

FRI-UW-9705
April 1997

FISHERIES RESEARCH INSTITUTE
School of Fisheries
University of Washington
Seattle, Washington 98195

A BRISTOL BAY ALMANAC FOR 1997

D.E. ROGERS

Approved

Submitted 22 April 1997

Ray Hilborn
Director

Contents

	Page
List of Figures	iv
List of Tables	iv
Port Moller Test Boat.....	1
Bristol Bay Runs	1
Daily Almanac	2
Figures	3
Tables	9
Almanac	19

List of Figures

Figure	Page
1. Correlation between ocean age and the average length of sockeye salmon off Port Moller	5
2. Correlation in the percent 3-ocean fish between Bristol Bay and Port Moller	5
3. Daily sockeye salmon catches during 20 June to 20 July for 1993–95	6
4. Daily sockeye salmon escapements during 20 June to 20 July for 1993–95	7

List of Tables

Table	Page
1. Port Moller daily sockeye index catches	11
2. Daily cumulative sockeye index catches off Port Moller	12
3. Surface water temperatures off Port Moller	13
4. Average sockeye salmon catch off Port Moller by station and 5-d period	14
5. Average chum salmon catch off Port Moller by station and 5-d period	15
6. Daily sockeye salmon catches in Bristol Bay	16
7. Preseason forecasts of the 1997 Bristol Bay inshore run	17
8. Daily sockeye salmon catches in the South Unimak June fishery, 1985–96	17

Acknowledgments

B. Cross, J. Miller, and A. Shaul of the Alaska Department of Fish and Game kindly provided preliminary fishery statistics from 1996 which were used in this almanac. Marcus Duke compiled the manuscript.

Key Words

Bristol Bay, forecasts, *Oncorhynchus* spp., Port Moller, sockeye and chum salmon

A BRISTOL BAY ALMANAC FOR 1997

D.E. ROGERS

The purpose of these daily summaries is to provide Bristol Bay processors with the statistics to forecast the total sockeye (*Oncorhynchus nerka*) salmon run in 1997 from the Port Moller index catches starting June 20 (the earliest that forecasts are feasible) and ending July 7 (the recent mid-point in the Bristol Bay catch). Also, by using the daily Alaska Department of Fish & Game (ADFG) summaries of the cumulative catches and escapements, processors can compare the daily 1997 numbers through July 10 with averages and ranges from recent past years (1987–96).

PORT MOLLER TEST BOAT

The test boat attempts to fish each day at 4 stations located along a transect line between Port Moller and Cape Newenham. The stations, 2 to 8, are located 33, 43, 53, and 63 mi out from Port Moller (13, 23, 33, and 43 mi from the coastline). An index catch at each of the four stations is the number caught per 100 fm 60 min⁻¹. A 200-fm net is usually fished for about 60 min, so the station index is usually about one-half of the actual catch. In past years, the daily index was the sum of the index catches at the four stations and the cumulative index (used to forecast) was the sum of the daily indices starting with June 11. In 1995, salmon were distributed well offshore with the largest catches made at station 8 (43 mi from the coastline). This unusual distribution resulted in underforecasting the run in 1995 because in past years salmon were usually concentrated at stations 4 or 6.

In 1996, a new daily index was calculated to account for the fact that salmon may be distributed farther out from station 8 than inside station 2. The new daily index gave the catch at station 8 twice the weight of catches made at the other stations. Therefore, we add catches at stations 2, 4, 6, and 2 times the catch at station 8. This sum divided by 5 and then multiplied by 4 (or the sum multiplied by 0.8) provides the daily index catch. The daily index catches are added each day beginning June 11 to calculate the cumulative indices that are used to forecast the final run. The daily and cumulative indices are given in Tables 1 and 2.

Daily water temperatures off Port Moller are given in

Table 3. The timing of the Bristol Bay runs (especially from Port Moller to the Bay) is usually related to temperature in the Bering Sea and North Pacific with fish swimming faster or starting their migrations earlier at warmer temperatures, and slower or later at colder temperatures. However, there have been years with average timing when temperatures were either warm (over 8°C) or cold (under 5°C) at Port Moller.

About June 20, we will have a forecast of run timing based on an analysis of ocean temperatures in the North Pacific. Spatial and temporal distribution off Port Moller can be examined from index catches of sockeye and chum (*O. keta*) salmon by station and 5-d periods in Tables 4 and 5.

An early indication of the ocean age composition in the Port Moller catches can be obtained from the average lengths of the fish that are reported daily (scales take longer to be aged). Usually, if the average length is over 550 mm, the majority of the sockeye are 3-ocean fish, and if they are under 550 mm, they are mostly 2-ocean fish (Fig. 1). However, in 1990–92 and 1994, the 3-ocean fish were very small because ocean growth was poor and average lengths as low as 535 mm were still associated with a majority of 3-ocean fish in the Port Moller catch. When the Port Moller scales are aged, we can then estimate the age composition in the Bristol Bay run (Fig. 2). Because of net selectivity there is not a one-to-one relationship in ocean age between Port Moller catches and the Bristol Bay run. When there are high percentages of 3-ocean fish at Port Moller, we can expect lower percentages in Bristol Bay (e.g., when 75% of the fish caught at Port Moller are 3-ocean, we would expect only 65% of the fish in the Bristol Bay run to be 3-ocean).

BRISTOL BAY RUNS

The daily commercial catches and the escapements at towers for 1993, 1994, and 1995 are shown in Figures 3 and 4 to illustrate the range in run timing. In a typical year with a large run (1995), large numbers of sockeye are first present in the fishing districts between 25 and 30 June,

but they have shown up as early as 21 June (1993) or as late as 2 July (1994). The daily catches in Bristol Bay (all districts) and the dates on which 50% of the season's catch were made are given in Table 6. This date is usually 1 to 2 days later than the mid-point in the run and is affected by run timing (early in 1979 and 1993 and late in 1986 and 1994), strikes (1980 and 1991), or management (restricted early fishing in 1987 and extensive early fishing in 1996).

The 1997 preseason forecasts are given in Table 7. Over half of the large forecasted run is expected to be ages 2.2 and 1.3 from the 1992 brood year, and most of these are expected to be bound for the Egegik and Kvichak systems. An early indication of the Bristol Bay run magnitude may come from the False Pass fishery (Table 8). There is a good correlation between the South Unimak catch and the Bristol Bay run if the 1990 and 1994–96 data are excluded (the same years that are outliers in the Port Moller/Bristol Bay data). If the Bristol Bay run is going to be about 35 million as forecasted, then the South Unimak catch through 20 June should exceed 0.5 million and through 25 June the catch should exceed 1.1 million.

DAILY ALMANAC

The ensuing 21 daily summaries provide the following: (1) the average cumulative catches and escapements through midnight of the date shown and the average and range in the percentages of the season totals that were reached by that date for 1987–96; (2) the average and range in the daily and cumulative Port Moller index catches for 1987–96 for comparison with 1997; (3) a plot of the past Bristol Bay runs on the cumulative indices through the date shown and the predictive equation (through July 7); and (4) Port Moller fishery and escapement comments. The 1990 run was unusual in that it was very large, started late, had a very concentrated peak, and then ended as usual; the 1994 run was late throughout. In those years, the False Pass fishery had difficulty catching their quota because the fish were not distributed in a typical manner. The 1990 and 1994 data points in our predictive equations were thus considered outliers (excluded from calculations) for predictions through June 27 (mid-point at Port Moller). The years 1990 and 1994 are shown as open circles on the graphs.

Figures

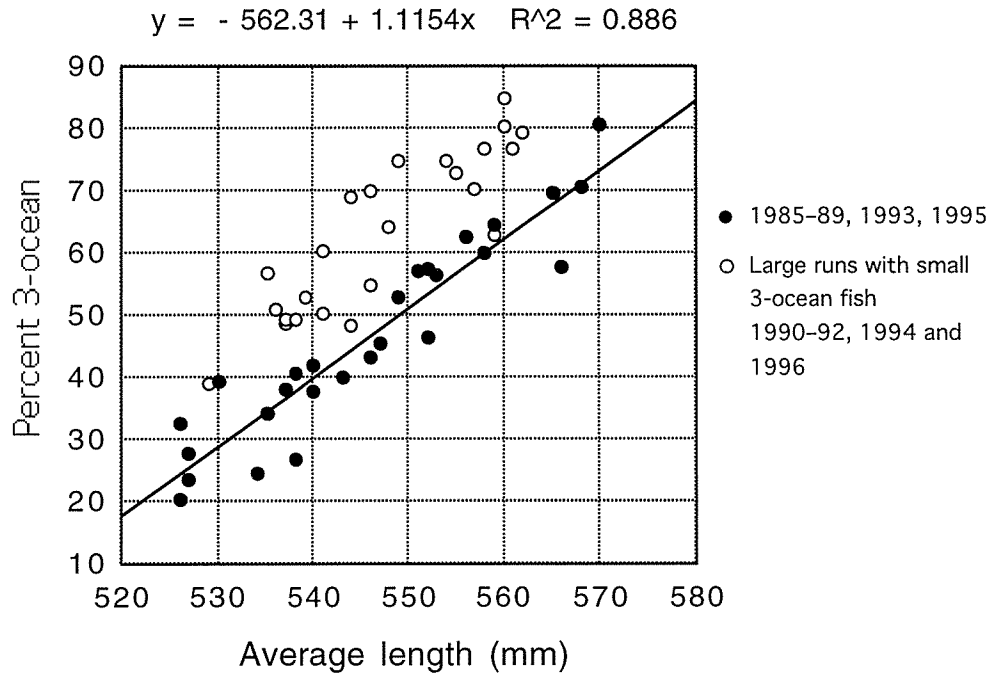


Figure 1. Correlation between ocean age and the average length of sockeye salmon off Port Moller.

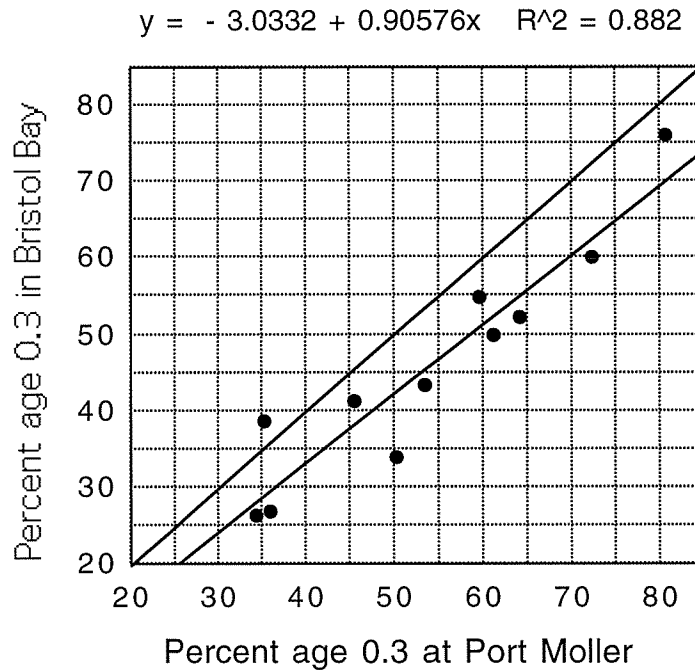


Figure 2. Correlation in the percent 3-ocean fish between Bristol Bay and Port Moller.

