



# Occupation Report

## Mathematical Science Occupations

Sacramento-Roseville-Folsom, CA MSA



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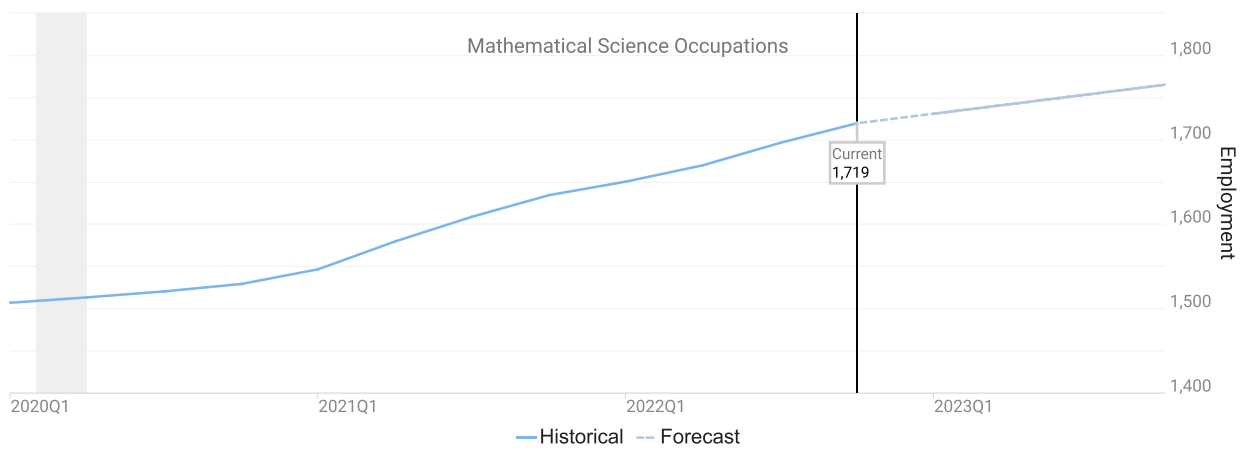
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# Occupation Snapshot

6-Digit Occupation	Empl	Avg Mean Wages	LQ	3-Year Empl Change	Annual Demand	Forecast Ann Growth
Data Scientists	785	\$99,100	0.98	199	84	2.8%
Operations Research Analysts	495	\$90,600	0.72	24	48	2.3%
Statisticians	259	\$100,700	1.10	16	28	3.0%
Actuaries	144	\$122,700	0.84	-7	12	2.3%
Mathematical Science Occupations, All Other	23	\$84,100	0.77	4	2	2.6%
Mathematicians	13	\$125,000	0.96	-3	1	1.1%
<b>Mathematical Science Occupations</b>	<b>1,719</b>	<b>\$98,900</b>	<b>0.89</b>	<b>233</b>	<b>176</b>	<b>2.7%</b>



- 💡 “Annual Demand” is the projected need for new entrants into an occupation. New entrants are needed due to expected growth and to replace workers who left the occupation due to factors such as retirement or switching careers.
- 💡 “Forecast Ann Growth” is the expected change in jobs due to national, long-term trend projections (per the BLS) as well as local factors such as industry mix and population growth (as computed and modeled by Chmura).

