










Hydrologic Technicians

Labor Market Analysis: San Diego County

November 2023

Summary

NEW PROGRAM RECOMMENDATION?	EVIDENCE OF A SUPPLY GAP?	AT OR ABOVE THE LIVING WAGE?	EXPECTED LEVEL OF EDUCATION
 Proceed with Caution	 	 	<input type="checkbox"/> Doctorate Degree <input type="checkbox"/> Master's Degree <input type="checkbox"/> Bachelor's Degree <input type="checkbox"/> Apprenticeship <input checked="" type="checkbox"/> Associate Degree <input type="checkbox"/> Some College or Certificate <input type="checkbox"/> HS Diploma or Equivalent <input type="checkbox"/> Less Than a HS Diploma
SUPPORT FOR PROGRAM MODIFICATION?	NUMBER OF INSTITUTIONS THAT PROVIDE TRAINING	NUMBER OF ANNUAL JOB OPENINGS	
 	<p>LOW</p> 	<p>LOW</p> 	

This brief provides labor market information about *Hydrologic Technicians* to assist the San Diego & Imperial Counties Community Colleges with program development and strategic planning. According to available labor market information, *Hydrologic Technicians* in San Diego County have a labor market demand of eight annual job openings (while average demand for a single occupation in San Diego County is 289 annual job openings), and no institutions supply awards for this occupation, suggesting that there is a supply gap in the labor market. Entry-level wages for this occupation are above the living wage. The COE recommends proceeding with caution when developing a new program because While entry level wages pay at or above the living wage and a supply gap exists, the COE recommends proceeding with caution because the **gap is extremely small, with only eight annual job openings a year.**

Introduction

This report provides labor market information in San Diego County for the following occupational code in the Standard Occupational Classification (SOC)¹ system:

Hydrologic Technicians (SOC 19-4044): Collect and organize data concerning the distribution and circulation of ground and surface water, and data on its physical, chemical, and biological properties. Measure and report on flow rates and ground water levels, maintain field equipment, collect water samples, install and collect sampling equipment, and process samples for shipment to testing laboratories. May collect data on behalf of hydrologists, engineers, developers, government agencies, or agriculture. Sample reported job titles include:

- Groundwater Monitoring Technician
- Hydrography Technician
- Hydrologic Aid

Projected Occupational Demand

Between 2022 and 2027, employers in San Diego County will need to hire **eight** workers annually to fill new jobs and backfill jobs in *Hydrologic Technicians* due to attrition caused by turnover and retirement, for example (Exhibit 1).

Exhibit 1: Number of Jobs for *Hydrologic Technicians* in San Diego County (2022-2027)²

Occupational Title	2022 Jobs	2027 Jobs	2022 - 2027 Net Jobs Change	2022- 2027 % Net Jobs Change	Annual Job Openings (Demand)
Hydrologic Technicians	73	75	2	3%	8

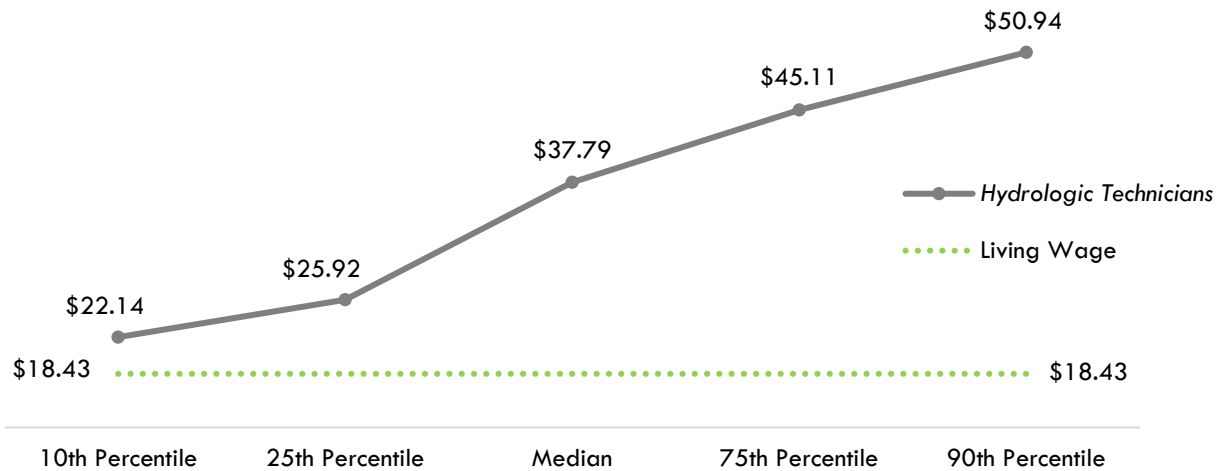
¹ The Standard Occupational Classification (SOC) system is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating, or disseminating data. [bls.gov/soc/](https://www.bls.gov/soc/).

