WATER WORKFORCE

Survey Report

The Ripple Effect Initiative

May 2026

KINGS WATER ALLIANCE

FRESNO STATE
California Water Institute

About the Kings Water Alliance

Kings Water Alliance is a nonprofit public benefit organization and the governing body for the Kings Management Zone, which includes the Kings and Tulare Lake groundwater subbasins. Formed to help implement new water quality requirements, KWA works with residents, agriculture, cities, counties, community-based organizations, groundwater sustainability agencies, and other local partners to address nitrate impacts, improve access to safe drinking water, and support long-term groundwater sustainability.

KWA serves a 1.5-million-acre area encompassing portions of Fresno, Kings, and Tulare Counties. (See Figure 1.) Services are offered to rural residents in the Central Valley who rely on domestic wells for drinking water, including households in rural areas surrounding communities such as Fresno, Kerman, Sanger, Selma, Dinuba, and Riverdale. Through domestic well testing for nitrate, bottled water delivery to homes whose wells test above the safe limit of 10mg/L, drinking water fill stations, outreach, and stakeholder engagement, KWA helps connect eligible residents with short-term safe drinking water solutions. KWA is beginning work on long-term drinking water solutions and seeks to serve as a facilitator or bridge between nitrate impacted communities identified through nitrate testing of domestic wells, and organizations with the authority and organizational infrastructure to offer permanent drinking water supply options. This work will be very specific to each community and what could work best to meet their needs.

Through the Ripple Effect Initiative, KWA seeks to collect insight into the structure and skillset required to future-proof the water sector workforce in the Central Valley, ensuring communities, with a focus on rural communities, have the required know-how and workforce to manage their own water quality and supply needs for generations to come. The area of focus is Fresno, Kings, and Tulare Counties:

- Surveys of water-focused organizations, training and education providers, and job seekers to uncover workforce needs and opportunities, training and education needs and opportunities, and gauge awareness of the water sector as a professional option.
- A comprehensive inventory of all drinking water systems within KWA's 1.5-million-acre service area, from those that serve a business to those that service thousands of connections.
- Subsequent individual contact to a subset of drinking water systems with a significant number of residential connections to solicit information on topics such as planned infrastructure projects and openness to potential consolidation or expansion of services to nearby domestic well-reliant households.

KWA is stewarding The Ripple Effect Initiative because safe drinking water is not only a water quality issue; it is also a workforce, infrastructure, and community resilience issue. The initiative brings together water agencies, utilities, training institutions, nonprofits, employers, and workforce partners to map local water projects, jobs, and education pathways across rural Fresno, Kings, and Tulare counties. Its goal is to help future-proof the water sector workforce so local communities have the knowledge, skills, and capacity to manage their own water quality and supply for generations to come.

About the California Water Institute:

The California Water Institute (CWI), based at California State University, Fresno, is a multidisciplinary hub dedicated to advancing sustainable water resource management across California through research, education, and collaboration. It brings together faculty, students, and a broad network of partners to develop practical, science-based solutions to complex water challenges, emphasizing innovation, outreach, and community engagement. Through applied research, workforce development, and public education initiatives, CWI works to connect knowledge with action and support resilient water systems, informed decision-making, and long-term environmental and economic sustainability for the state.

Research Team

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AI Use Disclosure

Generative Artificial Intelligence (AI) was not used to write, review or edit any part of this report. It was also not used for data analysis, nor figure or table creation. Initial Spanish language translations were done within the Qualtrics platform using their internal Advanced Google Cloud Translation's API. The translation was then manually reviewed and corrected by Laura Ramos at CWI and edited in Qualtrics by Lisa Bryant.

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1 Executive Summary

Background

The Ripple Effect Initiative was created to help the Central Valley better understand, strengthen, and prepare the workforce needed to support the future of water in our region. The goal of this study is to understand current and future water sector needs and current workforce development conditions. The results can help stakeholders build a stronger water jobs pipeline: one that supports local agencies, prepares students and workers for meaningful careers, and helps communities shape a more resilient water future.

Methodology

Data for this report was collected using two survey instruments, targeting three distinct groups of respondents: one for those currently working in the water sector or working in educational or training programs focused on developing the water workforce, and one targeted at current jobseekers and students. Surveys were fielded between February 11 and April 13, 2026. Responses were collected online using Qualtrics survey software and analysis is limited to descriptive statistics due to sample sizes.

Key Findings

- 68% of respondents say they *sometimes* have difficulty filling mission critical positions and 25% reported that they *always* have difficulty filling mission critical positions
- 78% of those in the water sector report that it is difficult to find employees who have the required licenses or certifications needed to perform jobs in the water sector
- Only 39% of respondents say that it is easy to find employees with the adequate “soft skills” or interpersonal skills needed to carry out their jobs
- 61% of educators and trainers report that they rely on word-of-mouth to learn about current job openings and industry needs
- 69.7% of respondents use online job sites most frequently when looking for jobs
- 53.9% of students reported using career center/advisors for job searches
- Job *stability*, followed by salary, career growth, and health benefits were the most important job characteristics desired by job seekers.
- 71.9% of respondents are willing to commute 30 minutes or less
- 60.7% of respondents reported that a job is more desirable if it helps their local community
- 57% of respondents were interested in learning more about careers in the water sector

Key Recommendations:

- Create and maintain a list of all training providers, educational, and employment opportunities in the area to help grow a local network for water sector careers
- Create a list of publicly available pay scales, job descriptions, and retirement data or projections for the Central Valley, making it easier for people to learn about jobs

- Create a listserv or other communication channel for members of the water sector and water educators to easily share information regularly
- Connect with college advisors and career centers to raise awareness of water sector careers among current students and share current job postings
- Create internship opportunities for students and early career jobseekers
- Create recruitment material that highlights the importance of water sector jobs to local community benefits of water sector jobs
- Create recruitment materials that highlight stability of water sector jobs

2 Introduction

The future of water in California is filled with uncertainty — a reality that carries significant implications for the Central Valley's economy, communities, agriculture, public health, and quality of life. In a region where water shapes nearly every part of daily life, the question is not only how we respond to today's challenges, but how we use them as a catalyst for innovation, workforce readiness, technical career training, and stronger collaboration between education and industry.

The Ripple Effect Initiative

Across the Central Valley, safe and reliable water depends on more than infrastructure. It depends on people — skilled operators, technicians, managers, engineers, educators, trainers, and future leaders who are prepared to operate, maintain, protect, and modernize the systems our communities rely on. This report lives at the intersection of the **"know-what"** and the **"know-how"** in water. We understand issues facing California's water future, and building solutions will require shared knowledge, aligned training pathways, and coordinated action across the region.

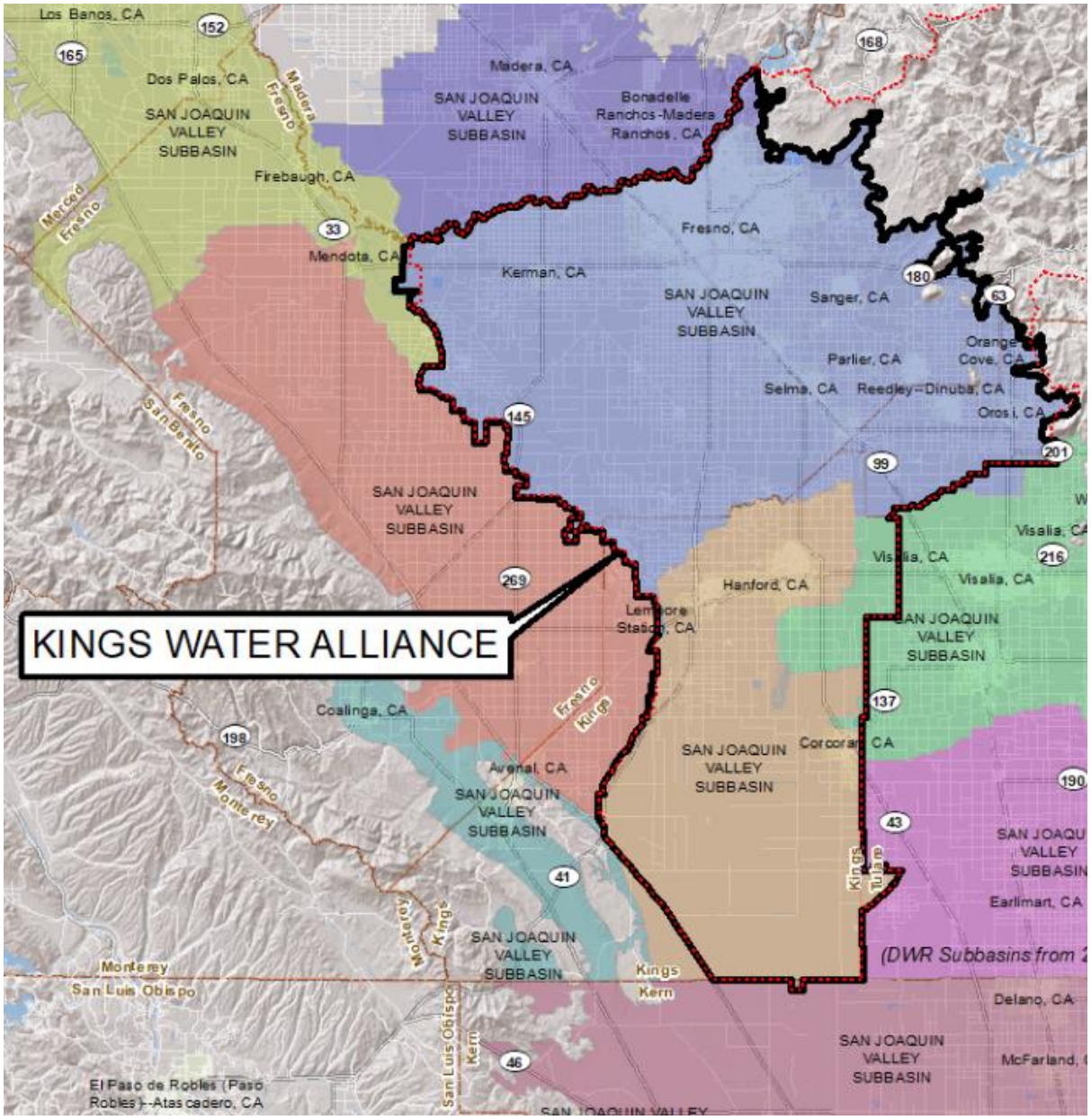
That need is becoming increasingly urgent. As some of the Valley's most experienced water professionals approach retirement, the sector faces the growing challenge of transferring decades of technical knowledge, institutional memory, and practical expertise to a new generation. With an estimated **30% to 50% of the water workforce expected to retire within the next decade** (Dickerson and Butler 2018), there are not yet enough younger workers prepared to step into these critical roles.

This report explores the Central Valley's water workforce from three connected perspectives: the water agencies and employers working to fill essential roles, the educators and trainers preparing future talent, and the job seekers who may be looking for stable, meaningful, and rewarding career opportunities in a wide range of job types — whether or not they currently recognize that those opportunities exist in water.

Through this work, The Ripple Effect Initiative seeks to identify and promote water-focused jobs with clear and rewarding career pathways, connect education and training programs with real workforce needs, better understand knowledge and awareness gaps within the water sector, and support Central Valley communities in shaping the future of their own water supply.

This report is about building a stronger, more prepared, and more connected regional workforce — one capable of meeting today's water challenges while helping secure the future of the Central Valley's communities, with a focus on connecting people in smaller, rural communities with the training and education they need to manage their own water needs.

Figure 1. Kings Water Alliance Service Area



Study Goals

The Ripple Effect Initiative was created to help the Central Valley better understand, strengthen, and prepare the workforce needed to support the future of water in our region. This work has been made possible through grant funding from the **Central Valley Community Foundation**, whose mission is to "connect capital and communities for a just and thriving Central Valley," and through support connected to the **Sierra San Joaquin Jobs Initiative, or S2J2**, a regional effort focused on creating quality jobs and expanding equitable economic access across Fresno, Madera, Tulare, and Kings counties. S2J2

is one of 13 regional economic plans under the California Jobs First Initiative, a statewide strategy for job growth and regional economic development.

Through these surveys, KWA sought to gather insight from three interconnected groups: water agencies and employers, educators and trainers, and job seekers. Together, these perspectives help identify where workforce needs, training systems, career awareness, and employment opportunities are aligned — and where gaps still need to be addressed.

The goal is to better understand how the Central Valley can build a stronger water jobs pipeline: one that supports local agencies, prepares students and workers for meaningful careers, and helps communities shape a more resilient water future.

Survey 1: Workforce Development Survey

The workforce-focused survey was designed to better understand the current state of employment within the Central Valley's water sector, as well as the future needs of the agencies and organizations responsible for managing, operating, protecting, and improving local water systems and a range of connected regional water-focused organizations including those responsible for providing conservation, conveyance, flood control, and wastewater services.

This includes identifying current workforce challenges, anticipated retirements, hard-to-fill roles, technical skills gaps, succession planning concerns, and opportunities to better prepare the next generation of water professionals. The survey also explores how agencies view the future of water work — from operations and maintenance to compliance, technology, conservation, management, and innovation.

Ultimately, this helps define what the water sector needs from its future workforce and how regional partners can better support those needs through training, education, outreach, and collaboration.

The educator and trainer portion of the survey was developed to better understand how the Central Valley's education and workforce development systems currently introduce, prepare, and train individuals for careers in water.

This includes exploring how water-related topics are represented in curriculum, career technical education, community college and university programs, certification pathways, workforce training, and career readiness efforts. The survey also seeks to understand what educators and trainers need from water agencies and industry partners to better connect students and job seekers with real employment opportunities.

The goal of the first survey is to strengthen the bridge between education and industry so that future water professionals are not only aware of available careers, but prepared with the knowledge, skills, and confidence needed to pursue them.

Survey 2: Job Seeker Survey

The job seeker survey was designed to understand how individuals view water-related careers, what they know about available opportunities, and what barriers may prevent them from entering the field.

This includes exploring awareness of water jobs, perceptions of the industry, understanding of required training or certifications, access to career guidance, and the clarity of available pathways into employment. For many job seekers, water careers may be stable, meaningful, and locally relevant — but not always visible or easy to understand.

The goal of this survey is to identify and bridge gaps in communication, outreach, and career navigation so that water-sector jobs are easier to find, understand, and pursue. By listening directly to job seekers, KWA and its partners can better connect motivated individuals with rewarding careers that support both their future and the future of water in the Central Valley.

3 Methodology

Survey Methodology

To answer the research questions posed for each of the groups identified above, researchers at the California Water Institute (CWI) worked with the Kings Water Alliance (KWA) to develop two survey instruments: (1) the ***workforce development survey*** for those currently working in the water sector or working in educational or training programs focused on developing the water workforce; and (2) the ***job seeker survey,*** designed to learn more about current students and job seekers.

As noted in the previous section, the workforce development survey included questions about the size and demographic makeup of the current water workforce, expected future employment needs for the water sector, recruitment efforts, difficulties in filling positions in the sector, and educational opportunities for future water workers. (See Appendix 10.1 for the water sector questionnaire.)

Also discussed in the previous section, the jobseeker survey included questions about employment preferences, job-seeking tactics, the desirability of different workplace settings and environments, and the knowledge and desirability of jobs in the water sector. The survey also included demographic questions about the respondents. Respondents include current students and current jobseekers and accounted for those who were currently students seeking jobs at the same time. (See Appendix 10.2 for the job seeker questionnaire.)

Respondents for the surveys were recruited through a broad range of outreach and engagement efforts conducted between September 2025 and April 2026. Recruitment strategies included direct email invitations, e-newsletter promotions, presentations and meetings, partner website features, tabling events, social media outreach, and in-person engagement activities.

The following is a detailed list of recruitment efforts and dates, as applicable:

Direct Email Outreach:

- California Water Institute distributed survey invitations to 391 individuals on March 3, 2026, with a follow-up reminder sent on March 16, 2026.
- The ACWA Foundation distributed two e-blasts promoting the surveys
- The Maddy Institute at Fresno State sent an email to attendees of a recent water workforce summit that included links to both surveys.

