

Feeding habits plasticity of maturing masu salmon (*Oncorhynchus masou*) in the Sea of Japan, under the different ages.

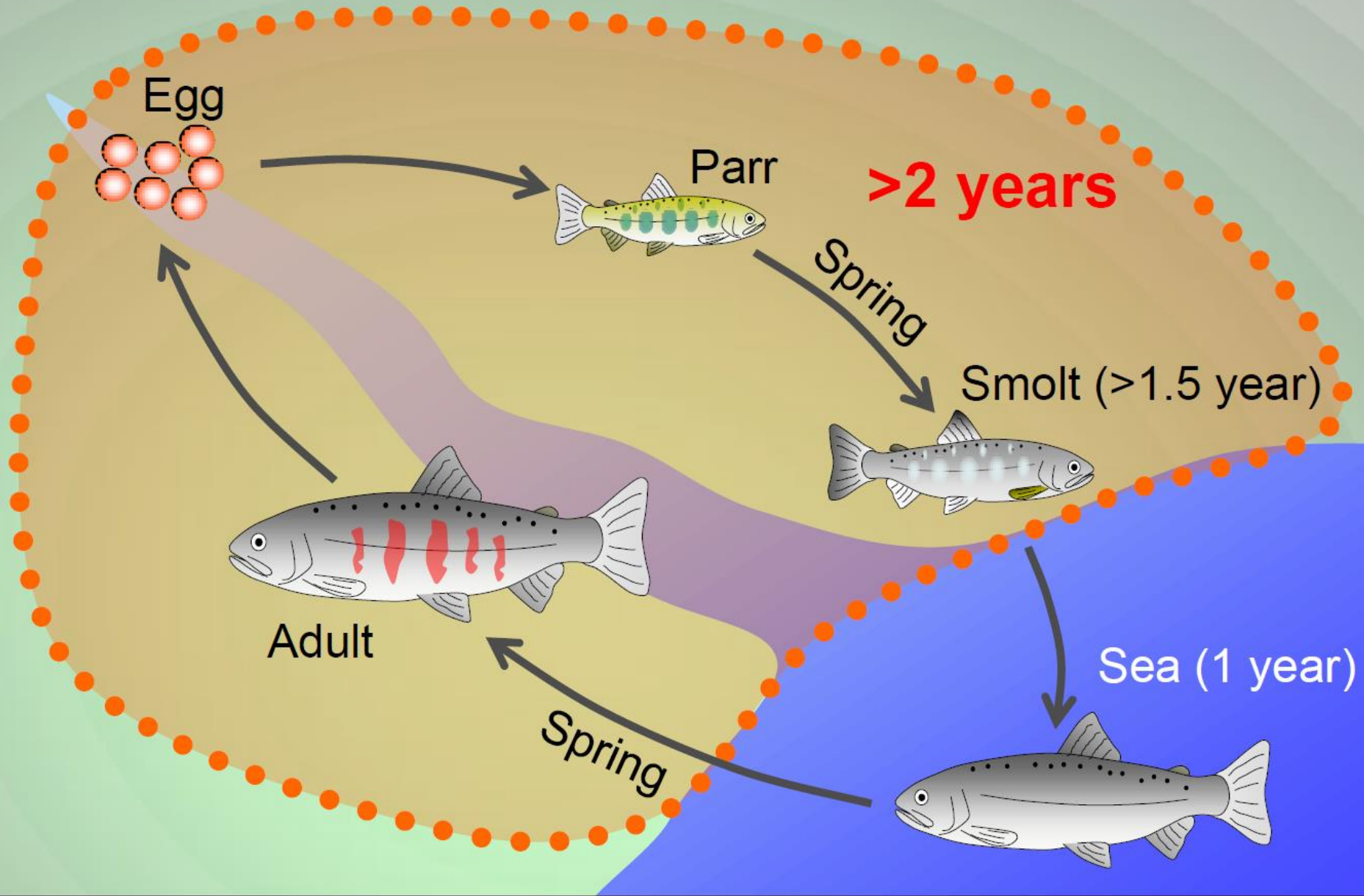
Toru Nagasawa (HNFRI FRA Japan)



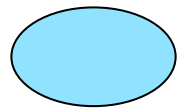
Large one(Typical deep-body “Ita-masu”) FL: 722mm , Small one FL; 315 mm

