ACADEMIC SENATE
CSU BAKERSFIELD

New Bachelor of Science in Environmental Science
RES 252636

AAC, BPC

RESOLVED: That the Academic Senate approves the proposed Bachelor of Science in Environmental Science degree program.

RATIONALE: The Bachelor of Science in Environmental Science program focuses on interdisciplinary, experiential learning in the natural sciences. It is designed for students interested in environment-related issues, including water, energy, climate change, natural resources, and pollution. This new degree program will prepare students to work in industries that can address the major environmental issues in Kern County regarding water, energy, and ecosystems. These local issues and other environmental issues throughout California are driving increasing demand for a well-prepared workforce. The Bachelor of Science in Environmental Science program addresses an important community need and every level of review has found it to be sound academically. The proposed degree program will be supported by sufficient existing resources to ensure its successful future operations.

Attachment: *Referral 2025-2026 36 New Degree Proposal for Bachelor of Science in Environmental Science*

Distribution List:

President
Provost and Vice-President for Academic Affairs
Vice-President for Student Affairs and Strategic Enrollment Management
AVP for Faculty Affairs
AVP Academic Affairs and Dean of Academic Programs
College Deans
Dean of Libraries
Dean of Antelope Valley
Dean of Extended Education and Global Outreach
Associate Deans
General Faculty

Approved by the Academic Senate: March 26, 2026
Sent to the President: April 10, 2026
President Approved: April 27, 2026

ACADEMIC SENATE
CSU BAKERSFIELD

2025-2026 REFERRAL #36

New Degree Proposal for Bachelor of Science in Environmental Science

From: Melissa Danforth, Academic Senate Chair

To: Tiffany Tsantsoulas, Academic Affairs Committee (AAC) Chair
Amanda Grombly, Budget and Planning Committee (BPC) Chair

Date: January 20, 2026

cc: Katherine Van Grinsven, Academic Senate Administrative Analyst

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At their meeting on December 2, 2025, the Academic Senate Executive Committee requested that the Academic Affairs Committee (AAC) and Budget and Planning Committee (BPC) review and address the new proposal for a Bachelor of Science in Environmental Studies.

During your discussion, please consider:

- rationale as presented in the attached proposal
- impact on students.

Please take up this matter with your committees and get back to me with your recommendations. If your recommendation requires Senate action, please prepare a resolution and the rationale for the resolution.

Thank you.

Attachments:

(1) Link to view in CIM: https://next-catalog.csub.edu/programadmin/ Enter 518 in the search box.
(2) 49011_Enviormental Science.pdf

DR. MELISSA DANFORTH, CHAIR, ACADEMIC SENATE
California State University, Bakersfield
9001 Stockdale Hwy. • Mail Stop: 20 BDC • Bakersfield, CA 93311

academicsenatechair@csub.edu csub.edu/senate

49011 : ENVIRONMENTAL SCIENCE

In Workflow

1. 310 - GEOL Curriculum Review (arathburn@csub.edu)
2. NSM Curriculum Committee (dgilliland@csub.edu)
3. NSM Dean Office (jdong2@csub.edu,klopez@csub.edu)
4. Academic Programs (eadams6@csub.edu)
5. Academic Operations (amendoza145@csub.edu,czuniga-prado@csub.edu,org-curriculum@csub.edu)

Approval Path

1. Tue, 23 Sep 2025 22:41:22 GMT
   Anthony Rathburn (arathburn): Approved for 310 - GEOL Curriculum Review
2. Wed, 24 Sep 2025 22:53:01 GMT
   Denise Gilliland (dgilliland): Approved for NSM Curriculum Committee
3. Fri, 03 Oct 2025 18:20:46 GMT
   Jane Dong (jdong2): Approved for NSM Dean Office

History

1. Sep 8, 2025 by Cindy Zuniga-Prado (czuniga-prado)
2. Sep 8, 2025 by Cindy Zuniga-Prado (czuniga-prado)

Date Submitted: Tue, 23 Sep 2025 22:15:58 GMT

Viewing: 49011 : Environmental Science
Last approved: Mon, 08 Sep 2025 18:44:40 GMT
Last edit: Fri, 03 Oct 2025 18:20:26 GMT

Changes proposed by: Anthony Rathburn (001502085)

Contact

User ID
000695916

Proposer Name
Anthony Rathburn

Proposer E-mail
arathburn@csub.edu

Proposer Department
Geology

Program Information

Program Type
Bachelor of Science

Propose Program Moratorium?
No

Effective Catalog
2026-2027

Effective Term
Fall 2026

College
Natural Sciences, Mathematics, and Engineering

Department
Geology

Program Title
Environmental Science

Program Code
49011

CIP Code
30.4101 - 30.4101

Academic Career
Undergraduate

Support Type
State Support

Delivery Format
Hybrid

Is the proposed program subject to WASC Substantive Change?
No

Program Overview and Rationale

Provide a brief descriptive overview of the program citing its 1) purpose and strengths, 2) fit with the institutional mission or institutional learning outcomes and 3) the compelling reasons for offering the program at this time.

