CPR - Instructional

A. Program Description

1. Describe your program’s purpose and identity/focus, noting any changes since the last review.

There are four diversified yet integrated academic programs within the Earth Science department: Anthropology, Astronomy, Geography and Geology. We also have Career Education (CE; formerly CTE, Career Technical Education) programs housed within the Earth Science Department mostly under the overarching umbrella of the Sustainable Technologies Programs (STP): Solar Photovoltaic Installation (PV); Recycling and Resource Management (RRM); Energy Efficiency (EE), and Geospatial Technology, but also within Geospatial Technologies (GIS) and Cultural Resource Management (CRM - in the Anthropology Program). (The PV and EE Programs are currently suspended. Our one full-time faculty member who taught these classes retired in 2019, and we have not been successful in replacing him with a new faculty hire.)

Although we are a diversified academic department, housing four separate disciplines and our CE programs, we have many common objectives including fostering the following behaviors and attitudes in our students as they participate in our courses:

- Promote intellectual inquiry using the Scientific Method.
- Recognition of environmental and cultural diversity.
- Intellectual curiosity about the evolution of humankind, the Earth and the Universe.
- Develop basic discipline-specific literacy and currency in Anthropology, Astronomy, Geography, Geology, and STP.
- Prepare students for career opportunities in Solar Photovoltaic Installation, Energy Efficiency, and Recycling and Resource Management.

These behaviors and attitudes are clearly in line with the SMC Mission statement…*“encourages personal and intellectual exploration, and challenges and supports students in achieving their educational goals”; “…students learn to contribute to the global community as they develop an understanding of their relationship to diverse social, cultural, political, economic, technological, and natural environments”; “… programs … assist students in the development of skills needed to succeed in college, prepare students for careers and transfer”.*

With the addition of two new full-time hires in the fall 2023 semester, the Earth Science Department now has 12 full-time faculty and approximately 25-30 adjunct faculty. The Earth Science Department has accomplished a great deal in terms of active involvement in college communities, engagement with the business community through our Advisory Boards and internship partnerships, and development of programs that are beneficial to our students. We offer three state-approved Certificates in Achievement: 18-unit Recycling and Resource Management, 19-unit Solar Photovoltaic Installation, and 18-unit Geospatial Technology. We also offer six departmental certificates: 8-unit Basic Solar Photovoltaic Installation; 14-unit Solar Photovoltaic Installation; 13-unit Energy Efficiency Specialist; 12-unit Recycling and Resource Management; 15-unit Geospatial Technology Certificate; and 9-unit Cultural Resource Management Certificate. There are also two Associate Degrees offered: AA/AS in Solar Photovoltaic Installation, and AA/AS in Recycling and Resource Management.

We have also created AA-T degrees in Anthropology and Geography, as well as an AS-T in Geology. (The investigation of a possible AS-T degree in Astronomy found no transfer model curriculum template at the California Community Colleges Chancellor’s office website.) Pathway models were created for Anthropology, Astronomy, Geography, Geology, EE, PV, and RRM.

Since our last Program Review, our department has created a new Sustainability Systems & Technology (SST) non-credit program of nine new non-credit courses, and three non-credit certificates: Sustainability in Organics Aide Certificate, Sustainability Assistant Certificate, and Sustainability Services Technician Certificate. These non-credit certificates act as feeders into our RRM Program courses and certificates. The Anthropology Program has recently created the state's first Certificate of Achievement in Cultural Resource Management (CRM). This Certificate not only trains students in the field of archaeology but examines state and federal legislation aimed at protecting Native American heritage and cultural resources.

2. What are the critical ways your program advances the college’s mission, vision, and goals?

As stated above, our Earth Science Department has many common objectives including fostering the following behaviors and attitudes in our students as they participate in our courses:

- Promote intellectual inquiry using the Scientific Method.
- Recognition of environmental and cultural diversity.
- Intellectual curiosity about the evolution of humankind, the Earth and the Universe.
- Develop basic discipline-specific literacy and currency in Anthropology, Astronomy, Geography, Geology, and STP.
- Prepare students for career opportunities in Solar Photovoltaic Installation, Energy Efficiency, or Recycling and Resource Management.

These behaviors and attitudes are clearly in line with the **SMC Mission statement**…*“encourages personal and intellectual exploration, and challenges and supports students in achieving their educational goals”; “…students learn to contribute to the global community as they develop an understanding of their relationship to diverse social, cultural, political, economic, technological, and natural environments”; “… programs … assist students in the development of skills needed to succeed in college, prepare students for careers and transfer”.*

B. People Involved – Your Students

Population and Demographics:

3. What are the key characteristics that define your program’s student population? Compare your program's population to the overall college population, and discuss the extent to which your program’s student makeup (including subgroups who are over or under-represented) currently aligns with your program’s intended target populations.

The table below that compares Earth Science Headcount in relation to SMC Headcount from 2016 to 2020. (There is no data in Precision Campus for 'Headcount' for the years 2020-2021 to 2023.)

	ES	ES	ES	SMC	SMC	SMC
Year	**2016**	**2020**	**% change**	**2016**	**2020**	**% change**
Female	3957	3614	-8.70%	123,507	101,696	-17.70%
Male	3498	2855	-18.20%	100,156	73,221	-26.90%
Asian	928	535	-42.40%	38,364	17,130	-55.40%
Black	545	498	-8.60%	17,268	14,339	-17.00%
Latine/x	2944	2639	-10.40%	78,340	65,182	-16.80%
White	2320	1968	-15.20%	67,458	53,497	-20.70%
19> years	2352	2242	-4.70%	67,930	57,445	-15.40%
20-24 years	3651	2708	-25.80%	88,181	57,957	-15.40%
25-40 years	1250	1355	7.70%	40,877	37,393	-8.50%
40+ years	193	405	52.30%	26,676	26,830	0.10%
TOTAL	7446	6710	-9.90%	223,664	179,625	-19.70%

A few items to note from the data in the table above:

- Almost all student categories indicate a decline in enrollment from 2016-2020, both in the Earth Science Department and in SMC overall. The exceptions (highlighted in green for ES and pink for SMC college-wide) are the '25-40' age and '40+' age student groups.
- The decline in student enrollment in all categories (except the '20-24' age cohort) is less within the Earth Science Department in comparison to total SMC student enrollment.

In terms of generation status, 50% of our students are first-generation, this is higher than the college average (about 48%)

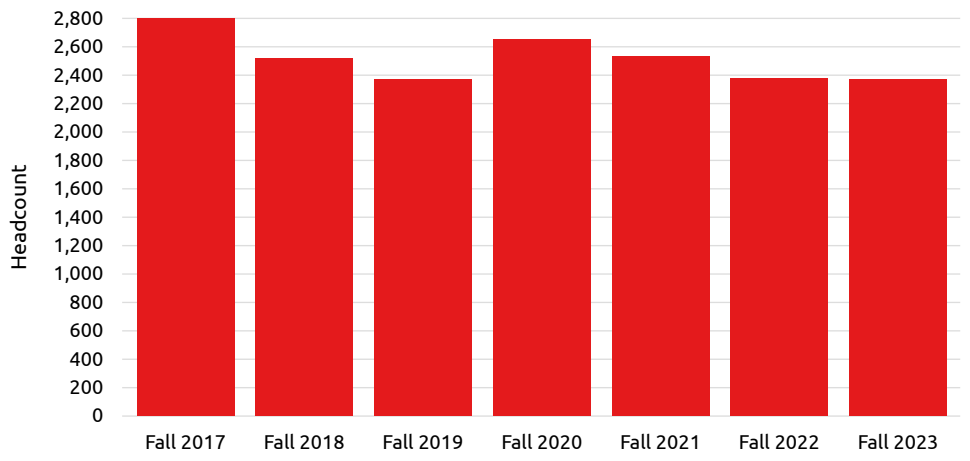
In terms of financial aid status, about 55% of our students receive the aid, and this is significantly higher than the college average (about 45%)

In terms of residence, about 11% of our students come from other countries (i.e., international students) before the pandemic and about 8% after the pandemic. Both are greater than college average (9.5% before and 7% post-pandemic).

There have been several factors impacting our enrollment. This trend mirrors general declines in enrollment across our college. This decline in enrollment is impacted by wider demographic trends across the State. For instance, the California State Department of Finance has projected a 24% decline in the number of public high-school graduates in Los Angeles County between 2021 and 2031. In the face of greater economic uncertainty and inflation, students are being increasingly faced with deciding between full-time employment and college. With an increased preference for online educ;.ation, accelerated by the COVID-19 pandemic, students have greater choice in where and how they wish to attain a college education. In order to be an attractive option for students, our department offers high quality online and hybrid options, in addition to our on-ground offerings. A noteworthy factor in declining enrollment is the continuous cutting of our class sections across all disciplines and a hesitancy by the College to add new class sections even when there is evident student demand for additional course offerings.

Student Headcount

Earth Science



Measures: Headcount

	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022	Fall 2023
Measures	2,797	2,520	2,369	2,651	2,532	2,374	2,368

Outreach and Planning:

4. What opportunities do your analyses reveal about your current and future student outreach and planning efforts?

The ethnicity data show that the Earth Science Department clearly attracts our local Latina/o/x population locally. Our international students are mainly from Asian countries. We will work with other local institutions and groups, such as Santa Monica High School and Climate Action

Santa Monica, for student recruitment.

Christyanne Melendez co-led the Global Studies 35: Field Studies Abroad course to Costa Rica during the Summer 2023 semester where she represented and promoted the Earth Science department. Similarly, Joy Fritschle is developing a domestic (in-broad) trip to the northern CA redwood region and Cal Poly Humboldt in which she will represent and promote the department.

Both full-time and adjunct faculty have regularly attended SMC Welcome Day events to promote departmental course offerings.

