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RELEASES AND RECOVERIES OF U.S. SALMONID DATA STORAGE TAGS, AND RECOVERIES OF HIGH SEAS TAGS IN NORTH AMERICA, 2000

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ABSTRACT

Information is reported on all high-seas salmon tags recovered in North America from 1 October 1999 through 30 September 2000, and all releases and recoveries of U.S. data storage tags (DSTs). Thirty-one DSTs, which record temperature and depth data, were placed on Pacific salmonids in the North Pacific Ocean and Bering Sea during two research cruises aboard two Japanese vessels in 2000. Eight sockeye, two chum, and two chinook salmon were tagged with DSTs in June and July in the central North Pacific and Bering Sea. Nineteen salmon (13 coho, 3 pink, 2 chinook, and 1 chum) were tagged with DSTs in the Gulf of Alaska in July.

Five tags from 1999 and five tags from 2000 tagging operations have been returned to date in North America; seven are DSTs and three are disk tags only. Two sockeye tagged in the Gulf of Alaska with temperature-only DSTs were recovered in Egegik, Alaska, and in the Nass River, B.C. The Nass River tag was the first recovery of a high seas DST from a Canadian fish. A third sockeye, tagged in the Bering Sea and carrying only a disk tag, was caught at Ugashik, Alaska. Seven coho salmon, all tagged in the Gulf of Alaska, were recovered in Alaska. Two, tagged with disk tags only, were caught at Kodiak Island. The other five carried DSTs and were caught at Unimak Island, Cook Inlet, Prince William Sound, the Tsiu River, and Marsh Island in southeast Alaska. The recovery in Prince William Sound was the first of a high seas DST from a North American hatchery fish (Solomon Gulch Hatchery).

One recovery in Hokkaido, Japan, in 1999 of a chum salmon carrying a U.S. temperature-only DST is also reported. Graphs of ambient temperature and pressure data from the DSTs are presented.

INTRODUCTION

Information is reported on all high-seas salmon (*Oncorhynchus* spp.) tags recovered in North America from 1 October 1999 through 30 September 2000, and all releases and recoveries of U.S. data storage tags (DSTs). One recovery in Japan in 1999 of a chum salmon carrying a U.S. DST is also reported. The Fisheries Research Institute (FRI), School of Aquatic and Fishery Sciences, University of Washington, serves as a processing center for all North American recoveries of Canadian, Japanese, Russian, and U.S. high-seas salmon tags, and recoveries of U.S. high-seas salmon tags and DSTs by all nations.

Releases and recoveries of all U.S. DSTs are reported, in order to have a complete record in one document. (Releases of U.S. DSTs from Japanese vessels and Japanese recoveries of U.S. DSTs are also reported in Fukuwaka et al. 2000.) Graphs of ambient temperature and pressure data from the DSTs are presented.

MATERIALS AND METHODS

Fish were captured by research longline on one Japanese vessel and by research longline and hook-and-line on another Japanese vessel. U.S. high-seas tags are 20 mm diameter plastic red-and-

white Petersen disk tags. The DSTs are small circuit boards potted in a clear urethane manufactured by Conservation Devices, Inc. Model 31 of these tags weighs approximately 9.5 g, and is 40 x 23 x 8 mm in dimension. Model 41 is 27 x 16 x 8 mm and weighs 5 g. Both tags record temperature and depth data. Tags were attached to fish just anterior to the dorsal fin using one 76 mm nickel pin for disk tags, or two pins for DSTs with labeled U.S. and Japanese or blank disk tags placed on the pins on the other side of the fish.

FRI's high-seas tag processing center activities include: (1) advertising for tag recoveries, (2) returning tags and original recovery information to the appropriate release agencies, (3) mailing information on tag recoveries and a tag reward to fishermen and processors, (4) maintaining a file of original correspondence, data, and tags of all recoveries of U.S., U.S.-Russia, and Japan-U.S. tags (1956-present), (5) maintaining and updating an all-agency tag release and computer database, and (6) reporting all recoveries of U.S., U.S.-Russia, and Japan-U.S. high-seas tags to the North Pacific Anadromous Fish Commission (NPAFC). In addition, FRI scientists periodically prepare reports and maps based on historical recoveries of high-seas tags that describe the know ocean ranges of major regional stocks of Asian and North American salmonids (for example, Myers et al. 1996). The complete all-agency (Canada, Japan, Russia, and United States) high-seas tag release and recovery computer database (1954-present) is available from FRI upon request from the parties of NPAFC so that all member nations can have access to a common database.

RESULTS AND DISCUSSION

Thirty-one DSTs, which record temperature and depth data, were placed on Pacific salmonids in the North Pacific Ocean and Bering Sea during two research cruises aboard two Japanese vessels in 2000 (Table 1). Eight sockeye, two chum, and two chinook salmon were tagged with DSTs in June and July in the central North Pacific and Bering Sea. Nineteen salmon (13 coho, 3 pink, 2 chinook, and 1 chum) were tagged with DSTs in the Gulf of Alaska in July.

From 1 October 1999 through 30 September 2000, ten high-seas salmon tags from recoveries in North America have been returned (Table 2). Five are from 1999 and five are from 2000 tagging operations, and all recoveries but one are from Alaska. Seven are DSTs and three are disk tags only. Three sockeye salmon from 1999 tagging operations were recovered in 1999. Two of the sockeye were tagged with temperature-only DSTs in May 1999 and were recovered in Egegik, Alaska, and in the Nass River, B.C. (Figs. 1 and 2). The Nass River tag was the first recovery of a high seas DST from a Canadian fish. A third sockeye, tagged in the Bering Sea and carrying only a disk tag, was caught at Ugashik, Alaska. Seven coho salmon, all tagged in the Gulf of Alaska in July, were recovered in Alaska. Three were tagged and recovered in 1999 and four were tagged in 2000. Two, tagged with disk tags only, were caught at Kodiak Island. The other five carried DSTs and were caught at Unimak Island, Cook Inlet, Prince William Sound, the Tsiu River, and Marsh Island in southeast Alaska (Figs. 3-7). The recovery in Prince William Sound was from a fish in the raceway at Solomon Gulch Hatchery. This is the first recovery of a high seas DST from a North American hatchery fish. Tag 793, recovered in Cook Inlet, was a tag reused from 1999, when it was recovered from a pink salmon (Walker et al. 1999). The depth data from this tag after 10 days was not reliable because of a sudden jump to large values. The pressure sensor may have been damaged during testing after the 1999 recovery.