² Lightcast 2023.03; QCEW, Non-QCEW, Self-Employed.

Earnings

Hydrologic Technicians receive entry-level hourly earnings of \$25.92; this is higher than the living wage for a single adult in San Diego County, which is \$18.43 per hour (Exhibit 2).³

Exhibit 2: Average Hourly Earnings⁴ for *Hydrologic Technicians* in San Diego County⁵



Educational Supply

Educational supply for an occupation can be estimated by analyzing the number of awards in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes.⁶ There is **no** TOP code and **one** CIP code related to *Hydrologic Technicians* (Exhibit 3). Because the TOP code 0303.00 (Environmental Technology) trains for a variety of environmental occupations, there is no one-to-one match between the TOP code and SOC code. As a result, this brief only calculates awards from Hydrology and Water Resources Science (CIP 40.0605) for *Hydrologic Technicians* to avoid double counting the educational supply for this occupation.

Exhibit 3: Related TOP and CIP Codes for *Hydrologic Technicians*⁷

TOP or CIP Code	TOP or CIP Program Title
TOP 0303.00	Environmental Technology
CIP 40.0605	Hydrology and Water Resources Science

³ "Family Needs Calculator (formerly the California Family Needs Calculator)," Insight: Center for Community Economic Development, last updated 2021. insightccd.org/family-needs-calculator.

⁴ 10th and 25th percentiles could be considered entry-level wages, and 75th and 90th percentiles could be considered experienced wages for individuals who may have been in the occupation longer, received more training than others, etc.

⁵ Lightcast 2023.03; QCEW, Non-QCEW, Self-Employed.

⁶ TOP data comes from the California Community Colleges Chancellor's Office MIS Data Mart (datamart.cccco.edu) and CIP data comes from the Integrated Postsecondary Education Data System (nces.ed.gov/ipeds/use-the-data).

⁷ This brief uses a conservative estimate of program supply and only calculates awards from the TOP codes in Exhibit 3.

According to TOP and CIP data, two community colleges supply the region with awards for this occupation: Cuyamaca College and Southwestern College. According to CIP data, no non-community-college institution supplies the region with awards for this occupation. While provided below, this brief only calculates awards from Hydrology and Water Resources Science (CIP 40.0605) for Hydrologic Technicians as previously mentioned (Exhibit 4).

**Exhibit 4: Number of Awards (Certificates and Degrees) Conferred by Postsecondary Institutions
(Program Year 2019-20 through Program Year 2020-21 Average)**

TOP6 or CIP Code	TOP6 or CIP Program Title	3-Yr Annual Average CC Awards (PY19-20 to PY21-22)	Other Institutions 2-Yr Annual Average Awards (PY19-20 to PY20-21)	Total Average Supply (PY19-20 to PY21-22)
0303.00	Environmental Technology	20	0	20
	<ul style="list-style-type: none"> • Cuyamaca 	18	0	
	<ul style="list-style-type: none"> • Southwestern 	2	0	
40.0605	Hydrology and Water Resources Science	0	0	0
			Total	20

Demand vs. Supply

Comparing labor demand (annual openings) with labor supply⁸ suggests that a **supply gap** exists for this occupation in San Diego County, with **eight** annual openings and **zero** awards. Comparatively, there are **49** annual openings in California and **25** awards, suggesting that there is a **supply gap** across the state⁹ (Exhibit 5).

