

**The Russian Federation Annual Report to the SPRFMO Scientific Committee  
on the fisheries in the Pacific in 2008 -17**

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**1. Description of the fishery*****1.1. Fishery in 1972-2017***

Practically right after finding of the huge concentrations of jack mackerel in the South Pacific by the Russian researchers in the second half of 1970 – the first half of 1980, this species became the basic object for fishery in the area. Chub mackerel was also one of the main important species for fishery.

The development of fishery stimulated studying of biology and stock conditions of jack mackerel. Till the beginning of 1990 the main researches of oceanic jack mackerel were made by the Russian scientists. From 1955 till 1992 Russia executed 562 expeditions in the South Pacific.

The combined value of the fishery biomass of jack mackerel in the area was estimated in 25-40 mln. t (in 1980), including 16-25 mln. t in the Southeast Pacific and 9-15 million t in the Southwest Pacific. Considering catch as a whole it is possible to ascertain that the fishery of jack mackerel in the South Pacific in that period did not reach the level exceeding productional possibilities of that species to support its abundance at stably high level. The maximum total share of withdrawal by fishery from size of all biomass of the species during 1978-2006 made approximately 6.5-10.5 %.

The information about the number vessels, which fished in the area is shown in Tables 1-2.

Table 1. Number of the fishing vessels during the fishery in the Southeast Pacific from 1972 till 2017

Year	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Number of vessels	?	?	0	0	0	0	?	81	75	92
Year	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Number of vessels	90	92	104	113	91	93	84	113	120	110
Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Number of vessels	43	3	4	3	?	0	0	0	0	0
Year	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Number of vessels	0	3	3	3	0	0	1	6	1	2
Year	2012	2013	2014	2015	2016	2017				
Number of vessels	0	0	0	1	0	1				

Note: “?” means that the information is absent

Table 2. Number of the fishing vessels during the fishery in the Southwest Pacific from 1977 till 2017

Year	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Number of vessels	?	?	?	?	4	13	13	6	4	55
Year	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Number of vessels	?	1	12	20	42	?	?	?	?	?
Year	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Number of vessels	?	?	?	0	0	0	0	0	0	0
Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Number of vessels	0	0	0	0	0	0	0	0	0	0
Year	2017									
Number of vessels	0									

Note: “?” means that the information is absent.

The Russian catches of jack mackerel and chub mackerel from 1972 to 2017 in the Southeast Pacific and from 1977 to 1999 in the Southwest Pacific are presented in the Tables 3-4 and Figures 1-4. There was no Russian fishing activity in the Southwest Pacific from 2000 to 2017.

The largest catch of jack mackerel (1 122 297 t) was taken in the Southeast Pacific in 1990, and in 1986 (146 200 t of jack mackerel) in the Southwest Pacific (Fig. 1, 3). As concerns

chub mackerel, the largest catches of this species were taken in 1990 (74 168 t) and in 1991 (828 t) in the Southeast and in the Southwest Pacific accordingly (Fig. 2, 4).

Table 3. Russian catch of jack mackerel and chub mackerel in the Southeast Pacific in tons

Catch, t	Year									
	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981
Jack mackerel	5500	0	0	0	0	0	49220	532209	544970	771630
Chub mackerel	0	0	0	0	0	0	1773	5800	48300	41500
Catch, t	Year									
	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Jack mackerel	735898	866500	1056600	837700	785000	818628	938288	1096292	1122297	591800
Chub mackerel	41878	4416	71952	38275	1920	3835	34805	28160	74168	18257
Catch, t	Year									
	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Jack mackerel	32000	0	0	0	0	0	0	0	0	0
Chub mackerel	970	0	0	0	0	0	0	0	0	0
Catch, t	Year									
	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Jack mackerel	0	7540	62300	7040	0	0	4800	9113	41315	8229
Chub mackerel	0	0	0	0	0	0	387	535		12
Catch, t	Year									
	2012	2013	2014	2015	2016	2017				
Jack mackerel	0	0	0	2561	0	3188				
Chub mackerel	0	0	0	463	0	37				

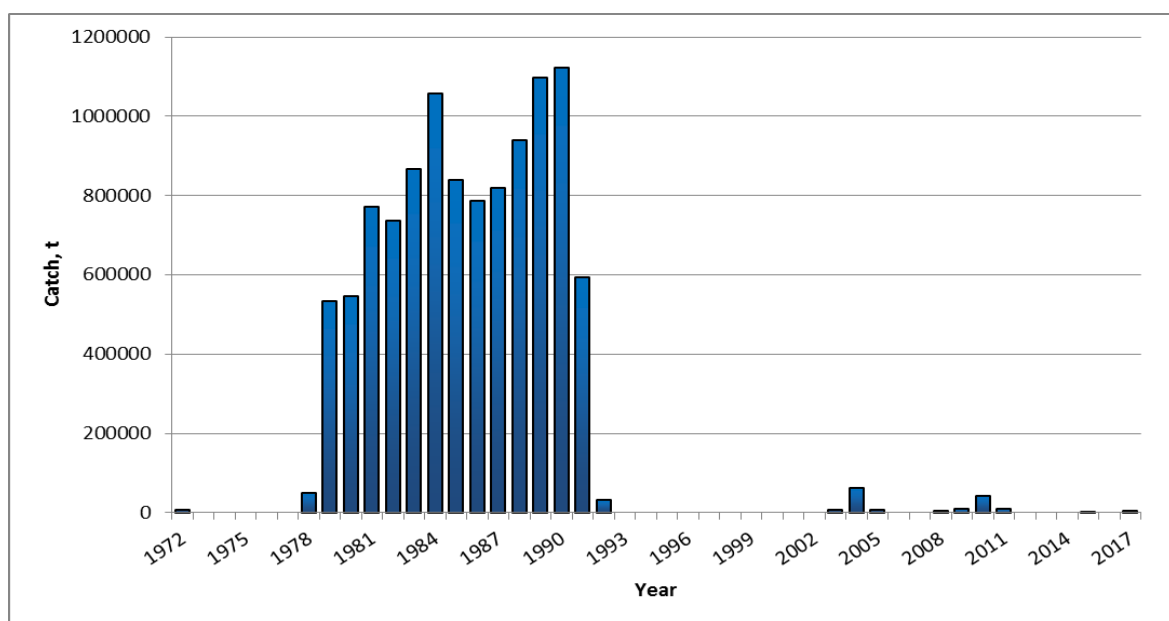


Figure 1. Russian catch of jack mackerel in the Southeast Pacific

Table 4. Russian catch of jack mackerel and chub mackerel in the Southwest Pacific in tons

Catch, t	Year									
	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Jack mackerel	710	254	0	13	0	4953	10651	22300	133350	146200
Chub mackerel	0	0	0	0	0	0	0	0	50	0
Catch, t	Year									
	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Jack mackerel	107379	58997	57243	67618	127828	2892	4586	2008	1677	2280
Chub mackerel	50	200	700	100	828	?	326	204	75	0
Catch, t	Year									
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Jack mackerel	886	52	223	0	0	0	0	0	0	0
Chub mackerel	0	0	0	0	0	0	0	0	0	0
Catch, t	Year									
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Jack mackerel	0	0	0	0	0	0	0	0	0	0
Chub mackerel	0	0	0	0	0	0	0	0	0	0
Catch, t	Year									
	2017									
Jack mackerel	0									
Chub mackerel	0									

Note: “?” means that the information is absent.

