



**HOW DO WE
TRAIN
THE NEXT
GENERATION
OF WATER
INDUSTRY
PROFESSIONALS?**

REPORT

California's Water Industry
Skill Panel Meeting

February 14-15, 2013
Cuyamaca College



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\$69 BILLION
CALIFORNIA'S WATER
AND WASTEWATER
INFRASTRUCTURE NEEDS
OVER THE NEXT 20 YEARS

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EXECUTIVE SUMMARY

The oldest Baby Boomer turned 65 in 2011, and according to the Pew Research Center, 10,000 Boomers will turn 65 every day through 2030.¹ Industries critical to public health and safety -- think water, energy and healthcare -- must address this issue. According to the American Water Works Association, 30% of water and wastewater system operators nationwide will reach retirement age by 2016.

In California, 38 million people and the ninth largest economy in the world depend on the water industry for a safe and reliable water supply and wastewater sanitation. Water is the essential ingredient in everything, from agriculture to manufacturing to the California lifestyle, and it is not something we can take for granted. Like the Boomers, much of California's water and wastewater infrastructure is at retirement age, and the long term reliability of our current water resources is evaporating in the face of climate change and population growth.

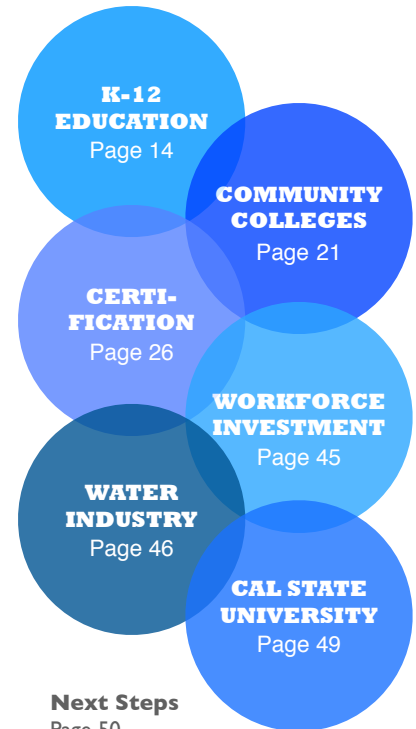
Van Ton Quinlivan, Vice Chancellor of Workforce and Economic Development for the California Community Colleges, asked Cuyamaca College to convene a panel of key people from water, education and workforce development to discuss a collaborative approach to training the state's next generation of water industry workers. Invitations were sent to people recognized by their peers for understanding the challenges facing California's water utilities, job seekers and community colleges; or, for already developing training solutions that can be modeled statewide.

Their recommendations are to develop water industry skill panels throughout California and have each panel manage and market the career pathways in their region. It is a large task, but the panel believes these are the best strategies for competing against other industries for middle-skill workers and developing the skills the water industry needs. The panel wants to create a model for the regions to use, and continue meeting until the model is completed. This report presents their findings: who the partners on a skill panel are, and what role they play.

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&
VISION**

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HOW TO TRAIN CALIFORNIA'S NEXT GENERATION OF WATER INDUSTRY WORKERS

<p>Panel Findings</p>	<p>Issues</p> <ul style="list-style-type: none"> • Baby Boomer retirements • Training the next generation of workers <p>Recommendations</p> <ul style="list-style-type: none"> • Develop water industry skill panels • Develop water industry career pathways
<p>Comments</p>	<p>“We can’t herd a bunch of people into the pipeline but not build the bridges to what the industry needs. Where should we invest?”</p> <p>“We want to target the smartest and best students for our industry”</p> <p>“We would do better collaboratively.”</p>

The Baby Boomers

The coming wave of Boomer retirements is often referred to as the Silver Tsunami, an apt metaphor given the devastating impact on organizational knowledge predicted when it hits. Boomers make up 51% of the country’s managers and 49% of professionals, and when they retire, decades of job specific knowledge and organizational memory will go with them. ²

Like other companies and industries, California's water and wastewater utilities will be hit hard. The Centers of Excellence, which provide labor market research for the California Community Colleges Economic and Workforce Development Program, surveyed water and wastewater utilities in Southern California in 2011 and found that 3,400 system operators, mechanics, electricians and instrument technicians would be eligible for retirement by 2014.³

However, if that many workers are leaving, why can't community college students find job openings at water and wastewater utilities? That was the question asked by panelists Corine Doughty, Deborah Mann and Mollie Smith, who manage the water technology programs at Santiago Canyon Community College in Orange County, Solano College in the Bay Area, and Palomar College in the San Diego area. This was the first of many *let's get to the point* questions posed by the panel over the one and a half day discussion.



2011 Centers of Excellence Report

Getting to the point is what happens when studies, data and traditional thinking are all on the table, there are no sacred cows, each person is very good at what they do, and the purpose of the meeting is to come up with new ideas. The task was to develop strategies for training California's next generation of water industry workers -- in time to replace retiring Baby Boomers.

As it turns out, *eligible for retirement* is not the same as retirement. National studies indicate that Boomers want to continue earning a paycheck and health insurance. Generation X employees aren't going anywhere either; 62% of 45 to 60 year olds told the Conference Board in a 2012 survey that their financial assets have lost 20% or more of their value.⁴

The survey respondents pointed to the bursting of the housing bubble, the stock market crash, salary reductions and layoffs. The respondents probably convinced a few colleagues, too, because a 2012 survey by the Pew Research Center found that 38% of adults are “not too” or “not at all” confident that they will have adequate income and assets for retirement.⁵ It looks like the silver tsunami won't hit until interest rates on retirement funds rise or the Dow reaches 16,000.

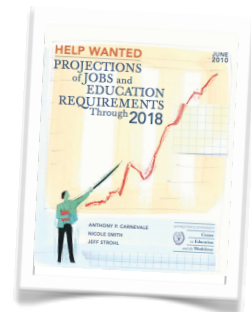
The Next Generation

With the tsunami alert rescinded, California's water and wastewater utilities can focus on an equally serious issue: there is a shortage of middle skill workers. These are workers who have more than a high school diploma but less than a bachelor's degree. The options in between include industry-based certificates, academic certificates and two year associate degrees attained at a community college.

Companies are already feeling the pain. When the Manufacturing Institute surveyed 1,100 U.S. manufacturers in 2010, 95% of respondents reported a shortage of machinists, operators, technicians, distributors and craft workers, and 86% reported a shortage of engineering technologists.⁶

Unfortunately, the shortage is expected to get worse. A 2010 study by the Georgetown University Center on Education and the Workforce forecasts a national shortage of 4.7 million middle skill workers by 2018.⁷ What this means is that the competition will intensify between industries that need students and job seekers interested in middle skill careers,

California's water and wastewater utilities won't escape this trend. Most operations jobs in water are middle skill jobs, but so are a multitude of positions in healthcare, energy, manufacturing, construction, transportation, hospitality, financial services, business and retail. Research by the Workforce Alliance shows that 50% of jobs in California are middle skill jobs, but middle skill workers make up just 38% of the state's workforce.⁸

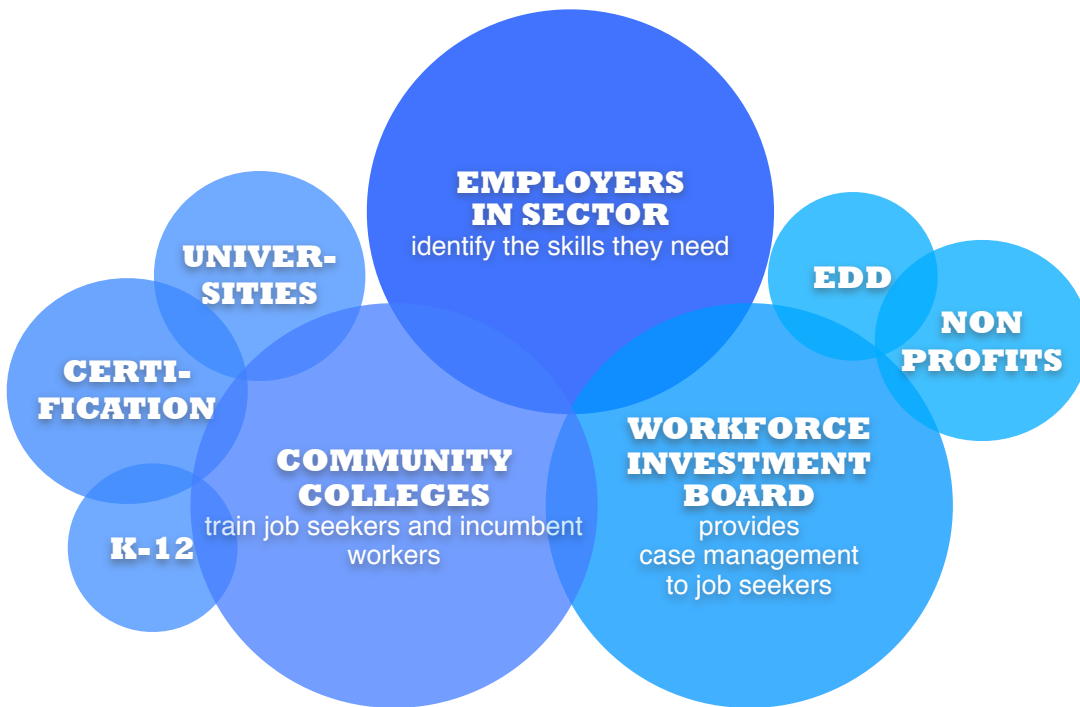


Study:
Georgetown University
Center on Education and
the Workforce

“We want to target the smartest and best students for our industry,” said panelist Gene Patricio, who manages the Apprentice and Technical Training Unit for Metropolitan Water District of Southern California. The panel agreed and recommends implementing two proven workforce development strategies: *skill panels* and *career pathways*.