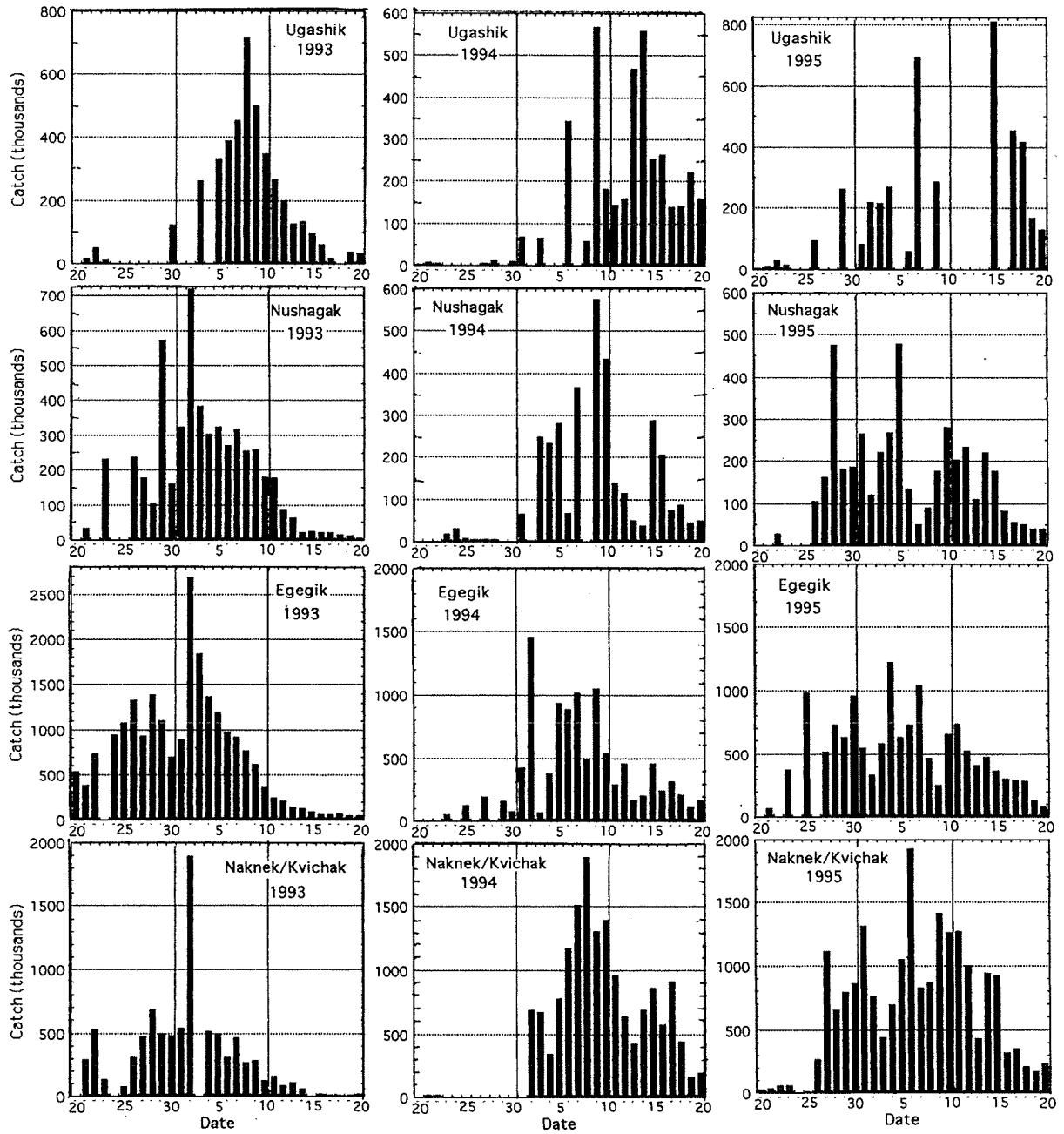


Figure 3. Daily sockeye salmon catches during 20 June to 20 July for 1993–95.

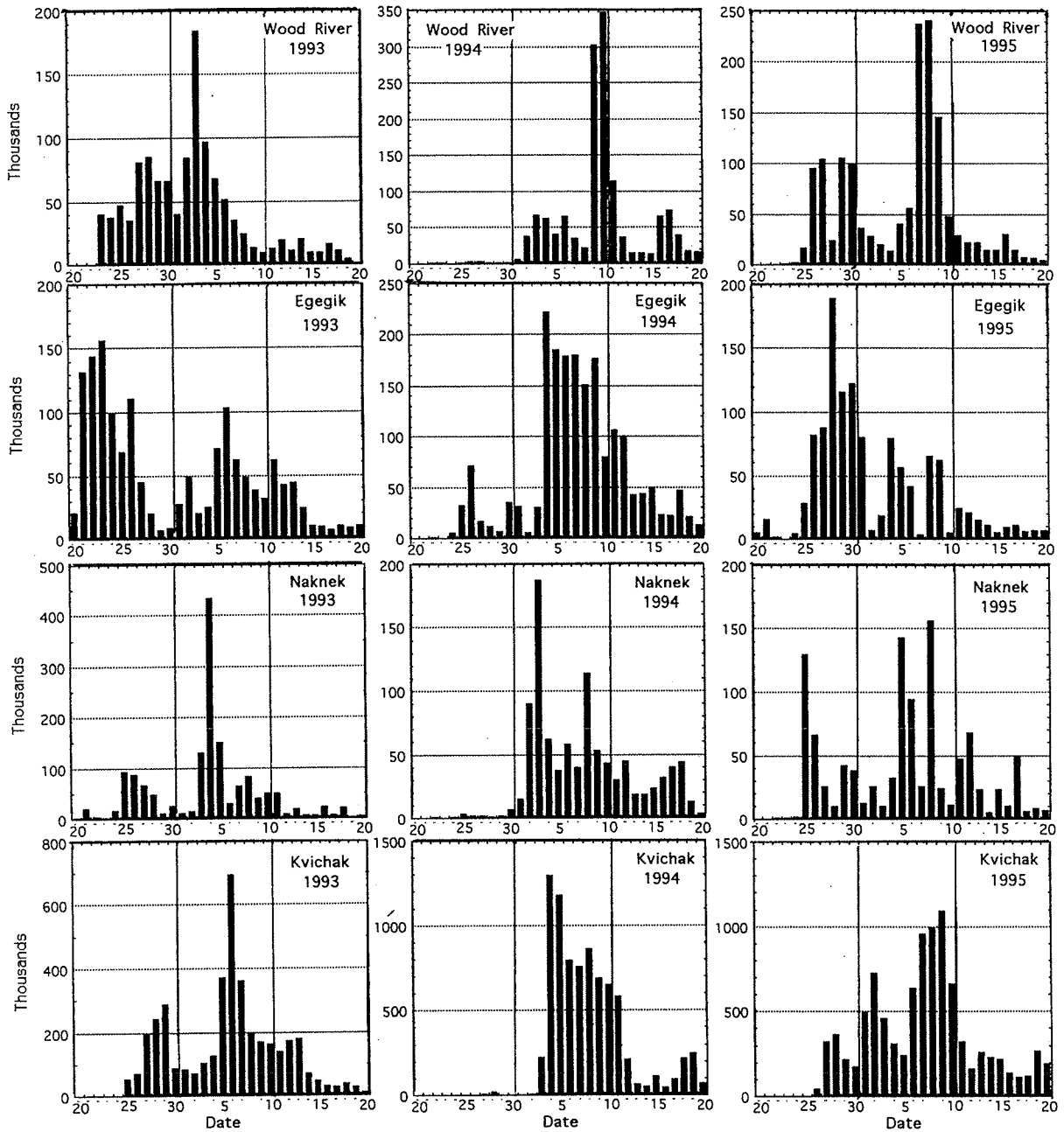


Figure 4. Daily sockeye salmon escapements during 20 June to 20 July for 1993–95.

Tables

Table 1. Port Moller daily sockeye index catches.

Date	1997 index	Past index catches										
		1996	1995	1994	1993	1992	1991	1990	1989	1988	1987	1985
6/11		21	33	4	18	18	6	7	17	7	7	8
12		22	29	3	11	19	7	12	26	9	8	5
13		24	38	5	28	19	6	12	23	12	7	16
14		53	87	9	89	20	6	11	18	12	8	23
15		39	62	17	62	46	17	18	26	15	14	39
16		98	89	17	85	54	24	23	26	18	10	51
17		58	63	10	89	6	40	16	57	9	8	102
18		76	152	35	89	114	58	43	102	7	10	40
19		56	137	45	91	132	81	41	83	6	14	39
20		106	73	37	118	112	60	41	87	19	52	21
21		100	116	86	144	118	98	42	83	15	14	55
22		77	97	110	188	124	157	46	94	26	71	81
23		88	135	152	122	144	96	62	89	28	74	73
24		100	105	117	100	141	180	137	67	50	86	63
25		102	142	95	232	110	54	154	57	22	86	21
26		132	153	111	158	48	55	106	28	51	138	80
27		109	124	141	158	108	131	137	70	48	61	54
28		111	182	149	190	120	68	284	118	33	140	175
29		78	217	135	112	133	95	197	94	85	75	162
30		130	146	260	287	226	20	243	94	51	73	170
7/1		104	187	161	175	170	79	173	94	46	26	28
2		155	172	167	242	85	50	155	94	46	27	44
3		117	188	123	60	162	174	223	118	23	33	78
4		184	149	197	79	105	66	101	195	22	30	76
5		108	122	143	100	109	127	62	140	48	30	98
6		157	182	146	81	103	67	61	137	23		94
7		59	106	107	74	64	56	60	108	39		
8		96	53	105	33	120	69					
9		77	89	54	62	43	87					
10					35							
Run (millions)		37	61	50	52	45	42	48	44	23	27	36

Table 2. Daily cumulative sockeye index catches off Port Moller.

Date	1997	Past index catches										
	Index	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987	1985
6/11		22	33	4	18	18	6	7	17	7	8	8
12		43	62	7	29	37	13	19	43	16	15	13
13		67	99	12	57	56	19	32	67	28	22	28
14		120	186	21	146	76	25	43	85	40	30	51
15		159	248	38	208	122	42	61	111	56	43	91
16		257	337	55	293	176	66	84	137	74	53	142
17		315	400	66	382	182	106	100	194	82	61	244
18		391	552	101	472	296	164	143	297	89	71	284
19		447	689	146	562	428	245	184	380	95	85	323
20		552	762	183	681	540	305	225	468	114	138	343
21		653	878	269	824	658	404	267	550	128	151	398
22		730	975	379	1012	783	561	313	644	154	223	479
23		818	1110	531	1135	927	657	374	733	181	296	553
24		918	1214	648	1234	1068	837	511	799	231	383	616
25		1020	1356	743	1466	1178	891	665	857	253	469	637
26		1152	1509	854	1624	1226	946	771	885	305	607	717
27		1261	1633	995	1783	1334	1077	908	955	353	668	771
28		1371	1815	1144	1973	1453	1146	1192	1072	386	808	947
29		1449	2033	1279	2085	1586	1241	1389	1166	472	883	1109
30		1580	2179	1538	2372	1812	1261	1632	1261	523	956	1279
7/1		1684	2365	1699	2547	1981	1340	1804	1354	568	983	1307
2		1838	2537	1866	2789	2066	1390	1960	1448	614	1010	1351
3		1955	2725	1990	2849	2228	1564	2182	1566	637	1043	1429
4		2139	2874	2187	2928	2333	1629	2284	1761	659	1073	1505
5		2247	2995	2330	3028	2443	1756	2345	1901	707	1104	1603
6		2404	3177	2476	3109	2546	1823	2406	2038	730	1135	1697
7		2463	3283	2583	3183	2610	1878	2466	2147	769		
8		2560	3336	2689	3216	2730	1947					
9			3424	2742	3278	2773	2034					
10					3313							
Run, excl. jacks		37	61	50	52	45	42	48	44	23	27	36

Cumulative indices include estimates for missing days (average of 2 d before and 2 d after the missing day or days).

Table 3. Surface water temperatures (°C) off Port Moller.

Date	81	82	83	84	85	87	88	89	90	91	92	93	94	95	96	97
6/11	9.3	4.2	8.8		5.0	5.9	8.4	4.4	6.6	4.5	7.1	7.2	7.2			
12	10.1	4.7	8.5	8.7	3.8	5.4	8.1	4.8	6.7	4.9	6.5	6.9	7.0	7.2	4.9	
13	10.6	5.8	8.8	8.1	4.1	4.9	7.5	5.0	6.0	4.7	6.5	7.3	6.2	6.8	5.0	
14	10.5	5.6	9.1	7.9	4.1	5.0	7.5	5.3	5.2	4.6	5.9	7.7	5.7	6.8	5.4	
15	10.2	5.8	9.4	8.0	5.0	5.0	7.0	6.2	5.8	4.6	5.5	8.0	6.1	6.9	5.6	
16	9.8	6.3	9.2	8.5	5.0	4.9	6.8	5.9	6.3	3.8	7.2	7.4	5.6	6.9	5.9	
17	9.5	6.9	9.2	9.1	6.1	4.8	6.8	7.2	6.8	4.0	7.1	7.3	5.4	7.1	5.9	
18	10.3	6.4	9.3	9.3	5.8	4.7	6.9	7.3	7.4	4.5	7.4	7.2	6.3	6.9	5.8	
19	10.1	6.7	9.3	9.8	5.4	5.0	7.2	7.1	7.4	5.0	8.3	7.1	6.9	6.7	5.8	
20	10.0	6.5	9.3	9.8	6.0	4.9	7.2	6.7	7.1	5.0	8.3	7.5	6.6	7.2	5.9	
21	10.0	6.3	9.3	10.0	6.1	5.1	7.4	6.4	6.8	5.0	9.2	8.4	6.8	6.9	5.8	
22	10.0	6.2	9.4	9.8	5.9	5.2	7.0	6.4	6.8	5.0	8.5	8.0	7.1	6.6	6.8	
23	10.1	5.9	9.4	9.5	6.0	5.2	6.9	5.9	7.4	4.9	8.2	8.3	7.1	6.8	6.9	
24	10.4	5.8	9.4	9.0	5.6	5.4	6.8	5.7	7.0	6.5	9.1	8.6	6.5	7.2	6.6	
25	10.4	6.6	9.7	8.9	5.3	5.8	6.9	5.6	6.9	6.0	8.3	9.2	5.9	7.3	6.3	
26	10.5	6.9	9.1	9.1	5.5	6.2	6.7	5.8	6.9	6.4	7.5	8.4	6.0	8.4	6.1	
27	10.9	6.8	8.7	8.9	5.8	6.7	7.0	6.4	7.3	6.0	7.6	8.3	6.8	7.4	6.4	
28	10.5	6.3	9.2	9.3	6.6	7.0	7.2	6.9	7.3	5.9	7.8	7.5	6.8	7.0	6.0	
29	10.4	6.0	9.2	9.3	7.1	6.6	8.0	6.1	7.8	5.6	7.9	7.7	7.1	7.4	6.4	
30	10.3	6.2	9.7	9.2	7.3	6.1	7.9	6.1	8.5	5.8	8.0	7.7	7.6	7.9	6.1	
7/01	10.0	6.6	10.0	9.8	6.9	6.0	7.9	5.4	8.8	5.1	7.8	7.6	6.9	7.6	6.2	
2	9.9	6.1	10.4	10.4	6.6	6.7	7.9	6.5	9.3	5.8	7.6	7.4	7.0	7.9	6.3	
3	9.9	5.8	10.5	10.6	6.8	6.8	8.0	7.7	9.1	5.9	7.9	7.5	7.0	7.8	6.5	
4	10.0	5.6	10.8	10.4	6.9		8.9	8.6	8.7	7.0	7.2	7.6	6.9	7.9	6.5	
5					7.0		8.4		9.0	7.1	6.5	7.6	6.6	7.6	6.5	
6										8.1	7.0	8.0	6.2	7.9	6.0	
7										8.8	7.2	8.2	6.9	7.9	8.0	
8										9.7	7.8	8.8	7.1	7.6	7.5	
9										8.9	8.5	9.1	7.2	7.4		
10												9.4				

Figure 5. Average chum salmon catch off Port Moller by station and 5-d period; number caught by 100 fm (5-in mesh) fished for 1 h.

