

Pacific salmon of Kamchatka and Alaska: past, nowadays and future

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This paper represents results of the analysis of the Pacific salmon stock dynamics of the main reproduction areas of North Pacific: Kamchatka and Alaska, from 1920s to now. Also the biological production characteristics or indexes (average body weight) were examined more detailed.

For analysis were used data of the commercial catch of 5 Pacific salmon species – pink, chum, sockeye, coho, and chinook - represented in the next special publications of the both countries: USA and Russia, and data of NPAFC organization (1-4).

All statistical data were divided into 3 periods in both areas: 1 – 1925-1970 – decrease of commercial catches (“past”); 2 – 1971-2000 – restoration of salmon abundance (“nowadays”), and 3 – 2001-2009 – highest salmon abundance (“future”). We found 3 peaks of high commercial catches in both areas in the each period: in Alaska – 1937, 1995, and 2007; in Kamchatka – 1928, 1997, and 2007 (see Figures). But, during last 20 years the highest commercial catches in Kamchatka were observed two years later than in Alaska (next 3 peak of commercial catch in Kamchatka will be 2009 – our prognosis).

During last period proportion of different species of Pacific salmon has a high variation (Figures). In Southeastern and Central Alaska commercial catches of pink salmon decrease, and in Western Alaska increase. In Eastern and Western Kamchatka commercial catches of chum and sockeye salmon increase, and pink salmon Eastern Kamchatka also increase. Besides, the highest commercial runs met in the north regions in both areas.

Average body weight of all Pacific salmon species in different regions has a large variability during last 37 years. So, average body weight of chum salmon decreased from 7 to 26.3% everywhere (excluding Primorie), and pink salmon mostly increases from 1.4 to 16.8% (table 1). Only in 3 regions – Primorie, Amur and Western Sakhalin average body weight of pink salmon decreases from 7.9 to 21.7%. Average body weight of three others species has a different situation (table 2). But, the better food supply of Pacific salmon met in the Sea of Okhotsk, where average body weight of all Pacific salmon species has a positive tendency. On the contrary there is a negative tendency in the Bering Sea, where the average of the body weight of some Pacific salmon population decreases. In our opinion this situation coincides with the density-dependant salmon stocks in both reproduction areas occupy the Bering Sea during feeding period, which reproducing in the both continents - Asia and North America. These data allow conclude that the forage base in the Bering Sea has a limitation according the Pacific salmon population for the both reproduction areas.

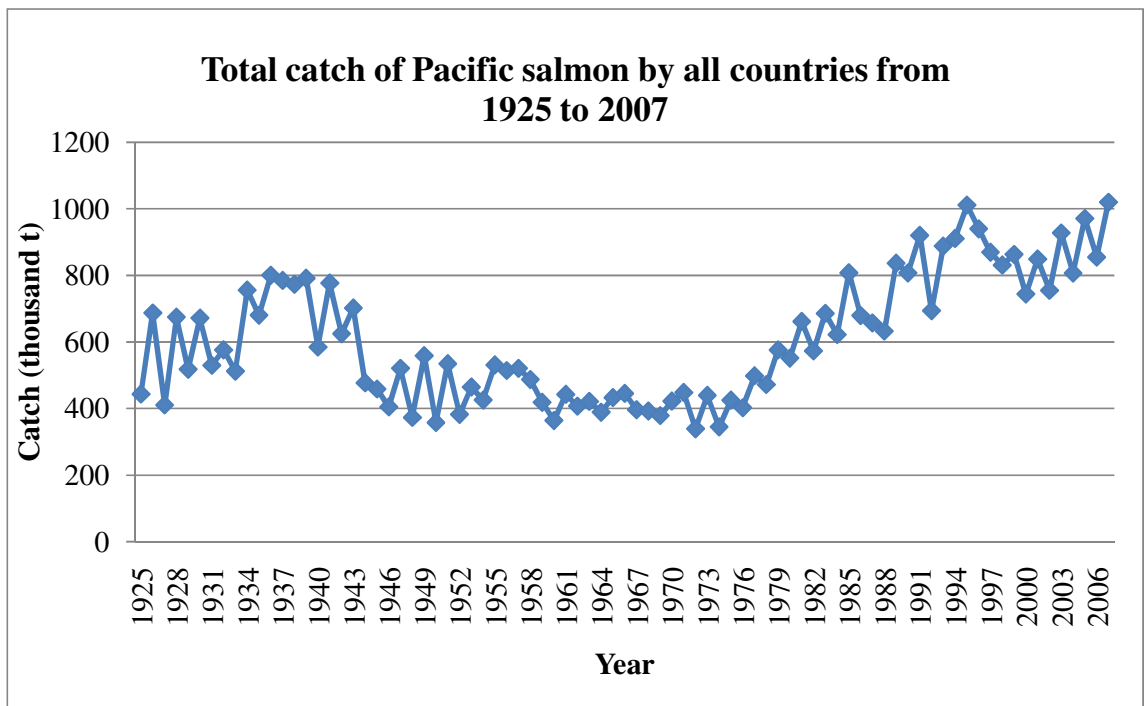
Results and conclusions for last period:

- 1 – in Asia and North America the Pacific salmon occupy the north regions;
- 2 – in Kamchatka the structure of commercial catches changes: increase portion chum and sockeye salmon in the catches;
- 3 – in some regions of Alaska the commercial catches of pink salmon decrease; other species are in the stable level;
- 4 – everywhere the average body weight of all species (excluding pink in Kamchatka) decreases. The highest changes of the body weight has chum salmon;

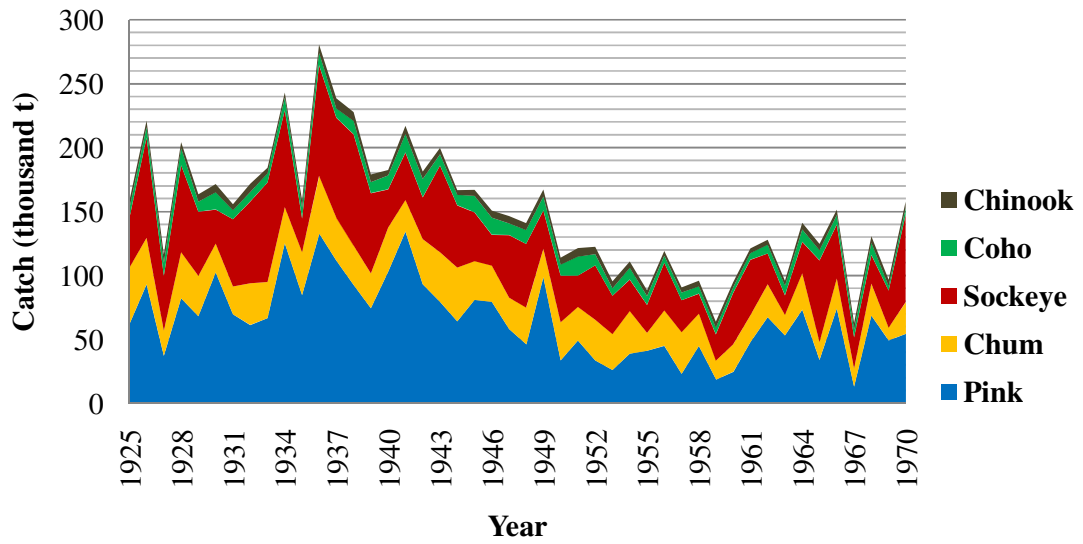
5 – next 2 years the commercial catches will be increased in Kamchatka, and slowly decreased in Alaska.