**SKILL
PANELS**

a.k.a.
Sector Strategies
Industry Partnerships
Skill Alliances
Clusters of Opportunity



A skill panel is a partnership between the employers in a region or industry sector, education, workforce development and other community-based stakeholders. The purpose of the collaboration is to build a pipeline of trained and retrained workers with the skills employers need. Since providing industry with skilled workers and workers with high paying jobs is the cornerstone of economic development, government often becomes a partner, as well, providing grants and other support.

The State of Massachusetts launched the first skill panel in the country in 1981. Twenty five states were operating or implementing skill panels in 2010. While managing these partnerships is a considerable challenge, McKinsey's 2012 study of education to employment initiatives in the U.S. and eight other countries showed that skill panels are an effective recruiting strategy worth the effort.⁹

44%

of the employers never interacted with education

25%

of them were finding the talent they need

31%

of employers considered interacting with education very important

69%

of them reported no challenges in recruiting the talent they need



McKinsey
Education to Employment
Study

Panelist Don Jones, who helped develop Cuyamaca Colleges's water technology program, noted that, "Water utilities spend millions on long term capital improvement programs, CIPs, but very little on people improvement programs, PIPs." The following examples show the additional incentives behind collaborative skill panels and building people pipelines -- lower costs and higher productivity.



Georgia Power is one of 50 utilities in a collaborative program with four technical colleges for recruiting and training electrical line workers. The collaboration reduced the number of initial candidates for openings by almost 90% and Georgia Power reduced its own recruiting and training costs by 31%. The icing? Georgia Power's employee retention rate rose to 93%.
(Harvard Business Review)



UPS almost moved its hub out of Kentucky in 1996 because of a shortage of skilled workers. Instead, the State of Kentucky, Jefferson Community College and UPS opened Metropolitan College. Students work part time with full benefits on the UPS night shift and attend college during the day. UPS and government split each student's tuition costs and UPS pays for textbooks. Now, 45% of UPS workers have postsecondary degrees, and annual employee turnover is down 80%.
(Center for American Progress)



When the wind energy industry discovered Oregon's windy and sparsely populated Columbia River Gorge, Columbia Gorge Community College partnered with Acciona Energy North America, Black & Veatch and Intel to develop a regional workforce. One- and two-year programs now produce skilled workers for wind energy, hydropower, automated manufacturing and engineering technician positions, and Acciona has the service workers it needs. The placement rate for graduates in wind energy is 80%.
(Center for American Progress)

CAREER PATHWAYS



Creating, managing and marketing career pathways is what skill panels do. Career pathways introduce students and job seekers to the employers, careers and salaries in an industry, and show the path of courses, certificates, degrees and jobs to get there. There is also support along pathways, including mentors, counseling and financial aid.

Upfront information and support along the way helps students, especially disadvantaged students, find their way to certification and employment. A case in point is Pooja Sankar, who was profiled in *Money* magazine. She grew up in the interior of India among illiteracy and teenage marriage but had an educated father who wanted his daughter to have an education, too.

“Education is more than lectures, assignments, and exams. It's a means to envision a different life from the one you're living,” states Sankar, who graduated from the Indian Institute of Technology and developed the platform used by Stanford, MIT and Princeton that allows students and teachers to have class discussions online.¹⁰ Sankar says students need three things to succeed:

When asked if their high school career counselor was helpful, 58% of panelists said “No”.

1. A Pathway

Students need a plan for their education, not just access to classes.

2. A Peer Group

The ability to collaborate with peers “struggling with the same material at the same time” prevents hopelessness and alienation.

3. A Mentor

“What was really most important in my education was that at key moments I was able to envision the next step. Usually, I did it with the help of a mentor, or at least someone who'd taken that next step before I had. The journey was personal but guided.”

There are numerous pathway programs across the U.S. that embody Sankar's recommendations. One of these programs, the BioWork Certificate Program in North Carolina, is recognized as an example of best practices based on its high retention, completion and job placement rates.¹¹ What also makes it unique is the level of interaction between students and workers, to each one's benefit.



Pooja Sankar:
Rethinking the Online
Education Revolution

BIOWORK

Biogen Idec, GlaxoSmithKline and Bayer collaborated with North Carolina Biotechnology Center and North Carolina Community Colleges to create the program.

The 128 hour course trains workers for entry level jobs at 200 life sciences companies in North Carolina

Companies help with course development and provide state-of-the-art equipment to the colleges for hands on training

Multiple community colleges provide the course

Computer literacy, teamwork, time management, and problem solving are integrated into the curriculum

The course also provides a job market overview, job search tools and strategies, resume preparation, and interviewing practice

Companies send their own workers to the program for specialized training

Company managers and engineers visit classes, advise students on career opportunities, and discuss technical and organizational issues

Average salary in North Carolina's life sciences industry is higher than the state average

The program has attracted other life sciences companies to North Carolina



GlaxoSmithKline



Lastly, it is important to note that career pathways bring big financial benefits to students, just like skill panels bring big cost savings and productivity gains to employers and community colleges – it is a win-win-win. The Aspen Institute, an educational and policy studies organization, and Public/Private Ventures (now issuelab.org) demonstrated this with longitudinal studies of participants in 12 career pathways programs. They established each participant’s baseline situation and then tracked their post-training experience. Two years after training, their outlook was greatly improved.¹²

		Baseline	2 Years After Training
MEDIAN INCOME	Aspen Institute	\$8,580	\$17,732
	P/P Ventures	\$10,486	\$18,875
YEAR ROUND EMPLOYMENT	Aspen Institute	23%	66%
	P/P Ventures	22%	61%
HEALTH INSURANCE	Aspen Institute	50%	78%
	P/P Ventures	49%	73%

These examples show a few important things. First, that business and education, and people from different industries can work well together. Second, these examples show that skill panels and career pathways really are proven strategies for producing a skilled workforce. Third, they show that helping students and job seekers envision a career and better life is where it starts.

Lastly, these examples show what people can accomplish at the regional level. High level collaboration is possible, perhaps because stakeholders share a sense of community, The California Department of Water Resources and the California Community Colleges are among many organizations looking to manage change one region at a time. *Doing What Matters*, the initiative launched in 2013 by the California Community Colleges, encourages the colleges within a region to collaborate and innovate to serve employers and job seekers in the best possible way.



[Read more](#)

The panel believes this is how the water industry will attract the best and brightest to join its ranks, and that regional collaboration among colleges is essential. The timing could not be better. What follows are the panel’s recommendations for each phase of a job seeker’s journey up a career pathway.