C. People Involved – Your Staff

Population and Demographics:

5a. Discuss your program's staff (PT/FT faculty, non-faculty, and classified).

We have 12 full-time faculty in our department: six women and six men. Six are white men, four are white women, one woman is Latina/x, and one woman is Asian. Two of our faculty are nationals of countries outside of the US. Our adjunct faculty population varies from year to year, but as of 2023 was comprised of 14 men and 12 women. Of the male adjuncts, 11 are white, two are Middle Easterners, and one is Black. Of the 12 women adjuncts, nine are white women, 2 are Latina/x, and one is Asian. We have one part-time Administrative Assistant, a white male. We also have two part-time classified employees who coordinate the Planetarium Program (The John Drescher Planetarium - Santa Monica College (smc.edu)). One is a white a white man and the other a white women. Our department does not currently have any student employees.

5b. How reflective of your program's student population is your staff?

The comparison of Earth Science student data (*Headcounts*) as demonstrated above in section 3 of thousands of data points with our Earth Science Department staff of less than 50 people is, 1) statistically not valid, and 2) problematic to draw conclusions from the small sample size of ES staff. Nevertheless, we will answer the question posed to us, simply showing the numbers without commenting on what this may/may not indicate.

We do not ask our staff their ages, so the table comparison below of student with ES staff demographics will only show gender and race/ethnic numerical comparisons. We do not have a complete list of gender and race/ethnic data of ES staff from the years 2016-2019, so will use gender and race/ethnic data of ES staff from 2023 in comparison to student gender and race/ethnic data from 2020.

Year	2020 Students	2023 Earth Science Staff
Female	3614	18
Male	2855	21
Asian	535	2
Black	498	1
Latine/x	2639	3
White	1968	31
Middle Eastern	no data	2

Staffing Changes:

6. Discuss your program's staffing changes since the last review. How have these changes impacted your program's ability to achieve its desired student outcomes?

Since our last two-year review, our department has been fortunate to hire three new full-time faculty: one in geography in 2022, one in anthropology in 2023, and a one person in our RRM Program in 2023. With our new hire, Victoria Charles, in the RRM Program, we now have a full-time faculty member to manage the Sustainable Technologies Program (STP) in which the RRM Program is housed.

Staffing Challenges:

7a. Looking ahead to the next review period, discuss any staffing challenges you anticipate. How is your program planning to address these challenges?

Our department is one of the smaller ones on campus and we hope to add at least one new full-time faculty hire (Astronomy) this coming academic year. For two decades, the Astronomy program operated with three full-time faculty, but for the past several years, that number has been reduced to two by retirement. Furthermore, the two remaining faculty both are now in their third decade of service to the college, so we believe hiring a new full-time astronomer is essential to the future of the program. The department's upcoming move to a new Science building, which will feature a state-of-the-art planetarium and observatory, makes the next few years an especially important opportunity to invest in the next generation of Astronomy at SMC.

Unfortunately, we feel hamstrung by the unpredictable nature of the college's decisions on hiring each year, which requests for a new Astronomy faculty member repeatedly denied. Earth Science, like many other departments, seems to be constantly begging for more faculty to spread the administrative service load in the department and we instead see a homeostasis of sorts where new hires are balanced out by retirements for no net gain of staff.

7b. What institutional support does your program need to address these challenges?

Our department is scheduled to move into the new Science Building in the fall 2024 semester. We desperately need a lab technician. ***We are currently the only science department on campus that does not have a lab technician***. We envision a lab technician position that can hold a joint appointment as the lab tech for our department while also operating the brand-new public Planetarium and Observatory. These resources will also be used by the local Santa Monica school system.

The Planetarium is much lauded by the administration and is a very visible public facing part of our program and college. The shows at the Planetarium provide a key service to our local schools and community. In order to create a seamless move, it is imperative to have a staff member in charge of the new Planetarium and Observatory. Combining that role with a lab technician for our teaching laboratories is an economical way to meet the needs of both.

8. What key elements of your department culture facilitate and impede your program's ability to achieve its desired student outcomes?

Every 1-2 months, we have a department meeting led by each discipline in our department on a rotating basis. All faculty, including full-time and part-time, are welcome to join the meeting and share their thoughts and voices. We also enjoy the department gathering in our Chair's house at the beginning of the fall semester, and local field trips together each semester. All these activities greatly facilitate the formation of a welcoming and open culture in our department.

Department faculty maintain and contribute to an Earth Science blog, reporting on experiences both in and outside the classroom (link: http://smcearthscience.com). This has served as an additional place to share ideas of mutual interest to our various disciplines, including the work done by our student clubs. Such collaborative activity slowed during the pandemic, as club and field experiences were placed on hold and time and attention were focused on transitioning to the new online learning environment. As we continue to reemerge from the pandemic, we expect to revive our past collaborative activities and to blog about it as well.

Staff Support and Professional Development:

9a. Discuss how your program involves and supports its staff (classified, non-faculty, and PT/FT faculty).

Earth Science faculty members provide in-house trainings on a wide variety of topics including accessibility, equity, and Canvas best practices. Department faculty members regularly attend a variety of professional conferences to stay current in their disciplines, and encourage SMC students to attend when appropriate (the Anthropology Club has helped students attend the Center for Academic Research and Training in Anthropogeny symposia at UCSD). Earth Science classified staff are invited to participate in all department meetings, and field trips (as explained in question 8 above). Full-time faculty Ciarán Brewster is the PI on the multiyear NSF STEM Equity grant (award # 1928737). Full-time STEM faculty are giving professional development training across multiple semester to help them implement more equitable teaching practices in their class. Lisa Collins, Joy Fritschle, Jing Liu and Christyanne Melendez have participated in this initiative. In 2023, Ciarán Brewster was the PI of a one-day NSF STEM Equity conference (# 2231669) hosted by SMC. The conference included presenters and participants from SMC and across the US. Twelve SMC full-time and part-part-time Earth Sciences faculty have completed Equitizing Gateway Courses training.

9b. What roles do your program's staff play on campus and in the off-campus community?

Our faculty members are involved with various committees on campus as well as off-campus organizations/groups, including Climate Action Santa Monica, Friends of Geography at UCLA, and the UCLA Cotsen Institute of Archaeology. We also advise student clubs, including the Earth Science Club, the Anthropology Club, Women in STEM club, Geology Club, and Rock Climbing, Wilderness, the Organic Learning Garden Club and Environmentalism Club.

Earth Science faculty and students maintain a long tradition of serving on various campus initiatives and Academic Senate committees. In recent years, Earth Science faculty have participated in each the following Academic Senate Committees: Curriculum, Distance Education, Environmental Affairs, Global Council (Eric Minzenberg as Chair 2013-2015) and Professional Development.

Catherine Haradon (Anthropology) gives science lessons at a local Catholic elementary/middle school (Saint Anne's) in order to support their science curriculum, especially regarding evolution and prehistory. Ciaran Brewster, Eric Minzenberg, and now Catherine Haradon has each served as Faculty Advisors for the Anthropology Club. Lisa Collins, Jing Liu, and Eric Minzenberg are each participants in the BECAP grant. Victoria Charles and Eric Minzenberg are participating in the ZTC/ OER grant.

Victoria Charles serves as a member of the Environmental and Nature judging panel for the City of Santa Monica's annual Sustainability Quality Awards. Victoria serves as a mentor to high school students in the Climate Action Leadership program, which she founded in 2019.

Lisa Collins (Geology) serves on the curriculum committee (2021-2024), participated in EGC, completed the Equity Avengers program, and has served as a coach on the NSF STEM equity grant from 2020-2024.

Christyanne Melendez (Cohort 2) and Jing Liu (Cohort 1) participated in the NSF-funded research project at SMC entitled Fostering an Equity-minded Student Success Culture in STEM Through Faculty Development. This is a multi-semester program that encourages and assesses equity-minded strategies to improve and support student success.

Christyanne Melendez, Victoria Charles, and Catherine Haradon completed the Equitizing Gateway Courses (EGC) program.

Eric Minzenberg is developing a new course, *Ethnographic Methods for Designers*, in conjunction with the IDX Program. The IDX Program approached us in the spring 2024 semester for us to develop an ethnography methods course that will be a graduate requirement for IDX students. Our plan is to have this new course co-taught with an IDX professor and an anthropology professor, with the first offering of this course in the fall 2025 semester.

9c. Discuss how your staff’s professional activities since the last review period have positively impacted your program.

Jing Liu received a national-level certificate of achievement in geospatial technology named as "Geospatial Educator's Certification" (https://www.geotechcenter.org/) in 2022. She also received the "Distinguished Geospatial Technology Educator Award" through the program. This professional development activity has greatly facilitated our Geography and Geospatial Technology programs to incorporate the most innovative technologies in classrooms. It also greatly helped improve the equity and diversity in our classes.

Since the last Earth Science Program Review, Brandon Lewis has authored or co-authored four publications, including two in the past year (“Ancient Maya Movement in the Rio Bravo Conservation and Management Area, Northwestern Belize,” in the *Journal of Archaeological Science* and “Fragmento de Epitáfio Paleocristão –Nossa Senhora do Freixo, in *Ficheiro Epigrafico Suplemento de 248 Inscricoes).* In addition, Professor Lewis has presented 5 national papers for the Society for American Archaeology, been awarded a sabbatical for distinguished academic research, served as Principal Investigator for eight international and multi-institutional archaeological research projects (two in Belize and six in Portugal), and was the lead professor for the Latin American Education Program’s Study Abroad initiative in Argentina. Critical to the above-mentioned research is the involvement of Santa Monica College students. These research endeavors not only provide uncommon opportunities for student training and publication but are also the backbone for our newly created State Certificate of Achievement in Cultural Resource Management.

Brandon Lewis was awarded the $15,000 John F. Drescher Chair of Excellence Award (2023-2025) for research in Scientific and Environmental Studies.