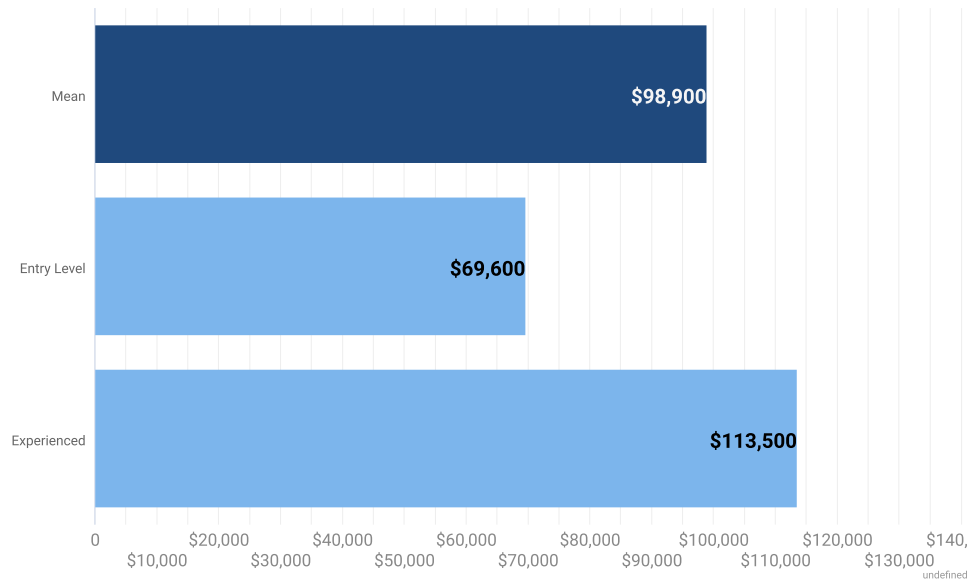
# Employment by Industry

Industry Title	% of Occ Empl	Empl	10-Year Separations	10-Year Empl Growth	10-Year Total Demand
Insurance Carriers	9.6%	165	121	48	169
Scientific Research and Development Services	8.0%	138	112	51	163
Computer Systems Design and Related Services	7.7%	132	110	57	167
Management, Scientific, and Technical Consulting Services	7.6%	130	104	51	155
Management of Companies and Enterprises	6.9%	119	93	34	126
Executive, Legislative, and Other General Government Support	6.0%	103	76	18	94
Agencies, Brokerages, and Other Insurance Related Activities	4.5%	77	56	25	82
Administration of Human Resource Programs	3.5%	61	45	10	55
Colleges, Universities, and Professional Schools	3.3%	57	46	19	65
Administration of Environmental Quality Programs	3.3%	57	42	9	52
General Medical and Surgical Hospitals	3.2%	55	43	15	59
Administration of Economic Programs	3.1%	53	39	9	48
Justice, Public Order, and Safety Activities	2.9%	50	38	9	47
Other Professional, Scientific, and Technical Services	2.3%	40	32	10	42
Employment Services	2.0%	35	27	10	37
Depository Credit Intermediation	1.9%	32	26	11	37
Architectural, Engineering, and Related Services	1.8%	31	24	7	31
Nondepository Credit Intermediation	1.2%	21	17	7	24
Office Administrative Services	1.1%	19	15	6	21
Accounting, Tax Preparation, Bookkeeping, and Payroll Services	1.0%	17	13	5	18
All Others	19.0%	327	259	102	361

 The industry distribution indicates the industries in which workers in the occupation(s) are primarily found.

 “10-Year Empl Growth” may show industries with positive as well as negative growth; this would indicate that the occupation(s) being examined are expected to expand within some industries while contracting in others.

# Wages

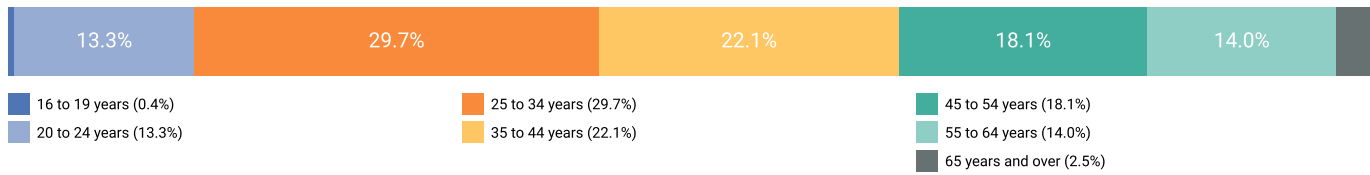


Occupation	Mean	Median	Entry Level	Experienced
Mathematicians	\$125,000	\$125,500	\$79,600	\$147,700
Actuaries	\$122,700	\$108,900	\$78,100	\$145,100
Statisticians	\$100,700	\$104,400	\$69,200	\$116,500
Data Scientists	\$99,100	\$85,300	\$74,200	\$111,600
Operations Research Analysts	\$90,600	\$84,800	\$60,100	\$105,800
Mathematical Science Occupations, All Other	\$84,100	\$69,300	\$47,400	\$102,500

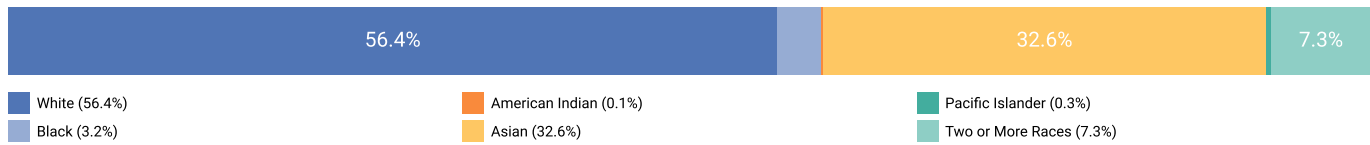
- 💡 Occupation wages here utilize BLS OEWS data, imputed and brought forward by Chmura.
- 💡 When this report is run for an occupation group, the table above displays up to the top ten detailed occupations which have the highest average wages within the occupation group.

