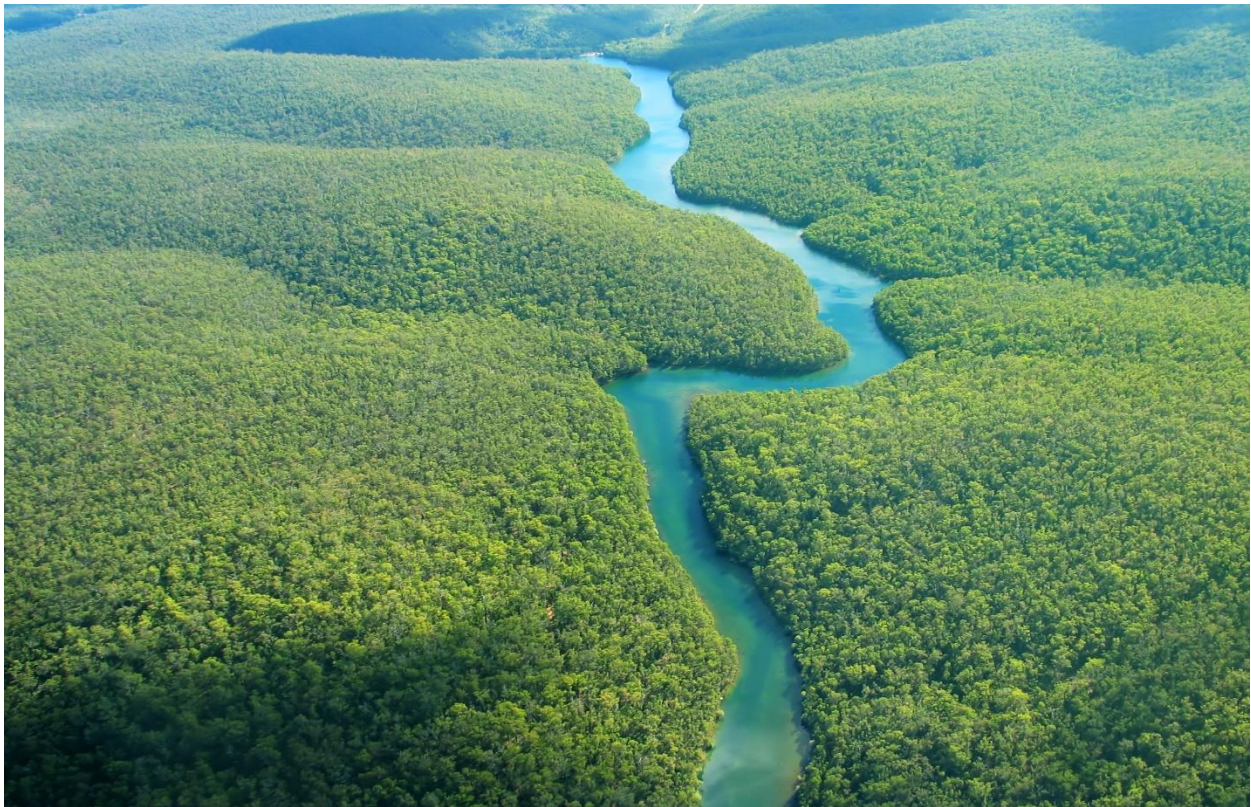


December 2022

Labor Market Analysis

River Ecology and Management



Prepared by Central Valley/Mother Lode Center of Excellence



POWERED BY



Table of Contents

- Summary 2
 - Key Findings..... 2
 - Recommendation..... 3
- Introduction..... 3
- Occupational Demand 4
- Wages 5
- Job Postings 6
 - Top Employers..... 6
 - Top Occupational Titles..... 6
 - Salaries..... 7
 - Education 7
 - Baseline, Specialized, and Software Skills..... 7
 - Certifications..... 8
- Education, Work Experience, & Training 8
- Supply 8
- Student Outcomes 9
- Recommendation 10
- Appendix A: Methodology & Data Sources 12

COVID-19 Statement: This report includes employment projection data by Lightcast. Lightcast’s projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy during the projection period will be at approximately full employment or potential output. To the extent that a recession or labor shock, such as the economic effects of COVID-19, can cause long-term structural change, they may impact the projections. At this time, it is not possible to quantify the impact of COVID-19 on projections of industry and occupational employment. Other measures such as unemployment rates and monthly industry employment estimates will reflect the most recent information on employment and jobs in the state and, in combination with input from local employers, may help validate current and future employment needs as depicted here.

