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## A BRISTOL BAY ALMANAC FOR 1995

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Approved

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Director



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## 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 1995 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 and Game summaries of the cumulative catches and escapements, processors can compare the 1995 numbers with averages and ranges from recent years (1985–94).

## PORT MOLLER TEST BOAT

Tables 1 and 2 give the Port Moller daily and cumulative index catches of sockeye salmon. An index catch at each of the four stations is the number caught per 100 fm per 60 min. A 200-fm net is usually fished for about 60 min, so the index is usually about one-half of the actual catch. The daily index is the sum of the index catches at the four stations and the cumulative index (used to forecast) is the sum of the daily indices starting with June 11.

Daily water temperatures are given in Table 3. The timing of the Bristol Bay runs (especially from Port Moller to Bristol Bay) is usually related to temperature 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. The index catches of sockeye and chum (*O. keta*) salmon at each station are summarized by 5-day periods in Tables 4 and 5. If fish are concentrated inshore (station 2), our daily index may be overestimating their abundance, whereas if they are concentrated offshore (station 8), the daily index may be underestimating their abundance relative to past years (catches were usually largest at stations 4 and 6).

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 >550 mm, the majority of the sockeye are 3-ocean fish and if they are <550 mm, they are mostly 2-ocean fish (Fig. 1). However, in 1990-92 and 1994, the 3-ocean fish were very small from poor ocean growth, 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 and the Bristol Bay run if there are high percentages of 3-ocean fish (e.g., when 75% of the fish caught at Port Moller are 3-ocean, we would expect only 60% of the Bristol Bay run to be 3-ocean fish).

## BRISTOL BAY RUNS

The daily commercial catches and the escapements at towers for 1993 and 1994 are shown in Figures 3 and 4 to illustrate the range in run timing. In a typical year, 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 seasons catch were made are given in Table 6. This date is usually 1 to 2 days later than the midpoints 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).

The 1995 pre-season forecasts are given in Table 7. About half of the large forecasted run is expected to be 2-ocean fish from the 1990 brood year (age 2.2), and most of these are expected to be bound for the Kvichak River system. 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 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 ~54 million as forecasted, then the South Unimak catch through 20 June should exceed 1.7 million, and through 25 June the catch should exceed 2.2 million (Fig. 5).

## DAILY ALMANAC

The 18 daily summaries included in this report provide the following information:

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 1985-94;
2. the average and range in the daily and cumulative Port Moller index catches for 1985, 1987-94 for comparison with 1995;
3. a plot of the past Bristol Bay runs on the cumulative indices through the date shown and the predictive equation; and
4. Port Moller, fishery and escapement comments.

The 1990 run was unusual in that it was very large and 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 (midpoint at Port Moller). The years 1990 and 1994 are shown as open circles on the graphs.

## **FIGURES**



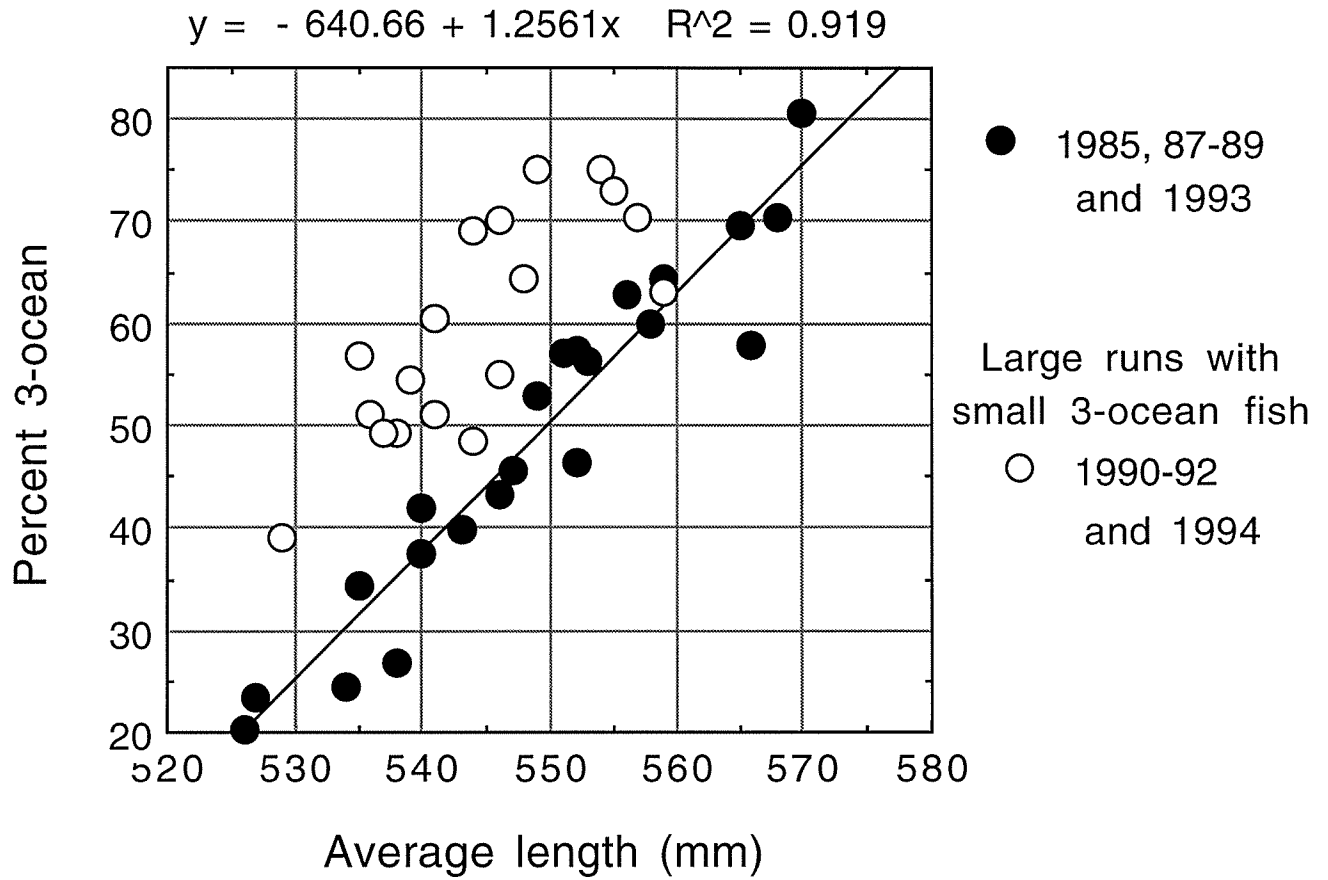


Figure 1. Correlation between ocean age (percent 3-ocean) and the average length of sockeye salmon off Port Moller.

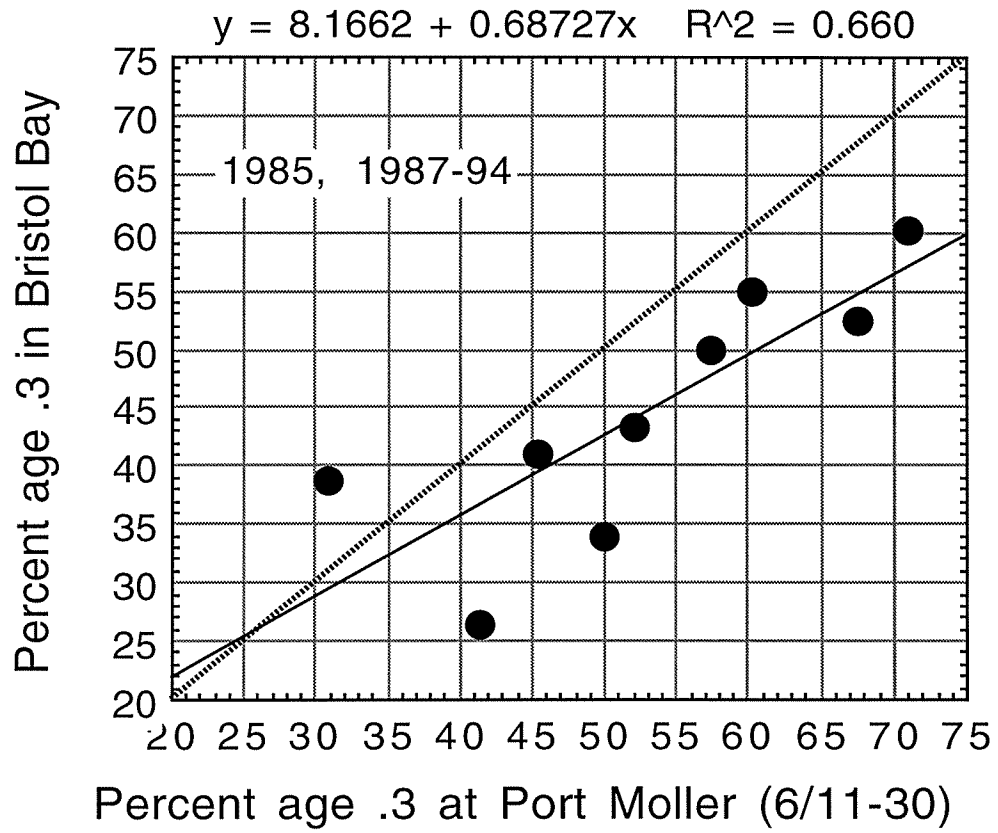


Figure 2. Correlation in the percent 3-ocean fish between Bristol Bay and Port Moller.