# Occupation Demographics

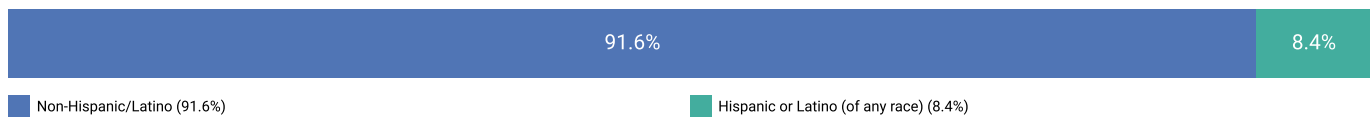
## Age



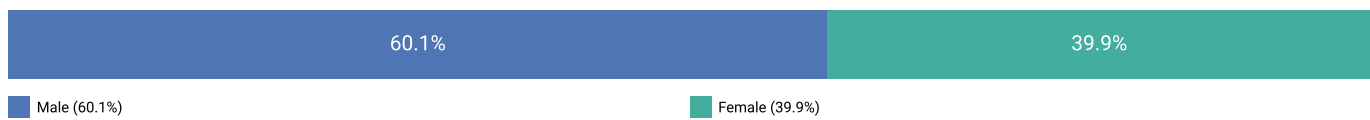
## Race



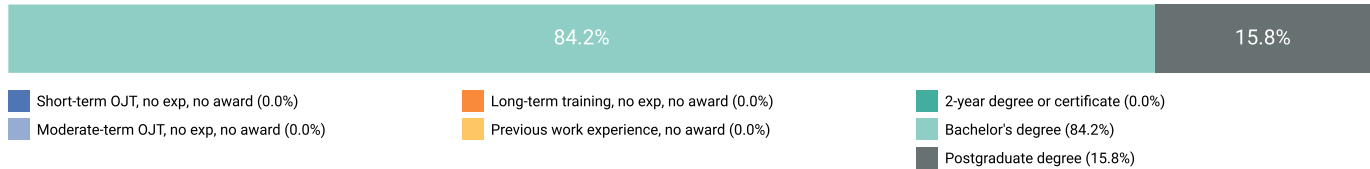
## Ethnicity



## Gender

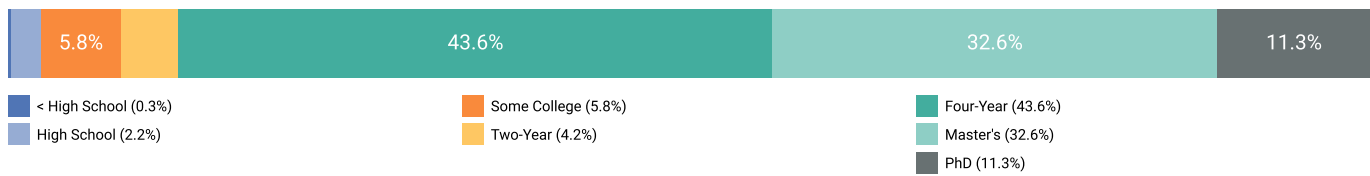


## Education and Training Requirements



# Education Profile

## Educational Attainment




Occupation	Typical Entry-Level Education	Previous Work Experience	Typical On-the-Job Training
Data Scientists	Bachelor's degree	None	None
Operations Research Analysts	Bachelor's degree	None	None
Statisticians	Master's degree	None	None
Actuaries	Bachelor's degree	None	Long-term on-the-job training
Mathematical Science Occupations, All Other	Bachelor's degree	None	None
Mathematicians	Master's degree	None	None


 The stacked bar chart here illustrates the estimated mix of educational attainment of the workers in this occupation(s) in aggregate.

 The table indicates typical education and training requirements rather than the mix of attainment of workers in such positions.

