FRI-UW-9806
June 1998

A BRISTOL BAY ALMANAC FOR 1998

D.E. ROGERS

Acknowledgments

Bev Cross, Jim Miller, and Arnie Shaul of the Alaska Department of Fish and game kindly provided prelimniary fishery statistics from 1997 which were used in this almanac. Marcus Duke compiled the manuscript.

KEY WORDS

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

A Bristol Bay Almanac for 1998

D.E. ROGERS

INTRODUCTION

The purpose of these daily summaries is to provide Bristol Bay processors with the statistics to forecast the total sockeye salmon (*Oncorhynchus nerka*) run in 1998 from the Port Moller index catches starting June 20 (the earliest that forecasts are feasible) and ending July 7 (the recent midpoint in the Bristol Bay catch). Also, by using the daily Alaska Department of Fish & Game (ADF&G) summaries of the cumulative catches and escapements, processors can compare the daily 1998 numbers through July 10 with averages and ranges from recent years (1987–97).

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 per 60 min. A 200-fm net of 5-1/8 in mesh is usually fished for about 60 min. Thus, 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. Spacial and temporal distribution off Port Moller can be examined from index catches of sockeye and chum (*O. keta*) salmon by station and 5-day 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. Average lengths of sockeye salmon in the Port Moller catches can be converted to average weights from length and weight statistics from Bristol Bay catches (Table 6). 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% 3-ocean in the Bristol Bay run).

BRISTOL BAY RUNS

The daily commercial catches and the escapements at towers have been a poor predictor of the total run until about the mid-point of the run (Fig. 3). Beginning about July 7, the final run has been closely correlated with the cumulative catch and escapement except for the very late run in 1994 and the very early run in 1993. In a typical year with a large run (e.g., 1995), large numbers of sockeye salmon 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 7. 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 1998 pre-season forecasts are given in Table 8. Over half of the large forecasted run is expected to be ages 2.2 and 1.3 from the 1993 brood year, and most of these are expected to be bound for the Egegik and Kvichak systems. However, 25% to 33% of the run is expected to be age 1.2 fish from the 1994 brood year and returning mainly to the Kvichak and Wood rivers. An early indication of the Bristol Bay run magnitude may come from the False Pass fishery (Table 9). There is a fair correlation between the South Unimak catch and the Bristol Bay run if the 1990 and 1994–97 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 30–34 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 1987–97; (2) the average and range in the daily and cumulative Port Moller index catches for 1987–97 for comparison with 1998; (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 a very large run that 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; 1990 and 94 are shown as open circles on the graphs). The observation for 1997 (small run for a relatively large index) was also excluded for forecasting the 1998 run. It was concluded that there was an unusually high mortality of salmon within Bristol Bay that was caused by the exceptional environmental conditions in 1997 and that situation is unlikely to occur in 1998.

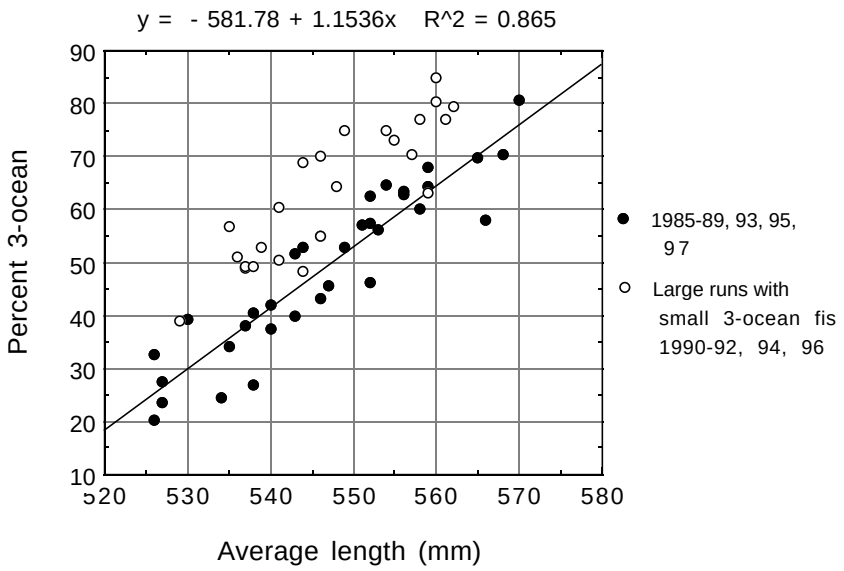


FIGURE 1. Correlation between ocean age and the average length of sockeye salmon off Port Moller.

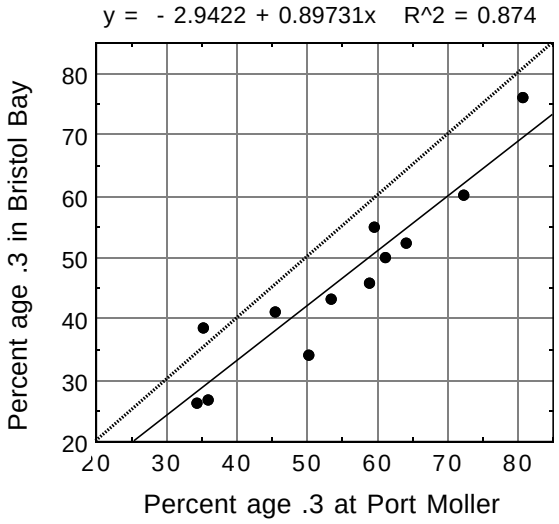


FIGURE 2. Correlation in the percent 3-ocean fish between Bristol Bay and Port Moller.

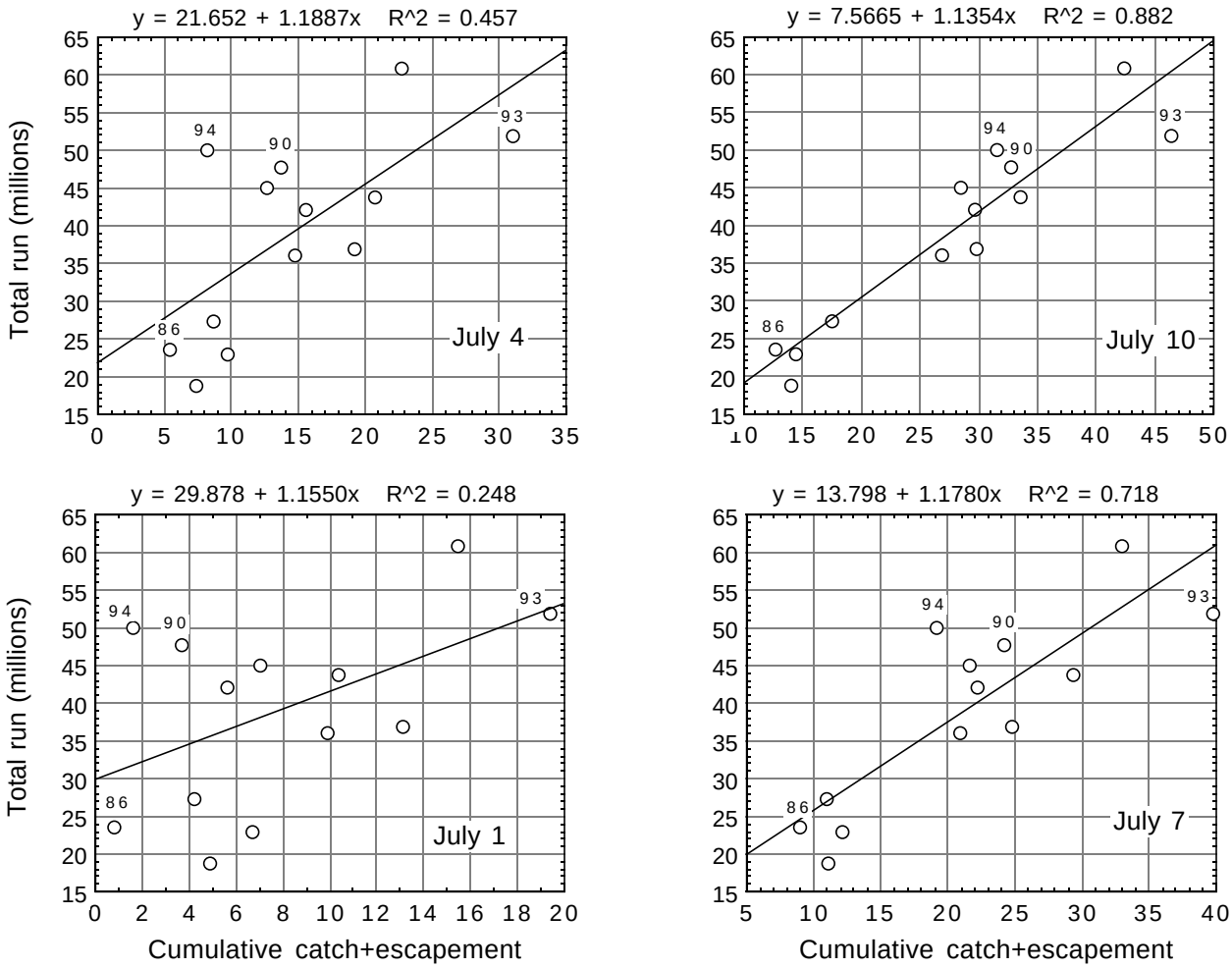


FIGURE 3. Relationships between total run and cumulative catch + escapement, 1985–97.

TABLE 1. Port Moller daily sockeye index catches.