Photo H. Mayama

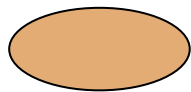
Masu salmon life history



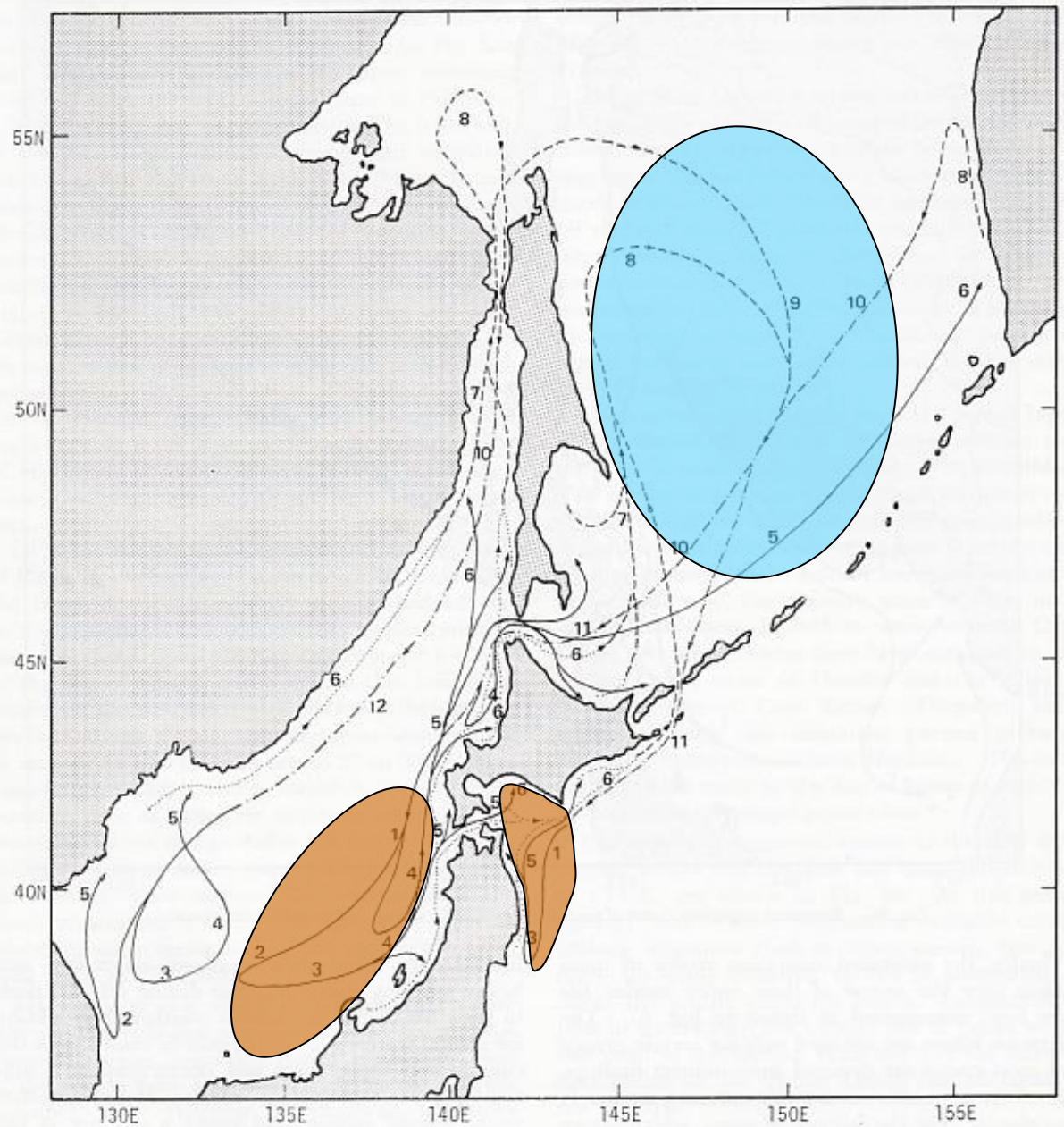
Migration model of masu salmon (Machidori and Kato, 1984)



