Students use classroom lessons to help improve their local environment

Wetlands Work

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Why was it such a struggle for my biology students to connect what they were learning in the classroom to their everyday life? How could I help my students learn to collect, analyze, and make sense of data they manipulated in the classroom? These two pressing questions initiated my search four years ago for a cross-curricular project in science, math, history, and environmental science that resulted in an ongoing stewardship project.

I began by talking with friends and colleagues to develop ideas and locate sources of help and funding. One acquaintance recommended I brainstorm for ideas with the Louisiana Sea Grant College Program education coordinator. Working together, we identified a historically important local wetland area, Alligator Bayou, which was in need of water monitoring. As it turned out, the project that developed from this initial brainstorming served to meet the needs of the stewards of Alligator Bayou, my students, and Louisiana Sea Grant.

Monitoring water quality

Our training on wetland issues and water monitoring began in November 1999. After a series of miniworkshops on wetland restoration, hydrology, nutrient recycling, and local history, we went to Alligator Bayou on a Saturday for training. By that afternoon, students had collected their first water monitoring data, which included fecal coliform bacteria cultures, pH, water and air temperatures, nitrates, phosphates, and dissolved oxygen from seven sites around the Alligator Bayou watershed.

We have continued monitoring the water quality parameters every other weekend (even during holidays and summer vacations) for four years since that first day of training—all on a volunteer basis. Today we use tradi-
tional wet chemistry methods, CBL, and probeware to collect our water quality data.

**Using data in the classroom**

I incorporate the collected data into my biology classes by teaching how to statistically analyze the data and how the various parameters change with seasons and weather. Math teachers use the collected data to teach students to look for relationships and trends. We also contribute our data to the Lake Pontchartrain Basin Foundation’s Water Watch Program database. Several students have used the project site and data as a basis for experimental science projects. Three students have even traveled to the International Science and Engineering Fair with their ecological work from Alligator Bayou!

**Planting a seed**

Flood protection levees have altered the hydrology of this wetland, resulting in year-round standing water in the Alligator Bayou watershed. Because cypress seeds need to experience a wet and cold winter and spring, followed by a drier late spring and summer in order to germinate, no new cypress trees grow in the swamp—year-round standing water breaks the wet/dry cycle needed for germination.

Several months after we began monitoring the water-quality parameters my students participated in a cypress tree planting at Alligator Bayou. Even though bald cypress is the Louisiana State Tree, the cypress seedlings we planted that spring day were extremely hard to obtain because of a multiyear drought in Louisiana.

The lack of easily obtainable trees became the “seed idea” for the Coastal Roots Project (CR) that Louisiana Sea Grant started a year later. In this project students grow their own restoration seedlings from seeds at school-based nurseries. We are now one of 17 schools participating in CR across south Louisiana.

Our own school-based nursery funding came from a successful grant I wrote to the Louisiana Governor’s Office of Environmental Education. This funding enabled us to purchase reusable seedling cups and trays, planting media, fertilizer, and materials to build a cold frame in which to start our cypress seedlings in the winter. Louisiana Sea Grant paid for an automatic watering system and a fenced-in nursery yard for our seedlings.

Through CR my students have learned about seed stratification, planting techniques, and nursery management. They analyze data on seed germination, growth, and survival rates. Students now understand why we must take time to stratify the seeds before we plant them; this important step artificially mimics the wet/dry cycle the cypress seeds usually receive in the swamps. Once our seedlings reach planting size, we travel to a site to continue the ecosystem restoration efforts we began four years ago at Alligator Bayou.

**Passing on the knowledge**

Each year, our more experienced water-monitoring students help train new students coming into the wetlands stewardship project. Passing on knowledge is a wonderful benefit of the project. Our experienced students are confident about their science skills and can back up the science content they understand with action. Students are able to articulate why their wetland stewardship projects at Alligator Bayou and other locations are important.

For the last three years, our students have participated as exhibitors at Louisiana State University—Louisiana Sea Grant’s Ocean Commotion event, showing more than 2300 visiting K–8 grade students each year how we collect our water monitoring data and how we’ve been good stewards of our wetlands. Students have spoken at Louisiana YES!, an environmental education conference for students, and to teachers at the Louisiana Environmental Education Symposium. They have presented the results of their water monitoring data to the community and the media at Lake Pontchartrain’s Water Watch symposium.

I know my students understand the importance of protecting our ecosystems because they have seen with their own eyes what happens when we don’t. They understand that knowledge based on data can help us understand and protect these ecosystems. The search I began four years ago to find a project to enhance my students’ science education has grown into a project that has benefited not only my students, but also the owners of Alligator Bayou and students at other schools across Louisiana.

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