



Forecasting Pink Salmon Harvest in Southeast Alaska using Ecosystem Metrics from the Southeast Alaska Coastal Monitoring (SECM) Project

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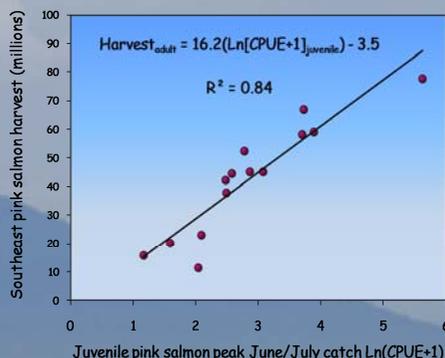
Researchers from the **Auke Bay Laboratories** of the **Alaska Fisheries Science Center** have provided forecasting information to stakeholders of the pink salmon resource of Southeast Alaska (SEAK) since 2004. The forecasting parameters are derived from an ongoing time series of data collected by the **Southeast Alaska Coastal Monitoring (SECM)** project. The SECM pink salmon forecasts enable stakeholders to anticipate the harvest with more certainty than previous forecasting methods have allowed. In seven of the past eight years, these forecast estimates have deviated from the actual pink salmon harvests by an average of only 7%. Accurate pre-season SECM pink salmon harvest forecasts help to increase the economic efficiency of the commercial salmon fisheries in SEAK and also help to promote resource sustainability.



http://www.afsc.noaa.gov/ABL/MSI/msi_sae_psf.htm

Methods:

1. Collect SECM ecosystem data during surveys in the Icy Strait vicinity: May-June-July-August
2. Evaluate SECM biophysical metrics to develop the "best" forecast model
3. Share SECM data with the Alaska Department of Fish & Game
4. Present SECM pre-season pink salmon harvest forecast to resource stakeholders

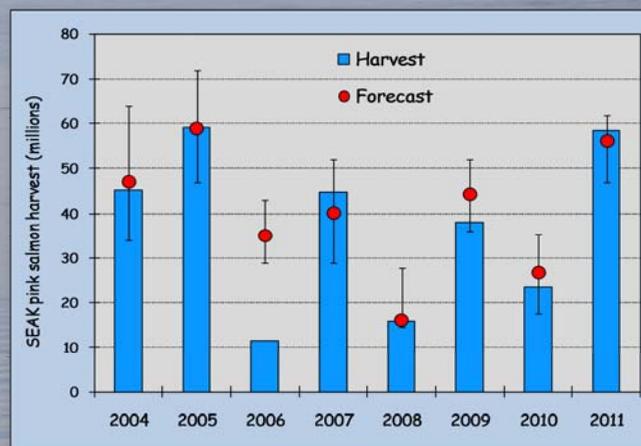


Assumptions:

1. Icy Strait CPUE represents the entire SEAK region
2. The monthly "peak" CPUE adequately captures the magnitude of the seaward migration signal
3. No significant mortality events occur after juvenile salmon enter the ocean
4. Interannual trawling efficiency of survey vessels is accounted for

"BEST" values (upper 3")		"OK" values (middle 3")				"WORST" values (lower 3")			
Ecosystem metrics (over the SECM time series) considered for forecasting pink salmon harvest to Southeast Alaska for 2012		BY +1		BY		BY +1		BY +1	
Adult pink salmon return year	SEAK pink harvest (increase variable)	Close entry year	Juvenile peak pink CPUE _{max} July	Peak seaward migration month	W/Bic Index (June, July, Aug)	W/Bic Index (pink in juvenile salmon catch)	NSFAS adult pink escapement index SEAK	Male Creek fry migration (000s) Lat 58°N	Upper water column Icy Strait (0-20m) Icy Strait temperature - May
Data sources	→	NOAA	NOAA	GSD	NOAA	ADFG	NOAA	NOAA	
1998	42.5	1997	2.5	July	15.8	18%	19.1	15.1	7.3
1999	77.8	1998	5.6	June	18.1	69%	14.8	60.8	7.8
2000	20.2	1999	1.8	July	15.8	22%	14.3	53.0	6.5
2001	67.0	2000	3.7	July	17.0	25%	27.3	132.1	6.5
2002	45.3	2001	2.9	July	16.8	39%	20.8	61.5	7.1
2003	52.5	2002	2.8	July	15.6	48%	18.6	150.1	6.4
2004	45.3	2003	3.1	July	16.1	42%	16.6	95.1	7.4
2005	59.1	2004	3.9	June	18.3	40%	20.0	169.6	7.6
2006	11.6	2005	2.0	Aug	15.5	31%	15.7	87.9	8.1
2007	44.8	2006	2.6	June	17.0	44%	19.9	65.9	6.7
2008	15.9	2007	1.2	Aug	15.7	21%	10.2	81.9	7.0
2009	38.0	2008	2.5	Aug	16.1	59%	17.6	117.6	6.1
2010	23.4	2009	2.1	Aug	15.3	24%	9.8	34.8	7.3
2011	58.5	2010	3.7	June	17.6	59%	12.7	121.6	8.1
2012	77.7	2011	1.3	Aug	15.7	36%	11.2	30.9	6.7
Pearson correlation "r" ² =		0.92	-0.75	0.64	0.63	0.48	0.40	0.08	
P-value (* = significant @ <0.05) =		0.00*	0.00*	0.01*	0.02*	0.08	0.16	0.79	

Ecosystem metrics and SEAK pink salmon harvest



Pink salmon forecast model accuracy: 2004-2011