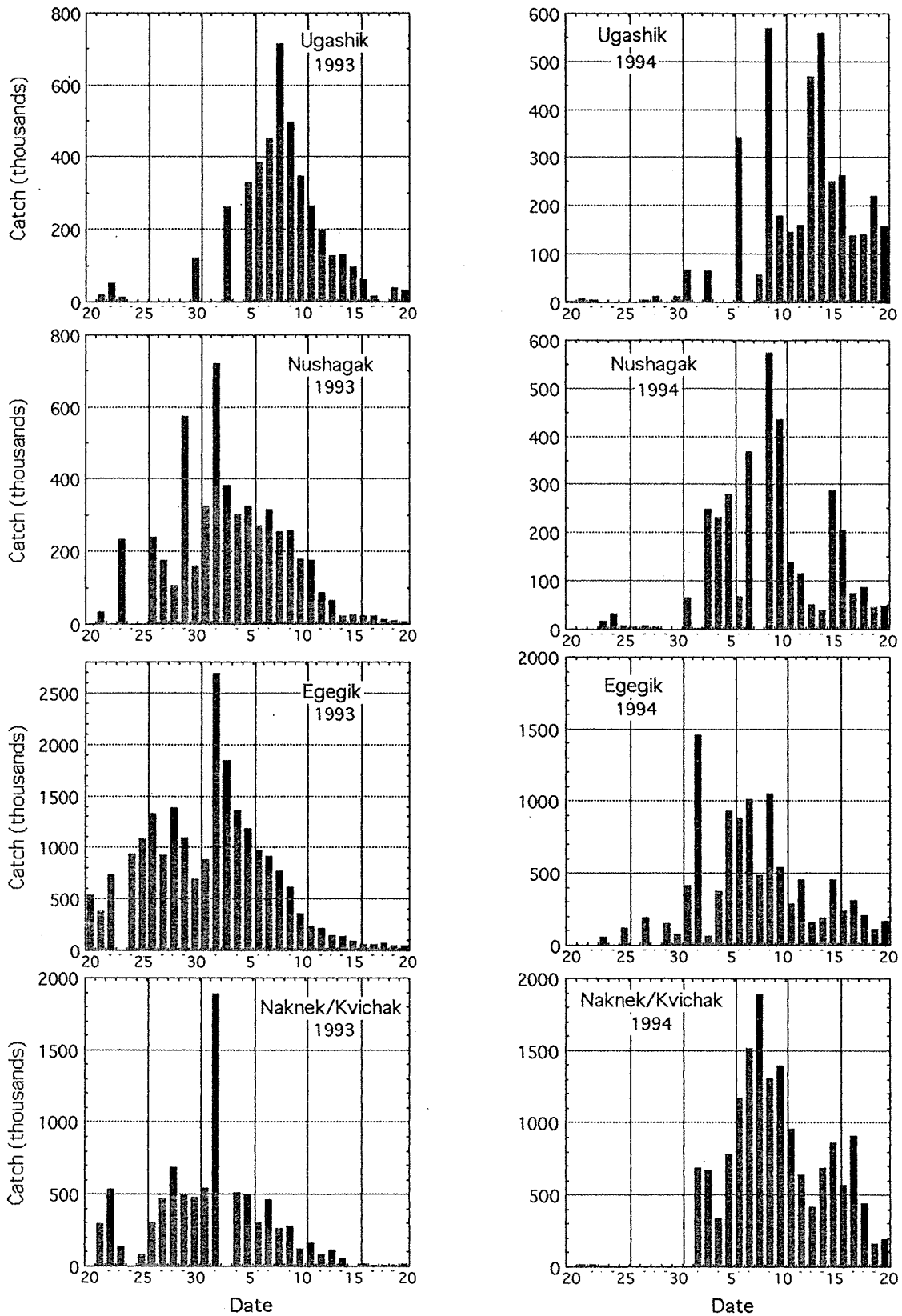


Figure 3. Daily sockeye salmon catches during 20 June to 20 July in 1993 and 1994.

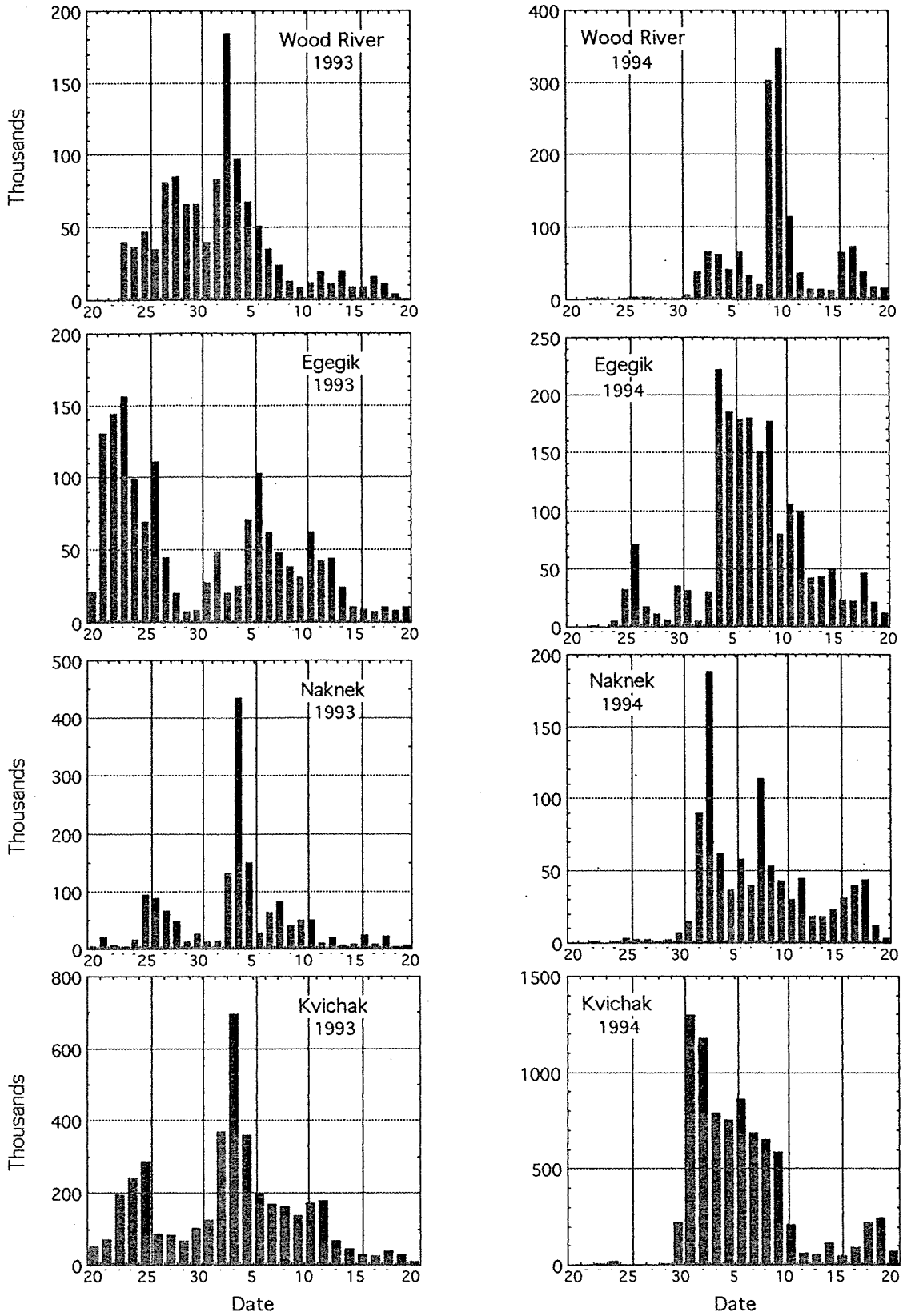


Figure 4. Daily sockeye salmon escapements during 20 June to 20 July in 1993 and 1994.

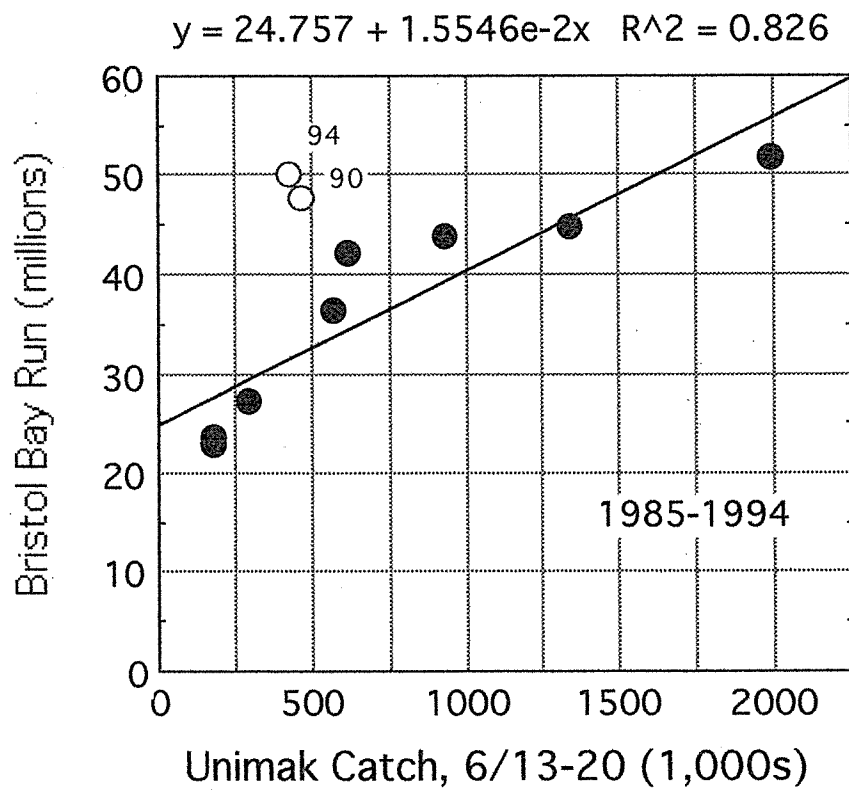
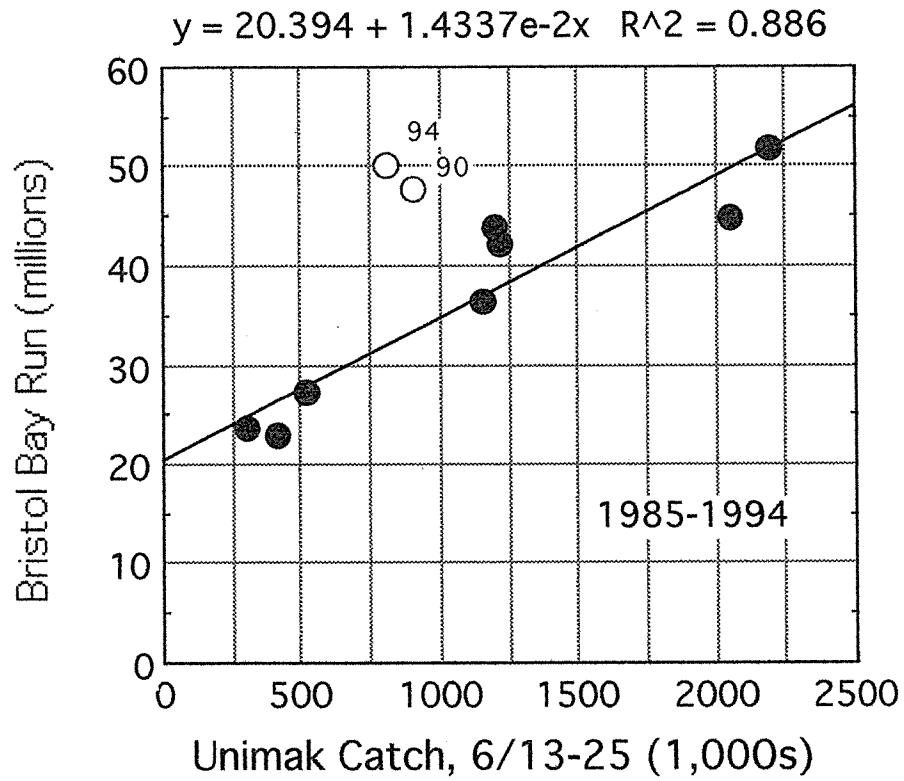