E-newsletter Features:

- CV-SALTS e-newsletter - September 2025
- The Central Valley Community Foundation e-newsletter - March 2026
- Kings Partnership e-newsletter on a weekly basis for one month
- Kings Water Alliance monthly e-newsletter

1:1 Meetings & Presentations

- Workforce Investment Board of Tulare County
- Fresno Regional Workforce Development Board
- Madera Workforce Investment Board

- Kings Basin Water Authority (3 presentations at 3 meetings)
- Sarge Green at Fresno State
- Kurt Madden at Career Nexus

Partner Organization Website Features

- ACWA (Association of California Water Agencies) Foundation – homepage feature for duration of the survey period
- ACWA – Blog post promoting the Ripple Effect Initiative and survey(s)

In-Person Outreach & Events

- Maddy Institute's "California Energy Transition: How Will It Impact California Agriculture?" – February 25, 2026 where survey information was shared during emcee remarks and through an outreach table.
- Valley Veterans Water Forum – April 11, 2026, where Laura Ramos from California Water Institute promoted the survey during a panel presentation and the Kings Water Alliance hosted an informational table.
- Reedley College Safari Days – April 2026
- Resource Fairs - March & April 2026

Fresno State Volunteer Team (job seeker survey recruitment, exclusively)

- Four Fresno State student volunteers contributed approximately 60 hours (total) of outreach through classroom presentations, foot-traffic engagement on campus, flyer canvassing throughout campus and local gathering spaces, and tabling at outreach events.

Organic & Paid Social Media

- Social media outreach included organic promotional posts to KWA profiles, related groups, partner organizations also shared content and promotions (Fresno Regional Workforce Development Board and the ACWA Foundation),
- Paid advertising campaigns on LinkedIn (survey 1) and Meta (survey 2) platforms.

Both surveys were fully administered online through Qualtrics The water workforce development survey was in the field from February 11, 2026, until April 13, 2026. A total of 63 respondents completed the survey through the end. The margin of error for the water sector survey is 12.3% (p=.5). The jobseeker survey was in the field from March 10, 2026, through April 13, 2026. A total of 144 respondents began the survey and 89 completed the survey in its entirety. The margin of error for the job seeker survey is 10.4% (p=.5). Due to size limitations and the questions of interest, analysis is primarily limited to descriptive statistics.

Data Limitations

There are clear data limitations for both surveys, including unknown sampling frames and small sample sizes. While a 2018 Brookings Institute study estimates that water workers make up approximately one percent of the total workforce in the Fresno Metro area, and it is reasonable to assume that estimate could apply to the Kings Water Alliance coverage area as well. To the best of our knowledge, there is no known accurate data available on how large the current water workforce is in the area covered by KWA, nor how many employees work in the sector. Similarly, it is unknown how many current or future job seekers have an interest in entering the water workforce or are aware of the types of jobs that exist in the water sector. These limitations required the use of non-probability sampling, primarily convenience sampling, which resulted in a limited number of complete survey responses.

Due to the limitations, the data presented in this report should not be considered generalizable to or representative of the entire population of the water workforce or those who may desire to enter the water workforce. Again, this is a preliminary study using descriptive statistics and is meant to establish baseline information on these issues for the KWA service area and the Central Valley more broadly.

4 Water Workforce Development Survey

Workforce Development Survey Respondents

A total of 141 respondents agreed to the consent form to take the survey, though that dropped to 117 respondents by the second question of the survey and only 63 completed the entire survey.[1] There were a fair number of people who completed approximately half of the survey and we have left those responses in the analysis to provide as much information as possible.

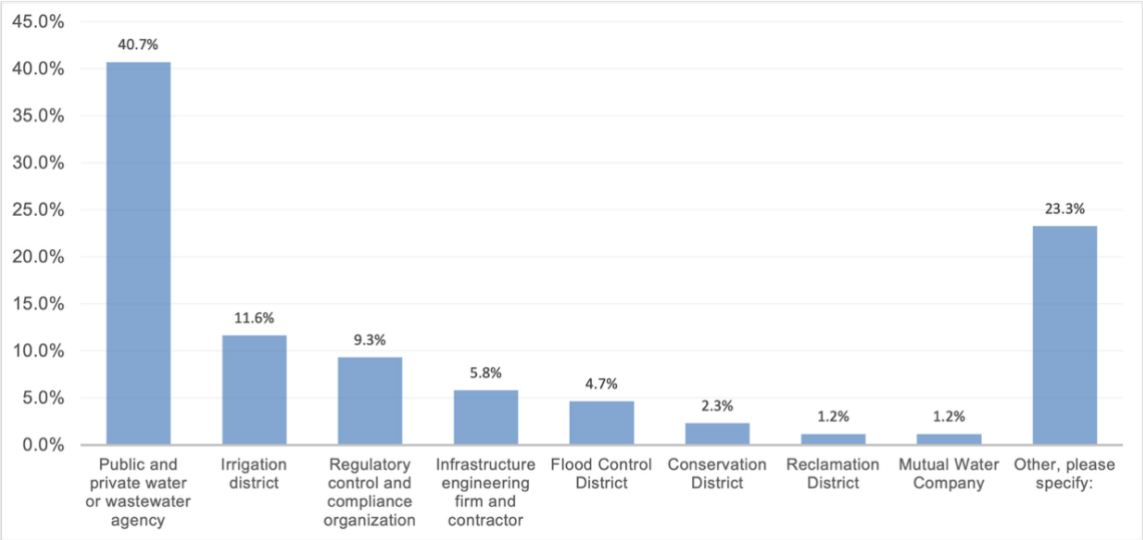
Of the 63 who completed the demographic information at the end of the survey, 81% (51) reported that they work in the water sector, 16% (10) reported that they are water workforce educators and 3% (2) reported that they are both educators and work in the water sector.[2] Of the 61 respondents who provided a response, 55.7% (34) were male and 44.3% (27) were female and the proportions were the same for both the employer/workforce respondents and the educators. Just over 34% of respondents were 44 or younger, 47% were between 45-54 and 18% were 55 and over. Nearly 40% had a bachelor's degree and 41% had a graduate or professional degree. The remaining 16% had an associate's degree or lower. Just over 27% (17) of respondents have been a union member. About 27% (17) of respondents have for fewer than five years, 19% have worked in the field 6-10 years, 27% (16) between 11 and 20 years, and another quarter (16) have worked in the industry for 21 or more years.

4.1 Water Sector Organizations

The water sector respondents primarily came from public and private water and wastewater agencies (41%), though there were several respondents from irrigation districts, regulatory agencies and various districts. Figure 2 shows that over one-in-five respondents reported that they were from an organization not represented in the survey selections and examination of their responses shows that a several of them are consultants to the water sector, though a few work for the government or special districts.

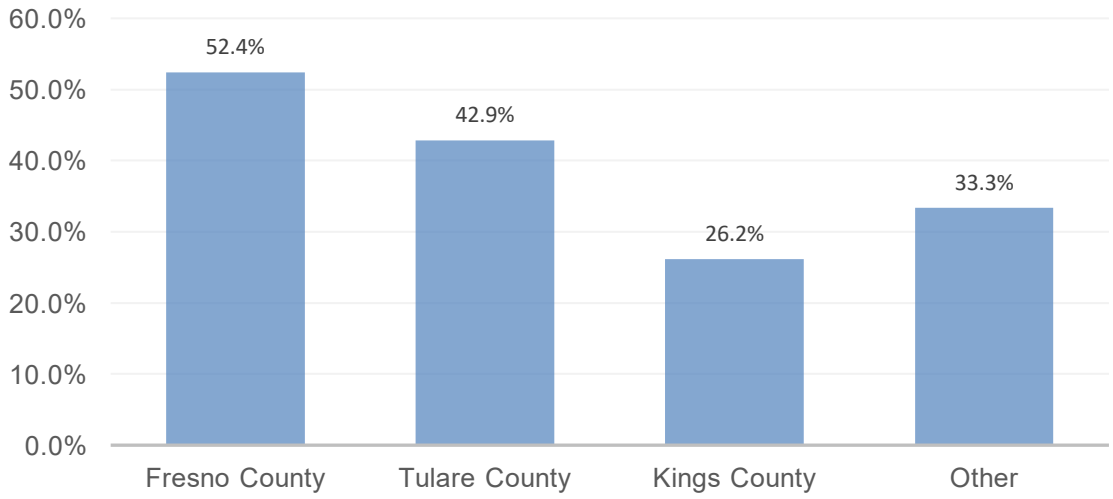
[1] The immediate drop-off in respondents is likely due to a mismatch between the email distribution list and the type of work the respondent performs, which was revealed when answer choices were provided.
[2] Respondents who indicated they were both in the water sector workforce and an educator received all questions in the survey. All other respondents received a subset of questions targeted to their role.

Figure 2. Respondent Organization or Company Role in the Water Industry



Respondents were asked to identify their service areas by county. Organizations can, and do, serve areas that extend into one or more county, so responses were not limited to one county. Figure 3 shows that over half of the respondents indicated their organization or company service area includes portions of Fresno County, while 43% include Tulare County and 26% include Kings County. One-third of respondents reported that their company or organization serves an area outside of the three-county region, the most common being Kern, Madera, and Merced Counties. Multiple respondents reported working with districts across the state.

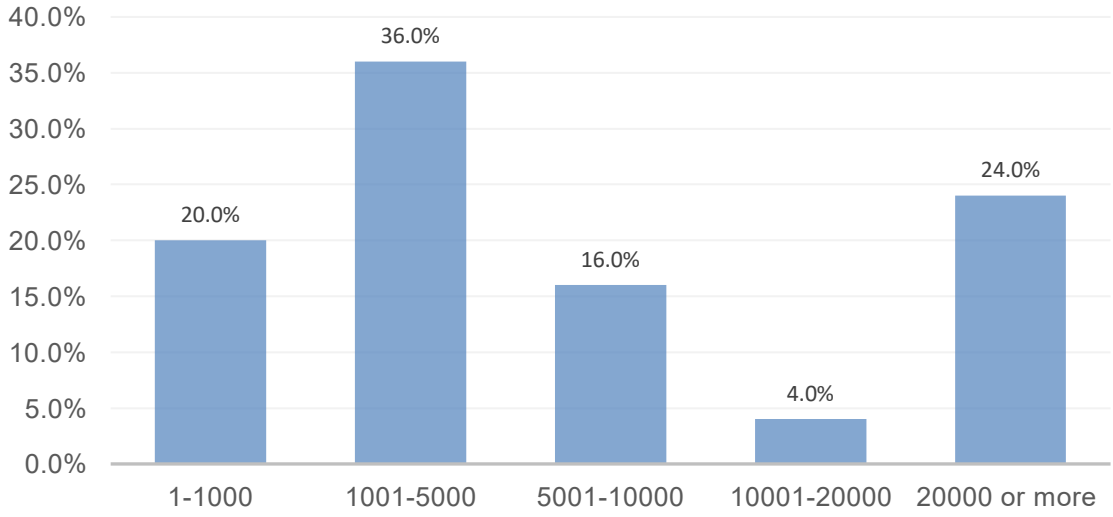
Figure 3. Counties Served by Respondent Organization



Just over 10% of respondents who work for a water agency or organization report that they work for small or very small system such as a gas station, campground, or small community with fewer than 1,000 homes and businesses. About 30% of respondents work for medium areas such as small cities or townships. The majority, 44% reported that they work in mid-to-large cities, counties or large water districts.

When looking at the number of connections in a water system, 20% of respondents reported that they have between 1 and 1,000 connections, 36% reported between 1,001 and 5,000 connections, 20% reported between 5,000 and 20,000 connections and nearly one-fourth reported working for systems that have over 20,000 connections. (See Figure 4.)

Figure 4. Number of Service Connections for Water Systems



4.2 Current Employees and Expected Employment Trends

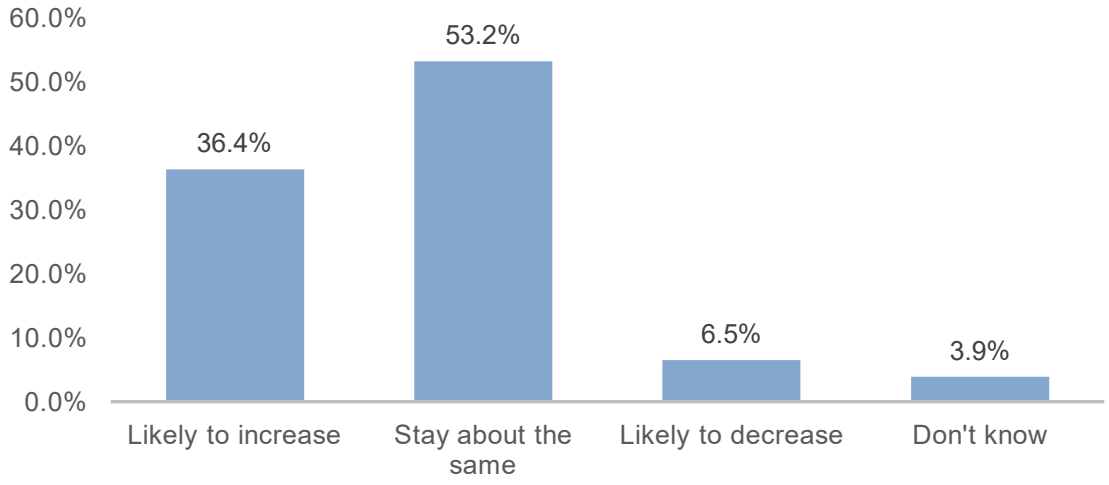
One of the primary purposes of the study is to get a better idea of the state of the current workforce. We asked respondents, “to the best of your knowledge, how many people does your organization currently employ?” Table 1 shows that there is sizeable variance in the number of employees in organizations. For example, 40 percent of organizations with one to 1,000 connections have fewer than five employees, but 20 percent report that they have between 41 and 60 employees. Organizations with between 1,001 and 5,000 service connections have the widest range in the number of employees, but 44% report having between 5 and 20 employees. As expected, large districts with over 10,000 connections generally have over 100 employees, though one organization with over 20,000 connections reports having between 21 and 40 employees.

Table 1. Number of Employees by Service Connections in Organization

Percent	1-1000	1,001-5,000	5,001-10,000	10,001-20,000	20,000 or more
Fewer than 5 people	40.0	11.1	0.0	0.0	0.0
5-20 people	20.0	44.4	50.0	0.0	0.0
21-40 people	0.0	11.1	50.0	0.0	16.7
41-60 people	20.0	11.1	0.0	0.0	0.0
81-100 people	0.0	22.2	0.0	0.0	0.0
100-249 people	20.0	0.0	0.0	0.0	50.0
250-499 people	0.0	0.0	0.0	0.0	16.7
More than 500 people	0.0	0.0	0.0	100.0	16.7

To get an idea of the jobs outlook for the water sector, we asked respondents, “is the number of employees [in your organization] expected to increase, decrease, or stay about the same over the next five years?” Of the 77 people who responded to this question, approximately 36% expect the number of employees to increase and 53% percent expect the number of employees to stay about the same. Figure 5 shows that just under 7% of respondents expect the number of employees to decrease and another 4% are unsure. Overall, these results suggest will likely be a need for both new positions and possible replacement hires in the next five years.

