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January-July 2025 fishing season for squid (*Dosidicus gigas*) in Chilean waters

Chile

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Abstract

Preliminary fishing and biological information is reported for the Chilean jumbo flying squid fishery for the period January–July 2025, including landing records from the artisanal and industrial fleets, as well as length structure data from catches sampled by IFOP scientific observers. Total landings amounted to 91,313 tons, a value similar to that recorded during the same period in 2024 (92,037 tons). Of this total, 90,715 tons were landed by the artisanal fleet as the target species, and 598 tons by the industrial fleet as incidental catch. Compared to the same period in 2024, there was an increase in reported activity in the northern (31–32°S) and central (33–35°S) areas, while a significant decrease was observed in the central-southern area (36–37°S), which historically accounts for the highest percentage of landings. Catch per unit effort (CPUE) showed a trend similar to that of the previous year. The artisanal CPUE peaked in March–April, followed by a decline in the final weeks of the series compared to the previous year. The size composition of the artisanal catch was similar to that recorded during the same period in 2024. The modal size ranged between 70 and 80 cm mantle length (ML). An analysis of the results in relation to environmental conditions and the expected response of *Dosidicus gigas* is presented; however, it is still not possible to draw clear conclusions regarding the resource–environment relationship. It is recommended to continue monitoring the development of the 2025 fishery and the environmental variables relevant to the dynamics of *D. gigas.*

Background

The jumbo squid (*Dosidicus gigas*) is a squid species endemic to the eastern Pacific Ocean, distributed vertically from the surface down to 1,200 meters, and geographically ranging between 40°N and 47°S (Payá and Cabello, 2024). This species is characterized by rapid growth and early maturity, with a life cycle lasting approximately 1 to 2 years. However, these traits are highly variable and strongly influenced by environmental conditions.

In the regional context (FAO Area 87), jumbo squid catches include those within the convention area of the South Pacific Regional Fisheries Management Organization (SPRFMO) and within the Exclusive Economic Zones (EEZs) of Chile, Peru, and Ecuador. In recent years, jumbo squid has become the most important species in terms of catch volume within the SPRFMO area. Currently, there is ongoing analysis and discussion regarding the existence of a single large stock with three phenotypes or morphs (small, medium, and large). In Chile, catches consist predominantly of the large morph.

During 2024, the Squid Working Group discussed stock assessment model results that estimated a healthy squid stock status for the year 2022. Meanwhile, squid catches in 2024 showed a significant decrease in both the Convention Area and Peruvian waters. Due to the two-year delay between current stock conditions and the stock assessment results, in-season monitoring of this squid fishery is necessary. Therefore, the present working paper reports on the January–May 2025 monitoring of the squid fishery in Chilean waters.

The Fishery Fleet

Composition and Available Data

Since 2020, and in accordance with current Chilean regulations, jumbo flying squid catches are carried out exclusively by the artisanal fleet, while the industrial fleet is limited to reporting incidental catches.

To update the fishery monitoring, data from January to July 2025 were analyzed, using the same period in 2024 as a reference. This includes official landing records reported by SERNAPESCA, which comprise records from boats and launches (artisanal fleet), as well as reports of incidental catches made by the industrial hake fishery. In addition, records collected by IFOP scientific observers were included, consisting of biological databases and fishing logbooks.

Figure 1 shows the location of IFOP monitoring stations during the described period in 2025. These samplings were conducted from the Coquimbo Region to the Biobío Region for the artisanal fleet (boats and launches), and only in the Biobío Region for the industrial fleet.

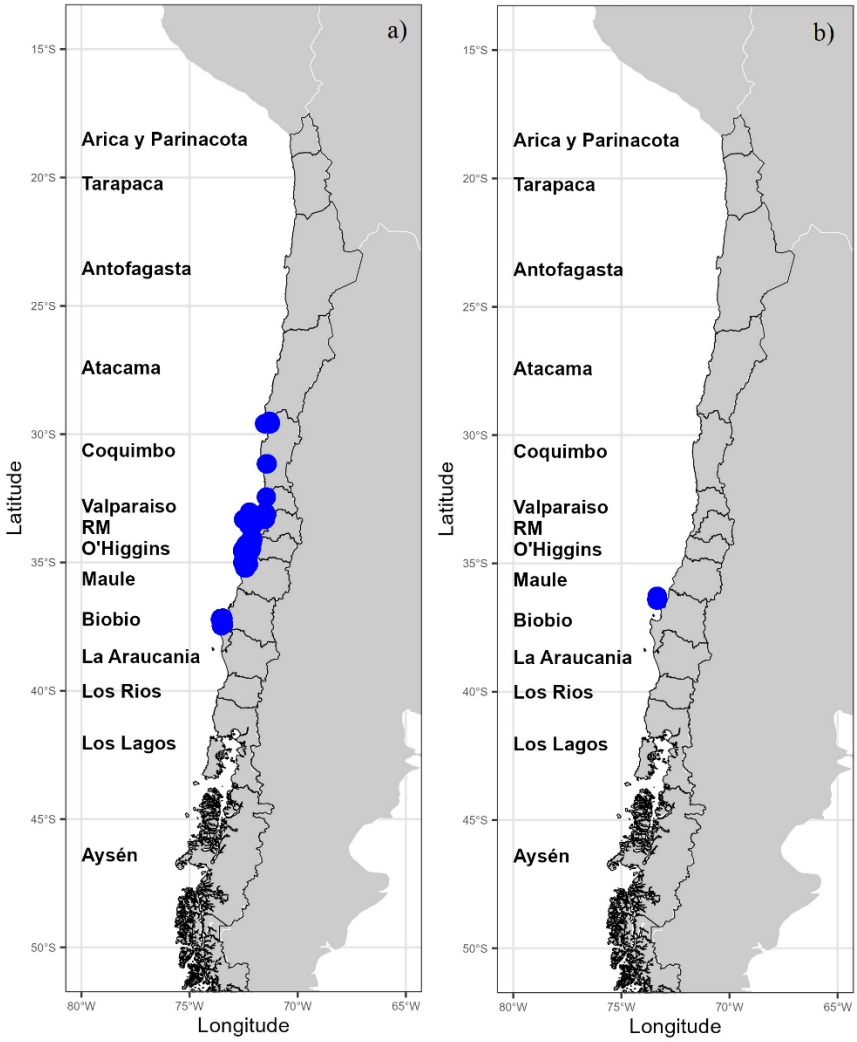


Figure 1. IFOP sampling points for the artisanal fleet (a) and the industrial fleet (b). Source: IFOP 2025. The labels correspond to the region names.

Artisanal Fishery

Reported landings between January and July 2025 totaled 90,715 tons, including both boats and launches, which together comprise the artisanal fleet. When broken down by vessel type, boat landings accounted for 94.3% of the artisanal fleet, significantly surpassing launches landings. In both cases, the highest monthly landing was recorded in March, with a total of 21,428 tons. From that month onward, reported landings began to noticeably decline, reaching a minimum at the end of the period (Table 1).

Table 1. Landings of jumbo squid by the artisanal fleet reported between January and May 2025, in tons. Source: SERNAPESCA.

Month	Boat	Launch	Artesanal total
Junuary	12819.9	814.4	13634.3
February	17229.8	425.0	17654.8
March	19917.4	1511.3	21428.6
April	15857.8	325.6	16183.3
May	8681.5	680.3	9361.8
June	7414.5	862.6	8277.2
July	3599.4	575.6	4175.1
Total	**85520.3**	**5194.8**	**90715.0**

The weekly pattern of artisanal landings in 2025 differed from that of 2024. Boats and launches landed more tons during the first 12 weeks of 2025 compared to 2024, followed by a decline until week 22. In week 23, there was a peak in landings for both vessel types, corresponding to the first week of June (Figure 2).

Regarding cumulative weekly landings, the 2025 records for boats show a total similar to the same period in 2024 (~85,000 tons) (Figure 3). Meanwhile, the cumulative total for launches was slightly lower in 2025 (~5,000 tons).

In terms of landings by region, jumbo flying squid catches were mainly landed in the central-southern regions of the country (Figures 1 and 4). Boat records increased in the northern and central zones compared to 2024, especially in the regions of Coquimbo, Valparaíso, and Maule. Conversely, the Biobío Region recorded a significant decrease (~80%) in landings in 2025 compared to 2024, a region that has historically reported the highest landings. As for launches, preliminary values are not noticeably different from those of 2024; however, reports were observed in the northern zone and were absent in the southern zone, unlike the previous year.

