Appendix G: IPR Submittal and Checklist Form

This form is to be completed and submitted as a cover sheet for the final self-study report.

Name of the program: Earth Science Department

Date submitted: Feb. 17, 2021

Scheduled visitation date: Feb. 16, 2021

IPR Committee Liaison: Colleen McKinley

All courses in the program have been reviewed by the Curriculum Committee within the last six-year cycle. ◉ Yes ○ No

Explain any exceptions for non-compliance with curriculum requirements:

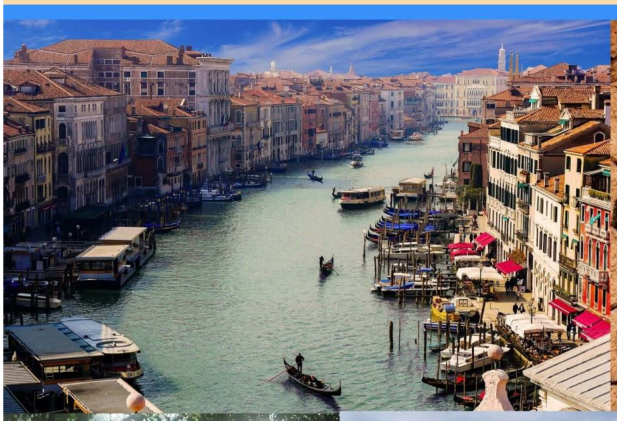
Check-list to ensure the self-study report adequately addresses the following components:

Components	Yes	No
Overview of the program	◉	○
Analysis of program data	◉	○
Assessment and student learning outcomes (SLOs)	◉	○
Curricular course review	◉	○
Six-year program reflection	◉	○
Program's direction, vision, and goals	◉	○
Resource requests	◉	○
Conclusion and recommendations	◉	○

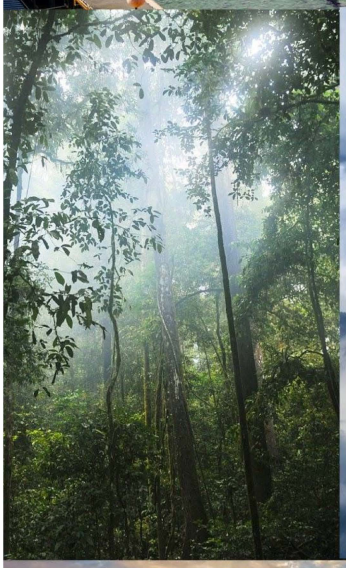
Program review prepared by: D. DeKraker, R. Goode, N. Iwaz, T. Lacy, C. LoVetere (Print Name) 2/17/2021 Date

Reviewed by Division Dean: Andrew Vines (Print Name) Date

EARTH SCIENCE DEPARTMENT
Program Review 2020-2021



Dan DeKraker (chair)
Ryan Goode
Nicole Iwaz
Tor Lacy
Crystal Lovelere



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Earth Science Department

Overview

The Earth Science (ES) Department is thoroughly committed to promoting all aspects of student learning and success. The mission of the ES Department includes five principal goals. First, provide a wide variety of rigorous introductory courses that satisfy the physical science breadth requirements (both with and without laboratories) for university transfer students. Second, actively work to attract and encourage students to major in geology, geography, or other ES subjects. Third, provide in-person and online courses that satisfy basic requirements for our majors, keep abreast of developments in the local universities, and satisfy general education requirements for transferring students. Fourth, offer courses within the geography curriculum that satisfy social science transfer requirements. Fifth, connect our students to the greater academic and professional communities.

The ES Department believes that an effective department demonstrates sustainable student enrollment in its courses offered over time; provides instruction that enables high rates of retention and student success; offers a curriculum that is relevant to its students; provides creative and engaging in-person, field-based, and online laboratory experiences; fosters collaboration among part-time and full-time faculty; and, makes available courses that meet transfer requirements. Finally, the ES Department strives to continually improve instruction and therefore welcomes this opportunity for self-reflection and subsequent improvement.

The ES Department has an ongoing partnership with the TeacherTrac program and has actively been involved in grant writing and implementation. Commencing in 2015 were projects associated with the Hispanic Serving Institutions - Science Technology Engineering and Math (HSI-STEM) Grant, which are helping to increase the number of Hispanic and other underrepresented student groups in STEM areas, such as Earth Science.

The ES Department currently has 5 full-time faculty members, Crystal LoVetere, Tor Lacy, Dan DeKraker (Department Chair), Nicole Iwaz and Ryan Goode. Nicole earned her tenure at Cerritos College in 2019 and Ryan Goode earned his tenure in 2020. The ES department is thrilled to have these two fabulous additions to the department and campus. The department offers courses in three ES subject areas, earth science (ESCI), geography (GEOG), and geology (GEOL).

The ES department has been very active in community and campus outreach to broaden awareness of the earth sciences and increase interest in STEM majors. On-campus activities have included but were not limited to, annually participating in the campus major fair, participating in the STEM Open House, and dispersing major and earthquake safety information during Great ShakeOut evacuations. The department has also been actively involved in community events that broaden awareness of the earth sciences and STEM in general, including running a tectonic activity booth at Luther Elementary School to promote STEM to

young children in 2018, hosting a student and faculty “social event” with a local geology hobbyist group in 2018, The Delvers Mineralogical Society, a fossil craft booth at the Columbia Memorial Space Center’s City of STEM Festival in 2019, and guest speaking at the YMCA of Greater Long Beach’s Family STEM Night/STEM Gender Equity Program in 2019.

The ES department has developed several partnerships that have strengthened enrollment. For example, GEOL 101 Physical Geology is part of the President Scholars Academy, which enrolls students from local high schools, while GEOL 103 was adopted as a general education course in the automotive pathway in 2019. Recently in 2020, this pathway was adopted by the entire Technology division. Earth Science (ESCI 110) is taught in the summer as part of the Summer STEM program.

The ES department has been active in grant proposal development on campus. Our faculty collaborated with California State University, Long Beach (CSULB) on grant proposals to NSF in 2014 and 2018 to increase the participation of underrepresented students (specifically women and Hispanics) in geology majors and careers. The faculty also collaborated with geology faculty at California State University, Los Angeles (CSULA) in 2017. Although these grants were not awarded, constructive feedback was given and relationships were strengthened with our university partner. An HSI STEM grant was also prepared in part by ES Department faculty. Grant goals were realized over the course of 5 years and resulted in the expansion of ES course offerings and in the number offered, as well as an increase in the number of ES majors and transfers. Grant-related work also resulted in initiating professional relationships with faculty at local universities, including University of California, Los Angeles,(UCLA), California State Polytechnic University, California State University, Long Beach (CSULB), California State University, Los Angeles (CSULA), and California State University, Fullerton (CSUF). Two of our faculty are also currently involved in the development and implementation of an HSI grant (BE-STELLAR) recently awarded by NSF to the Teacher TRAC Program. This program is aimed at increasing the number of STEM-majoring-students (with a focus on Hispanic/Latinx students) considering teaching professions in secondary education. In 2018 the department was awarded a Cerritos College Foundation grant, which resulted in the construction of an augmented reality sandbox to help students better understand how to interpret landforms on topographic maps.

The ES Department faculty made significant efforts to help prepare students for the next step in their academic and professional careers. Earth Science Social Hour events were held to help students learn about ES professions, mingle with the Delvers Mineralogy Society (a local geology club), meet alumni majoring in geology and geography, and learn about internship opportunities. ES faculty are also committed to developing and sustaining positive relationships with our students. The department supports a geography reunion/alumni panel where current students meet with former students to discuss university-level geography programs and internship/career opportunities.

The ES faculty are committed to helping students expand their horizons, and advance academically and professionally. Several students have participated in competitive internships locally and nationally e.g. with NSF REU's, Los Angeles Natural History Museum, NASA

Community College Aerospace Scholars. The department has organized tours of university geology, geography, and ES departments and campuses, including California State University at Long Beach, California State University at Los Angeles, California State University at Pomona, California State University at Fullerton, and the University of California at Los Angeles. Additional efforts have been made to increase exposure to bachelor and master programs, such as through the GEOL 103 tour of the University of Southern California's Wrigley Institute on Catalina Island and CSUF student poster day. The department has involved students with local ES professionals and professional organizations at events including the South Coast Geological Society student poster presentation, Tilden-Coil drilling demonstration for geology students during the construction of the new Fine Arts and Mathematics building, and the Cone Penetration Test demonstration for geology students during the construction of the new Child Development Center. Efforts have also been made to integrate awareness of career opportunities in the classroom, such as through live virtual tours in GEOL 101, ESCI 104, and ESCI 110 with geoscientists and geologic technicians aboard the oceanographic research drilling vessel, the Joides Resolution.

The ES Department is committed to developing and sustaining positive relationships with our students. All instructors maintain multiple relationships because we believe this, in turn, translates to higher levels of engagement, motivation, and academic success. Furthermore, we have closely mentored approximately twenty students through Cerritos College as students or ES Department employees onto University, Graduate School, or into the workplace. We value these opportunities to work closely with our students.

The ES Department encourages student interests in all earth science-related fields, such as oceanography, meteorology, and environmental policy, and offers associate degrees for transfer in geology and geography. The table below highlights the AA-T in Geography and the AS-T in Geology.

Earth Science Department Associate Degrees for Transfer

Geography AA-T

REQUIRED CORE (7 Units)		
GEOG 101	Physical Geography	3
GEOG 101L	Physical Geography Laboratory	1
GEOG 102	Natural and Cultural Geography	3
LIST A (Select 6-8 Units)		
GEOG 105	World Regional Geography	3
GEOG 140	California Geography	3
ESCI 106	Weather and Climate	3
GEOG 160	Field Studies in Geography	2
LIST B (Select 6-8 Units)		
Any List A not used		
GEOG 103	Environmental Geography	3
MATH 112	Elementary Statistics	4
MATH 170	Analytic Geometry and Calculus I	4
BIOL 120	Introduction to Biological Science	4
ANTH 100	Cultural Anthropology	3
GEOL 102	Physical Geology Lecture	3
	Total Degree Requirements	19-23

Geology AS-T

REQUIRED CORE (26 Units)		
GEOL 101	Physical Geology	4
or GEOL 102	Physical Geology Lecture	3
& GEOL 102L	Physcial Geology Laboratory	1
GEOL 201	Earth History	4
CHEM 111	General Chemistry	5
CHEM 112	General Chemistry	5
MATH 170	Analytic Geometry and Calculus I	4
MATH 170	Analytic Geometry and Calculus II	4
	Total Degree Requirements	26

Cerritos College Mission Alignment with Department

Cerritos College Mission Statement

> Cerritos College provides its diverse student population with high-quality, comprehensive instructional programs and support services through clear, equity-minded pathways to their educational goals. In doing so, the college develops culturally competent students with the knowledge, skills, and values that prepare them to be productive members of their local and global communities.

The work of the ES Department aligns with the mission of Cerritos College. The department strives to introduce subject matter with an enthusiasm that will guide our diverse student population towards a greater appreciation of other places, cultures, landscapes and how those environments are created over time through physical processes. We aim to broaden their exposure to the physical and cultural variety found throughout our increasingly globalized planet Earth. The community college classroom, both in-person and virtual, provides a platform for this undertaking. In this environment we are keenly aware that the range in students' ages can be large, the variety of ethnicities can be great and learning abilities can be dissimilar, which helps us add authenticity to the ES classroom and topics we discuss. We use this diversity within our classrooms to also better understand diversity around the world. For example, we recognize that our students are often first-generation college students and some of our favorite experiences are mentoring students through the academic processes. We work closely with the Student Accessibility Services (SAS) department to ensure our SAS students are receiving the resources they need to be successful in our courses. We offer morning, evening, weekend, and online courses to accommodate our students who often work or have other personal obligations. Some of our faculty have completed the Dreamers and Safe Zone workshops to better understand the needs of these students and are committed to continuing with these workshops and others, like Vet Net Ally training.

At the core of sustainability or environmental issues is an understanding of equity and social justice. Environmental issues are paramount in ES courses. We understand that for many students, our general education courses might be the only time they learn natural physical processes and how those processes coupled with our actions as humans can negatively affect that planet. Unacceptably, these negative outcomes affect some communities more than others and we believe that it is our role to highlight that all people should have access to clean water, clean air, clean food sources, and an overall healthy environment.

The ES Department recognizes that equity in education for our diverse student population needs to be tackled in a variety of ways and must always be at the forefront of our own personal expansion as faculty.

Since our last Program Review, the ES Department appreciates fulfillment of requested support by the college. For example, after two ES faculty retired and two other faculty relocated, the

department again has five full-time, tenured faculty members as of 2020. Nicole Iwaz and Ryan Goode were both hired since our last program review, rounding out the department and filling the much-needed specialty for an Environmental Geologist and Cultural Geographer respectively.

The department was also granted an important technological teaching tool that will add value to our courses: the Mavic Pro 2 Quadcopter Drone. We should also highlight that the new departmental drone will create some excitement for students when they, for example, witness rock formations from high in the sky at California sites such as Red Rock Canyon State Park. These captured images will be valuable for in-person as well as online courses.

An Augmented Reality Sandbox was also installed in the ES Laboratory which allows students to witness how landforms are created, shaped, and also displayed on topographic maps. This visual assists all learners, but especially visual learners. Many “ah ha’s” are heard after confused students get a visual mini-lecture at the augmented reality sandbox.

A large floor model, 25-inch relief globe was added to one laboratory classroom and one designated ES lecture hall. These mobile globes show excellent relief of Earth and tectonic plate boundaries and make it possible for students to see features, even from a distance. These globes, a new digital camera, and various departmental teaching supplies and tools allow the department to continue to advance our ability to successfully teach ES to our students.

The ES Department recognizes that there are resource needs across the campus and in various departments. We are always appreciative of the support that we receive which allows us to continue to improve our ES courses for Cerritos College students.

Program Data

The ES Department analyzed program-related data provided by Cerritos College Institutional Effectiveness, Research, and Planning Office and the Tableau dashboard.

Demographics

In the 2019-2020 academic year, the gender of the Cerritos College student body was approximately 54% female, 44% male, and 2% unknown. ES Department enrollment gender demographics aligned with the campus: 57% were female, 41% were male, and 1% were unknown. The gender proportions have been mostly stable for both the college and the ES department since 2014.

There is a significantly higher proportion of male students than female students in geology and geography majors as a whole. In Spring 2020, there were 44 geography majors and 18 geology majors. Of the geography majors, 13 students identified as female (30%), 30 identified as male (68%), and 1 student was unknown. Of the geology majors, 7 students identified as female

(39%), and 11 students identified as male (61%). One of our full-time instructors has been a Women in STEM advisor for the past two years, which we hope will help attract more women into the earth sciences.

In the 2019-2020 academic year, the race/ethnicity of the Cerritos College student body was 67% Hispanic/Latino, 9% white, 9% Asian, 6% black or African American, 6% unknown, 2% biracial, and 1% Native Hawaiian/pacific islander. The ES Department enrolled a significantly higher percentage of Hispanic Latino students, accounting for 77% of our class enrollment. 7% of students enrolled in ES classes were Asian, 6% were white, 5% were black or African American, 3% were unknown, and 2% were biracial. The race and ethnicity proportions have been mostly stable for both the college and the ES Department.

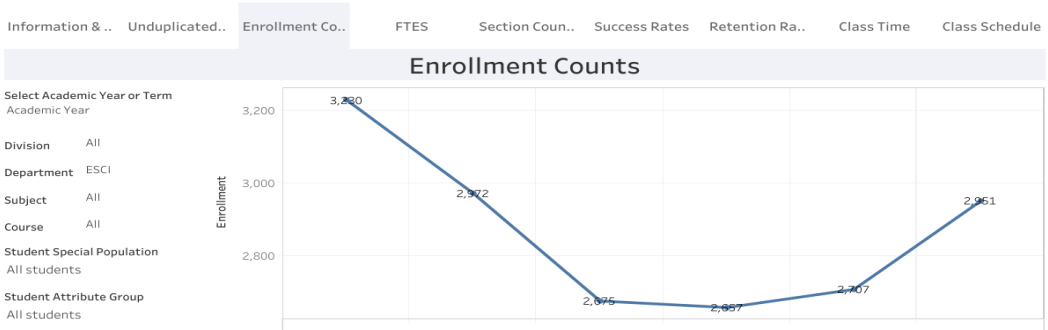
In the 2019-2020 academic year, the age of the Cerritos College student body was 31% 20-24 years, 26% 25-34 years, 22% 19 years and under, and 21% 35 years and older. The ES Department enrolled a significantly higher proportion of students age 20-24 (47%) and age under 19 years (27%) and a significantly lower proportion of students age 35 and older (7%). The campus is experiencing a downward trend in enrollment of students age 20-24 years, and an upward trend in all other age groups. Although there is a slight increasing trend in enrollment of students under 19 years, the enrollment of most age groups has been stable.

Demographic Trends

Enrollment

ES Department enrollment has generally mirrored campus-wide enrollment patterns over this review cycle. There was declining enrollment in the first three years of the review cycle (2014 - 2017), a plateau mid-cycle (2017-2018), and steady gains in the last two years (2018 - 2020). While both Geology and Geography course enrollment fit this trend, ES subject courses have had a notable rise in enrollment across the review cycle. Enrollment in Geology has rebounded so significantly that enrollment numbers in 2019- 2020 were the highest of any year in the cycle. Geography enrollment also increased to a lesser extent over the 2019 - 2020 academic years.

Earth Science Department Enrollment Counts Graph

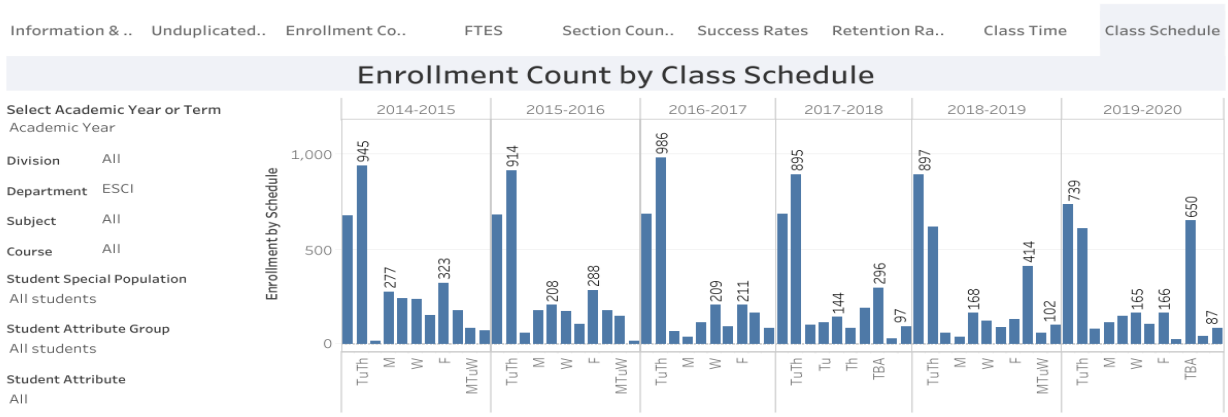


Relative to in-person classes, online classes show a distinct upward trend in enrollment. The online offerings for earth science and geography both increased over the review cycle. These

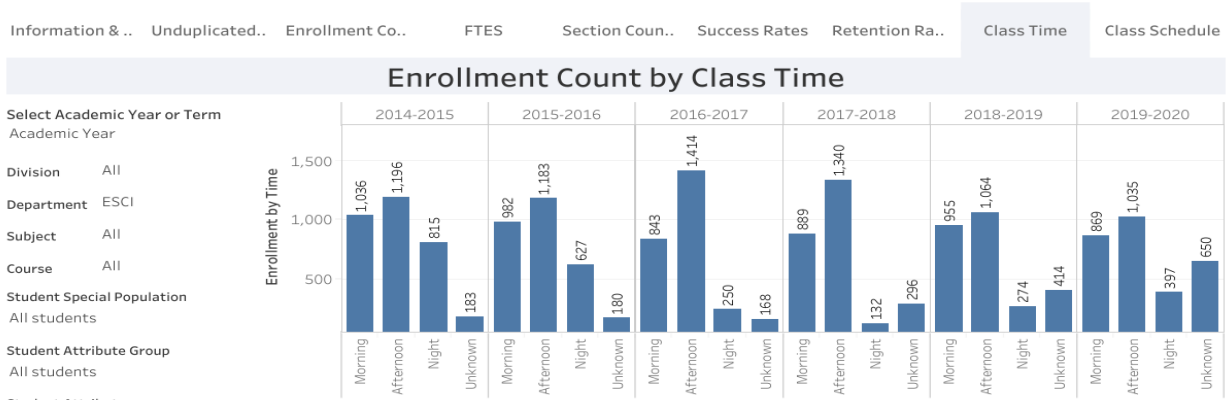
online courses tend to be very popular and are almost always filled. Geology classes started being offered during the Fall 2020 semester and will become a regular component of the course schedule for the department.

Environmental Geography enrollment decreased significantly over the course of the review period. We attribute this to the loss of a full-time Environmental Geographer instructor at the beginning of the cycle who has yet to be replaced. Geography is hoping to hire a new full-time Environmental Geographer to revive this area of lagging enrollment.

Earth Science Department Enrollment Count by Class Schedule



Earth Science Department Enrollment Count by Class Time



The majority of our sections are scheduled on Tuesdays and Thursdays and during mornings and afternoons. After analyzing and discussing the data our department agreed to address this issue by more evenly distributing section offerings Monday through Thursday and by offering an additional earth science, geology, and geography evening class.

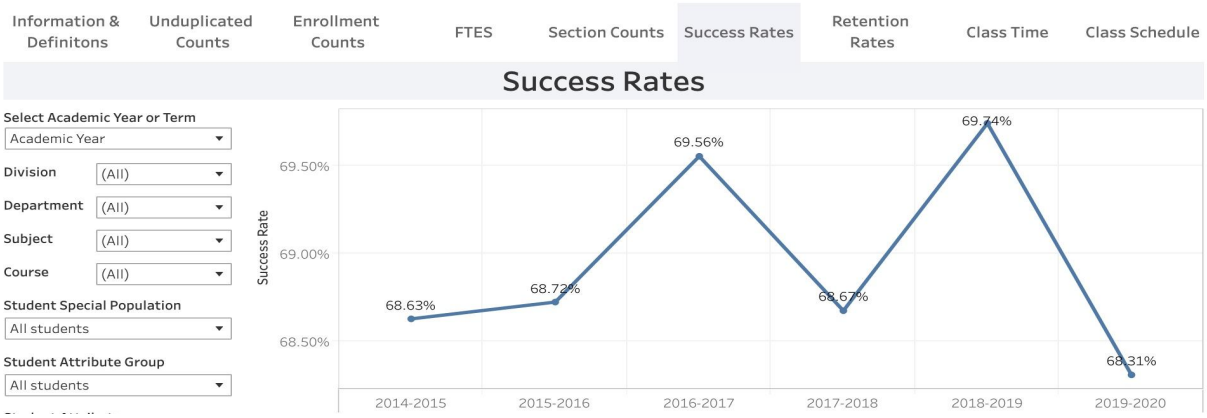
Success and Retention Rates

Success rates in ES courses have improved over the reporting period. At the beginning of the reporting period, department success rates were at 65.45%, about 3% below the campus as a

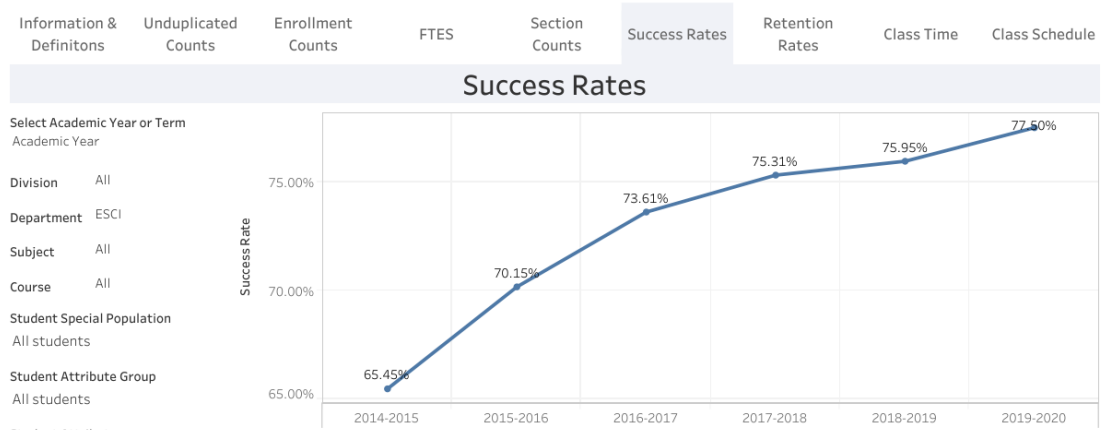
whole, and by the end of the period, they had increased to 77.6%, almost 9% higher than that of all Cerritos College students. Geology, in particular, showed impressive progress with student success rates rising from 65.91% at the beginning of the period to over 81.68% by the end. Geography also increased their success rates from 61.95% at the beginning of the period to 76.31% by the end. In terms of demographics, Earth Sciences was able to increase the success rate of Black/African American, Asian American, and Hispanic/Latino/a students by over 10% for each group. Asian American success rates increased from 69.7% to 87.4%. Hispanic/Latino/a success rates increased from 65.7% to 77.6%. African American or Black success rates increased from 52.8% to 63.7%. White students showed modest growth in success rates from 79.8% to 80.6% over the reporting period.

Though African-American and Black success rates improved by over 10% during the reporting period, we still consider a 63.7% success rate too low. Our department is committed to incorporating a more culturally diverse curriculum that really focuses on local environmental issues omnipresent in our students' communities. We are also committed to further diversifying our faculty so our students are exposed to a variety of voices and perspectives in the department. We are also making strides to ensure our online curriculum is accessible across all devices students may be accessing our courses from. This includes cell phones, which student survey data has shown is the most readily accessible device students have access to. Our department also realizes students have uneven access to the internet (only 59% have it all the time) and quiet study space in their homes (only 27% have it all the time). As such, our faculty is committed to remaining as flexible as possible with our online course requirements and due dates. We are also trying to deliver as much asynchronous content as possible to accommodate those students with uneven internet access and/or a quiet place to study.

Cerritos College Student Success Rates

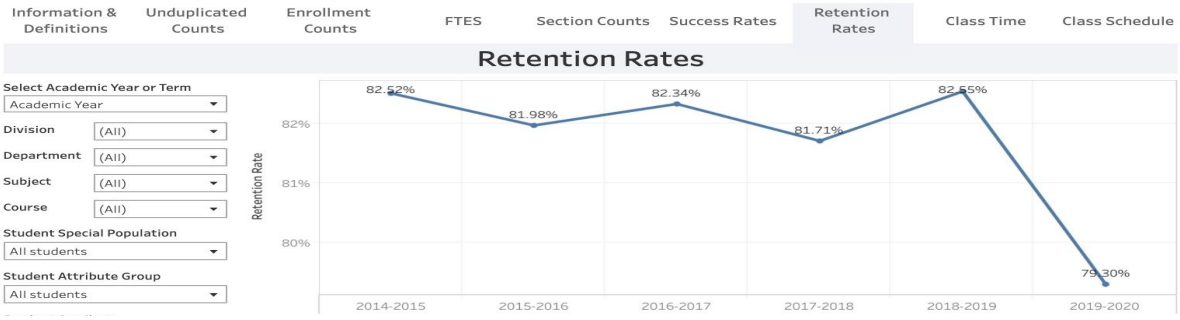


Earth Science Department Student Success Rates

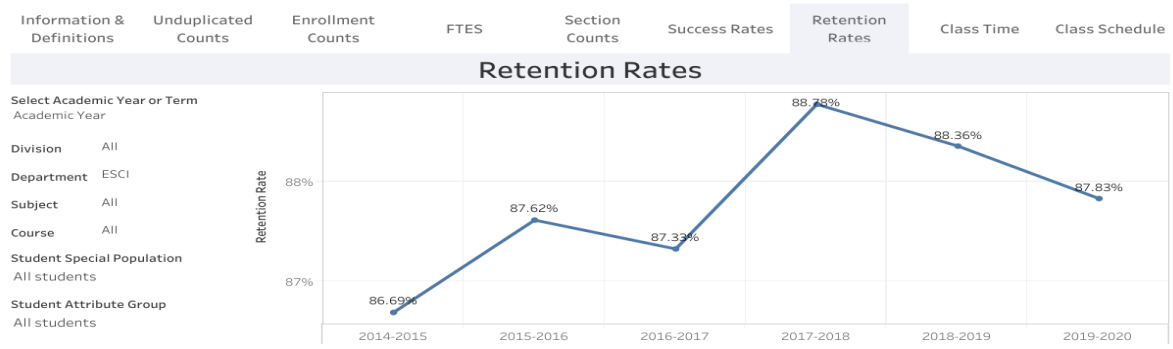


ES Department student retention rates were 4-8% higher over the reporting period than retention rates for students campus-wide. All demographic groups in our classes showed an increase in retention rates, with exception of Hispanics and white students, who remained more or less constant. Asian student retention increased as much as 22% and black students as much as 40% during the reporting period. The dropoff in retention for most groups during the 2019-2020 year can be attributed to switching to online instruction during the Spring 2020 semester due to COVID-19. Geography and geology classes showed an approximate increase in retention rates of 1% and 8%, respectively, during the reporting period.

Cerritos College Student Retention Rates



Earth Science Department Student Retention Rates



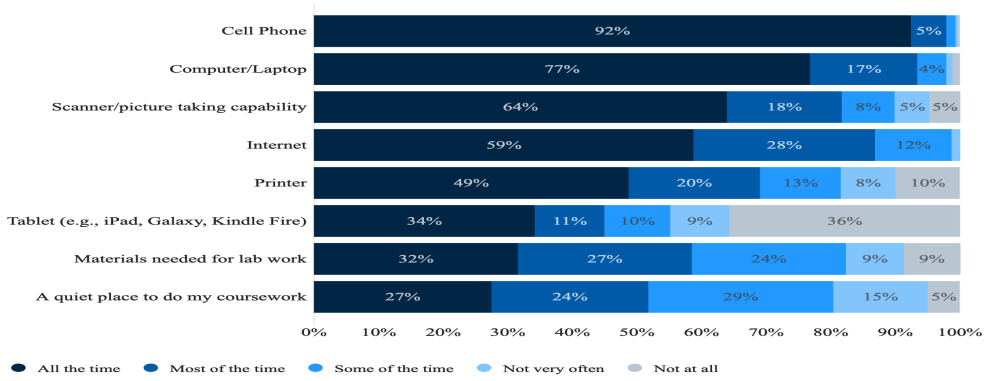
Retention and success rates are higher in traditional, in-person classes than they are in the department's online courses. Though, in the final year of the reporting period, success rates improved dramatically in online ES courses. We are hopeful our success and retention rates will continue to climb with the additional training our online teaching faculty have received over the last year. All five of our tenured/tenure-track faculty have now completed the distance education training course. Recent student survey data suggests video lectures and discussion activities are particularly helpful tools for the understanding of the ES curriculum. ES plans to encourage our faculty to produce more video-based lecture content moving forward. We are very excited to use our new drone to film more on-location lecture content. The department encourages all faculty members to have a more 'active presence' in their online courses through engaging message board activities and consistent communication with students. To address this issue, ES held a department meeting in Fall 2020 to share best practices in terms of facilitating online discussions and improving student engagement in online courses. Faculty members will continue to take professional development courses to improve our online teaching craft in hopes of improving the retention rates in our online courses.

Student Surveys

The ES Department developed surveys for current and past students that were administered to 628 students. The goal of these surveys was to determine: how students are accessing course materials, the off-campus learning materials available to them, to assess student needs, and to gauge what teaching practices our students find most effective.

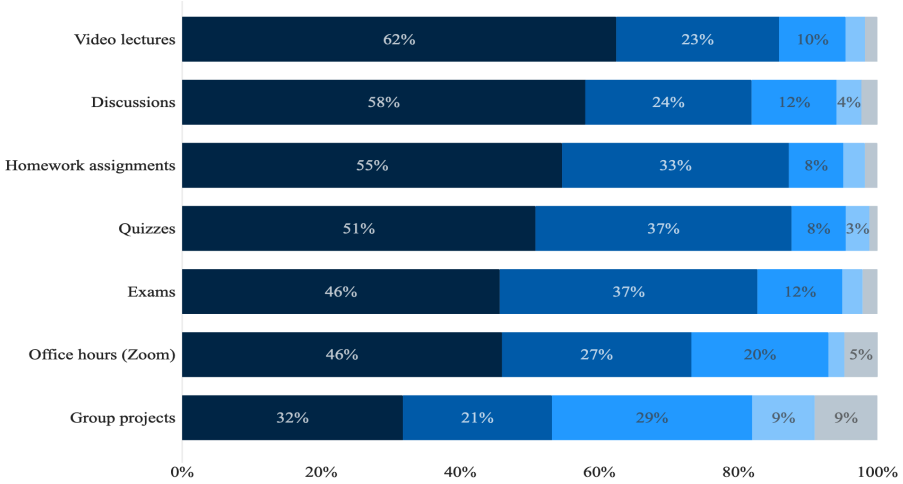
Most students use a cell phone to access our courses, while a significant percentage do have access to computers at least some of the time. All students appear to have access to the internet at least some of the time and most have at least limited access to a printer. Unfortunately, only about 60% have the materials needed for lab work most or all of the time and about half of our students seem to be struggling to find a quiet place to work on their studies. This data indicates that ES instructors cannot assume students will be able to print out assignments or course materials from home and that funding is needed to provide ES students with the materials needed to help them master student learning outcomes.

Student Access and Learning Materials Survey



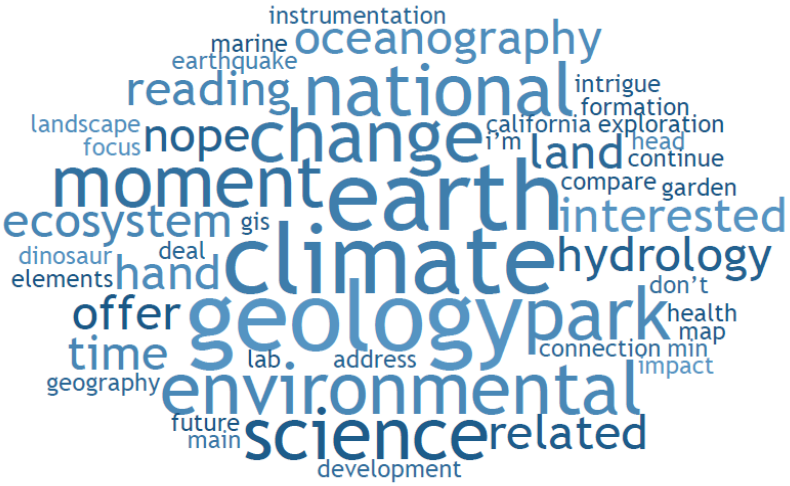
Overall, it appears that all teaching practices included in our survey are helping the vast majority of our students learn course content. Video lectures were most helpful, while students least preferred group projects. Nearly all students also found quizzes and exams to be a helpful learning tool. Going forward, ES instructors will consider teaching practices that include more formative and informal assessments, such as practice quizzes and pre-tests.

Teaching Practices Survey



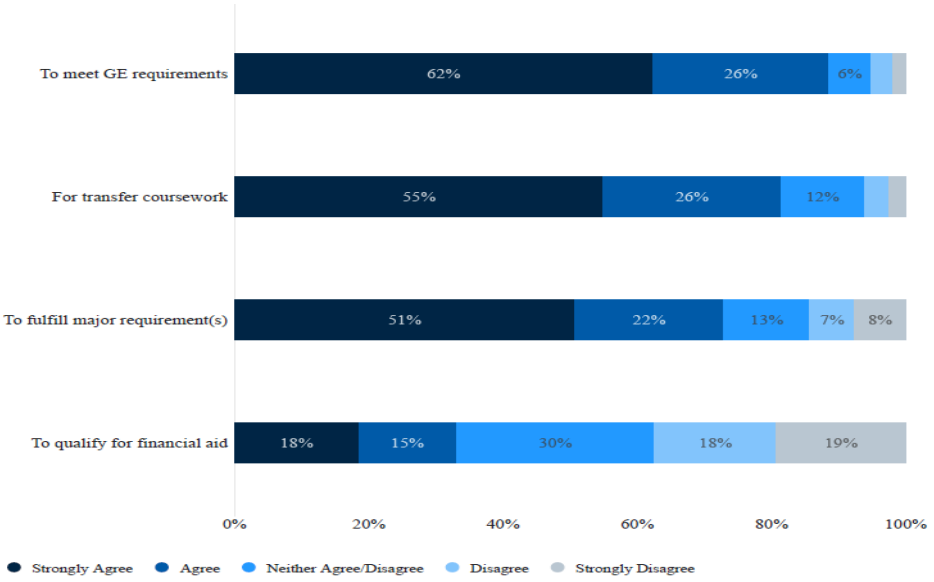
The 186 open-ended survey question answers were summarized in one word, weighted by font size in the “cloud survey” below.

Cloud Survey of Student Interest in Future Class Topics



Consistent with our anecdotal evidence from years past, our student surveys revealed that the majority of our students take earth science classes in order to fulfill GE and transfer requirements. Considering this, we will work with counseling and other departments to include our classes in as many appropriate pathways as possible as means of exposing as many students as possible to our courses.

Reasons Why Students Took an Earth Science Course Graph



Assessments and Student Learning Outcomes

There are many challenges to the course student learning outcomes (SLO) process that the ES Department is in the process of correcting. The primary challenge has been a difficulty with the technical side, using Elumen, and gaining “buy-in” from part-time faculty members. Also, the process to upload SLO data is time-consuming and difficult. Even with the video tutorials and resources available on the website, faculty members do not feel comfortable using the Elumen platform. To have the SLO process run smoothly, it is evident that all faculty, both full-time and part-time, need to be trained on how to use Elumen. Similarly, we are experiencing disconnects between the curriculum side of Elumen and the SLO side of Elumen. Not all courses, but some, when the curriculum is updated and the course student learning outcomes (CSLO) are updated, these CSLO’s are not changed in the SLO side of Elumen; the order of CSLOs also can change, making it easy to input student data for the wrong CSLO. The department will again need to audit all course CSLO’s in the near future. This inconsistency has frustrated faculty and has led to some disparities in the data. In further review of Elumen, where and how to add action plans is not constantly being completed. Another challenge of Elumen is understanding the bigger picture and the tasks involved with program SLOs and college-wide SLO’s and then aligning everything with the department’s CSLO’s.

Even though the department has had some struggles with the technology, course-specific student learning outcomes, program learning outcomes, and overall student learning is paramount to the success within the department. In the past 6 years, all of the CSLO’s have been evaluated and updated in the Elumen curriculum guides for each course. These CSLO’s are readily available to all faculty members and each faculty member is asked to display them on their course syllabus for the semester. In the past 6 years, the department developed program learning outcomes for the Geology AA-T and the Geography AS-T. These program

SLO's have been aligned to a few courses, but more effort is needed to complete this project. For our high enrollment courses, faculty members have created CSLO quizzes that can be given by both part-time and full-time instructors teaching those courses. One positive outcome of the transition to online teaching was the inputting of these CSLO assessments into the department's Canvas courses. Now department members can easily assess CSLO's by using their grade books to copy the SLO data into an excel spreadsheet which is ultimately uploaded into Elumen.

The ES review process has been to assess all CSLO's in all courses during the fall semester of each year. Then, after reviewing the data in January, the department members create an improvement plan for each course. The goal is to make improvements in the following year's fall semester courses. The SLO data and the action plans are discussed in department meetings. Changes are made to the curriculum in the fall and also discussed in department meetings. Improving the SLO process directly improves student success. One specific example would be the action plan for Earth Science 110 in 2016 was to introduce certain topics earlier in the semester, like atmosphere ideas. This reorganizing of topics and emphasis on improving ES leads to fewer students falling in the "emergent" category the following fall (see tables below). ESCI 110 Fall 2016 emergent percent was 22.8% and in ESCI 110 Fall 2017 the percent of emergent decreased to 16.1%

The compiled SLO data for Earth Science, Geography, and Geology courses (see below) are useful in analyzing the ES Department's SLO process. The general trend for each discipline is a decrease in "good" percentages and an increase in "emergent" percentages. There are certainly many variables that contribute to negative results, but most likely with a greater emphasis on accurately assessing students and overall more students being assessed, the percentages are normalizing. As you can see in Fall 2018, 407 geography students were assessed and in Fall 2019, 2080 students were assessed.

SEM Division SLO Results Fall 2017 - Spring 2020

Cerritos College SLO Committee - Course SLO Assessment Results - Three Year Comparison (Fall 2017 to Spring 2020)

SEM Division	Semester	Number of Assessments				Percentages		
		Good	Satis.	Emergent	Total	Good	Satis.	Emergent
Engineering	Spring 2020	-	-	-	-	-	-	-
	Fall 2019	152	151	14	317	47.9%	47.6%	4.4%
	Spring 2019	-	-	-	-	-	-	-
	Fall 2018	-	-	-	-	-	-	-
	Spring 2018	279	141	30	450	62.0%	31.3%	6.7%
	Fall 2017	66	20	10	96	68.8%	20.8%	10.4%
	Total	497	312	54	863	57.6%	36.2%	6.3%
Earth Science	Spring 2020	-	-	-	-	-	-	-
	Fall 2019	527	614	497	1,638	32.2%	37.5%	30.3%
	Spring 2019	-	-	-	-	-	-	-
	Fall 2018	455	653	359	1,467	31.0%	44.5%	24.5%
	Spring 2018	-	-	-	-	-	-	-
	Fall 2017	743	632	348	1,723	43.1%	36.7%	20.2%
	Total	1,725	1,899	1,204	4,828	35.7%	39.3%	24.9%
Geography	Spring 2020	-	-	-	-	-	-	-
	Fall 2019	918	603	559	2,080	44.1%	29.0%	26.9%
	Spring 2019	-	-	-	-	-	-	-
	Fall 2018	274	96	37	407	67.3%	23.6%	9.1%
	Spring 2018	-	-	-	-	-	-	-
	Fall 2017	247	136	52	435	56.8%	31.3%	12.0%
	Total	1,439	835	648	2,922	49.2%	28.6%	22.2%
Geology	Spring 2020	-	-	-	-	-	-	-
	Fall 2019	289	189	463	941	30.7%	20.1%	49.2%
	Spring 2019	-	-	-	-	-	-	-
	Fall 2018	210	107	140	457	46.0%	23.4%	30.6%
	Spring 2018	-	-	-	-	-	-	-
	Fall 2017	267	108	181	556	48.0%	19.4%	32.6%
	Total	766	404	784	1,954	39.2%	20.7%	40.1%

The overall course SLO data is positive and reflects students gaining appropriate discipline knowledge. Although the data is not available for certain courses, the SLO improvement plan will improve the way the department interacts with the outcomes and ultimately makes changes to improve student success.

Earth Science Department Course Assessment Results Fall 2015 - Fall 2018

Cerritos College SLO Committee - Assessment Results - Three Year Comparison (Fall 2015 to Spring 2018)

Earth Science Department	Semester	Number of Assessments				Percentages		
		Good	Satis.	Emergent	Total	Good	Satis.	Emergent
ESCI 104	Spring 2018	-	-	-	-	-	-	-
	Fall 2017	226	177	161	564	40.1%	31.4%	28.5%
	Spring 2017	-	-	-	-	-	-	-
	Fall 2016	140	166	197	503	27.8%	33.0%	39.2%
	Spring 2016	-	-	-	-	-	-	-
	Fall 2015	112	155	160	427	26.2%	36.3%	37.5%
	Total	478	498	518	1,494	32.0%	33.3%	34.7%
ESCI 104L	Spring 2018	-	-	-	-	-	-	-
	Fall 2017	-	-	-	-	-	-	-
	Spring 2017	-	-	-	-	-	-	-
	Fall 2016	43	36	47	126	34.1%	28.6%	37.3%
	Spring 2016	-	-	-	-	-	-	-
	Fall 2015	81	61	38	180	45.0%	33.9%	21.1%
	Total	124	97	85	306	40.5%	31.7%	27.8%
ESCI 110	Spring 2018	-	-	-	-	-	-	-
	Fall 2017	517	455	187	1,159	44.6%	39.3%	16.1%
	Spring 2017	-	-	-	-	-	-	-
	Fall 2016	630	419	310	1,359	46.4%	30.8%	22.8%
	Spring 2016	-	-	-	-	-	-	-
	Fall 2015	131	153	180	464	28.2%	33.0%	38.8%
	Total	1,278	1,027	677	2,982	42.9%	34.4%	22.7%
GEOL 101	Spring 2018	-	-	-	-	-	-	-
	Fall 2017	220	68	128	416	52.9%	16.3%	30.8%
	Spring 2017	-	-	-	-	-	-	-
	Fall 2016	72	182	150	404	17.8%	45.0%	37.1%
	Spring 2016	-	-	-	-	-	-	-
	Fall 2015	-	-	-	-	-	-	-
	Total	292	250	278	820	35.6%	30.5%	33.9%
GEOL 102	Spring 2018	-	-	-	-	-	-	-
	Fall 2017	47	40	53	140	33.6%	28.6%	37.9%
	Spring 2017	-	-	-	-	-	-	-
	Fall 2016	103	54	73	230	44.8%	23.5%	31.7%
	Spring 2016	-	-	-	-	-	-	-
	Fall 2015	-	-	-	-	-	-	-
	Total	150	94	126	370	40.5%	25.4%	34.1%

Earth Science Department Course Assessment Results Fall 2015 - Fall 2018 (cont.)

Cerritos College SLO Committee - Assessment Results - Three Year Comparison (Fall 2015 to Spring 2018)

Earth Science Department	Semester	Number of Assessments				Percentages		
		Good	Satis.	Emergent	Total	Good	Satis.	Emergent
GEOL 120	Spring 2018	-	-	-	-	-	-	-
	Fall 2017	-	-	-	-	-	-	-
	Spring 2017	-	-	-	-	-	-	-
	Fall 2016	31	23	2	56	55.4%	41.1%	3.6%
	Spring 2016	-	-	-	-	-	-	-
	Fall 2015	-	-	-	-	-	-	-
	Total	31	23	2	56	55.4%	41.1%	3.6%
GEOG 101	Spring 2018	-	-	-	-	-	-	-
	Fall 2017	83	40	13	136	61.0%	29.4%	9.6%
	Spring 2017	-	-	-	-	-	-	-
	Fall 2016	763	128	89	980	77.9%	13.1%	9.1%
	Spring 2016	-	-	-	-	-	-	-
	Fall 2015	-	-	-	-	-	-	-
	Total	846	168	102	1,116	75.8%	15.1%	9.1%
GEOG 105	Spring 2018	-	-	-	-	-	-	-
	Fall 2017	164	96	39	299	54.8%	32.1%	13.0%
	Spring 2017	-	-	-	-	-	-	-
	Fall 2016	-	-	-	-	-	-	-
	Spring 2016	-	-	-	-	-	-	-
	Fall 2015	-	-	-	-	-	-	-
	Total	164	96	39	299	54.8%	32.1%	13.0%
Report Totals	Spring 2018	-	-	-	-	-	-	-
	Fall 2017	1,257	876	581	2,714	46.3%	32.3%	21.4%
	Spring 2017	-	-	-	-	-	-	-
	Fall 2016	1,782	1,008	868	3,658	48.7%	27.6%	23.7%
	Spring 2016	-	-	-	-	-	-	-
	Fall 2015	324	369	378	1,071	30.3%	34.5%	35.3%
	Total	3,363	2,253	1,827	7,443	45.2%	30.3%	24.5%

No data for ESCI 101, 102, 104, 104L, 106, 110, 180, 298
No data for GEOL 100, 102L, 105L, 201, 204, 207, 208, 209
No data for GEOG 102, 103, 105, 140, 160

The department is developing a robust plan to improve the SLO process. Unfortunately, the disaggregated data was not available for the ES Department during this program review cycle. Disaggregated data will be integrated into the SLO assessment process moving forward. The department will analyze this new data in the next program review cycle. Listed below are the key action items that will improve the SLO process for the ES Department.

- All faculty (full-time and part-time) will be trained to use Elumen for data entry and data retrieval and development of action plans. Included in this training is how to run reports to have usable data on the department's programs and specific course SLO's.
- The faculty will meet with Amber Hrock to understand the "bigger picture" of Program SLO's, College Assessments, alignments, and related tasks.
- CSLO's will be assessed and uploaded into Elumen in both the spring and fall semesters. Similarly, action plans will be developed and uploaded to Elumen.
- Continue to develop SLO assessments in Canvas and faculty will seek training to better understand how to develop rubrics, link quiz questions to outcomes, and submit outcome data on Canvas to Elumen.

Curricular Course Review

All courses in the ES Department have been updated at least twice in the past six years. In 2018, the department went through the "Elumen Clean-Up" where textbooks were updated, CSLO's were checked and general updates were completed. Similarly, in 2020 with the COVID-19 pandemic and transitioning all courses online, we also added distance education to each course, with the exception of historical geology. Historical geology was not scheduled to be taught and the direct use of laboratory materials and fossils would not make this course a good fit for distance education.

The diverse student body at Cerritos College represents an array of needs toward course completion. Some students will only need one science laboratory course and other students will be Geology, Geography, Earth Science, Environmental Science, and other science majors. To accommodate our students we have created combined Lecture/Laboratory courses as well as separated Lecture and Laboratory courses. These combined and separated courses provide students various options to complete their degree requirements. The department offers seven different courses in Earth Science, eight different courses in Geography, and thirteen different courses in Geology. The department offers courses that will help students transfer and prepare students to be successful in the respective disciplines of Earth Science, Geography, and Geology. Our courses and degrees are meeting the students' transfer and career training needs and this was validated in the department's fall survey data (see "Student Survey" section above).

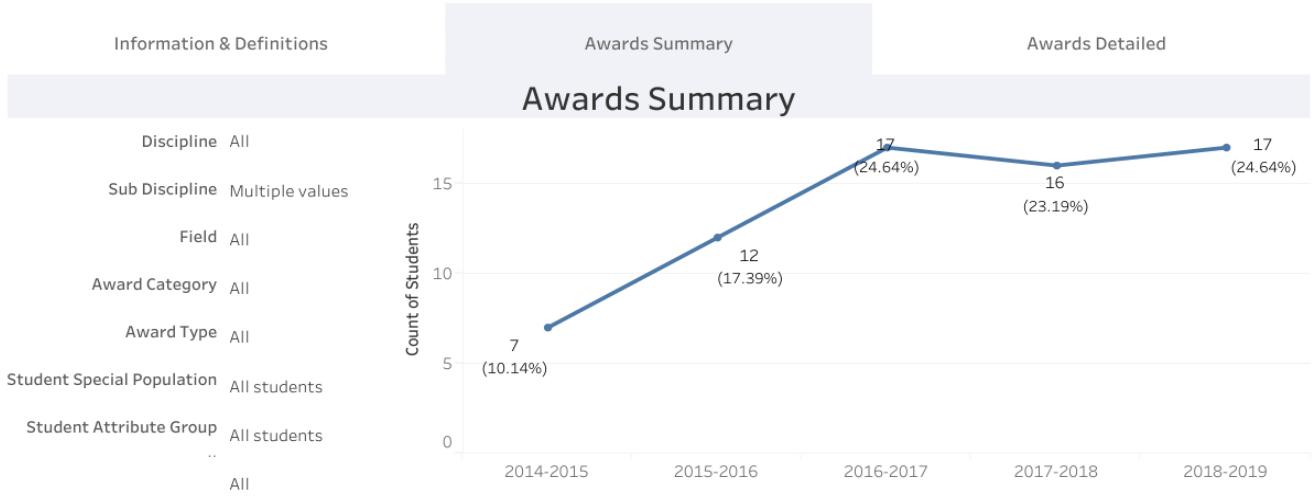
The most recent examples of curriculum changes, Weather and Climate, Environmental Geology and Physical Geography, include these types of courses. A former course, ESCI 101 and 102 was rebranded and reorganized into Environmental Geology GEOL 103 and Environmental Geology Laboratory GEOL 103L. This separated course was recently submitted

to Curriculum to be offered as a combined four-unit course as GEOL 104. Earth science 106 Weather and Climate was approved for distance education in 2019, and the department created a new course ESCI 106L Weather and Climate Laboratory was approved in the fall of 2020. GEOG 101 and GEOG 101L, a historically separated course will also be submitted, Spring 2021, to Curriculum as a combined course GEOG 115. The ES Department understands that these changes will benefit in-person courses, but will greatly benefit online courses and the students who we serve through distance learning.

During this past program review cycle, updates of curriculum changes transitioned from the SEM office personnel to department faculty using the software Elumen. The department has navigated this transition at times smoothly and other times it has been a little rocky. The department deleted GEOL 10 and GEOL 110 as these courses were old and not being taught. The department also transitioned ESCI 101 and 102 to GEOL 103 and GEOL 103L. The department does need to investigate some courses that are not accessible in Elumen that we would like to keep but are not in Elumen. These courses are Environmental policy, GEOL 298, GEOG 106, and GEOL 257. GEOG 257 was a course-specific to Vietnam. The geographers are discussing adding other course electives that will investigate specific countries or regions of the planet.

The ES Department has 2 degrees; the Geology AS-T and the Geography AA-T. The department does not currently have any certificates or licensure/certification exams required for program completion. The department has a positive trend of students completing degrees for transfer. The IERP data is presented below. The department is excited about the increases in degrees, but the faculty members would like to determine how many students are, in fact, transferring into our disciplines without completing the degree and thus being added to the data below. Fourteen geography degrees per year is sufficient for the size of the department. Conversely, 2-3 geology degrees per year would be insufficient compared to the size of the department. But as previously mentioned, students are most likely pursuing degrees in Earth Science and Geology as these disciplines are interdisciplinary.

Earth Science Department Degree and Certificate Awards Summary Diagram



Six-year Program Reflection

Student Demographics and Enrollment

The total number of geography majors has been relatively steady with no notable trend, ranging from 32-45. Enrollment of female geography majors (Geography-AAT and Geography/Tran combined) peaked at 27 in Fall 2016, yet has been declining overall since then. On the contrary, enrollment of male geography majors (Geography-AAT and Geography/Tran combined) fluctuated during this same period but appears to be increasing significantly since Spring 2019 (16 in Spring 2019 to 30 in Spring 2020). Our department should take into consideration the low and declining participation of female students in the geography major.

The total number of geology majors appeared to be relatively stable between Fall 2014 and Spring 2018, ranging from 27-32. However, there appears to be a consistent decline in geology majors since then, steadily decreasing from 32 in Spring 2018 to 18 in Spring 2020. This decline appears to be mainly attributed to a decrease in male majors, steadily declining from 22 in Spring 2018 to 11 in Spring 2020. Although there was a slight decline in female majors in Spring 2020, the number of female majors has remained relatively stable. Our department should take into consideration the low participation of female students, and the recent decline in participation of male students, in the geology major.

The gender proportions have been mostly stable for both the college and the ES Department since 2014. Despite there being a significantly higher proportion of male students than female students in geology and geography majors as a whole, more female students are enrolled in the department's classes (57% female versus 41% male in the 2019-2020 academic year.)

The race and ethnicity proportions have been mostly stable for both the college and the ES Department, and the department currently serves a significantly higher percentage of Hispanic/Latino students (77 % of class enrollment) than the campus racial demographics (67% Hispanic/Latino.)

The proportion of each age group in department classes has remained stable, and the department currently serves a significantly higher proportion of students age 20-24 (47% versus the campus's 31%) and age under 19 years (27% versus the campus's 22%), and significantly lower proportion of students age 35 and older (7% versus the campus's 21%). This is likely due to the ES Department's participation in the dual enrollment program with local high schools and the likelihood that a majority of our students use our courses as transfer requirements.

Covid-19

While we reflect on the past six years, Covid-19 brought the largest shifts for the department, faculty, the campus, the community, and ultimately the entire planet. Covid-19 most certainly is the most formative "experience" we have ever encountered and perhaps ever will. We could

reflect endlessly on how Covid-19 has affected us in every aspect of our lives, instead, we will reflect on the educational changes, negative and also positive. But first, it should be noted that we are all healthy and our families and loved ones have escaped the detrimental effects of this virus so far. We are thankful for so much. Also, we look forward to the distribution of the vaccine and in time, returning to some normal contact with each other and the campus community.

The ES Department offers many one day and weekend field experiences that are required parts of our courses. Day trips such as Red Rock Canyon, Bolsa Chica Ecological Reserve, Cabrillo Marine Aquarium, and weekend camping trips to Joshua Tree and the Owen's Valley are vital parts of our academic program. It is through these field experiences that we often see students become majors, but also students learn to appreciate the natural environment, to respect it as they see Earth's physical processes in person rather than reading in a textbook. The ES Department looks forward to being able to offer these experiences again. While nothing will ever replace the value of those field experiences, the ES faculty has created online-based virtual field trips and tours for courses offered online.

Covid-19 has also required all full-time ES faculty to complete their online certification. Janet Lambert's Canvas courses have been exceptional for faculty who needed to earn their certification but also for faculty that took a few courses to continue to improve their online teaching. As the department reflects on the work done since March 2020, to move all our lecture and lab classes to an online format, we feel proud of the quality we have been able to maintain in our courses and instruction. It was and continues to be a lot of work, but well worth the effort. We are continually making changes to improve the quality of our online offerings, which not only benefits our current students, but will facilitate improvements in our future in-person class. Our online work over the last year will also create more opportunities for the department to diversify our course offerings, as we intend to increase the percentage of online courses offered in the ES Department.

Campus Involvement and Achievements

Faculty have been very active in on-campus organizations, clubs, and committees. Two faculty members regularly participated in one or two Teacher TRAC Faculty Inquiry Groups each semester. Faculty members participated on the following committees: Program Review, Faculty Senate, CCFF member at large, CCFF division representative, Academic Calendar, Digital Learning Committee, and Facilities. Faculty members advised the following student clubs: Geography Club, Geology Club, and Women in STEM. One faculty member served as the Co-PI for Cerritos College's participation in the Kickstarter Program - a technical assistance program that prepares and positions Community College HSIs to compete successfully for federal funds with a focus on student recruitment and retention in STEM fields.

Faculty presented research and teaching resources at conferences and in the media. One faculty member submitted abstracts and gave poster presentations at 2016, 2019, and 2020 American Geophysical Union Fall Meetings. One faculty member was featured on KPBS

Evening Edition television broadcast and KPBS Midday Edition radio program discussing their research.

Faculty participated in numerous conferences, including InTeGrate Workshop - ""The Importance of Diversity and Equity in Supporting the Whole Student" and "Teaching the Impacts of Human Carbon Emissions on the Atmosphere Oceans, Climate, and Economy" - 2016; American Geophysical Union Fall Meeting - 2016, San Francisco; Center for Teaching Excellence Student Success Summer Institute – Harnessing the Power of Technology: How iPads and Apps Can Be Used Towards Increasing Student Engagement - 2017; SAGE2YC Workshop (Supporting and Advancing Geoscience Education at Two-Year Colleges) - 2017 Pasadena City College; COACh Workshop (COACHing Strong Two-Year College Educators in Strategic Negotiations) - 2018, Washington D.C.; SAGE2YC Workshop (Building Strong Geoscience Programs at Two-Year Colleges) - 2018, Washington D.C.; Mount San Antonio College; Early Career Geoscience Faculty Workshop, 2019, College Park, MD; American Geophysical Union Fall Meeting - 2019, San Francisco, CA; American Geophysical Union Fall Meeting - 2020, Online Platform; Association of American Geographers - Spring 2020 - Remote; GeoEd Conference - Summer 2019 - Louisville, Kentucky; and GeoEd Conference - Summer 2018 - Gettysburg, Pennsylvania.

Other notable achievements of our faculty include the following. Two of our faculty members completed sabbatical projects, resulting in the development of a field trip guidebook for earth science educators and research toward study abroad at Cerritos College. All five full-time faculty completed the online-teaching certification. Two of our faculty members received Outstanding Faculty Awards and Outstanding Club Advisor Awards. One faculty member served as a grant reviewer for the National Science Foundation.

Status Update on Former Goals and Resources

In our last program review we put forth six goals: (1) increase the number of ES majors; (2) develop a consistent SLO assessing and data tracking process; (3) improve functionality and effectiveness of the ES Department; (4) increase quantity of part-time instructors; (5) Improve student success rate to 70%; and (6) Improve students retention rate to 90%.

Increase ES majors

Our data shows that over the past 6 years the net number of geography and geology majors has remained steady. The department has addressed this shortcoming through preparing this report and will implement strategies to increase majors, such as promoting our program through social media, hosting more ES Department socials and alumni meetings, and involving students in internships.

Develop a consistent SLO assessing and data tracking process

We feel that our SLO assessing and data tracking has improved significantly over the past 6 years and that we have met this goal. Most instructors, both full and part-time, assess SLOs

and input the data at least once per academic year. Currently, full-time instructors are preparing to pilot a more comprehensive SLO assessing system that should allow for more frequent SLO assessment through Canvas.

Improve functionality and effectiveness of the ES Department

This goal has been met through updating our ES Department webpage and creating ES Department faculty and student course shells in Canvas, which house learning materials that have been utilized by faculty and students. We are pleased with our improved relationships and more frequent interactions with part-time faculty. We have enjoyed increased input from our part-timers on department business and their presence at department meetings and our semester-ending “Happy Hour”.

Increase the number of part-time instructors

Since 2014 the number of part-time instructors employed by the ES Department has remained steady. There are two hindrances to increasing the number of adjunct faculty, quality and supply. We have a difficult time keeping the most effective part-time instructors because they are eventually hired on as full-time faculty at another college, while less effective instructors typically don’t make it through the hiring process. In terms of supply, there simply aren’t that many ES subject instructors in the workforce, so our hiring pools are generally small.

Improve student success rate to 70%

The ES Department is proud of meeting and exceeding this goal. As was discussed in the Demographics section of this report, our success has increased consistently from 2014 to 2020, with the 2019-2020 academic year reaching a peak rate of success of 77.6%.

Improve student retention rate to 90%

Our retention rates have also increased since 2014, with a peak of nearly 89% for the 2017-2018 year. Last year we saw retention rates slip to just under 88%, which we attribute to needing to shift fully to online instruction half way through the semester. We will continue to strive for 90%+ rates of retention in our courses and feel confident that this goal will be attained through strategies such as increasing our ‘active presence’ in online courses and applying “best practices” learned in online teaching workshops.

Assessment Data Demonstrating Increased Student Success

The most direct correlation between increased student success and additional resources in the past 6 years would certainly be the investment in hiring 2 full-time faculty members. Niki and Ryan’s contribution to the success of students is profoundly significant. The year after Niki started the Geology 101 percentage of “Good” assessments increased to 53% up from 18% the year prior. Similarly, the year Ryan was hired, the department began to assess the learning outcomes for World Regional Geography, and 55% of those students scored in the “Good” category.

Program’s Direction, Vision and Goals

The ES Department has five data-driven goals that support the mission of Cerritos College and reflect the program’s direction in that they will provide an opportunity to our students for equity-minded pathways to transfer and will serve to prepare them to be productive members of their local and global communities. We view these collaborative goals as open-ended in terms of timeline, as we feel they could be expanded upon indefinitely. Our goals, actions to reach those goals and our measurements of achievement are summarized in the table on the next page.

Earth Science Department Goals

GOAL 1: Increase Visibility of the ES Department on Campus and to our Community	
ACTION	Improve Communication & Marketing
	Collaborate with counselors
	Add ES courses to pathways
	Create flyers through Public Relations
	Utilize social media
	Designate a lab tech to manage social media
MEASURE	Use data from IERP to track # of students transferring with a GEOG AA-T or GEOL
	Use data from National Student Clearinghouse Data to track number of students that transferred with an alternative degree yet majored in an ES discipline
GOAL 2: Increase Environmental Awareness	
ACTION	Research and develop new Environmental or Sustainability AA
	Create Environmental Literacy Certificate
	Add environmental literacy to coursework
	Add Sustainability courses to curriculum
	Integrate ES environmental courses in pathways
	Environmental focused marketing
	Develop community/industry/educational partnerships
MEASURE	Track number of students earning an Environmental Literacy certificate
	Track enrollment in environmental classes
	Actively manage a database of partnerships
	Survey faculty on integration of environmental literacy to coursework
	Track changes in coursework inclusion in pathways
GOAL 3: Increase Diversity of ES majors	
ACTION	Improve marketing for Latino & Black majors
	Improve marketing for female majors
	Improve marketing for veteran majors
	Hold more Earth Science socials - in person and via zoom
	Invite more guest speakers and alumni that represent diversity
	Involve students in ES conferences that focus on diverse participants
	Add diversity into language and discussions in coursework
MEASURE	Track changes in diversity of ES majors
	Informally survey faculty on integration of diverse language to coursework
GOAL 4: Diversify Course Offerings and Scheduling	
ACTION	Full-time instructors offer an increased variety of classes
	Write new course curriculum
	Increase online teaching up to 40% for full-time faculty
	Balance sections across the week
	Increase Monday/Wednesday courses
	Increase evening and weekend courses
MEASURE	Department chair will each semester monitor and track
GOAL 5: Increase Departments Overall Percentage on SLO Assessments	
ACTION	All faculty will be trained to use Elumen
	SLO's will be assessed and uploaded in the Spring and Fall semesters
	Instructors develop individualized “actions plans” to modify delivery of instruction related to SLOs where data shows significant # of students testing as emergent
	Create SLO assessments in department Canvas page
	Link questions to outcomes
	Write rubrics
	Learn how to submit outcome data on Canvas to Elumen
MEASURE	Annually analyze SLO data to identify where there are significant emergent vs satisfactory and good performance

Resource Requests

Currently, the ES Department has five full-time faculty and five to ten part-time faculty. The department also employs one or more part-time lab assistants on a semester-by-semester basis. We are allotted approximately 25 hours, sometimes less, which are shared among the lab assistants. Some of our classes also utilize embedded tutors. These tutors are an excellent resource for our students and the ES Department would like to request that the campus continues to invest in this resource. Regarding staffing, the ES Departments needs a full-time tenured track Environmental Geographer and also guaranteed lab assistant hours.

Full-Time Environmental Geographer

Geography largely serves non-majors from an array of fields by offering an opportunity to fulfill their Physical and/or Social Science requirements. Non-science majors often choose Geography to fulfill their science requirement thus making Geography their only introduction to basic physical and environmental processes. There are three components to our Geography program; Physical, Cultural/World-Regional, and Environmental. Our gap is in Environmental Geography. This specialty requires instruction from experts with experience in the field or related municipalities. Field courses are a proven way to bring students into STEM. Yet, the curriculum for Field Studies in Geography (GEOG 160) was approved to fulfill the AA-T in Geography and has not been offered.

Our Geography program is ascending. In Spring 2020 we had 44 majors, an approximate 700% increase from previous years. We attribute this growth to the elevated profile of our program. The Geography Club held numerous campus events and was awarded club of the year for the last two years. Area high schools are finally teaching Geography which has led to the heightened awareness of our discipline. Finally, students realize how integral a geographic approach that incorporates the interrelationships of people, places, and the environment is to facing the daunting ecological, environmental, and social problems of the 21st century. Our department needs a full-time faculty member that is an expert in this ‘in-demand’ subfield of Geography to help us further grow the program and meet the environmental education needs of Cerritos College students.

Informal polling in our geography classes has shown environmental issues are the primary area of interest and concern for our students. This falls in line with a 2019 Amnesty International survey in which 44% of the ten thousand 18 to 25-year-olds surveyed cited global warming as the top issue facing the world. Pollution came in second at 36%. This suggests Generation Z is acutely aware and interested in environmental challenges facing our planet.

There is a gap in our department. We need a Geographer with a specialty in Environmental Geography and field courses. Finding adjunct instructors with expertise in Environmental Geography has proven to be challenging. Furthermore, due to the nature of field courses, it is important to have experienced full-time faculty teach these multi-day courses. An article in Ecology and Evolution (May 2020) highlights the importance of field courses to increase

confidence and interest in STEM courses, especially among underrepresented groups. Cerritos College students are largely urban young people that have often not experienced camping, National Parks, and much of the natural world found throughout California. The ES Department recognizes the importance of these experiences for our students and wishes to continue to advance these opportunities. We would like to meet the demand for environmental education and activism by hiring a dynamic Environmental Geographer that can bridge the gap between classroom instruction and fieldwork. Moreover, we want to center Geography as the 'home' discipline for the many students wishing to study a variety of environmental issues on campus.

A full-time tenured Environmental Geographer is needed in the immediate 1-2 year frame and should be requested annually until this position is granted. The cost of this position will start at $70,084 to the high end of the faculty pay scale plus the cost to the college for benefits.

Guaranteed Lab Assistant Hours

The ES Department is the only science department on campus without a classified support staff position. The allotted part-time lab assistant hours often change from semester to semester and are sometimes discontinued altogether, as has been the case since the campus instituted stay-at-home orders. The department would like a commitment to support the department with 40 part-time lab assistant hours every semester including the summer session. Lab assistance, lab maintenance, map inventory, laboratory supplies organization, and social media marketing are all areas that need constant attention. The cost to the college for 40 part-time lab assistant hours is minor compared to a full-time employee and yet invaluable for the department.

Guaranteed lab assistant hours should be granted immediately. The cost of guaranteed lab assistant hours is minimal compared to a full-time, classified support staff position. These 40 hours would cost the college $32,400 (40 hours per week x 18 weeks per semester x $15 per hour x 3 semesters).

Professional Development

The last 10 years have seen an explosion of technological innovation within Geosciences. Our faculty is incredibly eager to receive professional training so we can utilize these emergent technologies in our classrooms. Some of the technologies our faculty would like to be trained in include: drones (UAVs), ArcGIS Online, Open Street Map, ESRI Story Maps, and Survey 123. Geospatial training often occurs at regional conferences that can end up costing faculty several hundreds of dollars in out-of-pocket expenses after registration fees travel, and hotel expenses are accounted for. The current conference stipend allocated to ES faculty only covers a small fraction of conference expenses. As such, ES faculty members do not attend these conferences and do not receive the requisite training. In order to keep our faculty on the cutting edge of emergent geospatial technologies, we are asking for a significant increase in conference and professional training allowance. A $2,500 annual allowance (to cover conference fees, airfare, hotel, meals) per tenured faculty member would allow our instructors to attend at least one major conference each year. The $2,500 annual cost is a worthwhile investment for it will allow

our students to be exposed to the latest geospatial technologies they will need as they transfer to universities and begin working professionally.

There are several other areas the department is requesting training and professional development. Many of our part-time faculty have had difficulty using ELumen to submit their SLO data. This has led to our department chair having to spend a great amount of time and effort to train and assist these faculty members. Our department proposes all part-time faculty be paid a stipend to take ELumen/SLO submission training so they are self-sufficient in this process. Faculty members would also like training in website management and social media marketing to elevate the department's presence in virtual space. Improved opportunities and access to the full resources in Canvas such as the various Add Ons would benefit the department as well.

New Laboratory Classroom

The ES Department maintains two designated laboratory classrooms (PST 137 & PST 143), each with a capacity for thirty students, one lecture hall (S101), with a capacity for sixty students, and the stockroom laboratory (PST 140) which houses our rocks, maps, and various laboratory supplies, but is not a teaching classroom. The ES Department moved into the PST building in 2012. This building has had construction issues since the ribbon was cut. Some of those issues have been fixed over the years. Most recently, work on the damaged floors in PST 137 and PST 143 was completed. However, this completed work does not reflect the floor of a merely 9-year-old building. Perhaps one day this will be corrected. A more urgent issue is the lighting in the mineral cabinets in PST 143. At least ten requests for this lighting to be repaired have been made over the course of many years. We hope that this will be corrected immediately so the display case can be utilized during lecture and laboratory instruction.

Due to the organization of our six-hour, four-unit lecture/lab combination class as well as the campus-wide shifts to value smaller class sizes, our two designated laboratory classes are often full from morning until late evening. To accommodate our departmental needs and the needs of Cerritos College students, it is essential for the ES Department to have an additional thirty student capacity laboratory classroom. This classroom should be equipped similarly to PST 137 or PST 143 with shared lab tables for collaborative work, wall maps, topographic maps, student globes, a large floor model globe, rock sets, instructional models, topographic map sets, and a document reader along with the usual campus technology. The cost of a new laboratory classroom varies. Is there a classroom available now that we could rework into an ES space? Is there an opportunity to be assigned to a new building?

Aesthetic Improvements

To improve the on-campus experience for students, to highlight the location of our discipline, and to help attract majors the ES Department would like to request assistance from the campus and facilities to hang a 92" X 60" world wall map in the hallway of PST. This map has been in the possession of the department for years and we would like to put it on display.

In addition to the World Wall Map, the ES Department would like to hang discipline appropriate photo wall murals in the hallway of PST. There are numerous options relevant to our discipline. These large murals fill wall space, floor to ceiling, making a large impact on the space. Some options might relate to Geomorphology, Vulcanism, Glaciation, or Atmospheric Conditions. These wall murals typically cost under $300. However, professional installation and support from the campus are needed to make these additions.

Technology and Software

The ES Department uses Google Earth and other app-based platforms for lecture and lab classes. Map-based instruction and introduction to technological resources are paramount to our instruction. To enhance and better utilize technology for our students, we need secure yet easily accessible large-screen iPad Pros for each table in the two current laboratory classrooms and the new laboratory classroom as well as 5 iPad Pros for current faculty. A secured box on each table will house the iPads and be easily accessible for collaborative work and instruction. For one, 12.9 inch, iPad Pro with 512 GB the cost is $1300 plus tax. A campus purchase of 35 would cost $50,164. For secure storage, ULINE.com has a lockable drawer that can be mounted to our tables for $120 each totaling $3,600.

Prioritized Recommendations

Prioritized Recommendations						
		Must Have	**Valuable**	**Nice If**	***Supported Goals**	**$**
1	Environmental Geographer	X			2,3,4	70,084 +
2	Gauranteed Lab Assistant Hours	X			1,3,5	32,400 +
3	New Laboratory Classroom	X			1,4	varies
4	Mineral Display Case Lighting	X			1,2,3,5	varies
5	Classroom Set iPad Pros		X		2,3,5	50,164
	Lockable Drawers					3,600
6	Professional Training		X		4,5	2,500
7	Wall Murals in Hallway			X	1,2,3	1,000
*	**Department Goals**					
1	Increase visibilty of the Earth Science Department on campus and to our surrounding community					
2	Increase environmental awareness					
3	Increase diversity of Earth Science majors					
4	Diversify course offering and scheduling					
5	Increase the department's percentage of students that score "good" and "satisfactory" on SLO assessments					

Conclusions and Recommendations

The ES Department has significantly grown in its capacity to support the needs of our students over the last six years. We welcomed two new full-time faculty to our department and nurtured a productive and congenial team. We saw positive trends in student success and retention rates. We supported our students in their professional and academic development through rigorous, relevant, and meaningful curriculum, evidence-based pedagogical techniques, and the promotion and support of extracurricular opportunities such as internships, connections with local professionals and alumni, and experiences that bridge the gap between Cerritos College and their transfer institution or profession. Our faculty were also very active in our campus community, participating in grant development, clubs, and committees.

Through this evaluation, our department has identified areas where we would like to focus our time, energy, and procurement of resources. To increase the diversity of our class enrollment, we will continue to develop curricula that are designed toward the demographics of our student population (e.g. incorporating culturally relevant and local topics, utilize names and examples that allow students to see individuals similar to themselves in the field). We hope to increase enrollment of our majors and classes through improved marketing and relations with students,

integration of our courses in pathways, strategic use of resources, and the addition of another laboratory space. We also hope to continue encouraging and improving access to, professional development opportunities for our faculty through increased funding support.

The development and wellbeing of our students is our primary focus, and we have and will continue to, make strides to support them to the best of our ability. We look forward to accomplishing our goals over the next six years and welcome any feedback that can help us achieve these goals.