

## Mesozooplankton in the Straits of Florida: Patterns in Biomass and Distribution

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**Abstract :** Effective fisheries management is necessarily dependent on the accuracy of fisheries models, which can be limited if they omit critical elements. One critical element in the formulation of these models is the trophic interactions at the larval stage of fish development. At this stage, fish mortality rates are at their peak and survival is often determined by resource limitation. Thus it is crucial to identify and quantify essential prey resources and determine how they vary in abundance and availability. The main resources larval fish consume are mesozooplankton. In the Straits of Florida, little is known about temporal and spatial variability of the mesozooplankton community despite its importance as a spawning ground for fish such as the Blue Marlin. To investigate mesozooplankton distribution patterns in the Straits of Florida, a transect of 16 stations from Miami to the Bahamas was sampled once a month in 2003 and 2004 at four depths. We found marked temporal and spatial variability in mesozooplankton biomass, diversity, and depth distribution. Mesozooplankton biomass peaked on the western boundary of the SOF and decreased gradually across the straits to a minimum at eastern stations. Midcurrent stations appeared to be a region of enhanced year-round variability, but limited seasonality. Examination of dominant zooplankton groups revealed groups could be parsed into 6 clusters based on abundance. Of these zooplankton groups, copepods were the most abundant zooplankton group, with the 20 most abundant species making up 86% of the copepod community. Copepod diversity was lowest at midcurrent stations and highest in the Eastern SOF. Interestingly, one copepod species, previously identified to compose up to 90% of larval blue marlin and sailfish diets in the SOF, had a mean abundance of less than 7%. However, the unique spatial and vertical distribution patterns of this copepod coincide with peak larval fish spawning periods and larval distribution, suggesting an important relationship requiring further investigation.

**Keywords :** mesozooplankton biodiversity, larval fish diet, food web, Straits of Florida, vertical distribution, spatiotemporal variability, cross-current comparisons, Gulf Stream

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