The Archaeology Program has expanded its international research to now include the Programme for Belize Archaeological Project and the Nossa Senhora do Freixo Archaeological Project, Portugal. These projects provide uncommon opportunities for creative research, intellectual growth, student training, and professional development.

Catherine Haradon was a co-author with colleagues from the Smithsonian Institution on a 2018 paper in *Science* titled "Environmental dynamics during the onset of the Middle Stone Age in eastern Africa". This research demonstrated that flexible and adaptable behaviors characteristic of early *Homo sapiens*, such as increased mobility, resource selectivity, and the manufacture of small and portable tools, were associated with periods of heightened climatic variability.

Joy Fritschle participated in the New Faculty Institute (NFI), which hosted or co-hosted several workshops and invited speakers related to DEI. These trainings and other workshops related to DEI made their way onto her course syllabi, class policies, and course materials. For example, in course units on climate change in *GEOG 1: Physical Geography*, *GEOG 5: Physical Geography with Lab*, and *GEOG 7/ENVRN 7: Intro to Environmental Studies*, she assigned readings and led class discussions that address how Latinx, Black, and indigenous communities all have to deal with climate change in ways that are uniquely related to their experiences of systemic racism. She also underwent several trainings in distance education through the SMC Distance Education Office, including the 2023 Distance Education Winter Institute, and completion of the Spring 2023 Online Distance Training (ODT) Certificate (an 8-week course).

Eric Minzenberg was one of the organizers of the *Waorani*: *Guardians of the Amazon* film (indigenous people of eastern Ecuador) with Q&A of filmmakers shown on campus on October 4, 2023.

Christyanne Melendez and Pete Morris organized the following speaking event featuring Dr. M Jackson: *Living with Ice: Glaciers and Climate Change.* This event took place on campus on Thursday, November 3, 2022. Dr. M Jackson is a National Geographic Explorer, TED Fellow, glaciologist, and geographer who spoke about her experiencing living and working directly with communities impacted by climate change. This event was sponsored by SMC Global Citizenship, SMC Associates, and SMC Associated Students.

Christyanne Melendez co-led the Global Studies 35: Field Studies Abroad course to Costa Rica with Delphine Broccard (Communication Department) during the Summer 2023 semester. During this course, students explored core concepts related to geology (Melendez) and communications (Broccard) while in Costa Rica. The course had a strong environmental and social justice focus.

Eric Minzenberg was the faculty lead for the Belize/Guatemala Study Abroad Program in summer 2018.

Lisa Collins, Jing Liu and Eric Minzenberg are participants in the BECAP (*Blue Economy and Climate Action Pathways*) Grant which extends for two years from 2024-2026. This is an interdisciplinary grant comprised of SMC and LA City Community Colleges (with SMC as the lead) designed to create GIS and climate action materials for the classroom (climatizing the curriculum), and to educate SMC students for future BECAP jobs and careers.

Victoria Charles and Eric Minzenberg are participants in the ZTC/OER (Zero Textbook Cost Degree Program/Open Educational Resources) Grant. This interdisciplinary grant is designed to create ZTC/OER degrees and pathways in sustainability programs, such as the Earth Science Departments RRM Program. We will create OER education resources for all existing RRM courses and revise our RRM Certificates and AS-T so that students have the option to complete these degrees using OER materials.

Victoria Charles, through the Perkins Grant, has successfully secured 20 workshop vouchers for students to participate for free in the internationally renowned USGBC TRUE Advisor workshop, enabling them to attain accreditation.

Gillian Grebler has completed the AASHE Training on "Building a Curriculum Development Program for Your Institution: The Piedmont/Ponderosa Model." Additionally, she organizes expert speakers in the SMC Organic Learning Garden, aligning topics with curriculum content on food systems and California State organics recycling legislation aimed at reducing methane emissions contributing to climate change.

Victoria Charles and Gillian Grebler have collaborated to develop and instruct three noncredit career education certificates in sustainability, offered online for free. SMC stands as the sole community college providing such noncredit, no-cost sustainability courses and certificates.

Lisa Collins served as the President-elect of the Southern California Academy of Sciences (2020-2022), the oldest scientific society in Southern California. She continues to serve on the President's Advisory Council for SCAS. She is also a member of the National Network for Ocean and Climate Change (NNOCCI) as a member of the Training Committee. As a result of her work on the Aquaculture Program, she is a member of the Aquaculture Community of Practice a group of academics, industry experts, DEI experts, non-profits and small-scale aquaculture farmers committed to creating a strong, equitable workforce in aquaculture.

9d. What additional areas of professional development and trainings are needed for your staff?

Training in the use of AI is sorely needed throughout our college. Students and faculty need to have some guidelines (with demonstratable examples) of problematic use of AI (e.g., "cheating) and constructive use of AI. We have discussed the use of AI in our Earth Science Department meetings and will continue to do so in the coming years.

Our Earth Science Department meeting on November 2, 2023, was dedicated solely to the discussion of the use of AI in our department. Our department has begun the process to create AI resources for our faculty and students.

If applicable:

10a. In what professional organizations does your program's staff participate?

Anthropology: American Anthropological Association; American Association of Biological Anthropologists; PaleoAnthropology Society; Society for American Archaeology; Register of Professional Archaeologists; Center for Academic Research and Training in Anthropogeny

Astronomy: American Astronomical Society, Royal Astronomical Society of Great Britain.

Geography: American Association of Geographers (AAG), North American Cartographic Information Society (NACIS), Association of Pacific Coast Geographers (APCG), California Geographical Society (CGS)

Geology: American Geophysical Union (AGU), American Society of Limnologists and Oceanographers (ASLO), American Association of Petroleum Geologist (AAPG), Pacific Section of American Association of Petroleum Geologist (PSAAPG), Southern California Academy of Sciences (SCAS), National Network for Ocean and Climate Change Interpretation (NNOCCI)

RRM: United States Green Building Council (USGBC), TRUE Advisor, California Association of Professional Scientist, California Resource Recovery Association, Northern California Recycling Association.

10b. Discuss your staff's grant-funded research and projects.

Full-time Anthropology faculty Ciarán Brewster is the Principal Investigator on the NSF grant (award # 1928737) titled "Fostering an Equity-Minded Student Success Culture in STEM Through Faculty Development". This grant is multi-year grant (awarded in 2019 and set to run until 2025) has provided professional training for STEM faculty at SMC. Thirty-two SMC STEM faculty have participated in the initiative, including five Earth Science faculty.

Ciarán Brewster is the Principal Investigator on an NSF-sponsored one-day virtual conference (award # 2231669) titled "The State of Equitable STEM Pedagogy at California Community Colleges" that was hosted by SMC on October 20, 2023. There were 229 individuals registered for the conference with 99 people attending the live event. The conference included presenters and attendees from across the US, with the majority coming from California Community Colleges.

Victoria Charles serves as the lead for the California State Perkins Grants dedicated to the STP and SST Career Education (CE) programs. This grant funds faculty attendance at industry-related conferences, fostering ongoing education and understanding of industry trends. Annually, the Perkins grant allocates funds for 20 vouchers for SMC's RRM students, enabling participation in the USGBC TRUE Advisor accreditation program. Furthermore, funding from the Perkins grant supports enrollment outreach and marketing efforts for the RRM and SST programs, alongside ongoing research into best practices within the sustainability industry.

The new Aquaculture and GIS grant comes from the Blue Economy and Climate Action Pathways (BECAP) project. Three of our department's full-time faculty, geologist Lisa Collins, geographer Jing Liu, and anthropologist Eric Minzenberg are participating in the 2-year BECAP grant. The project aims to meet the emerging employment demands in ocean-related labor markets that are aligned with climate action and environmental justice priorities. BECAPs overarching goals are 1) to increase and improve training opportunities in the areas identified in these reports as both promising and fast-growing career pathways in the ocean economy, including a) Regenerative Aquaculture, b) Ocean Renewable Energy, c) Blue Tech & Underwater Robotics, and d) Ecosystems Conservation and Restoration. These project goals will be accomplished through the augmentation of existing curricula, degree programs, and certificates and/or creation of new curricula and programs; 2) Create a faculty community of practice to facilitate the development new education, training, internships, apprenticeships and other on-the-job training opportunities by working with current and potential partners (e.g. Alta Sea& tenants), and 3) to assist community college students' transition from internships into permanent employment.

Victoria Charles and Eric Minzenberg are participants in the ZTC/OER (Zero Textbook Cost Degree Program/Open Educational Resources) Grant. This interdisciplinary grant is designed to create ZTC/OER degrees and pathways in sustainability programs, such as the Earth Science Departments RRM Program. We will create OER education resources for all existing RRM courses and revise our RRM Certificates and AS-T so that students have the option to complete these degrees using OER materials.

10c. Discuss your program's partnerships with regional educational institutions.

Jing Liu is a Board member of UCLA's Friends of Geography.

Brandon Lewis is a Research Associate at the Cotsen Institute of Archaeology, University of California, Los Angeles. In addition, our State Certificate of Achievement in Cultural Resource Management incorporates joint research projects and laboratory analyses with the UCLA Cotsen Institute of Archaeology.

Catherine Haradon teaches upper-division classes at California State University, Northridge in order to maintain a professional network with a local CSU and to strengthen SMC's relationship with the CSUN Anthropology department for the benefit of transfer students.

Lisa Collins, Jing Liu and Eric Minzenberg are participants in the BECAP (*Blue Economy and Climate Action Pathways*) Grant which extends for two years from 2024-2026. This is an interdisciplinary grant comprised of SMC and LA City Community Colleges (with SMC as the lead) designed to create GIS and climate action materials for the classroom.

10d. Discuss your program's industry partnerships and relationships.