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Summary

The Central Valley/Mother Lode Center of Excellence developed this report for Columbia College to determine whether there is demand in the local labor market that is not being met by the supply from community college programs. This report summarizes labor market demand, wages, skills, and postsecondary supply for *River Ecology and Management Occupations*, which include:

- Environmental Science and Protection Technicians, Including Health (SOC 19-4042)
- Life, Physical, and Social Science Technicians, All Other (SOC 19-4099)
- First-Line Supervisors of Farming, Fishing, and Forestry Workers (SOC 45-1011)

Key Findings

- **Occupational demand** — *River Ecology and Management Occupations* have a labor market demand of 271 annual job openings in the North Central Valley/Northern Mother Lode (NCV/NML) subregion. Between 2021 and 2026, first-line supervisors of farming, fishing, and forestry workers are projected to have the most demand with 219 annual job openings and a projected growth rate of three percent.
- **Wages** — Average entry-level earnings of \$17.90/hour for *River Ecology and Management Occupations* are higher than the living wage in the NCV/NML subregion, which is \$12.65/hour for a single adult.¹ Environmental science and protection technicians, including health earn the highest entry-level wages, \$20.28/hour.
- **Employers** — Employers in the NCV/NML subregion include Simwon America Corp, Danaher Corporation, and Cepheid.
- **Occupational titles** — The most common occupational title in job postings in the subregion is Quality Control Analysts. The most common job title is Quality Assurance Technician.
- **Skills and certifications** — The top baseline skill is communication skills, the top specialized skill is quality assurance and control, and the top software skill is Microsoft Excel. The most in-demand certification is an American Society For Quality (ASQ) Certification.
- **Education** — A high school diploma or equivalent is typically required for first-line supervisors of farming, fishing, and forestry workers. An associate degree is typically required for life, physical, and social science technicians, all other and environmental science and protection technicians, including health.
- **Supply** — An analysis of postsecondary degrees awarded shows that, on average, 18 awards were conferred in NCV/NML subregion and 42 were conferred in the CVML region.
- **Supply and Demand Analysis** — Based on 271 annual openings (i.e., demand), and 42 postsecondary degrees awarded (i.e., supply), an analysis of supply and demand suggests there is an undersupply of 253 workers in the NCV/NML subregion and an undersupply of 990 workers in the CVML region.

¹ The term "living wage" in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center's California Family Needs Calculator for each county in the subregion: <https://insightccd.org/tools-metrics/self-sufficiency-standard-tool-for-california/>.

Recommendation

Based on a comparison of demand and supply, there is an undersupply of trained workers in the NCV/NML subregion and the CVML region. The Center of Excellence recommends that Columbia College work with the regional directors, the college's advisory board, and local industry in the expansion of programs to address the shortage of River Ecology and Management workers.

Introduction

The Central Valley/Mother Lode Center of Excellence developed this report to provide Columbia College with labor market information for River Ecology and Management. The geographical focus for this report is the North Central Valley/Northern Mother Lode (NCV/NML) subregion, but regional demand and supply data has been included for broader applicability and use. Analysis of the program and occupational data related to River Ecology and Management resulted in the identification of applicable occupations, known as *River Ecology and Management Occupations*. The Standard Occupational Classification (SOC) System code and occupational titles used in this report from the Bureau of Labor Statistics and O*NET OnLine are shown below. Please note that there is no data available for life, physical, and social science technicians, all other.

