Program Endorsement Brief:

Agricultural Technology and Sciences in the North region

North/Far North Center of Excellence, January 2020

INTRODUCTION

This report provides an overview of the labor market demand and educational program supply for occupations related to agricultural technology and sciences in the 7-county North region and the broader 22-county North/Far North region.

SUMMARY OF KEY FINDINGS

- Agriculture technology occupations are projected to have 170 annual openings in the North region over the next five years.

- Median hourly wages for the selected occupations are above the regional living wage for a single adult. Hourly wages range from $15 to $22 per hour.

- Agriculture technology training programs in the North region conferred an average of 36 awards per year over the last three years.

The report contains the following sections:
- Occupational demand,
- Wages and job postings,
- Education and training,
- Regional program supply, and
- Findings and recommendations.

OCCUPATIONAL DEMAND

The following Standard Occupational Classification (SOC) codes related to the proposed program were included in the analysis:[1]

19-4011.01 - Agricultural Technicians	
Description:	Set up or maintain laboratory equipment and collect samples from crops or animals. Prepare specimens or record data to assist scientists in biology or related life science experiments.
Sample job titles:	Agricultural Research Technician, Agricultural Research Technologist, Agricultural Technician, Laboratory Technician (Lab Tech), Research Assistant, Research Associate, Research Specialist, Research Technician, Seed Analyst, Senior Agricultural Assistant

19-4011.02 - Food Science Technicians	
Description:	Perform standardized qualitative and quantitative tests to determine the physical or chemical properties of food or beverage products.
Sample job titles:	Central Lab Technician (CLT), Food Science Technician, Lab Tech (Laboratory Technician), Laboratory Assistant (Lab Assistant), Operations Technician, Quality Analyst, Quality Assurance Analyst (QA Analyst), Quality Control Technician (QC Technician), Quality Technician, Technical Services Analyst

45-1011.00 - First-Line Supervisors of Farming, Fishing, and Forestry Workers	
Description:	Directly supervise and coordinate the activities of agricultural, forestry, aquacultural, and related workers.
Sample job titles:	Please see job titles in job postings section

45-2011.00 - Agricultural Inspectors	
Description:	Inspect agricultural commodities, processing equipment and facilities, and fish and logging operations, to ensure compliance with regulations and laws governing health, quality, and safety.
Sample job titles:	Brand Inspector; Consumer Safety Inspector (CSI); Deputy Brand Inspector; Food Inspector; Food Sanitarian; Grain Inspector; Inspector; Inspector, Food Safety and Inspection Service (Inspector, FSIS); Seed and Fertilizer Specialist; Shipping Point Inspector

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[1]O*NET OnLine. U.S. Department of Labor Education & Training Administration. Accessed November 22, 2019. https://www.onetonline.org/.
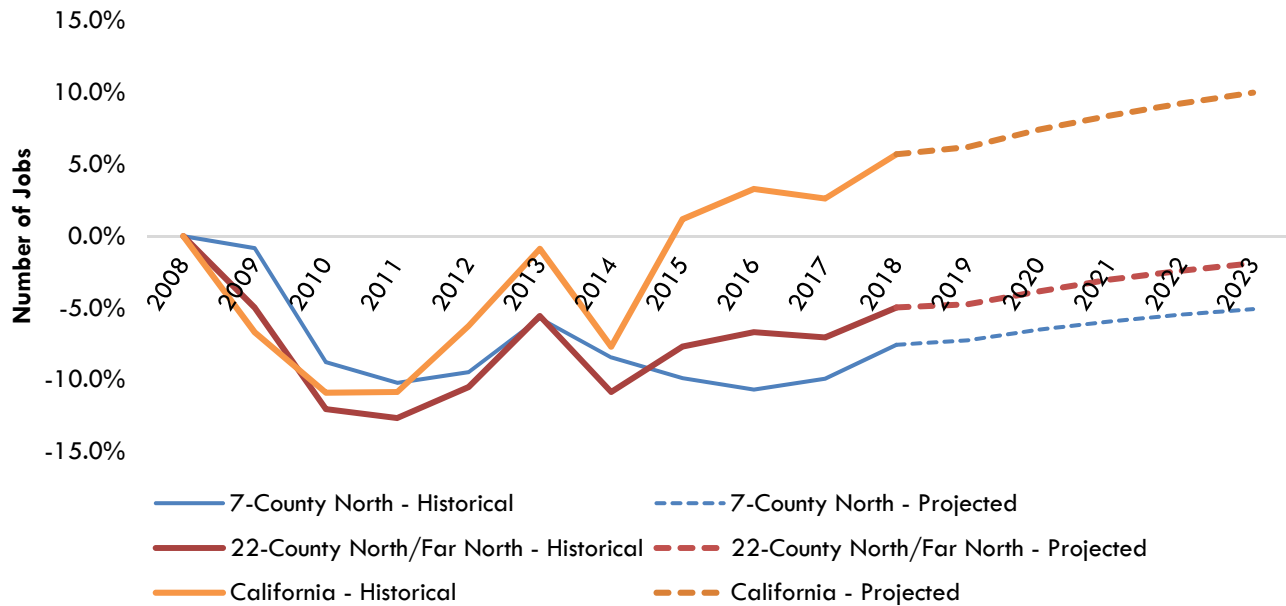
Exhibit 1 summarizes the job trends by SOC codes in the 7-county North region, 22-county North/Far North region, and California.[2]

