Using an intensive, semester-long collaborative project to develop student quantitative ecology skills

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Ecology students require skills and training in quantitative analysis of ecological data sets, yet they are often resistant to developing these skills. One successful approach in an advanced ecology course is to combine quantitative analysis and presentation in the framework of a multipart, collaborative field site assessment expressly linked to "career-based" skills appealing to students. Placed in an active-learning enhanced ecology course, the project consumes approximately 1/3 of the course and builds complexity across three different levels: 1) field sampling techniques, 2) quantitative analysis (primarily statistical analysis), and 3) scientific presentation of quantitative information. For the quantitative analysis, students collect data on different aspects of a field site (physical environment, flora, and fauna) with data that grows in complexity from basic descriptive statistics to designed data sets that fit common statistical tests easily to complex data sets where students must identify appropriate approaches and recognize data limitations. The collaborative nature of the assignment, with individual reporting responsibility, as well as a requirement for revision helps ensure development of core skills while the personal linkages to "real" data collected by students, field work, and career development enhance engagement. Experimental design skills, statistical expertise, and ability to present quantitative information have shown marked improvement as has student confidence.