Environmental Science and Protection Technicians, Including Health (SOC 19-4042)

- **Job Description:** Perform laboratory and field tests to monitor the environment and investigate sources of pollution, including those that affect health, under the direction of an environmental scientist, engineer, or other specialist. May collect samples of gases, soil, water, and other materials for testing.
- **Knowledge:** English Language, Biology, Law and Government, Mathematics, Chemistry
- **Skills:** Active Listening, Critical Thinking, Reading Comprehension, Speaking, Science

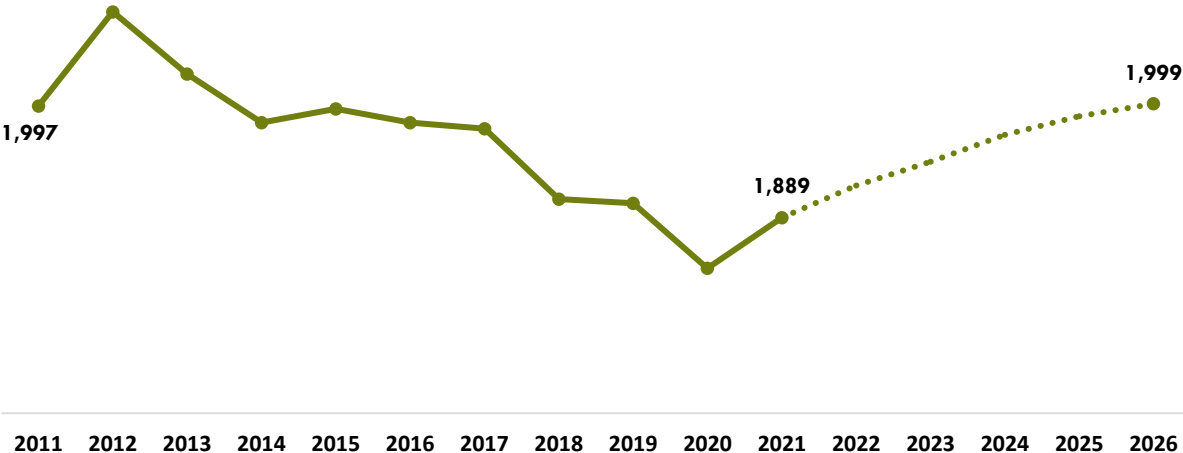
First-Line Supervisors of Farming, Fishing, and Forestry Workers (SOC 45-1011)

- **Job Description:** Directly supervise and coordinate the activities of agricultural, forestry, aquacultural, and related workers.
- **Knowledge:** Administration and Management, Production and Processing, Customer and Personal Service, English Language, Mechanical
- **Skills:** Coordination, Critical Thinking, Monitoring, Speaking, Management of Personnel Resources

Occupational Demand

Exhibit 1a shows trends for *River Ecology and Management Occupations* in the NCV/NML subregion. Between 2021 to 2026, the number of jobs for *River Ecology and Management Occupations* is projected to increase by 58 jobs, or three percent.

Exhibit 1a. Occupational projections for *River Ecology and Management Occupations* in the NCV/NML subregion



Between 2021 to 2026, demand for *River Ecology and Management Occupations* in the NCV/NML subregion is 271 annual openings (Exhibit 1b). First-line supervisors of farming, fishing, and forestry workers are projected to have the most demand with 219 annual job openings and a projected growth rate of three percent.

Exhibit 1b. Occupational projections for *River Ecology and Management Occupations* in the NCV/NML subregion

Occupation	2021 Jobs	2026 Jobs	5-Year Change	5-Year % Change	Annual Openings
First-Line Supervisors of Farming, Fishing, and Forestry Workers	1,449	1,489	40	3%	219
Life, Physical, and Social Science Technicians, All Other	243	256	13	5%	33
Environmental Science and Protection Technicians, Including Health	146	152	6	4%	19
TOTAL	1,839	1,897	58	3%	271