Figure 5. Regressions of Bristol Bay run on South Unimak catches through 20 June and 25 June.



## **TABLES**



Table 1. Port Moller daily sockeye index catches (totals for stations 2, 4, 6, and 8).

Date	1995 index	Past index catches								
		1994	1993	1992	1991	1990	1989	1988	1987	1985
6/11		5	16	15	7	9	21	7		9
12		3	14		9	13	30	8		5
13		6	24		7		27		8	17
14		10	80	15	6	12	22		9	26
15		21	60	36	17	22	33	14	16	48
16		20	82	50			32	22		58
17		12		7	47	20	53	9		123
18		35		94	58	46	90	8	10	45
19		52	85	130	91			8	17	43
20		43	106	95	69			23	62	26
21			133	121				17	16	68
22		100	189	112	169	58	94	31	85	85
23		155	123	123	70	69	90		86	67
24			99	114	157	148		62		
25		110	220		56	160	61	28		25
26		121		44	62	121	33	63	146	99
27		124		101	152	147			66	63
28		136	185	117	84	302	117	37	158	214
29		133	106	137	110	227		86		181
30		224	238	205	23	285		58	75	174
7/1		151		163	90	202	92		22	36
2		166	244	97	62	168	97		26	52
3		123	63	168	182	239	113	28	38	81
4		218	71		79	118	195	28		93
5			105		144	76		53		97
6		134	90	104	81		136	28		103
7		108	86	80	58		112	42		
8		120	36	137	79					
9		53	66	39	96					
10			41							
Run (millions)		50	52	45	42	48	44	23	27	36

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

Date	1995	Past index catches								
	Index	1994	1993	1992	1991	1990	1989	1988	1987	1985
6/11		5	16	15	7	9	21	7	9	9
12		8	30	30	16	22	51	15	18	14
13		14	54	45	23	36	78	28	26	31
14		24	134	60	28	48	100	40	35	57
15		45	194	96	46	70	133	54	51	105
16		65	276	146	73	94	165	76	62	162
17		77	359	153	120	114	208	85	72	285
18		112	443	247	178	161	298	93	81	331
19		164	527	377	270	209	377	101	99	373
20		207	634	472	338	257	456	124	161	399
21		294	766	593	438	305	535	141	177	468
22		394	955	706	608	362	629	172	262	553
23		549	1078	829	678	432	719	207	348	620
24		670	1177	943	835	579	788	268	444	689
25		780	1397	1039	892	739	849	296	540	714
26		901	1550	1082	953	859	882	359	686	814
27		1025	1702	1183	1105	1006	955	413	752	877
28		1160	1887	1301	1189	1308	1092	450	909	1090
29		1293	1993	1437	1299	1535	1167	536	990	1271
30		1517	2232	1642	1322	1820	1262	593	1065	1446
7/1		1668	2394	1806	1412	2022	1354	643	1086	1481
2		1834	2638	1902	1474	2184	1451	693	1112	1534
3		1957	2701	2070	1655	2423	1564	722	1151	1614
4		2175	2772	2184	1735	2540	1759	750	1183	1707
5		2321	2877	2304	1879	2616	1898	803	1215	1804
6		2454	2967	2408	1960	2676	2034	831	1265	1907
7		2562	3053	2488	2018		2146	873		
8		2682	3087	2625	2097					
9		2735	3153	2664	2193					
10			3194							
Run, excl. jacks		50	52	45	42	48	44	23	27	36

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

Table 3. Surfacewater temperatures (°C) off Port Moller (stations 1–9, 1981–84, and 2, 4, 6, and 8, 1985).

Date	81	82	83	84	85	87	88	89	90	91	92	93	94	95
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
7/01	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	
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	
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	
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	
5					7.0		8.4		9.0	7.1	6.5	7.6	6.6	
6										8.1	7.0	8.0	6.2	
7										8.8	7.2	8.2	6.9	
8										9.7	7.8	8.8	7.1	
9										8.9	8.5	9.1	7.2	
10												9.4		

Table 4. Average sockeye salmon catch off Port Moller by station and 5-d period; number caught by 100 fm (5-in mesh) fished for 1 h. The stations 2 to 8 are 33, 43, 53, and 63 mi from Port Moller, or 13, 23, 33, and 43 mi from the coastline.

Year/dates	Station				Means	Year/dates	Station				Means
	2	4	6	8			2	4	6	8	
1985						1991					
6/11-15	4	8	7	2	5	6/11-15	2	5	1	1	2
16-20	4	26	25	4	15	16-20	14	16	21	7	15
21-25	7	27	17	10	15	21-25	15	24	36	39	29
26-30	48	64	20	14	37	26-30	26	32	22	6	22
7/1-5	29	24	9	9	18	7/1-5	33	35	32	12	28
6	4	49	36	14	26	6-9	17	24	29	8	20
Mean-7/5	18	30	16	8	18	Mean-7/5	21	22	22	13	19
1987						1992					
6/11-15	1	3	6	1	3	6/11-15	1	2	5	11	5
16-20	7	18	3	2	8	16-20	10	15	21	29	19
21-25	24	15	20	4	16	21-25	13	26	28	46	28
26-30	7	40	47	18	28	26-30	11	29	43	38	30
7/1-5	4	10	7	8	7	7/1-5	10	55	42	25	33
Mean-7/5	9	17	17	7	12	6-9	3	33	41	13	22
1988						1993					
6/11-15	0	2	4	3	2	6/11-15	3	6	17	13	10
16-20	1	3	9	1	4	16-20	5	14	38	30	22
21-25	11	15	8	1	9	21-25	29	35	45	44	38
26-30	10	22	21	8	15	26-30	28	37	42	60	42
7/1-5	9	17	8	2	9	7/1-5	24	30	40	35	32
6-7	2	18	12	4	9	6-9	16	29	17	8	17
Mean-7/5	6	12	10	3	8	Mean-7/5	18	24	36	36	29
1989						1994					
6/11-15	8	8	9	1	7	6/11-15	3	3	2	0	2
16-20	12	12	16	19	15	16-20	2	13	13	4	8
21-25	14	22	27	19	21	21-25	32	30	27	18	27
26-30	14	17	29	16	19	26-30	14	31	51	52	37
7/1-5	19	50	23	32	31	7/1-5	30	51	43	37	40
6-7	32	47	16	29	31	6-9	11	31	37	25	26
Mean-7/5	13	22	21	17	18	Mean-7/5	16	26	27	22	23
1990						1995					
6/11-15	2	5	6	1	4	6/11-15					
16-20	5	12	13	4	9	16-20					
21-25	8	45	39	16	27	21-25					
26-30	35	96	60	25	54	26-30					
7/1-5	53	46	43	18	40	7/1-5					
Mean-7/5	21	41	32	13	27	6-9					
						Mean-7/5					

Table 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. The stations 2 to 8 are 33, 43, 53, and 63 mi from Port Moller, or 13, 23, 33, and 43 mi from the coastline.

Year/dates	Station				Means	Year/dates	Station				Means
	2	4	6	8			2	4	6	8	
1985						1991					
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
1987						1992					
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	1.9
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
						6-9	0.7	2.7	2.9	0.4	1.7
Mean-7/5	0.2	0.6	1.4	0.9	0.8	Mean-7/5	0.8	0.9	1.7	2.5	1.5
1988						1993					
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	6-9	2.2	4.1	1.9	1.0	2.3
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
1989						1994					
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
1990						1995					
6/11-15	0.1	0.4	1.4	0.8	0.7	6/11-15					
16-20	0.1	0.5	3.3	1.0	1.2	16-20					
21-25	0.1	0.5	2.3	1.0	1.0	21-25					
26-30	0.4	1.1	4.4	2.6	2.1	26-30					
7/1-5	1.2	2.1	2.3	1.1	1.7	7/1-5					
						6-9					
Mean-7/5	0.4	0.9	2.7	1.3	1.3	Mean-7/5					

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

Date	1979	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94
-6/23	1.0	.1	.8	.2	.7	.9	.7	.2	.3	1.5	1.5	.3	.1	.6	3.1	.1
24	.2	.1	.2	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.9	.0
25	.3	.0	.5	.1	.0	.2	.0	.0	.2	.0	.2	.0	.0	.7	1.2	.1
26	.4	.1	.5	.2	.4	1.0	.0	.0	.0	.1	.7	.0	.0	.0	1.9	.0
27	.2	.1	.5	.3	2.4	.2	1.0	.0	.6	.9	.1	.0	.0	1.0	1.6	.2
28	1.5	.1	.6	.5	.8	.0	1.1	.1	.0	.2	1.2	.1	.0	.0	2.2	.0
29	1.8	.2	.2	.7	1.4	.9	1.8	.0	.4	.9	1.8	1.1	.0	.5	2.2	.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
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	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
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
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
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
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
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
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
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
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
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
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
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
14	.4	.6	.6	.3	.8	1.3	.3	.6	.6	.7	.4	1.3	.7	1.9	.4	1.5
15	.3	.5	.3	.2	.3	1.0	.1	.5	.5	.4	.7	1.0	.5	1.6	.2	1.9
16	.2	.2	.2	.1	.4	.7	.3	.4	.4	.4	.5	.7	.6	1.2	.2	1.3
17	.2	.1	.2	.1	.1	.4	.2	.3	.5	.2	.5	.8	.4	.8	.1	1.4
18	.2	.1	.2	.1	.4	.2	.2	.2	.2	.1	.4	.5	.3	.4	.1	.9
7/19-	.3	.4	.4	.3	.6	.3	.9	.5	.9	.3	.7	1.2	1.1	1.3	.1	2.8
Total	22	24	26	15	37	25	24	16	16	14	29	33	26	32	41	35
Run	40	62	34	22	46	41	37	24	27	23	44	48	42	45	52	50
	early	strike		strike				late					strike		early	late

Table 7. Pre-season forecasts of the 1995 Bristol Bay inshore run (millions).