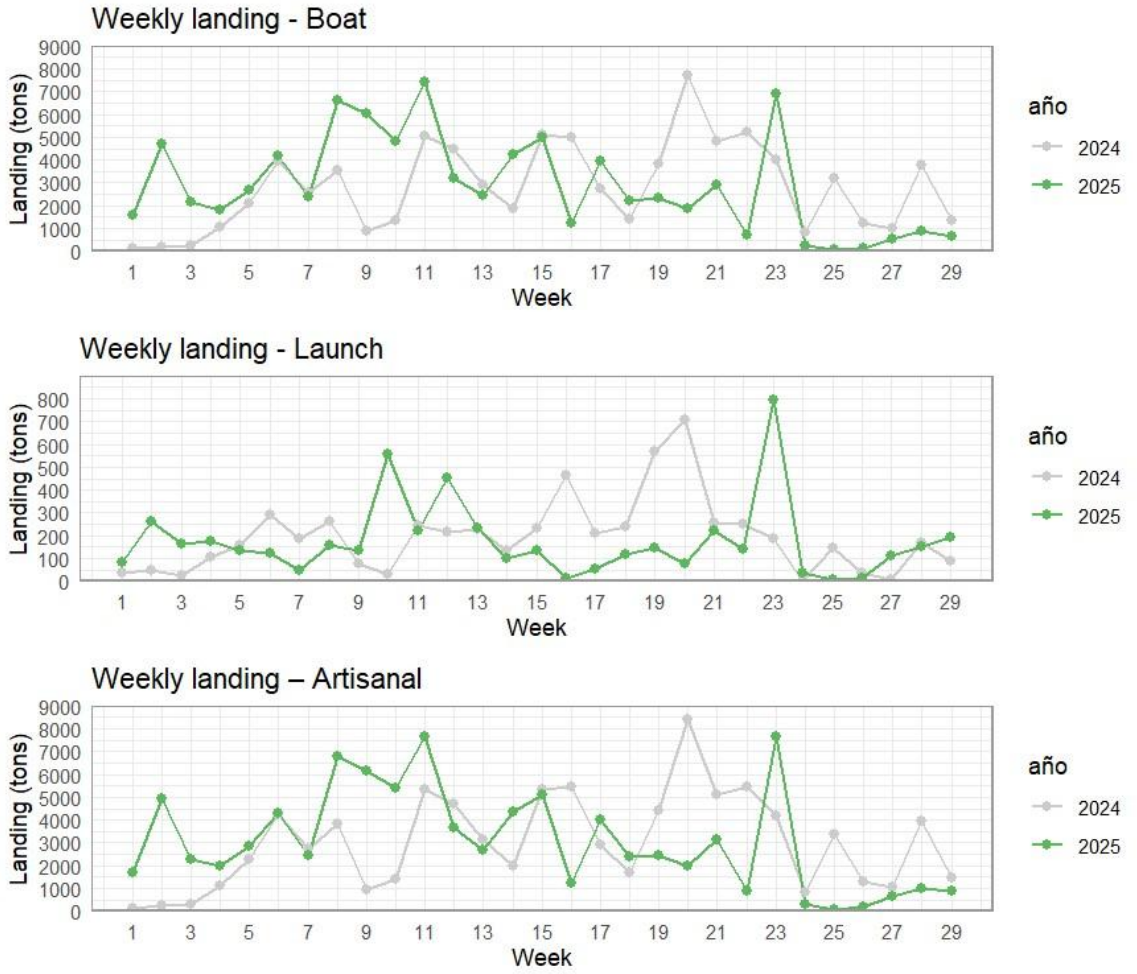


Figure 2. Weekly landing of jumbo squid reported for the artisanal fleet during the January–July 2024–2025 period. Source: SERNAPESCA.

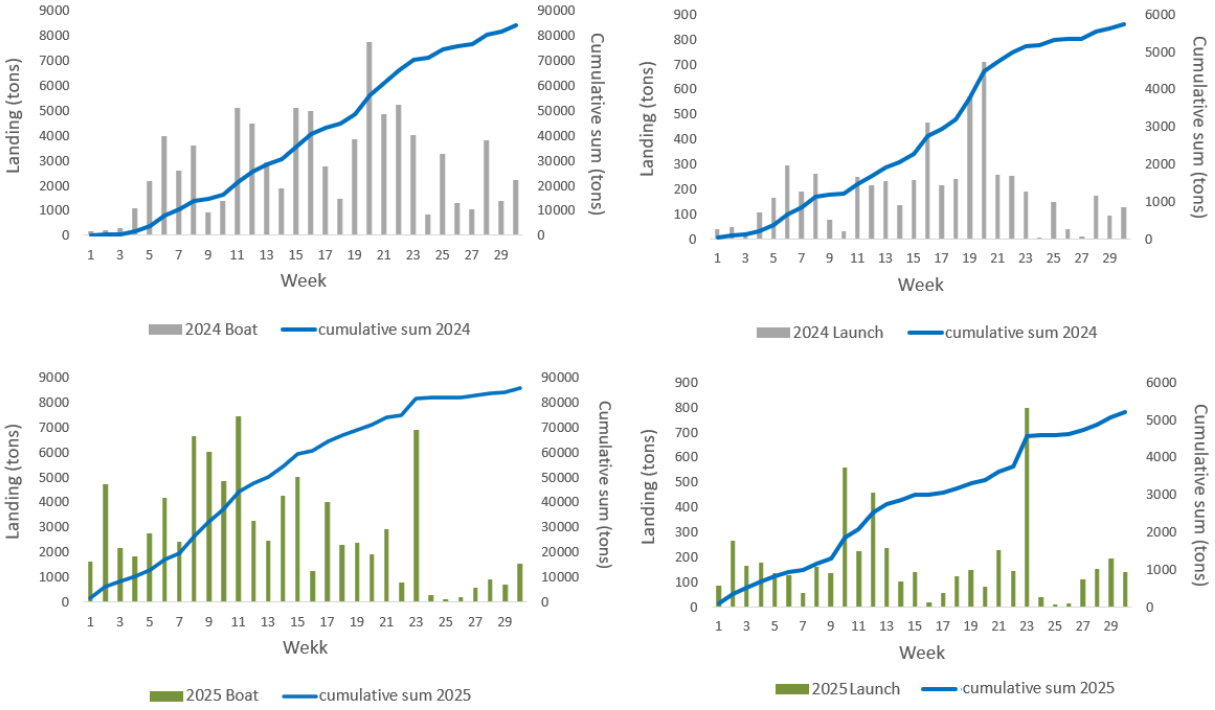


Figure 3. Artisanal weekly and cumulative landings (tons) for January–July in 2024 and 2025. Boats in left panel and launches in the right panel.

