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BRIDGE TROLLs and STARs yield valuable data for VIMS online educators

Virginia Sea Grant's award-winning Bridge online Ocean Sciences Education Center, based at the Virginia Institute of Marine Science (VIMS), has benefited over the years from the conscientious input of dozens of science teachers from across the country, through the TROLLs program. TROLLs, which stands for "Teacher Reviewer of OnLine Learning" is a program that began in 2000 to give the site's key users -- elementary and high school teachers -- a way to become involved in the expansion and improvement of the site. TROLLs data has been an invaluable resource for the educational team.

More recently, the Bridge has also been recruiting STARs (Scientific and Technical Advisory Reviewer).

STARs are ocean sciences researchers who help evaluate the scientific accuracy and validity of educational resources before they are added to the Bridge, and also answer scientific and technical questions from site users.

Anyone interested in browsing the Bridge, or serving as a TROLL or STAR, should go to <http://www.vims.edu/bridge> - links to the TROLL and STAR registration forms are in the 'About the Bridge' section.

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Sea Grant/NMFS Fellow Explores Evolutionary Effects of Wild Harvest

Robert Leaf, a Ph.D. Candidate in the Department of Fisheries and Wildlife Science at Virginia Tech has begun work on a 3-year Sea Grant / National Marine Fisheries Service (NMFS) population dynamics fellowship. Under the advisorship of Dr. Yan Jiao, Leaf will be investigating the effects of fishing on genetic diversity in wild populations.

Fishery management practices, such as gear and size restrictions, and market forces generally target the largest individuals in a population. Research has shown that the effects of size-selective harvesting can have profound evolutionary effects. Some marine fish populations are maturing earlier and at smaller sizes in response to size-selective fishing pressure. The removal of the larger fish from the population can result in a spawning stock that is composed solely of smaller and slower-growing individuals – fish that reproduce early in life and at smaller sizes. In this way, size selective harvesting inadvertently imposes a breeding program on the population, and the spawning stock that remains is different in both life history and phenotypic characteristics from the aggregate stock. 'Evolutionarily enlightened' management that incorporates the ability of a stock to exhibit a dynamic response to management strategies while maximizing sustainable yield has been recognized as a necessity, but has not been fully developed. The evolution of fish toward slow-growing phenotypes can be rapid, following similar timeframes as those typically used in fishery and ecological dynamics models.

Robert Leaf's research will explore the effects of fishing on genetic diversity and changes in the life history of marine fish populations, in order to predict how alterations in life history characteristics affect overall population dynamics and fishery management plans. Leaf will also describe whether collapsed stocks, which may already exhibit a significant reduction in genetic and phenotypic diversity, may be able to rebound to pre-exploitation levels of genetic diversity and life history trait variance over ecological time scales. Hypotheses will be tested using experimental manipulations and analysis of historical fishing data. Completion of this project is anticipated in the spring of 2010.



Robert Leaf

Robert Leaf came to Virginia Tech after earning his M.S. in Marine Science at the Moss Landing Marine Laboratories (Moss Landing, CA). His master's thesis was titled Biology of the Red Abalone, *Haliotis rufescens*, in northern California. His undergraduate work was completed at the University of California at Santa Cruz (B.A., Biology). His undergraduate research was on intertidal fish species in the Monterey Bay.

After graduation, Robert Leaf is considering working for the National Oceanic and Atmospheric Administration's NMFS or perhaps working internationally on marine resource conservation, modeling techniques for fisheries management, and stock assessment models.