

Some data on the biology and distribution of larval capelin *Mallotus villosus catervarius* on the shelf of Western Kamchatka

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Objective:

- **GOAL:**
- Improving collected data pool on spatial distribution of capelin larvae on the shelf of Western Kamchatka
- **OBJECTIVES:**
- make an assessment of the density and frequency of the early ontogenesis stages of capelin based on results of long-term researches of ichthyoplankton on the shelf of Western Kamchatka;
- distinguish effect of water dynamic after «cold» and «warm» winters on the larval capelin distribution.

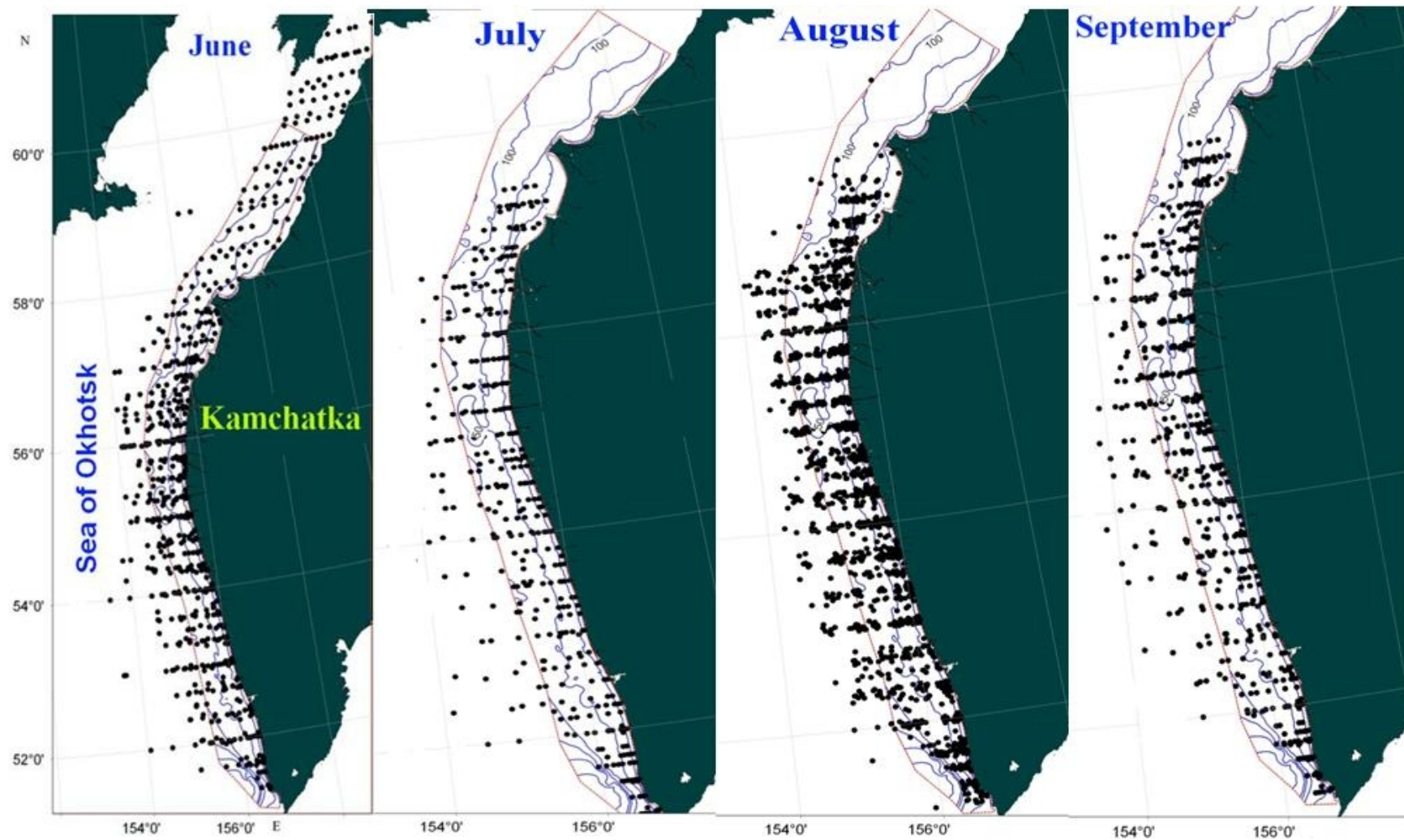
Data pool and methods

The summer-autumn surveys on the shelf of Western Kamchatka in the Eastern part Sea of Okhotsk for 1964-2005