# Postsecondary Programs Linked to Mathematical Science Occupations

Program	Awards
<b>American River College</b>	
Mathematics, General	42
<b>California State University-Sacramento</b>	
Computer Science	310
Mathematics, General	78
<b>Sierra College</b>	
Mathematics, General	83
<b>University of California-Davis</b>	
Applied Mathematics, General	86
Computer Science	444
Econometrics and Quantitative Economics	661
Management Science	120
Mathematics, General	107
Statistics, General	286

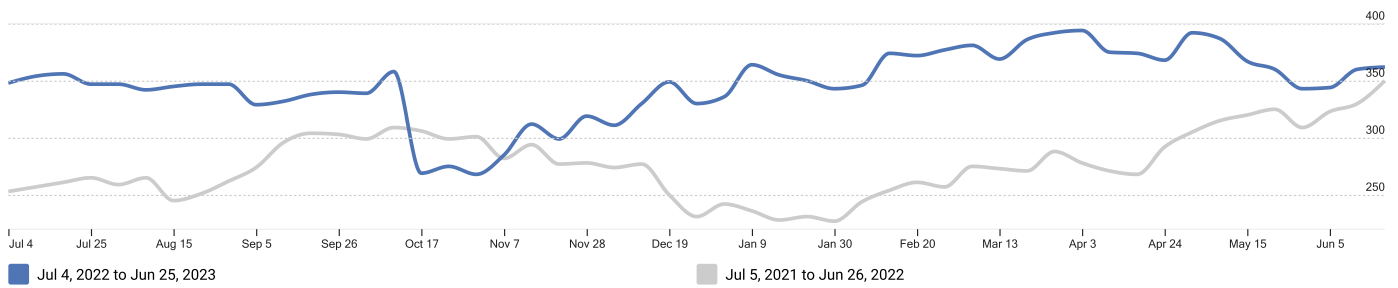
 The number of graduates from postsecondary programs in the region identifies the pipeline of future workers as well as the training capacity to support industry demand.

 Among postsecondary programs at schools located in the Sacramento-Roseville-Folsom, CA MSA, the sampling above identifies those most linked to Mathematical Science Occupations. For a complete list see JobsEQ®, <http://www.chmuraecon.com/jobseq>



# RTI (Job Postings)

Active Job Ads by Date



 Online job ads are a timely indicator of local demand. Occupation assignments shown below are made by Chmura based upon analysis of job titles and job descriptions. Top employers and listed job requirements are shown on the following pages.

## Occupations

SOC	Occupation	Active Job Ads
15- 2031.00	Operations Research Analysts	2,647
15- 2051.01	Business Intelligence Analysts	165
15- 2041.00	Statisticians	85
15- 2011.00	Actuaries	36
15- 2041.01	Biostatisticians	22
15- 2051.00	Data Scientists	14
15- 2051.02	Clinical Data Managers	6
15- 2099.01	Bioinformatics Technicians	1

### Locations

Location	Active Job Ads	
Sacramento, California	1,039	
Sacramento County, California	809	
University of California Davis	171	
Yolo County, California	84	
Folsom, California	69	
West Sacramento, California	32	
Davis, California	29	
Rancho Cordova, California	28	
Roseville, California	28	
Rocklin, California	23	

### Employers

Employer Name	Active Job Ads	
CA DEPARTMENT OF JUSTICE	198	
CA DEPARTMENT OF PARKS AND RECREATION	125	
Davis, California	107	
Sacramento, California	85	
CA STATE HOSPITALS	78	
CALIFORNIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT	62	
State of California Public Utilities Commission	59	
CalHR	54	
State of California Department of Consumer Affairs	51	
State of California Department of Public Health	43	

### Hard Skills

Skill Name	Active Job Ads	
Microsoft Excel	850	
Telecommunications	565	
Statistics	427	
Data Analysis	423	
Structured Query Language (SQL)	400	
Microsoft Office	388	
Computer Programming/Coding	324	
Tableau	291	
Microsoft Word	289	
Microsoft Outlook	286	

### Job Titles

Job Title	Active Job Ads	
STAFF SERVICES ANALYST (GENERAL)	152	
STAFF SERVICES MANAGER I	123	
ASSOCIATE GOVERNMENTAL PROGRAM ANALYST	114	
STAFF SERVICES MANAGER II (SUPERVISORY)	83	
STAFF SERVICES ANALYST	75	
RESEARCH DATA SPECIALIST II	53	
RESEARCH DATA ANALYST II	50	
RESEARCH DATA SPECIALIST I	48	
ASSOCIATE PERSONNEL ANALYST	46	
Data Analyst	44	