One chum salmon tagged in 1999 in the Bering Sea with a U.S. temperature-only DST was recovered at Abashiri on the Okhotsk Sea coast of Hokkaido, Japan, in 1999 (Fig. 8). This fish is also reported in Fukuwaka et al. (2000).

Release data from 1999 tagging operations and other recoveries in 1999 were reported in Walker et al. 1999.

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Walker, R.V., K.W. Myers, H.R. Carlson, and K.D. Friedland. 1999. U.S. releases and recoveries of salmonid data storage tags and disk tags in the North Pacific Ocean and Bering Sea, 1999. (NPAFC Doc. 412.) FRI-UW-9910. Fisheries Research Institute, University of Washington, Seattle, WA. 19 p.

Table 1. U.S. archival data storage tags placed on salmonids in the North Pacific Ocean and Bering Sea in 2000. All tags record temperature and depth data. SST = sea surface temperature in °C. LL = longline; HL = hook and line. FRI = Fisheries Research Institute; FAJ = Fisheries Agency of Japan.

Vessel and	Tag		Release	Location				Fork		Other tags	
Data Tag #	Model	Species	Date	Latitude	Longitude	SST	Gear	Len.	Age	FRI	FAJ
R/V *Wakatake maru*											
712	RL-31	Chum	06/22/00	47°30'N	180° 00'	6.1	LL	490	0.3	LL3354	EE4147
717	RL-31	Chum	06/23/00	48°30'N	180° 00'	6.0	LL	598	0.3	LL3363	EE4156
719	RL-31	Sockeye	06/24/00	49°30'N	180° 00'	6.7	LL	602	1.3	LL3375	EE4168
725	RL-31	Sockeye	06/25/00	50°30'N	180° 00'	6.4	LL	620	1.4	LL3378	EE4171
740	RL-31	Sockeye	06/25/00	50°30'N	180° 00'	6.4	LL	515	1.3	LL3379	EE4172
744	RL-31	Sockeye	06/25/00	50°30'N	180° 00'	6.4	LL	638	1.3	LL3382	EE4175
1077	RL-31	Sockeye	06/26/00	51°30'N	180° 00'	5.5	LL	510	2.3	LL3387	EE4180
1076	RL-31	Sockeye	06/27/00	52°30'N	180° 00'	4.7	LL	540	2.3	LL3393	EE4186
1078	RL-31	Sockeye	06/27/00	53°30'N	180° 00'	5.5	LL	610	2.3	LL3493	EE4286
1079	RL-31	Sockeye	06/28/00	53°30'N	180° 00'	5.5	LL	554	1.3	LL3494	EE4287
1080	RL-31	Chinook	07/03/00	58°30'N	180° 00'	8.4	LL	635	1.3	LL3658	EE4451
1081	RL-31	Chinook	07/03/00	58°30'N	180° 00'	8.4	LL	685	1.3	LL3657	EE4450
T/S *Oshoro maru*											
792	RL-31	Coho	07/04/00	56°00'N	145° 00'W	9.4	HL	670	2.1	LL1603	BB6404
1082	RL-31	Coho	07/04/00	56°00'N	145° 00'W	9.4	HL	615	X.1	LL1600	BB6402
1083	RL-31	Coho	07/04/00	56°00'N	145° 00'W	9.4	HL	635	1.1	LL1601	BB6403
1084	RL-31	Coho	07/04/00	56°00'N	145° 00'W	9.4	HL	700	1.1	LL1602	BB6405
1085	RL-31	Chinook	07/04/00	56°00'N	145° 00'W	9.4	HL	730	X.2	LL1604	BB6406
85	RL-41	Pink	07/05/00	55°58'N	144° 56'W	10.5	LL	480	0.1	LL1612	BB6414
793	RL-31	Coho	07/05/00	55°58'N	144° 56'W	10.5	LL	655	2.1	LL1611	BB6413
1086	RL-31	Chum	07/05/00	55°58'N	144° 56'W	10.5	LL	575	0.3	LL1605	BB6407
1087	RL-31	Coho	07/05/00	55°58'N	144° 56'W	10.5	LL	590	X.1	LL1606	BB6408
1088	RL-31	Coho	07/05/00	55°58'N	144° 56'W	10.5	LL	600	1.1	LL1610	BB6412
1090	RL-31	Coho	07/06/00	55°02'N	144° 58'W	9.7	LL	660	1.1	LL1616	BB6418
1091	RL-31	Coho	07/06/00	55°02'N	144° 58'W	9.7	LL	575	2.1	LL1617	BB6419
86	RL-41	Coho	07/07/00	54°01'N	144° 52'W	9.3	LL	435	1.1	LL1623	BB6425
87	RL-41	Pink	07/07/00	54°01'N	144° 52'W	9.3	LL	605	0.1	LL1624	BB6426
1092	RL-31	Coho	07/07/00	54°01'N	144° 52'W	9.3	LL	640	2.1	LL1622	BB6424
1093	RL-31	Coho	07/07/00	54°01'N	144° 52'W	9.3	LL	625	1.1	LL1625	BB6427
88	RL-41	Chinook	07/09/00	51°01'N	144° 55'W	10.8	HL	479	1.1		BB6431
1094	RL-31	Coho	07/09/00	51°01'N	144° 55'W	10.8	HL	583	2.1	LL1628	BB6430
89	RL-41	Pink	07/10/00	49°59'N	144° 57'W	11.3	HL	425	0.1		BB6432

Table 2. Preliminary release and recovery information for U.S. tags and cooperative Japan-U.S. tags returned from 1 October 1999 to 30 September 2000. A blank indicates the information is not available. LL=longline, GN= gillnet, PS=purse seine, HL=hook and line. Age designation is the European method, first number is the number of freshwater annuli, second number is the number of ocean annuli. FL=fork length, MEFT=mid-eye-fork of tail length, and BW=body weight. Data storage tags: T = temperature only, TD = temperature and depth.

