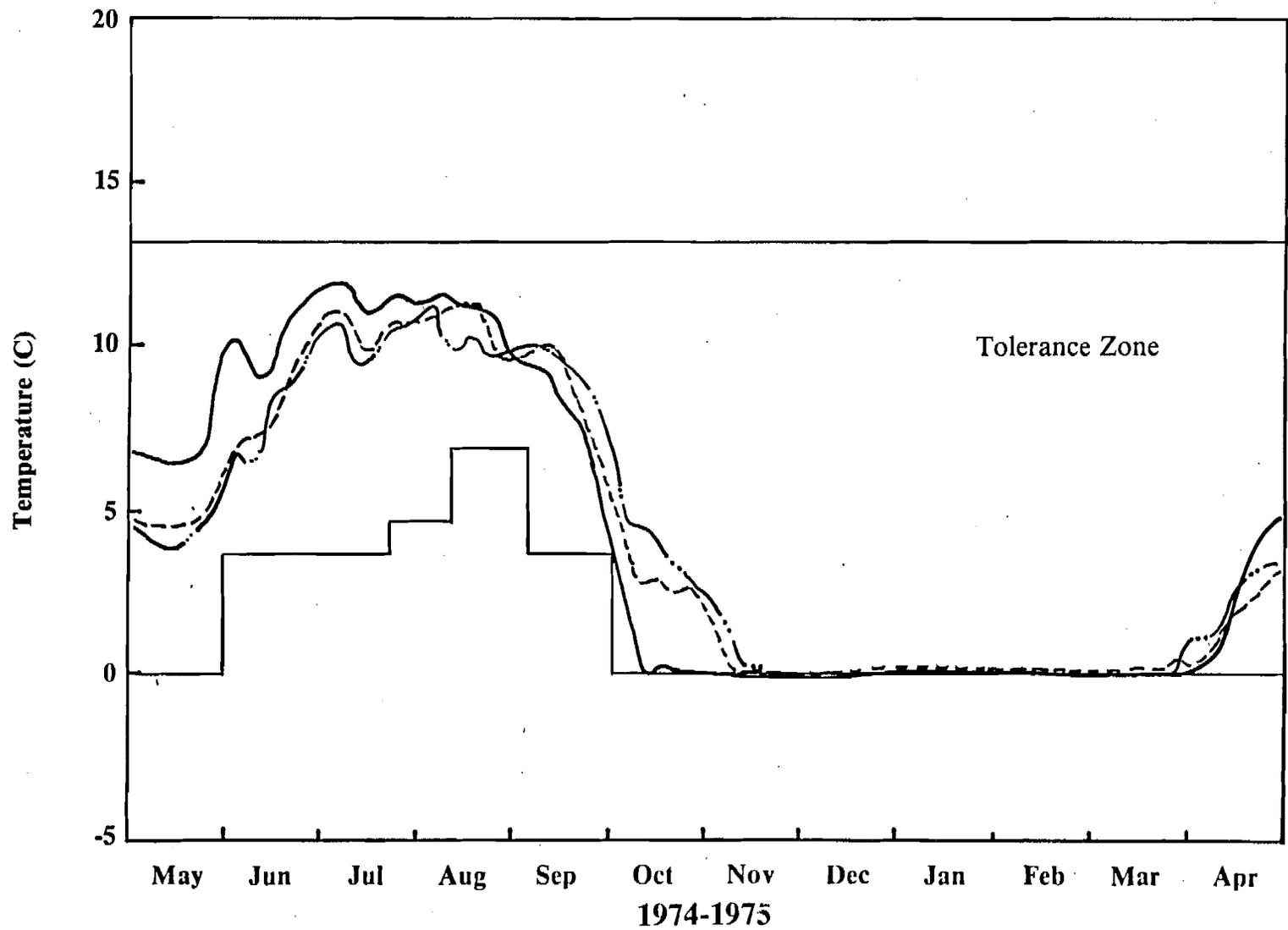
1971-1972

River Mile 150

PINK SALMON

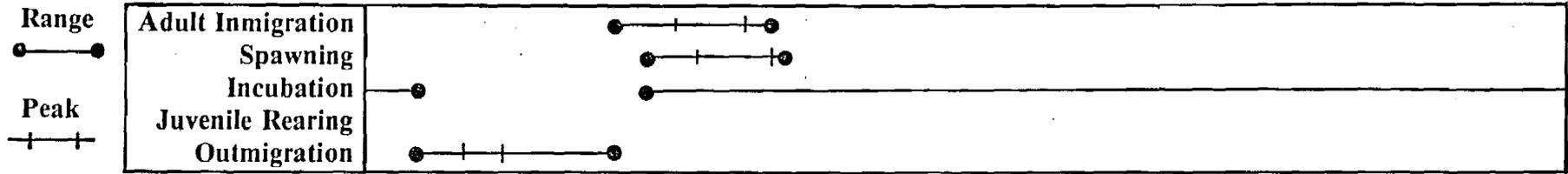


7H
 Devil Canyon
 2002
 — + + —
 Watana
 1996
 - - - -
 Natural
 — + + —



River Mile 100

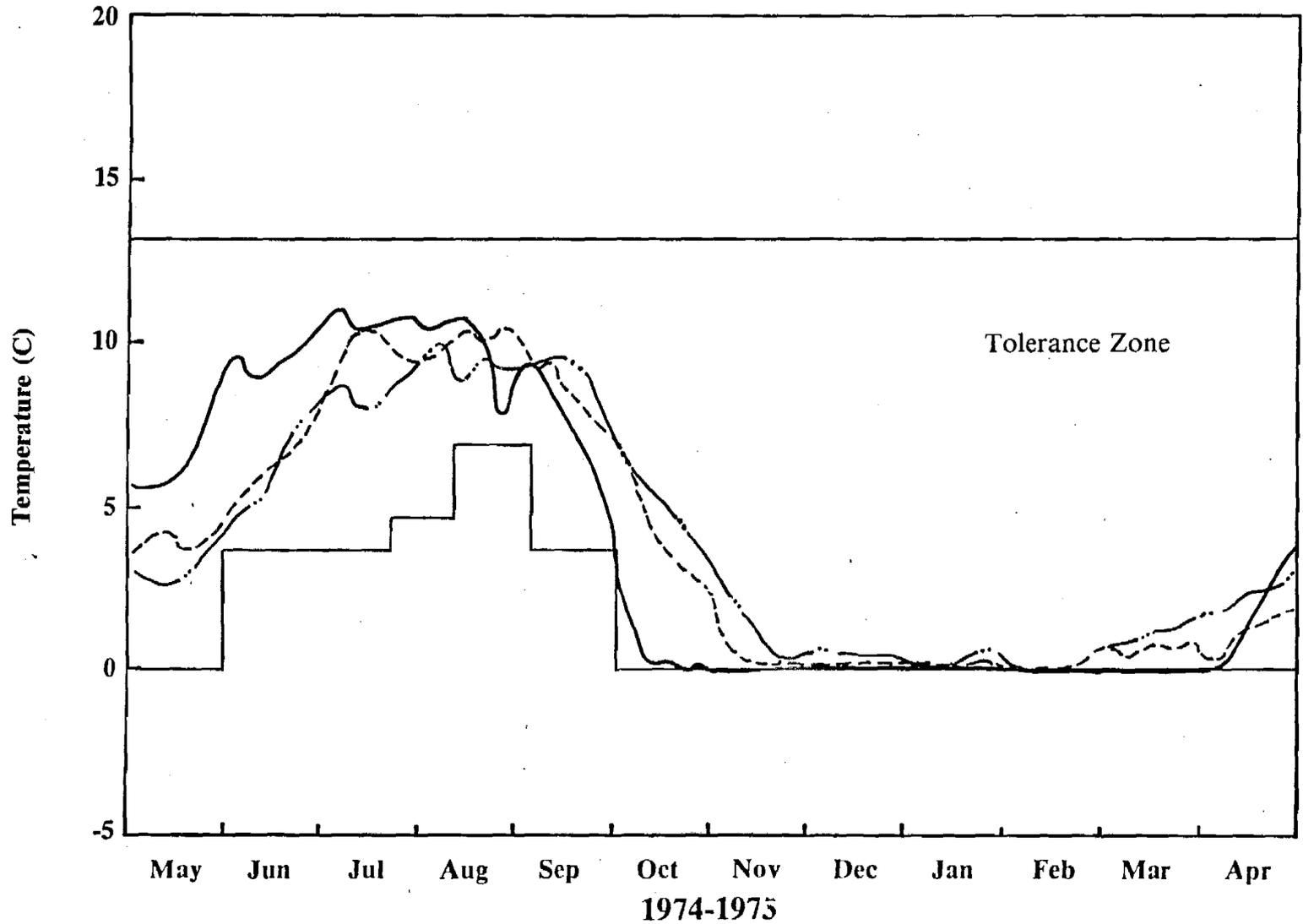
PINK SALMON



HS
Devil Canyon
2002

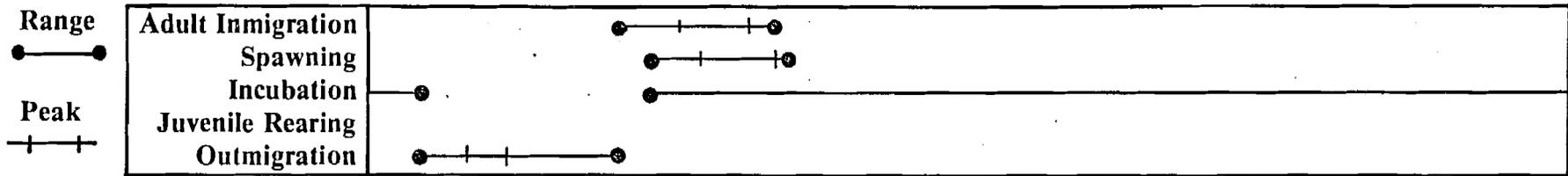
Watana
1996

Natural



River Mile 130

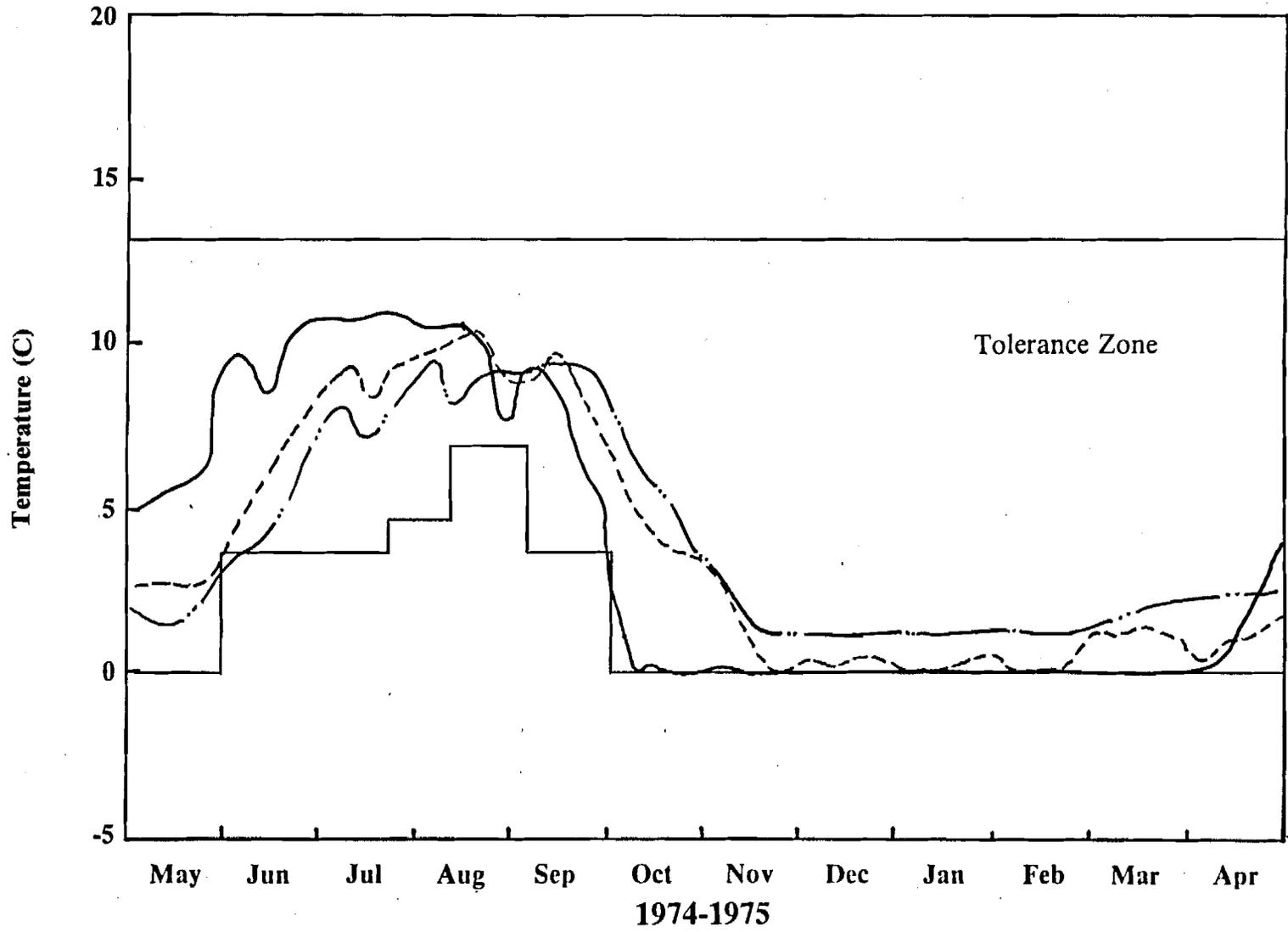
PINK SALMON



9H
Devil Canyon
2002

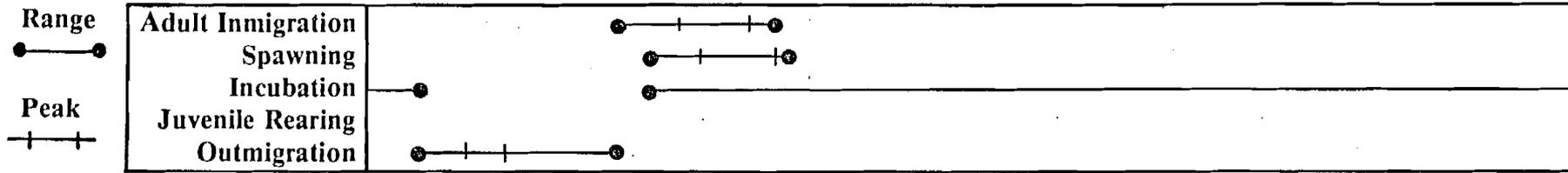
Watana
1996

Natural



River Mile 150

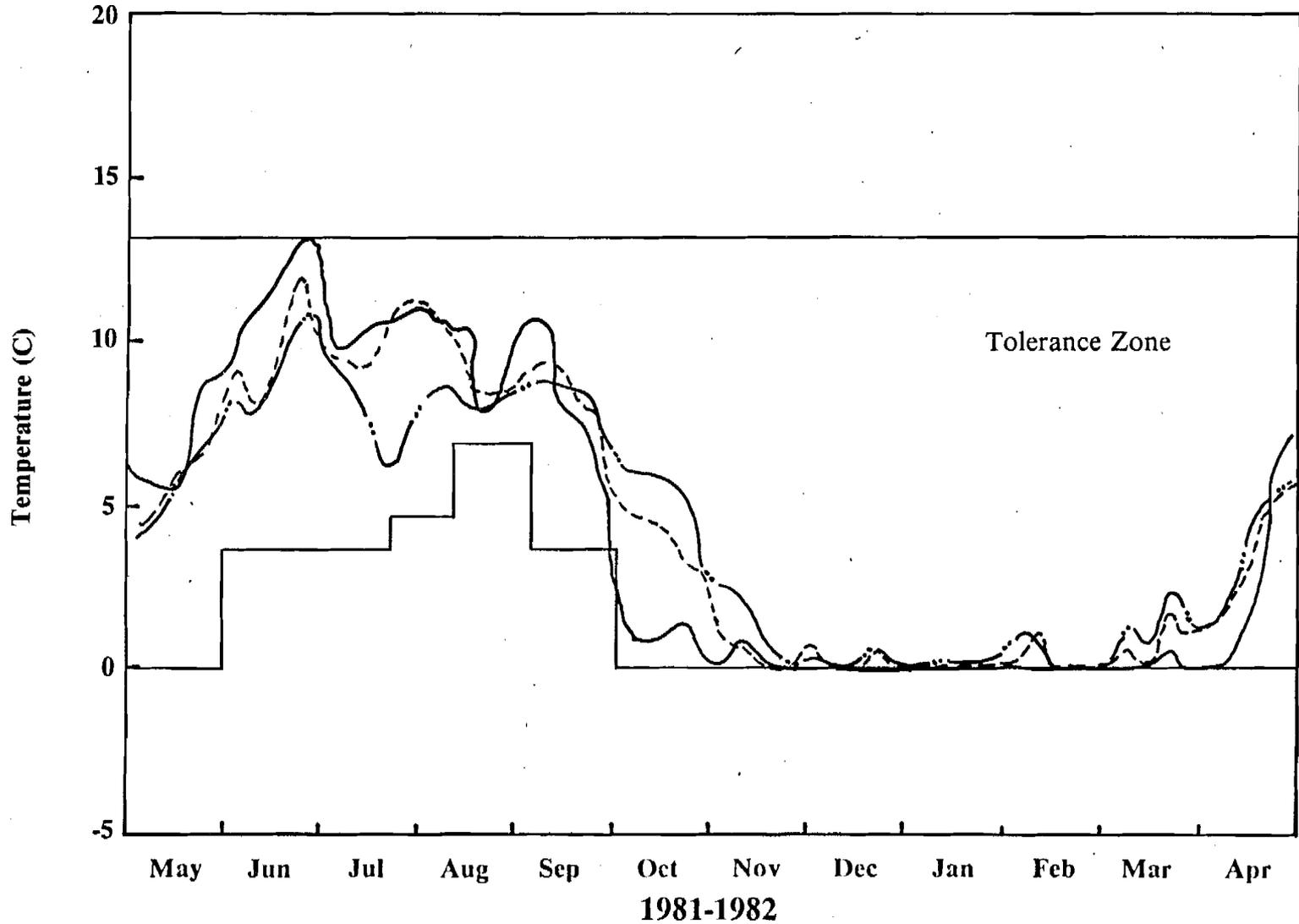
PINK SALMON



Devil Canyon
2002

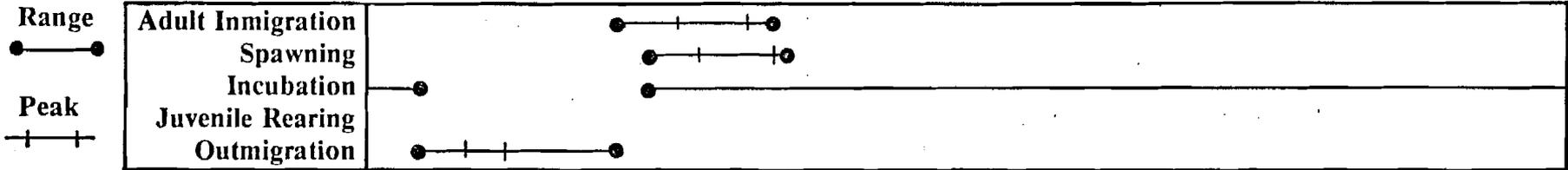
Watana
1996

Natural



River Mile 100

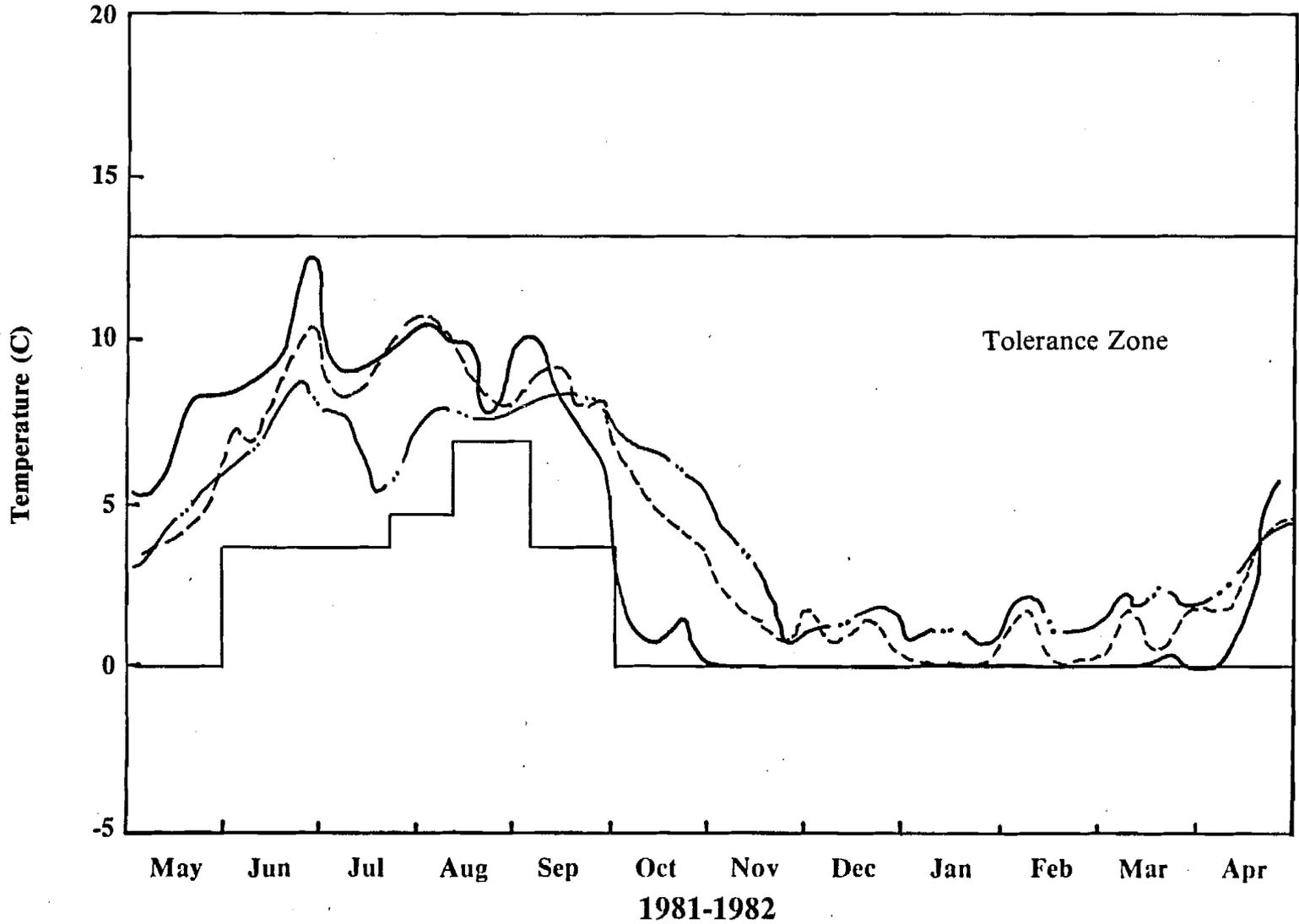
PINK SALMON



8H
Devil Canyon
2002

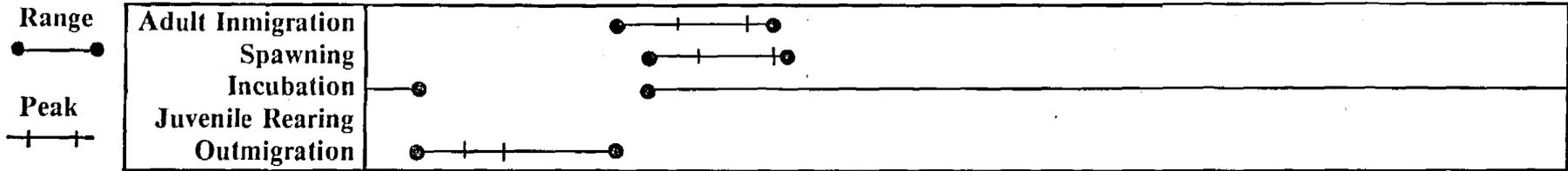
Watana
1996

Natural



River Mile 130

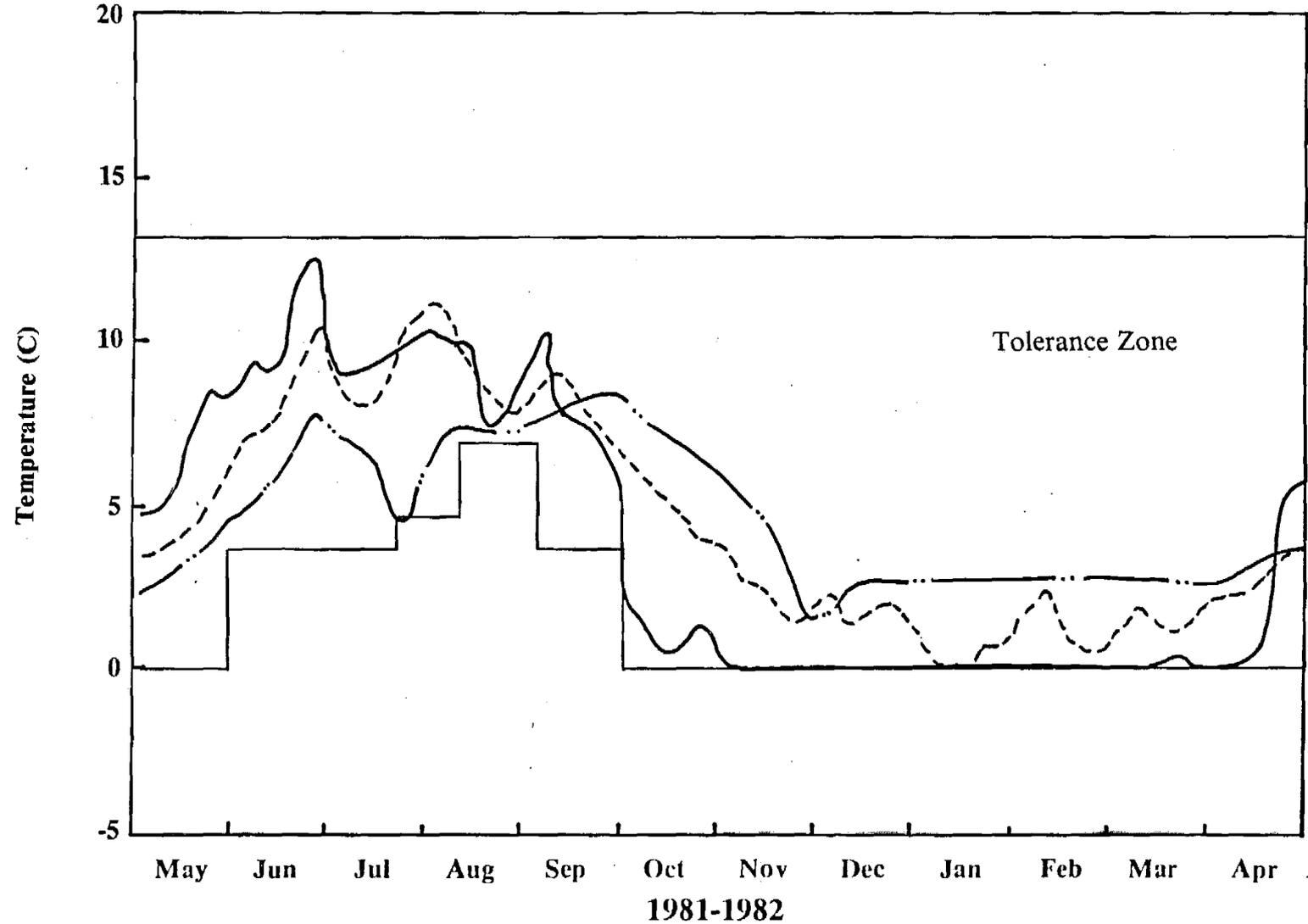
PINK SALMON



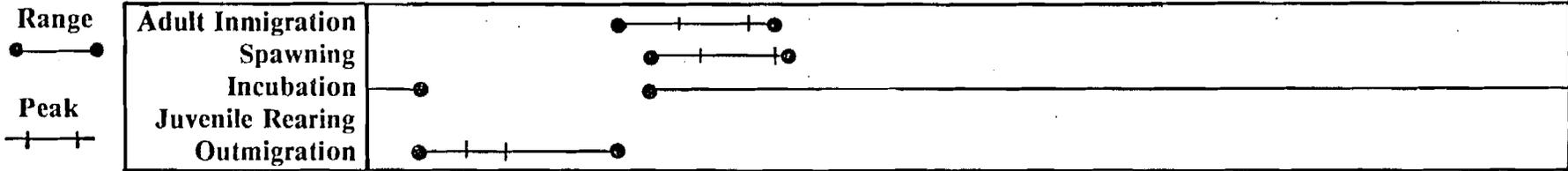
6H
Devil Canyon
2002

Watana
1996

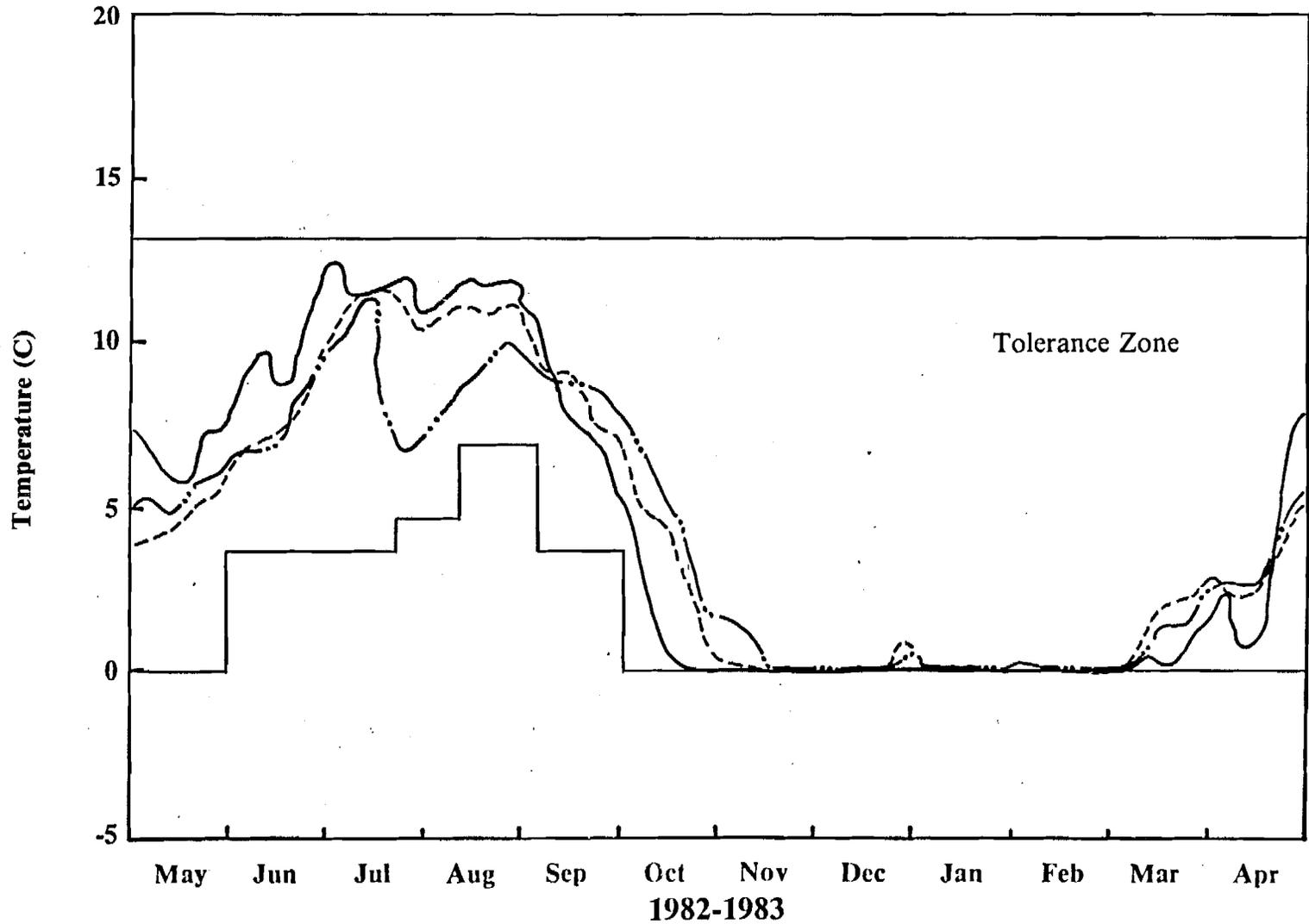
Natural



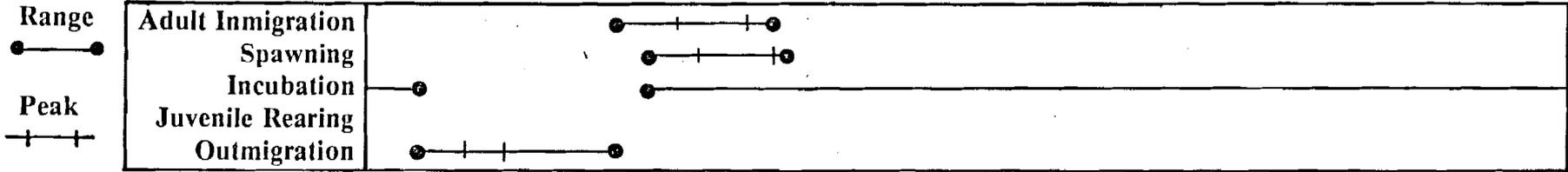
PINK SALMON



OTH
 Devil Canyon
 2002
 ———
 Watana
 1996
 - - - -
 Natural
 ———



PINK SALMON

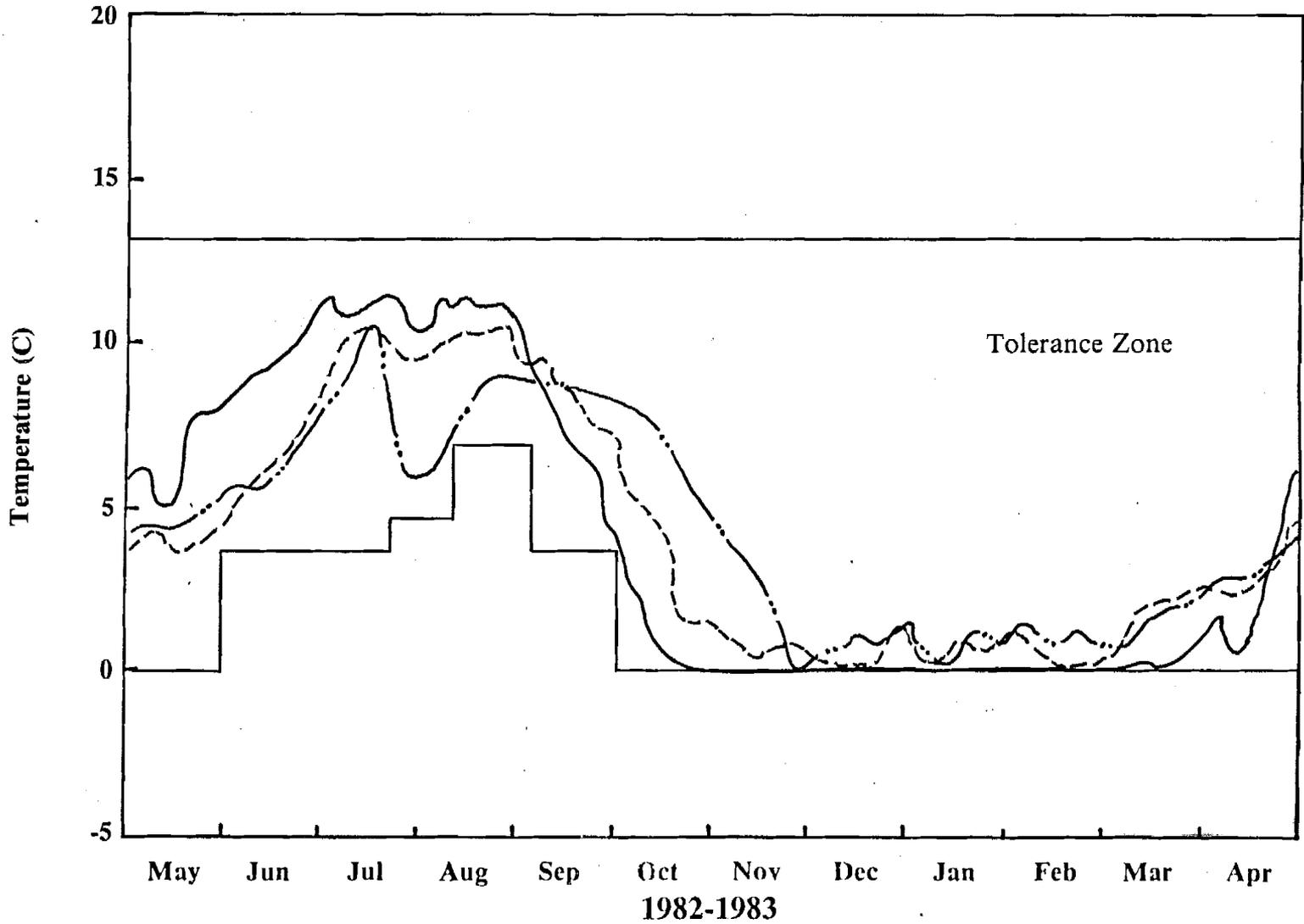


1TH

Devil Canyon
2002
.....

