



Program Endorsement Brief:

Geographic Information Systems (GIS)

North/Far North Center of Excellence, August 2019

INTRODUCTION

This report provides a brief overview of labor market demand and educational program supply for middle-skill occupations related to Geographic Information Systems (GIS) in the North/Far North region. While many occupations across a variety of industries require workers with GIS competency, this occupational group is emerging. Therefore, traditional labor market information is not yet available at the 8-digit SOC code level. Data for SOC 17-3031.00, Surveying and Mapping Technicians, are the focus of this report. Related middle-skill occupations at the 8-digit level include: GIS technicians, geo-spatial information scientist and technologists, cartographers and photogrammetrists, mapping technicians, and remote sensing technicians.

Key findings include:

- Nearly 100 job openings for surveying and mapping technicians are projected over the next five years in the North/Far North region.
- Entry-level and median hourly wages for this occupation are above the North/Far North living wage estimate of \$25.58.
- Over the past three years, only one college in the Far North has conferred awards in (TOP) code 2206.10- Geographic Information Systems (GIS). The three-year average number of program awards for community colleges in the North/Far North region is 12 degrees and 21 certificates.
- No colleges in the North/Far North region have conferred degrees for TOP code 0957.30- Surveying over the past three years.

Findings in this report were determined using labor market data from EMSI and Burning Glass. Education supply data is sourced from the Community College Chancellor's Office MIS via Datamart and Launchboard.

This report contains the following sections:

- Occupational demand
- Wages and job postings
- Educational attainment and supply, and
- Findings and recommendations

OCCUPATIONAL DEMAND

The following Standard Occupational Classification (SOC) code was analyzed in relation to the proposed program¹:

17-3031.00 - Surveying and Mapping Technicians

Perform surveying and mapping duties, usually under the direction of an engineer, surveyor, cartographer, or photogrammetrist to obtain data used for construction, mapmaking, boundary location, mining, or other purposes. May calculate mapmaking information and create maps from source data, such as surveying notes, aerial photography, satellite data, or other maps to show topographical features, political boundaries, and other features. May verify accuracy and completeness of maps.

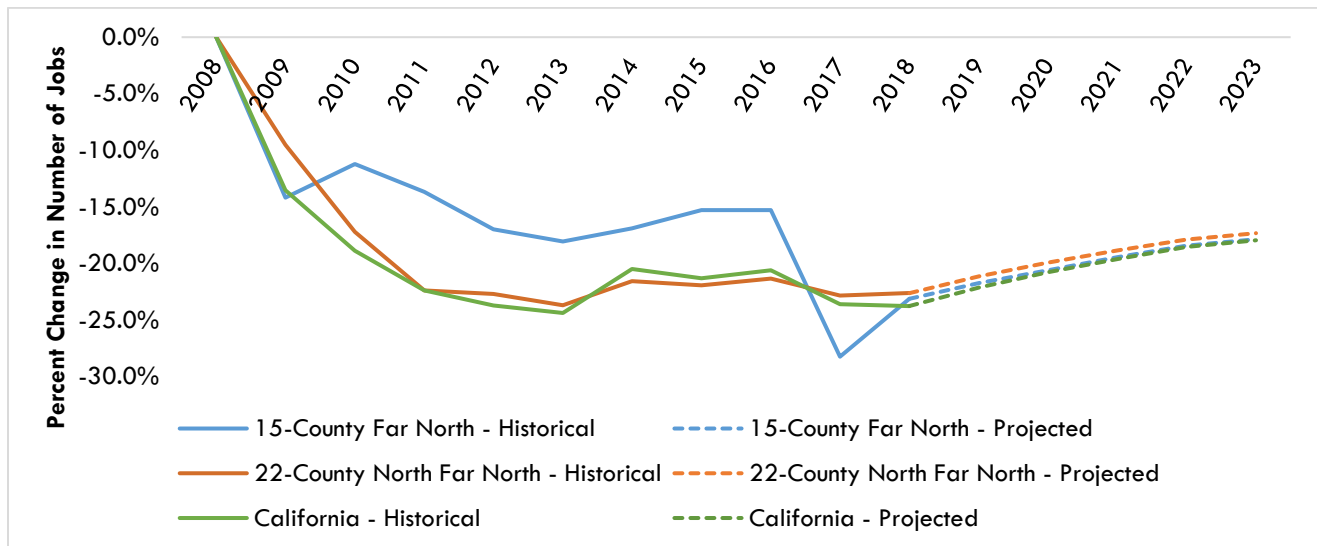
Exhibit 1 summarizes job trends per the SOC code in the 15-county Far North region, the 22-county North/Far North region, and California.