Year/dates	Station				Means	Year/dates	Station				Means
	2	4	6	8			2	4	6	8	
<u>1985</u>						<u>1991</u>					
6/11-15	0.1	0.2	0.9	0.5	0.4	6/11-15	0.2	1.8	0.6	1.1	0.9
16-20	0.2	0.5	1.5	1.0	0.8	16-20	0.8	1.0	5.5	1.7	2.3
21-25	0.0	0.2	0.2	1.4	0.5	21-25	0.2	0.4	1.3	1.5	0.9
26-30	1.3	0.7	0.6	2.7	1.3	26-30	1.6	1.6	0.6	1.1	1.2
7/1-5	1.0	0.8	0.3	1.6	0.9	7/1-5	1.5	3.4	3.2	3.1	2.8
6	0.0	4.4	5.4	2.9	3.2	6-9	0.6	2.0	3.2	4.4	2.6
Mean-7/5	0.5	0.5	0.7	1.4	0.8	Mean-7/5	0.9	1.6	2.2	1.7	1.6
wt'd index					0.9						1.6
<u>1987</u>						<u>1992</u>					
6/11-15	0.0	0.6	0.2	0.3	0.3	6/11-15	0.3	0.0	1.9	2.2	1.1
16-20	0.3	0.8	1.5	0.2	0.7	16-20	0.0	0.6	1.3	5.5	1.8
21-25	0.6	0.7	3.3	1.9	1.6	21-25	0.4	1.1	2.4	1.3	1.3
26-30	0.1	0.8	1.2	1.4	0.9	26-30	1.3	1.6	1.8	2.7	1.9
7/1-5	0.1	0.0	0.7	0.5	0.3	7/1-5	1.9	1.3	1.0	0.6	1.2
Mean-7/5	0.2	0.6	1.4	0.9	0.8	6-9	0.7	2.7	2.9	0.4	1.7
wt'd index					0.8	Mean-7/5	0.8	0.9	1.7	2.5	1.5
											1.7
<u>1988</u>						<u>1993</u>					
6/11-15	0.0	0.1	1.2	0.6	0.5	6/11-15	0.3	0.5	2.0	0.6	0.8
16-20	0.2	0.5	0.9	0.4	0.5	16-20	0.0	0.3	1.9	1.1	0.8
21-25	0.7	2.0	1.4	0.8	1.2	21-25	0.7	0.1	0.8	0.6	0.6
26-30	0.7	3.7	2.1	2.0	2.1	26-30	1.5	0.5	1.9	7.2	2.8
7/1-5	0.6	2.8	1.3	1.4	1.5	7/1-5	1.3	1.4	0.9	1.5	1.3
6-7	0.5	1.6	0.7	5.1	2.0	6-10	2.9	3.0	1.7	1.0	2.2
Mean-7/5	0.4	1.8	1.4	1.0	1.2	Mean-7/5	0.8	0.6	1.5	2.2	1.3
wt'd index					1.1						1.4
<u>1989</u>						<u>1994</u>					
6/11-15	0.2	0.4	0.7	0.5	0.5	6/11-15	0.9	0.5	4.9	0.7	1.8
16-20	0.1	0.4	0.8	1.2	0.6	16-20	0.9	2.3	3.7	1.3	2.1
21-25	0.7	0.7	1.2	1.9	1.1	21-25	0.9	2.4	4.4	1.5	2.3
26-30	0.7	0.9	0.3	1.9	1.0	26-30	0.8	0.3	1.1	0.9	0.8
7/1-5	0.9	2.3	0.5	1.8	1.4	7/1-5	0.5	1.2	2.1	1.6	1.4
6-7	0.9	1.0	0.2	3.8	1.5	6-9	0.4	0.9	0.4	0.8	0.6
Mean-7/5	0.5	0.9	0.7	1.5	0.9	Mean-7/5	0.8	1.3	3.2	1.2	1.7
wt'd index					1.0						1.5
<u>1990</u>						<u>1995</u>					
6/11-15	0.1	0.4	1.4	0.8	0.7	6/11-15	0.1	0.5	1.7	0.8	0.8
16-20	0.1	0.5	3.3	1.0	1.2	16-20	0.4	0.4	1.0	0.9	0.7
21-25	0.1	0.5	2.3	1.0	1.0	21-25	0.0	0.7	0.5	1.7	0.7
26-30	0.4	1.1	4.4	2.6	2.1	26-30	0.3	0.4	1.4	1.7	1.0
7/1-5	1.2	2.1	2.3	1.1	1.7	7/1-5	0.4	0.1	0.1	0.9	0.4
Mean-7/5	0.4	0.9	2.7	1.3	1.3	6-9	0.4	0.4	0.1	1.2	0.5
wt'd index						Mean-7/5	0.2	0.4	0.8	1.2	0.7
						wt'd index					0.8
<u>1996</u>						<u>1996</u>					
						6/11-15	1.7	1.4	2.1	1.2	1.6
						16-20	1.0	2.9	1.4	3.0	2.1
						21-25	0.5	1.7	3.2	1.5	1.7
						26-30	0.8	2.0	2.1	1.1	1.5
						7/1-5	0.8	1.3	0.9	1.2	1.1
						6-8	0.8	1.9	1.6	1.8	1.5
						Mean-7/5	1.0	1.9	1.9	1.6	1.6
						wt'd index					1.6

wt'd index= sta2+sta4+sta6+(2*sta8)/5

Table 6. Daily sockeye salmon catches in Bristol Bay (millions). = 50% of cumulative catch.

Date	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
-6/23	1.0	.1	.8	.2	.7	.9	.7	.2	.3	1.5	1.5	.3	.1	.6	3.1	.1	.8	.7
24	.2	.1	.2	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.9	.0	.0	.7
25	.3	.0	.5	.1	.0	.2	.0	.0	.2	.0	.2	.0	.0	.7	1.2	.1	1.0	1.0
26	.4	.1	.5	.2	.4	1.0	.0	.0	.0	.1	.7	.0	.0	.0	1.9	.0	.5	.6
27	.2	.1	.5	.3	2.4	.2	1.0	.0	.6	.9	.1	.0	.0	1.0	1.6	.2	1.8	.7
28	1.5	.1	.6	.5	.8	.0	1.1	.1	.0	.2	1.2	.1	.0	.0	2.2	.0	1.9	1.4
29	1.8	.2	.2	.7	1.4	.9	1.8	.0	.4	.9	1.8	1.1	.0	.5	2.2	.2	1.9	2.2
30	1.6	.3	2.0	.7	2.8	1.0	2.9	.0	1.1	.0	.9	1.0	.6	1.4	1.5	.1	2.0	2.2
7/1	1.1	.4	1.5	.4	1.7	1.6	.4	.3	.2	1.7	.7	.4	1.7	.8	1.8	.6	2.2	2.5
2	1.3	.3	1.0	.5	2.1	1.2	1.9	.8	1.1	.5	3.0	2.1	1.7	.7	5.3	2.1	1.4	2.0
3	1.3	1.7	.9	1.0	3.1	.2	.7	2.0	.2	.4	1.0	3.4	1.6	1.9	2.5	1.1	1.5	1.6
4	1.2	2.0	2.3	.7	2.3	.8	.9	.6	1.1	.1	2.3	1.3	2.8	1.8	2.2	.9	2.5	1.3
5	1.2	2.2	2.5	.9	2.5	1.9	1.3	1.5	.0	.6	.8	2.8	1.8	3.2	2.4	2.0	2.2	1.5
6	1.2	2.4	2.3	1.3	2.3	.9	1.3	.3	.2	.3	2.8	2.6	1.1	1.8	1.9	2.5	2.9	1.6
7	.8	2.3	.9	1.4	1.6	1.2	1.4	.9	1.2	.1	1.5	1.8	1.7	1.3	2.2	2.9	2.6	1.5
8	.7	1.6	1.1	1.6	1.9	1.6	1.1	.0	.5	.4	.7	2.4	1.6	1.3	2.0	2.4	1.4	1.7
9	.7	1.6	1.7	1.0	1.3	2.1	1.0	1.7	1.2	.5	.9	1.8	2.2	2.0	1.7	3.5	2.1	1.2
10	.8	1.7	1.2	.5	1.8	1.9	1.1	.5	1.1	.2	1.1	1.9	2.0	2.6	1.0	2.5	2.2	.9
11	.8	1.8	1.0	.5	1.8	.9	1.3	2.1	.9	1.1	1.5	1.8	1.9	1.5	.8	1.5	2.2	.7
12	.7	1.5	.7	.4	1.5	.9	1.2	.7	1.2	.7	1.6	1.8	1.1	.8	.6	1.4	1.8	.6
13	.5	.6	.7	.3	1.6	1.2	.5	1.5	1.4	.9	1.2	1.2	.7	1.0	.5	1.1	1.0	.5
14	.4	.6	.6	.3	.8	1.3	.3	.6	.6	.7	.4	1.3	.7	1.9	.4	1.5	1.7	.3
15	.3	.5	.3	.2	.3	1.0	.1	.5	.5	.4	.7	1.0	.5	1.6	.2	1.9	2.3	.6
16	.2	.2	.2	.1	.4	.7	.3	.4	.4	.4	.5	.7	.6	1.2	.2	1.3	.7	.4
17	.2	.1	.2	.1	.1	.4	.2	.3	.5	.2	.5	.8	.4	.8	.1	1.4	1.2	.4
18	.2	.1	.2	.1	.4	.2	.2	.2	.2	.1	.4	.5	.3	.4	.1	.9	1.0	.2
7/19-	.3	.4	.4	.3	.6	.3	.9	.5	.9	.3	.7	1.2	1.1	1.3	.1	2.8	.5	.5
Total	22	24	26	15	37	25	24	16	16	14	29	33	26	32	41	35	44	30
Run	40	62	34	22	46	41	37	24	27	23	44	48	42	45	52	50	61	37
	early	strike	early	strike	late	late	strike	late	late	late	strike	strike	strike	strike	early	late	late	late

Table 7. Preseason forecasts of the 1997 Bristol Bay inshore run (millions).

District	Age					Total	Catch
	1.2	2.2	0.3	1.3	2.3		
1. ADFG							
Naknek/Kvichak	3.8	2.7		2.6	1.7	10.8	5.6
Egegik	0.7	5.9		1.7	4.5	12.8	11.8
Ugashik	1.0	1.6		0.7	0.5	3.8	3.1
Nushagak	1.7	0.2	0.6	3.2	0.1	5.7	3.9
Togiak	0.1	+		0.3	+	0.5	0.4
TOTAL	7.3	10.4	0.6	8.5	6.8	33.6	24.8
Percent	22	31	2	26	20		
2. FRI							
Naknek/Kvichak	6.2	1.7		1.9	2.1	11.9	6.3
Egegik	1.3	6.7		3.6	2.3	13.9	12.9
Ugashik	0.7	1.0		0.7	0.5	2.9	2.1
Nushagak	1.7	0.2	0.3	3.6	0.1	5.9	3.8
Togiak	0.1	0.0		0.3	0.1	0.5	0.3
TOTAL	10.0	9.6	0.3	10.1	5.1	35.1	25.4
Percent	28	27	1	29	15		

Table 8. Daily sockeye salmon catches (thousands) in the South Unimak June fishery, 1985–96.