Literature

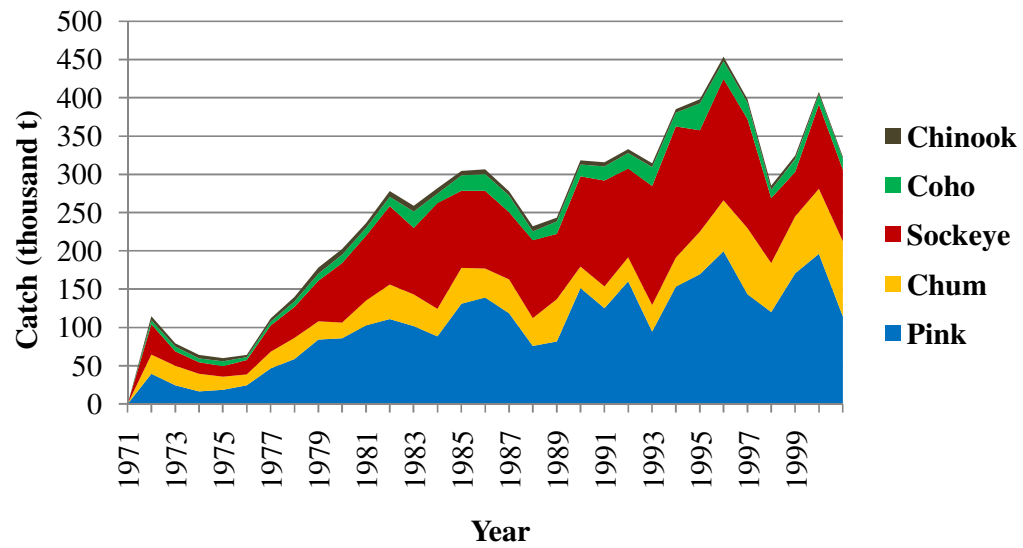
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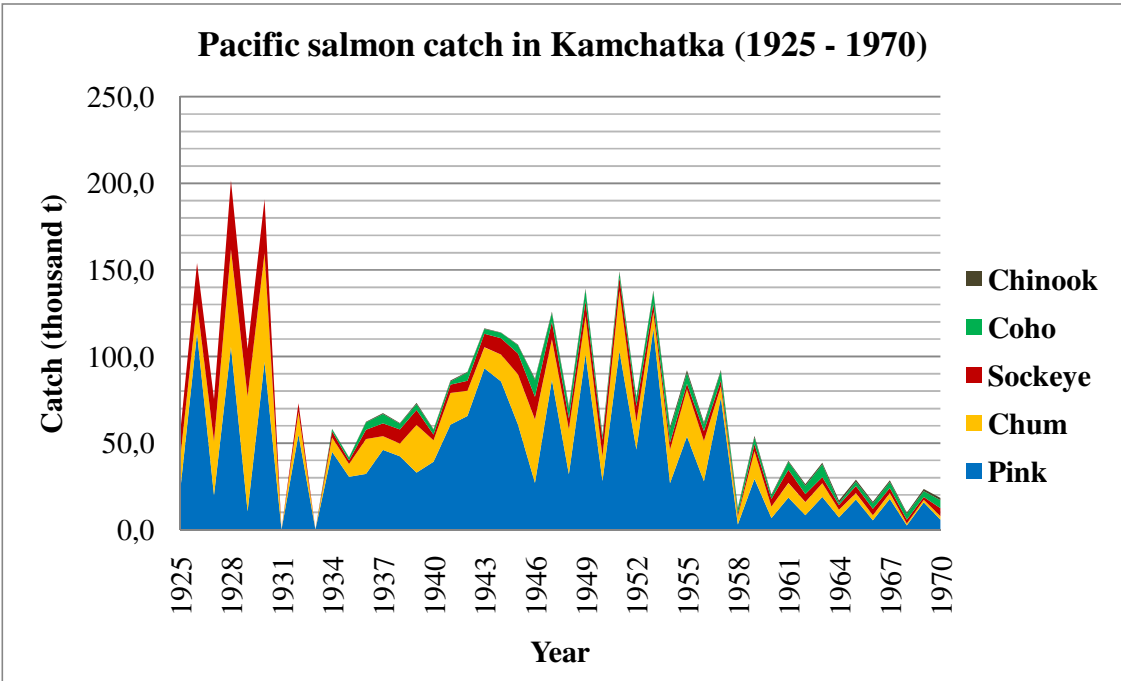
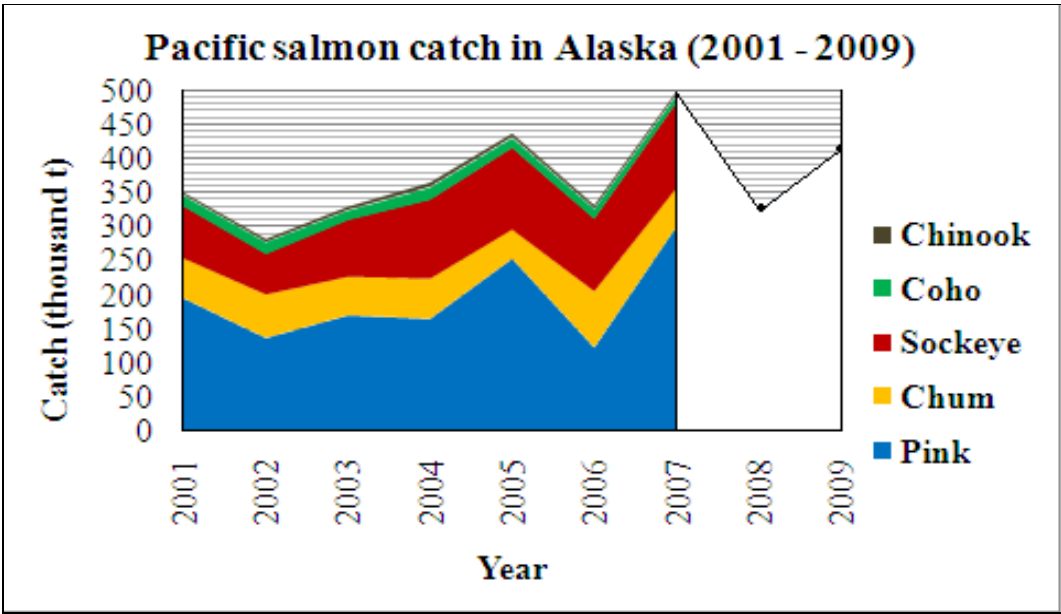