Exhibit 1. Employment and projected occupational demand[3]

Occupation	SOC	2008 Jobs	2018 Jobs	2023 Jobs	2018-23 % Change	Annual Openings
Agricultural and Food Science Technicians	19-4011	846	737	793	7.6%	82
First-Line Supervisors of Farming, Fishing, and Forestry Workers	45-1011	509	462	480	3.8%	66
Agricultural Inspectors	45-2011	155	160	160	0.0%	22
NORTH	**TOTALS**	**1,509**	**1,359**	**1,432**	**5.4%**	**170**
Agricultural and Food Science Technicians	19-4011	900	854	879	3.0%	91
First-Line Supervisors of Farming, Fishing, and Forestry Workers	45-1011	1,231	1,137	1,179	3.7%	163
Agricultural Inspectors	45-2011	303	323	331	2.4%	45
NORTH/FAR NORTH	**TOTALS**	**2,435**	**2,314**	**2,388**	**3.2%**	**299**
Agricultural and Food Science Technicians	19-4011	3,506	4,551	4,721	3.7%	496
First-Line Supervisors of Farming, Fishing, and Forestry Workers	45-1011	12,711	12,665	13,209	4.3%	1,824
Agricultural Inspectors	45-2011	2,188	2,237	2,313	3.4%	315
CALIFORNIA	**TOTALS**	**18,405**	**19,454**	**20,243**	**4.1%**	**2,635**

Exhibit 2 compares the rates of change of the total number of jobs between 2008 and 2018 in the North region, the North/Far North region, and California. It also compares occupational demand projections from 2018 through 2023 across the same areas. The rate of change is indexed to the base year 2008 total number of jobs.

Exhibit 2. Rate of Change for Selected Occupations[4]

7-County North - Historical
7-County North - Projected
22-County North/Far North - Historical
22-County North/Far North - Projected
California - Historical
California - Projected

WAGES AND JOB POSTINGS

Exhibit 3 compares the median hourly wages of the selected occupations in the study regions to the North region's 7-county average living wage for a one-adult household.[5]

