

# Program Endorsement Brief:

Aquaculture in the Far North region

**North/Far North Center of Excellence, January 2020**

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## INTRODUCTION

This report provides an overview of the labor market demand and educational program supply for occupations related to aquaculture in the 15-county Far North region and the broader 22-county North/Far North region.

## SUMMARY OF KEY FINDINGS

- Aquaculture occupations are projected to have 30 annual openings.
- Median hourly wages for the selected occupations are above the North/Far North living wage for a single adult. Hourly wages range from \$23 to \$80 per hour.
- National educational attainment data indicates between 12 and 29% of incumbent workers in aquaculture occupations have completed some college or earned an associate degree.
- There are no awards in the aquaculture-related TOP code 1920.00 – Ocean Technology.

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:<sup>1</sup>

11-9013.03 - Aquacultural Managers	
<b>Description:</b>	Direct and coordinate, through subordinate supervisory personnel, activities of workers engaged in fish hatchery production for corporations, cooperatives, or other owners.
<b>Sample job titles:</b>	Aquaculture Cooperative Marketing Director, Aquaculture Director, Aquaculture Program Director, Facility Operations Manager, Farm Operations Technical Director, Fish Hatchery Manager, Hatchery Manager, Hatchery Supervisor, Recirculating Aquaculture Systems Specialist, Shellfish Manager
45-1011.06 - First-Line Supervisors of Aquacultural Workers	
<b>Description:</b>	Directly supervise and coordinate activities of aquacultural workers.
<b>Sample job titles:</b>	Brood Hatchery Manager, Fish Culture Supervisor, Fish Farm Manager, Fish Hatchery Manager, Fisheries Manager, Fisheries Technician Supervisor, Hatchery Manager, Marine Site Manager, Wildlife Manager, Wildlife Technician Supervisor
45-2093.00 - Farmworkers, Farm, Ranch, and Aquacultural Animals	
<b>Description:</b>	Attend to live farm, ranch, or aquacultural animals that may include cattle, sheep, swine, goats, horses and other equines, poultry, finfish, shellfish, and bees. Attend to animals produced for animal products, such as meat, fur, skins, feathers, eggs, milk, and honey. Duties may include feeding, watering, herding, grazing, castrating, branding, de-beaking, weighing, catching, and loading animals. May maintain records on animals; examine animals to detect diseases and injuries; assist in birth deliveries; and administer medications, vaccinations, or insecticides as appropriate. May clean and maintain animal housing areas. Includes workers who shear wool from sheep, and collect eggs in hatcheries.
<b>Sample job titles:</b>	Cowboy, Farm Hand, Farrowing Worker, Herdsman, Livestock Handler, Milking Worker, Ranch Hand, Rancher, Vaccinator, Wrangler
45-3011.00 - Fishers and Related Fishing Workers	
<b>Description:</b>	Use nets, fishing rods, traps, or other equipment to catch and gather fish or other aquatic animals from rivers, lakes, or oceans, for human consumption or other uses. May haul game onto ship.
<b>Sample job titles:</b>	Captain, Clam Digger, Commercial Crabber, Commercial Fisherman, Commercial Fishing Vessel Operator, Crew Member, Deckhand, Fisherman, Lobsterman, Menhaden Fishing Crew Member

<sup>1</sup>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 15-county Far North region, 22-county North/Far North region, and California.<sup>2</sup> Since demand data is not available for 8-digit detailed occupational codes, 6-digit occupational codes are used. The data represented here is not specific to aquaculture occupations.