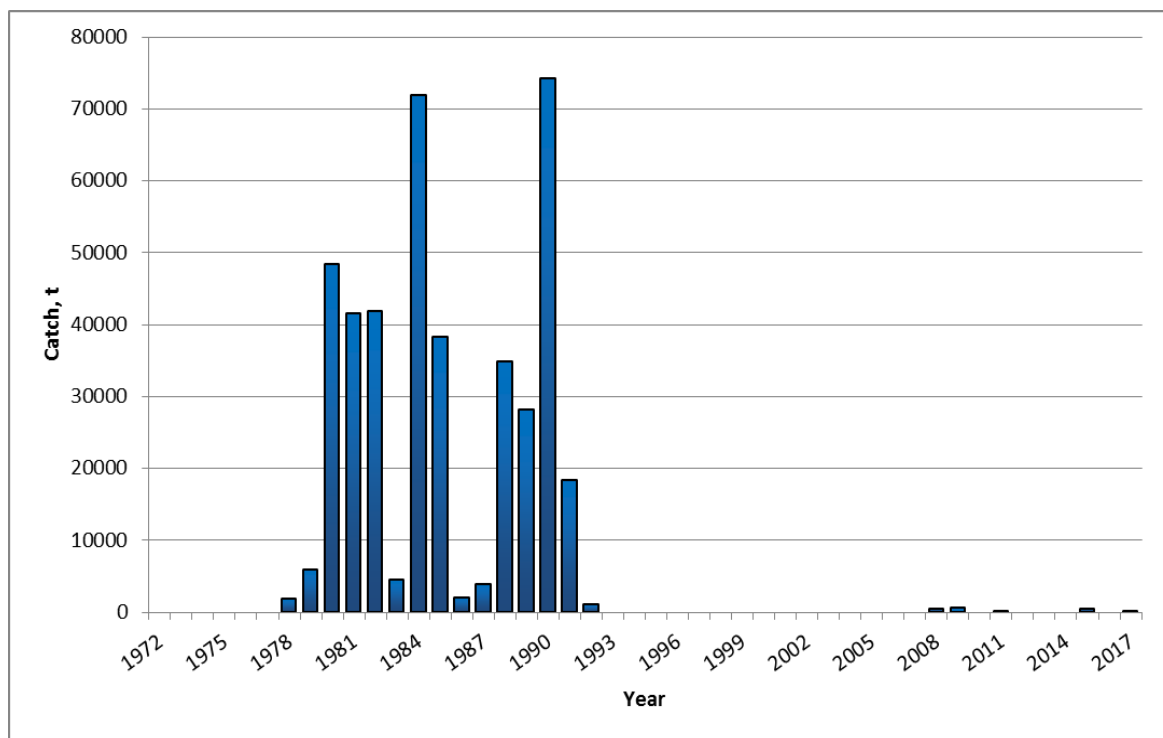


Figure 2. Russian catch of chub mackerel in the Southeast Pacific

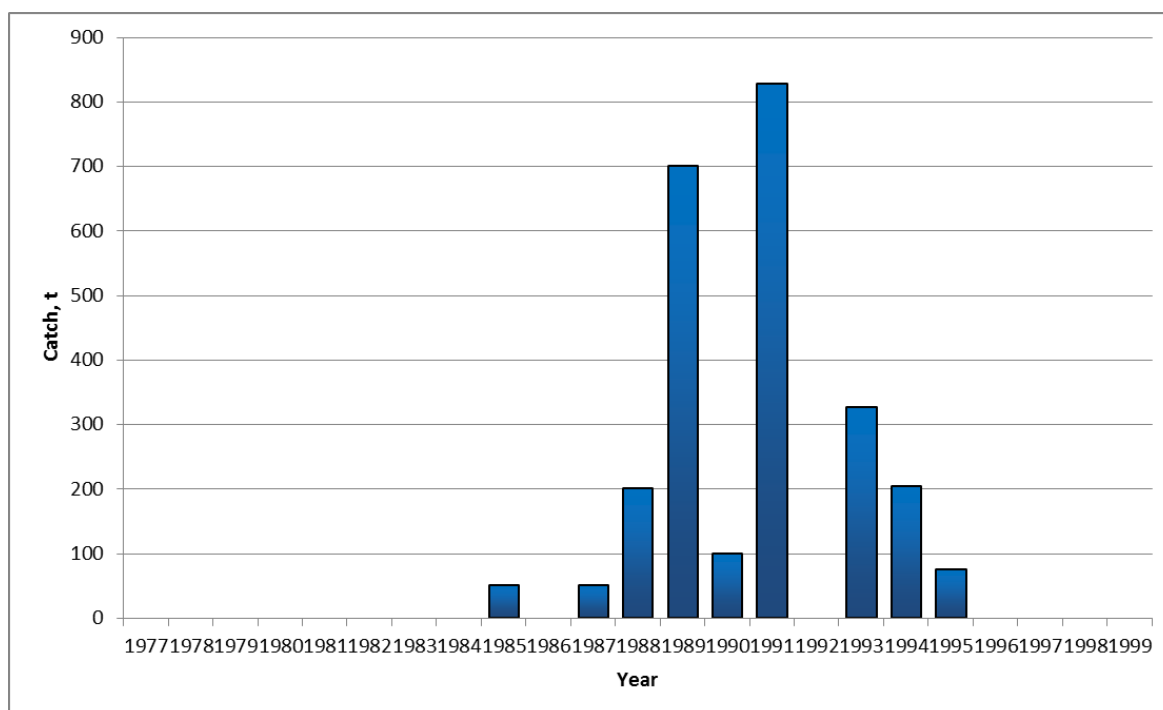


Figure 3. Russian catch of jack mackerel in the Southwest Pacific

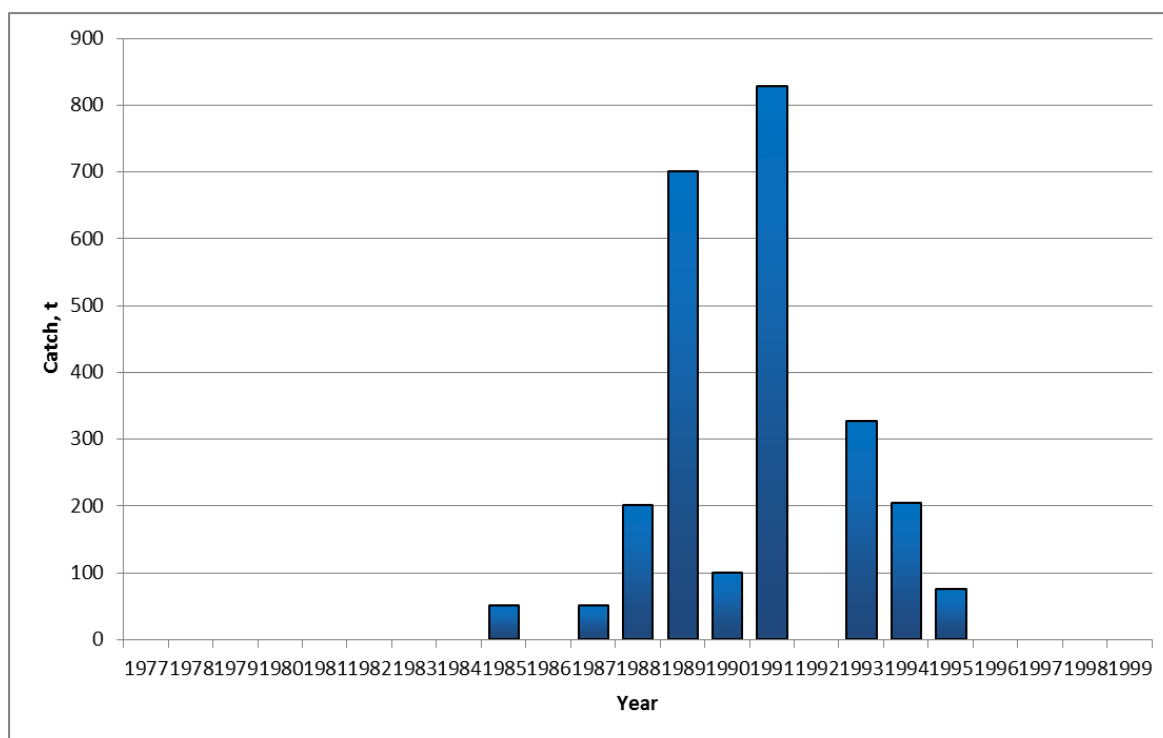


Figure 4. Russian catch of chub mackerel in the Southwest Pacific

### ***1.2. Fishery in 2008-2017***

In the year 2008, the Russian trawler “Persey” caught jack mackerel and chub mackerel in the high seas of Southeast Pacific. The total catch was 4800 t for jack mackerel and 386.74 t for chub mackerel in 62 fishing days (Tab. 5, 6, 7).

In 2009 the number of the Russian fishing fleet has increased to 6 vessels. “Germes”, “Ivan Lyudnikov”, “Semiozernoe”, “Kapitan Kuznetsov”, “Atlantida” and “Lafayette” (their GT are shown in Table 5) caught jack mackerel and chub mackerel in the high seas of the Southeast Pacific.

In 2011 two Russian vessels (“Leader” and “Sheriff”) worked in the high seas of the Southeast Pacific (Tab. 5, 6, 7, Fig. 5).

In 2015 the Russian trawler Alexander Kosarev worked in the high seas of the Southeast Pacific. The total catch was 2561.2 t for jack mackerel and 462.5 t for chub mackerel in 38 fishing days (Tab. 5, 6, 7, Fig. 6).

In 2017 the Russian trawler Alexander Kosarev worked in the high seas of the Southeast Pacific. The total catch was 3188.4 t for jack mackerel and 37.4 t for chub mackerel in 73 fishing days (Tab. 5, 6, 7, Fig. 7).

Table 5. Russian actively fishing vessels for 2008-2017

Year	Name	GT
<b>2008</b>	<b>Persei</b>	<b>4638</b>
2009	Germes	4629
2009	Ivan Lyudnikov	6144
2009	Semiozerno	6231
2009	Kapitan Kuznetsov	6231
2009	Atlantida	2062
2009	Lafayette	49173
<b>total for 2009</b>		<b>74470</b>
<b>2010</b>	<b>Lafayette</b>	<b>49173</b>
2011	Leader	6144
2011	Sheriff	6232
<b>total for 2011</b>		<b>12376</b>
<b>2012</b>	<b>no</b>	<b>no</b>
<b>2013</b>	<b>no</b>	<b>no</b>
<b>2014</b>	<b>no</b>	<b>no</b>
<b>2015</b>	<b>Alexander Kosarev</b>	<b>7765</b>
<b>2016</b>	<b>no</b>	<b>no</b>
<b>2017</b>	<b>Alexander Kosarev</b>	<b>7765</b>

