On-campus Recruitment of Geology Majors: developing service-learning alternatives to Physical Geology

SITUATION

- ***want to increase number of majors***
- ***recruitment from large-lecture Physical Geology classes accounts for 50% of majors***
  - mixed frosh-senior enrollment
  - co-enrollment in lab not required
  - no field trips

***HYPOTHESIS*: on-campus recruitment might improve if we**

- ***focused on topics of high public interest***
  - **Dinosaur World**
  - **Earthquakes and Volcanoes**
  - **Earth's Atmosphere and Oceans**
- ***changed class design***
  - 50-student lecture tied to two, 25-student lab sections, all taught by same instructor
  - University funded overnight field trip
- ***limited enrollment to freshmen***
  - offer courses through Freshman Programs
    - learning communities focused on university retention

***MODEL*: add alternate General Education portals to degree**

- ***majors take either Physical Geology lecture or a lecture-lab Earth Science topics course***
  - ALL majors must take Physical Geology lab
  - each topics course must cover 100-level learning objectives required for geology majors
- ***the breadth and scope of the Earth Sciences are given heightened visibility in the major***

SERVICE-LEARNING COMPONENT

- ***required by Freshman Programs***
  - enhances retention
  - connects students to community
  - includes writing, reflection and presentation
  - demonstrates relevance of course content to society
- ***in accord with CSUF Mission and Goals***
  - Through experiences in and out of the classroom, students develop the habit of intellectual inquiry, prepare for challenging professions, strengthen relationships to their communities, and contribute productively to society.
- ***support provided by University***
  - upper-division, peer-mentor assistant for each section
  - liability issues handled by centralized office
  - field trip funding (we hope!)

EXAMPLE: project from Earth's Atmospheres and Oceans
ORIGINAL DESIGN by Dr. Matthew Kirby, Assistant Professor

- **Goal:** *To develop an appreciation for system interaction in the Earth Sciences, with a focus on social implications and anthropogenic influences.*
- **Objective:** *To research and develop small group projects focused on one of southern California's most popular recreational communities: Big Bear and Big Bear Lake.*
- **Question:** To what degree have natural and anthropogenic forcings affected the health of Big Bear Lake?
- **Approach: students divided into 3 teams focused on**
  - *geosphere, hydrosphere, atmosphere*
  - *each group will approach the question from their individual system perspective*
  - ***appropriate data collected and analyzed***
  - *lake core; water samples; historical climate data*
  - *3 groups integrate their observations/interpretations*
  - *students make several trips to site to study the setting, collect data, and to present findings to the Big Bear Municipal Water District*
- **Assessment:** reflection journals; field reports; group poster and oral presentations

100-level learning objectives for CSUF geology majors

Educational:	***Scientific:***	***Discipline Specific:***
1. improve critical thinking skills; 2. improve test-taking skills; 3. improve ability to make observations of the Earth.	1. introduce students to scientific method; 2. understand the sources of Earth's energy; 3. understand (or be introduced to) the value and limits of scientific data; 4. improve understanding of mathematics and ability to read and interpret graphical data.	1. understand the basic concepts of plate tectonics; 2. understand uniformitarianism and geologic time; 3. know the characteristics and general formation processes of igneous, sedimentary, and metamorphic rocks; 4. understand the movement of water.