	1998	Past Index Catches											
Date	index	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987	1985
6/11		13	*21*	*33*	4	18	18	6	7	17	7	*7*	8
12		17	22	29	3	11	*19*	7	12	26	9	*8*	5
13		12	24	38	5	28	*19*	6	*12*	23	*12*	7	16
14		25	53	87	9	89	20	6	11	18	*12*	8	23
15		30	39	62	17	62	46	17	18	26	15	14	39
16		47	98	89	17	85	54	*24*	*23*	26	18	*10*	51
17		46	58	63	10	*89*	6	40	16	57	9	*8*	102
18		27	76	152	35	*89*	114	58	43	102	7	10	40
19		82	56	137	45	91	132	81	*41*	*83*	6	14	39
20		86	106	73	37	118	112	60	*41*	*87*	19	52	21
21		56	100	116	*86*	144	118	*98*	*42*	*83*	15	14	55
22		102	77	97	110	188	124	157	46	94	26	71	81
23		94	88	135	152	122	144	96	62	89	*28*	74	73
24		93	*100*	105	*117*	100	141	180	137	*67*	50	*86*	*63*
25		76	102	142	95	232	*110*	54	154	57	22	*86*	21
26		82	132	153	111	*158*	48	55	106	28	51	138	80
27		140	109	124	141	*158*	108	131	137	*70*	*48*	61	54
28		154	111	182	149	190	120	68	284	118	33	140	175
29		114	78	217	135	112	133	95	197	*94*	85	*75*	162
30		124	130	146	260	287	226	20	243	*94*	51	73	170
7/1		83	104	187	161	*175*	170	79	173	94	*46*	26	28
2		133	155	172	167	242	85	50	155	94	*46*	27	44
3		234	117	188	123	60	162	174	223	118	23	33	78
4		76	184	149	197	79	*105*	66	101	195	22	*30*	76
5		132	108	122	*143*	100	*109*	127	62	*140*	48	*30*	98
6		138	157	182	146	81	103	67	*61*	137	23		94
7		90	59	106	107	74	64	56	*60*	108	39		
8		79	96	53	105	33	120	69					
9				89	54	62	43	87					
10						35							
Run (millions)		19	37	61	50	52	45	42	48	44	23	27	36

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

	1998	Past index catches											
DATE	Index	1997	1996	1995	1994	1993	1992	1991	1990	1989	1988	1987	1985
6/11		13	22	33	4	18	18	6	7	17	7	8	8
12		30	43	62	7	29	37	13	19	43	16	15	13
13		42	67	99	12	57	56	19	32	67	28	22	28
14		67	120	186	21	146	76	25	43	85	40	30	51
15		97	159	248	38	208	122	42	61	111	56	43	91
16		144	257	337	55	293	176	66	84	137	74	53	142
17		190	315	400	66	382	182	106	100	194	82	61	244
18		217	391	552	101	472	296	164	143	297	89	71	284
19		299	447	689	146	562	428	245	184	380	95	85	323
20		386	552	762	183	681	540	305	225	468	114	138	343
21		441	653	878	269	824	658	404	267	550	128	151	398
22		543	730	975	379	1012	783	561	313	644	154	223	479
23		637	818	1110	531	1135	927	657	374	733	181	296	553
24		730	918	1214	648	1234	1068	837	511	799	231	383	616
25		806	1020	1356	743	1466	1178	891	665	857	253	469	637
26		888	1152	1509	854	1624	1226	946	771	885	305	607	717
27		1029	1261	1633	995	1783	1334	1077	908	955	353	668	771
28		1183	1371	1815	1144	1973	1453	1146	1192	1072	386	808	947
29		1297	1449	2033	1279	2085	1586	1241	1389	1166	472	883	1109
30		1421	1580	2179	1538	2372	1812	1261	1632	1261	523	956	1279
7/1		1504	1684	2365	1699	2547	1981	1340	1804	1354	568	983	1307
2		1637	1838	2537	1866	2789	2066	1390	1960	1448	614	1010	1351
3		1871	1955	2725	1990	2849	2228	1564	2182	1566	637	1043	1429
4		1947	2139	2874	2187	2928	2333	1629	2284	1761	659	1073	1505
5		2079	2247	2995	2330	3028	2443	1756	2345	1901	707	1104	1603
6		2217	2404	3177	2476	3109	2546	1823	2406	2038	730	1135	1697
7		2307	2463	3283	2583	3183	2610	1878	2466	2147	769		
8		2386	2560	3336	2689	3216	2730	1947					
9				3424	2742	3278	2773	2034					
10						3313							
Run, excl. jacks		19	37	61	50	52	45	42	48	44	23	27	36

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

TABLE 3. Surface water temperatures off Port Moller.

Date	81	82	83	84	85	87	88	89	90	91	92	93	94	95	96	97	98
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			7.1	
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	7.1	
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	7.4	
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	6.7	
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	7.6	
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	7.6	
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	8.5	
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	8.0	
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	9.8	
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	9.6	
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	8.8	
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	9.5	
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	10.0	
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	9.9	
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	9.6	
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	9.4	
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	9.9	
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	10.0	
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	11.0	
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	11.1	
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	11.4	
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	11.1	
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	12.0	
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	12.5	
5					7.0		8.4		9.0	7.1	6.5	7.6	6.6	7.6	6.5	12.5	
6										8.1	7.0	8.0	6.2	7.9	6.0	12.6	
7										8.8	7.2	8.2	6.9	7.9	8.0	12.9	
8										9.7	7.8	8.8	7.1	7.6	7.5	11.4	
9										8.9	8.5	9.1	7.2	7.4			
10												9.4					

TABLE 4. Average sockeye salmon catch off Port Moller by station and 5-day period; number caught by 100 fm fished for 1 h.

	Station						Station				
Year/dates	2	4	6	8	Means	Year/dates	2	4	6	8	Means
1985						1992					
6/11-15	4	8	7	2	5	6/11-15	1	2	5	11	5
16-20	3	26	25	4	15	16-20	10	15	21	29	19
21-25	10	26	17	10	16	21-25	13	26	28	46	28
26-30	48	64	19	14	36	26-30	11	29	43	38	30
7/1-5	29	24	9	9	18	7/1-5	10	55	42	25	33
6	4	49	36	14	26	6-9	3	33	41	13	22
Mean-7/5	18.8	29.6	15.4	7.8	17.9	Mean-7/5	9.0	25.4	27.8	29.8	23.0
wt'd index					15.9						24.4
1987						1993					
6/11-15	1	2	6	1	3	6/11-15	3	6	17	13	10
16-20	5	12	3	2	6	16-20	5	14	38	30	22
21-25	22	20	27	7	19	21-25	29	35	45	44	38
26-30	7	37	44	17	26	26-30	28	37	42	60	42
7/1-5	4	11	8	7	8	7/1-5	24	30	40	35	32
						6-10	15	25	16	8	16
Mean-7/5	7.8	16.4	17.6	6.8	12.2	Mean-7/5	17.8	24.4	36.4	36.4	28.8
wt'd index					11.1						30.3
1988						1994					
6/11-15	0	2	5	3	3	6/11-15	3	3	2	0	2
16-20	1	3	9	1	4	16-20	2	13	13	4	8
21-25	11	15	8	0	9	21-25	32	30	27	18	27
26-30	10	22	20	8	15	26-30	14	31	51	52	37
7/1-5	8	18	12	4	11	7/1-5	30	51	43	37	40
6-7	2	18	12	4	9	6-9	11	31	37	25	26
Mean-7/5	6.0	12.0	10.8	3.2	8.0	Mean-7/5	16.2	25.6	27.2	22.2	22.8
wt'd index					7.0						22.7
1989						1995					
6/11/15	8	8	9	1	7	6/11-15	1	7	17	19	11
16-20	8	12	23	22	16	16-20	1	4	36	44	21
21-25	14	20	26	19	20	21-25	2	6	39	51	24
26-30	14	23	27	18	21	26-30	10	14	51	65	35
7/1-5	21	50	23	33	32	7/1-5	24	31	41	54	38
6-7	32	47	16	29	31	6-9	11	35	26	31	26
Mean-7/5	13.0	22.6	21.6	18.6	19.0	Mean-7/5	7.6	12.4	36.8	46.6	25.8
wt'd index					18.9						30.0
1990						1996					
6/11-15	2	5	5	1	3	6/11-15	25	10	4	1	10
16-20	5	15	14	4	10	16-20	20	45	18	8	23
21-25	8	40	35	13	24	21-25	15	57	30	7	27
26-30	35	96	60	25	54	26-30	33	51	36	10	32
7/1-5	53	47	43	18	40	7/1-5	14	45	50	29	34
Mean-7/5	20.6	40.6	31.4	12.2	26.2	6-8	2	43	41	22	27
wt'd index					23.4	Mean-7/5	21.0	42.0	28.0	11.0	25.2
1991						1997					
6/11-15	2	5	1	1	2	6/11-15	1	5	12	4	5
16-20	14	16	21	7	15	16-20	1	5	34	16	14
21-25	15	25	35	36	28	21-25	10	30	35	16	23
26-30	26	32	22	6	22	26-30	14	46	46	24	33
7/1-5	33	35	32	12	28	7/1-5	20	50	37	29	34
6-9	17	24	29	8	20	6-8	27	41	30	15	28
Mean-7/5	18.0	22.6	22.2	12.4	19.0	Mean-7/5	9.2	27.2	32.8	17.8	21.7
wt'd index					17.5						17.8

TABLE 5. Average chum salmon catch off Port Moller by station and 5-day period; number caught by 100 fm fished for 1 h.