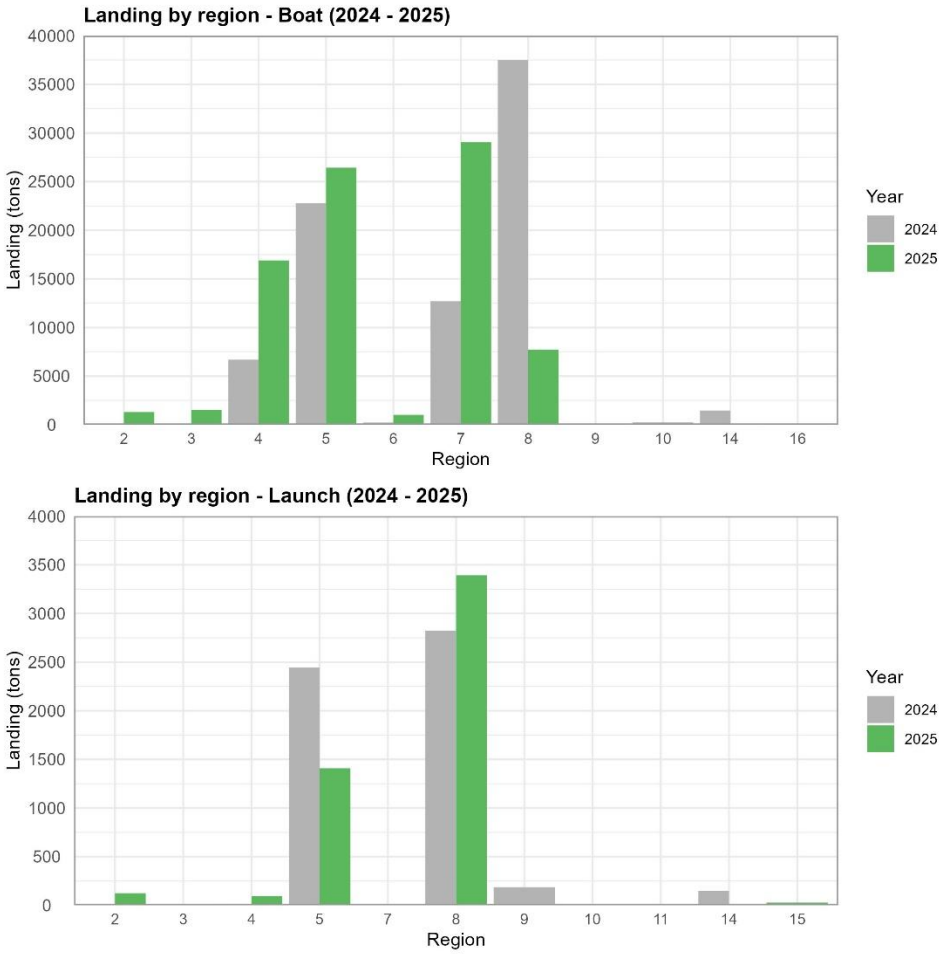


Figure 4. Regional landings of jumbo squid reported for the artisanal fleet during the January–July 2024–2025 period. 2: Antofagasta Region, 3: Atacama Region, 4: Coquimbo Region, 5: Valparaíso Region, 6: O'Higgins Region, 7: Maule Region, 8: Biobío Region, 9: La Araucanía Region, 11: Aysén Region, 14: Los Ríos Region, 15: Arica y Parinacota Region.
Source: SERNAPESCA.

Industrial Fishery

Jumbo flying squid reported as incidental catch from the hake fishery totaled 598.2 tons between January and July 2025 (Table 2). As with the artisanal fleet, the highest landings were recorded in March, with a peak in week 10 (Figure 5), followed by a significant decline from May to July. Weekly landings were variable during the initial period (January–April 2025), then decreased significantly from week 19 (May) through the end of the period (July), during which incidental squid catches were virtually absent (Figure 5).

Total landings of incidental jumbo flying squid catch showed a decrease compared to the previous year (Figure 6). For the current period, a peak was observed in week 10 (105.8 tons);

however, from week 19 (corresponding to May), landings were scarce. This is reflected in the cumulative landings, which stabilized around ~450 tons in the final weeks and are visibly lower than those recorded during the same period in 2024.

Regarding regional records (Figure 7), during the January–July 2025 period, industrial fleet landings of jumbo flying squid were mainly reported in the central-southern zone (Biobío Region, Figure 1), with volumes lower than those of the same period in 2024. In contrast, an increase in incidental catch reports was observed in the northern zone (Tarapacá Region), and no incidental catches have been recorded in the southernmost part of the country.

Table 2. Landings of jumbo squid by the industrial fleet reported between January and July 2025, in tons. Source: SERNAPESCA.

Month	Industrial
Junuary	134.1
February	127.1
March	201.3
April	128.0
May	5.4
June	2.2
July	0.1
Total	**598.2**

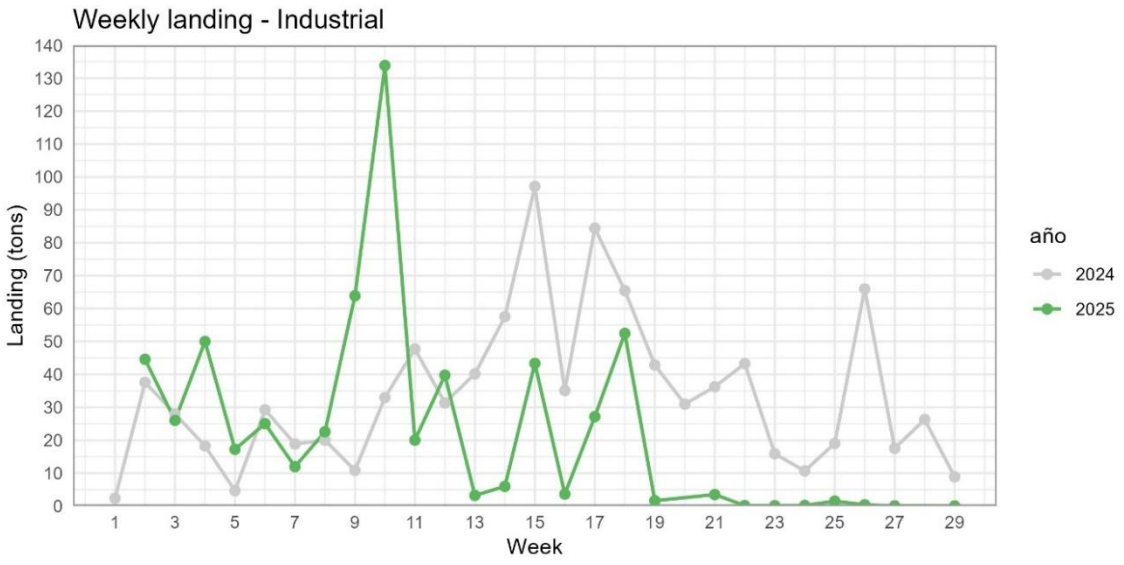


Figure 5. Weekly landing of jumbo squid reported for the industrial fleet during the January–July in year 2024 and year 2025. Source: SERNAPESCA.

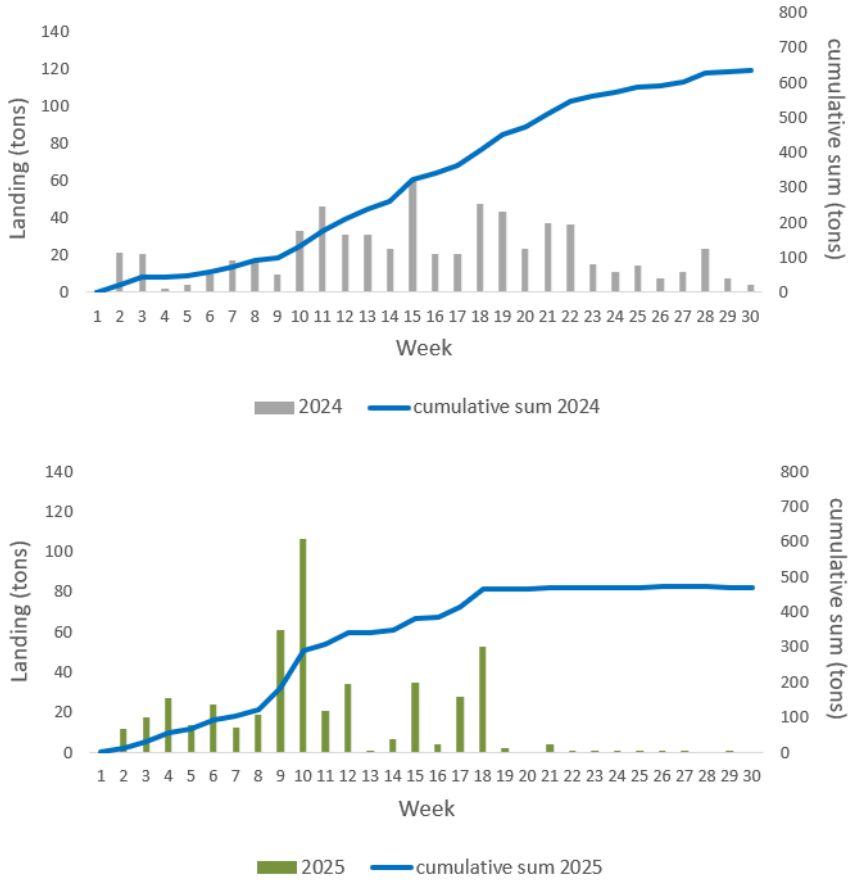


Figure 6. Total landings (tons) and cumulative sum during the January–July 2024 and 2025 period for the industrial fleet.