**Exhibit 1. Employment and projected occupational demand<sup>3</sup>**

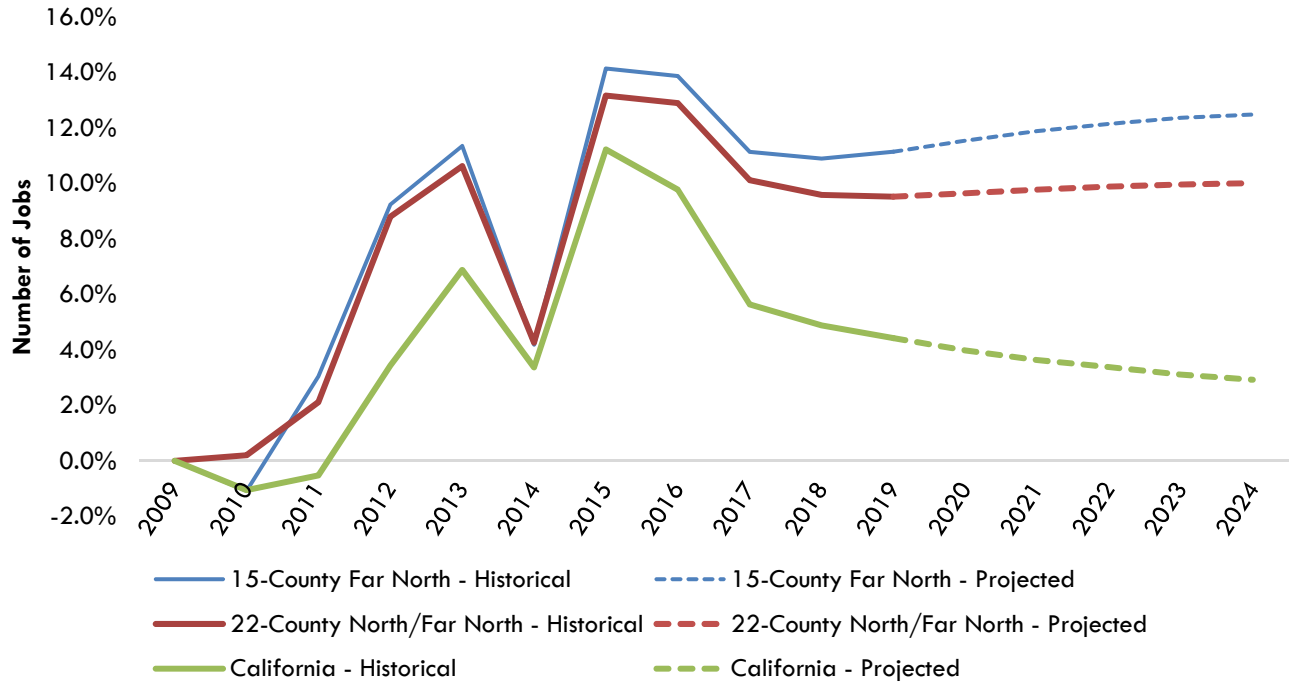
Occupation	SOC	2009 Jobs	2019 Jobs	2024 Jobs	2019-24 % Change	Annual Openings
Farmers, Ranchers, and Other Agricultural Managers	11-9013	2,844	2,991	3,010	0.6%	241
First-Line Supervisors of Farming, Fishing, and Forestry Workers	45-1011	638	671	702	4.6%	98
Farmworkers, Farm, Ranch, and Aquacultural Animals	45-2093	1,158	1,548	1,559	0.7%	247
Fishers and Related Fishing Workers	45-3011	324	305	313	2.7%	34
<b>FAR NORTH</b>	<b>TOTALS</b>	<b>4,965</b>	<b>5,516</b>	<b>5,585</b>	<b>1.3%</b>	<b>620</b>
Farmers, Ranchers, and Other Agricultural Managers	11-9013	4,878	5,020	5,011	-0.2%	400
First-Line Supervisors of Farming, Fishing, and Forestry Workers	45-1011	1,135	1,139	1,185	4.0%	164
Farmworkers, Farm, Ranch, and Aquacultural Animals	45-2093	2,136	2,820	2,816	-0.2%	447
Fishers and Related Fishing Workers	45-3011	398	381	391	2.6%	43
<b>NORTH/FAR NORTH</b>	<b>TOTALS</b>	<b>8,546</b>	<b>9,361</b>	<b>9,402</b>	<b>0.4%</b>	<b>1,055</b>
Farmers, Ranchers, and Other Agricultural Managers	11-9013	55,028	53,176	51,891	-2.4%	4,056
First-Line Supervisors of Farming, Fishing, and Forestry Workers	45-1011	11,726	12,725	13,277	4.3%	1,836
Farmworkers, Farm, Ranch, and Aquacultural Animals	45-2093	23,864	29,180	28,558	-2.1%	4,503
Fishers and Related Fishing Workers	45-3011	1,642	1,261	1,231	-2.4%	131
<b>CALIFORNIA</b>	<b>TOTALS</b>	<b>92,259</b>	<b>96,343</b>	<b>94,957</b>	<b>-1.4%</b>	<b>10,526</b>