U.S.	Japan	Release							Recovery										
Tag.	Tag		Lat.		2°X5°		FL			Lat.		Area			FL	BW	Gonad		
Nos.	No.	Date	(°N)	Long.	Area	Gear	(mm)	Age	Date	(°N)	Long.	Code	Gear	Sex	(mm)	(g)	(g)	Age	Location
A. Sockeye Salmon																			
LL1210, T data tag no. 344		20-May-99	54°45	145°00W	W4554	trawl	615	2.2	14-Aug-99	55°18	129°04W	71-7	fish-wheel	-	-	-	-	-	Grease Harbour, approx. 60 km upstream from mouth of Nass River, B.C., Canada
LL1211, T data tag no. 351		20-May-99	54°45	145°00W	W4554	trawl	520	2.2	13-Jul-99	58°12	157°24W	48-0	setnet	female	-	-	-	-	mouth of Egegik River, Bristol Bay, western Alaska, USA
LL2939, disk tag	HH2168	30-Jun-99	51°29	179°58W	W8056	LL	564	2.2	29-Jul-99	57°36	157°41W	49-0	setnet	-	-	-	-	-	Smoky Point, Ugashik River, Bristol Bay, western Alaska, USA
B. Chum Salmon																			
LL2983, T data tag no. 247	HH2212	02-Jul-99	53°30	180°00	W8052	LL	601	0.3	26-Oct-99	44°03	144°15E	02-2	setnet	male	614	2337	130	-	Abashiri, Okhotsk Sea coast Hokkaido, Japan

(continued)

Table 2. continued

U.S.	Japan	Release							Recovery										
Tag.	Tag		Lat.		2°X5°		FL			Lat.		Area			FL	BW	Gonad		
Nos.	No.	Date	(°N)	Long.	Area	Gear	(mm)	Age	Date	(°N)	Long.	Code	Gear	Sex	(mm)	(g)	(g)	Age	Location
D. Coho salmon																			
LL1381, disk tag	BB2581	14-Jul-99	55°04	144°57W	W4554	LL	512	1.1	28-Sep-99	57°36	152°26W	56-2	HL	-	-	-	-	-	Kalsin Pond, Kodiak Is., central Alaska, USA
LL1353, TD data tag no. 792	BB2553	10-Jul-99	52°02	144°58W	W4552	LL	585	2.1	20-Sep-99	56°07	132°43W	64-1	GN	male	-	4500	-	2.1	1.5 mi. off Marsh Island, Clarence Strait, southeast Alaska, USA
LL1611, TD data tag no.793	BB6413	05-Jul-00	55°58	144°56W	W4554	LL	655	2.1	31-Jul-00	60°14	151°24W	57-3	setnet	-	-	-	-	2.1	Clam Gulch, Cook Inlet, central Alaska, USA
LL1602, TD data tag no.1084	BB6405	04-Jul-00	56°00	145°00W	W4556	LL	700	1.1	06-Sep-00	61°02	146°17W	59-0	hatch-ery	male	733	3910	-	2.1	Solomon Gulch Hatchery, Valdez, Prince William Sound, central Alaska, USA
LL1606, TD data tag no. 1087	BB6408	05-Jul-00	55°58	144°56W	W4554	LL	590	2.1	03-Aug-00	54°40	163°04W	53-1	GN	-	-	2700	-	2.1	off Cape Pankof, Unimak Island, eastern Aleutian Islands, Alaska, USA
LL1623, TD data tag no. 1092	BB6424	07-Jul-00	54°01	144°52W	W4554	LL	640	1.1	21-Aug-00	60°04	143°08W	61-6	setnet	-	-	-	-	1.1	Tsiu River, central Alaska, USA
LL1613, disk tag	BB6415	06-Jul-00	55°01	144°58W	W4554	LL	600	2.1	16-Jul-00	57°47	152°11W	56-2	PS	-	540 MEFT	-	-	2.1	1 mile east of Long Island, Kodiak Is., central Alaska, USA

