SKILLS THAT SUPPORT THE CCCCO

AGRICULTURE, WATER, AND ENVIRONMENTAL TECHNOLOGIES SECTOR

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EXECUTIVE SUMMARY

The California Community College Chancellor's Office (CCCCO) Agriculture, Water, and Environmental Technologies Sector is the region's smallest in terms of middle-skill regional employment at 9,921 jobs in 2024, or 1.2% of middle-skill employment in the region. However, middle-skill occupations in this sector are projected to grow by 10.5%, faster than the 8.0% average across all sectors. Middle-skill agriculture, water, and environmental technologies occupations, those requiring more than a high school diploma but less than a four-year degree, represent 20% of all agriculture, water, and environmental technologies-sector jobs. These occupations generate nearly 1,800 annual job openings, positioning community colleges and K-12 partners as essential engines of workforce preparation.

This report examines the skills that define middle-skill agriculture, water, and environmental technologies occupations, relying on employer job postings for one minor occupational group that accounted for 1,085 regional jobs in 2024. Using a comparison of two date periods, 2019–2023 and 2024–2025, the analysis identifies which skills are increasing, declining, or persistently in demand across the sector.

Please note that agricultural employers post substantially fewer job advertisements than employers in other industries across the Inland Empire/Desert Region and California. Comparing job ads to total employment highlights this gap: across all industries, there are roughly seven jobs per job ad, compared to approximately 50 jobs per ad in agriculture. This reflects distinct hiring practices in the sector. According to the Department of Labor, 70% of agricultural workers obtain jobs through referrals from friends or relatives.[1] As a result, job postings capture a smaller share of hiring activity in agriculture, and this analysis may not fully reflect the complete range of in-demand, growing, or declining skills in the industry

Key Findings

Employer demand is shifting toward both foundational and cross-sector competencies rather than highly specialized skills.

Across occupational groups, foundational skills account for the majority of those increasing in demand (71.1% in IE/D; 64.5% in California), underscoring the growing importance of broad, transferable competencies across the sector. Skills such as communication, attention to detail, and problem-solving continue to serve as core requirements across roles and are increasingly critical for supporting more structured, compliance-driven operations.

However, the analysis (Section 3) also shows that a meaningful share of growing skills are cross-sector technical competencies, reflecting rising expectations for standardized processes, safety protocols, and quality management systems that apply across multiple industries.

These include:

- Good Manufacturing Practices (GMP)
- Hazard Analysis and Critical Control Points (HACCP)
- Food Safety and Sanitation
- Food Manufacturing
- Quality Management

[1] Department of Labor (DOL). California Findings from the National Agricultural Workers Survey (NAWS) 2015-2019: A Demographic and Employment Profile of California Farmworkers. (2022). JBS International. Retrieved from: https://www.dol.gov/sites/dolgov/files/ETA/naws/pdfs/NAWS%20Research%20Report%2015.pdf

These skills point to an evolving production environment in which consistency, traceability, and adherence to industry standards are increasingly important in daily work. Notably, very little growth is occurring in occupation-specific skills, indicating that demand is driven not by narrowly defined technical expertise but by adaptable skills that transfer across roles and functions.

Routine cognitive and broad technical skills are declining across the sector.

The shrinking-skills analysis shows a consistent decline in routine cognitive and broadly applied technical competencies, particularly within cross-sector (46.2% IE/D) and foundational categories (38.5% IE/D). Declining foundational skills include mathematics, research, planning, and coordination, functions that are increasingly supported or streamlined by digital tools and workflow automation.

Declining cross-sector skills include fire suppression systems, forestry, and soil science. These represent more generalized technical knowledge areas that appear less frequently in job postings, suggesting a shift away from broad technical expectations toward more targeted operational and compliance-related skill sets. Within occupation-specific categories, declining skills (15.4% IE/D), such as irrigation and rangeland management, reflect established competencies that remain essential but are likely embedded within broader roles or treated as baseline expectations rather than as differentiating hiring criteria.

Highly specialized technical skills play a limited role in current skill growth.

Unlike other sectors, there are no industry-specific skills identified as growing or declining under this methodology (0.0% IE/D). This reinforces that demand is not concentrated in highly specialized or niche technical areas, but rather in foundational and cross-sector competencies that support day-to-day operations across multiple roles.

These patterns reveal a structural shift in agriculture, water, and environmental technologies work.

Across the sector, employer demand is moving away from narrowly defined technical specialization and toward a blend of foundational and cross-cutting skills that support standardized, safety-focused, and quality-driven operations. At the same time, routine cognitive and broad technical functions are becoming less visible in hiring demand, reflecting changes in how work is organized and supported by digital systems and workflow automation.

As a result, workers are increasingly expected to operate within structured environments that require attention to detail, adherence to process, and the ability to support compliance, documentation, and continuous improvement.

Implications for Education & Training in the Inland Empire/Desert Region

The regional shift in skill demand points to several opportunities for K-12 and community college programs to strengthen workforce alignment:

1. **Align curriculum with rising foundational and cross-sector skills.**

    Programs should emphasize communication, attention to detail, and problem-solving, alongside cross-sector technical skills such as quality management, food safety, sanitation, and standardized production processes (e.g., HACCP and GMP). These skills represent the most consistent areas of growth across occupational groups and are critical for modern, compliance-driven work environments.

2. **Align curriculum and pathways to industry-recognized standards.**

   Given the importance of cross-sector technical competencies, programs should integrate widely recognized frameworks such as HACCP and good manufacturing practices into coursework, lab activities, and work-based learning. This ensures students develop skills that are directly transferable across roles and industries.

3**. Strengthening K-12 pathway and community college alignment.**

   K-12 pathways can better align with postsecondary programs by providing early exposure to foundational and cross-sector competencies, including communication, problem-solving, safety practices, and basic concepts in food production and environmental systems. Expanding hands-on learning and dual enrollment opportunities can improve student readiness and support smoother transitions into community college programs and related careers.

Conclusion

The CCCCO agriculture, water, and environmental technologies sector is a critical component of the Inland Empire/Desert Region workforce, with employer demand increasingly centered on foundational, transferable competencies. At the same time, growth in cross-sector technical competencies reflects rising expectations for standardized processes, safety protocols, and quality systems that ensure consistency and traceability across operations.

This report is part of a ten-sector series that provides a skills-based roadmap for strengthening workforce preparation across K-12, community colleges, and regional partners. Together with forthcoming analyses on artificial intelligence, job-creation strategies, and climate-related shifts in the regional economy, this work will guide the development of programs that equip learners with the competencies required for today's agriculture, water, and environmental technologies workforce and for the evolving demands ahead.