PURPOSE AND STRENGTHS
The purpose of the proposed BS in Environmental Science is to fill an important gap in science, technology, engineering, and mathematics (STEM) programs offered at CSUB, and to offer students the opportunity to obtain the interdisciplinary skills and knowledge necessary for employment infields related to environmental science. The BS in Environmental Science would be designed for students interested in environment-related issues, including water, energy, climate change, natural resources, and pollution. This degree program would focus on interdisciplinary, experiential learning in the natural sciences. The proposed program thus provides an essential, rigorous foundation in the scientific skills needed for environmental science careers. It also provides the greatest flexibility in elective courses of any environmental science program offered in California. This flexibility allows students to shape their coursework and experiences to reflect their interests and career goals.

FIT WITH INSTITUTIONAL MISSION OR LEARNING OUTCOMES
CSUB is the only public university within 100 miles, lying in the southern San Joaquin Valley in Bakersfield, the heart of Kern County. CSUB strives to be a model for supporting and educating students to become knowledgeable, engaged, innovative, and ethical leaders in the regional and global community. CSUB emphasizes its great value, student-faculty interactions, career opportunities, and community engagement. The proposed BS in Environmental Science will advance CSUB's mission, providing essential training and knowledge to students who will enter the workforce in a field critical to the future of southern California.

COMPELLING REASONS FOR OFFERING THIS PROGRAM AT THIS TIME
Environmental science issues will remain prominent in California's future, and will result in a significant need for highly trained scientists, educators, and policy-makers in environment-related fields. Many institutions in California already offer a bachelor's degree in environmental science, but CSUB is notably missing an environmental science degree, despite major environmental issues in Kern County regarding water, energy, and ecosystems. These local issues and other environmental issues throughout California are driving increasing demand for a well-prepared workforce. The proposed BS in Environmental Science at CSUB will prepare students for a wide range of available jobs relevant to their community. In addition, the personnel, courses, facilities, and equipment needed for the program all currently exist at CSUB. No new or additional resources are required to offer the program at this time.

Program Description (i.e. Catalog Description)

Program Description

The Department of Geological Sciences offers the Bachelor of Arts in Geology, the Bachelor of Science in Geology, the Master of Science in Geology, and the Bachelor of Science in Environmental Sciences. A minor in Geology is also available. Geology and Environmental Science encompass a broad array of studies focused on natural and physical sciences related to Earth and environmental issues and their impact on society. Our degree programs address geological and environmental topics related to the geosphere, biosphere, hydrosphere, and atmosphere through the development of fundamental knowledge and skills, with an emphasis on experiential learning. The curricula in the Geology and Environmental Science programs are designed to provide flexibility for interdisciplinary exploration that incorporates fieldwork, technical analysis, individual study, and research participation. Students are encouraged to take advantage of diverse opportunities to conduct fundamental and applied research with experienced research mentors using state-of-the-art scientific equipment.

CSUB is located in an excellent geographic region with convenient access to mountain ranges, valleys, rivers, deserts, oil fields, agricultural areas, nature conservancies, national parks, and the Pacific Coast.

At the completion of their Geology or Environmental Science degree program, students will have broad foundational knowledge and strong field and laboratory skills that provide them with the qualifications for professional employment as well as prepare them for continued academic studies in a graduate degree program.

Graduates with degrees in Geology or Environmental Science have excellent employment opportunities locally, across California, and elsewhere in the United States. These careers can be in government regulation, carbon management, minerals exploration, pollution remediation, energy and water resources, environmental consulting, hazard mitigation, land use planning, and conservation. The degree programs also provide a strong foundation for secondary school science teaching or graduate study in Geology and Environmental Science. Students planning on attending graduate school are advised to pursue a BS degree as the coursework typically represents the minimum coursework required for acceptance into a graduate program, including the Master of Science in Geology program at CSUB.

Program Requirements

Code	Title	Units
General Education Requirements		
Subject Area 1A: English Composition		3
Subject Area 1B: Critical Thinking		3
Subject Area 1C: Oral Communication		3
Subject Area 2: Mathematical Concepts & Quantitative Reasoning [1]		0
Subject Area 3A: Arts		3
Subject Area 3B: Humanities		3
Upper Division 3 Arts or Humanities: (3UD) [2]		3
Subject Area 4: Social and Behavioral Sciences		3
Upper Division 4 Social and Behavioral Sciences: (4UD) [2]		3
Subject Area 5A: Physical Science [1]		0
Subject Area 5B: Biological Sciences [1]		0
Subject Area 5C: Laboratory [1]		0
Upper Division 5 Science: (5UD) [1]		0
Subject Area 6: Ethnic Studies		3
General Education Subtotal		*27*
Campus Requirements		
First-Year Seminar (FYS)		2
American Institutions: Government [4]		3
American Institutions: History		3
Junior Year Diversity Requirement (JYDR)		3
Graduation Writing Assessment Requirement (GWAR)		3
Capstone [1]		0
Campus Requirement Subtotal		*14*
Major Requirements		
Required Lower Division Courses		
GEOL 2010	Physical Geology	4
GEOL 2020	Introduction to Environmental Science	4
GEOL 2050	Introduction to Soil Science	4
GEOL 2069	Sustainable Energy and Environment	3
Required Upper Division Courses		
GEOL 3010	Fundamentals of Geochemistry	4
GEOL 3080	Geomorphology	4
GEOL 4010	Hydrogeology	4
GEOL 4050	GIS for Natural Sciences	4
GEOL 4200	Professional Development for BA-BS Students	2
GEOL 4928	Senior Seminar for Environmental Science	1
ERM 4110	Environmental Law I	3
INST 4200	Electronic Legal Research Methods	1
Select a minimum of 20 units [3]		20
Required Cognates		
Complete 15 units of Cognates		15
Biology Cognate		
Select one of the following courses:		
BIOL 2010	Introductory Biology - Cells	

