

January 2024

Labor Market Analysis

Wildland Fire Technology



Prepared by Central Valley/Mother Lode Center of Excellence



POWERED BY



Table of Contents

Summary.....	2
Key Findings.....	2
Recommendation.....	2
Introduction.....	3
Employment.....	4
Wages.....	5
Job Postings.....	6
Top Employers.....	6
Top Job Titles.....	6
Salaries.....	7
Education.....	7
Baseline, Specialized, and Software Skills.....	7
Certifications.....	8
Education, Work Experience, & Training.....	8
Supply.....	9
Recommendation.....	10
Appendix: Methodology & Data Sources.....	11

If for any reason this document is not accessible or if you have specific needs for readability, please contact us and we will do our utmost to accommodate you with a modified version. To make a request, contact Juan Madrigal by email at juan@coeccc.net.

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 postsecondary programs. This report summarizes labor market demand, wages, skills, and postsecondary supply for *Wildland Fire Technology*:

- Firefighters (SOC 33-2011)
- Fire Inspectors and Investigators (SOC 33-2021)
- Forest Fire Inspectors and Prevention Specialists (SOC 33-2022)

Key Findings

- **Occupational Demand** — Occupations related to *Wildland Fire Technology* have a labor market demand of 185 annual job openings in the North Central Valley/Northern Mother Lode (NCV/NML) subregion. Between 2022 and 2027, *Firefighters* are projected to have the most demand with 175 annual job openings (growth of 7%).
- **Wages** — The occupations studied in this report have an average entry-level hourly wage of \$18.79/hour, which is above the living wage in the NCV/NML subregion – \$12.65/hour for a single adult.¹
- **Employers** — Top employers in the NCV/NML subregion include Defense Logistics Agency, Core & Main, and City of Stockton.
- **Skills** — The most common baseline skill is operations; the most common specialized skill is firefighting; and the most common software skill is Apache Ant.
- **Education** — A high school diploma/GED or a postsecondary nondegree award is the typical entry-level education for the *Wildland Fire Technology* occupations included in this report.
- **Supply and Demand Analysis** — Based on 185 annual openings (i.e., demand) and an average of 95 postsecondary degrees awarded (i.e., supply), an analysis of supply and demand suggests there is an undersupply of 90 workers in the NCV/NML subregion. In the CVML region, 241 awards were conferred suggesting an undersupply of 239 workers (based on 480 annual openings in the CVML region).

Recommendation

Based on a comparison of supply and demand, 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 development of programs to address the shortage of *Wildland Fire Technology* workers.

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/>.

Introduction

The Central Valley/Mother Lode Center of Excellence developed this report to provide Columbia College with labor market information for *Wildland Fire Technology*. The geographical focus for this report is the North Central Valley/Northern Mother Lode (NCV/NML) subregion, but regional supply and demand data has been included for broader applicability and use. Analysis of the program and occupational data related to *Wildland Fire Technology* is included in the report. The Standard Occupational Classification (SOC) System codes and occupational titles used in this report are from the Bureau of Labor Statistics and O*NET OnLine.

Firefighters (SOC 33-2011)

- **Job Description:** Control and extinguish fires or respond to emergency situations where life, property, or the environment is at risk. Duties may include fire prevention, emergency medical service, hazardous material response, search and rescue, and disaster assistance.
- **Knowledge:** Public Safety and Security, Customer and Personal Service, Education and Training, Building and Construction, English Language
- **Skills:** Critical Thinking, Coordination, Judgement and Decision Making, Service Orientation, Active Learning

Fire Inspectors and Investigators (SOC 33-2021)

- **Job Description:** Inspect buildings to detect fire hazards and enforce local ordinances and state laws, or investigate and gather facts to determine cause of fires and explosions.
- **Knowledge:** Public Safety and Security, Customer and Personal Service, Education and Training, Building and Construction, Law and Government
- **Skills:** Active Listening, Critical Thinking, Speaking, Writing, Reading Comprehension

