

**Recoveries of High Seas Tags and Tag Releases from  
High Seas Research Vessel Surveys in 2017**

by

The Working Group on Salmon Marking (WGSM),  
The Committee on Scientific Research and Statistics (CSRS)

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Submitted to the

**NORTH PACIFIC ANADROMOUS FISH COMMISSION**

April 2018

**THIS PAPER MAY BE CITED IN THE FOLLOWING MANNER:**

Working Group on Salmon Marking (WGSM). 2018. Recoveries of high seas tags and tag releases from high seas research vessel surveys in 2017. NPAFC Doc. 1758. 5 pp. WGSM, Committee on Scientific Research and Statistics (Available at <http://www.npafc.org>).

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**Keywords:** high seas salmon, tag release, recovery

## Abstract

In late July and early August 2017, tagging operations were conducted by the Japanese R/V *Hokko maru*, and 48 chum salmon and six sockeye salmon were released with tags in the Bering Sea. Among them, seven chum salmon were equipped with DST magnetic tag. Other tagging experiments were conducted by US scientists, in which 40 Chinook salmon were tagged with PSATs and released in Kachemak Bay near the Kenai Peninsula (n=20), Alaska in March 2017 and Unalaska Bay in the Aleutian Islands (n=20) in October–November 2017. Although no recovery of disc and DST magnetic tags released in the summer Bering Sea was reported in 2017, archived tag data were retrieved via the Argos satellite system from 19 PSATs that were attached to Chinook salmon in Kachemak Bay. The remaining 20 PSATs deployed in Unalaska Bay are still attached to free swimming Chinook salmon.

## Introduction

The Working Group on Salmon Tagging (WGST) was established by the Committee on Scientific Research and Statistics (CSRS) at the 15th Annual Meeting in 2007 to manage the INPFC-NPAFC tagging database and to coordinate high seas tagging activities of the Parties. The WGST was taken over by the Working Group on Salmon Marking (WGSM) in 2016. This document summarizes releases of tagged high-seas salmon in 2017 and reports recoveries of high-seas tags by the Parties, covering information updated since the previous report (WGST 2017).

## Releases of High Seas Tags in 2017

The Japanese R/V *Hokko maru* conducted trawl and hook-and-line operations at 17 stations in the Bering Sea in the summer of 2017 (Honda et al. 2018). During the research cruise, 48 chum salmon (*Oncorhynchus keta*) and six sockeye salmon (*O. nerka*) were tagged with two (Fisheries Agency of Japan (FAJ) and NPAFC) disk tags and released into the Bering Sea (Table 1). Among them, seven chum salmon were equipped with DST magnetic

tags. The DST magnetic tag (manufactured by Star-Oddi, Gardabaer, Iceland, size, 15 × 46 mm; weight in air, 19 g; number of records, 4,000 per sensor) records seawater temperature, depth, earth's magnetic field strength (in three directions), and tilt (in three directions) of maturing chum salmon. Relative magnetic field vectors are calculated from the magnetic field strength measurements, which can be put into models to find longitude and latitude of the fish. It is also a useful tool for recording compass directions.

In addition, US scientists (the University of Alaska Fairbanks) conducted tagging experiments in Kachemak Bay (59° 25'N-59° 44'N, 151° 03'W-151° 52'W) near the Kenai Peninsula and Unalaska Bay (53° 53'N-53° 59'N, 166° 31'W-166° 37'W) in the Aleutian Islands. Twenty Chinook salmon (*O. tshawytscha*) from Kachemak Bay caught by hook-and-line were tagged and released with pop-up satellite archival tags (PSATs) in March 2017, and an additional 20 Chinook salmon from Unalaska Bay were tagged and released with PSATs in October-November 2017 (Table 1). The PSAT (model miniPAT, manufactured by Wildlife Computer, Redmond, Washington) weighed 60 g in air, had an overall length of 30.5 cm (maximum diameter 3.8 cm, tag length 12 cm) and was slightly positively buoyant. The tags contained a lithium composite battery, temperature gauge, pressure sensor, light sensor, and a satellite transmitter. The PSATs recorded seawater temperature, depth, and ambient light level data every ten seconds. On a pre-programmed date, the PSATs automatically released from the fish and summaries of recorded data were transmitted through the Argos satellite system. In addition, the tags were programmed to release and transmit data if they were at a constant depth ( $\pm 5$  m) for more than 3 days.

