









Indigenous Environmental Science & Conservation Occupations

Baccalaureate Labor Market Analysis

July 2024

SUMMARY

BDP PROGRAM RECOMMENDATION?	EVIDENCE OF A SUPPLY GAP?	AT OR ABOVE THE LIVING WAGE?	EXPECTED EDUCATION FOR MAJORITY OF OCCUPATIONS ANALYZED
 Proceed with Caution	 	 	<input type="checkbox"/> Doctorate Degree <input type="checkbox"/> Master's Degree <input checked="" type="checkbox"/> Bachelor's Degree <input type="checkbox"/> Associate Degree <input type="checkbox"/> Some College or Certificate <input type="checkbox"/> HS Diploma or Equivalent <input type="checkbox"/> Less than a HS Diploma <input type="checkbox"/> Apprenticeship
DOES A SIMILAR PROGRAM EXIST AT A UC OR CSU?	EXISTING ASSOCIATE DEGREE PROGRAM IN REGION?	NUMBER OF ANNUAL JOB OPENINGS	
YES, a UC or CSU currently offers a similar program	 	<div style="background-color: #4a7ebb; color: white; padding: 2px; display: inline-block;">LOW</div> 	

The San Diego & Imperial Center of Excellence (COE) developed this brief to determine if an unmet workforce need exists for a baccalaureate degree program (BDP) for [Indigenous Environmental Science & Conservation Occupations](#). According to Assembly Bill No. 927, community college districts seeking approval for a BDP must 1) not offer “program curricula already offered by the California State University or the University of California” systems, 2) “continue to offer an associate degree program in the same academic subject”¹ of the proposed BDP, and 3) “provide evidence of unmet workforce needs.”²

This brief recommends that the San Diego & Imperial Counties Community Colleges proceed with caution when developing a BDP for [Indigenous Environmental Science & Conservation Occupations](#) because **although entry-level and median wages are above the living wage, there is no labor market supply gap for the selected occupations (however, it cannot be determined if there is a supply gap for the indigenous specialization). While traditional labor market information may not accurately measure the supply and demand for specialized skills like "indigenous," "ethnobotany," "ethnoecology," or**

¹ “The bill would require a community college district to continue to offer an associate degree program in the same academic subject for which a baccalaureate degree program has been approved, unless the community college district has received approval from the chancellor to eliminate the associate degree program, as specified.”

² “AB-927 Public postsecondary education: community colleges: statewide baccalaureate degree.” California Legislative Information. Accessed 09/05/2023. leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=202120220AB927

"Native American," data from online job postings offers a snapshot of consistent employer demand for these terms.

INTRODUCTION

According to Assembly Bill No. 927, community college districts seeking approval to offer a baccalaureate degree program (BDP) must:³

1. Not offer a BDP or “program curricula already offered by the California State University or the University of California”
2. “Continue to offer an associate degree program in the same academic subject for which a baccalaureate degree program has been approved”
3. Identify and document unmet workforce needs “in the local community or region of the district”

To determine the need for a new BDP, this brief examines labor market information (LMI) for [Indigenous Environmental Science & Conservation Occupations](#) using the following Standard Occupational Classification (SOC)⁴ codes:

- **Conservation Scientists** (SOC 19-1031): Manage, improve, and protect natural resources to maximize their use without damaging the environment. May conduct soil surveys and develop plans to eliminate soil erosion or to protect rangelands. May instruct farmers, agricultural production managers, or ranchers in best ways to use crop rotation, contour plowing, or terracing to conserve soil and water; in the number and kind of livestock and forage plants best suited to particular ranges; and in range and farm improvements, such as fencing and reservoirs for stock watering.
- **Environmental Scientists and Specialists, Including Health** (SOC 19-2041): Conduct research or perform investigation for the purpose of identifying, abating, or eliminating sources of pollutants or hazards that affect either the environment or public health. Using knowledge of various scientific disciplines, may collect, synthesize, study, report, and recommend action based on data derived from measurements or observations of air, food, soil, water, and other sources.
- **Foresters** (SOC 19-1032): Manage public and private forested lands for economic, recreational, and conservation purposes. May inventory the type, amount, and location of standing timber, appraise the timber’s worth, negotiate the purchase, and draw up contracts for procurement. May determine how to conserve wildlife habitats, creek beds, water quality, and soil stability, and how best to comply with environmental regulations. May devise plans for planting and growing new trees, monitor trees for healthy growth, and determine optimal harvesting schedules.