Wages

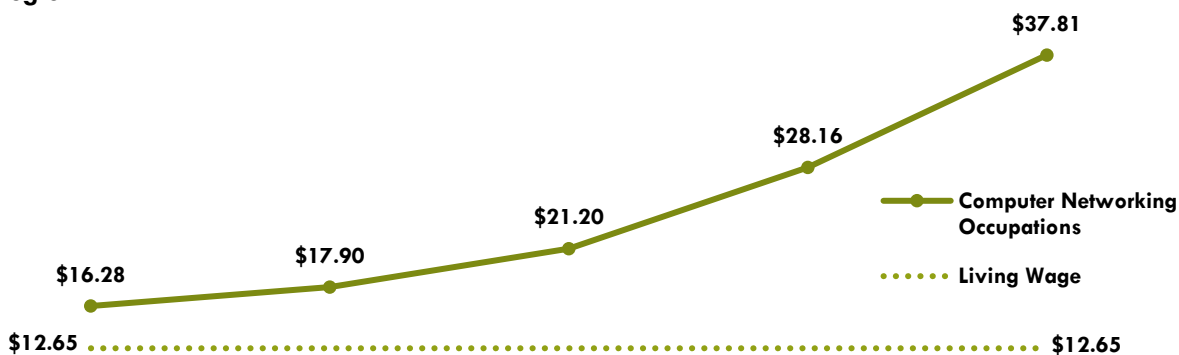
The average living wage for a single adult in the NCV/NML subregion is \$12.65/hour.² Exhibit 2a shows the hourly wages of *River Ecology and Management Occupations*. Environmental science and protection technicians, including health earn the highest entry-level wage, \$20.28/hour in the subregion.³ Please note 10th and 25th percentiles are considered entry-level wages while 75th and 90th are considered experienced wages, either by gained by long-term employment, extra training, etc...

Exhibit 2a. River Ecology and Management Occupations hourly wages in the NCV/NML subregion

Occupation	Pct. 25 Hourly Earnings	Median Hourly Earnings	Pct. 75 Hourly Earnings
Environmental Science and Protection Technicians, Including Health	\$20.28	\$23.53	\$31.95
Life, Physical, and Social Science Technicians, All Other	\$18.53	\$20.27	\$25.46
First-Line Supervisors of Farming, Fishing, and Forestry Workers	\$14.90	\$19.82	\$27.07

Exhibit 2b shows the average hourly wages for *River Ecology and Management Occupations*; the average entry-level wage is more than the average living wage for the NCV/NML subregion.

Exhibit 2b. River Ecology and Management Occupations average hourly wages in the NCV/NML subregion



10th Percentile 25th Percentile Median 75th Percentile 90th Percentile

² The term "living wage" in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center's California Family Needs Calculator for each county in the subregion: <https://insightccd.org/tools-metrics/self-sufficiency-standard-tool-for-california/>.

³ Entry-level wages are derived from the 25th percentile.

Job Postings

There were 200 job postings for *River Ecology and Management Occupations* in the NCV/NML subregion from June 2022 to November 2022.⁴

Top Employers

The top employers with the most job postings are listed in Exhibit 3. The top employers in online job postings were Simwon America Corp, Danaher Corporation, and Cepheid.

Exhibit 3. Top employers of *River Ecology and Management Occupations* by number of job postings

Employer
Simwon America Corp
Danaher Corporation
Cepheid
Clean Harbors Environmental Services
Foster Farms
On Site Health Safety
Basalite Concrete Products
Basalite Concrete Products Llc
Bausch & Lomb
Bristol Hospice

Top Occupational Titles

Exhibit 4 shows the O*NET OnLine occupational titles for *River Ecology and Management Occupations* in the NCV/NML subregion. Common job titles in postings include: Quality Assurance Technician, Quality Control Technician, and Quality Control Specialist.