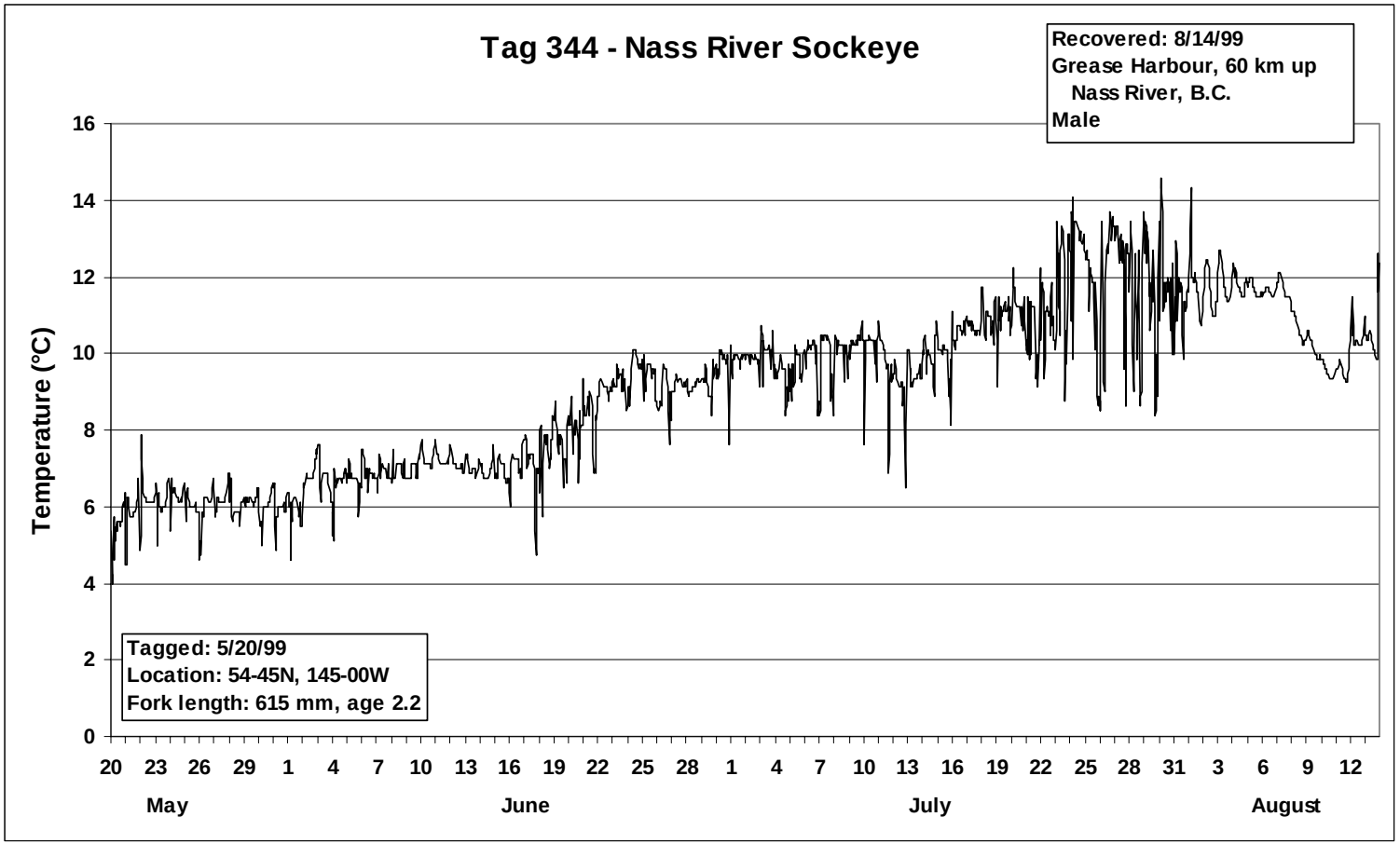

Figure 1. Temperature data recorded on a data storage tag placed on a 615 mm sockeye salmon in the Gulf of Alaska on 20 May 1999 and recovered in the Nass River, B.C., on 14 August 1999.

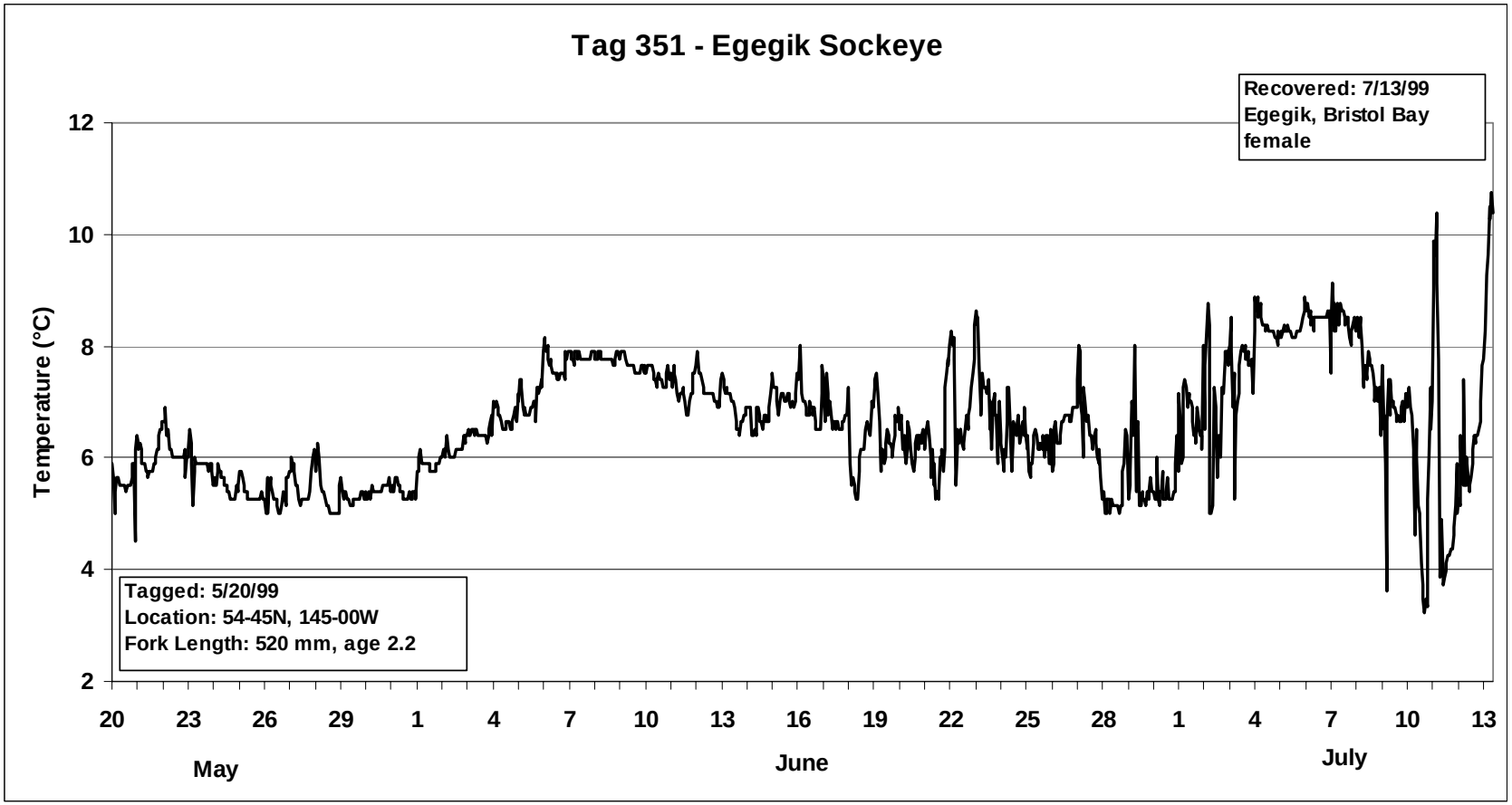

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Figure 2. Temperature data recorded on a data storage tag placed on a 520 mm sockeye salmon in the Gulf of Alaska on 20 May 1999 and recovered at Egegik, Bristol Bay, Alaska, on 13 July 1999.