³ “AB-927 Public postsecondary education: community colleges: statewide baccalaureate degree.” California Legislative Information. Accessed 09/05/2023. [leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220AB927](https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=202120220AB927)

⁴ The Standard Occupational Classification (SOC) system is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data. [bls.gov/soc/](https://www.bls.gov/soc/).

- **Soil and Plant Scientists (SOC 19-1013):** Conduct research in breeding, physiology, production, yield, and management of crops and agricultural plants or trees, shrubs, and nursery stock, their growth in soils, and control of pests; or study the chemical, physical, biological, and mineralogical composition of soils as they relate to plant or crop growth. May classify and map soils and investigate effects of alternative practices on soil and crop productivity.

According to available LMI, employers require a minimum educational attainment of a bachelor’s degree for **Indigenous Environmental Science & Conservation Occupations** (Exhibit 1). On average, the entry-level hourly earnings for **Indigenous Environmental Science & Conservation Occupations** are \$29.34, which is more than the \$18.43 per hour living wage for a single adult in San Diego County (Exhibit 1).⁵

**Exhibit 1: Average Earnings and Typical Education for
Indigenous Environmental Science & Conservation Occupations by SOC Code (2023)**

SOC Title (SOC Code)	Entry-Level Hourly Earnings ⁶	Median Hourly Earnings	Typical Entry-Level Education
Environmental Scientists and Specialists, Including Health (19-2041)	\$35.36	\$42.14	Bachelor's degree
Soil and Plant Scientists (19-1013)	\$28.99	\$36.15	Bachelor's degree
Conservation Scientists (19-1031)	\$28.41	\$36.54	Bachelor's degree
Foresters (19-1032)	\$24.58	\$24.78	Bachelor's degree

The following sections “assess the workforce value of [a] proposed baccalaureate degree program” for **Indigenous Environmental Science & Conservation Occupations** in accordance with AB-927.⁷

BDP PROPOSAL REQUIREMENTS

UC and CSU Programs

According to AB-927, community colleges must not offer a BDP or program curricula already offered by the CSU or UC systems. To determine if a BDP already exists for **Indigenous Environmental Science & Conservation Occupations**, the COE examined CSU and UC programs in related Classification of Instructional Programs (CIP) codes.⁸

⁵ Lightcast. 2024.02; QCEW, Non-QCEW, Self-Employed.

⁶ 25th Percentile. Lightcast. 2024.02; QCEW, Non-QCEW, Self-Employed.

⁷ “AB-927 Public postsecondary education: community colleges: statewide baccalaureate degree.” California Legislative Information. Accessed 09/05/2023. [leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=202120220AB927](https://leginfo.ca.gov/faces/billTextClient.xhtml?bill_id=202120220AB927)

⁸ CIP data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data). The COE uses the national SOC-CIP crosswalk to determine which programs could potentially train for the occupation in question. nces.ed.gov/ipeds/cipcode/post3.aspx?y=56

According to CIP data, the following institutions from the UC and CSU systems offer programs related to Indigenous Environmental Science & Conservation Occupations (Exhibit 2).

Exhibit 2: California UC and CSU Institutions with Related Programs by CIP Code (2022)⁹

CIP Code and Title

[01.0308 Agroecology and Sustainable Agriculture](#)

- No CSU or UC

[01.1004 Viticulture and Enology](#)

- No CSU or UC

[01.1105 Plant Protection and Integrated Pest Management](#)

- California State Polytechnic University-Pomona
- California State University-Fresno

[03.0101 Natural Resources/Conservation, General](#)

- California State Polytechnic University-Humboldt
- University of California-Berkeley
- University of California-Davis
- University of California-Irvine

[03.0103 Environmental Studies](#)

- California State Polytechnic University-Humboldt
- California State University-East Bay
- California State University-Monterey Bay
- California State University-San Bernardino
- California State University-San Marcos
- San Diego State University
- San Francisco State University
- San Jose State University
- University of California-Berkeley
- University of California-Davis
- University of California-Irvine
- University of California-San Diego
- University of California-Santa Barbara
- University of California-Santa Cruz

[03.0104 Environmental Science](#)

- California Polytechnic State University-San Luis Obispo
- California State Polytechnic University-Humboldt
- California State University-Channel Islands
- California State University-Chico
- California State University-Dominguez Hills

⁹ Lightcast. Q2 2024 Data Set. Program Overview. Completions by Institutions. Completions data for 2020 and 2022 to account for programs not captured after decline in enrollment from the COVID-19 pandemic.