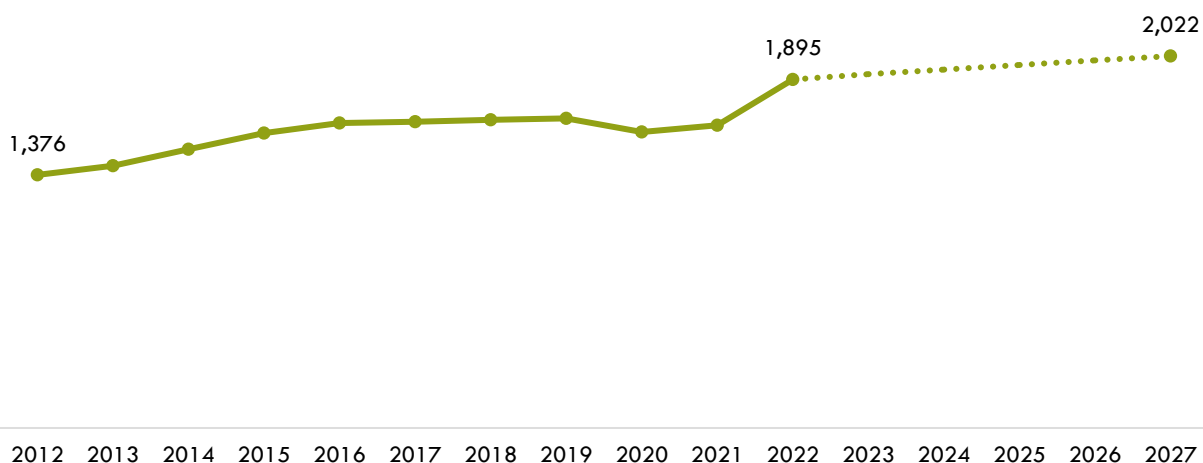
Forest Fire Inspectors and Prevention Specialists (SOC 33-2022)

- **Job Description:** Enforce fire regulations, inspect forest for fire hazards, and recommend forest fire prevention or control measures. May report forest fires and weather conditions.
- **Knowledge:** Administration and Management, Customer and Personal Service, Education and Training, Personnel and Human Resources, Public Safety and Security
- **Skills:** Active Listening, Critical Thinking, Speaking, Coordination, Judgement and Decision Making

Employment

Exhibit 1a shows employment trends for *Wildland Fire Technology* in the NCV/NML subregion. Between 2022 to 2027, the number of jobs for occupations related to *Wildland Fire Technology* is projected to increase by 127 (growth of 7%).

Exhibit 1a. Historical employment and projected occupational demand for *Wildland Fire Technology* occupations in the NCV/NML subregion, 2012-2027



Occupations related to *Wildland Fire Technology* in the NCV/NML subregion employed 1,895 workers in 2022 (Exhibit 1b). Of the three occupations, *Firefighters* are projected to have the most annual openings (175).

Exhibit 1b. Current employment and projected occupational demand for *Wildland Fire Technology* occupations in the NCV/NML subregion, 2022-2027

Occupation	2022 Jobs	2027 Jobs	5-Year Change	5-Year % Change	Annual Openings
Firefighters	1,808	1,927	119	7%	175
Fire Inspectors and Investigators	60	66	5	9%	7
Forest Fire Inspectors and Prevention Specialists	27	29	2	8%	3
TOTAL	1,895	2,022	127	7%	185

Wages

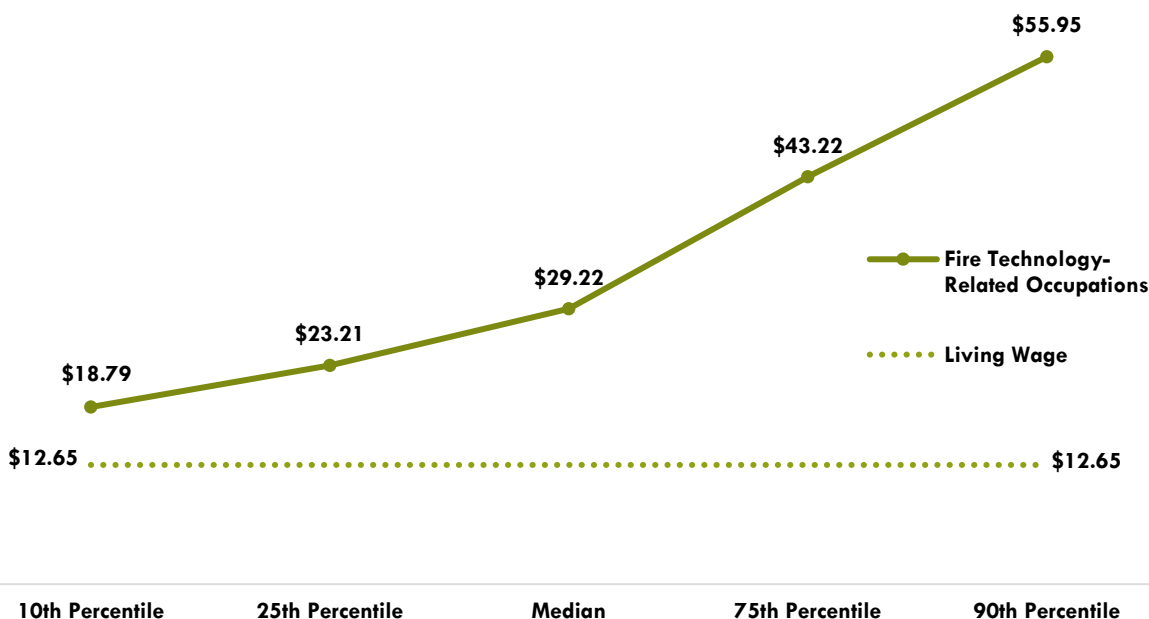
The average living wage for a single adult in the NCV/NML subregion is \$12.65/hour.² Exhibit 2a shows the hourly wages for the three occupations of interest.