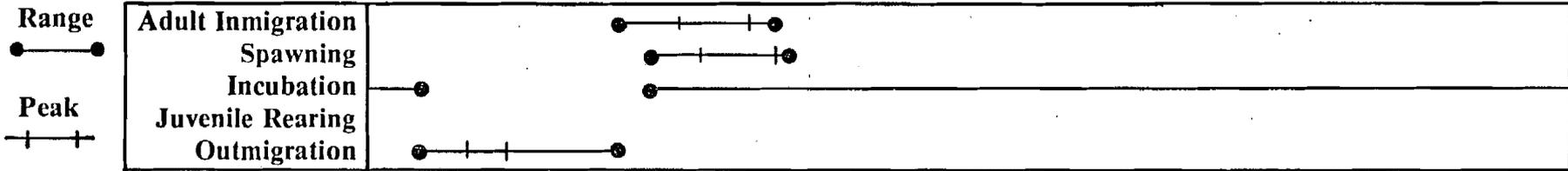
Watana
1996

Natural



River Mile 130

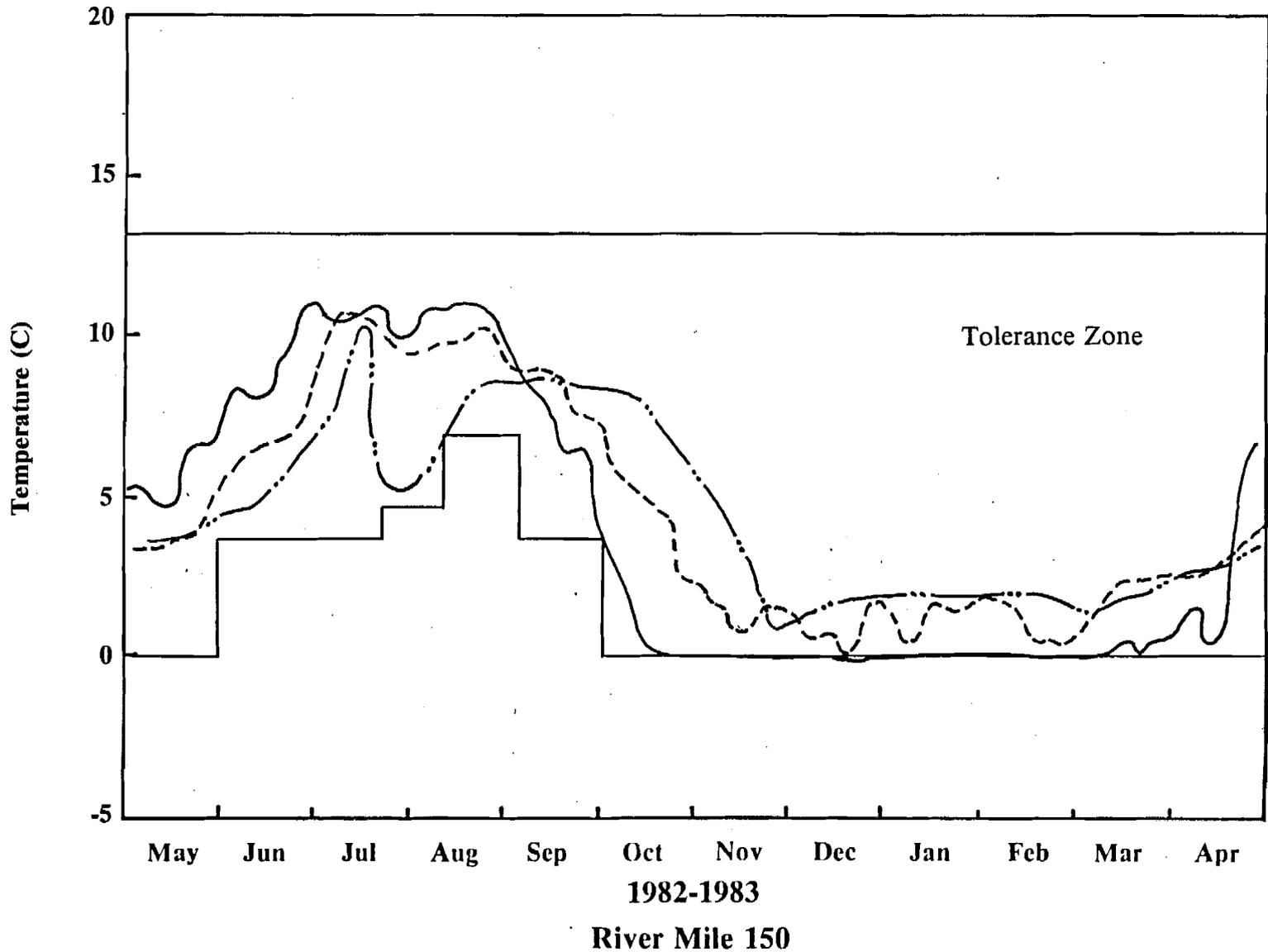
PINK SALMON



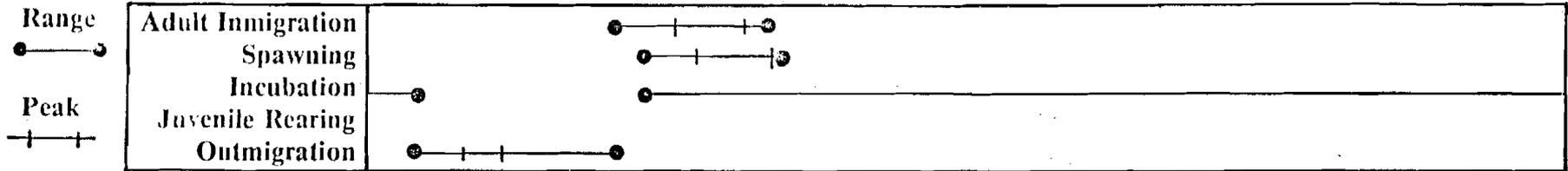
Devil Canyon
2002
HI 2

Watana
1996

Natural

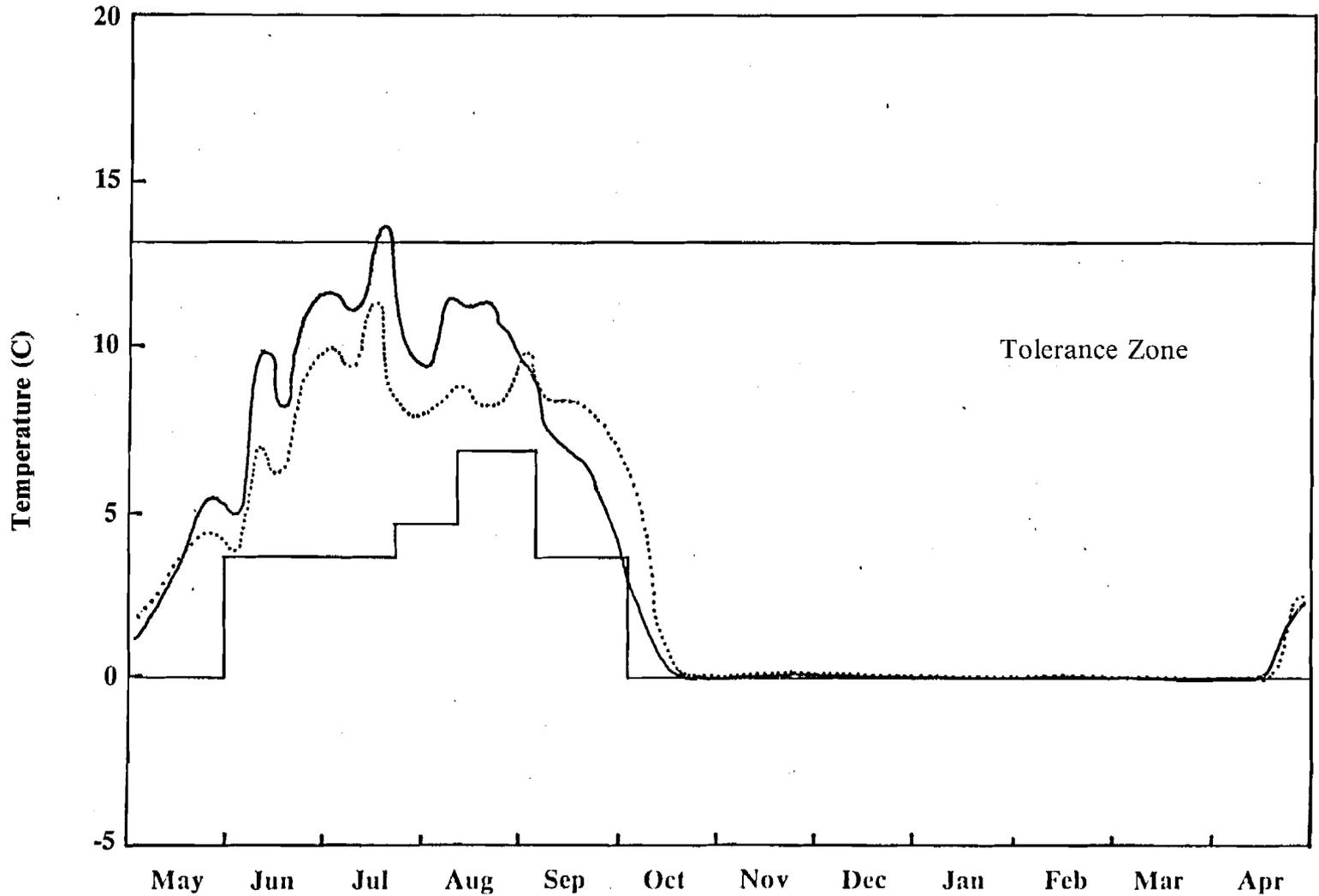


PINK SALMON



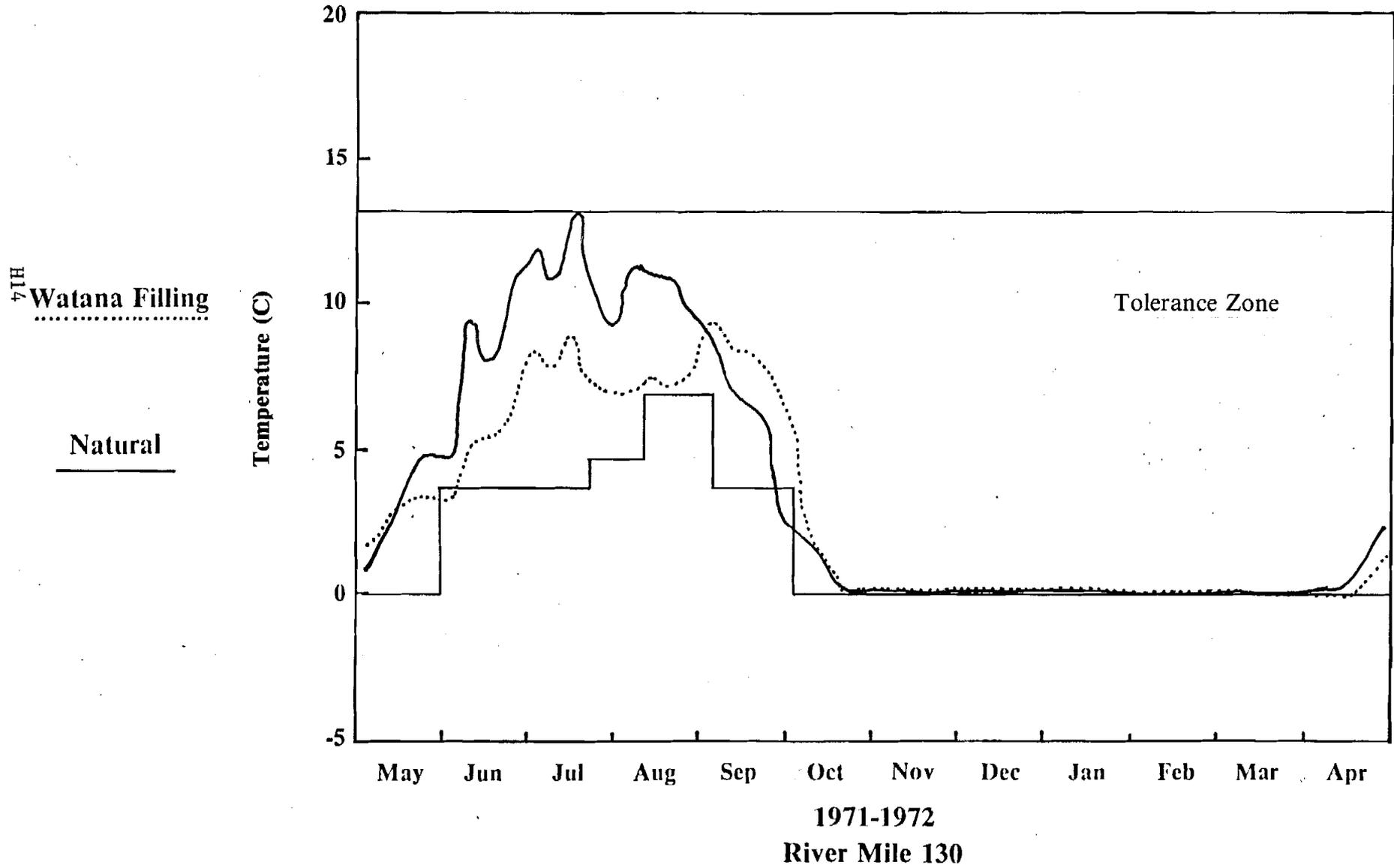
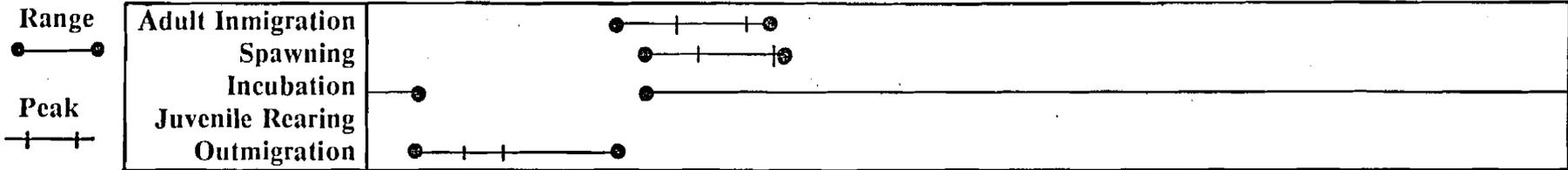
^{H13}
 Watana Filling

Natural

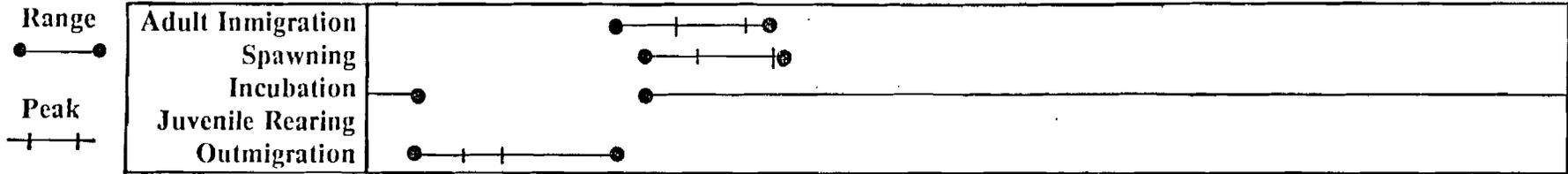


1971-1972
River Mile 100

PINK SALMON

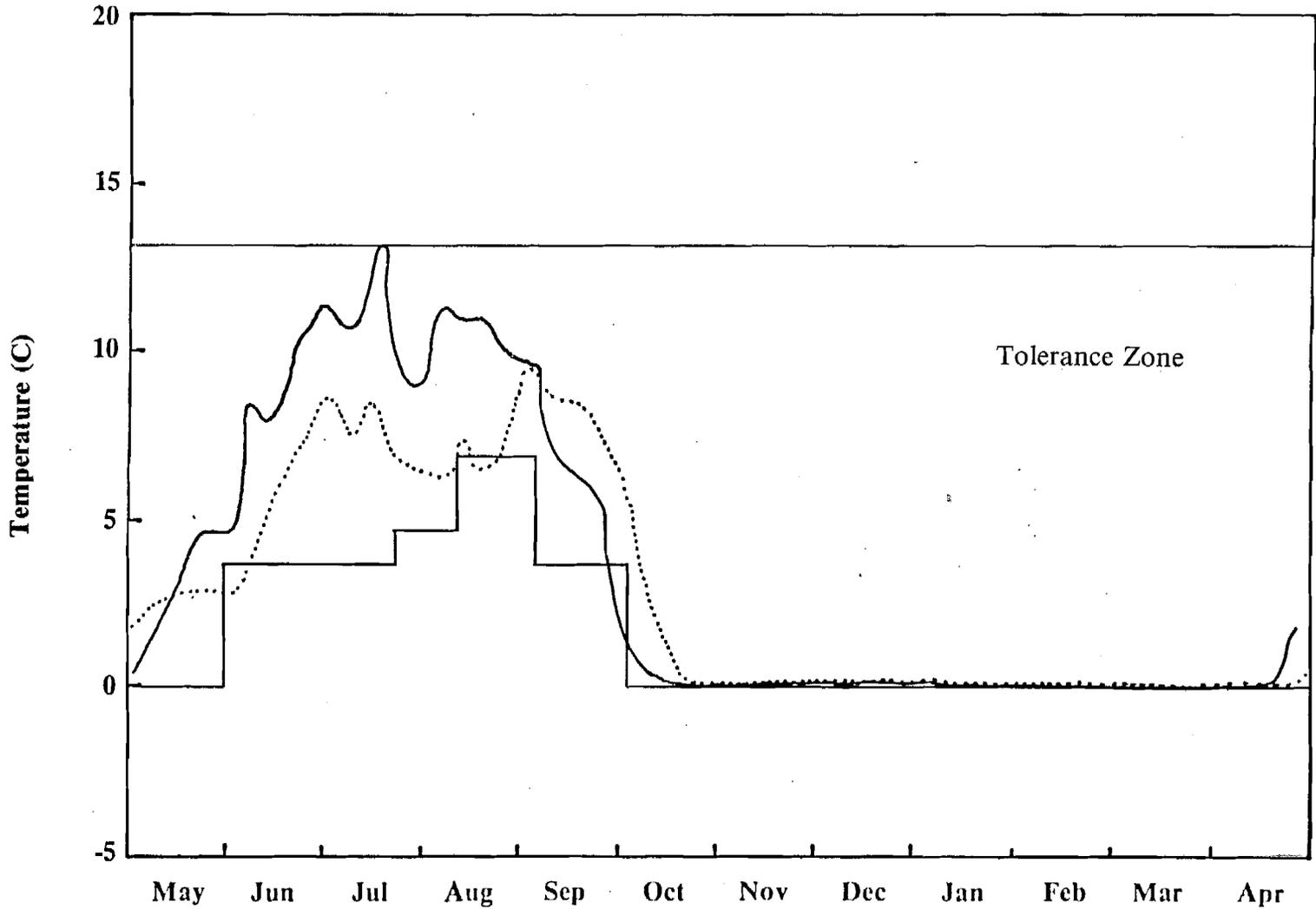


PINK SALMON



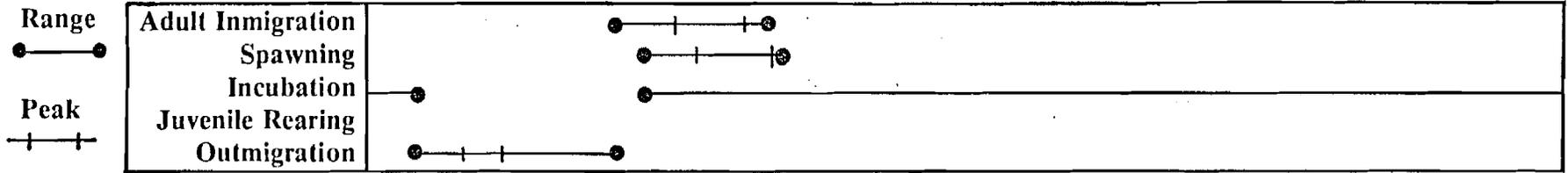
515
Watana Filling

Natural



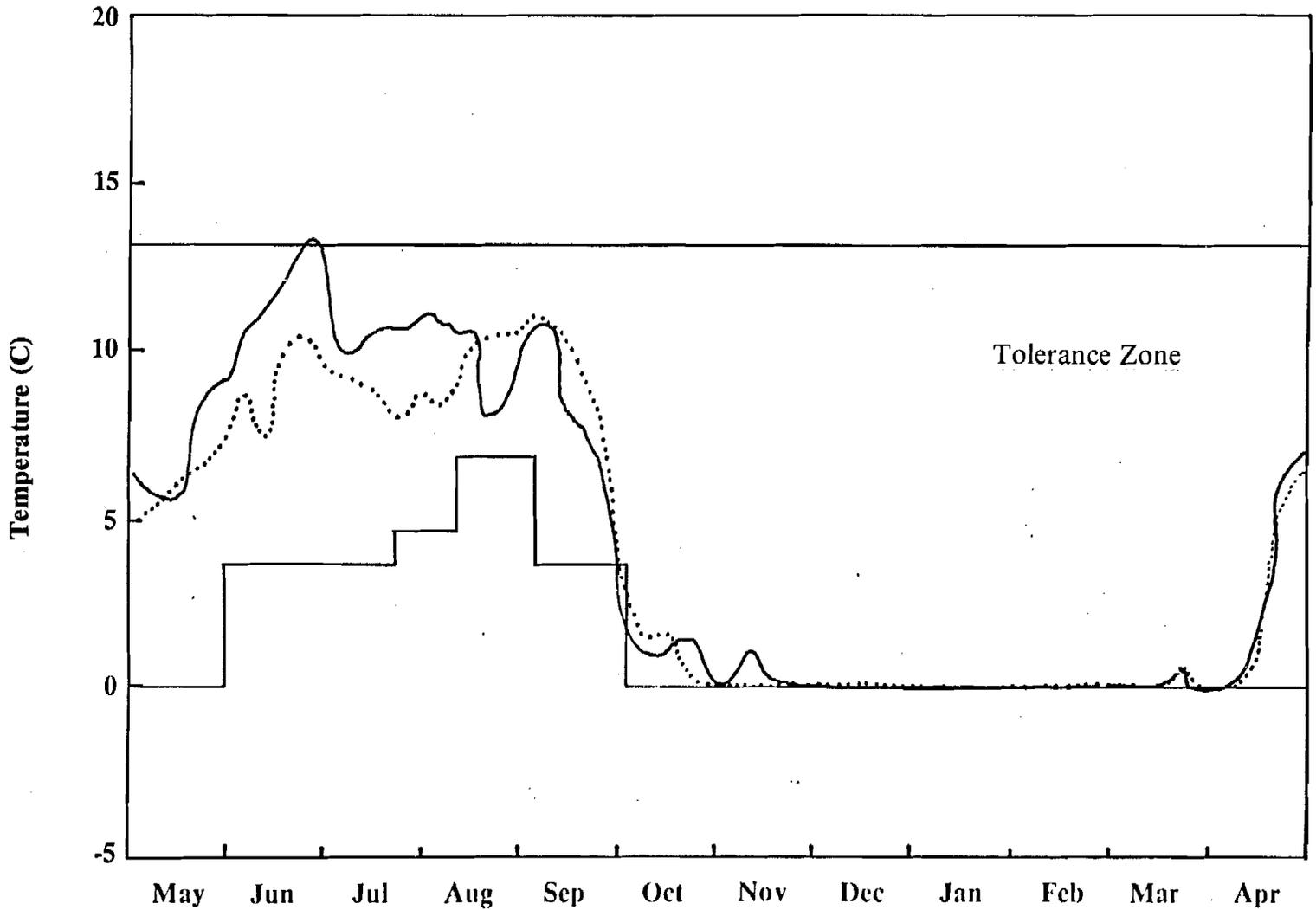
1971-1972
 River Mile 150

PINK SALMON



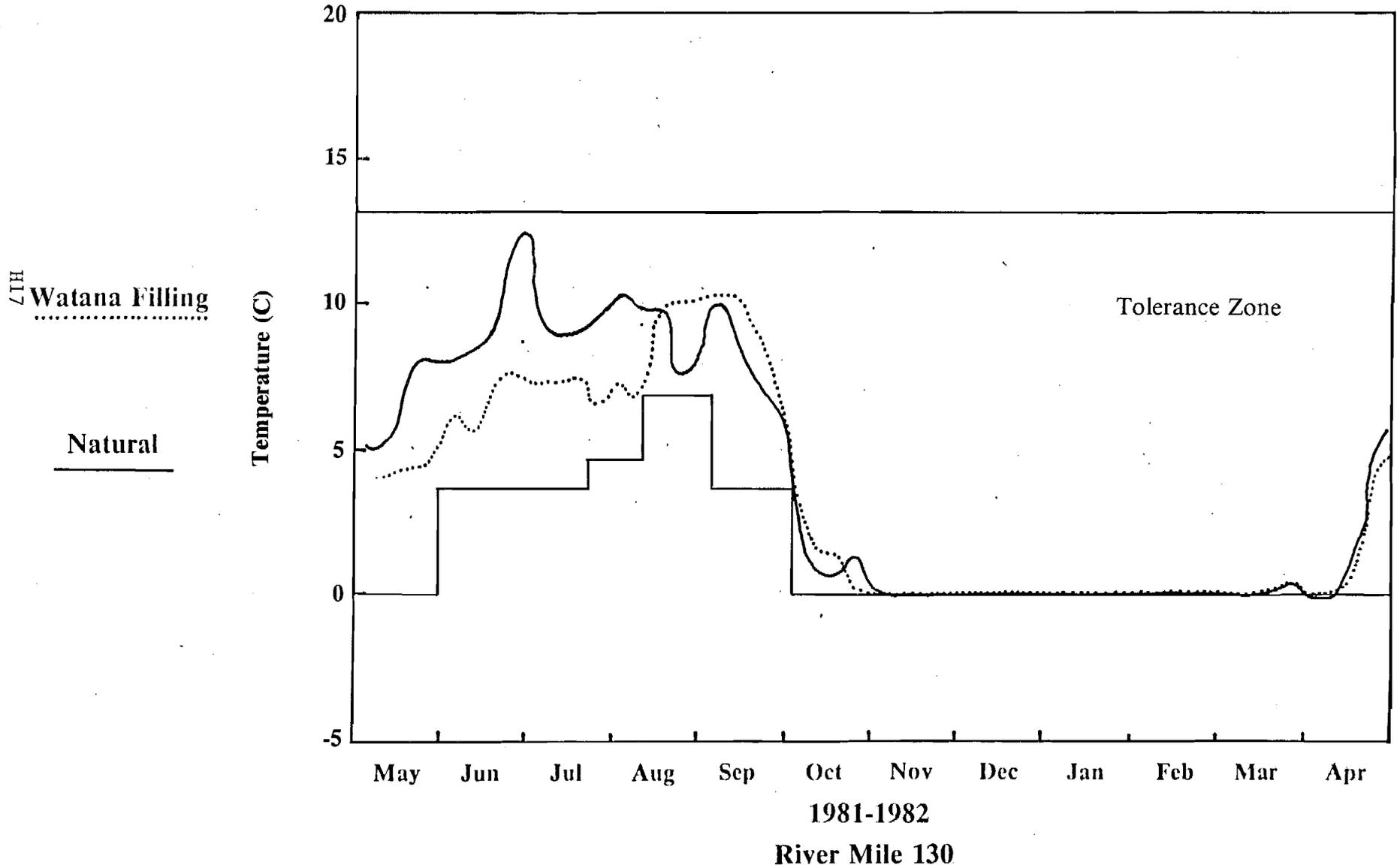
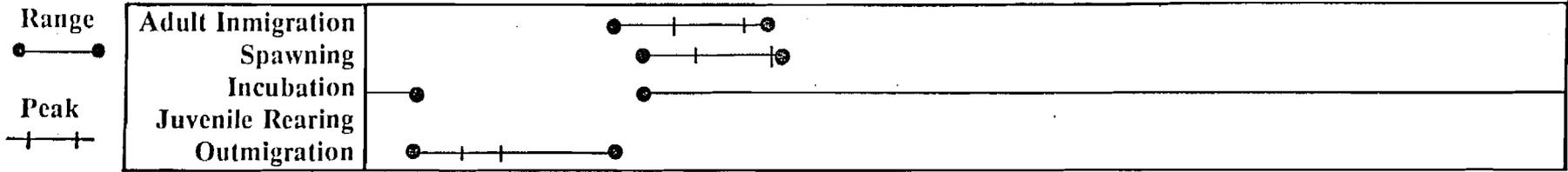
9TH Watana Filling

Natural



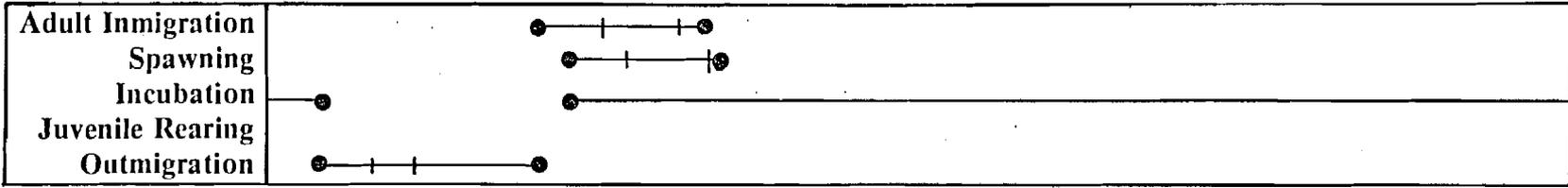
1981-1982
River Mile 100

PINK SALMON

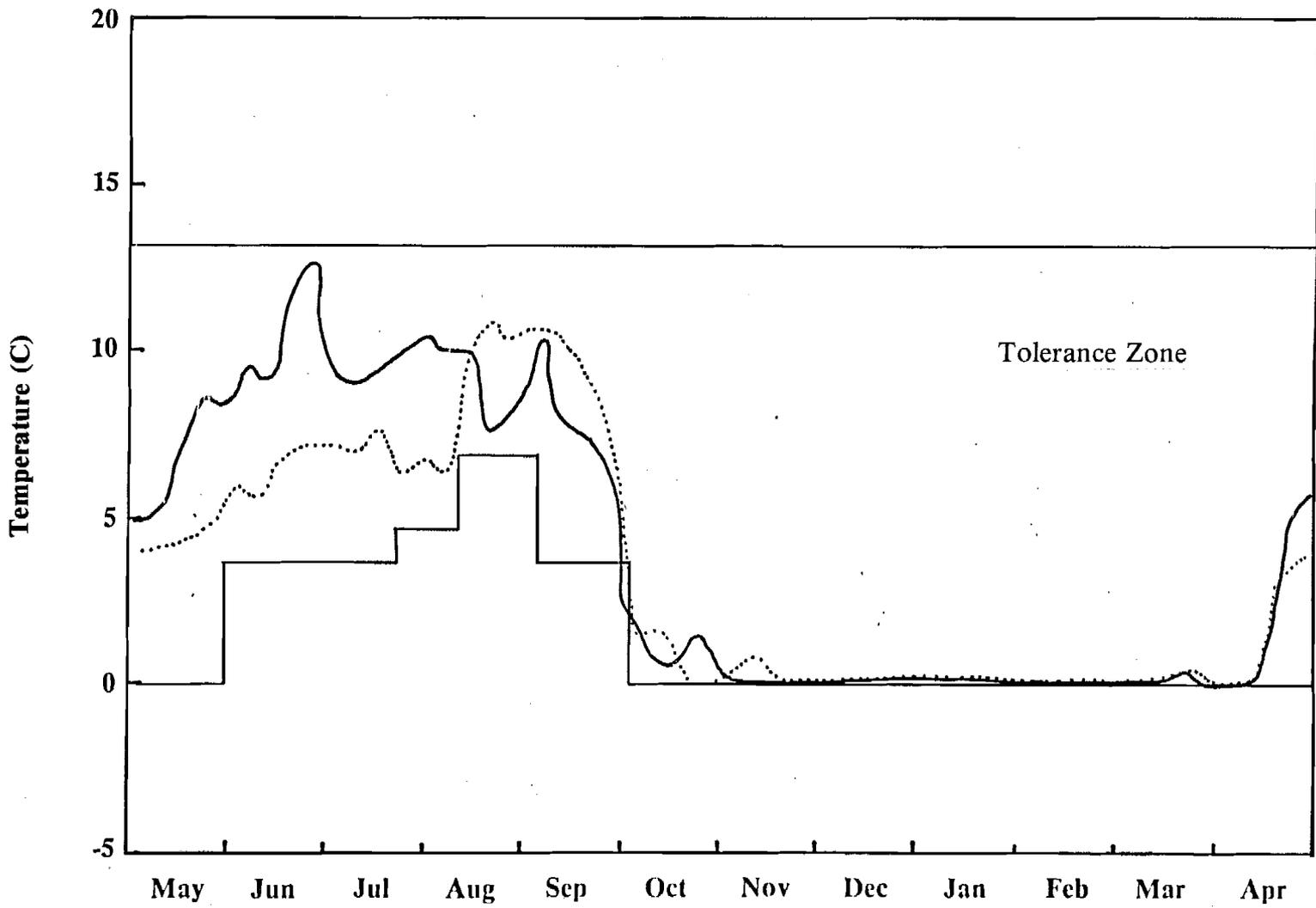


PINK SALMON

Range
●—●
Peak
+—+

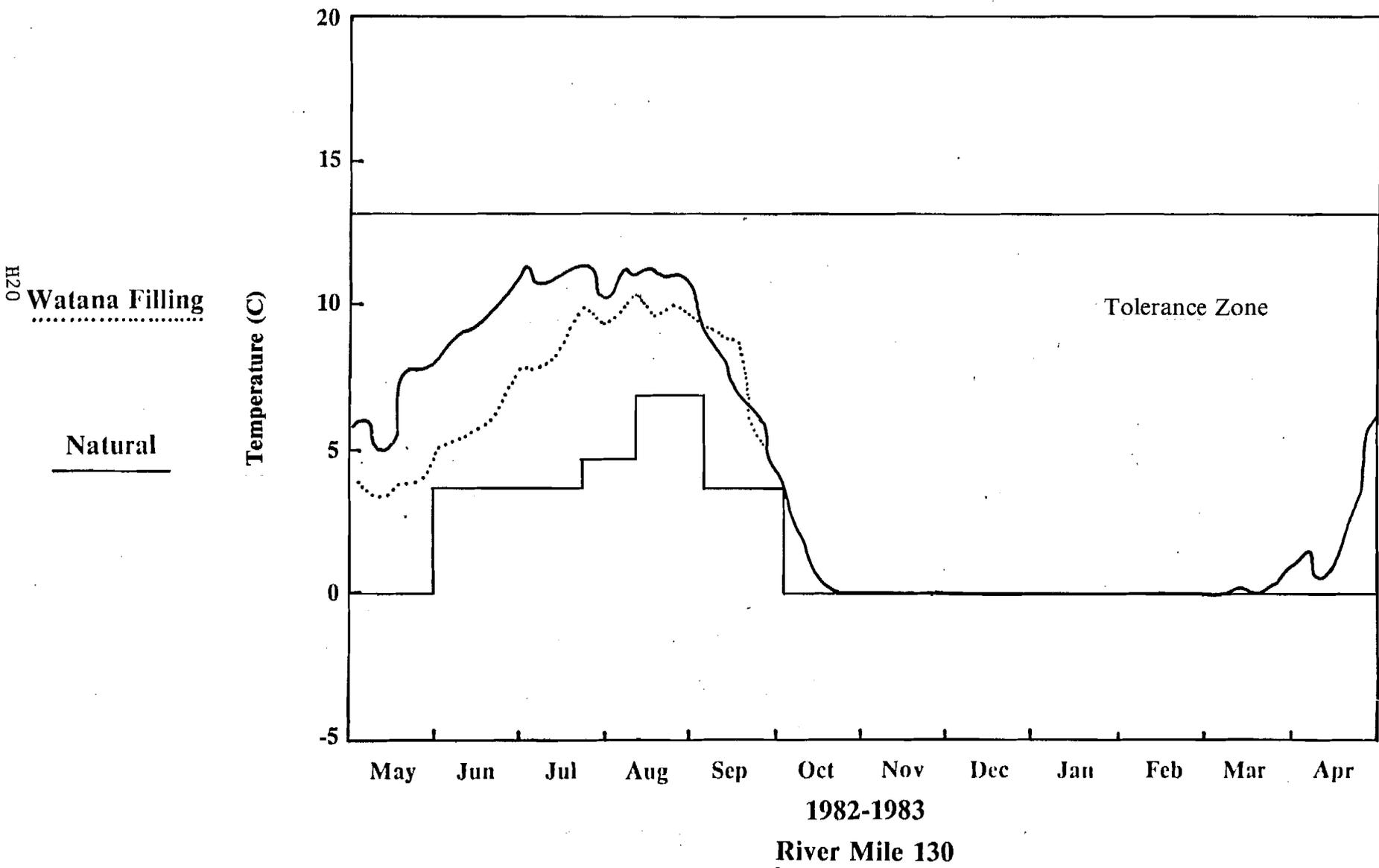
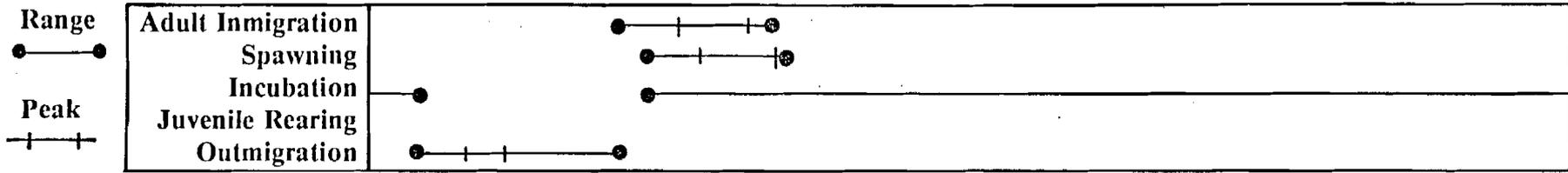