Exhibit 1: Employment and projected occupational demand²

Occupation	2008 Jobs	2018 Jobs	2023 Jobs	2018-23 Jobs % Change	Annual Openings
15-County Far North Region	200	154	164	6%	19
22-County North/Far North Region	863	642	683	6%	78
CALIFORNIA	7,013	5,122	5,485	7%	636

Exhibit 2 shows the percentage change in number of jobs between 2008 through 2018 and occupational projections from 2018 through 2023. The rate of change is indexed to the total number of jobs in 2008 as the base year and compares the 15-county Far North region, the 22-county North/Far North region, and California.

Exhibit 2: Rate of change for selected occupation³



¹ <https://www.onetonline.org>

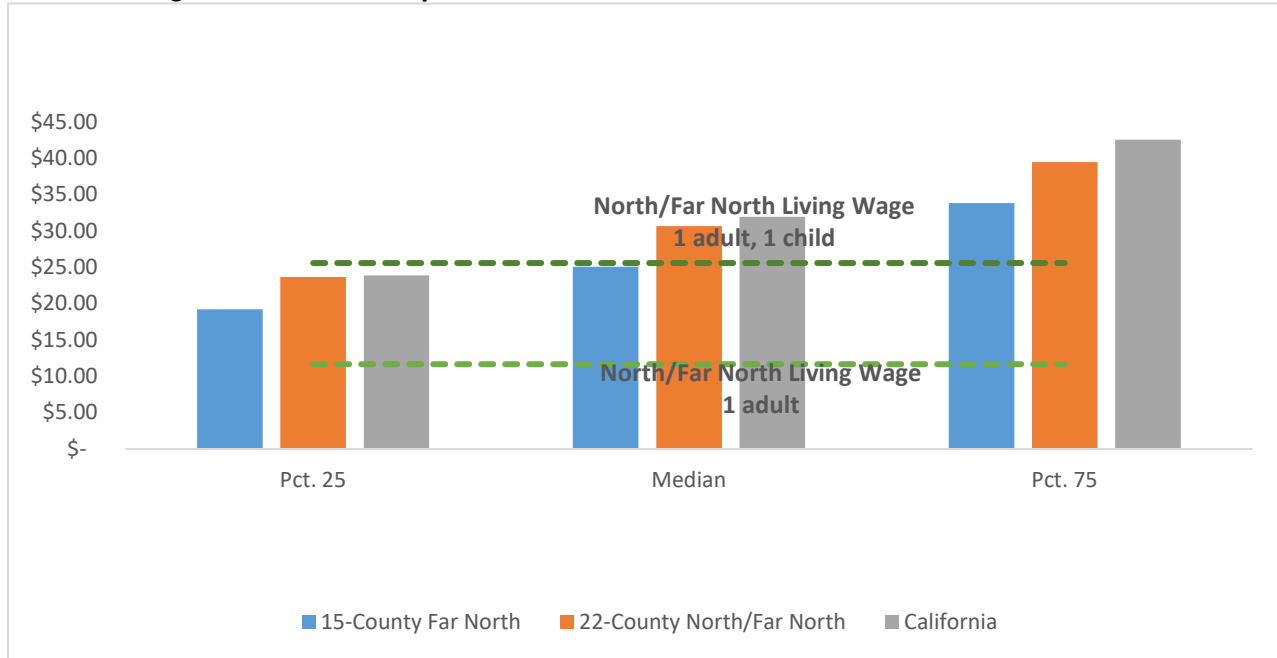
² Emsi 2019.3; QCEW Employees, Non-QCEW Employees and Self-Employed. The fifteen-county Far North region includes Butte, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Plumas, Shasta, Sierra, Siskiyou, Tehama and Trinity. The 22-county North/Far North region includes the aforementioned counties as well as El Dorado, Placer, Nevada, Sacramento, Sutter, Yolo and Yuba.

³ Ibid.