CIP Code and Title

- California State University-East Bay
- California State University-Fresno
- California State University-Fullerton
- California State University-Long Beach
- California State University-Los Angeles
- California State University-Monterey Bay
- California State University-Sacramento
- California State University-San Bernardino
- San Diego State University
- San Francisco State University
- San Jose State University
- Sonoma State University
- University of California-Berkeley
- University of California-Davis
- University of California-Irvine
- University of California-Los Angeles
- University of California-Merced
- University of California-Riverside
- University of California-Santa Barbara
- University of California-Santa Cruz

[03.0501 Forestry, General](#)

- California Polytechnic State University-San Luis Obispo
- California State Polytechnic University-Humboldt
- University of California-Berkeley

[03.0506 Forest Management/Forest Resources Management](#)

- University of California-Berkeley

[03.0601 Wildlife, Fish and Wildlands Science and Management](#)

- California State Polytechnic University-Humboldt
- University of California-Berkeley
- University of California-Davis

[03.9999 Natural Resources and Conservation, Other](#)

- California State University-Stanislaus
- University of California-Berkeley
- University of California-Davis

[26.0301 Botany/Plant Biology](#)

- California State Polytechnic University-Humboldt
 - California State Polytechnic University-Pomona
 - California State University-Chico
 - University of California-Berkeley
-

CIP Code and Title

- University of California-Davis
- University of California-Irvine
- University of California-Riverside

[30.4101 Environmental Geosciences](#)

- No CSU or UC

[30.4401 Geography and Environmental Studies](#)

- University of California-Los Angeles

Existing Associate Degree Program(s)

AB-927 also states that districts should “continue to offer an associate degree program in the same academic subject for which a baccalaureate degree program has been approved.” To determine if an associate degree program in the same subject area exists, the COE reviewed the [California Community Colleges Chancellor’s Office’s official TOP-CIP crosswalk](#) and found that there are 11 TOP codes and 13 CIP codes related to [Indigenous Environmental Science & Conservation Occupations](#) (Exhibit 3).

Exhibit 3: Chancellor’s Office TOP-CIP Crosswalk for Baccalaureate Degree Programs

TOP Code	TOP Title	CIP Code	CIP Title
0115.00	Natural Resources	01.0308	Agroecology and Sustainable Agriculture
0104.00	Viticulture, Enology and Wine Business	01.1004	Viticulture and Enology
0103.10	Agricultural Pest Control Adviser and Operator (Licensed)	01.1105	Plant Protection and Integrated Pest Management
0115.00	Natural Resources	03.0101	Natural Resources/Conservation, General
0302.00	Environmental Studies	03.0103	Environmental Studies
0301.00	Environmental Science	03.0104	Environmental Science
0114.00	Forestry	03.0501	Forestry, General
	No Match	03.0506	Forest Management/Forest Resources Management
0115.20	Wildlife and Fisheries	03.0601	Wildlife, Fish and Wildlands Science and Management
0399.00	Environmental Sciences and Technologies, Other	03.9999	Natural Resources and Conservation, Other
0402.00	Botany, General	26.0301	Botany/Plant Biology
0301.00	Environmental Science	30.4101	Environmental Geosciences
2206.00	Geography		

0302.00	Environmental Studies	30.4401	Geography and Environmental Studies
2206.00	Geography		

According to the [Chancellor's Office Curriculum Inventory \(COCI\)](#), six regional community colleges offer an associate degree program for the CIP codes listed above (Exhibit 4).¹⁰

Exhibit 4: San Diego Community Colleges with Associate Degree Programs in Related CIP Codes

CIP Code	CIP Title	Community College(s) with Existing Program in CIP Code
01.0308	Agroecology and Sustainable Agriculture	• None
01.1004	Viticulture and Enology	• MiraCosta
01.1105	Plant Protection and Integrated Pest Management	• None
03.0101	Natural Resources/Conservation, General	• None
03.0103	Environmental Studies	• Palomar • San Diego City • San Diego Mesa
03.0104	Environmental Science	• None
03.0501	Forestry, General	• None
03.0506	Forest Management/Forest Resources Management	• None
03.0601	Wildlife, Fish and Wildlands Science and Management	• None
0399.00	Environmental Sciences and Technologies, Other	• None
26.0301	Botany/Plant Biology	• None
30.4101	Environmental Geosciences	• Grossmont • Palomar • San Diego City • San Diego Mesa • Southwestern
30.4401	Geography and Environmental Studies	• Grossmont • Palomar • San Diego City • San Diego Mesa • Southwestern

¹⁰ "Programs. California Community Colleges Curriculum Inventory (COCI)." Accessed 04/01/2024. coci2.ccctechcenter.org/programs

WORKFORCE NEEDS ASSESSMENT: SUPPLY VS. DEMAND

According to AB-927, community colleges must identify and document unmet workforce needs “in the local community or region of the district.” To assess the regional workforce need for [Indigenous Environmental Science & Conservation Occupations](#), this section compares educational supply with labor market demand.

