



Jack mackerel Workshop, Santiago Chile, 30 June - 4 July 2008

The fishery for jack mackerel in the Eastern Central Pacific by trawlers from the European Union in 2007

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Abstract

After two years of test fishing by a single trawler, the EU fleet in 2007 increased to 6 units. Because an observer programme was not yet in place, the crew of the vessels was asked to take length measurements of the fish. This working document describes the distribution of the fishery from month to month, and the length distribution of the catches. During the fishing season, the fleet gradually moved north-west, to reach the vicinity of Eastern Island (108° W) towards the end of the season. Compared to the previous year, the fish were distributed further to the west. This may have been related to unusual hydrographic conditions in 2007.

1. The development of the EU fishery in the South Pacific

The presence of a European fleet in the South Pacific is a very recent phenomenon. The first trawler, the German ROS 171 Maartje Theadora, arrived in October 2005 and fished for three months before returning to Europe. In 2006, the vessel returned, and this time it fished from March to November.

In 2007, EU ship owners decided to send 6 trawlers to the Pacific. This increase in effort was at least partly prompted by the decision of the South Pacific Regional Fisheries management Organisation (SPRFMO) to introduce a freeze on fishing effort by the end of the year. Ship owners that wanted to keep the option of fishing in the region had to send a vessel there before the end of the year.

In total, 6 vessels from EU member states participated in the fishery in 2007. These were large to very large trawlers, the technical details of which are given in the text table below.

Vessel	Flag state	GT
ROS 171 Maartje Theadora	Germany	9082
ROS 785 Helen Mary	Germany	7278
BX 783 Jan Maria	Germany	7646
KL 749 Margiris	Lithuania	9499
KW 174 Annelies Ilena	Netherlands	14055
SCH 54 Franziska	Netherlands	7153

The vessels stayed in the Pacific between 2-6 months. The duration of the fishery of each vessel is shown in the table below.

Vessel	Presence in Pacific in 2007	Fishing days
ROS 171 Maartje Theadora	11 April – 19 October	110
ROS 785 Helen Mary	8 September – 2 October	20
BX 783 Jan Maria	12 June – 2 October	70
KL 749 Margiris	22 May – 21 October	89
KW 174 Annelies Ilena	29 May – 1 October	85
SCH 54 Franziska	22 August – 23 September	27

Fishing effort has been calculated as the number of days during which fishing activities have been reported. The total number of fishing days in the past three years is given in the table below.

year	Number of vessels	Number of fishing days
2005	1	44
2006	1	109
2007	6	401

No corrections have been made for differences in fishing power between the various vessels. The amount of data was insufficient to calculate correction factors.

The total catches taken in the past three years were:

year	Catch of jack mackerel in tons
2005	5973
2006	33766
2007	88246*

*) preliminaray

Although the fishery was aimed at jack mackerel (*Trachurus murphyi*), small quantities of other species were taken as well. The main by-catch species is chub mackerel (*Scomber japonicus*), which in 2007 made up about 9% of the catch. The average catch composition in 2007 is given in the table below.

species	Average percentage by weight in the catch
<i>Trachurus murphyi</i>	90
<i>Scomber japonicus</i>	9
<i>Brama japonica</i> and other species	1

Incidental by-catches of large species occurred rarely. Because no observer programme was yet in place in 2007, these by-catches have not been documented. According to the crew, they consisted of a few swordfish and giant squids.

Fishing effort and catches in 2007 were not distributed evenly during the season. The maximum effort and highest catches were recorded in June – September (Fig. 1).