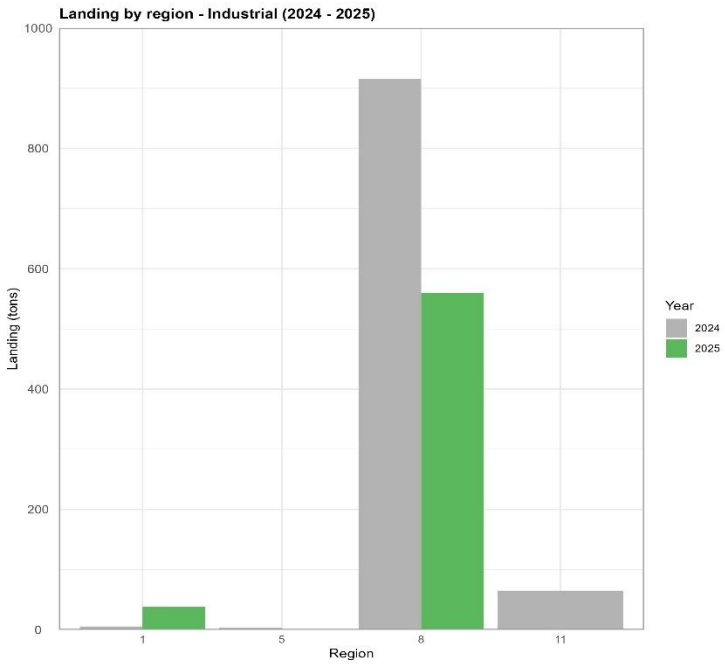


Figure 7. Regional landings of jumbo squid reported for the industrial fleet during January–July in years 2024 and 2025. 1: Tarapacá Region, 5: Valparaiso Region, 8: Biobío Region, 11: Aysén Region. Source: SERNAPESCA.

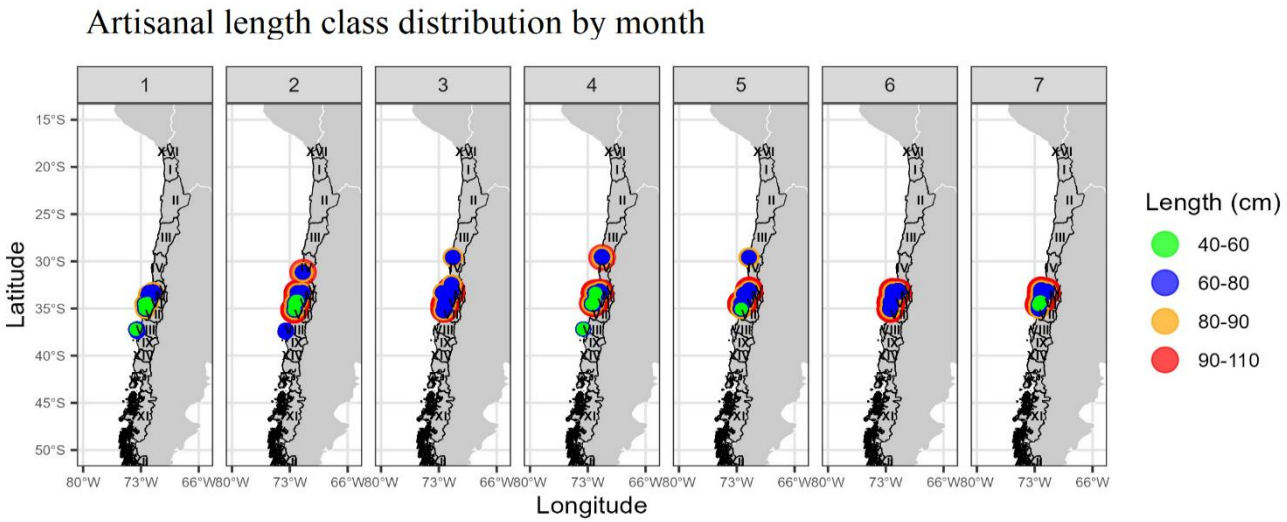
Catch length composition

Size classes for jumbo flying squid recorded by IFOP during the January–July 2025 period ranged between 40–60 and 90–110 cm mantle length (ML) for the artisanal fleet, distributed across the central-southern zone. In the industrial fleet, sizes varied between 60–80 and 80–90 cm, based solely on records from the Biobío Region (Figures 1 and 8). Table 3 shows how the proportion of larger size classes in the artisanal fleet increased over time, reaching ~48% in the 80–90 cm class and 13% in the largest class during July (week 7). Specimens larger than 100 cm were found in the Valparaíso and Maule regions in February (week 2) and June (week 6) of the current year.

On the other hand, incidental catch sizes of jumbo flying squid in the industrial fleet, recorded in the Biobío Region, mostly fluctuated between 60–80 cm ML, with 100% representation from January to March. In April (week 4), larger sizes were recorded, with 27% in the 80–90 cm class (Figure 8, Table 3).

When comparing the 2025 size structures with those of 2024 (Figure 9), no significant differences were found in the northern and central zones (Coquimbo and Maule Regions). However, in the Biobío Region, an increase in the proportion of individuals measuring 60–70 cm was observed in 2025.

In the case of the industrial fleet (Figure 10), which preliminarily includes only records from the Biobío Region, a clear difference is observed between 2024 and 2025. In 2024, a wide range of sizes was recorded, centered around 50 cm. In contrast, during the January–May 2025 period, records were centered around 70 cm, indicating that incidental catches of jumbo flying squid by the industrial fleet have consisted of individuals larger than the size at maturity (it is worth noting that no spawning individuals have been found in Chilean waters).



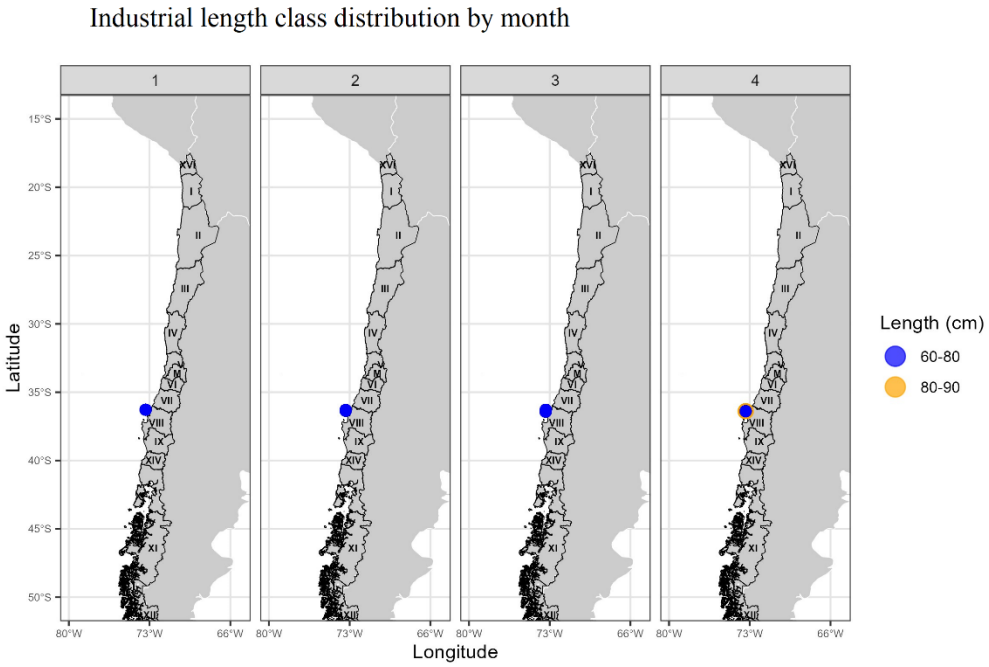


Figure 8. Locations of length classes of jumbo squid by month during 2025 for artisanal fleet (top) and industrial fleet (bottom). 1: January, 2: February, 3: March, 4: April, 5: May. Source: IFOP. The proportions of the different length classes are shown in table 3.

Table 3. Percentage (%) representation of each jumbo squid length class, according to Figure 8.