BIOL 2110	Introductory Biology - Animals	
BIOL 2120	Introductory Biology - Plants	
Chemistry Cognate		
Select one of the following courses (or equivalent):		
CHEM 1000	Foundations of Chemistry	
CHEM 1010	Preparation for College Chemistry	
Mathematics Cognate		
Select one of the following courses (or equivalent):		
MATH 1060	Precalculus II	
MATH 2010	Calculus for the Biological and Chemical Sciences I	
MATH 2310	Single Variable Calculus I for Engineers	
MATH 2510	Single Variable Calculus I	
Physics Cognate		
Select one of the following courses:		
PHYS 2110	College Physics I	
PHYS 2210	Physics for Scientists and Engineers I	
Major Subtotal [4]		*73*
Additional Units Needed Towards Graduation		**6**
Total Units		**120**

[1]
- Some General Education requirements are covered within the major and cognates.
  - Subject Area 2, 5A, 5B, and 5C
- Some Campus Requirements are satisfied in the major and cognates.
  - Capstone

[2] General Education courses for Upper Division Areas 3 and Upper Division Area 4 that are particularly relevant to the Bachelor of Science in Environmental Sciences:
- Upper Division Areas 3 (3 units are required for GE)
  - COMM 3089 Communication and the Environment
  - ENGL 3268 Writing Nature: Literature and the Environment
  - HIST 3258 The American Environment
  - PHIL 3368 Environmental Philosophy
- Upper Division Area 4 (3 units are required for GE)
  - ECON 3418 Energy Economics and Policy
  - ECON 3508 Environmental Economics
  - SOC 4008 Society and the Natural Environment

[3]
- Select a minimum of 20 units in any combination of:
  - natural science (GEOL, BIOL, CHEM, PHYS), mathematics (MATH), engineering (ENGR), computer science (CMPS), or public health (PH) disciplines, with at least 12 units from upper division courses.
- Students should check with their advisors about prerequisites for interdisciplinary elective courses. GE courses are not acceptable as interdisciplinary electives. Courses required for the Environmental Science B.S. degree (including cognates) cannot be counted as interdisciplinary electives. A maximum of four (4) units of research may be applied toward interdisciplinary elective requirements.

[4] The minimum acceptable GPA for these 73 units is 2.0

[5] American Institution - Government (American & Constitutional Ideals) satisfies one course of the two required in Subject Area 4.

Note: One semester unit normally represents 50 minutes of lecture or 150 minutes of laboratory study. For every unit, students are expected to devote 2-3 hours of outside study per week.

Program Learning Outcomes

Program Learning Outcome. Identify each PLO one by one (select the green "+" to add)

PLO 1: Utilize the scientific method and integrate the fundamental principles of geology, biology, chemistry, and physics to address complex environmental issues.

- 1. Goal 1: Critical reasoning and problem solving skills
- 3. Goal 3: Discipline-based and career knowledge
- 4. Goal 4: Numerical literacy
- 6. Goal 6: Students will develop a well rounded skill set.

Program Learning Outcome. Identify each PLO one by one (select the green "+" to add)

PLO 2: Be able to work individually and collaboratively in the collection, organization, analysis, and interpretation of environmental datasets in both field and laboratory settings.

- 1. Goal 1: Critical reasoning and problem solving skills
- 3. Goal 3: Discipline-based and career knowledge
- 4. Goal 4: Numerical literacy
- 5. Goal 5: Students will become engaged citizens.
- 6. Goal 6: Students will develop a well rounded skill set.

Program Learning Outcome. Identify each PLO one by one (select the green "+" to add)

PLO 3: Recognize the interactions and feedbacks between human activities and the natural environment at the local, national, and global scales.

- 1. Goal 1: Critical reasoning and problem solving skills
- 3. Goal 3: Discipline-based and career knowledge
- 5. Goal 5: Students will become engaged citizens.
- 6. Goal 6: Students will develop a well rounded skill set.