Exhibit 2a. Hourly wages for occupations related to *Wildland Fire Technology* in the NCV/NML subregion

Occupation	25 th Percentile Hourly Earnings	Median Hourly Earnings	75 th Percentile Hourly Earnings
Firefighters	\$23.53	\$31.01	\$38.25
Fire Inspectors and Investigators	\$26.05	\$26.80	\$49.89
Forest Fire Inspectors and Prevention Specialists	\$20.05	\$29.83	\$41.50

Exhibit 2b shows the average hourly wages for the three *Wildland Fire Technology* occupations; all five average hourly wages are above the living wage for the NCV/NML subregion.

Exhibit 2b. Average hourly wages for occupations related to *Wildland Fire Technology* in the NCV/NML subregion



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/>.

Job Postings

There were 99 unique job postings for occupations related to *Wildland Fire Technology* in the NCV/NML subregion from January 2023 to December 2023.³

Top Employers

The employers with the most job postings are listed in Exhibit 3. The top employers in online job postings were Defense Logistics Agency, Cal Fire, and U.S. Forest Fire.

Exhibit 3. Top employers of *Wildland Fire Technology* occupations

Employer
Defense Logistics Agency
Cal Fire (Nor Cal)
U.S. Forest Fire
Daily Dispatch
Core & Main
City of Tracy
National Park Service
City of Stockton
City of Lodi
California State Parks

Top Job Titles

Exhibit 4 shows the top job titles for occupations related to *Wildland Fire Technology* in the NCV/NML subregion.

Exhibit 4. Top job titles for *Wildland Fire Technology* occupations

Job Title
Firefighters
Park Rangers
Hazardous Materials Workers
Wildland Firefighters
Fire Prevention Specialists

³ Other than occupational 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 *Wildland Fire Technology*. These are calculated by Lightcast 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 *Wildland Fire Technology*

Market Salary	Job Postings
\$31,000-\$36,999	9
\$37,000-\$42,999	8
\$43,000-\$48,999	9
\$49,000-\$60,999	10
\$61,000-\$66,999	13
\$67,000-\$78,999	5
\$79,000+	6

Education

Of the 99 unique job postings, 70 listed a preferred or minimum educational requirement for the position being filled. Among those, 63% requested a high school diploma or GED (Exhibit 6).

Exhibit 6. Education levels requested in job postings for *Wildland Fire Technology*

Education Level	Job Postings
High school diploma or GED	44
Associate Degree	9
Bachelor’s Degree	13

Baseline, Specialized, and Software Skills

Exhibit 7 shows the top baseline, specialized, and software skills in job postings. The most common baseline skill is operations. The most common specialized skill is firefighting. The most common software skill is Apache Ant.

Exhibit 7. In-demand baseline, specialized, and software skills for *Wildland Fire Technology*

Baseline Skills	Specialized Skills	Software Skills
Operations	Firefighting	Apache Ant
Communication	Fire Suppression Systems	Spreadsheets
Customer Service	Fire Protection	Microsoft Word
Good Driving Record	Emergency Medical Services	Geographic Information Systems
First Aid	Fire Prevention	Microsoft Office

Certifications

Exhibit 8 shows the certifications most desired by employers in the NCV/NML subregion.

Exhibit 8. Top certifications requested in job postings for Wildland Fire Technology

Certifications	Job Postings
Valid Driver's License	39
Emergency Medical Technician (EMT)	18
Firefighter I Certification	17
Basic Life Support (BLS) Certification	12

Education, Work Experience, & Training

A high school diploma or equivalent is typically required for *Forest Fire Inspectors and Prevention Specialists*, while a postsecondary nondegree award is typically required for *Firefighters* and *Fire Inspectors and Investigators* (Exhibit 9).