INTRODUCTION

The purpose of this report is to strengthen community college program development and review by aligning regional education pathways with the evolving skill needs of the Inland Empire/Desert economy. Using the California Community Colleges Chancellor's Office (CCCCO) priority sector framework as its foundation, this analysis focuses on the skills that define and sustain the region's middle-skill Agriculture, Water, and Environmental Technologies workforce, providing research for K-12 schools and community colleges to examine how well programs prepare students for occupations within this priority sector.[2]

Within this framework, the CCCCO agriculture, water, and environmental technologies sector represents one of the region's smallest, yet fastest-growing areas of middle-skill employment, accounting for over 9,900 jobs in 2024 and projected to grow by 10.5% through 2029. This growth makes the CCCCO agriculture, water, and environmental technologies sector a worthy candidate for a broader, region-wide skills assessment.

This report examines the specialized and foundational skills appearing in employer job postings for middle-skill agriculture, water, and environmental technologies occupations. Middle-skill occupations are those that typically require more than a high school diploma, but less than a four-year degree, and are largely associated with community college CTE programs, placing community colleges at the center of preparing the workforce that supports regional agriculture, water, and environmental technologies.

This report is one of a ten-part series that leverages the CCCCO priority sector association to the region's middle-skill occupations. These sector reports will be released ahead of a companion analysis examining how emerging technologies are reshaping skill demand for middle-skill occupations. That research will sit alongside the sector series to help colleges understand both current and future drivers of workforce change. Before the release of this broader analysis, the COE will complete the sector reports, providing a full view of skill needs across the regional economy.

The ten-part skills analysis reports will be released in the following order:

1. Health
2. Energy, Construction, and Utilities
3. Advanced Manufacturing
4. Information and Communication Technologies/Digital Media (ICT/DM)
5. Business and Entrepreneurship
6. Advanced Transportation and Logistics
7. Retail, Hospitality, and Tourism
8. Public Safety
9. Education and Human Development
10. Agriculture, Water, and Environmental Technologies

The report seeks to answer three major questions:

- Section 1: How does the middle-skill agriculture, water, and environmental technologies workforce support the regional economy?
- Section 2: What skills are essential for middle-skill agriculture, water, and environmental technologies workers?

[2] https://www.cccco.edu/About-Us/Chancellors-Office/Divisions/Workforce-and-Economic-Development/Strong-Workforce-Program/SWP-Archive/Events/K12-SWP-Industry-Sector-Crosswalk

- Section 3: How can skills information be used to guide career education program development in the Inland Empire/Desert region?

METHODOLOGY

This report analyzes the skills essential to the middle-skill workforce in occupations associated with the California Community College Chancellor's Office (CCCCO) agriculture, water, and environmental technologies sector. The Chancellor's Office grouped career and technical education programs into twelve priority sectors, further referred to as CCCCO priority sectors.[3] The grouping of community college programs by CCCCO priority sector facilitates analysis of programs and occupations with similar knowledge bases and skill sets. The Center of Excellence, in collaboration with the CCCCO, developed a crosswalk that identifies vocational occupations associated with each program code. This crosswalk serves as the foundation for program and workforce assessments by the CCCCO priority sector. Please note that the CCCCO priority sector should not be confused with the industry employment sectors identified by the North American Industry Classification System (NAICS). Additionally, only ten CCCCO reports will be developed as the Life Sciences/Biotech and Global Trade priority sectors are typically rolled up into the larger sectors, Health and Business and Entrepreneurship, respectively.

Skills considered essential to the CCCCO agriculture, water, and environmental technologies sector occupations were identified through an analysis of employer job advertisements. Job advertisement information, such as skills and qualifications, was obtained from Lightcast's Job Posting Analytics, which aggregates job advertisements posted over 220,000 current and historical sources.[4] To provide a more nuanced perspective and to ensure the utility of this report, skills and qualifications information are analyzed at the minor occupation group level.

The Standard Occupational Classification (SOC) system aggregates occupation information by four levels: major group, minor group, broad occupation, and detailed occupation.[5] This report relies on the minor occupational groupings of detailed occupations for the skills analysis, as they provide greater detail than the broader occupational groups and ensure the feasibility and readability of this study, which would be lacking in a detailed occupation-based skills analysis.

The following is an example of the SOC coding structure for Agricultural Technicians (19-4012).

- Major Occupational Group: Life, Physical, and Social Science Occupations (19-0000)
    - Minor Occupational Group: Life, Physical, and Social Science Technicians (19-4000)
        - Broad Occupation: Agricultural and Food Science Technicians (19-4010)
            - Detailed Occupation: Agricultural Technicians (19-4012)

Minor occupational groups enable this report to focus on occupations connected by similar work activities and areas of focus in the priority sector, to determine which skills are currently most in demand, whose demand is growing rapidly, or whose demand is shrinking rapidly. This data will allow program designers, owners, and administrators to have a window into what skills employers need in their workforce for each group of occupations and how to plan for growing future needs.

This analysis focuses on minor occupational groups comprising three or more detailed occupations related to the CCCCO agriculture, water, and environmental technologies sector. This ensures that the occupations are grouped by similar work activities and have sufficient job advertisements to analyze. As

[3] DataVista Sector Explanation. 2024. Retrieved from: https://datavista.cccco.edu/resources/7

[4] Lightcast. Job Posting Analytics (JPA) Methodology. 2025. Retrieved from: https://kb.lightcast.io/en/articles/6957446-job-posting-analytics-jpa-methodology

[5] Bureau of Labor Statistics. Standard Occupational Classification and Coding Structure. 2018. Retrieved from: https://www.bls.gov/soc/2018/soc_2018_class_and_coding_structure.pdf

a result of this requirement, seven occupations related to the CCCCO agriculture, water, and environmental technologies sector are not included in this skills analysis. A list of these occupations is in the Appendix.

The skills analysis compares skills posted over a two-year period (January 2024 – December 2025) to a historical five-year period (January 2019 – December 2023) to identify skills that are growing and shrinking in terms of their prevalence in job ads. This report intentionally uses a two-year period for the current analysis to ensure a sufficient volume of recent job advertisements and avoid the instability that can come with relying on a single year of data. The five-year historical period provides a stable benchmark of longer-term industry skill patterns and reduces the influence of short-term fluctuations. This analysis also illuminates the skills with the highest share of job ads in the most recent period, addressing employer demand for skills that are persistently in demand across time.

One goal of this research was to include skills in this report that are most significant to the CCCCO agriculture, water, and environmental technologies sector workforce, based on their frequency in employer job postings. To ensure the analysis focuses on skills that employers consistently value, only skills appearing frequently in job ads within each minor occupational group during the most recent period (January 2024 – December 2025) were included.

The Lightcast taxonomy organizes skills into a tiered structure that groups related competencies according to the type of work or task they support. Within this framework, skills are categorized as common, specialized, or software skills. To determine which skills should be included in our analysis, we examined how frequently individual skills appear in job postings. We calculated the median share of job ads in which common skills appear across all occupations, providing a baseline measure of typical skill prevalence. Our analysis found that common skills typically appeared in roughly five percent of job postings across occupations. We used this median value as the threshold for determining which skills were included in our research.

The five percent threshold is sufficient to capture in-demand skills while eliminating skills included in job ads that are not essential for employment in the minor occupational group. Additionally, in-demand skills found in employer job ads posted throughout California are also included in this analysis to provide context for the regional skills data, highlighting nuances of the regional employment environment.