Exhibit 4. Top occupational titles in job postings for *River Ecology and Management Occupations*

Occupational Title
Quality Control Analysts
Environmental Science and Protection Technicians, Including Health
Precision Agriculture Technicians
First-Line Supervisors of Animal Husbandry and Animal Care Workers
Remote Sensing Technicians
First-Line Supervisors of Agricultural Crop and Horticultural Workers
First-Line Supervisors of Aquacultural Workers

⁴ Other than occupation titles and job titles, the categories below can be counted one or multiple times per job posting, and across several areas in a single posting. For example, a skill can be counted in two different skill types, and an employer can indicate more than one education level.

Salaries

Exhibit 5 shows the “Market Salaries” for *River Ecology and Management Occupations*. These are calculated by Burning Glass using a machine learning model built from millions of job postings every year. This accounts for adjustments based on location, industry, skills, experience, education, among other variables.

Exhibit 5. Market salaries for *River Ecology and Management Occupations*

Market Salary Percentile	Salary Amount
10th Percentile	\$28,044
25th Percentile	\$31,290
50th Percentile	\$35,744
75th Percentile	\$43,442
90th Percentile	\$55,686

Education

Of the 200 job postings, 129 listed a preferred or minimum educational requirement for the position being filled. Among those, 66% requested a high school or vocational training, 46% requested a bachelor’s degree, and 16% requested an associate degree (Exhibit 6). A job posting can indicate more than one education level. Hence, the percentages shown in the chart below may total more than 100%.

Exhibit 6. Education levels requested in job postings for *River Ecology and Management Occupations*

Education Level	Job Postings	% of Job Postings
High school or vocational training	85	66%
Bachelor's degree	59	46%
Associate's degree	21	16%
Doctoral degree	3	2%

Baseline, Specialized, and Software Skills

Exhibit 7 depicts the top baseline, specialized, and software skills in job postings. The three most important baseline skills are communication skills, computer literacy, and physical abilities. The top three specialized skills are Quality Assurance and control, quality management, and food safety. The top software is Microsoft Excel.

Exhibit 7. In-demand *River Ecology and Management Occupations* baseline and specialized skills

Baseline Skills	Specialized Skills	Software Skills
Troubleshooting	Customer Service	Microsoft Office
Communication Skills	Technical Support	Microsoft Word
Problem Solving	Repair	Microsoft Windows
Teamwork / Collaboration	Help Desk Support	Microsoft Excel
Multi-Tasking	Customer Contact	Microsoft Operating Systems

Certifications

Of the 200 job postings, 219 contained certification data. Among those, 14% indicated a need for a American Society For Quality (ASQ) Certification. The next top certification is Licensed Vocational Nurse (LVN) (Exhibit 8). Please note 51% of job postings indicated a need for a driver's license but it is not a certification.

Exhibit 8. Top River Ecology and Management Occupations certifications requested in job postings

Certifications	% of Job Postings
American Society for Quality (ASQ) Certification	14%
Licensed Vocational Nurse (LVN)	10%
Hazard Analysis and Critical Control Point (HACCP) Certification	8%
FSSC 22000	6%
Certified Quality Auditor (CQA)	4%

Education, Work Experience, & Training

A high school diploma or equivalent is typically required for first-line supervisors of farming, fishing, and forestry workers. An associate degree is typically required for life, physical, and social science technicians, all other and environmental science and protection technicians, including health (Exhibit 9).

Exhibit 9. Education, work experience, training, and Current Population Survey results River Ecology and Management Occupations⁵

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
First-Line Supervisors of Farming, Fishing, and Forestry Workers	High school diploma or equivalent	Less than 5 years	None	21.9%
Life, Physical, and Social Science Technicians, All Other	Associate's degree	None	None	36.6%
Environmental Science and Protection Technicians, Including Health	Associate's degree	None	None	33.0%

Supply

An analysis of program data from the Integrated Postsecondary Education Data System (IPEDS) for the last three program years shows that, on average, 18 awards were conferred in the NCV/NML subregion (Exhibit 10 and 11).

⁵ "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, <https://www.bls.gov/cps/>.