Program Learning Outcome. Identify each PLO one by one (select the green "+" to add)

PLO 4: Communicate effectively about environmental issues to both scientific and general audiences in written, oral, and visual formats.

- 1. Goal 1: Critical reasoning and problem solving skills
- 2. Goal 2: Oral and written communication
- 6. Goal 6: Students will develop a well rounded skill set.

Program Learning Outcome. Identify each PLO one by one (select the green "+" to add)

PLO 5: Demonstrate interdisciplinary knowledge and skills appropriate for graduate school or a career in environmental science.

- 1. Goal 1: Critical reasoning and problem solving skills
- 2. Goal 2: Oral and written communication
- 3. Goal 3: Discipline-based and career knowledge
- 4. Goal 4: Numerical literacy
- 5. Goal 5: Students will become engaged citizens.
- 6. Goal 6: Students will develop a well rounded skill set.

Learning Outcomes Display (show only)

Course Code	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5
GEOL 2010	#	#	#	#	#
GEOL 2020	#	#	#	#	#
GEOL 2050	#	#	#	#	#
GEOL 2069	#	#	#	#	#
GEOL 3010	#	#	#	#	#
GEOL 3080	#	#	#	#	#
GEOL 4010	#	#	#	#	#
GEOL 4050	#	#	#	#	#
GEOL 4200	#	#	#	#	#

GEOL 4928					
ERM 4110	#		#	#	#
INST 4200	#			#	#
BIOL 2010	#	#			#
BIOL 2110	#	#			#
BIOL 2120	#	#			#
CHEM 1000	#	#			#
CHEM 1010	#	#			#
MATH 1060	#	#			#
MATH 2010	#	#			#
MATH 2310	#	#			#
MATH 2510	#	#			#
PHYS 2110	#	#			#
PHYS 2210	#	#			#

Download the Curriculum Map PDF from the CIM Program Homescreen

Attach Curriculum Map
Curriculum Map Matrix.pdf

Attach 5 Year Assessment Plan
Comprehensive Assessment Plan and 5-yr Schedule.pdf

Does the program use courses offered by other programs?
Yes

Affected Departments

Department
Biology
Chemistry and Biochemistry
Mathematics
Physics and Engineering
Public Health
Economics
Computer & Electrical Engr & Computer Science

Attach letter of support from relevant department(s)
Letters of support from relevant Departments .pdf

The total number of units required for graduation (not just the total for the major):
120

Does this baccalaureate program require more than 120-semester units?
No

Does this program have any concentrations or emphasis planned under the proposed major?
No

List any new courses that are: (1) needed to initiate the program or (2) needed during the first two years after implementation. Include proposed catalog descriptions for new courses. For graduate program proposals, identify whether each new course would be at the graduate- or undergraduate-level.

NONE

Attach a proposed course-offering plan for the first three years of program implementation, indicating likely faculty teaching assignments.

3-yr Teaching Plan.pdf

Please specify the total number of prerequisite units required for the major. Note: The prerequisites must be included in the total program unit count.

0

For undergraduate programs, specify planned provisions for articulation of the proposed major with community college programs.

The proposed BS in Environmental Science relies entirely on existing courses in Geology, as well as cognate courses in Chemistry, Biology, Physics, and Mathematics. Articulation agreements with local community college programs already exist for many of the lower division and cognate courses required for the BS in Environmental Science. Requests for credit based on community college coursework, when an articulation agreement is not in place, will be evaluated on a case-by-case basis. Additional articulation agreements will be negotiated with community college programs as appropriate and will follow existing campus procedures.

Academic Roadmap Attachment

Roadmaps Environmental Science.pdf

Does this program change create new alignment with an ADT?

No

Is this program:

Currently accredited

Describe how accreditation requirements will be met, if applicable.

No specialized accreditation is required for this program.

Student Demand

Provide compelling evidence of student interest in enrolling in the proposed program. Types of evidence vary and may include (for example), national, statewide, and professional employment forecasts and surveys; petitions; lists of related associate degree programs at feeder community colleges; reports from community college transfer centers; and enrollments from feeder baccalaureate programs.

Included among other strong evidence for student interest in a BS in Environmental Science is the data from a similar program that was recently launched at the CSU campus closest to CSUB: CSU Northridge, 99 miles to the south of CSUB. The Department of Geological Sciences at CSU
Northridge started a BA in Environmental Science in Fall 2022. They proceeded to triple the number of majors in the department over the next three years, from 46 total majors in Geology (31), Geophysics (6), and Environmental Science (9) programs combined in Fall 2022, to 144 total majors (104 in the Environmental Science program) in Fall 2024. Applicants to the program increased from 75 in Fall 2022 to nearly 300 in Fall 2024. The enrollment data are shown in the figure below. The BS in Environmental Science at CSUB is anticipated to have similarly high student demand.