Foundational skills, or common skills, “are prevalent across many different occupations and industries, including both personal attributes and learned skills.”[6] Since these skills are found across industries, they are considered foundational for the workplace. Specialized skills, also known as technical skills, equip an individual to perform specific tasks effectively.[7] Our analysis of specialized skills will indicate whether they were specific to a minor occupation group, identified across multiple minor occupation groups, or across sectors.

Specialized skills are classified based on how broadly they appear across job advertisements. Skills appearing only within a single occupational group are considered occupation-specific, while those found across multiple occupational groups within the same industry are classified as industry-specific. Skills appearing across occupations in multiple industries are categorized as cross-sector, and those appearing across most occupational groups are reclassified as foundational skills. Since industry-specific skills are defined as those shared across multiple occupational groups within the same industry, the presence of only one qualifying occupational group in this analysis precludes their identification in this sector.

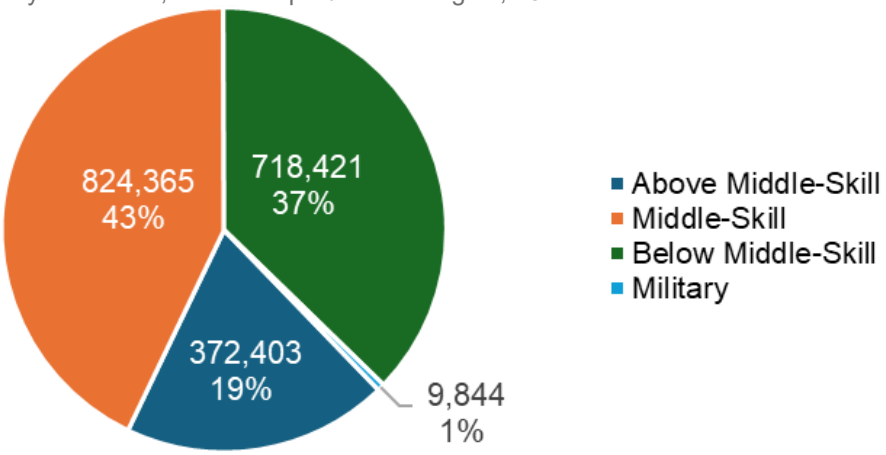
[6] Lightcast. Skills Glossary. 2023. Retrieved from: https://kb.lightcast.io/en/articles/7934140-skills
[7] Ibid.

SECTION 1: HOW DOES THE MIDDLE-SKILL AGRICULTURE, WATER, AND ENVIRONMENTAL TECHNOLOGIES WORKFORCE SUPPORT THE REGIONAL ECONOMY?

1.1 Regional Employment

In 2024, there were nearly 1.93 million jobs in the Inland Empire/Desert Region. Exhibit 1.1.1 displays the distribution of regional jobs in 2024 by skill level. Approximately 824,400 or 43% of regional jobs are middle skill. The number of regional jobs is projected to increase by more than 139,000 through 2029, representing 7% growth. While there are over 257,500 annual job openings expected between 2024 and 2029 across all jobs, these employment opportunities are not evenly distributed by skill level. Approximately 41% of annual job openings in the Inland Empire/Desert Region are expected to be for middle-skill workers, totaling over 107,500.

Exhibit 1.1.1: Distribution of Employment by Skill Level, Inland Empire/Desert Region, 2024



Source: Lightcast 2025.4 – Occupation Table, QCEW Employees, Non-QCEW Employees, and Self-Employed

Exhibit 1.1.2 displays the distribution of middle-skill employment by CCCCO priority sector in the Inland Empire/Desert Region in 2024. In 2024, there were 9,921 middle-skill jobs in the CCCCO agriculture, water, and environmental technologies sector, making it the smallest of the region's middle-skill sectors. Despite its small size, middle-skill employment in this sector is projected to grow by 10.5% through 2029.

Exhibit 1.1.2: Distribution of Middle-Skill Employment by CCCCO Priority Sector, Inland Empire/Desert Region, 2024

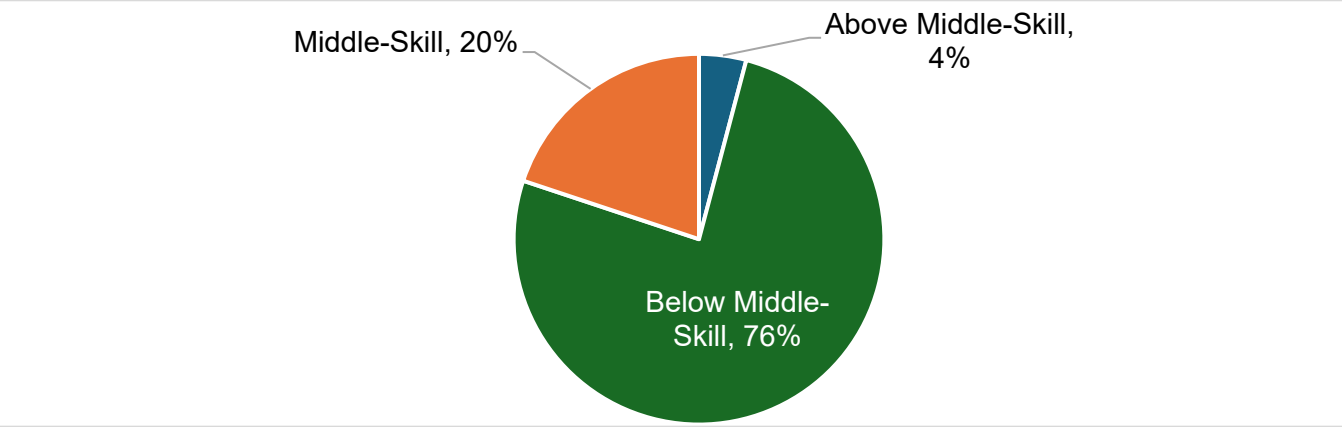
Source: Lightcast 2025.4 – Occupation Table, QCEW Employees, Non-QCEW Employees, and Self-Employed

1.2: Agriculture, Water, and Environmental Technologies Sector Overview

There are 23 TOP codes in the CCCCO agriculture, water, and environmental technologies sector that prepare students for employment. Across all levels of educational attainment, experience, and training, there are 44 occupations related to the CCCCO agriculture, water, and environmental technologies sector. Approximately 2.6% of regional jobs across all education levels are related to the CCCCO agriculture, water, and environmental technologies sector, at nearly 49,900 jobs in 2024. The share of employment in regional agriculture, water, and environmental technologies is similar to the national average (2.6%), but lower than California's overall (3.5%). Regional agriculture, water, and environmental technologies employment is projected to grow by 2.7% through 2029, the same as California, but less than the nation as a whole, at 4.7%.