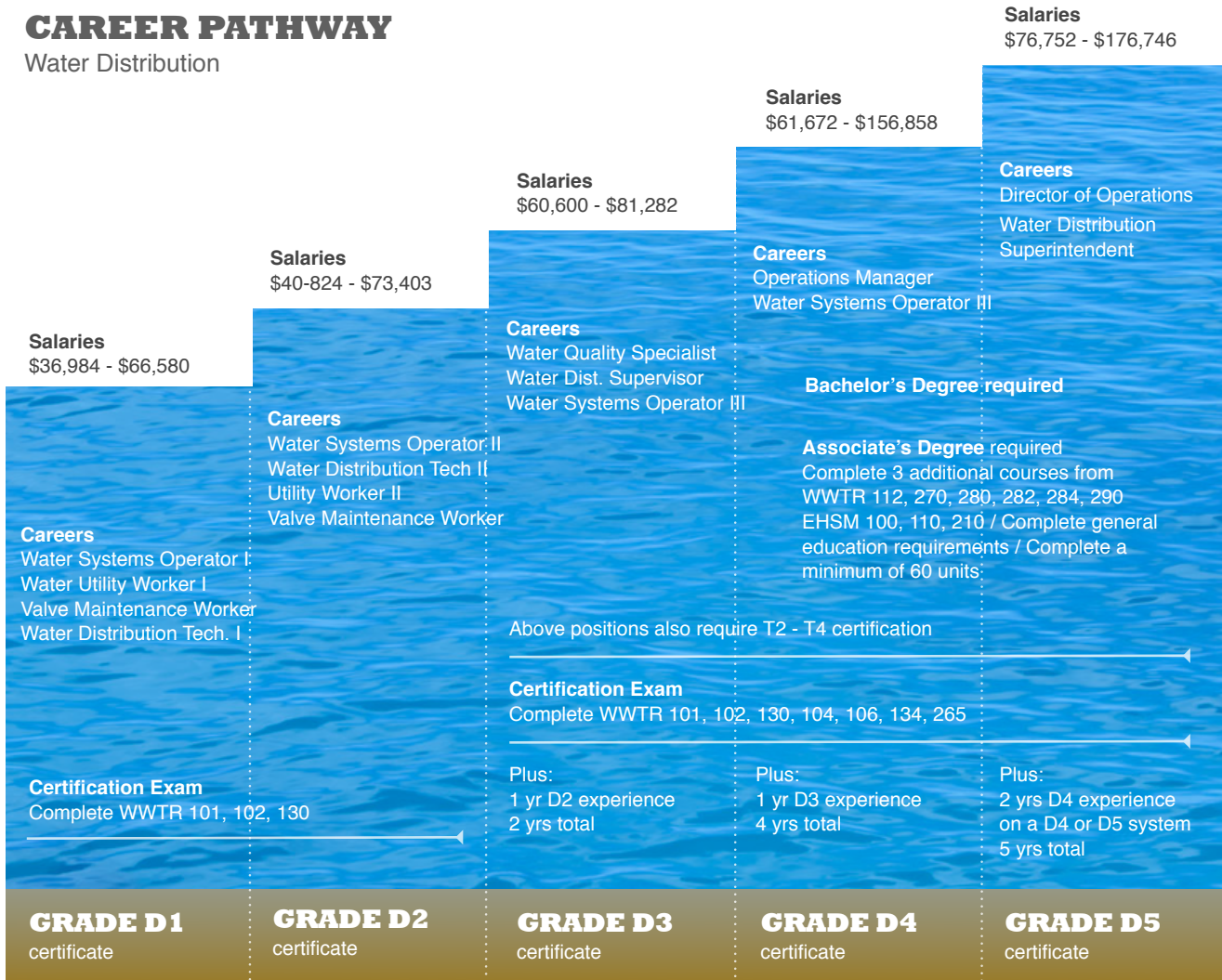
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WHY K-12 EDUCATION MATTERS

<p>Panel Findings</p>	<p>Issues</p> <ul style="list-style-type: none"> • Energy industry markets career opportunities to middle and high school students • Parents have a negative perception of water and wastewater careers <p>Recommendations</p> <ul style="list-style-type: none"> • Develop water industry marketing and community relations • Market career pathways to K-12 students, their parents and other job seekers • Market career pathways to middle and high school career counselors • Use water as a context to teach K-12 subjects -- math, science, social studies • Use STEM workshops and Edge GTS software to create curriculum • Model San Diego Unified School District: teachers and industry update and create curriculum during summer • Use Perkins and SB1070 to develop courses that articulate from high school to colleges to California State University • Bring college students back to talk to K-12 students • Bring K-12 students to Pathways Days at colleges 	
<p>Comments</p>	<p>“Our language, college vs. job, is wrong. Even our basic jobs have high standards.”</p> <p>“Agencies are downsizing or using technology and won’t replace every retiree.”</p> <p>“If I get this degree in water, where else can I work?”</p> <p>“The industry is large. There are lots of jobs in water technology with transferrable skills for water utilities.”</p> <p>“Every ship you see has a desal plant and a wastewater treatment plant on board.”</p> <p>“Breweries and industries with pretreatment systems want Cuyamaca students.”</p>	<p>“We need to show parents that every discipline is available within the water industry.”</p> <p>“Silicon Valley is full of engineers, too. Market high paying jobs, not water, then teach everything in a water context.”</p> <p>“This industry doesn’t share or explain itself. Needs to tell stories and engage Millennials.”</p> <p>“We’re most important to hard-luck students.”</p> <p>“We have pathways back to junior high.”</p>

CAREER PATHWAY

Water Distribution



A valuable feature of career pathways is that an incumbent worker, transitioning adult, discharged veteran or student can jump onto the path at any point and know what lies ahead and what they need to accomplish to get there. However, a career pathway has to begin where high school ends because this is the trailhead of all the other options.

In fact, a student needs to know about a career pathway when they are completing college applications their junior year in high school; or earlier, when they are deciding whether to go to college, join the military or work full time; or years before that, when they are becoming passionate about cities, the environment or science in middle school. This is where the competition for middle skill workers begins.

The energy industry understands this, and markets it's career pathways to K-12 students so they know where they are going after graduation. Over 80 energy utilities and national utility associations from across the country participate in the

Should community colleges develop a mid-career pathway for the water industry? 77% of panelists said "Yes".

Center for Energy Workforce Development (CEWD) to collaboratively develop solutions to the industry's approaching worker shortage.

Their key initiative is the *Get Into Energy* website, which provides interactive career pathways and targeted career content for students, veterans, transitioning adults and women. The site is supported by public outreach and collaboration with community colleges to produce internships, technical training and stackable credentials.

What does success look like? It looks like the photo and story in the Orange County Register in October 2012 about 360 sixth graders conducting water quality tests and learning about ecology on San Onofre Beach, courtesy of a grant from San Diego Gas & Electric to Orange County Coastkeeper.

The water industry needs to compete with the energy industry for future workers but does not appear to be trying. If it did, research suggests it would pique the interest of Millennials. A 2009 survey of Millennials by the Center for American Progress found that:

Millennials are civic minded

They strongly back investment in public schools and access to community colleges

67% believe they are more likely to be characterized by their concern for the environment than other generations

79% agree that it is each person's individual responsibility to improve the environment

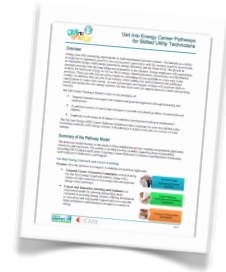
78% support clean energy alternatives¹³

**“Our language,
college vs. job, is wrong.
Even our basic jobs
have high standards.”**

**i.e.
MARKET OUR
CAREER PATHWAYS**

The above comment came from panelist Cheryl Davis, who manages BayWork, a partnership of water utilities and community colleges in the Bay Area. Davis is correct. When McKinsey interviewed U.S. students for its 2012 study, 73% stated that academic paths leading to white collar careers are valued more by society than paths leading to blue collar careers.

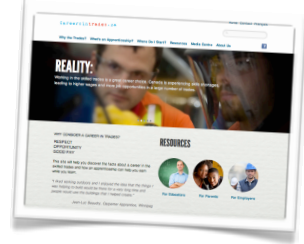
Preconceptions about careers in operations and the trades are a deterrent to students interested in the water industry and, unfortunately, the water industry has done little to improve its image. It has not developed a brand, positioned itself as a green industry, promoted sustainability, or marketed its excellent



Read this CEWD white paper on recruiting

salaries and benefits packages on a statewide scale. Combine that with the lack of transparency that characterizes most water agencies. Then add the fact that 99% of what the water industry does is located underground, invisible to the public. And, while water officials sometimes laud the 400 mile California Aqueduct, they never speak proudly about the 2,500 miles of water and sewer mains under Sacramento or the 17,000 miles of mains under Los Angeles.

Marketing career pathways to middle school, high school, college and university students is a targeted and efficient way to overcome these image deficits. Really good pathway designs, that match courses with certificates, certificates with jobs and jobs with salaries, help students envision a bright future. The draft design on page 15 is a good example.



