

Department of Earth and Environmental Sciences, CSCI



ASSESSMENT PLAN: B.S. in Environmental Science

Date prepared: Spring 2016

PROGRAM MISSION

CSUEB Environmental Science B.S. Program Description

Environmental science is an interdisciplinary field, focusing on the study of physical, chemical, and biological processes that underpin both natural ecosystems and human-influenced systems. While their focus is often on the physical and life sciences, environmental scientists must also be mindful of social issues, political context, economic factors, and human well-being in order to understand environmental issues and address environmental problems. The coursework for the Environmental Science degree reflects this broad, systems-level approach, with coursework in science and mathematics, as well as the social sciences. This allows students to gain a deeper understanding of the science and social issues involved in addressing complex environmental problems such as environmental contamination, access to food and safe drinking water, and climate change.

The undergraduate degree program in Environmental Science includes a core of required courses intended to provide students with an understanding of the fundamental principles of biology, chemistry, geology, mathematics, physics, and statistics necessary to understand environmental challenges. In addition, further required courses and electives allow students to apply this fundamental knowledge to broader environmental issues and problems, and to deepen their understanding of natural systems, human systems, and sustainability. The Environmental Science B.S. program serves as preparation for employment in a variety of related fields, both in technical and policy/management roles requiring extensive technical knowledge and background. Due to the breadth of disciplines involved in environmental science, students wishing to do independent work professionally may wish to consider graduate study in a field of specialization, if further training is required for their chosen path.

PROGRAM STUDENT LEARNING OUTCOMES (PLOs)

Students graduating with a B.S. in Environmental Science will be able to:

PLO 1 <i>ILO 1, 5, 6</i>	Demonstrate foundational knowledge of Earth processes, natural systems, and the effects of human activity (<i>Knowledge</i>)
PLO 2 <i>ILO 1, 2, 3, 4, 6</i>	Develop fundamental field, laboratory, and computer skills necessary for environmental science (<i>Skills</i>)
PLO 3 <i>ILO 1, 2, 3, 5, 6</i>	Critically evaluate, analyze, and integrate scientific findings, data, and socioeconomic context to understand environmental issues (<i>Analysis and Synthesis</i>)
PLO 4 <i>ILO 1, 2, 3, 4, 6</i>	Effectively communicate in oral and written form, and develop collaborative skills (<i>Communication</i>)

Year 1: 2018-2019

1. Which PLO(s) to assess	PLO2 (<i>Skills</i>), PLO3 (<i>Analysis and Synthesis</i>)
2. Is it aligned with an ILO?	Yes
3. If yes, list ILO.	ILO6: Specialized Knowledge (342), or ILO1: Critical Thinking (350) ILO2: Communication (499)
4. Course name and number	GEOL 342 - Planetary Geology ENSC 350 - Environmental Hydrology or ENSC 499 - Capstone Seminar in Geosciences
5. SLO's from course	GEOL 342: Recognize key aspects of the spatial and temporal scales of planetary science through observations of Sun, planets, and star-forming regions. ENSC 350: Critically evaluate hydrologic data from publicly available databases and the scientific literature. ENSC 499: Demonstrate the ability to gather, evaluate and articulate environmental geosciences information through advanced written and oral communication.
6. Assessment Activity	Data analysis or Final Project & Final Presentation and Report
7. Assessment Instrument	Department Rubric
8. How data will be reported	Quantitative and combined qualitative and quantitative report to include proportion of students in each level 1-5 (5 mastered)
9. Responsible person(s)	Various Faculty/Jean Moran & Various Faculty
10. Ways of closing the loop	Reports first to the Chair and then to the entire faculty for comment & discussion. An end-of-year meeting will be devoted to evaluating assessment results and "closing the loop." Identified "areas for improvement" will be incorporated into modified/updated core courses for future majors. Issues with the Thesis process will be discussed and acted upon.

Year 2: 2019-2020

1. Which PLO(s) to assess	PLO1 (<i>Knowledge</i>)
2. Is it aligned with an ILO?	Yes
3. If yes, list ILO.	ILO6: Specialized Knowledge (414 & 420)
4. Course name and number	ENSC/GEOL 414 - Hazardous Waste Management ENSC 420 - Global Change
5. SLO's from course	GEOL 414: Identify and discuss major US laws defining hazardous waste and impacting its management GEOL 420: Explain important experimental and theoretical methodologies used to help quantify and predict future global change (climate modeling, measurement of gas fluxes and ocean acidity, isotopic measurements, satellite-based measurements, etc.)
6. Assessment Activity	Final Project & Final Project and Presentation
7. Assessment Instrument	Department Rubric
8. How data will be reported	Combined quantitative and qualitative report to include proportion of students in each level 1-5 (5 mastered)
9. Responsible person(s)	Mike Massey, Various Faculty
10. Ways of closing the loop	Reports first to the Chair and then to the entire faculty for comment & discussion. An end-of-year meeting will be devoted to evaluating assessment results and "closing the loop." Identified "areas for improvement" will be incorporated into modified/updated core courses for future majors. Issues with the Thesis process will be discussed and acted upon.