Figure 5. Expected Change in Number of Employees in Next Five Years

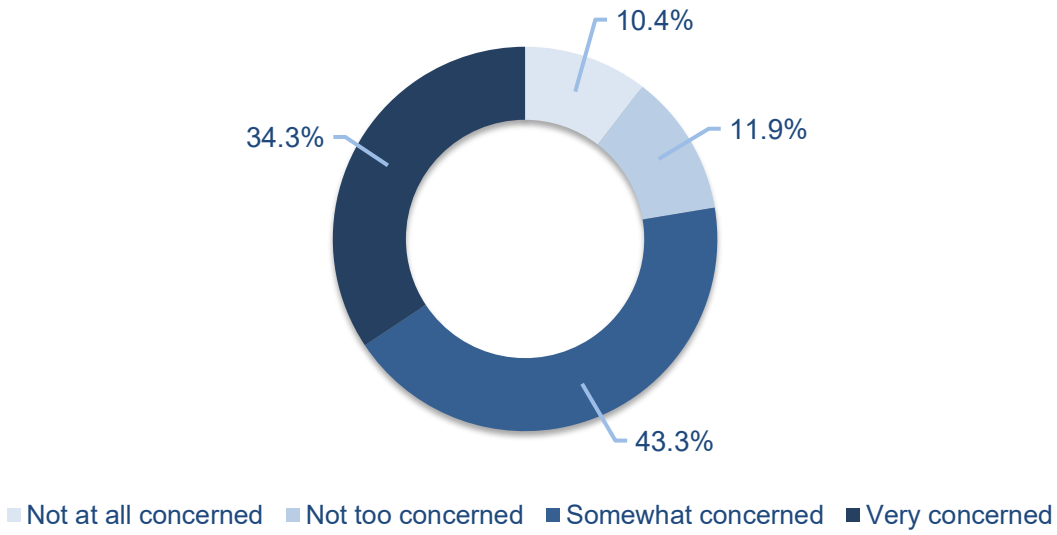


To get a better idea of how many vacancies may be opening in the future, we asked respondents to project, based on the best of their knowledge what percentage of employees would be retiring in the next five and ten years. About 44% of respondents expect that fewer than 10% of employees will retire in the next 5 years, while 42% think that between 10 and 25% will retire in the next 5 years and 14% say that more than 25% of their organization’s employees will retire in the next 5 years.

Looking a little further out, the numbers change fairly significantly. Approximately 23% of respondents say that less than 10% of employees will retire, while 53% say that between 10 and 25% will retire in the next 10 years. Just under 25% say that 26% or more of their co-workers will retire in the next decade.

With the expectation of future retirements or turnover, there may also be concerns about institutional knowledge loss within organizations or the industry. Figure 6 shows that over one-third of respondents (34%) are very concerned about the loss of institutional knowledge in the coming years and another 43% are somewhat concerned about. That combined total of nearly 78% far outweighs the 22% who are not concerned and suggests that companies should make an effort to focus on succession planning.

Figure 6. Concern Over Institutional Knowledge Loss



Those who expressed concern over institutional knowledge loss were asked what they were most concerned about as an open-ended question. Responses include everything ranging from concern over loss of knowledge about best practices to a loss of important client relationships. One respondent stated they were worried about the loss of, “experience of overseeing large projects combined with years of technical expertise for a given discipline (i.e., subsidence, geochemical modelling, machine learning modelling, expertise with noble gases, age dating)” and another stated they are concerned about the loss of, “field understanding of situational analysis,” because, “my students are required to work with the elder operators Level 3 and up to understand field safety.” A complete list of responses to this question appears in Appendix 10.3.

We asked respondents to share the ways they are actively planning for future workforce needs or succession. Nearly 60% said that they were engaged in upskilling or enhancing the skills of existing employees in preparation for advancement. The majority of respondents also reported that they are being proactive at identifying upcoming vacancies and critical roles that will need to be filled. About 40% of respondents are focused on building a strong talent pipeline or engaging in recruitment efforts to help prepare for vacancies. About one-third (30%) are reskilling existing employees for transition into a new career path or role, and one-fifth (20%) are not actively engaged in preparing for future vacancies.

Table 2. Succession Planning for Future Vacancies

Activity (select all the apply)	Fresno
Upskilling/enhancing existing skills for advancement	59.0%
Proactively identifying critical roles and upcoming vacancies	57.4%
Recruiting/building a strong talent pipeline through	39.3%
Reskilling for transition into a different role or career path	29.5%
Not actively engaged in succession/future planning at this time	19.7%

4.3 Jobs and Vacancies

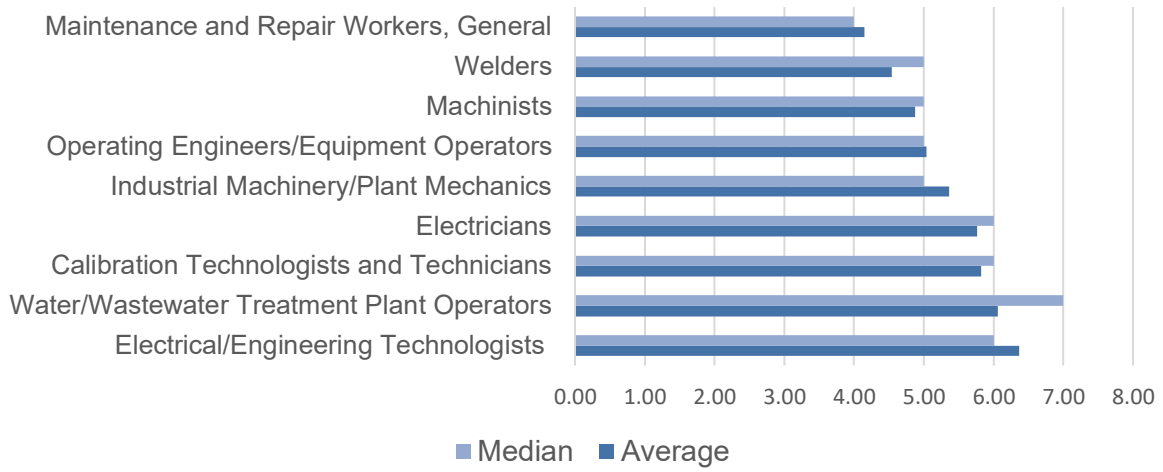
Understanding the current and future workforce needs of the water sector is one of the key goals of this study. To get a better idea of those needs, we asked respondents about the types of jobs their agencies or organizations currently provide, currently has vacant, or anticipates as a future need. We began by asking how often respondents have difficulties in filling mission critical positions that require at least a high school diploma. About 7% percent of respondents said they never have difficulty filling mission critical positions; 68% say they sometimes have difficulty and 25% reported that they always have difficulty filling these positions. Looking at difficulty by county, Fresno reports that they always have difficulty at a slightly higher rate than either Kings or Tulare counties. Medium sized districts also reported It is always difficult (33%) at a higher rate than small (13%) or large districts (25%). It is also interesting to note that those respondents who are from outside the service area report lower difficulty overall, suggesting that hiring educated workers may be more difficult in the Central Valley than other parts of the state.

Table 3. Difficulty in Hiring Mission Critical Positions by County

Difficulty Hiring	Fresno	Kings	Tulare	Other	Total
Never	3.1	0.0	7.1	17.4	7.2
Sometimes	68.8	78.6	67.9	60.9	68.0
Always	28.1	21.4	25.0	21.7	24.7

To get a better idea of which types of positions are most difficult to fill, we asked respondents to rate the difficulty of nine groups of jobs on a scale from 0 to 10, where 0 represents very easy to fill and 10 represents very difficult to fill. The average difficulty across all categories was 5.32 and the median was 5.0, which aligns very well with the three-point scale used in the previous question, where the majority of respondents said that hiring was “sometimes” difficult. Figure 7 shows the categories of jobs sorted from the least difficult to fill to the most difficult to fill. Not surprisingly, general maintenance and repair workers are among the easiest to hire, with an average difficulty of 4.2. Welders (4.5) and Machinists (4.9) also averaged below 5 on the difficulty scale.

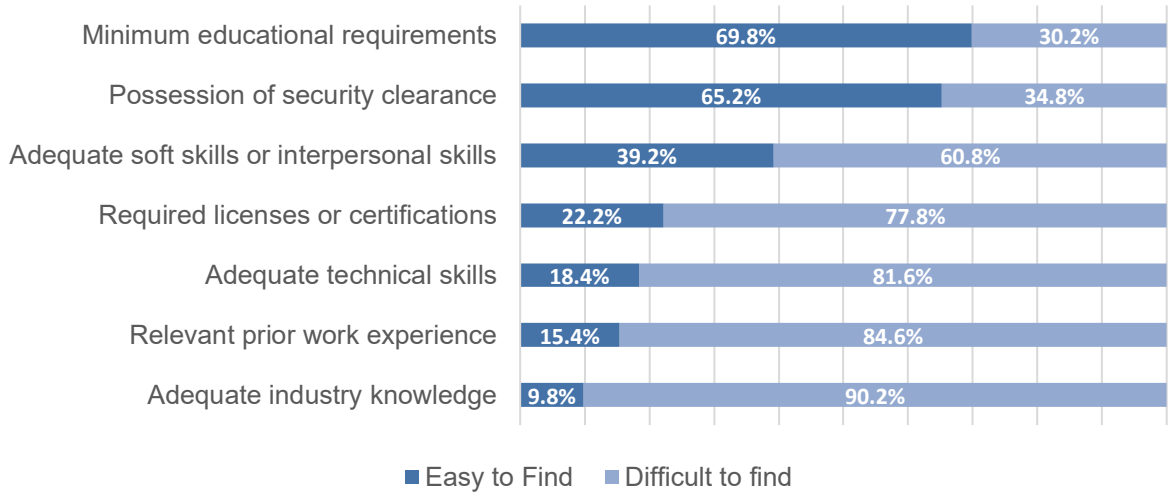
Figure 7. Difficulty in Hiring by Critical Position Type



Not surprisingly, some of the most technical jobs and those that require more education or specialized training are the most difficult to fill. Electricians (5.8), Calibration Technicians (5.8), Water and Wastewater Treatment and Plant Operators (6.1) and Electrical Engineers or Engineering Technologists (6.4) were all among the most difficult. Water/wastewater Treatment Operators had a median difficulty one full scale point higher than the average, suggesting some respondents have little difficulty filling these positions, while others find it very difficult.

Next, we asked respondents which skills or qualifications were the most difficult to fill when hiring. Figure 8 shows that nearly 70% of respondents report that it is easy to find applicants who have the educational requirements required for the jobs they are attempting to fill. Somewhat surprisingly, almost two-thirds (65%) say that it is easy to find applicants who have possession of or have the ability to obtain a security clearance if needed.

Figure 8. Difficulty Finding Applicants with Select Skills



The ease of finding necessary skills quickly drops for the remaining categories. Fewer than half of respondents (39%) report that it is easy to find employees with the adequate "soft skills" or interpersonal skills needed to carry out their jobs. This is somewhat concerning, given that it is difficult to train those skills on the job and many of these skills should be taught or acquired before entering the workforce. Over three-quarters of respondents (78%) report that it is difficult to find employees who have the required licenses or certifications needed to perform jobs in the water sector. This means that organizations will have to spend time and resources getting employees certified or licensed before they can complete all aspects of their jobs. Similarly, four out of five (82%) report that it is difficult to find employees with the adequate technical skills needed and 85% report that it is difficult to find employees with relevant prior work experience. Finally, nine out of ten respondents (90%) report that it is difficult to find employees with adequate industry knowledge. Taken together, these results demonstrate how difficult the hiring process can be for the water sector and suggest that better training and workforce development programs are needed and educational partners may need to focus more on technical training and certification.

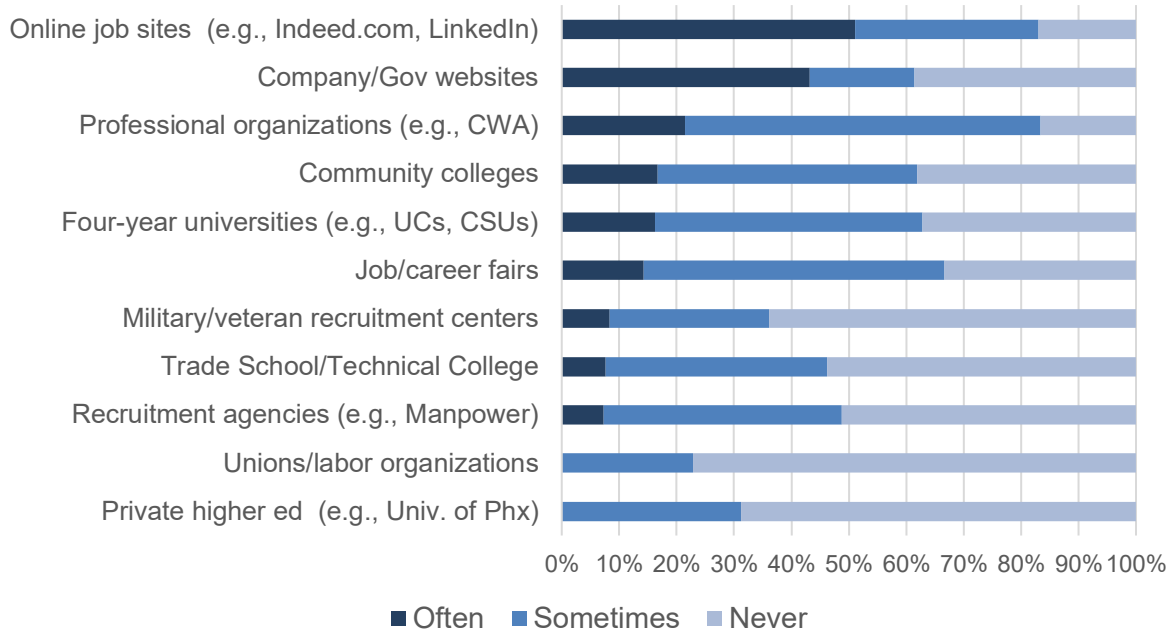
We concluded this portion of the survey by asking which skills respondents were most looking for in new hires. Appendix 10.4 shows the variety of responses received. Themes such as good communication skills, experience, and certifications emerge, but a fair number of respondents also referenced characteristics such as honesty, willingness to work hard, and being a good team player among the most important things they are looking for.

4.4 Recruitment and Job Preparation

To better understand how water agencies recruit employees, we asked respondents to share how often their agency or organization uses educational and workforce agencies to recruit or hire entry-level employees. Figure 9 shows that of the eleven categories offered as places to recruit, online recruiting platforms and company job boards were used the most often. Professional organization, job fairs community colleges, and four-year institutions were used somewhat often, though private colleges and institutions were not used very often. Interestingly, trade and technical college were also not used very often, nor were military and veteran recruitment centers or unions. Given the technical abilities of many veterans and union members, as well as those in trade schools, these could be partnerships worth exploring.

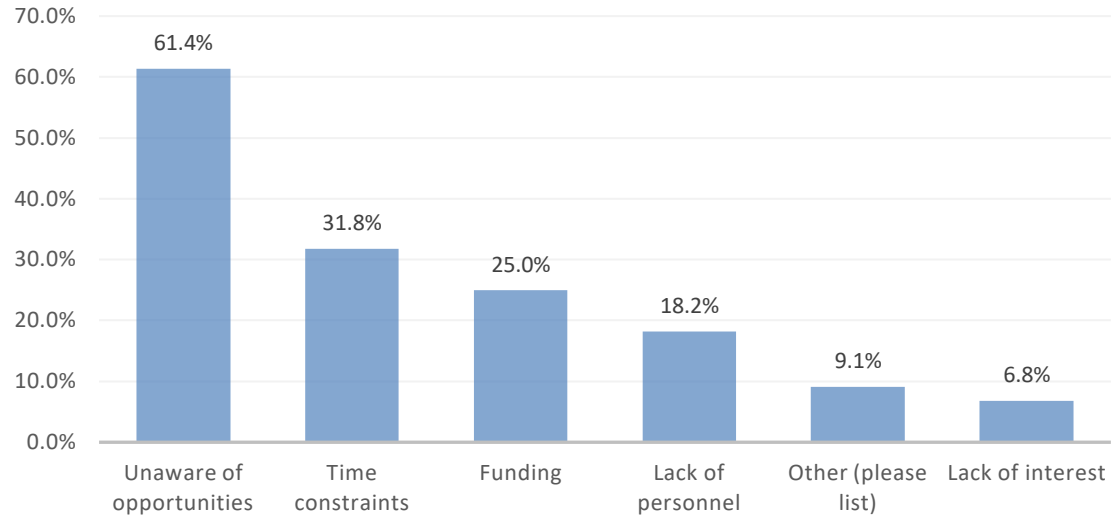
We also asked respondents, "Are you currently partnering with training agencies or educational institutions to fill your workforce pipeline?" More than 8 in 10 (86%) industry respondents reported that they were not currently working or partnering with any workforce agencies or educational institutions to fill vacancies. This is an area where mid-to-large size agencies that sometimes have difficulties filling positions, especially those that require specialized training or education could improve their practices. The 14% of respondents who were currently partnering with organizations to fill vacancies listed ACWA, CWEA, AWWA, American Water College, Fresno State, and USDA as some of the organizations they were working with.