8TH Watana Filling
.....
Natural

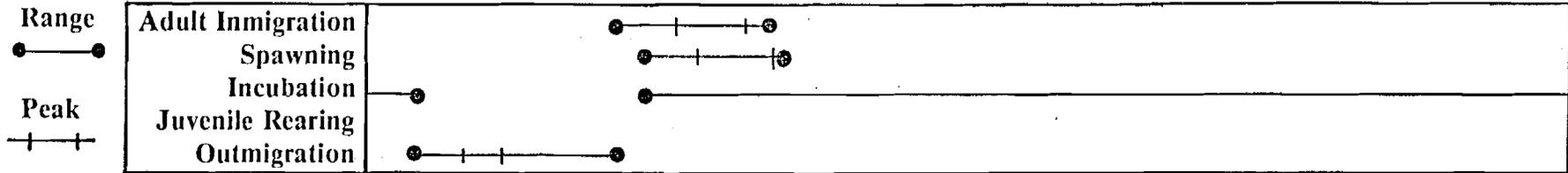


1981-1982
River Mile 150

PINK SALMON

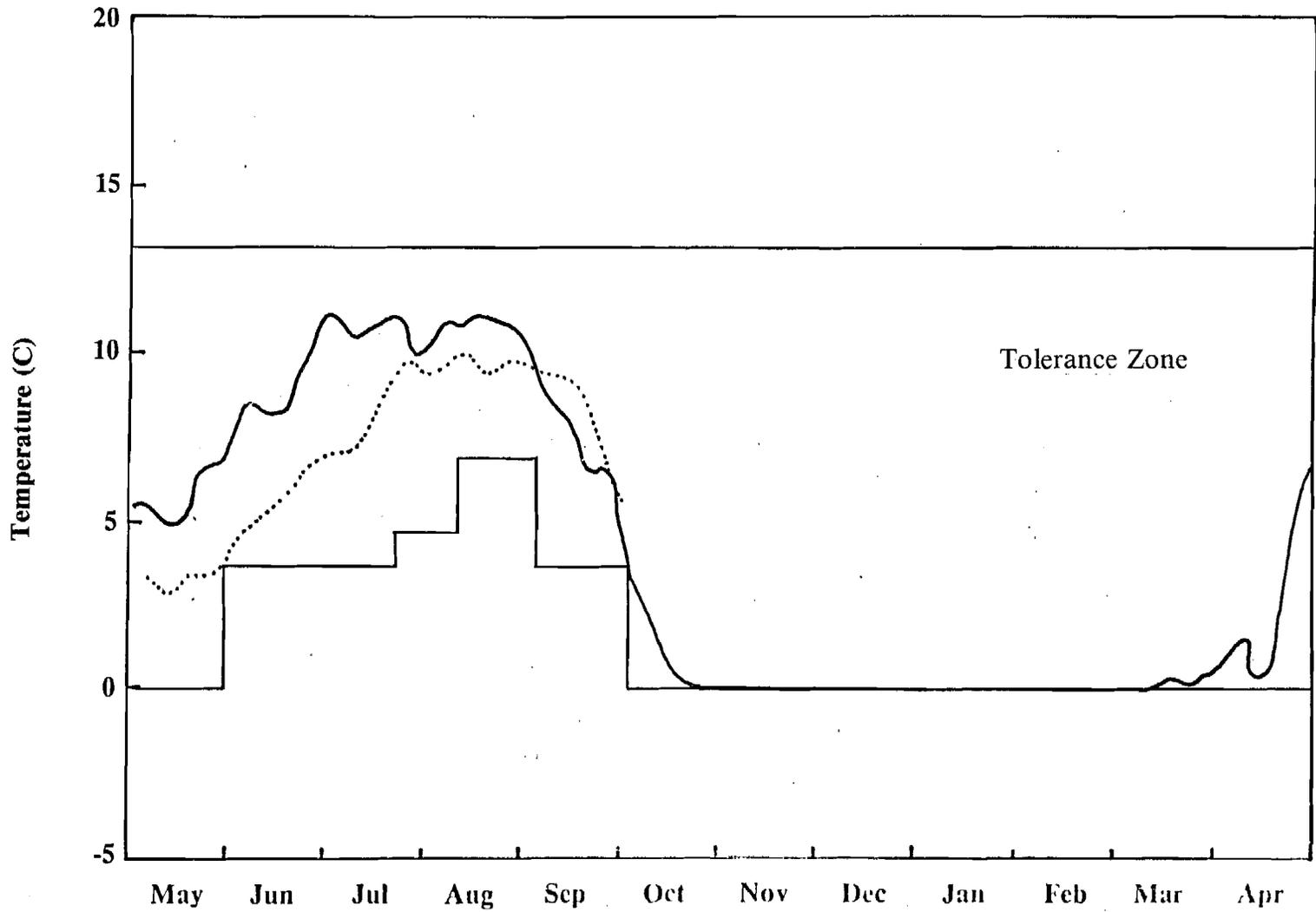


PINK SALMON



H2I
Watana Filling

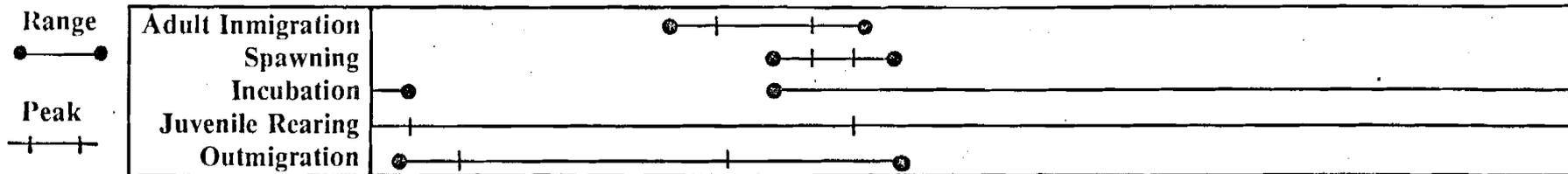
Natural



1982-1983

River Mile 150

COHO SALMON

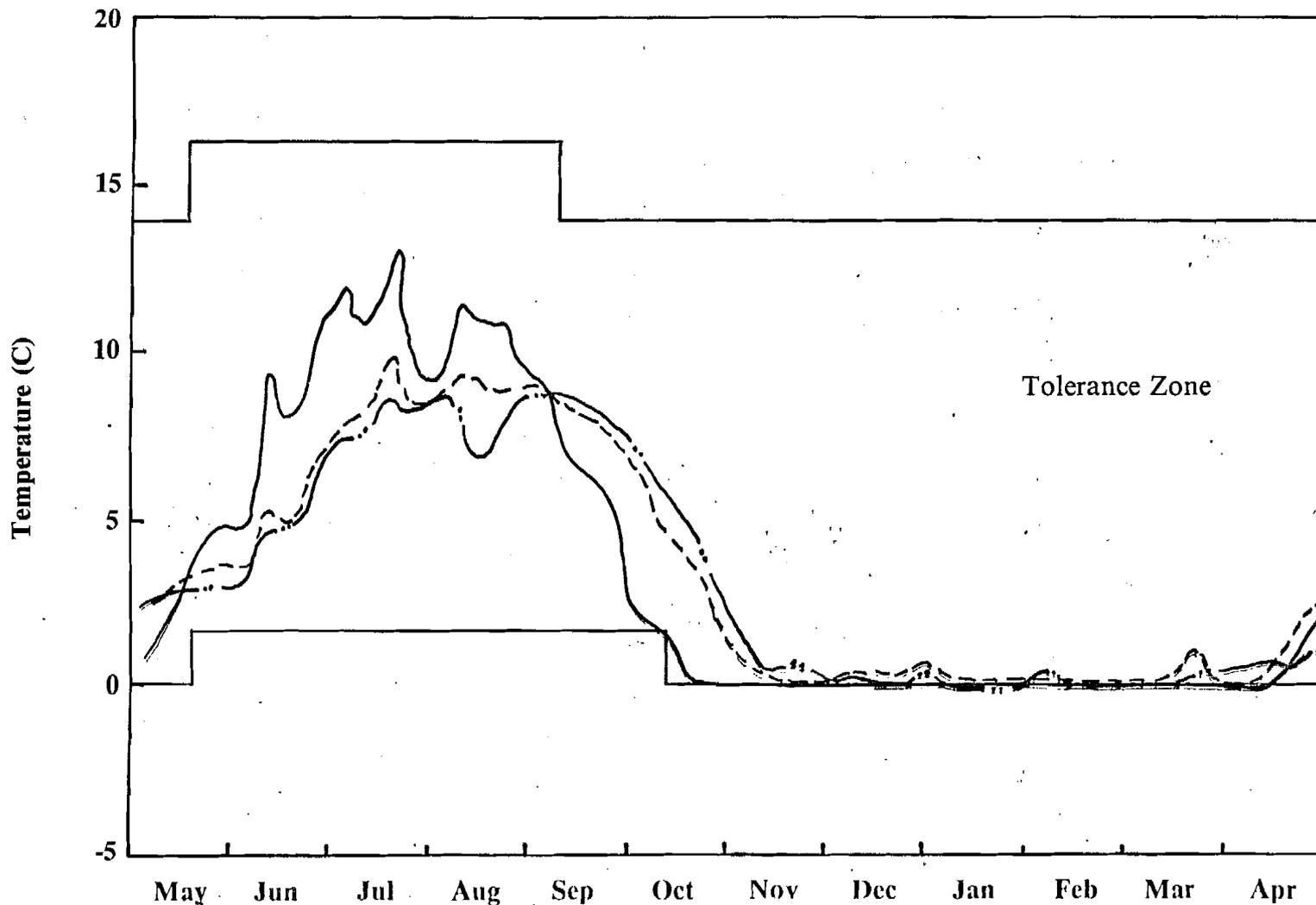


H23

Devil Canyon
2002

Watana
1996

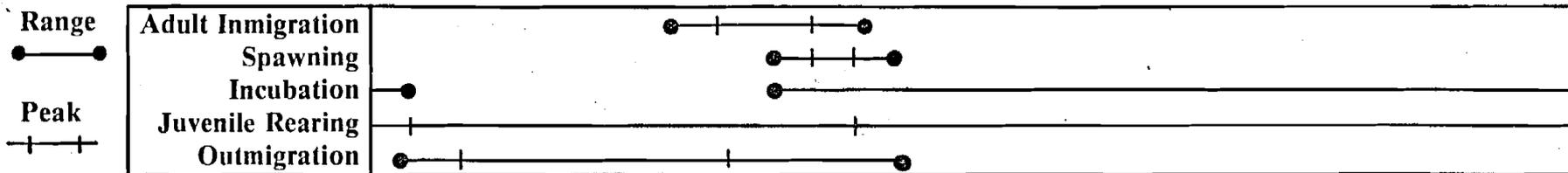
Natural



1971-1972

River Mile 130

COHO SALMON

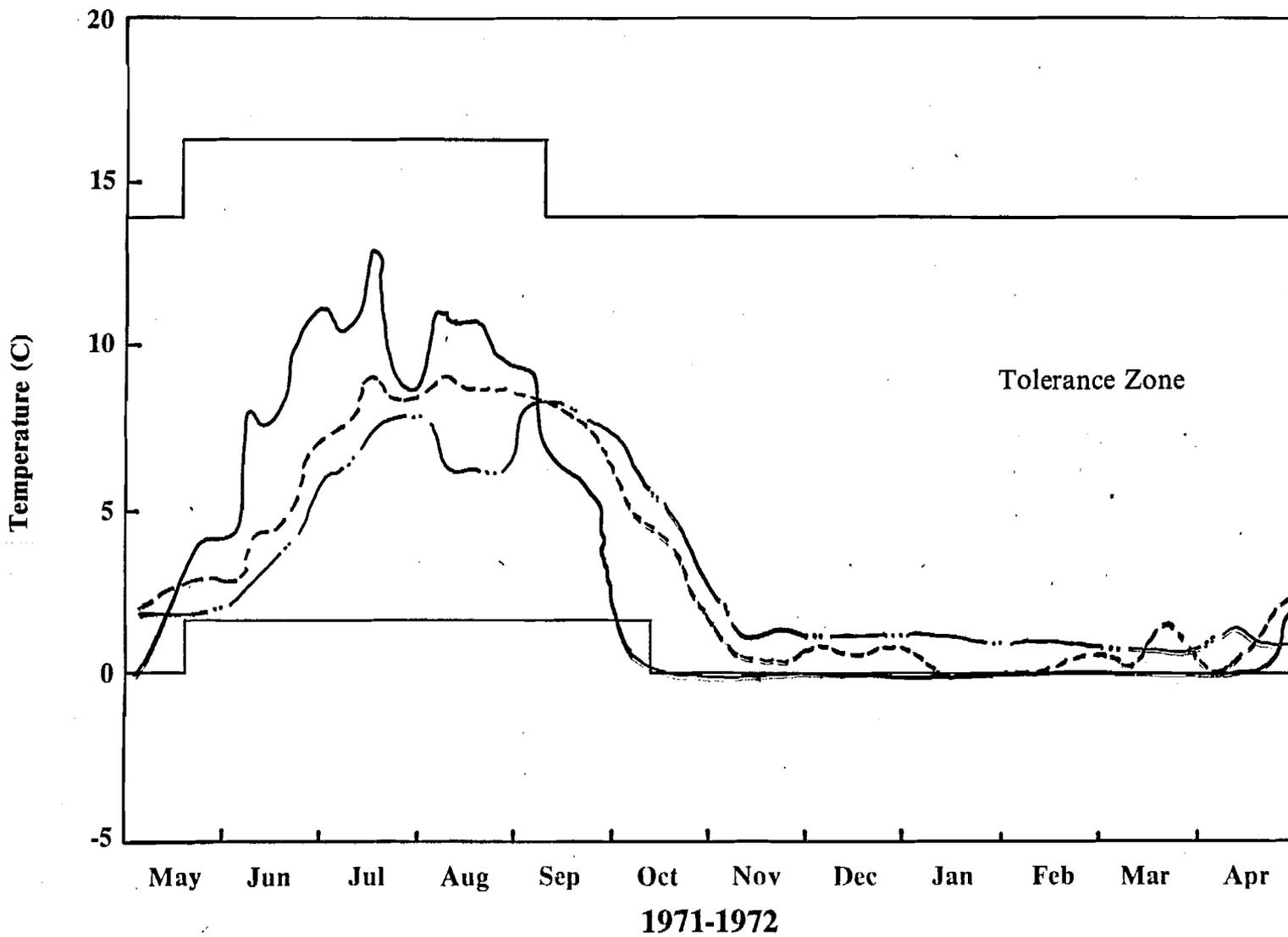


H24

Devil Canyon
2002

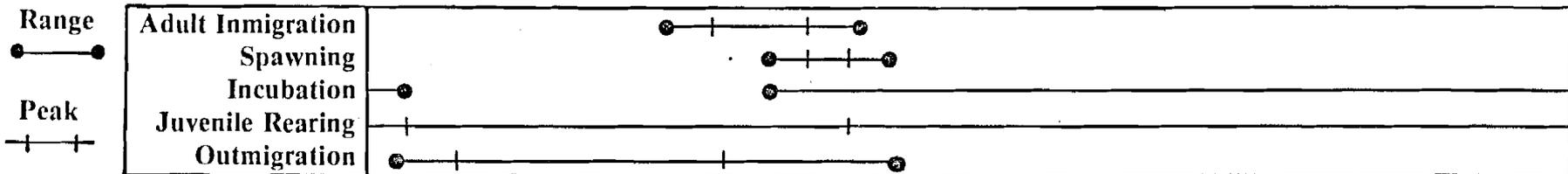
Watana
1996

Natural



River Mile 150

COHO SALMON

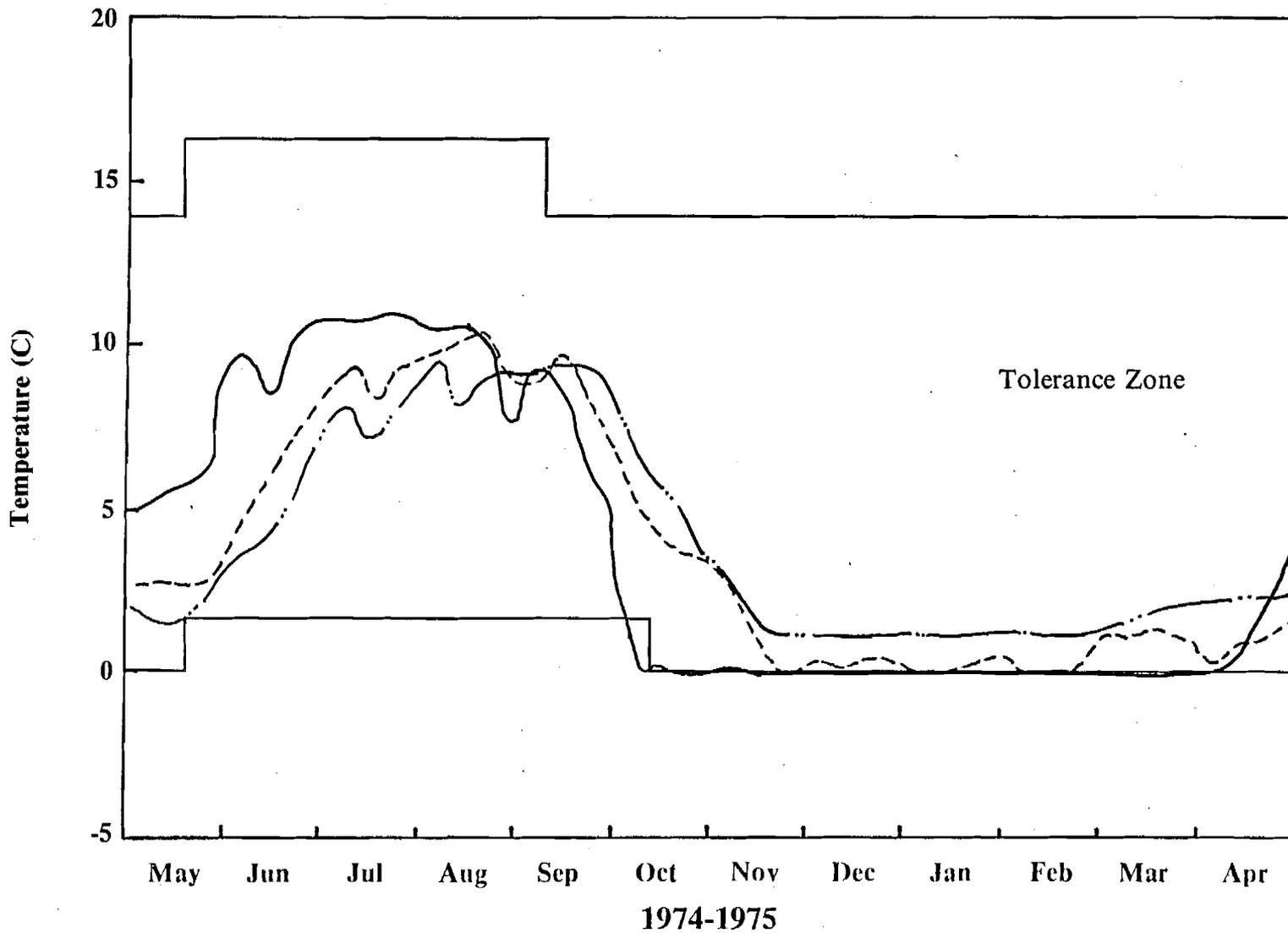


H27

Devil Canyon
2002

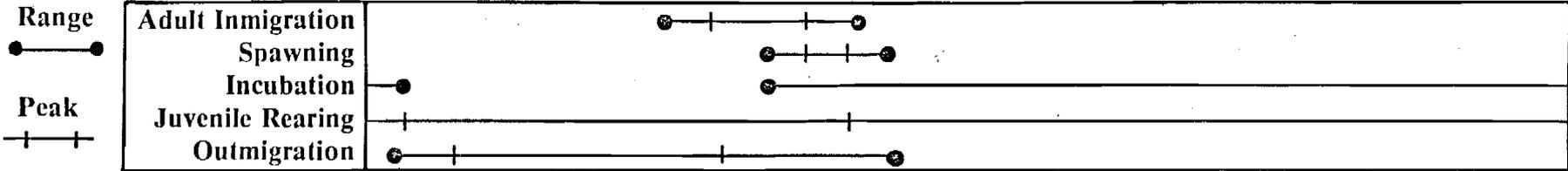
Watana
1996

Natural



River Mile 150

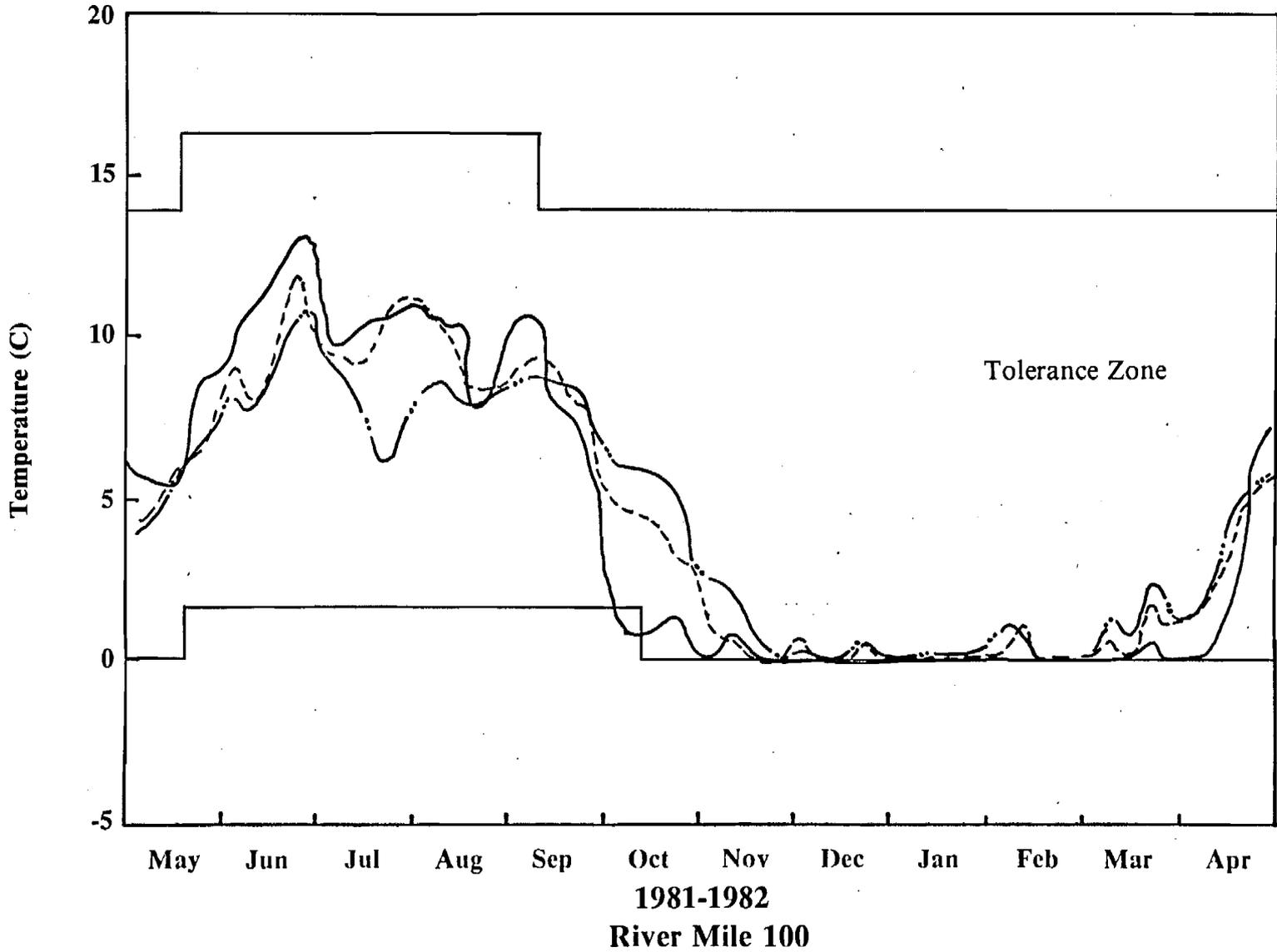
COHO SALMON



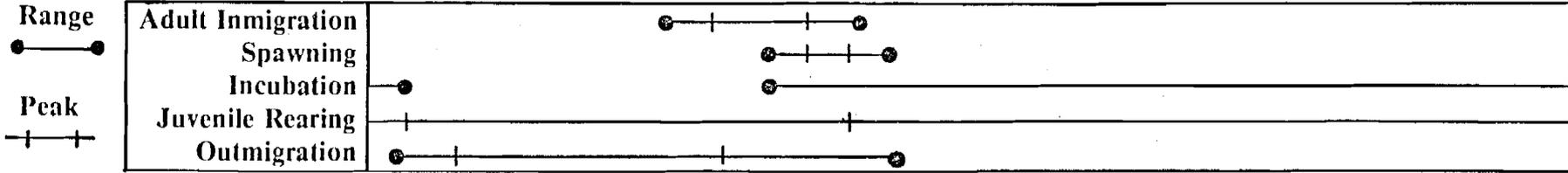
H28
Devil Canyon
2002

Watana
1996

Natural



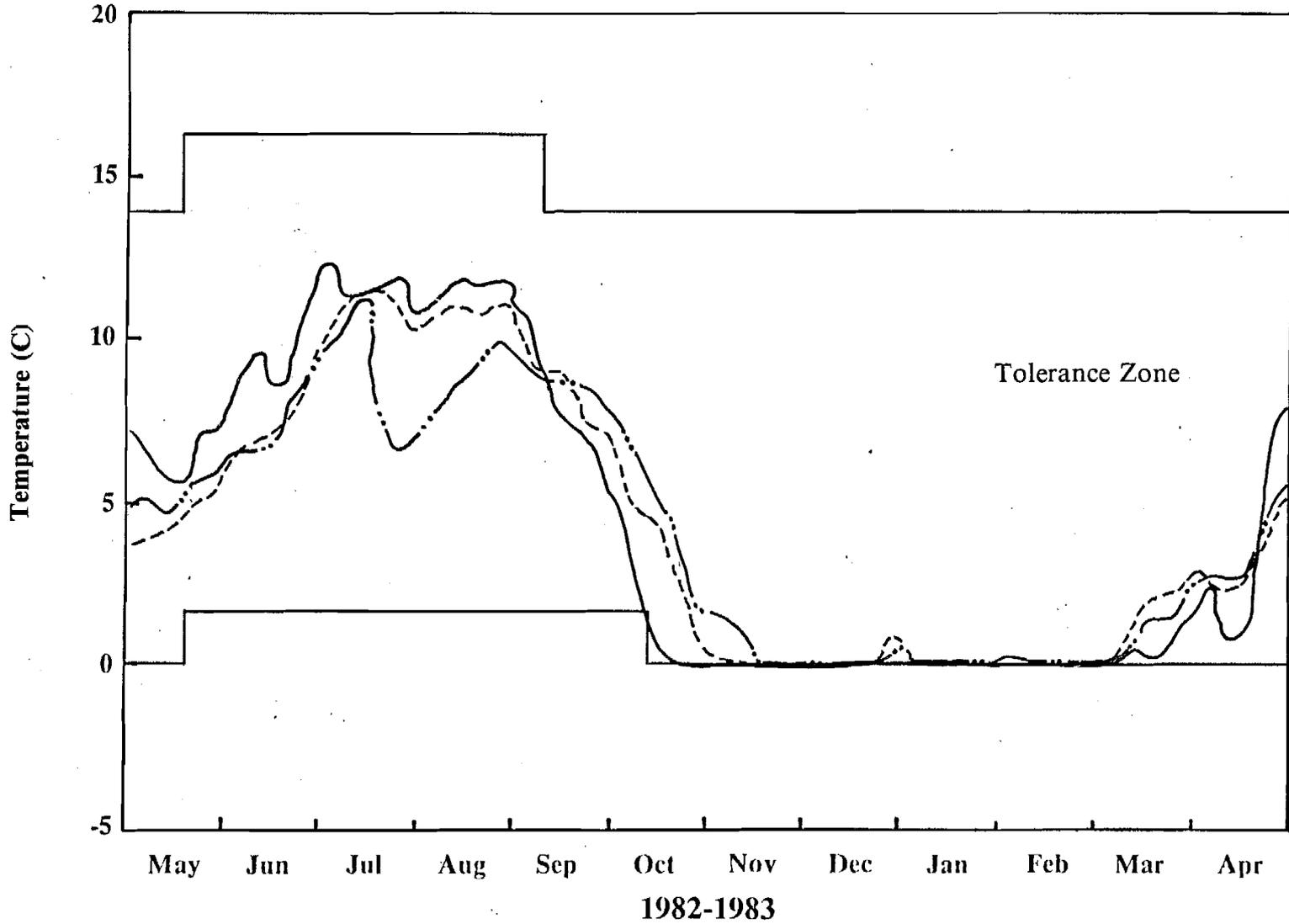
COHO SALMON



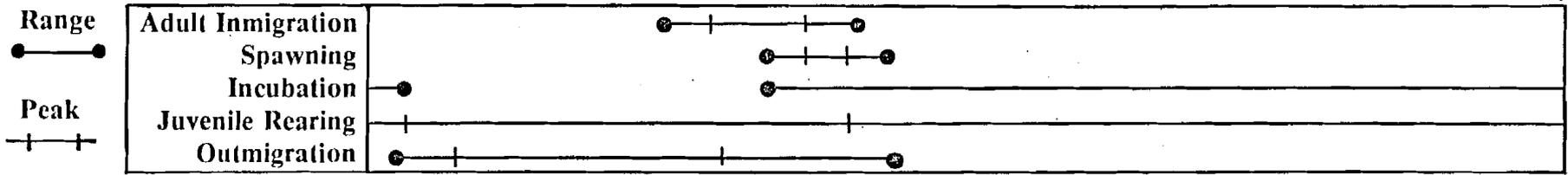
131 Devil Canyon
2002

Watana
1996

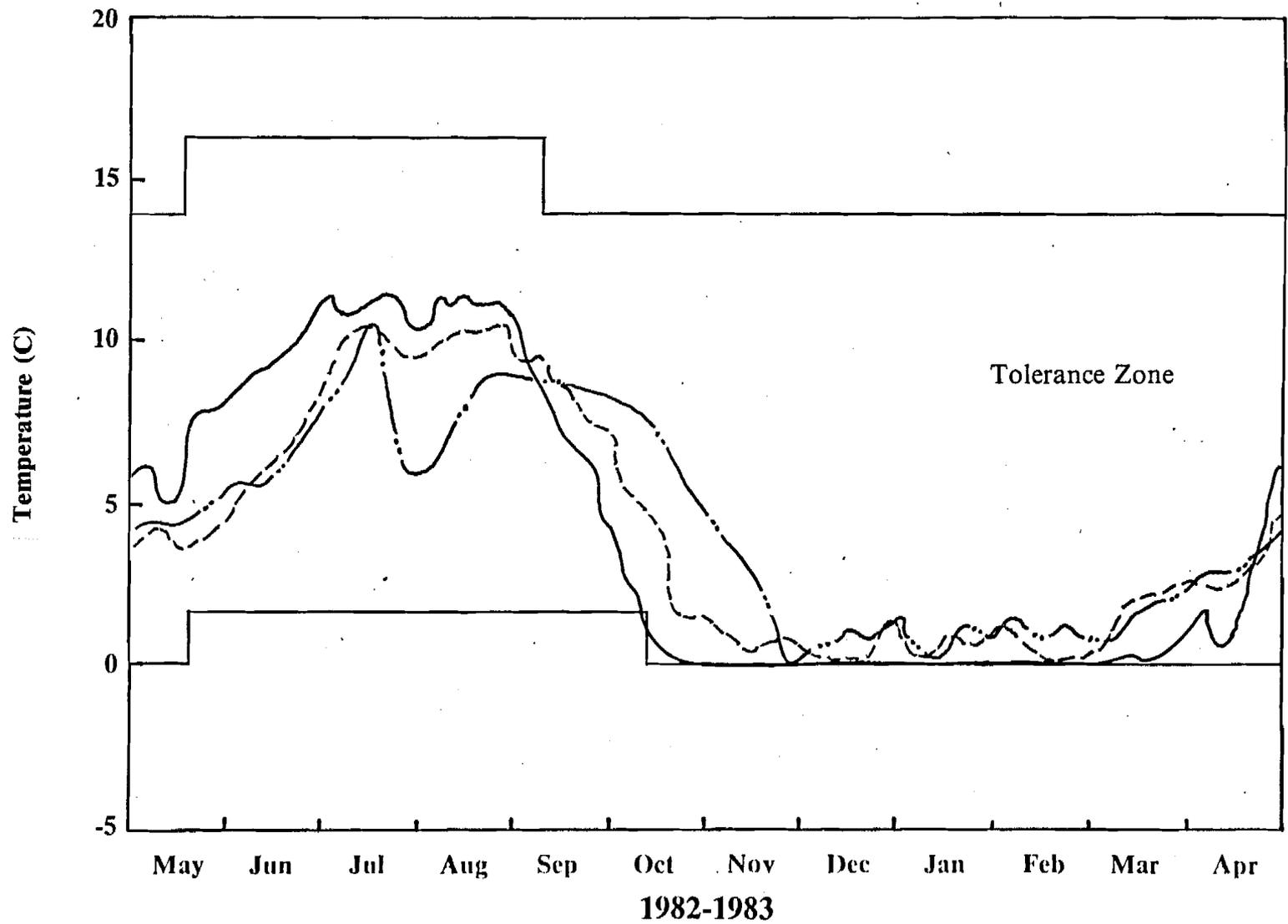
Natural



COHO SALMON

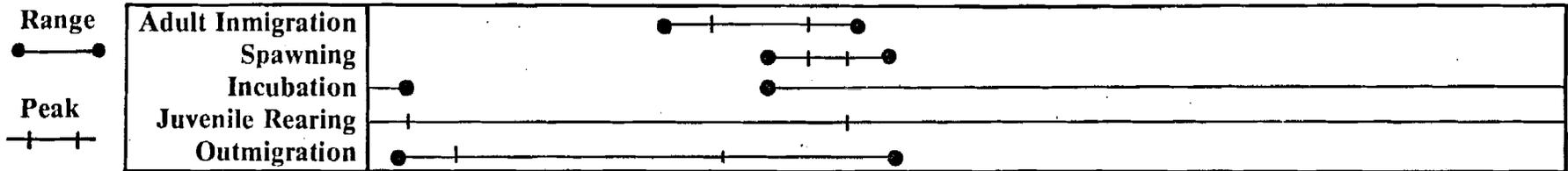


H32
Devil Canyon
2002
 —+—+—
Watana
1996
 - - - -