<sup>2</sup> The 7-county North region includes El Dorado, Placer, Nevada, Sacramento, Sutter, Yolo and Yuba. The 15-county Far North region includes the Butte, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Plumas, Shasta, Sierra, Siskiyou, Tehama and Trinity counties. The 22-county North/Far North region is the combination of the 7-county North and 15-county Far North regions.

<sup>3</sup> Emsi 2019.4; QCEW Employees, Non-QCEW Employees and Self-Employed.

Exhibit 2 compares the rates of change of the total number of jobs between 2009 and 2019 in the Far North region, the North/Far North region, and California. It also compares occupational demand projections from 2019 through 2024 across the same areas. The rate of change is indexed to the base year 2009 total number of jobs.

**Exhibit 2. Rate of Change for Selected Occupations<sup>4</sup>**

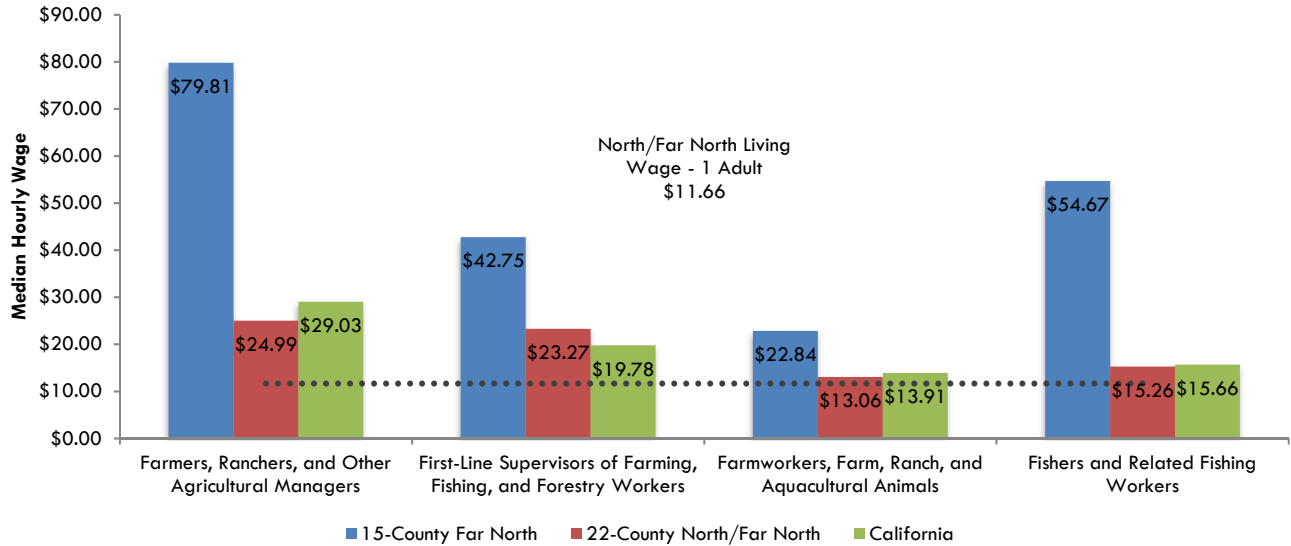


<sup>4</sup> Ibid.