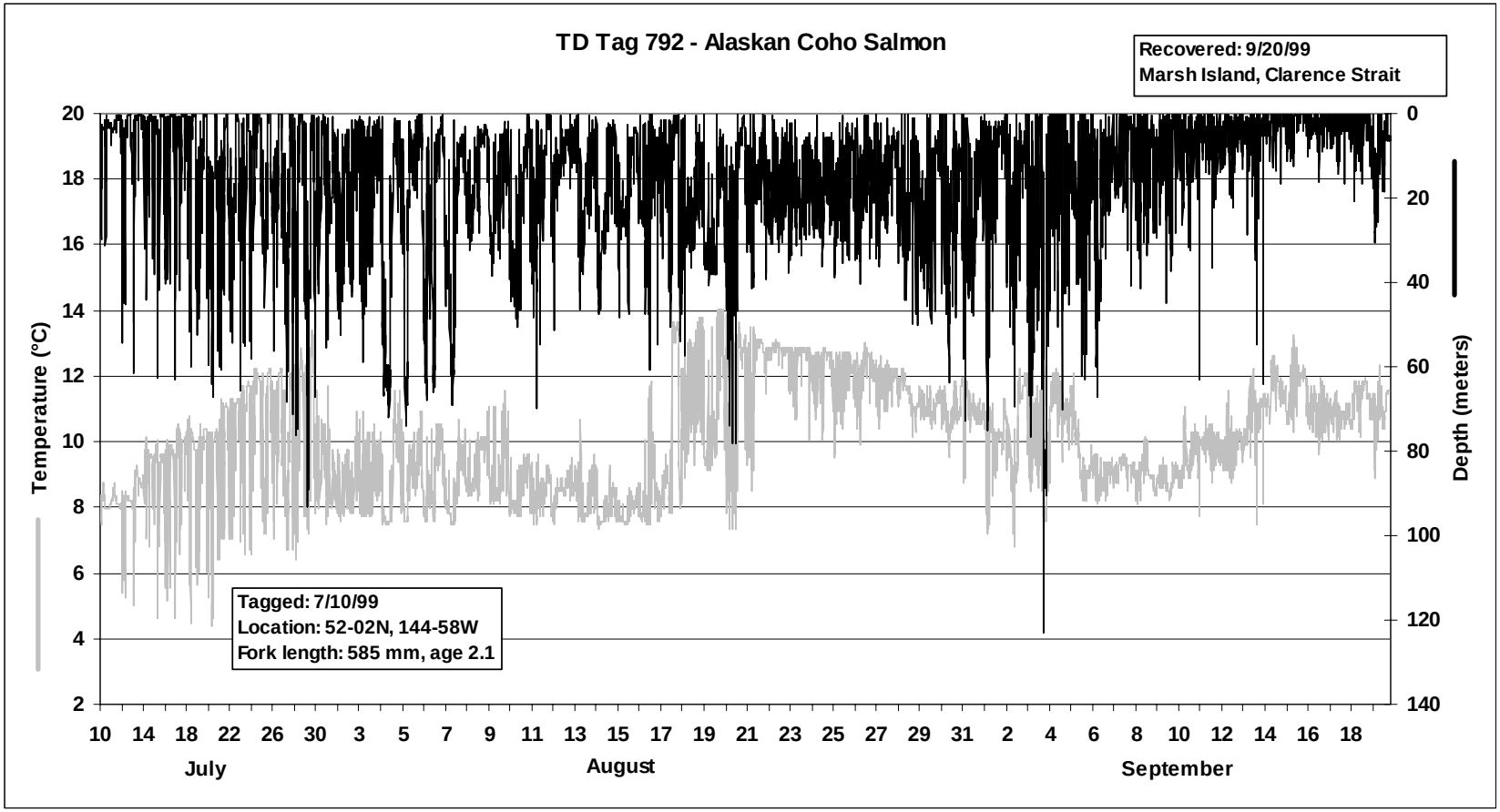

Figure 3. Temperature and depth data recorded on a data storage tag placed on a 585 mm coho salmon in the Gulf of Alaska on 10 July 1999 and recovered off Marsh Island, southeastern Alaska, on 20 September 1999.