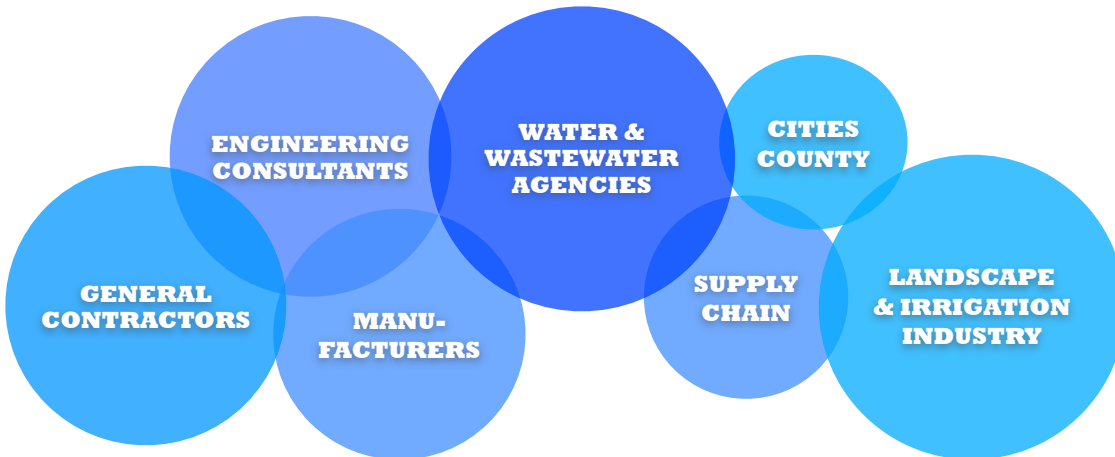
How the Canadian Apprenticeship Forum Recruits Students

“If I get this degree in water, where else can I work?” | **i.e. BE AN INDUSTRY**

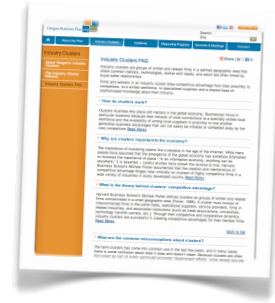
Water and wastewater utilities are independent organizations formed decades ago by local ballot measure. In the San Diego region, there are 24 water and wastewater utilities and one energy utility. The energy utility is a recognized brand name, and the water utilities are not. The situation is the same in the Los Angeles region and the Bay Area.

Water and wastewater utilities can even the workforce development playing field by developing water industry clusters. The most widely known industry cluster is Silicon Valley. While the public does not recognize most of the brand names in Silicon Valley, they know that the region, and the companies in it, are important.

INDUSTRY CLUSTER



In San Diego County, the water industry cluster includes the desalination industry: 35 manufacturers with 2,200 jobs and \$200 million in annual revenue. San Diego is also home to Hunter Industries, a global manufacturer of irrigation products. In any region in California, the water industry cluster includes construction and engineering firms, the landscaping industry, cities and counties and manufacturers. Panelist Kent Turner reminded the group that “Every ship you see has a desal plant and a wastewater treatment plant on board.” Don Jones added that, “Breweries and industries with pretreatment want Cuyamaca students.” This is networking at the organizational level.



Industry Cluster FAQs
Oregon Business Plan

**“Don’t market water.
Market water’s high
paying jobs. Then teach
everything in a water
context.”**

**i.e.
IMPRESS PARENTS**

The above comment was made by panelist Doug Coffin, a Career and Technical Education instructor at Santana High School in the San Diego area. He created the Engineering, Energy and Utilities Academy at Santana, develops pathways to careers with utilities for sophomores, and pushes the school’s top seniors towards engineering careers. Some of those seniors are now studying at Stanford, MIT and Princeton.

Parents will be less concerned about their child choosing a future that includes wastewater when they see the career pathways, salaries and the companies in the industry cluster. To win them over completely, throw in the following arguments:

1. Tuition Reimbursement

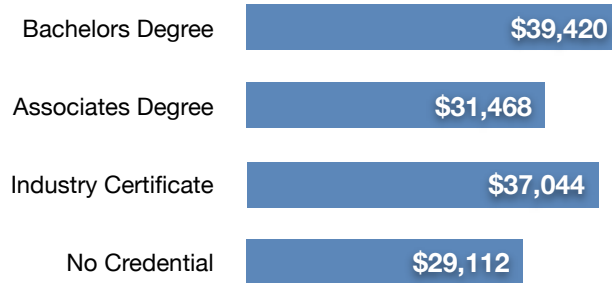
Many water utilities in California provide workers with tuition reimbursement at the California State University level. A recommended education strategy is to study water technology for one or two semesters at a community college, earn a grade 1-2 certificate in water distribution, water treatment or wastewater collection, and search for an entry level, Utility Worker I position at a utility. Once hired, utilize tuition reimbursement to pursue additional certificates and a degree.

2. Hourly Wage of a Utility Worker I

The hourly wage for a Water Utility Worker I is \$24.85 to \$30.20 at Contra Costa Water District in the Bay Area; \$23.23 to \$29.03 at Otay Water District in San Diego; and employees receive health insurance, paid vacation and retirement, as well.¹⁴

3. Industry Certificate vs. Bachelor's Degree

This 2009 chart from the Hudson Institute shows the median salary three to five years after college for each type of credential. ¹⁵



The water industry has the goods to compete for the best and brightest students and job seekers in California. If this information appeared on a website that was promoted by a blog, social media and industry involvement in schools, including employers talking to students and hosting field trips, the secret might just get out.

**TRAINING
& CERTIFICATION
ARE THE TICKET
TO A GREAT
CAREER**



5

CAN COMMUNITY COLLEGES CLOSE THE SKILL GAPS IN THE WATER INDUSTRY?

<p>Panel Findings</p>	<p>Issues</p> <ul style="list-style-type: none"> • Closing water industry skill gaps <ul style="list-style-type: none"> • Mechanical, electrical and construction trade skills • Grade 1-2 operators need to replace retiring grade 3-5 operators • Foundation and workplace skills <ul style="list-style-type: none"> • Math • Communications • Project management • Industry awareness • Networking • Life long learning • Initiative • Do agencies want entry level workers they can train themselves, or journeyman level? • Hands-on facilities require industry support <p>Recommendations</p> <ul style="list-style-type: none"> • Develop hands on technical training opportunities • Perform cost benefit analysis of immersion, facility based, blended learning models • Stakeholders who benefit should provide funding • Design curriculum for Millennials that develops foundation skills • Partner with industry associations to provide mid-career pathways 	
<p>Comments</p>	<p>“There’s not a shortage of operators. The shortage is hands-on electricians, machinists and carpenters.”</p> <p>“We let electricians walk off ships in San Diego and don’t hire them because they don’t have water industry experience.”</p> <p>“50% of my hands on people come from the military.”</p> <p>“We hire Operators in Training and they better have their T1. The community colleges don’t cater to hands on ability -- electrical shops, pump disassembly.”</p>	<p>“There could be a centralized apprenticeship program, but could the agencies come to an agreement?”</p> <p>“Agencies vary. Some hire entry level and develop them; some hire journey level.”</p> <p>“The state has lots of T1’s and T2’s, but it’s the T3, 4 and 5 operators who are retiring.”</p> <p>“Should we grow our own, or take a risk on an outside entity?”</p> <p>“MWD has scaled back education.”</p>

When asked to identify the skill gaps in water agencies, from both the employer and customer perspectives, the panel did not want to talk about climate change, new regulations or new technologies. In fact, that discussion was a non-starter, because the panel quickly identified and agreed upon two skill gaps.

“How do we motivate Generation Y? They have a different mindset.” | **i.e. ATTITUDE AND BASIC SKILLS**

Panelist Joe Young made that comment. He is a retired engineer and full time instructor in the Water and Wastewater Technology Program at Cuyamaca College. Attitude, reasoning, judgement and communications skills – listening, speaking, reading and writing – are called *foundation skills* because they give an individual the ability to learn other skills. The stronger the foundation, the higher the individual can build. However, when a person brings weak foundation skills to the workplace, it impacts other workers, processes and outcomes. According to panelists, this is what is happening with younger workers at water agencies.

This is a common complaint across industries. When the Society for Human Resources Management surveyed human resources managers in 2012, 52% said older workers exhibit a stronger work ethic, and 51% said they have stronger language, writing and spelling skills. A 2011 report from America's Edge revealed that 70% of students in California's community colleges need remedial math and English instruction before enrolling in their declared major. The report also found that only 33% of graduates in the high school class of 2007 met the eligibility requirements for admission to a California State University.

What these reports show is that students arrive at California's community colleges with a skill gap and take the gap with them into the workplace. The question is whether the California Community Colleges can improve student foundation skills in addition to teaching students job specific skills. Again, the timing could not be better. Because one of the four goals of the California Community Colleges' *Doing What Matters* initiative is retooling courses, curriculum and instructor training to meet the needs of employers. Water industry instructors, most of whom are adjunct faculty, need the tools to engage students who grew up with video games, the internet, smart phones and social media.

The traditional lecture is the least effective teaching approach for this generation of students. The approach used by college and university faculty throughout the country is to change what a class is doing every 10-15 minutes, use multimedia content and engage students in in-class group activities and project-based learning. This may be one reason why the apprenticeship programs offered by the energy industry have been successful and effective -- they cut classroom time in half and engage students in hands-on, technical training.