At CSUB, surveys of student interest in obtaining a degree in environmental science from CSUB were sent to dual enrollment geology classes at local high schools. Of the 121 dual enrollment students surveyed, 78 (64%) agreed or agreed strongly that they were interested in environmental issues, and 50 (41%) agreed or agreed strongly that they would consider an interdisciplinary major in environmental science. This indicates considerable interest in a BS in Environmental Science from the population of local high school students who are already taking courses to earn college credit. The same survey was distributed to students in GE Physical Geology and Natural Disasters courses at CSUB, most of whom were non-STEM majors. Of the 87 respondents (out of a total of 134 students in the courses), 62 (71% of the respondents, 46% of the total surveyed students) agreed or agreed strongly that they were interested in environmental issues, and 31 (36% of the respondents, 23% of the total surveyed students) agreed or agreed strongly that they would consider an interdisciplinary major in environmental science. This interest in the BS in Environmental Science even from students who have already chosen a different, non-STEM major suggests there will be substantial interest in students changing majors to join the program.

Identify how issues of diversity and access to the university were considered when planning this program. Describe what steps the program will take to insure ALL prospective candidates have equitable access to the program. This description may include recruitment strategies and any other techniques to insure a diverse and qualified candidate pool.

As with most of the undergraduate degree programs at CSUB, the proposed BS in Environmental Science is designed to serve the local community by covering topics relevant to Kern County and California, as well as training students to enter a growing workforce. We intend to recruit primarily from the Kern County and broader southern California region. Recruitment activities will

build on successful approaches used for attracting a diverse community of students into the BS in Geology program. These activities include hosting department and university tours for students and their families; running a career day for local students to explore opportunities; public outreach events and activities, e.g., at local museums and at community events; giving presentations and Q&A opportunities at regional community colleges; and by networking and outreach through the Department of Geological Sciences' extensive dual-credit program at regional high schools. These activities are targeted to recruit from the regional population, which is composed of over 65% from minority backgrounds, primarily of Hispanic origins. Similar activities have been successful in growing a diverse student population within the Department of Geological Sciences and more broadly at CSUB. The demographics of the CSUB student population, including most CSUB STEM majors, generally reflect the demographics of the regional community.

Describe professional uses of the proposed degree program.

Graduates from the proposed BS in Environmental Science program will be well prepared for jobs in government, industry, and education. Professional roles for those with a comparable bachelor's degree in currently open job positions in California include environmental remediation, environmental historical preservation, water permitting, environmental data science and analytics, site assessment, ecological impact assessment, hydrogeology, health and safety, and more. All students graduating from this program will be generally prepared for a variety of available jobs.

We have built substantial flexibility in the elective courses a student can take for earning a BS in Environmental Science. The specific direction a student chooses to take with their elective courses will make additional, more specific types of jobs available to them. Students focusing on elective courses in Geological Sciences will be better suited for jobs in hydrology, land use, erosion, and hazards. Students taking elective courses in Biology will be better suited for jobs in ecosystem analysis, ecological impacts, and wildlife preservation. Students taking elective courses in Chemistry will be better suited for jobs in water quality and contamination issues. Students taking elective courses in Physics, Engineering, Mathematics, or Computer Science will be better suited for jobs in environmental data analytics and modeling.

All these job positions come from a search of open jobs in California for environmental scientists and related fields.

Anticipated Student Demand (Majors)

	At Initiation	After 3 Years	After 5 Years
Number of Majors (Annual)	10-20	50-100	100-150
Number of Graduates (Cumulative)	0	10-20	40-80

Attach documentation as needed:

Student demand graph.pdf

Societal and Public Need for the Proposed Degree Major Program

List other California State University campuses currently offering or projecting the proposed degree major program; list neighboring institutions, public and private, currently offering the proposed degree major program.

Institution(s)
CSU Channel Islands (driving distance from CSUB: 119 mi)
Chico State (368 mi)
Cal State East Bay (256 mi)
Fresno State (117 mi)
Cal Poly Humboldt (549 mi)
Cal State Long Beach (139 mi)
CSU Monterey Bay (210 mi)
CSU Northridge (99 mi)
Sacramento State (287 mi)
Cal State San Bernardino (163 mi)
Cal State San Bernardino (163 mi)
San Diego State (251 mi)
San Francisco State (284 mi)
San Jose State (237 mi)
Cal Poly San Luis Obispo (123 mi)

CSU San Marcos (213 mi)
Sonoma State (317 mi)

Describe differences between the proposed program and programs listed above.

The proposed BS in Environmental Science is unique within the California State University system and more broadly across institutions in California. There are two primary features of the proposed program that set it apart from other similar programs:

• Focus on the geoscience aspects of environmental science. Many of the required courses in the proposed degree program are geological science courses (e.g., covering hydrogeology, soil science, geochemistry, energy issues). In contrast, the existing environmental science programs include geosciences but often focus more on the biological, chemical, and/or social science aspects of the field. To emphasize the focus on geoscience, CIP code 30.4101 (Environmental Geoscience) is suggested for the proposed program. According to nces.ed.gov, the only other institution in California using the Environmental Geoscience CIP code for their program is University of the Pacific.