	Station						Station				
Year/dates	2	4	6	8	Means	Year/dates	2	4	6	8	Means
1985						1992					
6/11-15	0.1	0.2	0.9	0.5	0.4	6/11-15	0.3	0.0	1.9	2.2	1.1
16-20	0.2	0.5	1.5	1.0	0.8	16-20	0.0	0.6	1.3	5.5	1.8
21-25	0.0	0.2	0.2	1.4	0.5	21-25	0.4	1.1	2.4	1.3	1.3
26-30	1.3	0.7	0.6	2.7	1.3	26-30	1.3	1.6	1.8	2.7	1.9
7/1-5	1.0	0.8	0.3	1.6	0.9	7/1-5	1.9	1.3	1.0	0.6	1.2
6	0.0	4.4	5.4	2.9	3.2	6-9	0.7	2.7	2.9	0.4	1.7
Mean-7/5	0.5	0.5	0.7	1.4	0.8	Mean-7/5	0.8	0.9	1.7	2.5	1.5
wt'd index					0.9						1.7
1987						1993					
6/11-15	0.0	0.6	0.2	0.3	0.3	6/11-15	0.3	0.5	2.0	0.6	0.8
16-20	0.3	0.8	1.5	0.2	0.7	16-20	0.0	0.3	1.9	1.1	0.8
21-25	0.6	0.7	3.3	1.9	1.6	21-25	0.7	0.1	0.8	0.6	0.6
26-30	0.1	0.8	1.2	1.4	0.9	26-30	1.5	0.5	1.9	7.2	2.8
7/1-5	0.1	0.0	0.7	0.5	0.3	7/1-5	1.3	1.4	0.9	1.5	1.3
						6-10	2.9	3.0	1.7	1.0	2.2
Mean-7/5	0.2	0.6	1.4	0.9	0.8	Mean-7/5	0.8	0.6	1.5	2.2	1.3
wt'd index					0.8						1.4
1988						1994					
6/11-15	0.0	0.1	1.2	0.6	0.5	6/11-15	0.9	0.5	4.9	0.7	1.8
16-20	0.2	0.5	0.9	0.4	0.5	16-20	0.9	2.3	3.7	1.3	2.1
21-25	0.7	2.0	1.4	0.8	1.2	21-25	0.9	2.4	4.4	1.5	2.3
26-30	0.7	3.7	2.1	2.0	2.1	26-30	0.8	0.3	1.1	0.9	0.8
7/1-5	0.6	2.8	1.3	1.4	1.5	7/1-5	0.5	1.2	2.1	1.6	1.4
6-7	0.5	1.6	0.7	5.1	2.0	6-9	0.4	0.9	0.4	0.8	0.6
Mean-7/5	0.4	1.8	1.4	1.0	1.2	Mean-7/5	0.8	1.3	3.2	1.2	1.7
wt'd index					1.1						1.5
1989						1995					
6/11-15	0.2	0.4	0.7	0.5	0.5	6/11-15	0.1	0.5	1.7	0.8	0.8
16-20	0.1	0.4	0.8	1.2	0.6	16-20	0.4	0.4	1.0	0.9	0.7
21-25	0.7	0.7	1.2	1.9	1.1	21-25	0.0	0.7	0.5	1.7	0.7
26-30	0.7	0.9	0.3	1.9	1.0	26-30	0.3	0.4	1.4	1.7	1.0
7/1-5	0.9	2.3	0.5	1.8	1.4	7/1-5	0.4	0.1	0.1	0.9	0.4
6-7	0.9	1.0	0.2	3.8	1.5	6-9	0.4	0.4	0.1	1.2	0.5
Mean-7/5	0.5	0.9	0.7	1.5	0.9	Mean-7/5	0.2	0.4	0.8	1.2	0.7
wt'd index					1.0	wt'd index					0.8
1990						1996					
6/11-15	0.1	0.4	1.4	0.8	0.7	6/11-15	1.7	1.4	2.1	1.2	1.6
16-20	0.1	0.5	3.3	1.0	1.2	16-20	1.0	2.9	1.4	3.0	2.1
21-25	0.1	0.5	2.3	1.0	1.0	21-25	0.5	1.7	3.2	1.5	1.7
26-30	0.4	1.1	4.4	2.6	2.1	26-30	0.8	2.0	2.1	1.1	1.5
7/1-5	1.2	2.1	2.3	1.1	1.7	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	0.4	0.9	2.7	1.3	1.3	Mean-7/5	1.0	1.9	1.9	1.6	1.6
wt'd index					1.3						1.6
1991						1997					
6/11-15	0.2	1.8	0.6	1.1	0.9	6/11-15	0.0	0.9	2.2	2.6	1.4
16-20	0.8	1.0	5.5	1.7	2.3	16-20	0.2	0.3	0.8	7.7	2.3
21-25	0.2	0.4	1.3	1.5	0.9	21-25	0.3	0.3	1.9	7.6	2.5
26-30	1.6	1.6	0.6	1.1	1.2	26-30	1.0	0.8	1.9	7.9	2.9
7/1-5	1.5	3.4	3.2	3.1	2.8	7/1-5	0.6	0.7	1.9	6.9	2.5
6-9	0.6	2.0	3.2	4.4	2.6	6-8	1.2	2.2	3.6	3.4	2.6
Mean-7/5	0.9	1.6	2.2	1.7	1.6	Mean-7/5	0.4	0.6	1.7	6.5	2.3
wt'd index					1.6						3.2

TABLE 6. Average lengths and weights from Bristol Bay catches.

Average length (mm)	Average weight (lbs)	Average length (mm)	Average weight (lbs)	Average length (mm)	Average weight (lbs)
490	4.0	530	5.3	570	6.7
495	4.1	535	5.5	575	6.8
500	4.3	540	5.7	580	7.0
505	4.5	545	5.8	585	7.2
510	4.6	550	6.0	590	7.4
515	4.8	555	6.2	595	7.5
520	5.0	560	6.3	600	7.7
525	5.2	565	6.5	605	7.9

TABLE 7. Daily sockeye salmon catches in Bristol Bay.

Date	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98
-6/23	.7	.9	.7	.2	.3	1.5	1.5	.3	.1	.6	3.1	.1	.8	.7	0.9	
24	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.9	.0	.0	.7	0.2	
25	.0	.2	.0	.0	.2	.0	.2	.0	.0	.7	1.2	.1	1.0	1.0	0.3	
26	.4	1.0	.0	.0	.0	.1	.7	.0	.0	.0	1.9	.0	.5	.6	0.1	
27	2.4	.2	1.0	.0	.6	.9	.1	.0	.0	1.0	1.6	.2	1.8	.7	0.5	
28	.8	.0	1.1	.1	.0	.2	1.2	.1	.0	.0	2.2	.0	1.9	1.4	0.4	
29	1.4	.9	1.8	.0	.4	.9	1.8	1.1	.0	.5	2.2	.2	1.9	2.2	0.2	
30	2.8	1.0	2.9	.0	1.1	.0	.9	1.0	.6	1.4	1.5	.1	2.0	2.2	0.5	
7/1	1.7	1.6	.4	.3	.2	1.7	.7	.4	1.7	.8	1.8	.6	2.2	2.5	0.9	
2	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	0.4	
3	3.1	.2	.7	2.0	.2	.4	1.0	3.4	1.6	1.9	2.5	1.1	1.5	1.6	0.7	
4	2.3	.8	.9	.6	1.1	.1	2.3	1.3	2.8	1.8	2.2	.9	2.5	1.3	0.7	
5	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	1.1	
6	2.3	.9	1.3	.3	.2	.3	2.8	2.6	1.1	1.8	1.9	2.5	2.9	1.6	0.7	
7	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	0.8	
8	1.9	1.6	1.1	.0	.5	.4	.7	2.4	1.6	1.3	2.0	2.4	1.4	1.7	0.6	
9	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	0.8	
10	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	0.1	
11	1.8	.9	1.3	2.1	.9	1.1	1.5	1.8	1.9	1.5	.8	1.5	2.2	.7	0.5	
12	1.5	.9	1.2	.7	1.2	.7	1.6	1.8	1.1	.8	.6	1.4	1.8	.6	0.3	
13	1.6	1.2	.5	1.5	1.4	.9	1.2	1.2	.7	1.0	.5	1.1	1.0	.5	0.3	
14	.8	1.3	.3	.6	.6	.7	.4	1.3	.7	1.9	.4	1.5	1.7	.3	0.4	
15	.3	1.0	.1	.5	.5	.4	.7	1.0	.5	1.6	.2	1.9	2.3	.6	0.2	
16	.4	.7	.3	.4	.4	.4	.5	.7	.6	1.2	.2	1.3	.7	.4	0.1	
17	.1	.4	.2	.3	.5	.2	.5	.8	.4	.8	.1	1.4	1.2	.4	0.1	
18	.4	.2	.2	.2	.2	.1	.4	.5	.3	.4	.1	.9	1.0	.2	0.1	
7/19-	.6	.3	.9	.5	.9	.3	.7	1.2	1.1	1.3	.1	2.8	.5	.5	0.3	
Total	37	25	24	16	16	14	29	33	26	32	41	35	44	30	12	
Run	46	41	37	24 late	27	23	44	48	42 strike	45	52 early	50 late	61	37	19	

= Date of 50% of total catch.

TABLE 8. Preseason forecasts of the 1998 Bristol Bay inshore run.

		Age						
	District	1.2	2.2	0.3	1.3	2.3	Total	Catch
1. ADF&G								
	Naknek/Kvichak	4.2	4.7		2.6	1.2	12.6	6.9
	Egegik	0.6	3.7		1.0	3.3	8.6	7.5
	Ugashik	0.8	1.1		0.6	0.7	3.2	2.4
	Nushagak	1.7	0.2	0.4	2.9	0.1	5.3	3.5
	Togiak	0.1	0.0		0.3	0.0	0.5	0.3
	TOTAL	7.5	9.6	0.4	7.4	5.3	30.2	20.6
	Percent	25	32	1	24	18		
2. FRI	Naknek/Kvichak	6.2	4.6		2.0	1.7	14.5	8.2
	Egegik	0.8	3.3		1.0	3.3	8.4	7.4
	Ugashik	1.2	0.9		1.5	0.7	4.3	3.3
	Nushagak	2.9	0.2	0.2	2.9	0.0	6.2	4.4
	Togiak	0.1	0.0		0.3	0.0	0.4	0.2
	TOTAL	11.2	9.0	0.2	7.7	5.7	33.8	23.5
	Percent	33	27	1	23	17		

TABLE 9. Daily sockeye salmon catches in the South Unimak June fishery, 1986–97.