## WAGES AND JOB POSTINGS

Exhibit 3 compares the median hourly wages of the selected occupations in the study regions to the North/Far North region's 22-county average living wage for a one-adult household.<sup>5</sup>

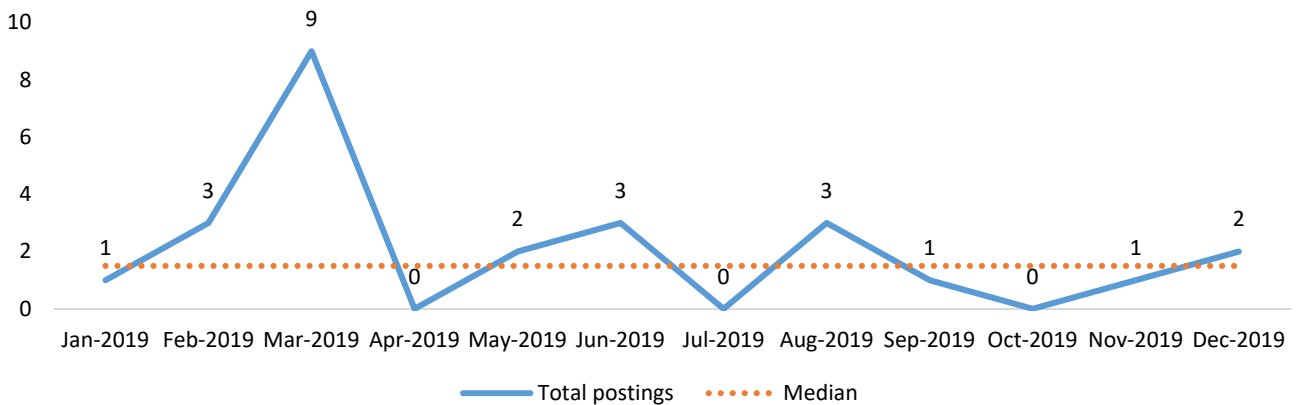
**Exhibit 3. Wages for selected occupations<sup>6</sup>**



In this instance, Burning Glass data is a better indicator of job demand for aquaculture occupations. This dataset is based on the 8-digit occupational codes, rather than the 6-digit levels, and as such forms a better picture of job demand for aquaculture occupations. Burning Glass identified a pool of 25 job postings in the Far 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 Far North region.

**Exhibit 4. Job postings trend for selected occupations<sup>7</sup>**



<sup>5</sup> "Family Needs Calculator (Formerly the Self-Sufficiency Standard)." Insight Center for Community Economic Development, February 2018. <https://insightcced.org/2018-family-needs-calculator/>.

<sup>6</sup> Emsi 2019.4; QCEW Employees, Non-QCEW Employees and Self-Employed.

<sup>7</sup> Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool," <http://www.burning-glass.com>, 2019.

Exhibit 5 compares the ten-year job posting trends of the selected occupations to the median number of job postings in the Far North region. There were a total of 305 job postings for aquaculture occupations between January 2010 and December 2019, or an average of 30 postings per year.

