



# FOOTHILL COLLEGE

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**Geospatial Technology Occupations Report  
for Greater Bay Area Region  
(Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo,  
Santa Clara, Solano, and Sonoma Counties)**

## Geospatial Technology

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Geospatial technology, an information technology field, acquires, manages, interprets, integrates, displays, analyzes or otherwise uses data focusing on geographic, temporal and spatial aspects of the world's environment. Geospatial technologies include remote sensing, geographic information systems (GIS) and global positioning systems (GPS) technologies. (Department of Labor).

## Target Occupations

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### Geospatial Information Scientists and Technologists

O\*NET 15-1199.04: Research or develop geospatial technologies. May produce databases, perform applications programming, or coordinate projects. May specialize in areas such as agriculture, mining, health care, retail trade, urban planning, or military intelligence.

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### Geographic Information Systems Technicians

O\*NET 15-1199.05: Assist scientists, technologists, or related professionals in building, maintaining, modifying, or using geographic information systems (GIS) databases. May also perform some custom application development or provide user support.

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### Cartographers and Photogrammetrists

O\*NET 17-1021.00: Collect, analyze, and interpret geographic information provided by geodetic surveys, aerial photographs, and satellite data. Research, study, and prepare maps and other spatial data in digital or graphic form for legal, social, political, educational, and design purposes. May work with Geographic Information Systems (GIS). May design and evaluate algorithms, data structures, and user interfaces for GIS and mapping systems.

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### Remote Sensing Scientists and Technologists

O\*NET 19-2099.01: Apply remote sensing principles and methods to analyze data and solve problems in areas such as natural resource management, urban planning, or homeland security. May develop new sensor systems, analytical techniques, or new applications for existing systems.

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### Remote Sensing Technicians

O\*NET 19-4099.03: Apply remote sensing technologies to assist scientists in areas such as natural resources, urban planning, or homeland security. May prepare flight plans or sensor configurations for flight trips.

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### Precision Agriculture Technicians

O\*NET 19-4099.02: Apply geospatial technologies, including geographic information systems (GIS) and Global Positioning System (GPS), to agricultural production or management activities, such as pest scouting, site-specific pesticide application, yield mapping, or variable-rate irrigation. May use computers to develop or analyze maps or remote sensing images to compare physical topography with data on soils, fertilizer, pests, or weather.

## Geospatial Technology Occupations Breakdown Comparison\*

Target Occupations (O*NET)	Median Hourly Earnings	2014 Jobs	2014-2017 Change	2014-2017 Estimated Annual Openings
Geospatial Information Scientists and Technologists (per SOC 15-1199)	\$45.49	8,060	436	219
Geographic Information Systems Technicians (per SOC 15-1199)	\$45.49	8,060	436	219
Cartographers and Photogrammetrists (per SOC 17-1021)	\$31.41	311	28	13
Remote Sensing Scientists and Technologists (per SOC 19-2099)	\$52.15	892	19	25
Remote Sensing Technicians (per SOC 19-4099)	\$50.50	1,607	81	57
Precision Agriculture Technicians (per SOC 19-4099)	\$20.63	2,046	122	96

\*The target occupations are based on EMSI crosswalk of the Classification of Instructional Programs (CIP) codes with Standard Occupational Classification (SOC) codes as published by the U.S Department of Education. These occupations are housed within larger industries based on SOC codes, so the data may reflect that larger category rather than the specific occupation.

## Educational Attainment among Geospatial Technology Occupations

### Educational Attainment among Geospatial Information Scientists and Technologists (National)

Master's Degree	21%
Bachelor's Degree	61%
Associate's Degree (or other 2-year degree)	14%
Post-Secondary Certificate	4%

### Educational Attainment among Geographic Information Systems Technicians (National)

Master's Degree	27%
Bachelor's Degree	68%
Associate's Degree (or other 2-year degree)	1%
Post-Secondary Certificate	1%
High School Diploma (or GED or High School Equivalence Certificate)	3%

### **Educational Attainment among Cartographers and Photogrammetrists (National)**

Doctoral Degree	1%
Post-Baccalaureate Certificate	6%
Bachelor's Degree	54%
Associate's Degree (or other 2-year degree)	7%
Some College Courses	9%
Post-Secondary Certificate	4%
High School Diploma (or GED or High School Equivalence Certificate)	19%

### **Educational Attainment among Remote Sensing Scientists and Technologists (National)**

Doctoral Degree	4%
Master's Degree	50%
Bachelor's Degree	38%
Some College Courses	4%
Post-Secondary Certificate	4%