In fulfillment of the Independent Study requirement of our State Certificate in Cultural Resource Management (CRM), we have forged partnerships with directors at the Cotsen Institute of Archaeology at UCLA. Through this partnership our students have been volunteered at this world-renowned institute and have been able to garner experience in anthropological and archaeological laboratory methods.

Geospatial Technology Certificates Advisory Board:

The last advisory board meeting was held in 2022. In the meeting we discussed and approved the motion to convert the local departmental geospatial technology certificate to a state-level, chancellor office approved certificate of achievement. We also discussed internship/volunteer opportunities through the City of Santa Monica, ARUP (https://www.arup.com/services/digital/geospatial-services-and-earth-observation), Climate Action Santa Monica. The advisory board members also provided insights and suggestions to improve the curriculum in our Geospatial Technology courses.

RRM Industry Advisory Board:

In November 2023, the RRM Advisory Board convened with a strong attendance of over 20 members. During this meeting, a motion was discussed and unanimously approved to rename the RRM program from "Recycling and Resources Management" to "Sustainable Materials Management." This decision was influenced to be aligned with industry standards (EPA terminology). All board members expressed unanimous support for the name change. Furthermore, the board unanimously approved a motion to modify the existing RRM certificates as follows:

1. General Certificate of Achievement: 12 units
2. Advanced Certificate of Achievement: 18 units

10e. Discuss how your faculty are upskilled to address industry and/or curricular changes.

Jing Liu received a national-level certificate of achievement in geospatial technology named as "Geospatial Educator's Certification" (https://www.geotechcenter.org/) in 2022. She also received the "Distinguished Geospatial Technology Educator Award" through the program. This professional development activity has greatly facilitated our Geography and Geospatial Technology programs to incorporate the most innovative technologies in classrooms. It also helped greatly improve the equity and diversity in our classes.

Joy Fritschle applied for SMC's professional development funds to attend the 2023 Esri Education Users Summit in July. This is the top-tier GIS (geographical information systems/science) conference. This allowed her to stay abreast of the latest technology and applications that can be used to develop new materials and exercises in *GEOG 1: Physical Geography* and *GEOG 5: Physical Geography with Lab*.

Gillian Grebler completed the year-long OFAR (Open for Anti-Racism) training in 2022-2023.

10f. Provide your program's advisory board membership and meeting dates since the last review period.

Geospatial Technology Certificates Advisory Board Membership

- The City of Santa Monica
- The City of Culver City (the Fire Department)
- The City of Los Angeles (the Biodiversity Department)
- Climate Action of Santa Monica
- Friends of Geography at UCLA
- NASA/JPL
- ARUP

The last advisory board meeting was held on March 21, 2022.

RRM/SST Industry Advisory Board Membership

- City of Burbank
- City of Pasadena
- City of Santa Monica
- Abound Food Care
- Athens Services
- BlueSphere Partners
- Go2Zero
- MOCA (Museum of Modern Art)
- Sustainable Enviromental Managment Company
- Urban Rising Group
- USGBC-LA

At the last industry advisory board meeting on November 15, 2023, board members voted (unanimously) on the following RRM Program changes:

1. Change the RRM Program name to *'Sustainable Materials Managment (SMM)'* which aligns with the nomenclate of the US EPA.

2. Rename the existing 12-unit RRM Certificate of Achievement to *'SMM General Certificate of Achievement'.*
3. Create a new 18-unit *'SMM Advanced Certificate of Achievement.'*
4. Revise the elective courses for the newly created SMM Advanced Certificate of Achievement.

These changes have been submitted to Curriculum will be presented to the Curriculum Committee in the first spring 2024 meeting.

D. Curriculum, Courses, and Scheduling

11. Analyze your program's enrollment trends disaggregated by modality and other course attributes. Reflect on the extent to which your current course offerings and class scheduling practices maximize student success. Include any evidence to support your points. Discuss any changes your department plans to better respond to students' needs.

The three tables below indicate student enrollment in Earth Science classes for the fall 2021 and fall 2022 semesters based on the modality of instruction. (Data on Precision Campus only exists for the semesters fall 2021 and fall 2022 for all student variables.) *Table 1* demonstrates enrollment by modality of gender and race/ethnicity, *Table 2* demonstrates enrollment by modality of student residence, and *Table 3* demonstrates enrollment by modality of student age. (Cells highlighted in green indicate the highest enrollment for that particular column.)

Table 1: Enrollment by Modality of Gender and Race/Ethnicity

Modality	F 2021	F 2022	M 2021	M 2022	A 2021	A 2022	B 2021	B 2022	L 2021	L 2022	W 2021	W 2022
On-ground	39	345	47	351	11	40	8	43	28	257	27	203
Asynchronous	111	1,094	68	825	20	146	12	154	71	769	27	203
Flexible	0	1,077	0	709	0	142	0	153	0	749	47	572
Flex w/ Mtg	313	11	236	7	66	*nd	28	nd	188	11	188	8
Flex w/ Exam	75	33	37	38	4	5	9	6	66	28	27	17
Scheduled	94	70	69	77	8	18	15	11	60	49	63	53
TOTAL	**632**	**2630**	**457**	**2007**	**109**	**351**	**72**	**367**	**413**	**1863**	**379**	**1056**
	F = Female; M = Male; A = Asian; B = Black; L = Latine/x; W = White											
	*nd = no data											

Table 2: Enrollment by Modality of Residence

Modality	CA 2021	CA 2022	Out 2021	Out 2022	Int 2021	Int 2022
On-ground	78	536	7	73	5	108
Asynchronous	149	1,649	20	163	15	172
Flexible	0	1,529	0	136	0	111
Flex w/ Mtg	444	21	80	*nd	44	*nd
Flex w/ Exam	100	58	10	10	2	5
Scheduled	140	135	16	14	13	4
TOTAL	911	3928	133	396	79	400
	CA = California Resident; Out = Out of State; Int = International					
	*nd = no data					

Table 3: Enrollment by Modality of Age

Modality	19> 2021	19> 2022	20-24 2021	20-24 2022	25-40 2021	25-40 2022	40+ 2021	40+ 2022
On-ground	41	336	30	301	13	73	3	7
Asynchronous	56	722	78	855	36	316	14	61
Flexible	0	636	0	693	0	363	0	84
Flex w/ Mtg	140	2	219	6	155	8	54	5
Flex w/ Exam	35	24	62	35	12	13	3	1
Scheduled	56	44	71	62	36	34	6	13
TOTAL	328	1764	460	1952	252	807	80	171

19> = 19 or younger; 20-24 = 20-24 years; 25-40 = 25-40 years; 40+ = 40 and older

*nd = no data

Observations from the above three tables:

- Across all variables, the modality *'Flexible with Meetings'* had the highest Earth Science student enrollment in the fall 2021 semester, and the modality *'Asynchronous'* had the highest student enrollment in the fall 2022 semester. Slight variations exist for 'White' students in fall 2022, and '25-40' aged students and '40+' aged students in fall 2022.
- Earth Science student enrollment increased for all student groups in all teaching modalities except the *'Scheduled'* modality from fall 2021 to fall 2022.

Tentative inferences based on data in above three tables, and *other thoughts*:

- During the Covid years, and into recent post-Covid school closures, distance education (in the varied online modalities) is more popular with both students and faculty.
- The data modalities *'Asynchronous*' and *'Flexible'* are not explained in Precision Campus to indicate a difference between these modalities. Our understanding is that these modalities nomenclate appear to be measuring the same type of teaching modality.

Enrollment Trends:

Enrollments in Earth Science courses have recovered from the pandemic downturn more robustly than for the college as a whole. For all of SMC, course enrollments in Fall 2022 remained down 21.5% compared to Fall 2016. In Earth Science, the level of comparable decline has been almost half as severe, with a 13.2% decline between Fall 2016 and Fall 2022. Indeed, Earth Science enrollments in Fall 2022 had almost completely recovered to their Fall 2019 figures, down only 1.2%, from 2,698 to 2,667.

Earth Science faculty have been early returners to on-campus teaching as the pandemic emergency waned in 2022. In Fall 2022, enrollments in Earth Science on-ground courses were 717, up more than eight-fold compared to Fall 2021 (87). This represented 27% of all Earth Science enrollments in Fall 2022, which trailed the campus-wide figure (43%) but represented a considerable closing of the gap that existed in 2021.

SMC

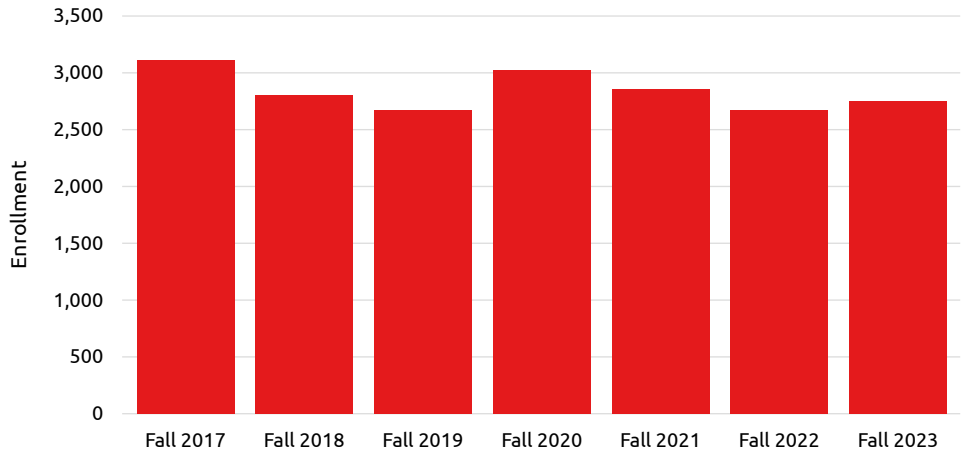
- Fall 2016: 92,969 (headcount = 34,226)
- Fall 2019: 90,586 (headcount = 31,492)
- Fall 2022: 72,956 (headcount = 25,516)