Summer distribution

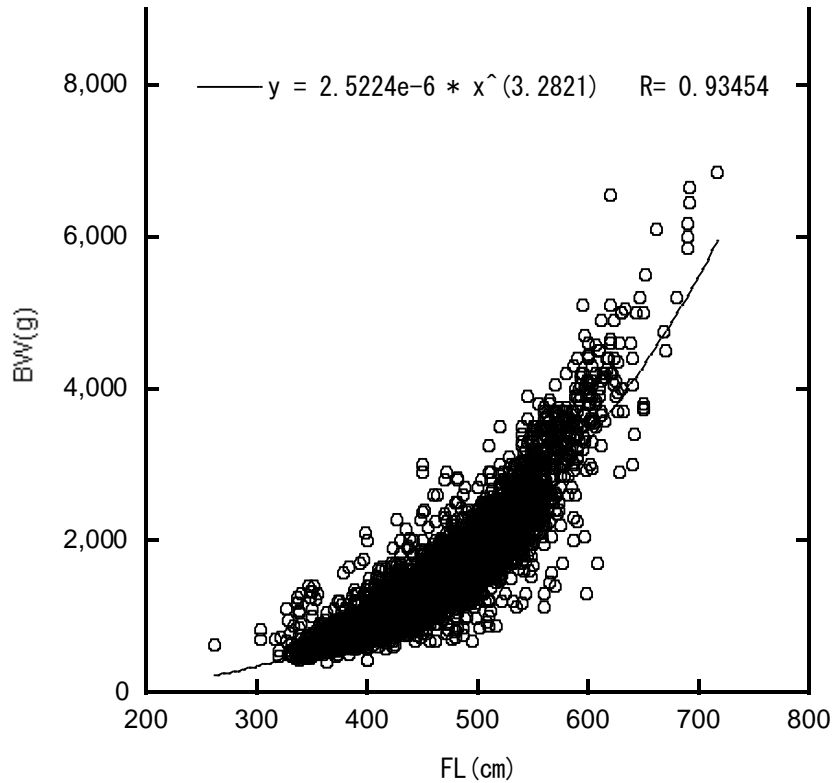


Overwintering and Spring distribution

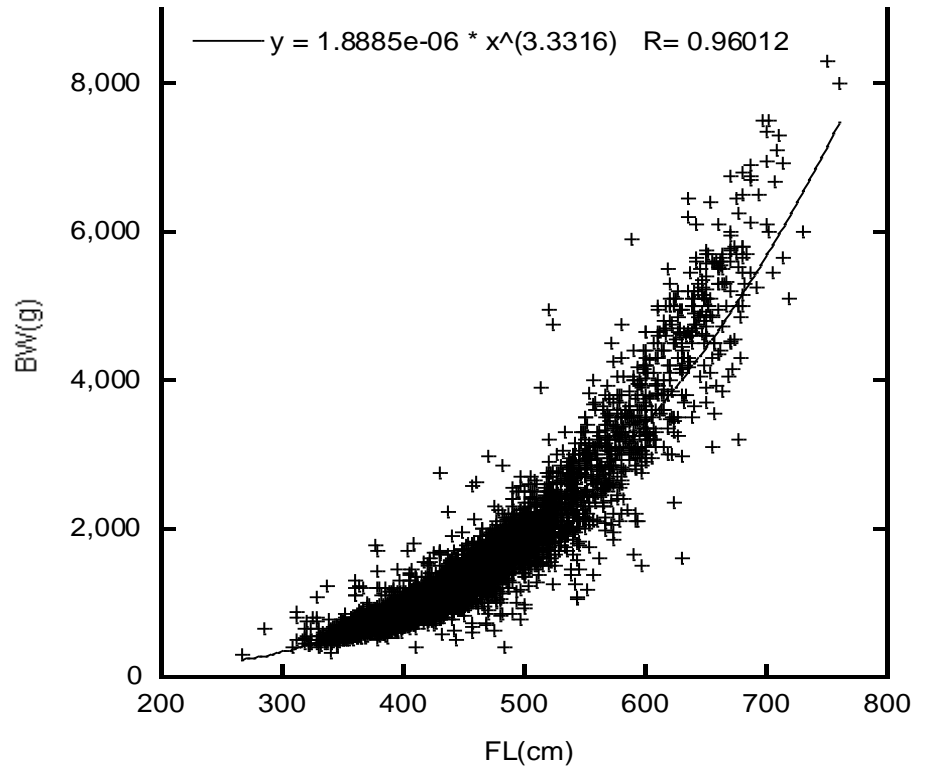


Relationships between folk length and body weight of masu salmon collected by driftle nets survey operations in the Sea of Japan in spring.

Female



Male



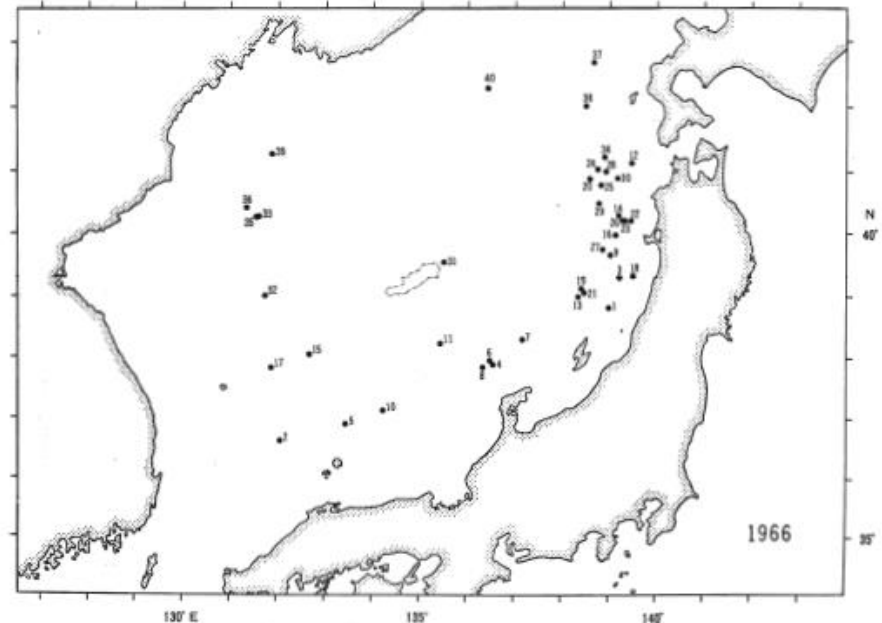
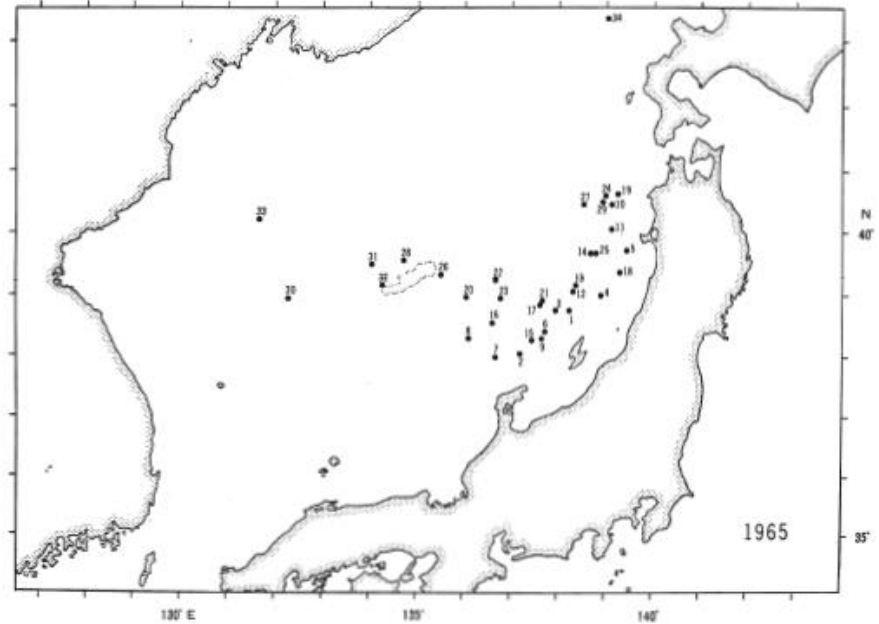
Variation of masu salmon body size caught at same day in E- May