### **Educational Attainment among Remote Sensing Technicians (National)**

Master's Degree	0%
Post-Baccalaureate Certificate	8%
Bachelor's Degree	62%
Associate's Degree (or other 2-year degree)	9%
Some College Courses	6%
Post-Secondary Certificate	5%
High School Diploma (or GED or High School Equivalence Certificate)	9%

### **Educational Attainment among Precision Agriculture Technicians (National)**

Post-Baccalaureate Certificate	4%
Bachelor's Degree	43%
Associate's Degree (or other 2-year degree)	25%
Some College Courses	11%
Post-Secondary Certificate	11%
High School Diploma (or GED or High School Equivalence Certificate)	7%

## LMI Overview - Settings

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**Region Name:** Greater Bay Area Region

**Region Areas:**

County Areas: Alameda, CA (6001), Contra Costa, CA (6013), Marin, CA (6041), Napa, CA (6055), San Francisco, CA (6075), San Mateo, CA (6081), Santa Clara, CA (6085), Solano, CA (6095), Sonoma, CA (6097)

**Timeframe:** 2014 - 2017

**Selection Type:** O\*Net Occupation

**Selection:** Geospatial Information Scientists and Technologists (15-1199.04)

**Dataset Version:** QCEW Employees, Non-QCEW Employees & Self-Employed - EMSI 2014.3 Class of Worker BETA

## Occupation Description - Settings

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**Region Name:** Greater Bay Area Region

**Region Areas:**

County Areas: Alameda, CA (6001), Contra Costa, CA (6013), Marin, CA (6041), Napa, CA (6055), San Francisco, CA (6075), San Mateo, CA (6081), Santa Clara, CA (6085), Solano, CA (6095), Sonoma, CA (6097)

**Selection Type:** O\*Net Occupation

**Selection:** Geospatial Information Scientists and Technologists (15-1199.04), Geographic Information Systems Technicians (15-1199.05), Cartographers and Photogrammetrists (17-1021.00), Remote Sensing Scientists and Technologists (19-2099.01), Remote Sensing Technicians (19-4099.03), Precision Agriculture Technicians (19-4099.02)

**Dataset Version:** QCEW Employees, Non-QCEW Employees & Self-Employed - EMSI 2014.3 Class of Worker BETA

## Educational Attainment - Settings

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## Data Sources and Calculations

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This report uses employment data from the Quarterly Census of Employment & Wages (QCEW) reported by the US Bureau of Labor Statistics (BLS) and includes self-employed workers who count their self-employed work as their primary source of income (3<sup>rd</sup> quarter data). This report also uses state data from the following agencies: California Labor Market Information Department.

### Occupation Data

EMSI occupation employment data are based on final EMSI industry data and final EMSI 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 EMSI earnings by industry.

Wage data is found in the Quarterly Census of Employment & Wages (QCEW) and is only reported at the Standard Occupation Classification (SOC) code level. EMSI Crosswalk data classifies the targeted occupations under the following SOC codes. All wage information is based on these data.

#### Computer Occupations, All Other (SOC 15-1799)

- Software quality assurance engineers and testers (O\*NET 15-1199.01)
- Computer systems engineers/architects (O\*NET 15-1199.02)
- Web administrators (O\*NET 15-1199.03)
- Geospatial Information scientists and technicians (O\*NET 15-1199.04)
- Geographic Information systems technicians (O\*NET 15-1199.05)
- Business intelligence analysts (O\*NET 15-1199.08)
- Information technology project managers (O\*NET 15-1199.09)
- Video game designers (O\*NET 15-1199.11)

#### Cartographers and Photogrammetrists (SOC 17.1201)

- Cartographers and Photogrammetrists (O\*NET 17-1021.00)

#### Life, physical, and social science technicians, other (SOC 19-4099)

- Quality control analysts (O\*NET 19-4099.01)
- Precision agriculture technicians (O\*NET 19-4099.02)
- Remote sensing technicians (O\*NET 19-4099.03)

#### Physical Scientists, other (SOC 19-2099)

- Remote sensing scientists and technologists (O\*NET 19-2099.01)

### Educational Attainment Data

EMSI's educational attainment numbers are based on EMSI's demographic data and the American Community Survey. By combining these sources, EMSI interpolates for missing years and projects data at the county level. Educational attainment data cover only the population aged 25 years or more and indicate the highest level achieved.