Exhibit 10. TOP and CIP codes for River Ecology and Management Occupations

TOP Titles	CIP Titles
011500 - Natural Resources	01.0308 - Agroecology and Sustainable Agriculture
	03.0101 - Natural Resources/Conservation, General

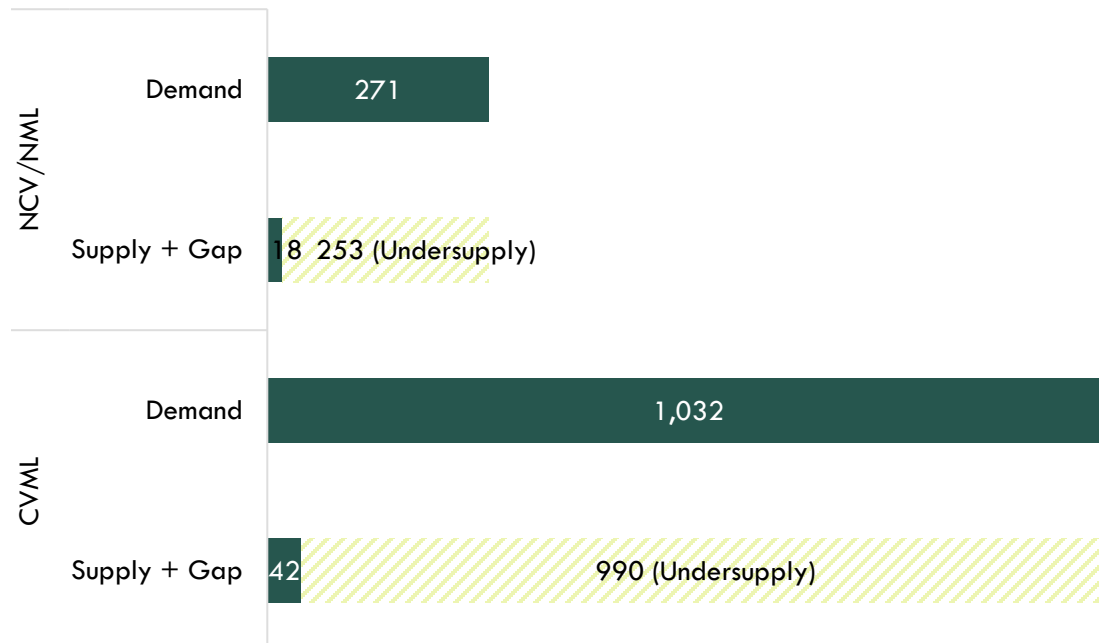
Exhibit 11. Postsecondary supply for River Ecology and Management Occupations

TOP/CIP Code- Title	College	Associate Degree	Certificate 16 < 30 Semester Units	Certificate 18 < 30 Semester Units	Certificate 30 < 60 Semester Units	Certificate 6 < 18 Semester Units	Subtotal
011500 - Natural Resources	Columbia	12*			6*	1*	18*
	Fresno City			0	0		1
	Reedley College	5	5	13			23
NCV/NML TOTAL		12			6	1	18
CVML TOTAL		17	5	13	6	1	42

*NCV/NML awards

There is an undersupply of 253 River Ecology and Management workers in the NCV/NML subregion and an undersupply of 990 workers in the region (Exhibit 12).

Exhibit 12. River Ecology and Management Occupations workforce demand (annual job openings), postsecondary awards (supply), and additional students needed to fill gap in the NCV/NML subregion and region