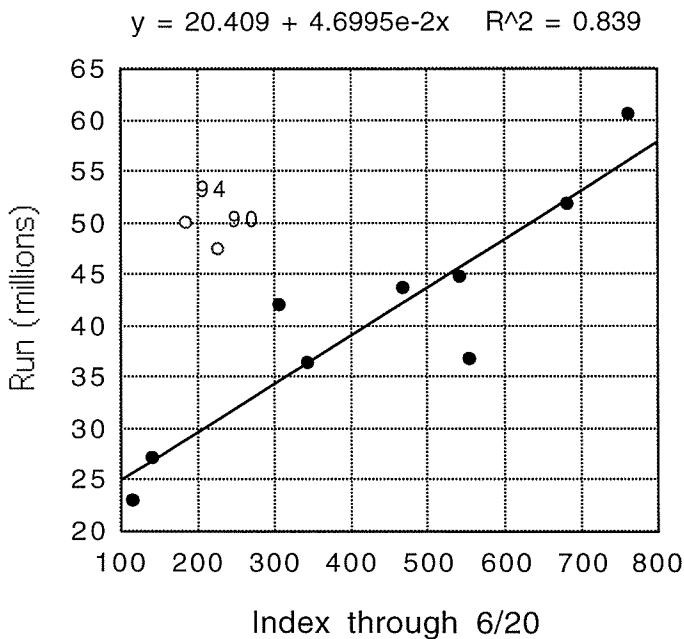
Date	Year												
	85	86	87	88	89	90	91	92	93	94	95	96	97
13						12			284		138		
14	389	55	44			34							
15			48	43			124	223	255		213	61	
16		31		79	361	69		143	305		73	6	
17			85			147	53	258	304	133	62	71	
18		92	67	59		91	106	345		71	10	56	
19	182				133	34	110	371	350	172	10	60	
20			56		441	82	226		492	53	77	63	
21	258	66	98	82		122		359		42	168	66	
22			76	35		120		354	203	96	151	63	
23	333	21		116	265	106	189			132	161	2	
24		17				88	262			66	128	22	
25		25	45				146			47	83	10	
Totals													
13-20	571	178	300	181	935	469	619	1340	1990	429	583	317	
13-25	1162	307	519	414	1200	905	1216	2053	2193	812	1274	480	
BB run	37	24	27	23	44	48	42	45	52	50	61	37	

Almanac

Through June 20
1987-1996

District Catch	Average 1,000s	Cumulative through 6/20			River Escapement	Average 1,000s	Cumulative through 6/20		
		Percent of season total					Percent of season total		
		Average	Low	High			Average	Low	High
Naknek/Kvichak	67	1	0	2	Kvichak	0	0	0	0
Egegik	169	2	0	7	Naknek	0	0	0	0
Nushagak	11	0	0	1	Egegik	5	0	0	2
Togiak	3	1	0	5	Wood	0	0	0	0
Ugashik	31	1	0	2	Igushik	0	0	0	0
All districts	274	1	0	4	Nushagak	3	0	0	1
					Togiak	0	0	0	0
					Ugashik	0	0	0	0

Port Moller sockeye index	Average 6/20 daily	Cumulative through 6/20	Forecast of total run (millions)
1987-96			
Average	71	397	In past years the index through 6/20 accounted for 44% of the variation in Bristol Bay runs (84% excluding 1990 and 94).
Lowest	19	114	
Highest	118	762	
1997=			(1997 cumulative index)X(.047)+(20.4)= total run
Bristol Bay runs 1987-96			example: if 1997 index was 397 (average for past years) we would forecast the total run by: (397)X(.047)+20.4= 39.1 a run of 39 million
Average	43		
Lowest	23		
Highest	61		



Comments

This is the first date that the Port Moller test fishery catches are used to forecast the total run. Prior to 6/19, Port Moller catches explained less than 50% of the variation in past runs. Sockeye passing Port Moller on this date will arrive in the Bay 6 to 9 days later (main body of the run). If water temperatures at Port Moller are averaging less than 4 C, we would expect a late run and if temperatures are over 8 C we can expect an early run.

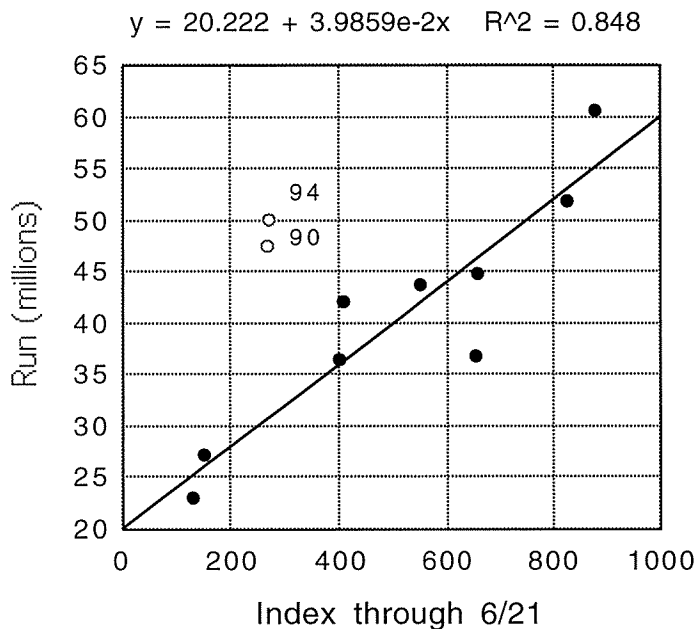
There was very little fishing effort through June 20 and, in recent years, little fishing time, so catches were usually small through this date (except for the early run in 1993).

Tower counting usually begins now in the major rivers but few fish are present.

Through June 21
1987-96

District Catch	Cumulative through 6/21			River Escapement	Cumulative through 6/21			
	average 1,000s	Percent of season total			average 1,000s	Percent of season total		
		Average	Low	High		Average	Low	High
Naknek/Kvichak	138	1	0	4	Kvichak	0	0	0
Egegik	250	2	0	10	Naknek	3	0	1
Nushagak	14	0	0	1	Egegik	22	2	10
Togiak	5	2	0	7	Wood	1	0	1
Ugashik	39	1	0	2	Igushik	0	0	0
All districts	439	2	0	6	Nushagak	4	0	1
					Togiak	0	0	0
					Ugashik	0	0	0

Port Moller sockeye index	6/21 daily	Cumulative through 6/21	Forecast of total run (millions)
1987-96			
Average	82	478	
Lowest	14	128	
Highest	144	878	
1997=			
			(1997 cumulative index)X(.040)+(20.2)= total run
Bristol Bay runs 1987-96			
Average	43		example: if 1997 index was 478 (average for past years) we would forecast the total run by: (478)X(.040)+20.2= 39.3
Lowest	23		a run of 39 million
Highest	61		



Comments

The Port Moller index through June 21, 1994 was only 269 (well below average) yet the run turned out to be 50 million (the 3rd largest in recent years). Except for 1990 & 94, the relation between index catch and run is very close. The Port Moller test boat has been blown out 4 out of 10 years on this date.

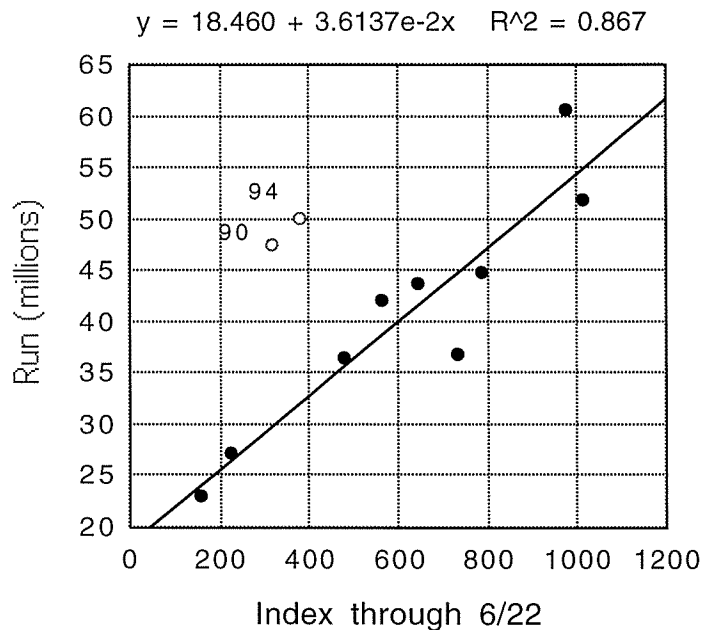
Bristol Bay catches were usually small on this date (except for the early 1993 run)

There were Egegik escapements on this date only in 1989, 92, 93 and 95. Typically, escapements are in the hundreds of fish this early in the season.

Through June 22
1987-96

District Catch	Cumulative through 6/22				River Escapement	Cumulative through 6/22			
	average 1,000s	Percent of season total				average 1,000s	Percent of season total		
		Average	Low	High			Average	Low	High
Naknek/Kvichak	254	3	0	10	Kvichak	0	0	0	0
Egegik	349	3	0	14	Naknek	4	0	0	2
Nushagak	17	0	0	1	Egegik	42	2	0	18
Togiak	7	2	0	9	Wood	2	0	0	1
Ugashik	54	2	0	3	Igushik	0	0	0	0
All districts	672	3	0	9	Nushagak	5	0	0	2
					Togiak	0	0	0	0
					Ugashik	0	0	0	0

Port Moller sockeye index	Cumulative 6/22 daily	Cumulative through 6/22	Forecast of total run (millions)
1987-96			
Average	99	577	
Lowest	26	154	
Highest	188	1012	
1997=			(1997 cumulative index)X(.036)+(18.5)= total run
Bristol Bay runs 1987-96			example: if 1997 index was 1012 (highest for past years) we would forecast the total run by: (1012)X(.036)+18.5= 54.9 a run of 55 million
Average	43		
Lowest	23		
Highest	61		



Comments

In 1988, some fish arrived early in the Bay and provided exceptional catches at Egegik (14% of total catch through 6/22). This led some to expect a large run that unfortunately did not materialize. The low index catches at Port Moller correctly forecast the relatively small run of 23 million. In contrast, the large 1990 & 94 runs were slow to develop, both at Port Moller and in the Bay. The indices through the 22nd (313 & 379) did not indicate runs of 48 & 50 million were on the way.

The high Port Moller index (188) on June 22, 1993 did correctly indicated that a large and early run (52 million) was coming.

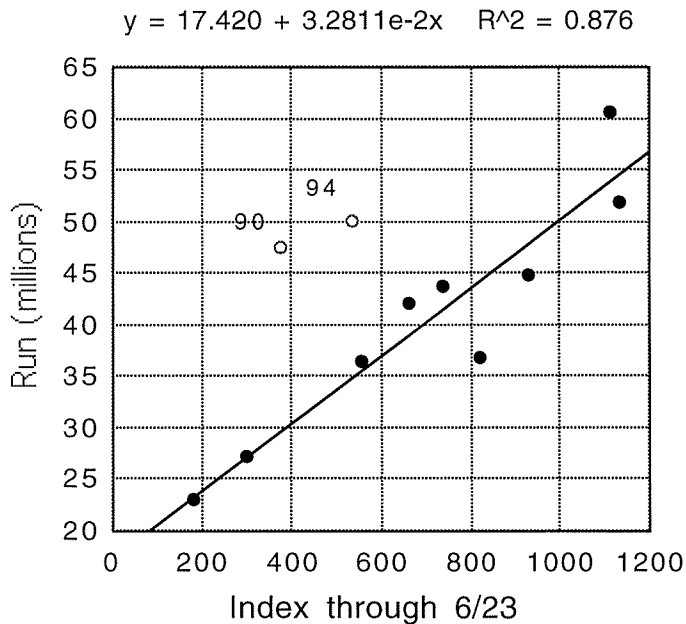
Through June 23
1987-96

District Catch	Cumulative through 6/23			River Escapement	Cumulative through 6/23			
	average 1,000s	Percent of season total (%)			average 1,000s	Percent of season total		
		Average	Low	High		Average	Low	High
Naknek/Kvichak	309	3	0	11	Kvichak	0	0	0
Egegik	491	5	0	18	Naknek	8	1	0
Nushagak	42	1	0	5	Egegik	66	4	0
Togiak	8	2	0	10	Wood	8	1	0
Ugashik	61	2	0	4	Igushik	1	0	0
All districts	902	3	0	11	Nushagak	9	1	0
					Togiak	0	0	0
					Ugashik	0	0	0

Port Moller sockeye index	6/23 daily	Cumulative through 6/23	Forecast of total run (millions)
1987-96			
Average	99	676	
Lowest	28	181	
Highest	152	1135	
1997=			
			(1997 cumulative index)X(.033)+(17.4)= total run
Bristol Bay runs 1987-96			
Average	43		
Lowest	23		
Highest	61		

In past years the index through 6/23 accounted for 55% of the variation in Bristol Bay runs (88% excluding 1990 & 94).

example: if the 1997 index was 181 (lowest for past years) we would forecast the total run by: (181)X(.033)+17.4= 23.4 a run of 23 million



Comments

The accuracy of forecasts from the Port Moller catches through 6/23 is still rather poor because of the 1990 and 94 indices and runs (374, 531 and 48, 50 million); however, for other years, there has been a very close correlation between the index and the final run.