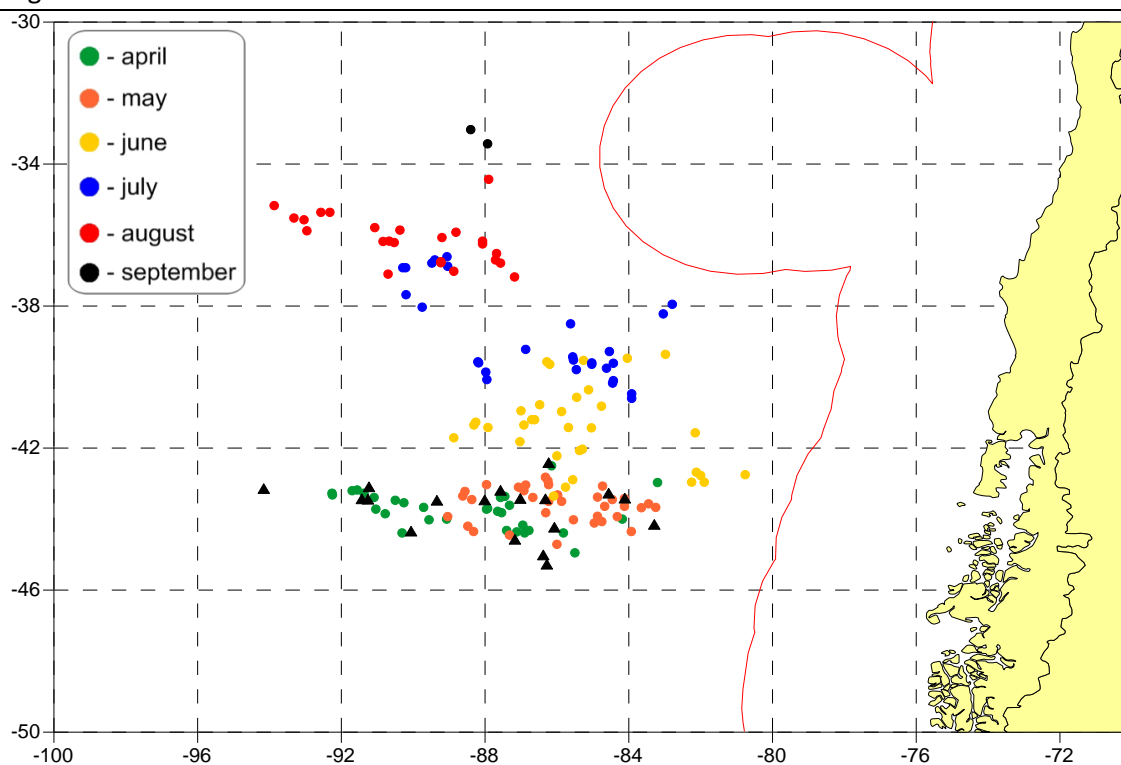


Figure 5. Catch distribution by month of the Russian Federation fleet in 2011

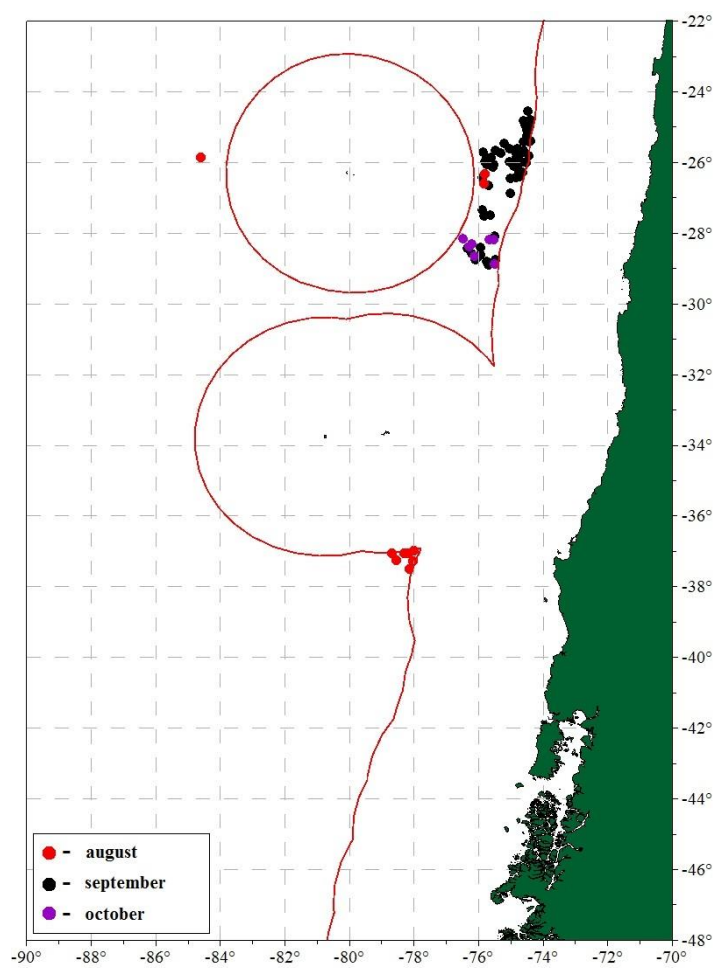


Figure 6. Catch distribution by month of the Russian Federation fleet in 2015

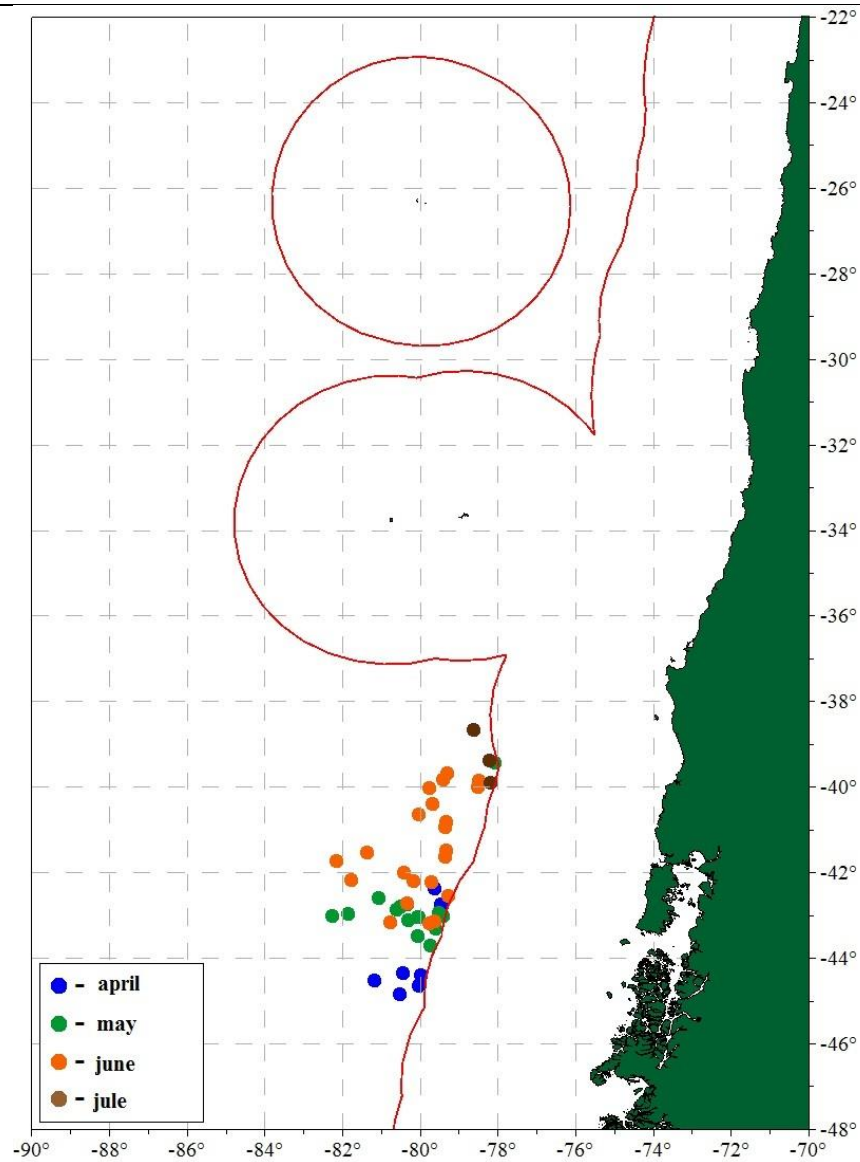


Figure 7. Catch distribution by month of the Russian Federation fleet in 2017

The vessels which were involved in this fishery used single midwater trawls. They operated in the area from 31.33 S to 38.87 S and from 85.33 W to 100.63 W in 2008, from 34.65 S to 43.98 S and from 79.05 W to 126.07 W in 2009, from 32.85 S to 45.53 S and from 80.5 W to 94.63 W in 2011, from 24.53 S to 37.51 S and from 74.40 W to 84.63 W in 2015, from 39.30 to 43.20 S and from 78.20 to 82.00 W in 2017.

Table 6. The information about fishery in the high seas of the South Pacific in 2008-2017

Year	Number of vessels	Number of tows	Number of fishing days
2008	1	96	62
2009	6	235	153
2010	1		
2011	2	208	182
2012	0	0	0
2013	0	0	0
2014	0	0	0
2015	1	89	38
2016	0	0	0
2017	1	87	73

The Russian vessels operated in the area from July till October 2008, from May to September 2009, from March to October 2011, from August to October 2015 and from April to June 2017. The main catch of jack mackerel and chub mackerel in 2008 was taken in September, the main catch of both species was taken in July 2009, in 2011 the main catch of jack mackerel and chub mackerel was taken in April, in 2015 the main catch of jack mackerel and chub mackerel was taken in September, in 2017 the main catch of jack mackerel and chub mackerel was taken in May (Fig. 8, 9).

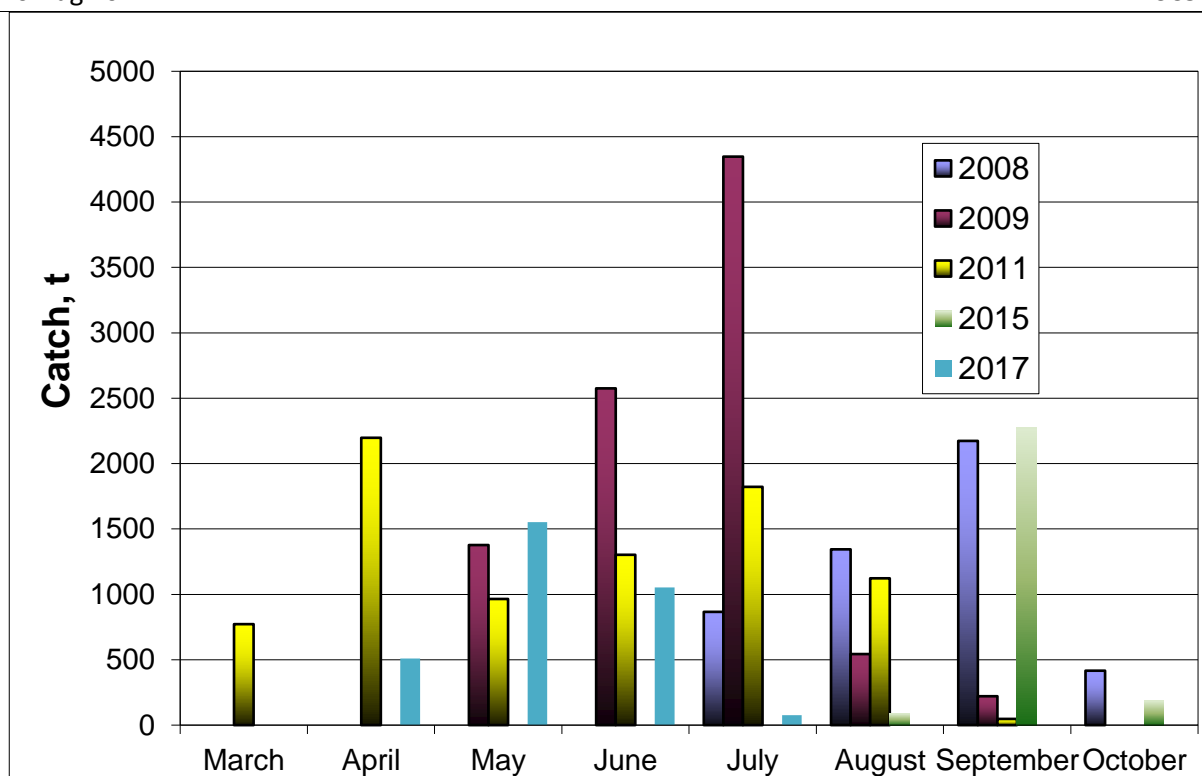


Figure 8. Monthly catches of jack mackerel by the Russian vessels in 2008, 2009, 2011, 2015 and 2017.

