Longfin Inshore Squid (*Doryteuthis pealeii*) Ecosystem & Socioeconomic Profile Report Card

Spring 2026

Key Findings from the Life History Working Group

Lifespan and aging
Hypothesis of 1 statolith ring/day is well-established but includes some uncertainty of aging error if daily statolith increments are incorrect. Discussions from the longfin squid summit estimate a maximum age of 15 months. Literature review supports a lifespan of less than 1 year. Recent (2024) statolith aging of longfin squid in the SQUIBS dataset (right) - assuming 1 statolith ring/day - indicate maximum ages of ~7 months for females and ~8.6 months for males.

Migration and movement dynamics
Previous literature suggests the possibility of a "winter cohort" of longfin squid that hatch south of Cape Hatteras and subsequently migrate onto the Northeast U.S. continental shelf. Fishery observations describe a spatial gradient of 1-6 cm ML squid from waters south of Hatteras through the Mid-Atlantic and southern New England, with the smallest squid detected further south. Dr. David Richardson proposed a mechanism for this migration hypothesis in which the recruitment transport of juvenile squid from winter hatching grounds on the Southeast U.S. shelf is facilitated by the Gulf Stream and warm core rings.
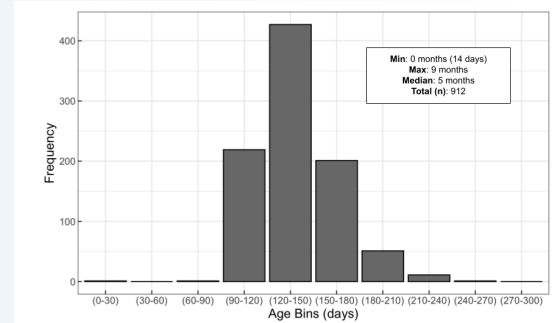
Reproductive dynamics
Traditionally, longfin squid were thought to spawn in two distinct cohorts: spring and summer/fall. Consideration of the hypothesis of a winter cohort spawning south of Hatteras indicates the presence of multiple cohorts of longfin squid, with some outside of the traditional Northeast shelf stock area, and provides evidence of year-round spawning in the stock.

Natural mortality
Potential relationships between natural morality and longfin inshore squid differ by age and life stage; however, quantifying these relationships is complex and is dependent on accurate age and life cycle estimates. It is likely that multiple natural mortality approximations will need to be developed to match lifespan hypotheses. Intraspecific predation impacts natural mortality in longfin squid, but methods are not currently available to directly quantify
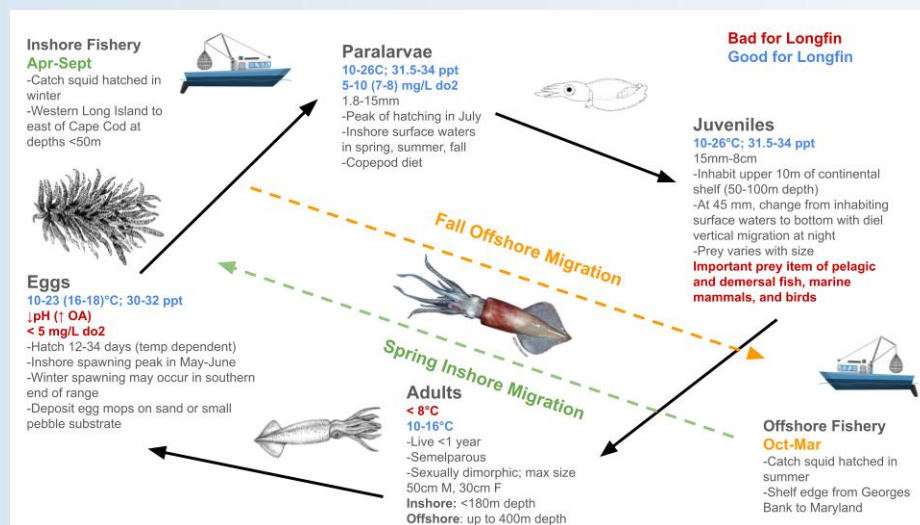
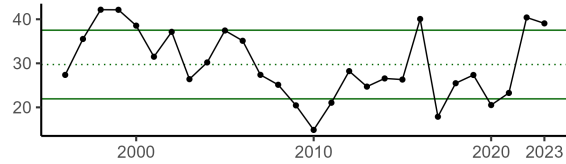## Longfin Squid Age Frequency from SQUIBS dataset