Exhibit 9. Education, work experience, training, and Current Population Survey results for occupations related to Wildland Fire Technology⁴

Occupation	Typical Entry-level Education	Work Experience Required	Typical On-The-Job Training	CPS
Firefighters	Postsecondary nondegree award	None	Long-term on-the-job training	59%
Fire Inspectors and Investigators	Postsecondary nondegree award	5 years or more	Moderate-term on-the-job training	47%
Forest Fire Inspectors and Prevention Specialists	High school diploma or equivalent	Less than 5 years	Moderate-term on-the-job training	47%

⁴ "Labor Force Statistics from the Current Population Survey," Bureau of Labor Statistics, <https://www.bls.gov/cps/>.

Supply

An analysis of program data from the Integrated Postsecondary Education Data System (IPEDS) for the last three program years shows that, an average of 95 awards were conferred in the NCV/NML subregion and 146 awards were conferred in the SCV/SML subregion (Exhibits 10 and 11).

Exhibit 10. TOP and CIP codes relevant to Wildland Fire Technology

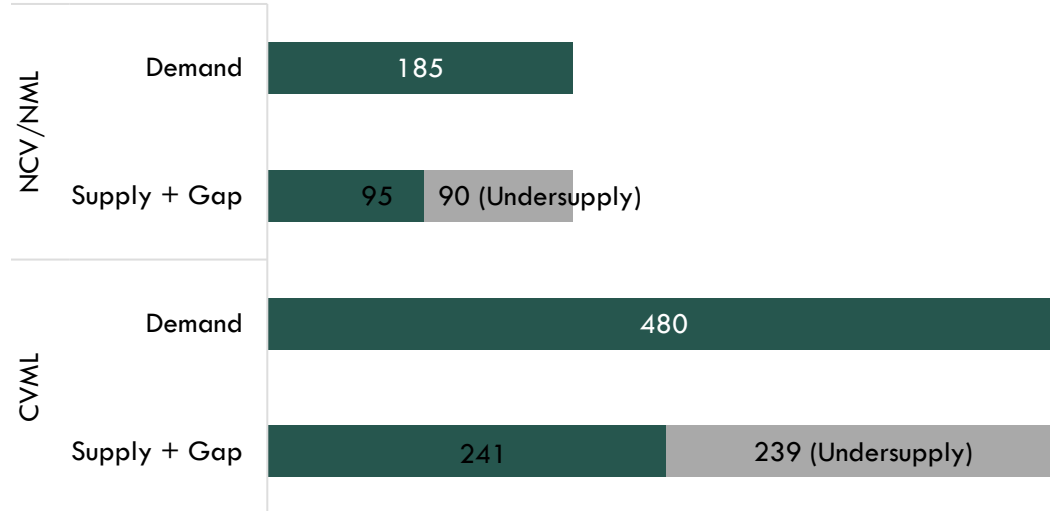
TOP Titles	CIP Titles
2133.00 – Fire Technology	43.0201 – Fire Prevention and Safety Technology/Technician
2133.10 – Wildland Fire Technology	43.0203 – Fire Science/Firefighting
2133.50 – Fire Academy	43.0205 – Fire/Arson Investigation and Prevention
	43.0206 – Wildland/Forest Firefighting and Investigation

Exhibit 11. Postsecondary supply data for Fire Technology-related programs

TOP Code	Program	College	2019-2020 Awards	2020-2021 Awards	2021-2022 Awards	3-Year Award Average
2133.00	Fire Technology	Columbia	30	35	42	36
		Merced	6	6	9	7
		Modesto	32	26	39	32
		NCV/NML Subtotal	68	67	90	75
		Bakersfield	28	30	49	36
		Fresno City	17	22	37	25
		Porterville	1	-	-	0
		Reedley	-	-	13	4
		Sequoias	7	14	13	11
			SCV/SML Subtotal	53	66	112
	CVML Subtotal	121	133	202	152	
2133.10	Wildland Fire Technology	Bakersfield	3	1	-	1
		Porterville	-	30	-	10
		Reedley	-	-	1	0
		SCV/SML Subtotal	3	31	1	12
	CVML Subtotal	3	31	1	12	
2133.50	Fire Academy	Modesto	25	18	18	20
		NCV/NML Subtotal	25	18	18	20
		Fresno City	22	39	42	34
		Sequoias	38	30	-	23
		SCV/SML Subtotal	60	69	42	57
Supply Subtotal/Average			85	87	60	77
Supply Total/Average			209	251	263	241

There is an undersupply of 90 workers in the NCV/NML subregion and an undersupply of 239 workers in the CVML region (Exhibit 12).

Exhibit 12. Workforce demand (annual job openings), postsecondary awards (supply), and additional students needed to fill gap in the NCV/NML subregion and CVML region



Recommendation

This report suggests there is a shortage of 90 workers in the NCV/NML subregion and a shortage of 239 workers in the CVML region for *Wildland Fire Technology* workers. 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 *Wildland Fire Technology* 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 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 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.