The Millennial Generation & The Lecture
Danielle Hart, MD

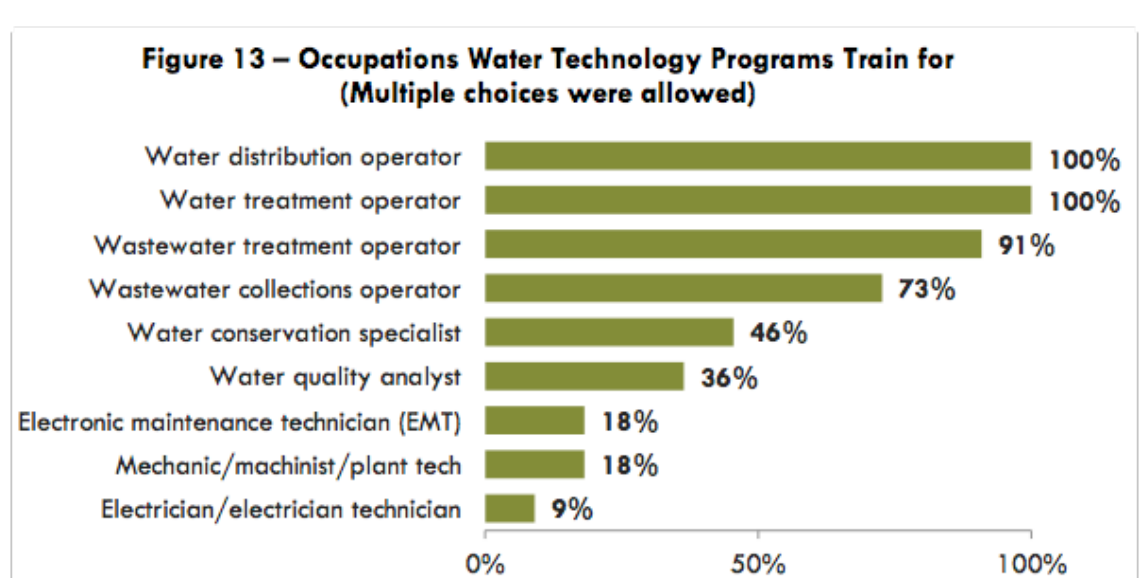
“There’s not a shortage of operators. The shortage is hands-on electricians, machinists and carpenters.”

i.e. TECHNICAL SKILLS

Panelist Simon Watson said this. He manages maintenance for the Orange County Sanitation District. It’s not an easy job. The district treats 207 million gallons of wastewater each day at two treatment plants, purifies 70 million gallons and injects it into the district’s world renowned Groundwater Replenishment System, and recycles enough energy from the treatment process to operate two thirds of the facility. The district also operates and maintains 15 off-site pump stations and 587 miles of pipe.

Who will train those electricians, machinists and carpenters is an open question. The survey of Southern California water agencies conducted by the Centers of Excellence in 2011 also looked at 12 of the community colleges training their workers. It found that, while all 12 colleges offered training for certification as a water distribution or water treatment operator, few trained students for the Plant Maintenance Technologist, Electrical/Instrumentation Technologist or Mechanical Technologist certificates from the California Water Environment Association.¹⁶ This is the training that produces the electricians and machinists that Watson has difficulty hiring.

2011 COE Survey



The panel's recommendation is to explore opportunities for hands-on technical training programs. Panelists from community colleges see this as a bridge to employment for students, but acknowledge that colleges do not have funding for the facilities and equipment needed for hands-on training. "This is a huge problem and I would like the report to reflect the lack of apprenticeships," said panelist Corine Doughty. Panelists from the water industry pointed out that water and wastewater agencies vary; some prefer to hire entry level workers and train them in-house while others prefer to hire journey level workers.

**How do we learn best?
73% of panelists said
"Show Me"**

One model is offered by Cuyamaca and Palomar Colleges: a six year old internship program with the 24 water and wastewater agencies in the San Diego region. The 33 week program includes orientation and four 8-week modules -- hands-on time in system operations, system maintenance, water treatment and wastewater treatment. Participants are selected through an interview process and must maintain at least a "C" average in the accompanying classwork. So far, 42 of the 57 graduates have been hired.

Metropolitan Water District of Southern California, Los Angeles Department of Water and Power and the San Francisco Public Utilities Commission have apprenticeships, too, because of their large size and large unions. Panelist Gene Patricio manages the Apprentice and Technical Training Unit at Metropolitan Water District of Southern California. While Metropolitan prefers to develop its own workers in its own facilities, Patricio acknowledged that finding qualified trainers is difficult and that the district is scaling back the program. "There could be a centralized apprenticeship program," he said, and then asked, "Can the agencies come to an agreement?"

The question is whether skill panels make water industry apprenticeship possible, and the answer appears to be yes. By bringing employers, education and workforce investment boards together at the regional level, skill panels provide the collaboration, management team and access to funding needed. Regional skill panels also give small utilities access to training on a larger scale. The panel's recommendation is to follow up with a cost benefit analysis of immersion, facility based and blended learning models.

Promising, too, is that the California Community Colleges support apprenticeship programs throughout the state: approximately 25,000 apprentices are enrolled in over 160 programs at 39 campuses.¹⁷ Each apprenticeship program is a partnership between an employer and the California Community Colleges or the California Department of Education, and apprentices learn on the job during the day and attend college in the evening for Related and Supplemental Instruction (RSI) selected by the employer. Allowing regional skill panels to utilize this successful model and partner with the California Community Colleges to fund apprenticeship programs would be an exciting next step. Perhaps the *Doing What Matters* initiative is the vehicle to make this happen.



INTEGRATED WATER MANAGEMENT

MULTIPLE BENEFITS

MULTIPLE SKILLS

MULTIPLE JOBS

6

IS CERTIFICATION ALIGNED WITH THE WATER INDUSTRY?

<p>Panel Findings</p>	<p>Issues</p> <ul style="list-style-type: none"> • Job seekers and instructors find certification structure confusing • Certification, colleges and industry not working collaboratively <p>Recommendations</p> <ul style="list-style-type: none"> • No micro credentials • Help students combine multiple industry recognized certificates • Mid-career pathways • Coordinate AWWA, CWEA, college and utility training 	
<p>Comments</p>	<p>“We already have a plethora of credentials.”</p> <p>“I need a roadmap of certifications.”</p> <p>“Whether to get certified in water or wastewater is the most common email I get.”</p> <p>“What should we say to people? Which certificate? Match certificates to jobs.”</p> <p>“We don’t ask for a certificate. We ask for certification.”</p>	<p>“Bay area employers want the college certificate.”</p> <p>“Community colleges are for students wanting to get into the industry and associations are for continuing education.”</p> <p>“Let’s be honest. We all compete for trainees.”</p> <p>“AWWA is recognized nationally and internationally.”</p>

**“We already have a
plethora of credentials.”**

**i.e.
NO MICRO-
CREDENTIALS**

While the panel recognizes the educational goals of micro-credentials — to help job seekers earn and stack credentials within one year — they see more harm than good in adding new credentials to a certification system that is already confusing to students, instructors and employees alike. It is important to note, too, that current water industry certificates meet micro-credential goals. The recommended preparation for the Grade 2 Certification Exam in water distribution or water treatment is two or three 8-week courses. Each course is 3 units and total time in class is 144 hours. Water industry certificates are stackable, too.

**“Whether to get
certified in water or
wastewater is the most
common email I get.”**

**i.e.
ALIGNMENT WITH
THE INDUSTRY**

The industry is more than water and wastewater. In 2002, the California legislature passed the Integrated Regional Water Management Act to encourage water utilities to collaboratively manage water quality and reliability. The same year, Californians passed Proposition 50, which provided \$500,000,000 to fund competitive grants for integrated water projects. This year, integrated regional water management appears to be gaining traction:

The San Diego City Council approved an indirect potable reuse project to provide up to 40% of the city’s water supply. The key to approval? The project reduces the need for upgrades to the city’s wastewater treatment plant, saving about \$1,000 per acre foot of water.¹⁸

In its 2013 Report Card on American Infrastructure, the American Society of Civil Engineers recognizes cities that are using green infrastructure solutions to reduce combined sewer overflows.¹⁹

The Los Angeles Bureau of Sanitation turned a nine acre, underutilized maintenance yard into a stormwater wetland park, creating recreational greenscape in a disadvantaged community.²⁰

These three examples show how utilities are now managing water, wastewater, stormwater and land use in a single project. In an interview with Brown & Caldwell, the Los Angeles Bureau of Sanitation’s assistant director, Adel Hagekhalil, describes how far integration goes:

We are maximizing the capture and reuse of our resources. These include maximizing water reuse, harvesting rainwater, constructing green projects, reusing biosolids, converting biogas to energy, and integrating solar energy into our facilities.²¹

Clearly, integrated regional water management involves skills beyond water treatment and distribution and wastewater collection and treatment. Water conservation specialists work outside their certification, too, advising homeowners how to manage stormwater and prevent urban runoff. Why? Because rainwater harvesting is now recognized as a water efficient landscaping best practice, and landscaping strategies – green infrastructure – are now regarded as a stormwater management best practice.

The California Stormwater Quality Association states that it is developing a low impact development certificate, but does not provide a timeframe, and the American Water Works Association certificate for water use efficiency practitioners does not address stormwater. An updated, integrated certificate would help water efficiency experts gain entrance into stormwater management positions and projects.