**Exhibit 5. Ten-year job postings trend for selected occupations<sup>8</sup>**

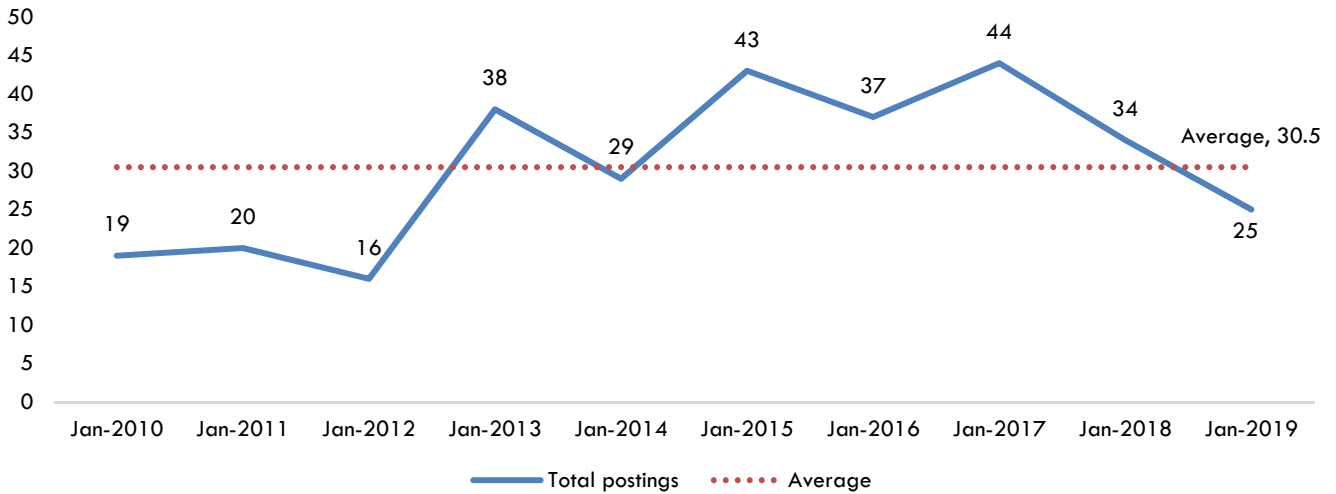
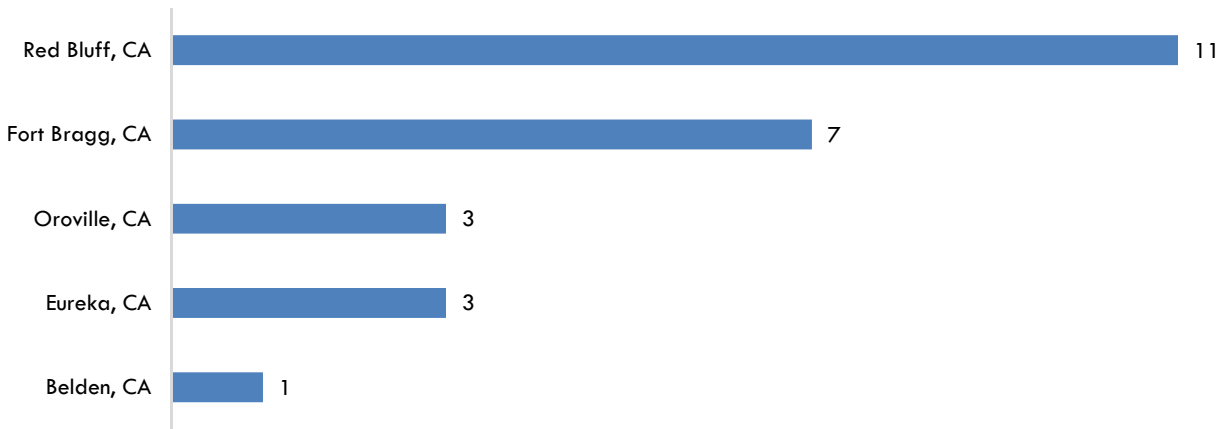


Exhibit 6 shows the number of job postings in the Far North region, by city, for the selected occupations.

**Exhibit 6. Top job postings locations for selected occupations<sup>9</sup>**



<sup>8</sup> Burning Glass Technologies, "Labor Insight Real-Time Labor Market Information Tool," <http://www.burning-glass.com>, 2019.  
<sup>9</sup> Ibid.

Exhibit 7 lists Far North region employers with the most job openings for the selected occupations. Twenty-three of the 25 job postings included the employer's name.

**Exhibit 7. Top employers by number of job postings<sup>10</sup>**

Employer	Far North (n = 25)	
	Number of Postings	Percent of Postings
Pacific States Marine Fisheries Commission	21	84%
Normandeau Associates Incorporated	1	4%
Americorps Watershed Stewards Program	1	4%

Exhibit 8 shows the top job titles for the selected occupations in the Far North region. All 25 job postings included a job title.

**Exhibit 8. Top job titles by number of job postings<sup>11</sup>**

Job Title	Far North (n = 25)	
	Job Postings	% Job Posting
Technician	12	48%
Technician, Surveys	4	16%
Technician/Sampler	2	8%
Technician, Program	2	8%
Assistant Technician/Trailer	2	8%
Area Technician/Sampler	2	8%
Fisheries Technician	1	4%

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<sup>10</sup> Ibid.