Year 3: 2020-2021

1. Which PLO(s) to assess	PLO4 (<i>Communication</i>), PLO5 (<i>Global</i>)
2. Is it aligned with an ILO?	Yes
3. If yes, list ILO.	ILO5 Sustainability (280); ILO2: Communication (499)
4. Course name and number	ENSC 280 - Humans and the Environment in California ENSC 499 - Capstone Seminar in Geosciences
5. SLO's from course	ENSC 280: Apply knowledge of matter and energy, and how concepts of matter and energy relate to "sustainability," in understanding the interactions between human systems and natural systems. ENSC 499: Demonstrate the ability to gather, evaluate and articulate environmental geosciences information through advanced written and oral communication.
6. Assessment Activity	Written & Oral Presentations; Final Project & Presentation
7. Assessment Instrument	Department Rubric
8. How data will be reported	Combined quantitative and qualitative report to include proportion of students in each level 1-5 (5 mastered)
9. Responsible person(s)	Various Faculty
10. Ways of closing the loop	Reports first to the Chair and then to the entire faculty for comment & discussion. An end-of-year meeting will be devoted to evaluating assessment results and "closing the loop." Identified "areas for improvement" will be incorporated into modified/updated core courses for future majors. Issues with the Thesis process will be discussed and acted upon.

Year 4: 2020-2021

1. Which PLO(s) to assess	PLO3 (<i>Analysis & Synthesis</i>), PLO5 (<i>Sustainability & Global Thinking</i>)
2. Is it aligned with an ILO?	Yes
3. If yes, list ILO.	ILO5: Sustainability (350) ILO2: Communication (499)
4. Course name and number	ENSC 350 - Environmental Hydrology ENSC 499 - Capstone Seminar in Geosciences
5. SLO's from course	ENSC 350: Practice calculating water budgets and residence times for individual basins, for California, and in the global water cycle. ENSC 499: Synthesize and integrate information on aspects of physical sciences, law, policy, economics and social science in an assessment of the selected topic.
6. Assessment Activity	Data analysis/Final Project & Final Presentation and Report
7. Assessment Instrument	Department Rubric
8. How data will be reported	Quantitative and combined qualitative and quantitative report to include proportion of students in each level 1-5 (5 mastered)
9. Responsible person(s)	Various Faculty/Jean Moran & Various Faculty
10. Ways of closing the loop	Reports first to the Chair and then to the entire faculty for comment & discussion. An end-of-year meeting will be devoted to evaluating assessment results and "closing the loop." Identified "areas for improvement" will be incorporated into modified/updated core courses for future majors. Issues with the Thesis process will be discussed and acted upon.

Year 5: 2022-2023

1. Which PLO(s) to assess	PLO1 (Knowledge)
2. Is it aligned with an ILO?	Yes
3. If yes, list ILO.	ILO6: Specialized Knowledge (414 & 420)
4. Course name and number	ENSC/GEOL 414 - Hazardous Waste Management ENSC 420 - Global Change
5. SLO's from course	GEOL 414: Identify and discuss major US laws defining hazardous waste and impacting its management GEOL 420: Explain important experimental and theoretical methodologies used to help quantify and predict future global change (climate modeling, measurement of gas fluxes and ocean acidity, isotopic measurements, satellite-based measurements, etc.)
6. Assessment Activity	Final Project & Final Project and Presentation
7. Assessment Instrument	Department Rubric
8. How data will be reported	Combined quantitative and qualitative report to include proportion of students in each level 1-5 (5 mastered)
9. Responsible person(s)	Mike Massey, Various Faculty
10. Ways of closing the loop	Reports first to the Chair and then to the entire faculty for comment & discussion. An end-of-year meeting will be devoted to evaluating assessment results and "closing the loop." Identified "areas for improvement" will be incorporated into modified/updated core courses for future majors. Issues with the Thesis process will be discussed and acted upon.