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# Nano-Sponge Cleans Up Water Runoff

Breakthrough Award winner Paul Edmiston is using his super-sponge to clean up storm water runoff.

BY SARAH FECHT

We've all seen the oily rainbow sheen in parking lot puddles after a storm. But it's easy to forget what happens next: That oil finds its way to a storm drainage system, where it's likely to be flushed untreated into local waterways, and could carry with it pesticides, household chemicals, PCBs, and nutrients that cause algae blooms.

"Stormwater runoff is one of the biggest problems in America in terms of water pollution," says Paul Edmiston, a chemist with ABSMaterials who won a 2011 PopMech Breakthrough Award for Osorb, a nanoparticle product that soaks up non-polar molecules and can remove 90 to 100 percent of water pollutants. (You can watch the video of Edmiston emptying a bottle of motor oil into a glass of water, shaking in the white powder, and then drinking it up.) Edmiston and ABSMaterials have announced they are now using Osorb to clean up storm water runoff at the College of Wooster in Ohio.

Wooster contracted the ABSMaterials team to set up bioswales, drainage ditches that use plants to slow the movement of water, across the campus' agricultural fields and parking lots. These bioswales will also contain a small percentage of Osorb mixed in with the soil and plants. The Osorb grabs the pollutants in the runoff, then releases them slowly so that the soil microbes and plants can biodegrade the chemicals without being poisoned.

Edmiston estimates that one 20-foot by 5-foot Osorb bioswale plot can reduce the runoff from a

30,000 square foot parking lot by 516,000 gallons of water per year, and could treat up to 1 million gallons per month. The output is clean water that seeps into the ground, and Edmiston says the plants seem to like growing in the Osorb-soil.

His team has already been testing a plot at the College of Wooster, and is now working to expanding to treat runoff from the campus' 20 acres of parking lots and other areas where drainage is a problem. Ohio State and Purdue universities are also considering installing Osorb-enhanced bioswales.

"We can't build a pipe to every parking lot and agricultural field, but if we can take a small amount of space and turn it into green infrastructure, we can treat the water on-site and percolate it into groundwater cleanly," Edmiston says.

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