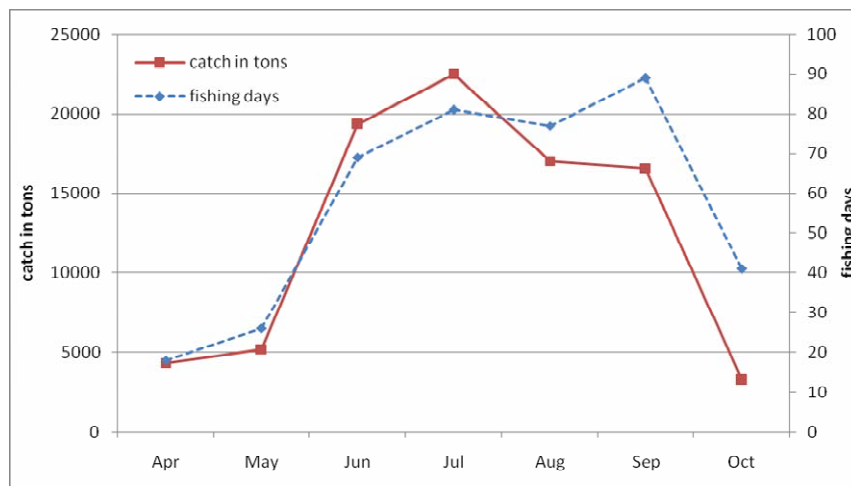


Figure 1. Total catches per month and fishing effort of EU trawlers in 2007

Catches per unit of effort (Fig. 2) were highest in June and July, and tapered off towards the end of the season in October. By that time, some of the vessels had already left the area.

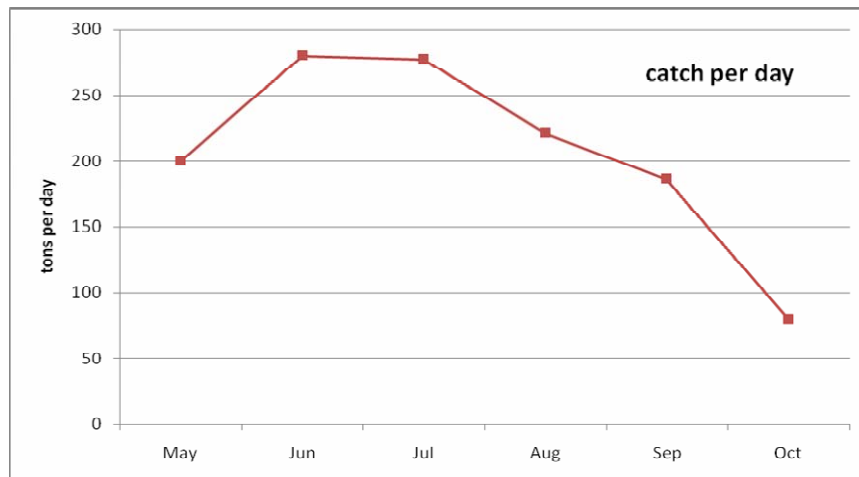


Fig. 2 Catch per unit of effort (fishing day) for EU trawlers in 2007

2. Geographical distribution of catches

A description of the geographic distribution of the fishery in 2007 is presented in Figure 3. The fishery started in April just outside the Chilean EEZ between 42 and 44 °S. In subsequent months, the fleet moved gradually north and then northwest, until the vessels lost contact with the schools in October. By this time, the fleet had reached the vicinity of Eastern Island (34°S, 108 °W).

The general pattern of the fishery was the same as in 2006, be it that the catches in 2007 were distributed further to the west than in 2006 (Figure 4a-d). This might have been related to unusual (cooler) temperature conditions in the ocean.