• Flexible choice of interdisciplinary elective courses. Environmental science is an extremely broad, interdisciplinary, and applied field. The curricula for existing environmental science programs are likewise broad, but often include only a narrow suite of course offerings, limiting student choice and disciplines covered (see the previous point). However, having the option to explore a wider array of appropriate scientific topics related to environmental science beyond the core requirements can enhance student interest and result in a more broadly trained cohort. To accommodate the interests of as many students as possible and to generate a broadly trained workforce with a rigorous core of skills and training, the proposed program allows students to select from a wide list of elective courses in related fields. This program design allows students to customize their experience to best achieve their career goals, match their topical interests, and enhance their individual strengths, while having robust interdisciplinary qualifications for environmental science jobs and graduate programs.

Below is a comparison between the proposed program and those offered at other CSU campuses. For the sake of space, we only compare to the three nearest CSU campuses (see attached table on page 7 in attachments).

List other curricula currently offered by the campus that are closely related to the proposed program.

Curricula
BA and BS in Geology; BS in Environmental Resource Management (Dr. Aaron Hegde, head of the BS in Environmental Resource Management program, provided a comparison between that program and the proposed program, demonstrating limited overlap; this comparison has been provided in as an attachment (5c).

Describe community participation, if any, in the planning process. This may include prospective employers of graduates.

The Environmental Science Program Planning Committee reached out to community members to solicit their opinions and perspectives on the proposed program, as well as the potential for graduates of the program to be hired. Several positive responses were received, including the following:

“CalGEM hires many graduates from CSUB’s geology and engineering programs. In fact, more than 40% of the technical staff in CalGEM’s Bakersfield office hold degrees from these departments, and many more CSUB alumni work throughout our organization. We consistently see the value of CSUB’s educational programs in preparing students for science-based roles in public service.

The Department of Conservation (DOC), including CalGEM and other divisions, regularly hires Environmental Scientists and Environmental Planners. These are professional classifications within the State of California that require a bachelor’s degree in environmental science as a minimum qualification. A new Environmental Science degree from CSUB would make graduates eligible for these roles and provide a direct path into state service. These entry-level positions offer clear promotional pathways, making the degree a strong launching point for long-term careers in environmental protection, planning, and regulation. Additionally, depending on the electives selected, students in the proposed environmental science program can meet the educational qualifications to be hired as Engineering Geologists—a key role at CalGEM.

At CalGEM, our mission is to ensure that oil wells and underground injection projects are operated safely, in compliance with regulations, and in a way that protects public health, groundwater, and the environment. One of the biggest challenges we face is the implementation of the California Environmental Quality Act (CEQA), which requires environmental review and mitigation for energy development projects. Environmental Scientists and related professionals play a critical role in this work. Increasing the number of qualified environmental science graduates will help alleviate this bottleneck and support California’s broader climate and clean energy goals.

I support the creation of the BS in Environmental Science at CSUB and believe it will be a valuable addition to the region’s academic and professional landscape.”

Matthew Van Grinsven
Senior Oil and Gas Engineer
California Geological Energy Management

California Department of Conservation

“During my student-professional career (1989-current), I have been an officer or member of the San Joaquin Geological Society (GS), New Orleans GS, Houston GS, currently am president of the Los Angeles Basin GS, and happen to be president-elect of the Pacific Section of the American Association of Petroleum Geologists.

The creation of an Environmental Sciences BS program is an excellent idea. The need for such a program is manifest and the demand for the skills produced by it will only grow in the future. Land use, surface faulting, environmental remediation & clean up, site restoration, and advisory, just to name the low-hanging fruit, have been live issues in all the areas where we have lived and worked, in particular California.

An Environmental Sciences professional should have a seat at the table for the monumental task of the progressive abandonment and re-purposing of the vast tracts of land currently occupied partially or totally by oilfield operations. This mega project will break into public- and privately-funded efforts, will have innumerable issues to consider, and will take decades to complete. Re-use and re-purposing conversations are happening now as you're no doubt aware.

I am pleased to learn of this development and pledge to advocate for its development, specifically by getting the word out to my professional sphere of influence. I am excited for this planned program and especially for the general good that can come from its future graduates!”

Daniel Steward
Iron Horse Consulting

“Fifty years ago 7 CSUB science students participated in a 5 year Biology Baccalaureate, with an Environmental Studies Option....The quality of my life has been greatly improved by my following through with that program. The benefits go way beyond job entitlement.”

David Hanley
Adjunct Instructor, University of La Verne
KRPF Nature Center Volunteer

“Looking into Environmental Scientist classification/series [from the California government; calhr.ca.gov]...this new degree would allow graduates to apply to these jobs.”

Grant Obenshain
Senior Oil and Gas Engineer
California Department of Conservation

Provide applicable workforce demand projections and other relevant data.

Workforce demand.docx

Existing Support Resources for the Proposed Degree Major Program

List faculty who would teach in the program, indicating rank, appointment status, highest degree earned, date and field of highest degree, professional experience, and affiliations with other campus programs. Note: For all proposed graduate degree programs, there must be a minimum of five full-time faculty members with the appropriate terminal degree.