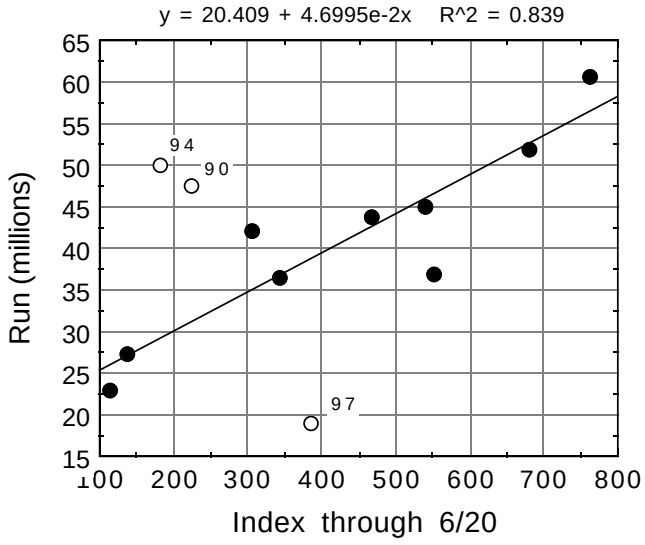
	Year												
Date	86	87	88	89	90	91	92	93	94	95	96	97	98
13					12			284		138		46*	
14	55	44			34							53*	
15		48	43			124	223	255		213	61	44*	
16	31		79	361	69		143	305		73	6	62*	
17		85			147	53	258	304	133	62	71	57*	
18	92	67	59		91	106	345		71	10	56	99	
19				133	34	110	371	350	172	10	60	105	
20		56		441	82	226		492	53	77	63	116	
21	66	98	82		122		359		42	168	66	81	
22		76	35		120		354	203	96	151	63	78	
23	21		116	265	106	189			132	161	2	73	
24	17				88	262			66	128	22	78	
25	25	45				146			47	83	10	79	
Totals													
13-20	178	300	181	935	469	619	1340	1990	429	583	317	577	
13-25	307	519	414	1200	905	1216	2053	2193	812	1274	480	966	
BB run	24	27	23	44	48	42	45	52	50	61	37	19	

* Gillnet fleet only, purse seines on strike.

Through June 20
1987-1997

District Catch	Cumulative through 6/20 average 1,000s	Percent of season total (%) Average	Low	High	River Escapement	Cumulative through 6/20 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	63	1	0	3	Kvichak	0	0	0	0
					Naknek	0	0	0	0
Egegik	173	2	0	7	Egegik	8	0	0	4
Nushagak	11	0	0	1	Wood	0	0	0	0
					Igushik	0	0	0	0
Togiak	3	1	0	5	Nushagak	4	1	0	3
Ugashik	33	1	0	4	Togiak	0	0	0	0
					Ugashik	0	0	0	0
All districts	277	1	0	4					

Port Moller sockeye index	6/20 daily	Cumulative through 6/20	Forecast of total run (millions)
1987-97			
Average	72	396	
Lowest	19	114	In past years the index through 6/20 accounted for 44% of the
Highest	118	762	variation in Bristol Bay runs (84% excluding 1990, 94 & 97)
1998=			**(1998 cumulative index)X(.047)+(20.4)= total run**
Bristol Bay runs 1987-97			example: if 1998 index was 396 (average for past years) we
Average	41		would forecast the total run by: (396)X(.047)+20.4= 39.0
Lowest	19		a run of 39 million
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
1987-1997

District Catch	Cumulative through 6/21 average 1,000s	Percent of season total (%) Average	Low	High	River Escapement	Cumulative through 6/21 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	128	1	0	4	Kvichak	0	0	0	0
					Naknek	2	0	0	1
Egegik	246	2	0	10	Egegik	25	2	0	10
Nushagak	14	0	0	1	Wood	1	0	0	1
					Igushik	0	0	0	0
Togiak	5	1	0	7	Nushagak	5	1	0	3
Ugashik	40	2	0	4	Togiak	0	0	0	0
					Ugashik	0	0	0	0
All districts	427	2	0	6					

Port Moller sockeye index	6/21 daily	Cumulative through 6/21
1987-97		
Average	79	475
Lowest	14	128
Highest	144	878
1998=		

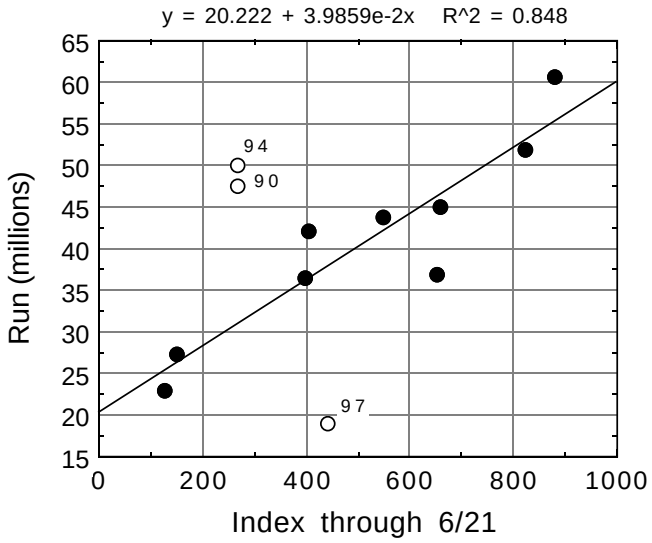
Forecast of total run (millions)

In past years the index through 6/21 accounted for 48% of the variation in Bristol Bay runs (85% excluding 1990, 94 & 97).

(1998 cumulative index)X(.040)+(20.2)= total run

example: if 1998 index was 475 (average for past years) we would forecast the total run by: (475)X(.040)+20.2= 39.2 a run of 39 million

Bristol Bay runs 1987-97	
Average	41
Lowest	19
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, 95 & 97. Usually, escapements are in the hundreds of fish this early in the season.

Through June 22
1987-1997

District Catch	Cumulative through 6/22 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	232	3	0	10
Egegik	349	3	0	14
Nushagak	17	0	0	1
Togiak	6	2	0	9
Ugashik	53	2	0	4
All districts	672	3	0	9

River Escapement	Cumulative through 6/22 average 1,000s	Percent of season total (%) Average	Low	High
Kvichak	0	0	0	0
Naknek	4	0	0	2
Egegik	47	3	0	18
Wood	3	0	0	1
Igushik	0	0	0	0
Nushagak	6	1	0	2
Togiak	0	0	0	0
Ugashik	0	0	0	0

Port Moller sockeye index	6/22 daily	Cumulative through 6/22
1987-97		
Average	99	574
Lowest	26	154
Highest	188	1012
1998=		

Bristol Bay runs 1987-97

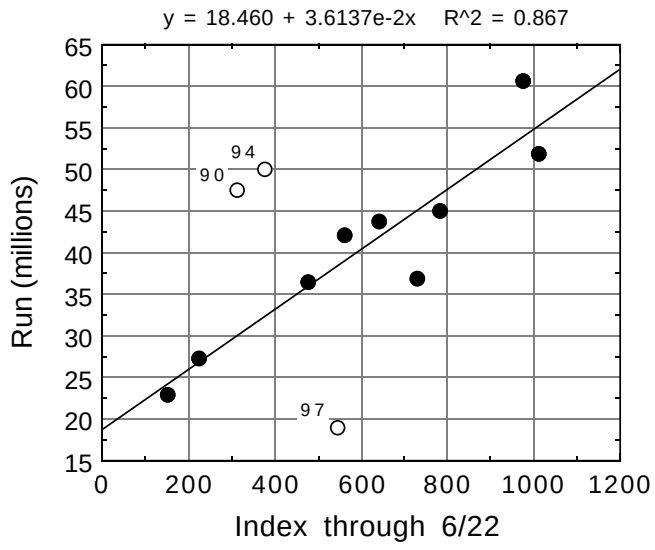
Average	41
Lowest	19
Highest	61

Forecast of total run (millions)

In past years the index through 6/22 accounted for 50% of the variation in Bristol Bay runs (87% excluding 1990, 94 & 97).

(1998 cumulative index)X(.036)+(18.5)= total run

example: if 1998 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



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
1987-1997

District Catch	Cumulative through 6/23 average 1,000s	Percent of season total (%) Average	Low	High	River Escapement	Cumulative through 6/23 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	283	3	0	11	Kvichak	0	0	0	0
					Naknek	7	1	0	2
Egegik	516	5	0	18	Egegik	69	4	0	28
Nushagak	40	1	0	5	Wood	9	1	0	3
					Igushik	1	0	0	1
Togiak	7	2	0	10	Nushagak	10	1	0	4
Ugashik	59	2	0	4	Togiak	0	0	0	0
					Ugashik	0	0	0	0
All districts	900	4	0	11					

Port Moller sockeye index	6/23 daily	Cumulative through 6/23
1987-97		
Average	99	673
Lowest	28	181
Highest	152	1135
1998=		

Bristol Bay runs 1987-97

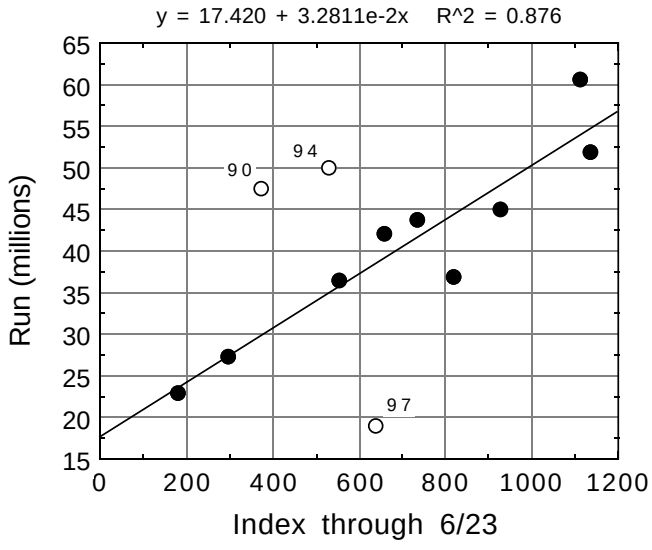
Average	41
Lowest	19
Highest	61

Forecast of total run (millions)

In past years the index through 6/23 accounted for 55% of the variation in Bristol Bay runs (88% excluding 1990, 94 & 97).