Survey period	Vessel	Number of stations	Stations with observed capelin larvae	Number of larvae	Number of measured larvae
31.07-04.08.1964	SRTM "Baydar"	295	7	16	—
16.06-29.06.1968	ST "Algama"	35	13	129	128
01.07-01.08.1968	ST "Algama"	149	33	238	235
13.08-22.08.1970	NPS "Iskatel"	142	15	37	22
02.09-28.09.1970	NPS "Iskatel"	173	28	31	31
26.06-20.08.1972	SRTM "8-461"	280	62	364	12
20.07-06.08.1973	SRTM "Delfin"	93	31	68	4
12.06-08.09.1974	SRTM "Delfin"	195	12	21	—
17.06-29.06.1975	NPS -452	158	9	38	—
04.07-21.07.1975	NPS -452	118	10	19	—
07.08-15.08.1975	NPS 8-461	132	4	8	7
07.08-22.08.1977	—	103	9	18	5
06-17.09.1977	—	56	9	14	14
18.06-04.07.1978	SRTM 8-453	125	4	6	—
09.07-12.07.1978	SRTM 8-454	56	10	80	5
17.07-27.07.1978	SRTM 8-454	77	13	37	8
28.07-14.08.1982	SRTM "Zavitinsk"	106	6	12	10
27.07-11.08.1999	SRTM-K "Shursha"	132	6	11	10
02.07-15.09.2001	SRTM-K "Pogranichnik Petrov"	107	34	508	—
15.07-12.08.2002	STR "Sopochnoe"	101	11	19	—
03.09-10.10.2003	SRTM "Pankara"	237	2	2	2
02.07-23.08.2005	RV "Professor Probatov"	146	50	366	324
In the total		3016	388	2042	817

Data pool and methods

The ichthyoplankton survey stations on the shelf of Western Kamchatka for 1964-2005 in GIS “Chart Master” (Bizikov et al., 2007)



Data pool and methods

Samplings of the plankton were conducted using net IKS-80 in the vertical column from the bottom to the surface at each station on depth >200 m

Frequency of occurrence (FO) the capelin larvae was estimated as a percent ratio between the number of catches (stations) with larvae and the total number of the catches