Natural
 —+—+—

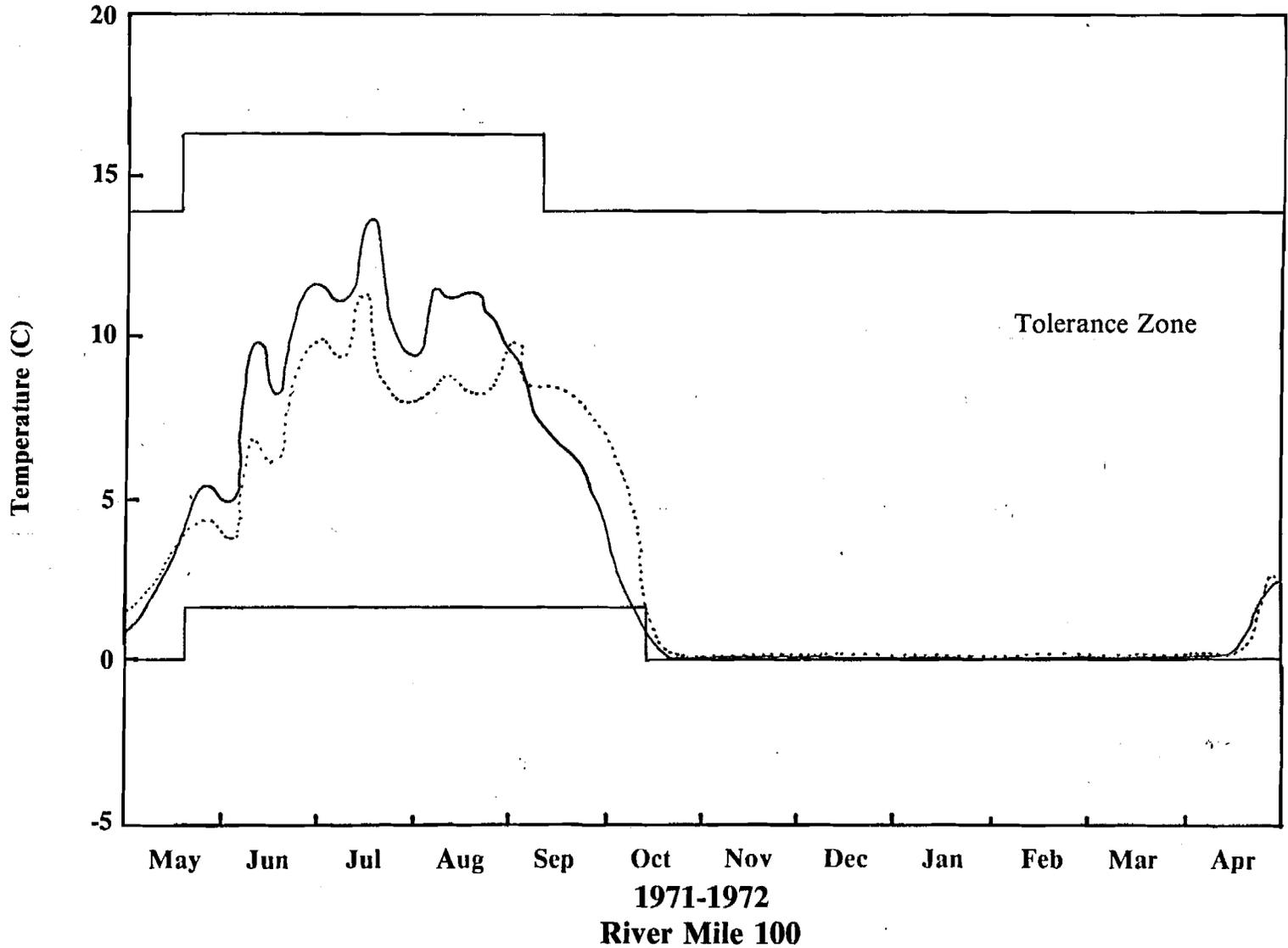


River Mile 130

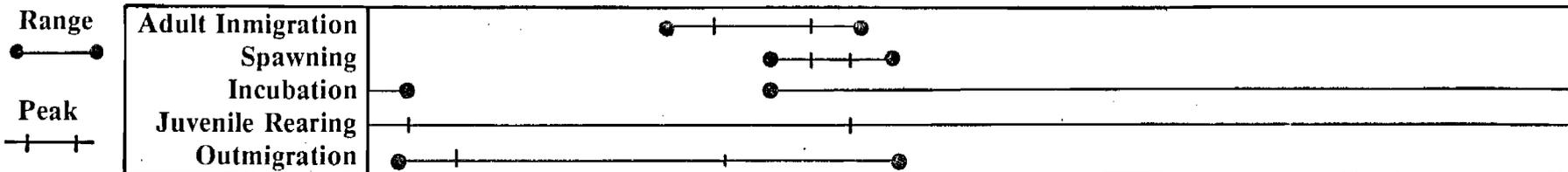
COHO SALMON



³⁴H
Watana Filling
Natural

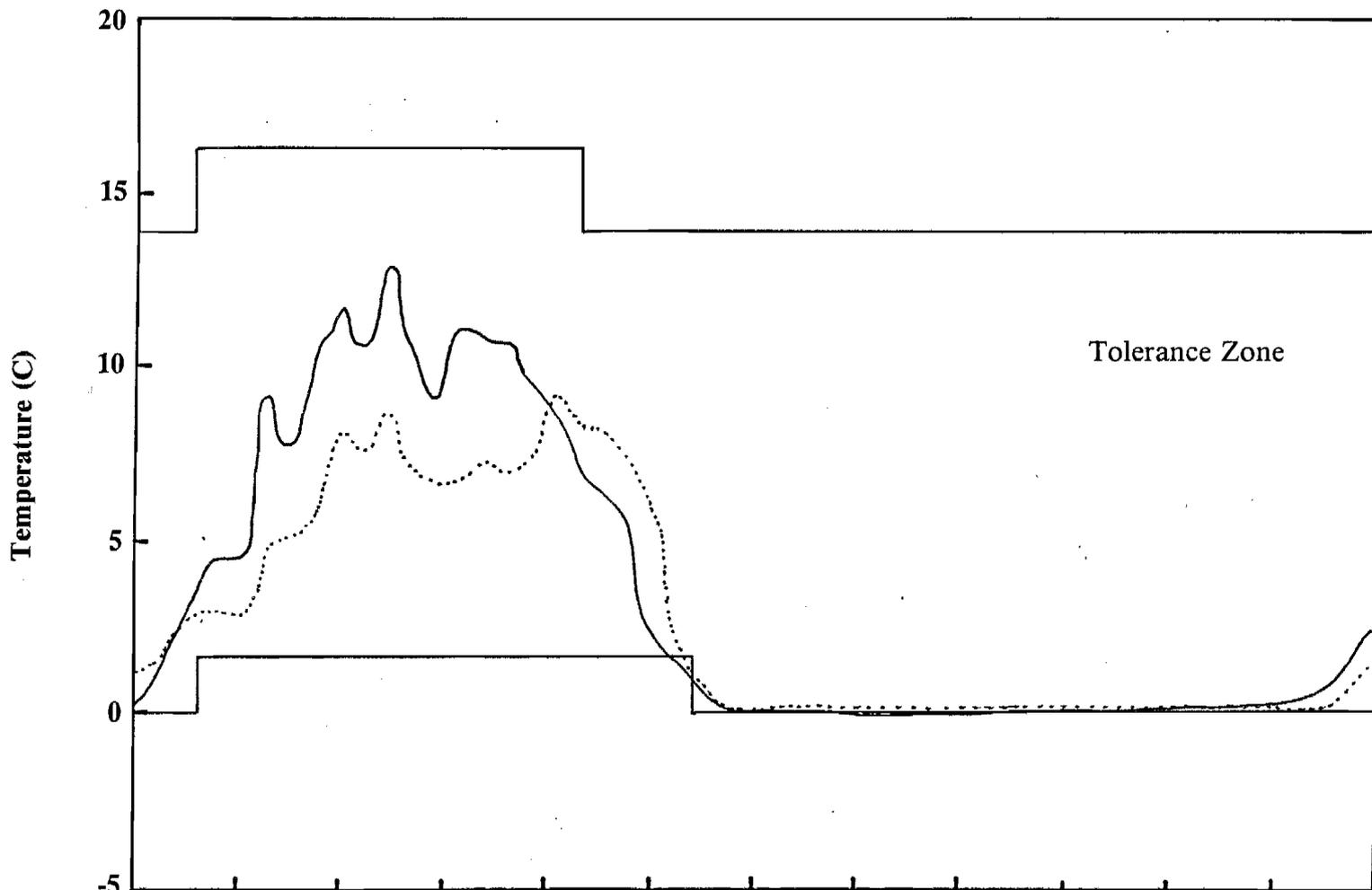


COHO SALMON



H35
Watana Filling

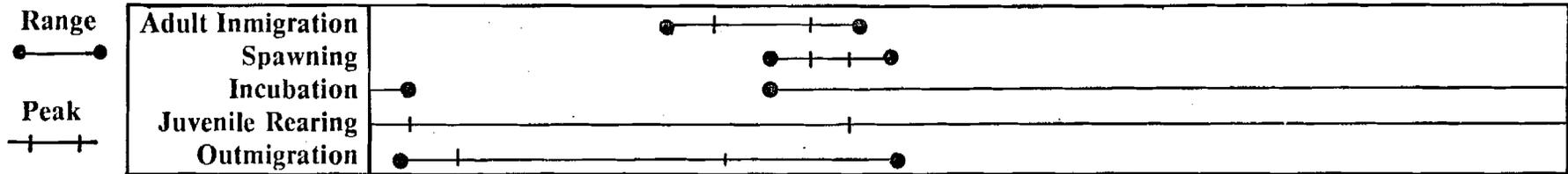
Natural



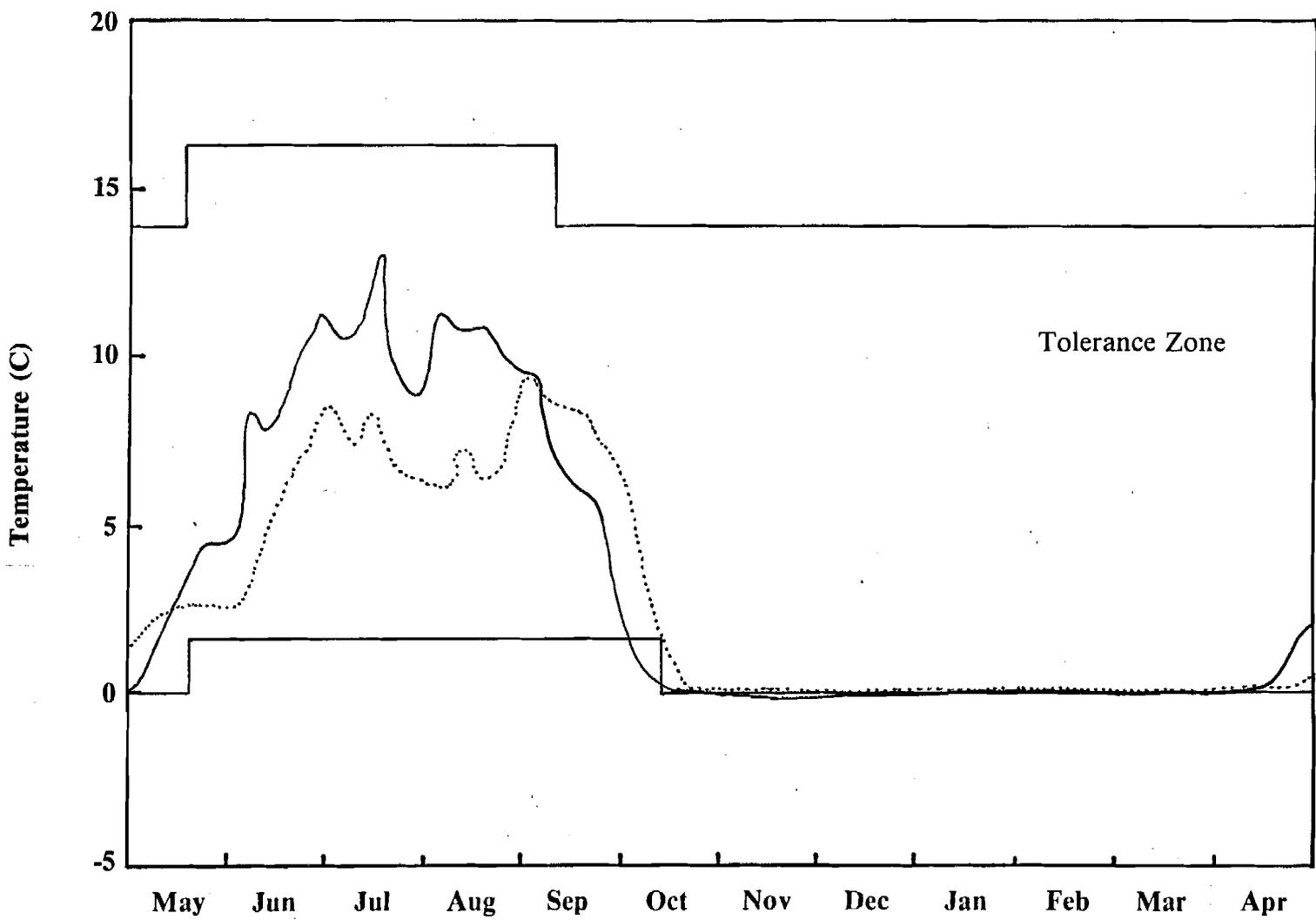
May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr

1971-1972
River Mile 130

COHO SALMON

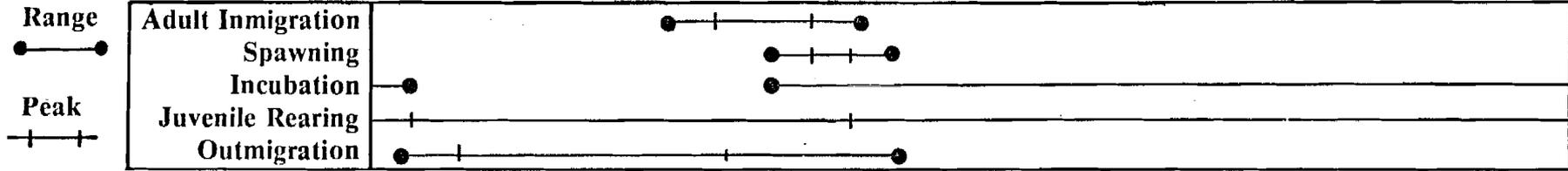


H36
Watana Filling
Natural



1971-1972
 River Mile 150

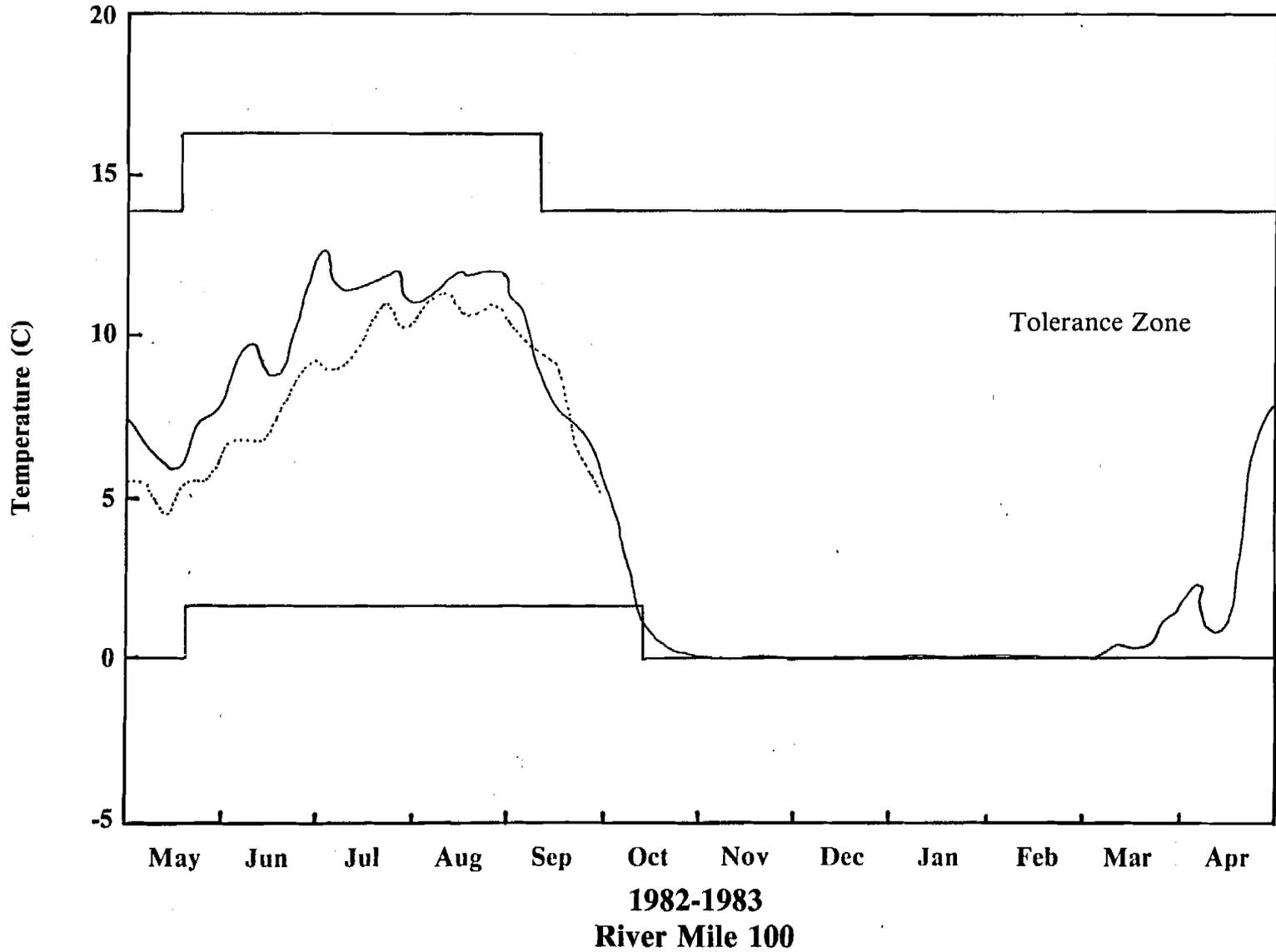
COHO SALMON



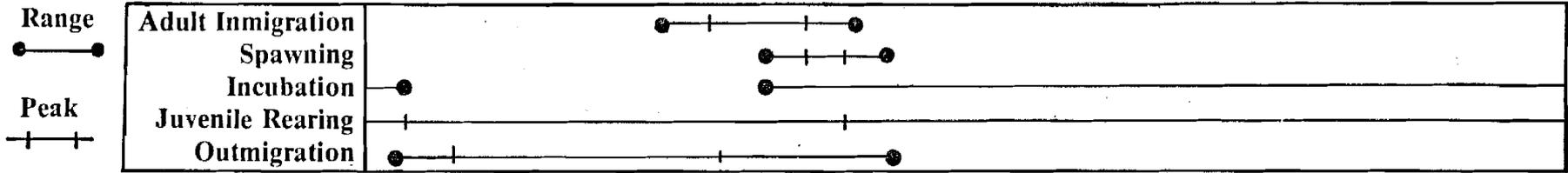
H4H

Watana Filling

Natural

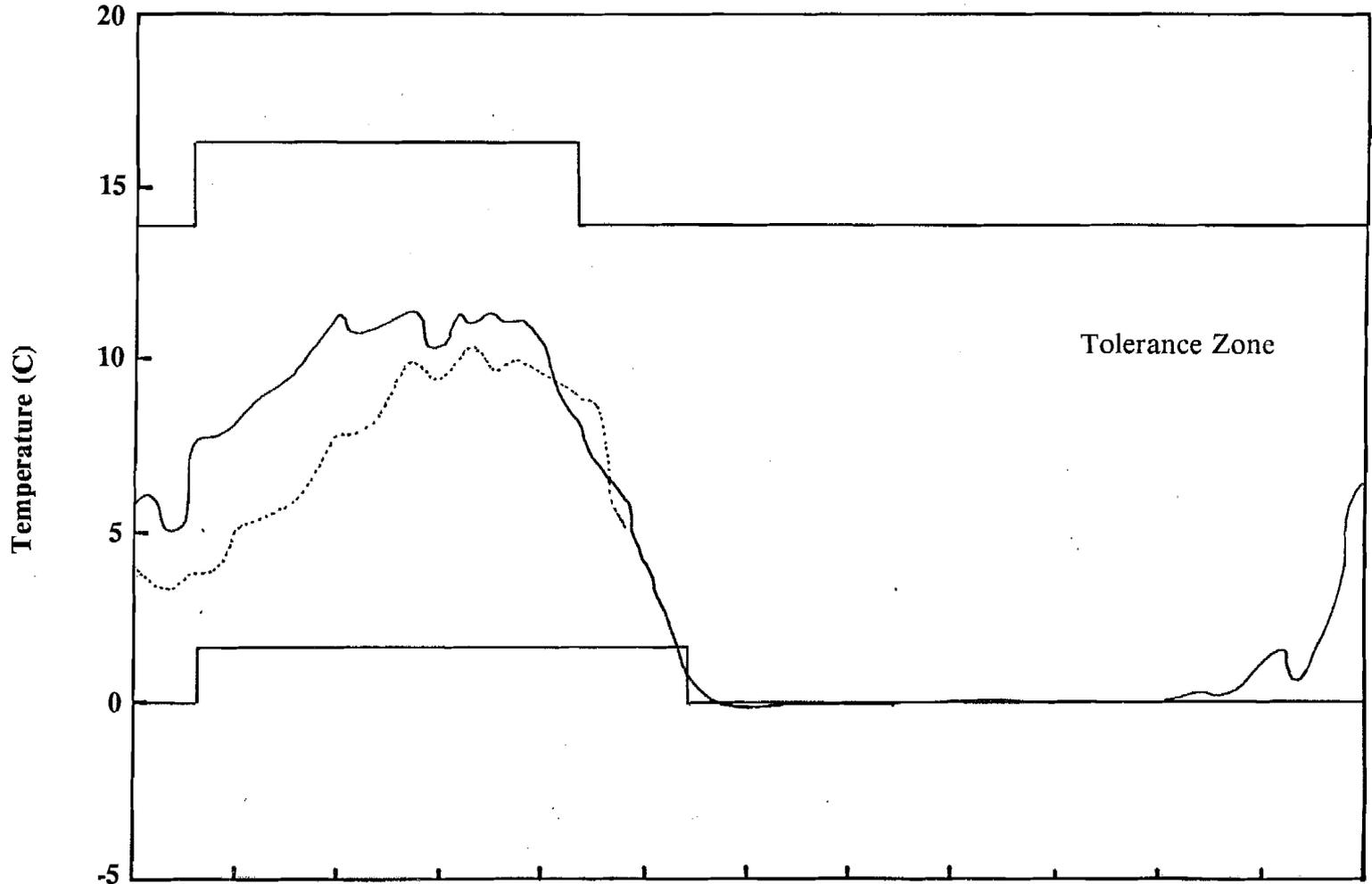


COHO SALMON



¹⁷H
Watana Filling

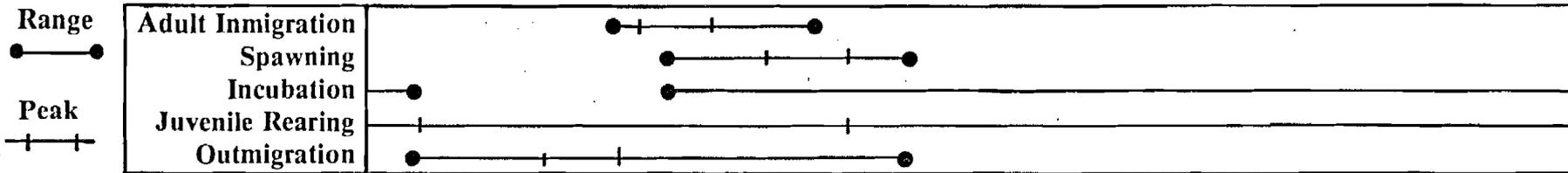
Natural



May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr

1982-1983
River Mile 130

SOCKEYE SALMON

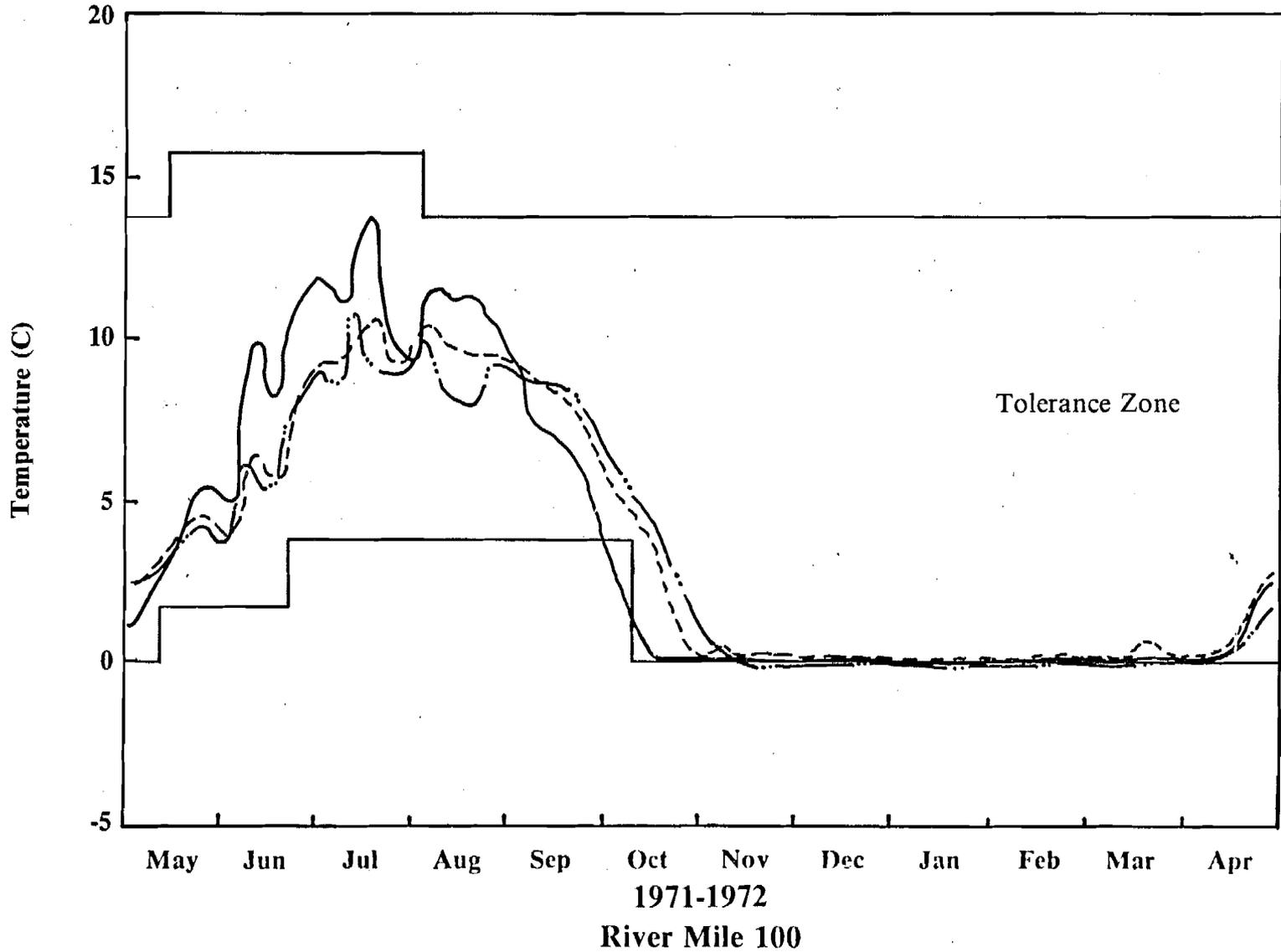


**Devil Canyon
2002**

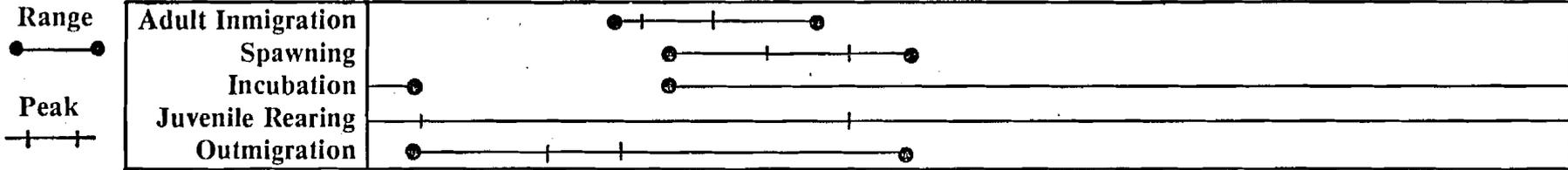
H43

**Watana
1996**

Natural



SOCKEYE SALMON

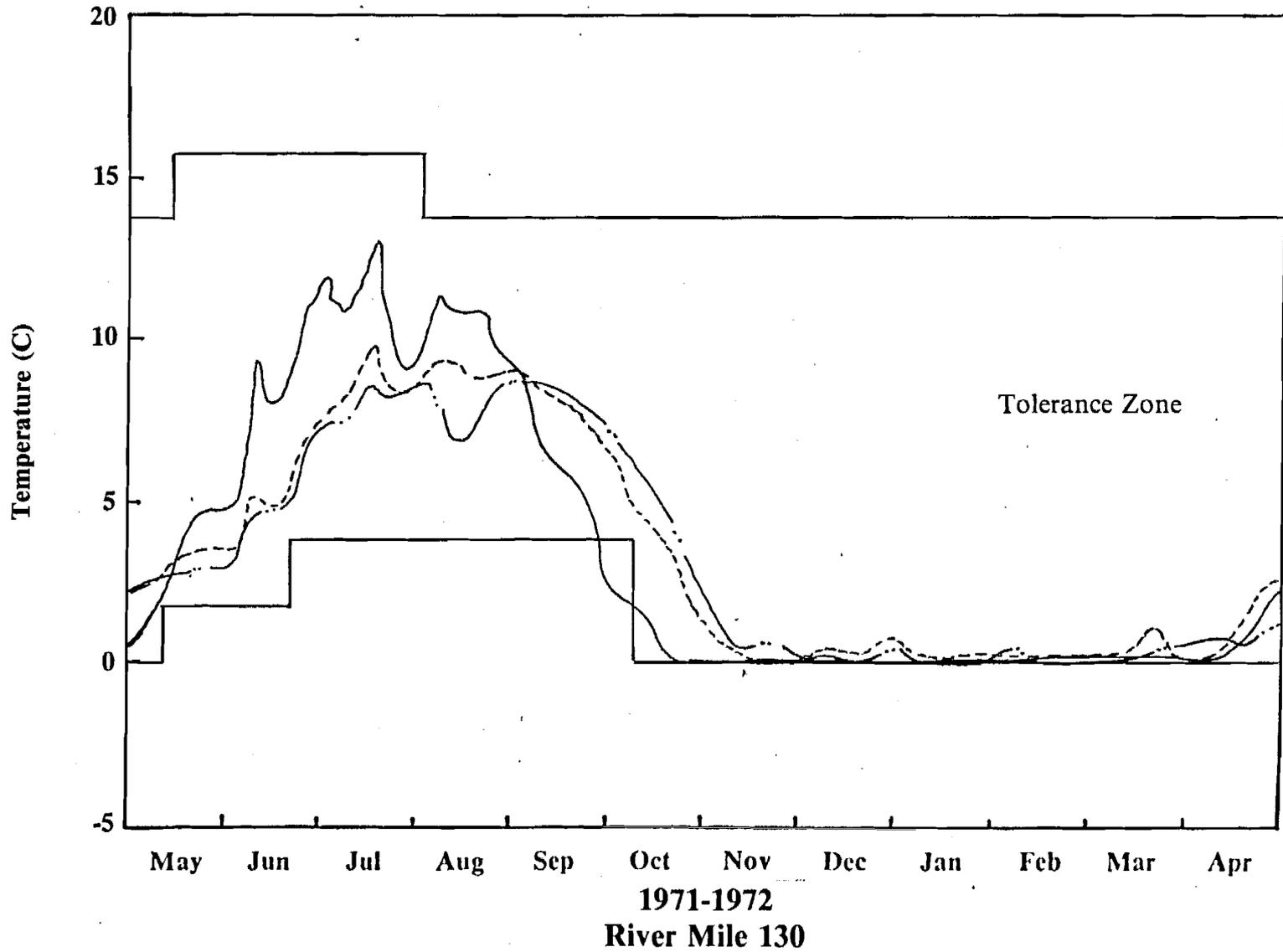


**Devil Canyon
2002**

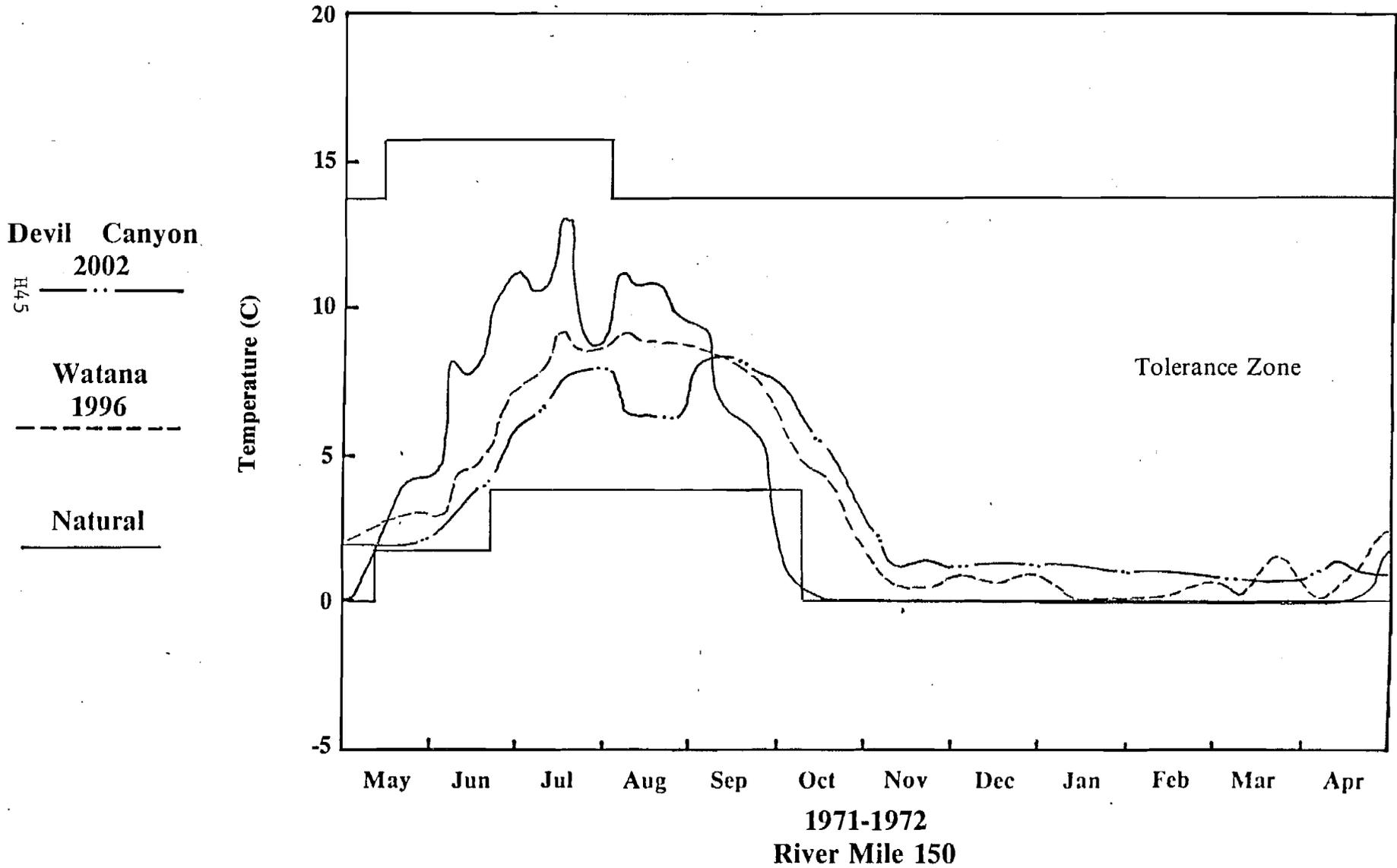
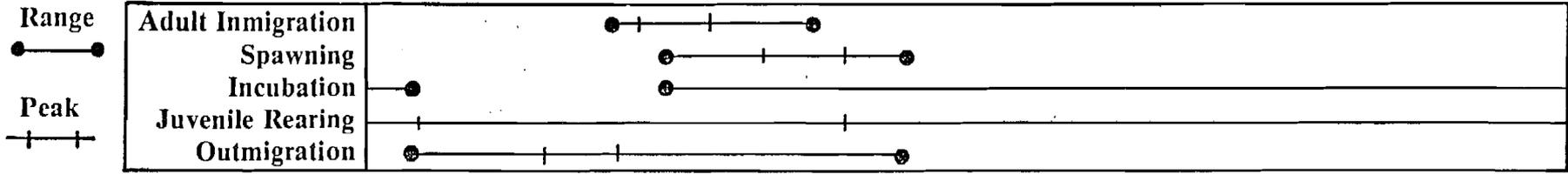
H44

