

## ▲ Panning for clams helps monitor water quality

Streams of Tennessee might not be rich in gold, but ORNL scientists were spotted recently sifting through silt and gravel in search of other valuable material. A team headed by Teresa Mathews of the Environmental Sciences Division went out panning for *Corbicula fluminea*, or Asiatic clams, in Little Sewee Creek located outside of Sweetwater. The clams will be used as part of an annual water quality monitoring project conducted at ETPP and other locations around ORNL.

Testing aquatic sites for organic contaminants such as polychlorinated biphenyls (PCBs) can be difficult since the pollutants are difficult to detect in water. Clams concentrate PCBs in fatty material (lipids). By placing the clams in cages near storm drain outfalls for four weeks, researchers can then analyze clam tissues for PCBs to more effectively assess the levels of PCBs at test locations.

Weighing and measuring the clams prior to distribution in the test sites lets the team track changes in clam health over the course of the project, which is an indication of water quality. Since the project's inception over 10 years ago, researchers have noticed improvements in water quality in certain locations.

"There are sites where they've been doing remediation, and there have been improvements in water quality, which is exciting," says Teresa, who serves as the PI for the clam research.

*Watch some [video of clam collection](#).*

In addition to clam monitoring around ETPP sites, caged clams will also be used as test subjects at 10 White Oak Creek locations near ORNL this summer. At these locations, semi-permeable membrane devices, or SPMDs, will also be put into the stream in conjunction with the clams.

"SPMDs are basically bags of liquid lipid, which is similar to margarine," says Teresa. "Because it's a fatty material, they will just sit in the water and pick up any PCBs over the month they're sitting there." By comparing the measured PCB levels in the clams with the amounts found in the membrane devices, the team will be able to analyze dissolved and particulate pollutants.

In addition to analyzing PCB levels, the team plans to check for mercury pollution. "The more toxic form of mercury is methyl mercury, and that's what fish accumulate, to a greater extent," says Teresa. "But clams, it turns out, accumulate both inorganic mercury ( $Hg^{2+}$ ), as well as the organic form. So that's something we're looking into."

Asiatic clams are found in many Tennessee reservoirs, rivers and streams throughout East Tennessee, including those streams around the Oak Ridge DOE facilities. Because they are extremely common and hardy, they provide good test organisms near industrial sites. The results are expected to provide important information as to the specific source of contaminants to area streams and help target future remediation efforts. *Morgan McCorkle*



**Teresa Mathews (top) and Allison Fortner sift for clams.**