

## 26<sup>th</sup> Annual International Submerged Lands Management Conference

### Assessing the Impacts of Land Use Change on Hard Clam Aquaculture in Old Plantation Creek, Northampton County, Virginia

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**Abstract:** One of the main threats to water quality in the Chesapeake Bay is contamination by bacterial loading from point and non-point sources. While only very high levels of fecal bacteria (greater than 200 cfu/100ml) indicate the potential of a health threat to humans from contact with water, lower concentrations (14 cfu/100 ml) make the shellfish from contaminated waters unfit for human consumption. Many near-shore submerged lands that are vulnerable to bacterial contamination are also suitable for the propagation of shellfish, including the hard clam (*M. mercenaria*). This is especially true on Virginia's Eastern Shore, where shallow, sheltered waters with optimal salinity and little pollution support a hard clam aquaculture industry that had an economic impact upwards of \$48 million in 2004 (Murray and Kirkley, 2005). Over the past decade, however, development pressures on the Eastern Shore have increased, and land has been converted from forests and fields to subdivisions and strip malls and a faster rate than in the past. Even in the absence of a point source of bacteria such as a wastewater treatment plant, bacterial loads from non-point sources associated with increased land development have the potential to degrade water quality to the detriment of marine life and aquaculturists. One area where the conflict between aquaculture and development pressure is building is the Old Plantation Creek watershed on the Chesapeake Bay side of the Eastern Shore. By using a GIS-based watershed model to simulate land use and associated fecal bacteria loads, linked to a Tidal Prism Water Quality Model to estimate the disbursement of bacteria throughout the water body, this study shows that allowing development to continue to the maximum buildout allowed under current regulations would lead to the condemnation of a large portion of the shellfish leases in Old Plantation Creek. By coupling this linked scientific model with an economic Input/Output (I/O) model, it was possible to determine the economic impact of those condemnations to the aquaculture industry and the economy of Virginia.

**Speaker Information:** Matt Strickler is a recent graduate of the College of William and Mary and VIMS with master's degrees in marine science and public policy. Matt's research at VIMS focused on coastal land use, non-point source pollution, and economically beneficial instream uses, including aquaculture. He is currently serving a one-year Sea Grant Fellowship in the NOAA Office of International Affairs in Washington, DC.