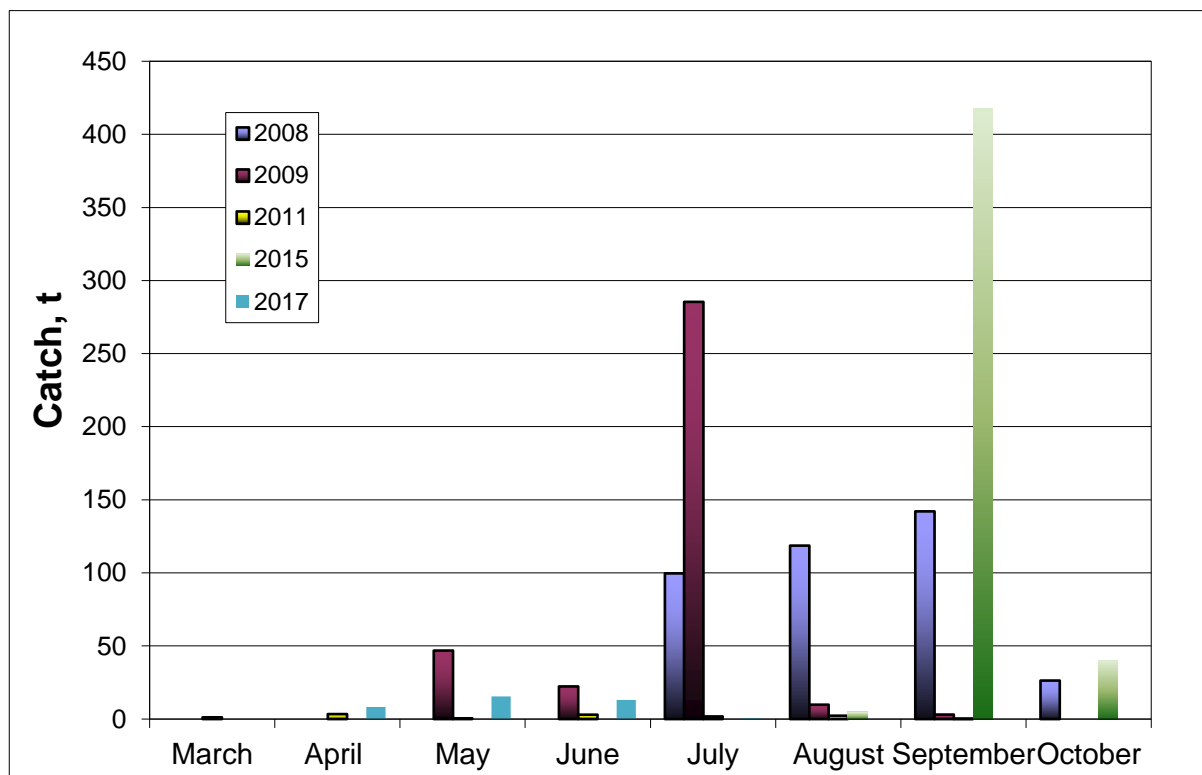


Figure 9. Monthly catch of chub mackerel by the Russian vessels in 2008, 2009, 2011, 2015 and 2017.

In 2015 the Russian large-capacity freezing trawler “Alexander Kosarev” (vessel length - 120 m, gross tonnage – 7 765 t, fishing gear - midwater trawl) started fishing in the Convention area of the Commission of South Pacific Regional Fisheries Management Organization (SPRFMO) to the south of the Juan Fernandez Islands (Chile) in August where 8 vessels from other countries had already been operating. The vessels were fishing for jack mackerel in the area between 37-38°S and 78-79°W. Fishing conditions were very poor, catches obtained by the trawler “A. Kosarev” ranged from 1 to 20 t per tow, daily catches did not exceed 20 - 30 t per fishing day. In the third decade of August fishing conditions even more deteriorated, and all the vessels went to search. The Russian trawler “A. Kosarev” doubled westward the area of the Juan Fernandez Islands and got to the underwater mountain of the Salas y Gómez Ridge. At the seamount with the coordinates 25°51 S, 84°38 W in the pelagic layer of 150 - 200 m above 400 m depth a control hourly trawling was performed. The catch made up 30 t of spawning redbait (*Emmelichthys nitidus*) with the length of 20 - 30 cm, modal length class of 24 cm, and with average weight of 154 g. On 31 August - 1 September the Russian trawler got to the area between the island zones and the continental EEZ of Chile, where jack mackerel concentrations were found and all fishing vessels centered. The fishing conditions were unsustainable there but much better than in the area south of the Juan Fernandez Islands zone. Vessels were operating in the waters between 24.5-29°S and 74.4-76°W performing trawlings in the surface layer within 24 hours. Catches of the trawler “A. Kosarev” ranged from 2 to 100 t per trawl, daily performance in September averaged approximately 100 t per fishing day. Catches consisted of jack mackerel, chub mackerel often occurred in by-catch. In early October, the fishing conditions got worse, on October 7 the Russian fishing vessel finished fishing operations.

In 2017 the Russian trawler "Alexander Kosarev" began fishing on April 23. Until the end of the month, fishing activity took place in the area between 42°00` – 45°00` S, with a slight distance from the Chile EEZ. In May-June, the Russian trawler, together with the vessels of other countries, gradually shifted to the north and worked in the area between 39°30` – 43°20` S and 78°20- 82°00 W. Trawling was carried out mainly in the near-surface layer 0-50 m. The catches widely fluctuated from 5-15 to 80-120 tons per trawl. The average CPUE of the

Russian trawler "Alexander Kosarev" in April was about 65 tons, in May - 87 tons, in June – 48 tons for fishing day. In the beginning of July chub mackerel stocks were dispersed, the catches did not exceed 20 tons per trawl, on July 4 the Russian trawler stop fishing in the Convention area.

## 2. Catch, effort and CPUE summaries

Development of catches and efforts in fishing of jack mackerel and chub mackerel by the Russian vessels is presented in the Tables 7, 8.

Table 7. Catches and CPUE for jack mackerel and chub mackerel fishery in the SPRFMO area by year

Year	Catch, t per day	Catch, t		Catch per hour, t	
	jack mackerel	jack mackerel	chub mackerel	jack mackerel	chub mackerel
2008	77.419	4800	386.74	10.06	0.84
2009	59.563	9113.2	534.93	7.94	0.57
2010		41315			
2011	45.213	8228.8	12.41	5.45	0.05
2015	69.222	2561.2	462.5	5.88	1.13
2017	43.676	3188.4	37.4	6.6	0.2

Table 8. The average monthly catch and CPUE of jack mackerel and chub mackerel by the Russian vessels in the Southeast Pacific in 2008-2017

Month	Catch, t		Catch per hour, t	
	jack mackerel	chub mackerel	jack mackerel	chub mackerel
<b>2008</b>				
July	866.12	99.66	19.13	2.22
August	1344.21	118.65	9.81	0.86
September	2173.45	142.09	10.66	0.75
October	416.21	26.34	2.87	0.18
<b>2009</b>				
May	1377.11	46.86	8.18	0.28
June	2575.17	22.33	7.82	0.64
July	4347.26	285.39	8.52	0.84
August	543.44	9.84	5.21	0.11
September	220.90	3.08	6.33	0.07
<b>2011</b>				
March	772.12	1.20	5.43	0.04
April	2197.31	3.41	5.15	0.20
May	964.66	0.52	2.91	0.01
June	1302.56	3.00	3.60	0.03
July	1822.08	1.80	10.63	0.03
August	1122.68	2.30	7.51	0.03
September	47.42	2.89	0.18	0.03
<b>2015</b>				
August	91.62	4.88	1.99	0.20
September	2279.80	417.64	6.53	1.21
October	189.80	39.98	4.69	0.99
<b>2017</b>				
April	508.5	8.2	7.9	0.2
May	1551.4	15.5	7.6	0.2
June	1051.7	13.1	5.6	0.1
July	76.8	0.6	2.6	0.1

The CPUE of jack mackerel and chub mackerel in July-October 2008, May-September 2009, March-August 2011, August-October 2015, April-July 2017 are shown in the Figures 10 and 11.