Figure 9. Frequency of Outlets Used for Recruitment



For those who indicated they were not working with any organizations to fill vacancies (N=44), we asked the reasons why not. Figure 10 shows that three-fifths (61%) said they were not aware of any opportunities to partner, 32% said it was due to time constraints, 25% reported it was due to lack of funding, 18% said it was due to a lack of personnel to carry out the tasks, and 7% said it was a lack of interest in the partnerships. For the 9% that replied “other” and offered a reason, respondents reported that they either had too few openings (so partnering with was not required to fill vacancies) or it was due to federal workforce cuts and the resources were not available. We also asked respondents if they had any apprenticeships in place and 55% reported that they do not, while 45% stated that they do. These results clearly show that there is a critical need to create a link between those educating and training the future water workforce and those hiring for the water industries, because most are unaware that those opportunities exist.

Figure 10. Reasons for not Partnering with Organizations for Recruitment



Note: Respondents could select all that apply, so total equals more than 100%.

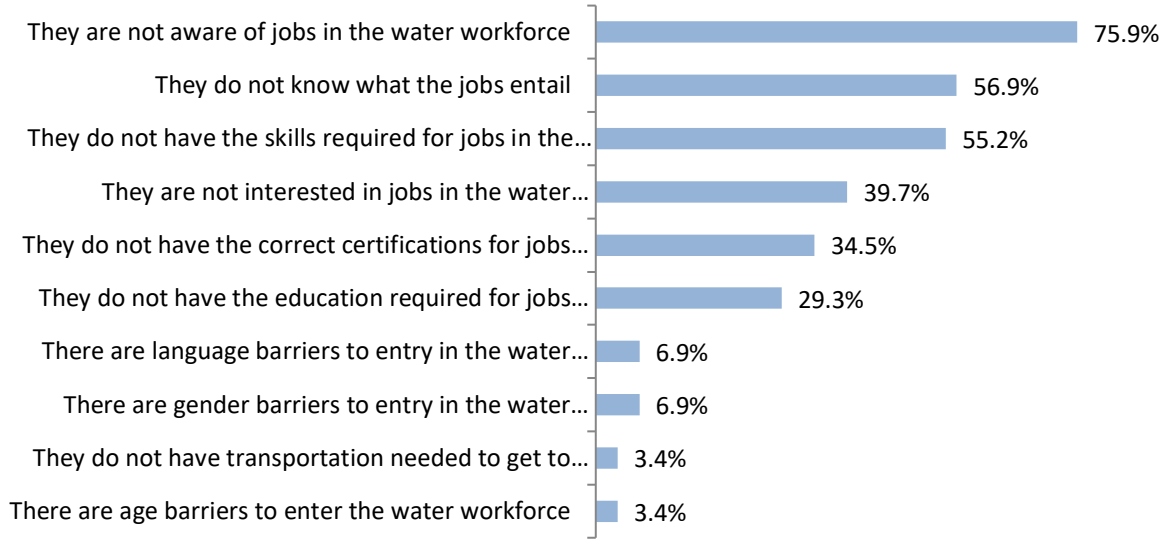
4.5 Workforce Conditions, Barriers to Entry, and Future Concerns

When thinking about how to prepare for future hiring and recruitment, having well-defined career paths and compensation structures can help attract new talent into careers. We asked respondents how they defined career paths and compensation structures within their organizations. Of the 58 respondents, 80% reported that their organizations had very well or somewhat well-defined career paths and compensation structures and 20% said that their structures were not very well defined or not defined at all. A closer look revealed that respondents who reported a lack of clearly defined career paths and compensation structures came from agencies in small, medium, and large service areas. Clear definitions allow employees to prepare for their future in the industry and set goals. It could help keep current employees in the workforce and help attract new talent.

While the majority of respondents reported that their organizations had clear compensation structures, when we asked about the average salaries for a variety of water workforce positions, the most common response across all categories was “don’t know”. For example, 65% of respondents reported they did not know the salary range for environmental compliance inspectors, 54% did not wager a guess for electricians’ salary ranges and 53% offered no estimate of welders’ salaries. These were the highest, but they demonstrate the pattern. The two jobs with the least “don’t know” responses were project manager and wastewater/water treatment operator. The estimates for those salaries were between $60,000 and over $100,000 for project managers and between $40,000 and $80,000 for treatment operators. It is possible that respondents are unfamiliar with salaries outside of their own positions but having access to information about average salaries in the immediate or larger service area could help with recruitment into the workforce.

We asked respondents what they thought the largest barriers job seekers face when trying to enter into the water workforce and overwhelmingly respondents said that people are not aware of jobs in the water workforce. This suggests that there is a need to spread the word about the types of careers that are available in the industry. Figure 11 shows that the second most common response is that people do not know what the job entails and that could prevent them from applying to or seeking out positions in the water sector. (Section 6.2 of this report reaffirms this finding.) Over half of respondents believe that a lack of required skills creates a barrier to positions in the work force as well. Fewer than half of the respondents felt that lack of interest, lack of certifications or lack of education creates a barrier to entrance. It is clear that respondents do not think individual characteristics such as language, gender, age or access to transportation create barriers to entering the water workforce. The top six barriers in this list could be addressed or solved through increasing awareness, education, standardization, consistency and clarity in what is expected in the job.

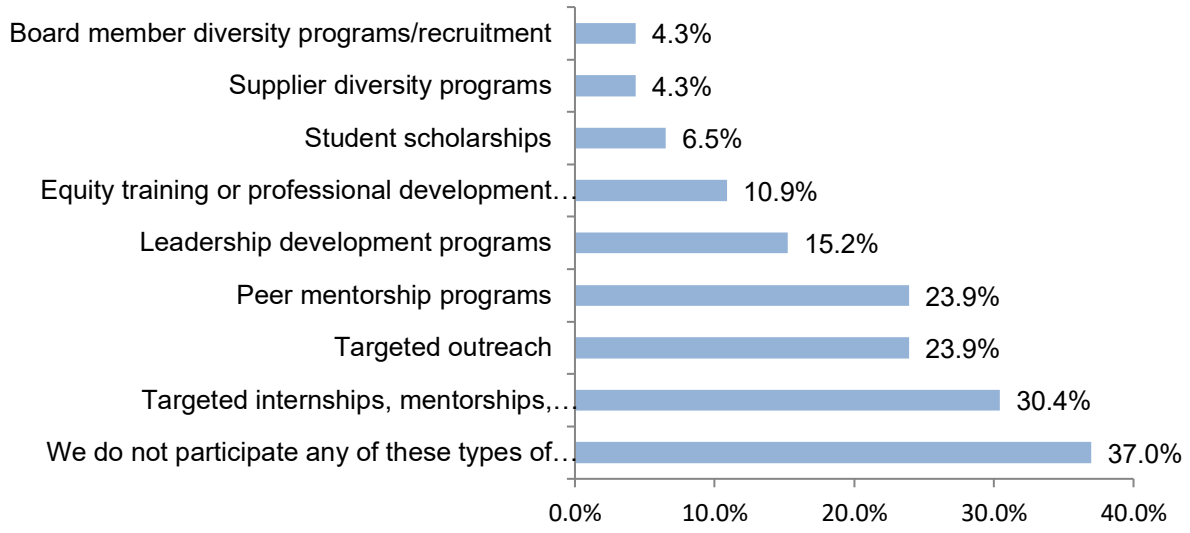
Figure 11. Barriers to Entering the Water Workforce



Note: Respondents could select all that apply, so totals do not equal 100%.

While few respondents replied that they saw gender or language skills as a barrier to entry into the water workforce, previous studies have shown that women and people of color are often underrepresented in the industry (Sandoval Solis, et al. 2025). To that end, we asked if their organizations engaged in any efforts to diversify their organizations. While 37% of organizations reported that they do not engage in any such activities, Figure 12 shows that the majority of respondents identified some efforts aimed at diversity among their workforce or boards. The most common types of programs were outreach and internships or mentorships targeted at underrepresented minority groups. Peer mentoring was also identified as a program that approximately one-quarter of all respondent organizations participated in. Less common practices are leadership development programs and equity trainings for staff and managers.

Figure 12. Programs Focused on Underrepresented Groups the Water Sector



Note: Respondents could select all that apply, so totals do not equal 100%.

Turning to concerns over the future of the water workforce, we asked respondents if there any emerging roles or skills they anticipate needing that do not currently exist in their organization or agency. While most respondents did not identify any, several listed expertise using AI, robotics and advanced IT knowledge as a possible area. Given the speed that AI is developing and moving into virtually all sectors, this is not surprising. The second most common response volunteered was the need for treatment technicians who were familiar with more advanced systems and technologies. Less common responses included more advanced GIS skills, more geophysicists, and people with knowledge of alternative energy sources who could help create more sustainable water districts.

In addition to new and emerging skills that are needed, we asked respondents to rate how concerned they were about a variety of conditions that might impact the water workforce in the next 5 years. Table 4 shows the average and median responses using a scale where 0 represents not at all concerned and 10 represents very concerned. The first thing to note is that the average is lower than 5 for all of the questions, suggesting that respondents are not overly concerned about all of the items on the list. There are two items with a median response of 5, which indicates moderate concern. Those items of highest concern are that cybersecurity threats or a recession or economic strain could impact the workforce. Just behind those with a median response of 4.5 is that political instability could impact the water workforce. This survey was in the field in the months after federal cuts resulted in numerous job losses, so this result is not too surprising.

Table 4. Concerns Over Future Events that May Impact Water Sector Job Outlook

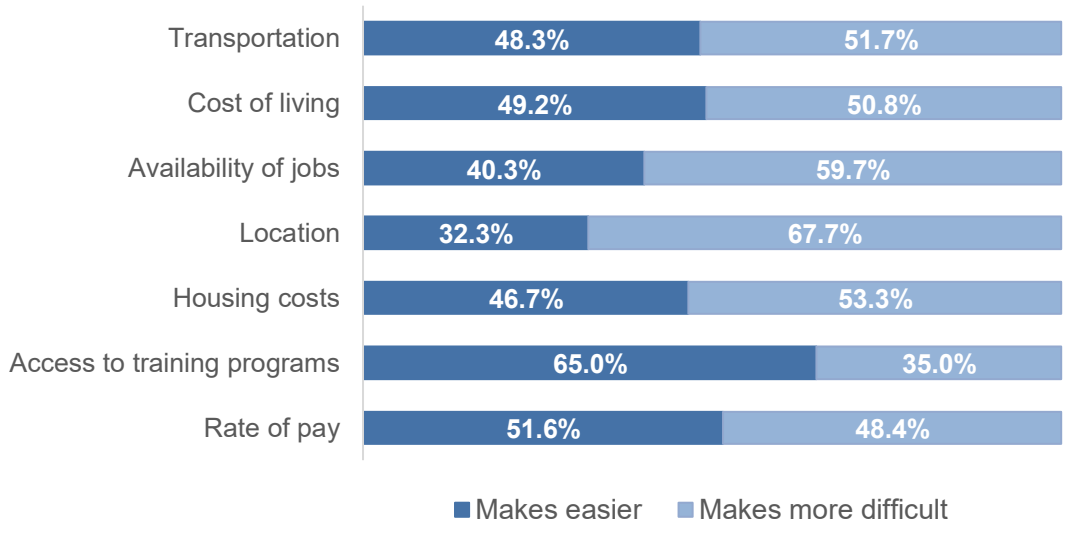
	Average	Median	Count
Lower demand due to population changes	2.05	1.0	41
Artificial Intelligence (AI) will make some jobs obsolete	2.71	2.0	45
Supply chain management issues	3.59	3.5	44
Increased demand due to population changes	3.90	3.0	41
Climate change/extreme weather will impact workforce	4.02	4.0	47
Political instability could impact the workforce	4.16	4.5	44
Federal budget cuts or reductions impacting water workforce	4.18	4.0	49
Recession/economic instability	4.52	5.0	48
Cybersecurity threats could impact workforce	4.76	5.0	45

Note: Respondents were not required to answer each question, resulting in a different number of responses for each item.

4.6 Central Valley Conditions and the Workforce

To get a better idea of other factors that may impact employer's ability to fill vacancies in the water workforce, we asked respondents to indicate whether conditions in the Central Valley make hiring easier or more difficult. Figure 13 shows that access to training programs is the number one thing that makes hiring easier. This should be highlighted for institutions offering training in this area. The rate of pay for the water sector jobs also makes hiring easier. Issues like cost of living, housing costs and a lack of public transportation neither make it easier nor more difficult. Respondents report that the lack of available jobs and the location itself are some of the biggest obstacles to attracting talent to the water sector jobs in the Central Valley.

Figure 13. Central Valley Conditions Influence on Ability to Hire



Because there are few (or no) baseline studies about the water sector in the Central Valley, we asked respondents what data or information would help them with their hiring or workforce planning. Appendix 10.5 includes all of the responses, but some helpful items mentioned include having a list of all training providers, educational, and employment opportunities in the area, pay scales in the region, job descriptions, and retirement data or projections.

We also asked respondents if there was anything not asked that was a concern. Those responses appear in Appendix 10.6.

4.7 Water Workforce Educators

A total of 20 educators and trainers responded to the survey, with approximately 35% working in non-profits or community benefit organizations, 25% working for four-year institutions, 15% representing community colleges, 10% representing workforce agencies, and 15% working as career technical program trainers or consultants.[3] When asked which certifications or degrees their programs offer for water-focused careers, 14 respondents indicated their institutions or organizations offered degrees in engineering and geology/hydrology, a minor in water studies, and certificates or training in water distribution, environmental compliance, wastewater treatment, and regional water management.

Mission Critical Training

When asked what mission critical positions their programs or organizations are training for, the majority, four out of fourteen, responded that they offer general maintenance and repair training. Nearly 30% of respondents (n=4) are with organizations that train welders, fabricators and electricians. Two out of fourteen respondents reported that their organizations offer training in areas including electrical technicians and technologies, equipment machine operators, treatment plant and systems operators, and machinists. Only one of the respondents, from a four-year institution, indicated their program offers engineering degrees. Of the fourteen respondents, four (28%) indicated they do not train for any mission critical positions.

Beyond the degree or certificate obtained, it is important to know what other knowledge, skills, and abilities students develop after completing a water workforce related program or degree. We asked respondents to identify all of the skills their program provides. Table 5 indicates that conflict resolution was the most cited skill developed in training programs. While this is an important skill, it is somewhat surprising, given this is not a skill most programs advertise or use for recruitment. Specialized software use and development skills in programs such as CAD, CAM, and GIS, in addition to database management and data analytics also ranked high among respondents and these are skills that can be critical to the industry. Less common were skills such as welding, fabricating, and electrical repair, which are equally important to the water sector. Notably missing are American Society for Quality (ASQ)

[3] Again, while this may seem like a small number of respondents, this study targets a very specialized group of respondents, each answering on behalf of a program or institution.

Certification, enterprise resource planning (ERP), good manufacturing practices, NIMS training, and predictive or preventative maintenance and repairs.

Table 5. Knowledge and Skills Acquired During Workforce Training Program or Degree

	Count
Conflict Resolution	5
Development Environment Software	5
Computer Aided Design (CAD) or Manufacturing (CAM)	4
Microsoft Office Suite applications	4
Technical/Water Science	4
Geological sciences	4
Data Analytics, Database User Interface, or Query Software	3
Hand and Power Tools use	3
Geographic Information Systems (GIS)	3
Quality Assurance and Control	2
Project Management	2
Technical/Water Mathematics	2
Welding and Fabricating	2
Computer Numerical Control (CNC)	1
Electrical Repair	1
Forklift/Heavy Equipment Operation	1
Occupational Health and Safety Practices	1
SCADA (Supervisory Control and Data Acquisition)	1
Water/Wastewater Treatment, Distribution, and Quality Sampling	1

Note: Respondents could select all that apply, so totals equal more than the total number of respondents.