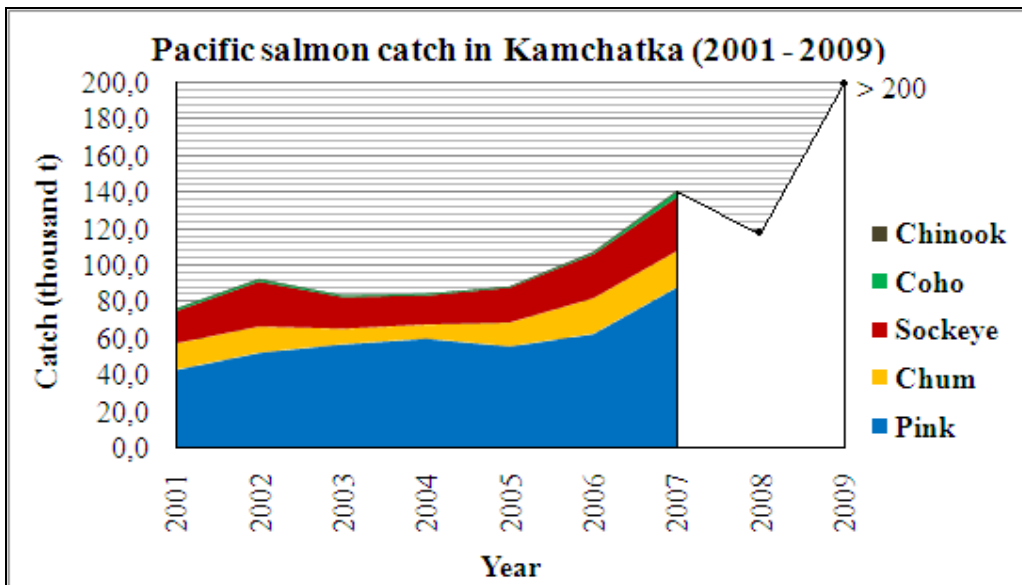
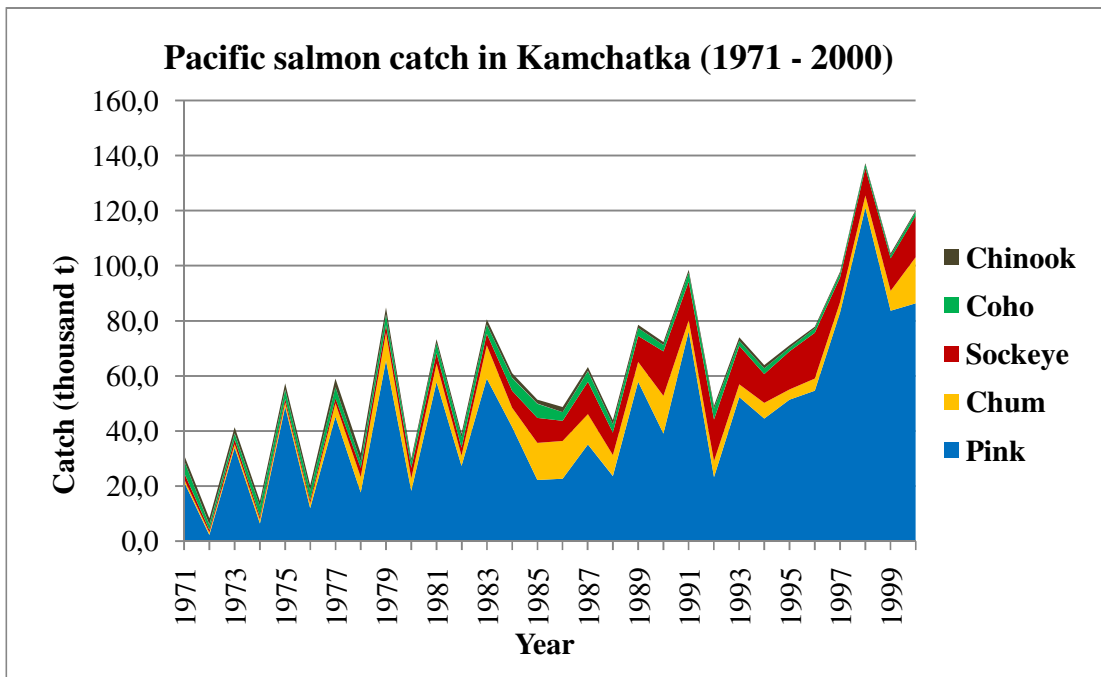
Pacific salmon catch in Alaska (1925 - 1970)