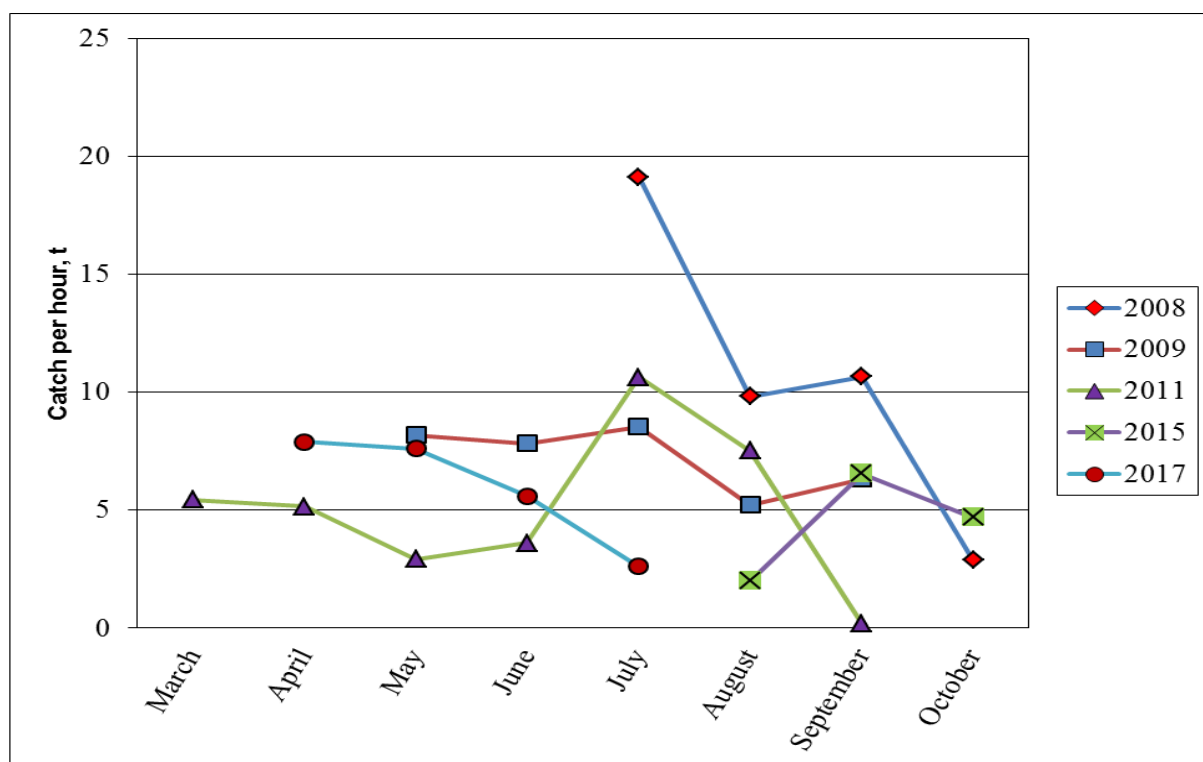


Figure 10. CPUE of jack mackerel in 2008, 2009, 2011, 2015 and 2017

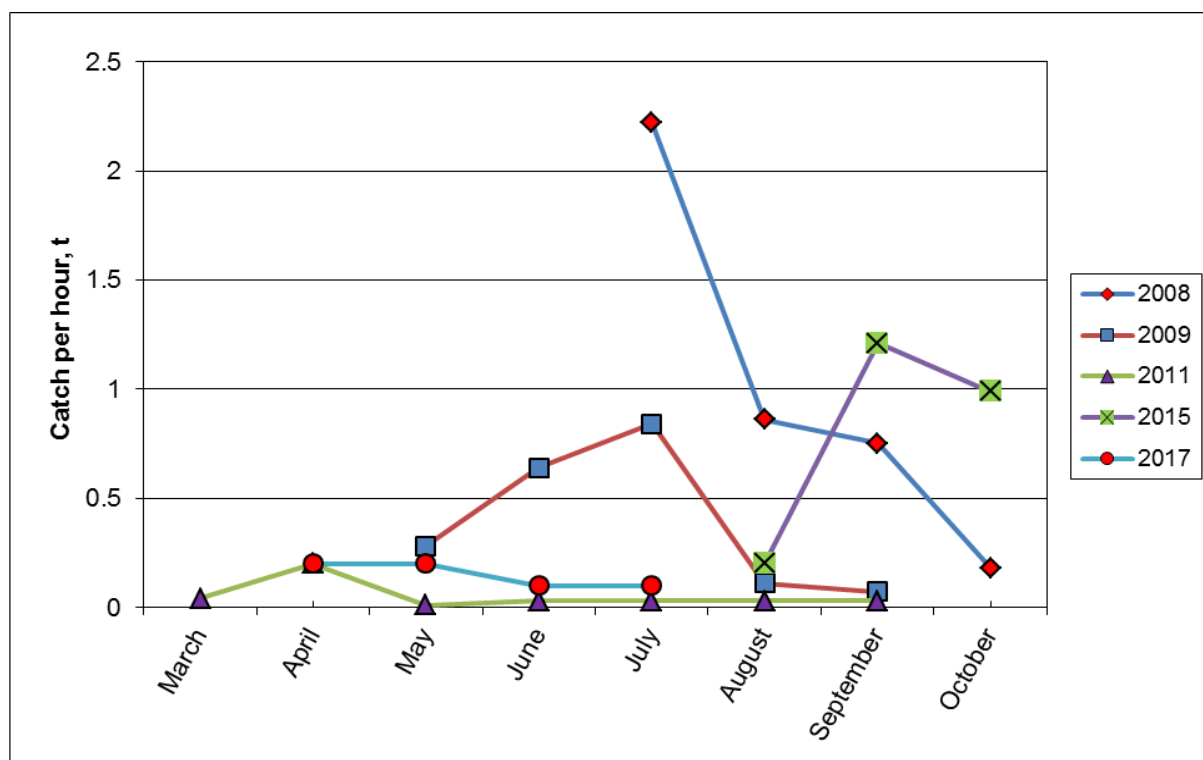


Figure 11. CPUE of chub mackerel in 2008, 2009, 2011, 2015 and 2017.

### **3. Fisheries data collection and research activities**

#### **3.1. Collection of haul-by-haul information from the captains**

Each trawler provided the detailed information for each individual haul. That information contained data about the vessel and the trawl; tow start and end date and time; tow start and end position; height and width net opening; gear and bottom depth; intended target species and the catch data.

The size of the individual catches was estimated.

#### **3.2. Data collection by observers at sea**

In accordance with the SPRFMO recommendation on Data and Information Working Group, this program attempted to obtain at least 10% coverage of all hauls made by the fleet. For this purpose, observers were onboard of the Russian vessel during the fishing in 2008.

In 2009 the observers were onboard of fishing vessel “Germes” and onboard of R/V “Atlantida”. 30.64% of hauls were observed.

In 2011 the observer worked onboard of the vessel “Leader”. 33.17% of hauls were observed.

The data on vessel, fisheries and biological information were recorded onboard of commercial vessel of distant-water fisheries.

The Russian scientific observer was onboard the trawler “Alexander Kosarev” during the whole period of activities in 2015. Observations covered 80 hauls of 89 (89.9%).

The Russian scientific observer was onboard the trawler “Alexander Kosarev” during the whole period of activities in 2017. Observations covered 70.5% of hauls.

#### 4. Biological sampling and length/age composition of catches

Biological sampling for mid-water trawl catch has been carried out to obtain the length data on jack mackerel and chub mackerel. The Figures 12-13 present the length composition for 2008, 2009 and 2011.

A total of 2400 specimens of jack mackerel and 2400 specimens of chub mackerel were measured in 2008, compared to 5766 and 576 in 2009 and 11131 and 266 in 2011, respectively.

Jack mackerel of 34-37 cm, 34-36 and 18-20 cm, 32-35 and 40-43 cm dominated in catches in 2008, 2009 and 2011 respectively (Fig. 12).

Chub mackerel of 35-38 cm dominated in catches in 2008, specimens of 27, 30 and 34-35 cm dominated in 2009 and fish of 32-37 cm dominated in 2011 (Fig. 13).

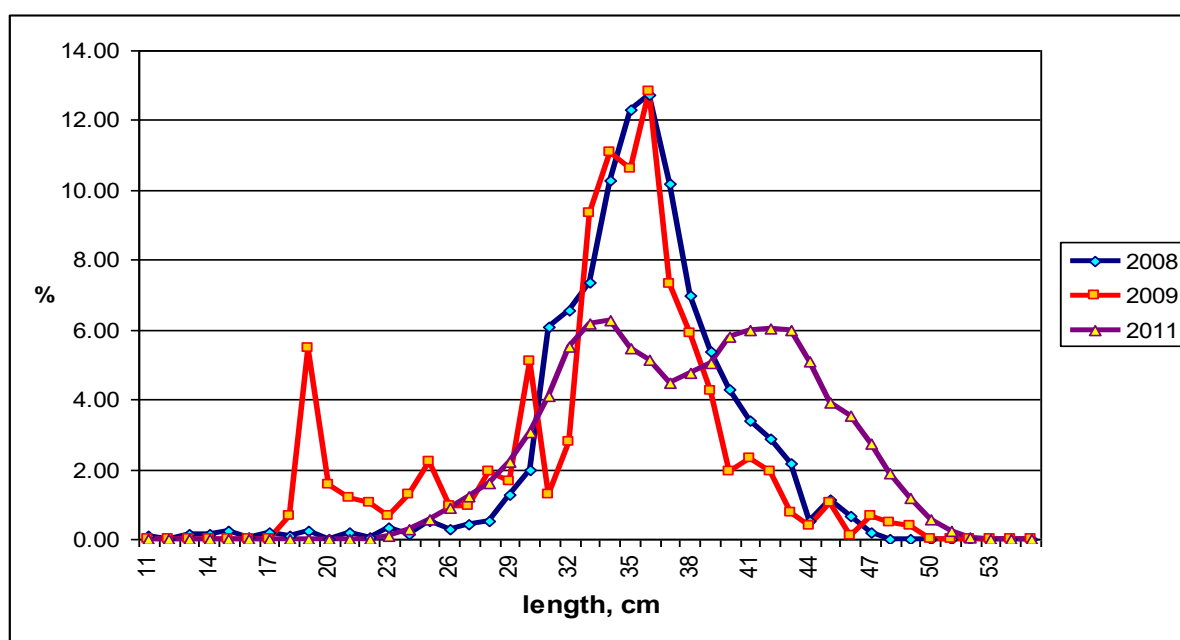


Figure 12. Length composition of jack mackerel in spring-autumn 2008, 2009 and 2011