Artisanal				Month			
length	Junuary	February	March	April	May	June	July
40-60	2.17	4.17	-	4.17	0.59	-	2.21
60-80	89.3	69.9	52.02	63.04	41.82	48.34	36.95
80-90	8.52	22.7	40.18	30.87	46.55	39.73	47.79
90-110	-	3.22	7.8	1.92	11.05	11.93	13.05
Industrial				Month			
length	Junuary	February	March	April	May	June	July
40-60	-	-	-	-	-	-	-
60-80	100	100	100	72.7	-	-	-
80-90	-	-	-	27.3	-	-	-
90-110	-	-	-	-	-	-	-

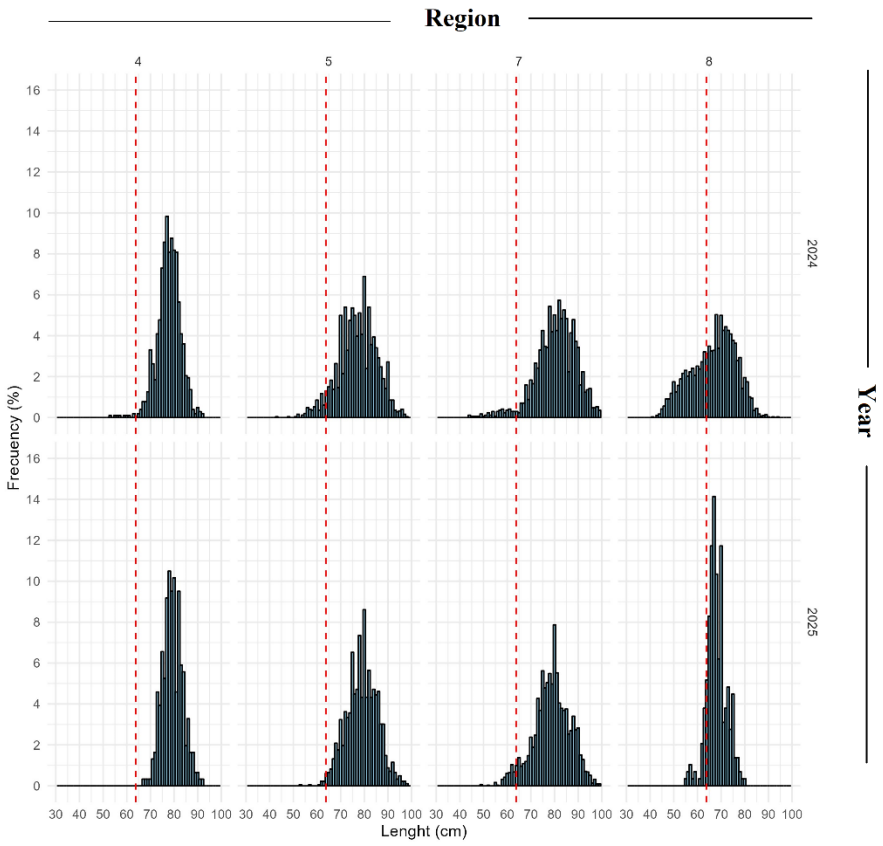


Figure 9. Artisanal catch length composition by region during January–July in year 2024 (top) and year 2025 (bottom). Vertical red line indicates the age at first maturity (Liu *et al*., 2010). 4: Coquimbo Region, 5: Valparaíso Region, 7: Maule Region, 8: Biobío Region. Source: IFOP.

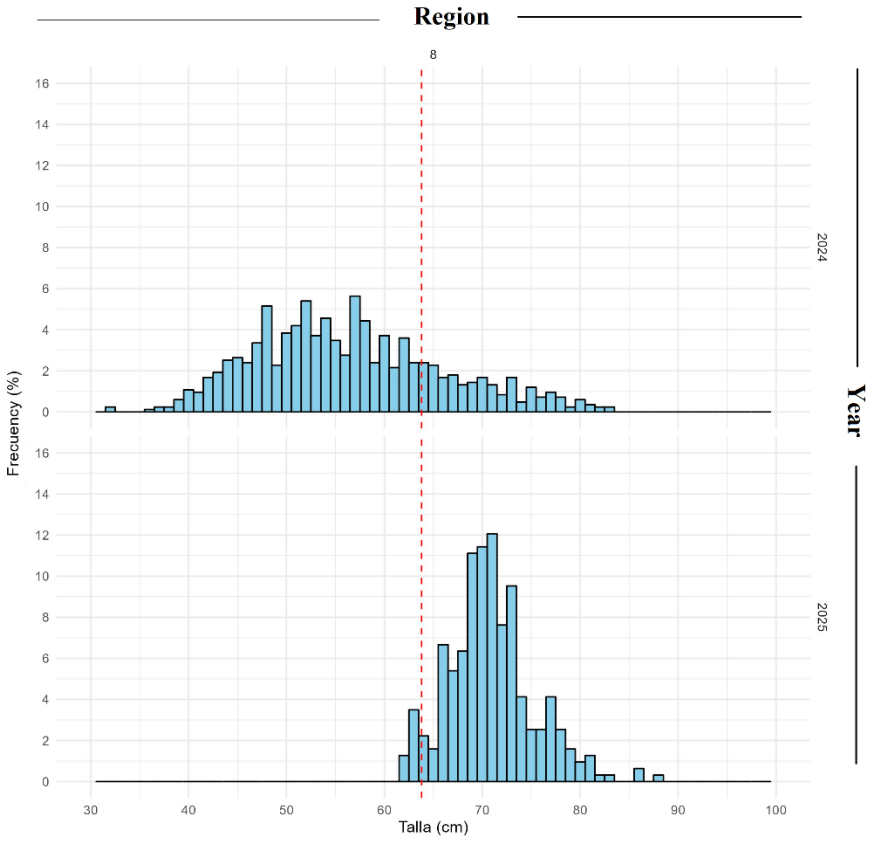


Figure 10. Squid length compositions in bycatch of hake industrial fishery in the Biobío Region during January–July in year 2024 (top) and in year 2025 (bottom). Vertical red line indicates the age at first maturity (Liu *et al*., 2010). Source: IFOP.

CPUE

The preliminary CPUE of the artisanal jumbo flying squid fleet for the January–July 2025 period showed a slight difference compared to the same period in the previous year (Figure 11).

For both boats and launches, an increase in CPUE was observed between weeks 9 and 17, corresponding to the months of March–April, followed by a decline in the subsequent weeks, except for a peak recorded in launches during week 26, which corresponds to the last week of June. In the final period, performance in 2025 was lower than in 2024, associated with the decrease in landings during the last weeks of the analysis.

Regarding the preliminary industrial CPUE, greater variability was observed in the values during the 2025 period, with week 10 (March 3–9) standing out due to a peak in landings with lower effort (days at sea) compared to the rest of the period. As with the artisanal fleet,

a decline in CPUE was observed in the final weeks, reaching minimum values in June and July due to the limited number of reported landings during that period (Table 2).

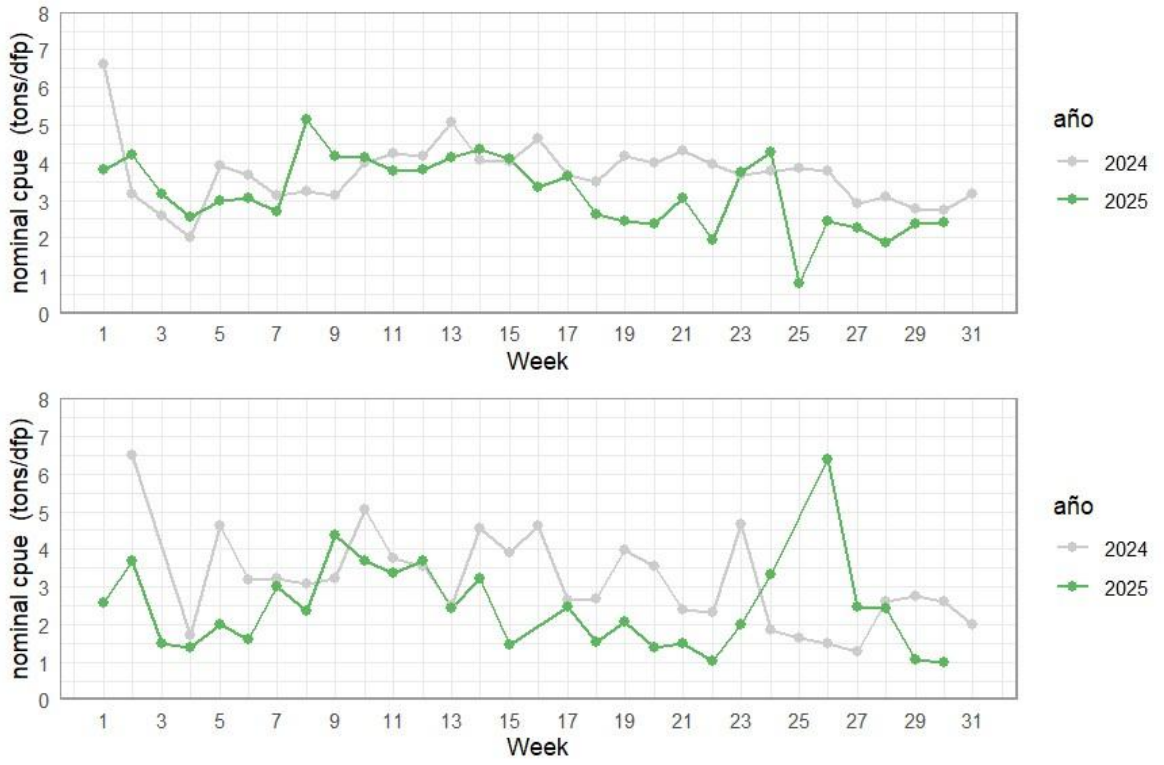


Figure 11. Nominal CPUE of artisanal jumbo squid for the period January–July 2024 and 2025 (tons / days out of port). Boats in left panel and launches in the right panel.