Exhibit 1.2.1 displays the share of CCCCO agriculture, water, and environmental technologies sector jobs by skill level in the Inland Empire/Desert Region in 2024. The 12 middle-skill occupations in this sector accounted for 20% of regional jobs in 2024, at 9,921 jobs. Twenty of the 44 occupations in the CCCCO agriculture, water, and environmental technologies sector are below middle-skill, accounting for 76% of sector employment in the region. While there are 12 above middle-skill occupations related to this sector, they account for only 4% of regional employment, indicating there are fewer opportunities for individuals with higher education and experience requirements in the region.

Exhibit 1.2.1: Distribution of Agriculture, Water, and Environmental Technologies Employment by Skill Level, Inland Empire/Desert Region, 2024



Source: Lightcast 2025.4 – Occupation Table, QCEW Employees, Non-QCEW Employees, and Self-Employed

Exhibit 1.2.2 displays minor occupational group employment for middle-skill occupations in the CCCCO agriculture, water, and environmental technologies sector. This report provides an in-depth skills analysis for one minor occupational group related to the CCCCO agriculture, water, and environmental technologies sector, accounting for nearly 1,100 jobs in 2024. The middle-skill agriculture, water, and environmental technologies occupations analyzed in this report are projected to grow by 4% through 2029, adding 45 jobs to the region. This occupational group is projected to have over 150 annual openings through 2029.

See Appendix for a list of the seven middle-skill CCCCO agriculture, water, and environmental technologies sector occupations not included in the skills analysis. These occupations were excluded from this report due to the methodology.

Exhibit 1.2.2: Middle-skill Agriculture, Water, and Environmental Technologies Employment by Minor Group, Inland Empire/Desert Region, 2024-2029

SOC Minor Group Title	2024 Jobs	2029 Jobs	2024 - 2029 % Change	Average Annual Openings	Occupation Count
Life, Physical, and Social Science Technicians	1,085	1,129	4%	153	5
Middle-Skill Total	**1,085**	**1,129**	**4%**	**153**	**5**

Source: Lightcast 2025.4 – Occupation Table, QCEW Employees, Non-QCEW Employees, and Self-Employed

The following section will analyze the specialized skills, foundational skills, qualifications, and programs for the minor occupational group above.

SECTION 2: WHAT SKILLS ARE ESSENTIAL FOR MIDDLE-SKILL AGRICULTURE, WATER, AND ENVIRONMENTAL TECHNOLOGIES WORKERS?

2.1: Life, Physical, and Social Science Technicians

Exhibit 2.1.1 displays current and projected employment data for the life, physical, and social science technicians occupational group from 2024 to 2029. The life, physical, and social science technicians occupational group comprises five occupations with nearly 1,100 jobs in 2024. This occupational group is projected to grow by 4%, adding 45 jobs to the region through 2029. Collectively, this occupational group is projected to have 153 job openings available annually through 2029. More than half of the regional jobs and annual job openings for this occupational group are for forest and conservation technicians.

Exhibit 2.1.1: Current and Projected Employment for the Life, Physical, and Social Science Technicians Occupational Group, Inland Empire/Desert Region, 2024-2029

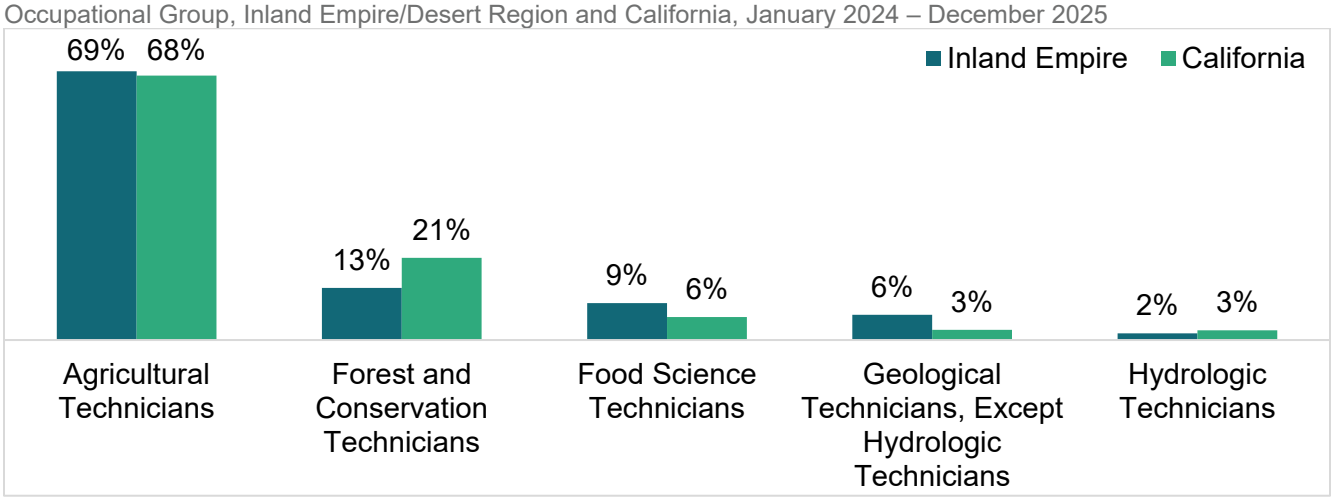
Occupation Title	2024 Jobs	2029 Jobs	2024-2029 % Change	Average Annual Openings	Median Hourly Earnings
Forest and Conservation Technicians	628	647	3%	83	$31.86
Food Science Technicians	270	291	8%	44	$23.20
Agricultural Technicians	117	118	1%	18	$24.51
Geological Technicians, Except Hydrologic Technicians	36	40	9%	5	$27.35
Hydrologic Technicians	33	34	2%	4	$38.36
Total	**1,085**	**1,129**	**4%**	**153**	

Source: Lightcast 2025.4 – Occupation Table, QCEW Employees, Non-QCEW Employees, and Self-Employed

Over the last 24 months, from January 2024 to December 2025, referred to as the “most recent period” going forward, there were 232 job ads posted for the life, physical, and social science technicians occupational group in the Inland Empire, as compared to 2,875 job ads posted for the same occupations across California. In the previous period, from January 2019 to December 2023, there were 813 job ads posted for this occupational group in the Inland Empire and 9,471 in California.

Exhibit 2.1.2 displays the share of job advertisements by occupation for the life, physical, and social science technicians occupational group in the Inland Empire/Desert Region and California. More than two-thirds of regional and statewide job ads for the life, physical, and social science technicians occupational group were posted for agricultural technicians. The scale of these occupational job advertisements may influence the skills most frequently requested by employers for this occupational group.

