ANNUAL PROGRAM REPORT

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<th>College of Science</th>
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<td>Department</td>
<td>Earth and Environmental Sciences</td>
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<td>Program</td>
<td>Geology BS/BA, Env Science BS, Env Geoscience MS</td>
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<td>Reporting for Academic Year</td>
<td>2017-2018</td>
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<td>Last 5-Year Review</td>
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<tr>
<td>Department Chair</td>
<td>Jean Moran (until August 2018)</td>
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<td>Mike Massey (after August 2018)</td>
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I. **SELF-STUDY** *(suggested length of 1-3 pages)*

A. **Five-Year Review Planning Goals**
   
   Present your planning goals from your last 5-year plan. *(A PARAGRAPH OR TWO)*

   *From the AY12-13 5 year review:*

   1) **Curriculum**
   
   We plan to revise our curriculum during the next two years in response to the University’s plan to move from the quarter system to the semester system by Fall 2018. This will require a thorough review of all courses and program requirements. Some courses will be expanded, others eliminated, and some redesigned as hybrid or online courses. We plan to redesign the Environmental Science BS program by combining the current options, to offer increased flexibility and choice for students in designing a program to fit their needs, and decreased time-to-degree.

   2) **Degree Programs**
   
   Continued growth of our programs and improved graduation rates would be stimulated by developing new courses in areas that provide students with practical skills in areas that are becoming increasingly important; these include spatial analysis, environmental monitoring, instrumental analysis, soil science, and engineering geology. We may develop additional hybrid or online courses on topics such as pollution modeling.

   3) **General Education**
   
   Cluster proposals are normally solicited and approved about every three years; we anticipate that our participation in clusters will continue. We foresee a growing demand for General Education (GE) curriculum related to climate. We have accordingly prepared a new course proposal for a lower-division Environmental Science course on Global Change for non-majors that has been approved as a new course and for GE (area B3) credit.

   4) **Etc.**
   
   The top priority for future faculty hires is for an Environmental Scientist with a specialty in climate/global change and/or interactions between the hydrosphere, atmosphere and solid Earth. The second priority for a new faculty hire would be in the area of Environmental Geoscience with a focus on surficial processes.
B. Progress Toward Five-Year Review Planning Goals

Report on your progress toward achievement of the 5-Year Plan. Include discussion of problems reaching each goal, revised goals, and any new initiatives taken with respect to each goal.

1) Curriculum

A huge amount of time and effort over the past three years went into curriculum design and general education under semesters. Field courses were added to enable completion of the BS Geology degree requirements at CSUEB. A concentration in Geoscience Education was developed in collaboration with the Department of Liberal Studies. A number of Geology and Environmental Sciences courses were approved for GE as well as for the Sustainability Overlay.

Additionally, we have developed a concentration in Environmental Health for our Environmental Science degree. The Department of Health Sciences discontinued their program in Environmental Health, and we developed our program in close collaboration with Health Sciences.

2) Degree Programs

Courses in Soil Science, Engineering Geology, Professional Geologist Preparation and Geographic Information Systems (‘practical skills’ areas noted in five year goals) have been approved for semesters.

3) General Education

Several lower and upper division courses focused on climate change were approved as hybrid and/or online courses, which will likely prove popular with students. The department will provide a service course, ENSC 280 (Humans and the Environment in California) to all Health Science and Environmental Science majors, beginning in Fall 2018 (as a hybrid course). Additionally, ENSC 320 (The Science of Climate Change) is being offered as a service course for Liberal Studies majors, and B6 GE credit, in Spring 2019.

Four proposals for Freshman Learning Communities under semesters were approved and the department continued to participate in four clusters in AY 17-18. Even as this program is phased out, we anticipate continued strong demand for our courses.

4) Etc.

During AY 16-17, a new faculty member, with expertise in carbon cycling and biogeochemistry, joined the department. Another new faculty member, with expertise in sedimentology and paleoclimatology, began in Fall of 2017. These two hires fulfill the five year planning goals. However, one faculty member left the department during AY 16-17.

C. Program Changes and Needs

Report on changes and emerging needs not already discussed above. Include any changes related to SB1440, significant events which have occurred or are imminent, program demand projections, notable changes in resources, retirements/new hires, curricular changes, honors received, etc., and their implications for attaining program goals. Organize your discussion using the following subheadings.

Overview:

Curriculum:

Students: Our courses in Fall 2018 are at 140% of previous enrollment, despite overall enrollment for the College and University being down by approximately 10%. We anticipate continued strong demand for our service courses and GE offerings. We continue to attempt to recruit majors, since we have graduated ~90-100 students in the past five years (which is
substantial for a department of ~70-90 students). This assumes the data are accurate, which has historically not been the case, but we will investigate it.

**Faculty:** Our department faculty continue to receive both external and internal recognition and research funding. Our faculty received several Faculty Support Grants, as well as external funding totaling over $400,000. Faculty often use this funding to decrease teaching workload in order to make time for research and scholarship. One of our faculty members also received the Rosemary and Matthew Spitzer Distinguished Science Faculty Award.

**Staff:** Our Administrative Support Assistant retired in August 2018, and we are in the process of hiring an Administrative Support Coordinator to manage our department office. A new Instructional Support Technician began in October 2017, and has been a strong contributor to the Department.