### Education Levels

Minimum Education Level	Active Job Ads	
Bachelor's degree	854	
Master's degree	112	
High school diploma or equivalent	52	
Associate's degree	39	
Doctoral or professional degree	28	
Unspecified/other	1,891	

### Programs

Program Name	Active Job Ads	
Statistics	199	
Computer Science	151	
Economics	141	
Mathematics	126	
Business	96	
Business Administration	96	
Finance	83	
Accounting	66	
Engineering	64	
Public Health	48	

# Top Skill and Certification Gaps

Top 10 Skill Gaps in Sacramento-Roseville-Folsom, CA MSA

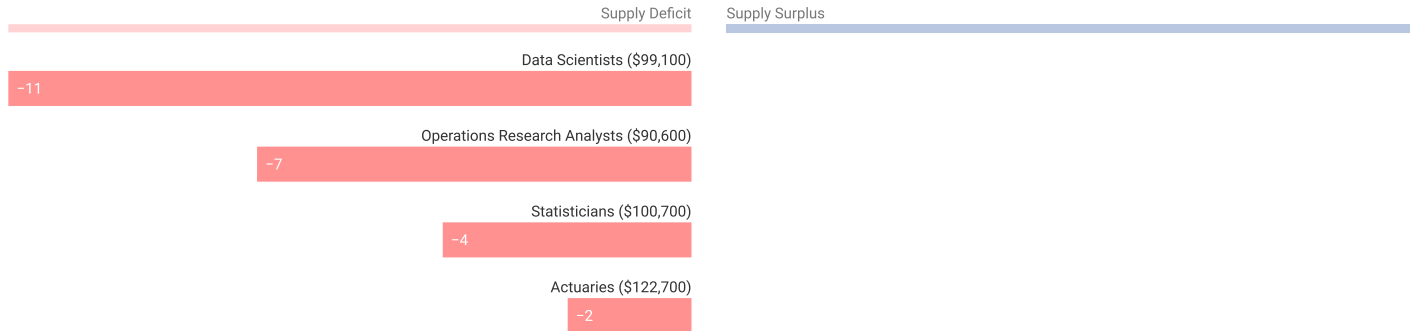
Name	Candidates	Openings	Gap
R	9	16	-8
Report Writing/Report Preparation	2	9	-7
Mathematics	13	19	-6
Microsoft Visual Basic for Applications (Microsoft VBA)	5	10	-5
Data Modeling	8	13	-5
Extract, Transform, Load (ETL)	23	28	-5
Calculators	1	6	-4
Pivot Tables	4	8	-4
Leadership Development	0	4	-4
Oracle Business Intelligence Enterprise Edition	0	4	-4

Top 10 Certification Gaps in Sacramento-Roseville-Folsom, CA MSA

Name	Candidates	Openings	Gap
Associate of the Society of Actuaries (ASA)	0	3	-3
Certified Associate in Project Management (CAPM)	0	1	-1
Project Management Professional (PMP)	1	1	-1
Fellow in the Casualty Actuarial Society (FCAS)	0	1	-1
Fellow of the Society of Actuaries (FSA)	1	2	0
Secret Clearance	1	0	1

 Skill and certifications gaps can help inform employee development programs, as well as provide a comparison of the needs of regional employers to the supply.