Exhibit 2.1.2: Share of Advertisements by Occupation for the Life, Physical, and Social Science Technicians Occupational Group, Inland Empire/Desert Region and California, January 2024 – December 2025

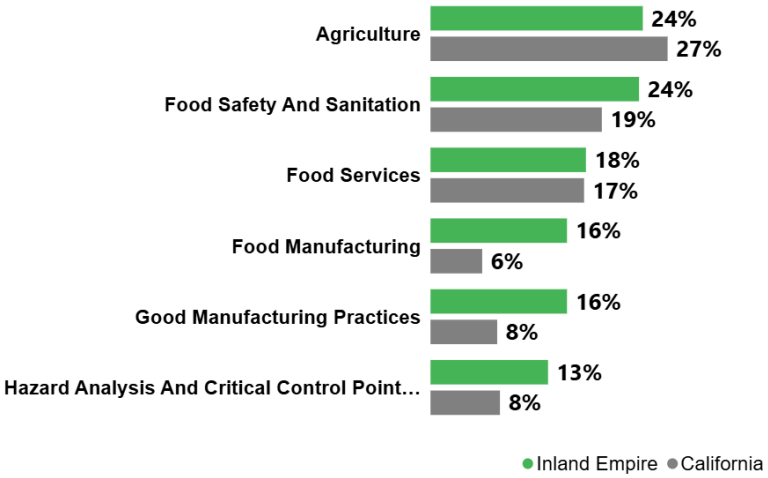


Source: Lightcast 2025.4 – Job Posting Analytics

Specialized Skills

Exhibit 2.1.3 displays the top specialized skills included in employer job advertisements for life, physical, and social science technicians in the Inland Empire/Desert Region and their share of job ads in California. The top skills may provide insight into the specialized skills employers find critical to employment.

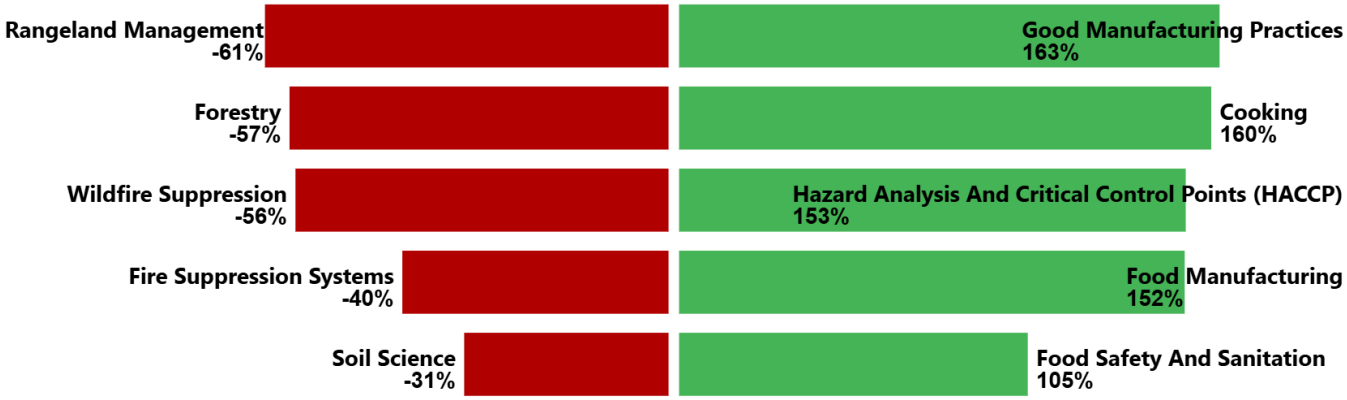
Exhibit 2.1.3: Top Specialized Skills from Employer Job Ads for the Life, Physical, and Social Science Technicians Occupational Group, Inland Empire/Desert Region and California, January 2024 – December 2025



Source: Lightcast 2025.4 – Job Posting Analytics

Exhibit 2.1.4 displays the specialized skills that have increased or decreased the most in their share of job advertisements for the life, physical, and social science technicians occupational group in the Inland Empire/Desert Region, based on a comparison of the two time periods. Recent employer demand (2024-2025) for candidates with good manufacturing practices, cooking, hazard analysis, and critical control points (HACCP), and food manufacturing skills has increased by more than 150% since the previous period (2019-2023). Employers' desire for candidates with rangeland management, forestry, and wildfire suppression skills has decreased by over 50% between the two periods in the Inland Empire.

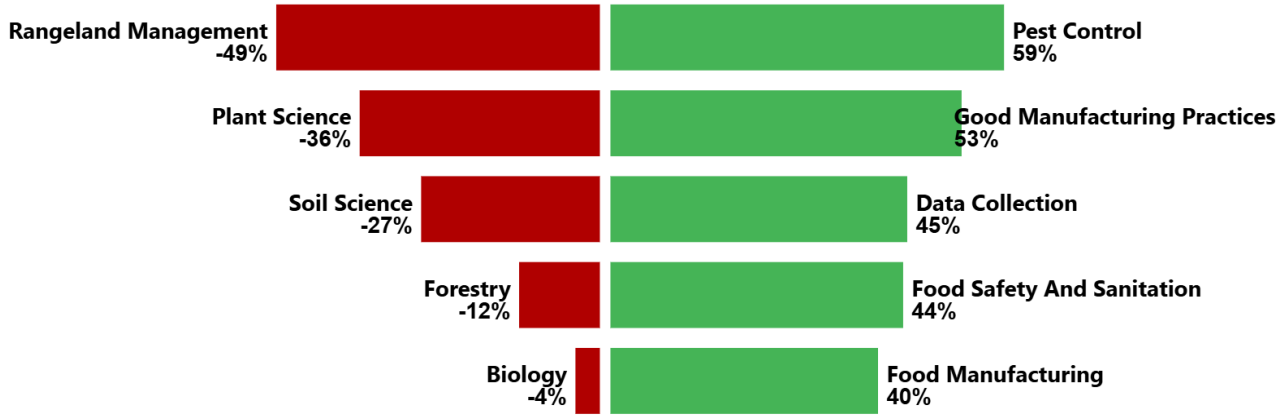
Exhibit 2.1.4: Specialized Skills that Have Increased or Decreased the Most in Their Share of Job Advertisements for the Life, Physical, and Social Science Technicians Occupational Group in the Inland Empire/Desert Region



Source: Lightcast 2025.4 – Job Posting Analytics

Exhibit 2.1.5 displays the specialized skills that have increased or decreased the most in their share of job advertisements for the life, physical, and social science technicians occupational group in California, based on a comparison of the two time periods. Recent employer demand (2024-2025) for candidates with pest control and good manufacturing practices skills has increased by more than 50% compared to the previous period (2019-2023). In California, employers' desire for candidates with rangeland management skills has decreased by 49% between the two periods.