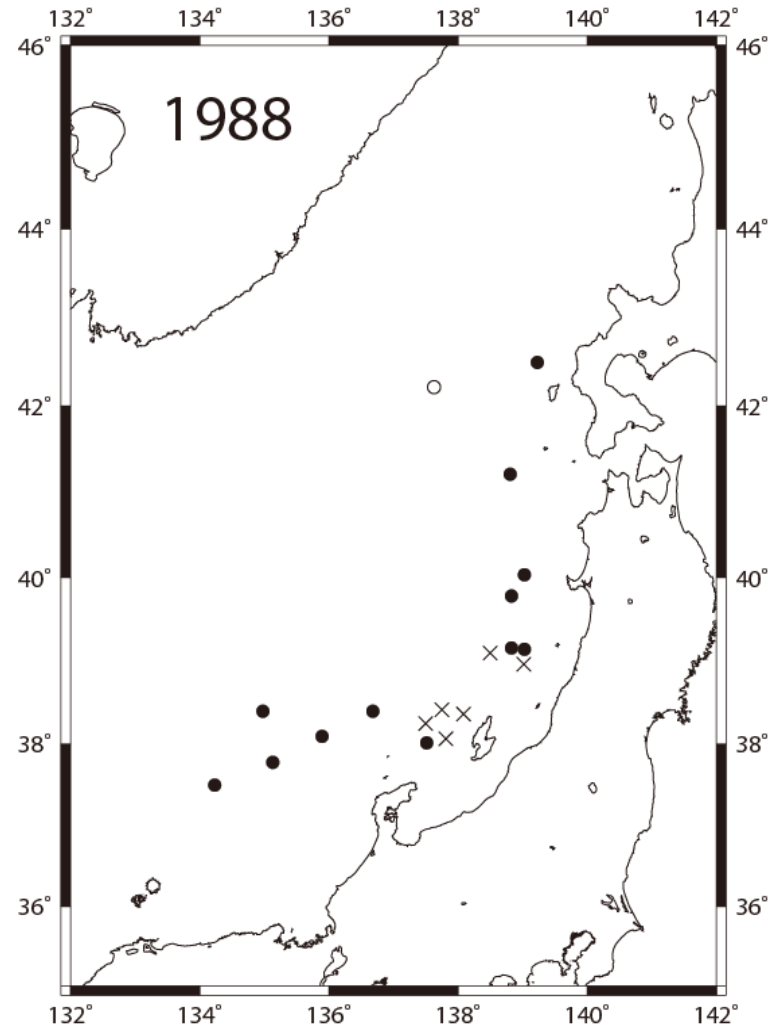
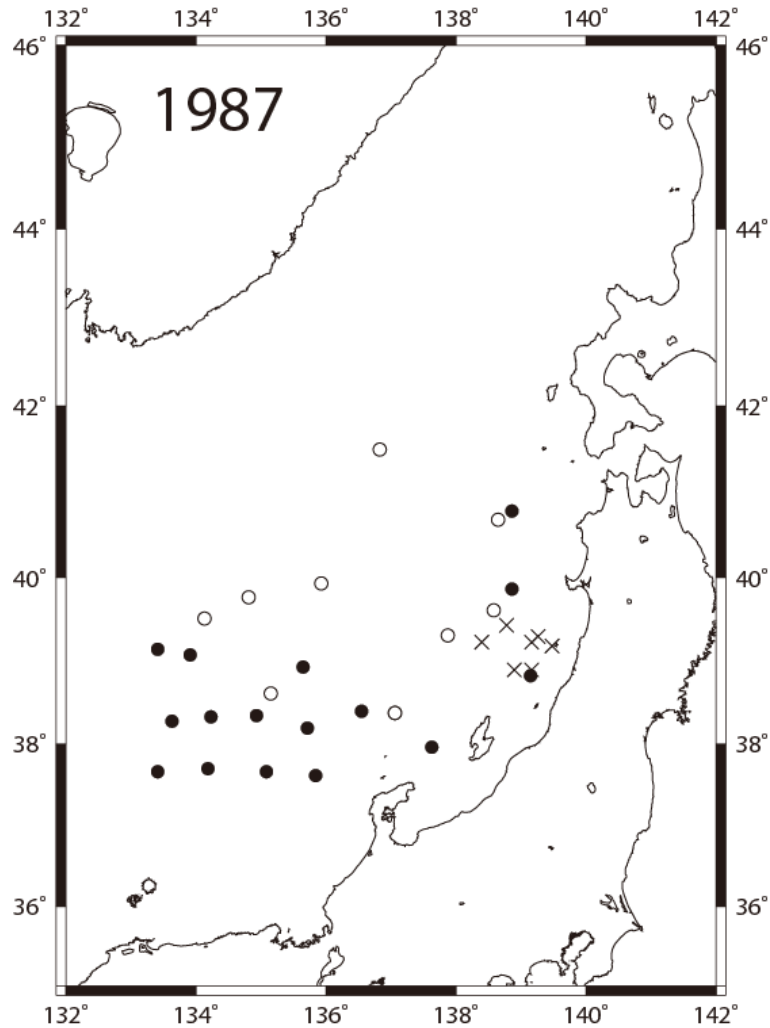
Large one(Typical deep-body “Ita-masu”) FL: 722mm , Small one FL; 315 mm
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Previous study of maturing masu salmon feeding habits by Fukataki (1969)