Student Outcomes

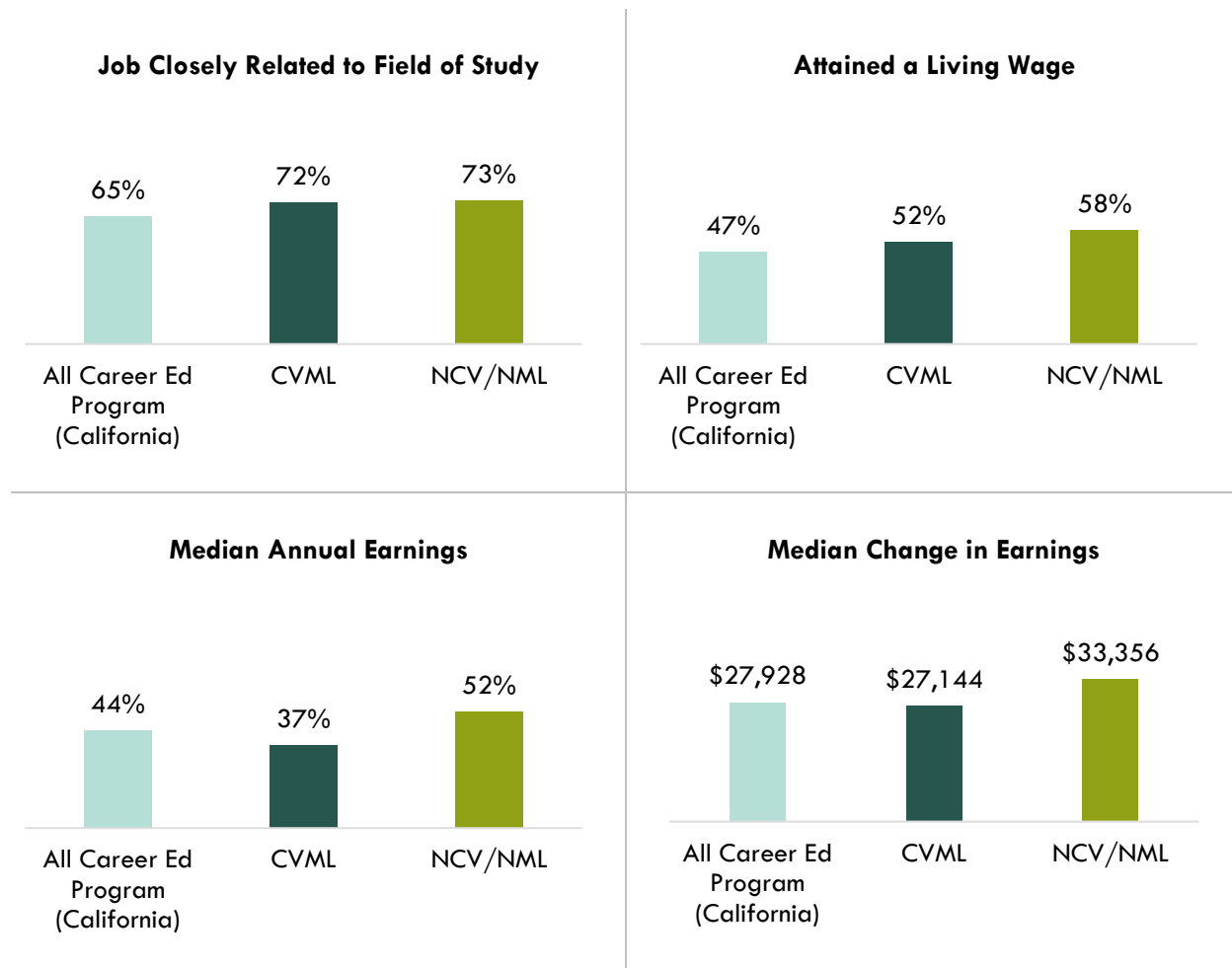
Exhibits 13a-13b summarize outcomes from California Community College Chancellor’s Cal-PASS Plus LaunchBoard for TOP codes related to *River Ecology and Management Occupations*. Notably, 73% of students obtained a job closely related to their field of study in the subregion and 58% attained a living wage.

Exhibit 13a. Regional metrics for TOP 011500 - Natural Resources

Metric	
Students Who Got a Degree or Certificate or Attained Apprenticeship Journey Status	25
Number of Students Who Transferred	37

*denotes data not available in table and charts

Exhibit 13b. Metrics for TOP 011500 - Natural Resources



Recommendation

This report suggests there is a shortage of 253 workers in the NCV/NML subregion and a shortage of 990 workers in the CVML region for *River Ecology and Management Occupations*. Based on these findings, it is recommended that Columbia College work with the regional directors, the college's advisory board, and local industry in the development of programs to address the shortage of River Ecology and Management workers in the region.

