

Lauren L. Bergey. Variability of striped bass, *Morone saxatilis*, egg characteristics in populations along the eastern seaboard: implications for aquaculture and stock enhancement. (Under the direction of Roger A. Rulifson). Department of Biology, December 2000.

Populations of striped bass *Morone saxatilis* along the eastern seaboard of North America inhabit several different watershed types and must adapt to the unique environmental conditions of the habitat for long-term success. Perhaps the most critical period for survival is the early life stage. Thus, careful consideration should be given to the selection of source brood fish for stock enhancement and restoration programs. In an effort to quantify relationships between habitat location and egg characteristics, individual egg densities, egg diameters, oil diameters, and lipid content were examined. To investigate potential genetic influence on these traits, caudal fin clips from females that had spawned were obtained to ascertain genetic similarities in brood fish from similar watershed types. Eggs were collected from brood fish from seven hatcheries representing nine watersheds from Georgia to Canada. Water quality conditions among hatchery locations were significantly different. Results of egg characteristics tested under ambient and controlled water quality conditions indicated no differences within hatcheries. However, among hatcheries there were significant differences in egg diameter, oil diameter, density, and fatty acid content. Eggs from swift coastal systems had heavier eggs and large amounts of saturated and monounsaturated fatty acids in both the neutral and phospholipid fractions, while eggs from slower moving systems had less dense eggs and large amounts of polyunsaturated fatty acids in both neutral lipids and phospholipid fractions. Genetic sequences of one region of the mitochondrial DNA (D-loop) indicated invariance for almost all sites with the exception of one location. One distinct feature of the sequences was that the Roanoke River population from North Carolina has a 3-base anomaly at one site not exhibited in fish from the other sampling location illustrated. Differences in egg characteristics may be related to watershed conditions, nutrition of the female, genetics, or a combination of these factors.