

## Delaware cleanup project makes use of NIEHS-funded technology

By Sara Mishamandani

Work is now underway on an innovative project to clean up Mirror Lake in Dover, Del., with SediMite, a product developed and tested by a team led by University of Maryland, Baltimore County (UMBC) researcher [Upal Ghosh, Ph.D.](http://userpages.umbc.edu/~ughosh/)

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An NIEHS Superfund Research Program (SRP) Individual Research grant provided funds to take the product, which uses activated carbon technology, from the lab into the field.

Delaware Governor Jack Markell, Dover Mayor Carleton Carey, members of the Delaware Department of Natural Resources and Environmental Control (DNREC), and others involved in the project were on hand Nov. 7 to view the progress of the lake restoration, which began Oct. 1.

### Developing and applying the new remediation technology

#### SediMite

(<http://sedimite.com/>)

uses activated carbon, the same technology employed in many water filters, to bind contaminants in sediment, reducing availability of harmful chemicals in the lake. The product's material is packaged with clay and sand into pellets that are convenient to handle and deliver. It slowly breaks up over time and mixes through natural processes when added to the water column.

"After we developed SediMite, we needed to test how the product would work," said Ghosh. "That is where NIEHS stepped in, through an SRP grant that funded a [pilot-scale study](http://pubs.acs.org/doi/abs/10.1021/es102694h) (<http://pubs.acs.org/doi/abs/10.1021/es102694h>) in 2007. The grant mechanism provided funds for innovative approaches to remediation of sediments, and it provided us with the funding to demonstrate our emerging *in-situ* sediment remediation technology in the field."

The new project in Dover marks the largest application of SediMite since it was created by Ghosh in collaboration with Charlie Menzie, Ph.D., an expert in the field of risk assessment. The technology stemmed from earlier activated carbon material work by Ghosh and Richard Luthy, Ph.D., at Stanford University.

After they were able to demonstrate the effectiveness of their technology, Ghosh partnered with Menzie and founded a startup company, Sediment Solutions, which worked to scale-up the production of the pelletized product SediMite and make it available to users. Sediment Solutions has licensed two patents for the technology. The first is on the core binding technology of amending sediments, and the second on the technology of packaging sorbents into pellets.

### Restoring Mirror Lake

The project at Mirror Lake is the first full-scale implementation of the technology. DNREC came to Sediment Solutions looking for a way to reduce risk of exposure, from polychlorinated biphenyls (PCBs) in sediments in Mirror Lake, without causing major ecological damage to the lake as part of a restoration effort.

Mirror Lake and downstream areas have been in decline for several decades from stormwater runoff; contamination from chemicals, including PCBs and mercury; excess nutrients; bacteria; and invasive plant species. If left untouched, and with no further contamination, DNREC forecasts it would take several decades for the lake to clean itself naturally and for fish in the lake to be safe to eat. With the use of the SediMite technology, DNREC scientists anticipate a reduction of contaminants in fish tissue up to 90 percent within a few years.

(Sara Mishamandani is a research and communication specialist for MDB Inc., a contractor for the NIEHS Superfund Research Program and Division of Extramural Research and Training.)



After SediMite was applied to Mirror Lake, a layer of sand was placed around a natural sand bar, to create a small wetland environment that will be planted in the spring to provide a new habitat for fish and wildlife. (Photo courtesy of Upal Ghosh)



Ghosh deploys passive PCB samplers in Mirror Lake, to monitor the effectiveness of the remediation technology. (Photo courtesy of Upal Ghosh)

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