Educational Supply

Baccalaureate educational supply for an occupation can be estimated by analyzing the number of completions¹¹ in related CIP codes. According to CIP data, the following institutions supply [San Diego County](#) with awards for [Indigenous Environmental Science & Conservation Occupations](#) (Exhibit 5).

Exhibit 5: Number of Completions by Postsecondary Institutions (San Diego County, 2022)

CIP Code	CIP Title	Completions (2022)
03.0103	Environmental Studies	
	• California State University-San Marcos	48
	• San Diego State University	71
	• University of California-San Diego	79
03.0104	Environmental Science	
	• San Diego State University	41
Total		239

Exhibit 6 lists related program completions by CIP Code statewide.

Exhibit 6: Number of Completions by Postsecondary Institutions (California, 2022)

CIP Code	CIP Title	Completions (2022)
01.0308	Agroecology and Sustainable Agriculture	41
01.1004	Viticulture and Enology	81
01.1105	Plant Protection and Integrated Pest Management	94
03.0101	Natural Resources/Conservation, General	206
03.0103	Environmental Studies	1,206
03.0104	Environmental Science	1,048
03.0501	Forestry, General	74
03.0506	Forest Management/Forest Resources Management	0

¹¹ Completion numbers include bachelor's degree programs or higher.

CIP Code	CIP Title	Completions (2022)
03.0601	Wildlife, Fish and Wildlands Science and Management	194
0399.00	Environmental Sciences and Technologies, Other	1
26.0301	Botany/Plant Biology	90
30.4101	Environmental Geosciences	0
30.4401	Geography and Environmental Studies	27
Total		3,062

Labor Market Demand

Between 2023 and 2028, employers in San Diego County will need to hire 154 workers annually to fill new jobs and backfill jobs due to attrition caused by turnover and retirement for Indigenous Environmental Science & Conservation Occupations (Exhibit 7).

Exhibit 7: Labor Demand (Annual Job Openings) for Indigenous Environmental Science & Conservation Occupations

SOC Code	Occupational Title	Average Annual Job Openings (2023-2028)	
		San Diego County	California
19-2041	Environmental Scientists and Specialists, Including Health	109	1,218
19-1013	Soil and Plant Scientists	21	266
19-1031	Conservation Scientists	18	233
19-1032	Foresters	6	118
		154	1,835

Demand vs. Supply

Comparing labor market demand (annual job openings) with educational supply (bachelor's degree completions) suggests that there is an oversupply for Indigenous Environmental Science & Conservation Occupations in San Diego County, with 154 annual openings and 239 awards. Comparatively, there are 1,835 annual openings in California and 3,062 awards, suggesting that there is also an oversupply across the state ¹² (Exhibit 8).

¹² "Supply and Demand," Centers of Excellence Student Outcomes, coecc.net/our-resources

Exhibit 8: Labor Demand (Job Openings) vs. Educational Supply (Completions)¹³

	Demand (Job Openings)	Supply (Completions)	Supply Gap or Oversupply
San Diego	154	239	-85
California	1,835	3,062	-1,227

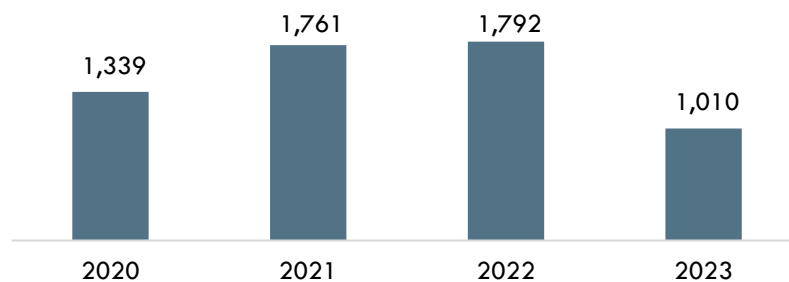
¹³ This is a basic analysis of supply and demand of labor. The data does not include workers currently in the labor force who could fill these positions or workers who are not captured by publicly available data. This data should be used to discuss the potential gaps or oversupply of workers; however, it should not be the only basis for determining whether or not a program should be developed.