District	Age					Total	Catch
	1.2	2.2	0.3	1.3	2.3		
1. ADF&G							
Naknek/Kvichak	4.5	19.4		4.2	2.7	30.8	19.6
Egegik	1.0	7.8		1.2	3.1	13.1	12.1
Ugashik	1.6	1.8		0.7	1.3	5.4	4.7
Nushagak	1.6	0.3	0.4	2.9	0.1	5.3	3.5
Togiak	0.1	0.0		0.4	0.0	0.5	0.4
TOTAL	8.8	29.3	0.4	9.4	7.2	55.1	40.3
Percent	16	53	1	17	13		
2. FRI							
Naknek/Kvichak	2.2	19.8		3.5	4.7	30.2	17.7
Egegik	0.8	5.5		1.1	4.7	12.1	10.0
Ugashik	0.6	1.3		1.7	1.4	5.0	3.4
Nushagak	1.3	0.1	0.3	3.3	0.1	5.3	3.0
Togiak	0.1	0.0		0.4	0.0	0.5	0.3
TOTAL	5.0	26.7	0.3	10.0	10.9	53.1	34.4
Percent	9	50	2	19	20		

Table 8. Daily sockeye salmon catches (thousands) in the South Unimak June fishery, 1985-94.

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

# ALMANAC



Through June 20  
1985-994

District Catch	Cumulative through 6/20				River Escapement	Cumulative through 6/20			
	Average 1,000s	Percent of season total (%)				Average 1,000s	Percent of season total (%)		
		Average	Low	High			Average	Low	High
Naknek/Kvichak	58	1	0	2	Kvichak	0	0	0	0
Egegik	162	2	0	7	Naknek	0	0	0	0
Nushagak	7	0	0	1	Egegik	0	0	0	1
Togiak	4	1	0	5	Wood	0	0	0	0
Ugashik	31	1	0	2	Igushik	0	0	0	0
All districts	251	1	0	4	Togiak	0	0	0	0
					Ugashik	0	0	0	0

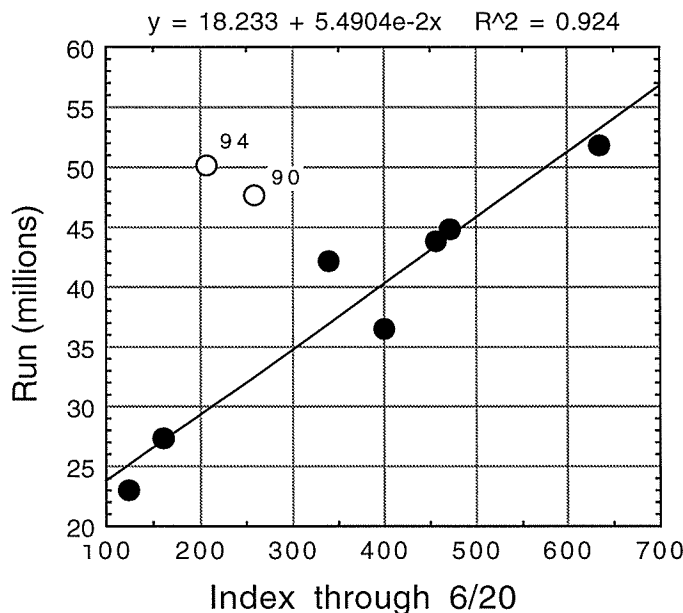
1985, 1987-94	Cumulative		Forecast of total run (millions)
Port Moller sockeye index	6/20 daily	through 6/20	
Average	61	339	In past years the index through 6/20 accounted for 39% of the variation in Bristol Bay runs (92% excluding 1990 and 94).
Lowest	23	124	
Highest	106	634	

1995= ?

$$(1995 \text{ cumulative index}) \times (.055) + (18.2) = \text{total run}$$

Bristol Bay runs 1985, 1987-94	
Average	41
Lowest	23
Highest	52

example: if 1995 index was 339 (average for past years) we would forecast the total run by:  $(339) \times (.055) + 18.2 = 36.8$   
a run of 37 million



Comments

This is the first date that the Port Moller test fishery can provide a rough forecast of the total run. Prior to this date, Port Moller catches explained less than 39% 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  
1985-1994

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	131	1	0	4	Kvichak	0	0	0	0
Egegik	255	3	0	10	Naknek	3	0	0	1
Nushagak	9	0	0	1	Egegik	18	1	0	10
Togiak	5	2	0	7	Wood	0	0	0	0
Ugashik	38	1	0	2	Igushik	0	0	0	0
All districts	431	2	0	6	Togiak	0	0	0	0
					Ugashik	0	0	0	0

1985, 1987-94 Port Moller sockeye index	Cumulative 6/21 daily	through 6/21	Forecast of total run (millions)
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Average	74	413
Lowest	16	141
Highest	133	766

In past years the index through 6/21 accounted for 46% of the variation in Bristol Bay runs (95% excluding 1990 and 1994).

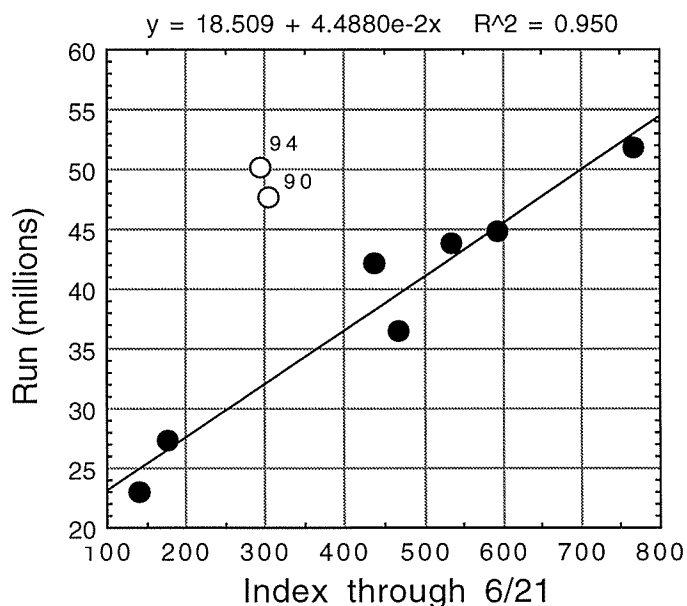
1995= ?

$$(1995 \text{ cumulative index}) \times (.045) + (18.5) = \text{total run}$$

Bristol Bay runs 1985, 1987-94

Average	41
Lowest	23
Highest	52

example: if 1995 index was 413 (average for past years) we would forecast the total run by:  $(413) \times (.045) + 18.5 = 37.1$   
a run of 37 million



Comments

The Port Moller index through June 21, 1994 was only 294 (well below average) yet the run turned out to be 50 million (the 2nd 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 9 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, 1992 and 1993. Typically escapements are in the hundreds of fish this early in the season.

Through June 22  
1985-1994

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	242	3	0	10	Kvichak	0	0	0	0
Egegik	364	4	0	14	Naknek	4	0	0	2
Nushagak	9	0	0	1	Egegik	38	2	0	18
Togiak	7	2	0	9	Wood	0	0	0	0
Ugashik	51	2	0	3	Igushik	0	0	0	0
All districts	667	3	0	9	Togiak	0	0	0	0
					Ugashik	0	0	0	0

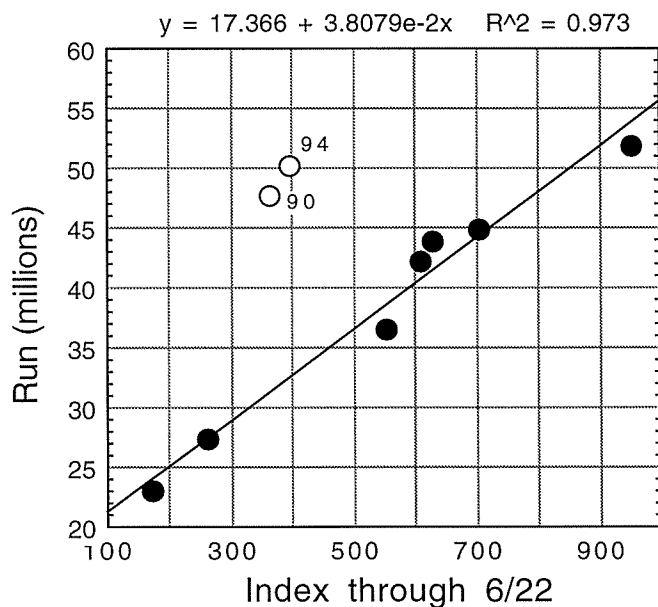
1985, 1987-94	Cumulative		Forecast of total run (millions)
Port Moller sockeye index	6/22 daily	through 6/22	
Average	103	516	In past years the index through 6/22 accounted for 47% of the variation in Bristol Bay runs (97% excluding 1990 & 94).
Lowest	31	172	
Highest	189	955	

1995= ?