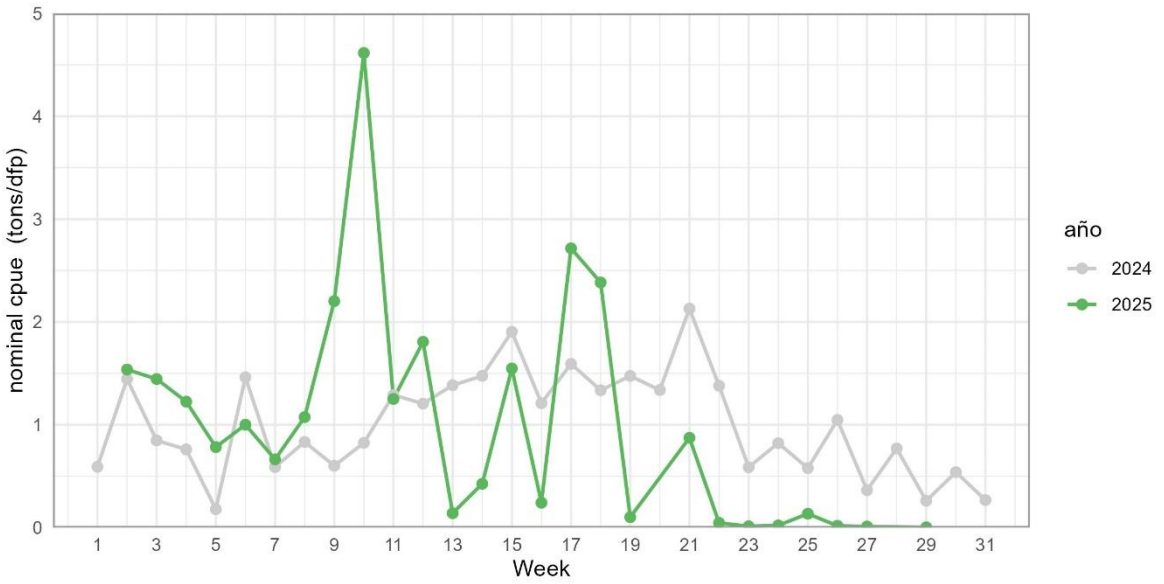


Figure 12. Nominal CPUE of industrial jumbo squid for the period January–July 2024 and 2025 (tons / days out of port).

Discussion

The preliminary results obtained during the January–July 2025 period showed similar behavior in both the artisanal fleet (boats and launches) and the industrial fleet (incidental catch), compared to landings in early 2024 (up to March–April). From that point onward, landings generally tended to decrease, reaching the absence of the resource in incidental catches by the industrial fleet.

One of the most significant changes compared to previous years was the regional distribution (Figure 4), particularly in the Biobío Region (Figure 1), where squid landings experienced a sharp decline, dropping by approximately 80% compared to the previous year. In absolute terms, nearly 30,000 fewer tons were extracted—an unusual condition for this region, considering it has historically recorded the highest landings. Conversely, landings were concentrated in the northern and central zones of Chile, with notable increases in the Coquimbo Region (~29–32°S) and the Maule Region (~34–36°S), which rose by 152% and 129%, respectively, compared to 2024.

So far, there is no clear explanation for the variations that have affected the fishery during this period. Studies on the biology of *Dosidicus gigas* have allowed researchers to classify the developmental stages of the resource and have highlighted the importance of the environmental conditions in which it develops. Ruvalcaba and Sánchez (2024) describe the egg stage, which develops at temperatures between 15 and 25 °C under highly oxygenated conditions (Staaf et al., 2008). The paralarval stage involves extremely rapid growth rates (up to 6% per day), requiring high oxygen concentrations. For this reason, individuals remain in surface layers and cannot migrate to deeper waters due to the risk of entering hypoxic zones (Ruvalcaba-Aroche et al., 2022). Only in the juvenile stage, once they acquire strong swimming capabilities, are they able to perform vertical migrations, reaching oxygen minimum zones, which are later used as refuge and hunting grounds.

Although reaching adulthood in *Dosidicus gigas* implies a wide distribution range, the contrasting environmental conditions across regions facilitate its dispersal and migration. It has been observed that temperature changes—such as those caused by ENSO events—alter size structure and modify reproductive timing. Warming events tend to reduce both the size and number of squid, while cooling events increase size and availability.

Ruvalcaba and Sánchez (2024) indicate that if juveniles experience warm and low-productivity conditions, they will redirect their energy toward reproduction. This results in smaller-sized squid that may become reproductively active more quickly, but with a shorter lifespan (Arkhipkin et al., 2015; Frawley et al., 2019).

Ruvalcaba and Sánchez (2024) also explain what has occurred in ecosystems such as the Gulf of California, where: “the prolonged decrease in wind intensity led to lower primary productivity (decline in chlorophyll levels) following ENSO events (Robinson et al., 2016),

along with changes in prey composition (Markaida, 2006a). These conditions likely had a negative impact on the jumbo flying squid population in the Gulf of California, even at the population structure level, favoring small and medium morphotypes at the expense of the large phenotype (Markaida, 2006b)."

Payá (2019) described the impact of the warm ENSO event (El Niño) during 2015–2016 on the availability and size structure of jumbo flying squid off the coast of Chile. In this case, a sharp decrease in sizes was detected during the 2019 catches, dropping from 70 to 40 cm mantle length, along with a north-to-south shift in distribution. The same report suggests the activation of an early maturation strategy, which results in smaller sizes. It also notes that the delayed effect in Chile compared to Peru was likely due to the influence of the Humboldt Current, which may have mitigated the impact of the warming event by prolonging high productivity levels that support the development of larger squid.

For the time period analyzed along the Chilean coast in this document—January to July 2025—and following a new warming event that occurred in 2023, a response similar to that described by Payá (2019) was expected. However, the observed variations in distribution and size were contrary to expectations. As previously described, the shift in catch distribution moved from south to north, while squid sizes showed a tendency to be larger than in recent years, even exceeding historical monthly averages (Figure 13).

To identify the environmental changes that could potentially explain the variations in the distribution and size structure of *Dosidicus gigas,* various sources of information were used, as described below. One of the main references for understanding the state of the Pacific Ocean is the reports published by NOAA's Climate Prediction Center (CPC). Figure 14 shows that since the 2023 El Niño warming event, sea surface temperature anomalies have been unstable, fluctuating between warm and cold anomalies of varying magnitude across the NINO 1+2 region. Positive anomalies were particularly notable during the early part of 2025, with values reaching +1.5 °C. The latest ENSO bulletin published for August describes cold conditions, in contrast to the initial forecast for the year, which had predicted neutral conditions for the Niño 3+4 region.

On the other hand, satellite images from Mercator Ocean International (MOi) (Figure 15) show that between September and December 2024—after the remnants of the 2023 warming event had "subsided"—negative anomalies were present in the South Pacific, with a trend toward neutral conditions along the coast from Ecuador to southern Chile. However, in January, a core of positive anomalies was detected off the coast of New Zealand and a weaker one off the coast of Chile. The latter intensified in February and persisted through March of the current year.

Figure 16 shows a snapshot of sea surface temperature anomalies published by the SAPO (Alert, Prediction and Observation System). This image was captured on March 11 of the

current year to detect the location of the high anomalies previously observed in Figure 15. The highest values were located off the Biobío Region, reaching +2 °C.

Figure 17 shows historical chlorophyll-a concentrations along the Chilean coastal strip, where a sustained decline in values has been observed since 2023. Although a recovery was noted in early 2024, values dropped again, a condition that persisted into the first months of 2025.