Water Sector Career Awareness and Perceptions

We asked educators and trainers if students are generally aware of careers in the water workforce. Nine out of thirteen (69%) said definitely or probably not, while only four (31%) replied probably yes. No respondents replied that students or job seekers definitely know about water sector jobs. We followed up by asking respondents, based on their experience, what people typically think of when they hear about careers in the water workforce. Eight out of twelve respondents (66%) said that students think of plumbers when they hear about jobs in the water sector. Other popular answers include wastewater management (5), pumping/well drilling (4), meter readers (4), utility/water company employee (4), environmentalist/water conservationist (4), irrigation systems/agriculture (3), hydrologists/geologists (2), water inspectors (2), and finally, construction workers (1) and engineers (1). While some of these responses are careers related to the water workforce, several are not, including the most common response. Taken together, these results present both a problem and an opportunity for the water sector. More public education about careers in the water workforce are needed on higher education campuses and in the community.

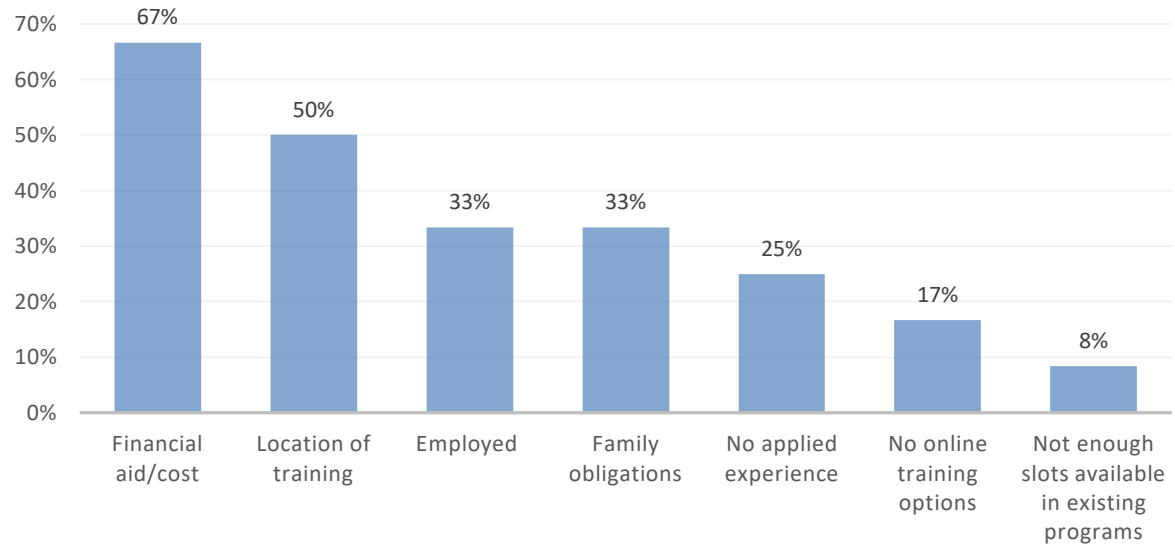
Misconceptions About Water Careers

We asked educators and water workforce trainers what they thought were some of the most common misconceptions about careers in water, and over half (57%) reported that students think they are low paying jobs. Almost as many, 46% believe that there are not many jobs available and that they (students) do not have the skills required to perform water sector jobs. Nearly 40% said that students believe that all water sector jobs are physical labor positions and that the jobs are "dirty". A smaller number reported that students think they are agriculture based (3), highly gendered in nature (3), or trades based (2). Interestingly, none of the respondents reported that students think the jobs require a high number of hours or are stressful. These could be positive aspects to highlight when recruiting for the future water workforce.

Challenges for Students

Educators and trainers were asked what were some of the biggest challenges for students who wanted to complete programs focused on the water sector. As is common in higher education across the country, Figure 14 shows that the cost of programs and lack of financial aid or financial resources presents a barrier for many students. Respondents also reported that the location of the training or educational programs can be too far for some students to travel to. Nearly one-third of respondents reported that students work while in school or have family obligations that also present barriers to completing their programs or training. This is very typical among college and technical school students across the Central Valley. One-quarter of respondents reported that students have no applied experience which can present a barrier and nearly one-in-five reported a lack of online training options presents a barrier. Finally, fewer than 10% report that a lack of slots or openings in existing programs can present a challenge.

Figure 14. Barriers to Student Completion of Water Sector Educational Programs



Note: Respondents could select all that apply, so totals do not equal 100%.

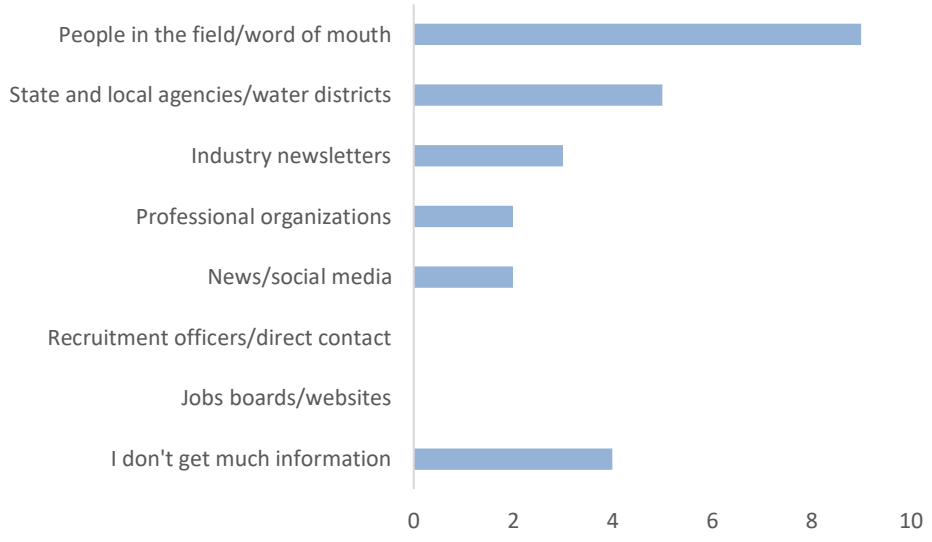
Once students complete their programs, they enter the job market. We asked respondents if their students have difficulty finding employment, and five out of seven respondents to the question (71%) reported that they are able to find employment in the water sector fairly easily. The two that reported difficulties stated that there are not enough entry-level jobs or no local jobs available. As a follow up, we asked how long it takes to find a job and educators reported that approximately 50% were employed in the water sector within six months and nearly 80% are employed in the industry within one year.

When asked how transparent the water sector is about career paths and compensation, 43% said that the sector is not very transparent, while 57% said that they are somewhat or very transparent. Educators reported that approximately 30% of students expect to be paid $60,000 or less for a full-time, entry level position in the water sector, while 40% believe that students expect to be paid between $60,000 and $80,000, and 30% report they expect to be paid between $80,000 and $100,000 for an entry-level position.

Workforce Educators and Water Labor Market Information (LMI) Alignment

To try and understand how workforce educators ensure that their training and curriculum align with the labor market, we asked educators how they stay informed of current job needs and demands. The overwhelming majority (61%) said that they rely on word-of-mouth information (as is shown in Figure 15). That was followed by state and local water agencies or water districts (39%), industry newsletters (23%) and professional organizations (15%). Very few hear from news or social media. Most concerning, no educators or trainers reporting hearing directly from recruitment officers or direct contacts and nearly one-third of respondents said they do not receive much information at all. This may indicate that there is an opportunity for the water sector to make more direct connections with educators.

Figure 15. How Educators Hear About Workforce Needs



Based on the results in the previous question, it is not surprising that when we asked respondents if they are in regular contact with water utilities or employers about changing job requirements, nearly half

(46%) reported that they have no contact. Of those who do have contact, 38% report regular contact and 15% report that they have some contact. When asked if programs update their curriculum to align with industry needs, six out of thirteen (46%) report that they continuously update their curriculum, while four (31%) reported they do not and three (23%) reported that do not know.

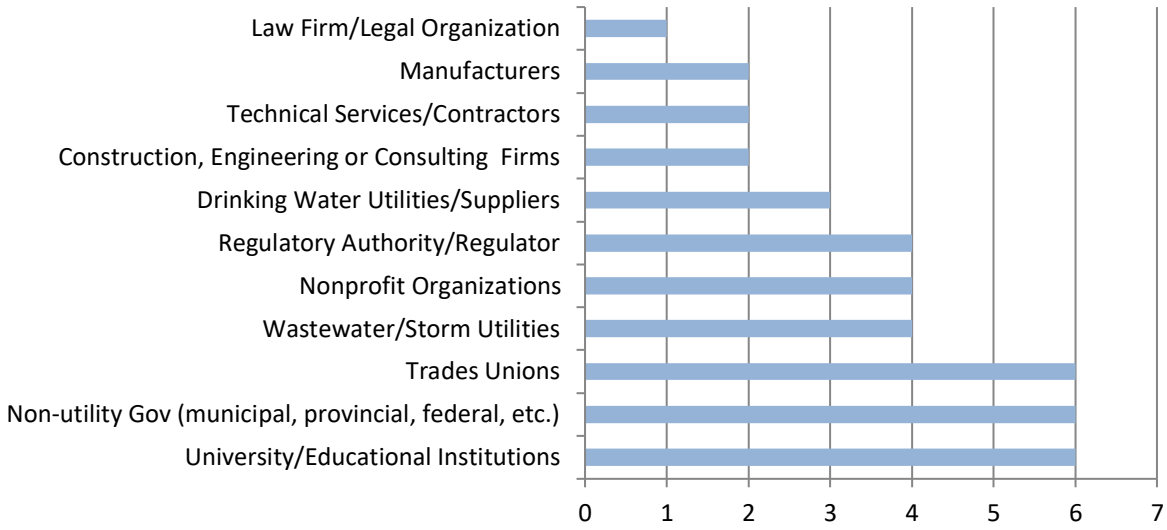
We asked respondents what types of partnerships they already have with those in the water sector and what types of partnerships would help them develop their water workforce training programs. Of the 9 respondents who have partnerships in place with water sector agencies and organizations, 66% of them reported that they have campus visits from potential employers. The same number also responded that they have water sector employers at job fairs. Four out of nine (44%) said that their institutions have applied instruction by those in the field and 33% said that they arrange apprenticeships to build connections between students and the industry.

To follow up on these partnerships, we asked educators trainers the type of response they receive from seasoned or long-term water industry employees when asked to train or mentor new talent. The responses were split, with half saying that experienced employees generally embrace mentoring and half saying they get a mixed response from seasoned employees. If seasoned employees appear unwilling to mentor new talent, it could create barriers for expanding the water workforce in the future.

If educational or training institutions are going to grow their programs to meet the future needs of the Central Valley, they may have to develop strategic partnerships with more organizations. We asked respondents which types of groups or organizations would be the most helpful in growing their programs. Figure 16 shows that partnerships with trades unions, non-utility governmental bodies and universities or educational institutions may be the most useful in growing existing training programs. These three are followed by regulatory authorities or agencies, nonprofit or community benefit organizations, and wastewater or storm utility organizations. Law firms, manufacturers and contractors were among the least likely to help grow existing training and certification programs.

When we asked if respondents were interested in developing new partnerships, 69% said that they were very or somewhat interested, while 31% said that they were not interested at this time.

Figure 16. Partnerships that would be Helpful Developing or Growing Water Workforce Training Program



5 Discussion of the Water Workforce Development Survey Results

Survey results show that over 1/3 of water agencies and organizations expect to increase in the number of people they employ in the next five years and 42% think that between 10 and 25% will retire in the next 5 years and an additional 14% say that more than 25% of their organization's employees will retire in the next 5 years, meaning that understanding the pipeline for the water sector in the Central Valley is imperative. Looking to the near future, over 75% of respondents are somewhat or very concerned about the loss of critical knowledge as people leave or retire their positions. Concerns are likely very warranted, as nearly 20% of agencies are not actively engaged in any succession planning.

Water sector respondents report that it is difficult to fill both mission critical positions and support positions. They report that applicants often do not have the skills, education, experience or certifications needed for water sector careers. The majority of respondents, 65% think that lack of access to training programs in the Central Valley contributes to the difficulty in filling positions. Another somewhat surprising result is that water sector professionals report that many applicants do not have basic workplace skills needed for entry level positions. One way to build a skilled workforce is through internships or apprenticeships, but only about one-third of respondents report providing these opportunities and fewer than 25% engage in any targeted outreach or mentoring programs to recruit people into the water sector. This presents an area for improvement.

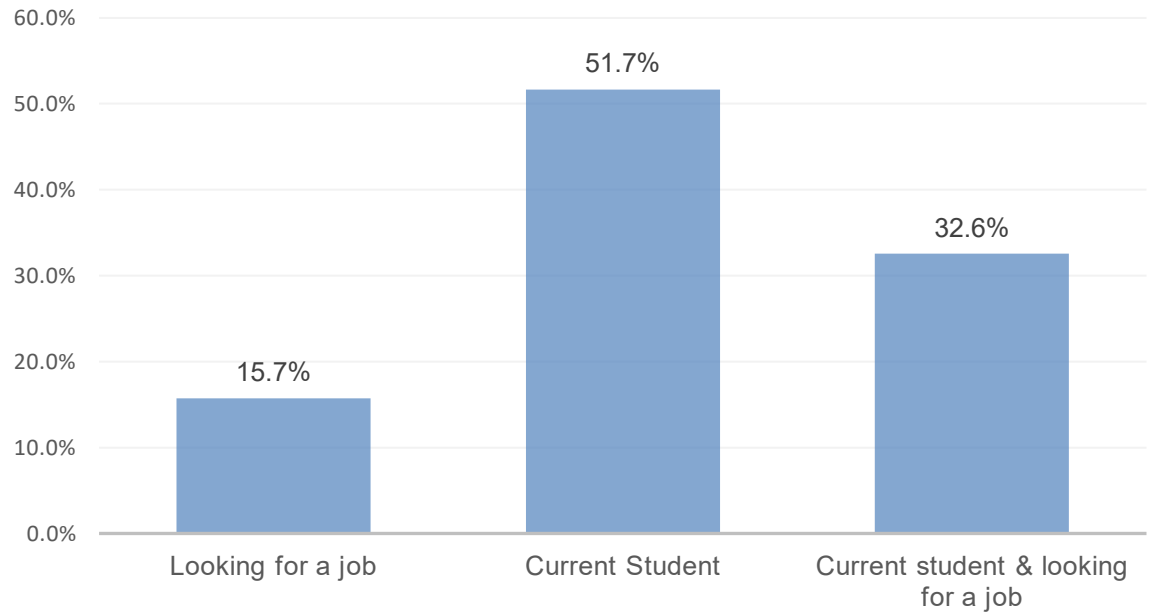
Water workforce educators and trainers also provided some key insights into the workforce pipeline. Educators reported that the cost of education and training programs could be a barrier students face in the Central Valley and likely contributes to the difficulty in filling water sector jobs. Educators also shared that students have little awareness of careers in the water sector and may not know where to find out information about job openings or requirements. Educators themselves primarily rely on word-of-mouth and personal connections to find out about current trends, industry needs, and job openings in the water sector. The lack of knowledge and communication between the trainers or educators and those working or hiring in the water sector is something that should be addressed to ensure trained, skilled students are applying for openings. This may require the development of a permanent working group or advisory council made up of educators and water industry leaders to help improve the education and labor market alignment.

6 Jobseeker Survey

Jobseeker Survey Respondents

A total of 139 people consented to participate in the survey, though that number dropped to 124 when asked their current status as students and job seekers. The number of respondents further dropped to 89 when asked if they currently reside in California. Respondents were made up predominantly of current students (46), current students looking for a job (29), and those looking for work, but not currently in school (14). Of the respondents who were students, most were attending a 4-year university (64). Most of the respondents were seeking work (67). Only 22 respondents reported that were not presently seeking work (see Figure 17).

Figure 17. Current Job Seeker Status



Respondents from Fresno made up the largest percentage of respondents (n=40), followed by Clovis (10), Madera (10), other Central Valley cities including Hanford, Reedley, Porterville, Tulare, Visalia.