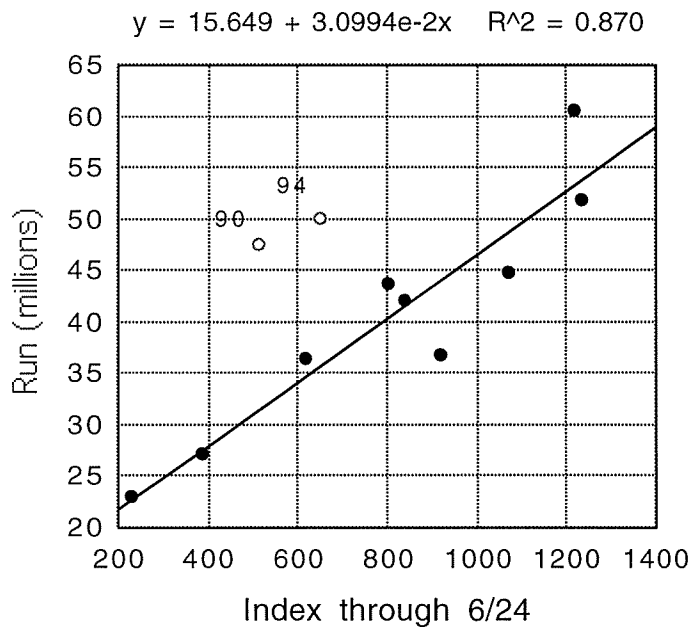
There were major fishery openings on this date in only 5 of the past 10 years. The catches were 311,000 (1988), 569,000 (1989) and 432,000 (1992), 379,000 (1993) and 444,000 (1995). There was only one opening (1993) in the Nushagak over the past 10 years on 6/23.

Escapements are just beginning at Naknek and Wood River towers. Egegik has had 2,000 or more past the tower on this date in 6 of the past 10 years. The largest daily escapement at Egegik in 1993 (156,000) occurred on this early date.

Through June 24
1987-96

District Catch	Cumulative through 6/24				River Escapement	Cumulative through 6/24			
	average 1,000s	Percent of season total				average 1,000s	Percent of season total		
		Average	Low	High		Average	Low	High	
Naknek/Kvichak	323	3	0	11	Kvichak	4	0	0	1
Egegik	552	5	0	18	Naknek	15	1	0	5
Nushagak	48	1	0	5	Egegik	85	5	0	35
Togiak	9	3	0	10	Wood	18	1	0	7
Ugashik	61	2	0	4	Igushik	3	1	0	3
All districts	1067	4	0	11	Nushagak	19	3	0	13
					Togiak	0	0	0	0
					Ugashik	0	0	0	0

1987-96 Port Moller sockeye index	6/24 daily	Cumulative through 6/24	Forecast of total run (millions)
Average	108	784	In past years the index through 6/24 accounted for 59% of the variation in Bristol Bay runs (87% excluding 1990 & 94).
Lowest	50	231	
Highest	180	1234	
1997=			(1997 cumulative index)X(.031)+(15.6)= total run
Bristol Bay runs 1987-96			example: if 1997 index was 784 (average for past years) we would forecast the total run by: (784)X(.031)+15.6= 39.9 a run of 40 million
Average	43		
Lowest	23		
Highest	61		



Comments

The relation between the Port Moller index catch and the total Bristol Bay run improves on this date, but the 1990 & 94 indices and runs are still unusual. The test boat has been blown out on the 24th four times in the past 10 years. Sockeye passing Port Moller on this date will arrive in Bristol Bay about July 1-2.

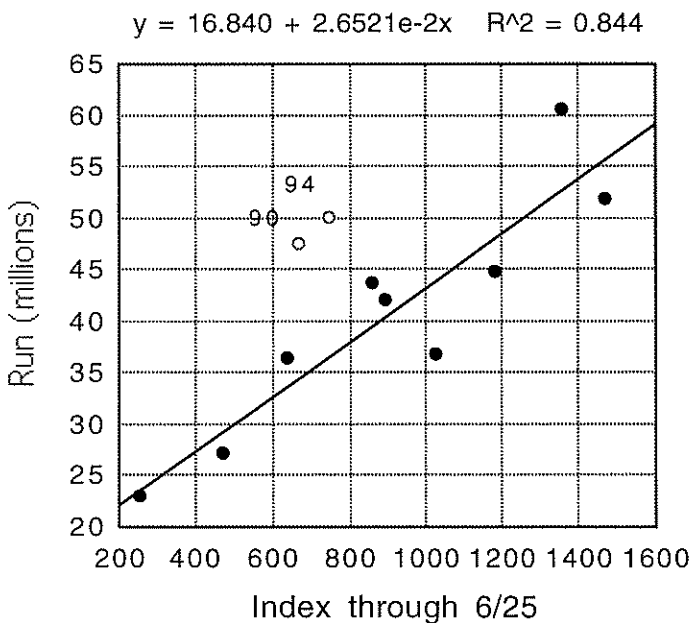
There has been only one major fishery opening on this date (Egegik, 1993) during the past 10 years. On average, 3% of the Nushagak runs, 5% of the Naknek/Kvichak runs and 8% of the Egegik runs passed through the fishing district by this date.

The Naknek tower count was 1,000 or more on this date in every year except 1987, whereas the Kvichak tower count was less than 1,000 except in 1992 and 1993

Through June 25
1987-96

District Catch	Cumulative through 6/25				River Escapement	Cumulative through 6/25			
	average 1,000s	Percent of season total				average 1,000s	Percent of season total (%)		
		Average	Low	High			Average	Low	High
Naknek/Kvichak	350	4	0	12	Kvichak	12	0	0	1
Egegik	990	8	0	18	Naknek	49	4	0	12
Nushagak	92	2	0	6	Egegik	105	7	0	39
Togiak	10	3	0	10	Wood	34	3	0	11
Ugashik	77	2	0	6	Igushik	5	1	0	4
All districts	1510	5	1	13	Nushagak	29	5	1	16
					Togiak	0	0	0	0
					Ugashik	0	0	0	0

1987-96 Port Moller sockeye index	Cumulative 6/25 daily	Cumulative through 6/25	Forecast of total run (millions)
Average	105	890	In past years the index through 6/25 accounted for 62% of the variation in Bristol Bay runs (84% excluding 1990 & 94)
Lowest	22	253	
Highest	232	1466	
1997=			(1997 cumulative index)X(.027)+(16.8)= total run
Bristol Bay runs 1987-96			example: if 1997 index was 1466 (highest for past years) we would forecast the total run by: (1466)X(.027)+16.8= 56.4 a run of 56 million
Average	43		
Lowest	23		
Highest	61		



Comments

This is the first date on which we made forecasts from Port Moller index catches in past years. The relation between index and run is now fairly close as we are about 3 days from the mid point of the run at Port Moller.

About this time we will compare the age composition of sockeye at Port Moller with the pre-season forecasts and the average lengths by age & sex will be examined--small fish=large run, large fish=small run.

There were major fishery openings on this date in 6 of the past 10 years. Catches were 200,000 in 1987 & 1989; 700,000 in 1992; 1,200,000 in 1993; 130,000 in 1994; and 1 million in 1995.

Escapements are usually just under way, an exception was in 1993 with 10% of the total by 6/25

Through June 26
1987-96

District Catch	Cumulative through 6/26				River Escapement	Cumulative through 6/26			
	average 1,000s	Percent of season total				average 1,000s	Percent of season total		
		Average	Low	High			Average	Low	High
Naknek/Kvichak	489	5	0	16	Kvichak	50	1	0	4
Egegik	1154	9	0	23	Naknek	93	7	0	18
Nushagak	157	4	0	10	Egegik	147	9	0	47
Togiak	12	4	0	16	Wood	58	4	0	14
Ugashik	86	3	0	6	Igushik	9	2	0	6
All districts	1889	6	1	17	Nushagak	45	8	1	19
					Togiak	0	0	0	0
					Ugashik	0	0	0	0

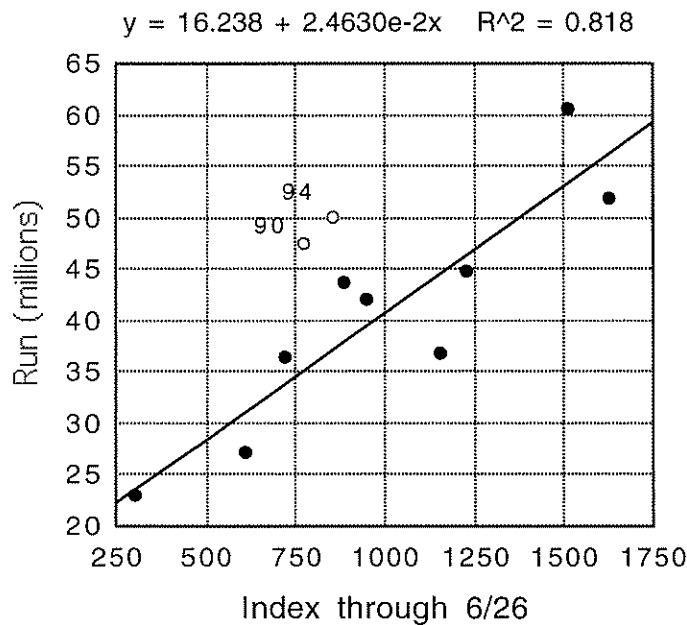
1987-96 Port Moller sockeye index	6/26 daily	Cumulative through 6/26	Forecast of total run (millions)
Average	98	988	In past years the index through 6/26 accounted for 62% of the variation in Bristol Bay runs (82% excluding 1990 & 94).
Lowest	28	305	
Highest	158	1624	

1997=

$$(1997 \text{ cumulative index}) \times (.025) + (16.2) = \text{total run}$$

Bristol Bay runs 1987-96	
Average	43
Lowest	23
Highest	61

example: if 1997 index was 988 (average for past years) we would forecast the total run by: $(988) \times (.025) + 16.2 = 40.9$ a run of 41 million



Comments

The weather at Port Moller was fishable on this this date every year except 1993. We are about 2 days before the mid point in the run at Port Moller (average timing).

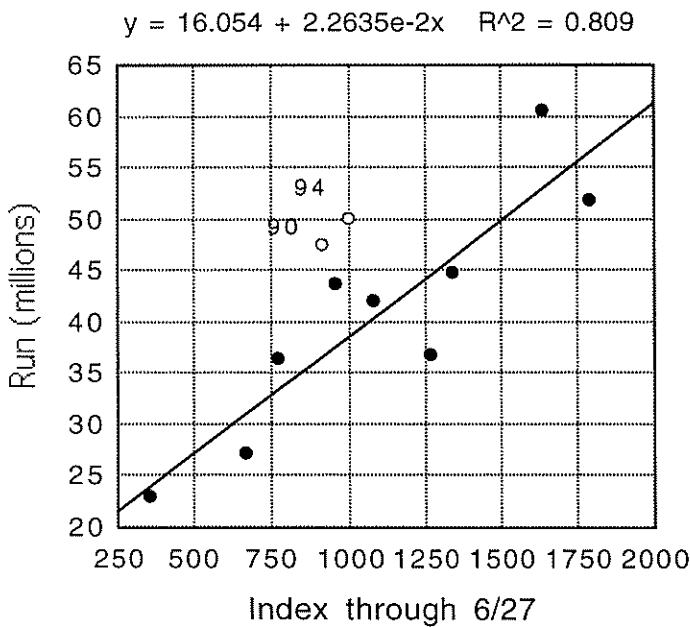
There were only 4 major fishery openings on this date: 1989 (695,000); 1993 (all districts 1,155,000); 1995 (991,000); and 1996 (1,005,000).

On the average through 6/26, 7% of the Nushagak run, 11% of the Naknek/Kvichak run, and 14% of the Egegik run had passed through the fishing district. However in 1993, 17%, 19% and 24% of these runs were through the districts. At the other extreme, only 1% of the BB run was through the districts by 6/26 in 1986.

Through June 27
1987-96

District Catch	Cumulative through 6/27				River Escapement	Cumulative through 6/27			
	average 1,000s	Percent of season total				average 1,000s	Percent of season total		
		Average	Low	High			Average	Low	High
Naknek/Kvichak	730	7	0	21	Kvichak	135	2	0	8
Egegik	1528	12	0	27	Naknek	132	9	0	20
Nushagak	219	5	0	13	Egegik	189	11	0	45
Togiak	15	5	0	22	Wood	93	6	0	16
Ugashik	86	3	0	6	Igushik	18	5	1	9
All districts	2570	9	1	21	Nushagak	66	13	1	29
					Togiak	0	0	0	0
					Ugashik	0	0	0	0

1987-96	Cumulative	Forecast of total run (millions)
Port Moller sockeye index	6/27 daily	6/27
Average	109	1097
Lowest	48	353
Highest	158	1783
1997=		
		(1997 cumulative index)X(.025)+(16.2)= total run
Bristol Bay runs 1987-96		example: if 1997 index was 353 (lowest for past years) we would forecast the total run by: (353)X(.025)+16.2= 24.7, a run of 25 million
Average	43	
Lowest	23	
Highest	61	



Comments

Sockeye passing Port Moller on this date usually take about 7 days to reach the fishing districts. Earlier (6/11-15) the fish take longer (8-10 days) because temperatures are usually colder. The sockeye may take only 5-6 days to reach the districts in July.