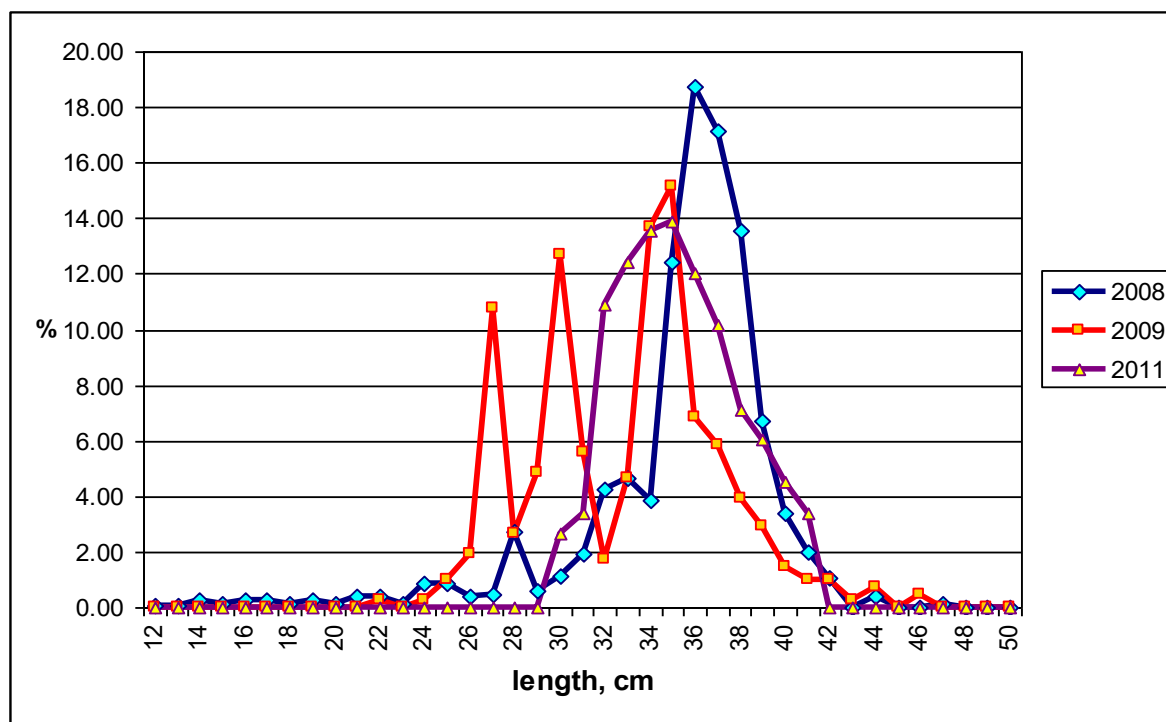


Figure 13. Length composition of chub mackerel in summer-autumn 2008, 2009 and 2011

The average length of jack mackerel and chub mackerel by ten-day period in 2008, 2009 and 2011 are shown in Figures 14-15.

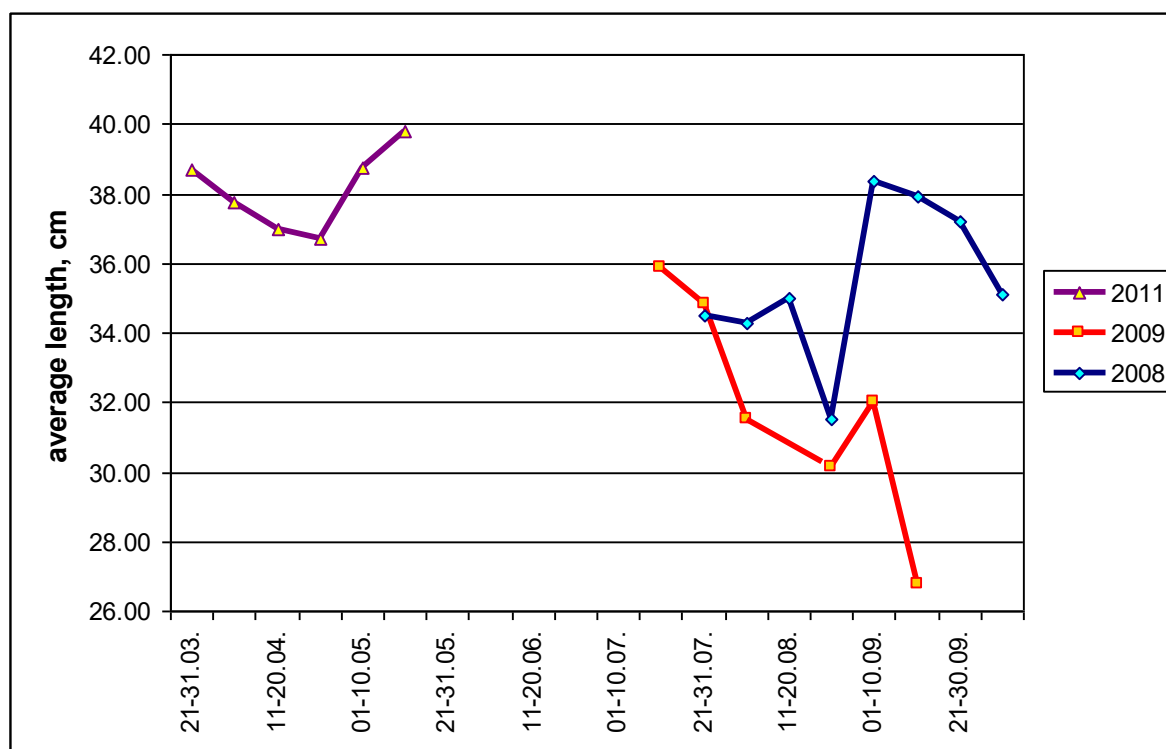


Figure 14. Average length of jack mackerel by ten-day period in 2008, 2009 and 2011

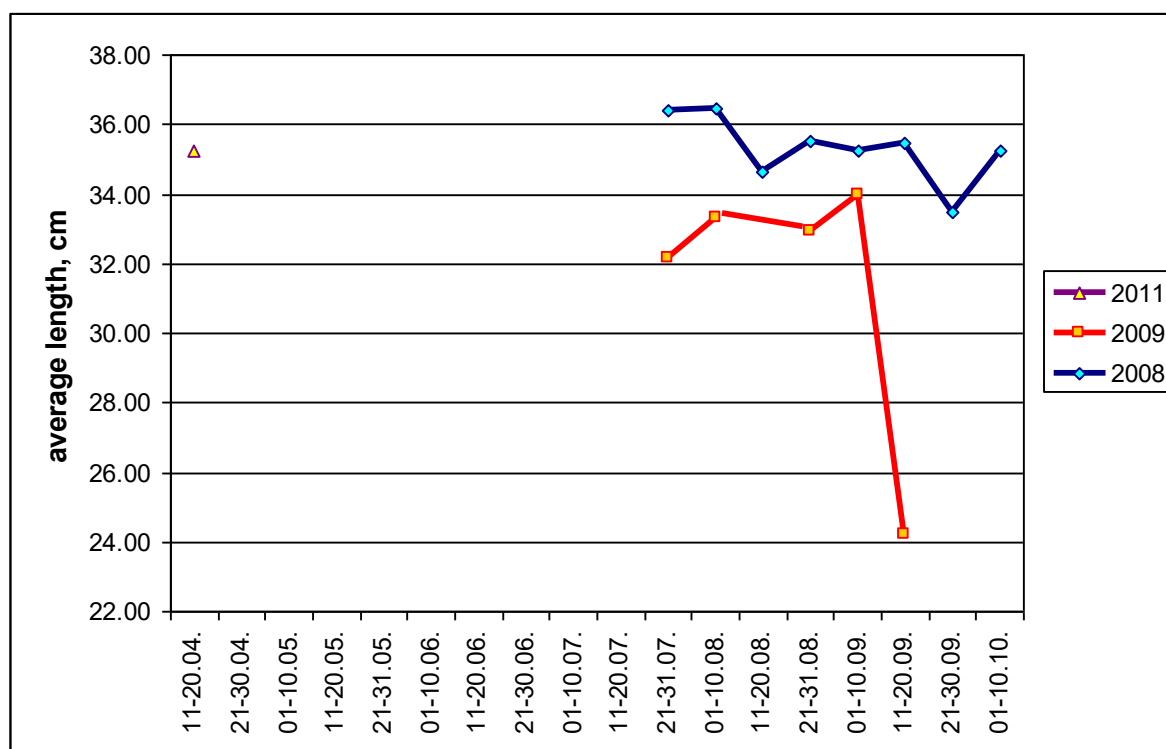


Figure 15. Average length of chub mackerel by ten-day period in 2008, 2009 and 2011

According to our data for 2008-2011 the occurrence of jack mackerel juveniles in the catches increased in advancing from the east to the west, causing a decrease in the average sizes of fish in the catches (Fig. 16).

According to the Russian data in 1979-2002 the average length of jack mackerel, on the contrary, decreased in a direction from the west to the east, that is, off the coast of the South America the smallest jack mackerel was caught. According to the data collected during the cruise of R/V “Atlantida” in 2009, the average length of jack mackerel in catches increased at advancement in the east direction of the water area from 126° W to 74° W.

Thus, since 2008 abundance of jack mackerel juvenile which was found in the coastal waters was essentially reduced in comparison with the period from 1979 to 2002.

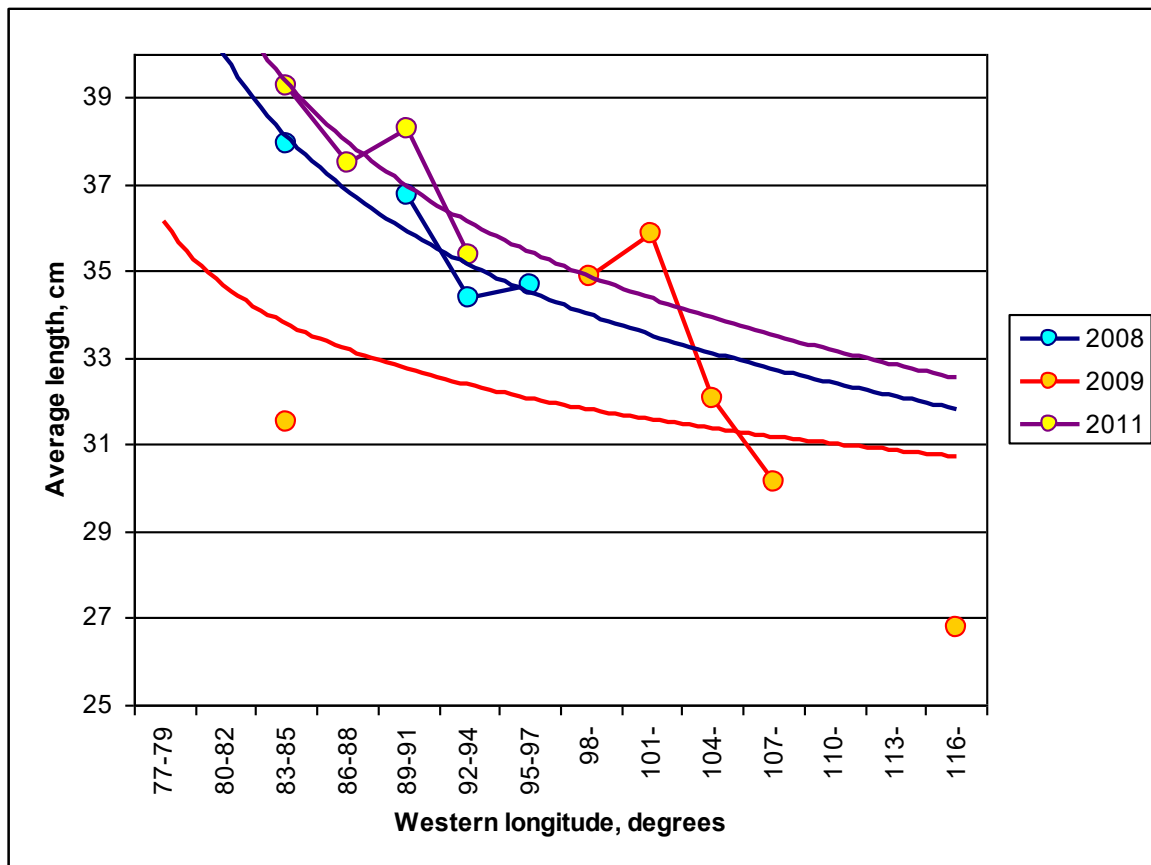


Figure 16. The average length of the jack mackerel in the catches on different meridians in 2008-2011

