



Algal Scrubber Will Reduce Harmful Nutrients

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The Maryland Port Administration has teamed up with scientists on an experimental project that will reduce nutrients in the water column of the Baltimore Harbor.

Nutrients degrade water quality in the Chesapeake Bay and its rivers because the amount that enters the water is far too high. The overload of nutrients triggers an overgrowth of algae that blocks the sunlight and robs the water of oxygen. Large, dense patches known as algal blooms often lead to fish kills.

This summer, a new piece of equipment was installed at the Dundalk Marine Terminal that could help solve this problem. The new equipment, called an algal scrubber, removes algae from the water — along with the nutrients it contains.

“We create conditions for algae to grow and harvest it regularly, which pulls nutrients out of the water column,” said Dr. Peter May, a senior environmental scientist with Biohabitats Inc. and an adjunct professor at the University of Maryland.

To grow the algae, water is pumped out of the harbor at a rate of 90 gallons per minute. It flows across the scrubber, a plastic sheeting material with a screen that is 300 feet long and six feet wide, and then is returned to the harbor.

As the water runs through the screen, the algae grow, feasting on the nutrients and carbon in the harbor water while injecting oxygen back into the water a byproduct of photosynthesis.

Once a week, the algae are removed from the scrubber by scraping or vacuuming. Scientists take wet and dry measurements to see how much nitrogen, phosphorus, and carbon are removed in each pound of algae and determine how much oxygen is resupplied to the harbor.

After the algae is removed, it can be used for other projects, such as making biofuel, dietary supplements, soil amendments, animal feed, or compost.

May said scientists hope to keep the system operating for a year in order to obtain data on nutrient removal in all types of seasons and weather conditions.

Reducing nutrients in the Chesapeake Bay and its rivers is critical for meeting region-wide pollution limits known as the Total Maximum Daily Load (TMDL).



The algal scrubber at the Dundalk Marine Terminal helps remove nutrients from the water. Photo/Bill McAllen.



Water from the harbor is pumped over the screens at a rate of 90 gallons per minute. Photo/Bill McAllen.

Installing the algal scrubber is one way in which the Maryland Port Administration contributes toward this goal. But while the scrubber is promising, it is literally a drop in the bucket — it filters an estimated 100,000 gallons a day from a harbor filled with a much larger volume of water.

In the future, the project could be replicated on a larger scale to make important contributions toward improving water quality in the Chesapeake. For example, if the project were scaled-up over several acres, it could process millions of gallons per day.

“It’s a simple method, using the power of natural systems,” May said. “Even the low-end range is really very good as far as nutrient removal is concerned. This is one of the most effective ways of doing it.”

The [Port of Baltimore magazine](#) contributed to this article.

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