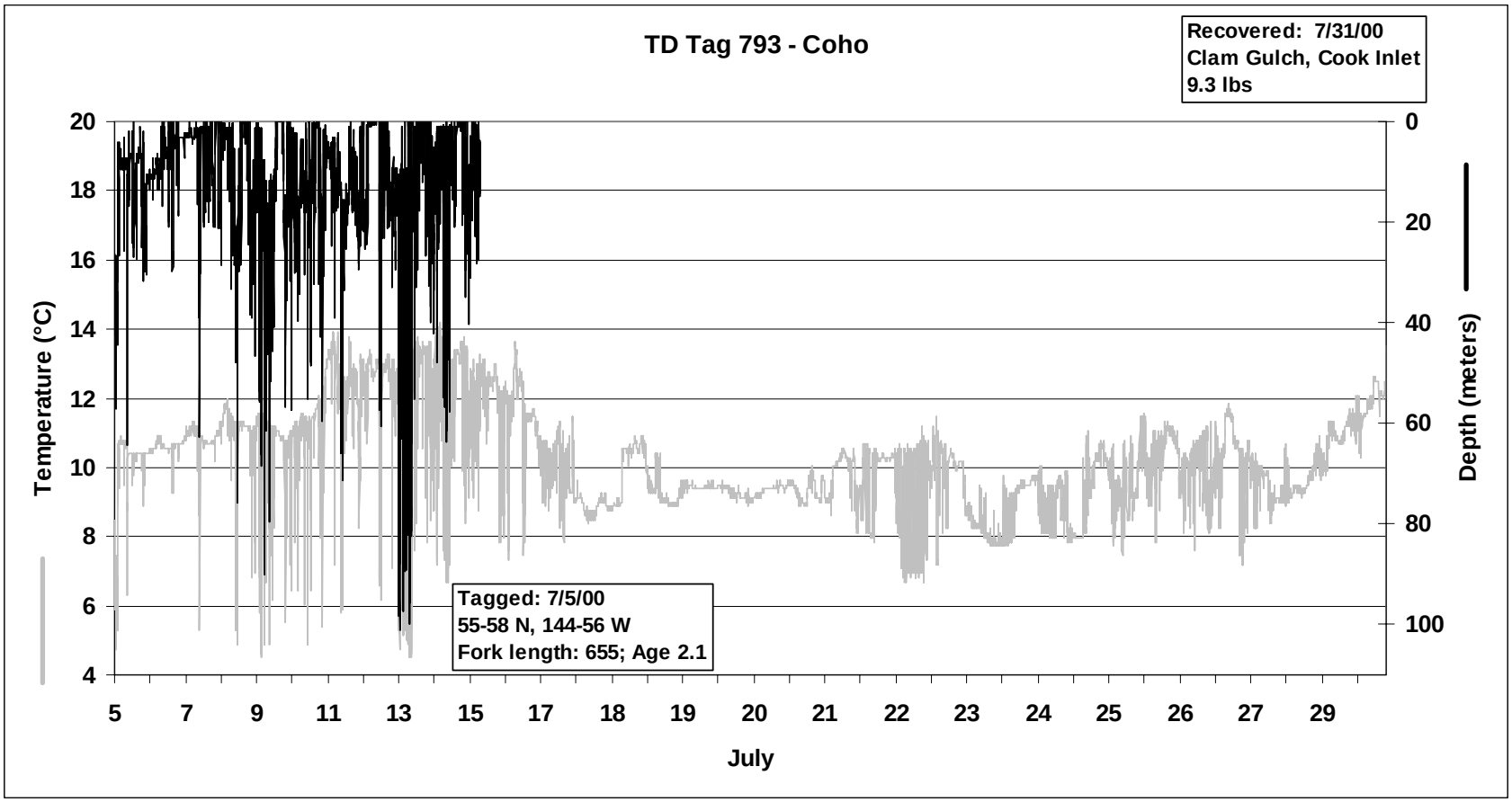

Figure 4. Temperature and depth data recorded on a data storage tag placed on a 655 mm coho salmon in the Gulf of Alaska on 5 July 2000 and recovered in Cook Inlet, central Alaska, on 31 July 2000.

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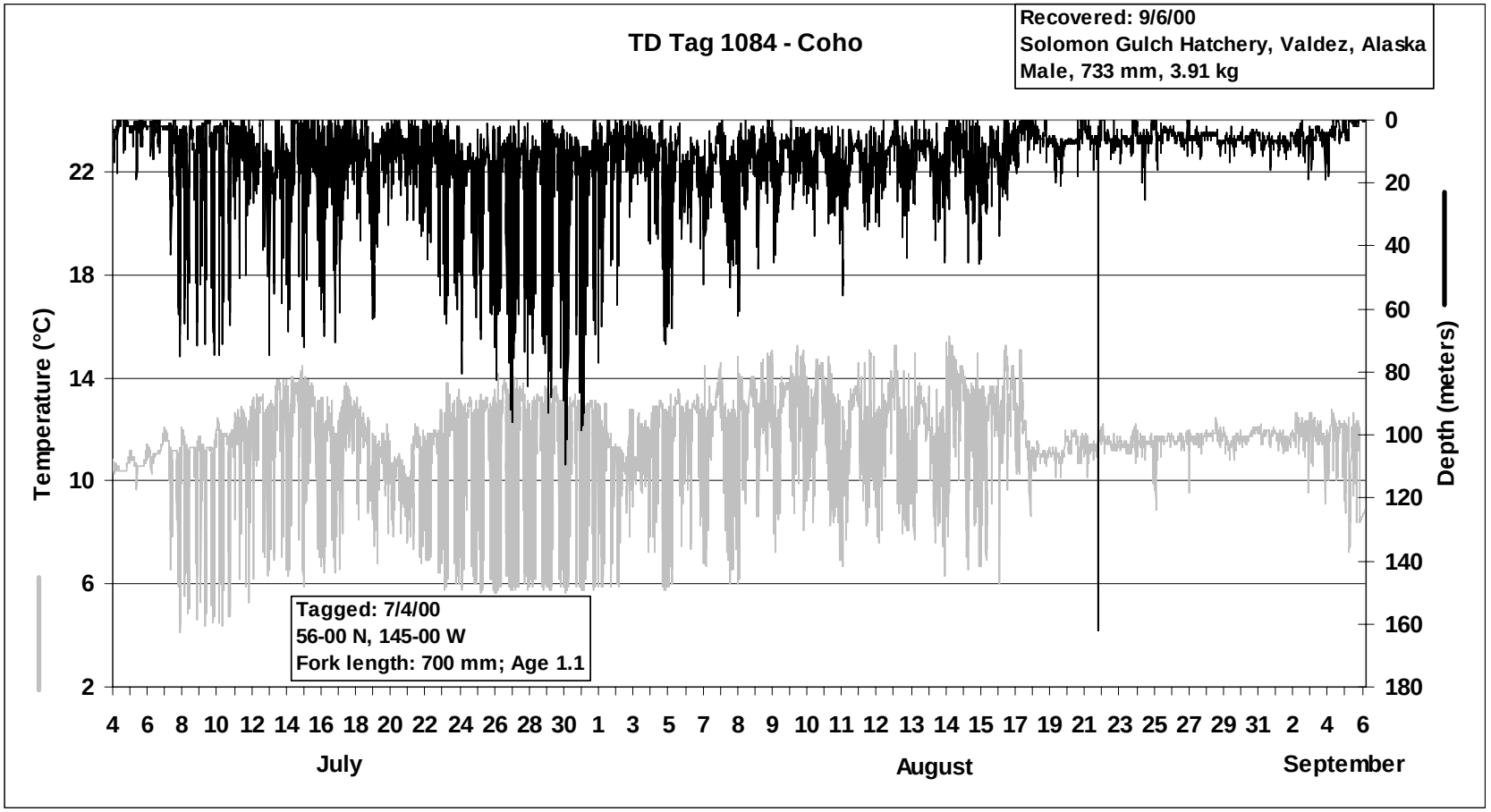

Figure 5. Temperature and depth data recorded on a data storage tag placed on a 700 mm coho salmon in the Gulf of Alaska on 4 July 2000 and recovered at Solomon Gulch Hatchery, Prince William Sound, central Alaska, on 6 September 2000.