**Watana
1996**

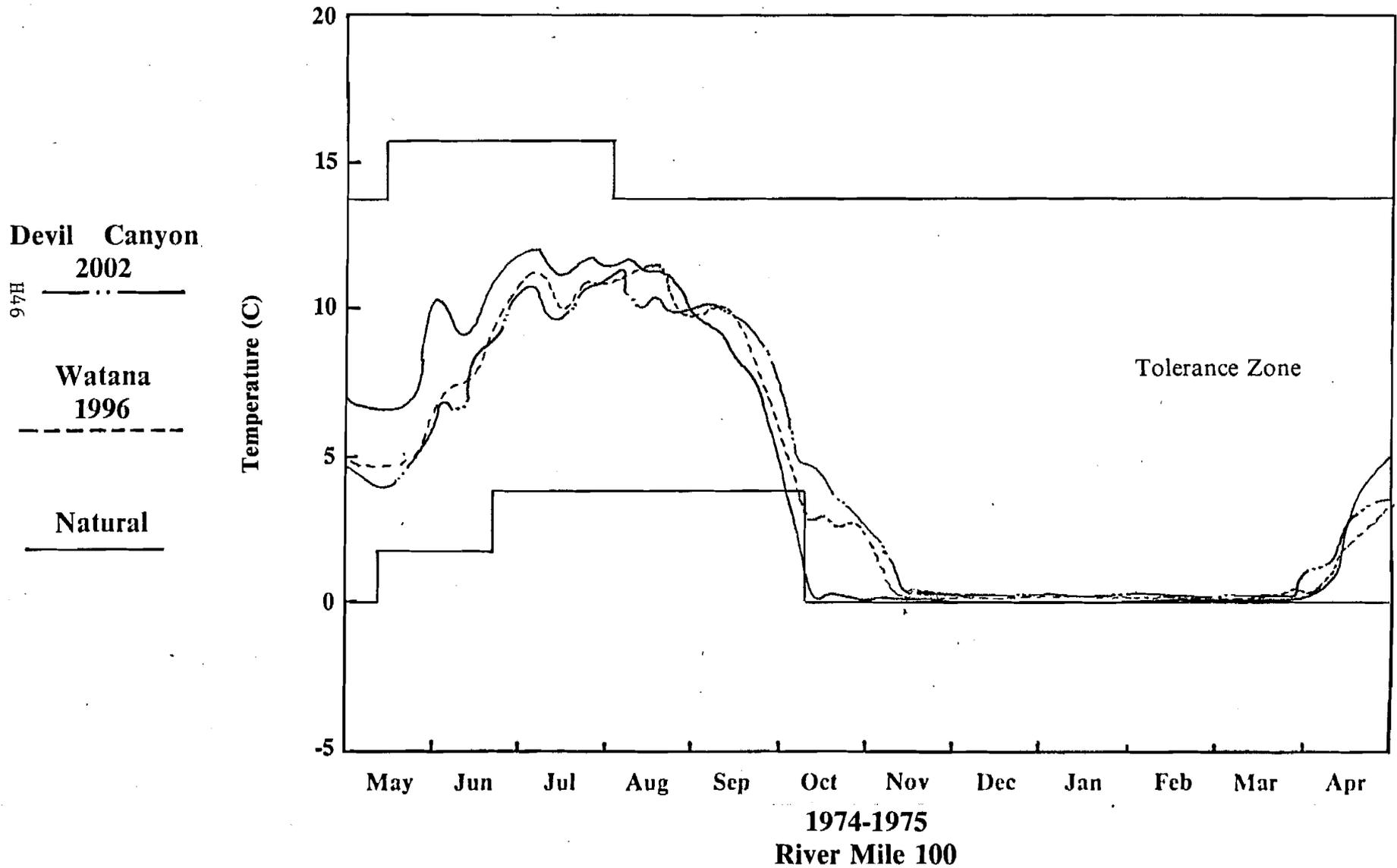
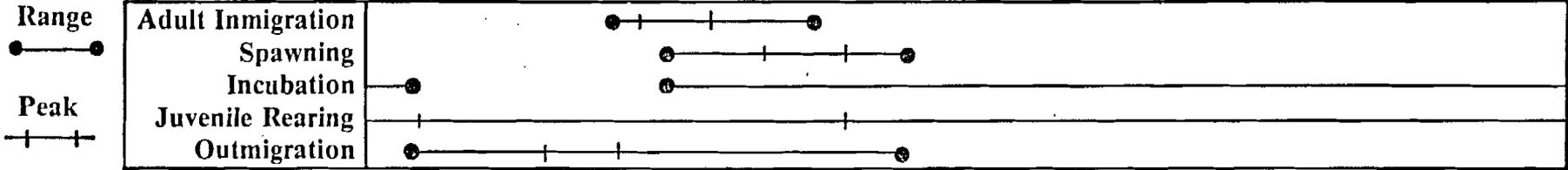
Natural



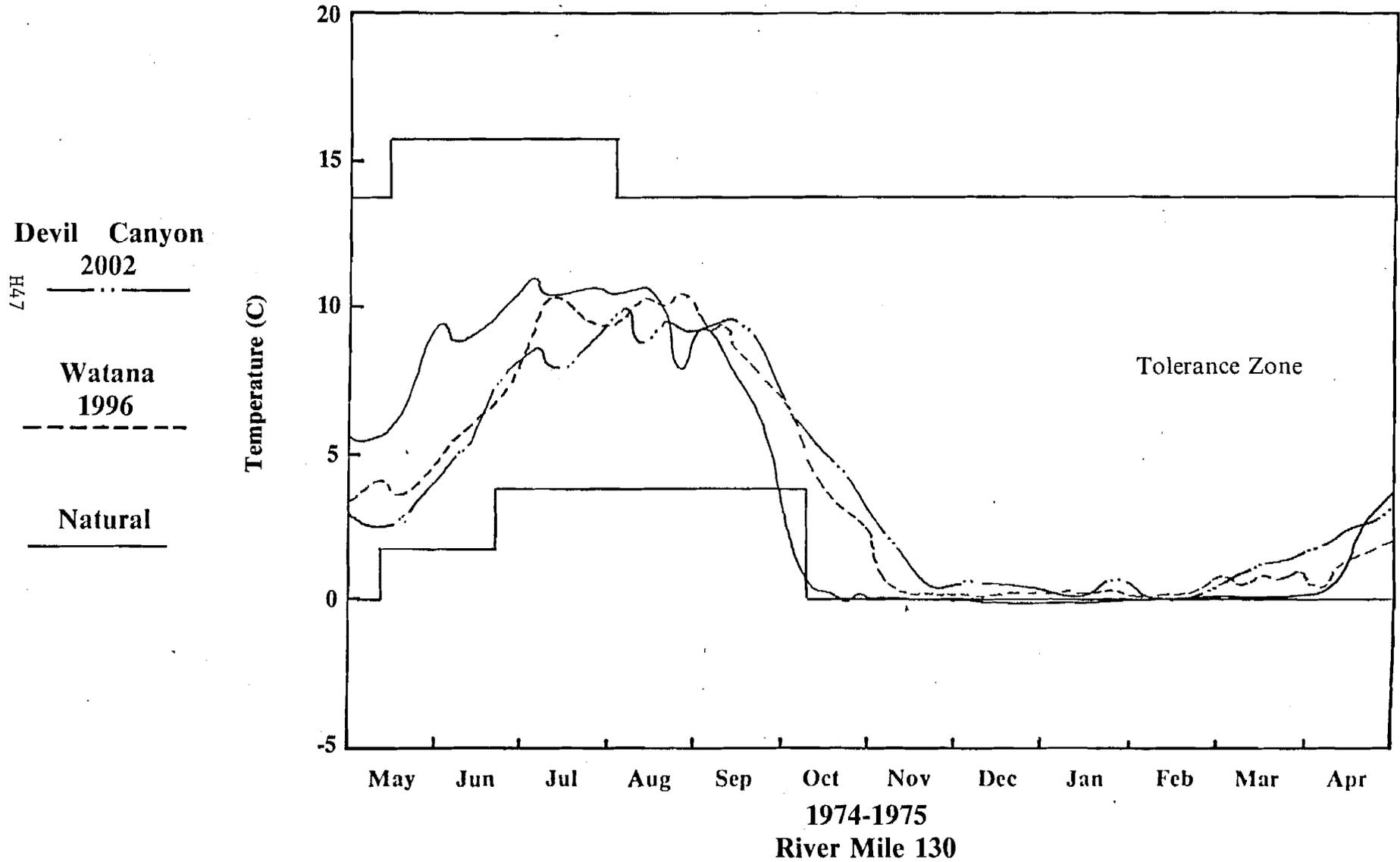
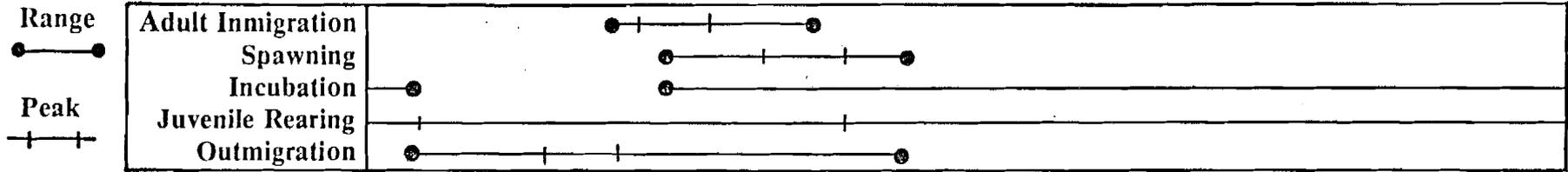
SOCKEYE SALMON



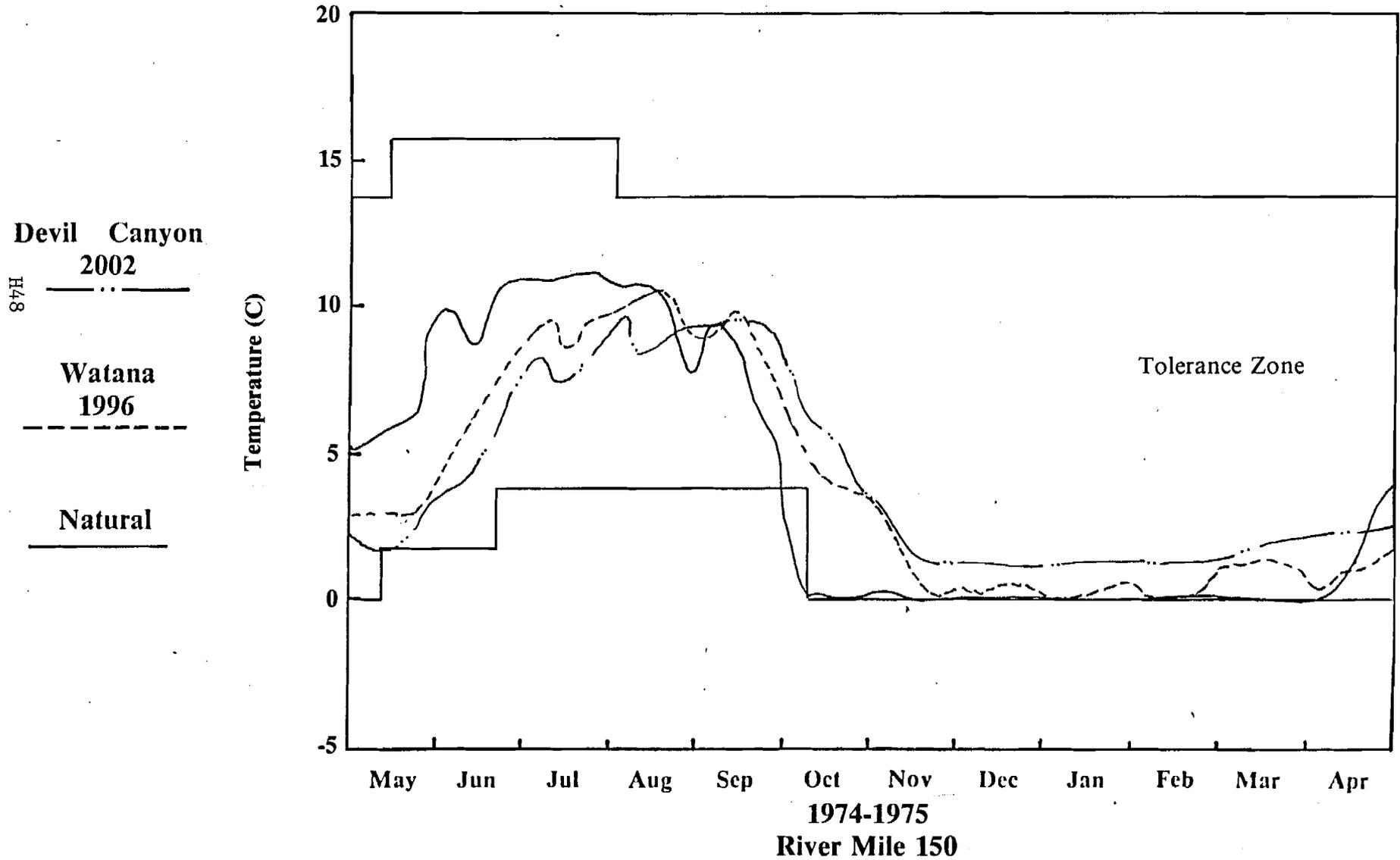
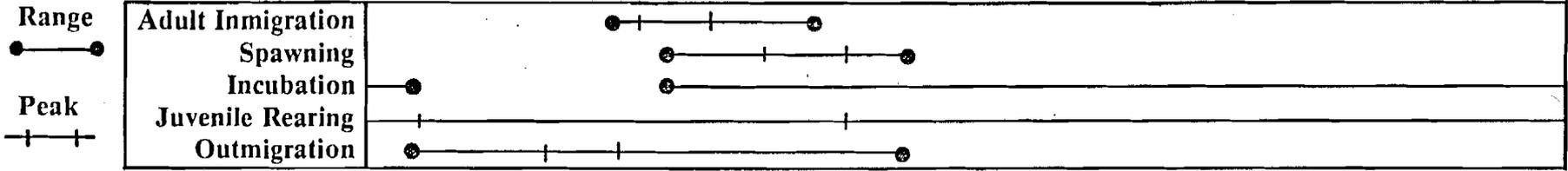
SOCKEYE SALMON



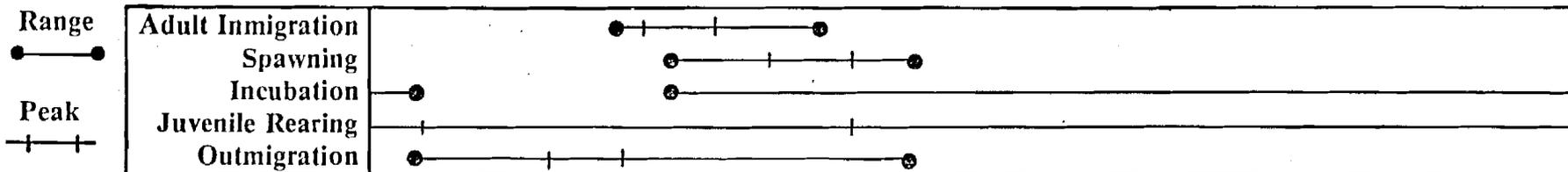
SOCKEYE SALMON



SOCKEYE SALMON



SOCKEYE SALMON

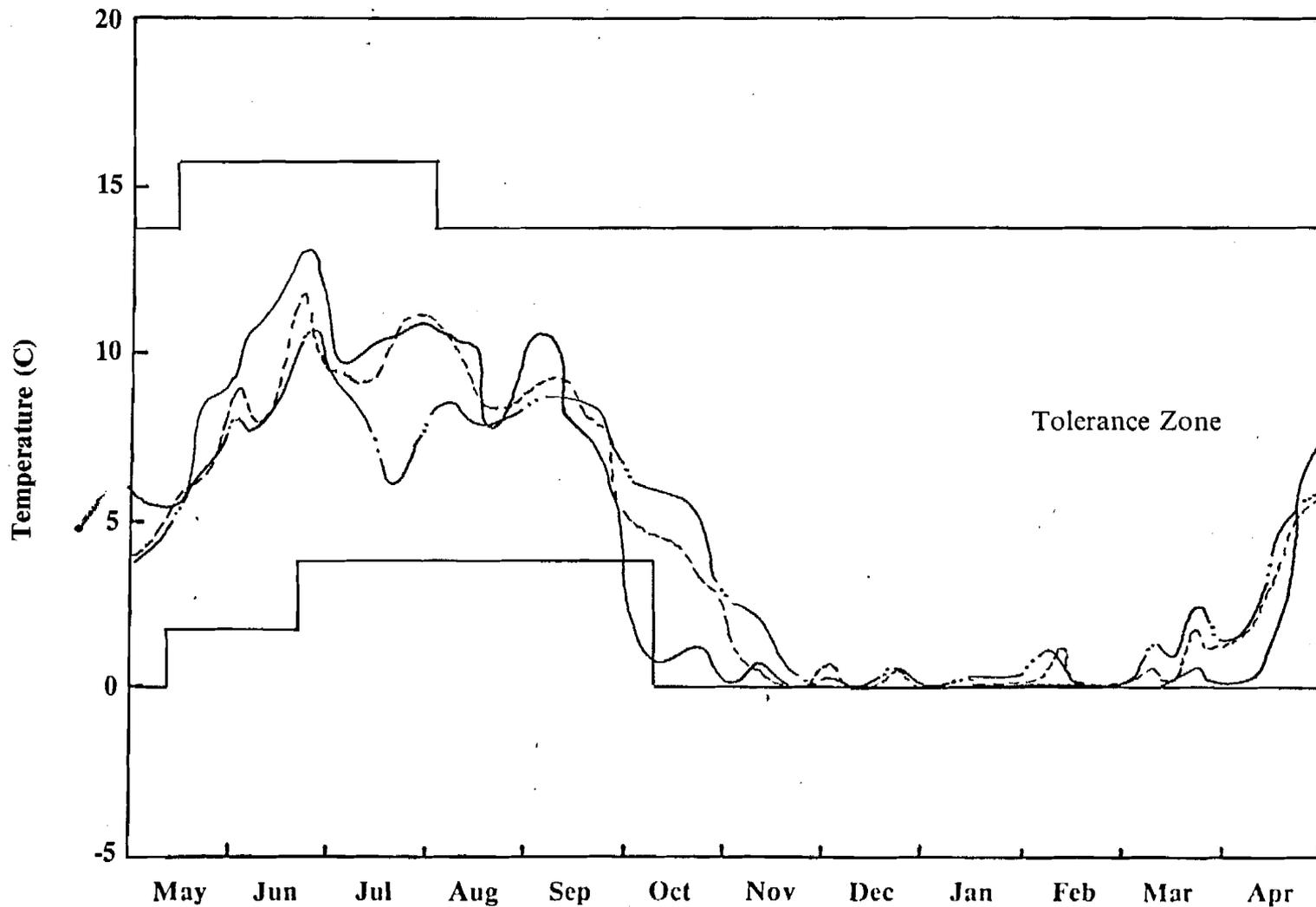


Devil Canyon
2002

H49

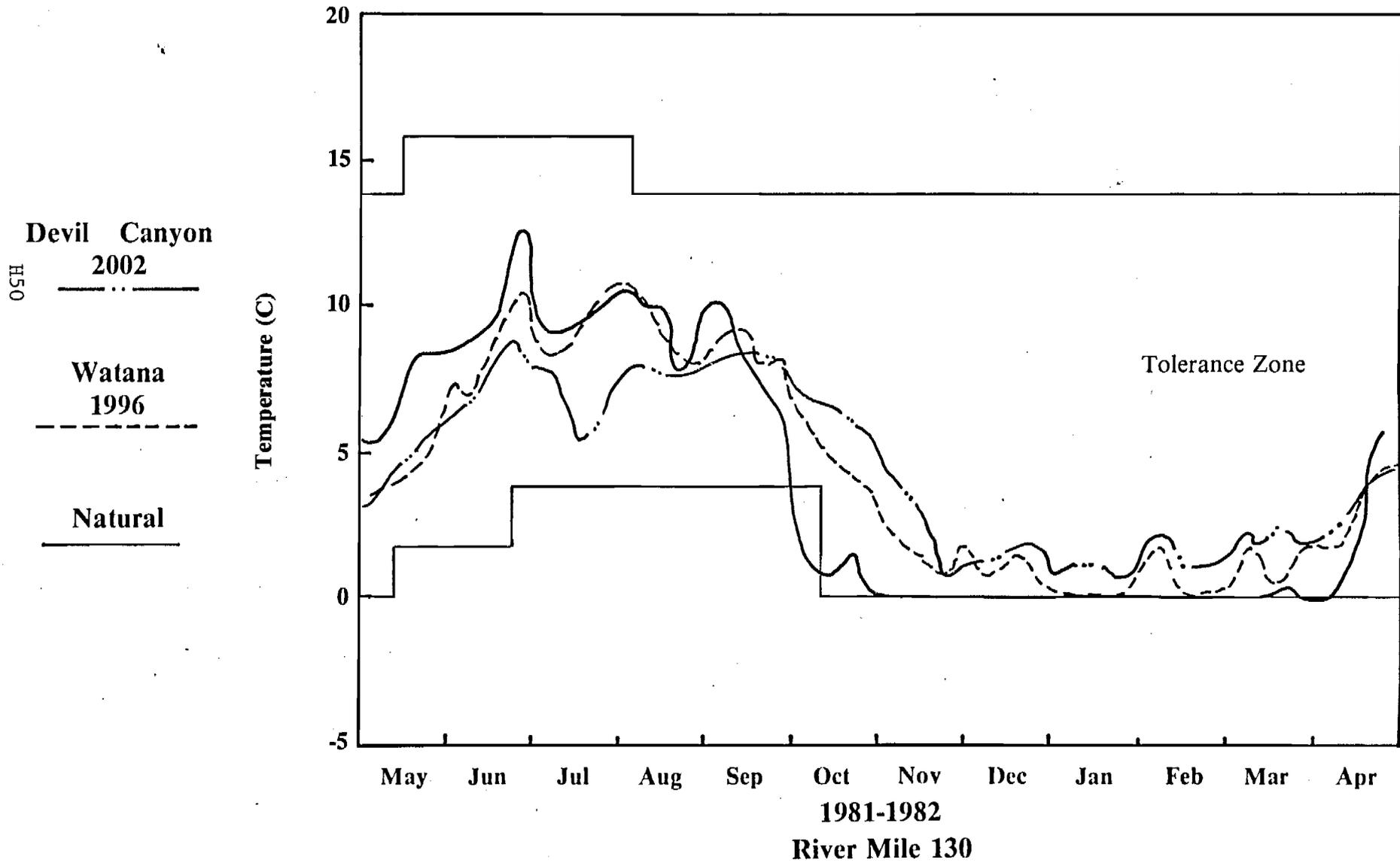
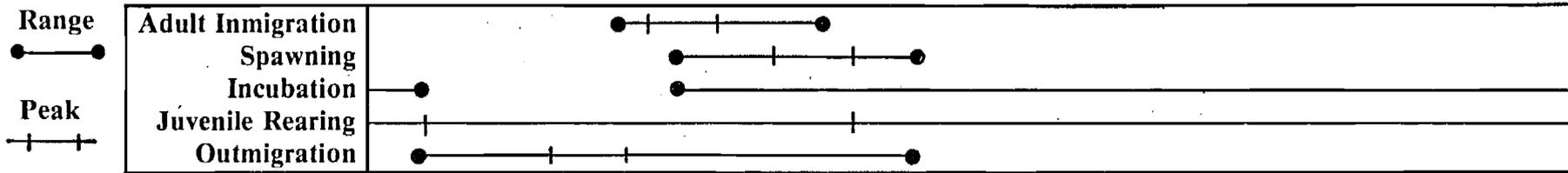
Watana
1996

Natural

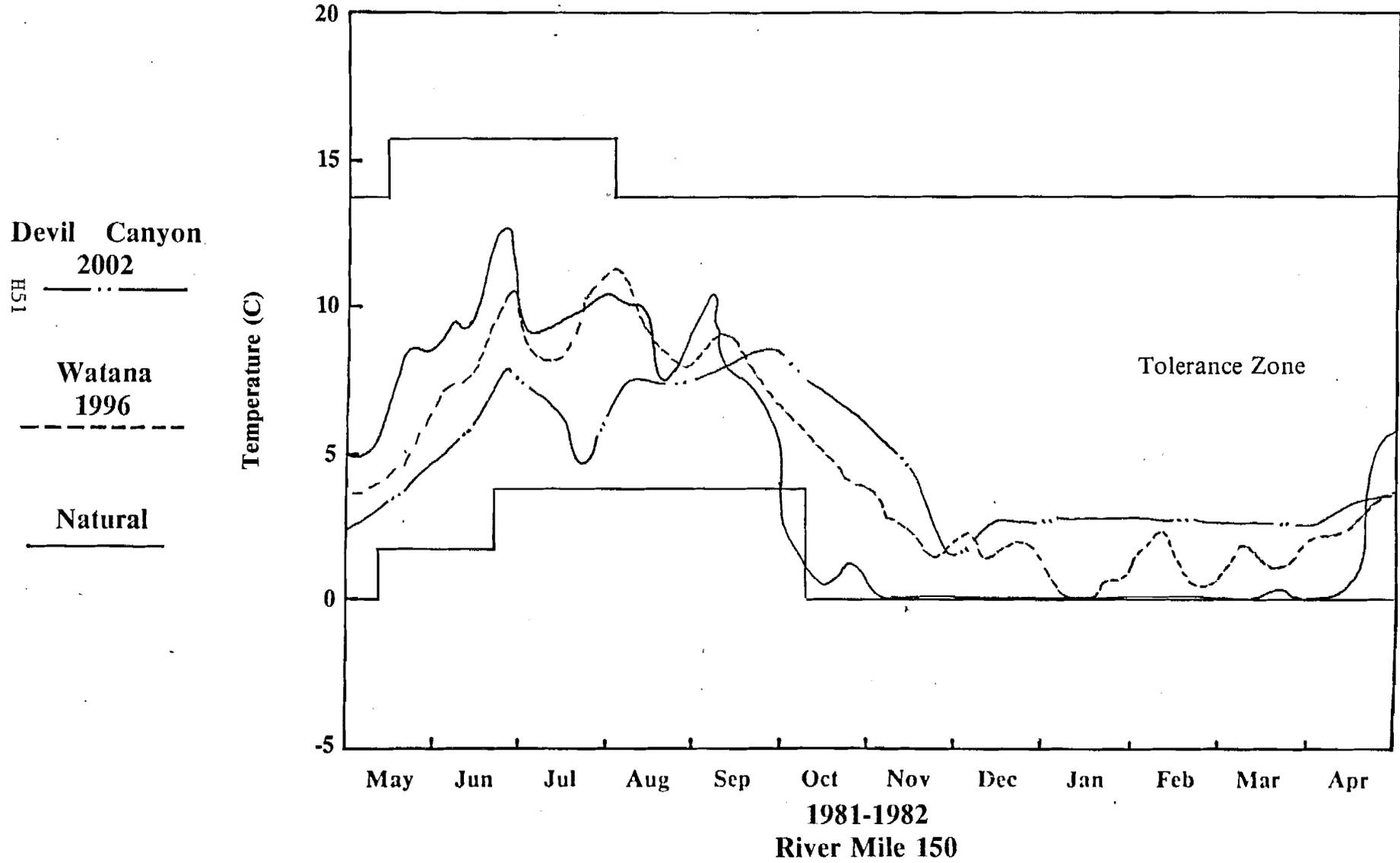
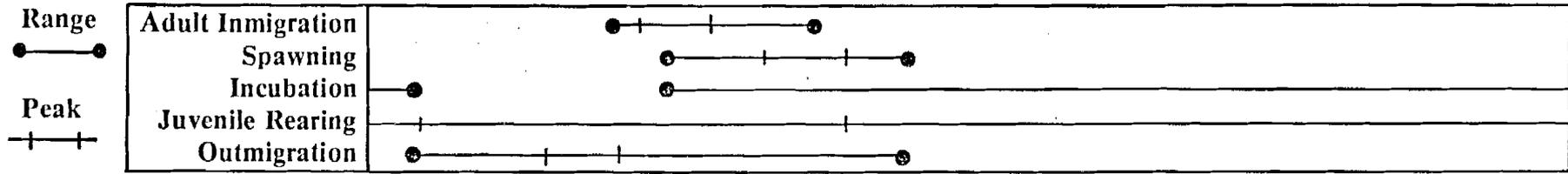


1981-1982
River Mile 100

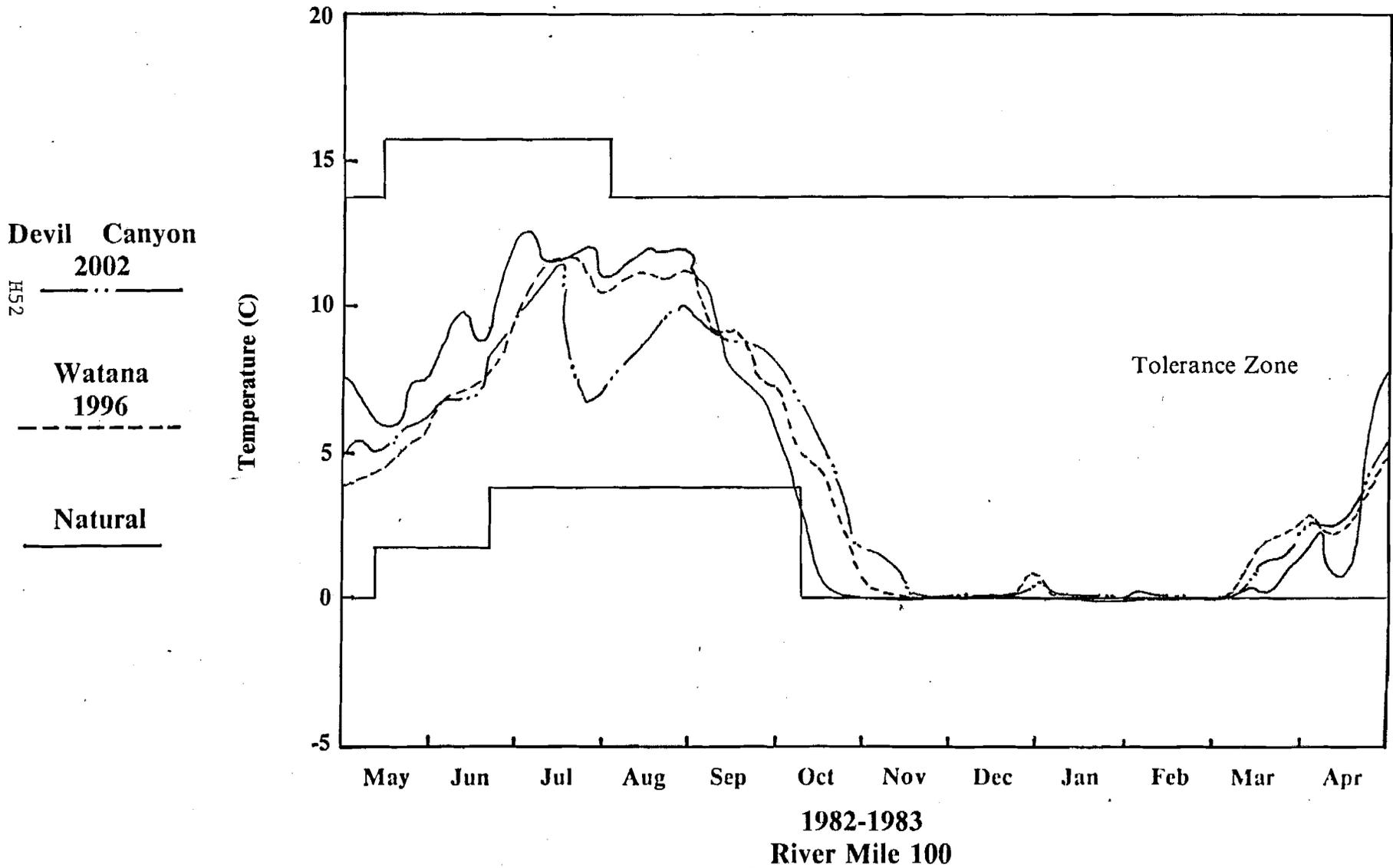
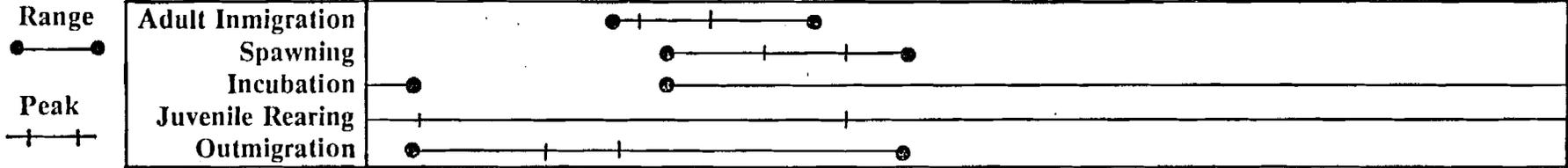
SOCKEYE SALMON