Exhibit 3. Wages for selected occupations[6]
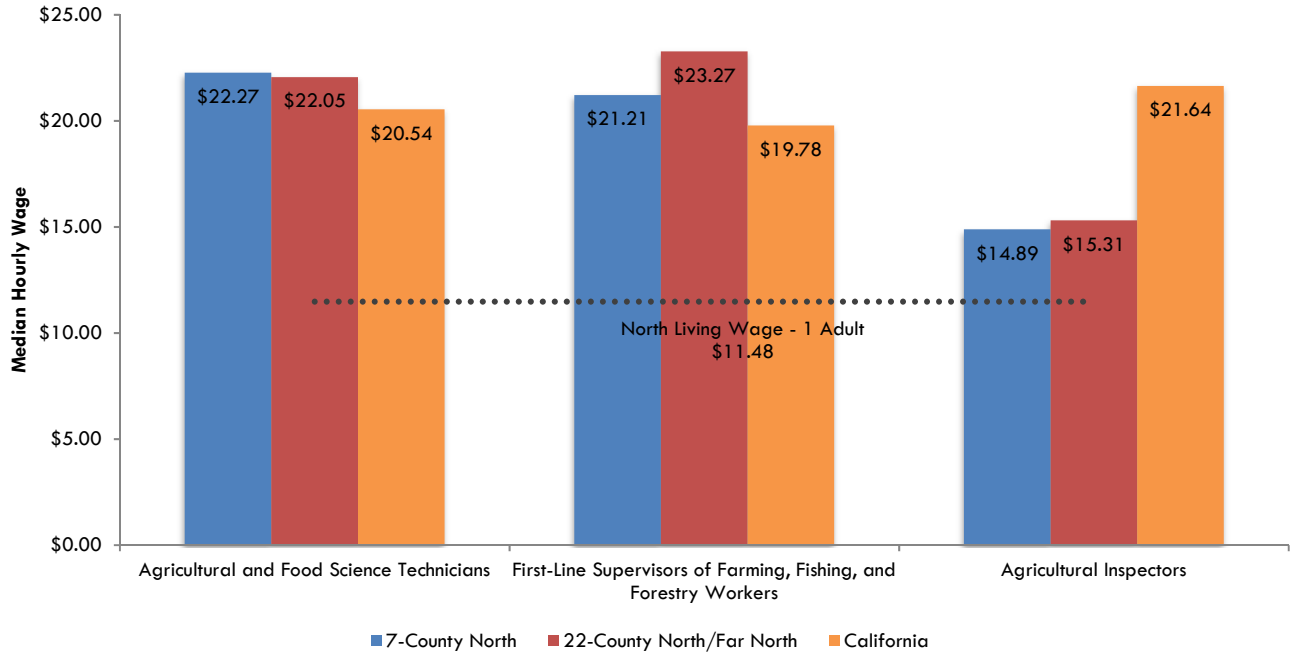
Burning Glass identified a pool of 109 job postings in the North region for the selected occupations. This data represents job listings posted online within the last year, from January 1, 2019, through December 31, 2019.

Exhibit 4 compares the 12-month job posting trends of the selected occupations to the median number of job postings in the North region.

Exhibit 4: Job postings trend for selected occupations[7]
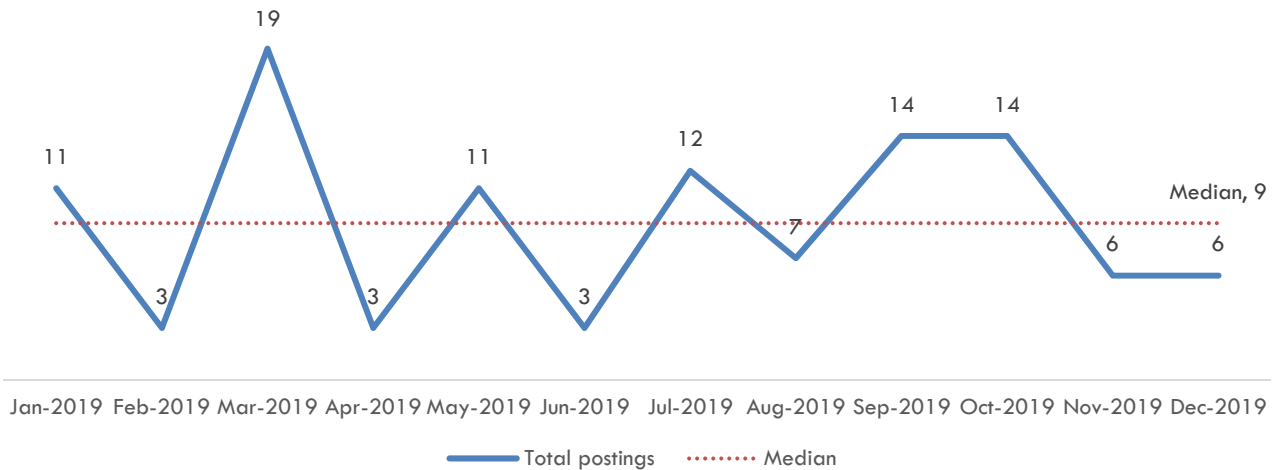
[5] "Family Needs Calculator (Formerly the Self-Sufficiency Standard)." Insight Center for Community Economic Development, February 2018. https://insightcced.org/2018-family-needs-calculator/.
[6] Emsi 2019.4; QCEW Employees, Non-QCEW Employees and Self-Employed.
[7] Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool," http://www.burning-glass.com, 2019.