- Masu salmon was more piscivorous compared to pink salmon.
- Dominant prey were two large plankton species *Themist japonica* and *Thysanoessa longipes* with four fishes (arabesque greenling, sand fish, sand lance and saury)
- He use **Feeding Intensity Index** to describe the stomach contents fullness of the each sampling station.
$$FII = \frac{\sum(SCW)}{\sum(BW - SCW)} \times 100$$
where SCW is the stomach contents weight (g) and BW is body weight (g).

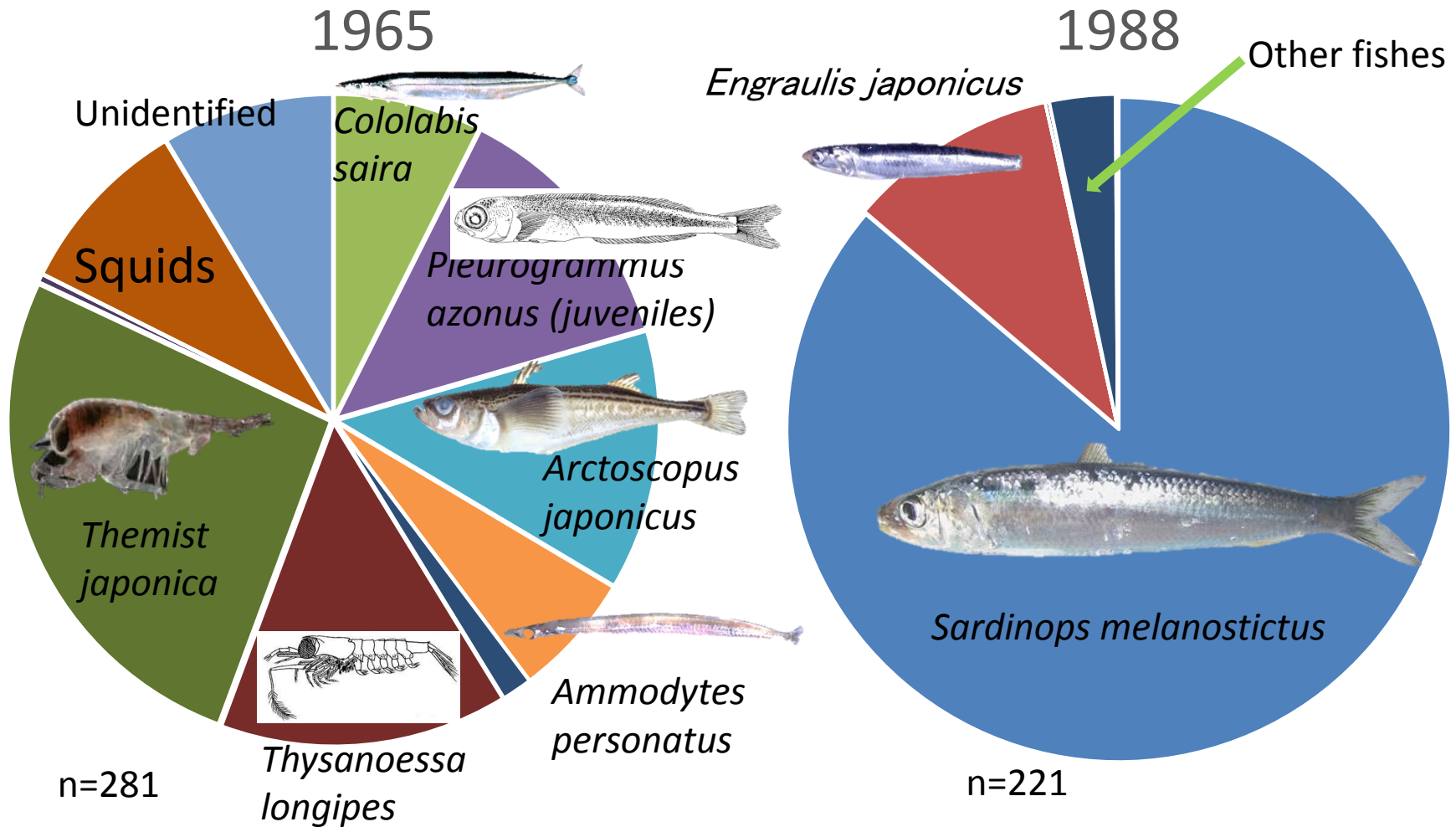


Sampling locations in late 1980'S



× : March ● : April ○ : May

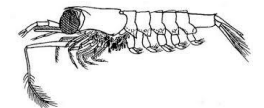
Comparison of stomach contents prey composition of masu salmon (in wet weight) between 1965 and 1988



Fukataki (1969)

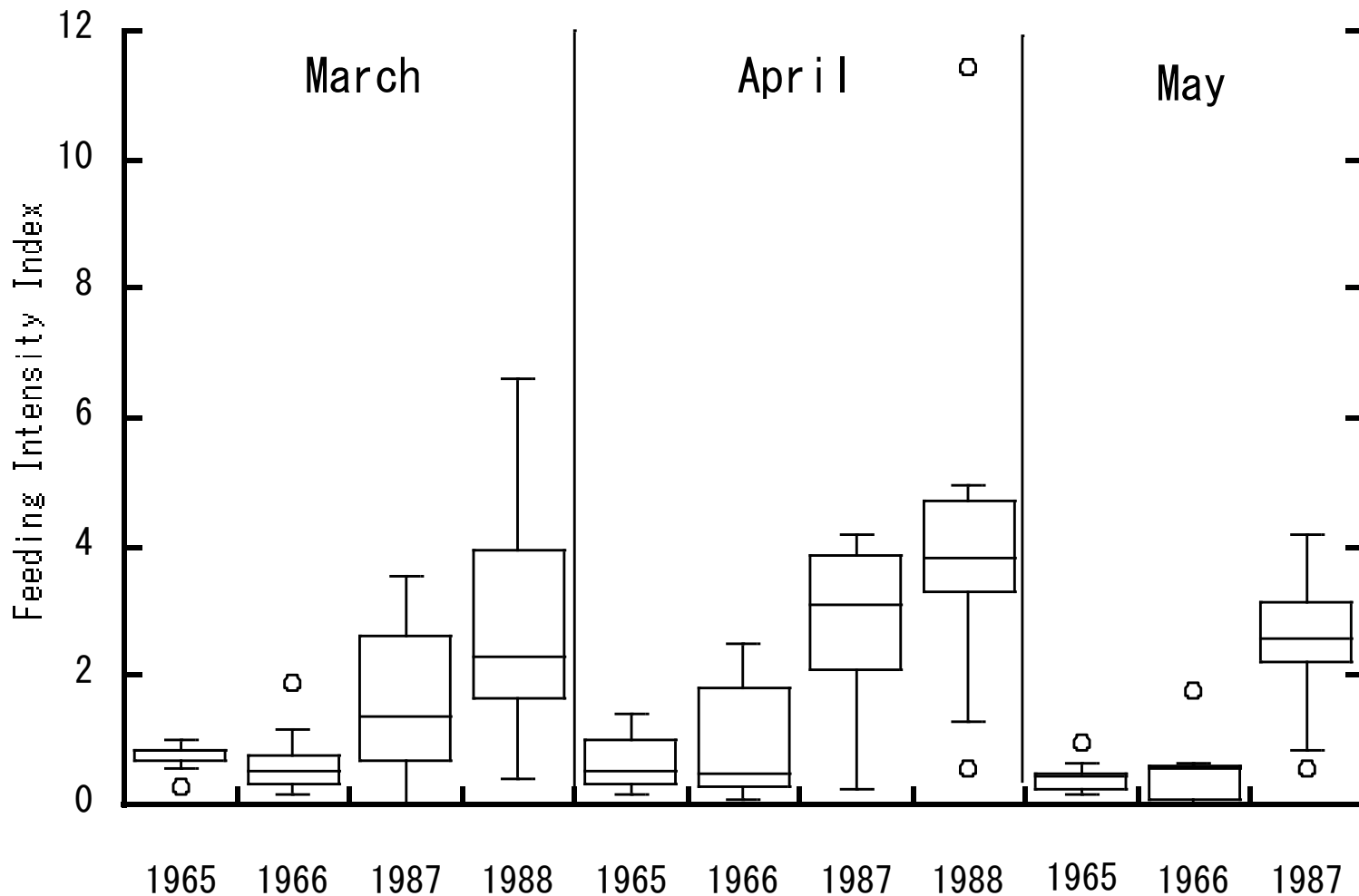
Comparison of wet weight composition of prey organisms from masu salmon stomachs between 1960's and 1980'