Exhibit 2.1.5: Specialized Skills that Have Increased or Decreased the Most in Their Share of Job Advertisements for the Life, Physical, and Social Science Technicians Occupational Group in California

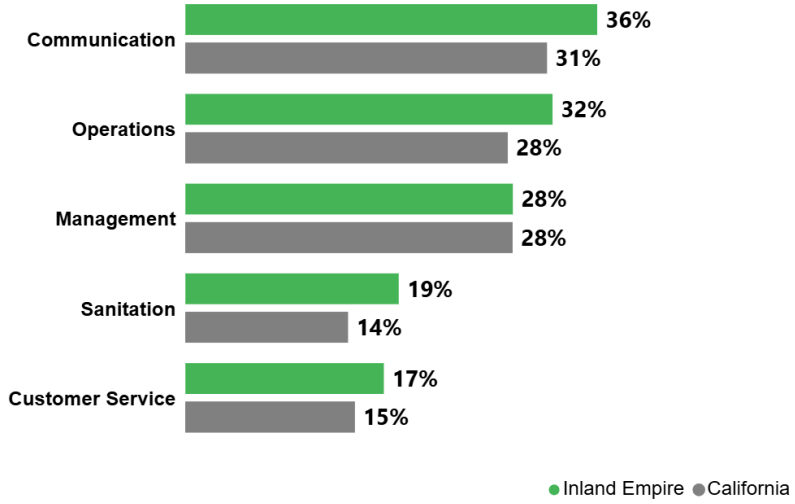


Source: Lightcast 2025.4 – Job Posting Analytics

Foundational Skills

Exhibit 2.1.6 displays the top foundational skills included in employer job advertisements for the life, physical, and social science technicians occupational group in the Inland Empire/Desert Region and their share of job ads in California. The top skills may provide insight into the foundational skills employers find critical to employment. Communication was the top foundational skill for this occupational group across both regions, followed by operations and management.

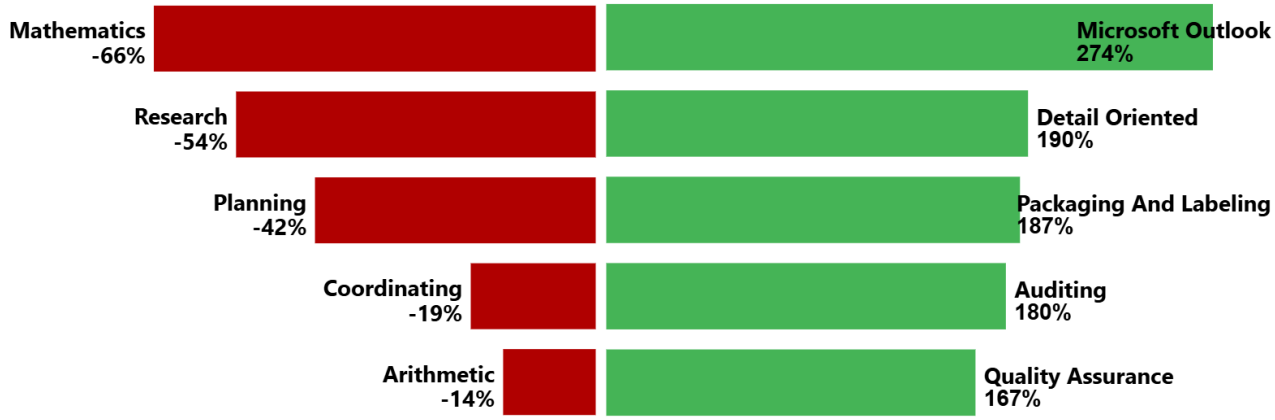
Exhibit 2.1.6: Top Foundational Skills from Employer Job Ads for the Life, Physical, and Social Science Technicians Occupational Group, Inland Empire/Desert Region and California, January 2024 – December 2025



Source: Lightcast 2025.4 – Job Posting Analytics

Exhibit 2.1.7 displays the foundational skills that have increased or decreased the most in their share of job advertisements for the life, physical, and social science technicians occupational group in the Inland Empire/Desert Region, based on a comparison of the two time periods. Recent employer demand (2024-2025) for candidates with Microsoft Outlook skills has increased by 274% since the previous period (2019-2023). Employers' desire for candidates with mathematics skills has decreased by 66% between the two periods in the Inland Empire.

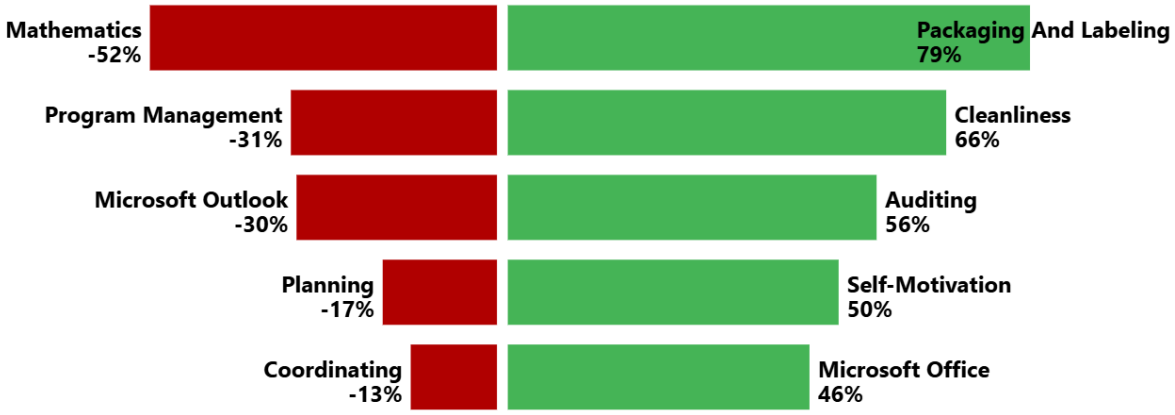
Exhibit 2.1.7: Foundational Skills that Have Increased or Decreased the Most in Their Share of Job Advertisements for the Life, Physical, and Social Science Technicians Occupational Group in the Inland Empire/Desert Region



Source: Lightcast 2025.4 – Job Posting Analytics

Exhibit 2.1.8 displays the foundational skills that have increased or decreased the most in their share of job advertisements for the life, physical, and social science technicians occupational group in California, based on a comparison of the two time periods. Recent employer demand (2024-2025) for candidates with packaging and labeling skills has increased by 79% compared to the previous period (2019-2023). In California, employers' desire for candidates with mathematical skills has decreased by 52% between the two periods.

Exhibit 2.1.8: Foundational Skills that Have Increased or Decreased the Most in Their Share of Job Advertisements for the Life, Physical, and Social Science Technicians Occupational Group in California



Source: Lightcast 2025.4 – Job Posting Analytics

Qualifications and Programs

Exhibit 2.1.9 displays the qualifications most frequently included in employer job advertisements for the life, physical, and social science technicians occupational group. A valid driver's license (CDL Class C) was the most frequently requested qualification in employer job advertisements, appearing in between 29% and 36% of job ads.

Exhibit 2.1.9: Top Qualifications Skills from Employer Job Ads for the Life, Physical, and Social Science Technicians Occupational Group, Inland Empire/Desert Region and California, January 2024 – December 2025

Inland Empire/Desert Region		California	
Qualification	Share	Qualification	Share
Valid Driver's License (CDL Class C)	29%	Valid Driver's License (CDL Class C)	36%
ServSafe Certification	3%	30-Hour OSHA General Industry Card	2%
Hazard Analysis and Critical Control Point (HACCP) Certification	3%	ServSafe Certification	1%
ACI Concrete Field Testing and Strength Testing Technician	3%	Cardiopulmonary Resuscitation (CPR) Certification	1%

Source: Lightcast 2025.4 – Job Posting Analytics

The following community college programs prepare students for employment in the life, physical, and social science technicians occupational group.