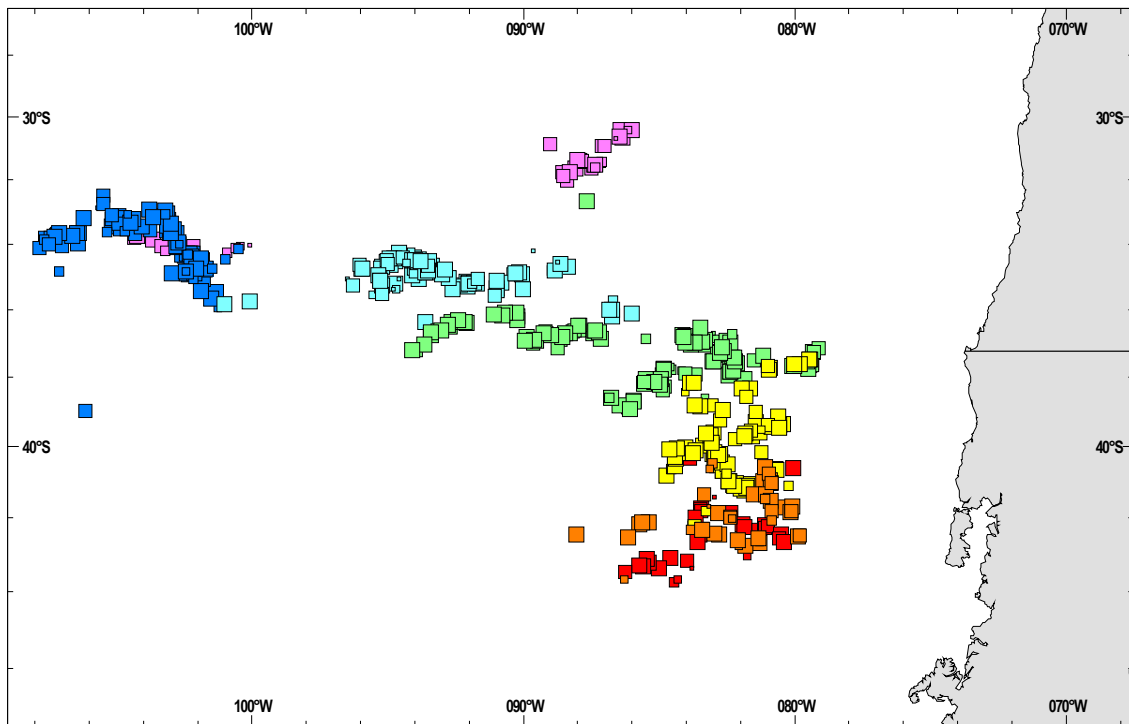


Figure 3. Catch distribution by month of the EU fleet in 2007. Red = April, orange = May, yellow = June, green = July, light blue = August, dark blue = September, purple = October. Size of squares is proportional to catches (1-10, 11-25, 26-50, 51-100, and > 100 ton)