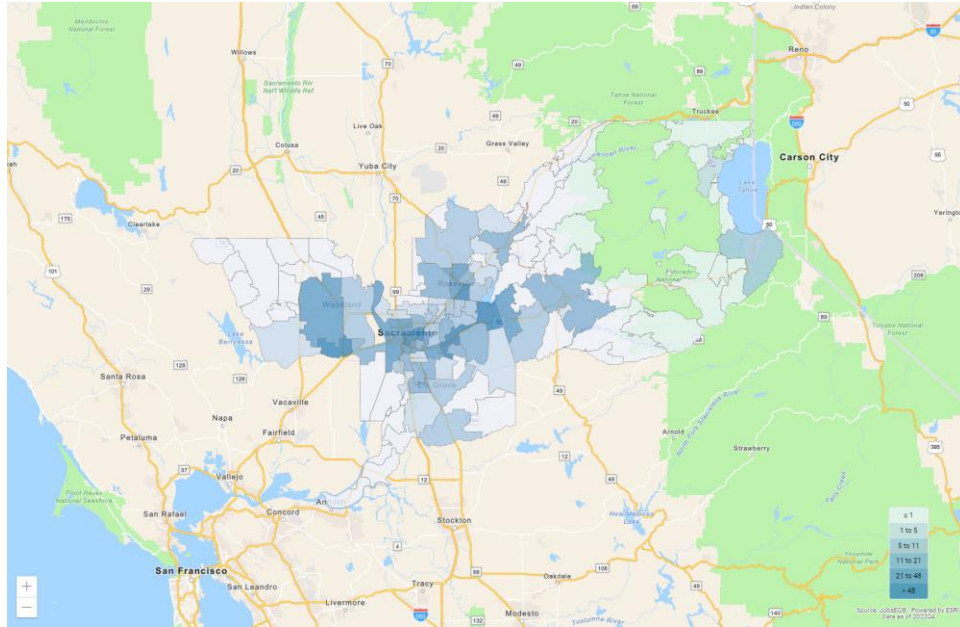
# Occupation Gaps



💡 The above are the potential average annual gaps over 10 years. Many variables go into this analysis, but at its core it is based on a forecast comparing occupation demand growth to the local population growth and the projected educational attainment of those residents. When an area, for example, has an occupation expected to grow quickly but the educational requirement for the occupation does not match well with the educational attainment of its residents, there is a high potential for an occupation shortfall in the region. Alternatively, slow-growing or contracting occupations often represent potential supply surpluses.

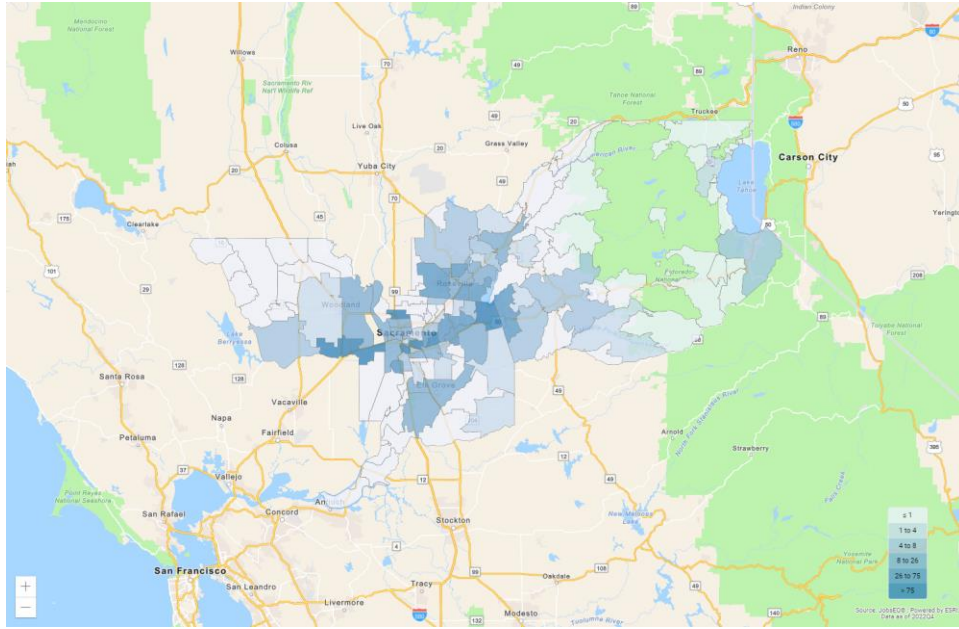
💡 The potential supply shortfall is an underlying force that the market needs to resolve one way or another, such as by employers recruiting from further distances for these occupations, wages going up to attract more candidates, and/or increased demand and wages enticing more local residents to get training for these occupations. While this an important analysis for determining local occupation needs, the occupation gap should be considered along with other regional data including growth and separation forecasts, unemployment rates, wage trends, and award and skill gap analyses.