- Food Processing and Related Technologies (0113.00)
- Forestry (0114.00)
- Natural Resources (0115.00)
- Other Agriculture and Natural Resources (0199.00)
- Plant Science (0103.00)
- Viticulture, Enology, and Wine Business (0104.00)

SECTION 3: HOW CAN SKILLS INFORMATION BE USED TO GUIDE CAREER EDUCATION PROGRAM DEVELOPMENT IN THE INLAND EMPIRE/DESERT REGION?

To identify which skills are increasing most noticeably in employer demand, we compared their prevalence in job postings across the two time periods analyzed. We then examined how many middle-skill occupational minor groups each skill appeared in. Weighing skills by the number of occupational groups in which they increased provides a clearer indication of which skill shifts are occurring broadly across the sector rather than within isolated occupations. Below is the distribution within each skills tier for skills that are increasing by 10% or more:

- Foundational skills (71.1% IE/D; 64.5% California)
    - Foundational skills account for the majority of those increasing in demand, underscoring the growing importance of broad, transferable competencies across the sector. Foundational abilities such as communication, attention to detail, and problem-solving underpin essential functions tied to food production and safety, as well as detail-oriented processes like packaging and labeling, auditing, and quality assurance.
- Specialized or technical skills
    - Industry-specific (0.0% IE/D; 0.0% California)
        - These skills are typically indicative of greater depth and require operational expertise. However, as a result of this report's methodology, no industry-specific skills are growing for the agriculture, water, and environmental technologies occupations profiled.
    - Occupation-specific: (5.3% IE/D; 9.7% California)
        - Occupation-specific skills represent a relatively small share of those increasing in demand, indicating that growth in the sector is not being driven primarily by highly specialized or technical competencies. While skills such as those in environmental science or pest control remain essential and require targeted training, their limited growth suggests that most roles are evolving to prioritize adaptable workers who can operate in standardized, compliance-driven environments.
    - Cross-Sector: (23.7% IED; 25.8% California)
        - While these skills require more specialized training, they are not unique to agriculture and are commonly applied across food production, manufacturing, and related industries. Examples include good manufacturing practices, hazard analysis and critical control points (HACCP), food manufacturing, and food safety and sanitation. Their prevalence highlights the importance of industry-recognized processes and standards that support consistency, safety, and quality across production environments.

Using the same approach as described above, we present the distribution of skills that declined in prevalence between the two time periods. This approach highlights which skill declines are sector-wide rather than limited to a single occupational group. Below is the distribution within each skills tier for skills that are decreasing by 10% or more:

- Foundational skills (38.5% IE/D; 60.0% California)
    - The skills decreasing in prevalence are not the manufacturing or production-oriented competencies reflected in the growing skills above. Instead, they are primarily analytical, such as in mathematics, research, planning, and coordination. This pattern suggests a shift in how these functions are performed, with some tasks increasingly supported or streamlined by digital tools and workflow automation, reducing the need to request these skills in job postings explicitly.

- Specialized or technical skills
    - Industry-specific (0.0% IE/D; 0.0% California)
        - These skills are typically indicative of greater depth and require operational expertise. However, as a result of this report's methodology, there are no industry-specific skills that are shrinking for the agriculture, water, and environmental technologies occupations profiled.
    - Occupation-specific: (15.4% IE/D; 20.0% California)
        - Declining skills in this tier tend to reflect established, occupation-specific activities that are foundational to agricultural work but are no longer increasing in demand. These include irrigation (landscaping and agriculture) and rangeland management. Their decline in postings does not indicate reduced importance, but rather suggests these competencies are widely expected, embedded within broader roles, or less frequently specified as distinct hiring requirements.
    - Cross-Sector: (46.2% IED; 20.0% California)
        - Cross-sector skills account for a substantial share of those declining in demand, suggesting a shift away from certain specialized but broadly applicable technical competencies. These skills are not unique to agriculture and include fire suppression systems, forestry, and science. Their decline may reflect changes in how these functions are performed, including greater reliance on specialized roles, external partners, or evolving technologies that reduce the need for these skills to be explicitly required across a wide range of positions.

The distribution of growing skills indicates that employer demand in the agriculture, water, and environmental technologies sector is shifting in a clear and consistent direction. Foundational skills account for the majority of those increasing in demand (71.1% IE/D), underscoring the rising importance of broad, transferable competencies across occupations. Skills such as communication, attention to detail, and problem-solving are not only widely applicable but also increasingly essential for supporting more structured, compliance-driven operations. These foundational abilities underpin critical functions tied to food production and safety, as well as detail-oriented processes such as packaging and labeling, auditing, and quality assurance.

In contrast to this strong growth in foundational skills, relatively little of the increase is concentrated in highly specialized or occupation-specific competencies. Occupation-specific skills account for only a small share of those growing (5.3% IE/D), suggesting that demand is not driven primarily by narrowly defined technical expertise. Instead, growth is concentrated in cross-sector skill sets that can be transferred across roles and functions. Cross-sector skills (23.7% IE/D), including good manufacturing practices, hazard analysis and critical control points (HACCP), and food safety and sanitation, underscore the importance of standardized processes and industry-recognized frameworks that support consistency, safety, and quality across production environments.

By comparison, the distribution of shrinking skills reveals a different pattern. Declining skills are more evenly distributed across tiers, with notable concentrations in cross-sector (46.2% IE/D) and foundational categories (38.5% IE/D). Among foundational skills, those decreasing in prevalence tend to be routine cognitive skills, such as mathematics, research, planning, and coordination, suggesting a shift in how these functions are performed. Within the technical tiers, declining occupation-specific skills (15.4% IE/D), such as irrigation and rangeland management, reflect established competencies that remain essential but are likely embedded within broader roles or treated as baseline expectations rather than differentiating hiring criteria. Similarly, declining cross-sector skills, including fire suppression systems, forestry, and science, point to a reduced emphasis on broadly applied technical knowledge in favor of more targeted operational and compliance-related skill sets.

Taken together, these patterns indicate a shift in the nature of work across the sector. Rather than increasing demand for highly specialized technical expertise, employers are placing greater emphasis on foundational and cross-cutting skills that support standardized, quality-oriented, and safety-focused operations. At the same time, some analytical and broad technical functions are becoming less visible in hiring demand, reflecting changes in how work is organized and supported by technology.

This shift underscores the importance of preparing students with strong foundational competencies that can be applied across a wide range of roles, while also ensuring exposure to key industry standards and processes. For K-12 systems and community colleges, these findings highlight several opportunities to strengthen program design and student outcomes:

Curriculum alignment with growing skills.
Programs should emphasize foundational competencies such as communication, attention to detail, and problem-solving, alongside cross-sector technical skills related to quality assurance, food safety, and standardized production processes. Embedding these skills across coursework and applied learning experiences will better prepare students for the expectations of modern, compliance-driven work environments.