(1995 cumulative index) X (.038 ) + ( 17.4 ) = total run

Bristol Bay runs 1985,1987-94	
Average	41
Lowest	23
Highest	52

example: if 1995 index was 955 (highest for past years) we would forecast the total run by: (955)X(.038)+17.4= 53.69 a run of 54 million



**Comments**

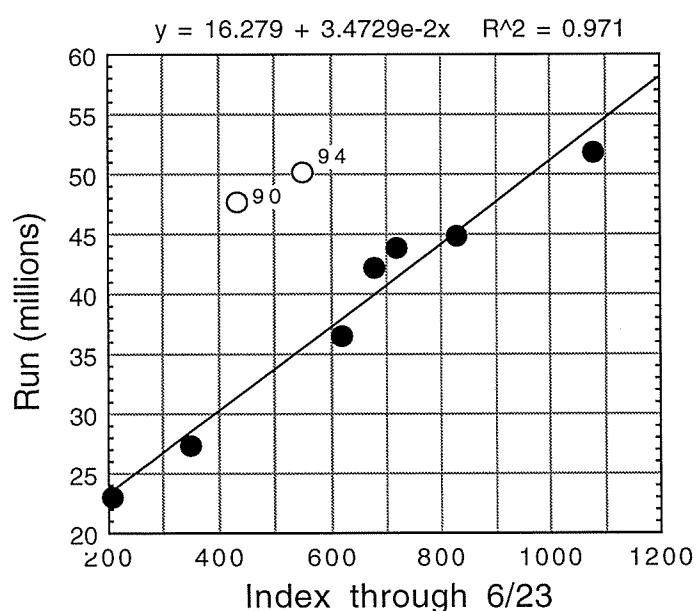
In 1988, some fish arrived early in the Bay and provided exceptional catches at Egegik (14% of total catch through 6/22). This led some to expect a large run that unfortunately did not materialize. The low index catches at Port Moller correctly forecast the relatively small run of 23 million. In contrast, the large 1990 & 94 runs were slow to develop, both at Port Moller and in the Bay. The indices through the 22nd (362 & 394) did not indicate runs of 48 & 50 million were on the way.

The high Port Moller index (189) on June 22, 1993 did correctly indicated that a large and early run (52 million) was coming.

Through June 23  
1985-1994

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	294	3	0	11	Kvichak	0	0	0	0
Egegik	461	5	0	18	Naknek	5	0	0	2
Nushagak	34	1	0	5	Egegik	61	4	0	28
Togiak	9	2	0	10	Wood	5	0	0	3
Ugashik	56	2	0	4	Igushik	1	0	0	1
All districts	773	3	0	11	Togiak	0	0	0	0
					Ugashik	0	0	0	0

1985, 1987-94 Port Moller sockeye index	Cumulative 6/23 daily	Cumulative through 6/23	Forecast of total run (millions)
Average	91	607	In past years the index through 6/23 accounted for 54% of the variation in Bristol Bay runs (97% excluding 1990 & 94).  (1994 cumulative index) X (.035 ) + ( 16.3 ) = total run  example: if the 1995 index was 207 (lowest for past years) we would forecast the total run by: (207)X(.035)+16.3= 23.55 a run of 24 million
Lowest	35	207	
Highest	155	1078	
1995= ?			
Bristol Bay runs 1985, 1987-94			
Average	41		
Lowest	23		
Highest	52		



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 (432, 549 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 4 of the past 10 years. The catches were 311,000 (1988), 569,000 (1989) and 432,000 (1992) and 379,000 (1993). 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  
1985-1994

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	294	4	0	11	Kvichak	4	0	0	1
Egegik	554	5	0	18	Naknek	9	1	0	3
Nushagak	39	1	0	5	Egegik	76	5	0	35
Togiak	10	3	0	10	Wood	11	1	0	7
Ugashik	56	2	0	4	Igushik	2	1	0	3
All districts	872	4	0	11	Togiak	0	0	0	0
					Ugashik	0	0	0	0

1985, 1987-94 Port Moller sockeye index	Average	Cumulative 6/24 daily	through 6/24	Forecast of total run (millions)
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Average	116	710
Lowest	62	268
Highest	157	1177

In past years the index through 6/24 accounted for 61% of the variation in Bristol Bay runs (97% excluding 1990 & 94).

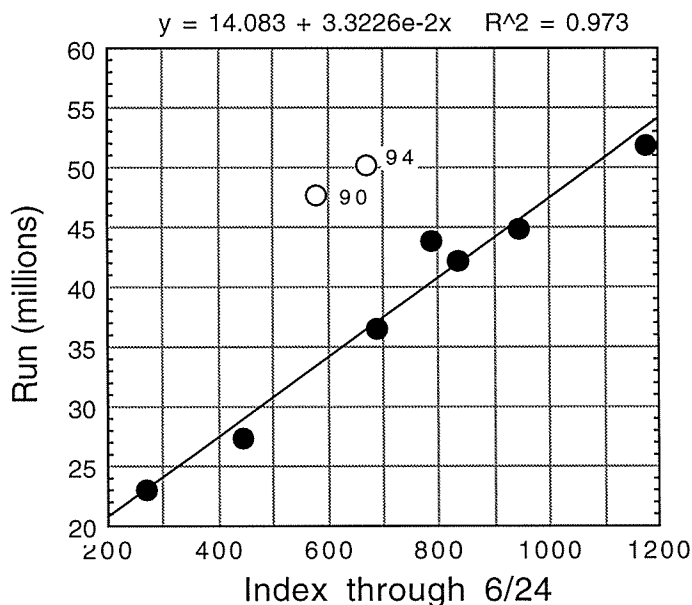
1995= ?

(1995 cumulative index) X (.033 ) + ( 14.1 ) = total run

Bristol Bay runs 1985, 1987-94

Average	41
Lowest	23
Highest	52

example: if 1995 index was 710 (average for past years) we would forecast the total run by: (710)X(.033)+14.1= 37.53 a run of 38 million



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 9 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  
1985-1994

District Catch	average 1,000s	Cumulative through 6/25		
		Percent of season total (%)		
		Average	Low	High
Naknek/Kvichak	302	4	1	12
Egegik	767	6	0	18
Nushagak	61	2	0	6
Togiak	12	3	0	10
Ugashik	56	2	0	4
All districts	1116	4	1	13

River Escapement	average 1,000s	Cumulative through 6/25		
		Percent of season total (%)		
		Average	Low	High
Kvichak	12	0	0	1
Naknek	25	2	0	9
Egegik	91	6	0	39
Wood	21	2	0	11
Igushik	3	1	0	4
Togiak	0	0	0	0
Ugashik	0	0	0	0

1985, 1987-94	Cumulative		Forecast of total run (millions)
Port Moller sockeye index	6/25 daily	through 6/25	

Average	95	805
Lowest	25	296
Highest	220	1397

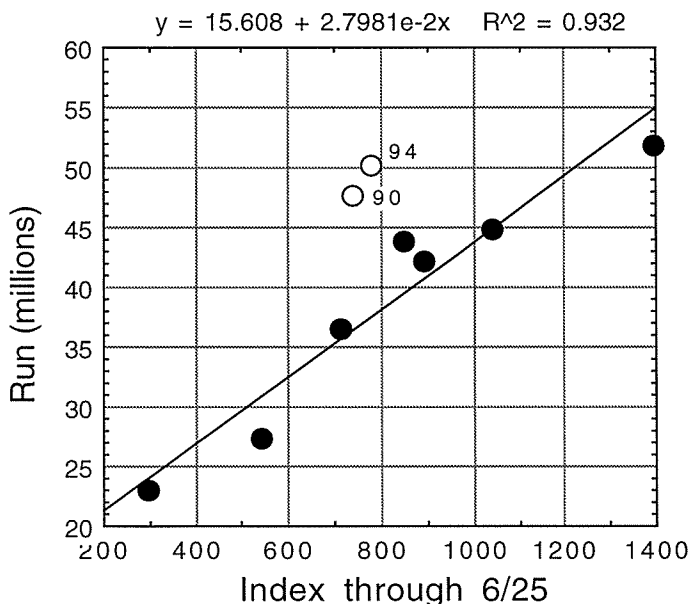
In past years the index through 6/25 accounted for 67% of the variation in Bristol Bay runs (93% excluding 1990 & 94)

1995= ?

$$(1995 \text{ cumulative index}) \times (.028) + (15.6) = \text{total run}$$

Bristol Bay runs 1985, 1987-94	
Average	41
Lowest	23
Highest	52

example: if 1995 index was 1397 (highest for past years) we would forecast the total run by:  $(1397) \times (.028) + 15.6 = 54.72$  a run of 55 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 only 5 of the past 10 years. Catches were about 200,000 in 1987 & 1989; 700,000 in 1992; 1,200,000 in 1993 and 130,000 in 1994.

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

Through June 26  
1985-1994

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	397	4	0	16	Kvichak	44	1	0	4
Egegik	900	7	0	23	Naknek	60	4	0	15
Nushagak	100	2	0	10	Egegik	125	8	0	47
Togiak	14	5	0	16	Wood	32	3	0	14
Ugashik	56	2	0	4	Igushik	5	2	0	5
					Togiak	0	0	0	0
					Ugashik	0	0	0	0
All districts	1385	5	1	17					

1985, 1987-94 Port Moller sockeye index	Cumulative 6/26 daily	through 6/26	Forecast of total run (millions)
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Average	93	898
Lowest	33	359
Highest	146	1550

In past years the index through 6/26 accounted for 66% of the variation in Bristol Bay runs (86% excluding 1990 & 94).