Appendix: Methodology & Data Sources

Data Sources

Labor market and educational supply data compiled in this report derive from a variety of sources. Data were drawn from external sources, including the Economic Modeling Specialists, Inc., the California Community Colleges Chancellor’s Office Management Information Systems Data Mart and the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS). Below is the summary of the data sources found in this study.

Data Type	Source
Labor Market Information/Population Estimates and Projections/Educational Attainment	Economic Modeling Specialists, Intl. (LIGHTCAST). LIGHTCAST occupational employment data are based on final LIGHTCAST industry data and final LIGHTCAST staffing patterns. Wage estimates are based on Occupational Employment Statistics (QCEW and Non-QCEW Employees classes of worker) and the American Community Survey (Self-Employed and Extended Proprietors). Occupational wage estimates also affected by county-level LIGHTCAST earnings by industry: economicmodeling.com .
Typical Education Level and On-the-job Training	Bureau of Labor Statistics (BLS) uses a system to assign categories for entry-level education and typical on-the-job training to each occupation for which BLS publishes projections data: https://www.bls.gov/emp/tables/educational-attainment.htm .
LaunchBoard	Chancellor’s Cal-PASS Plus LaunchBoard. https://www.calpassplus.org/LaunchBoard/SWP.aspx
Labor Force, Employment and Unemployment Estimates	California Employment Development Department, Labor Market Information Division: labormarketinfo.edd.ca.gov .
Job Posting and Skills Data	Burning Glass: burning-glass.com/ .
Additional Education Requirements/ Employer Preferences	The O*NET Job Zone database includes over 900 occupations as well as information on skills, abilities, knowledge, work activities and interests associated with specific occupations: onetonline.org .

Key Terms and Concepts

Annual Job Openings: Annual openings are calculated by dividing the number of years in the projection period by total job openings.

Education Attainment Level: The highest education attainment level of workers age 25 years or older.

Employment Estimate: The total number of workers currently employed.

Employment Projections: Projections of employment are calculated by a proprietary Economic Modeling Specialists, Intl. (LIGHTCAST) formula that includes historical employment and economic indicators along with national, state and local trends.

LaunchBoard (Attained the Living Wage): Among SWP students who exited college and did not transfer to any postsecondary institution, the proportion who attained the district county living wage for a single adult measured immediately following academic year of exit

LaunchBoard (Median Annual Earnings): Among SWP students who exited the community college system and who did not transfer to any postsecondary institution, median earnings following the academic year of exit.

LaunchBoard (Median Change in Earnings): Among SWP students who exited and who did not transfer to any postsecondary institution, median change in earnings between the second quarter prior to the beginning of the academic year of entry and the second quarter after the end of the academic year of exit from the last college attended.

LaunchBoard (Job Closely Related to Field of Study): Among SWP students who responded to the CTE Outcomes Survey and did not transfer to any postsecondary institution, the proportion who reported that they are working in a job very closely or closely related to their field of study.

Living Wage: The cost of living in a specific community or region for one adult and no children. The cost increases with the addition of children.

Occupation: An occupation is a grouping of job titles that have a similar set of activities or tasks that employees perform.

Percent Change: Rate of growth or decline in the occupation for the projected period; this does not factor in replacement openings.

Replacements: Estimate of job openings resulting from workers retiring or otherwise permanently leaving an occupation. Workers entering an occupation often need training. These replacement needs, added to job openings due to growth, may be used to assess the minimum number of workers who will need to be trained for an occupation.

Total Job Openings (New + Replacements): Sum of projected growth (new jobs) and replacement needs. When an occupation is expected to lose jobs, or retain the current employment level, number of openings will equal replacements.

Typical Education Requirement: represents the typical education level most workers need to enter an occupation.

Typical On-The-Job Training: indicates the typical on-the-job training needed to attain competency in the skills needed in the occupation.