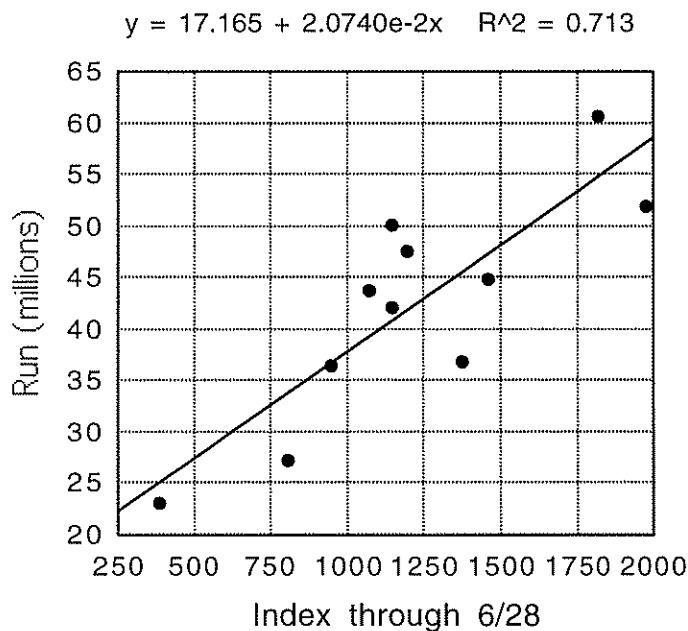
On this date, there were only 3 major openings in the Nushagak (1992,1993, 1995; ca 170,000 ea) and in Naknek/Kvichak (1988, 361,000; 1993, 470,000 and 1995, 1.1 million) however, there have been 7 openings at Egegik since 1987 with an average catch of 534,000.

The average BB catch plus escapement on this date was 927,000 and the cumulative average C+E was 3.1 million. An average of 7% of the annual runs were accounted for by the C+E through 6/27.

Through June 28
1987-96

District Catch	Cumulative through 6/28				River Escapement	Cumulative through 6/28			
	average 1,000s	Percent of season total				average 1,000s	Percent of season total		
		Average	Low	High			Average	Low	High
Naknek/Kvichak	895	9	0	29	Kvichak	240	4	0	14
Egegik	1940	15	0	33	Naknek	161	11	0	22
Nushagak	334	8	0	18	Egegik	244	16	0	51
Togiak	18	6	0	26	Wood	118	9	0	28
Ugashik	87	3	1	6	Igushik	33	8	1	14
All districts	3267	11	1	26	Nushagak	86	16	2	40
					Togiak	0	0	0	0
					Ugashik	0	0	0	0

1987-96 Port Moller sockeye index	6/28 daily	Cumulative through 6/28	Forecast of total run (millions)
Average	140	1236	In past years the index through 6/28 accounted for 71% of the variation in Bristol Bay runs and all years are included for forecasting from this date on. (1997 cumulative index)X(.021)+(17.2)= total run
Lowest	33	386	
Highest	284	1973	
1997=			
Bristol Bay runs 1987-96			example: if 1997 index was 1236 (average for past years) we would forecast the total run by: (1236)X(.021)+17.2= 43.2, a run of 43 million
Average	43		
Lowest	23		
Highest	61		



Comments

The average daily index catch (sum of catches at stations 2-8) has been highest on the 28th to 30th, which is about the mid point in the run past Port Moller. The largest recorded daily indices were 284 made on 6/28/90 and 287 made on 6/30/93.

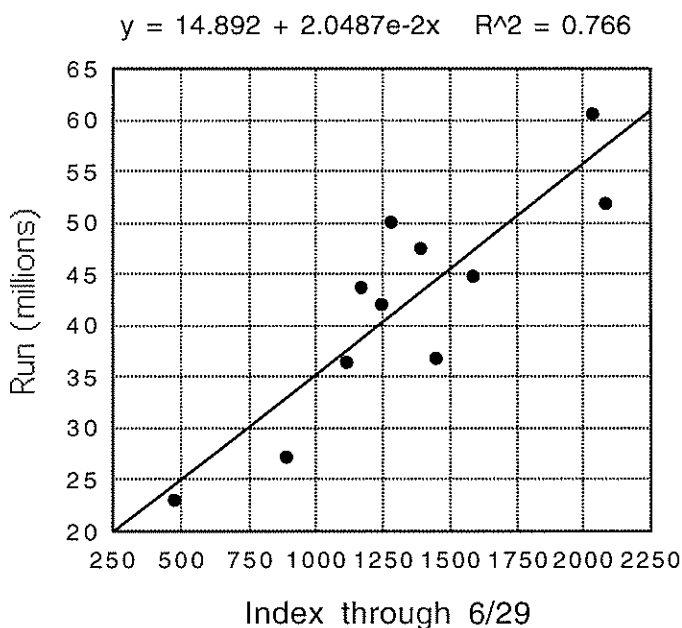
Prior to 1993, when all districts were open with a total catch of 2.2 million, there had been only one major opening on this date for: Egegik (1989; 1.2 million), Naknek/Kvichak (1985; 1.1 million), and Nushagak (1988; 181,000) since 1985. The total BB catch in 1995 was 1.9 million on 6/28.

This has usually been the first date of large escapement to the Kvichak (50,000+); however, there was no escapement through 6/28 in 1986 and 1987, and only 5,000 in 1990 and 24,000 in 1994. Naknek has had over 100,000 escapement by 6/28 except in 1986, 1987 and 1994.

Through June 29
1987-96

District Catch	Cumulative through 6/29				River Escapement	Cumulative through 6/29			
	average 1,000s	Percent of season total				average 1,000s	Percent of season total		
		Average	Low	High		Average	Low	High	
Naknek/Kvichak	1302	12	0	34	Kvichak	345	6	0	21
Egegik	2422	20	0	41	Naknek	249	16	0	32
Nushagak	513	12	0	26	Egegik	295	19	1	52
Togiak	22	7	0	31	Wood	151	12	1	33
Ugashik	140	4	1	12	Igushik	46	11	2	19
All districts	4375	14	1	32	Nushagak	101	19	2	45
					Togiak	0	0	0	0
					Ugashik	0	0	0	0

1987-96 Port Moller sockeye index	Cumulative 6/29 daily	Cumulative through 6/29	Forecast of total run (millions)
Average	122	1358	In past years the index through 6/29 accounted for 77% of the variation in Bristol Bay runs
Lowest	75	472	
Highest	217	2085	
1997=			(1997 cumulative index)X(.020)+ (14.9)= total run
Bristol Bay runs 1987-96			example: if 1997 index was 2085 (highest for past years) we would forecast the total run by: (2085)X(.020)+14.9= 56.6, a run of 57 million
Average	43		
Lowest	23		
Highest	61		



Comments

The middle of the Bristol Bay run passes Port Moller at this time and index catches have been relatively high in all years. Forecasts from the Port Moller daily cumulative index catches have about the same reliability from 6/29 to 7/3.

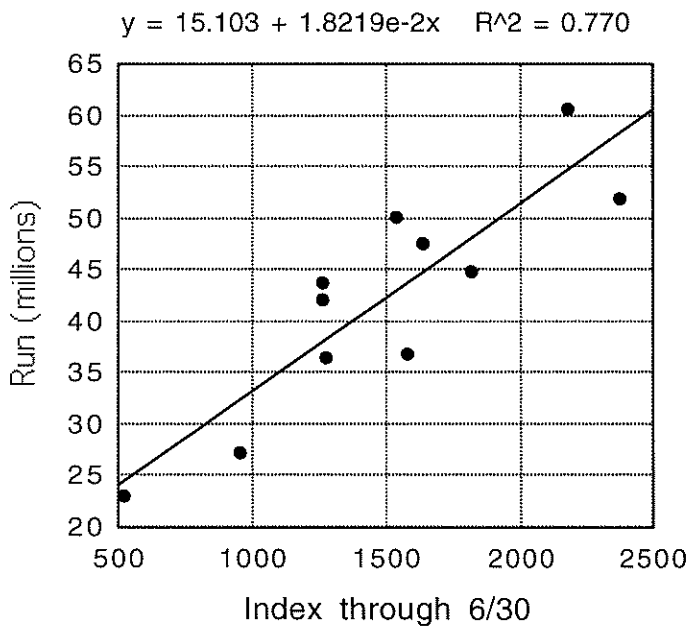
Fishery openings on this date in either the Naknek/Kvichak or Egegik districts have produced an average of 600,000 fish. There were only three Nushagak openings on 6/29 since 1985: 1989 (350,000), 1993 (570,000), and 1995 (180,000).

On the average, the cumulative catch plus escapement through 6/29 has accounted for 11% of the final run (range: 2%-30%).

Through June 30
1987-96

District Catch	Cumulative through 6/30				River Escapement	Cumulative through 6/30			
	average 1,000s	Percent of season total				average 1,000s	Percent of season total		
		Average	Low	High		Average	Low	High	
Naknek/Kvichak	1719	14	0	39	Kvichak	471	8	0	23
Egegik	2917	25	4	42	Naknek	347	21	2	38
Nushagak	670	15	0	32	Egegik	351	23	2	52
Togiak	29	8	0	34	Wood	206	16	1	39
Ugashik	159	4	1	12	Igushik	58	14	2	28
All districts	5456	18	2	35	Nushagak	121	23	2	52
					Togiak	0	0	0	2
					Ugashik	0	0	0	0

1987-96 Port Moller sockeye index	6/30 daily	Cumulative through 6/30	Forecast of total run (millions)
Average	153	1511	In past years the index through 6/30 accounted for 77% of the variation in Bristol Bay runs
Lowest	20	523	
Highest	287	2372	
1997=			(1997 cumulative index)X(.018)+ (15.1)= total run
Bristol Bay run 1987-96			example: if 1997 index was 1511 (average for past years) we would forecast the total run by: (1511)X(.018)+15.1= 42.3, a run of 43 million
Average	43		
Lowest	23		
Highest	61		



Comments

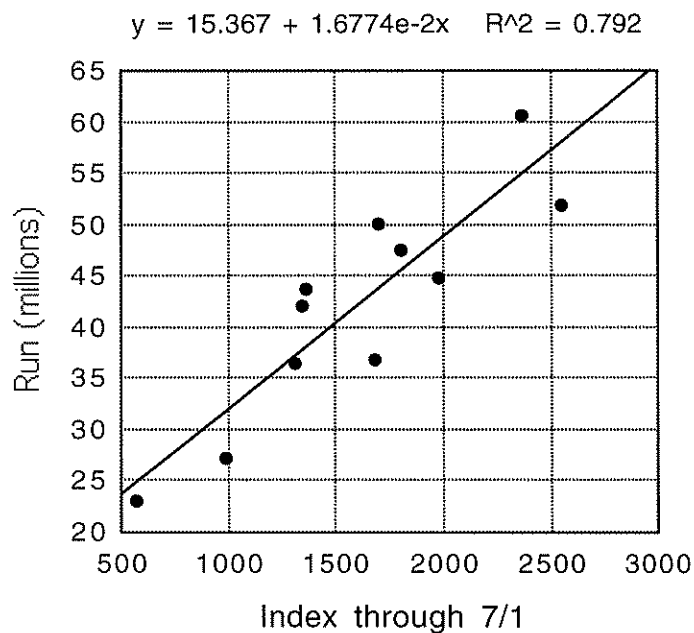
There was an unusually low index on this date in 1991 (20), but index catches averaged 168 in other years. With average or early run timing, a forecast by district can be made with statistics through 6/30 (forecast made on 7/1). With district forecasts, we can then forecast the total Bristol Bay catch.

On the average since 1987, 18% of the Bristol Bay catch was made by the 30th; however, 23% of the Nushagak runs, 27% of the Naknek/Kvichak runs and 31% of the Egegik runs passed through the fishing district by 6/30. In a very early run in 1979, over 50% of the Bristol Bay run was through the districts by the 30th; in contrast, in the late run of 1971, less than 10% of the run was in the districts by the 30th.