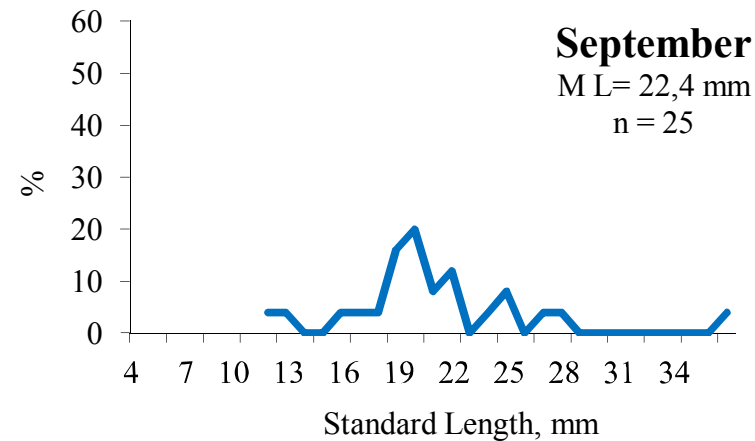
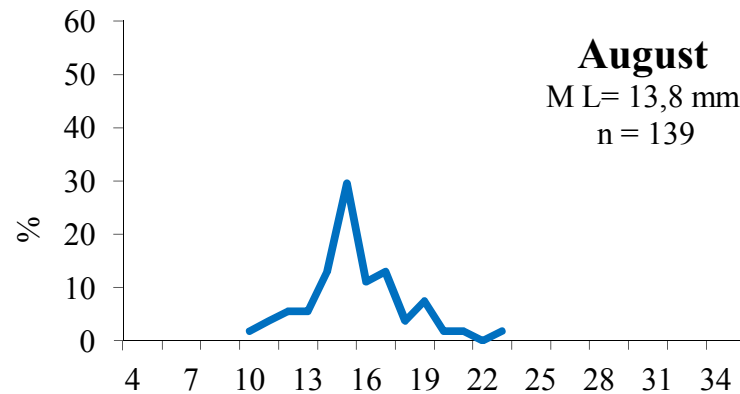
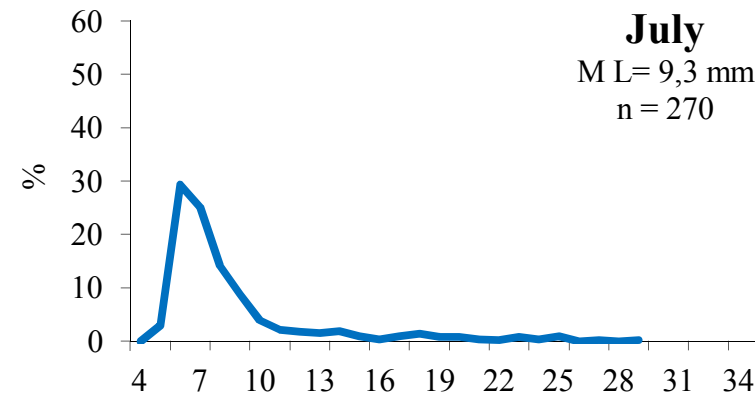
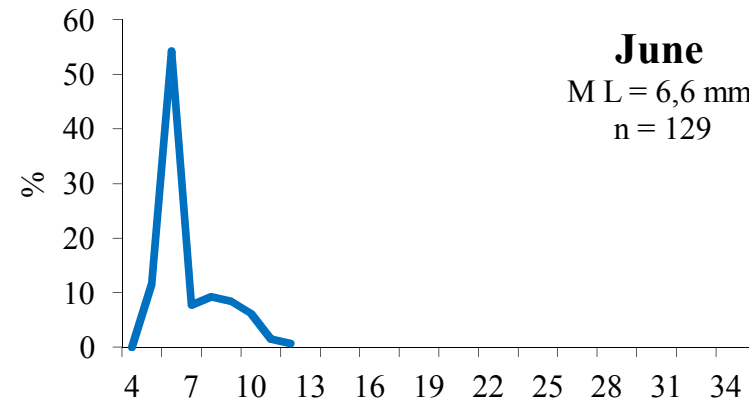
The distribution map of the capelin larvae was built in GIS «ChartMaster 4.1» by the method of 2D-spline interpolation (Bizikov et al., 2007)

Maps of the currents were built based on the daily satellite altimetry data (<http://www.avisioceanobs.com>) using Surfer 10

Winters were typified as in terms of severity based on the values of general ice cover in the Sea of Okhotsk in February-March (Khen et al., 1993). We distinguish 2001 as «cold» and 2005 as «warm» years.