Exhibit 5 shows the number of job postings in the North region, by city, for the selected occupations.

Exhibit 5. Top job postings locations for selected occupations[8]

City	Number of Postings
Sacramento, CA	64
Woodland, CA	10
Davis, CA	7
Elk Grove, CA	4
Rocklin, CA	3
El Dorado, CA	3
Yolo, CA	2
Truckee, CA	2
Roseville, CA	2
Folsom, CA	2

Exhibit 6 lists North region employers with the most job openings for the selected occupations. Seventy-seven of the 109 job postings included the employer's name.

Exhibit 6: Top employers by number of job postings[9]

Employer	North (n = 77)	
	Number of Postings	**Percent of Postings**
State of California	26	34%
Hupp Draft Services Inc	14	18%
County of Sacramento	4	5%
University of California, Davis	3	4%
California State Teachers' Retirement System	3	4%
Yolo County	1	1%

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[8] Ibid.
[9] Ibid.

Exhibit 7 shows the top job titles for the selected occupations in the North region. All 109 job postings included a job title.

Exhibit 7. Top job titles by number of job postings[10]

Title	Job Postings	% Job Posting
Agricultural Technician	22	20%
Technician	16	15%
Inspector	8	7%
Brand Inspector	8	7%
Seed Technician	4	4%
Agricultural Program Aide	4	4%
Specialist	3	3%
Label Verification	3	3%
Agricultural Biological Technician	3	3%
Senior Brand Inspector	2	2%

Exhibit 8 shows the skills most in-demand for the selected occupations in the North region. Ninety of the 109 job postings included skills information.

Exhibit 8. Top skills by number of job postings [11]

Specialized Skills	Job Postings	% Job Postings	Baseline Skills	Job Postings	% Job Postings
Environmental Science	13	14%	Communication Skills	25	28%
Machinery	13	14%	Organizational Skills	22	24%
Microscope	11	12%	Detail-Oriented	21	23%
Animal Health	10	11%	Building Effective Relationships	17	19%
Brand Experience	10	11%	Research	16	18%
Data Entry	10	11%	Self-Motivation	16	18%
Vehicle Inspection	10	11%	Microsoft Excel	15	17%
Food Safety	9	10%	Writing	13	14%
Packaging	8	9%	Computer Literacy	12	13%

Software Skills	Job Postings	% Job Postings
Microsoft Excel	15	17%
Microsoft Access	10	11%
Microsoft Office	8	9%
Word Processing	8	9%
Microsoft Word	7	8%
SAP	7	8%
Microsoft PowerPoint	6	7%
FileMaker Pro	1	1%
Geographic Information System (GIS)	1	1%

[10] Ibid.
[11] Ibid.

EDUCATION AND TRAINING

Exhibit 9 shows the average level of educational attainment for workers 25 years and older by occupation across the U.S.

Exhibit 9. Typical educational attainment for selected occupations, nationally[12]
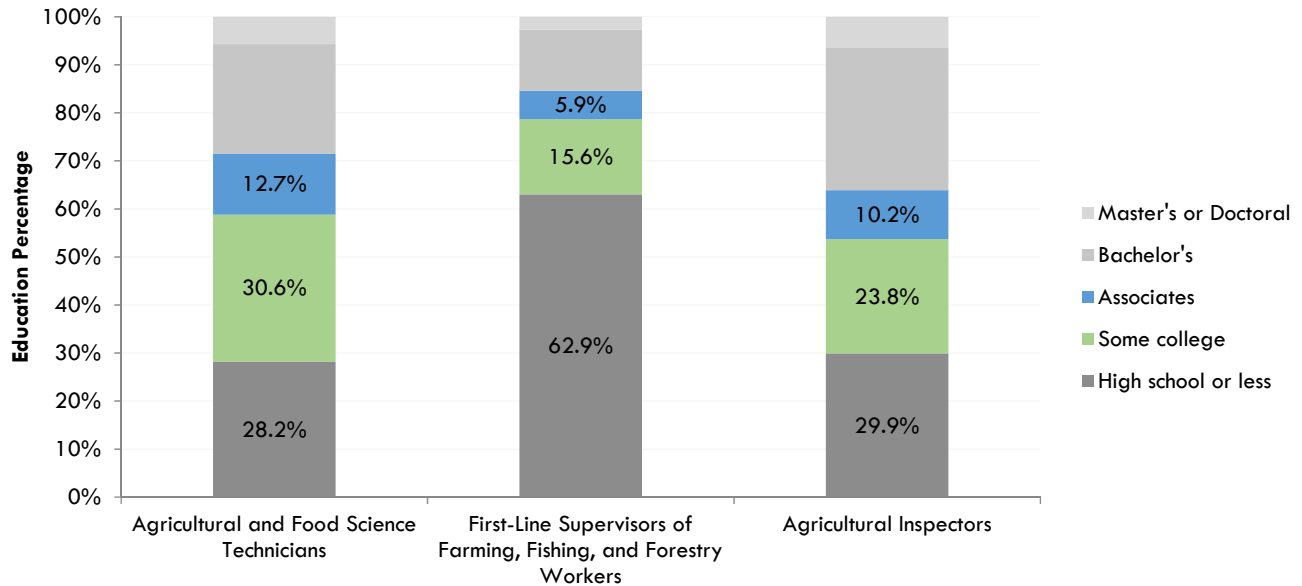