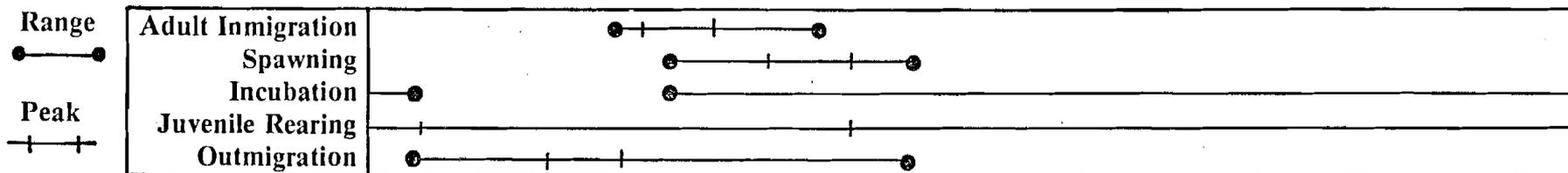
SOCKEYE SALMON



SOCKEYE SALMON



SOCKEYE SALMON

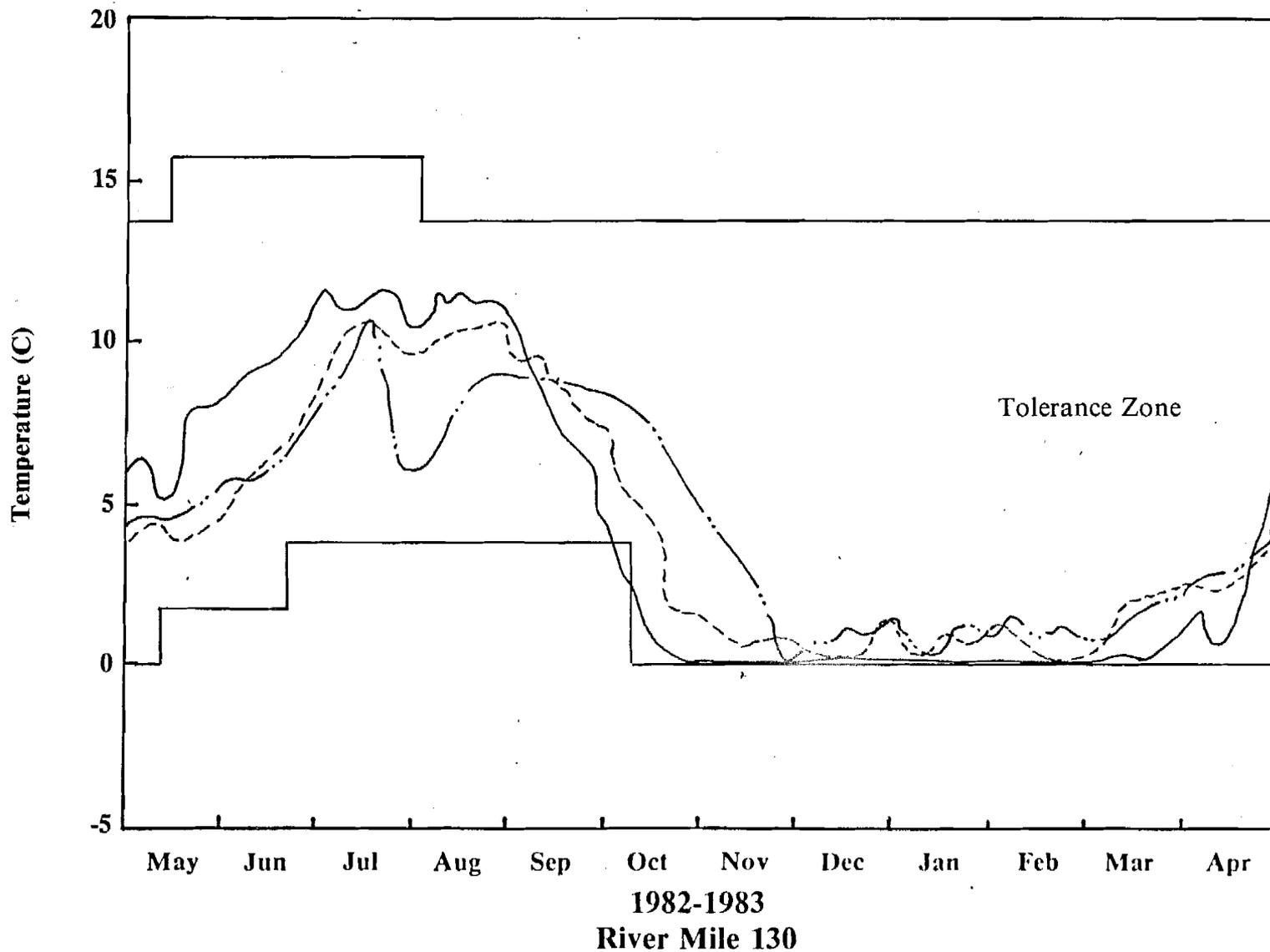


Devil Canyon
2002

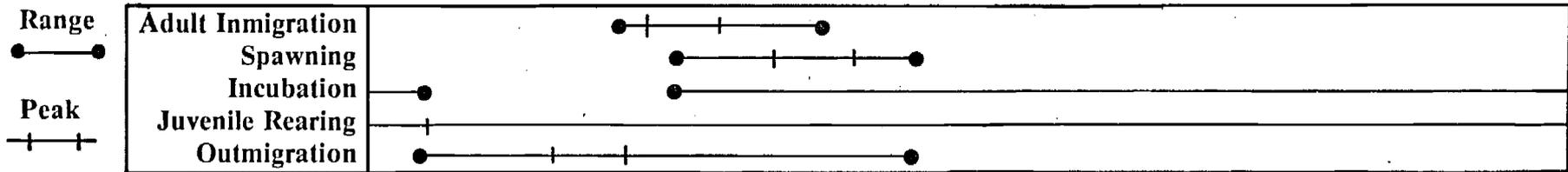
H53

Watana
1996

Natural



SOCKEYE SALMON

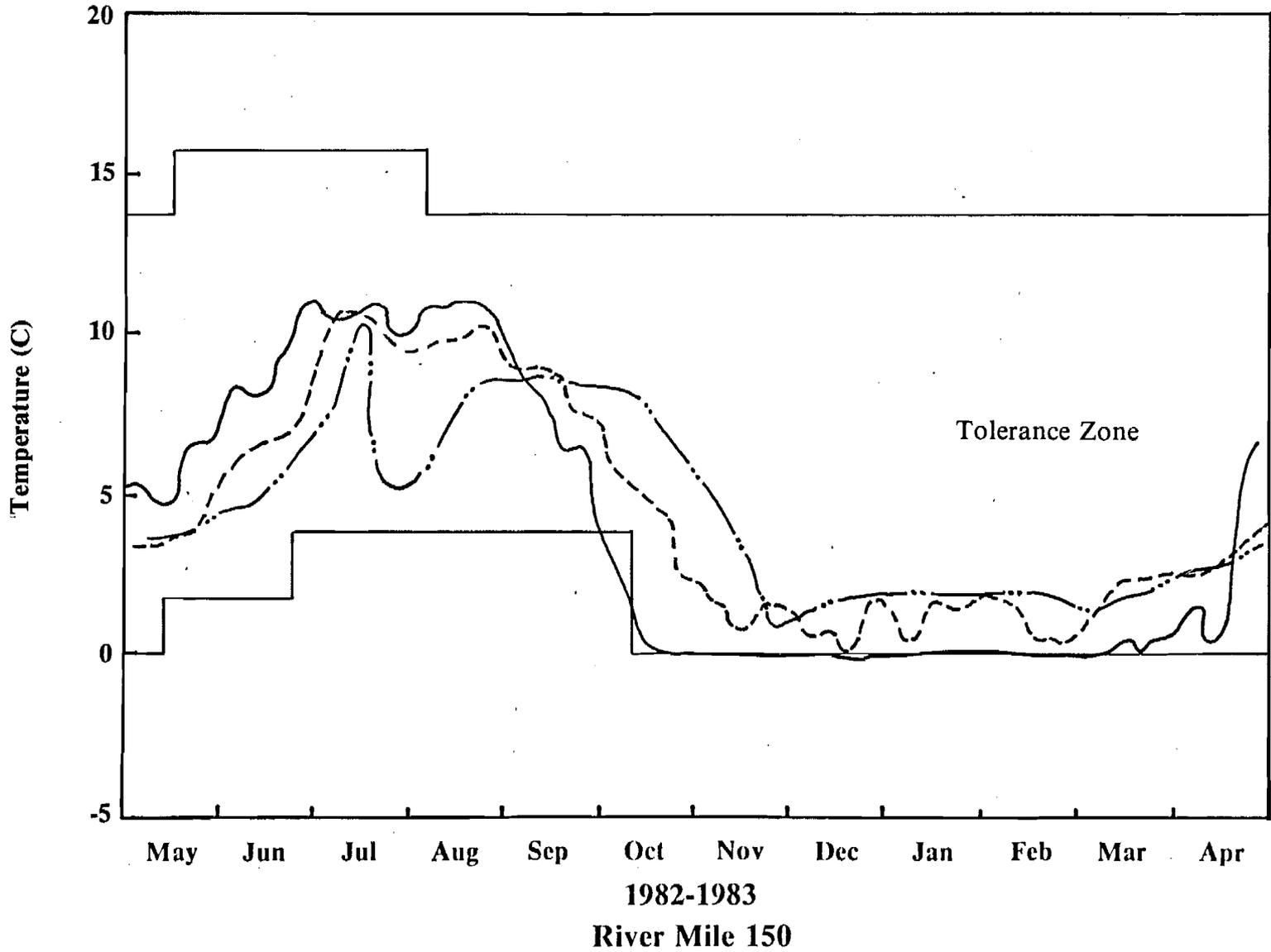


H54

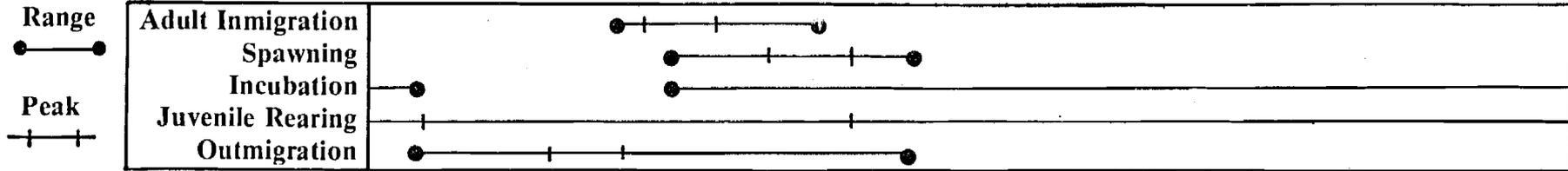
Devil Canyon
2002
— · · —

Watana
1996
- - - - -

Natural
—————

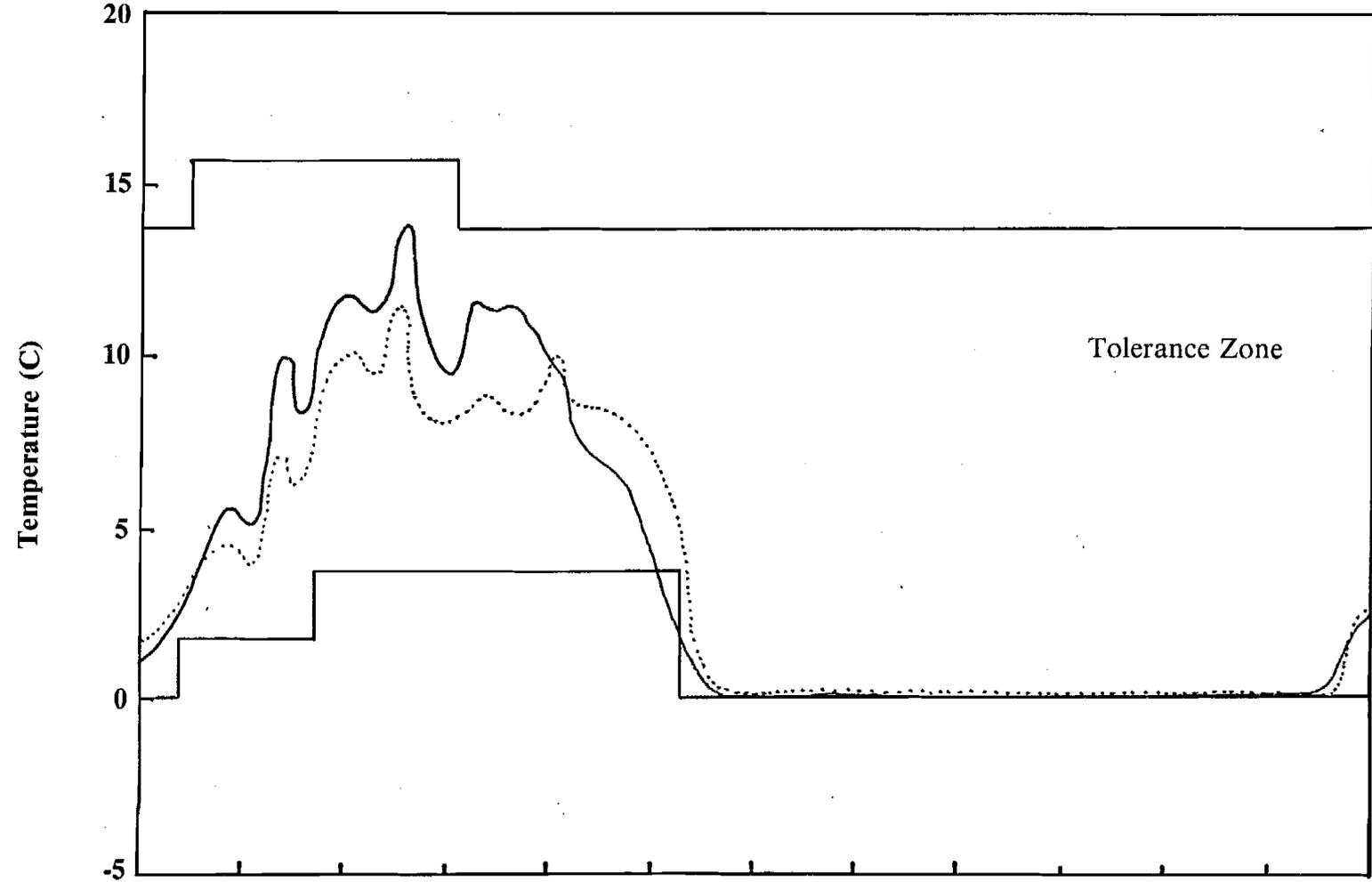


SOCKEYE SALMON



H55
Watana Filling

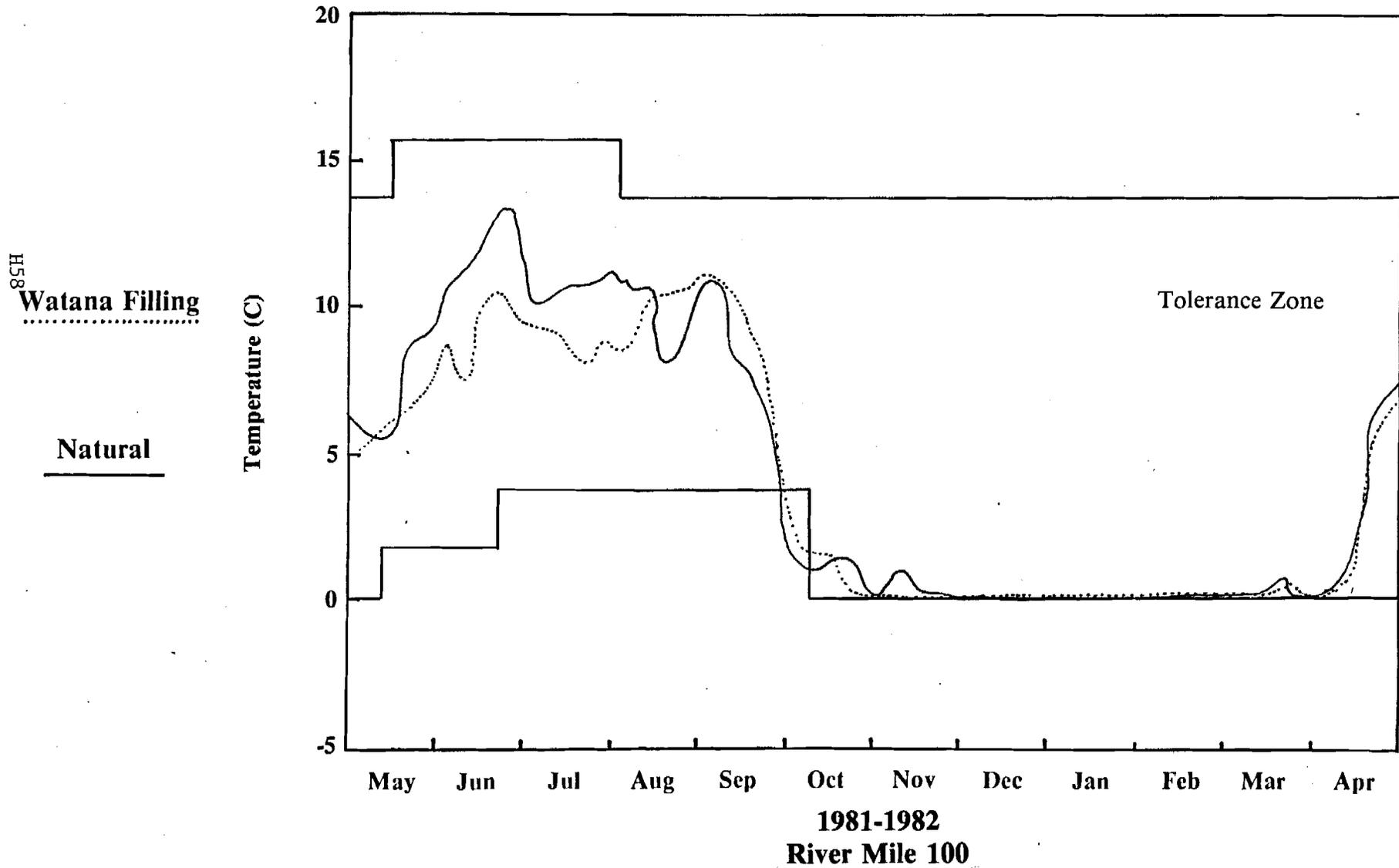
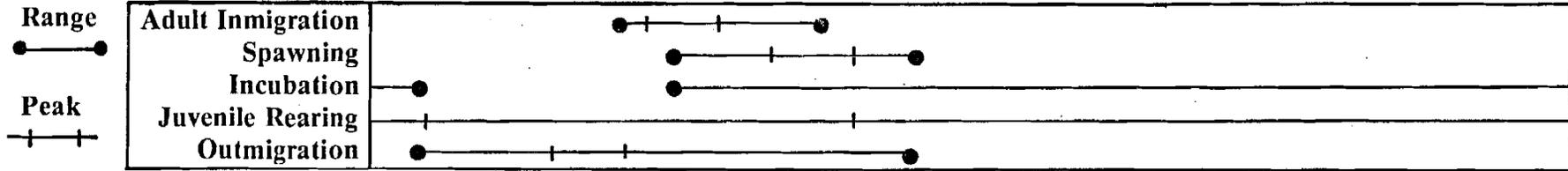
Natural



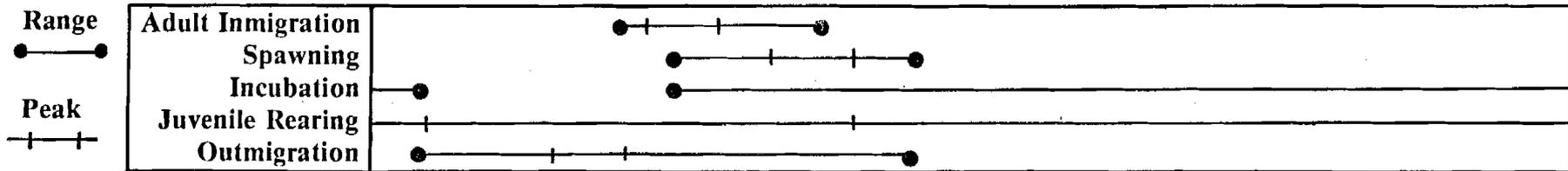
May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr

1971-1972
River Mile 100

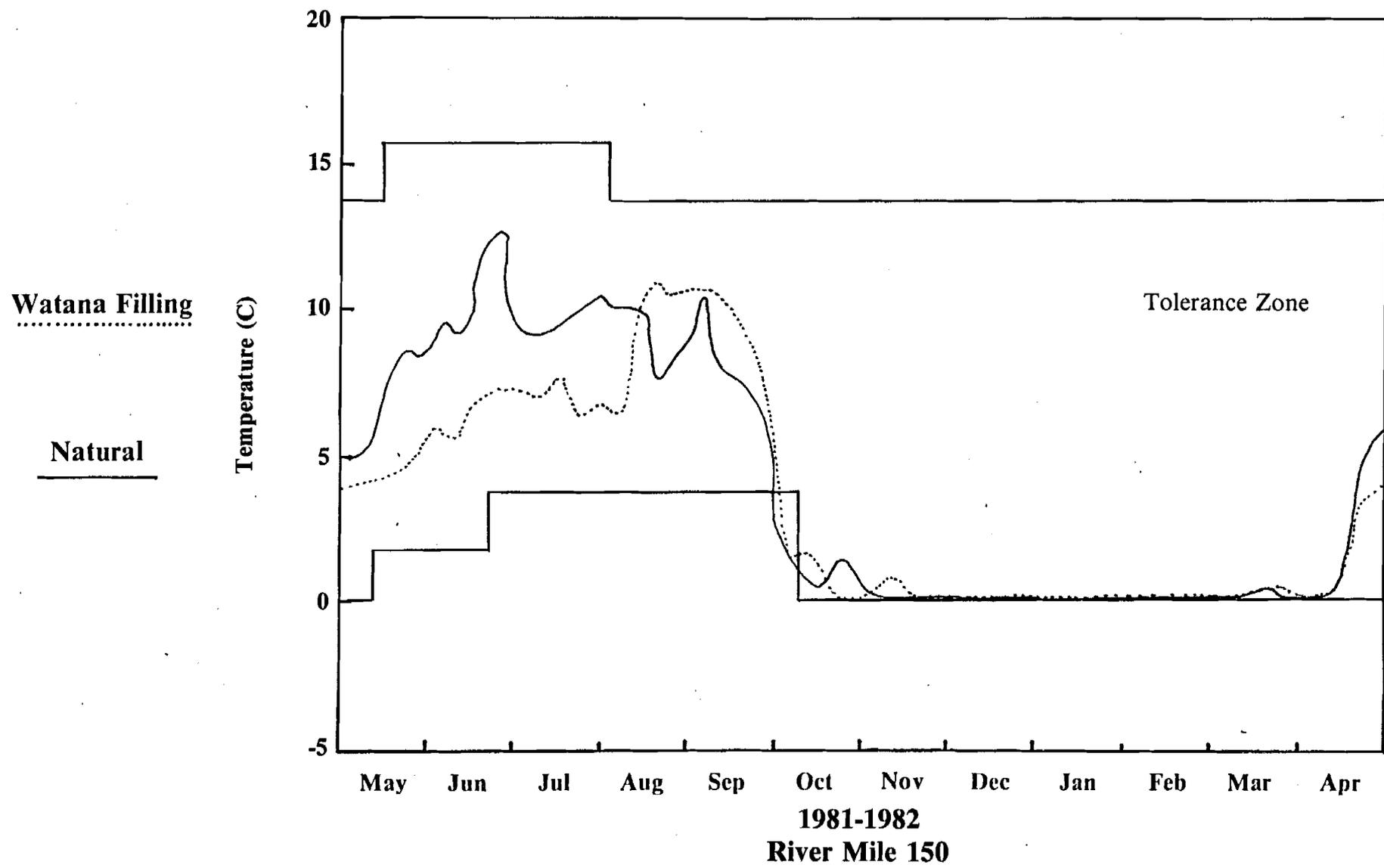
SOCKEYE SALMON



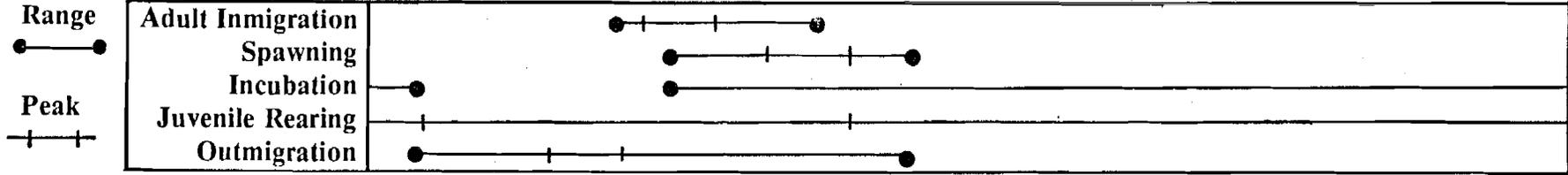
SOCKEYE SALMON



H60



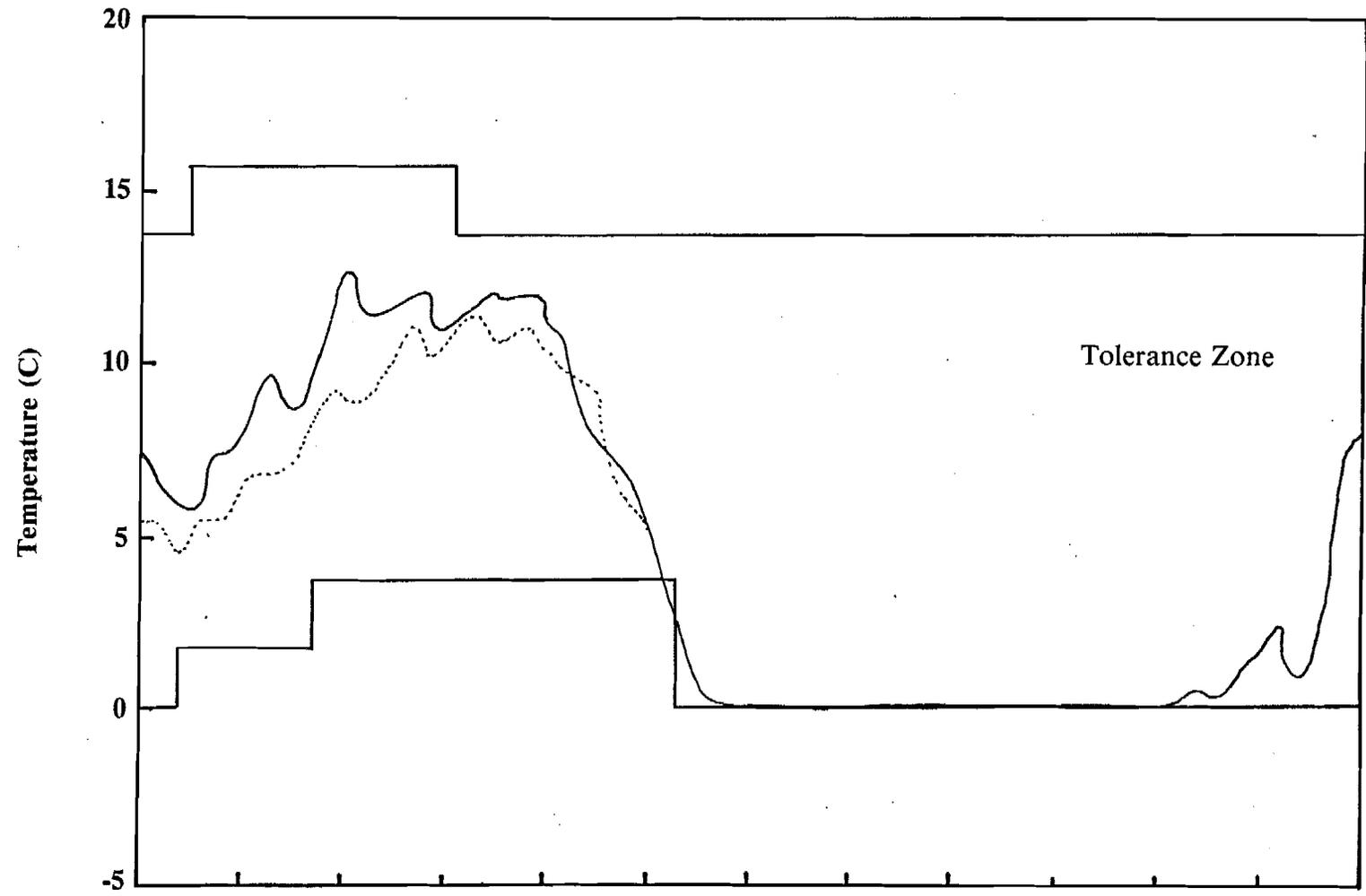
SOCKEYE SALMON



19H

Watana Filling
.....

Natural

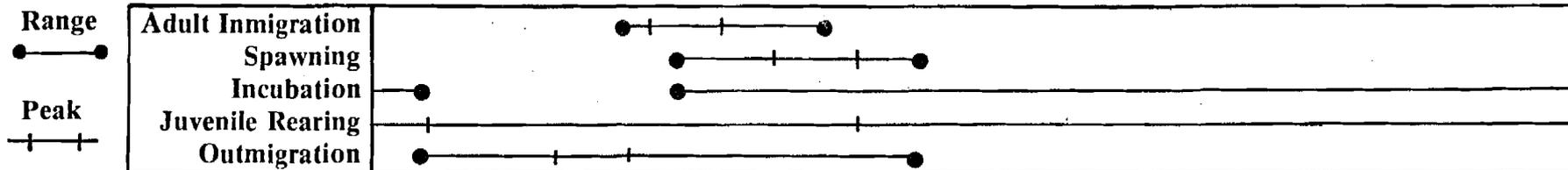


May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr

1982-1983

River Mile 100

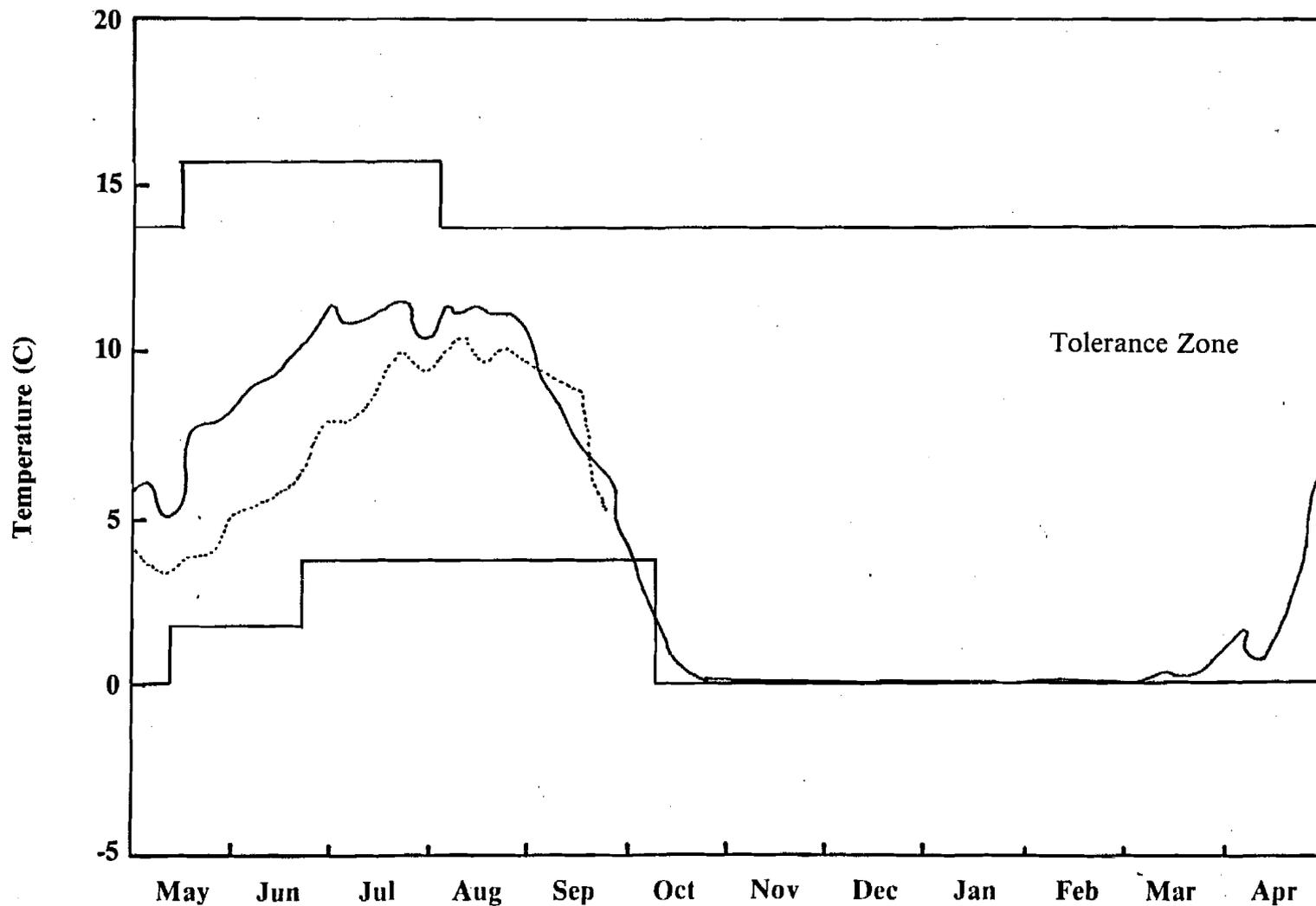
SOCKEYE SALMON



H62

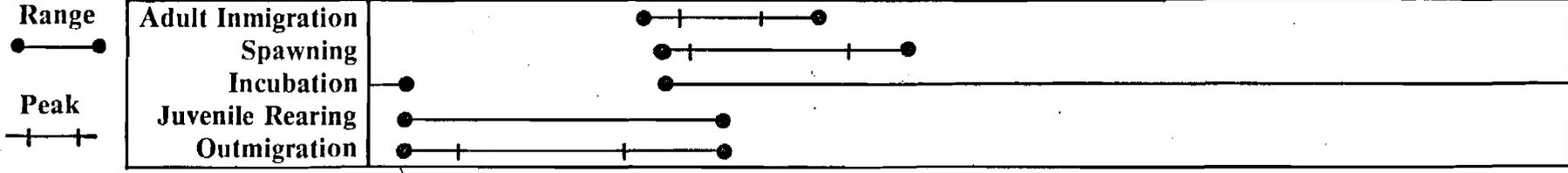
Watana Filling

Natural



1982-1983
River Mile 130

CHUM SALMON

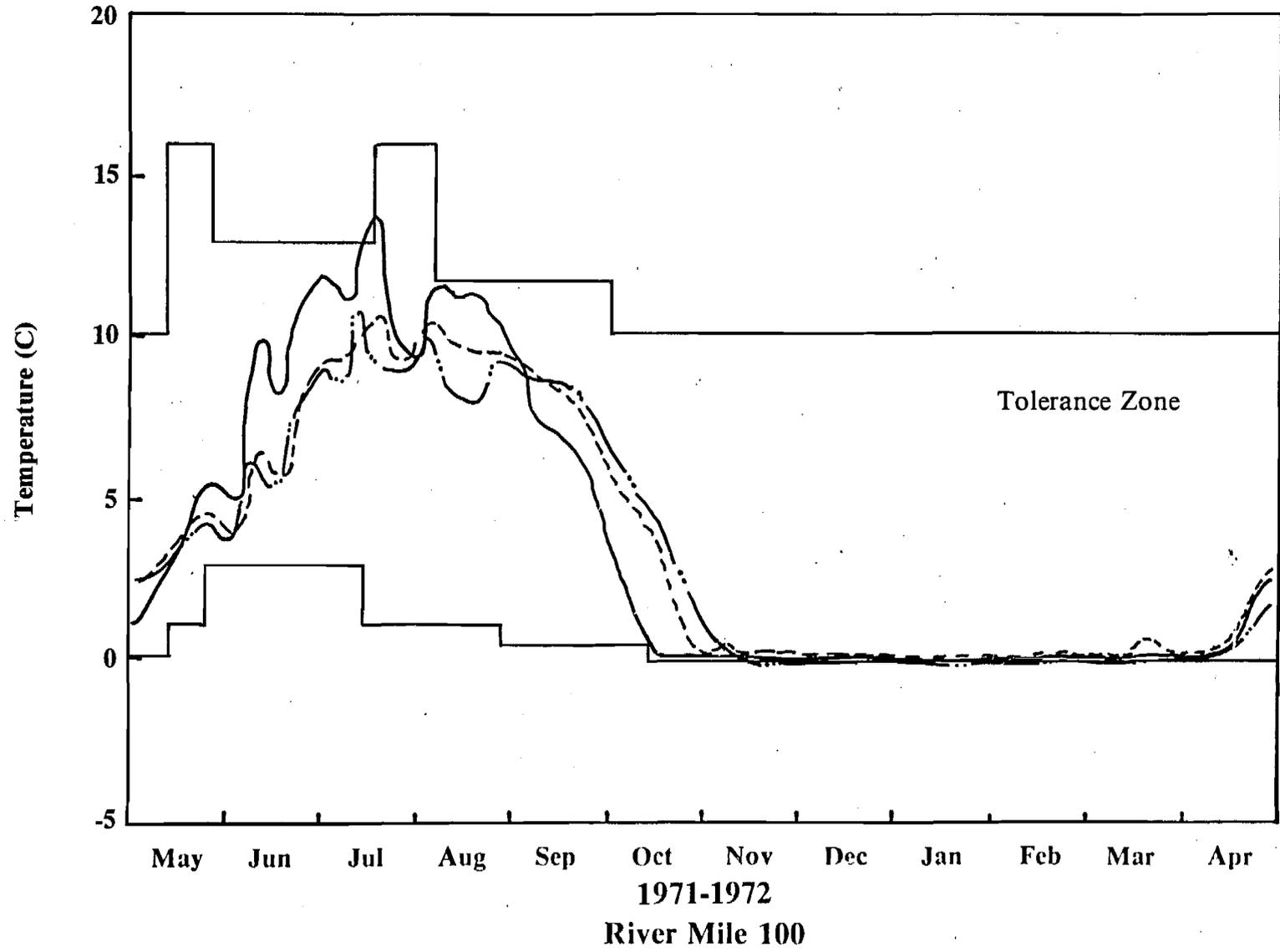


79H

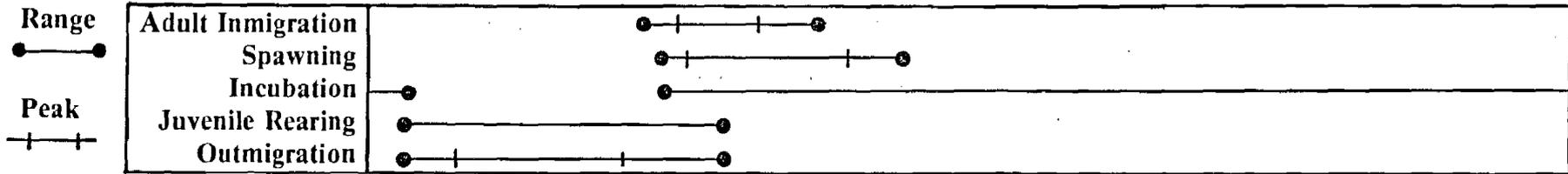
Devil Canyon
2002
.....