Exhibit 5: Labor Demand (Annual Openings) Compared with Labor Supply (Average Annual Awards)

	Demand (Annual Openings)	Supply¹⁰ (Annual Awards)	Supply Gap or Oversupply
San Diego	8	0	8
California	49	25	24

Please note: This is a basic analysis of supply and demand of labor. The data does not include workers currently in the labor force who could fill these positions or workers who are not captured by publicly available data. This data should be used to discuss the potential gaps or oversupply of workers; however, it should not be the only basis for determining whether or not a program should be developed.

⁸ Labor supply can be found from two different sources: Lightcast or the California Community Colleges Chancellor's Office MIS Data Mart. Lightcast uses CIP codes while MIS uses TOP codes. Different coding systems result in differences in the supply numbers.

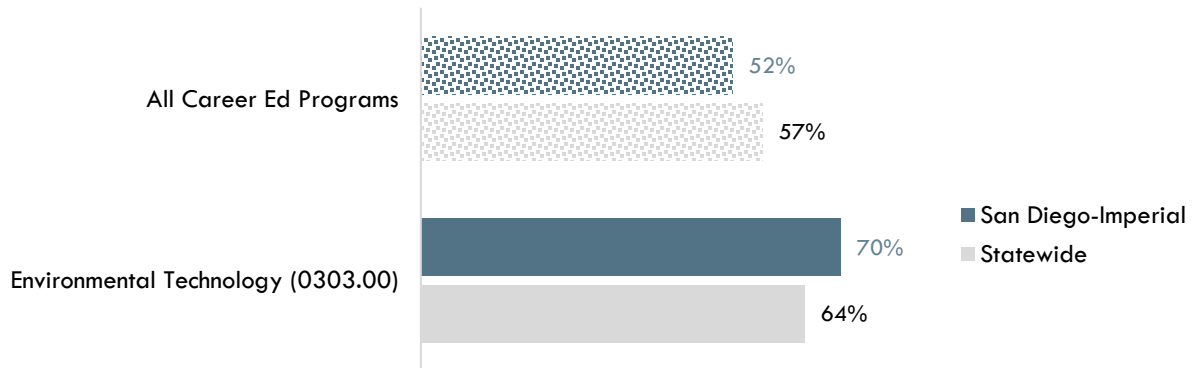
⁹ "Supply and Demand," Centers of Excellence Student Outcomes, <https://coeccc.net/our-resources/>.

¹⁰ Awards included: associate degree; award <1 year; award 1<2 years; and postsecondary awards.

Student Outcomes and Regional Comparisons

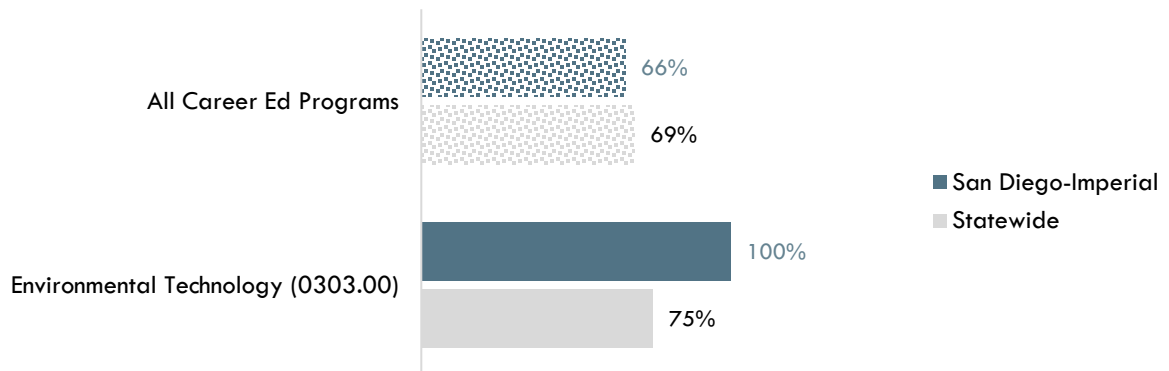
According to the California Community Colleges LaunchBoard, 72 percent of students in the San Diego-Imperial region earned a living wage after completing an Environmental Technology (TOP 0303.00) program, compared to 71 percent statewide and 57 percent of students in Career Education programs in general across the state (Exhibit 6a).¹¹