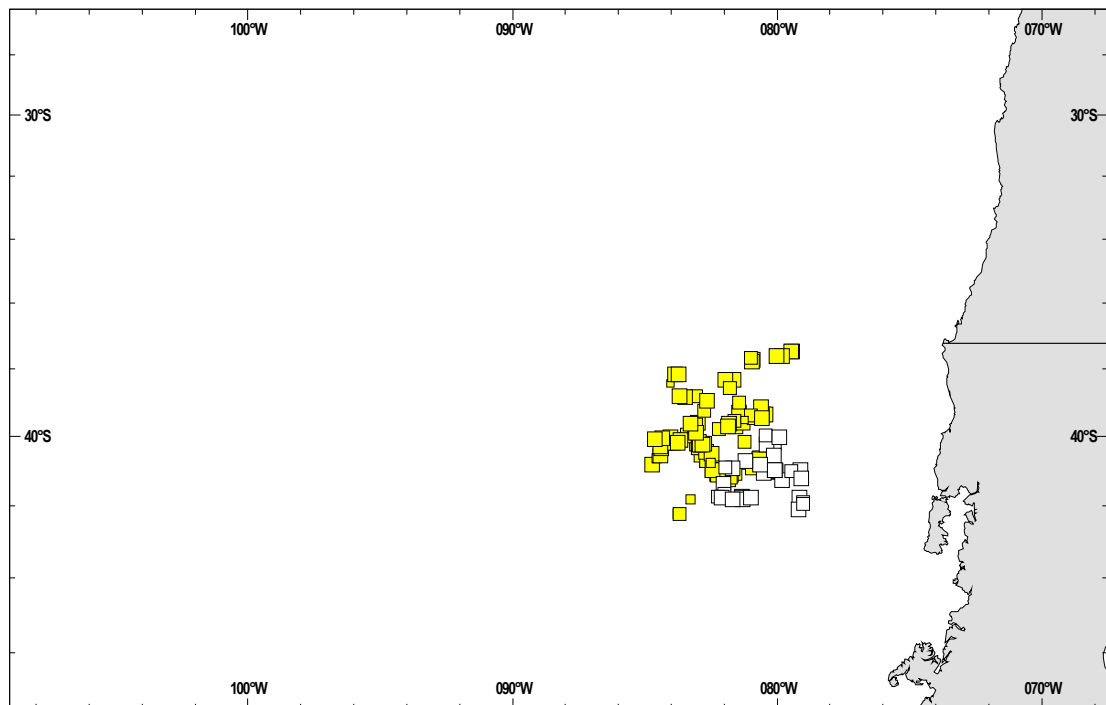


Fig 4a. Comparison catch distribution in June 2006 (blank squares) and June 2007 (yellow squares). Size of squares is proportional to catches as in Fig. 3.

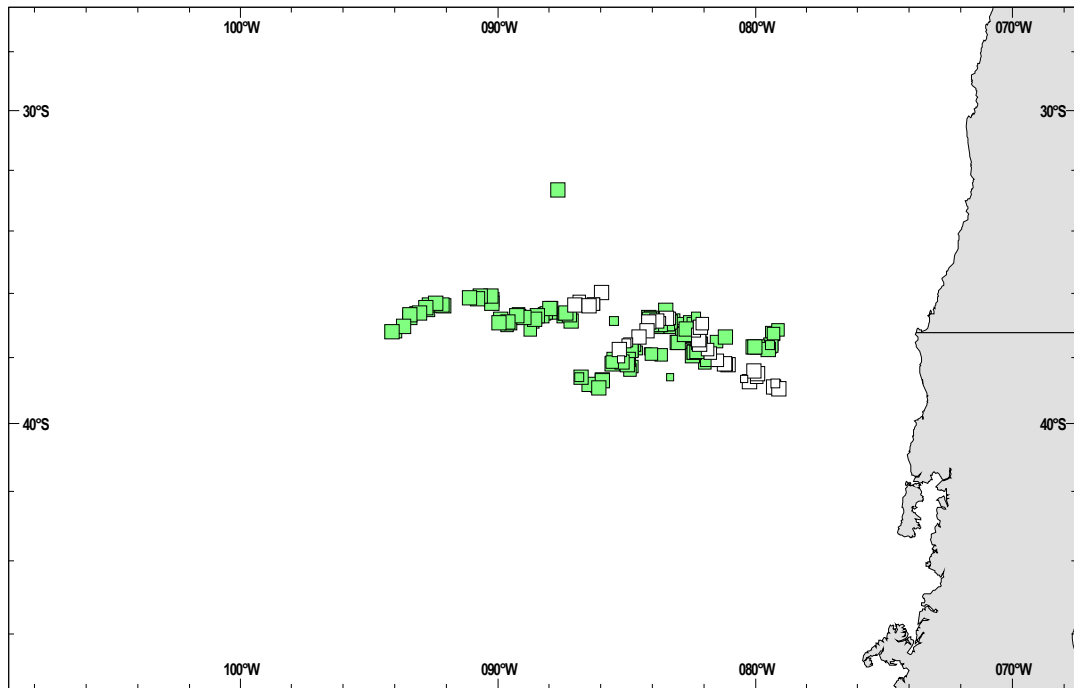


Fig 4b. Comparison catch distribution in July 2006 (blank squares) and July 2007 (green squares). Size of squares is proportional to catches as in Fig. 3.