### **Recovery of High Seas Tags in 2017**

Although no recovery of disc and DST magnetic tags released in the summer Bering Sea was reported in 2017, archival tag data were retrieved via data communication through the Argos satellite system from 19 PSATs that were attached to Chinook salmon in Kachemak Bay (Table 2). The remaining 20 PSATs deployed in Unalaska Bay are still attached to free swimming Chinook salmon.

### **References**

- Honda, K., S. Sato, T. Sato, A. Yoshida, T. Nakayama, and K. Suzuki. 2018. The summer 2017 Japanese salmon research cruise of the R/V *Hokko maru*. NPAFC Doc. \*\*\*\*. 16 pp. (Available at [www.npafc.org](http://www.npafc.org)).
- Working Group on Salmon Tagging (WGSM). 2017. Recoveries of high seas tags and tag releases from high seas research vessel surveys in 2016. NPAFC Doc. 1706. 4 pp. WGST, Committee on Scientific Research and Statistics (Available at <http://www.npafc.org>).

**Table 1.** Release of high-seas tagged salmon in 2017. Age designation is the European method, where the first number is the number of freshwater annuli and the second number is the number of ocean annuli. DS tag, data storage tag; PSAT, pop-up satellite archival tag; G, sampling gear; HL, hook and line; FL, fork length (mm); x, undetermined number of annuli.