In conclusion, based on the evidence presented in this document, changes have occurred both in the resource and in environmental conditions. However, when attempting to relate both factors, the patterns contradict previous observations and the established theory regarding the distribution and reproductive strategy of *Dosidicus gigas*. It is therefore of interest to continue monitoring and evaluating resource–environment variability in order to strengthen the knowledge base that will support improved fishery management.

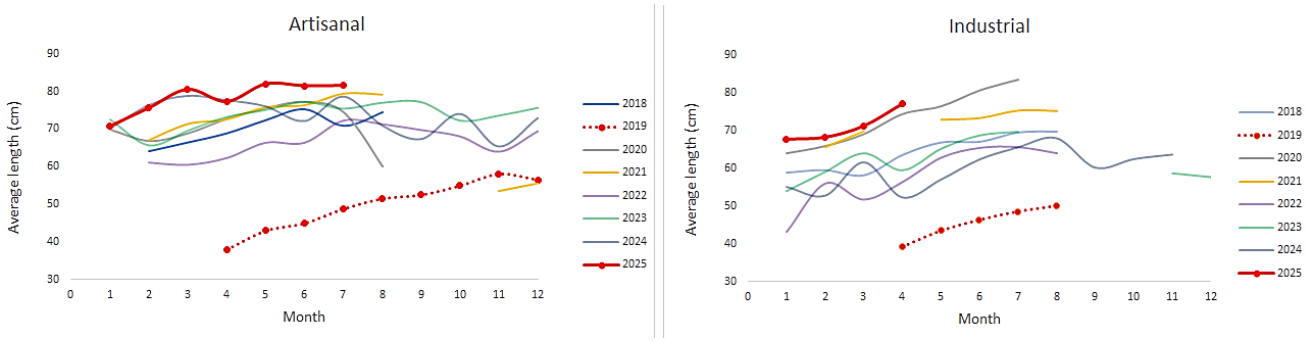


Figure 13. Historical mantle lengths (ML) of jumbo flying squid. The years 2019 (dotted line) and 2025 (solid line) are highlighted in red.

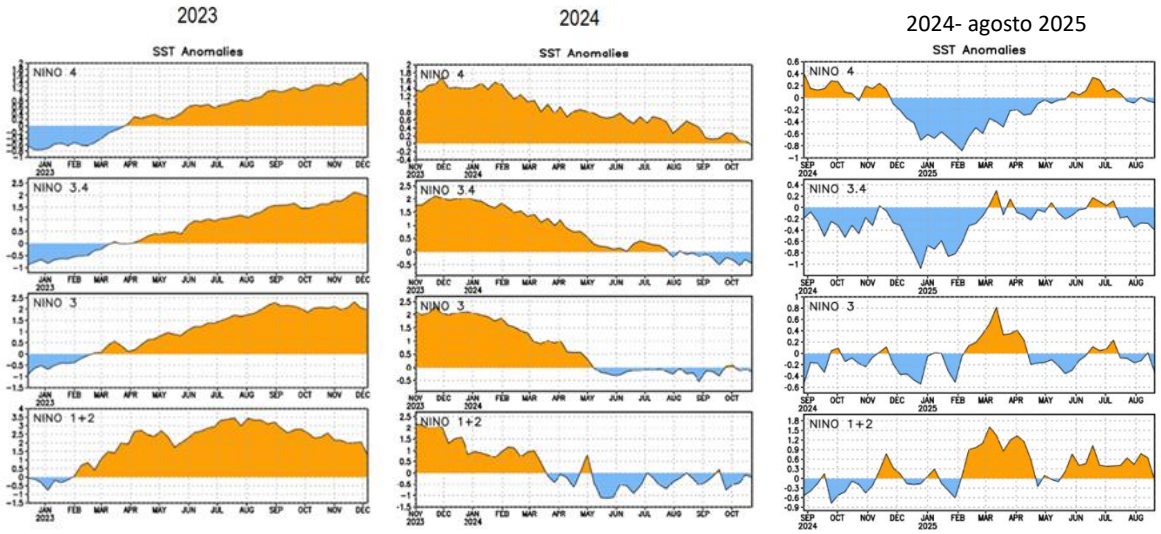


Figure 14. Time series of sea surface temperature anomalies (°C) averaged over each Niño region from the 2023 El Niño event to August 2025. Source: https://www.cpc.ncep.noaa.gov.

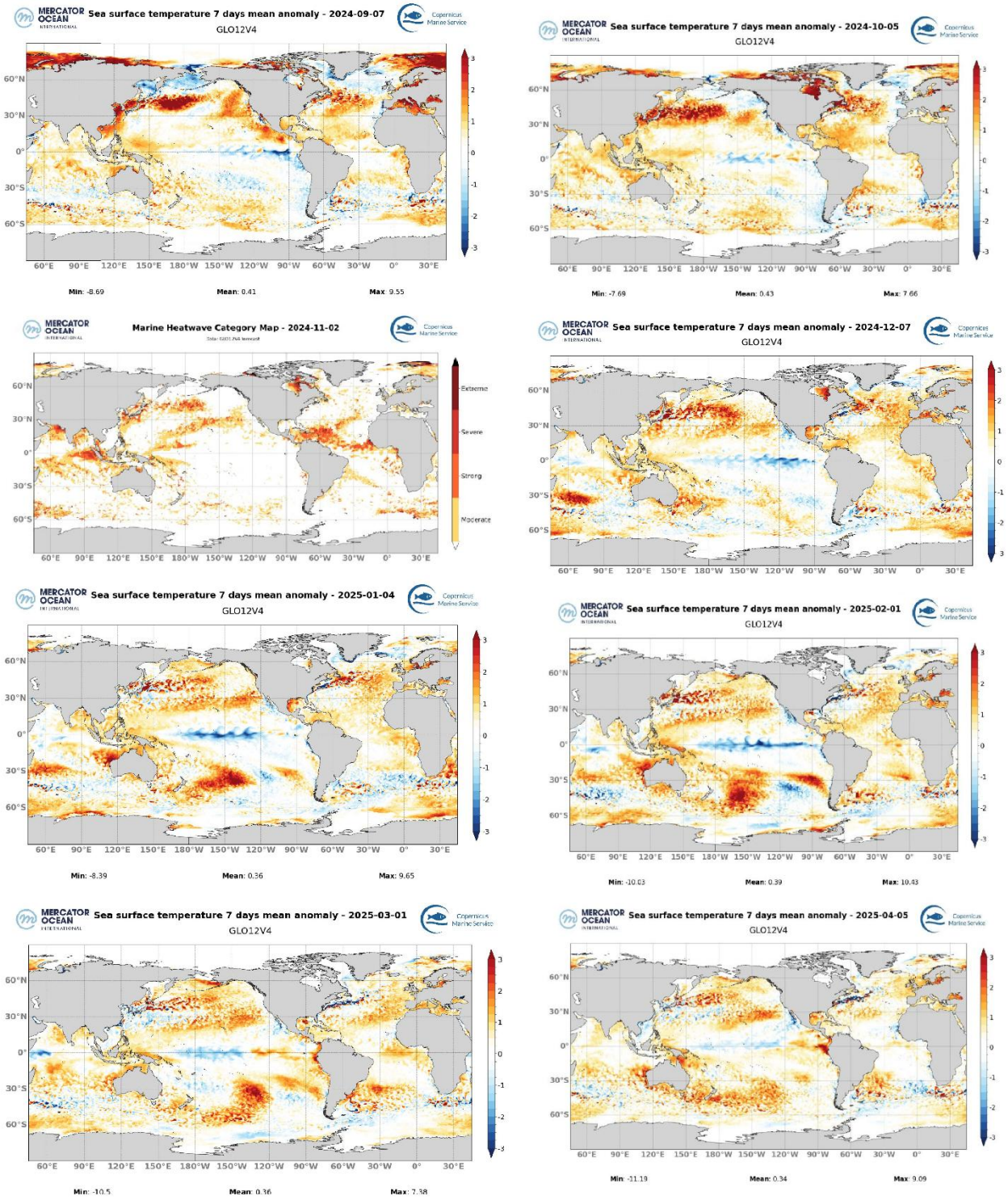


Figure 15. Sea Surface Temperature (SST) anomaly between September 2024 and April 2025. Source: Marine Heatwave Bulletin (https://www.mercator-ocean.eu).