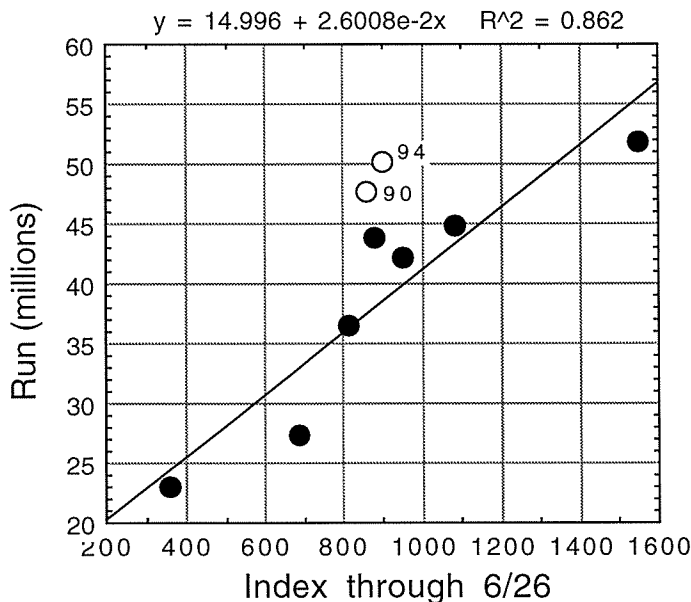
1995= ?

(1995 cumulative index) X (.026 ) + ( 15.0 ) = total run

Bristol Bay runs 1985, 1987-94

Average	41
Lowest	23
Highest	52

example: if 1995 index was 898 (average for past years) we would forecast the total run by: (898)X(.026)+15.0= 38.35, a run of 38 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 3 major fishery openings on this date: Nushagak in 1988 (100,000); Naknek/ Kvichak in 1989 (642,000); and all districts in 1993 (1,900,000)

On the average through 6/26, 5% of the Nushagak run, 10% of the Naknek/Kvichak run, and 12% 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  
1985-1994

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	495	6	0	21	Kvichak	95	2	0	7
Egegik	1288	11	0	27	Naknek	113	7	0	19
Nushagak	140	4	0	13	Egegik	160	9	0	45
Togiak	18	6	0	22	Wood	43	4	0	16
Ugashik	66	2	0	4	Igushik	11	3	0	9
All districts	1925	7	1	21	Togiak	0	0	0	0
					Ugashik	0	0	0	0

1985, 1987-94 Port Moller sockeye index	Cumulative 6/27 daily	through 6/27	Forecast of total run (millions)
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Average	104	1002
Lowest	54	413
Highest	153	1702

In past years the index through 6/27 accounted for 70% of the variation in Bristol Bay runs (86% excluding 1990 & 94).

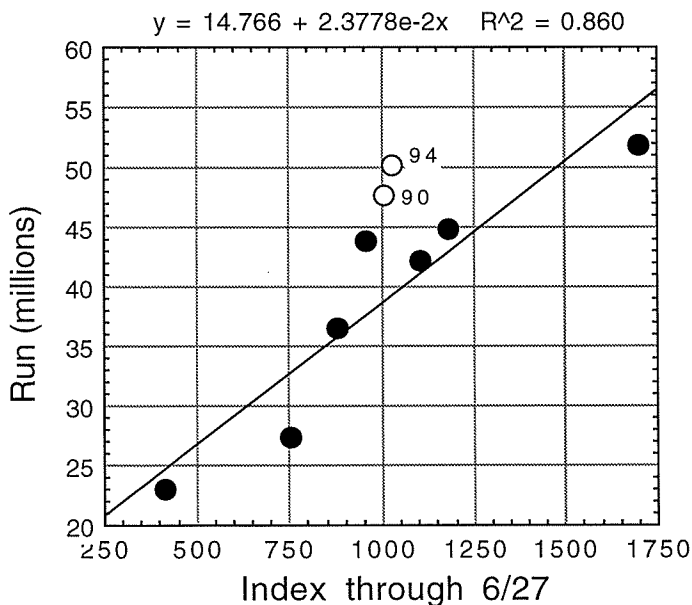
1995= ?

(1995 cumulative index) X (.024 ) + (14.8 ) = total run

Bristol Bay runs 1985, 1987-94

Average	41
Lowest	23
Highest	52

example: if 1995 index was 413 (lowest for past years) we would forecast the total run by: (413)X(.024)+14.8= 24.71, a run of 25 million



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 2 major openings in the Nushagak (1992; 165,000 and 1993; 176,000) and in Naknek/Kvichak (1988; 361,000 and 1993; 470,000) however, there were six openings in Egegik since 1985 with an average catch of 491,000

The average catch plus escapement on this date was 776,000 and the cumulative average C+E was 2.7 million. An average of 6% of the annual runs were accounted for by the C+E through 6/27.

Through June 28  
1985-1994

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	682	8	0	29	Kvichak	175	3	0	14
Egegik	1567	14	0	33	Naknek	163	9	0	22
Nushagak	171	4	0	15	Egegik	197	12	0	51
Togiak	22	7	0	26	Wood	62	6	0	28
Ugashik	67	2	1	4	Igushik	21	5	0	14
					Togiak	0	0	0	0
					Ugashik	0	0	0	0
All districts	2427	9	1	26					

1985, 1987-94 Port Moller sockeye index	Cumulative 6/28 through daily 6/28		Forecast of total run (millions)
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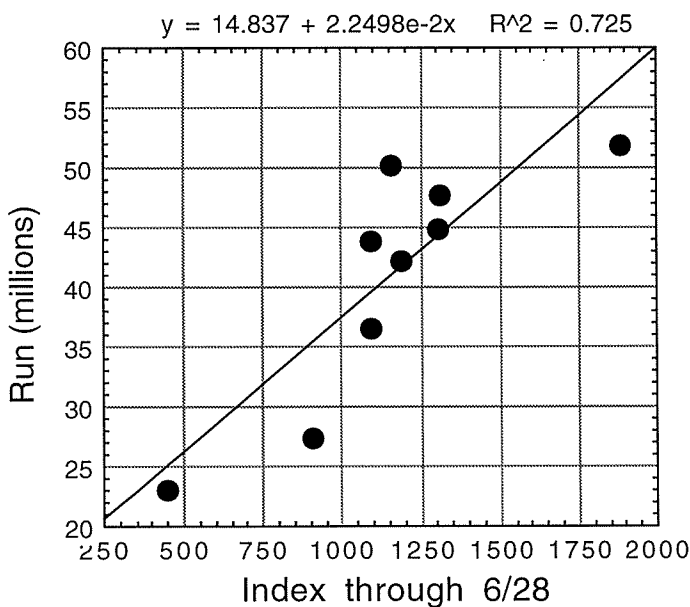
Average	150	1154
Lowest	37	450
Highest	302	1887

In past years the index through 6/28 accounted for 73% of the variation in Bristol Bay runs (84% excluding 1990 & 94, these data points are included for forecasting from this date on).  
(1995 cumulative index) X (.022 ) + ( 14.8 ) = total run

1995= ?

Bristol Bay runs 1985, 1987-94	
Average	41
Lowest	23
Highest	52

example: if 1995 index was 1154 (average for past years) we would forecast the total run by: (1154)X(.022)+14.8= 40.19, a run of 40 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 index (302) was made on 6/28/90.

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.

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  
1985-1994

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	1020	11	0	34	Kvichak	283	5	0	21
Egegik	1986	18	0	41	Naknek	244	13	0	32
Nushagak	274	7	0	26	Egegik	239	15	1	52
Togiak	26	8	0	31	Wood	83	8	0	33
Ugashik	93	2	1	6	Igushik	31	8	0	18
					Togiak	0	0	0	0
					Ugashik	0	0	0	0
All districts	3307	12	1	32					

1985, 1987-94 Port Moller sockeye index	Cumulative 6/29 daily	through 6/29	Forecast of total run (millions)
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Average	128	1280
Lowest	80	536
Highest	227	1993

In past years the index through 6/29 accounted for 75% of the variation in Bristol Bay runs

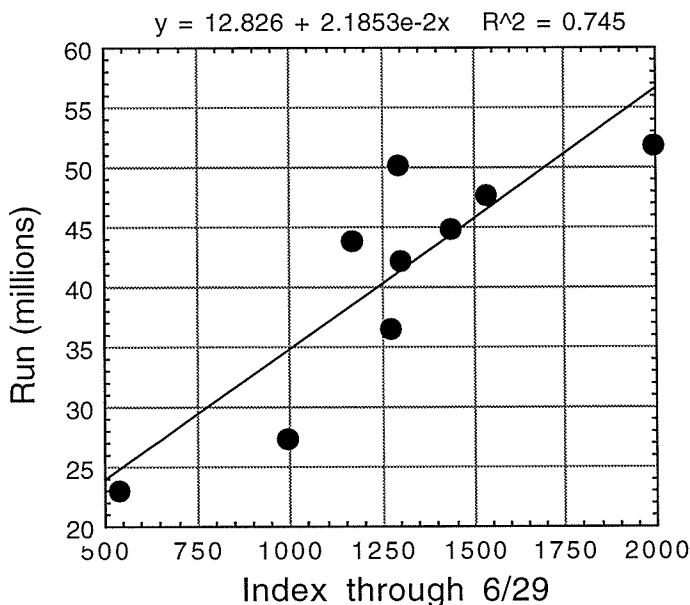
1995= ?

(1995 cumulative index) X (.022 ) + ( 12.8 ) = total run

Bristol Bay runs 1985, 1987-94

Average	41
Lowest	23
Highest	52

example: if 1995 index was 1993 (highest for past years) we would forecast the total run by: (1993)X(.022)+12.8= 56.65, 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 6/28 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 two Nushagak openings on 6/29 since 1985 (1989; 350,000 and 1993; 570,000).