The Pacific Northwest Center of Excellence for Clean Energy provides a compelling model for updating the range of knowledge and requirements for water industry certificates. The Center's Energy Industry Skill Standards Project is identifying critical work functions, key activities, performance indicators and the knowledge, skills, and abilities an individual needs to succeed in certain energy-related occupations. The goal of the project is to update and develop new community college curriculum.

Who is doing the work? Focus groups of front line employees with hands on experience in each occupation. They are selected from different utilities so that procedures can be compared, and they work for two days with a facilitator experienced in developing skill standards.

“What should we say to people? Which certificate? Match certificates to jobs.” | **i.e. SIMPLIFICATION**

The comment above was from panelist Rhonda Wooten-Savino, one of three panelists from the State of California's Economic Development Department, who works with veterans transitioning into civilian employment. They need to provide accurate information and advice. Pages 29-43 show each water industry certificate and how to prepare for it. The analysis revealed the complexity of the various certification programs and how curriculum varies from college to college.



Adel Hagekhalil

Pp 29-43

Certificates & Courses

29. Water Treatment
30. Water Distribution
31. Water Quality Laboratory Analyst
32. Backflow Prevention
33. Cross Connection Specialist
34. Water Use Efficiency Practitioner
35. Irrigation Auditor/Manager
36. Collection System Maintenance
37. Environmental Compliance Inspector
38. Wastewater Treatment
39. industrial Treatment
40. Plant Maintenance / Electrical / Instrumentation
41. Plant Maintenance / Mechanical
42. Laboratory Analyst (Wastewater)
43. Biosolids Land Application Management

WATER TREATMENT

Certificates

Water Treatment Operator / California Department of Public Health (CDPH)

Water Treatment Operator / American Water Works Association (AWWA)

Water Treatment Associate / American Water Works Association (AWWA)

Qualifications to Take Certification Exam

	Agency	Degrees & Certification	Treatment Plant Experience	Courses
T1	CDPH	Diploma / GED	none	none
	AWWA	Diploma / GED	6 mos	3 units
T2	CDPH	Diploma / GED	none	3 units
	AWWA	Diploma / GED	2 yrs / 1 yr at T1 in T1 plant	6 units
T3	CDPH	Diploma / GED	2 yrs / 1 yr at T2 in T2 plant	6 units
	AWWA	Diploma / GED	4 yrs / 1 yr at T2 in T2 plant	9 units
T4	CDPH	Diploma / GED	4 yrs / 1 yr at T3 in T3 plant	9 units
	AWWA	Diploma / GED	5 yrs / 2 yrs at T3 in T3 plant	12 units
T5	CDPH	Diploma / GED	5 yrs / 2 yrs at T4 in T4 plant	12 units

Note:

AWWA Associate Certificate requires degree and coursework only.

Core Courses

T1-3*	Most Common Courses	Less Common Courses
	Water and Wastewater Mathematics Applied Hydraulics Instrumentation and Controls Water Treatment I / Basic	Introduction to Water and Wastewater Laboratory Analysis / Chemistry
T3-5*	Water Treatment II / Advanced	

* Most of the schools offer classes to prepare students for grade 1-3 certificates, and advanced classes to prepare them for grade 4-5 certificates. From college to college, however, a few courses prepared students for grade 1-2 certificates only.

WATER DISTRIBUTION

Certificates

Water Distribution Operator / California Department of Public Health

Water Distribution Operator / American Water Works Association

Water Distribution Associate / American Water Works Association

Qualifications to Take Certification Exam

	Agency	Degrees & Certification	Distribution System Experience	Courses
D1	CDPH	Diploma / GED	none	none
	AWWA	Diploma / GED	6 mos	3 units
D2	CDPH	Diploma / GED	none	3 units
	AWWA	Diploma / GED	2 yrs / 1 yr at D1 on D1 system	6 units
D3	CDPH	Diploma / GED	2 yrs / 1 yr at D2 on D2 system	6 units
	AWWA	Diploma / GED	4 yrs / 1 yr at D2 on D2 system	9 units
D4	CDPH	Diploma / GED	4 yrs / 1 yr at D3 on D3 system	9 units
	AWWA	Diploma / GED	5 yrs / 2 yrs at D3 on D3 system	12 units
D5	CDPH	Diploma / GED	5 yrs / 2 yrs at D4 on D4 system	12 units

Note:

AWWA Associate Certificate requires degree and coursework only.

Core Courses

D1-3	<p>Most Common Courses</p> <p>Water and Wastewater Mathematics Hydraulics Mechanical and Electrical Systems Water Distribution Systems I / Basic</p>	<p>Less Common Courses</p> <p>Introduction to Water and Wastewater Backflow Prevention Testing Cross Connection Specialist</p>
D3-5	Water Distribution II / Advanced	

WATER QUALITY LABORATORY ANALYST

Certificates

Water Quality Laboratory Analyst / American Water Works Association

Qualifications to Take Certification Exam

Note the various ways to qualify.

	Agency	Degrees & Certification	Water Quality Laboratory Experience
Gr1	AWWA	Diploma / GED	1 yr
Gr2	AWWA	Diploma / GED	4 yrs
		AA / AS Degree	2 yrs
		BA / BS Degree	1 yr
Gr3	AWWA	Diploma / GED	7 yrs
		AA / AS Degree	5 yrs
		BA / BS Degree	3 yrs
Gr4	AWWA	Diploma / GED	10 yrs
		AA / AS Degree	8 yrs
		BA / BS Degree	6 yrs
		Advanced Degree	4 yrs

Core Courses

Gr1-2	Most Common Courses	Less Common Courses
	Lab Analysis for Water and Wastewater Water Treatment I / Basic	Water Treatment II / Advanced

BACKFLOW PREVENTION

Certificates

Backflow Prevention Assembly Tester / American Water Works Association
 Backflow Prevention Assembly Tester / American Backflow Prevention Association
 Backflow Prevention Specialist / American Backflow Prevention Association

Qualifications to Take Certification Exam

Note the various ways to qualify.

	Agency	Degrees & Certification	Backflow Prevention Experience	Courses
Tester	AWWA	Diploma / GED	none	40 hrs
		Diploma / GED	2 yrs	none
Tester	ABPA	Diploma / GED	none	40 hrs
		Diploma / GED	2 yrs	none
Specialist	ABPA	Backflow Tester Certification	none	3 units
		Backflow Tester Certification	2 yrs	none
		None	5 yrs of specialist experience	none

Core Courses

Gr1-2 Most Common Courses
 Backflow Prevention Testing

CROSS CONNECTION SPECIALIST

Certificates

Cross Connection Specialist / American Water Works Association

Qualifications to Take Certification Exam

Note the various ways to qualify.

Agency	Degrees & Certification	Cross Connection Specialist Experiences	Courses
AWWA	Diploma / GED	None	40 hrs
	& Backflow Prevention Assembly Tester Certificate*	2 yrs	none

Core Courses

Most Common Course Cross Connection Specialist	Less Common Courses Mathematics for Water and Wastewater Applied Hydraulics Water Distribution I
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WATER USE EFFICIENCY PRACTITIONER

Certificates

Water Use Efficiency Practitioner / American Water Works Association

Qualifications to Take Certification Exam

	Agency	Degrees & Certification	Water Use Efficiency Experience	Courses
CA*	AWWA	Diploma / GED	none	0-3 units
Gr1	AWWA	Diploma / GED	6 mos	
Gr2	AWWA	Grade 1 Certificate	2 yrs of experience in: - water/energy public education - landscaping - water conservation at a water utility - a Field Services Worker II position	

* CA = Certificate of Achievement. Must be enrolled in a waterworks course and in good standing.

Core Courses

Gr1	<p>Most Common Course Water Use Efficiency Practitioner</p>	<p>Less Common Water Conservation</p>
Gr2	<p>Less Common Courses Cuyamaca College offers a 35-41 unit certificate that provides extensive training in water efficient landscaping.</p>	

IRRIGATION AUDITOR / MANAGER

Certificate

Certified Landscape Irrigation Auditor / Irrigation Association
Certified Landscape Water Manager / Irrigation Association
Certified Water Manager / California Landscape Contractors Association

Qualifications to Take Certification Exam

	Agency	Degrees & Certification	Irrigation Experience
Auditor	IA	None	1 yr
Manager	IA	Irrigation Auditor Certificate	3 yrs
Manager	CLCA	None	None

Core Courses

Most Common Course
Water Use Efficiency Practitioner

Less Common Courses
Cuyamaca College offers a 35-41 unit certificate that provides extensive training in water efficient landscaping.

COLLECTION SYSTEM MAINTENANCE

Certificate

Collection System Maintenance / California Water Environment Association

Qualifications to Take Certification Exam

Note the various ways to qualify.