No.	Japan tag #	NPAFC tag #	DS tag		Date	Latitude	Longitude	G	Species	FL (mm)	Age
			#	Type							
1	N4787	NA5842			7/24/17	56°00'N	175°00'E	HL	Chum	418	0.2
2	N4772	NA5858			7/24/17	56°00'N	175°00'E	HL	Chum	422	0.2
3	N4773	NA5866	J1120	magnetic	7/24/17	56°00'N	175°00'E	HL	Chum	566	0.4
4	N4780	NA5862			7/24/17	56°00'N	175°00'E	HL	Chum	390	0.2
5	N4795	NA5850	669	magnetic	7/24/17	56°00'N	175°00'E	HL	Chum	516	0.3
6	N4749	NA5831			7/24/17	56°00'N	175°00'E	HL	Chum	442	0.2
7	N4756	NA5894			7/25/17	54°00'N	175°00'E	HL	Chum	456	0.3
8	G6900	NA3720			7/25/17	54°00'N	175°00'E	HL	Chum	442	0.2
9	N4764	NA5833			7/25/17	54°00'N	175°00'E	HL	Chum	432	0.2
10	G6890	NA3786			7/25/17	54°00'N	175°00'E	HL	Chum	448	0.2
11	G6894	NA3664			7/29/17	57°30'N	180°00'	HL	Chum	461	0.3
12	G6889	NA5822			7/29/17	57°30'N	180°00'	HL	Chum	431	0.2
13	N4751	NA5830			7/29/17	57°30'N	180°00'	HL	Chum	442	0.2
14	G6888	NA3788			7/30/17	58°30'N	180°00'	HL	Chum	489	0.2
15	G6892	NA5824			7/30/17	58°30'N	180°00'	HL	Chum	476	0.2
16	G6886	NA3724			7/30/17	58°30'N	180°00'	HL	Chum	471	0.2
17	N4750	NA5827			7/30/17	58°30'N	180°00'	HL	Sockeye	509	2.2
18	N4785	NA5864			7/30/17	58°30'N	180°00'	HL	Sockeye	520	2.2
19	N4782	NA5863			7/30/17	58°30'N	180°00'	HL	Sockeye	433	1.2
20	N4769	NA5838			7/30/17	58°30'N	180°00'	HL	Chum	477	0.2
21	N4777	NA5861			7/30/17	58°30'N	180°00'	HL	Chum	470	0.2
22	G6887	NA3240			7/30/17	58°30'N	180°00'	HL	Chum	368	0.1
23	N4798	NA5868			7/30/17	58°30'N	180°00'	HL	Sockeye	472	1.2
24	N4766	NA5835			7/30/17	58°30'N	180°00'	HL	Chum	442	0.2
25	N4781	NA5841			7/30/17	58°30'N	180°00'	HL	Chum	400	0.2
26	N4765	NA5834			7/30/17	58°30'N	180°00'	HL	Sockeye	379	1.1
27	N4794	NA5865			7/30/17	58°30'N	180°00'	HL	Chum	388	0.2
28	N4799	NA5846			7/30/17	58°30'N	180°00'	HL	Chum	488	0.2
29	N4791	NA5856			7/30/17	58°30'N	180°00'	HL	Chum	423	0.2
30	N4771	NA5840			7/30/17	58°30'N	180°00'	HL	Sockeye	468	1.2
31	N4786	NA5867			7/30/17	58°30'N	180°00'	HL	Chum	408	0.2
32	N4789	NA5854			7/30/17	58°30'N	180°00'	HL	Chum	457	0.2
33	N4755	NA5898			7/30/17	58°30'N	180°00'	HL	Chum	382	0.1
34	G6899	NA5823	J1037	magnetic	7/31/17	58°00'N	175°00'W	HL	Chum	547	0.4
35	N4788	NA5852	J1123	magnetic	7/31/17	58°00'N	175°00'W	HL	Chum	514	x.x
36	N4762	NA5825			7/31/17	58°00'N	175°00'W	HL	Chum	448	0.2
37	N4793	NA5855	608	magnetic	7/31/17	58°00'N	175°00'W	HL	Chum	478	0.3
38	N4763	NA5832			7/31/17	58°00'N	175°00'W	HL	Chum	400	0.2
39	N4776	NA5849			7/31/17	58°00'N	175°00'W	HL	Chum	458	0.2
40	N4797	NA5844			7/31/17	58°00'N	175°00'W	HL	Chum	356	0.1
41	N4775	NA5848			7/31/17	58°00'N	175°00'W	HL	Chum	440	0.2
42	N4757	NA5895			7/31/17	58°00'N	175°00'W	HL	Chum	442	0.2
43	E0844	NA5872			7/31/17	58°00'N	175°00'W	HL	Chum	434	0.2
44	N4796	NA5843			7/31/17	58°00'N	175°00'W	HL	Chum	340	0.1
45	E0847	NA5875	J1044	magnetic	8/1/17	56°00'N	175°00'W	HL	Chum	489	0.3
46	E0841	NA5869			8/1/17	56°00'N	175°00'W	HL	Chum	453	0.2
47	E0551	NA5891			8/1/17	56°00'N	175°00'W	HL	Chum	422	0.2
48	E0848	NA5873			8/1/17	55°00'N	175°00'W	HL	Chum	420	0.2
49	E0845	NA5874	J1098	magnetic	8/2/17	54°00'N	175°00'W	HL	Chum	472	0.2
50	E0850	NA5876			8/2/17	54°00'N	175°00'W	HL	Chum	442	0.2

