



# Oyster Aquaculture Training Program



## **Aquaculture Genetics and Breeding Technology Center at the Virginia Institute of Marine Science (VIMS)**

The Oyster Aquaculture Training program is a five month hands-on program, focusing on various principles of oyster aquaculture. Located at VIMS in Gloucester Point, Virginia, participants will be learning and working alongside researchers during our oyster hatchery season from April to August. They will receive a stipend for the duration of their involvement. To ensure a one-on-one experience, we accept a maximum of three participants. Participants will be expected to work Monday through Friday, 40 hours a week during normal business hours. During the five month program, participants will rotate through various stages of oyster aquaculture, from our hatchery and field grow-out operations, to our laboratory. Working through these rotations will provide a sound understanding of all phases of the oyster life-cycle. Oysters are referred to as oyster larvae during the first few weeks of their life when they are free-swimming animals. After roughly three weeks, larvae lose their swimming abilities, settle to the bottom of the water column, and attach themselves to shell, and at that point they are called spat. As spat grow, they develop into juvenile oysters (oyster seed), eventually reaching market size around 18 to 24 months.

Throughout our hatchery rotation, participants will concentrate on the first two phases of the oyster life-cycle. They will grow and maintain healthy algae cultures (algae are microscopic plants oysters eat for food), as well as perform calculations to determine how much algae to feed our oyster larvae. Participants will understand the importance of the process of conditioning (preparing adult oysters for the hatchery season) and sexing our adult oyster broodstock. They will be learning how to collect gametes (eggs and/or sperm) from adults for spawning. Also, they will care for oyster larvae by measuring water quality, cleaning tanks, counting culture densities, and measuring shell lengths. As the oyster larvae grow and develop into spat, participants will learn cultch verses cultchless setting operations. For cultch setting, larvae set onto whole oyster shells, we refer to this as spat-on-shell. However, in cultchless setting, larvae settle onto sand-like bits of oyster shell, eventually out growing them to become "individual" oysters. Once fully developed, spat are transferred to our nursery and field sites where we focus on the latter phases of the oyster life-cycle. Participants will learn various upwelling systems and how to care for larger spat. Upwelling is a way to provide spat with a constant flow of raw seawater and food. For the field, participants will work the farm(s), learning the importance of seawater flow rates, sieve and bag sizes, and oyster seed sizes and densities. They will also learn various field grow-out methods, such as rack and bag. Trips to commercial facilities will acquaint students with various alternative grow-out methods.

The last rotation will be conducted in our working laboratory where participants will have the opportunity to study the basic principles of genetics, such as ploidy analysis. These tests, using flow cytometry, allow researchers to identify if an oyster is diploid (two sets of chromosomes), triploid (three sets), or tetraploid (four sets). Participants will also review basic laboratory skills, such as weighing materials and making solutions. In addition to hands-on experience, regular lectures will also be conducted to provide participants with background information. These lectures will include worldwide aquaculture, oyster biology, and oyster diseases and predators, for example. Field trips will be taken to various research and commercial hatcheries, along with visits to farms and shucking houses to demonstrate or expose participants to different methods and aspects of oyster aquaculture. By the end of the program, participants will have a clear understanding of various areas of oyster aquaculture and will be confident in their ability to perform tasks in both oyster hatchery and field operations.