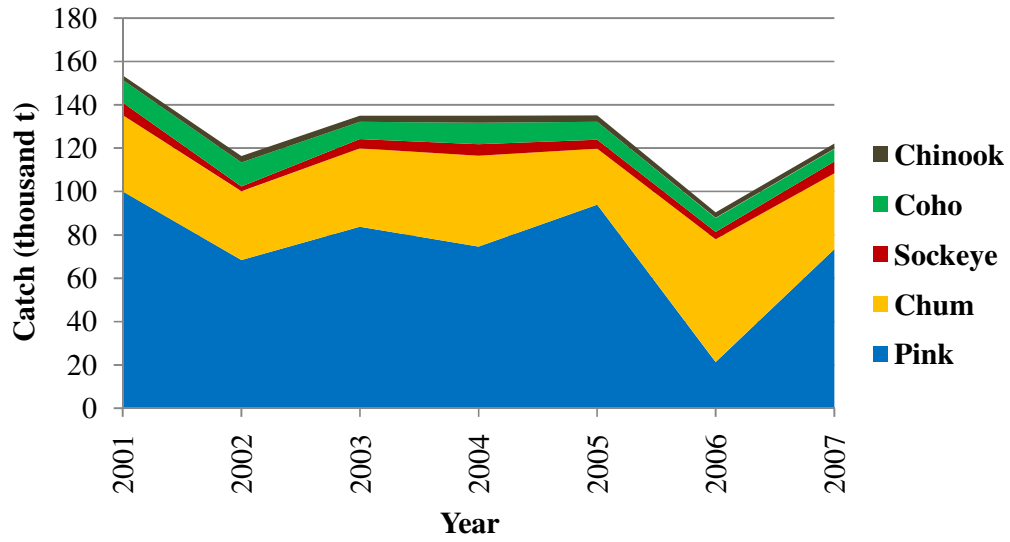
Pacific salmon catch in Alaska (1971 - 2000)