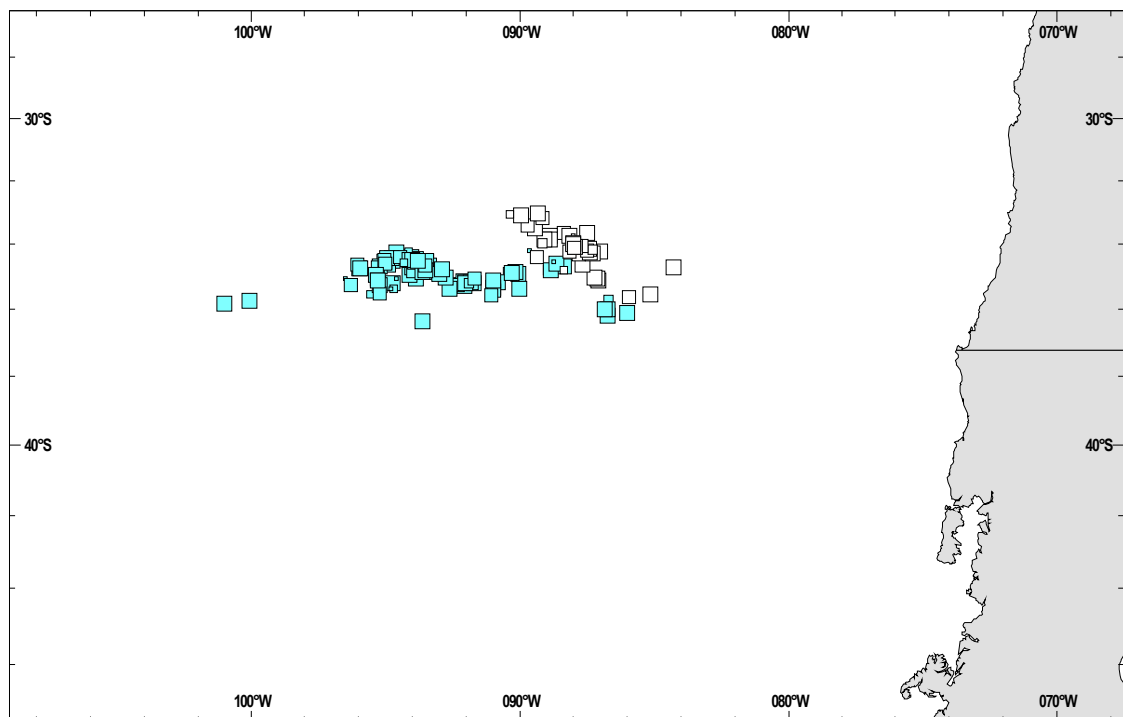


Fig 4c. Comparison catch distribution in August 2006 (blank squares) and August 2007 (light blue squares). Size of squares is proportional to catches as in Fig. 3.

