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

**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!)

**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

**100-level learning objectives for CSUF geology majors**

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<th>Educational:</th>
<th>Scientific:</th>
<th>Discipline Specific:</th>
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<td>1. improve critical thinking skills; 2. improve test-taking skills; 3. improve ability to make observations of the Earth.</td>
<td>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.</td>
<td>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.</td>
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**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