<sup>11</sup> Ibid.

Exhibit 9 shows the skills most in-demand for the selected occupations in the Far North region. All of the job postings included skills information.

**Exhibit 9. Top skills by number of job postings** <sup>12</sup>

Specialized Skills	Far North (n = 25)	
	Job Postings	% Job Posting
Fishery Biology	23	92%
Spreadsheets	23	92%
Ventilation	23	92%
Water Quality	23	92%
Database Management	21	84%
Report Writing	21	84%
Sample Collection	21	84%
Data Collection	19	76%
Repair	18	72%
Global Positioning System (GPS)	16	64%
Baseline Skills	Far North (n = 25)	
	Job Postings	% Job Posting
Physical Abilities	23	92%
Word Processing	23	92%
Communication Skills	22	88%
Research	21	84%
Written Communication	21	84%
Writing	19	76%
Computer Literacy	4	16%
Positive Disposition	4	16%
Detail-Oriented	3	12%
Oral Communication	3	12%
Software Skills	Far North (n = 25)	
	Job Postings	% Job Posting
Word Processing	23	92%
Database Software	2	8%

<sup>12</sup> Ibid.



## EDUCATION AND TRAINING

Exhibit 10 shows the average level of educational attainment for workers 25 years and older by occupation across the U.S.

**Exhibit 10. Typical educational attainment for selected occupations, nationally<sup>13</sup>**

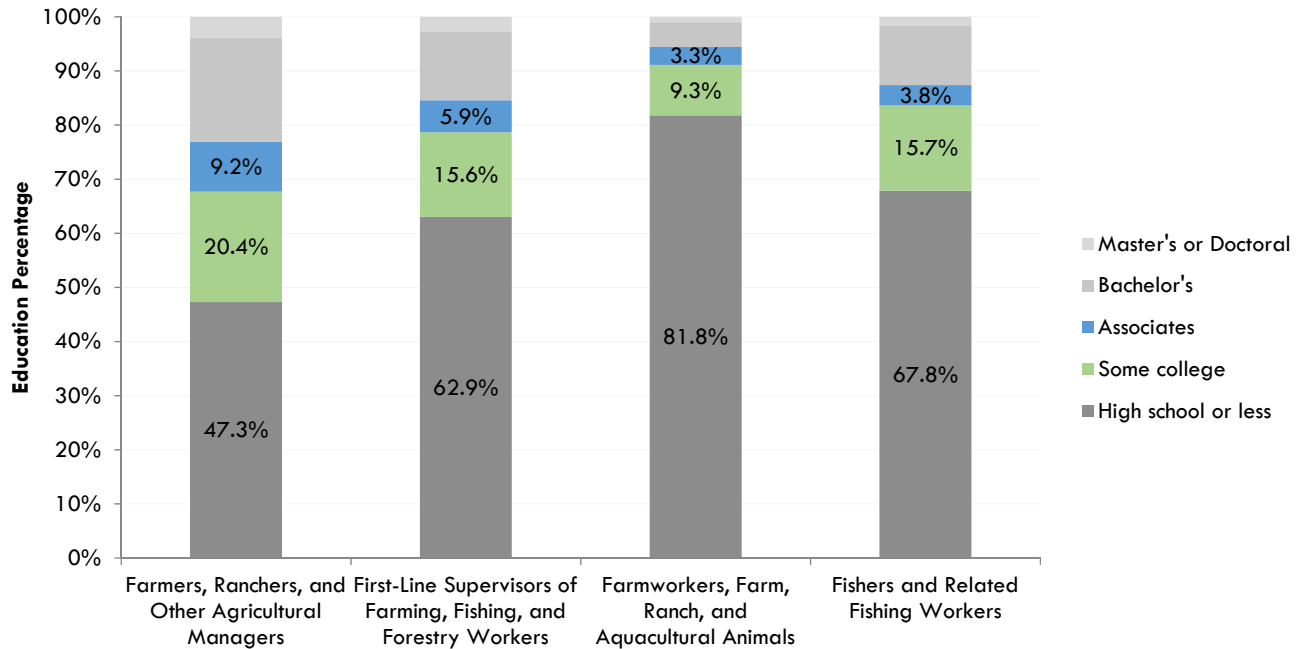


Exhibit 11 shows the typical education requirements, on-the-job training, and work experience requirements for entry-level positions in the selected occupations in the Far North region.

