

River Research, Education and Adventure CHarters

“River Report Cards”

Description of Activities

The River REACH "River Report Cards" program is best suited for high school students. It is designed to help students gain a comprehensive understanding of watersheds and how pollution originating within the watershed can affect water quality and aquatic organisms.

During their four-hour cruise, students split up into specialized groups to conduct in-depth assessments of water chemistry, fish, plankton and Ohio River food webs, using a variety of indexes used by scientists in the field. Student groups then share their results in the classroom after their trip.

This program includes an extensive pre- and post-voyage curriculum that helps students better understand the work they perform on-board and the data they collect.

Capacity

In order to keep our floating classroom as hands-on as possible, we limit the number of passengers on-board the Queen City Princess to 40 students. There must also be a minimum of three chaperones to accompany students.

Fees

The fee for this program is currently \$15 per student*. A group minimum charge of \$400 applies for groups less than 27 students. Payment can be submitted the day of the voyage or FORE can invoice your school after the trip. Checks should be made out to the Foundation for Ohio River Education.

Discounts are available for schools with 25% or more of students on free and reduced lunch programs. We will work with schools as much as we can to keep our rates affordable. Please contact Heather Mayfield at 513-231-7719, or at hmayfield@orsanco.org for more information about pricing options.

Pre-Voyage Program

The pre-voyage lessons will focus on watersheds and measuring water quality. Teachers new to the program must attend a one-day Curriculum Training Workshop in order to implement the pre-voyage activities in their classroom. The workshop will be scheduled at least one month prior to the cruise.

The training includes water quality testing at a local stream where all participating teachers become certified through ORSANCO's Riverwatchers volunteer monitoring program. The training also includes hands-on instruction and materials for teachers to teach pre-voyage activities in the classroom. Once teachers register for the program, FORE's director will coordinate training dates that work best for all participants. The training will take place at least one month prior to the start of the cruise season.

Pre-voyage instruction will take approximately two weeks in the classroom. Teachers will receive a "Stream Savers Chest" (SS Chest), a curriculum kit that will help prepare students for concepts and skills addressed during the voyage. The SS Chest contains hands-on, inquiry-based lessons; materials to complete these lessons; and optional activities.

River Voyage

Students will collect water quality samples from a designated monitoring site and will perform basic water chemistry tests and habitat observations. They will then *split up* into specialized teams to assess the quality of the monitoring site through more extensive water chemistry experiments and assessments of fish and algae communities (please note that they do not rotate). Students will also conduct habitat assessments, while studying land use and infrastructure in and around the river.

Group Learning Stations

Station 1: Water Quality

Students at this station will be determining the water quality at the monitoring site by using sophisticated probes and bench equipment to measure dissolved oxygen, temperature, conductivity, pH turbidity, nutrients, and E. coli levels. Students will also calculate a Water Quality Index (WQI) for the monitoring site, investigating how the index is affected by different water quality parameters and the weight of these parameters in determining the water quality value.

Station 2: Fish Assessment

At this station students will learn how fish are used to indicate water quality. Students will work with fish that have been collected from the monitoring site from ORSANCO biologists through a method called electrofishing. Students will look at the morphological characteristics of the fish and discuss adaptations that enable them to survive in the river environment. Students will then use metrics employed by ORSANCO biologists to calculate an Ohio River Fish Index (ORFI_n) score, which is a method of measuring the health of fish communities in the Ohio River.

Station 3: Ecological Impacts

Students at this station will construct food webs using insects, algae, and zooplankton collected on the boat and from the water, as well as plants and animals identified in their observations. While constructing their food webs, they will assess communities of algae and zooplankton from the monitoring site and will screen their samples for biological invaders, such as zebra mussels, that have affected ecological processes in the Ohio River.

Macroinvertebrate Assessment and Wrap-Up

At the end of the day, *all* students will gather on the dock at Queen City Riverboats to collect and process macroinvertebrates off of Hester-Dendy sampling plates. Students then calculate a Stream Quality Index (SQI) using the taxa they identified.

Before dismissal, students will participate in a brief discussion to summarize the data they collected as a full group, and in their specialized groups.

Post-Voyage Activities

On-board the floating classroom, students split up into teams, focusing on Water Quality, Ohio River Fish, or Ecological Impacts. Back in the classroom, the teams will convene to synthesize the big picture. Ideally, one member from every on-board station will meet with members from each of the other stations to compile data and discuss their findings. FORE has developed exercises and questions in our classroom curriculum that can be used to guide students through this process.