	Agency	Degrees & Certification	Collection System Maint. Experience
Gr1	CWEA	None	none
Gr2	CWEA	None	4 yrs
		Grade 1 Collection Maint. Certificate for 1 year	2 yrs
		AA / AS Degree	2 yrs
		BA / BS Degree	1 yr
Gr3	CWEA	None	6 yrs
		Grade 2 Collection Maint. Certificate for 2 years	4 yrs
		AA / AS Degree	4 yrs
		BA / BS Degree	3 yrs
Gr4	CWEA	None	8 yrs / 1 yr as supervisor
		Grade 3 Collection Maint. Certificate for 2 years	6 yrs / 1 yr as supervisor
		AA / AS Degree	6 yrs / 1 yr as supervisor
		BA / BS Degree	5 yrs / 1 yr as supervisor

Core Courses

Gr1-2	<p>Most Common Courses Water and Wastewater Mathematics Mechanical and Electrical Maintenance Instrumentation and Controls Wastewater Collection I</p>
Gr3-4	Wastewater Collection II

ENVIRONMENTAL COMPLIANCE INSPECTOR

Certificate

Environmental Compliance Inspector / California Water Environment Association

Qualifications to Take Certification Exam

Note the various ways to qualify.

	Agency	Degrees & Certification	Compliance Inspector Experience
Gr1	CWEA	None	none
Gr2	CWEA	None	4 yrs
		Grade 1 Environmental Compliance Cert. for 1 yr	2 yrs
		AA / AS Degree	2 yrs
		BA / BS Degree	1 yr
Gr3	CWEA	None	6 yrs
		Grade 2 Environmental Compliance Cert. for 2 yrs	4 yrs
		AA / AS Degree	4 yrs
		BA / BS Degree	3 yrs
Gr4	CWEA	None	8 yrs / 1 yr as supervisor
		Grade 3 Environmental Compliance Cert. for 1 yr	6 yrs / 1 yr as supervisor
		AA / AS Degree	6 yrs / 1 yr as supervisor
		BA / BS Degree	5 yrs / 1 yr as supervisor

Core Courses

Unable to find a college offering this course.

WASTEWATER TREATMENT

Certificate

Wastewater Treatment Plant Operator / State Water Resources Control Board

	Agency	Degrees & Certification	Wastewater Treatment Experience	Courses
Gr1	SWRCB	None	none	6 units
Gr2	SWRCB	Diploma / GED	2 yrs	6 units
		Diploma / GED Grade 1 Certificate	1.5 yrs at T1	6 units
Gr3	SWRCB	Diploma / GED	4 yrs	6 units
		Diploma / GED Grade 2 Certificate	3 yrs at T2	6 units
		AA / AS Degree (or units)	2 yrs	60 units
Gr4	SWRCB	Diploma / GED	6 yrs	12 units
		Diploma / GED Grade 3 Certificate	4 yrs at T3	12 units
		AA / AS Degree (or units)	4 yrs	60 units
		BA / BS Degree	2 yrs	
Gr5	SWRCB	Diploma / GED	10 yrs	18 units
		Diploma / GED Grade 4 Certificate	6 yrs at T4	18 units
		AA / AS Degree (or units)	6 yrs	60 units
		BA / BS Degree	5 yrs	
		Civil or chemical engineer license	4 yrs	

Core Courses

Gr1-3	More Common Courses Water and Wastewater Mathematics Mechanical and Electrical Systems Instrumentation Wastewater Treatment I / Basic	Less Common Courses Introduction to Water and Wastewater Wastewater Recycling
	Gr4-5 Wastewater Treatment II / Advanced	

INDUSTRIAL WASTE TREATMENT

Certificate

Industrial Waste Treatment Plant Operator / California Water Environment Association

Qualifications to Take Certification Exam

Note the various ways to qualify.

	Agency	Degrees & Certification	Industrial Treatment Experience
Gr1	CWEA	None	none
Gr2	CWEA	None	4 yrs
		Grade 1 Indus. Trmt. Operator Certificate for 1 yr	2 yrs
		AA / AS Degree	2 yrs
		BA / BS Degree	1 yr
Gr3	CWEA	None	6 yrs
		Grade 2 Indus. Trmt. Operator Certificate for 2 yrs	4 yrs
		AA / AS Degree	4 yrs
		BA / BS Degree	3 yrs
Gr4	CWEA	None	8 yrs / 1 yr as supervisor
		Grade 3 Indus. Trmt. Operator Certificate for 1 yr	6 yrs / 1 yr as supervisor
		AA / AS Degree	6 yrs / 1 yr as supervisor
		BA / BS Degree	5 yrs / 1 yr as supervisor

Core Courses

CSU Sacramento offers course.

PLANT MAINTENANCE: ELECTRICAL / INSTRUMENTATION

Certificate

Plant Maintenance Technologist, Grade 1 / California Water Environment Association
 Electrical / Instrumentation Technologist, Grades 2-4 / California Water Environment Association

Qualifications to Take Certification Exam

Note the various ways to qualify.

	Agency	Degrees & Certification	Electrical / Instrumentation Experience
Gr1	CWEA	None	none
Gr2	CWEA	None	4 yrs
		Grade 1 Plant Maintenance Certificate for 1 yr	2 yrs
		AA / AS Degree	2 yrs
		BA / BS Degree	1 yr
Gr3	CWEA	None	6 yrs
		Grade 2 Electrical / Instrumentation Cert. for 2 yrs	4 yrs
		AA / AS Degree	4 yrs
		BA / BS Degree	3 yrs
Gr4	CWEA	None	8 yrs / 1 yr as supervisor
		Grade 3 Electrical / Instrumentation Cert. for 2 yrs	6 yrs / 1 yr as supervisor
		AA / AS Degree	6 yrs / 1 yr as supervisor
		BA / BS Degree	5 yrs / 1 yr as supervisor

Core Courses

Gr2	Most Common Courses	Less Common
	Mechanical and Electrical Systems Intro. to Electrical and Instrumentation Processes Electrical Wiring and Controls for Operators	Wastewater Treatment Plant Operations I

PLANT MAINTENANCE: MECHANICAL

Certificate

Plant Maintenance Technologist, Grade 1 / California Water Environment Association
 Mechanical Technologist, Grades 2-4 / California Water Environment Association

Qualifications to Take Certification Exam

Note the various ways to qualify.

	Agency	Degrees & Certification	Mechanical Experience
Gr1	CWEA	None	none
Gr2	CWEA	None	4 yrs
		Grade 1 Plant Maintenance Certificate for 1 yr	2 yrs
		AA / AS Degree	2 yrs
		BA / BS Degree	1 yr
Gr3	CWEA	None	6 yrs
		Grade 2 Mechanical Certificate for 2 yrs	4 yrs
		AA / AS Degree	4 yrs
		BA / BS Degree	3 yrs
Gr4	CWEA	None	8 yrs / 1 yr as supervisor
		Grade 3 Mechanical Certificate for 2 yrs	6 yrs / 1 yr as supervisor
		AA / AS Degree	6 yrs / 1 yr as supervisor
		BA / BS Degree	5 yrs / 1 yr as supervisor

Core Courses

	Most Common Courses	Less Common
Gr1-2	Mechanical and Electrical Systems Mechanical Maintenance Motors and Pumps Operations and Maint.	Wastewater Treatment Plant Operations I

LABORATORY ANALYST (WASTEWATER)

Certificate

Laboratory Analyst Grades 1-4 / California Water Environment Association

Qualifications to Take Certification Exam

Note the various ways to qualify.

	Agency	Degrees & Certification	Mechanical Experience
Gr1	CWEA	None	none
Gr2	CWEA	None	4 yrs
		Grade 1 Lab Analyst Certificate for 1 yr	2 yrs
		AA / AS Degree	2 yrs
		BA / BS Degree	1 yr
Gr3	CWEA	None	6 yrs
		Grade 2 Lab Analyst Certificate for 2 yrs	4 yrs
		AA / AS Degree	4 yrs
		BA / BS Degree	3 yrs
Gr4	CWEA	None	8 yrs / 1 yr as supervisor
		Grade 3 Lab Analyst Certificate for 2 yrs	6 yrs / 1 yr as supervisor
		AA / AS Degree	6 yrs / 1 yr as supervisor
		BA / BS Degree	5 yrs / 1 yr as supervisor

Core Courses

Gr1	Most Common Course Laboratory Analysis for Water and Wastewater	Less Common Courses Basic Chemistry Sanitary Chemistry
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BIOSOLIDS LAND APPLICATION MANAGEMENT

Certificate

Biosolids Land Application Management / California Water Environment Association

Qualifications to Take Certification Exam

Note the various ways to qualify.

Agency	Education	Experience
CWEA	None	1 yr in biosolids management
	24 semester units or 36 quarter units, including 16 hours of biosolids land application management training	none
	Combination of education and experience equivalent to 1 yr of experience	
	Acceptable Experience: <ul style="list-style-type: none">• Biosolids Generator / working with biosolids at a wastewater treatment plant• Biosolids Transporter / hauling biosolids• Biosolids Applier / application of biosolids to the land• Grower / growing crops on soil amended or fertilized with biosolids	

Core Courses

Unable to find a college offering this course.

