

## Can Spray Dredging Help Save Local Marshes?

Scientists at VIMS are investigating the potential of spray dredging to provide new solutions to environmental management problems. Spray dredging is a technique for disposing of materials dredged from channel bottoms by spraying a thin layer of material over adjacent areas. The method was developed for use in the Louisiana coastal wetlands. Removing material dredged from the canals to remote disposal sites was always a problem until someone thought of mixing the material with a stream of water and spraying it in a thin layer over wide areas next to the dredging project.

The spray method of dredged material disposal has always been prohibited in Virginia, where vegetated wetlands are protected under the state's tidal wetlands law. VIMS scientists have been cautious about the potential impacts on existing wetlands, but recently they have been motivated to examine the technique more closely for two reasons. First, there is always a need to find economical and environmentally acceptable methods of

disposing uncontaminated dredged material. Second, some of the Commonwealth's tidal wetland resources are showing signs of stress due to rising sea levels.

Marshes must accrete or accumulate material on their surface at a rate equal to the rise in sea level in order to sustain themselves. If material accumulates too slowly, marshes are inundated by tides at increasing frequency, until finally the vegetation can no longer survive. VIMS scientists reasoned that applying thin layers of dredged material might aid marshes in keeping pace with sea-level rise, if it could be done in a manner that did not destroy existing vegetation.

The Pamunkey River, just above West Point in the York River system, has some of the nation's largest pristine tidal freshwater and low salinity wetlands. These marshes are among those in the mid-Atlantic showing the greatest potential impact from rising sea level. Private owners of these wetlands, led by Mr. Sture Olsson, have provided funding to enable VIMS

scientists to study the changes and to investigate potential management methods designed to preserve existing plant communities. Spray dredging is one of the leading methods under investigation.

The experiments are led by Dr. Carl Hershner, Director of the Center for Coastal Resources Management at VIMS, and Mr. Troy Deal, president of Aztec Development Company of Orlando, Florida. Aztec has refined the techniques necessary to produce a thin, even layer of material over a broad band next to the dredge site.

Under the direction of VIMS scientists, the dredge operators removed sediments from the bottom of the Pamunkey River and a small channel in one of the marshes just upstream of West Point. The material was sprayed onto test plots, which have been studied by researchers for the past year. The experiment will allow VIMS scientists to document the

same time without requiring the replanting of those that haven't reached market size. Commercial growers see greater returns when they can save the effort of replanting slow-growing clams.

The clams will also be monitored for resistance to the recently discovered clam disease QPX. QPX was first observed in New Brunswick, Canada in the 1950s and has recently been detected farther south. The parasite is common in parts of Massachusetts, where some productive clam growing areas had to be abandoned. It was first detected in Virginia waters in 1996 by VIMS researchers. Last summer the disease caused sufficient mortality to have an economic impact on Virginia clam growers for the first time. One Eastern Shore grower lost an entire crop to the disease. Finding clam strains resistant to QPX can help avoid such losses in the future.



Spray dredging is a version of hydraulic dredging. Underwater sediments are cut loose by a rotating head on the dredge. The sediment is mixed with surrounding water and sucked into the dredge by a powerful pump. The slurry is then forced, under great pressure, through a hose and nozzle, which can spray the mix up to 100 feet over adjacent areas.

impacts of the disposal method on the vegetation and fauna of the marshes.

Scientists hope to determine whether the spray-dredging technique can be used in Virginia as an environmentally acceptable method of dredged-material disposal. They also hope to discover if the technique has promise as a beneficial use of dredged material to help marshes sustain themselves in the face of rising sea level.

Scientists expect to see the first evidence of effects next spring when the marsh vegetation begins to regrow. The experiments on the Pamunkey marshes will extend over four years.

## VIMS Researchers Are Domesticating the Wild Clam

Researchers at VIMS just began a new experiment that may change the future of clam farming in Virginia. Dr. Mark Camara, Breeding Research Manager for the VIMS Aquaculture Genetics and Breeding Technology Center at VIMS, led a team that planted hundreds of thousands of clams for monitoring from Mobjack Bay to the Eastern Shore in cooperation with commercial clam growers who are providing growing space and logistical support. Camara explained that the purpose is to determine through genetic

experimentation which clams thrive best in various environments and to begin selective breeding to improve them.

Dr. Camara began this experiment at the center's clam hatchery at the Eastern Shore Laboratory in Wachapreague with five of the most common clam stocks purchased by Virginia growers and mated these five strains in all possible pair combinations, resulting in 15 distinct genetic lines. The 15 lines of clams are being planted in areas of different salinity and will be

monitored for about two years to see which clams perform best in each environment.

Camara will be looking for clams with high survival and fast, uniform growth. The time spent harvesting clams is greatly reduced when all the clams in a planted bed grow at a uniform rate, allowing all clams to be harvested at the



VIMS team planting clams at one of several research sites.

“Clam farming is very new compared to land-based agriculture,” Camara commented, “and the clams being farmed have only been in the hatchery for a few generations. This can add difficulties in farming because they really aren't yet adapted for domestication.”

Camara says to get stocks that perform well in different areas, “You need to do more than just breed big clams with big clams. There's no such thing as a ‘super clam’ strain that will survive and grow under any conditions,” he says “You've got to tailor the animals' genetics to environmental conditions, and that is a big part of our mission at the center. Right now, most clam aquaculture takes place on the Eastern Shore. We're planning to develop a number of strains that thrive in other areas and make aquaculture profitable in a wider range of environments.”