(1998 cumulative index)X(.033)+(17.4)= total run

example: if the1998 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 6 of the past 11 years. The catches were 311,000 (88), 569,000 (89), 432,000 (92), 379,000 (93), 444,000 (95) & 419,000 (97). There was only one opening (1993) in the Nushagak over the past 11 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 7 of the past 11 years. The largest daily escapement at Egegik in 1993 (156,000) occurred on this early date.

Through June 24
1987-1997

District Catch	Cumulative through 6/24 average 1,000s	Percent of season total (%) Average	Low	High	River Escapement	Cumulative through 6/24 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	296	3	0	11	Kvichak	4	0	0	1
					Naknek	14	1	0	5
Egegik	668	6	0	18	Egegik	87	5	0	35
Nushagak	45	1	0	5	Wood	19	1	0	7
					Igushik	2	1	0	3
Togiak	8	3	0	10	Nushagak	19	3	0	13
Ugashik	59	2	0	4	Togiak	0	0	0	0
					Ugashik	0	0	0	0
All districts	1072	4	0	11					

1987-97 Port Moller sockeye index	6/24 daily	Cumulative through 6/24
Average	107	779
Lowest	50	231
Highest	180	1234

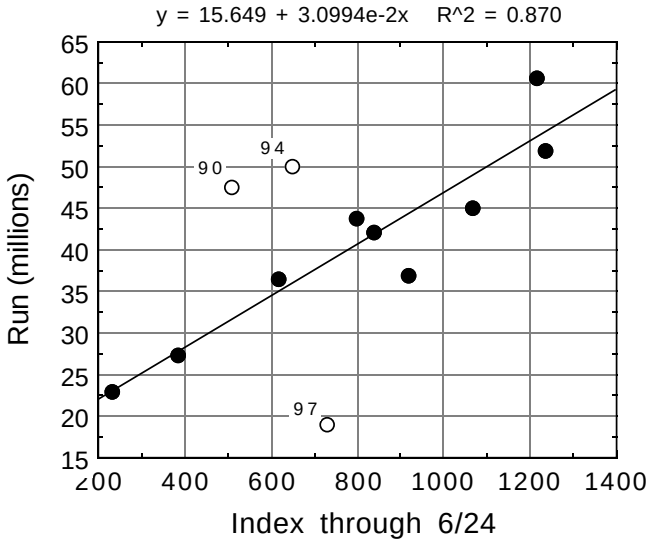
Forecast of total run (millions)

In past years the index through 6/24 accounted for 59% of the variation in Bristol Bay runs (87% excluding 1990 & 94).

1997= **(1998 cumulative index)X(.031)+(15.6)= total run**

example: if 1998 index was 779 (average for past years) we would forecast the total run by: (779)X(.031)+15.6= 39.7
a run of 40 million

Bristol Bay runs 1987-97	
Average	41
Lowest	19
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 11 years. Sockeye passing Port Moller on this date will arrive in Bristol Bay about July 1-2.

There have been only two major fishery openings on this date (Egegik, 93 & 96) during the past 11 years. On average, 4% of the Nushagak runs, 6% of the Nak/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, 93, and 97.

Through June 25
1987-1997

District Catch	Cumulative through 6/25 average 1,000s	Percent of season total (%) Average	Low	High	River Escapement	Cumulative through 6/25 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	320	4	0	12	Kvichak	11	0	0	1
					Naknek	47	4	0	12
Egegik	1014	9	0	18	Egegik	105	7	0	39
Nushagak	86	2	0	6	Wood	36	3	0	11
					Igushik	4	1	0	4
Togiak	9	3	0	10	Nushagak	28	5	1	16
Ugashik	74	3	0	6	Togiak	0	0	0	0
					Ugashik	0	0	0	0
All districts	1498	6	1	13					

1987-97 Port Moller sockeye index	6/25 daily	Cumulative through 6/25
Average	103	882
Lowest	22	253
Highest	232	1466

1998=

Bristol Bay runs 1987-97

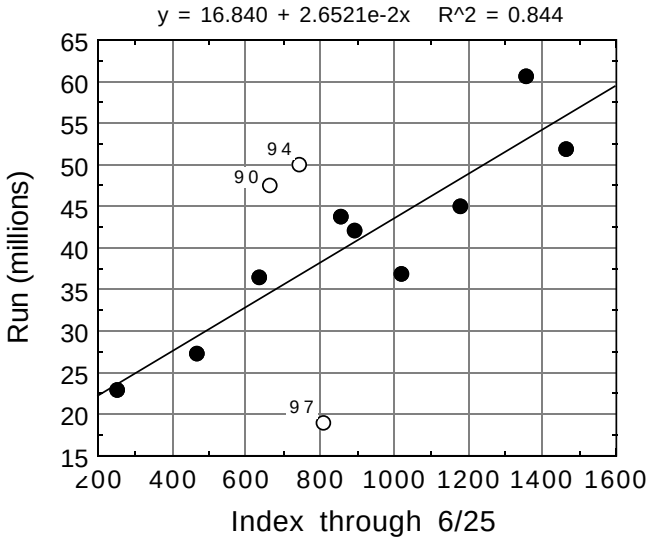
Average	41
Lowest	19
Highest	61

Forecast of total run (millions)

In past years the index through 6/25 accounted for 62% of the variation in Bristol Bay runs (84% excluding 1990, 94 & 97)

(1998 cumulative index)X(.027)+(16.8)= total run

example: if 1998 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



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 8 of the past 11 years. Catches were 200,000 in 1987 & 1989; 700,000 in 1992; 1,200,000 in 1993; 130,000 in 1994; 1 million in 1995 and 1996; and 260,000 in 1997.
Escapements are usually just under way, an exception was in 1993 with 10% of the total by 6/25

Through June 26
1987-1997

District Catch	Cumulative through 6/26 average 1,000s	Percent of season total (%) Average	Low	High	River Escapement	Cumulative through 6/26 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	447	5	0	16	Kvichak	47	1	0	4
					Naknek	88	6	0	18
Egegik	1172	9	0	23	Egegik	144	9	0	47
Nushagak	146	4	0	10	Wood	60	5	0	14
					Igushik	8	2	0	6
Togiak	11	4	0	16	Nushagak	44	9	1	19
Ugashik	82	3	0	6	Togiak	0	0	0	0
					Ugashik	0	0	0	0
All districts	1853	7	1	17					

1987-97 Port Moller sockeye index	6/26 daily	Cumulative through 6/26
Average	97	979
Lowest	28	305
Highest	158	1624

1998=

Bristol Bay runs 1987-97

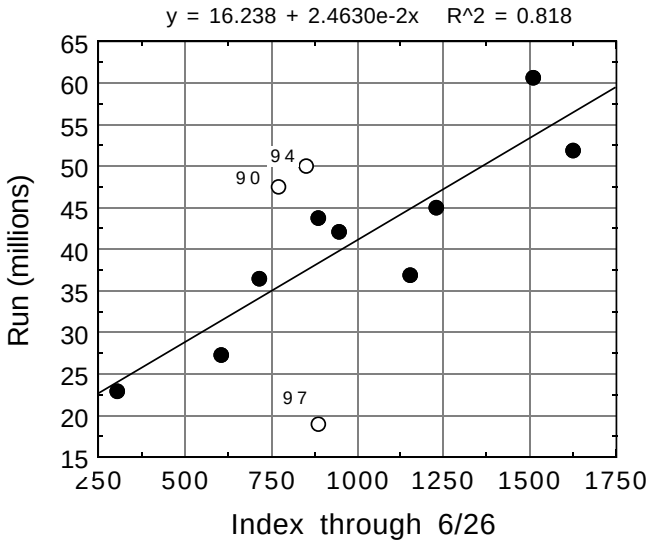
Average	41
Lowest	19
Highest	61

Forecast of total run (millions)

In past years the index through 6/26 accounted for 62% of the variation in Bristol Bay runs (82% excluding 1990, 94 & 97).

(1998 cumulative index)X(.025)+(16.2)= total run

example: if 1998 index was 979 (average for past years) we would forecast the total run by: (979)X(.025)+16.2= 40.7 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, 8% of the Nushagak run, 10% 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
1987-1997

District Catch	Cumulative through 6/27 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	667	7	0	21
Egegik	1556	13	0	27
Nushagak	203	5	0	13
Togiak	14	5	0	22
Ugashik	82	3	0	6
All districts	2517	9	1	21

River Escapement	Cumulative through 6/27 average 1,000s	Percent of season total (%) Average	Low	High
Kvichak	126	2	0	8
Naknek	125	9	0	20
Egegik	184	11	0	45
Wood	95	6	0	16
Igushik	16	5	1	9
Nushagak	65	13	1	29
Togiak	0	0	0	0
Ugashik	0	0	0	0

1987-97 Port Moller sockeye index	6/27 daily	Cumulative through 6/27
Average	112	1091
Lowest	48	353
Highest	158	1783

1998=

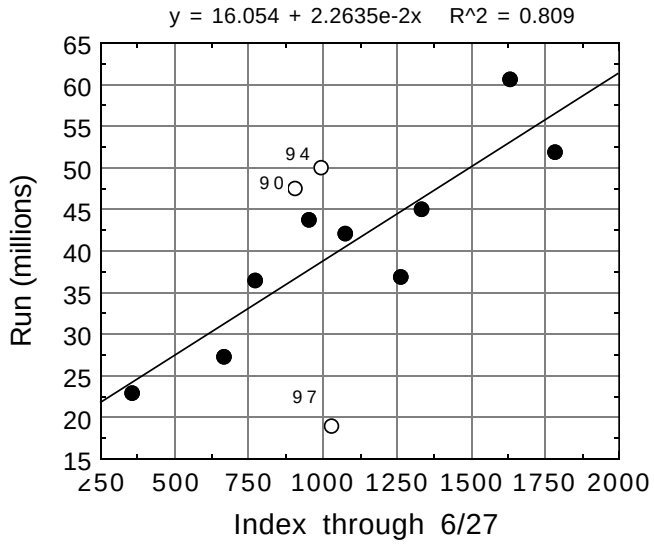
Forecast of total run (millions)

In past years the index through 6/27 accounted for 66% of the variation in Bristol Bay runs (81% excluding 1990, 94 & 97).

(1998 cumulative index)X(.025)+(16.2)= total run

example: if 1998 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

Bristol Bay runs 1987-97	
Average	41
Lowest	19
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 8 openings at Egegik since 1987 with an average catch of 528,000.

The average BB catch plus escapement on this date was 883,000 and the cumulative average C+E was 3.1 million. An average of 8% of the annual runs were accounted for by the C+E through 6/27.

Through June 28
1987-1997

District Catch	Cumulative through 6/28 average 1,000s	Percent of season total (%) Average	Low	High	River Escapement	Cumulative through 6/28 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	824	9	0	29	Kvichak	224	4	0	14
					Naknek	151	10	0	22
Egegik	1960	17	0	33	Egegik	238	16	0	51
Nushagak	307	8	0	18	Wood	122	9	0	28
					Igushik	31	8	1	14
Togiak	17	6	0	26	Nushagak	84	16	2	40
Ugashik	84	3	1	6	Togiak	0	0	0	0
					Ugashik	0	0	0	0
All districts	3187	11	1	26					

1987-97 Port Moller sockeye index	6/28 daily	Cumulative through 6/28
Average	141	1231
Lowest	33	386
Highest	284	1973
1998=		

Bristol Bay runs 1987-97

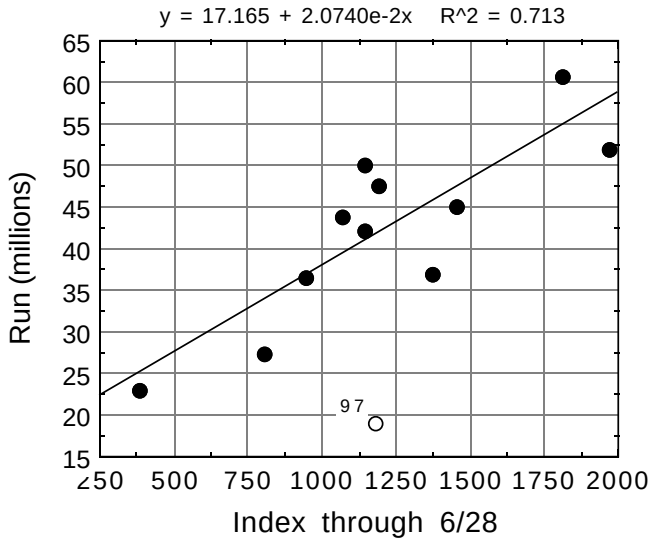
Average	41
Lowest	19
Highest	61

Forecast of total run (millions)

In past years the index through 6/28 accounted for 71% of the variation in Bristol Bay runs and all years except 1997 are included in forecasting from this date on.

(1998 cumulative index)X(.021)+(17.2)= total run

example: if 1998 index was 1231 (average for past years) we would forecast the total run by: (1231)X(.021)+17.2= 43.1, a run of 43 million



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 miliion), 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 and1987, and only 5,000 in 1990 and 24,000 in 1994. Naknek has had over 100,000 escapement by 6/28 except in 1987, 94 and 97.

Through June 29
1987-1997

District Catch	Cumulative through 6/29 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	1195	12	0	34
Egegik	2416	21	0	41
Nushagak	468	11	0	26
Togiak	21	7	0	31
Ugashik	132	4	1	12
All districts	4212	15	1	32

River Escapement	Cumulative through 6/29 average 1,000s	Percent of season total (%) Average	Low	High
Kvichak	319	6	0	21
Naknek	232	15	0	32
Egegik	288	19	1	52
Wood	157	12	1	33
Igushik	43	11	2	19
Nushagak	99	19	2	45
Togiak	0	0	0	0
Ugashik	0	0	0	0

1987-97 Port Moller sockeye index	6/29 daily	Cumulative through 6/29
Average	121	1353
Lowest	75	472
Highest	217	2085

1998=

Bristol Bay runs 1987-97

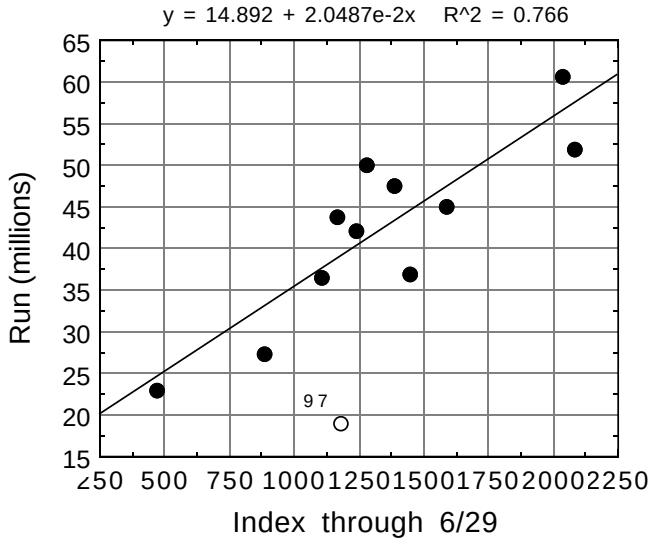
Average	41
Lowest	19
Highest	61

Forecast of total run (millions)

In past years the index through 6/29 accounted for 77% of the variation in Bristol Bay runs (excluding 1997)

(1998 cumulative index)X(.020)+ (14.9)= total run

example: if 1998 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



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 four Nushagak openings on 6/29 since 1985: 1989 (350,000), 93 (570,000),95 (180,000) & 96 (500,000).

On the average, the cumulative catch plus escapement through 6/29 has accounted for 13% of the final run (range: 2%-30%).

Through June 30
1987-1997

District Catch	Cumulative through 6/30 average 1,000s	Percent of season total (%) Average	Low	High	River Escapement	Cumulative through 6/30 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	1583	14	0	39	Kvichak	435	8	0	23
					Naknek	322	20	2	38
Egegik	2899	26	4	42	Egegik	342	22	2	52
Nushagak	610	14	0	32	Wood	212	16	1	39
					Igushik	54	14	2	28
Togiak	28	9	0	34	Nushagak	119	23	2	52
Ugashik	149	4	1	12	Togiak	0	0	0	2
					Ugashik	0	0	0	0
All districts	5237	19	2	35					

1987-97 Port Moller sockeye index	6/30 daily	Cumulative through 6/30
Average	150	1503
Lowest	20	523
Highest	287	2372

1998=

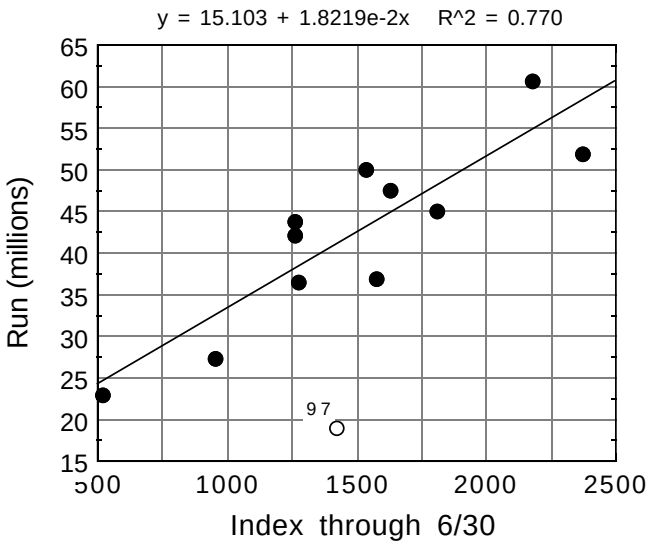
Bristol Bay run 1987-97	
Average	41
Lowest	19
Highest	61

Forecast of total run (millions)

In past years the index through 6/30 accounted for 77% of the variation in Bristol Bay runs, excluding 1997.

(1998 cumulative index)X(.018)+ (15.1)= total run

example: if 1998 index was 1503 (average for past years) we would forecast the total run by: (1503)X(.018)+15.1= 42.2, a run of 42 million



Comments

There was an unusually low index on this date in 1991 (20), but index catches averaged 150 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, 19% of the Bristol Bay catch was made by the 30th; however, 22% of the Nushagak runs, 26% 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
1987-1997

District Catch	Cumulative through 7/1 average 1,000s	Percent of season total (%) Average	Low	High	River Escapement	Cumulative through 7/1 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	2027	19	0	42	Kvichak	590	10	0	25
					Naknek	451	27	3	51
Egegik	3431	31	4	57	Egegik	403	26	4	54
Nushagak	794	19	3	35	Wood	266	20	1	42
					Igushik	66	17	3	37
Togiak	36	11	1	34	Nushagak	145	29	4	58
Ugashik	194	6	1	18	Togiak	1	1	0	5
					Ugashik	0	0	0	0
All districts	6449	23	4	40					

1987-97 Port Moller sockeye index	7/01 daily	Cumulative through 7/01
Average	118	1621
Lowest	26	568
Highest	187	2547

1998=

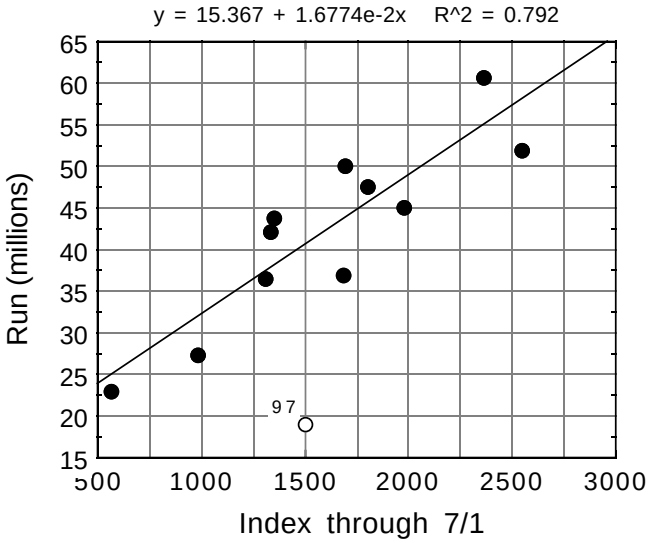
Bristol Bay runs 1987-97	
Average	41
Lowest	19
Highest	61

Forecast of total run (millions)

In past years the index through 7/1 accounted for 79% of the variation in Bristol Bay runs, excluding 1997.

(1998 cumulative index)X(.017) + (15.4)= total run

example: if 1998 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



Comments

Over the past 11 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 July1, the Kvichak escapements were under way except in1994. In 1989 and 1993, 25% of the total escapement passed the tower by 7/1.

On average, 37% of the Egegik runs, 33% of Naknek/ Kvichak runs, and 28% of Nushagak runs have passed through the fishing districts by July 1.

Through July 2
1987-1997

District Catch	Cumulative through 7/2 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	2724	26	4	67
Egegik	4313	39	16	58
Nushagak	1011	25	4	48
Togiak	44	13	1	34
Ugashik	253	7	1	22
All districts	8312	30	10	53

River Escapement	Cumulative through 7/2 average 1,000s	Percent of season total (%) Average	Low	High
Kvichak	853	15	0	31
Naknek	573	34	12	65
Egegik	469	30	11	58
Wood	339	26	4	49
Igushik	79	21	4	48
Nushagak	176	35	9	61
Togiak	2	1	0	8
Ugashik	0	0	0	0

1987-97 Port Moller sockeye index	7/02 daily	Cumulative through 7/02
Average	121	1741
Lowest	27	614
Highest	242	2789

1998=

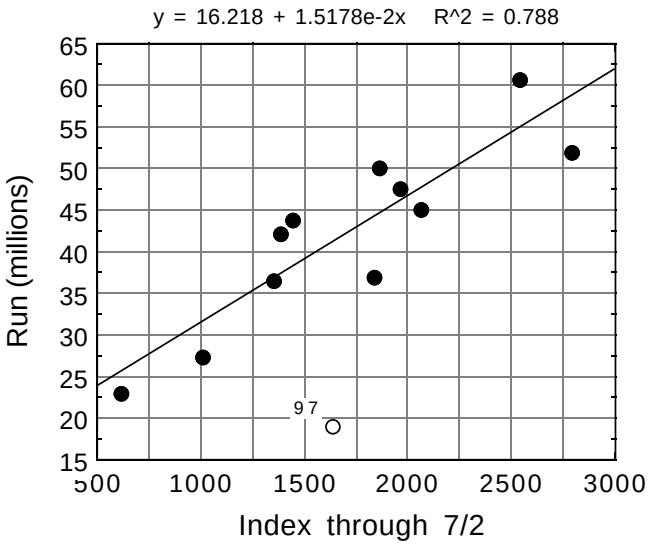
Bristol Bay runs 1987-97	
Average	41
Lowest	19
Highest	61

Forecast of total run (millions)

In past years the index through 7/2 accounted for 79% of the variation in Bristol Bay runs, excluding 1997.

(1998 cumulative index)X(.015) + (16.2)= total run

example: if 1998 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



Comments

The Egegik fishery was open 10 of the past 11 years on 7/2 and the catches ranged from 330,000 to 2.7 million. The average Bristol Bay catch on this date was 1.9 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 6 of the past 11 years.

Although an average of 30% of the seasons catch was made by 7/2, 43% of the Egegik runs, 40% of the Naknek/Kvichak runs and 34% 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.

Total catch + escapement through July 2 has averaged 27% of the final run (1987-97 range: 14%-48%).

Through July 3
1987-1997

District Catch	Cumulative through 7/3 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	3226	31	6	67
Egegik	4885	43	23	66
Nushagak	1294	34	11	58
Togiak	53	16	2	34
Ugashik	323	9	1	26
All districts	9750	35	13	59

River Escapement	Cumulative through 7/3 average 1,000s	Percent of season total (%) Average	Low	High
Kvichak	1187	21	3	40
Naknek	710	43	15	74
Egegik	576	35	13	59
Wood	466	36	8	65
Igushik	92	24	5	53
Nushagak	215	43	16	71
Togiak	3	1	0	11
Ugashik	1	0	0	1

1987-97 Port Moller sockeye index	7/03 daily	Cumulative through 7/03
Average	132	1874
Lowest	23	637
Highest	234	2849

Forecast of total run (millions)

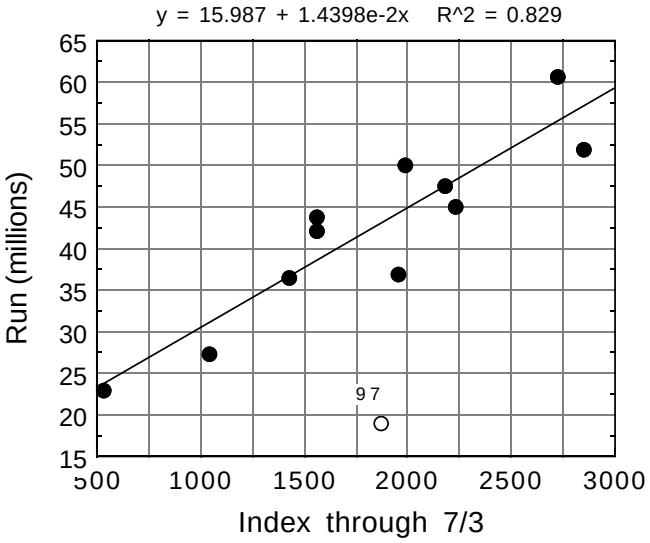
In past years the index through 7/3 accounted for 83% of the variation in Bristol Bay runs, excluding 1997.

1998=

(1998 cumulative index)X(.014) + (16.0)= total run

example: if 1998 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

Bristol Bay runs 1987-97	
Average	41
Lowest	19
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 11 years on 7/3 and catches averaged 283,000 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 10 of the past 11 years the Naknek escapement has exceeded 300,000 by 7/3 and the Egegik escapement has exceeded 300,000 in 8 of the past 11 years

Through July 4
1987-1997

District Catch	Cumulative through 7/4 average 1,000s	Percent of season total (%) Average	Low	High	River Escapement	Cumulative through 7/4 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	3772	36	6	73	Kvichak	1641	28	11	53
					Naknek	836	51	22	80
Egegik	5576	50	27	73	Egegik	701	42	25	66
Nushagak	1469	38	17	61	Wood	559	44	13	73
					Igushik	110	29	8	55
Togiak	65	19	4	38	Nushagak	258	51	25	81
Ugashik	450	14	3	33	Togiak	4	2	0	13
					Ugashik	5	1	0	5
All districts	11300	40	16	64					

1987-97 Port Moller sockeye index	7/04 daily	Cumulative through 7/04
Average	109	1983
Lowest	22	659
Highest	197	2928

1998=

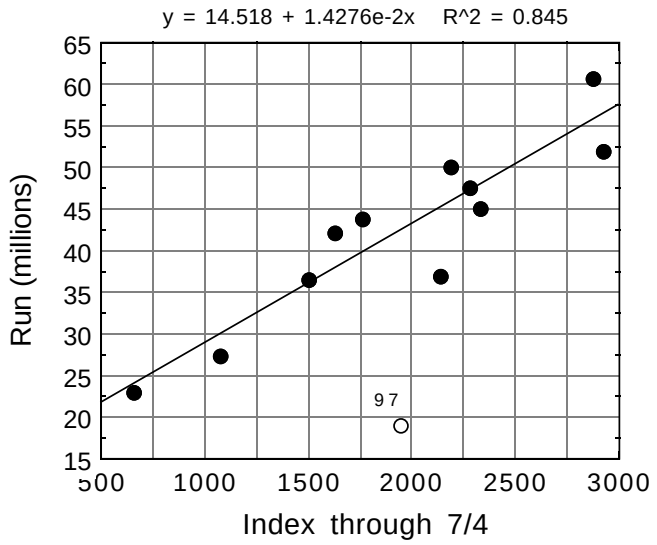
Bristol Bay runs 1987-97	
Average	41
Lowest	19
Highest	61

Forecast of total run (millions)

In past years the index through 7/4 accounted for 85% of the variation in Bristol Bay runs

(1998 cumulative index)X(.014) + (14.5)= total run

example: if 1998 index was 1983 (average for past years) we would forecast the total run by: (1983)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 11 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
1987-1997

District Catch	Cumulative through 7/5 average 1,000s	Percent of season total (%) Average	Low	High	River Escapement	Cumulative through 7/5 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	4472	42	6	78	Kvichak	2073	36	14	65
					Naknek	907	56	29	81
Egegik	6216	56	36	78	Egegik	818	48	25	70
Nushagak	1690	44	17	67	Wood	613	48	15	79
					Igushik	133	34	11	58
Togiak	77	22	5	45	Nushagak	280	55	28	87
Ugashik	553	17	3	43	Togiak	6	3	0	15
					Ugashik	18	2	0	15
All districts	12976	46	21	70					

1987-97 Port Moller sockeye index	7/05 daily	Cumulative through 7/05
Average	102	2085
Lowest	30	707
Highest	143	3028

1998=

Bristol Bay runs 1987-97

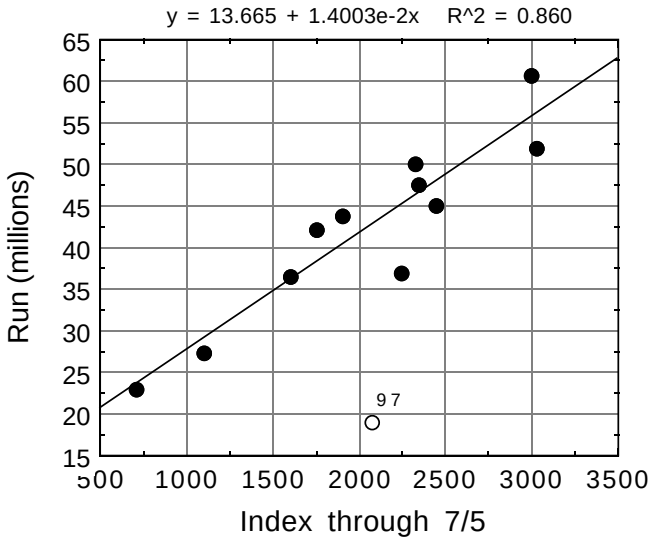
Average	41
Lowest	19
Highest	61

Forecast of total run (millions)

In past years the index through 7/5 accounted for 86% of the variation in Bristol Bay runs, excluding 1997.