**SKILL PANELS
ARE A LOT OF
WORK**



7

HELP IS AVAILABLE: WORKFORCE DEVELOPMENT ORGANIZATIONS

<p>Panel Findings</p>	<p>Issues</p> <ul style="list-style-type: none"> • Certified veterans are not getting hired • WIB funded training must conclude in a job <p>Recommendations</p> <ul style="list-style-type: none"> • Water industry support of EDD interview skills training
<p>Comments</p>	<p>“We’re (EDD) discovering water. We can find grants.”</p> <p>“Our Fresno WIB supports our CSU cluster.”</p> <p>“We have to report on job placement for our grant funding.”</p>

A local workforce investment board will assist a skill panel by playing the role of the convener who brings the partners to the table, the analyst who researches and develops labor market data, and the investor who can secure grant funding for the partnership. More importantly, they will assist students and job seekers on a career pathway, providing skill assessment, counseling, financial aid and job placement.

Where did they pick up these skills? They were launched by the Workforce Investment Act of 1998 and operate over 3,000 *One-Stop Career Centers* across the U.S. Because of their combination of on-the-ground resources, they received \$3.95 billion through the American Recovery and Reinvestment Act of 2009 to get unemployed Americans back to work.

There are 49 local workforce investment boards in California and they have access to Workforce Investment Act Title I training funds and other state and federal programs. It is best to note in advance that when a workforce investment board secures grant funds, it needs to result in job placements.

8

IS THE WATER INDUSTRY READY TO COLLABORATE?

<p>Panel Findings</p>	<p>Issues</p> <ul style="list-style-type: none"> • Knowledge management • Skill gaps of Generation X and Millennial workers • Water utilities do not hire young workers • Do not train in-house for <i>emerging</i> trends <p>Recommendations</p> <ul style="list-style-type: none"> • Invest in skill panels and training • Develop the water industry cluster • Implement internship / apprenticeship model for young workers • Create a model and train Boomers to be mentors and trainers • Teach workers to learn from other agencies and their own mistakes • Video emergencies, repairs, installations and other teaching moments • In-house pathways to experience • Integrate Millennials into teams, projects, cross training, on-site technical training
<p>Comments</p>	<p>“Boomers should have to give one year notice of retirement and be trainers their last year.”</p> <p>“Ops guys don’t stand up and speak, so partner them with a millennial to do their presentation.”</p> <p>“Where are the general managers? They’re with the associations, which should work together with the community colleges.”</p> <p>“We need a better source of funding than grants.”</p> <p>“We’re (CSU Fresno) funded by PG&E rates. Get enough people, get political power. The German model of <i>craft</i> has been very successful.”</p>

Despite all this talk about partnership, and actually meeting partners and getting to know them over the course of a two day meeting, water and wastewater utilities are fiercely independent organizations formed decades ago by a local vote, and governed today by a locally elected Board. So, do they really want to collaborate on a skill panel?

The two day discussion gives reason to be optimistic. When brainstorming how to capture the knowledge of retiring Baby Boomers, the panel jumped on the progressive idea of Boomers taking on a full time mentor role for their last 12

months with the organization. Could that role extend to the local community college, mentoring students on water industry career pathways, or teaching classes? When discussing how to manage Millennial workers, the panel came up with an equally progressive idea: reverse mentorships where Millennials are paired with older workers to teach them about technology, and to absorb old-timer wisdom while doing it.

The larger questions surrounding skill panels and career pathways remain because they require the input and approval of water utility leaders.

BIG QUESTION

Are water utilities ready to hire younger workers?

A running joke among water industry workers is that they fell into their career, and for many, water is a second or third career. The advantages of this passive approach to workforce development is that new hires have received training from previous employers and have reached a level of maturity.

However, this approach does not align with career pathways, which will have students knocking on water utility doors one year out of high school with their Grade 2 certificate in hand. What then?

The panel hopes that senior managers will, after reading this report, see the attributes of apprenticeship. What if utilities turned their Utility Worker I positions into apprenticeships? What if each apprentice was mentored and served as a reverse mentor in technology? What if utilities started apprentices at a lower hourly rate than the Water Utility Worker I rate, and increased the rate each time the apprentice achieved a milestone? How much would the utility save? And, more importantly, how much would the utility gain?

Are you working in a field that matches up with your college major? 61% of panelists said "No"

BIG QUESTION

Are water utilities ready to develop water industry clusters?

The benefits of forming water industry clusters are substantial:

- Workforce development**
- Cross pollination and innovation**
- Industry recognition**
- Lobbying power**
- Sharing best practices**
- Networking and career opportunities**

BIG QUESTION

**Are water utilities
ready to invest money
and staff time?**

The funding partners -- the employers -- will be the default leaders of skill panels. Will responsibility for managing a utility's role in a skill panel fall on the human resources manager? Who will attend meetings: the general manager, a board member, or others? Subject matter expertise will be important, so count on contributing supervisors and front line employees for standards and curriculum development.

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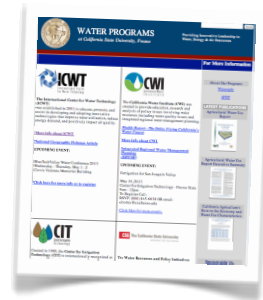
CALIFORNIA STATE UNIVERSITY IS SHOWING THE WAY

<p>Panel Findings</p>	<p>Issues</p> <ul style="list-style-type: none"> • No equivalent to CSU Fresno's California Water Institute and International Center for Water Technology among community colleges • Water technology program varies from college to college <p>Recommendations</p> <ul style="list-style-type: none"> • Explore four year degree in water technology • Explore articulation of community college credits to CSU degrees • Establish a lead college to coordinate curriculum and program development
<p>Comments</p>	<p>"Before we put together this meeting, we didn't know each other existed."</p>

The panel convened for this meeting knows how critical it is to put a workforce development program in place for California's water and wastewater utilities. By the second day of the meeting, panelists recognized that the utilities, industry clusters and job seekers throughout California would be better served if they continued their collaboration.

However, funding for additional panel meetings is not in place. This meeting was funded by a grant to Cuyamaca College's Environmental Training Center. Looking ahead, developing and implementing the panel's recommendations across the 20 or more community colleges with water technology programs, and launching programs, perhaps, at additional colleges, will require extensive resources and coordination.

An option to consider is to assign responsibility for coordination to a single college. The basis for this recommendation is California State University Fresno. Panelist Dan Clawson is a project manager for the university, which hosts the California Water Institute and International Center for Water Technology, and coordinates the water technology program across the 23 Cal State campuses. How Clawson and Cal State Fresno approach relationship building with the private sector should be considered a best practice approach for this panel, too. This would be a large and challenging project and, perhaps, another opportunity to tap into the resources available through the Doing What Matters initiative.



Cal State Fresno Water Programs

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NEXT STEPS

The steering committee would like to thank the panel for a day and a half of insightful and out-of-the-box thinking. However, everyone involved recognizes that this first meeting was a first step and there is much work ahead.

The panel is ready to continue. They want to develop a model to guide regional skill panels throughout the state. The first issue to consider is how to collaborate: whether to facilitate regional collaboration now, or collaborate with additional stakeholders on each of the initiatives shown below and develop a more formal model for regions to adopt. The only way to know where water industry leaders stand on skill panels, career pathways, apprenticeship and other recommendations of the panel is to ask them.

Equally important is securing funding from the California Community Colleges and the water industry to survey the industry, convene meetings and develop the initiatives recommended by the panel. These recommendations, presented throughout this report, are summarized below. Months of research, coordination, meetings and design development lie ahead. What is important for all stakeholders to remember is that there are numerous models throughout the country from which to incorporate ideas, best practices and confidence.

Career Pathways	Develop four versions:	
	<ul style="list-style-type: none"> • Show the path from entry level to senior management • Show the path to Grade 1-2 certification • Show water industry employees the path to Grade 3-5 certification • Show water industry retirees the path to mentoring and teaching 	
	Develop pathways for some all available certificates: <ul style="list-style-type: none"> • Water Treatment • Water Distribution • Water Quality Laboratory Analyst • Backflow Prevention • Cross Connection Specialist • Water Use Efficiency Practitioner • Irrigation Auditor/Manager 	or
Pathways match: <ul style="list-style-type: none"> • Courses to certificates and degrees • Certificates and degrees to jobs • Jobs to salaries 		

<p>Marketing</p>	<p>Market career pathways to:</p> <ul style="list-style-type: none"> • Grade 6-12 students • Grade 6-12 students' parents • Middle and high school career counselors • Adult job seekers • Water industry employees • Water industry retirees 	
	<p>Develop marketing campaign:</p> <ul style="list-style-type: none"> • Website • