



Cañada College

**COMPREHENSIVE
PROGRAM REVIEW
REPORT**

Earth Science

Program Context

1. Mission

Share how your program contributes to the College or fits into the College's Mission. For example, what other academic programs and student/academic services does your program engage with? Examples of student/academic services include the Learning Center, Library, STEM Center, SparkPoint, Dream Center, etc. Another example, how does your program fit into any of the College's plans (such as Equity, Technology, Strategic Enrollment, etc.)? If your program has a mission statement, you may include it here.

The Earth Science Department prepares students for successful transfer to 4-year institutions, provides the prerequisite Earth science foundation for further study in Earth science fields, fosters critical thinking and active learning, and fulfills the needs and interests of students by having a well-rounded curriculum of lecture and laboratories.

Currently our program focuses primarily on transfer students. Most students take Earth Science courses to fulfill general education requirements and/or degree requirements for their 4-year degrees. We would like to work to grow our department's degree programs. Further, we see a need to develop pathways for Earth Science career/technical training, and we are beginning to research possibilities. All courses in our department help students develop their critical thinking, communication, and quantitative reasoning skills. Disciplines in our department include: Environmental Science (ENVS), Geography (GEOG), Geology (GEOL), Meteorology (METE), and Oceanography (OCEN). A few of the programs that our program engages with include the Honors Transfer Program, the Learning Center, the Transfer Center, the STEM Center, and the Disability Resource Center. We have occasional ties with many other programs, including other departments in our division, the library, and others, though we could probably benefit from even deeper and broader collaboration.

2. Articulation

Are there changes in curriculum or degree requirements at high schools or 4-year institutions that may impact your program? If so, describe the changes and your efforts to accommodate them. If no changes have occurred, please write "no known changes."

There are no known curricular or degree requirement changes at the high school level that would impact our program, though we do acknowledge that our program would benefit from developing closer ties to the local high school programs.

The Common Course Numbering project (CCN) will impact the numbering of the courses in all disciplines of our department. Most of our courses are consistent with existing C-ID course descriptions, so we hope that we will not need significant changes to our course outlines of record. We will work with our college's articulation officer to keep abreast of CCN review/issues for all disciplines. More discussion on C-ID and Transfer Model Curriculum (TMC) for each discipline is below. It's important to our department to keep current with our transfer degrees, as we want to use these degrees to stimulate additional interest in our department and successful transfer for Cañada College students.

ENVS: The full-time faculty member of our department was involved in the Faculty Discipline Research Group (FDRG) that developed the original Transfer Model Curriculum (TMC) for Environmental Science. The state of California approved the TMC template for Environmental Science in Spring 2017 and our ENVS AS-T was among the first two programs in the state to be approved when it launched in 2018. The ENVS TMC was supposed to begin the 5-year review process in Fall 2021, though no update has yet been published. The TMC for ENVS is huge and complicated, so we are not surprised that no update has been finalized. Our full-time faculty member did not have time to allocate to the state-wide committee for this review. We will look out for any changes in the TMC over the next year, so that our ENVS AS-T can be amended, if needed. At a minimum, we need to add our new ENVS 101 lab course to our AS-T, but we will wait until the TMC is updated. There is only one C-ID descriptor in ENVS. It has not been updated since 2017. It will likely be addressed during the CCN process, and we anticipate being mandated to change our course number for ENVS 115.

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GEOG: The state-wide TMC for Geography underwent 5-year review in 2017 and was scheduled for another 5-year review in Fall 2022. No update has been published. We don't anticipate any changes in the TMC, but we will look out for changes if they do occur. We need to add our new Geography lab (GEOG 101) class as an option in our Geography AA-T. Notably, GEOG is a low-unit major that has lots of room for growth at our college. Students can easily complete the AA-T requirements in 2 years, and all neighboring 4-year CSU and UC schools have robust and diverse GEOG programs. (UC Berkeley is generally ranked #1 in the US and often among the top few in the world.... and the degree requirements can be easily completed in 2 years after transfer, allowing students time to double major, conduct research, or study abroad.) We would like to collaborate with other departments/services on campus to figure out how to increase the visibility of this degree program and the frequency of course offerings. With CCN it is possible/likely that our one METE course will change to a GEOG prefix.

GEOL: The state-wide TMC for Geology underwent 5-year review in 2016 and was scheduled for another 4-year review in Fall 2020. No update has been published. We don't anticipate any changes in the TMC, but we will look out for changes if they do occur. Since 2016, we have planned to create a Geology AS-T. One new course (Historical Geology) must be created and then the degree template needs to be developed and submitted to our curriculum committee and the state. The course outline was started, but not finished. It stalled simply due to lack of faculty time and the reality that we won't likely be able to offer Historical Geology in the near future. Currently we lose a small number of geology students to our sister schools where the Geology AS-T is available.

OCEN: There is no TMC for Oceanography and no C-ID descriptors. With CCN it is possible/likely that our two OCEN courses will change to a GEOL prefix.

3. Community & Labor Needs

Are there changes in community needs, employment needs, technology, licensing, or accreditation that may affect your program? If so, describe these changes and your efforts to accommodate them. If no changes have occurred, please write "no known changes". CTE programs: identify the dates of your most recent advisory group meeting and describe your advisory group's recommendations for your program.

In our previous two program reviews, we used data from the Occupational Outlook Handbook published by United State Department of Labor Bureau of Labor Statistics. In those reviews we noted Earth science-related jobs outpaced general employment growth, with 5 of the 6 jobs profiled growing "faster" or "much faster" than the national average. The sixth (Geographer) grew, but only by 1%, so it was in the "little or no change" category. This growth in Earth-science-related jobs beyond the national average has been consistent over several program review cycles. Further, in our past program reviews, we noted that California had the highest or second highest employment level in all jobs profiled, except for Geographer which was 3rd. Additionally, cities in our region were in the top 10 cities in the country for both employment level and pay for hydrologists, environmental scientists, and environmental technicians.

In previous program reviews we used we looked at job data for the following 6 jobs.

- environmental technician
- environmental scientist
- geological/hydrological technician
- geoscientists
- hydrologist
- geographer

This year, using the Lightcast Occupation Overview provided by our Workforce Development program, we looked at similar jobs as we did for last program review, though the compilation of jobs were in slightly different categories and a few were added.

- environmental science and protection technician
- environmental scientists and specialists
- geological technicians, except hydrological technician
- geoscientists, except hydrologists and geographers
- mining and geological engineers
- hydrological technician
- hydrologists
- atmospheric and space scientists

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- geographer
- cartographer and photogrammetrists
- surveying and mapping technician

For the two **environmental science** job categories, the Lightcast report summarized there was “aggressive job posting demand over a deep supply of regional jobs”. The SF Bay Area is a “hotspot” for this type of job. There is higher than average supply of jobs and earnings are high, 38% higher than national average. The sectors where local jobs were found was split among 4 major areas. Consulting services (management, scientific, and technical) and local government were among the highest, but the “other” category is quite high too (19%), suggesting that there is demand for these jobs among a broad range of industries. Over half of the skillsets listed as necessary, defining, or distinguishing for these jobs (in the Lightcast report) were in the “rapidly growing relative to job market” category.

For the three **geology** job categories, the Lightcast report summarized there was “aggressive job posting demand over a deep supply of regional jobs”. Again, the SF Bay Area is a “hotspot” for this type of job. There is higher than average supply of jobs and earnings are high, 23% higher than national average. Nearly half the local jobs were in the architectural/engineering/related services sector and the remainder were split primarily into consulting services (management, scientific, and technical), scientific research, and “other”. Most of the skillsets listed were in the “growing relative to job market” category, though a few (including program management) were in the “rapidly growing relative to job market” category.

Though we have no hydrology classes in our department, students pursuing hydrology-related careers often study environmental science and/or hydrology at the community college level. For the two **hydrology** categories, the Lightcast report summarized there was “light job posting demand over a deep supply of regional jobs”. So it appear there are many job regionally, as the SF Bay Area was a “hotspot” for this type of job, but currently light hiring demand. Earnings are lower (17%) than the national average. This likely reflects more hydrology technician jobs than hydrology jobs in their sample set.

For the **atmospheric science** job category, the Lightcast report summarized there was “light job posting demand over a thin supply of regional jobs”. Earnings are slightly (7%) higher than the national average, but the SF Bay Area was not a “hotspot” for this type of job. Looking at the skillsets needed for the jobs in this category, it seems this category is dominated by weather forecasting, rather than jobs related to climate change forecasting, mitigation, and adaptation. Perhaps climate-change related jobs are included in the environmental science categories.

For the three **geographer** job categories, the Lightcast report summarized there was “light job posting demand over a thin supply of regional jobs”. Earnings were much (63%) higher than the national average, but the SF Bay Area was not a “hotspot” for this type of job. It’s a bit strange to lump these 3 job categories together, as a surveying/mapping technician is likely a low-skilled position, whereas many of the geographer jobs are likely in government or academia. Indeed 60% of the Lightcast report jobs were in architectural/engineering/related services... surveying technicians. Even more importantly, students earning a bachelor degree in geography are not generally hired in jobs titled “geographer”, and thus these jobs likely aren’t reflected in the Lightcast report. The valuable knowledge and skill-set related to spatial processes and human relationships to the environment can lead to employment in a wide variety of sectors.

Overall, as noted above, many Earth science related jobs in the SF Bay area continue to grow faster than the national average. California (and the SF Bay Area in particular) has a heightened focus on energy, solid waste management, water, and climate change.... and the local resource and economic needs related to those issues is only going to increase over the next decade.

Our department would like to develop effective new pathways (i.e. certificates or degrees) for career/technical education related to Earth science. There is a demand for skilled environmental science technical workers in California and our region. Students with 2-year degrees are appropriate for these positions, and with the improved economy there are likely again opportunities for these students. The major industries for technical employment in environmental science are consulting, analysis labs, and local, state, and federal government. More research is needed on local industry demand, top local employers, and the programs already available at nearby institutions. We plan to work with the Director of Workforce Development to help develop our programs.

Many, but not all, career opportunities in Earth science-related fields require a 4-year degree. Further, in the SF Bay Area some of the technical jobs, which typically require 2-year degrees, are actually filled by people

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with 4-year degrees. (This is especially true during economic downturns.) Thus, clearly it is important that we continue to develop and market our transfer degree programs.

Looking Back

4. Curricular changes

List any significant changes that have occurred over the prior years in your program's curricular offerings, scheduling, or mode of delivery. For decisions made by your department, explain the rationale for these changes. If applicable, how have state policy changes affected your curricular offerings?

The department offers classes in 5 disciplines, including: Environmental Science (ENVS), Geography (GEOG), Geology (GEOL), Meteorology (METE), and Oceanography (OCEN). METE is only offered in the summer, the other 4 disciplines are offered each semester. We no longer offer evening classes, due to their chronic low enrollment. Online classes have taken their place.

ENVS is offered both online and face-to-face, and we feel strongly that we need both modalities. We have offered two sections of ENVS 115 each semester (one online and one face-to-face) for over 8 years. Starting in Spring 2022, we have offered an ENVS 101 lab course (face-to-face) each semester, so interested students could have a transferable lab component to accompany ENVS 115.

GEOG courses have not been offered fully face-to-face for over 8 years. The addition of online classes, initially to grow the program to a second section each term, resulted in an inability to fill the face-to-face sections... and then cancellation of face-to-face sections. This is not ideal, as the online format is not ideal for all students. We shifted the one Physical Geography section offered from online to hybrid in Fall 2022. Over 6 semesters, the online section averaged over 20 students per class. When we shifted the course to hybrid, enrollment dropped significantly to 13 students per class. Moving the course from Monday to Tuesday may help with enrollment. We are trying that in Spring 2025. We have not offered Cultural Geography or World Regional Geography since Spring 2019 when we lost a long-time adjunct instructor and also needed to cut classes in the division for budgetary reasons. The dean at the time opted to not continue these classes for the time being. Prior to then, the courses filled each semester. The Geography program needs thoughtful rebuilding.

GEOL: For the past 8 years we have generally offered one GEOL 100 section per semester. Prior to that we offered two sections per semester. College-wide enrollment decline and the rise of ENVS sections likely reduced demand for GEOL. In that time-period, GEOL enrollment has decreased district-wide. Historically we offered GEOL 101 lab each semester. We have not successfully offered the lab course since Fall 2019. We are now (successfully) trying to regrow our GEOL 100 enrollment to the point that we can offer the lab once per year in the spring.

METE: For the last 8 years or more, METE 100 has only been offered in the summer and only online. We offer one section each summer session.

OCEN: Prior to COVID, we offered 1 face-to-face section and 1-2 online section of OCEN 100 each semester and 1-2 face-to-face sections of OCEN 101 lab. Now all of our sections of OCEN 100 are online, online synchronous, or hybrid... with no face-to-face sections. For OCEN 101 lab, over recent years we have offered an online synchronous section in fall and spring, and an additional face-to-face section in the spring. In spring 2025, we will just have the one online synchronous lab section... no face-to-face option. Our decision to eliminate face-to-face classes results from student enrollment trends and instructor availability.

5A. Progress Report - IPC Feedback

Provide your responses to all recommendations received in your last program review cycle.

Our last program review was rated as "highly effective" and commended for being thorough. There were no "overall recommendations", nor suggestions within the specific sections.

5B. Progress Report - Prior Program Goals

Provide a summary of the progress you have made on the program goals identified in your last program review.

In our last program review, we identified the following 9 program objectives, which actually may be too ambitious for a department with one full-time faculty.

1. Update Environmental Science AS-T degree: Waiting for state update. This goal was written to ensure we updated the ENVS AS-T after the transfer model curriculum (TMC) was updated at the state level. The TMC

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review was supposed to commence in F21. There has been no posted update by the state, so this goal is on hold.

2. Revise current Environmental Science AS degree: Completed! This has been in the works since 2017. Our former AS degree predated the development of an AS-T and was essentially identical to the AS-T. The AS degree was updated to facilitate easy transfer with our nearest CSU transfer partners (SFSU, SJSU, and CS East Bay), as they do not require the full AS-T for transfer. The AS degree is now less units and has a bit more flexibility than the AS-T.

3. Update Geography AA-T and Geography AA: Waiting for state update (AA-T) and not yet completed (AA). Our Geography AA-T needs minor updating to include our new lab course (GEOG 101), and the program map should be reviewed. We were waiting to update the degree until after the TMC was reviewed at the state level, as that work was supposed to commence in F22, but there has been no posted update by the state. The Geography AA degree predates the AA-T degree. We need to consider whether the older Geography AA degree is still relevant, but simply haven't found the time to do this.

4. Create a Geology AS-T degree: Initiated, not completed. Little progress has been made on this goal because we are unsure how to proceed. We are lacking only one course and that course is offered consistently at one of our sister schools. The course outline for that course has been initiated, it would likely take only 2-3 day's work to get the course and program ready to submit to the curriculum committee. However, we are unlikely to offer the course, so we are unclear if we should develop the degree program. Notably, students can complete the rest of the degree requirements here at Cañada. Currently, Cañada student interested in the Geology AS-T take GEOL 100 here, but end up earning the degree at CSM.

5. Create an easy path to Earth Science degree program from other STEM programs: Initiated several years ago, but we have not continued this to the extent needed. This goal actually pre-dated the college's implementation of the program mapper. We have since done a bit of work to update the program mapper for one of our programs, but there are still errors that need to be addressed. Further, we need to get more involved in the Science and Health Interest Area to develop awareness of Earth Science options and pathways that include GEOL 100 or ENVS 115 for first year STEM students. This can simultaneously help identify students interested in Earth science, provide an option for students who later do not persist in some of the other STEM fields.

6. Develop print and online marketing materials for Earth Science department programs: Not completed and no significant work done. Thoughtful marketing materials and a recruitment plan will help increase underrepresented minority students in our classes and degree programs. Recruitment needs to be done on campus and at our local feeder high schools. We also need further collaboration with our college recruiter, our campus support programs (e.g. EOPS, BTO, Umjoa, Promise, etc.), and our interest area faculty/staff.

7. Increase field experiences and student research opportunities in Earth Sciences. Field and research experiences have increased in ENVS courses (both ENVS 115 and ENVS 101). There has been a significant increase in ENVS 115 honors students in the mixed honors/non-Honors section, to the point that it is not manageable for the instructor. We should consider a separate section for Honors students, which would improve the Honors experience for students as well. In ENVS 101, students have several field trips that allow them to apply class learning in the field and interact with environmental science professionals. (It's especially rewarding when some of those professionals have been former Cañada College students!) Additionally, we now have a on-campus grassland study site for ENVS 101 field studies and future Honors research work. More work is needed to include field and research opportunities in the other disciplines within our department. For example, we intended to revive our Marine Science Institute boat trips on SF Bay for OCEN and ENVS classes, but we did not follow through with this initiative. We no longer have any face-to-face OCEN 100 classes and one of the OCEN 101 labs was also online synchronous. We find this harder to organize with online, online synchronous, and hybrid classes... but it is still valuable and should still be doable.

8. SLO and PLO update and use. Continuing. We have a SLO assessment plan and it is mapped to our PLOs and ILOs, but we are not on track with SLO assessment in some of our courses. We need to prioritize this goal in the next cycle.

9. Improve student success through adoption of antiracist course design strategies. Continuing. Some faculty have participated in flex day seminars, but no coordinated training occurred.

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6A. Impact of Resource Applications

Describe the impact to date of previously requested new resources (assignment, equipment, facilities, research, funding) including both resource requests that were approved and not approved. What impact have these resources had on your program and measures of student success? What have you been unable to accomplish due to resource requests that were not approved?

We had funding to arrange Marine Science Institute boat trips and other field experiences, though we did not fully follow through with these initiatives. We did use money for one ENV5 101 lab field trip to a local grassland restoration site. This proved very valuable, as the restoration ecologist that managed the site has now become engaged with our on-campus grassland restoration site. His expertise is valuable to us. We have also used money to get start up supplies for conducting research on our campus grassland site. This site is used by ENV5 101 lab students and there are also several Honors students interested in pursuing field projects next spring and fall.

Anecdotally, ENV5 115 and ENV5 101 students routinely note that field trip and field experiences are their favorite parts of the class. ENV5 majors use these experiences for networking and opening their minds to varied career opportunities, and some of our students have gone on to volunteer and paid internships with our field trip community partners. Our department should likely try to track or quantify this in some way.

6B. Impact of Staffing Changes

Describe the impact on your program of any changes within the last program review cycle in staffing levels (for example, the addition, loss or reassignment of faculty/staff). If no changes have occurred please write "not applicable."

Our department has one full-time faculty member, and we have reduced down to just two adjunct faculty, both of whom work at multiple schools/districts. It's probably wise for our department to develop a deeper pool of adjunct faculty in our varied disciplines. Also, the only full-time member of the department is now on phased in retirement, and is not planning to hold a 100% load moving forward. This will likely make it even more difficult to find time to do the extra non-instructional work that needs to be done for the department (e.g. marketing the program, developing partnerships with transfer schools, curriculum work, degree development, helping adjuncts with PLO/SLO, etc...).

Current State of the Program

7A. Enrollment Trends

Use the data provided by PRIE to examine your enrollments by department or courses. Describe trends in headcount, FTES, and load. If applicable, describe any other enrollment data that is relevant to your program.

From 2013/14 to 2016/17, we reported that the Earth Science department census headcount, end-of-term headcount, FTES, load, and fill rates all increased significantly each year ... even though during that same time college census headcount was decreasing. From 2017/18 to 2019/20, most metrics went down considerably (15-20%), but we were seeing a modest increase from 2019/20 to 2020/21... even at the start of COVID. Enrollment and headcount plummeted about 20% from 2020/21 to 2021/22 and stayed constant through 2022/23. In 2023/24, we saw a 20% increase... brining us back to pre-COVID levels. FTES mirrored enrollment and headcount, dipping during 2020/21 to 2021/22, but we are now back up to pre-COVID 2019/20 levels.

In previous program reviews, we reported that from 2017/18 to 2020/21, the number of sections decreased from 27 to 19. This decline in sections was part of the reason for our enrollment decline at that time. In some cases, we did not have instructors, so sections that would likely have filled were dropped. More recently, from 2020/21 to 2023/24, our sections have increased to 21 sections.

FTEF has increased to over pre-COVID levels and is constant from 2022/23-2023/24 at 4.00. Load has fluctuated considerably over the last 5 years, but consistently stayed well above the college average and most recently (2023/24) was at 484. Fill rates have also varied considerably (62.1% to 77.2%) over the last 5 years, but have always been well above the college average. Our most recent (2023/24) fill rate was 77.2%, compared to the college average of 61.8%.

Department-wide, we continue to see significantly greater headcounts in the spring semester, compared to the fall semester... generally around a 30% increase, but fluctuating year to year. Perhaps new incoming

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students are not taking science GE classes their first semester and/or students are putting off their GE science courses until the spring semester prior to transfer. As a result of this phenomena, we offer more sections in spring, and even so we also generally maintain high fill rates in spring as well. We will keep this in mind when we consider how to grow our program.

Looking at specific disciplines within our department, Oceanography continues to be our highest enrolled and most productive discipline. We have consistently offered 11 sections per year and over the last 5 years OCEN fill rates averaged over 85% (which is down from the over 97% value from the previous 5 years). OCEN enrollment has not gotten back to pre-COVID levels. ENVS enrollment is the second most enrolled discipline, and it is growing, up nearly 75% since 2019/20. The addition of the new ENVS 101 lab class increased enrollment numbers and likely increased the number of students taking ENVS 115 as well. GEOG and GEOL are next with just two sections per year each, only at about 50% filled. METE is the lowest enrolled discipline and is offered just once per year in the summer.

7B. Significant Changes in Your Program

Have there been any significant changes in enrollment trends or course offerings? For example, has there been a significant increase or drop in FTES or Load? If applicable, consider trends in class cancellation rates and how it might have affected your course offerings. If needed, consider how the pattern of course offerings (times/days/duration/delivery mode/number of sections) affected your enrollment?

Oceanography has been pretty stable. However, our long-time adjunct instructor who built the program retired in Spring 2020. Her presence was impactful in the face-to-face sections, which were almost always over-enrolled and had high retention and success rates. Further, she developed the OCEN 101 lab, which similarly did very well with 1-2 face-to-face sections each semester. During COVID everything moved online, but we are eager to get to continue to re-build our OCEN 100 and OCEN 101 face-to-face sections.

As noted in Section 7A, Environmental Science consistently offers 4 well-enrolled sections of ENVS 115 per year (1 face-to-face and 1 online section each semester.) We have also now added 2 sections of ENVS 101 lab each year, 1 face-to-face lab each semester. We attribute some of the growth in ENVS 115 to having a reliable ENVS 101 lab option to pair with the course. We anticipate that this program will continue to grow.

As noted in Section 4, Geography has had significant decline in enrollment during the previous program review cycle. This was primarily due to the loss of an adjunct instructor who had been teaching GEOG 110 during the semester and GEOG 100 in the summer. When offered, these three sections were all filling. Thus, we believe this loss of enrollment is reversible. During the last program review, GEOG 100 enrollment also declined in part because Skyline ramped up their section offerings considerably, and thus we no longer had as much cross-district enrollment. More recently, in attempt to have some face-to-face opportunity for students, we shifted our one remaining GEOG 100 section from online to hybrid, and this resulted in approximately 40% drop in enrollment. We'd like to figure out a way to successfully offer GEOG 100 face-to-face, as the online offering does not meet all student's needs. Success rates were higher in hybrid delivery. However, due to low enrollment, it's unclear if the hybrid class is the answer.

Including last program review, Geology enrollment declined significantly, from 5 sections and 131 students in 2016/17 to a low of 1 section (and no lab) and 12 students in 2022/23. As enrollment dropped during that time, we also stopped offering the lab (GEOL 101). Not offering the lab on a consistent basis, likely has accelerated the decline of the lecture course enrollment. Further, Skyline stopped teaching GEOL 100 and GEOL 101, moving instead toward one combined class. Thus, we likely lost some cross-district enrollment. Additionally, starting Fall 2017, the GEOL courses moved from being taught by a full-time instructor to an adjunct instructor, and there was less on-campus marketing for the courses as well. Geology enrollment is down district-wide, perhaps in part due to an increase in ENVS enrollment. With all that said, we do think the program can rebound. Also, there are several AS-A/T degree programs that require Geology 100/101, so it is important to continue to offer and build this discipline. Recently, we have had some success. In 2023/24, we were able to offer the GEOL 100 in both semesters and enroll 42 students. We plan to again offer GEOL 101 lab in spring semesters, so that may help spur GEOL 100 enrollment as well.

7C. Planning for Your Program

What changes could be implemented, including changes to course scheduling (times/days/duration/delivery mode/number of sections), curriculum, marketing, and articulation of pathways that might improve these trends?

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If applicable, include plans for faculty recruitment and faculty training. NOTE: If other sources of data are used, please upload these documents or provide URLs.

It's important that our program get more involved in our Interest Area in Guided Pathways and to be even more proactive in our involvement with academic counseling. Earth Science related careers opportunities related to ENV5 and GEOL are on track to continue to increase in California, especially as our state and country work to address climate change, energy issues, and water issues. Additionally, students who don't persist in some of our engineering programs may find it easy to transfer into our programs. The Guided Pathways model should be able to help these students find our programs, but we also need to ensure that we are visible and offering the courses needed.

Our department needs to do much more marketing/outreach on campus, and relatedly we need to update our website. Further, ideally we need to develop better connections with high school feeder programs.

To increase enrollment, retention and success, we would like to connect our curriculum more directly to our local community and our students lives. As an example, we've done this most effectively recently is through field trip-based labs and projects in ENV5 115/ENV5 101. Historically, Oceanography (our largest discipline) has the longest history with field-based learning, as for over 14 years students went out on the SF Bay to collect and analyze physical, chemical, and biological data, and they have also had field-trip based projects along the ocean coast. However, we haven't done these trips since COVID. We would like to expand the number of such opportunities (across our curriculum), deepen some of existing projects by better tying them to curriculum, and work to develop more authentic research projects within our courses through course undergraduate research experiences (CUREs) in our lab courses and through our college Honors program.

We briefly address each discipline in our department below.

Environmental Science: As noted in section 7A/7B, ENV5 is growing. We plan to work with our Interest Area and counselors to continue to grow ENV5 courses, and would like to consider offering a dedicated ENV5 115 Honors course, instead of the dual-CRN Honors section. ENV5 101 lab offers a great opportunity to incorporate more authentic research opportunities and community-based learning into the ENV5 curriculum. We have recently initiated a campus native grassland restoration study site, which we use with our ENV5 101 students and (soon) with our Honors students. We also hope to include ENV5 101 in the MSI research boat trips. Further we would like to develop longer term projects with some of our existing/past community partners (e.g. Grassroots Ecology, San Mateo Resource Conservation District, SMCCCD Facilities, etc...) These projects may take the form of single lab/field activities and/or a longer CURE. Additionally, we are excited to offer an exceptional opportunity for community-based learning when we offer ENV5 115 as a study abroad course in Peru! In Summer 2025, ENV5 115 will start during the 6-week summer session and then finish with a 2-week trip to Peru. In Peru, approximately half of our time will be working on hands-on projects related to ecological restoration, renewable energy, and wastewater treatment in a rural village on the northern coast. We hope this class can be offered on a routine basis, and it seems like a good fit for our HSI college, especially since district-wide there have historically been very few study abroad programs in Latin American and very few study abroad opportunities in STEM.

Currently there are very few students who successfully complete the ENV5 AS-T or the ENV5 AS. We hope the recently revised ENV5 AS will help increase numbers, but we would also like to foster more institutionalized connections (e.g. campus visits, social events, joint field trips, etc...) with the three closest CSU transfer partners.

Geography: As noted in Section 7B, we feel that some of the decline in Geography enrollment is reversible by again offering GEOG 110 (Cultural Geography) and/or GEOG 150 (World Regional Geography) and by offering one or more GEOG classes in the summer. To do so, we would need to increase our adjunct pool. We also have a new GEOG 101 (Physical Geography lab) class that may help boost enrollment in GEOG 100, but we need more planning to ensure enrollment. With CCN it is likely that our one METE course (METE 100: Weather and Climate) will get renumbered as a GEOG course, which actually might help both METE 100 and the Geography program. As noted in Section 2, we strongly believe that GEOG is a fantastic transfer option for students. Further, understanding the spatial/global nature of environmental and cultural issues and being able to interpret spatial data are both skills that are increasingly needed in a wide variety of career fields. This program needs some focused revision.

Geology: After several years of decline, GEOL enrollment is on the rise. We need work with our dean, the STEM Center, and others to figure out how/when to best offer GEOL 100 and GEOL 101 in a routine and

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predictable manner. Additionally, we need to determine if it makes sense to create the Geology AS-T. Further, we will need to better market the class on campus and perhaps to concurrent high school students interested in engineering. We have also shifted a full-time instructor to these courses, which may make field trips and field opportunities more feasible and sustainable.

Oceanography: Prior to COVID we were committed to always having at least one face-to-face section of OCEN 100 and all OCEN 101 labs were face-to-face. Now, all OCEN 100 classes are online or synchronous online and all labs are synchronous online. We would like to go back to offering a face-to-face option of both courses, but typically these sections don't enroll as well. Face-to-face offerings would also likely make field trip components (e.g. Marine Science Institute, tide pool field trip, etc...) more feasible and allow us to expand to offer students more opportunities for authentic research by deepening our relationship with MSI and/or through CUREs.

8A. Access & Completion

Describe the student completion and success rate in your courses and/or program using the data provided by PRIE. Look at your course offerings, in the last program review cycle was it possible for a student to complete your certificates or degrees while only completing courses at Cañada College? How can the college help you improve student completion and success? What changes could be made?

In each of the last 5 years, our department retention rate was always at least 2.1% (and on average 3.2%) above the college-wide retention rate. In each of the last 5 years, our department success rate was always at least 3.7% (and generally 7-8%) above the college-wide success rate.

Of our 5 disciplines, GEOG generally has the lowest completion and success rates. The average retention rate over 5 years was 74.9% and the average success rate was 58.7%. There are likely several underlying reasons. E.g. All of our GEOG classes are online or (more recently) hybrid, so there are no face-to-face options for students who need that. Geography is also often (incorrectly) assumed (by counselors and students) to be the easiest choice to complete a science GE. Thus, students who are already apprehensive about science are now also taking the class online. For many, a face-to-face option might be better. To improve these metrics, we switched our one online GEOG 100 class to hybrid. Enrollment dropped significantly, but retention improved by 6% and success improved by 14%. We have also developed a new Physical Geography Lab course (GEOG 101) to offer hands-on learning opportunities to reinforce GEOG 100 lecture material, but the class has yet to be offered. Engaging with material in a lab setting may help increase lecture class retention and success.

METE has our highest retention and success rates. We only offer one section per year, and it is in the summer. We assume that a significant number of the students in our summer METE course are students home for the summer from 4-year universities.

Our department has recently started to work more closely with the Learning Center to provide tutoring in ENVS. We hope to do the same with GEOG, GEOL, and OCEN. We have done this sporadically in the past, but we need a more focused and consistent effort.

Our department officially has five degree programs (ENVS AS-T, ENVS AS, GEOG AA-T, GEOG AA, and Earth Science AS). All five have very low enrollment, and all need some attention.

The Environmental Science AS-T degree program prepares students to transfer to any CSU and most UC schools. The ENVS degree map needs revision to refine the suggested sequence of classes and to show students the options that exist. This program has a very high number of units and uses the GE Breadth for STEM requirements (i.e. fewer GE classes than the standard CSU GE pattern). Even so, most students will likely need to take an extra semester or take classes during a summer term in order to complete the degree. As noted in Section 4, the ENVS AS-T is due for 5-year review at the state level. We will keep an eye out for changes.

The Environmental Science AS degree was written PRIOR to the establishment of an AS-T degree, and, for years, it was redundant with the AS-T. We recently revised the ENVS AS program to align with the transfer requirements for ENVS programs at our three nearest CSU transfer schools, which resulted in a degree suitable for transfer, but with fewer units. The program map likely needs to be revisited. Additionally, we would like to develop closer ties with these schools (e.g. transfer days, joint field trips, etc...) to help students choose their transfer school and make a smooth transfer.

The Geography AA-T degree program map should undergo a periodic review. Notably though, currently the degree could not be completed at Cañada because two necessary GEOG classes have not been offered

Program Review

recently. These courses are offered elsewhere in the district, though we could fairly easily offer them at Cañada (once we find an instructor). With updates and more promotion, we think this degree program has good potential for growth. As noted in Section 4, the GEOG AA-T is due for 5-year review at the state level. We will keep an eye out for changes. The Geography AA degree program predates the Geography AA-T and is now redundant and likely should either be updated or banked.

The Earth Science AS degree program can be completed at Cañada, but it is not a transfer degree. Students who have used it in the recent past are generally interested in transferring to local state schools in Geology. As noted in Section 2, we currently do not have a Geology AS-T degree. We should consider developing an AS-T in Geology and/or revising the Earth Science AS degree to ensure that it efficiently prepares students to transfer into Earth Science-related degrees at our local transfer schools.

8B. Student Equity

One of the goals of the College's Student Equity plan is to close the performance gaps for disproportionately impacted students. Use the data provided by PRIE that indicates which groups are experiencing a disproportionate impact in your program. Which gaps are most important for improving outcomes in your program? How can the college help you address these gaps? What changes could be made?

For **access**, our department classes do not have any statistically significant access equity gaps for race/ethnicity ... though our relatively small sample sizes may also make discerning race/ethnic equity gaps difficult. In 2022/23, we had a small equity gap for female students, but it was not present in any of the other years. In all years we have an equity gap for "less than part-time" students. Perhaps this category of students is more aligned with taking classes for personal fulfillment, rather than degree/transfer. Further, in 4 of the last 5 years, we have an access equity gap for face-to-face students. We assume this means we offer a smaller % of face-to-face classes than the college at large. (Notably, we would like to offer more face-to-face classes!)

As a department, we had two statistically significant success equity gaps. In 2020-21 we had an equity gap of 18.4% for Filipino students (with a margin of error of 16.8%). This equity gap did not reappear in subsequent years. In 2023-24 we had an equity gap of 6.9% for Hispanic students (with a margin of error of 5.9%)

Looking through each of our five disciplines, the only discipline with any retention or success equity gaps was oceanography, which had the same success equity gaps for Filipino students and Hispanic students as was listed above. This was likely the driver for the overall department success gap for Filipino students.

To address these success gaps, and to better serve all students, we hope to incorporate more antiracist concepts into our courses, and we will encourage our faculty to take part in CORA training and/or related professional learning opportunities. Additionally, we plan to make better use of intervention strategies (e.g. early alert, tutoring) and our community resources (e.g. engaging students in local projects, guest lecturers, etc.). Also, importantly, we hope to better connect curriculum to our local community and students' lives through expanding field trip opportunities, deepening our collaboration with community partners, and developing more authentic research projects through CUREs, Honors, etc...

Historically, Earth science professions have suffered from a lack of diversity, nation-wide. Part of our department's role is to help fix this! The data we used for this program review focused on our courses, but we would also like to see students from traditionally under-represented groups persist in our degree programs. As previously noted, we need to revise our degree programs, and there is work to be done to ramp up marketing and outreach and work more closely with other campus support groups (e.g. EOPS, BTO, Umoja, Promise, STEM Center, etc...)

We also need to get more involved in the Guided Pathways initiative, as our programs may appeal to students who first express interest in engineering or biology or other more well-known fields. Additionally, our programs might help catch students who are struggling in other programs. For example, students who don't persist in engineering due to waning interest in engineering courses and/or difficulties in higher math may find they are interested in Earth science fields, particularly environmental science and geology.

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8C. Completion – Success Online

The college has a goal of improving success in online courses. Using the data provided by PRIE, what significant gaps do you see in success between online/hybrid and non-online courses? What changes could be made to reduce these gaps? If your program does not offer online/hybrid courses, please write “not applicable”.

Within our department, in some years face-to-face courses have higher success rates than online classes and in some years online classes have higher success rates than face-to-face classes. In all cases, our online success rates are 7-15% above the college average. It surprised us that online classes have (in some years) had higher success than in-person classes. The success rates differ by discipline, with OCEN and METE having higher success rates than ENVS, GEOG, and GEOL. This will be interesting to dig into within our department.

Interestingly looking at the department as a whole, synchronous and hybrid classes have lower success rates than either face-to-face or online classes. Synchronous classes were most common during COVID, but we still offer synchronous sections in OCEN 100 and OCEN 101 classes and occasionally hybrid courses of OCEN as well... and the success rates are lower than the online and face-to-face modalities. Interestingly, we offer hybrid and synchronous classes in part to try and boost student success. It's unclear if they help... or perhaps they attract students who would already find the courses more difficult. In one discipline (GEOG) the hybrid sections averaged higher success rates than the online sections, though the sample size is small.

Notably though we also found errors in the modality data, as the data showed 106 enrollments in face-to-face OCEN classes in 2023/24, though there was actually only one lab of 10 students. This doesn't really alter the fact that synchronous and hybrid classes have lower success rates than online and face-to-face classes. Importantly, even though our departmental retention and success rates for online classes are high, we do still have some courses that we would like to see improvement for online success rates. Strategies to pursue include departmental discussion of what is working and not working, increased our use of Early Alert, revised syllabus policies, better use of tutors, etc...

9A. SLO Assessment - Compliance

Are all active courses being systematically assessed over a three-year cycle? Refer to the Program's /Department's Three-Year Assessment Plan and describe how the plan is completed across sections and over time.

We previously had a functioning 3-year assessment plan, though now as we write this program review we see that we were supposed to update the plan in 2023. We are also two semesters behind in inputting assessment data. Our two adjunct faculty who were trained to input assessment data no longer work at Cañada, and our remaining adjunct faculty have not been trained to input assessment data. Clearly, we are out of compliance, and this will be a high priority for our department and will be completed by Fall 2024. Our previous plan was well-conceived and will likely be replicated. Previously, we addressed courses every other year by discipline. The thought was that it would be easy to keep track of with OCEN, GEOL, and METE grouped in one year, and ENVS and GEOG grouped in the next year. Within those groupings, OCEN and ENVS classes are assessed fall semesters and GEOG and GEOL classes are addressed spring semesters. METE classes are only offered in the summer, so our sole METE course will be assessed in summer. Thus, there is one discipline assessed each semester.

9B. SLO Assessment - Impact

Summarize the dialogue that has resulted from these course SLO assessments. What specific strategies have you implemented, or plan to implement, based upon the results of your SLO assessment?

In 2021-2023, faculty met occasionally to discuss assessment. In OCEN we discussed ideas for better modeling of the scientific method in earlier labs, prior to the lab where students design their own study. That discussion also led to improvements in the ENVS 101 lab activities. We also discussed that the GEOL 101 lab does not incorporate as intensive instruction in the scientific method as the OCEN 101 lab. No discussions have occurred since 2023.

Program Review

10 PLO Assessment

Describe your program's Program Learning Outcomes assessment plan using your Program/Department's Three Year Assessment Plan Summarize the major findings of your PLO assessments. What are some improvements that have been, or can be, implemented as a result of PLO assessment?

Our program has 3 PLOs, though looking at Nuventive it appears we have not mapped all our course SLOs to PLOs, which is strange as we remember doing this. Regardless, we are not in compliance with PLO assessment, and it will be a high priority for our department. Honestly, with only one full-time faculty (who until last year had up to 40% re-assigned time out of the department), the loss of two adjuncts who helped coordinate our assessment, and adjunct faculty teaching many department courses... this is something that has simply fallen through the cracks. We need to work more on this.

Looking Ahead

11. Planning for the future is an important part of Program Review. This is your opportunity to identify new directions for growth and improve your program. Based on your analysis of the data and your responses to the questions above, identify specific and measurable goals and action plans for achieving those goals. Consider goals such as, but not limited to: updating curriculum, closing equity gaps, responding to student and community needs, etc. Please enter your response in the textbox below

1. SLO and PLO Update and Use

We will redevelop our SLO assessment plan and map our SLOs to PLOs and ILOs. Further, we need to follow our plan by routinely assess all classes and also better use assessment for course and program improvement. To accomplish this, the full-time faculty member will draft the new assessment plan this fall and do the mapping (likely consulting the assessment coordinator). After that we will use departmental time at a division meeting to review the plan and assign tasks. The plan and map should be completed in F24, and routine input of assessment data will happen each semester thereafter. Departmental time at one division meeting each semester can be allocated to discussing SLO data. No resource requests are needed for this goal.

2. Update and Invigorate ENVS degrees

The TMC for our ENVS AS-T is currently being updated at the state level. We will stay tuned and ensure that we update our ENVS AS-T if any changes are made to the TMC. Additionally, the program maps for the ENVS AS-T and ENVS AS degrees should be reviewed to ensure they are correct and updated as needed. Also, these two degrees need more visibility... to students, counselors, and faculty/staff. We would like to work with Science & Health Interest Area faculty, counselors, retention specialists, and student mentors to bring awareness to this degree program AND also explore the program maps of other degrees to see if we can reach students who may have initially started along a different path. Further, we would like to have at least one event or campus visit prior to Spring 2025 for students interested in transferring into an ENVS program at a local CSU. Most likely this will be a collaboration with SJSU. No resource requests are being requested at this time for this goal.

3. Update, Possibly Consolidate, and Invigorate GEOG degrees

The TMC for our GEOG AA-T is currently being updated at the state level. We will stay tuned and ensure that we update our AA-T if any changes are made to the TMC. Additionally, the program maps for the GEOG AA-T and GEOG AA degrees should be reviewed to ensure they are correct and updated as needed. Also, we will consider eliminating the GEOG AA degree, as it is largely redundant with the AA-T. Further we would like to work with our dean to develop a plan to offer GEOG AA-T courses on a routine basis, so that student can actually obtain this degree at Cañada. Also, the GEOG AA-T needs more visibility... to students, counselors, and faculty/staff. Geography is a low unit degree at the community college and at most 4-year institutions. There are several excellent Geography programs at nearby universities, and the knowledge/skills learned through this degree are increasingly important. We would like to work with other college groups (e.g. Social Sciences, Umoja, Speaker Series, etc...) to bring guest speakers from nearby UC/CSU (especially UC Berkeley) to participate in a college speaker series. No resource requests are being requested at this time for this goal.

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4. Develop a Geology AS-T degree and/or update the Earth Science AA Degree

An AS-T degree will help us attract and retain Geology students, increasing GEOL 100/101 enrollment, and importantly it will help facilitate student transfer to 4-year schools. Currently, we lose interested students to other schools, as students who know they have an interest in geology are less likely to attend Cañada, and students who find a passion for Geology after taking a class are likely to move on to a school that offers an AS-T. Additionally, as with our two Environmental Science degrees, a Geology AS-T degree program can likely help "catch" students who are not persisting in other STEM fields (e.g. engineering). Many second or third semester engineering students already have all but one or two of the required Geology AS-T courses completed. The Geology AS-T has few classes, so it is a relatively easy degree to complete and it facilitates successful transfer. Additionally, as noted in section 3 above, there are significant job opportunities in California (and our local area in particular). For this goal, we will work with the dean and others to determine if development of a Geology AS-T is warranted... and if so, we will develop the degree program. If no Geology AS-T is created, we will consider revising the Earth Science AA degree to include the CSM Historical Geology class as an elective, ensuring that a student with an Earth Science degree can transfer to a Geology program at CSUs. No resource requests are being requested at this time for this goal.

5. Increase Lab Experiences, Field Experiences, and Student Research Opportunities in Earth Science disciplines.

Connecting curriculum more directly to our local environment and/or local community can help students engage with the material and see the relevance of the subject matter to their lives. In end-of-class surveys, students often cite field trips as their favorite part of our Earth Science sources. Through this goal, we want to expand some of our existing field trip opportunities to more classes, deepen our curricular relationships with some of our existing community partners, and increase the number of authentic research opportunities for students. Funding for field trips and supplies are necessary.

Further, improving our classroom laboratory resources can increase student interest and student success. For example, we need additional hand-samples for our instructor mineral/rock collection. New models and posters may also be warranted to improve understanding of difficult concepts.

Next Step: If your program is requesting resources, please go to "STEP 2: Resource Request (OPTIONAL)" and submit your specific requests there. Otherwise, this is the last prompt in the comprehensive program review form.

Supporting Information

Non-Personnel Item (2024 - 2025)

Requested Year

2024 - 2025

Program Requesting Resources

Earth Science

Item Requested

Funding for Marine Science Institute Field Trip on SF Bay

Item Description

For over a decade we offered the MSI boat trip to Oceanography students. Funding for this trip has never come out of our direct departmental budget, and with turnover of faculty and administrators, it is not totally clear how this trip was funded. We would like to include one trip per semester in our annual budget. The trip would be for OCEN 101 and ENVS 101 students.

Program Goals this Request Supports

#5 Increase Field Experiences and Student Research Opportunities in Earth Science disciplines.

Status

Continued Request - Active

Type of Resource

Instructional Expenses (under \$5,000) e.g., lab supplies, Student Athletic supplies, calculators, etc.

Cost

2,800

One-Time or Recurring Cost?

Recurring Cost

Critical Question: How does this resource request support closing the equity gap?

Interestingly, our OCEN program historically did not have equity gaps by race/ethnicity... and historically we included two impactful field trips for all face-to-face OCEN students, the MSI boat trip and a tide pool field trip. In our current program review we note our only two equity gaps were in OCEN ... one year for Filipino student success and one year for Hispanic student success. We are not suggesting that simply including field trips will erase equity gaps, but we do know that building community outside the classroom and connecting our course work to real places that students relate to is an important way to increase interest, persistence, and success.

Critical Question: How does this resource request support Latinx and AANAPISI students?

The literature (e.g. Weaver et al, 2008 and many others) suggests that undergrad research experiences help retain students and set students up for success in STEM. The MSI boat trip gives students the experience of collecting and analyzing physical, chemical, and biological data on the SF Bay. Further, are most interested students are invited to continue research with MSI. We would like to continue these trips and also work with MSI to get more students involved in MSI-related research by using more MSI data sets in our labs and by increasing the number of our students who work as MSI interns.

Map Request to College Goals and Strategic Initiatives

Which of Cañada College's Goals does this resource request support?

Student Access and/or Success and/or Completion
Equity-Minded and Antiracist College Culture
Community Connections

Which of Cañada College's Strategic Initiatives does this resource request support?

Support innovative teaching that creates more equitable and antiracist learning environments
Help students explore and find employment in fields of their choice

Resource Requests

Non-Personnel Item (2024 - 2025)

Non-Personnel Item (2024 - 2025)

Requested Year

2024 - 2025

Program Requesting Resources

Earth Science

Item Requested

Supplies/Support for Campus Native Grassland Restoration Research Site

Item Description

With support from District Facilities we have initiated a research site for our ENVS 101 lab students and ENVS honors students. We anticipate a couple hours each semester touring a nearby native grassland (\$800), expert consulting on our site (\$400), as well as materials/supplies for class and honors student research projects. (\$800)

Program Goals this Request Supports

#5 Increase Lab Experiences, Field Experiences and Student Research Opportunities in Earth Science disciplines.

Status

New Request - Active

Type of Resource

Instructional Expenses (under \$5,000) e.g., lab supplies, Student Athletic supplies, calculators, etc.

Cost

2,000

One-Time or Recurring Cost?

Recurring Cost

Critical Question: How does this resource request support closing the equity gap?

In our current program review, we did not have equity gaps in ENVS, though that may have been in part to small sample sizes. Notably though, we do know that historically Hispanic, Filipino, Native American, and Black/African American are under-represented in the Geosciences. Further, engaging students with authentic research experiences can help students persist and succeed in these areas.

Critical Question: How does this resource request support Latinx and AANAPISI students?

The literature (e.g. Weaver et al, 2008 and many others) suggests that undergrad research experiences help retain students and set students up for success in STEM.

Map Request to College Goals and Strategic Initiatives

Which of Cañada College's Goals does this resource request support?

Student Access and/or Success and/or Completion
Equity-Minded and Antiracist College Culture
Community Connections

Which of Cañada College's Strategic Initiatives does this resource request support?

Help students explore and find employment in fields of their choice
Support innovative teaching that creates more equitable and antiracist learning environments

Non-Personnel Item (2024 - 2025)

Non-Personnel Item (2024 - 2025)

Requested Year

2024 - 2025

11/12/2024

Resource Requests

Program Requesting Resources

Earth Science

Item Requested

Mineral and Rock Hand Specimens for Geology

Item Description

Rock and mineral specimens, larger and of better quality than those in the student kits... especially to show characteristic mineral properties. Historically, our classes relied on the samples from the personal collection of the full-time professor. This private collection (of approximately 50 samples) went missing from the department prep room several years ago. Now that we are trying to once again offer Geology 100 each semester and Geology 101 lab each spring, we need to rebuild the specimen collection. Since the appropriate samples are sometimes hard to find, we are suggesting building the collection gradually over 2 years... so a recurring cost over two years. In addition to hand samples of rocks/minerals, we anticipate also updating some of our models and posters.

Program Goals this Request Supports

#5 Increase Lab Experiences, Field Experiences and Student Research Opportunities in Earth Science disciplines.

Status

New Request - Active

Type of Resource

Instructional Expenses (under \$5,000) e.g., lab supplies, Student Athletic supplies, calculators, etc.

Cost

800

One-Time or Recurring Cost?

Recurring Cost

Critical Question: How does this resource request support closing the equity gap?

In our current program review, we did not have equity gaps in ENVS, though that may have been in part to small sample sizes. Notably though, we do know that historically Hispanic, Filipino, Native American, and Black/African American are under-represented in the Geosciences. Stimulating classroom materials can help engage student interest and thus improve retention/success.

Critical Question: How does this resource request support Latinx and AANAPISI students?

As noted above, historically Hispanic, Native American, and Filipino populations are under-represented in the Geosciences. Further, while Asian Americans are well-represented in many STEM fields, those numbers don't translate into the Geosciences. Stimulating classroom materials can help engage student interest, retention, and success. Clearly more concerted effort than simply improving our mineral collection is needed to improve representation of under-represented groups in Earth Sciences, but having a robust collection will improve the lab experience for all students including our under-represented groups. Further, ensuring that students have a rigorous lab experience here, will help ensure their success in science fields upon transfer.

Map Request to College Goals and Strategic Initiatives

Which of Cañada College's Goals does this resource request support?

Accessible Infrastructure and Innovation
Student Access and/or Success and/or Completion

Which of Cañada College's Strategic Initiatives does this resource request support?

Support innovative teaching that creates more equitable and antiracist learning environments
Strengthen K-16 pathways and transfer