

Jones, D. L. 2007. Distributional ecology of coral reef fish larvae (Labridae, Scaridae) in the southern Straits of Florida. Ph.D. dissertation, University of Miami, Coral Gables, FL; 255 pp.

#### Abstract

This study targets the poorly described egg and larval stages of wrasses and parrotfishes that as adults inhabit coral reefs and seagrasses in the western central Atlantic. Descriptions are provided to allow laboratory identification of the egg and larval stages of these fishes. Accounts are given for 16 of the 20 species of labrid and six of the 14 species of scarids that occur here. The biological, hydrographic, and meteorological data from four oceanographic surveys of the southern Straits of Florida were analyzed to provide a synthesis of the effects of the environment on the distribution of larval fishes occupying a region that is influenced by geostrophic currents and mesoscale recirculation features. Results indicate these oceanographic phenomena play an important role in influencing the distribution of these fishes in their pelagic nursery habitat. The most striking evidence for this comes from the close association of high abundances of fish larvae with the Tortugas Gyre, a semi-permanent mesoscale eddy frequently present off the western Florida Keys. Most species were found in greatest abundance near the center of the eddy, while others were limited to offshore waters along its periphery in deeper depth strata. Older larvae occurred more frequently than younger stages. Those taxa most abundant near the center of the eddy were also more often taken as older larvae. Two hypotheses are proposed to account for larval accumulation in the center of the eddy, which are not mutually exclusive. The first is based on advection of passive larvae that are cyclonically entrained into the center of the eddy along the horizontal plane, while the second provides for a cascade of ecological effects that originate from eddy-induced upwelling in the vertical plane. Diel and ontogenetic effects were shown to be important components of the vertical distribution patterns displayed by these fishes. The vertical distribution of most species within the top 115 m of the water column was non-uniform. Mean depths of most larvae were deeper during the day than at night, with older stage larvae occurring deeper than younger stages.