The respondents were slightly more likely to be men (n=46) compared to women (n=38). Respondents were racially diverse including white (28), Asian (19), Hispanic/Latino (29), Black (1), and Native and Pacific Islander (1). Respondents skewed on the younger side most of which were between 18-24 (63) or between 25-34 (17), which is not surprising given students made up the bulk of respondents. Education levels for respondents ranged from high school diploma to graduate-level degrees (n=88). Many of the respondents had completed an associates or technical degree (29), while 15 completed a bachelor's degree, 26 had completed some college but did not yet have a degree, and 13 had completed a high school diploma or GED. Only a handful had completed a trade certification (2), or graduate degree (1), and two did not respond.

6.1 Work Environment Expectations

Online job sites were the most popular resources used to search for jobs at 69.7%. Career centers and college advisors were also reported by the majority of respondents at 53.9% (55 used online job sites like Indeed, 32 used college advisors, 23 used social media). Figure 18 shows that the most important factors for the job seekers when considering a job included stability (mean 81.97), salary (mean importance 79.98/100) growth (75.96), and health benefits (75.55).

Figure 18. The Most Important Factors when Considering a Job

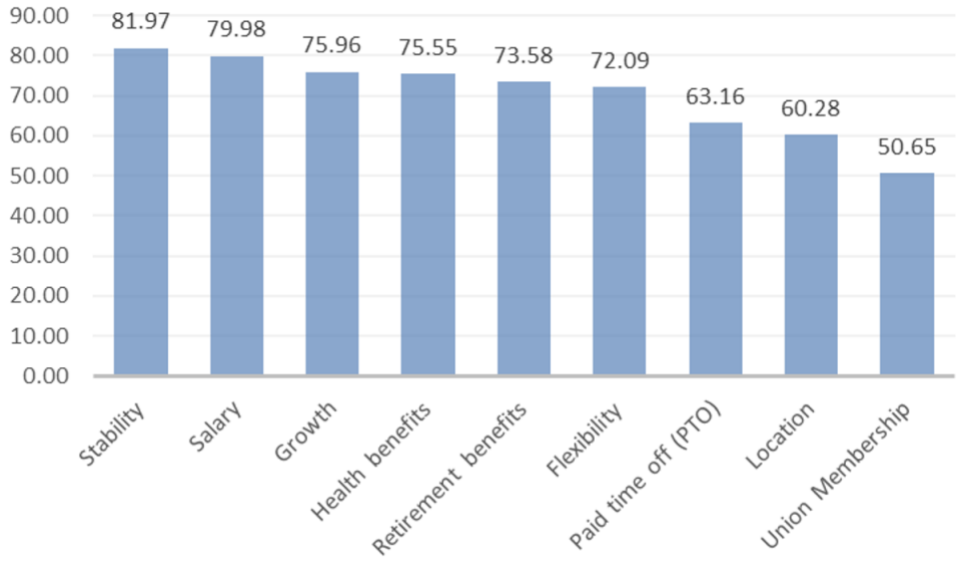
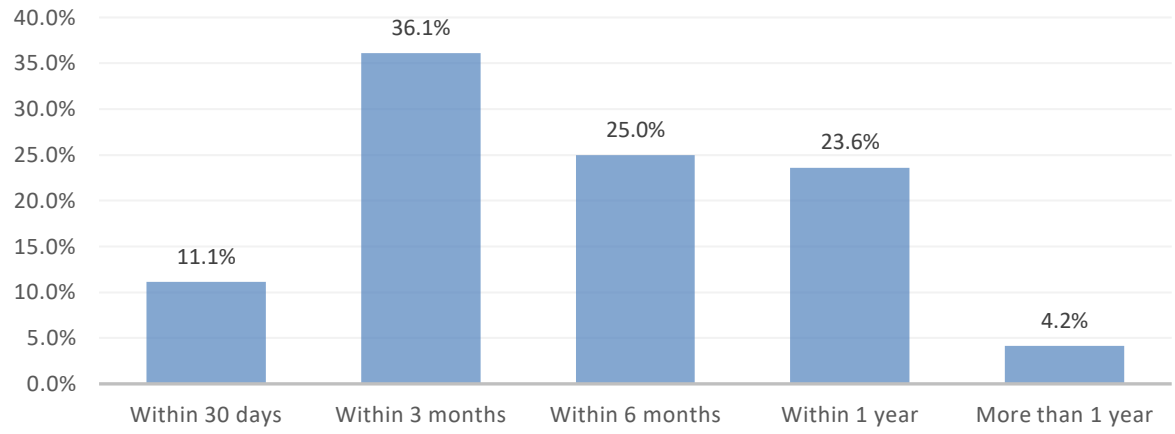


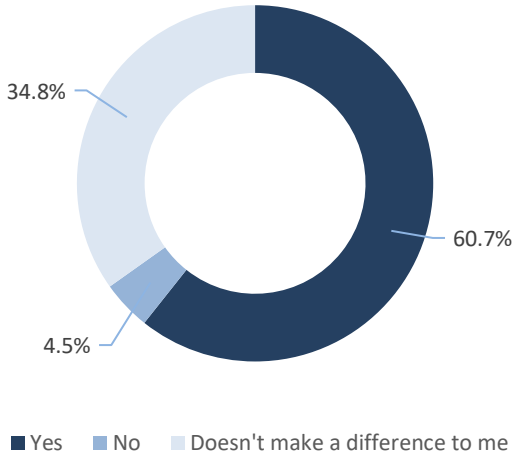
Figure 19 shows that the majority of respondents expected to find a job in under a year (69 respondents). In particular, 36.1% of respondents expected to find a job in their chosen field within 3 months.

Figure 19. Expected Time to Find a Job



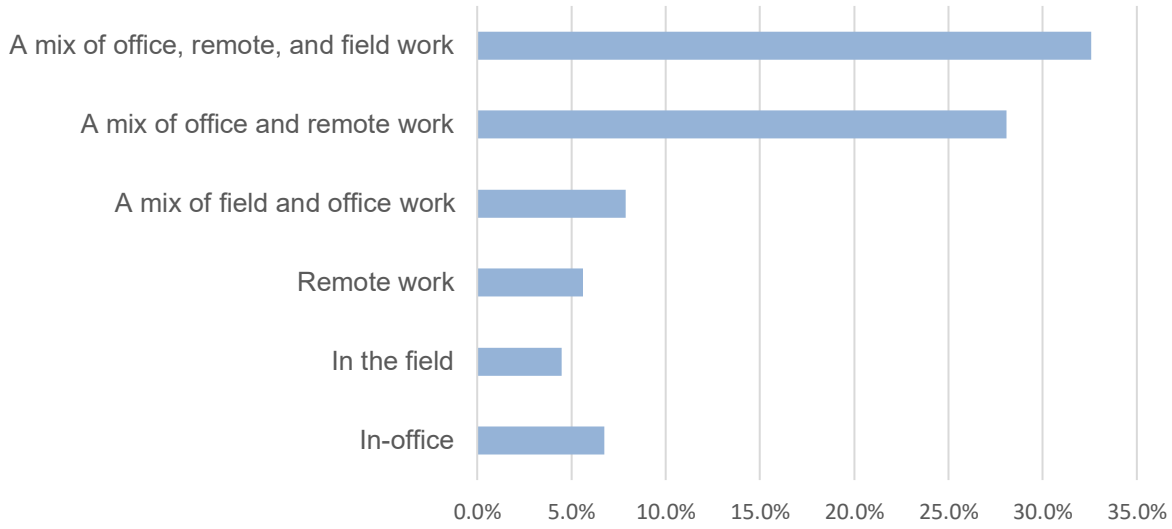
The survey also asked about the types of work settings and jobs that were seen positively by respondents. When asked if a job is more desirable if it helps their local community in a positive way, 60.7% of respondents (54) said yes, while 4% said no and 35% were indifferent on whether or not a job helps the local community (Figure 20).

Figure 20. Preference for a Job that Helps the Local Community



Respondents reported a variety of preferences for their ideal workplace arrangements. Most respondents preferred a mix of office, remote, and field work (29), followed by a mix of office and remote (25), a mix of field and office work (13). (See Figure 21)

Figure 21. Workplace Preferences of Job Seekers



The majority of respondents would be willing to commute to work 30 minutes or less (71.9%; 64 respondents). Students rate internships as the most helpful tools when making career decisions (an average of 8.2 out of 10 for internships, 6.26 for career fairs, 6.7 for on-campus demonstrations).

6.2 Water-Sector Career Awareness

Most respondents, 79.8%, were not aware of water sector jobs in their town or city (71). The majority of respondents were also not aware that water sector jobs often don't require a 4-year degree (74 didn't know, 15 knew).

Respondents were fairly equally divided in their interest in water sector jobs. Just over one-third (34) of respondents reported they would be interested in water sector jobs, compared to 28 who were not interested, and 27 who were unsure. When asked why they were not interested in water sector jobs responses included: "[it] sounds labor-intensive or boring"; "not my field of interest", "my major does not pertain to water jobs", "it doesn't have any growth towards my career trajectory" and, "it's just not anything I've thought of".

When asked about the types of water sector jobs respondents recalled hearing about, the majority had heard of electricians (45), welders (42), and many had heard of maintenance workers (39), and project managers (38). Fewer respondents had heard of positions such as wastewater treatment plant operators (22), operating engineers (21), hydrologists (12), and calibration technologists (8). Figure 21 displays the types of jobs respondents with which respondents were familiar.

Figure 22. Types of Water Sector Jobs Respondents Had Seen

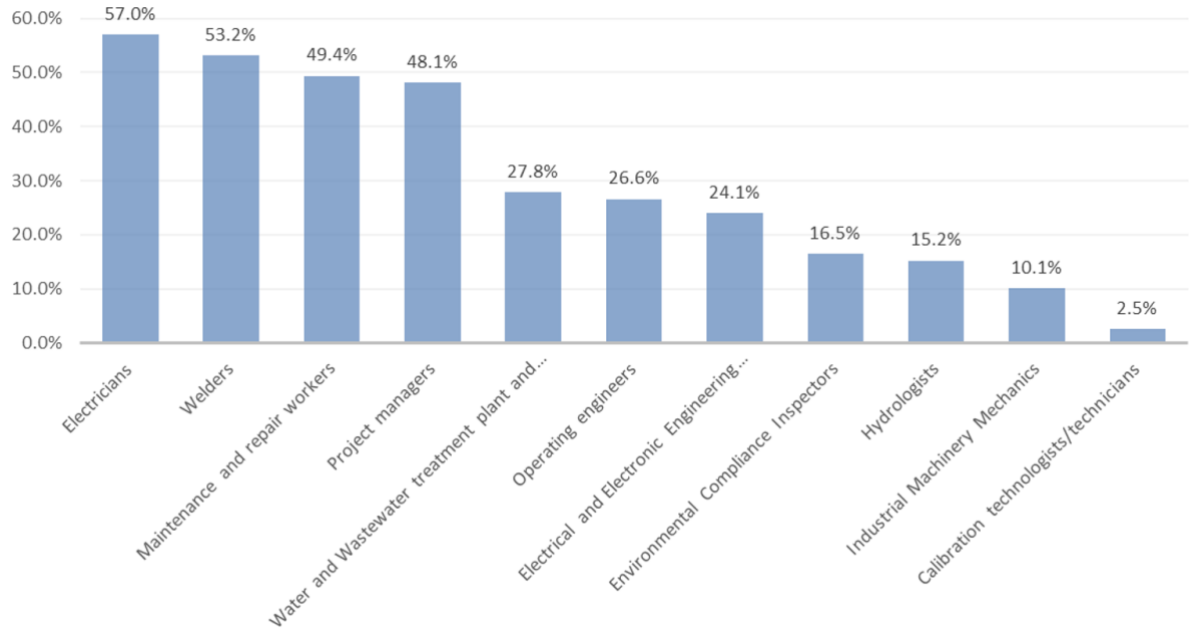
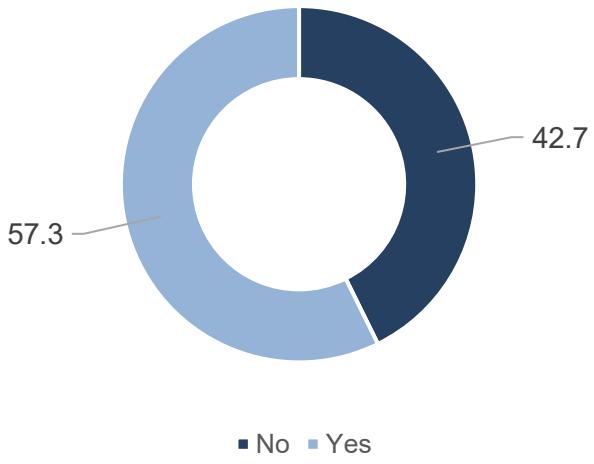


Figure 22 shows that more than half of respondents (57%) said they were interested in learning more about careers in water organizations after taking the survey, which suggests that increasing awareness could increase interest in the industry as a career option.

Examination of interest by demographics showed no gender or racial differences in interest in water sector jobs or interest in learning about jobs in the water sector. There were some slightly statistically significant differences by age: 18–24-year-olds were split on wanting to learn more about water careers (28 yes, 35 no); while 25–34-year-olds were more interested in learning about careers in the water organizations (14 yes, 3 no).

Figure 23. Percent Interested in Water Sector Jobs



7 Discussion of the Job Seeker Survey Results

The results highlighted that of the surveyed students and job seekers, many of them are open to learning about jobs in the water sector, though there are not currently high level of knowledge about such jobs. While there was limited statistical effect across different demographic groups, the slight increase in interest among jobseekers in the 25-34 age group could be interesting to examine with a larger sample. It may be that as jobseekers move beyond the early college years, they are more open to other opportunities or less set in a certain major or field of study.

The jobseekers prioritized a fairly close commute, as well as stability, good pay, opportunities for growth, and health benefits when considering job opportunities. Because respondents value a short commute, rural recruitment efforts should consider connecting with local residents where possible to keep commute times down. Respondents provided a variety of perspectives about their preferences for in-office versus fieldwork, and remote work, suggesting that they are fairly open. The results of the survey showed that the majority of respondents considered a job that benefited their local community to be a positive asset in their job search. Therefore, water sector employers should highlight these community-oriented aspects of the jobs, as well as characteristics such as long-term stability to help connect with jobseekers.

Respondents, particularly current students, report that they utilize career centers and advisors quite regularly when seeking work, suggesting that industry leaders should continue to connect with these

educational partners to foster connections with students through institutional gatekeepers. Similarly, internships were reported as the most useful tools by students looking to make career decisions, suggesting that providing high-quality internships can be an excellent way to grow interest and attachment to the water sector.

Considering most of the sample consisted primarily of students, future efforts at recruiting potential jobseekers should consider a variety of ways to locate and recruit jobseekers outside of academic settings to tap into populations not directly tied to educational institutions. This could include recruiting survey respondents at regional career fairs and large public gatherings such as fairs and community events. Workforce development organizations or unemployment offices may also be useful to survey. Connecting with the larger community could be particularly helpful considering many water sector jobs do not require 4-year degrees.

Future recruitment efforts should also consider trying to prioritize in person recruitment to maximize the number of local responses given that the survey did see a fair number of out-of-state responses.

8 Recommendations

This study was designed with the intention of better understanding current and future water sector needs and current workforce development conditions. Results highlight that more work can be done to raise awareness of water sector careers and create deeper connections between water agencies, education institutions, and jobseekers. Recommendations such as filling the gaps between crucial skills and certifications needed by agencies and the types of training students and jobseekers receive are crucial for facilitating employment in this sector. Connecting with educational employees such as counselors and professors and providing information and materials that highlight specific details and positive traits about water sector jobs is another key recommendation from this survey. Finally, a collaborative effort to collect and develop more data around this topic would be greatly beneficial to future reporting and study efforts.