Watana
1996

Natural



CHUM SALMON

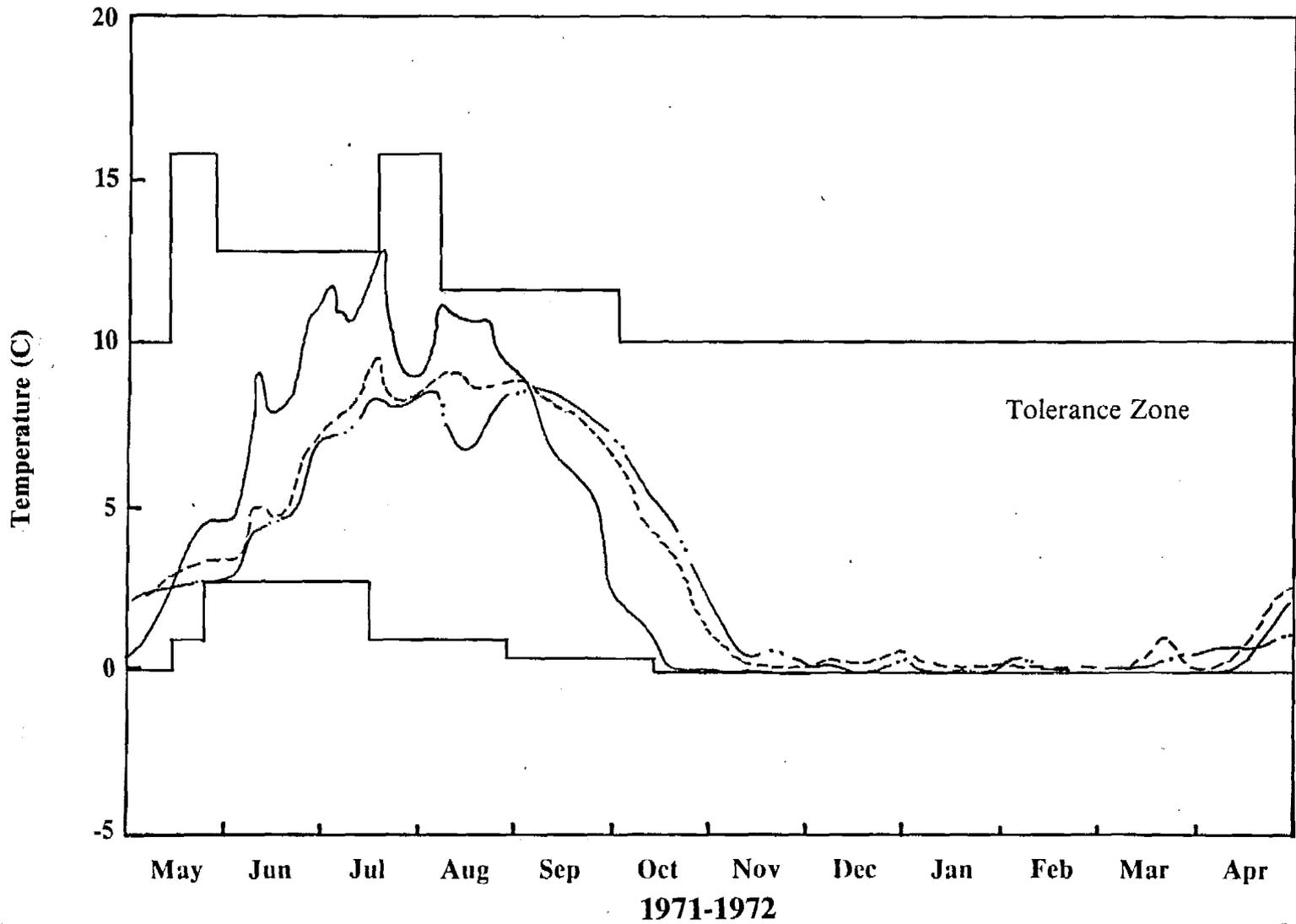


H65

Devil Canyon
2002

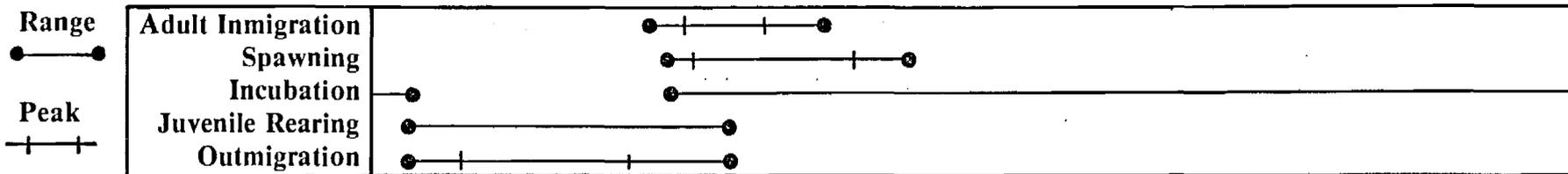
Watana
1996

Natural



1971-1972
River Mile 130

CHUM SALMON

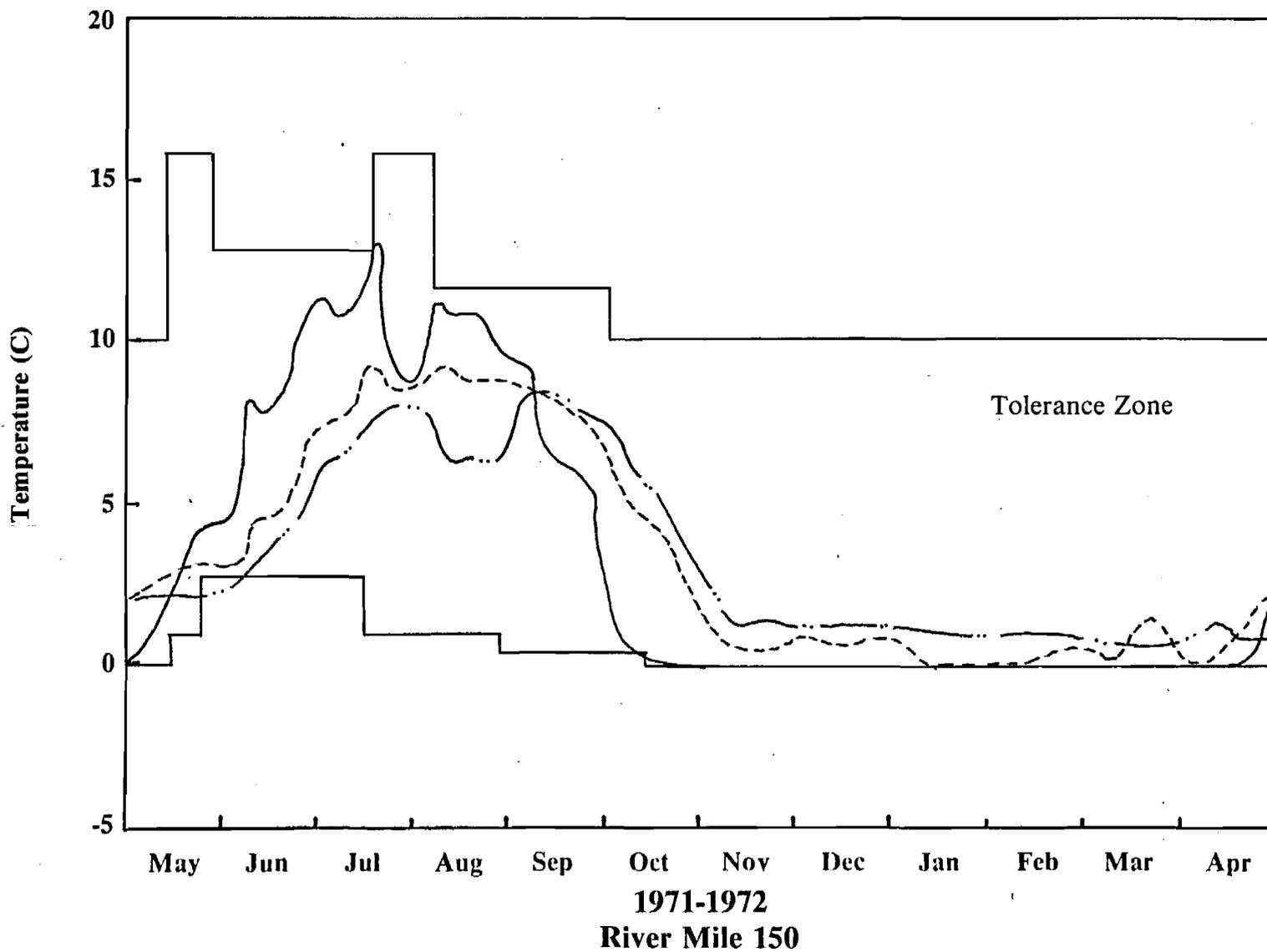


H66

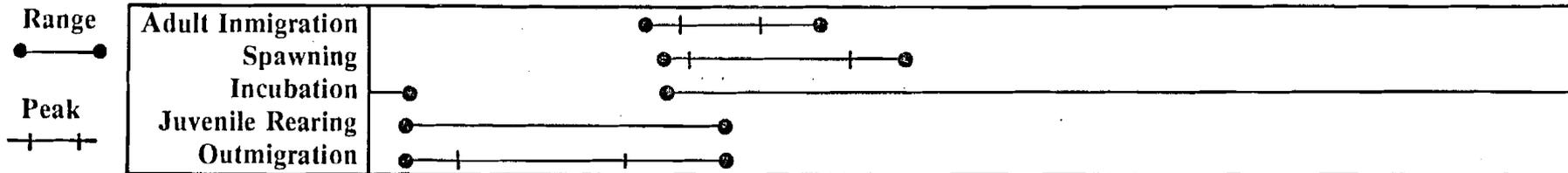
Devil Canyon
2002

Watana
1996

Natural



CHUM SALMON

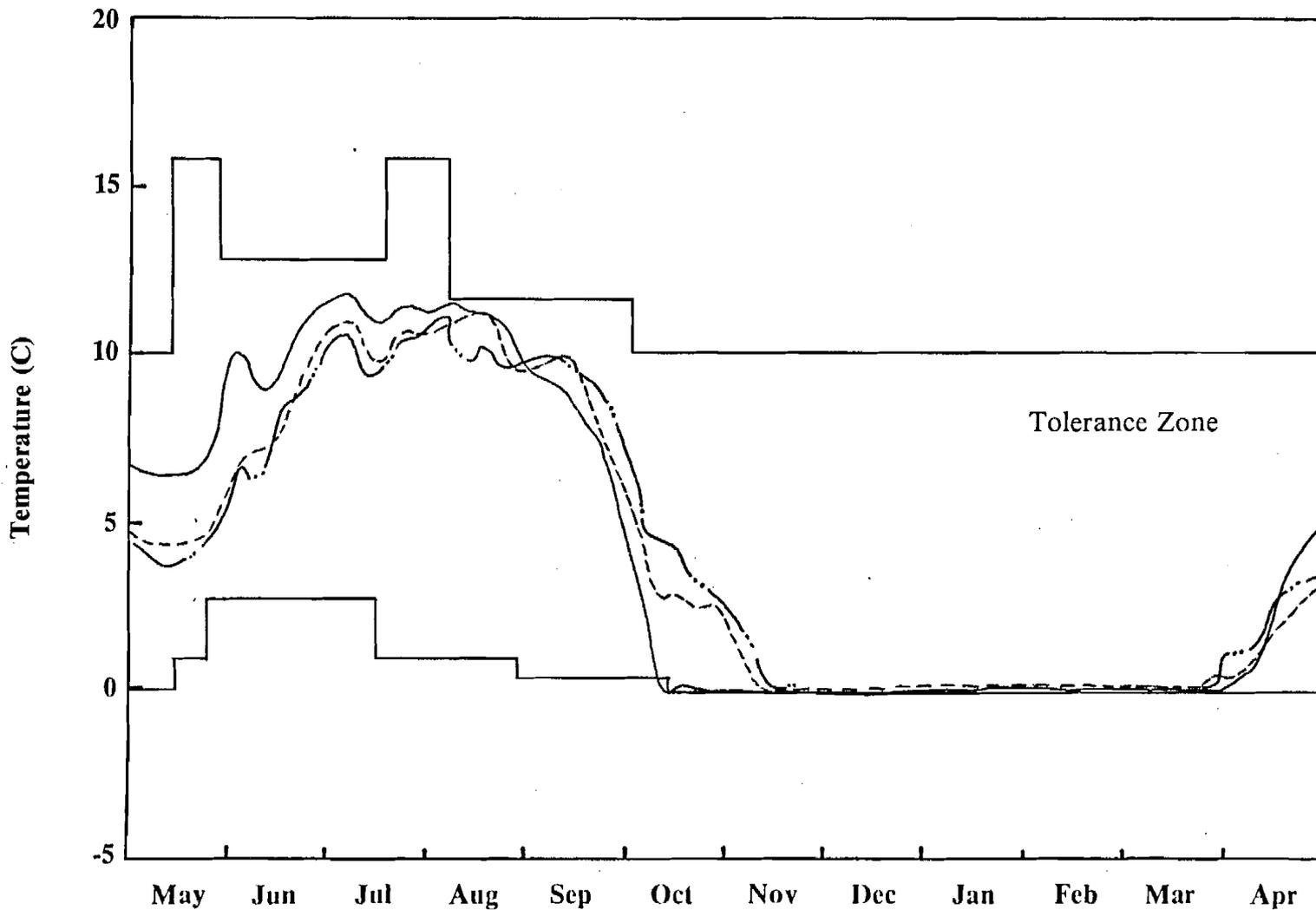


H67

Devil Canyon
2002

Watana
1996

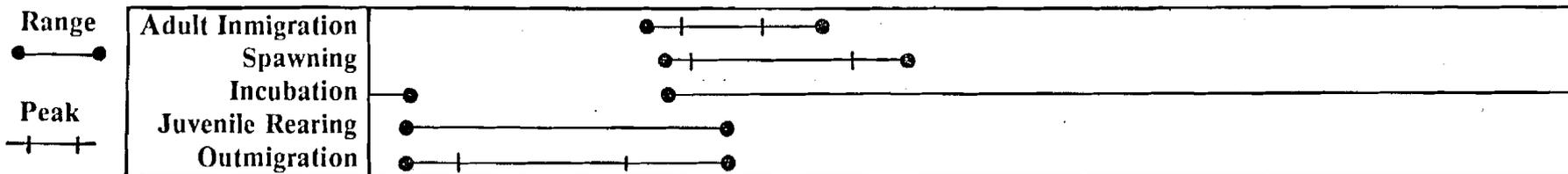
Natural



1974-1975

River Mile 100

CHUM SALMON

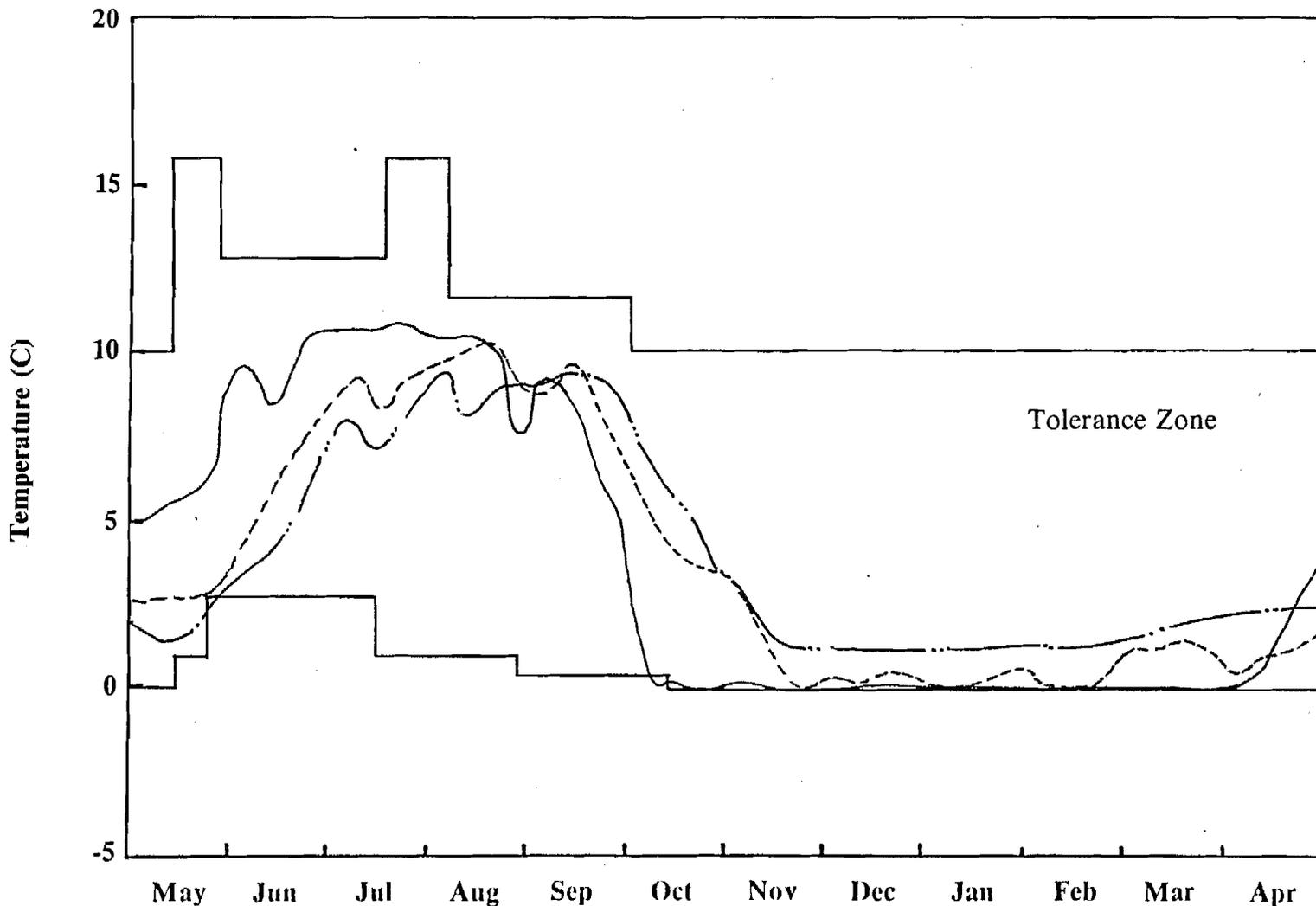


H69

Devil Canyon
2002

Watana
1996

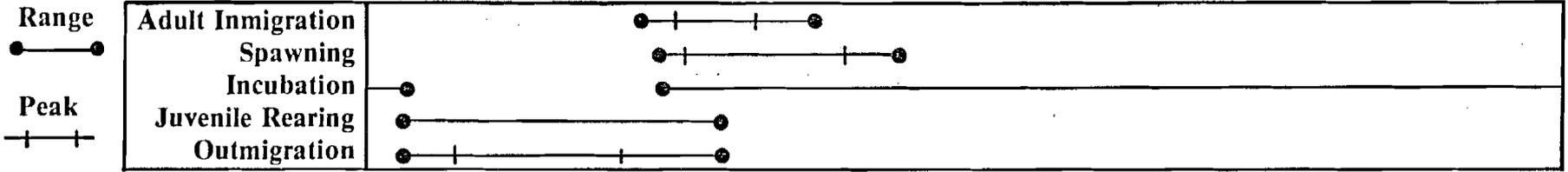
Natural



1974-1975

River Mile 150

CHUM SALMON

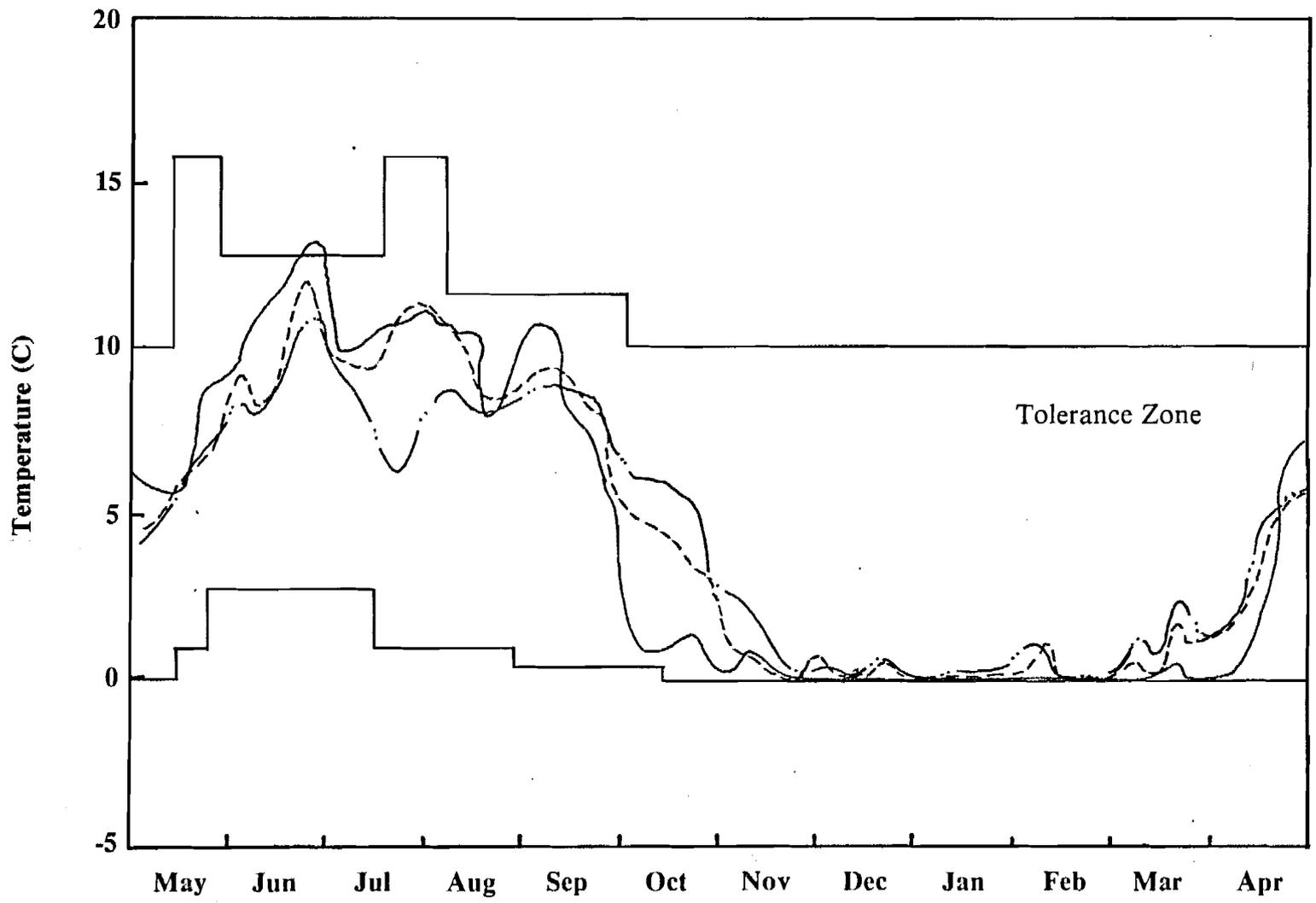


H70

Devil Canyon
2002
— · · —

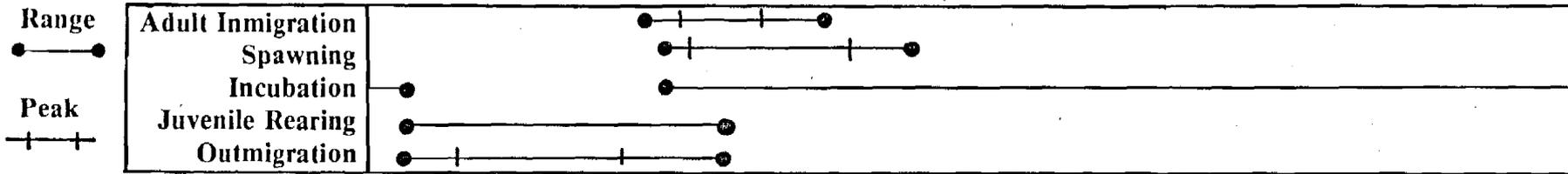
Watana
1996
- - - - -

Natural
—————



1981-1982
River Mile 100

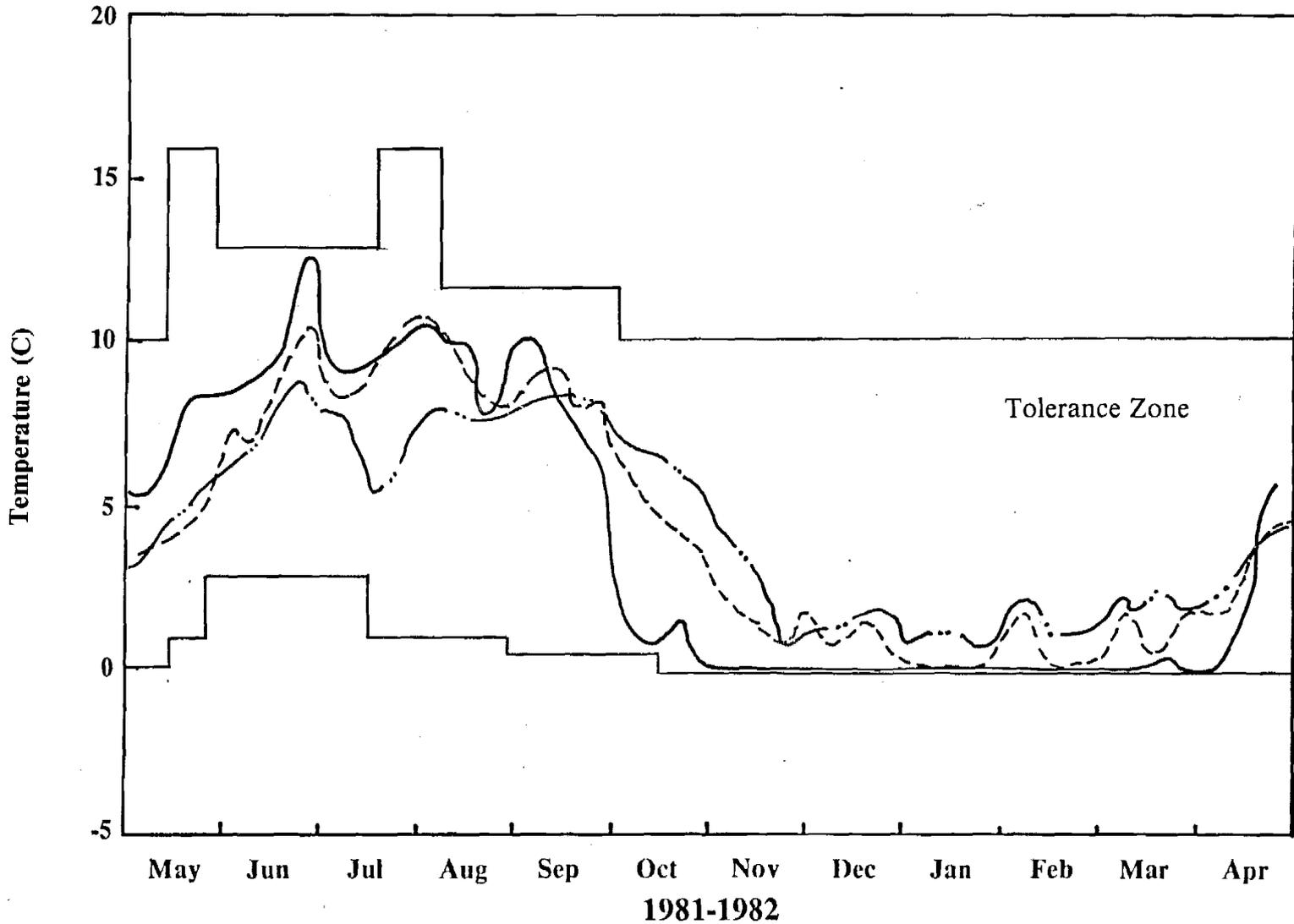
CHUM SALMON



171
 Devil Canyon
 2002

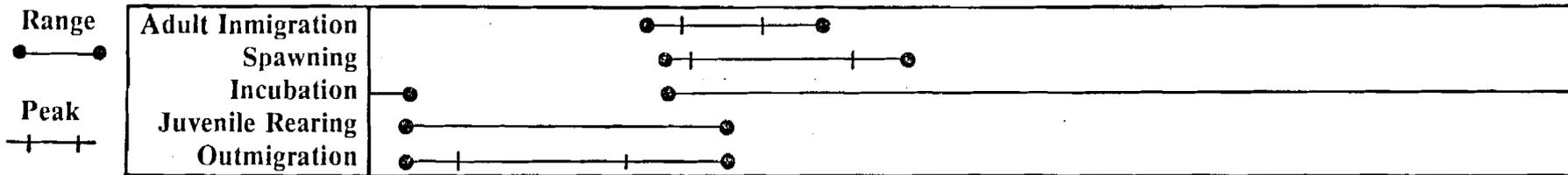
 Watana
 1996

 Natural



River Mile 130

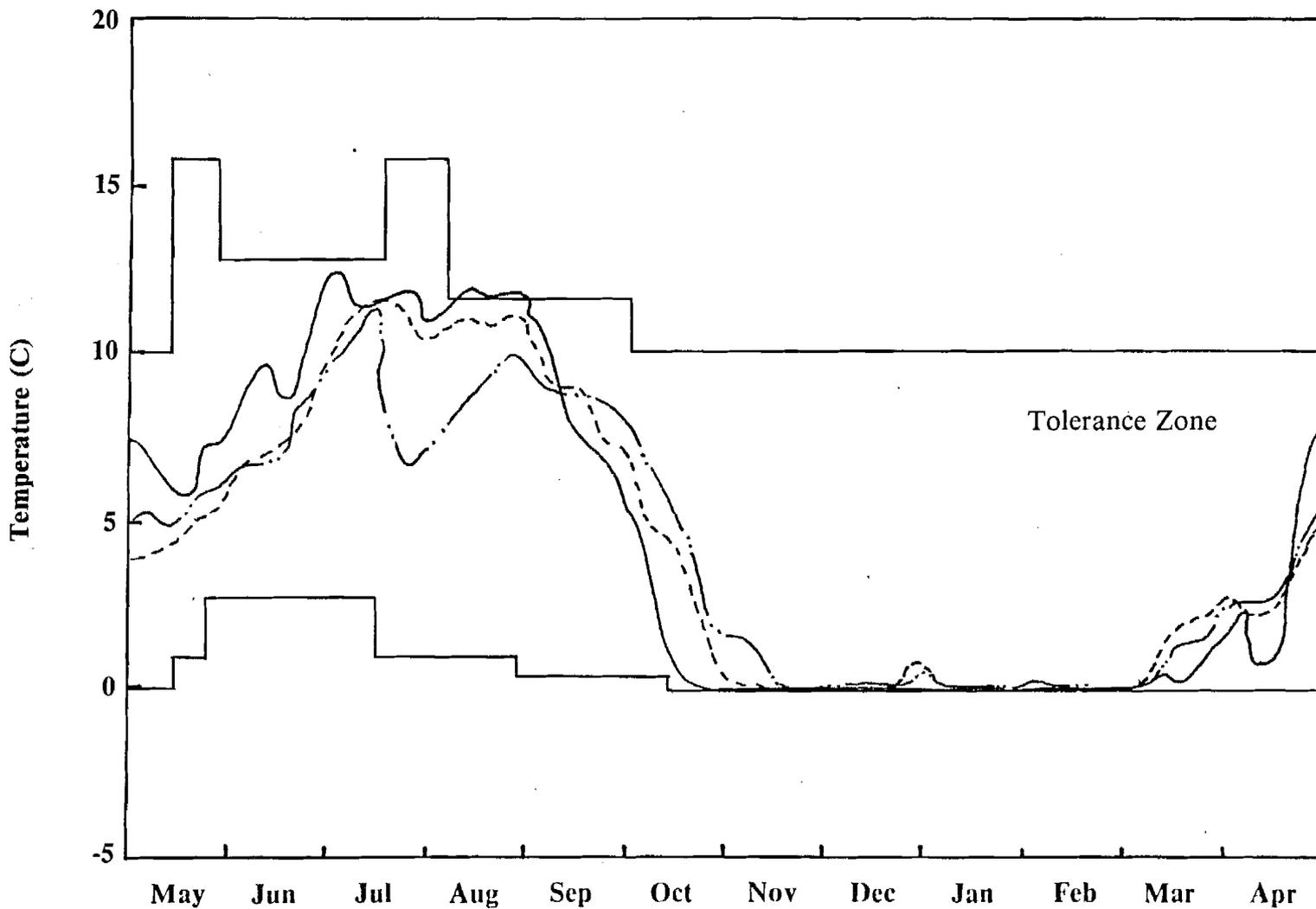
CHUM SALMON



H73 Devil Canyon
2002

Watana
1996

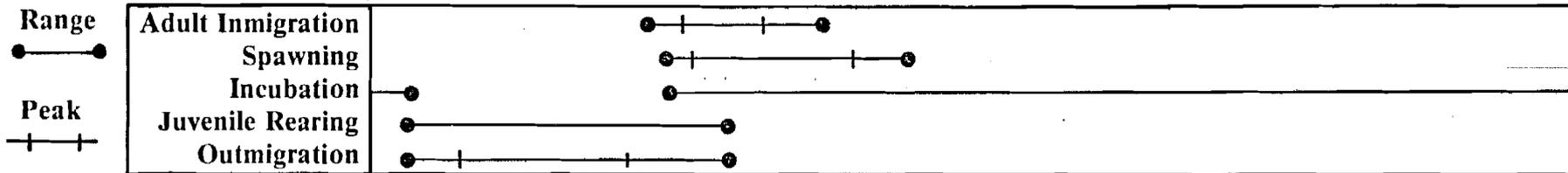
Natural



1982-1983