Exhibit 10 shows the typical education requirements, on-the-job training, and work experience requirements for entry-level positions in the selected occupations in the North region.

Exhibit 10. Typical education, training, and work experience for selected occupations[13]

Occupations	SOC	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training
Agricultural and Food Science Technicians	19-4011	Associate's degree	None	Moderate-term on-the-job training
First-Line Supervisors of Farming, Fishing, and Forestry Workers	45-1011	High school diploma or equivalent	Less than five years	None
Agricultural Inspectors	45-2011	Bachelor's degree	None	Moderate-term on-the-job training

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[12] "Educational Attainment for Workers 25 Years and Older by Detailed Occupation." U.S. Bureau of Labor Statistics. U.S. Department of Labor, September 4, 2019. https://www.bls.gov/emp/tables/educational-attainment.htm.
[13] Emsi 2019.4; QCEW Employees, Non-QCEW Employees and Self-Employed.

PROGRAM SUPPLY

This report analyzed the following Taxonomy of Program (TOP) and corresponding Classification of Instructional Programs (CIP) codes :

- TOP: 0101.00 – Agriculture Technology and Sciences, General
- CIP: 01.0000 – Agriculture, General

Exhibit 11 compares the total number of awards (certificates and degrees) conferred by related training providers in the selected TOP and CIP codes in the North region over the last three academic years.

Exhibit 11. Total awards conferred by North training providers, 2016-2019[14]

Exhibit 12 displays program awards by level and year for the selected education programs over the last three academic years.
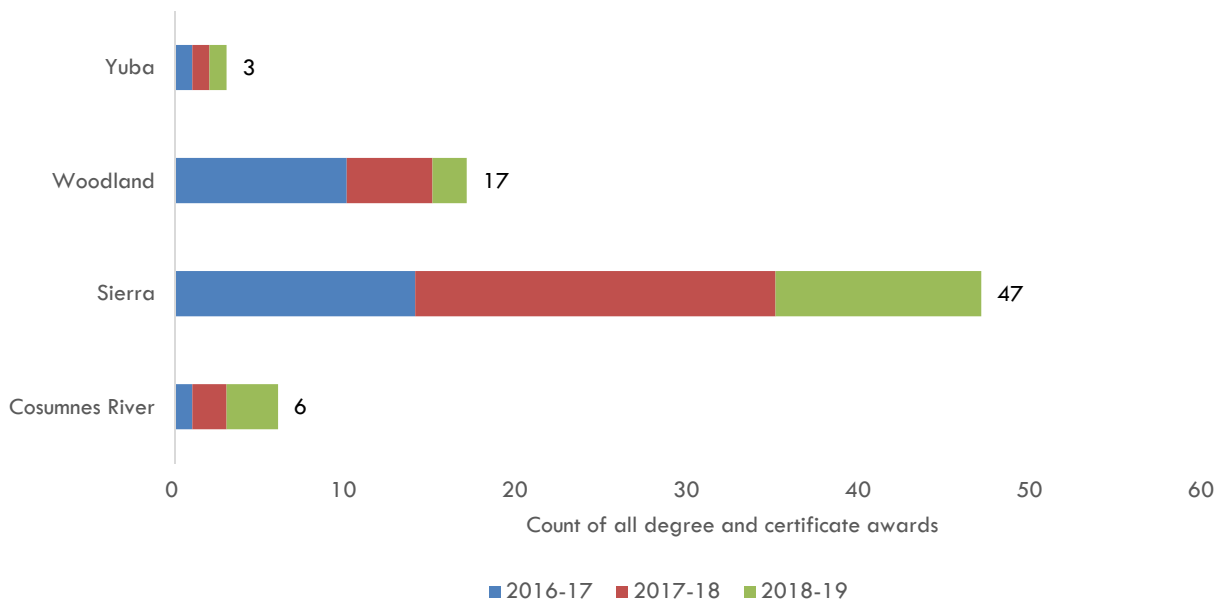
Exhibit 12 displays program awards by level and year for the selected education programs over the last three academic years.