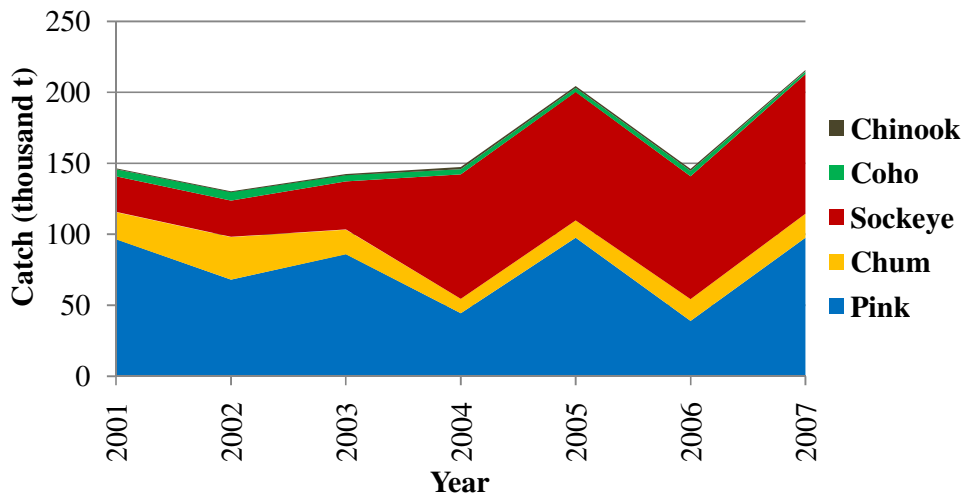




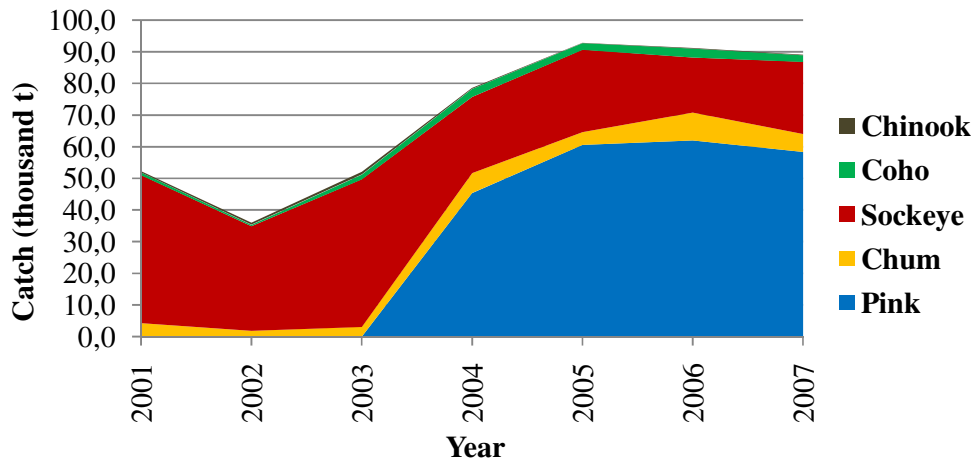
**Pacific salmon catch in Southeastern Alaska
(2001 - 2007)**



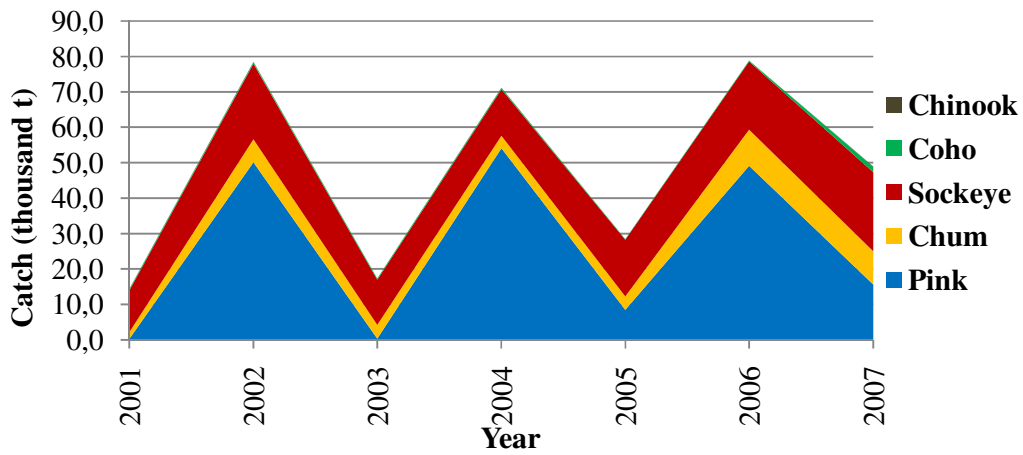
**Pacific salmon catch in Central Alaska
(2001 - 2007)**