**Exhibit 11. Typical education, training, and work experience for selected occupations<sup>14</sup>**

Occupations	SOC	Typical Entry-Level Education	Work Experience Required	Typical On-The-Job Training
Farmers, Ranchers, and Other Agricultural Managers	11-9013	High school diploma or equivalent	5 years or more	None
First-Line Supervisors of Farming, Fishing, and Forestry Workers	45-1011	High school diploma or equivalent	Less than 5 years	None
Farmworkers, Farm, Ranch, and Aquacultural Animals	45-2093	No formal educational credential	None	Short-term on-the-job training
Fishers and Related Fishing Workers	45-3011	No formal educational credential	None	Moderate-term on-the-job training

<sup>13</sup> "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>.

<sup>14</sup> Emsi 2019.4; QCEW Employees, Non-QCEW Employees and Self-Employed.

## PROGRAM SUPPLY

Analysis of existing educational programs shows that there is one Taxonomy of Program (TOP) code related to training for the selected aquaculture occupations: 1920.00 – Ocean Technology. The corresponding Classification of Instructional Programs (CIP) code is 41.9999 – Science Technologies/Technicians, Other.

There are no programs in 1920.00 – Ocean Technology in the Far North.

## FINDINGS

- Between 2008 and 2018, aquaculture occupations grew by a net of 551 jobs in the Far North region. Jobs for farmworkers, farm, ranch, and aquaculture animals made up the bulk of this growth, with 390 jobs added in the last 10 years.
- Jobs in aquaculture occupations are projected to increase by 1.3% over the next five years, adding 69 new jobs by 2024. Much of this growth will belong to first-line supervisors of farming, fishing, and forestry workers. Jobs in for first-line supervisors are projected to increase by 5% through 2024. Job growth in the Far North is projected to outpace the North/Far North region and California.
- Aquaculture occupations are projected to have nearly 620 job openings per year over the next five years. Most job openings are for managers (241 annual openings) and farmworkers (247 annual openings).
- Median hourly wages for aquaculture occupations are above the North/Far North living wage for a single adult (\$11.66). Hourly wages are highest for managers in the Far North at \$80 per hour. Farmworkers, farm, ranch, and aquaculture animals are estimated to earn \$23 per hour.
- Burning Glass Labor Insights identified a pool of 25 jobs for aquaculture occupations posted online in the last 12 months. All job posting were for aquaculture technicians. Employers were searching for workers who have knowledge of fishery biology, ventilation, and water quality, as well as technical skills in spreadsheets, database management, and word processing.
- Between January 2010 and December 2019 there were 305 job postings for aquaculture occupations in the Far North, an average of 30 postings per year.
- Across the studied occupations, the typical entry-level worker education level and educational attainment level for incumbent workers is a high school diploma. Only farmworkers and fishers occupations require some level of on-the-job training.
- Analysis of the relevant TOP and CIP codes for aquaculture (1920.00 – Ocean Technology) show that there are no aquaculture training programs in the Far North.

## RECOMMENDATIONS

- In the case of this report, Burning Glass data is a better indicator of job demand for aquaculture occupations due to the application’s ability to analyze occupational data at the most detailed 8-digit level. As a result, COE will use historical online job postings to estimate annual openings in place of EMSI data.
- Based on a three-year average of annual award in ocean technology (0 certificates and degrees), and projected yearly openings for aquaculture occupations (30 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
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## 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)

### **For more information, please contact:**

Ebony J. Benzing, Manager  
Center of Excellence, North Far North Region  
[Ebony.Benzing@losrios.edu](mailto:Ebony.Benzing@losrios.edu)

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