Earth Science

- Fall 2016: 3072 (headcount = 2763)
- Fall 2019: 2698 (headcount = 2390)
- Fall 2022: 2667 (headcount = 2374)

Course Enrollment

Earth Science



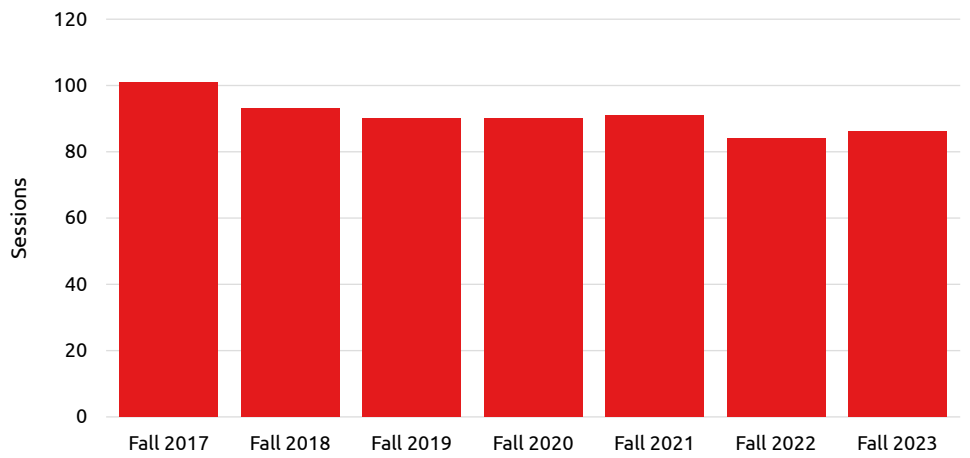
Measures: Enrollment

	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022	Fall 2023

Measures	3,115	2,800	2,671	3,019	2,854	2,667	2,747

Section Offerings

Earth Science



Measures: Sessions

	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022	Fall 2023
Measures	101	93	90	90	91	84	86

12. What institutional support do you need to create a more equity-minded and student-centered curriculum, course offerings, and class schedules?

The cutting of courses, exacerbated by the District's 100% efficiency model, has led to a lowering of morale among faculty and students alike. Our part-time faculty have been disproportionately impacted by cuts at the College. In some instances, we are unable to offer more specialized classes students need in order to complete State Certificates. As we schedule for the Spring 2024 semester, we are faced with uncertainty, as the district communicated to the Faculty Association that they reserve the right to cancel class sections that already have 18 or more students enrolled. Such a draconian approach seriously affects our class scheduling causing us to offer a more limited and conservative course offering, thereby limiting student choice. A redress of the current efficiency model will go some way toward allowing us to offer a broader curriculum that meets the varied needs of our students. We have been disappointed in how hesitant the College has been to add additional class sections even when presented with clear student demand. The decision process by which some additional course offerings are added and some are not can sometimes feel arbitrary. We would greatly benefit from a clearly outlined set of guidelines from Academic Affairs whereby class sections can be added when there is student demand. In order to better serve our Black and Latina/o/x students, some of our faculty have expressed interest in blocking off classes (i.e., giving priority enrollment) to students who are part of The Black Collegians Program/Umoja Community and Adelante Programs. However, such an approach is currently untenable given the existing policy (and uncertainties) around classes that do not make a cutoff or are slower to fill.

13. Document any substantial changes to your program curriculum since the last review and discuss what prompted these changes. Looking forward, what changes to the curriculum do you plan based on the emerging needs of your discipline, industry, student population, etc.

Covid changed everything. A significant change was a shift from mostly on-ground class offerings in all disciplines in our department, to mostly online class offerings post-Covid. As of this writing, our department still routinely reports higher course enrollment for online as opposed to on-ground/hybrid sections. Two of our professors, Jing Liu (geography) and Eric Minzenberg (anthropology), were part of the eight college-wide faculty group who participated in the HyFlex pilot program in the 2022-2023 academic year.

Since our last six-year review, we have developed a Certificate in Cultural Resource Management (CRM). Originally a Departmental Certificate, it was subsequently revised as a State Certificate of Achievement. This certificate was created to give our Anthropology students an edge when applying for employment in CRM, a major sector of employment for Anthropology majors. In addition to the classes that comprise this certificate, students have the opportunity to engage in Independent Study projects, collaborate with researchers at UCLA, and can elect to participate in a study abroad program.

We also added an AS-T degree for Geology as well as several new classes. Geology added Physical Oceanography with Lab, Environmental Geology with Lab, and Climate Change classes since the last program review.

As stated in section 9B, Eric Minzenberg is developing a new course, *Ethnographic Methods for Designers*, in conjunction with the IDX Program. The IDX Program approached us in the spring 2024 semester for us to develop an ethnography methods course that will be a graduate requirement for IDX students. Our plan is to have this new course co-taught with an IDX professor and an anthropology professor, with the first offering of this course in the fall 2025 semester.

Since our last Program Review we have created a new Anthropology course offering called "Introduction to Primatology". We successful update the name of our "Physical Anthropology" class to "Biological Anthropology" (the latter discipline name is now preferred at the colleges and universities most of our students transfer to). Additionally, we created a State Certificate in Cultural Resource Management, which prepares students for archaeological field work, as well as careers in museums or anthropological labs.

New Certificate of Achievement in Geospatial Technology

The new Certification of Achievement in Geospatial Technology has been approved by the State Chancellor's office in 2022. It requires 18-19 units, and it is stackable with the Departmental Geospatial Technology Certificate (15 units).

Geospatial Technologies, including GIS, Remote Sensing, GPS, and modern Cartography, have been widely applied in almost all the disciplines in almost all the areas, including Earth Sciences, Business, History, Sustainability, Law and Enforcement and many others. The mastering of Geospatial Technologies are also highly demanded in the job markets. In 2023, we made modality changes in the current GIS

courses to flexible online, and we have seen a significant increase in enrollment! We are planning to keep using the modality and working on adopting more effective online teaching strategies to achieve better student learning outcomes.

E. Evaluation, Effectiveness, and Equity:

Course Success and Retention: Indicate your program's chosen level of analyses for the review (choose one):

Department-level

14a. Analyze your program's course success and retention against your program's institution-set standards (minimum threshold) and improvement goals. Discuss any significant changes/trends over time. Include your program's plans to improve course success and retention.

Table 4: Earth Science Student Succes and Retention

Year	ES Success	SMC success	ES retention	SMC retention
2016	69%	68%	84%	83%
2017	71%	69%	85%	83%
2018	72%	68%	85%	83%
2019	73%	68%	87%	83%
2020	77%	69%	88%	84%
2021	84%	81%	100%	100%
2022	73%	66%	88%	83%

The above table indicates that ES department level Student Success and Retention rates are slightly higher the SMC college-wide Student Success and Retention rates. (Data from 2021 is a statistical outlier and not a valid comparison year as for example, 100% retention rates in 2021 reflect a policy of not issuing 'W' for students, and additionally, probably relaxed grading standards led to much increased success in 2021 in comparison to years prior and after 2021.)

Table 5: Earth Science Student Succes & Retention by Gender & Race/Ethnicity

	ES F	SMC F	ES M	SMC M	ES A	SMC A	ES B	SMC B	ES L	SMC L	ES W	SMC W	ES TTL	SMC TTL
2016 Success	68%	69%	70%	66%	77%	76%	51%	54%	61%	61%	78%	76%	69%	68%
2016 Retention	84%	83%	84%	82%	87%	88%	77%	75%	81%	79%	88%	86%	84%	83%
2017 Success	71%	70%	71%	67%	79%	78%	54%	55%	62%	60%	81%	77%	71%	69%
2017 Retention	84%	83%	86%	82%	90%	89%	79%	75%	81%	79%	88%	86%	85%	83%
2018 Success	73%	70%	71%	67%	76%	77%	51%	55%	66%	60%	80%	77%	72%	68%
2018 Retention	86%	83%	85%	82%	88%	88%	72%	75%	84%	79%	89%	86%	85%	83%
2019 Success	76%	70%	70%	66%	81%	77%	57%	54%	69%	60%	78%	76%	73%	68%
2019 Retention	88%	84%	85%	83%	91%	87%	77%	76%	86%	80%	87%	85%	87%	83%
2020 Success	78%	71%	75%	67%	86%	78%	62%	57%	72%	61%	82%	78%	77%	69%
2020 Retention	89%	85%	88%	83%	93%	87%	83%	76%	87%	81%	89%	87%	88%	84%
2021 Success	86%	82%	83%	80%	88%	88%	76%	70%	77%	75%	92%	89%	84%	81%
2021 Retention	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
2022 Success	73%	67%	72%	64%	78%	73%	58%	52%	67%	58%	82%	76%	73%	66%

2022 Retention	88%	84%	88%	83%	88%	85%	82%	76%	86%	80%	92%	87%	88%	83%
	F = Female; M = Male; A = Asian; B = Black; L = Latine/x; W = White													

Table 5 indicates the following:

- In most gender and racial/ethnic categories, the ES Department is slightly ahead of the SMC college-wide percentages for Student Success and Retention over the period fall 2016 through fall 2022.
- The highest rates for Student Success and Retention both in the ES Department and SMC college-wide are for the 'Asian' and 'White' racial/ethnic categories.
- The lowest rates for Student Success and Retention both in the ES Department and SMC college-wide are for the 'Black' category, followed by the 'Latine/x' category.
- 'Female' students have slightly higher Student Success and Retention rates than 'Male' students in both the ES Department and SMC college-wide.
- Student Success and Retention rates for all gender and racial/ethnic categories have trended upward for both the ES Department and SMC college-wide.