Through July 1
1987-96

District Catch	Cumulative through 7/1				River Escapement	Cumulative through 7/1			
	average 1,000s	Percent of season total				average 1,000s	Percent of season total		
		Average	Low	High			Average	Low	High
Naknek/Kvichak	2200	19	0	42	Kvichak	641	11	0	25
Egegik	3456	30	4	57	Naknek	485	29	3	51
Nushagak	843	20	3	35	Egegik	417	27	4	54
Togiak	37	10	1	34	Wood	260	20	1	42
Ugashik	201	5	1	18	Igushik	71	17	3	37
All districts	6698	22	4	40	Nushagak	147	29	4	58
					Togiak	1	1	0	5
					Ugashik	0	0	0	0

1987-96 Port Moller sockeye index	7/01 daily	Cumulative through 7/01	Forecast of total run (millions)
Average	122	1633	In past years the index through 7/1 accounted for 79% of the variation in Bristol Bay runs
Lowest	26	568	
Highest	187	2547	
1997=			(1997 cumulative index)X(.017) + (15.4)= total run
Bristol Bay runs 1987-96			example: if 1997 index was 568 (lowest for past years) we would forecast the total run by: (568)X(.017)+15.4= 25.1, a run of 25 million
Average	43		
Lowest	23		
Highest	61		



Comments

Over the past six years with runs over 40 million, the daily index catches ranged from 79 to 187 on July 1 and the cumulative indices were over 1340.

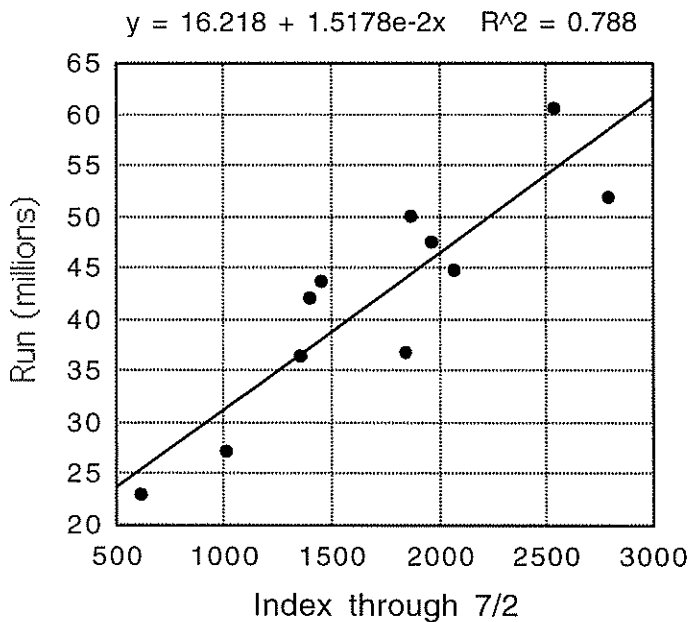
The average cumulative catch + escapement through 7/1 was 21% of the total Bristol Bay run (range: 3% in 1994 and 38% in 1993).

By July, 1 the Kvichak escapements were under way except in 1994. In 1989 and 1993, 25% of the total escapement passed the tower by 7/1.

Through July 2
1987-96

District Catch	Cumulative through 7/2				River Escapement	Cumulative through 7/2			
	average 1,000s	Percent of season total				average 1,000s	Percent of season total		
		Average	Low	High			Average	Low	High
Naknek/Kvichak	2958	26	4	67	Kvichak	930	16	0	27
Egegik	4393	38	16	58	Naknek	618	36	13	65
Nushagak	1082	27	4	48	Egegik	489	30	11	58
Togiak	45	12	1	34	Wood	332	26	4	49
Ugashik	266	7	1	22	Igushik	86	22	4	48
All districts	8704	29	10	53	Nushagak	179	35	9	61
					Togiak	2	1	0	8
					Ugashik	0	0	0	0

1987-96 Port Moller sockeye index	7/02 daily	Cumulative through 7/02	Forecast of total run (millions)
Average	119	1752	In past years the index through 7/2 accounted for 79% of the variation in Bristol Bay runs
Lowest	27	614	
Highest	242	2789	
1997=			(1997 cumulative index)X(.015) + (16.2)= total run
Bristol Bay runs 1987-96			example: if 1997 index was 2789 (highest for past years) we would forecast the total run by: (2789)X(.015)+16.2= 58.0, a run of 58 million
Average	43		
Lowest	23		
Highest	61		



Comments

Port Moller index catches on July 2 were over 50 when Bristol Bay runs were over 37 million and index catches were under 50 when the runs were less than 30 million.

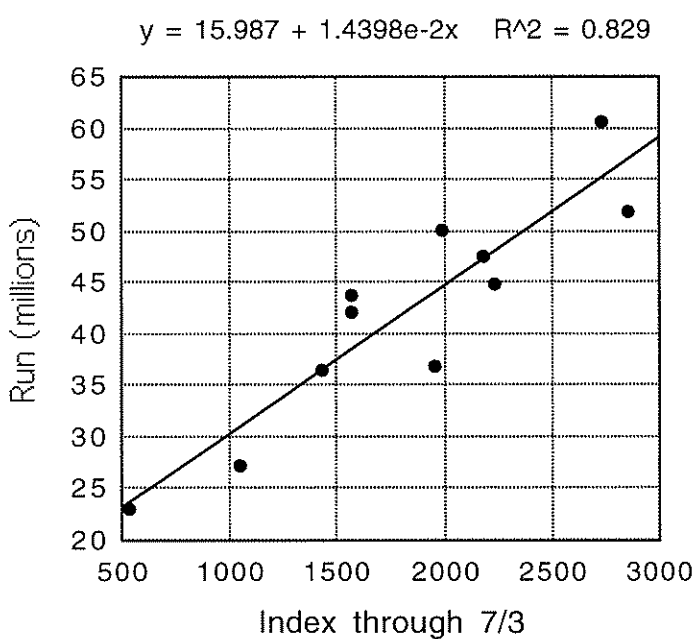
The Egegik fishery was open 9 of the past 10 years on 7/2 and the catches ranged from 330,000 to 2.7 million. The average Bristol Bay catch on this date was 2.0 million. The all-time record single-day catch in Bristol Bay (5.3 million) was on 7/2/93. The Nushagak has had a major opening on 7/2 in only 5 of the past 10 years.

Although an average of 27% of the seasons catch was made by 7/2, 41% of the Egegik runs, 38% of the Naknek/Kvichak runs and 32% of the Nushagak runs had passed through the fishing districts by July 2. Escapements have come more from the early part of the runs while catches have come from the later part.

Through July 3
1987-96

District Catch	Cumulative through 7/3				River Escapement	Cumulative through 7/3			
	average 1,000s	Percent of season total				average 1,000s	Percent of season total		
		Average	Low	High			Average	Low	High
Naknek/Kvichak	3510	31	6	67	Kvichak	1294	22	3	40
Egegik	4985	43	23	66	Naknek	766	46	31	74
Nushagak	1360	35	11	58	Egegik	605	36	13	59
Togiak	54	14	2	34	Wood	459	36	8	65
Ugashik	343	9	1	26	Igushik	100	25	5	53
All districts	10214	34	13	59	Nushagak	221	43	16	71
					Togiak	3	1	0	11
					Ugashik	1	0	0	1

1987-96 Port Moller sockeye index	7/03 daily	Cumulative through 7/03	Forecast of total run (millions)
Average	122	1874	In past years the index through 7/3 accounted for 83% of the variation in Bristol Bay runs
Lowest	23	637	
Highest	223	2849	
1997=			(1997 cumulative index)X(.014) + (16.0)= total run
Bristol Bay runs 1987-96			example: if 1996 index was 2849 (highest for past years) we would forecast the total run by: (2849)X(.014)+16.0= 55.9, a run of 56 million
Average	43		
Highest	61		



Comments

The middle part of the Bristol Bay run is still passing Port Moller on July 3 and the daily index catches have been over 60 when a large run was on the way.

Major openings at Egegik have produced an average catch of about 1 million on 7/3. The Nushagak was open each of the past 10 years on 7/3 and catches averaged 278,000 per opening. Sockeye have usually arrived inside Ugashik Bay by July 3. Openings in 1993, 1995 and 1996 produced catches of 260,000, 215,000 and 198,000.

Total catch and escapement through July 3 as reported by ADF&G, has averaged 32% of the final run.

In each of the past 10 years the Naknek escapement exceeded 300,000 by 7/3 and the Egegik escapement has exceeded 300,000 in 8 of the past 10 years

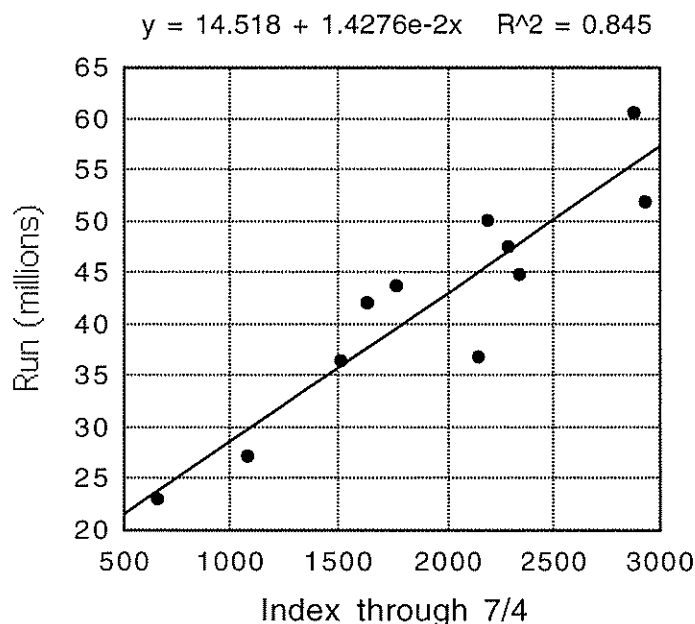
Through July 4
1987-96

District Catch	Cumulative through 7/4				River Escapement	Cumulative through 7/4			
	average 1,000s	Percent of season total				average 1,000s	Percent of season total		
		Average	Low	High			Average	Low	High
Naknek/Kvichak	4111	36	6	73	Kvichak	1789	30	19	53
Egegik	5693	49	27	73	Naknek	897	54	36	80
Nushagak	1552	39	17	61	Egegik	742	44	25	66
Togiak	67	17	4	34	Wood	548	44	13	73
Ugashik	465	13	3	33	Igushik	119	30	8	55
All districts	11848	39	16	64	Nushagak	267	52	25	81
					Togiak	4	2	0	13
					Ugashik	6	1	0	5

1987-96 Port Moller sockeye index	7/04 daily	Cumulative through 7/04	Forecast of total run (millions)
Average	113	1987	In past years the index through 7/4 accounted for 85% of the variation in Bristol Bay runs
Lowest	22	659	
Highest	197	2928	
1997=			(1997 cumulative index)X(.014) + (14.5)= total run

Bristol Bay runs 1987-96	
Average	43
Lowest	23
Highest	61

example: if 1997 index was 1987 (average for past years) we
would forecast the total run by: (1987)X(.014)+14.5=42.3,
a run of 42 million



Comments

Numbers of sockeye passing Port Moller should start declining after this date. Forecasts from the cumulative index catches have the greatest reliability for today and the next 2 days, because past indices have accounted for about 86% of the variation in the Bristol Bay runs (the data points on the graphs are close to the prediction line).

July 4 is the half way point in the average Egegik and Naknek/Kvichak run (July 5 for the Nushagak); however, only 36% of the average Naknek/Kvichak catch was made by July 4 over the past 10 years.

Total Bristol Bay catch + escapement through July 4 averaged 38% of the final runs since 1987 (range: 16% in 1994 to 60% in 1993).

The largest single day's escapement of 1.7 million was recorded on this date in 1994.

Through July 5
1987-96

District Catch	average 1,000s	Cumulative through 7/5			River Escapement	average 1,000s	Cumulative through 7/5		
		Percent of season total					Percent of season total		
		Average	Low	High			Average	Low	High
Naknek/Kvichak	4881	42	6	78	Kvichak	2260	38	25	65
Egegik	6320	54	36	78	Naknek	968	59	39	81
Nushagak	1766	44	17	67	Egegik	870	51	34	70
Togiak	79	19	5	34	Wood	601	48	15	79
Ugashik	578	16	3	43	Igushik	145	36	11	58
All districts	13584	45	21	70	Nushagak	291	56	28	87
					Togiak	6	3	0	15
					Ugashik	20	2	0	15

1987-96 Port Moller sockeye index	7/05 daily	Cumulative through 7/05	Forecast of total run (millions)
Average	99	2086	In past years the index through 7/5 accounted for 86% of the variation in Bristol Bay runs
Lowest	30	707	
Highest	143	3028	

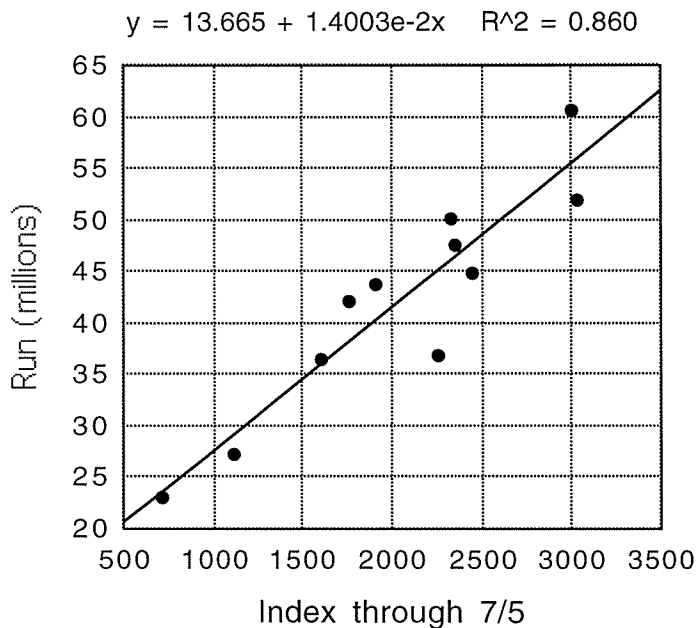
1997=

$$(1997 \text{ cumulative index}) \times (.014) + (13.7) = \text{total run}$$

Bristol Bay runs 1987-96

Average	43
Lowest	23
Highest	61

example: if 1997 index was 3028 (highest for past years) we
would forecast the total run by: $(3028) \times (.014) + 13.7 = 56.1$,
a run of 56 million



Comments

Sockeye passing Port Moller today should be in the fishing districts about the 11th or 12th.