Department of Geological Sciences Faculty with primary Environmental Science responsibilities:

• Jason Cotton, Lecturer, MS Geology 2018, BSIT 2004, CSUB faculty since 2019, specializes in data science, geographic information systems

• Robert Crewdson, Lecturer, PhD Geophysics 1976, CSUB faculty since 1991, specializes in geology, geophysics, geochemistry, hydrogeology

• Anna Cruz, Assistant Professor, PhD Geosciences 2016, CSUB faculty since 2021, specializes in environmental geochemistry, paleoclimatology

• Larry Drennan, Lecturer, MS 1979, CSUB faculty since 2017, specializes in petroleum geology, unconventional resource development

• Junhua Guo, Professor, PhD Geology 2012, CSUB faculty since 2014, specializes in sedimentology, paleoclimatology, geohazards

• Matthew Herman, Associate Professor, PhD Geosciences 2017, CSUB faculty since 2020, specializes in geodynamics, seismology, plate tectonics, numerical modeling

• Melissa Frank, Lecturer, JD 2004, CSUB faculty since 2011, Assistant General Counsel – Government Affairs at The Wonderful Company

• Alyssa Kaess, Lecturer, MS Geology 2016, CSUB faculty since 2020, specializes in reservoir analysis, mineralogy, sedimentology

• William Krugh, Professor, PhD Geosciences 2008, CSUB faculty since 2012, specializes in surface processes, tectonics, geomorphology, structural geology

• Katie O'Sullivan, Associate Professor, PhD 2013, CSUB faculty since 2015, specializes in mineralogy, petrology, planetary geology, volcanology

• Anthony Rathburn, Professor, PhD Geology 1992, CSUB faculty since 2016, specializes in micropaleontology, biogeochemistry, oceanography

• Liaosha Song, Associate Professor, PhD Geology 2018, CSUB faculty since 2018, specializes in carbon and hydrogen storage, petrophysics, geochemistry

Describe facilities that would be used in support of the proposed program.

CSUB has adequate facilities in place to support the proposed BS in Environmental Science. The Department of Geological Sciences and affiliated groups maintain spaces for faculty and students to perform research and hold teaching activities that will be utilized for the proposed program. These include the following:

• Centers of Research Excellence in Science and Technology (CREST) Lab: Modern, multi-purpose lab space for meetings, sample analysis, and computation

• Other Multi-Purpose Labs: Two additional lab rooms contain space for discussions, talks, equipment, sample analyses, and more

• Sample Preparation Lab: Multi-user lab for the preparation and analysis of rock, mineral, and soil samples

• Crushing Lab: Lab for cutting, crushing, and grinding of rock samples to liberate constituent minerals and particles

• Computer Lab: Room with (recently refreshed) computers for teaching and research

• Individual Research Labs: Labs designed for specialized equipment and analyses

• California Well Sample Repository: Well samples and data for applied courses and research

• Environmental Study Area: Outdoor classroom and outreach area on CSUB campus

• Energy Innovation Building: Labs for water and energy research, to be completed in 2027

• Cold Room Core Facility: Archive for sediment cores, used for education and outreach

Provide evidence that the institution provides adequate access to both electronic and physical library and learning resources.

See the attached letters of support from the CSUB Library (Attachment 7c).

Describe available academic technology, equipment, and other specialized materials.

The Department of Geological Sciences at CSUB has the following technology, equipment, and materials that will be utilized for the proposed BS in Environmental Science:

• Zeiss Sigma 300 Field Emission Scanning Electron Microscope and Hitachi S3400N Variable Pressure Scanning Electron Microscope: chemical and microstructure characterization

• Panalytical Empyrean X-Ray Diffractometer: crystallographic and mineralogical analysis

• Rigaku Supermini200 X-Ray Fluorescence Analyzer: elemental characterization

• ICAP RQ Single-Quad Inductively Coupled Plasma Mass Spectrometer with ASX-560 Autosampler: isotopic and trace element analysis

• ABEM Terrameter SAS 300C Electrical Resistivity Meter: subsurface direct-current conductivity/resistivity analysis

• Emriver Em3 Stream Table with Adjustable Single-Tilt Base, K500 Advanced Flow Controller, and Color-Coded Media: teaching hydrologic processes including erosion, sediment transport, and deposition

• Wave Maker for Emriver Em3 Stream Table: teaching shoreline/wave processes including longshore drift, sediment delivery, and grain size sorting

• Augmented Reality Sandbox: teaching topography and surface flow processes

• Petrographic & Stereographic Microscopes: mineral, microstructural, and micropaleontological analysis

• Thin Section Lab: samples production for microscope analysis

• Computational Resources: workstations for high-performance computing tasks including image analysis, reservoir simulations, finite element modeling, and data inversion

• Geoscience Software: professional and research-grade GIS, petroleum reservoir, general computing, and other software