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  
1985-1994

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	1430	14	0	39	Kvichak	419	7	0	23
Egegik	2358	23	4	44	Naknek	340	20	1	38
Nushagak	387	11	0	29	Egegik	287	18	2	52
Togiak	34	10	0	34	Wood	132	13	0	39
Ugashik	155	4	1	13	Igushik	39	11	0	21
					Togiak	0	0	0	2
					Ugashik	0	0	0	0
All districts	4261	16	2	35					

1985, 1987-94 Port Moller sockeye index	Cumulative 6/30 daily	Cumulative through 6/30	Forecast of total run (millions)
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Average 153 1433  
Lowest 23 593  
Highest 285 2232

In past years the index through 6/30 accounted for 76% of the variation in Bristol Bay runs

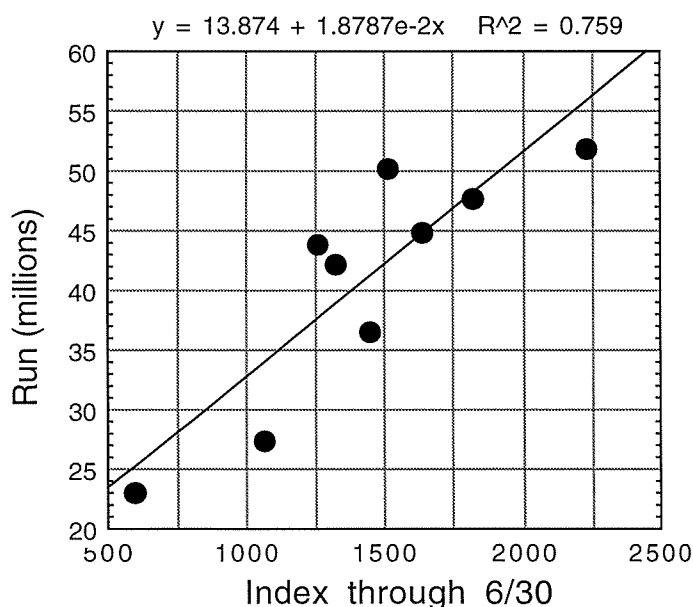
1995= ?

(1995 cumulative index) X (.019 ) + (1309 ) = total run

Bristol Bay run 1985, 1987-94

Average 41  
Lowest 23  
Highest 52

example: if 1995 index was 1433 (average for past years) we would forecast the total run by: (1433)X(.019)+13.9= 41.13, a run of 41 million



Comments

There was an unusually low index on this date in 1991 (23), but index catches averaged 169 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 1985, 16% of the Bristol Bay catch was made by the 30th; however, 20% of the Nushagak runs, 26% of the Naknek/Kvichak runs and 29% 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  
1985-1994

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	1710	19	0	46	Kvichak	574	10	0	25
Egegik	2742	27	4	57	Naknek	478	26	1	51
Nushagak	544	15	3	35	Egegik	350	22	4	54
Togiak	43	12	1	34	Wood	185	16	1	42
Ugashik	163	4	1	13	Igushik	48	12	1	27
All districts	5098	20	4	40	Togiak	1	1	0	5
					Ugashik	0	0	0	0

1985, 1987-94	Cumulative		Forecast of total run (millions)
Port Moller sockeye index	7/01 daily	through 7/01	

Average	107	1541
Lowest	22	643
Highest	202	2394

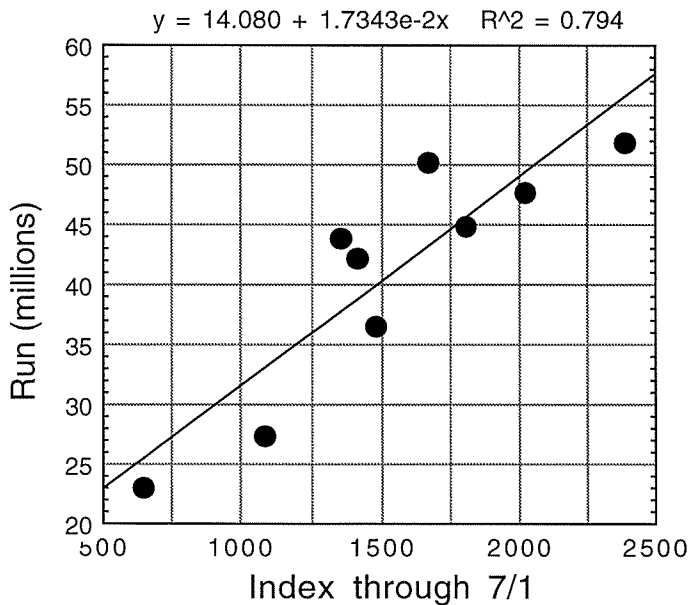
In past years the index through 7/1 accounted for 80% of the variation in Bristol Bay runs

1995= ?

(1995 cumulative index) X (.017 ) + (14.0 ) = total run

Bristol Bay runs 1985, 1987-94	
Average	41
Lowest	23
Highest	52

example: if 1995 index was 643 (lowest for past years) we would forecast the total run by: (643)X(.017)+14.0= 24.93, a run of 25 million



Comments

Over the past six years with runs over 40 million, the daily index catches ranged from 90 to 202 on July 1 and the cumulative indices were over 1350.

The average cumulative catch + escapement through 7/1 was 18% of the total Bristol Bay run (range: 4% in 1986 and 38% in 1993).

By July, 1 the Kvichak escapements were under way in all but 1986. In 1989 and 1993, 25% of the total escapement passed the tower by 7/1.

Through July 2  
1985-1994

District Catch	Cumulative through 7/2			
	average 1,000s	Percent of season total (%)		
		Average	Low	High
Naknek/Kvichak	2410	25	0	67
Egegik	3701	36	16	58
Nushagak	752	21	4	48
Togiak	53	15	2	34
Ugashik	206	5	1	17
All districts	7026	26	10	53

River Escapement	Cumulative through 7/2			
	average 1,000s	Percent of season total (%)		
		Average	Low	High
Kvichak	809	14	0	31
Naknek	650	35	13	65
Egegik	421	25	8	57
Wood	252	22	2	49
Igushik	58	15	1	30
Togiak	2	1	0	8
Ugashik	0	0	0	0

1985, 1987-94 Port Moller sockeye index	Cumulative 7/02 daily	through 7/02	Forecast of total run (millions)
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Average	107	1647
Lowest	26	693
Highest	244	2638

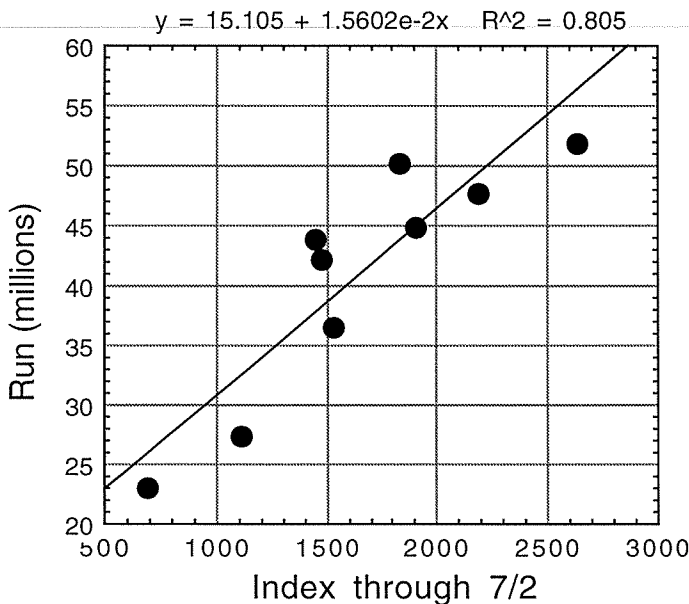
In past years the index through 7/2 accounted for 80% of the variation in Bristol Bay runs

1995= ?

(1995 cumulative index) X (.016 ) + (15.1 ) = total run

Bristol Bay runs 1985, 1987-94	
Average	40
Lowest	23
Highest	52

example: if 1995 index was 2638 (highest for past years) we would forecast the total run by: (2638)X(.016)+15.1= 57.31, a run of 57 million



Comments

Port Moller index catches on July 2 were over 60 when Bristol Bay runs were over 40 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 527,000 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 5 of the past 10 years.

Although an average of 26% of the seasons catch was made by 7/2, 41% of the Egegik runs, 38% of the Naknek/Kvichak runs and 31% 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  
1985-1994

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	2893	30	6	67	Kvichak	1127	20	1	40
Egegik	4237	41	23	66	Naknek	824	46	31	74
Nushagak	1014	29	11	56	Egegik	551	33	13	58
Togiak	63	18	7	34	Wood	373	32	3	65
Ugashik	387	9	1	27	Igushik	71	19	2	35
All districts	8499	32	13	59	Togiak	3	1	0	11
					Ugashik	0	0	0	0

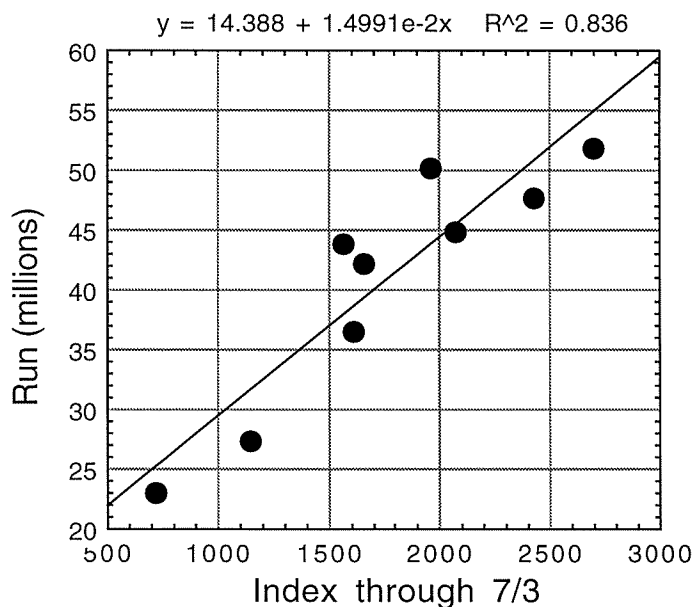
1985, 1987-94 Port Moller sockeye index	Cumulative 7/03 daily	through 7/03	Forecast of total run (millions)
Average	115	1762	In past years the index through 7/3 accounted for 84% of the variation in Bristol Bay runs
Lowest	28	722	
Highest	239	2701	

1995= ?

$$(1995 \text{ cumulative index}) \times (.015) + (14.4) = \text{total run}$$

Bristol Bay runs 1985, 1987-94	
Average	41
Lowest	23
Highest	52

example: if 1995 index was 2701 (highest for past years) we would forecast the total run by:  $(2701) \times (.015) + 14.4 = 54.92$ , a run of 55 million



**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 1,100,000 on 7/3. The Nushagak was open 9 of the past 10 years on 7/3 and catches averaged 291,000 per opening. Sockeye have usually arrived inside Ugashik Bay by July 3. Openings in 1986, 1987 and 1993 produced catches of 657,000, 793,000 and 260,000.