The Ugashik runs are usually well under way by now but few fish are past the tower. Ugashik catches on 7/5 have averaged about 282,000. The Egegik run is still near the peak and catches have averaged 784,000 on this date, whereas Naknek/Kvichak catches averaged 856,000. There were only 6 openings on the 5th in the Nushagak district, and catches on those openings averaged 357,000.

Escapement goals are usually assured by July 5 in Egegik, Naknek and Wood River, although the goals (1 million) may not be reached until another 2 or 3 days.

52% of the Nushagak runs have usually passed through the fishery by July 5.

Through July 6
1987-96

District Catch	Cumulative through 7/6				River Escapement	Cumulative through 7/6			
	average 1,000s	Percent of season total				average 1,000s	Percent of season total		
		Average	Low	High			Average	Low	High
Naknek/Kvichak	5615	48	8	82	Kvichak	2686	45	27	71
Egegik	6917	60	44	83	Naknek	1031	64	47	82
Nushagak	2019	50	28	73	Egegik	1007	58	36	78
Togiak	90	22	7	34	Wood	667	53	20	83
Ugashik	749	21	7	54	Igushik	172	42	13	61
All districts	15351	50	28	75	Nushagak	312	60	34	90
					Togiak	9	4	0	16
					Ugashik	41	4	0	29

1987-96 Port Moller sockeye index	7/06 daily	Cumulative through 7/06	Forecast of total run (millions)
Average	98	2148	In past years the index through 7/6 accounted for 94% of the variation in Bristol Bay runs
Lowest	23	730	
Highest	182	3177	

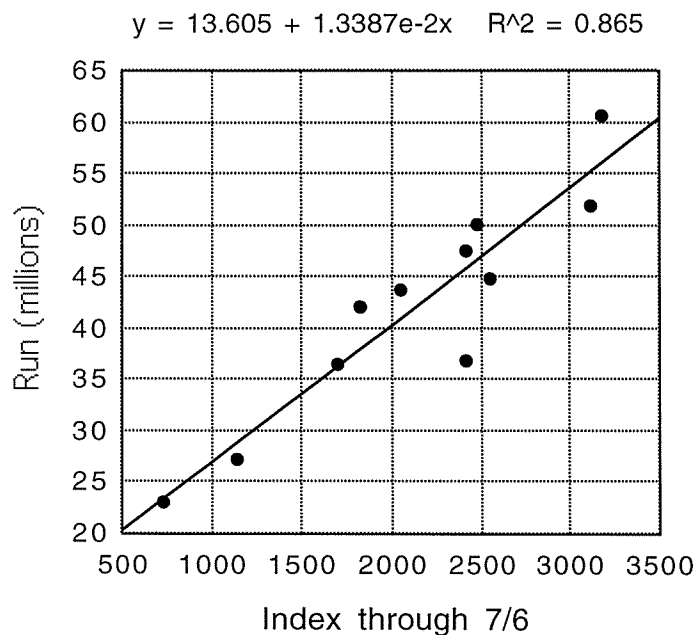
1997=

$$(1997 \text{ cumulative index}) \times (.013) + (13.6) = \text{total run}$$

Bristol Bay runs 1987-96

Average	43
Lowest	23
Highest	61

example: if 1997 index was 2148 (average for past years) we
would forecast the total run by: $(2148) \times (.013) + 13.6 = 43.1$,
a run of 43 million



Comments

Sockeye catches at Port Moller were still relatively high on this date except in 1988 (year of the small run). The cumulative indices show a very close correlation with past runs.

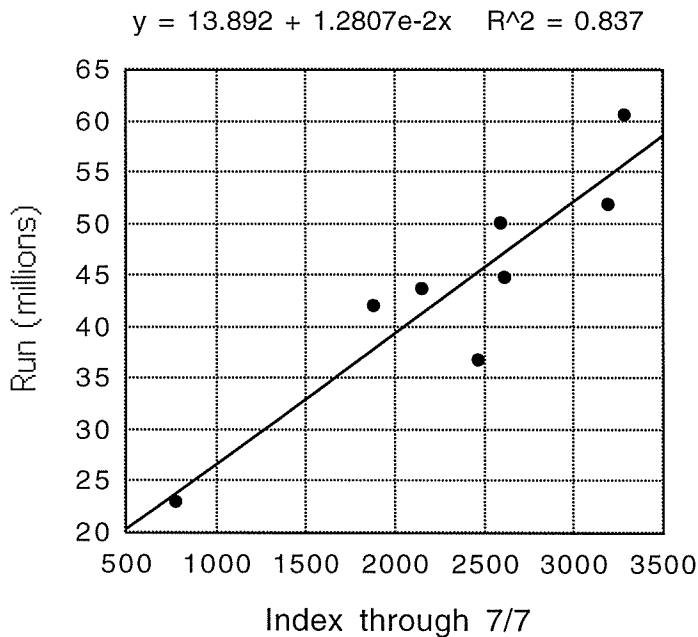
Over half of the Egegik catch has been made by July 6 and half of the total Bristol Bay catch (50%) since 1987. For the years with openings on 7/6, Nushagak catches averaged 316,000; Egegik catches averaged 746,000 and Naknek/Kvichak catches averaged 917,000. For 6 openings on this date in Ugashik the catches averaged 285,000.

On the average, 46% of the Bristol Bay escapement was counted by 7/6 and the total catch + escapement as reported by ADF&G through July 6 averaged 49% the final runs (range: 30% in 1994 to 72% in 1993).

Through July 7
1987-96

District Catch	Cumulative through 7/7			River Escapement	Cumulative through 7/7				
	average 1,000s	Percent of season total			average 1,000s	Percent of season total			
		Average	Low	High		Average	Low	High	
Naknek/Kvichak	6247	52	11	87	Kvichak	3083	51	29	79
Egegik	7521	65	52	87	Naknek	1092	69	51	83
Nushagak	2240	56	39	78	Egegik	1118	64	39	86
Togiak	101	24	7	37	Wood	769	61	22	86
Ugashik	958	26	7	62	Igushik	194	47	17	69
All districts	17030	56	37	80	Nushagak	362	68	39	93
					Togiak	15	6	0	19
					Ugashik	63	6	0	37

1988-89, 1991-96 Port Moller sockeye index	7/07 daily	Cumulative through 7/07	Forecast of total run (millions)
only 8 years			
Average	77	2364	In the 8 available years the index through 7/7 accounted for 84% of the variation in Bristol Bay runs
Lowest	39	769	
Highest	108	3283	
1997=			(1997 cumulative index) x (.013) + (13.9)=(total run)
Bristol Bay runs 1987-96			example: if the 1997 index was 2364 (average for 8 years) we would forecast the total run by (2364)X(.013) + 13.9= 44.6 a run of 45 million
Average	43		
Lowest	23		
Highest	61		



Comments

Sockeye salmon passing Port Moller today and tomorrow will probably be in the fishing districts by July 15.

This forecast is based only on 8 years but in another year or two we will make daily forecasts through July 9.

On the average through July 7 (1987-96), 70% of the Egegik runs, 69% of the Naknek/Kvichak runs, and 64% of the Nushagak runs had passed through the fishing districts, but only 65%, 52% and 56% of the catches were made by July 7. Fishing is usually continuous from now until July 20.

Total Bristol Bay catch + escapement through July 7 as reported by ADF&G averaged 55% of the final runs (range: 38% in 1994 to 77% in 1993).

About half of the Kvichak escapement was reached by this date and most escapement goals are assured by 7/7.

Through July 8
1987-96

District Catch	Cumulative through 7/8				River Escapement	Cumulative through 7/8			
	average 1,000s	Percent of season total				average 1,000s	Percent of season total		
		Average	Low	High			Average	Low	High
Naknek/Kvichak	6785	56	11	90	Kvichak	3518	58	32	86
Egegik	7992	69	58	90	Naknek	1170	76	63	86
Nushagak	2464	61	39	83	Egegik	1213	70	44	94
Togiak	116	27	8	44	Wood	854	68	24	88
Ugashik	1150	31	7	73	Igushik	217	53	18	75
All districts	18470	60	43	85	Nushagak	385	73	41	94
					Togiak	21	8	1	25
					Ugashik	114	10	0	42

1991-96 Port Moller sockeye index	7/08 daily	Cumulative through 7/08	Forecast of total run (millions)
only 6 years			
Average	79	2746	
Lowest	33	1947	
Highest	120	3336	No forecast until more years sampled on this date.
1997=			
Bristol Bay runs 1991-96			
Average	48		
Lowest	37		
Highest	61		

Comments

Bristol Bay catch + escapement through 7/8 has averaged 60% of the final run with a range of 46% in 1987 and 1994 to 82% in 1993.

The second largest single day escapement of 1.56 million was recorded on this date in 1995.

In an average year, 73% of the Naknek/Kvichak and Egegik runs and 70% of the Nushagak runs have passed through the fishing districts by this date.

Through July 9
1987-96

District Catch	Cumulative through 7/9				River Escapement	Cumulative through 7/9			
	average 1,000s	Percent of season total				average 1,000s	Percent of season total		
		Average	Low	High			Average	Low	High
Naknek/Kvichak	7431	61	17	93	Kvichak	3934	64	39	90
Egegik	8388	73	62	93	Naknek	1223	79	68	87
Nushagak	2743	68	51	88	Egegik	1290	74	50	96
Togiak	127	30	8	45	Wood	932	73	44	90
Ugashik	1534	44	21	79	Igushik	238	58	20	80
All districts	20187	66	51	89	Nushagak	403	77	48	95
					Togiak	27	11	1	29
					Ugashik	190	15	0	44

1991-95 Port Moller sockeye index	7/09 daily	Cumulative through 7/09	Forecast of total run (millions)
only 5 years			
Average			
Lowest	43	2034	No forecast until more years sampled on this date.
Highest	89	3424	

1997=

Bristol Bay runs 1991-95	
Average	50
Lowest	42
Highest	61

Comments

Bristol Bay catch + escapement through 7/9 has averaged 65% of the final run with a range of 55% in 1994 to 86% in 1993.

In the average year, 64% of the final Bristol Bay escapement was accumulated by July 9.

Togiak and Ugashik escapement counts were under way by this date in each of the past 10 years.

The Ugashik fishery has been open on July 9 each year since 1987 and the average catch has been 384,000 with a range of 212,000 in 1989 to 569,000 in 1994.

Through July 10
1987-96

District Catch	Cumulative through 7/10			River Escapement	Cumulative through 7/10				
	average 1,000s	Percent of season total			average 1,000s	Percent of season total			
		Average	Low	High		Average	Low	High	
Naknek/Kvichak	8079	67	27	94	Kvichak	4299	70	46	92
Egegik	8914	78	72	95	Naknek	1269	83	73	90
Nushagak	2955	74	58	91	Egegik	1360	79	70	96
Togiak	138	33	11	53	Wood	1005	79	56	90
Ugashik	1656	48	21	81	Igushik	255	63	24	82
All districts	21740	71	58	92	Nushagak	425	81	56	96
					Togiak	33	13	1	31
					Ugashik	260	20	0	69

Port Moller sockeye index	7/10 daily	Cumulative through 7/10	Forecast of total run (millions)
only one year			
Average			
Lowest			
Highest			

No forecast from Port Moller available for this date

1996= ?

Bristol Bay runs 1987-96	
Average	43
Lowest	23
Highest	61

Comments

Bristol Bay catch + escapement through 7/10 has averaged 71% of the final run with a range of 61% in 1988 to 90% in 1993.

In the average year, 69% of the final Bristol Bay escapement was also accumulated by July 10.

81% of the Egegik and Naknek/Kvichak runs and 80% of the Nushagak runs have passed through the fishing districts by midnight of July 10 with average run timing.

In 9 of the past 10 years the escapement to Egegik through July 10 has exceeded the escapement goal. The same has occurred at Naknek in 5 of the 10 years. The escapement goal to Wood River was assured by July 10 in 8 of the past 10 years and in 5 of the years the escapement exceeded the goal.