Table 6: Earth Science Student Succes & Retention by Student Age

	ES 19> years	SMC 19> years	ES 20-24 years	SMC 20-24 years	ES 25-40 years	SMC 25-40 years	ES 40+ years	SMC 40+ years
2017 success	73%	69%	69%	68%	71%	70%	69%	70%
2017 retention	86%	84%	86%	83%	82%	81%	80%	80%
2018 success	76%	69%	72%	68%	69%	69%	73%	70%
2018 retention	86%	85%	86%	82%	83%	81%	82%	81%
2019 success	76%	66%	73%	69%	71%	70%	78%	69%
2019 retention	89%	84%	86%	84%	84%	82%	91%	80%
2020 success	79%	67%	76%	70%	74%	72%	78%	75%
2020 retention	90%	85%	88%	84%	86%	83%	88%	84%
2021 success	85%	78%	82%	81%	84%	86%	88%	87%
2021 retention	100%	100%	100%	100%	100%	100%	100%	100%
2022 success	78%	65%	71%	67%	71%	67%	61%	68%
2022 retention	91%	84%	87%	83%	86%	81%	79%	81%

Table 6 indicates the following:

- In all age categories, the ES Department is slightly ahead of the SMC college-wide percentages for Student Success and Retention over the period fall 2017 through fall 2022, except in the 40+ age category for 2017 (student success) and 2022 (student success and student retention).
- The highest rates for Student Success and Retention over the period fall 2017 through fall 2022 are for the '19> years old' group.

Table 7: Earth Science Student Succes & Retention by Student Residence

	ES CA	SMC CA	ES Out	SMC Out	ES Int	SMC Int	ES TTL	SMC TTL
2016 Success	68%	66%	70%	65%	80%	80%	69%	68%
2016 Retention	83%	80%	86%	81%	92%	94%	84%	83%

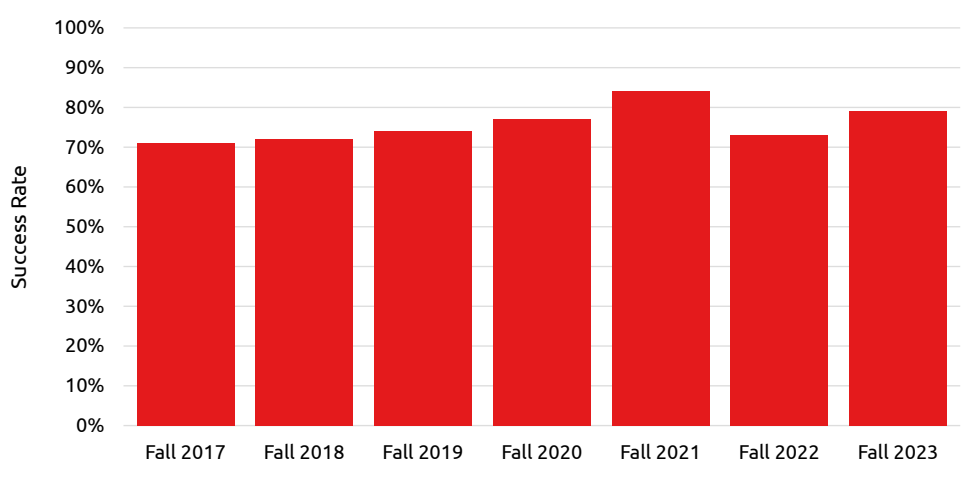
2017 Success	70%	67%	65%	66%	81%	81%	71%	69%
2017 Retention	84%	81%	82%	80%	96%	94%	85%	83%
2018 Success	71%	66%	70%	66%	82%	82%	72%	68%
2018 Retention	84%	81%	82%	81%	96%	94%	85%	83%
2019 Success	72%	65%	72%	67%	84%	83%	73%	68%
2019 Retention	86%	81%	87%	83%	94%	95%	87%	83%
2020 Success	76%	68%	71%	68%	91%	83%	77%	69%
2020 Retention	88%	83%	86%	83%	98%	94%	88%	84%
2021 Success	84%	81%	84%	80%	84%	86%	84%	81%
2021 Retention	100%	100%	100%	100%	99%	99%	100%	100%
2022 Success	71%	64%	78%	68%	85%	80%	73%	66%
2022 Retention	87%	82%	90%	84%	96%	94%	88%	83%
	CA = CA resident; Out = Out of State; Int = International Student							

Table 7 indicates the following:

- In all student residence categories, the ES Department is slightly ahead of the SMC college-wide percentages for Student Success and Retention over the period fall 2016 through fall 2022.
- The highest rates for Student Success and Retention over the period fall 2016 through fall 2022 are for 'International Students'. This probably reflects this groups higher economic status in comparison to 'California Residents' and 'Out of State Residents'.
- Student Success and Retention rates for all residence categories have trended upward slightly for both the ES Department and SMC college-wide.

Course Success Rates

Earth Science



Measures: Success Rate and Success Count and Attempts

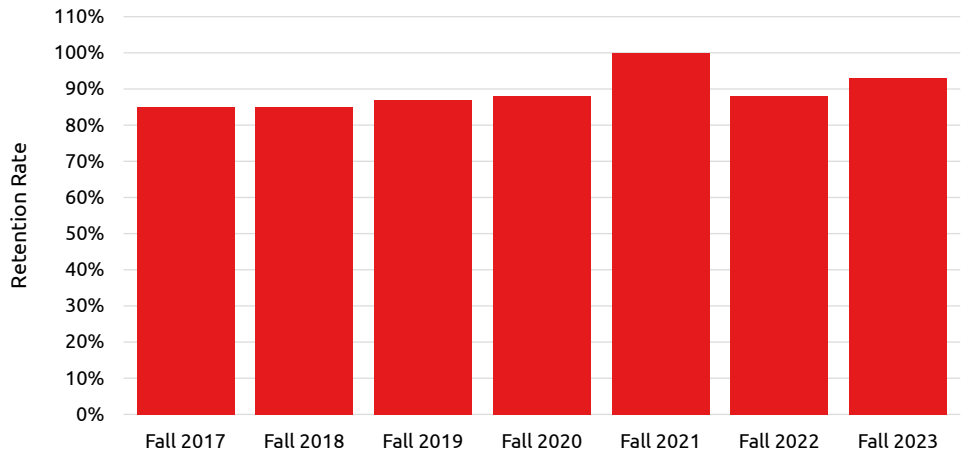
	Fall 2017			Fall 2018			Fall 2019			Fall 2020			Fall 2021			Fall 2022	
	Success Rate	Success Count	Attempts	Success Rate	Success Count	Attempts	Success Rate	Success Count	Attempts	Success Rate	Success Count	Attempts	Success Rate	Success Count	Attempts	Success Rate	Success Count
Measures	71%	2,203	3,115	72%	2,011	2,800	74%	1,967	2,670	77%	2,229	2,902	84%	2,008	2,395	73%	1,931

Credit Courses Only

Course Retention Rates

Earth Science

Limits: **Course Credit Type** Credit, Degree Applicable, Credit, Not Degree Applicable **Course Retention** Not Retained, Retained



Limits: **Course Credit Type** Credit, Degree Applicable, Credit, Not Degree Applicable **Course Retention** Not Retained, Retained

Measures: Retention Rate

	Fall 2017	Fall 2018	Fall 2019	Fall 2020	Fall 2021	Fall 2022	Fall 2023
Measures	85%	85%	87%	88%	100%	88%	93%

Credit Courses Only

14b. Disaggregated data: Which racial/ethnic student group completes their courses at the highest rates? Which racial ethnic groups experience the largest gaps when compared to the highest performing group? Analyze the trends across the last review period.

Over the previous three Fall semesters (2020, 2021 and 2022) Individuals with disabilities, Female, White, Asian students have been the highest performing groups according to our Term Course Success Rates for Equity Populations data. Conversely Black, Latina/o/x, and Foster Youth have experienced the largest disproportionate impact during the same period. These are percentage point groups (relative to highest performing) of the latter groups for those semesters.

Earth Science Department

	Fall 2022	Fall 2021	Fall 2020
Black	-23%	-15%	-24%
Foster Youth	-18%	-9%	-30%
Latina/o/x	-14%	-15%	-14%