In 2015, 22942 specimens of jack mackerel and 9090 specimens of chub mackerel were measured. There was a significant difference in size composition of jack mackerel in the southern and northern fishing areas of RTMKS “Alexander Kosarev”. As for the area to the south of the Juan Fernandez Islands zone, catch consisted of different-sized fish with the modal length classes of 28, 35 and 40 cm (Fig. 17). Size composition of jack mackerel in the catches was homogeneous (a dominance of 26 cm length specimens observed) in the northern area between the island zones and the continental area of Chile (Figures 17, 19).

There was few chub mackerel in the southern area, measurements were not made. Chub mackerel of bigger size with a dominating length of 34 - 35 cm occurred in the northern area (Figures 18, 20).

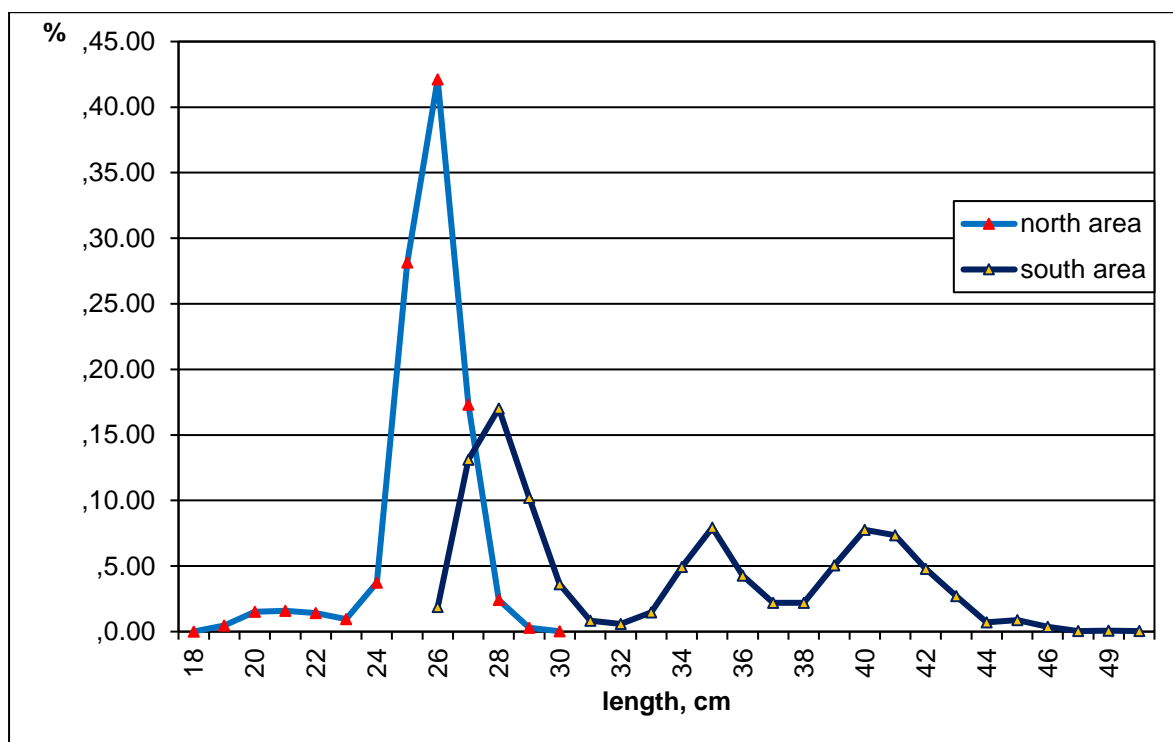


Figure 17. Length composition of jack mackerel in summer-autumn 2015

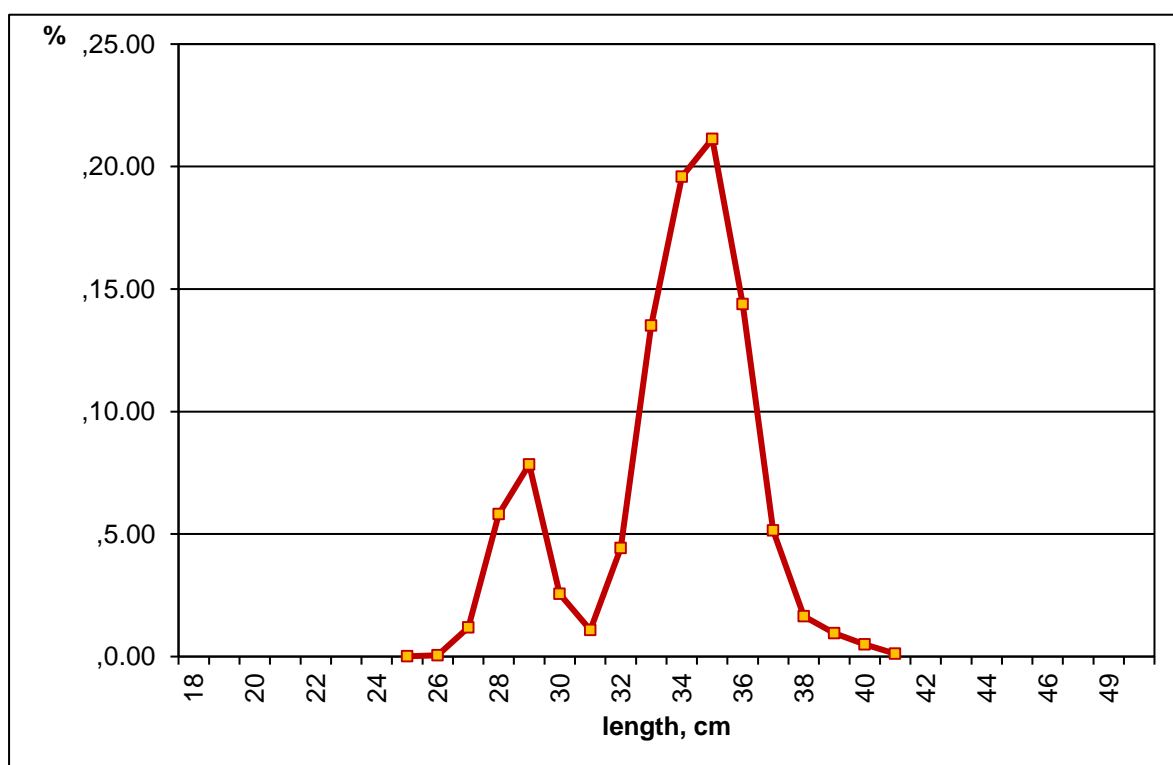


Figure 18. Length composition of chub mackerel in summer-autumn 2015 (north area)