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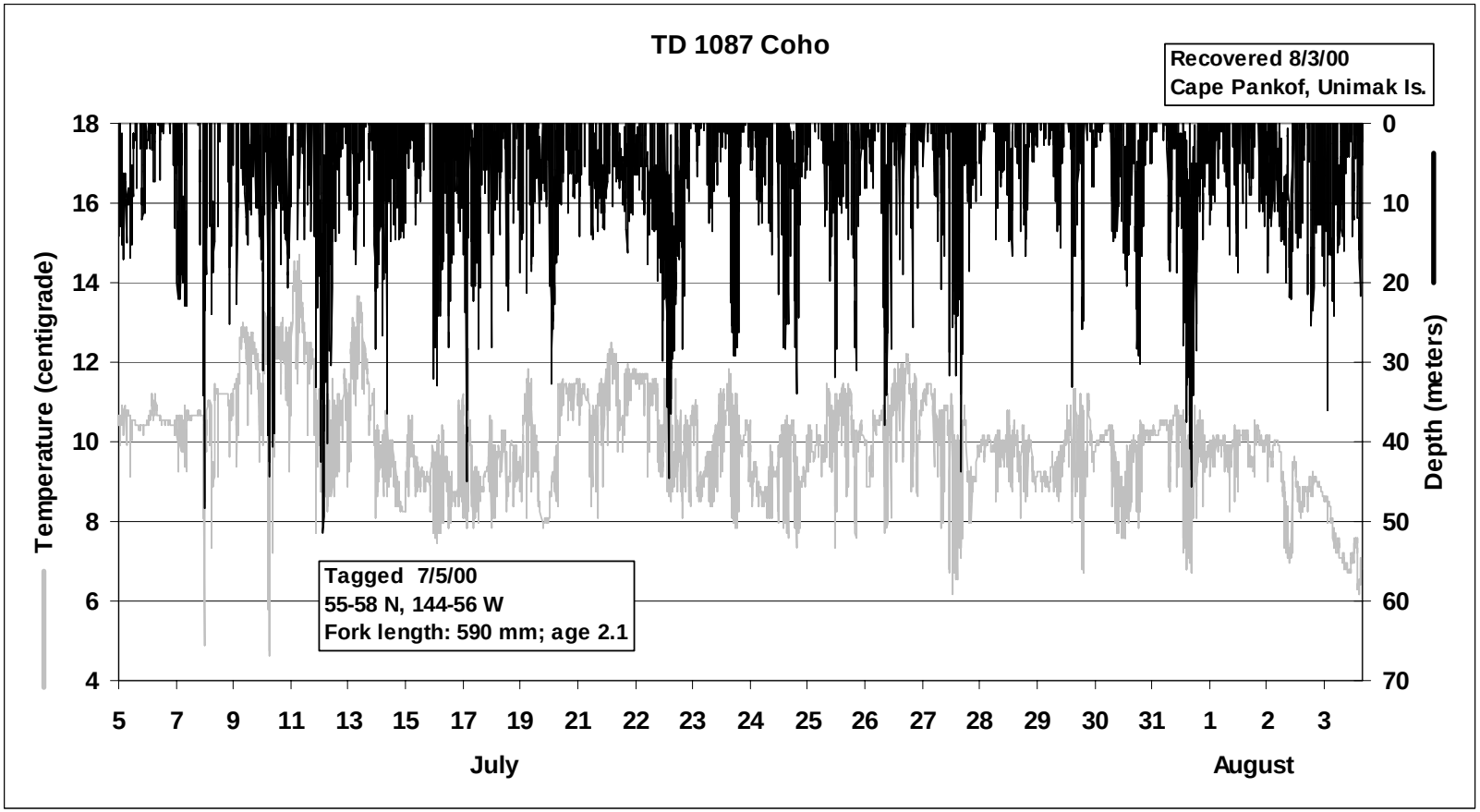

Figure 6. Temperature and depth data recorded on a data storage tag placed on a 590 mm coho salmon in the Gulf of Alaska on 5 July 2000 and recovered off the southeast coast of Unimak Island, eastern Aleutians, Alaska on 3 August 2000.

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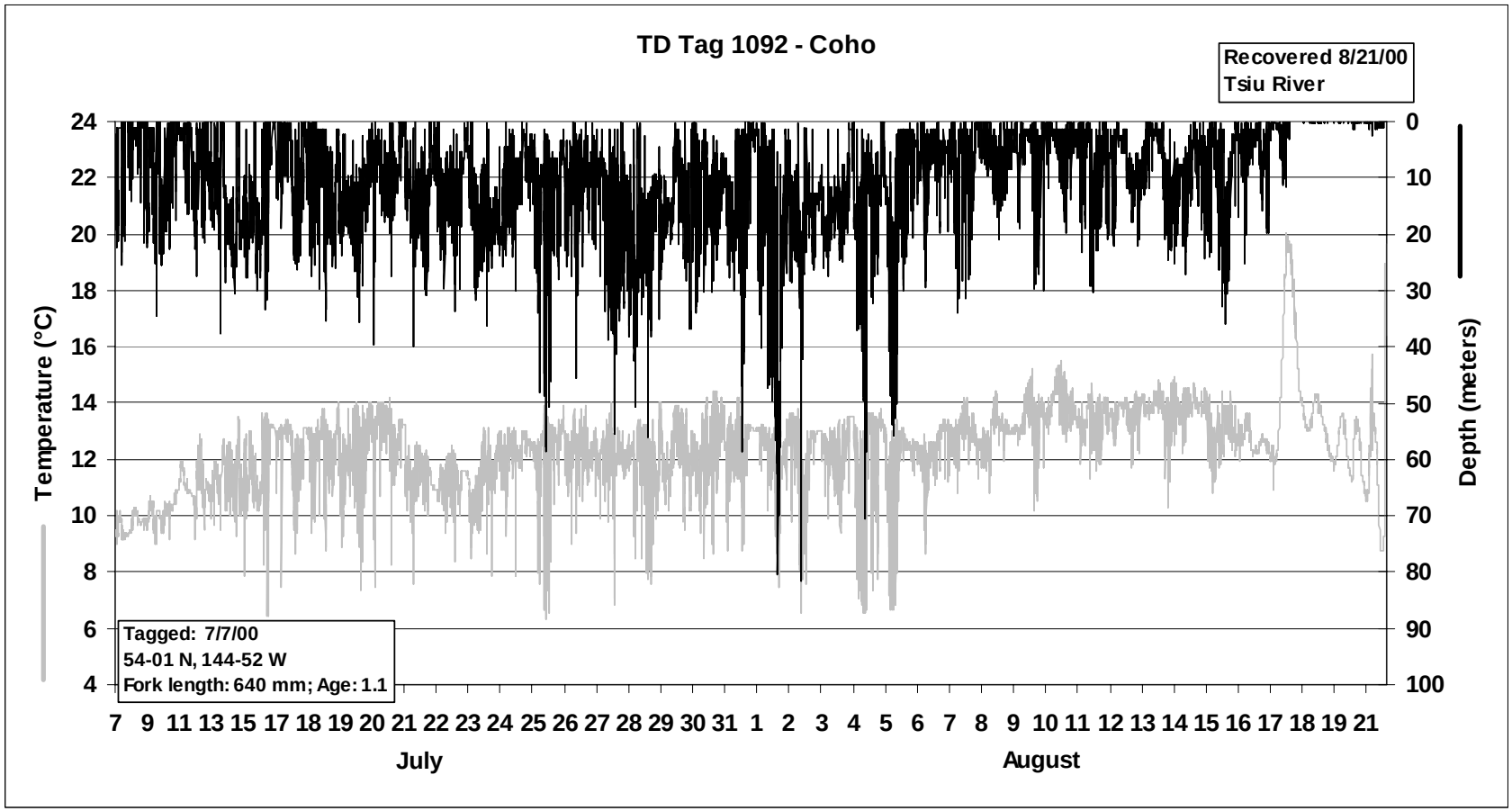

