College of Arts and Sciences (CAS) 2016 - 2017 Yearly Assessment Report

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NOTES:

- *2016-2017 Yearly Assessment Reports* for all CAS Majors, Minors, Graduate Programs, and Non-Degree Seeking Programs are due by 10/28/17; early submissions are welcome.
    - Undergraduate programs (majors and minors) must include two curricular maps – one showing how courses map onto Program Learning Outcomes (PLOs) and one showing how PLOs map onto Institutional Learning Outcomes (ILOs).
    - Graduate programs must include one curricular map showing how courses map onto PLOs.
    - Non-degree seeking programs must include one curricular map showing how PLOs map onto ILOs.

- This form **cannot be saved** once it is in-progress. If you close out of the form before submission, responses will be **discarded**. Please ensure you are ready to fill out the full form once you begin, and/or keep a backup copy of your responses.

- If you encounter any issues while utilizing this form, please contact Corie Schwabenland Garcia, Academic Data and Assessment Analyst, at x4285 or ceschwabenland@usfca.edu

Identifying Information

Name of Program *

B.S. in Environmental Science

Type of Program *

Major

College of Arts and Sciences Division *

Sciences

Name/Title/E-mail Address of Submitter *

John M. (Jack) Lendvay, Chair, Department of Environmental Science,
lendvay@usfca.edu

Name(s)/E-mail Address(es) of Additional Individual(s) Who Should Receive Feedback

Submissions via the following Google form are strongly encouraged. However, if your department/program wishes to upload its assessment report in lieu of completing this form, you can do so here. Would you like to upload a PDF version of your Yearly Assessment Report?

○ Yes

⦿ No

Yearly Assessment Report PDF Upload

If you wish to submit a separate PDF report, please be sure to include all the components listed in this google form (screen shots of the google form are available at https://myusf.usfca.edu/sites/default/files/2017_Yearly_Assessment_Report_preview.pdf)

Please upload a PDF version of your Yearly Assessment Report here: *

Please upload your program's PLO x Courses Curriculum map here (all file types allowed) *

Please upload your program's PLO x ILO Curriculum map here (all file types allowed)

If you would like to upload any other files (i.e. rubrics used to evaluate student work products, scripts/surveys/other indirect methods used to evaluate student work), you may upload them here. Please use descriptive file names (i.e. "SociologyAssessmentRubric").

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Mission Statement

Please type and/or copy-and-paste directly into the space below:

*

The mission of the Department of Environmental Science is to provide an interdisciplinary and integrated science curriculum in order to develop skills for solving environmental problems in a socially just manner. The program prepares students for careers and graduate study and to be good stewards of the environment.

Program Learning Outcomes (PLOs)

Please type and/or copy-and-paste directly into the space below:

*

Students who complete the degree requirements will be able to:

PLO 1 – Explain the interdisciplinary nature and complexities of environmental issues.

PLO 2 – Apply the scientific method to environmental issues.

PLO 3 – Skillfully communicate knowledge of environmental science.

PLO 4 – Demonstrate knowledge of environmental conditions so as to promote active participation and social justice.

Curriculum Maps

Please upload your Curriculum Maps below. All file types (Excel, PDF, etc.) are allowed.

Please upload your PLOs to Courses Curriculum map here *

Curricular Map 1 - ...

Please upload your PLOs to ILOs Curriculum map here *

Curricular Map 2 - ...

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Assessment Methods

Which of your Program Learning Outcomes did you assess during 2016-2017? *

PLO 1 – Explain the interdisciplinary nature and complexities of environmental issues.

PLO 2 – Apply the scientific method to environmental issues.

PLO 3 – Skillfully communicate knowledge of environmental science.

What student work products did you use to assess your PLO(s)? Pick one or more direct methods from the list below and briefly describe below what specific work product(s) you used. *

☐ Published (Standardized) Test (e.g., Major Field Test)

☐ Class Tests & Quizzes with Embedded Questions

☑ Class Presentations

☐ Off-Campus Presentations (NGOs, clients, agencies, etc.)

☐ Research Projects Reports

☐ Case Studies

☐ Term Papers

☐ Portfolio

☐ Artistic Performances, Recitals & Products

☑ Capstone Projects

☑ Poster Presentations

☐ Comprehensive Exams

☐ Thesis, Dissertation

☐ Pass Rates on Certification or Licensure Exams

☑ Group Projects

☐ In-/Out-of Class Presentations

☐ Competency Interviews (e.g., oral exams)

☐   Simulations

☐   Juried Presentations

☐   Other: ....

Brief description of student work products used to assess PLOs: *

Final presentations in the form of oral & poster format will be evaluated by department faculty using standardized rubrics for assessing progress relative to the program learning outcomes addressed by two specific courses. In ENVS-212, a second year course, student present a group project in the form of a formal poster presentation assessing their progress toward PLOs 1, 2, & 3. Upon the completion of the capstone course, ENVS-410, students present a group project in the form of a formal platform presentation as one might find at a national conference. Again, department faculty, using the same rubric used in the ENVS-212 course, evaluated student performance on PLOs 1, 2, & 3. This year, prior to the assessment, a department discussion was held to help calibrate the rubric as it was clear from last year's assessment report that faculty had differing views of what was expected at each level of assessment.

What tools did you use to evaluate the student work product(s) (e.g. rubric, test score)? *

A calibrated rubric

Please upload any tools used to evaluate student work product(s) here in PDF format only. Please use descriptive file names (e.g. "SociologyAssessmentRubric.PDF").

| PLO Rubric - 2016-... | PLO Table - 2016-2... |

Who evaluated the student work product? Check all that apply. *

☑ FT faculty members who were not instructor(s) of the course(s)

☐ FT faculty members who were instructor(s) of the course(s)

☐ PT faculty members who were not instructor(s) of the course(s)

☐ PT faculty members who were instructor(s) of the course(s)

☑ Other: Laboratory Staff

Describe the calibration procedure you employed, if any (i.e., how did you assure that faculty raters were consistent with each other in how they rated the student work products):

The same rubrics were used for the same assessment in last year's report. However, we found that some faculty were not evaluating students at where they would be expected to perform upon graduation from our program. Rather, they were assessing them with the same standards they would use for presenters at a national conference, usually senior graduate students, post doctoral fellows or faculty. Clearly this was a level beyond what we should fairly assess our graduating bachelor students. To counter these issues, we reflected on the process and openly discussed it during a department meeting in fall 2016.

What indirect methods did you employ, if any?

☐ Student Survey

☐ Student Interview

☐ Focus Groups

☐ Reflection Sessions

☐ Reflection Essays

☐ Faculty Survey

☐ Exit (end of program) Survey

☐ Exit (end of program) Interview

☐ Alumni Survey

☐ Employer Survey

☐ Diaries or Journals

☐ Data from Institutional Surveys

☐ Curriculum/Syllabus Analysis

☐ Other: ....

Please indicate and briefly describe what indirect methods you used (and/or attach the survey/script/interview below).

....

Attach survey/script/interview here as needed

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Results

What were the direct data results? *

Program learning outcomes 1-3 were evaluated at the completion of ENVS-212, Air & Water, and ENVS-410, Methods of Environmental Monitoring. These PLOs were evaluated by department faculty observing presentations of posters in ENVS-212 and oral (conference-style) presentations in ENVS-410. In each case, all departmental faculty were invited to attend and evaluate student efforts and many were able to attend at least some of the student presentations. A total of eleven different faculty evaluated some or all of the student presentations for ENVS-212 and a total of seven different faculty evaluated some or all of the student presentations for ENVS-410.

The values presented were defined in a grading rubric that was identical for both courses ranging from a score of 1 (Inadequate Knowledge), 2 (Introductory Knowledge), 3 (Developing Knowledge) to 4 (Mastery of Knowledge). Faculty were instructed to assess student performance on their presentations by giving them a score for each learning outcome listed as described within the rubric. Faculty were further instructed to compare the students' level of knowledge with what would be expected of that student upon graduation with a B.S. in Environmental Science.

The results of this direct evaluation follow where values presented are average values plus or minus one standard deviation...

AY 2015-2017	ENVS-212	ENVS-410
PLO1	2.36 +/- 0.70	3.44 +/- 0.68
PLO2	2.63 +/- 0.63	3.43 +/- 0.69
PLO3	2.58 +/- 0.76	3.38 +/- 0.59

What were the indirect data results? (If applicable)

How do you interpret these results? What do they mean? *

The results clearly demonstrate with scientific validity that students completing ENVS-212, Air & Water, have introductory to developing knowledge of program learning outcomes 1-3. Similarly, the results demonstrate that upon completion of ENVS-410, Methods of Environmental Monitoring, students have between developing and mastery of all three program learning outcomes. These results align with the expectations of our curricular map for each of these two courses. Moreover, given that mastery of each program learning outcome measured falls within one standard deviation of the average of our data, we can conclude that graduating seniors do master program learning outcomes 1-3 upon completion of the senior capstone course.

Closing the Loop

"Assessment is most likely to lead to improvement when it is part of a larger set of conditions that promote change: Assessment alone changes little. Its greatest contribution comes on campuses where the quality of teaching and learning is visibly valued and worked at. On such campuses, the push to improve educational performance is a visible and primary goal of leadership; improving the quality of undergraduate education is central to the institution's planning, budgeting, and personnel decisions. On such campuses, information about learning outcomes is seen as an integral part of decision making, and avidly sought."

   --9 Principles of Good Practice for Assessing Student Learning: American Association for Higher Education

Purpose: In the current field of higher education today, Assessment of student learning is seen as a critical tool to assist in the mission of student centered education. It is a way for faculty and the other university constituents involved in learning to use data driven results to bring about needed curricular or programmatic changes to improve student outcomes.

In the previous section, you have analyzed the data to get some critical insights into student learning. This section is for our way forward, and touches upon a few core areas:

What might you do as a result of these assessment results? What curricular or programmatic changes might you implement? *

- ☐ Revision of PLOs

- ☐ Changes in pedagogical practices

- ☐ Revision of program course sequence

- ☐ Revision of course(s) content

- ☐ Curriculum Changes (e.g. addition and/or deletion of courses)

- ☐ Modified program policies or procedures

- ☐ Designed measurement tools more aptly suited for the task

- ☐ Improved within and across school/college collaboration

- ☐ Improved within and across school/college communication

- ☐ Revised student learning outcomes in one or more courses

- ☐ Modified rubric

- ☐ Developed new rubric

- ☐ Developed more stringent measures (key assessments)

- ☐ Modified course offering schedules

- ☐ Changes to faculty and/or staff

- ☐ Changes in program modality of delivery

- ☑ Other:　Reflection and review of results in a faculty meeting.

Description of the Proposed Changes (as checked above): *

Given that we were directly assessing three PLOs with this report, it was important to the faculty that we repeat the process from last year which followed the same assessment. This was to determine if the results obtained were resilient.

The results of this direct evaluation follow where values presented are average values plus or minus one standard deviation...

AY 2015-2016	ENVS-212	ENVS-410
PLO1	2.32 +/- 0.82	3.44 +/- 0.71
PLO2	2.54 +/- 0.71	3.54 +/- 0.64
PLO3	2.41 +/- 0.84	3.53 +/- 0.51

AY 2016-2017	ENVS-212	ENVS-410
PLO1	2.41 +/- 0.56	3.44 +/- 0.62
PLO2	2.71 +/- 0.55	3.25 +/- 0.76
PLO3	2.74 +/- 0.66	3.06 +/- 0.64

Assessment results over the two year period were reviewed by faculty and differences noted. Results for ENVS-212 were remarkably consistent, however, results for the senior capstone course, ENVS-410 showed a decline in PLOs 3 & 4 but that decline was within the standard deviation of the results. Reflecting on the data collection, faculty who taught the courses were involved in the assessment process during the 2015-2016 academic year, while they were excluded in the 2016-2017 academic year to avoid any conflicts of interest. This likely resulted in lower overall scores for PLOs 3 & 4. Moreover, the class size of ENVS-410 declined significantly between the two academic years. In 2016, 26 students were enrolled, while in 2017, only 13 students were enrolled, half the class size of the previous year. Because presentation times are limited the reduction in class size directly resulted in smaller project groups. In 2016, the average project group had 3.7 students, in 2017, the average project group had only 2.2 students. Thus the amount of student hours dedicated to the projects were reduced and so it follows that the groups attained fewer results for their efforts.

It is also clear from the results that the faculty reflection of the previous years results appears to have effectively eliminated low ratings. In 2016, 5 groups were

given a rating of 2 (Introductory Knowledge) by three faculty for the ENVS-410 project presentations. In 2017, only 1 group was rated at 2 by only one faculty member for their project presentation. Obviously, there could be many reasons for this change, but a more clearly calibrated faculty is one of the potential reasons.

From the two years of assessment results for three PLOs, it is clear that we are graduating Environmental Scientists with at least developing knowledge in all three PLOs assessed and are trending toward Mastery of the PLOs. For PLO1, 6 of the 13 project groups scored 3.5 or higher; for PLO2, 9 of the 13 project groups scored 3.5 or higher; and for PLO3, 4 of the 13 project groups scored 3.5 or higher.

It would likely be helpful to further assess PLO3 via another assessment process to determine if remedial actions are required to strengthen this PLO prior to graduating our seniors. Such actions will be considered in a faculty meeting later this academic year.

Amendments to your assessment plan: If, in course of conducting current assessment, you felt a need to amend the assessment plan itself for future assessments, please discuss it here in a few sentences: *

During the 2017-2018 academic year, the Department of Environmental Science will assess PLO4 - Demonstrate knowledge of environmental conditions so as to promote active participation and social justice.

This form was created inside of Faculty & Staff DonsApps.

Google Forms

Curriculum Map 1

Table 1 - The curricular map below describes when and how each learning outcome is introduced, developed, or mastered as a student progresses through various courses within the B.S. in ENVS degree. I = Introduced, D = Developed, M = Mastered

Program Learning Outcomes / Course	PLO 1 – Explain the interdisciplinary nature and complexities of environmental issues.	PLO 2 – Apply the scientific method to environmental issues.	PLO 3 – Skillfully communicate knowledge of environmental science.	PLO 4 – Demonstrate knowledge of environmental conditions so as to promote active participation and social justice.
110 Introduction to Environmental Science (LAB)	I	I	I	I
210 Ecology & Human Impacts (LAB)	D	D	I	I
212 Air & Water (LAB)	D	D	I	
250 Environmental Data Analysis	I	D	I	
410 Methods of Environmental Monitoring (FIELD/LAB)	M	M	M	M
311 Environmental Chemistry	D		D	
320 Restoration Ecology (FIELD/LAB)	D	D	D	I
321 Wetland Ecology (FIELD/LAB)	D	D	D	I
325 California Ecosystems (LAB)	D	D	D	D
330 Environment & Ecosystem Health	M		M	I
335 Marine Environments (LAB)	D	D	D	
350 Energy & Environment	D	D	D	D
360 Climate Change: Science & Policy	D	D	D	D
366 Environmental Policy	M	D	D	D
370 Intro to Landscape Ecology & GIS	D	D	M	D
380 Environmental Engineering	I		D	

Curriculum Map 2

Table 2 - The curricular map below describes when and how each program learning outcomes (PLOs) for the B.S. in ENVS degree maps onto the Institutional Learning Outcomes (ILOs) for the University of San Francisco.

Program Learning Outcomes / Institutional Learning Outcomes	PLO 1 – Explain the interdisciplinary nature and complexities of environmental issues.	PLO 2 – Apply the scientific method to environmental issues.	PLO 3 – Skillfully communicate knowledge of environmental science.	PLO 4 – Demonstrate knowledge of environmental conditions so as to promote active participation and social justice.
ILO 1 – Students reflect on and analyze their attitudes, beliefs, values, and assumptions about diverse communities and cultures and contribute to the common good.				✔
ILO 2 – Students explain and apply disciplinary concepts, practices, and ethics of their chosen academic discipline in diverse communities.	✔	✔		✔
ILO 3 – Students construct, interpret, analyze, and evaluate information and ideas derived from a multitude of sources.	✔	✔		
ILO 4 – Students communicate effectively in written and oral forms to interact within their personal and professional communities.			✔	
ILO 5 – Students use technology to access and communicate information in their personal and professional lives.			✔	
ILO 6 – Students use multiple methods of inquiry and research processes to answer questions and solve problems.		✔		
ILO 7 – Students describe, analyze, and evaluate global interconnectedness in social, economic, environmental and political systems that shape diverse groups within the San Francisco Bay Area and the world.				✔

Please assess student performance on their ENVS-212 Poster Presentations or their Final Presentations in ENVS-410 by giving them a score (as indicated below) for each learning outcome listed. Use the associated scoring table provided. In evaluating students with this rubric, you are to compare their level of knowledge with what you would expect of a student graduating with a BS in Environmental Science. This same rubric is used for both ENVS-212 Poster Session and ENVS-410 Final Presentations. Our goal is to observe how a student develops as they attain the knowledge required for our degree.

Program Learning Outcome	Mastery of Knowledge Score = 4	Developing Knowledge Score = 3	Introductory Knowledge Score = 2	Inadequate Knowledge Score = 1
PLO 1 – Explain the interdisciplinary nature and complexities of environmental issues	Relationship between the study conducted and complexities of environmental issues are well explained. Student uses anecdotal evidence & examples in a robust and meaningful way.	Student has a solid understanding of the complexities of environmental issues. Explanations of interdisciplinary connections are at a basic level and are relevant to the topic.	Student has a limited understanding of how their topic relates to other environmental issues. They are not able to describe meaningful interdisciplinary connections.	Student has a little to no understanding of how their topic relates to other environmental issues. When asked how their presentation relates to other environmental topics they are not able to respond.
PLO 2 – Apply the scientific method to environmental issues	Student utilizes the scientific method associated with their presentation in a clear and logical fashion.	Student correctly utilizes the scientific method at a basic level or higher. Explains aspects of the scientific method that relate to the project.	Understands the elements associated with the scientific method and a rudimentary understanding of how those elements are connected.	Understands some but not all of the elements associated with the scientific method and lacks a rudimentary understanding of how those elements are connected.
PLO 3 – Skillfully communicate knowledge of environmental science	Student fully understands the scientific context and implications of the material presented. They are able to highlight examples of their project with anecdotal evidence & examples in a robust and meaningful way.	Student presents a problem statement and solution. Knowledge expands upon the information in the presentation with multiple external examples. Level of knowledge exceeds a basic level.	Student presents a problem statement and solution. Knowledge is limited to the information in the presentation with few external examples and in limited context. Level of knowledge exceeds a basic level.	Student fails to clearly present a problem statement and result. Knowledge is limited and some information presented is not understood.