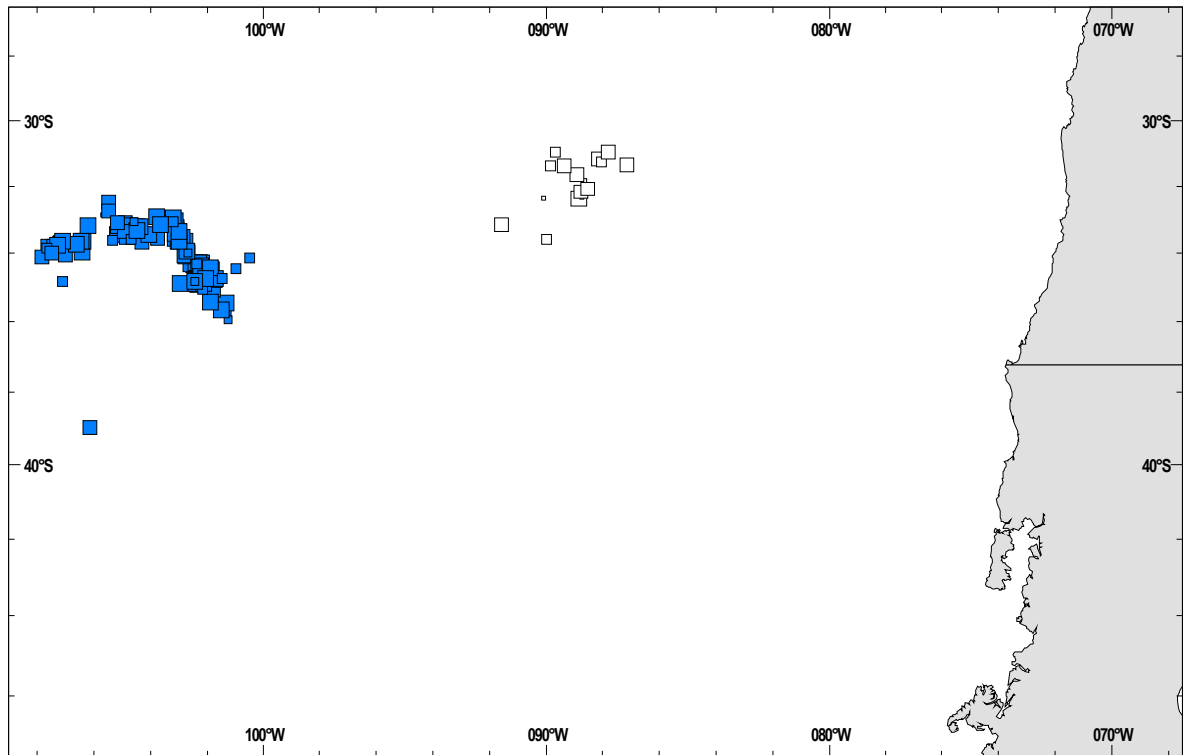


Fig 4d. Comparison catch distribution in September 2006 (blank squares) and September 2007 (dark blue squares). Size of squares is proportional to catches as in Fig. 3.

3. Length distributions of jack mackerel

Length measurements in 2007 were collected by one Russian observer on board the BX 783 Jan Marie, and by crew members on board the other vessels. For reasons of standardisation, it was decided to measure fork length, as is done by Chilean and Peruvian scientists. The fork length was measured to the whole centimetre below.

The initial training of crew members in taking length measurements took some time, and therefore no reliable data are available for the month of April. However, from May onwards, the data obtained from the various vessels were of sufficient quality, and they could therefore be pooled. The combined length data by month for the whole fleet are presented in Figure 5.

The length distributions for the first two months (May and June) show relatively large fish, with a modal length of 34 – 35 cm. Even much larger fish, up to 48 cm, are present in the catches.

In July and August, the fish became smaller and the modal length shifted to 30-31 cm. The very large fish also gradually disappeared from the catches.

In the last two months (September and October), the fleet took only small fish with a modal length of 31-32 cm.

It is not easy to interpret the results on length distribution. Apparently the fleet in the first months of the season exploited a mixture of several age groups, including relatively old fish. In June a component of younger fish started to dominate the catches, and the fishery in subsequent months concentrated on this young (recruiting?) age group. In August still smaller fish appeared in the catch, and in the remaining months, the fishery continued to target these younger fish. From the distribution of the catches (Figs. 3-4) it appears that this recruiting year-class migrated rapidly to the west.

The questions remains why the fleet in the last months of the year did not catch older fish. The general hypothesis about jack mackerel migrations in the South Pacific is that the older fish move towards the west. One would expect, therefore, the fleet to catch more of these older fish as they moved towards these western waters.

Older fish do occur in the population, as was shown by the length distributions for the first months of the season. It is not clear whether these older fish remained close to the Chilean EEZ, or whether they migrated west at a higher speed than the younger ones. In this case, the fleet, while concentrating on the abundant recruiting year-class, would have lost contact with the older population component.