WAGES AND JOB POSTINGS

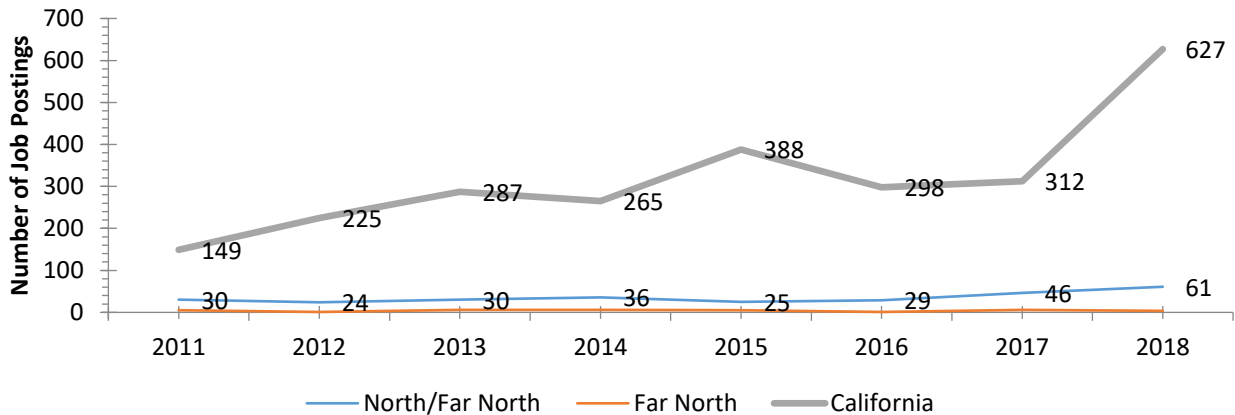
Exhibit 3 displays hourly wages for surveying and mapping technicians in the Far North, North/Far North, and California compared to the average living wages for a one-adult, one-child household and for one-adult households.⁴ In both regions, as in California, entry-level and median hourly wages for this occupation are above the average living wage.

Exhibit 3: Wages for selected occupations⁵



Burning Glass data for job postings for the representative SOC code identified a pool of 73 listings in the North/Far North region during the past year. Exhibit 4 shows job posting trends since 2011 for this occupation for each region and California.

Exhibit 4. Job posting trends for selected occupation⁶



⁴ Living Wage Calculator: Counties and Metropolitan Statistical Areas in California, <http://livingwage.mit.edu/states/06/locations>.

⁵ Emsi 2019.3.

⁶ Burning Glass.

Exhibit 5 displays the skills most requested by employers in the 22-county North/Far North region for the selected occupation during the 12 month period of August, 2018 through July, 2019. Sixty-two of the 73 postings included skills information.

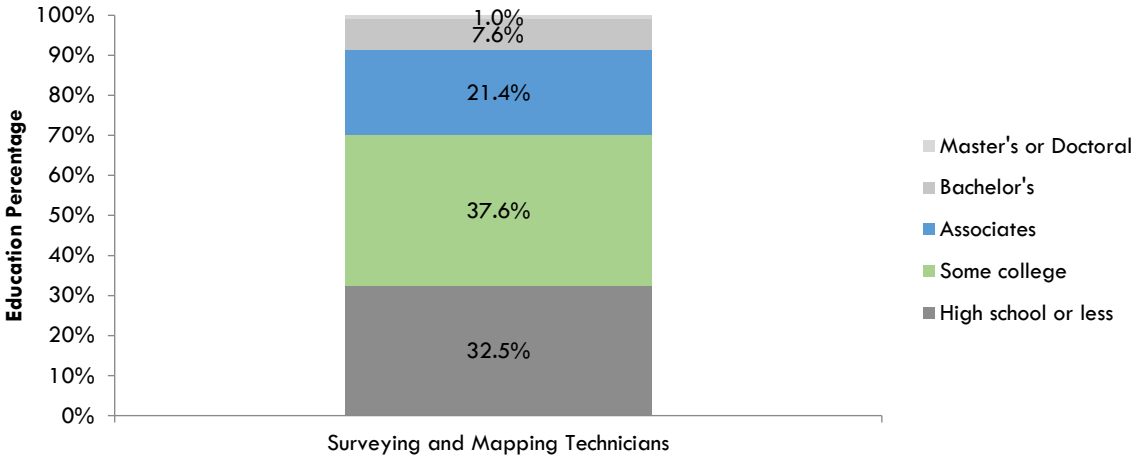
Exhibit 5. Top 10 skills desired in the selected occupation⁷

