Natural History and Ecology of Bad Creek Hydroelectric Station and Jocassee Gorges: a 4-H_2O Program for Teachers

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Purpose

In 2017, South Carolina ranked 48 among other states in the U.S. News &World Report education rankings. Professional development opportunities for teachers to improve content knowledge and develop connections with Cooperative Extension professionals are essential to building teacher capacity and providing teachers with instructional guidance in Science, Technology, Engineering & Mathematics (STEM) areas. To address the need for teacher education and training in STEM fields, the Clemson University College of Agriculture and Life Sciences partnered with the College of Biological Sciences to develop a graduate level course designed to educate, empower, and inspire k-12 educators in South Carolina in an effort to enhance student learning in the classroom.

Program Description

Over a decade ago, Cooperative Extension county agents and aquatic ecology specialists in Clemson University's Biological Sciences Department developed 4-H_2O curriculum to teach watershed ecology and scientific monitoring of our lakes and waterways across the state. The 4-H_2O program has been continually updated and is being offered to a new generation of educators through the Bad Creek course. Teachers receive hands-on instructional training while on Lake Jocassee and the surrounding rivers. A curriculum packet is included in the class resources which includes a 4-H_2O teacher's handbook and student guide. Common learning experiences include: exploring the local watershed; water chemistry testing; microscopic identification of invertebrates and algae; making and using Secchi disks; dissolved oxygen and temperature monitoring (including drawing a Dissolved Oxygen/Temperature profile of a stratified lake and fish identification.

Program Collaborators

Methods

Natural History and Ecology of Bad Creek Hydroelectric Station and Jocassee Gorges is a Clemson University annual summer graduate level course offered to K-12 school teachers from Duke Energy Service Areas that is held at the Bad Creek Hydroelectric Facility Outdoor Classroom, near Lake Jocassee and the Jocassee Gorges in the Upstate of South Carolina. The course is taught through a team instructional approach by content specific experts on South Carolina's native plants, animals, and insects, where school teachers are engaged through field studies and activities that they can later apply in the classroom.

Instructional Topics:

- Wildlife Management
- Wildlife Ecology
- Aquatic Ecosystems
- Hydroelectric Power

Instructional Methods:

- Field Trips
  - Bad Creek Hydroelectric Station
  - Duke Energy's World of Energy
  - Lake Jocassee Boat Tour
- Observations
  - Specimen Collection

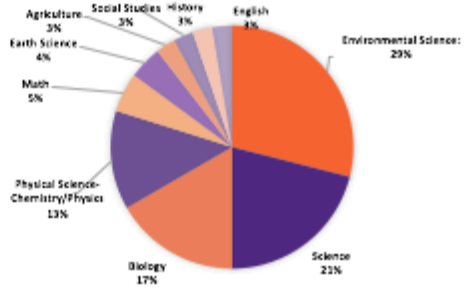
Survey Methods

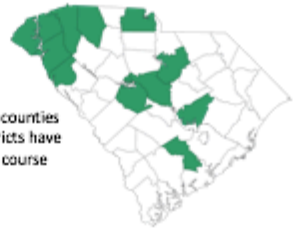
All course participants are given an evaluation at the conclusion of the course. Questions are based on program operations, implementation , and course delivery. In 2017, a follow up survey was sent to all teachers who had completed the course. These survey questions were designed to assess program outcomes and impact on the educators classroom teaching as a result of having participated in the Bad Creek course. Out of the 77 educators who have taken the course, 31 educators responded to the 2017 follow up survey which utilized Qualtrics Survey software.

Program Impact & Reach

- 77 educators have completed the course since 2013
- 20 School Districts and 20 counties represented
- Over 11,000 students have been impacted as a result of knowledge gained through the course
- 83.87% of teachers gained improved classroom teaching methods
- 86.67% of students demonstrated an increased understanding of the environment, 80% increased motivation to learn science, increased understanding of hydroelectric and nuclear power generation (80%), and increased understanding of the interrelationships of power generation (80%).

Courses Taught by Teachers Enrolled in Course





Educators from 20 counties and 20 school districts have participated in the course