Aligning curriculum and pathways to industry standards.
Given the importance of cross-sector technical skills, programs can align curriculum with widely recognized industry frameworks such as HACCP and good manufacturing practices. Integrating these standards into coursework and work-based learning opportunities can help ensure that students develop competencies directly applicable across multiple roles and industries.

K-12 pathway alignment.
K-12 pathways can provide early exposure to foundational and cross-sector skills, including communication, problem-solving, safety practices, and basic concepts in food production and environmental systems. Providing hands-on learning and dual-enrollment opportunities can help students build a strong foundation and transition more effectively into community college programs and related careers.

APPENDICES

APPENDIX A: RESEARCH DEFINITIONS AND METHODOLOGIES

Definitions

Labor market information was pulled from Lightcast, a labor market analytics firm that specializes in providing insights for workforce development, economic planning, and education. Lightcast compiles its regional and occupational datasets from a variety of federal and state sources. Among these are the Quarterly Census of Employment and Wages (QCEW), which offers detailed industry employment and wage data, and other critical sources such as the U.S. Census Bureau's American Community Survey (ACS) and Quarterly Workforce Indicators, the Bureau of Labor Statistics' Occupational Employment and Wage Statistics and Current Population Survey, and data from the Bureau of Economic Analysis.[8] These combined resources provide comprehensive insights into employment trends, wage patterns, and quality job workforce characteristics. The baseline year of 2024 was used to offer the maximum comparability with the student data available, and the projected data was through 2029.

Annual job openings include the projected growth (new jobs) and replacement needs of an occupation annually. This figure is often used to assess the expected employer demand for an occupation, providing a number of job openings that will require new workers to fill.

Educational attainment is the highest level of education attained by workers aged 25 years or older. This information may illuminate mismatches between resident skills and employment needs.

An **occupation** is a set of activities or tasks employees are paid to perform. Employees that perform essentially the same tasks are in the same occupation, whether or not they work in the same industry. Some occupations are concentrated in a few particular industries; other occupations are found in many industries. For example, jobs for registered nurses are concentrated in the healthcare industry sector, but educational industries may also employ these jobs.

SOC code: The Standard Occupational Classification system is a federally defined system used to classify workers into occupational categories that are grouped together according to job duties.[9]

TOP code: The Taxonomy of Programs is a system of codes used by the State of California to compare differently named academic programs with similar outcomes across community colleges.[10] Each course offered by California Community Colleges is assigned to a TOP code.

Methodologies and Sources

The data sources used in this study include data from Lightcast, a labor market analytics firm that specializes in providing insights for workforce development, economic planning, and education. Lightcast compiles its regional and occupational datasets from a variety of federal and state sources. Among these are the Quarterly Census of Employment and Wages (QCEW), which offers detailed industry employment and wage data, and other critical sources such as the U.S. Census Bureau's American Community Survey (ACS) and Quarterly Workforce Indicators, the Bureau of Labor Statistics' Occupational Employment and Wage Statistics and Current Population Survey, and data from the

[8] Lightcast (2025). Version 2025.1. Retrieved from https://lightcast.io/ in April 2025.
[9] "Standard Occupational Classification," Bureau of Labor Statistics, bls.gov/soc/
[10] ""Taxonomy of Programs," California Community Colleges, https://www.cccco.edu/-/media/CCCCO-Website/About-Us/Divisions/Educational-Services-and-Support/Academic-Affairs/What-we-do/Curriculum-and-Instruction-Unit/Files/TOPmanual6200909corrected12513

Bureau of Economic Analysis.[11] These combined resources provide comprehensive insights into employment trends, wage patterns, and industry-specific workforce characteristics across the Inland Empire/Desert regions.

The Lightcast taxonomy organizes skills into a tiered structure that groups related competencies according to the type of work or task they support. Within this framework, skills are categorized as common, specialized, or software skills. To determine which skills should be included in our analysis, we examined how frequently individual skills appear in job postings. We calculated the median share of job ads in which common skills appear across all occupations, providing a baseline measure of typical skill prevalence. Our analysis found that common skills typically appeared in roughly five percent of job postings across occupations. We used this median value as the threshold for determining which skills were included in our research.

The skills analysis compares skills posted over a two-year period (January 2024 – December 2025) to a historical five-year period (January 2019 – December 2023) to identify skills that are growing and shrinking in terms of their prevalence in job ads. This report intentionally uses a two-year period for the current analysis to ensure a sufficient volume of recent job advertisements and avoid the instability that can come with relying on a single year of data. The five-year historical period provides a stable benchmark of longer-term industry skill patterns and reduces the influence of short-term fluctuations. This analysis also illuminates the skills with the highest share of job ads in the most recent period, addressing employer demand for skills that are persistently in demand across time.

The Standard Occupational Classification (SOC) system aggregates occupation information by four levels: major group, minor group, broad occupation, and detailed occupation.[12] This report relies on the minor occupational groupings of detailed occupations for the skills analysis, as they provide greater detail than the broader major occupational groups and ensure the feasibility and readability of this study, which would be lacking in a detailed occupation-based skills analysis.

[11] Lightcast (2025). Version 2025.3. Retrieved from https://lightcast.io/ in July 2025.

[12] Bureau of Labor Statistics. Standard Occupational Classification and Coding Structure. 2018. Retrieved from: https://www.bls.gov/soc/2018/soc_2018_class_and_coding_structure.pdf

Appendix B: Additional Occupations Related to the CCCCO Agriculture, Water, and Environmental Technologies Sector

Exhibit B.1 displays current and projected employment data for the miscellaneous occupational group from 2024 to 2029. The miscellaneous occupational group includes seven occupations with over 8,800 jobs in 2024. This occupational group is projected to grow by 11%, adding 994 jobs to the region through 2029. The occupations are projected to have over 1,600 annual job openings through 2029.

Exhibit B.1: Additional Occupations Related to the CCCCO Agriculture, Water, and Environmental Technologies Sector, Inland Empire/Desert Region, 2024-2029

Occupation Title	2024 Jobs	2029 Jobs	2024 - 2029 % Change	Average Annual Openings	Median Hourly Earnings
Animal Caretakers	3,821	4,419	16%	846	$17.52
Pest Control Workers	1,590	1,656	4%	216	$18.61
Veterinary Assistants and Laboratory Animal Caretakers	1,083	1,235	14%	240	$18.56
Veterinary Technologists and Technicians	966	1,125	16%	130	$23.41
Animal Trainers	617	643	4%	94	$19.43
Floral Designers	542	534	(1%)	66	$21.49
Farm Equipment Mechanics and Service Technicians	216	218	1%	19	$22.64
Total	**8,837**	**9,831**	**11%**	**1,610**	**-**

Source: Lightcast 2025.4 – Occupation Table, QCEW Employees, Non-QCEW Employees, and Self-Employed