Most requested skills	% of postings (n=62)
Land Survey	50%
Geographic Information System (GIS)	36%
Surveys	31%
Global Positioning System (GPS)	29%
Field Surveys	26%
Calculation	19%
Robotics	18%
Trigonometry	18%
ArcGIS	16%
AutoCAD	16%

EDUCATIONAL ATTAINMENT AND SUPPLY

At the national level, the typical entry-level education for surveying and mapping technicians is a high school diploma or equivalent. Two-thirds of workers in this occupation have at least some college. Exhibit 6 shows educational attainment percentages of all workers in this occupation.

Exhibit 6. Typical educational attainment for selected occupations nationally⁸



To estimate supply, this study used the Taxonomy of Programs (TOP) code Geographic Information Systems (2206.10). Exhibits 7a and 7b show the number of awards conferred by community colleges in the North/Far North region during the past three academic years. The majority of awards were conferred by American River College in the North region. Only one college in the Far North region, Shasta, has conferred awards for this TOP code during the past three academic years.

⁷ Ibid.

⁸ Current Population Survey, Educational Attainment for Workers 25 Years and Older by Detailed Occupation, 2016-17, https://www.bls.gov/emp/ep_table_111.htm.

Exhibit 7a: Total awards conferred by community colleges in the North/Far North, 2015-2018⁹

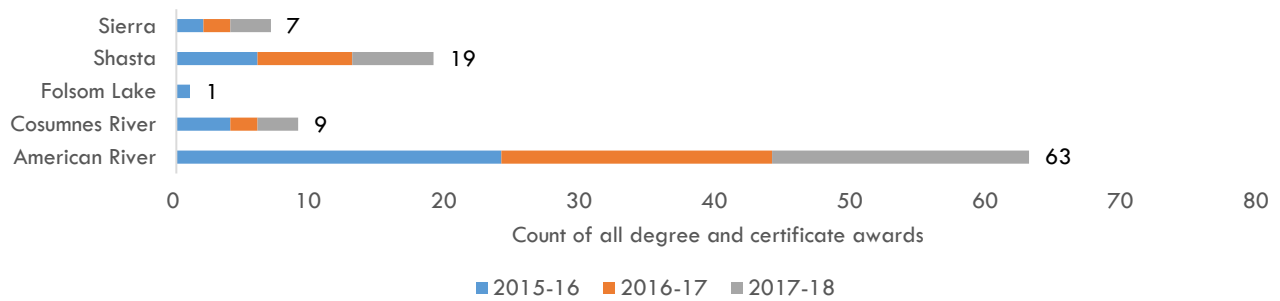


Exhibit 7b: Annual awards conferred by Far North community colleges, 2015-2018¹⁰

	Certificate				Associate Degree			
	2015-16	2016-17	2017-18	3-Yr Avg	2015-16	2016-17	2017-18	3-Yr Avg
American River	14	7	9	10	10	13	10	10
Cosumnes River	4	2	3	3	0	0	0	0
Folsom Lake	1	0	0	0	0	0	0	0
Shasta	5	7	5	5	1	0	1	1
Sierra	2	2	3	2	0	0	0	0
Total	26	18	20	21	11	13	11	12

FINDINGS AND RECOMMENDATION

- Occupations related to GIS are emerging.
- There are projected to be nearly 100 annual openings for surveying and mapping technicians in the North/Far North region through 2023.
- Entry-level and median wages for this occupation are above the average median hourly wage for the region.
- While the number of job postings for this specific occupation is not robust for the North/Far North region, Burning Glass data shows more than 400 postings that require GIS skills in the last 12 months for jobs across industries.
- Based on three-year average award data for colleges in the North/Far North region (12 degrees and 21 certificates) and projected annual openings in the region (97), there appears to be an opportunity for program growth.
- The COE recommends ongoing communication with industry partners to ensure program offerings align with industry need.

⁹ California Community Colleges Chancellor's Office Data Mart 8/20/19.

¹⁰ Ibid.

COE Recommendation

- Move forward with program
- Program is not recommended
- Additional information needed

APPENDIX A: 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)
- California Community Colleges Chancellor's Office Management Information Systems (MIS Datamart)
- California Community Colleges Chancellor's Office, Cal-PASS Plus LaunchBoard

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