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Department of Marine Sciences
Presents a Seminar by

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Using autonomous underwater vehicles (AUVs) and genetic analyses to characterize planktonic larval distributions

Technological advances in robotics and genetics are providing new insights into the distribution and transport of marine larvae, which are key to understanding adult population dynamics. The first pump-based autonomous zooplankton sampler, "SUPR REMUS", is based on the Suspended Particulate Rosette sampler (SUPR), which is a large-volume *in situ* filtration pump originally developed for deep sea geochemical sampling. SUPR was adapted for larval sampling and incorporated into a REMUS 600 autonomous vehicle, which can operate in water depths of up to 600 meters. SUPR REMUS can collect spatially discrete, including near-bottom, samples with associated hydrographic data. Larval behaviors and distribution patterns are likely species-specific; however, larvae are often lumped into higher taxonomic categories because they are difficult to identify. DNA barcoding, where diagnostic DNA sequences are matched to reference taxa, can provide species identification. The recent advent of metabarcoding, where sequences are obtained from bulk samples as opposed to individuals, has the potential to greatly expedite this process. Recent SUPR REMUS deployments in Buzzards Bay, MA yielded samples for genetic analyses, including metabarcoding, of barnacle and bivalve larvae. The novel use of AUVs for collection of samples for molecular genetic analysis has a number of advantages, although continued improvement is needed to ensure accurate assessment of larval diversity and distribution. Additional technological advances currently under development include the *Mesobot*, a new autonomous sampling vehicle designed for the mesopelagic zone, which will allow collection of samples of animals, particles, and environmental or extra-organismal DNA, while imaging and tracking particles and organisms.

Host: Ann Bucklin
Time & Date: 11:00 am, Friday, November 10, 2017
Place: Marine Sciences Building, Seminar Room 103