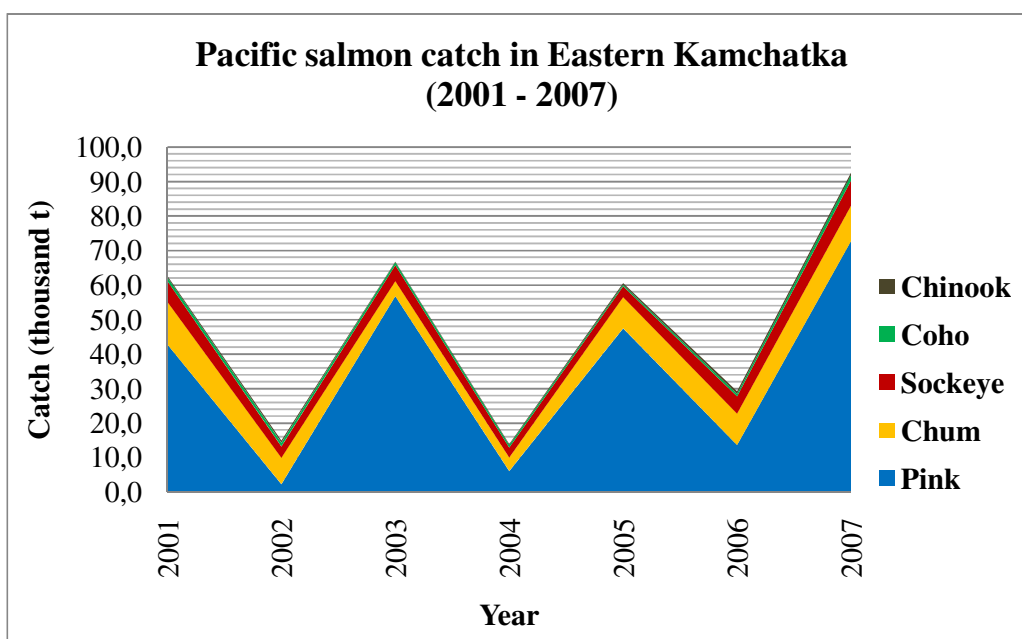


**Pacific salmon catch in Western Alaska
(2001 - 2006)**



**Pacific salmon catch in Western Kamchatka
(2001 - 2007)**





Productivity index (average body weight, kg)

Table 1

Average body weight (kg) pink and chum salmon in different region of Far East and its changes (%) from 1970-s to 2000-s

Region	Pink salmon, kg/%		Chum salmon, kg/%	
Primorie	1.48	-11.0	3.57	+3.8
Amur	1.24	-21.7	3.37	-18.0
Kuril Island	1.32	+10.2	3.78	-8.4
Western Sakhalin	1.24	-7.9	3.61	-7.0
Eastern Sakhalin	1.24	+8.2	3.58	-25.6
North coast of the Sea of Okhotsk	1.27	+5.6	3.78	-7.0
Western Kamchatka	1.44	+16.8	3.64	-12.1
Eastern Kamchatka	1.26	+13.8	3.53	-19.0
Anadyr	1.35	+1.4	3.58	-7.2
Japan (M. Kaeryama)*	-	-	-	-26.3
North Pacific (J. Helle)*	-	-	-	-25.6

* - Information of Salmon Symposium, 2008, Seattle

Table 2

Average body weight (kg) sockeye, coho and chinook salmon in different region of Far East and its changes (%) from 1970-s to 2000-s

Species	Western Kamchatka		Eastern Kamchatka		North coast of the Sea of Okhotsk		Anadyr	
Sockeye	2.80	+3.1	2.63	-4.4	2.59	-2.0	3.33	+1.2

salmon								
Coho salmon	3.05	+0.6	3.11	-10.3	3.86	+6.1	-	-
Chinook salmon	9.36	-45.1	8.42	-29.1	-	-	-	-