Specific Recommendations:

- A collaborative effort spearheaded by KWA or a similar organization should be made to develop a list or directory of those working in the water sector to make future studies easier and more informative.
- Water agencies reported at least some difficulty filling the mission critical positions within their agencies. Fresno County reported more challenges with filling these positions than Kings or Tulare counties, suggesting that new strategies may be necessary for recruiting for and filling these positions.
- The surveys demonstrated a crucial gap between workforce needs and the current certification and training available. Because agencies are struggling to find applicants with the necessary skills and certifications, educational partners may need to focus more on technical training and certification in the future.
- Because both jobseekers and educational institutions reported limited information about water sector careers, there is a large opportunity for increased awareness and information-sharing on the part of water agencies. Since the majority of these educational actors rely on word-of-mouth information, the potential for increased dialogue-sharing and conversations is great.
- Most jobseeker respondents desire jobs within a 30-minute commute of their homes. Future initiatives should focus on connecting people with water jobs where they live, particularly in rural areas where these types of connections are essential.
- Future efforts should emphasize awareness and knowledge of water sector jobs to important educational gatekeepers such as counselors and career center employees. Students seeking work report that these actors are important to them, as are internship opportunities. Therefore, high school and college career counselors can become important ambassadors to champion this type of career path.
- When creating recruitment materials for job seekers, materials that highlight qualities favorable to job seekers could help create a larger interest in these careers and also serve to demystify how these careers are structured. For instance, recruitment material that highlights the community-focused orientation of water sector jobs, the benefits of not sitting behind a desk all day, and the long-term career stability of these jobs could appeal to job seekers.

9 References

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10 Appendices

10.1 Survey Instrument for Water Sector Professionals/Educators

1. **This survey is being distributed to those in the water workforce/water management sector and those who are in water workforce education. Are you responding as:**
   an employer/member of the water industry
   a water workforce educator
   both an employer and educator

2. **What best describes your company or organization's role in the water/wastewater industry?**
   Public and private water or wastewater agency
   Regulatory control and compliance organization
   Infrastructure engineering firm and contractor
   Irrigation district
   Reclamation District
   Flood Control District
   Conservation District
   Mutual Water Company
   Other, please specify:

3. **What area does your organization serve?** ***Select all that apply***
   Fresno County
   Kings County
   Tulare County
   Other, please specify:

4. **What is the service area size of your water agency or organization?**
   Very small/private area (ex. private well, gas station, campground, etc.)
   Small area (ex. small community, fewer than 1000 people/households/businesses)
   Medium area (ex. small city/township, rural area, smaller water district)
   Large area (ex. midsize or large city, county/counties, larger water district)
   Other:
   Don't know/prefer not to answer

5. **To the best of your knowledge, what is the size of your water system (i.e., how many service connections does your system have)?**
   (For non-private systems, you can look up 2025 EPA information on the number of connections here: 2025 Community Water Systems Map (https://www.epa.gov/ground-water-and-drinking-water/community-water-system-service-area-boundaries?tab=map))
   1-5 connections (including private wells)
   6-15 connections
   16-25 connections
   26-50 connections
   51-100 connections
   101-500 connections
   501-1,000 connections
   1,001-5,000 connections
   5,001-10,000 connections
   10,001-15,000 connections
   15,001-20,000 connections
   20,001-40,000 connections
   40,001-60,000 connections
   Over 60,000 connections

Does not apply to my organization
Don't know/prefer not to answer

6. **To the best of your knowledge, how many people does your organization currently employ?**
   Fewer than 5 people
   5-20 people
   21-40 people
   41-60 people
   61-80 people
   81-100 people
   100-249 people
   250-499 people
   More than 500 people

7. **Is the number of employees expected to increase, decrease, or stay about the same over the next 5 years?**
   Likely to increase
   Stay about the same
   Likely to decrease
   Don't know/prefer not to answer

8. **We are interested in knowing more about the age distribution of the current water workforce.** To the best of your knowledge, what percentage of your current employees fall into the following age categories? (Totals should add to 100 percent, please provide your best estimates.)
   Under 20 years old
   20-29 years old
   30-39 years old
   40-49 years old
   50-59 years old
   60-65 years old
   Over 65 years old

9. **To the best of your knowledge, what percentage of your current employees fall in to the following categories? (Totals should add up to 100; please provide your best estimates.)**
   Men
   Women

10. **To the best of your knowledge, what percentage of your current employees are expected to retire in the next 5 years?**
    Less than 10%
    10-25%
    26-50%
    51-75%
    More than 75%
    Don't know/prefer not to answer

11. **Thinking a little further out in the future, what percentage of your current employees are expected to retire in the next 10 years?**
    Less than 10%
    10-25%
    26-50%
    51-75%
    More than 75%
    Don't know/prefer not to answer

12. **How concerned are you that institutional knowledge will be lost due to retirements in the next 5-10 years?**
    Not at all concerned
    Not too concerned
    Somewhat concerned
    Very concerned
    Don't know/prefer not to answer

13. **What information or skills are you most concerned about when it comes loss of institutional knowledge?**

14. **How often do you have difficulty filling vacancies for mission critical positions (i.e., water workforce positions, non-clerical positions)? For purposes of this study, "mission-critical positions" are essential to water and wastewater operations, difficult to fill, and typically require at least a high school diploma.**
    Never, mission critical positions are always easily filled
    Sometimes we have difficulty filling mission critical positions
    Always, it is very difficult to mission critical positions
    Don't know/cannot answer

15. **On a scale from 0 to 10, where 0 represents very easy to fill and 10 represents very difficult to fill, please let us know how difficult it is to fill each of the following water workforce mission-critical jobs. If your organization does not include a position, please click the "not applicable" option.**
    Calibration Technologists and Technicians
    Electrical and Electronic Engineering Technologists and Technicians (includes SCADA Technicians, Electronic Maintenance Technicians, Instrumentation and Control Technicians)
    Electricians
    Industrial Machinery Mechanics (Plant Maintenance Mechanics)
    Machinists
    Maintenance and Repair Workers, General
    Operating Engineers and Other Construction Equipment Operators
    Water and Wastewater Treatment Plant and System Operators
    Welders
    Other (please specify):

16. **What are the most difficult qualifications to find in job candidates for those positions you selected? If a qualification does not apply to positions in your organization, select not applicable.**
    Minimum educational requirements
    Required licenses or certifications
    Relevant prior work experience
    Adequate technical skills
    Adequate industry knowledge
    Adequate soft skills or interpersonal skills
    Possession of (or ability to acquire) security clearance
    What traits or skills are you most looking for in new hires? Please list or describe any that apply.
    Please indicate how often your agency or organization uses the following resources to recruit or hire entry-level employees? (Often, Sometimes, Never, DK)
    Company job board or career website (e.g., County of Kings.gov, SouthForkKings.org)
    Community colleges (e.g., Reedley CC, West Hills CC, Clovis CC)
    Trade/Technical Colleges
    Online recruiting platforms (e.g., Indeed.com, LinkedIn, ZipRecruiter)
    Recruitment agencies (e.g., Manpower, Labor Ready)
    Job fairs
    Military and veteran recruitment centers

Four-year universities (e.g., UCs, CSUs)
Private higher educational institutions (e.g., National University, Univ. of Phoenix)
Unions/labor organizations
Professional organizations (e.g., CA Assoc of Water Agencies, CWEA, American Water Works Assoc.)

17. **Are you currently partnering with training agencies or educational institutions to fill your workforce pipeline?**
    Yes
    No
    Don't know

18. **Which institution or institutions are your partnering with? Please list all.**

19. **If you are not currently partnering with other institutions, what are the reasons? *Select all that apply***
    Time constraints
    Lack of personnel
    Lack of interest
    Funding
    Unaware of opportunities
    Other (please list)

20. **Does your agency or organization offer any apprenticeships to train people for jobs in the water workforce?**
    Yes
    No
    Don't know

21. **How are you planning for future workforce needs or succession planning?**
    Select all that apply
    Proactively identifying critical roles and upcoming vacancies
    Reskilling or training for entirely new skills to transition into a different role or career path (e.g., moving from treatment operator to inspector)
    Upskilling (enhancing existing skills to advance in the same career path)
    Recruiting/building a strong talent pipeline through
    Other, please specify:
    We are not actively engaged in succession planning or future planning at this time

22. **How defined are career paths and compensation structure within your organization?**
    Very defined
    Somewhat defined
    Not very defined
    Not at all defined
    Don't know

23. **Based on your knowledge, what are average starting salaries in your company for the following job titles (in thousands of dollars)? Please leave blank if a job does not apply to your organization. (Less than $40K, $40-$60K, $80K-$100K, Over $100K, DK)**
    Water treatment/water distribution operators
    Wastewater collections (construction, maintenance, repair)
    Environmental Compliance Inspector
    Engineers/Water resources engineer
    Hydrologists/scientists
    Electricians/electrical maintenance
    General mechanics/technicians (repairs, etc.)

Welders/tradespeople
Project manager/construction manager
What are the most common barriers that job seekers face when trying to enter the water workforce? *Select all that apply*
They are not aware of jobs in the water workforce
They do not know what the jobs entail
They do not have the skills required for jobs in the water workforce
They do not have the education required for jobs in the water workforce
They do not have the correct certifications for jobs they are applying for
They do not have transportation needed to get to work
There are language barriers to entry in the water workforce
There are gender barriers to entry in the water workforce
There are age barriers to enter the water workforce
They are not interested in jobs in the water workforce
Other, please specify:
Don't know/prefer not to say

24. What programs does your agency or organization provide to recruit and train those from communities that are traditionally underrepresented in the water workforce?
Select all that apply
Targeted outreach to those traditionally underrepresented in the water workforce
Student scholarships for those traditionally underrepresented in the water workforce
Internships, mentorships, apprenticeships, or similar programs for those traditionally underrepresented in the water workforce
Employee resource groups (e.g., mentorship program for employees with similar experiences or backgrounds)
Leadership development programs for those traditionally underrepresented in the water workforce
Equity training or professional development programs for staff, board members or other individuals related to the organization
Supplier diversity programs (e.g., proactively solicits proposals from and contracts with minority-owned businesses or women-owned businesses)
Board diversity program (e.g., actively recruits board members with a diversity of backgrounds in mind)
Other, please specify:
We do not participate in or provide any of these types of programs
Don't know/prefer not to say

25. Are there any emerging roles or skills you anticipate needing that do not currently exist in your organization or agency? (e.g., positions related to AI, robotics, etc.) If yes, please list or describe anticipated needs.

26. On a scale from 0 to 10, where 0 represents not at all concerned and 10 represents very concerned, how concerned are that the following items might impact the water workforce in the next 5 years?
Artificial Intelligence (AI) will make some water workforce jobs obsolete
Climate change/extreme weather will impact workforce
Cybersecurity threats could impact workforce needs/requirements
Supply chain management issues
Political instability could impact the workforce
Lower demand due to population changes
Increased demand due to population changes
Recession/economic instability (unemployment, inflation, market instability, etc.)
Federal budget or cuts reductions impacting water workforce
Something else, please specify:

27. What type of educational or training institution(s) do you work for? ***Select all that apply***
Community college
Four-year college
Trade union/apprenticeship program
Career technical certification program (e.g., CWEA,CA-NVAWWA
Trade/Technical College
Agency (e.g., the Workforce Investment Board, CVRC)
State or local agency (e.g., CA State Water Control Board)
Non-profit organization
Other, please specify:

28. Which certifications or degrees do your programs offer for water-focused careers? ***Select all that apply***
Wastewater/water treatment operator certifications
Water distribution certification
Electrical & instrumentation technologist certification
Collection system maintenance certification
Mechanical technologist certification
Laboratory analyst certification
Environmental compliance inspector certification
Engineering (water, electrical, civil, systems, etc.)
Hydrology or geology
Other, please specify:

29. What mission-critical positions does your program train for? For purposes of this study, "mission-critical positions" are those essential to water and wastewater operations. ***Select all that apply.***
Electricians
Electrical and Electronic Engineering Technologists and Technicians (includes SCADA Technicians, Electronic Maintenance Technicians, Instrumentation and Control Technicians)
Maintenance and General Repair Workers
Industrial Machinery Mechanics (Plant Maintenance Mechanics)
Calibration Technologists and Technicians
Machinists
Welders/Fabricators
Operating Engineers and Other Construction Equipment Operators
Water and Wastewater Treatment Plant and System Operators
Other, please specify:
We do not train for any of these mission critical positions
Don't know

30. What other knowledge, skills, and abilities do your students develop after completing a Water and Wastewater Technology program at your institution, agency or organization? ***Select all that apply***
ASQ (American Society for Quality) Certification
Computer Aided Design (CAD) or Computer Aided Manufacturing (CAM) Software
Computer Numerical Control (CNC)
Conflict Resolution
Data Analytics, database User Interface, or query Software
Development Environment Software (e.g., C, Microsoft Visual Basic, Python, SQL, etc.)
Electrical Repair, Wiring, Systems, Diagrams, and Schematics
Enterprise Resource Planning (ERP)
Forklift Operation or Heavy Equipment Operation
Geological sciences
Geographic Information Systems (GIS)
Good Manufacturing Practices (GMP)

Hand and Power Tools use
Quality Assurance and Control
Microsoft Office Suite applications
NIMS training
Occupational Health and Safety practices
Predictive / Preventative Maintenance and Repair
Project Management
Sample Collection and Testing
SCADA (Supervisory Control and Data Acquisition)
Technical/Water Mathematics
Technical/Water Science
Water/Wastewater Treatment, Distribution, and Quality Sampling
Welding and Fabricating
Other, please specify:

31. **Do you think students are generally aware of the types of jobs that exist in the water workforce?**
Definitely not
Probably not
Probably yes
Definitely yes
Don't know

32. **What are the biggest misconceptions students have about water-related careers?** ***Select all that apply.***
They are all physical labor positions
There are not many jobs available/jobs are scarce
Jobs are low paying
The industry is gendered
Jobs are dirty (e.g., wastewater treatment, sewer treatment, etc.)
Jobs are all ag based
Jobs require skills they don’t have
Jobs require more hours than most careers
Jobs are stressful
Jobs are all trades (e.g., plumbers, welders, electricians, etc.)
Other, please specify:
Don't know

33. **In your experience, what do people think of when they hear, "careers in the water sector"?** ***Select all that apply***
Plumbing
Pumping/well drilling
Meter readers
Wastewater management
Agricultural/irrigation
Utility companies (e.g., drinking water supply)
Construction
Hydrology/geology
Environmental/water conservation
Engineers
Water inspectors
Other, please specify:
Don't know

34. How do you see current long-term or seasoned employees in the water industry responding to the idea of training or mentoring new talent?
They generally embrace mentoring new talent
They generally oppose mentoring new talent
There is mixed response to mentoring new talent
Don't know/no experience with older generations

35. How do you stay informed about which water sector jobs are most in demand? ***Select all that apply***
Professional organizations (e.g. American Water Works Association, CA Water Environment Association, etc.)
News (TV, newspapers, news websites)
Industry newsletters
State and local agencies/water districts
People in the field/word of mouth
Social media
Students
Jobs boards/websites
Recruitment officers/direct contact
I don't get much information about which jobs are in demand

36. Are you in regular contact with water utilities or employers about changing job requirements?
Yes, I have regular contact with those in the industry
I have some contact with employers in the industry, but it is sporadic
No, I am not in contact with those in the industry

37. Have you adjusted your curriculum recently to better align with industry needs?
Yes, we are continuously updating our curriculum
No, we have not updated our curriculum recently
Don't know/prefer not to say

38. What types of updates did you make to your curriculum?

39. What challenges or barriers do students face in completing your training or certification programs? ***Select all that apply***
Financial aid/cost
Employed while in school (delays completion)
Family obligations
Location of training (too far from where they live)
No online training options available
Not enough classes/slots available in existing programs
Language barriers
No applied experience/too difficult
Other, please specify:
Don't know

40. Do your students struggle to get hired after training?
Yes, they have difficulty finding jobs in the industry after training
No, most are able to find jobs in the industry fairly easily
Don't know

41. **Why do you think your students have difficulty finding jobs after completing training?** ***Select all that apply***
    Not enough jobs available in the industry
    Not trained for existing openings
    No local jobs available/unable to commute or relocate
    No entry level positions available
    Other, please specify:

42. **To the best of your knowledge, what percentage of your students secure employment in the water sector within:**
    0-20%
    21-40%
    41-60%
    61-80%
    81-100%
    6 months of completing your program
    1 year of completing your program

43. **In your experience, how transparent is the water sector about career paths and compensation?**
    Very transparent, detailed information on salaries is easily accessible
    Somewhat transparent, information on salaries is available, but not very specific
    Not very transparent, it is difficult for students to find information on what salaries to expect
    Don't know

44. **What salary do your students expect for a full-time entry-level position in the water sector?**
    Under $40,000 per year
    $40,000 to $60,000 per year
    $60,000 to $80,000 per year
    $80,000 to $100,000 per year
    Over $100K

45. **What types of partnerships do you already have in place with the water sector industry and employers?** ***Select all that apply***
    Apprenticeships, internships, or fellowships
    Campus/program visits
    Job fairs
    Applied instruction by those in the field
    Other, please specify:
    We do not have any of these types of partnerships
    Don't know

46. **What groups would be most helpful to partner with for developing or growing water workforce training program?** ***Select all that apply***
    Drinking Water Utilities/Suppliers
    Wastewater/Storm Utilities
    University/Educational Institutions
    Construction/Water Systems Engineering Civil/Environmental Engineering or Consulting Firms
    Non-utility Government (municipal, provincial, federal, etc.)
    Technical Services/Contractors
    Nonprofit Organizations
    Law Firm/Legal Organization
    Manufacturer (including products, representatives, and/or distributors)
    Regulatory Authority/Regulator
    Trades Unions (e.g., electricians, welders, plumbers, machinists, technicians, etc.)
    Other, please specify:

47. Are you interested in co-developing new programs with water workforce employers?
No, I am not interested
I am somewhat interested
Yes, I am very interested

48. How can initiatives like the Ripple Effect support your work as a workforce educator?

49. Do each of the following make workforce development easier or more difficult in the Central Valley?
Rate of pay
Access to training programs
Housing costs
Location
Availability of jobs
Cost of living
Transportation

50. What data would you find helpful to make better hiring or training decisions? Please describe

51. Is there anything we have not asked about that is a concern for you? Please share.

52. What 5-digit zip code is your agency or organization's office located in?

53. How long have you worked in the water sector, a water related industry, or water education?
Less than 5 years
6-10 years
11-15 years
16-20 years
21-25 years
More than 25 years

54. What is your current job title? (ex. water system owner/operator, engineer, policy analyst, hydrologist, educator, career advisor, etc.)