Min: 0 months (14 days)
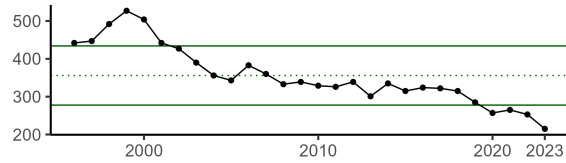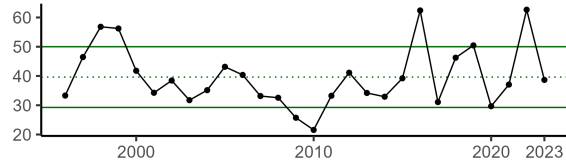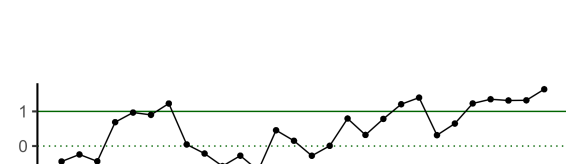Max: 9 months
Median: 5 months
Total (n): 912

Key Points from the Mid-Atlantic Risk Assessment

In the 2025 Mid-Atlantic EAFM Risk Assessment Update, longfin squid scored moderate-high risk in the following elements:

- Moderate-high risk to the stock due to:
    - High potential for and observed distribution shifts
- Moderate-high risk to the commercial fishery due to:
    - Risk of not achieving optimum yield due to interactions with non-Council managed species
    - Occasional recent changes in regulations; moderate (3-4) recreational regulation differences across states
    - Regular discards and incidental catch but managed; moderate discard mortality

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Indicator Units	Status In 2024	Implications	Time Series
Commercial landings (millions of lbs.)	Above long term average	Add implications here (3-5 sentences)	
Number of commercial vessels (#)	Below long term average	Add implications here (3-5 sentences)	
Commercial revenue (2023 USD)	Near long term average	Add implications here (3-5 sentences)	
Western Gulf Stream Index (shift in the western part of the Gulf Stream North wall: mean position: >0 = more northerly, <0 = more southerly)	Above long term average	Since the mid-1990s, north and westward shifts in the Gulf Stream have resulted in an increase in warm core rings and deep water, high salinity heat waves. The position of the Gulf Stream influences seasonal temperature and water mass mixing dynamics that affect longfin squid habitat suitability, temperature-dependent growth, and prey availability.	
Bottom temperature (°C)	Add status in 2024 here (short phrase)	Longfin squid seasonal distribution and growth rates are likely temperature dependent, avoiding water <8°C. Inshore temperature thresholds (around 14°C) initiate migration of squid from offshore overwintering habitats.	

Research Recommendations

-Expand ecosystem and socioeconomic indicator selection relevant to longfin squid stock dynamics. Potential ecosystem indicators include bottom salinity, sea surface temperature, warm core rings, marine heatwaves, storminess index, indices of food availability, and other oceanographic indicators relevant to shelf/slope dynamics. Potential socioeconomic indicators include fuel price, quotas, and ex-vessel price.

-Analyze indicators against longfin squid metrics, such as a standardized CPUE index.

-Estimate availability of longfin squid stock to fishery independent surveys and fishery. Through a seasonal habitat suitability model/species distribution model.

-Evaluate ecosystem and socioeconomic influences on longfin squid in reference to the stock assessment and fisheries management consideratio

Please contact nefsc.esp.leads@noaa.gov with any questions or comments.