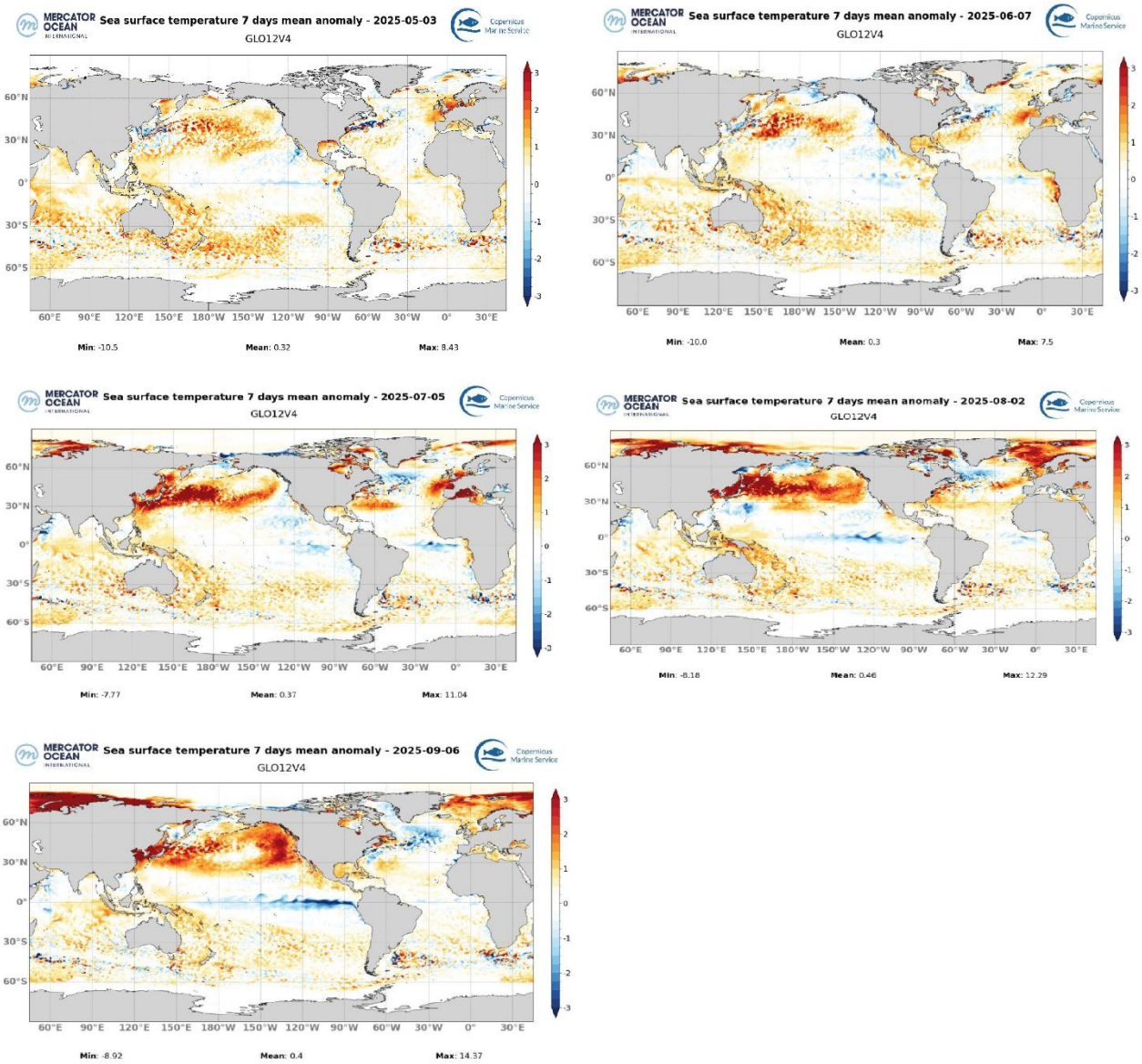


Figure 15 (Continue). Sea Surface Temperature (SST) anomaly between September 2024 and April 2025. Source: Marine Heatwave Bulletin (https://www.mercator-ocean.eu).

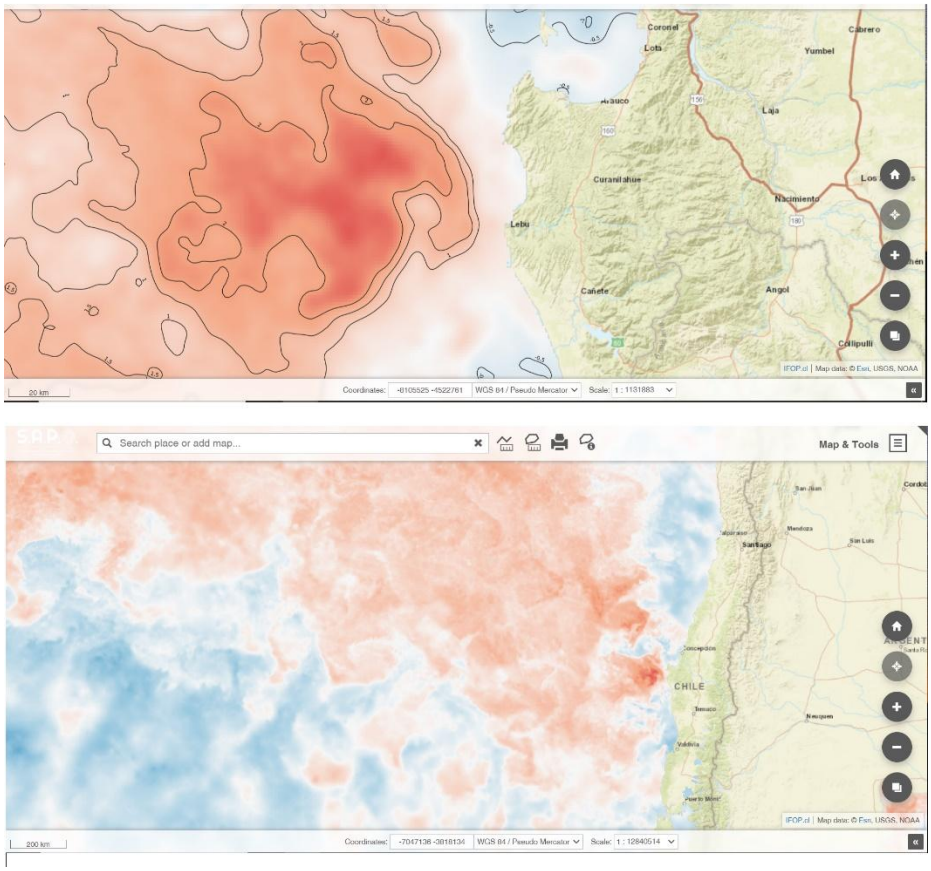


Figure 16. Snapshot of sea surface temperature (SST) anomaly on March 11, 2025, with emphasis on the Biobío Region. Source: IFOP-SAPO (https://giscc.ifop.cl).

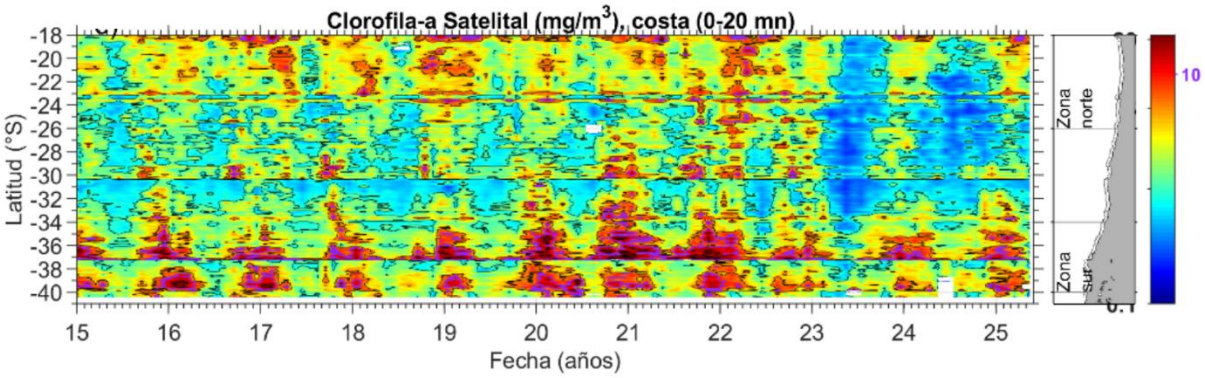


Figure 17. Satellite chlorophyll-a in the coastal band (0–20 nautical miles). Source: Bio-oceanographic Bulletin No. 11. IFOP (www.ifop.cl).

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