55. Are you now or have you ever been a member of a union related to your employment?
Yes
No
Prefer not to say

56. What is the highest level of education you have completed?
Some high school or less
High school diploma or GED
Some college, but no degree
Associates or technical degree
Bachelor’s degree
Graduate or professional degree (MA, MS, MBA, PhD, JD, MD, DDS etc.)
Prefer not to say

57. How old are you?

Under 18
18-24 years old
25-34 years old
35-44 years old
45-54 years old
55-64 years old
65+ years old

58. Are you?

Male
Female
Prefer to self describe
Prefer not to say

10.2 Survey Instrument for Job Seekers/Students

1. **Which of the following best describes your current status?**
   Looking for a job
   Current Student
   Current student & looking for a job

2. **Are you currently attending one of the following types of schools or programs?**
   GED
   Adult School
   Community college
   4-year university
   Private college or university
   Technical college or career academy
   Online career-focused certification program or specialized training program
   Other:

3. **Where did you hear about or learn about different careers you are considering? (*Select all that apply*)**
   Family members
   Friends
   Teachers/professors
   Social media
   School counselors/advisors
   Internships
   Clubs/organizations
   Other:

4. **Do you want a job that requires a 4-year degree?**
   Yes
   No
   Unsure

5. **Why do you prefer a job that requires a 4-year degree?**

6. **Why do you prefer a job that does not require a 4-year degree?)**

7. **How helpful are each of the following for helping you make career decisions? (0=Not at all helpful, 10=Very helpful)**
   Career fairs
   On-Campus demonstrations/lectures
   Internships

8. **What type of work are you seeking right now?**
   Part-time
   Full-time
   Either full or part time
   Consulting/Freelance
   I am not currently seeking work

9. **When you search for jobs, where do you typically search? (*Select all that apply*)**
   Online job sites (Indeed, ZipRecruiter, etc.)
   College career centers/advisors
   Social media platforms (LinkedIn, Facebook, etc.)
   State job website (CalJOBS, CalCareers)
   City/County websites
   Workforce Development/Workforce Investment Board
   Company websites
   Other:

10. **How quickly do you expect to find a job in your chosen career field or major?**
    Within 30 days
    Within 3 months
    Within 6 months
    Within 1 year
    More than 1 year
    Not sure

11. **How important are each of the following in finding a job right now? (0=Not at all important, 100=Very important)**
    Salary
    Stability
    Flexibility
    Location
    Growth
    Paid time off (PTO)
    Health benefits
    Retirement benefits
    Union membership

12. **Is a job more desirable to you if it directly impacts your local community in a positive way?**
    Yes
    No
    Doesn't make a difference to me

13. **What type of work setting would you most prefer?**
    In-office
    In the field
    Remote work
    A mix of field and office work
    A mix of office and remote work
    A mix of office, remote, and field work
    I have no preference

14. **How long are you willing to commute for work?**
    15 minutes or less
    30 minutes
    1 hour
    More than 1 hour

15. Are you aware of any water-related job opportunities in your town or city?
Yes
No

16. To the best of your recollection, where did you see or hear about the water-related job postings? (*Select all that apply)*
College career centers/advisors
Online job sites (Indeed, ZipRecruiter, etc.)
Social media platforms (LinkedIn, Facebook, etc.)
County/City government job websites
State job websites (CalJobs, CalCareers)
Workforce Development/Workforce Investment Board
Company websites
Other (please specify):

17. Do you have an interest in water sector careers (including public utilities, environmental science, or related fields)?
Yes
No
Unsure

18. Can you share some reasons why you are not interested in water sector jobs? (Open ended)

19. To the best of your recollection, have you ever come across any water-related job postings
No
Yes
Unsure

20. Were the job titles and responsibilities easy to understand?
Yes
No
I don't recall

21. Looking at the list below, which of the following water-related jobs have you heard of or seen posted on job sites? (*Select all that apply*)
Calibration technologists/technicians
Electrical and Electronic Engineering technologists/technicians
Electricians
Industrial Machinery Mechanics
Maintenance and repair workers
Operating engineers
Water and Wastewater treatment plant and system operators
Welders
Hydrologists
Project managers
Environmental Compliance Inspectors
Other (please specify):

22. Are you aware that many jobs in the water sector do not require a 4-year degree?
No
Yes

23. Would you be interested in learning more about careers with water organizations (such as jobs/careers with local water districts, flood control agencies, departments of water Resources, wastewater treatment facilities, water quality and testing facilities, etc.)?
Yes
No

24. What town or city do you currently live in? (Or list the closest one to where you live)

25. What is your 5-digit zip code? (Open ended)

26. Current employment status:
Unemployed/looking for a job
Unemployed/not looking for a job
Employed Part-time
Doing an internship
Employed Full-time
Retired/semi-retired
Other (specify):

27. What is the highest level of education you have completed?
Some high school or less
High school diploma or GED
Professional certification/skilled trade certification
Some college, but no degree
Associates or technical degree
Bachelor's degree
Graduate or professional degree (MA, MS, MBA, PhD, JD, MD, DDS etc.)
Prefer not to say

28. How old are you?
Under 18
18-24 years old
25-34 years old
35-44 years old
45-54 years old
55-64 years old
65+ years old

29. Are you?
Male
Female
Prefer to self-describe
Prefer not to say

30. Do you consider yourself: (*Select all that apply*)
White or Caucasian
Black or African American
American Indian/Native American or Alaska Native
Asian
Native Hawaiian or Other Pacific Islander
Other
Prefer not to say

31. If we conduct focus groups or follow up interviews on the future of the water workforce, would you be interested in participating?

Yes
Maybe
No

10.3 Responses to Concerns Over Loss of Institutional Knowledge

Q. What information or skills are you most concerned about when it comes loss of institutional knowledge?

Documenting as much institutional knowledge as possible. Good record keeping software. Knowing where to look for information.

Historical knowledge of community issues; relationships with existing communities being broken; general knowledge of hydrology in the area; impacts to domestic wells and small community wells; knowledge of funding programs.

Finance, engineering and operations.

Knack of running water and measurement of water.

Prior knowledge of policies and agreements between various GSAs, landowners, and government organizations that are otherwise not readily apparent.

Water policy agreements throughout the state and the politics that comes with it.

Knowledge of "why" (Why did we do this and not that?)

Experience in regulatory and environmental

Experience of overseeing large projects combined with years of technical expertise for a given discipline (i.e., subsidence, geochemical modelling, machine learning modelling, expertise with noble gases, age dating)

Experience

Proper operation of WWTP

Infrastructure

System knowledge, where things are located, and the why behind some of the decisions.

Basic knowledge of the entire system of the division that they are in.

Client relationships

System Operations and Water Treatment Operations continuity

Engineering, control system operators, pump and electrical system maintenance

We have done a good job of training generationally as part of our succession planning, but it doesn't replace

40+ years of industry experience. Troubleshooting in emergency situations is the knowledge I'm most concerned about losing - situational experience can only be learned through decades on the job.

Operation of legacy procedures, software, instruments, and machinery. Additionally, local connections which are important from emergency response to reducing project or program hurdles. Furthermore, the water sector can be relatively formal - younger employees are not as aware/adept in that setting.

Knowledge of operations

The local knowledge of the industry representatives, local water supply dynamics, and internal staff dynamics.

Historical data, system operations.

Just the past knowledge of how things were done a certain way.

Location and knowledge of water and sewer assets.

Inventory of actual infrastructure

General operational knowledge of the WWTP and Collection System.

We have a hydroelectric power plant that has been in commercial operation for 41 years. I am concerned that knowledge regarding the historical service and/or issues will be lost.
Things that aren't documented.

Field understanding of situational analysis. My students are required to work with the elder operators Level 3 and up to understand field safety.

The availability of fully accredited tier 1-3 water operators who want to stay local.

Facility locations and Operation Standards

Understanding the history of decisions that were made and why they were made across all departments. Often times, the decision-making process is not documented.

Internal best practices & undocumented processes

Technical skills, analogue skills, community outreach capabilities, Spanish language ability.

Best practices in water management for small special districts.

Historical operations; wide-variety of knowledge; loyalty - being with same employer their entire career; critical thinking, ability to effectively communicate.

Typically, my worries are with Surface Water: Water Delivery, Canal Capacities, Flow Management, Water Trading. On the Groundwater Sustainability front, I worry that there are not enough problem solvers moving towards the water realm. The kind of folks that can effectively advocate of boots on the ground solutions to CA water board leaders.

10.4 Responses to Skills Most Sought When Hiring

Q. What traits or skills are you most looking for in new hires? Please list or describe any that apply.

A willingness to learn, common sense, team work mentality. Having certifications is a plus, but it isn't always the most important thing.

Ability to build and maintain relationships with communities; bilingual-Spanish/English; ability to interpret technical documents and pass information to general public; ability to work with different stakeholders, including engineers, state staff, and regulators.

Ability to learn

Ability to work well with others

Ability to work with the team and provide value to the district.

Accountable and responsible

Adaptable, coachable, eager to learn, and having the ability to work in a team. We look for people that are able to both do hard labor in the field and also have technical skills to work in front of a computer.

Because it is hard to find qualified employees in our field, we often look for those folks who are eager to learn and work well with others.

Capacity to learn, accept new knowledge, and overall eagerness to gain new skills. In a complex sector such as water resources, I don't think one person truly knows it all - those who think or act as they do present challenges. Also, basic computer skills are a must yet sometimes lacking.

Certification and experience.

Certifications. Certified employees.

Communication skills, ability to do simple tasks, willingness to learn.

"Communication, Deference to Supervisor- management, emotional intelligence"
Communication, Organization

Education, work experience in a relevant sector, sector knowledge

Experience

Experience, education (BS or MS in a hard science), flexibility in work location

Experienced workers with solid critical thinking and troubleshooting skills. Individuals that are problem-solvers and self-motivated to figure it out.

Fast learners, critical thinkers, knowledgeable about planning
Fit. Customer-service mindset, as we are publicly owned.

Gets to work and asks questions.

Good attitude, fits with our culture as described in our culture statement, smart, wanting to learn, nice to people, hardworking

Good work ethic.

Hands on experience working with water wells and waste water management

Honesty, work ethic, responsibility, care and concern

Industry knowledge (x2)

Knowledge of water resources management, hydrology. Applied skills to the science.

Knowledge, aptitude and ability

Math skills; ability to work with difficult people;

Once the skill set is confirmed we look for fit within the organization. Communication, both verbal and written is critical.

Passion for water issues in California

Relevant experience/relevant work history

Reliability, teachability

Reliable, responsible and has current water and wastewater certifications.

Self-starter, technical skills, water system operations

Skilled

Strong technical skills are vital but the ability to work with others is paramount!

Team player and flexibility,

Trainability, completion oriented, computer literate, rural focused, and mathematically inclined.

Trustworthy, good work ethic

Understand ag, can talk with clients, public speaking, knowledge of public sector, and fit within company Values - integrity and humility - the rest will follow. ANY workforce development program should make this the number one priority

Warm bodies who want to work without beginning a position with no experience and who expect to earn 80K annually.

Well spoken, effective communicators; basic, proficient math skills; Problem solving; soft skills; Conflict

Management - Calm in Stressful Situations; Unconfrontational; Passionate

Willingness to be a team player and learn without wanting to climb the ladder quickly.

Willingness to learn (x2); reliability; honesty; integrity

Work well with people and computer savvy.

10.5 Responses to data that would be helpful for hiring/training

Q. What data would you find helpful to make better hiring or training decisions?
It would be good to have more information about what other district employee compensation levels are.
Actual hands-on training, not theory or book-based training for field staff would be amazing.
Amount of retirees in the field; cost breakdown at each location/region; future outlook on location/region; how to plan for more/less impact on changes in location/region/community.

Better descriptions of the type of jobs, the need for these jobs and their impact on communities or the public salary information. Technical skills that are needed.

Currently available and future jobs- what, where, and what training/ed/cert is needed. Maybe every single water workshop our agency conducts should include a presentation on careers/jobs/education needed relative to the water-related topic of that workshop. Ie: Workshop on the science of hydrology: Jobs could be education, engineering, governance, legal, field studies, weather, water management, water system operator. Workshop on community engagement jobs= elected officials, consulting, PR, social-science, NGO, fund raising, college educator/prof.

I need to build a '"workforce component" into all of our Workshops. Data KWA and CWI collect from this survey would/could be critical to developing that component.

Highschool graduation, GED, current scores in math and computer literacy testing.

List of opportunities

Local training providers for this field (x2)

Number of jobs available, title and rate of pay of water related careers, major water employers in the county and region, list of skills needed and required for each position.
Pay ranges for job types.

Position compensation trends, types of workforce development programs in the Central Valley, and average rate which operators go from no certification to the different levels.

What percent of local talent and skills trained in the Valley that ultimately leave for other career opportunities outside the region. Need to understand what can keep needed skills here with an aging workforce and changing demands.

Annual reports from training organizations on the types of training conducted and numbers of trainees succeeding.

Effectiveness of mentorship or other training opportunities.

List of Certified operators in region to recruit.

10.6 What Else Should We Know Responses

Q. Is there anything we have not asked about that is a concern for you? Please share.

I didn't see a question that captures "what mechanism/process/strategy do you already use to educate/promote your career opportunities/needs?".... or something like that. Followed by "rate how successful your efforts are" ....in some manner. 2) What do you see as the greatest challenges to your industry in a) recruiting, b) preparing/educating, c) retaining competent workforce members? Optional responses: general education, advanced education, specific training, certification, language, attitude toward working (commitment, desire, etc.), inability to reach/communicate with/advertise to potential candidates, sufficient salaries, generational challenges, job expectations (maybe for retention), etc.

Frankly, that running out of time. Seems has been an ongoing conversation for several years yet not seeing much improvement just quite yet.

How does KWA plan to bridge the gap of unpaid internship hours before initial certification

How to keep people to stick around.

I think what you're doing here is simply amazing and way overdue... nice work. To whoever instigated this program: good for you...

Provide list of employers that are willing to provide work experience post training.

The next generation of workers are not as educated or have the transferable skills needed to succeed due to COVID, social media, chat gbt (sic)

This survey would be very applicable to the College and Careers office in my organization.

For small community systems, there is also a lack of qualified general managers, office managers/techs, and other support positions that are super important.

Need apprenticeship training programs, reduce WWTP stigma