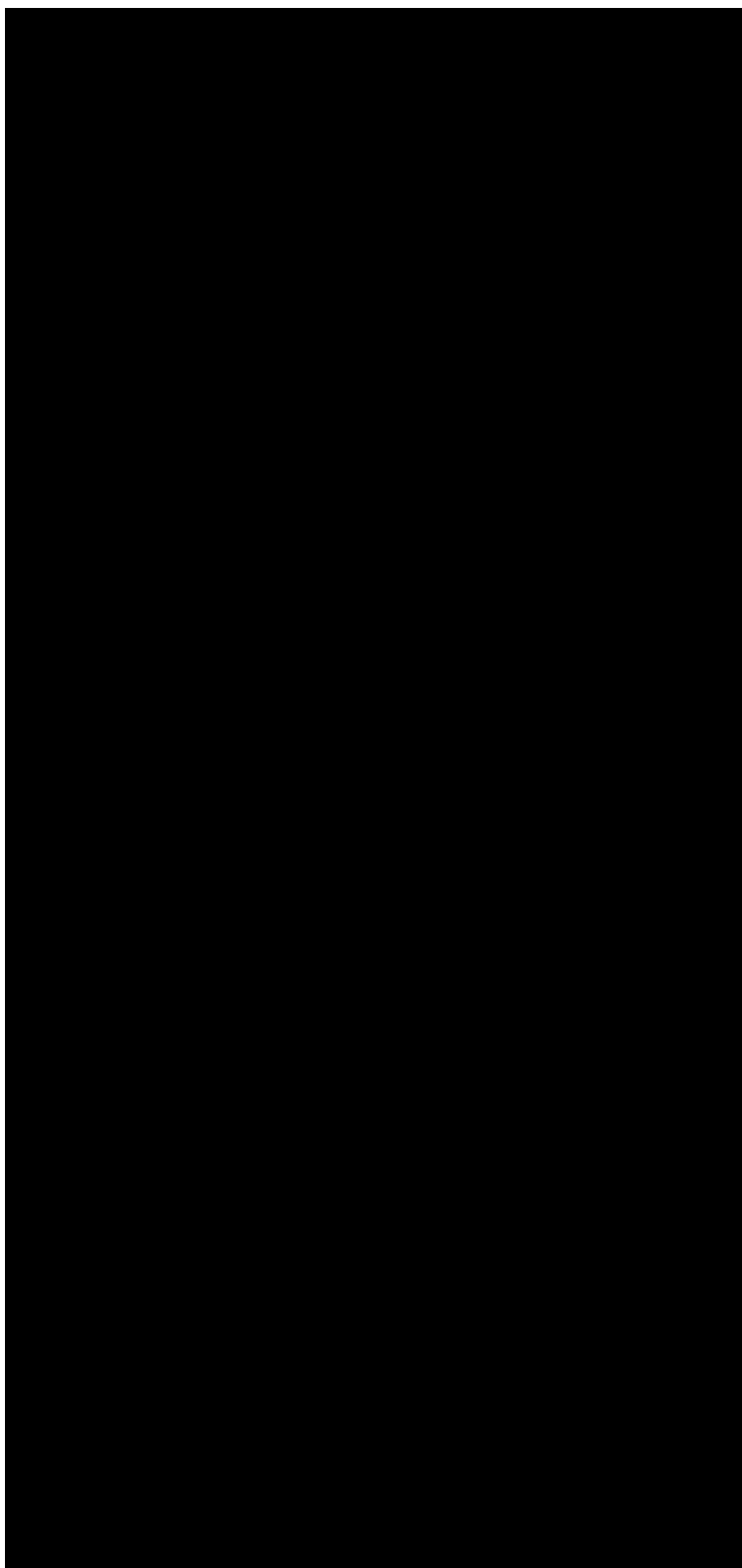


Figure 5. Length distribution jack mackerel taken by EU trawlers in 2007. Numbers on Y-axis are fish measured. Length is measured as fork length to the whole cm below.