(1998 cumulative index)X(.014) + (13.7)= total run

example: if 1998 index was 3028 (highest for past years) we would forecast the total run by: (3028)X(.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 782,000 on this date, whereas Naknek/Kvichak catches averaged 856,000. There have been 7 openings on the 5th in the Nushagak district, and catches on those openings averaged 348,000.

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
1987-1997

District Catch	Cumulative through 7/6 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	5140	48	8	82
Egegik	6760	60	44	83
Nushagak	1959	51	28	73
Togiak	87	24	7	45
Ugashik	728	22	7	54
All districts	14643	51	28	75

River Escapement	Cumulative through 7/6 average 1,000s	Percent of season total (%) Average	Low	High
Kvichak	2469	43	20	71
Naknek	976	62	42	82
Egegik	944	55	27	78
Wood	683	53	20	83
Igushik	158	40	13	61
Nushagak	300	59	34	90
Togiak	9	4	0	16
Ugashik	37	4	0	29

1987-97 Port Moller sockeye index	7/06 daily	Cumulative through 7/06
Average	102	2187
Lowest	23	730
Highest	182	3177

1998=

Bristol Bay runs 1987-97

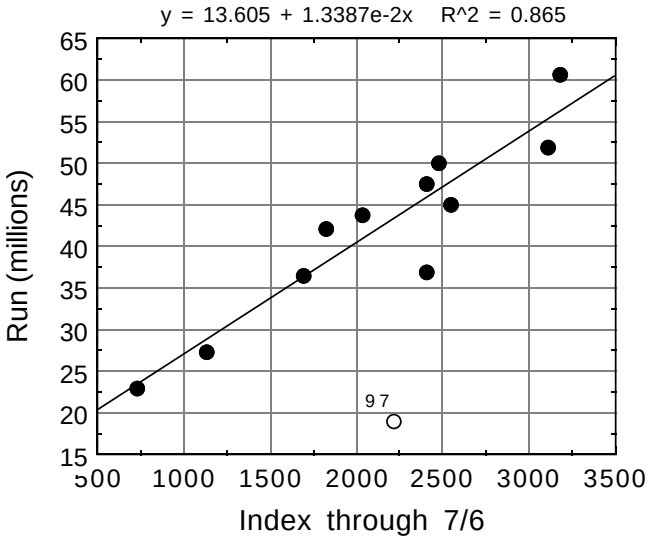
Average	41
Lowest	19
Highest	61

Forecast of total run (millions)

In past years the index through 7/6 accounted for 94% of the variation in Bristol Bay runs, excluding 1997.

(1998 cumulative index) X (.013) + (13.6)= total run

example: if 1998 index was 2187 (average for past years) we would forecast the total run by: (2187)X(.013)+13.6= 42.0, a run of 42 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, except for 1997.

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 360,000; Egegik catches averaged 839,000 and Naknek/Kvichak catches averaged 900,000. For 7 openings on this date in Ugashik the catches averaged 267,000.

On the average, 45% 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
1987-1997

District Catch	Cumulative through 7/7 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	5715	52	11	87
Egegik	7352	66	52	87
Nushagak	2171	56	39	78
Togiak	99	27	7	56
Ugashik	940	29	7	62
All districts	16247	57	37	80

River Escapement	Cumulative through 7/7 average 1,000s	Percent of season total (%) Average	Low	High
Kvichak	2843	49	29	79
Naknek	1040	67	51	83
Egegik	1061	62	39	86
Wood	783	61	22	86
Igushik	178	45	17	69
Nushagak	346	67	39	93
Togiak	14	6	0	19
Ugashik	58	6	0	37

1988-89, 1991-96 Port Moller sockeye index	7/07 daily	Cumulative through 7/07
only 8 years		
Average	77	2364
Lowest	39	769
Highest	108	3283

1998=

Bristol Bay runs 1987-97

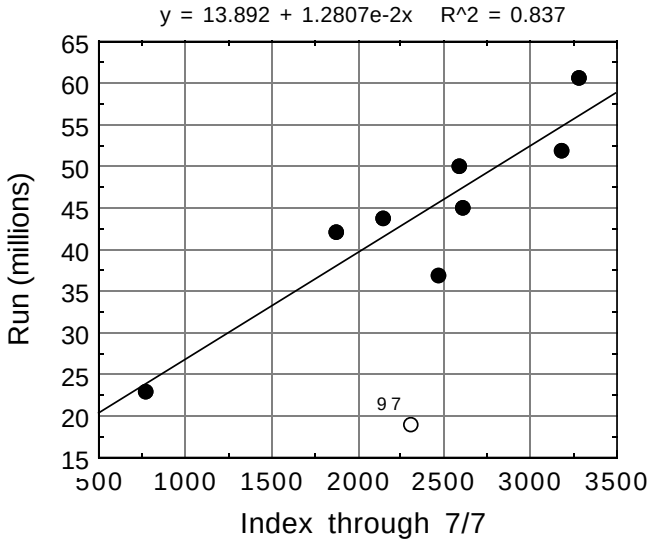
Average	41
Lowest	19
Highest	61

Forecast of total run (millions)

In the 8 available years the index through 7/7 accounted for 84% of the variation in Bristol Bay runs

(1998 cumulative index) x (.013) + (13.9)=(total run)

example: if the 1998 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



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 8.

On the average through July 7 (1987-97), 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 66%, 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
1987-1997

District Catch	Cumulative through 7/8 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	6204	56	11	90
Egegik	7809	70	58	90
Nushagak	2393	61	39	83
Togiak	114	31	8	67
Ugashik	1117	34	7	73
All districts	17606	61	43	85

River Escapement	Cumulative through 7/8 average 1,000s	Percent of season total (%) Average	Low	High
Kvichak	3256	56	32	86
Naknek	1121	74	62	86
Egegik	1159	68	44	94
Wood	867	67	24	88
Igushik	199	50	18	75
Nushagak	368	71	41	94
Togiak	19	8	0	25
Ugashik	105	9	0	42

1991-97 Port Moller sockeye index	7/08 daily	Cumulative through 7/08	Forecast of total run (millions)
only 7 years			
Average	79	2694	
Lowest	33	1947	
Highest	120	3336	No forecast until more years sampled on this date.
1998=			

Bristol Bay runs 1991-97	
Average	44
Lowest	19
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, 74% of Egegik, and 70% of the Nushagak runs have passed through the fishing disctricts by this date.

Cumulative catch+escapement through 7/8 can be used to predict the final run (millions) from: Run = 1.14 x (catch+escapement) + 12.3.
e.g. if cumulative C+E was 10 million through 7/8 we would predict a final run of 23.7 million and if the cumulative C+E was 25 million we would predict a final run of 40.8 million

Throughgh July 9
1987-1997

District Catch	Cumulative through 7/9 average 1,000s	Percent of season total (%) Average	Low	High	River Escapement	Cumulative through 7/9 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	6796	61	17	93	Kvichak	3649	63	39	90
					Naknek	1183	79	68	87
Egegik	8202	74	62	93	Egegik	1233	73	50	96
Nushagak	2665	68	51	88	Wood	952	74	44	90
					Igushik	219	55	20	80
Togiak	125	34	8	73	Nushagak	386	75	48	95
Ugashik	1483	46	21	79	Togiak	24	10	0	29
					Ugashik	177	14	0	44
All districts	19242	67	51	89					

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	
Highest	89	3424	No forecast until more years sampled on this date.

1998=

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

Comments

Bristol Bay catch + escapement through 7/9 has averaged 66% of the final run with a range of 55% in 1994 to 86% in 1993.

In the average year, 63% of the final Bristol Bay escapement was accumulated by July 9.

Togiak and Ugashik escapement counts were under way by this date in 10 of the past 11 years.

The Ugashik fishery has been open on July 9 each year since 1987 and the average catch has been 366,000 with a range of 183,000 in 1997 to 569,000 in 1994.

Through July 10
1987-1997

District Catch	Cumulative through 7/10 average 1,000s	Percent of season total (%) Average	Low	High	River Escapement	Cumulative through 7/10 average 1,000s	Percent of season total (%) Average	Low	High
Naknek/Kvichak	7388	67	27	94	Kvichak	3995	69	46	92
					Naknek	1230	83	73	90
Egegik	8684	79	72	95	Egegik	1303	78	59	96
Nushagak	2897	74	58	91	Wood	1021	79	56	90
					Igushik	236	60	24	82
Togiak	135	37	11	73	Nushagak	408	80	56	96
Ugashik	1594	50	21	81	Togiak	29	12	1	31
					Ugashik	245	20	0	69
All districts	20668	72	58	92					

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
1998= ?			

Bristol Bay runs 1987-97	
Average	41
Lowest	19
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 8 of the past 11 years the escapement to Egegik through July 10 had exceeded the escapement goal. The same has occurred at Naknek in 5 of the11 years. The escapement goal to Wood River was assured by July 10 in 9 of the past 11 years and in 6 of the years the escapement exceeded the goal.