Year	1965	1966	1987	1988
Food prey category				
Fishes				
<i>Sardinops melanostictus</i>	-		83.2	86.3
<i>Engraulis japonicus</i>	-	+	11.4	10.3
<i>Cololabis saira</i>	7.4	18.9	1.1	-
<i>Pleurogammus azonus</i>	13.1	3.3	2.9	0.2
<i>Arctoscopus japonicus</i>	13.0	3.3	0.0	0.0
<i>Ammodytes personatus</i>	6.2	7.5	0.3	0.0
Other fishes	1.5	5.4	0.4	3.2
Crustaceans				
Euphausiids				
<i>Thysanoessa longipes</i>	14.4	24.8	0.0	0.1
Amphipods				
<i>Themist japonica</i>	26.3	22.5	0.1	0.0
Other Crustaceans'	0.4	1.4	0.0	0.0
Insects	-	0.6	-	-
Squid	9.0	7.4	-	-
Unidentified	8.6	5.0	0.0	0.0



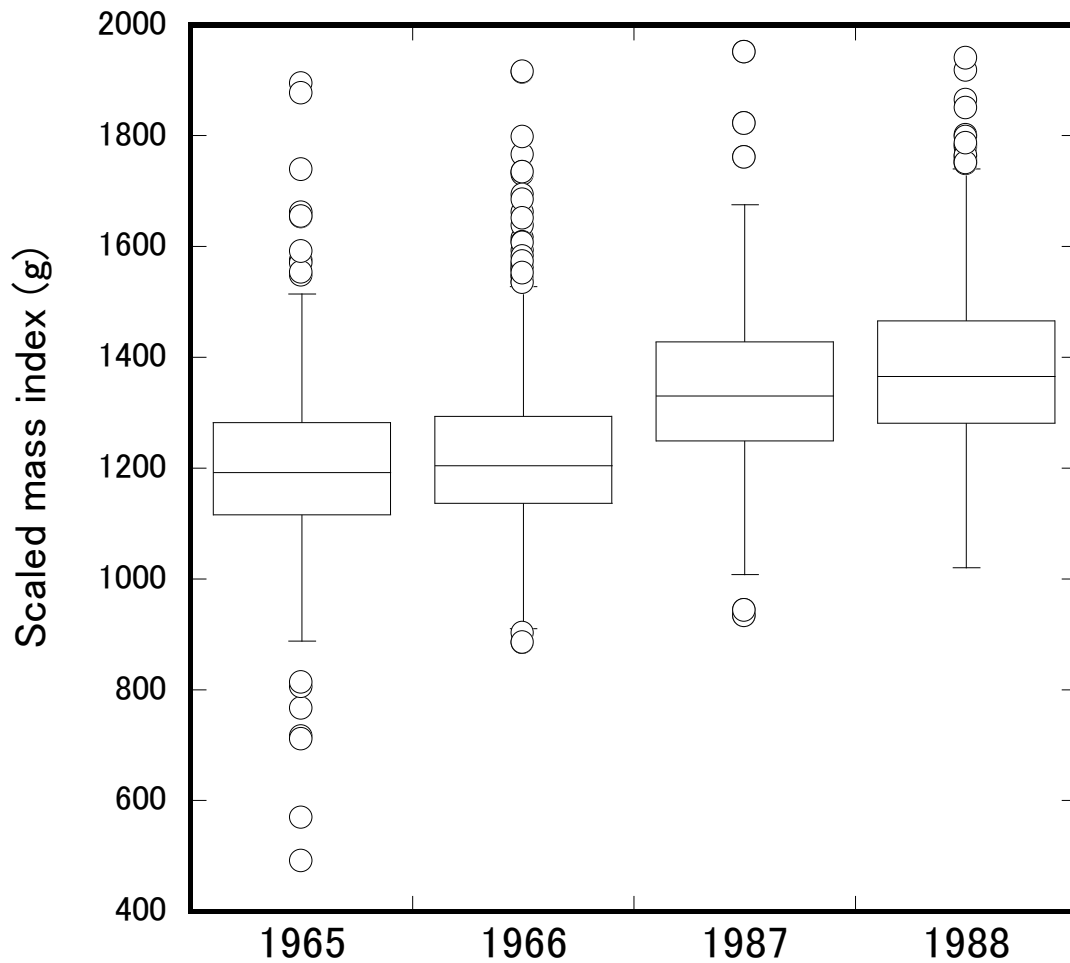
0.0: occurred but less than 0.1%, -: absent