**Resources:** (facilities, space, equipment, etc.)

**Assessment:**

**Other:** (e.g., major program modifications)

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### II. SUMMARY OF ASSESSMENT
(suggested length of 1-2 pages)

**A. Program Learning Outcomes (PLO)**

List all your PLO in this box. Indicate for each PLO its alignment with one or more institutional learning outcomes (ILO). For example: “PLO 1. Apply advanced computer science theory to computation problems (ILO 2 & 6).”

**B. Program Learning Outcome(S) Assessed**

List the PLO(s) assessed. Provide a brief background on your program’s history of assessing the PLO(s) (e.g., annually, first time, part of other assessments, etc.)

**C. Summary of Assessment Process**

Summarize your assessment process briefly using the following sub-headings.

- **Instrument(s):** (include if new or old instrument, how developed, description of content)
- **Sampling Procedure:**
- **Sample Characteristics:**
- **Data Collection:** (include when, who, and how collected)
- **Data Analysis:**

**D. Summary of Assessment Results**

Summarize your assessment results briefly using the following sub-headings.

- **Main Findings:**
- **Recommendations for Program Improvement:** (changes in course content, course
sequence, student advising)

Next Step(s) for Closing the Loop: (recommendations to address findings, how & when)

Other Reflections:

E. Assessment Plans for Next Year
Summarize your assessment plans for the next year, including the PLO(s) you plan to assess, any revisions to the program assessment plan presented in your last five-year plan self-study, and any other relevant information.

III. DISCUSSION OF PROGRAM DATA & RESOURCE REQUESTS
Each program should provide a one-page discussion of the program data available through CAPR. This discussion should include an analysis of trends and areas of concern. Programs should also include in this discussion requests for additional resources including space and tenure-track hires. Resource requests must be supported by reference to CAPR data only. Requests for tenure-track hires should indicate the area and rank that the program is requesting to hire. If a program is not requesting resources in that year, indicate that no resources are requested.

A. Discussion of Trends & Reflections
Notable Trends:
Summarize and discuss any notable trends occurring in your program over the past 3-5 years based on program statistics (1-2 paragraphs). You may include 1-2 pages of supplemental information as appendices to this report (e.g., graphs and tables).

The most notable trend in our program that has occurred in the past 5 years has been a marked increase in student graduation (visible in the marked change between AY 2012-2013, with a total of 4 undergraduate and 5 graduate degrees conferred, and subsequent years). Around 20-25+ students per year have graduated from our various programs, which was a marked increase from prior years. We have had difficulties growing our total number of majors as a result of this, since our majors are not usually easy to recruit. Beginning in AY 2018-2019, our new concentration in Environmental Health is expected to be an area of future growth. Additionally, as noted above, for Fall 2018, our enrollment is at 140% of previous years, despite the University and College enrollments being down by about 10%. We expect these strong totals to continue.

We are also proud to be a diverse program, especially compared to Earth and Environmental Sciences programs across the US. The Earth and Environmental Sciences fields have historically been dominated by white males. In contrast, students in our department are ~40% female, and ~60% non-white, which is substantially more diverse than the field as a whole. We strive to be welcoming to all students, and are committed to making strides with respect to improving representation among both students and department faculty.

Reflections on Trends and Program Statistics:
Provide your reflections on the trends discussed above and statistics and supplemental information presented in this report.
A perennial issue for our department has been the quality of these enrollment data and statistics. For example, in previous years, these data have not reflected students in all three Environmental Science options (on the quarter catalog), along with students who had not yet declared an option. This issue may persist, even now. If the historical inaccuracies persist, I suspect that the data may be under-counting our number of majors and graduates. However, at least as an order-of-magnitude estimate, the numbers seem reasonable.

Our hope is to double the size of our program (in terms of number of majors), and maintain strong enrollment in our service courses and GE offerings, in the coming years. Faculty and student diversity are also a focal point.

B. Request for Resources  (suggested length of 1 page)

1. Request for Tenure-Track Hires

The department plans to submit a proposal for a TT faculty search in AY 18-19. For students taking a course offered by the EES department, the chances of having a TT instructor are about 40%. In addition, the curricular demands of the new concentration Environmental Health, and in Geoscience Education (which includes an Atmospheric Science course), and advances in interdisciplinary approaches to the study of interactions between humans and the environment, call for a faculty member with expertise in these areas. Possible sub-disciplines include geostatistics, water quality and human health, air quality and atmospheric science, climate change and urban flooding & landslides, or sustainability and the food-water-energy nexus.

2. Request for Other Resources

The department anticipates increased needs for instructional software and for other instructional equipment as instruction becomes centered around active and experiential learning. For example, faculty requests for portable air quality monitoring equipment and water quality monitoring equipment could not be granted this year due to budget constraints, and software licenses for EdGCM, MATLAB, ROCKWORKS, and AnalyzeIT, etc. will amount to at least $4,000 more than previously budgeted for software expenses. A2E2/EIRA has become an indispensable source of funds for field trip transportation and new equipment, and will continue to be relied upon under semesters, to fund a portion of the field courses, and to update aging equipment in instructional laboratories.

The department holds teaching & learning workshops with instructional faculty to move toward student-centered, active learning. Funds are needed for release time for coordination of these events, and travel to NSF-SERC (Science Ed Resource Center) workshops for new faculty. Funds and support for marketing/outreach/recruitment will be required in order to grow our program in the future (we hope to double our majors within 5 years).