**Table 1.** Continued.

No.	Japan tag #	NPAFC tag #	DS tag		Date	Latitude	Longitude	G	Species	FL (mm)	Age
			#	Type							
51	E0549	NA5883			8/2/17	54°00'N	175°00'W	HL	Chum	412	0.2
52	E0547	NA5880			8/2/17	54°00'N	175°00'W	HL	Chum	434	0.2
53	E0555	NA5887			8/2/17	54°00'N	175°00'W	HL	Chum	376	0.2
54	E1674	NA5877			8/2/17	54°00'N	175°00'W	HL	Chum	476	0.2
55			159001b	PSAT	3/13/17	59°44'31"N	151°05'11"W	HL	Chinook	770	
56			159002b	PSAT	3/13/17	59°44'39"N	151°03'41"W	HL	Chinook	790	
57			159003b	PSAT	3/13/17	59°44'46"N	151°03'17"W	HL	Chinook	810	
58			159004b	PSAT	3/20/17	59°26'40"N	151°49'36"W	HL	Chinook	800	
59			159005b	PSAT	3/16/17	59°44'37"N	151°03'52"W	HL	Chinook	770	
60			159006b	PSAT	3/17/17	59°40'43"N	151°51'08"W	HL	Chinook	840	
61			159007b	PSAT	3/28/17	59°39'12"N	151°43'45"W	HL	Chinook	840	
62			159008b	PSAT	3/29/17	59°44'39"N	151°03'11"W	HL	Chinook	780	
63			159009b	PSAT	3/20/17	59°25'20"N	151°53'50"W	HL	Chinook	800	
64			159010b	PSAT	3/23/17	59°44'49"N	151°03'58"W	HL	Chinook	1000	
65			159011b	PSAT	3/27/17	59°44'46"N	151°03'30"W	HL	Chinook	830	
66			159012b	PSAT	3/27/17	59°44'31"N	151°04'58"W	HL	Chinook	810	
67			159013b	PSAT	3/29/17	59°44'48"N	151°03'11"W	HL	Chinook	750	
68			159014b	PSAT	3/17/17	59°40'24"N	151°48'54"W	HL	Chinook	730	
69			159015b	PSAT	3/27/17	59°44'59"N	151°03'07"W	HL	Chinook	860	
70			159016b	PSAT	3/29/17	59°44'40"N	151°03'22"W	HL	Chinook	790	
71			159017b	PSAT	3/29/17	59°44'39"N	151°03'11"W	HL	Chinook	790	
72			159018b	PSAT	3/28/17	59°41'10"N	151°52'30"W	HL	Chinook	820	
73			159019b	PSAT	3/30/17	59°44'43"N	151°03'02"W	HL	Chinook	820	
74			159020b	PSAT	3/29/17	59°44'48"N	151°03'11"W	HL	Chinook	750	
75			172901	PSAT	11/3/17	53°55'15"N	166°34'18"W	HL	Chinook	830	
76			172902	PSAT	11/3/17	53°55'16"N	166°34'07"W	HL	Chinook	690	
77			172903	PSAT	10/16/17	53°55'52"N	166°31'55"W	HL	Chinook	700	
78			172904	PSAT	11/2/17	53°54'49"N	166°34'56"W	HL	Chinook	770	
79			172905	PSAT	10/16/17	53°55'52"N	166°31'46"W	HL	Chinook	760	
80			172906	PSAT	11/3/17	53°55'18"N	166°34'12"W	HL	Chinook	700	
81			172907	PSAT	10/22/17	53°52'57"N	166°37'13"W	HL	Chinook	820	
82			172908	PSAT	10/10/17	53°53'06"N	166°36'51"W	HL	Chinook	800	
83			172909	PSAT	10/22/17	53°53'27"N	166°36'36"W	HL	Chinook	730	
84			172910	PSAT	10/27/17	53°59'13"N	166°35'53"W	HL	Chinook	760	
85			172911	PSAT	11/4/17	53°55'18"N	166°34'10"W	HL	Chinook	810	
86			172912	PSAT	11/3/17	53°55'20"N	166°34'17"W	HL	Chinook	820	
87			172913	PSAT	10/31/17	53°53'22"N	166°36'42"W	HL	Chinook	800	
88			172914	PSAT	10/19/17	53°55'56"N	166°31'37"W	HL	Chinook	630	
89			172915	PSAT	11/3/17	53°55'19"N	166°34'07"W	HL	Chinook	770	
90			172916	PSAT	10/23/17	53°53'32"N	166°36'47"W	HL	Chinook	650	
91			172917	PSAT	11/3/17	53°55'18"N	166°34'17"W	HL	Chinook	710	
92			172918	PSAT	10/22/17	53°53'05"N	166°36'46"W	HL	Chinook	740	
93			172919	PSAT	10/16/17	53°55'52"N	166°31'55"W	HL	Chinook	700	
94			172920	PSAT	11/4/17	53°55'12"N	166°34'23"W	HL	Chinook	1000	