Total catch and escapement through July 3 as reported by ADF&G, has averaged 30% of the final run.

In each of the past 10 years the Naknek escapement has exceeded 300,000 by this date and the Egegik escapement has exceeded 300,000 in 8 of the past 10 years

Through July 4  
1985-1994

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	3496	36	6	73	Kvichak	1615	28	6	53
Egegik	4763	46	27	73	Naknek	957	53	36	80
Nushagak	1215	35	17	61	Egegik	696	41	23	60
Togiak	76	22	5	41	Wood	457	40	7	73
Ugashik	460	12	3	29	Igushik	90	25	2	41
All districts	9914	37	16	64	Togiak	4	2	0	13
					Ugashik	1	0	0	1

1985, 1987-94 Port Moller sockeye index	Cumulative 7/04 through 7/04		Forecast of total run (millions)
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Average	105	1867
Lowest	28	750
Highest	218	2772

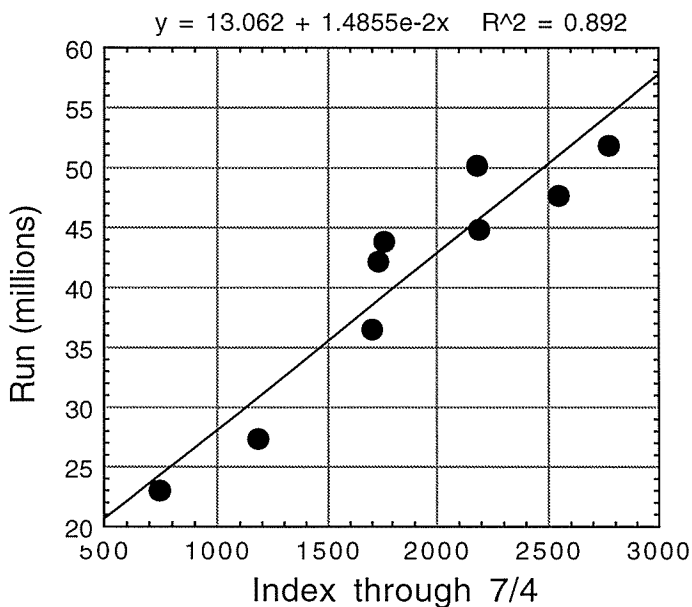
In past years the index through 7/4 accounted for 89% of the variation in Bristol Bay runs

1995= ?

(1995 cumulative index) X (.015 ) + (13.1) = total run

Bristol Bay runs 1985, 1987-94	
Average	41
Lowest	23
Highest	52

example: if 1995 index was 1867 (average for past years) we would forecast the total run by: (1867)X(.015)+13.1=41.11, a run of 41 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 90% 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 35% of the final runs since 1985 (range: 16% in 1994 to 60% in 1993).

Through July 5  
1985-1994

District Catch	Cumulative through 7/5				River Escapement	Cumulative through 7/5			
	average 1,000s	Percent of season total (%)				average 1,000s	Percent of season total (%)		
		Average	Low	High			Average	Low	High
Naknek/Kvichak	4219	44	6	78	Kvichak	2102	37	18	65
Egegik	5361	52	36	78	Naknek	1022	57	39	81
Nushagak	1381	39	17	67	Egegik	840	49	34	65
Togiak	88	24	8	48	Wood	502	44	11	79
Ugashik	604	15	3	31	Igushik	116	31	5	48
All districts	11557	43	21	70	Togiak	6	2	0	15
					Ugashik	8	1	0	4

1985, 1987-94 Port Moller sockeye index	Cumulative 7/05 through 7/05		Forecast of total run (millions)
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Average	102	1969
Lowest	53	803
Highest	146	2877

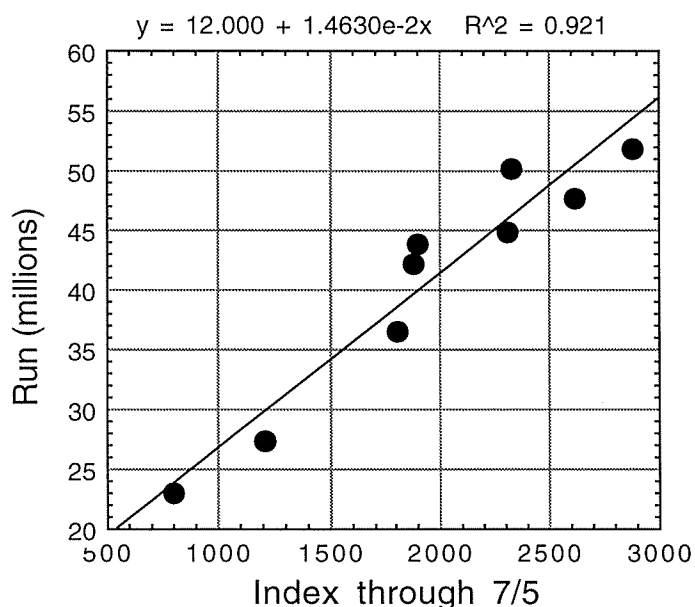
In past years the index through 7/5 accounted for 92% of the variation in Bristol Bay runs

1995= ?

(1995 cumulative index) X (.015 ) + (12.0) = total run

Bristol Bay runs 1985, 1987-94	
Average	41
Lowest	23
Highest	52

example: if 1995 index was 2877 (highest for past years) we would forecast the total run by: (2877)X(.015)+12.0= 55.16, a run of 55 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 287,000. The Egegik run is still near the peak and catches have averaged 748,000 on this date, whereas Naknek/Kvichak catches averaged 803,000. There were only 5 openings on the 5th in the Nushagak district, and catches on those openings averaged 330,000.

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.

Through July 6  
1985-1994

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	4733	49	9	82	Kvichak	2509	44	23	71
Egegik	5937	58	45	83	Naknek	1078	61	45	82
Nushagak	1586	46	28	77	Egegik	1003	59	44	78
Togiak	98	26	11	49	Wood	556	49	16	83
Ugashik	780	19	7	40	Igushik	145	38	12	61
					Togiak	9	3	0	16
					Ugashik	19	1	0	9
All districts	13038	48	28	75					

1985, 1987-94 Port Moller sockeye index	Cumulative 7/06 daily	through 7/06	Forecast of total run (millions)
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Average	97	2056
Lowest	28	831
Highest	136	2967

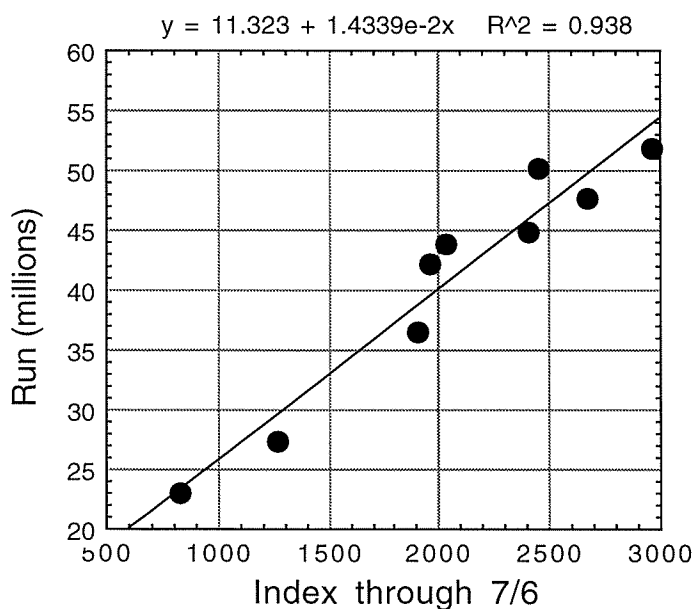
In past years the index through 7/6 accounted for 94% of the variation in Bristol Bay runs

1995= ?

(1995 cumulative index) X (.014 ) + (11.3) = total run

Bristol Bay runs 1985, 1987-94	
Average	41
Lowest	23
Highest	52

example: if 1995 index was 2056 (average for past years) we would forecast the total run by: (2056)X(.014)+11.3= 40.08, a run of 40 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 nearly half of the total Bristol Bay catch (48%) since 1985. For the years with openings on 7/6, Nushagak catches averaged 330,000; Egegik catches averaged 794,000 and Naknek/Kvichak catches averaged 492,000. For 5 openings on this date in Ugashik the catches averaged 290,000.

On the average, 44% of the Bristol Bay escapement was counted by 7/6 and the total catch + escapement as reported by ADF&G through July 6 averaged 47% the final runs (range: 30% in 1994 to 72% in 1993).

Through July 7  
1985-1994

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	5242	53	11	87	Kvichak	2850	50	23	79
Egegik	6490	64	51	87	Naknek	1151	67	48	83
Nushagak	1777	51	28	78	Egegik	1123	66	53	86
Togiak	109	29	12	49	Wood	628	55	21	86
Ugashik	1012	25	7	51	Igushik	169	44	17	69
All districts	14537	53	37	80	Togiak	14	5	0	19
					Ugashik	41	3	0	15

1985, 1987-94	Cumulative		Forecast of total run (millions)
Port Moller sockeye index	7/07 daily	through 7/07	
only 4 years			
Average			
Lowest	42	873	
Highest	112	3053	

1995= ?

No forecast until more years sampled through this date.

Bristol Bay runs 1985, 1987-94

Average	41
Lowest	23
Highest	52

Comments

1985, 1987-94

Sockeye salmon passing by Port Moller today and tomorrow will probably be in the fishing districts by July 15. Bristol Bay catches (except at Ugashik) decline substantially after the 15th, even in years with late runs. In another year or two we will make daily forecasts through July 8.

On the average through July 7 (1985-1994) 68% of the Egegik runs, 67% of the Naknek/Kvichak runs, and 61% of the Nushagak runs had passed through the fishing districts, but only 64%, 53% and 51% of the catches were made by July 7. Fishing is usually continuous from now until the 20th.

Total Bristol Bay catch + escapement through July 7 (reported by ADF&G) averaged 52% of the final runs (range: 38% in 1986 and 1994 to 77% in 1993).

About half of the Kvichak escapement was reached by this date and escapement goals to all but Togiak and Ugashik are usually achieved by July 7.