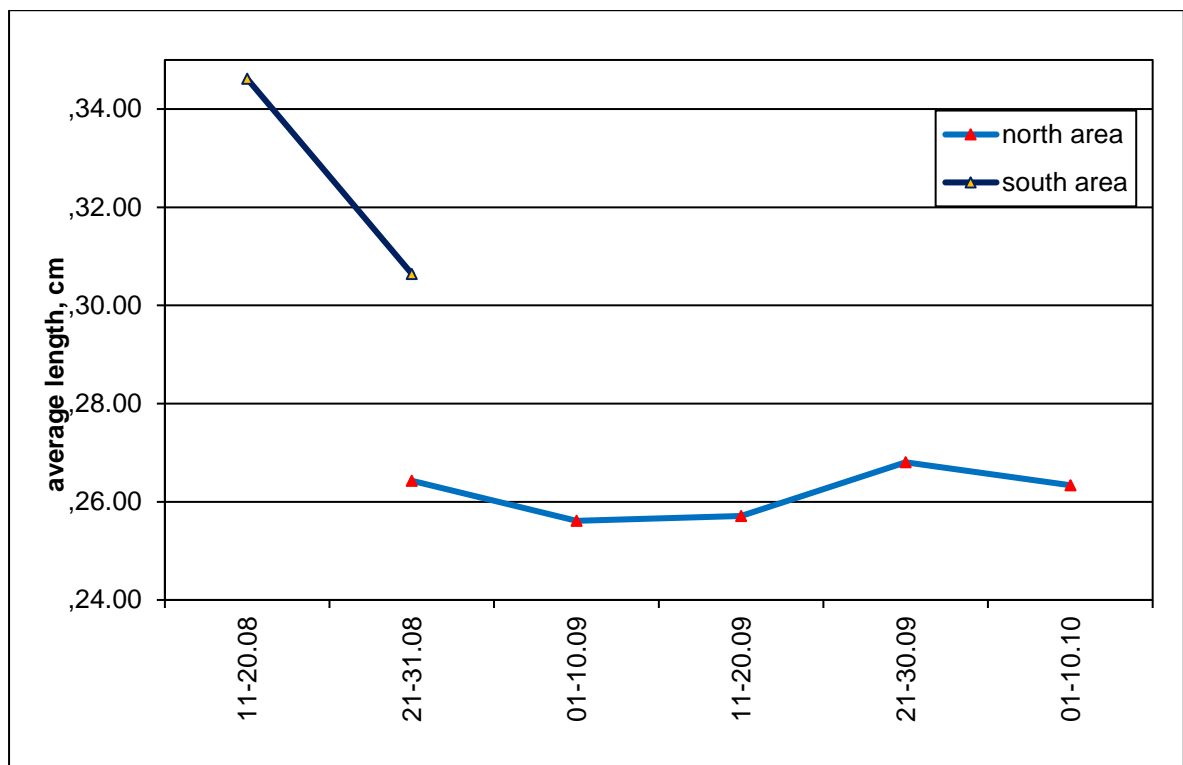


Figure 19. The average length of jack mackerel by ten-day period in 2015

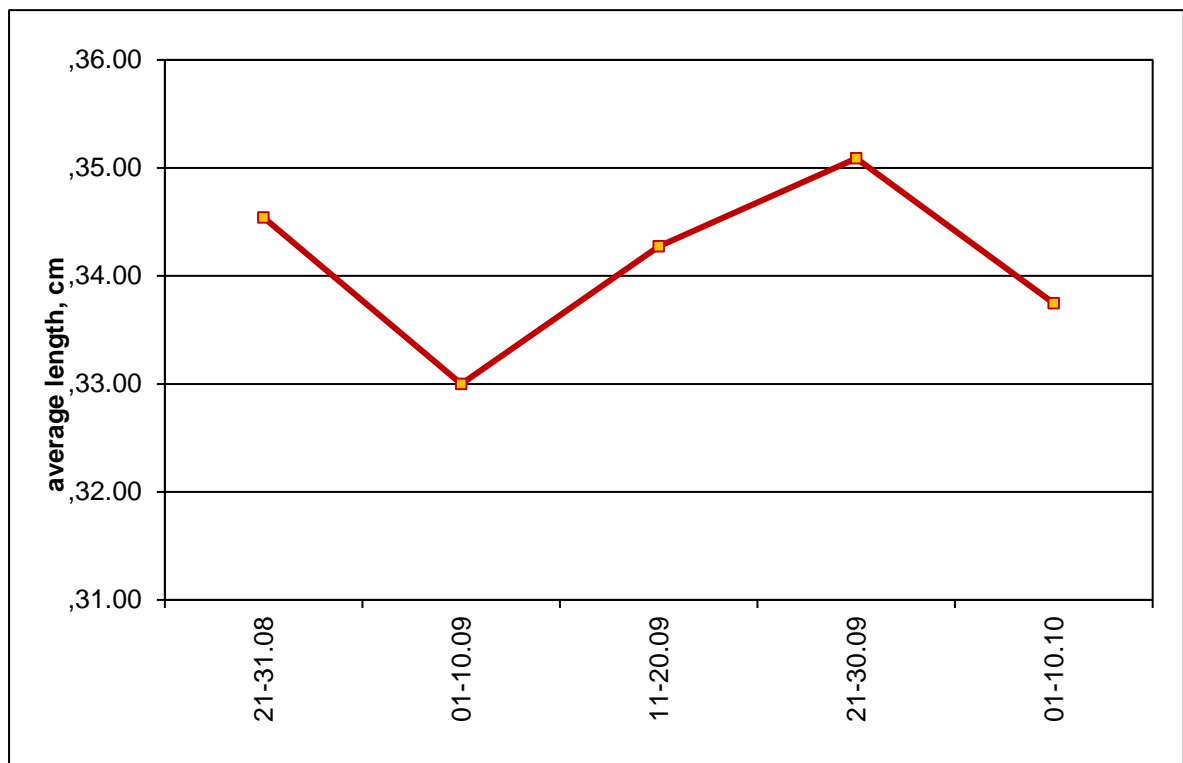


Figure 20. The average length of chub mackerel by ten-day period in 2015 (north area)

In 2017, 14803 specimens of jack mackerel, 1112 specimens of chub mackerel were measured. 2,100 specimens of jack mackerel, 800 specimens of chub mackerel were fully analyzed, according to CMM's. For 600 specimens of jack mackerel the age samples were taken. 70 bird observations were performed.

The size composition of the fished jack mackerel during the entire period of operations did not change significantly. The individuals 32-38 cm length predominated, the modal length class was constantly equal to 36 cm (Fig. 21).

The amount of chub mackerel in the catches of the Russian trawler "Alexander Kosarev" in 2017 was low (Fig. 22). According to the results of the measurements, the dominance of fish with a length of 37 cm is clearly distinguished.

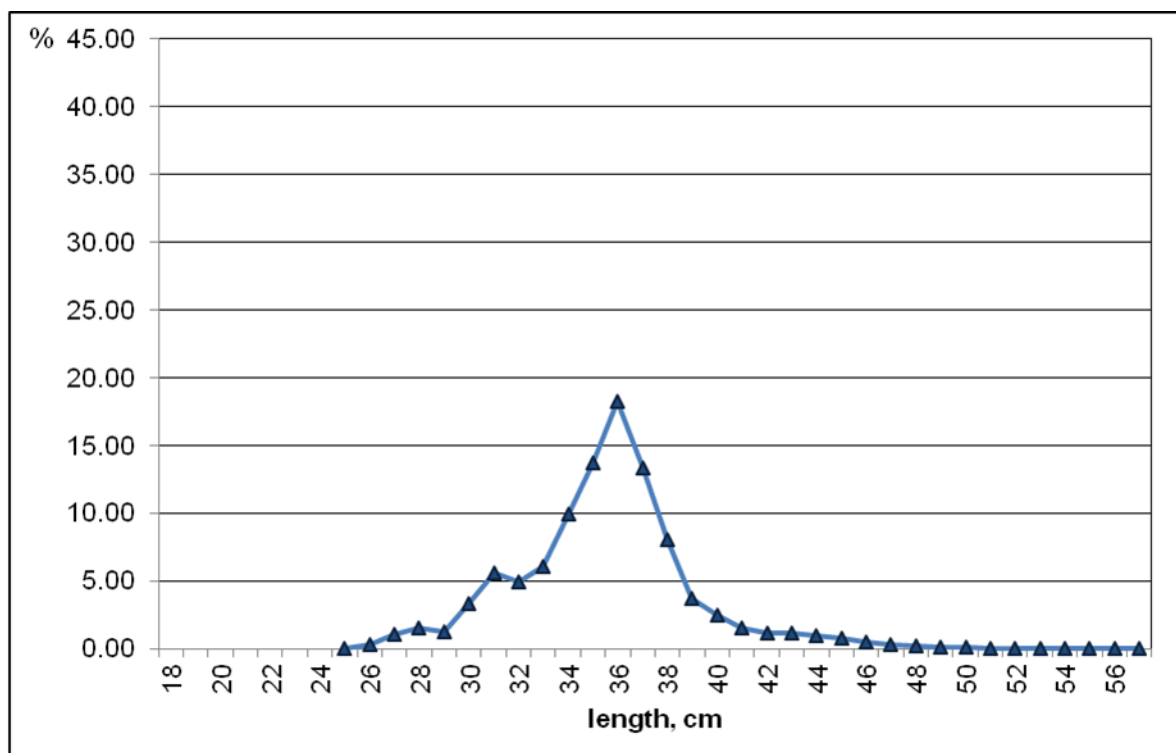


Figure 21. Length composition of jack mackerel in spring-summer 2017

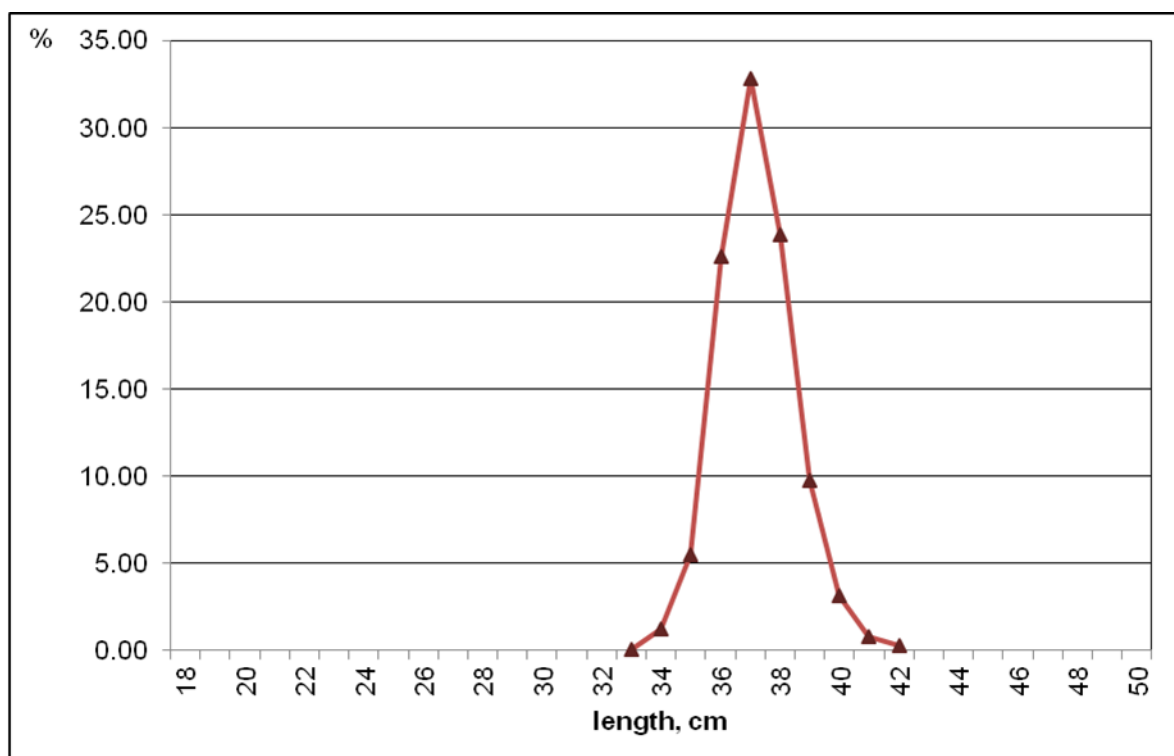


Figure 22. Length composition of chub mackerel in spring-summer 2017 (north area)