River Mile 100

CHUM SALMON



H74

Devil Canyon

2002

—+—+—

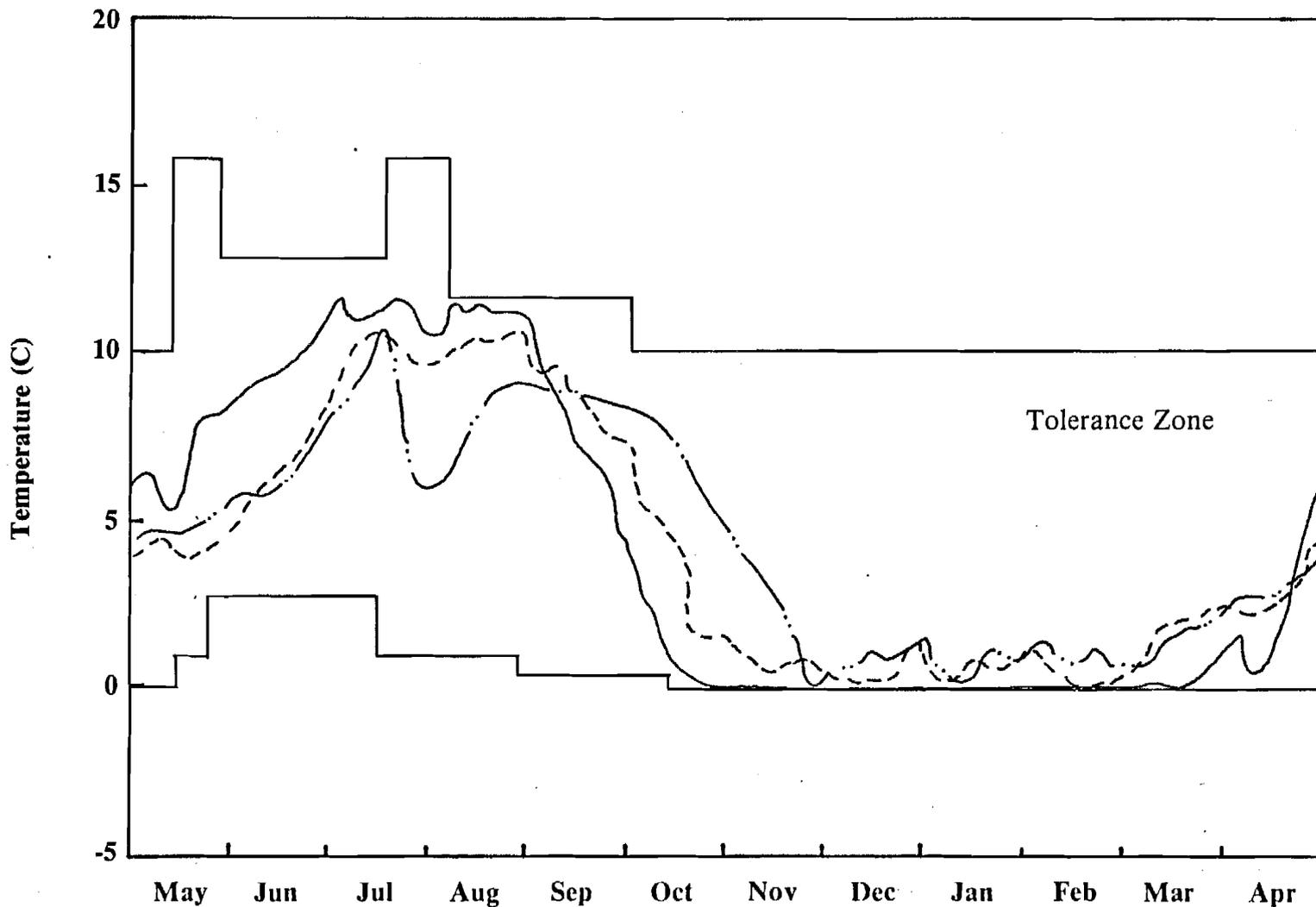
Watana

1996

- - - - -

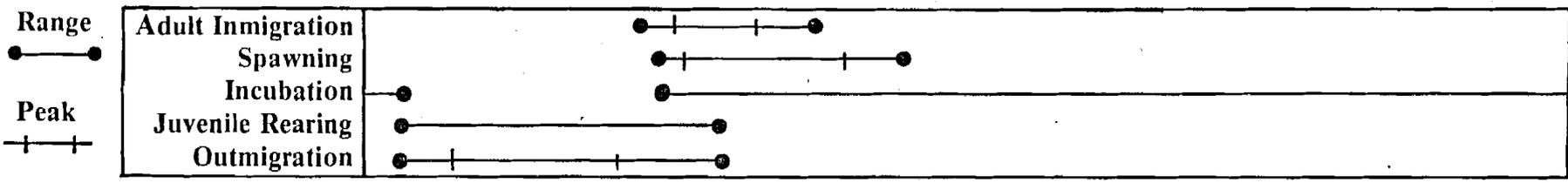
Natural

—————



1982-1983
River Mile 130

CHUM SALMON



H75

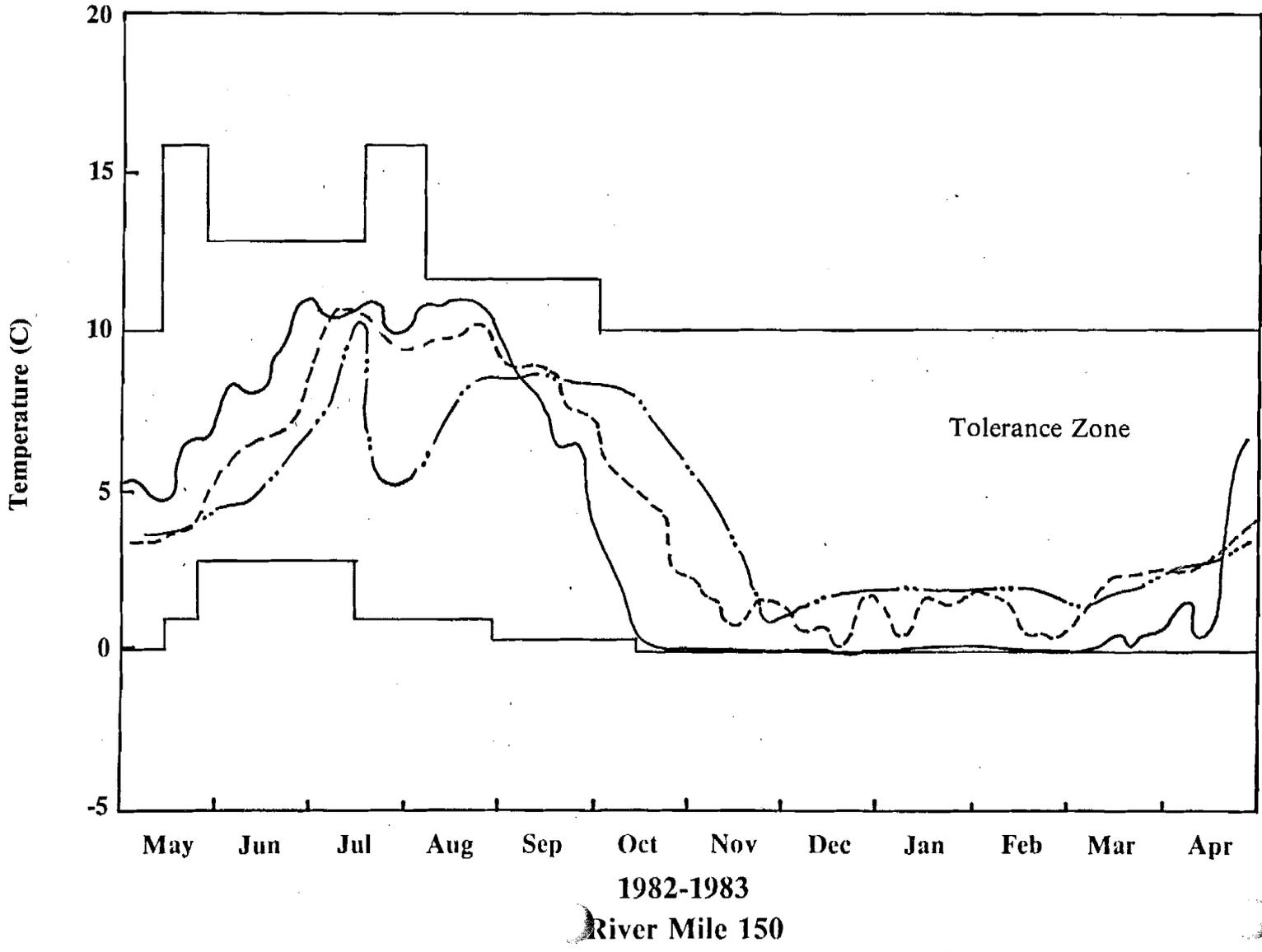
Devil Canyon
2002



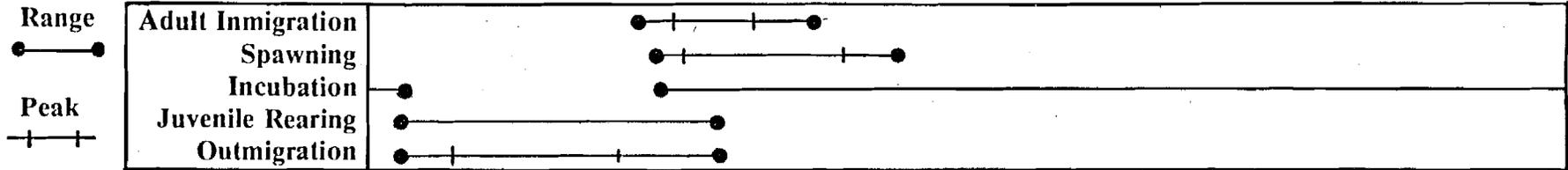
Watana
1996



Natural



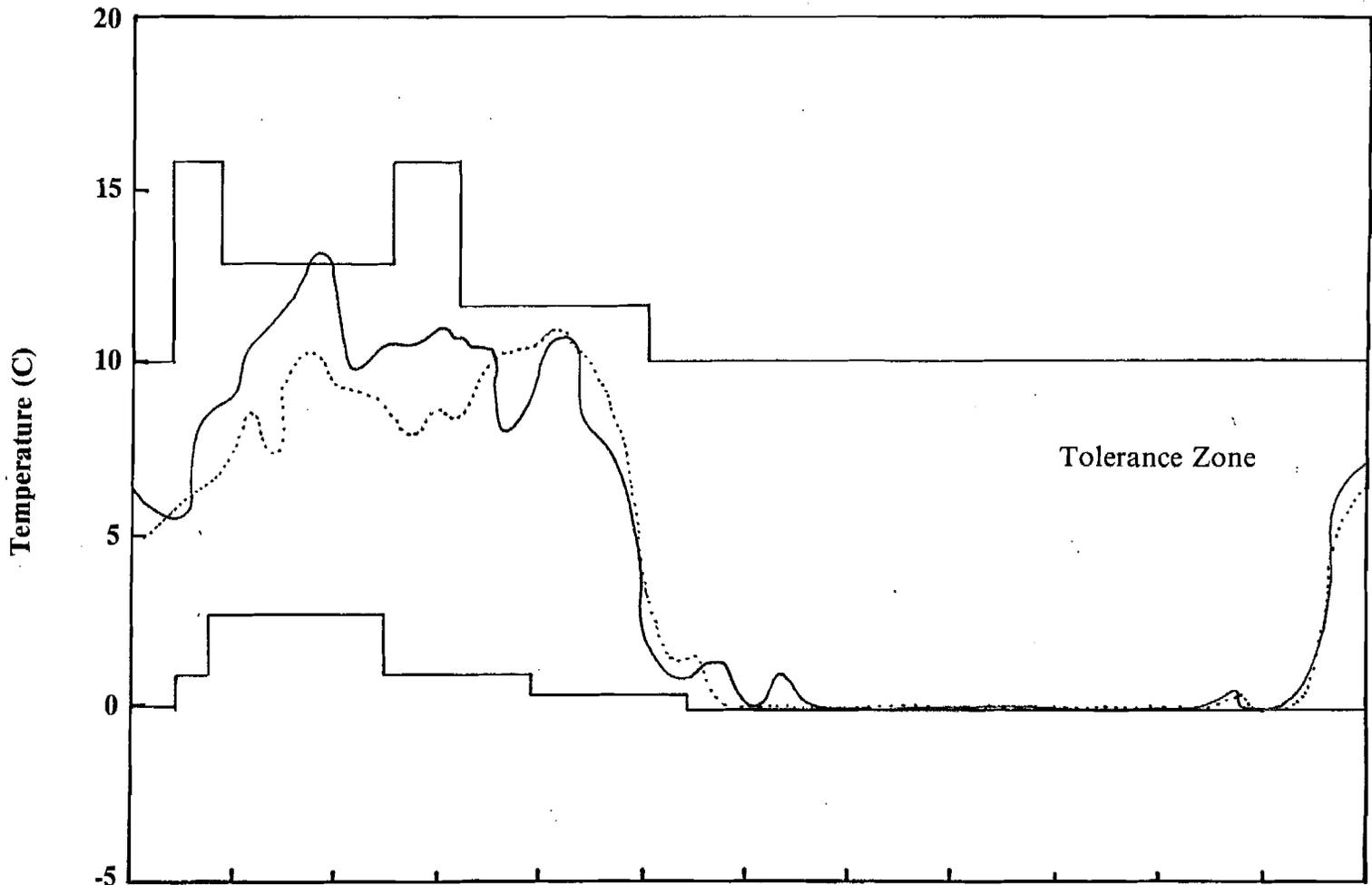
CHUM SALMON



H79

Watana Filling

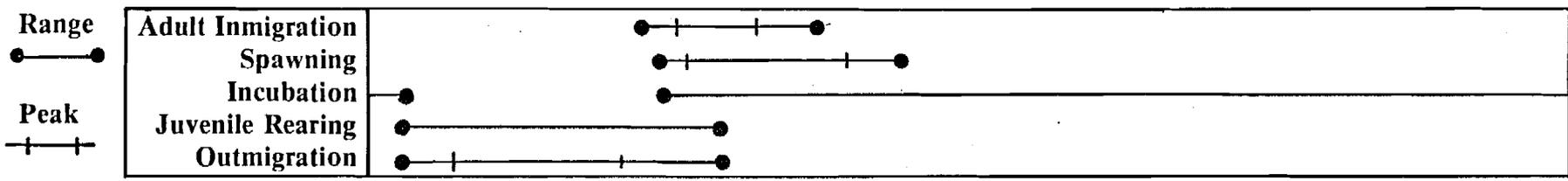
Natural



May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr

1981-1982
River Mile 100

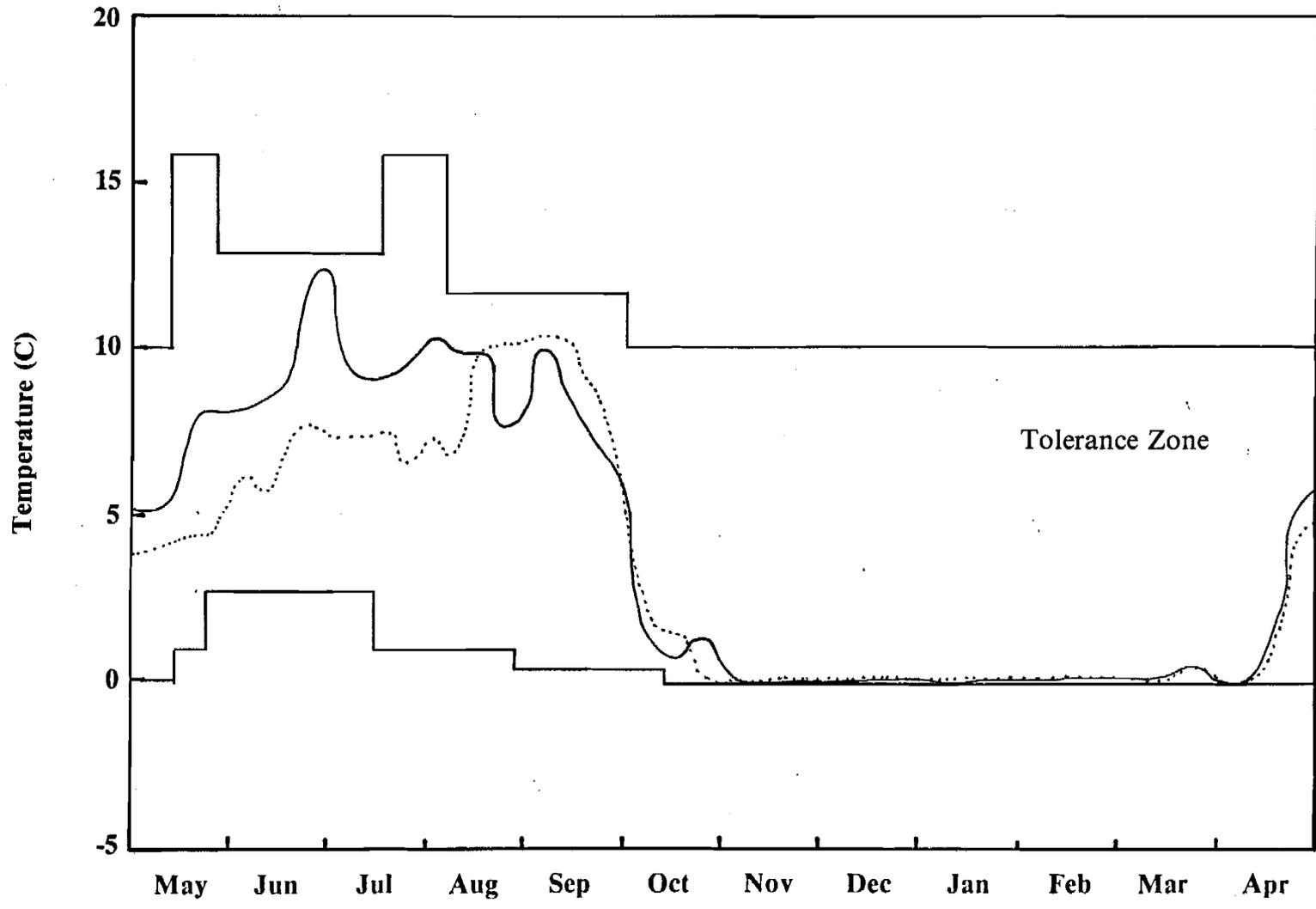
CHUM SALMON



08H

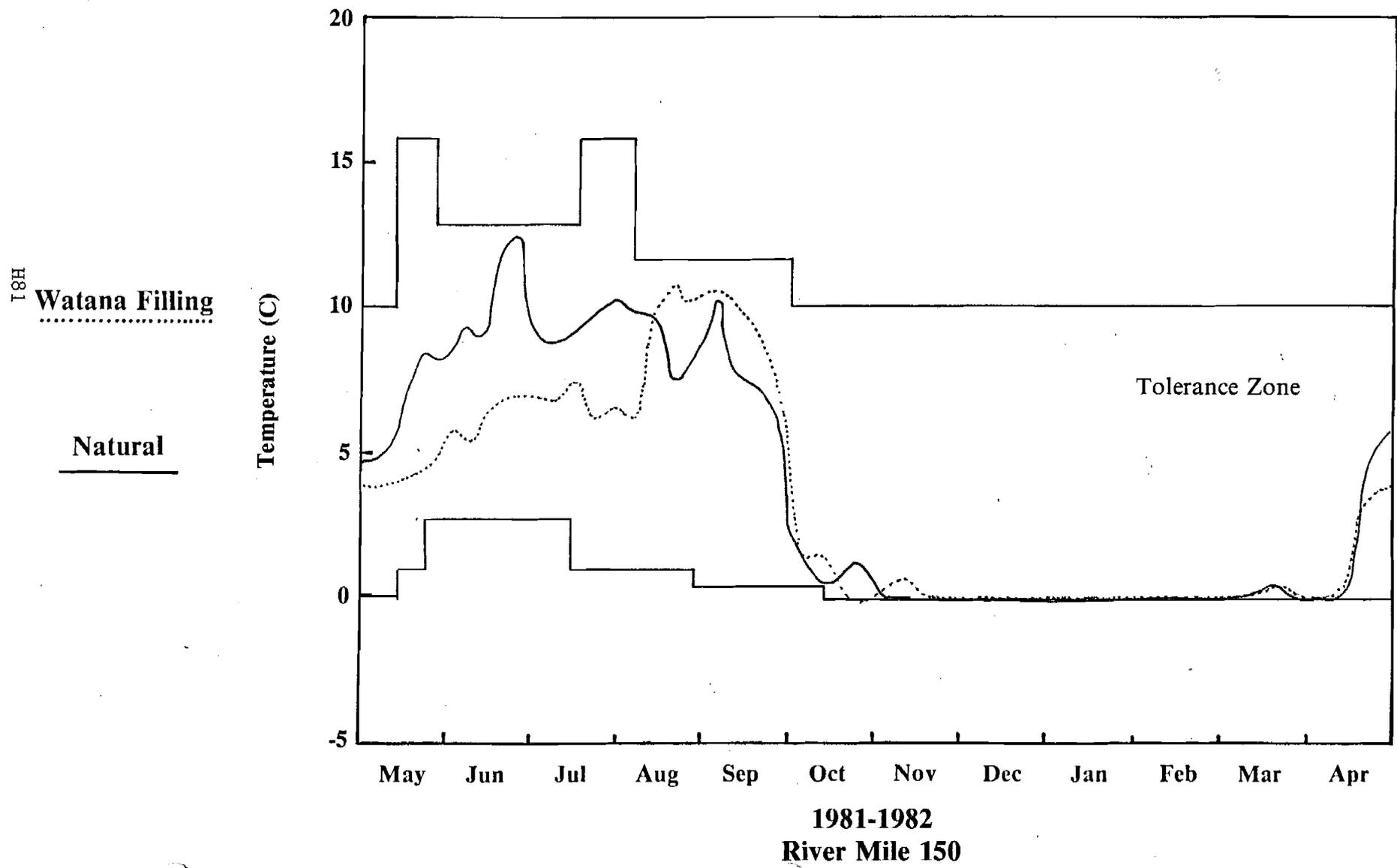
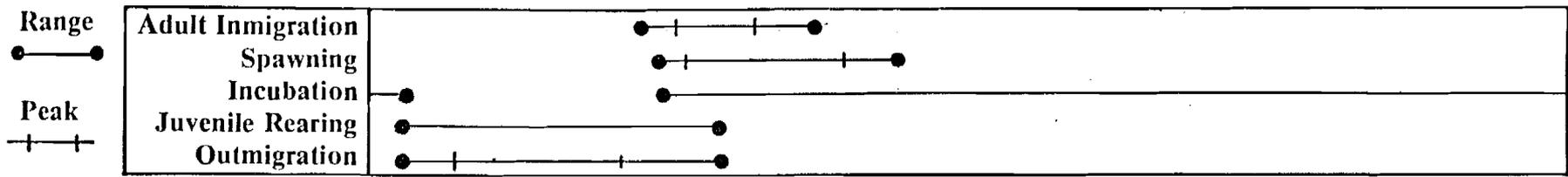
Watana Filling

Natural

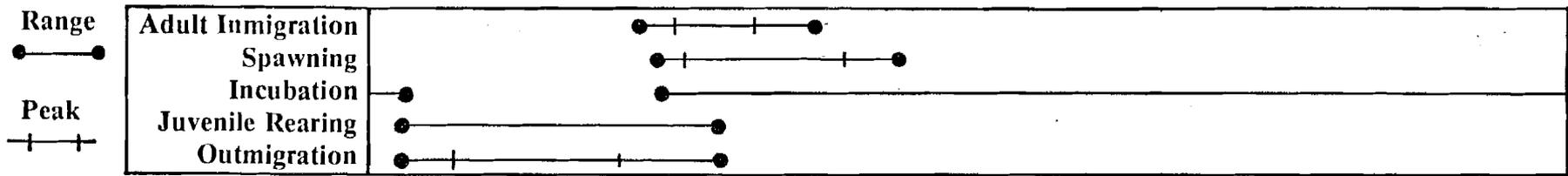


1981-1982
River Mile 130

CHUM SALMON



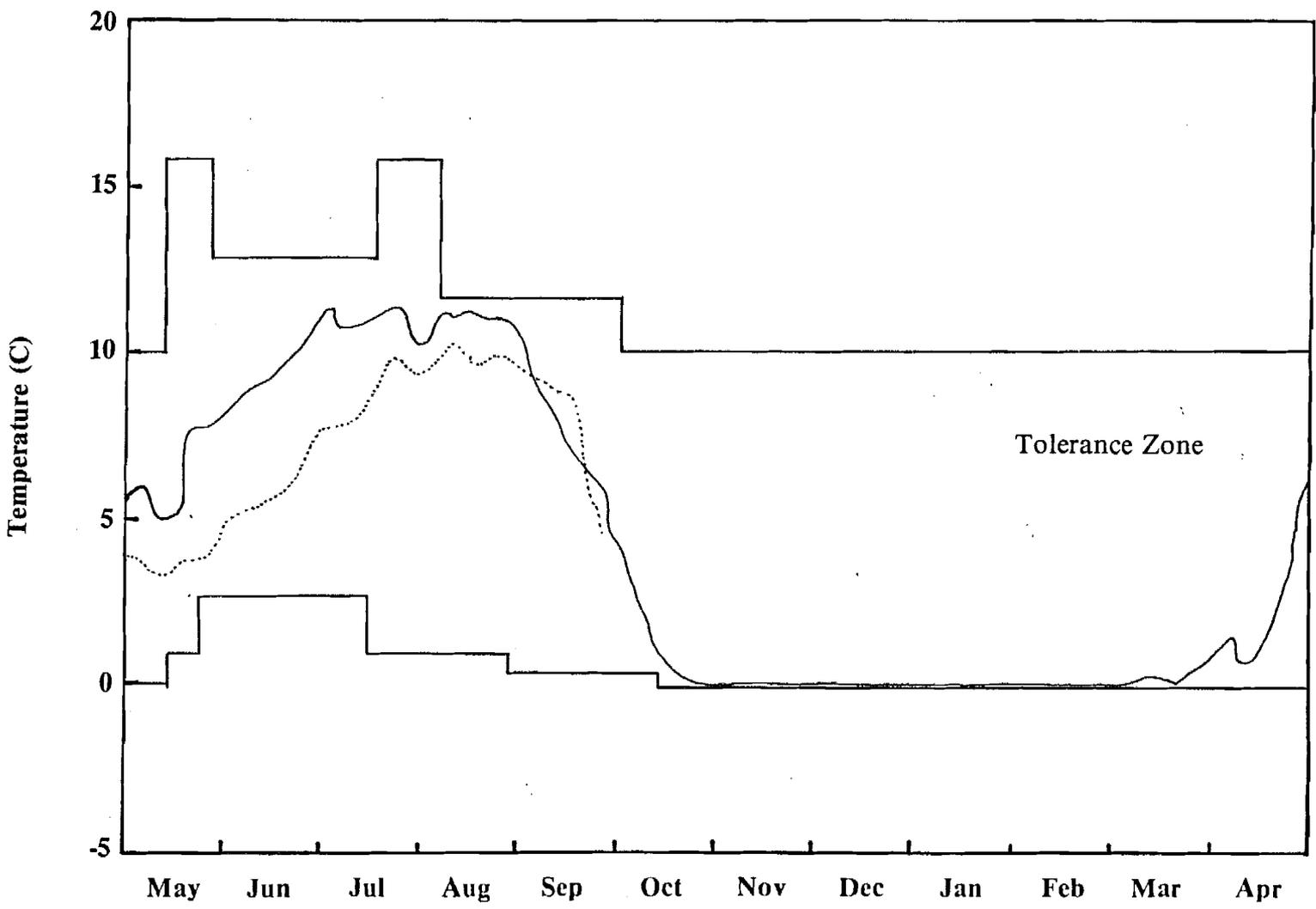
CHUM SALMON



H83

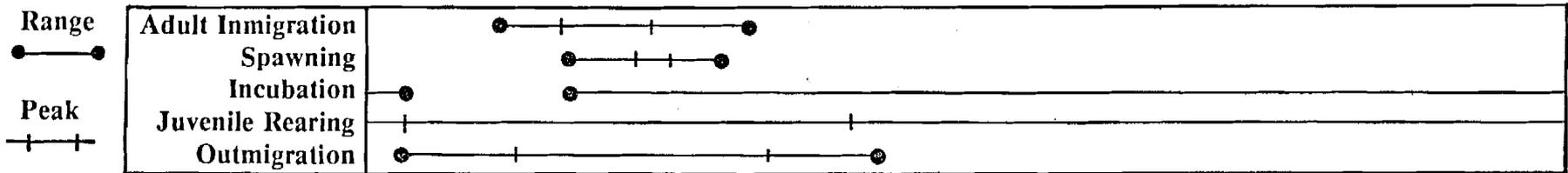
Watana Filling

Natural



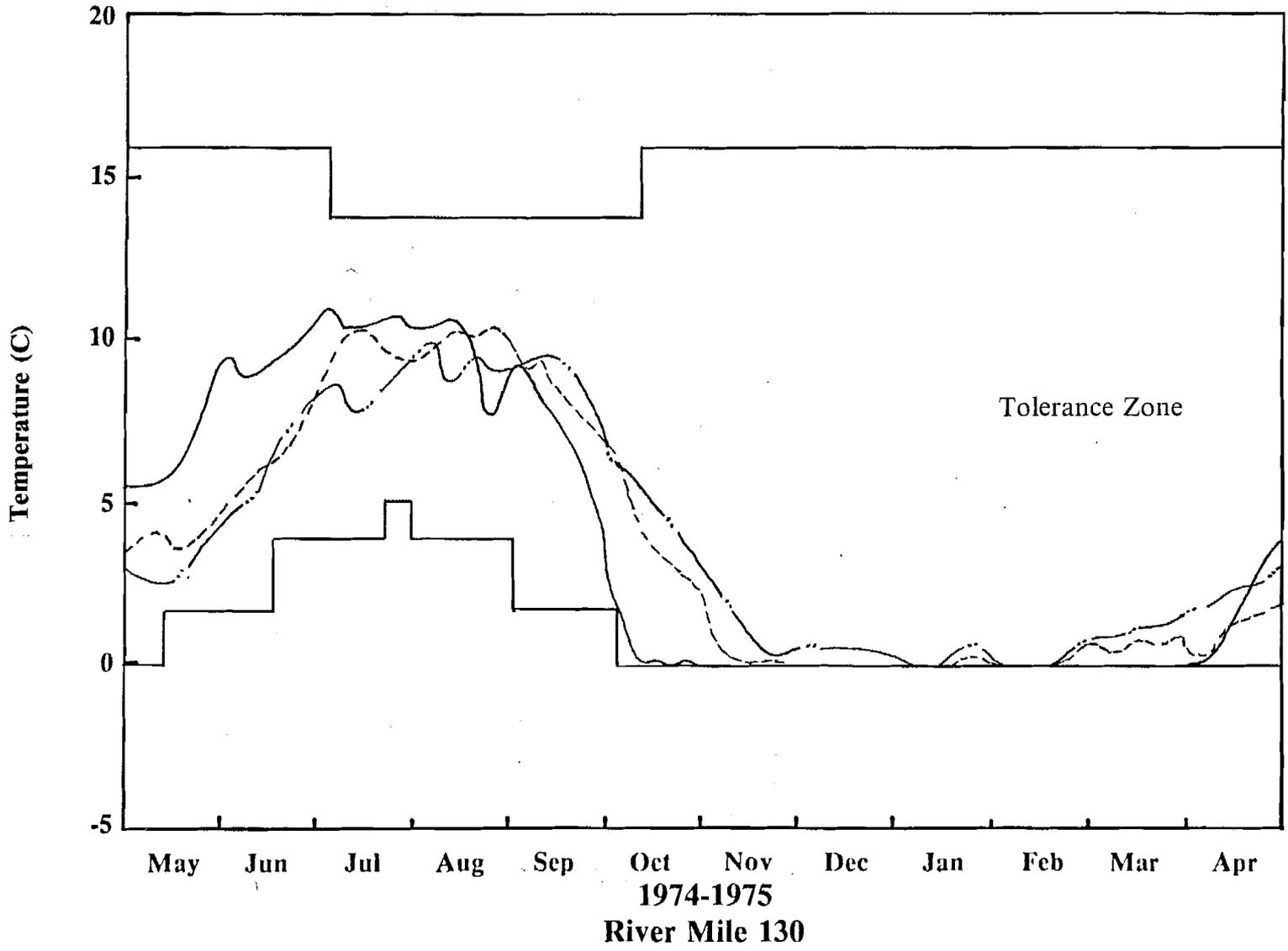
1982-1983
River Mile 130

CHINOOK SALMON

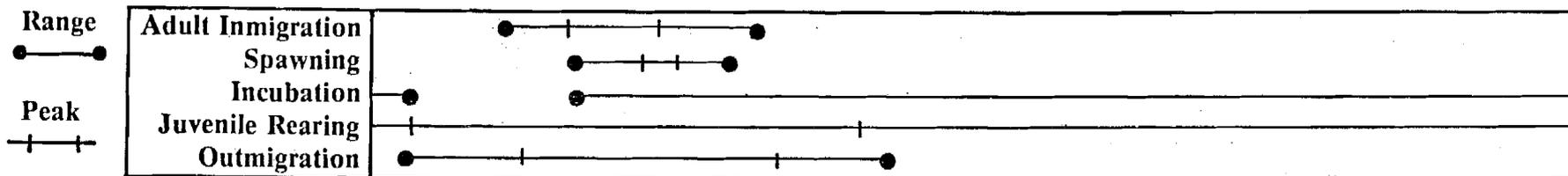


68H
 Devil Canyon
 2002

 Watana
 1996
 - - - - -
 Natural



CHINOOK SALMON



50TH
1105

Watana Filling

Natural