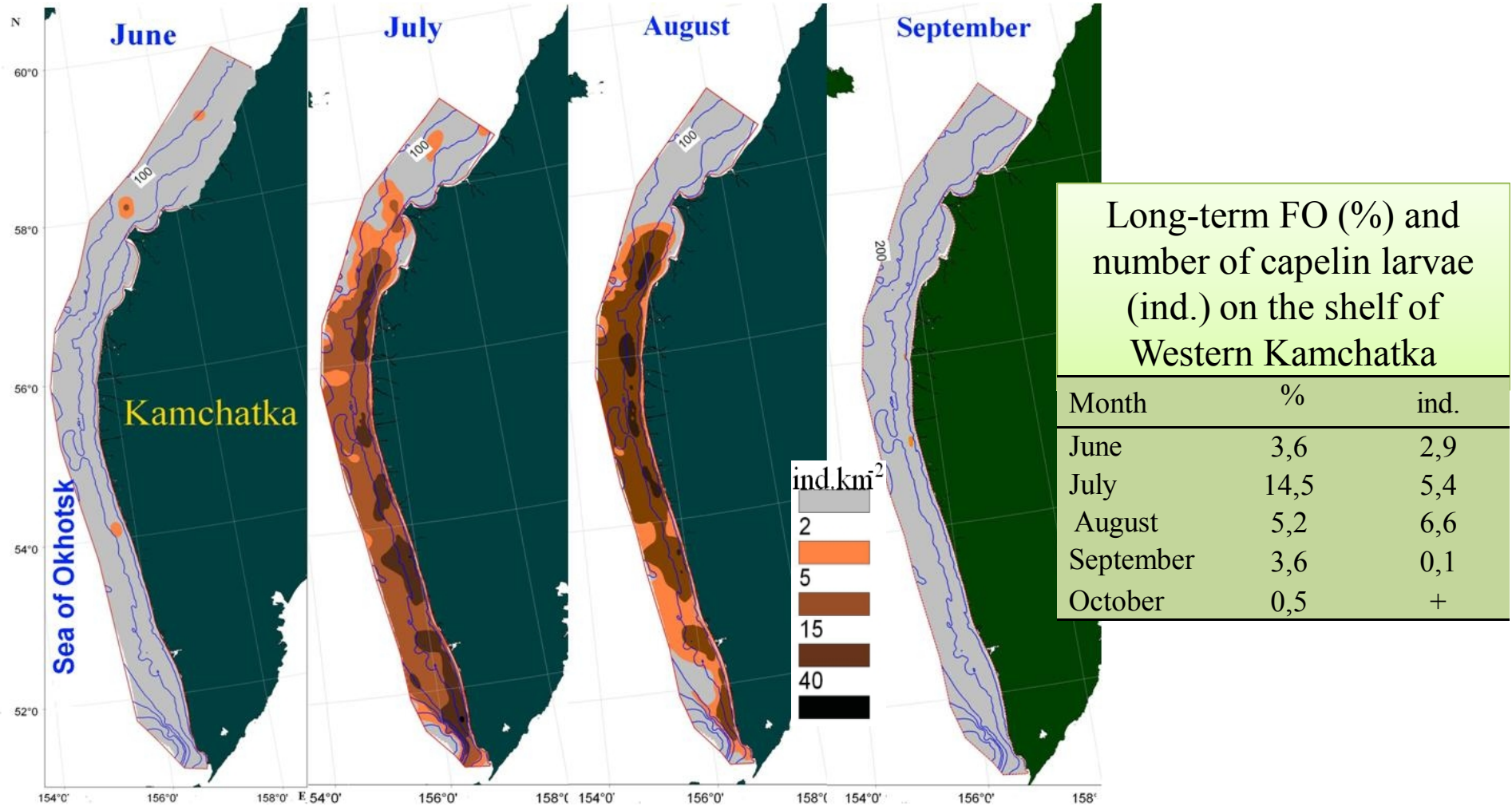
Results

Size composition (standard length) of capelin larvae in the first months of life on the shelf of Western Kamchatka in 1964-2005. The difference of mean length (ML) between months was significant ($p < 0.05$)