Exhibit 6a: Percentage of Students Who Earned a Living Wage by Program, PY2020-21¹²



According to the California Community Colleges LaunchBoard, 100 percent of students in the San Diego-Imperial region obtained a job closely related to their field of study after completing an Environmental Technology (TOP 0303.00) program, compared to 75 percent statewide and 69 percent of students in Career Education programs in general across the state (Exhibit 6b).¹³

Exhibit 6b: Percentage of Students in a Job Closely Related to Field of Study by Program, PY2019-20¹⁴



¹¹ "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.

¹² Most recent year with available data is Program Year 2020-21. Among completers and skills builders who exited, the percentage of students who attained a living wage.

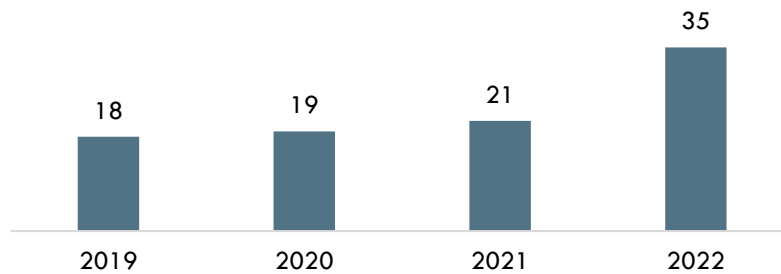
¹³ "California Community Colleges Strong Workforce Program," California Community Colleges, calpassplus.org/LaunchBoard/SWP.aspx.

¹⁴ Most recent year with available data is Program Year 2019-20. Percentage of Students in a Job Closely Related to Field of Study: Among students who responded to the CTEOS, the percentage reporting employment in the same or similar field as their program of study.

Online Job Postings

This report analyzes not only historical and projected (traditional LMI) data, but also recent data from online job postings (real-time LMI). Online job postings may provide additional insight about recent changes in the labor market that are not captured by historical data. Between 2019 and 2022, there was an average of 23 online job postings per year for *Hydrologic Technicians* in San Diego County (Exhibit 7). Please note that online job postings do **not** equal labor market demand; demand is represented by annual job openings (see Exhibit 1). While this brief includes online jobs postings data to help with curriculum development, the community colleges should note that this type of data is impacted by several variables: employers may post a position multiple times to increase the pool of applicants; a job posting can remain posted after a business decides not to fill a position; or an employer may use one posting to fill multiple positions, for example.

Exhibit 7: Number of Online Job Postings for *Hydrologic Technicians* in San Diego County (2019-2022)¹⁵



¹⁵ Lightcast; "Job Posting Analytics." 2018-2022.

Top Employers

Between January 1, 2020 and December 31, 2022, the top five employers in San Diego County for *Hydrologic Technicians* were David Evans And Associates, Leidos, Fugro USA Marine, Ocean Surveys, and J F Brennan based on online job postings (Exhibit 8).

Exhibit 8: Top Employers for *Hydrologic Technicians* in San Diego County¹⁶

Top Employers	
<ul style="list-style-type: none">• David Evans And Associates• Leidos• Fugro USA Marine• Ocean Surveys• J F Brennan	<ul style="list-style-type: none">• United States Department of the Interior• Valley Water• Tetra Tech

Education, Skills, and Certifications

Exhibit 9a indicates that the typical educational attainment for the occupation found currently in the National labor force is a *bachelor's degree*. The typical entry-level education is an *associate degree* (Exhibit 9a).