• Fossil Specimen, Rock, Mineral, and Map Collections

• Gilson Co. Direct Shear Machine: soil direct shear testing for quantification of soil mechanical properties

• Leica GS18 and GS18T Global Navigation Satellite System (GNSS) Receivers, Leica TS10 Manual Total Station, and Topcon Optical and Laser Levels: survey-grade equipment and software for precise geodetic positioning

• Sensefly eBee X Fixed Wing Unmanned Aerial System with Photogrammetric Camera: advanced 3D surface modeling

• DJI Mavic 2Pro Quadcopter Unmanned Aerial System: high-resolution photogrammetry

• Giddings Trailer Mounted Hydraulic Soil Sampling, Coring, and Drilling Machine: direct push and rotary drilling capabilities

• Malvern Mastersizer 2000: analysis of soil and sediment particle size distributions

• Worden Gravity Meter: subsurface density analysis

• Campus Water Well: hydrological teaching activities and research

• HP DesignJet T1700 PostScript Printer: map and poster printing

Additional Support Resources Required

Describe additional faculty or staff support positions needed to implement the proposed program.

The proposed BS in Environmental Science program does not need additional faculty or staff support positions for program implementation. The program relies on existing courses taught by faculty in the Department of Geological Sciences, as well as cognate and elective courses already taught at CSUB. Letters of support from participating programs have been provided (Attachment 8a).

Describe the amount of additional lecture and/or laboratory space required to initiate and to sustain the program over the next five years. Indicate any additional special facilities that will be required. If the space is under construction, what is the projected occupancy date? If the space is planned, indicate campus-wide priority of the facility, capital outlay program priority, and projected date of occupancy. Major capital outlay construction projects are those projects whose total cost is $610,000 or more (as adjusted pursuant to Cal. Pub. Cont. Code §§ 10705(a); 10105 and 10108).

The proposed BS in Environmental Science program does not require additional lecture or laboratory space at the time of program initiation. Additional lecture and laboratory space is not likely to be required to sustain the program over the next five years. The program review process will be used to plan for lecture and laboratory needs beyond the next five years.

Include a report written in consultation with the campus librarian which indicates any necessary library resources not available through the CSU library system. Indicate the commitment of the campus to purchase these additional resources.

Letter from CSUB Librarian.pdf

Indicate additional academic technology, equipment, or specialized materials that will be (1) needed to implement the program, and (2) needed during the first two years after initiation. Indicate the source of funds and priority to secure these resource needs.

No additional academic technology, equipment, or specialized materials will be needed to implement the program, and no additional materials will be needed after two years. All academic technology, equipment, and specialized materials needed for the program are already available.

Self-Support Program Information

Confirm that the proposed program will not be offered at places or times likely to supplant or limit existing state-support programs.

No

Explain how at least one of the following additional criteria shall be met:

The courses or program are primarily designed for career enrichment or retraining;

No

The location of the courses or program is significantly removed from permanent, state-supported campus facilities;

No

The course or program is offered through a distinct technology, such as online delivery;

No

For new programs, the client group for the course or program receives educational or other services at a cost beyond what could be reasonably provided within CSU Operating Funds;

No

For existing programs, there has been a cessation of non-state funding that previously provided for educational or other services costing beyond what could be reasonably provided within CSU Operating Funds.

No

Specify how all required EO 1099 self-support criteria are met.

Not a self-supported program.

The proposed program does not replace existing state-support courses or programs.

No

Academic standards associated with all aspects of such offerings are identical to those of comparable state-supported CSU instructional programs.

No

Basic Cost Recovery Budget Elements (Three to five year budget projection)

Student per-unit cost:

0

Number of units producing revenue each academic year:

0

Total cost a student will pay to complete the program:

0

Revenue

	1st Year	2nd Year	3rd Year	4th Year	5th Year
Student Fees	0	0	0	0	0
Projected Attrition Numbers	0	0	0	0	0
Totals	0	0	0	0	0

Additional Revenue Sources

	1st Year	2nd year	3rd Year	4th Year	5th Year
Grants	0	0	0	0	0
Other	0	0	0	0	0
Totals	0	0	0	0	0

Direct Expenses

	1st Year	2nd Year	3rd Year	4th Year	5th Year
Intstructional costs	0	0	0	0	0
Operational costs	0	0	0	0	0
Extended Education costs	0	0	0	0	0
Technology development and ongoing support	0	0	0	0	0
Totals	0	0	0	0	0

Indirect Expenses

	1st Year	2nd Year	3rd Year	4th Year	5th Year
Campus Partners	0	0	0	0	0
Campus reimbursement general fund	0	0	0	0	0
Extended Education overhead	0	0	0	0	0
Chancellor's Office overhead	0	0	0	0	0
Totals	0	0	0	0	0

Additional Questions

Is this program an accredited educator preparation program?

No

Do you want email notification when the course is fully approved?

No

Supporting Documentation

ENVI New Degree Proposal w Attachments - FINAL.pdf
Environmental Science BS.pdf
Support letter for BS in Enviromental Science.pdf

Key: 518