**Table 2.** Recoveries of high-seas tagged salmon in 2017. DS tag, data storage tag; PSAT, pop-up satellite archival tag; FL, fork length (mm).

No.	DS tag		Release					Recoveries		
	#	Type	Date	Latitude	Longitude	Species	FL (mm)	Date	Latitude	Longitude
1	159001b	PSAT	3/13/17	59°44'31"N	151°05'11"W	Chinook	770	04/18/17	59°37'54"N	151°28'29"W
2	159002b	PSAT	3/13/17	59°44'39"N	151°03'41"W	Chinook	790	05/15/17	58°49'48"N	151°50'50"W
3	159003b	PSAT	3/13/17	59°44'46"N	151°03'17"W	Chinook	810	04/02/17	59°42'21"N	151°12'27"W
4	159004b	PSAT	3/20/17	59°26'40"N	151°49'36"W	Chinook	800	03/26/17	59°14'29"N	152°32'14"W
5	159005b	PSAT	3/16/17	59°44'37"N	151°03'52"W	Chinook	770	04/09/17	59°36'11"N	151°20'14"W
6	159006b	PSAT	3/17/17	59°40'43"N	151°51'08"W	Chinook	840	05/15/17	58°25'02"N	137°24'17"W
7	159007b	PSAT	3/28/17	59°39'12"N	151°43'45"W	Chinook	840	04/09/17	59°32'43"N	153°04'02"W
8	159008b	PSAT	3/29/17	59°44'39"N	151°03'11"W	Chinook	780	04/24/17	59°36'35"N	151°26'24"W
9	159010b	PSAT	3/23/17	59°44'49"N	151°03'58"W	Chinook	1000	04/21/17	59°44'19"N	151°10'33"W
10	159011b	PSAT	3/27/17	59°44'46"N	151°03'30"W	Chinook	830	04/10/17	59°37'50"N	151°29'38"W
11	159012b	PSAT	3/27/17	59°44'31"N	151°04'58"W	Chinook	810	03/29/17	59°42'49"N	151°04'57"W
12	159013b	PSAT	3/29/17	59°44'48"N	151°03'11"W	Chinook	750	06/02/17	56°55'33"N	135°44'08"W
13	159014b	PSAT	3/17/17	59°40'24"N	151°48'54"W	Chinook	730	06/15/17	59°51'43"N	152°21'32"W
14	159015b	PSAT	3/27/17	59°44'59"N	151°03'07"W	Chinook	860	04/27/17	59°43'22"N	151°01'30"W
15	159016b	PSAT	3/29/17	59°44'40"N	151°03'22"W	Chinook	790	04/13/17	59°08'12"N	152°09'18"W
16	159017b	PSAT	3/29/17	59°44'39"N	151°03'11"W	Chinook	790	06/26/17	56°06'25"N	134°22'11"W
17	159018b	PSAT	3/28/17	59°41'10"N	151°52'30"W	Chinook	820	04/27/17	59°13'38"N	151°31'52"W
18	159019b	PSAT	3/30/17	59°44'43"N	151°03'02"W	Chinook	820	04/02/17	59°40'14"N	151°13'07"W
19	159020b	PSAT	3/30/17	59°44'48"N	151°03'11"W	Chinook	750	04/07/17	57°39'59"N	155°10'17"W