Exhibit 9a: National Educational Attainment for *Hydrologic Technicians*¹⁷

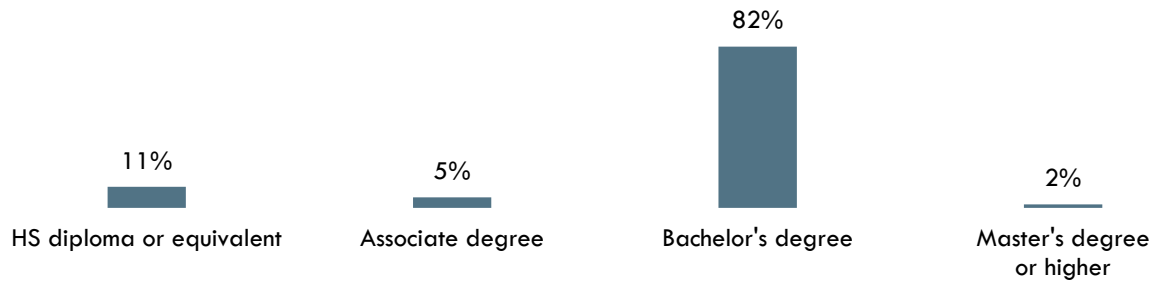
Occupational Title	Typical Entry-Level Education
Hydrologic Technicians	Associate Degree

¹⁶ Lightcast; "Job Posting Analytics." 2020-2022.

¹⁷ Lightcast 2023.03; QCEW, Non-QCEW, Self-Employed.

Based on online job postings between January 1, 2020 and December 31, 2022 in San Diego County, employers posted a **bachelor's degree** as the most requested educational requirement for *Hydrologic Technicians* (Exhibit 9b).¹⁸

Exhibit 9b: Educational Requirements for *Hydrologic Technicians* in San Diego County¹⁹



*May not total 100 percent due to rounding

Exhibit 10 lists the top specialized, soft, and software skills that appeared in online job postings between January 1, 2020 and December 31, 2022.

Exhibit 10: Top Skills for *Hydrologic Technicians* in San Diego County²⁰

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> Hydrography Data Processing Hydrographic Survey Multibeam Echosounder Sensors Data Acquisition Geographic Information Systems Physical Science Marine Science Data Analysis Data Management Field Research Geophysics Sediment Sampling Motion Detector 	<ul style="list-style-type: none"> Troubleshooting Quality Control Operations Communications Quality Assurance Management Verbal Communication Skills Planning Mathematics Self-Motivation Mentorship Report Writing Lifting Ability Interpersonal Communications Problem Solving 	<ul style="list-style-type: none"> Geographic Information Systems Global Mapper ArcGIS Quantum GIS

¹⁸ Lightcast; "Job Posting Analytics." 2020-2022.

¹⁹ "Educational Attainment for Workers 25 Years and Older by Detailed Occupation," Bureau of Labor Statistics, last modified April 9, 2021. bls.gov/emp/tables/educational-attainment.htm.

²⁰ Lightcast; "Job Posting Analytics." 2020-2022.

Exhibit 11 lists the top certifications that appeared in online job postings between January 1, 2020 and December 31, 2022.

Exhibit 11: Top Certification for *Hydrologic Technicians* in San Diego County²¹

Top Certification in Online Job Postings

- Secret Clearance
-

²¹ Lightcast; "Job Posting Analytics." 2020-2022.

Prepared by:

Tina Ngo Bartel, Director (tngobartel@miracosta.edu)

John Edwards, Research Analyst (jedwards@miracosta.edu)

San Diego & Imperial Center of Excellence

Important Disclaimers

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. This study examines the most recent data available at the time of the analysis; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and the report findings; however, neither the Centers of Excellence (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.