# Geographic Distribution



**Top ZCTAs by Place of Work for Mathematical Science Occupations, 2022Q4**

Region	Employment
ZCTA 95814	242
ZCTA 95670	209
ZCTA 95630	129
ZCTA 95827	71
ZCTA 95661	59
ZCTA 95815	54
ZCTA 95616	51
ZCTA 95811	49
ZCTA 95833	48
ZCTA 95678	47



**Top ZCTAs by Place of Residence for Mathematical Science Occupations, 2022Q4**

Region	Employment
ZCTA 95630	205
ZCTA 95616	149
ZCTA 95835	108
ZCTA 95818	100
ZCTA 95819	96
ZCTA 95816	92
ZCTA 95618 (Yolo County, CA portion)	84
ZCTA 95864	75
ZCTA 95762	73
ZCTA 95765	71

💡 “Place of work” employment is based upon the location of employers for these workers. “Place of residence” data refers to the home locations of the workforce, which is typically the preferred data set to use when calculating labor availability within a drive-time or radius of a potential worksite.



# Sacramento-Roseville-Folsom, CA MSA Regional Map



# Data Notes

- Occupation employment by default indicates employment by place of work. Occupation employment is as of 2022Q4 and is based on industry employment and local staffing patterns calculated by Chmura and utilizing BLS OEWS data. Employment forecasts are modeled by Chmura and are consistent with BLS national-level 10-year forecasts. Wages by occupation are as of 2022Q4, utilizing BLS OEWS data, imputed and brought forward by Chmura. Entry-level and experienced wages are derived from these source data, computed by Chmura.
- Industry employment is as of 2022Q4 and is based upon BLS QCEW data, imputed by Chmura where necessary, and supplemented by additional sources including Census ZBP data.
- Education and training requirements are from the BLS. Educational attainment mix and other occupation demographics data are modeled by Chmura for 2022Q4 using regional occupation employment from JobsEQ, ZCTA-level demographics data from the Census Bureau, and national occupation-demographics patterns from the BLS.
- Postsecondary awards are per the NCES and are for the 2020-2021 academic year. Any programs shown are linked with the occupation(s) being analyzed via the program-occupation crosswalk, which may not be comprehensive. Any programs shown reflect only data reported to the NCES; reporting is required of all Title IV schools. Training providers that do not report data to the NCES are not reflected.
- Job ads data are online job posts from the Real-Time Intelligence (RTI) data set, produced wholly by Chmura and gleaned from over 40,000 websites. Data reflect ads active during the last twelve month period ending 07/05/2023 and advertised for any Zip Code Tabulation Area in or intersecting with the region for which this report was produced. Historical ad volume is revised as additional data are made available and processed. Since many extraneous factors can affect short-term volume of online job postings, time-series data can be volatile and should be used with caution. All ad counts represent deduplicated figures.
- For skill and certification gaps, openings and candidates are based upon regional occupation demand (growth plus separations) and the percent of skill demand and supply. Skill demand mix data are per a one-year sample of RTI data; skill supply data are estimated using a five-year sample of resumes data; both data sets compiled as of August 2021. Data may be based, at least in part, on data from broader geographies; see the Skill Gaps analytic export for more details.
- Occupation gaps are modeled by Chmura, indicating long-term potential supply and demand mismatches in a region due, in part, to job demand and labor pool dynamics, including educational attainment and projected growth.
- Occupation employment by place of residence is as of 2022Q4 and modeled by Chmura based upon occupation employment by place of work and commuting patterns. Commuting patterns are derived from source data from the Census Bureau, occupation-specific commuting tendencies, and updated to reflect more recent population and employment estimates.
- Figures may not sum due to rounding.

# Region Definition

**Sacramento-Roseville-Folsom, CA MSA is defined as the following counties:**

El Dorado County, California

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Placer County, California

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Sacramento County, California

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Yolo County, California

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# FAQ

## What is (LQ) location quotient?

Location quotient is a measurement of concentration in comparison to the nation. An LQ of 1.00 indicates a region has the same concentration of an industry (or occupation) as the nation. An LQ of 2.00 would mean the region has twice the expected employment compared to the nation and an LQ of 0.50 would mean the region has half the expected employment in comparison to the nation.

## What is annual demand?

Annual demand is a of the sum of the annual projected growth demand and separation demand. Separation demand is the number of jobs required due to separations—labor force exits (including retirements) and turnover resulting from workers moving from one occupation into another. Note that separation demand does not include all turnover—it does not include when workers stay in the same occupation but switch employers. Growth demand is the increase or decrease of jobs expected due to expansion or contraction of the overall number of jobs.