Results

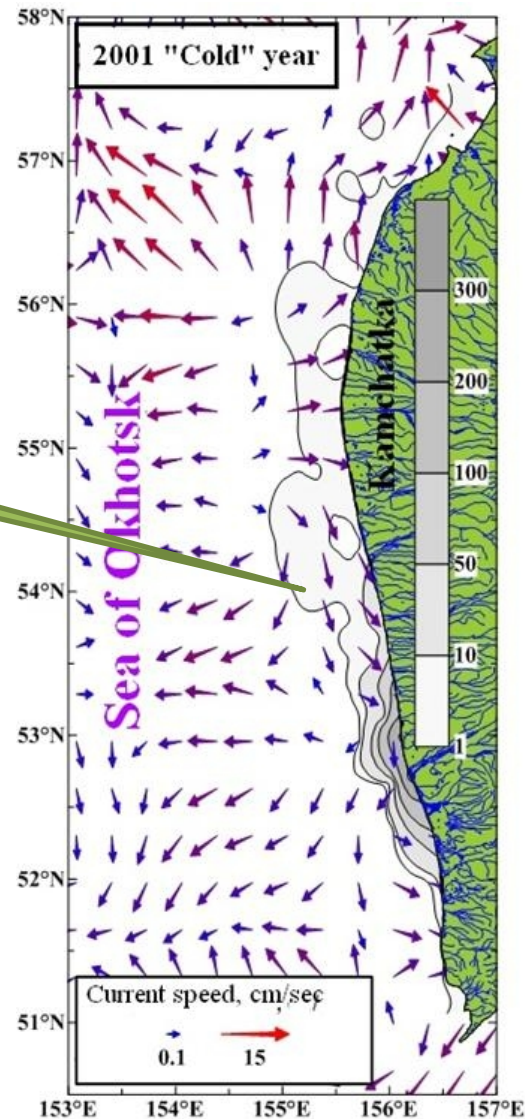
Long-term summer-autumn average distribution of capelin larvae (ind./m²) on the shelf of Western Kamchatka in 1964–2005



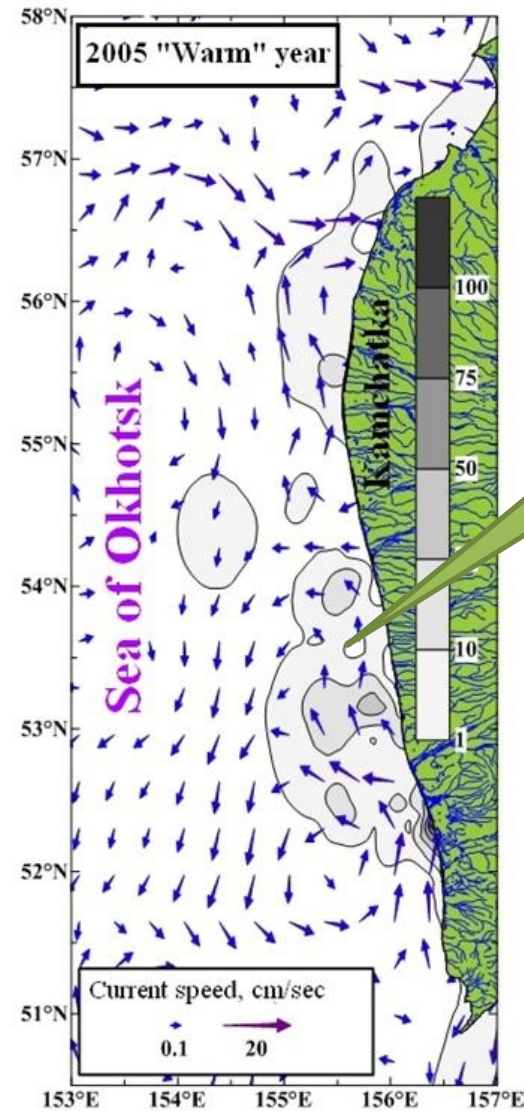
Results

Surface currents and distribution of capelin larvae in the eastern part of the Sea of Okhotsk in July 2001 and 2005

After «cold»
winters with intense
shelf current in the
south direction
(Compensatory
current)




After «warm»
winters with
current in the
north direction
(West Kamchatkan
current)




Conclusion


Capelin larvae appeared in the survey catches on the shelf of Western Kamchatka in June; maximum FO and number have been observed in July and decreased in September.




On emerging capelin larvae stay in vicinity of spawning grounds in the shallow water coastal zone. Larval length increases from June to September, but during each month its length has varied widely.



The spatial distribution of capelin larvae varies from year to year depending on the scheme of major currents on the shelf of West Kamchatka.



After «cold» winter, when the southward current circulate on the shelf of West Kamchatka, the larvae stay near spawning grounds in the narrow shallow part of the water coastal zone.



After «warm» winter, when the northward currents were dominant, most larvae were developing within the system of anticyclonic and cyclonic eddies, and a part of the larvae has been carried along the growth away to the North or seaward.

Thank you for your attention!