Exhibit 12. Program awards conferred by North region training providers, 2016-2019[15]

Training Providers	Certificate				Associate			
	2016-17	2017-18	2018-19	3-Yr Avg.	2016-17	2017-18	2018-19	3-Yr Avg.
Cosumnes River	0	2	2	**1**	1	0	1	**1**
Sierra	6	11	4	**7**	8	10	8	**9**
Woodland	0	1	0	**0**	10	4	2	**5**
Yuba	0	0	0	**0**	1	1	1	**1**
NORTH REGION TOTALS	**6**	**14**	**6**	**9**	**20**	**15**	**12**	**16**

FINDINGS

- Between 2008 and 2018, agriculture technology occupations declined by 150 jobs in the North region alone. Job losses were confined to two of the three studied occupations: ag and food science technicians lost109 jobs, and first-line supervisors of farming, fishing, and forestry workers lost 47 jobs.

- Jobs for ag and food technicians and first-line supervisors are projected to increase by 8% and 4%, respectively, over the next five years. Jobs for agricultural inspectors are projected to remain stable (no increase or decline) over the next five years.

- There will be an estimated 170 job openings per year for the three occupations in the North region over the next five years (through 2023).

- Median hourly wages for the selected occupations are above the regional living wage for a single adult ($11.48). Hourly wages are highest for ag and food technicians in the North, at $22 per hour. First-line supervisors of farming, fishing, and forestry workers are estimated to earn $21 per hour while agricultural inspectors are estimated to earn $15 per hour.

- Burning Glass Labor Insights identified a pool of 109 jobs for the three occupations studied. Most job postings were for ag and food technicians.

- Between 21.5% and 43% of incumbent workers in the studied occupations have either attended some college or earned an associate degree. Some college, and perhaps earning a postsecondary certificate, is the most common educational attainment level for ag and food science technicians and agricultural inspectors. Sixty-three percent of incumbent first-line supervisors hold only a high school diploma.

- The typical education level required for entry-level work includes a high school diploma for first-line supervisors, an associate's degree for ag and food science technicians, and a bachelor's degree for agricultural inspectors.

- Community colleges in the North region conferred an average of 20 certificates and 16 associate degrees in agriculture technology and science programs between 2016 and 2019.

RECOMMENDATIONS

- Based on a three-year average of annual awards in agriculture technology and sciences (36 certificates and degrees), and projected yearly openings for agriculture technology occupations (170 openings), the region appears to have some demand for programs related to the occupation.

COE Recommendation		
Move forward with program	Program is not recommended	Additional information needed
☒	☐	☐

METHODOLOGY

Occupations in this report were identified using O*Net. Findings in this report were determined using labor market data from the Bureau of Labor Statistics (BLS), U.S. Census Bureau data from Emsi, and jobs posting data from Burning Glass.

APPENDIX A: DATA SOURCES

Sources used for data analysis purposes in this report include:

- U.S. Department of Labor/Employment and Training Administration (DOLETA) O*NET Online

- Burning Glass, Labor Insight/Jobs

- Economic Modeling Specialists, International (EMSI)

- California Employment Development Department, Labor Market Information Division (EDD, LMID)

- Bureau of Labor Statistics, Occupational Employment Statistics (OES)

- California Community Colleges Chancellor's Office, Cal-PASS Plus LaunchBoard

- Living Insight Center for Community Economic Development, Self-Sufficiency Standard Tool for California

- California Community Colleges Chancellor's Office Management Information Systems (MIS Data Mart)

- U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS)

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