



K-12 Student Contributions to the CAP LTER Project

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Encouraging students to understand their local environment and collaborating with researchers from their local university are goals of Ecology Explorers, an educational outreach program of the Central Arizona—Phoenix Long-Term Ecological Project (CAP LTER). The program and its components are discussed in this poster.

Program Description

Students and teachers collect population data in their schoolyards or backyards that parallels the research protocols being carried out by CAP LTER scientists across the Metropolitan Phoenix Area. Data collected includes: bird surveys, ground arthropod surveys, bruchid beetle surveys and plant surveys. All of the protocols and purpose of each project are clearly outlined on the Ecology Explorer Web site at <http://caplter.asu.edu/explorers>. Students can also enter their data directly into the CAP LTER data base via the Web site and they can retrieve their data, as well as data from other schools to import directly into a spread sheet program such as Excel.

Ecology Explorers began in the 1998-99 academic year and has grown to 37 teachers at 28 schools (encompassing 10 school districts) with 14 additional teachers (adding 3 new school districts) completing internships summer 2000.

Scientist Participation

Scientists (faculty, post-doctoral students, graduate students, and advanced undergraduates) all play an integral role in the program.

CAP LTER scientists participated in developing protocols that would produce useful data for the overall project. As students are collecting more data, this aspect of the program appears to be becoming successful. In particular, the bruchid beetle study has already produced data that is potentially publishable by the CAP LTER scientists. A major disadvantage of working in urban ecology is access to backyards, thus working with students and having them collect data about their own backyards makes this data available to the larger project.

CAP LTER scientists who run the summer internships are supported by CAP LTER or other funds. We also pay small stipends for graduate or undergraduate students to visit classrooms and help with data collection. Scientists also get the opportunity to explain their research to a broader audience.



Teacher Participation

Teachers have been involved in the development of the Ecology Explorers program since its beginning. The major components that teachers have consistently felt important about the program are: involvement in real science research, interaction with scientists and teacher support. To this end program components for the teachers include:

- internships with CAP LTER scientists in the summer, these internships range from 1 week to 1 month and also include an initial workshop on inquiry-based lessons and how to analyze data. Teachers are paid to participate.
- classroom visits by CAP LTER personnel
- help with collecting, entering and analyzing data
- locating appropriate curriculum and other resources
- purchasing equipment or other resources
- development of "focused field trips" and assistance on field trips
- teacher listserv
- presentations to PTA, School Boards and other administrators
- two meetings per year with CAP LTER scientists and other teachers (December and May)
- assistance with writing grants
- aligning the program with AZ state standards (science, math, language & social studies)

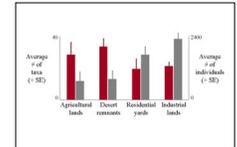
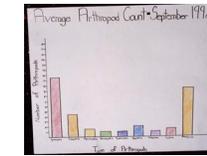
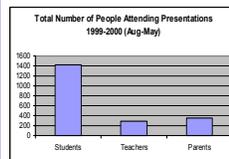
New this year we will be running several workshops throughout the year that focus on a specific topics. These will include: mapping the schoolyard, data analysis and technology, activities with insects.



Education Liaison Participation

Education liaisons play an important role in maintaining the connections between teachers, university researchers, and the broader community. Support provided by the education liaisons include:

- identification of curriculum resources
- visits to classrooms
- assistance on field trips,
- developing new field trips,
- data collection, entry and analysis.
- presentations to PTA groups and other administrators.
- writing grants to fund programs
- assisting teachers in writing grants
- coordinating workshops, biannual teacher meetings, and summer internships.
- administering the Teacher Listserv and the Ecology Explorer Web site.



Arthropod Data collected by Brimhall Junior High Students and CAP LTER Scientists

Student Participation

Students participate in the CAP LTER project by:

- surveying local bird populations
- surveying local arthropod populations
- surveying local plant diversity and attributes
- interacting with University researchers through classroom visits

Student work is displayed:

- at the annual CAP LTER poster symposium
- at the Annual Science, Engineering and Environment Day at ASU
- in the on-line Kid's Newsletter
- at science fairs



Students get the opportunity to work on a real research project. This teaches them about the process of science as inquiry (one of our state standards) more effectively than the traditional science simulation lessons. Teachers have told us that this motivates many students.

Technology

The Ecology Explorer Web site is the most important technology tool we have for keeping in touch with our teachers and students. The technology team at CAP LTER maintains and updates the Web site. Features include:

- scientific protocols
- PDF files for teachers
- "Kid's Newsletter"
- "Ask-a-Scientist"
- data retrieval
- data entry



<http://caplter.asu.edu/explorers>

Community Participation

Linking teachers to other community resources is important to the overall project. To this end we have contacted local informal education facilities (museums, zoos, parks) to host "focused field" trips for Ecology Explorers which reinforce ecological concepts students gain from their schoolyard studies.

Parents have also become involved in the projects through their children. For example, elementary and middle school teachers have reported to us that parents who normally don't get involved in the school are happy to help bird watching. This appears to be especially true in our schools with large Spanish-speaking populations.



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