Figure 7. Temperature and depth data recorded on a data storage tag placed on a 640 mm coho salmon in the Gulf of Alaska on 7 July 2000 and recovered in the Tsiu River, central Alaska, on 21 August 2000.

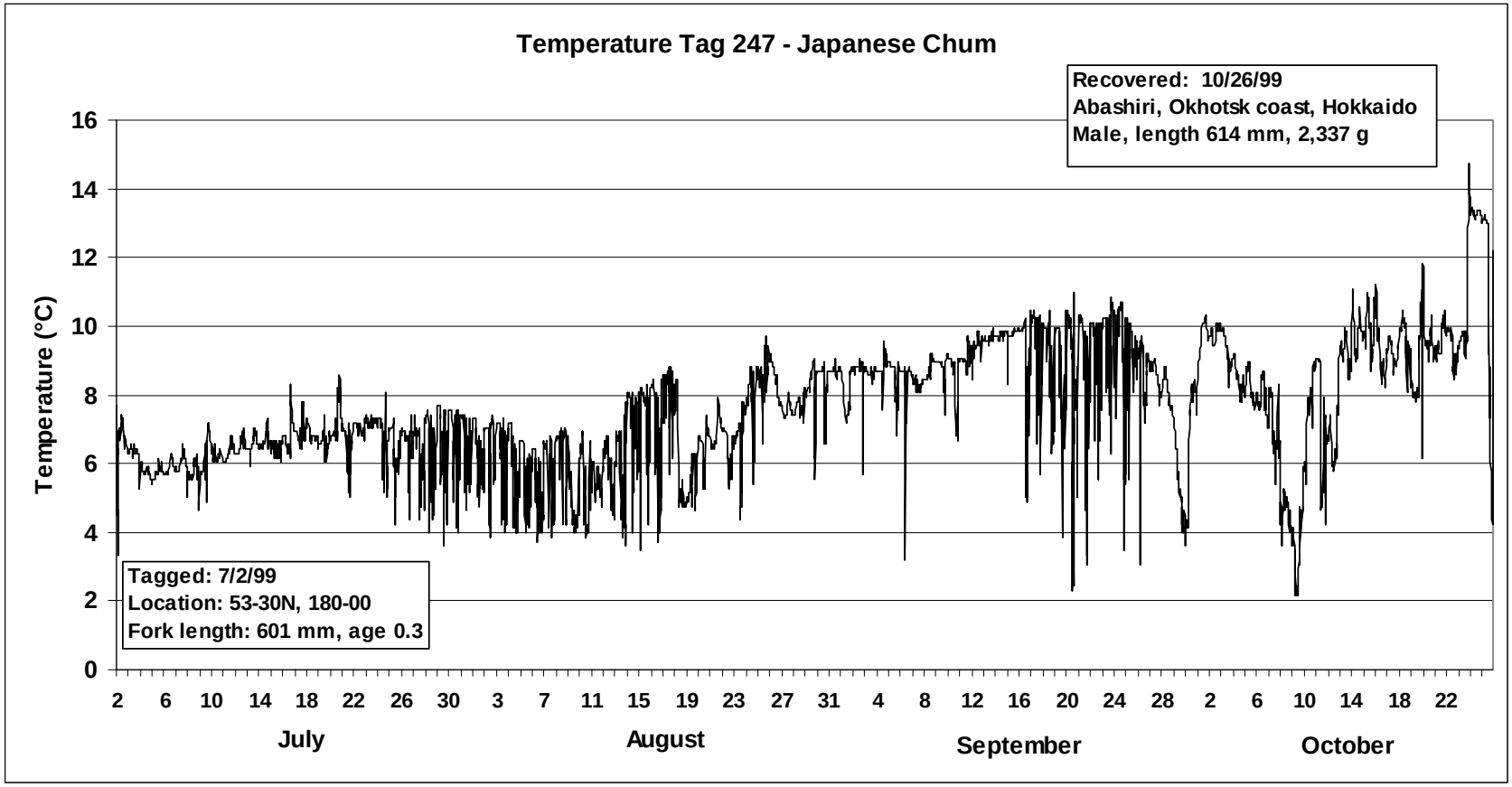

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Figure 8. Temperature data recorded on a data storage tag placed on a 601 mm chum salmon in the Bering Sea on 2 July 1999 and recovered at Abashiri, Hokkaido, Japan, on 26 October 1999.