

Distribution of larval fishes around an isolated oceanic island and the role of larval retention in population maintenance (Abstract)

George W. Boehlert, William Watson, and L. Charles Sun

Ichthyoplankton sampling was conducted in November 1984 in waters surrounding Johnston Island (16°44'N 169°32'E), a small, isolated atoll in the central Pacific Ocean. The typical flow pattern in this region is westward; the nearest island is in the Hawaiian Chain, 760 km distant. Discrete-depth sampling with a 1 m² Tucker trawl was concentrated in the upper 100 m, where larval abundances were greatest. Concurrently, a grid of CTD and XBT stations was occupied to later estimate patterns of geostrophic currents. Most collections were dominated by oceanic taxa. In the 0–50 m stratum, larval densities were relatively uniform, but densities at greater distances tended to be slightly lower. In the 50–100 m stratum, however, abundances on the west (downcurrent) side of the island were markedly higher than either upcurrent or further downcurrent. Oceanic taxa (as exemplified by the Myctophidae) did not display this pattern, while marked areas of very high abundance characterized the island-related taxa. The species responsible for most of the increased abundance

was the gobiid *Eviota epiphanes*. Geostrophic flow patterns indicated that this region was one of return flow associated with mesoscale eddies north and west of the island. This region may serve as a downcurrent retention area for the pelagic larvae of island-related taxa, and may facilitate recruitment back to the source populations. Population maintenance of species with pelagic larvae in tropical islands is poorly understood, but processes in the plankton are probably responsible for recruitment variability. More detailed measurements of currents and finer scale resolution of the vertical distribution of larvae will be necessary to understand these mechanisms of larval retention. Variability in the physical patterns may then be investigated to determine the effects on recruitment variability.

George W. Boehlert: NMFS, Southwest Fisheries Center Honolulu Laboratory, 2570 Dole St., Honolulu, HI 96822-2386, USA. William Watson: Marine Ecological Consultants, Encinitas, CA 92024, USA. L. Charles Sun: Department of Oceanography, University of Hawaii, Honolulu, HI 96822, USA.