Comparison of feeding intensity index (FII) of maturing masu salmon examined by month and year

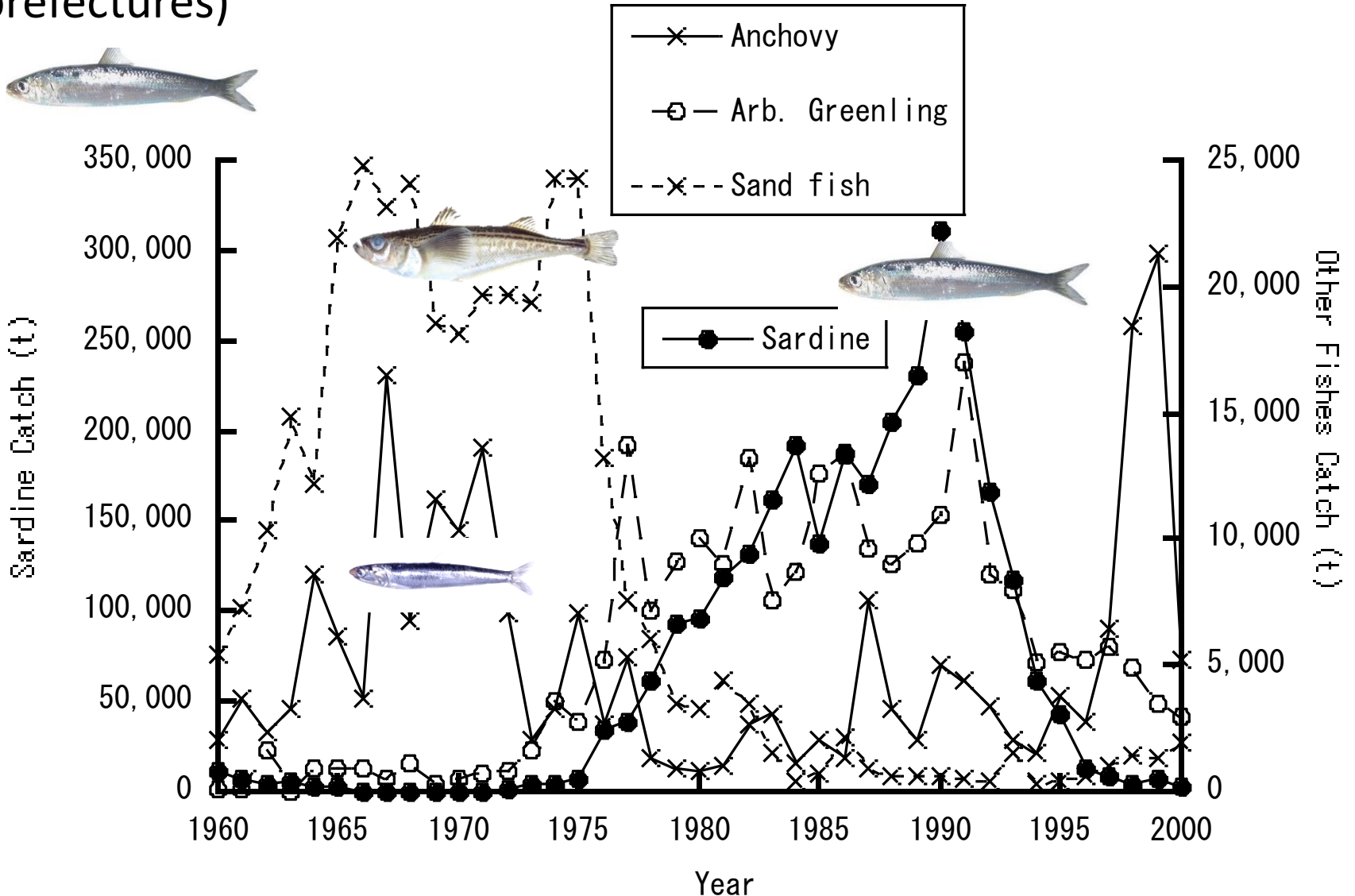


Feeding condition of masu salmon in late 1980's was excellent!

Inter annual comparison of scaled mass index (SMI, body weight standardized to 450 mm FL) of maturing masu salmon caught by the research vessel in March 1965, 1966, 1987 and 1988.



Inter annual fluctuation of commercial catch of main potential prey fishes for masu salmon at the Japanese coast in the Sea of Japan (Aomori, Akita, Yamagata, Niigata, Toyama, and Ishikawa prefectures)



Conclusion

- The high abundance of potential sardine prey should simplified the composition of prey of masu salmon in 1980'S
- Both scaled mass Index and feeding intensity index indicate that Feeding condition of masu salmon in late 1980's was excellent.
- The climate regime shifts of 1976/1977, or 1970/1971 affected the fluctuation of Japanese sardine biomass and other fishes.
- The climate change affected some ecological aspects of masu salmon at least the feeding habits through abundance of prey fish in the Sea of Japan.

Thank you !