OTHER LMI TO CONSIDER FOR PROGRAM DEVELOPMENT

Online Job Postings

This report analyzes not only historical and projected (traditional LMI) data, but also recent data from online job postings (real-time LMI). Online job postings may provide additional insight about recent changes in the labor market that are not captured by historical data. Between 2020 and 2023, there was an average of 1,476 online job postings per year for Indigenous Environmental Science & Conservation Occupations in San Diego County (Exhibit 9). Please note that online job postings do **not** equal labor market demand; demand is represented by annual job openings (see Exhibit 7). While this brief includes online jobs postings data to help with curriculum development, the community colleges should note that this type of data is impacted by several variables: employers may post a position multiple times to increase the pool of applicants; a job posting can remain posted after a business decides not to fill a position; or an employer may use one posting to fill multiple positions, for example.

Exhibit 9: Number of Online Job Postings for Indigenous Environmental Science & Conservation Occupations in San Diego County (2020-2023)¹⁴



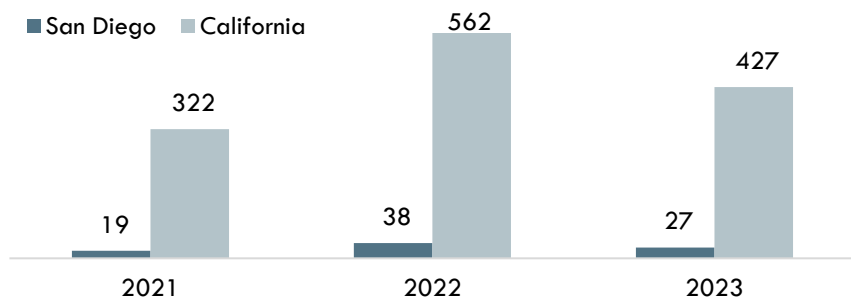
Because the proposed program focuses on an indigenous specialization within these occupations, the COE also examined online job postings for the following key terms and found that there was a stable number of online job postings for indigenous knowledge between January 2021 and December 2023:

- Ethnobotany
- Ethnoecology
- Indigenous
- Native American

Between January 1, 2021 and December 31, 2023, there was an average of 28 online job postings per year related to indigenous knowledge in San Diego County and 437 across California (Exhibit 10).

¹⁴ Lightcast; "Job Posting Analytics." 2020-2023.

Exhibit 10: Number of Online Job Postings with Keywords related to Indigenous Knowledge in San Diego County and California (2021-2023)¹⁵



Top Employers

Between January 1, 2021 and December 31, 2023, the top five employers in San Diego County were University of California San Diego, Kelly Services, Gilead Sciences, BioLegend, and Takeda Pharmaceutical Company based on online job postings (Exhibit 11).

Exhibit 11: Top Employers for Indigenous Environmental Science & Conservation Occupations in San Diego County¹⁶

Top Employers	
<ul style="list-style-type: none"> • University of California San Diego • Kelly Services • Gilead Sciences • BioLegend • Takeda Pharmaceutical Company 	<ul style="list-style-type: none"> • Aerotek • Scripps Institution Of Oceanography • Randstad • Scripps Research Ctr • PerkinElmer

¹⁵ Lightcast; "Job Posting Analytics." 2021-2023.
¹⁶ Lightcast; "Job Posting Analytics." 2021-2023.

Skills and Certifications

Exhibit 12 lists the top specialized, soft, and software skills that appeared in online job postings between January 1, 2021 and December 31, 2023.

Exhibit 12: Top Skills for Indigenous Environmental Science & Conservation Occupations in San Diego County¹⁷

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> • Biology • Molecular Biology • Biochemical Assays • Biochemistry • Cell Cultures • Cell Biology • Chemistry • Enzyme-Linked Immunosorbent Assay • Laboratory Experience • Data Analysis • Laboratory Equipment • Polymerase Chain Reaction • Immunology • Flow Cytometry • Ribonucleic Acid Sequencing 	<ul style="list-style-type: none"> • Research • Communication • Detail Oriented • Troubleshooting • Writing • Self-Motivation • Organizational Skills • Operations • Problem Solving • Management • Interpersonal Communications • Verbal Communication Skills • Multitasking • Quality Control • Presentations 	<ul style="list-style-type: none"> • Microsoft Excel • Microsoft PowerPoint • Microsoft Word

Exhibit 13 lists the top certification that appeared in online job postings between January 1, 2021 and December 31, 2023.

Exhibit 13: Top Certification for Indigenous Environmental Science & Conservation Occupations in San Diego County¹⁸

Top Certification in Online Job Postings

1. Valid Driver's License
2. Security Clearance
3. Hazardous Materials Certification - Technician Level

¹⁷ Lightcast; "Job Posting Analytics." 2021-2023.

¹⁸ Lightcast; "Job Posting Analytics." 2021-2023.

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Important Disclaimers

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