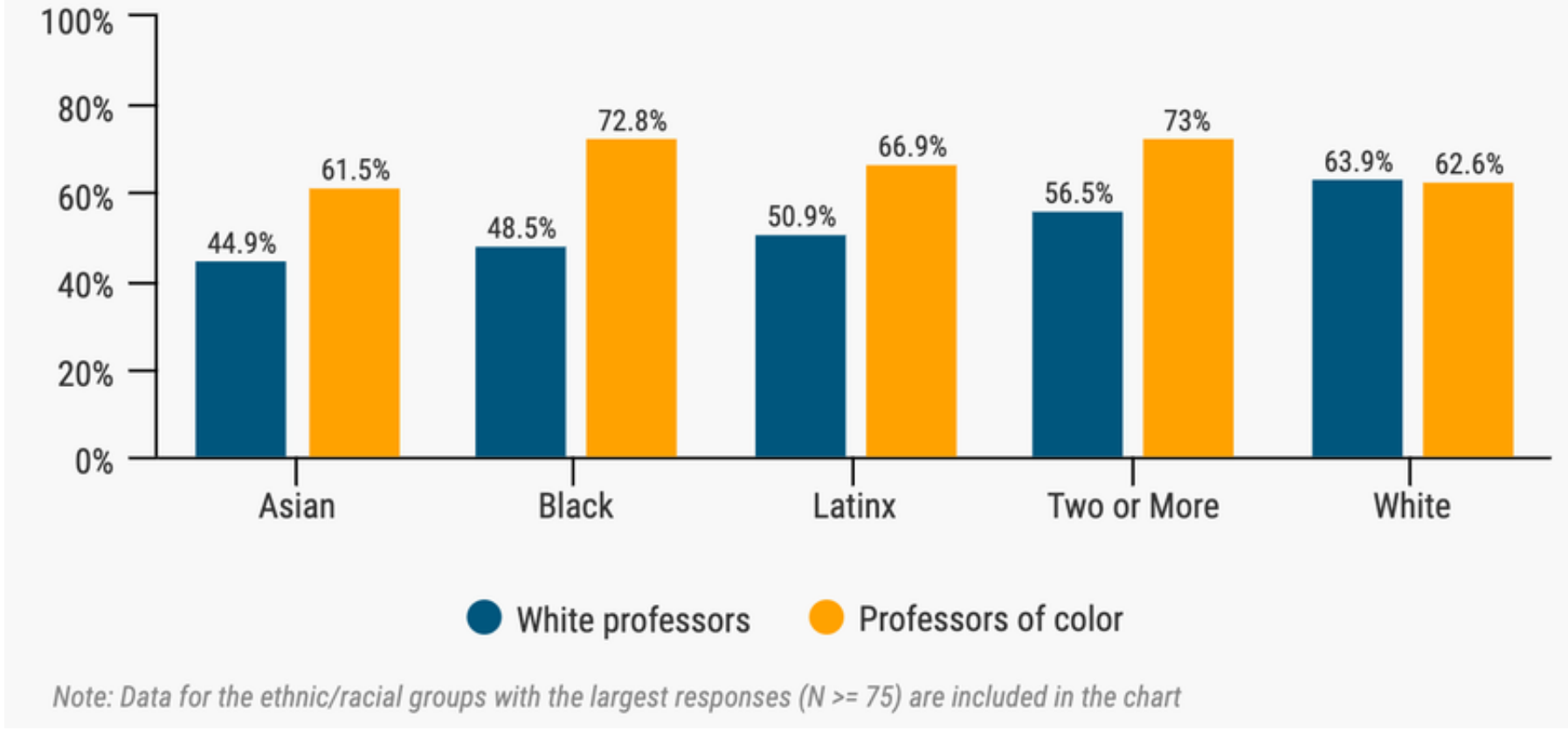
These gaps are similar in magnitude to those seen at the college-wide level:

College-wide

	Fall 2022	Fall 2021	Fall 2020
Black	-23%	-19%	-21%
Foster Youth	-16%	-15%	-20%
Latina/o/x	-16%	-14%	-16%

14c. Equity Gaps: What factors are contributing to the equity gaps? Consider factors that relate to people, programs, practices, and policies in the classroom, program, or college.

Our Institutional Research outlined some of the outstanding issues facing our disproportionately impacted students in the National Assessment of Collegiate Campus Climates (NACCC): 2019 Administration and Summary of Findings report. On average, Asian (48%) and Latinx students (64%) felt they 'mostly' or 'strongly mattered' in the out-of-class campus spaces (average across all items) when compared to other racial/ethnic groups. Overall, a larger proportion of students indicated they 'mostly' or 'strongly mattered' in classes taught by professors of color (70%) than classes taught by White professors (58%). The report includes the following table showing that students (N = 75) experienced higher concerns for their feelings and experiences from professors of color compared to White professors for all racial/ethnic student groups except for White.



Faculty in our department may need to highlight to a greater degree the various resources at SMC that can help better support students (e.g., GPS, Direct Connect, The Center for Wellness and Wellbeing, counselling, special programs). Class times, course modalities and classroom policies can disproportionately negatively impact certain students more than others, e.g., only offering on-ground options for certain courses or harsh late attendance policies impact students who travel greater distances to campus.

Data from NPSAS and elsewhere (e.g., Wood 2010, Wood et al 2015) show that students experiencing the largest equity gaps are oftentimes more likely to be faced with financial and employment instability, are more likely to spend more time commuting to class, more likely than their peers to have financial dependents, are more likely to have physically demanding jobs and late nights shifts and are more likely to experience stressful life events.

14d. What else does your program need to know to better understand how to address equity gaps in your program's course success and retention rates?

Four of our full-time faculty (Ciarán Brewster [anthropology faculty, principal investigator, and equity coach], Lisa Collins [geology, equity coach], Christyanne Melendez [geology, faculty participant] and Jing Liu [geography, participant]) participate in the NSF grant *Fostering an Equity-Minded Student Success Culture in STEM through Faculty Development.* The multiyear grant exposes STEM faculty to proven high-impact equity practices through varied professional development with the goal of faculty implementing practices in their classes and broadly disseminating their results to promote a positive equity culture on our campus. The intensive work aims to show participants ways to equitize their courses through careful content consideration, policy adjustment, and using technology to create true classroom community.

13 of our faculty have participated as part of the first Equitizing Gateway Courses cohort. Both full-time and part-time participated as coaches and participants although it was the same full-time faculty that participated in the NSF grant that participated in EGC.

Numerous Department faculty (including Ciarán Brewster, Victoria Charles, Lisa Collins, Joy Fritschle, Gillian Grebler, Jing Liu, Christyanne Melendez and Eric Minzenberg) have participated in various CORA training courses including "Teaching Men of Color in the Community College", "Course Design for Racial Equity", and "Black Minds Matter".

SLO Mastery Rates:

15a. Description of process: Describe your program's processes and practices for defining, assessing, and analyzing learning outcomes. Include a discussion of how your program uses the results of SLO data to inform course and program improvement efforts.

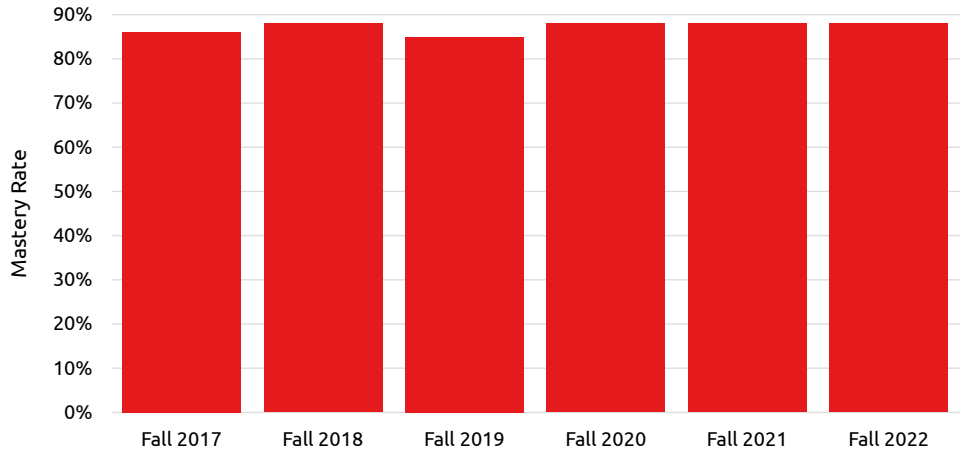
Currently our faculty do not find the SLO data for course or program level outcomes to be helpful or instructional. That data is not currently incorporated into our long-range forecasting. (Every Earth Science course assess all course SLOs, for every enrolled student, in every semester.) It is hoped that the current SLO Ambassador program will help the department rethink how we assess SLO's and how it can be helpful for our department.

15b. Most salient findings: Describe the most salient results of course or program SLO mastery rates data over the last review period, including results of disaggregated data. Include a discussion of how the results will be used to improve student learning.

Our department does not use SLO mastery data nor do we find it instructional for improving student learning.

Course SLO

Earth Science



Measures: Mastery Rate and Successes and Attempts

	Fall 2017			Fall 2018			Fall 2019			Fall 2020			Fall 2021			
	Mastery Rate	Successes	Attempts	Mastery Rate	Successes	Attempts	Mastery Rate	Successes	Attempts	Mastery Rate	Successes	Attempts	Mastery Rate	Successes	Attempts	Mastery Rate
Measures	86%	4,952	5,782	88%	4,002	4,529	85%	3,916	4,582	88%	3,537	4,036	88%	3,182	3,618	88%

Degrees and Certificates:

16a. Analyze your program's degree and certificate award trends against your department's institution-set standards (minimum threshold) and improvement goals. Document any significant changes or trends over the last review period.

A minimum of 56 students will have earned the State Certificate of Achievement in Cultural Resource Management by summer, 2024. The popularity of the CRM Certificate and the number of recipients is impressive considering the instructional challenges faced during the pandemic. Interest has increased each year, and we anticipate that an additional 12 students will earn the State Certificate of Achievement by the end of the Fall 2024 semester.

Term	RRM No. of AA Degrees Awarded	RRM No. of certificates awarded (18 units)	RRM No. of Departmental Certificates awarded 12 units
2020-21	4	2	23
2021-22	11	9	18
2022 -23	5	3	13

Term	Noncredit SST
2020-21	68
2021-22	37
2022-23	22

The Geospatial Technology Department Certificate was established in 2017, and there have been 27 students successfully finished the certificate program and received the certificate. There are 2 students are applying for the Certificate of Achievement in Geospatial Technology this year (2024)

Degrees and Certificates

Earth Science

Measures: Degrees and Certificates

Award Type Detailed	Program Title	2015-2016	2014-2015	2016-2017	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023
A.A.-T	**Anthropology**	0	0	2	19	21	33	17	20	27
	Geography	3	0	3	2	3	7	9	5	6
	Total	3	0	5	21	24	40	26	25	33
A.S.	**Recycling and Resource Management**	5	1	5	3	9	7	4	11	5
	Solar Photovoltaic and Energy Efficiency	2	2	5	3	2	1	2	0	0
	Total	7	3	10	6	11	8	6	11	5
Cert 12 to 17 Units	**Solar Photovoltaic Installation**	0	0	0	1	0	0	0	0	0
	Total	0	0	0	1	0	0	0	0	0
Cert 16 to 29 Units	**Recycling and Resource Management**	0	0	0	0	3	3	2	9	3
	Solar Photovoltaic Installation	0	0	0	0	1	1	0	0	0
	Total	0	0	0	0	4	4	2	9	4
Cert 18 to 29 Units	**Recycling and Resource Management**	0	0	0	4	0	0	0	0	0
	Total	0	0	0	4	0	0	0	0	0
Cert 30+ Units	**Cultural Resource Management**	0	0	0	0	0	0	20	5	0
	Recycling and Resource Management	4	3	6	0	0	0	0	0	0

	Solar Photovoltaic Installation	3	2	6	0	0	0	0	0	0
	Total	7	5	12	0	0	0	20	5	0
Departmental Cert	**Basic Solar Photov Install**	0	0	0	0	7	0	0	0	0
	Recycling and Zero Waste	0	0	0	0	14	0	0	0	0
	Total	0	0	0	0	21	0	0	0	0
Noncredit Cert	**Sustainability Assistant**	0	0	0	0	0	0	23	17	4
	Sustainability Services Technician	0	0	0	0	0	6	27	5	2
	Sustainability in Organics Aide	0	0	0	0	0	21	18	15	16
	Total	0	0	0	0	0	27	68	37	22
Total		17	8	27	32	60	79	122	87	64

16b. Which student racial/ethnic groups disproportionately earn more awards in your program? Which racial/ethnic groups earn disproportionately fewer degrees and certificates?

We do not have any data on the racial/ethnic identity of the students from our department who are awarded Certificates and degrees.

16c. Based on your analyses, what changes is your program exploring, including addressing any equity gaps?

A number of full-time and part-time faculty in the department have participated in or are leads in equity initiatives on campus. For example, multiple full-time and part-time faculty have completed or led the NSF-funded "Fostering an Equity-Minded Student Success Culture in STEM through Faculty Development" program. In addition, multiple full-time and part-time faculty have completed the Equitizing Gateway Courses (EGC) program. Each of these programs have introduced participating faculty to strategies that foster and support equity in the classrooms. The impact of implementing these strategies is assessed both at the individual level and through externally-evaluated surveys.

If applicable:

17a. Labor Market Data: Discuss the labor market demand for your program. What is the gap between demand and supply? How does labor market data inform your overall program planning?

Geoscience (Geology)

Takeaways:

- **Demand (Sectors to Experience Growth):** Employment projections from the U.S. Bureau of Labor Statistics indicate a 4.9% increase in geoscience jobs between 2019 and 2029, which exceeds the projected growth of the U.S. workforce over the same timeframe (3.7%). Job growth in geoscience will be concentrated within the professional, scientific, and technical services sector. Currently 39% of geoscientists work in these sectors.
- **Demand (Sectors to Experience Loss):** The sectors that are expected to experience a decline in total geoscience employment between 2019 and 2029 are the oil and gas extraction industry, jobs with the federal government, and jobs with utilities, wholesale trade, and manufacturing sectors.
- **Typical Entry-Level Education:** Bachelor's Degree
- **Wage:** As of 2022, $87,480 was the median pay ($42.06/hr).
- **Number of Jobs:** In 2022, the U.S. Bureau of Labor Statistics record 26,300 geoscience jobs. The average growth rate for geoscience jobs from 2022 - 2032 is 5%, faster than the average for all occupations.
- **Supply:** SMC students may now declare and follow an AS-T in Geology, which prepares them to complete a bachelor's degree at a transfer institution. Geology enrollment is consistently strong, so much so that demand for geology courses exceeds available instructors. The current course curriculum available at SMC supports the transition away from extractive career prospects by following a curriculum rooted in sustainability. Courses currently offered that best address this demand include: Physical Geology with or without lab, Introduction to Environmental Geology, Introduction to Physical Oceanography with Lab with or without lab.
- **Summary Report (2022):** https://www.bls.gov/ooh/life-physical-and-social-science/geoscientists.htm

Conclusion:

Geoscience is a growing field that is well equipped to meet the burgeoning renewable energy and environmental science demands that are and will be replacing extractive industries, such as oil and gas. Geology enrollment is strong and consistent. The two full-time geology instructors, Christyanne Melendez and Lisa Collins, continue to develop and expand the curriculum while promoting course offerings.

Geospatial Technology Labor Market Data report (2022) https://drive.google.com/file/d/1sJqLcfEEpJ9uTX89DX87veHT0Md9m1A5/view?usp=sharing

Discussion:

- **Demand and Supply**: Over the next five years, there is projected to be 172 jobs available annually in the greater Los Angeles region due to new job growth and replacements, which is more than the 87 awards conferred annually by educational institutions in the region.
- **Living Wage:** In Los Angeles County, the typical entry-level hourly wage for surveying and mapping technicians is $29.27, which is above the self-sufficiency standard wage e (living wage) for one adult in the region ($18.10 in Los Angeles County).
- **Educational requirements** – The Bureau of Labor Statistics (BLS) lists a high school diploma or equivalent as the typical entry-level education for surveying and mapping technicians. However, national-level educational attainment data indicates that 56% of workers in the field have completed some college or an associate degree.
- **Supply**: Between 2017 and 2020, five community colleges in the LA/OC region issued awards in programs that have historically trained for the middle-skill occupation of interest, conferring an average of 87 awards. Currently, there are no non-community college institutions in the

LA/OC region that have conferred awards in relevant programs.

Conclusion:

There is an obvious gap between supply and the demand. We need to further promote and expand our program and provide our students training on highly demanded Geospatial Technology knowledge and skills.

Labor Market data for RRM (2024):

- **Demand and Supply**: Over the next five years, there is projected to be an increase by 5% through 2027, 340 job openings annually for middle-skill environmental technology occupations in the Greater LA/OC region due to job growth and replacements. 65% were located in Los Angeles County.
- **Living Wage:** Entry level wages above the self-sufficiency standard wage for one adult. Wages are between $20.82 and $28.53 entry level. Experienced workers can expect wages between $29.93 and $41.86 in LA county.
- **Educational requirements:** The Bureau of Labor Statistics (BLS) lists a high school diploma or equivalent as the typical entry-level education. However, the national-level education attainment data indicates between 29%-51% of workers in the field have completed some college or an associate degree.
- **Supply**: 2019-22 in the related TOP codes: Environmental Technology (0303.00), and Water and Wastewater Technology (0958.00). The colleges with the most completions in the region are Santiago Canyon, Santa Monica, and Citrus. Currently, there are no other postsecondary institutions in the greater LA/OC region that have conferred awards in CIP codes related to environmental technology in the past three year; 65 community college awards (certificates or degrees).

RRM LMI Report https://drive.google.com/file/d/1HLWtGEbq6_BagF1uGxCUGAzeT97HsKbJ/view?usp=drive_link

Anthropology Labor Market Data (2022):

- **Demand (Sectors to Experience Growth):** Employment projection data from the U.S. Bureau of Labor Statistics indicate that the employment of anthropologists and archeologists is projected to grow 4% from 2022 to 2032, which is on par with for all occupations.
- **Typical Entry-Level Education:** Master's Degree
- **Wage:** As of 2022, $63,940 per year was the median pay ($30.74/hr).
- **Number of Jobs:** In 2022, the U.S. Bureau of Labor Statistics record 8,000 anthropology and archaeology jobs.
- **Supply:** SMC students may complete an AS-T in Anthropology, which prepares them to complete a bachelor's degree at a transfer institution. Anthropology enrollment is consistently strong, which has necessitated us adding additional class sections each semester. T
- **Summary Report (2022):** https://www.bls.gov/ooh/life-physical-and-social-science/anthropologists-and-archeologists.htm

17b. Additional Assessment: Describe the results of any additional assessment or evaluation your program conducts and how the findings inform program planning and improvement.

N/A

F. Your Program’s Past and Future

Past Action Plan:

18. Discuss the progress made on the action plan and objectives from your program’s last review.

N/A

Future Action Plan:

19a. Considering your program’s past plan and this review’s findings, what challenges and concerns need to be addressed in the next review period?

Complete the Earth Science Department's move and transition into the new Science building - scheduled for spring 2025.

Revitalize off-campus learning opportunities, which eroded during the pandemic years. These include class-specific and department-wide field trips and courses, research and internship opportunities, and study abroad/away programs of varying lengths.

19b. Identify 1 – 5 goals for your next review period’s Action Plan to address your program's challenges and concerns. Label the goals Ongoing, Revised, or New.

Due to the imminent completion of the new Science Building and associated Earth Science lab facilities:

(1) Recruit, Hire, and Train an Earth Science lab technician capable of coordinating and supporting course labs in cross-disciplinary fields such as Geophysics, Geochemistry, Physical Geology, Astrophysics, Biological Anthropology, Primatology, Paleoanthropology, and Forensic Anthropology.

(2) Recruit, Hire, and Train a full-time Director of Planetarium and Rooftop Observatory outreach programs

G. Resources and Budget

20. What are the most critical resources needed to implement your program’s Action Plan in the next review period?

People. As stated above in 19b, hiring a lab technician, and hiring a full-time Planetarium Director.

21. If additional resources are needed to implement your Action Plan, what new funding sources and/or budget reallocations is your program exploring?

The Earth Science Department used to employ a full-time Planetarium Director, Jon Hodge. After he passed away years ago, we have had to fill in the gaps with part-time contractors. Now, with the construction of the new Planetarium and world-class Astronomical Observatory atop the new Science Building (Phase 2) we are faced with an urgent need to hire two full-time staff members along the following lines summarized above in section 19b:

(1) Recruit, Hire, and Train an Earth Science lab technician capable of coordinating and supporting class experiments in cross-disciplinary fields such as Geophysics, Geochemistry, Physical Geology, Astrophysics, Biological Anthropology, Physical and Forensic Anthropology.

(2) Recruit, Hire, and Train a full-time Director of Planetarium and Rooftop Observatory outreach programs

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This form is completed and ready for acceptance.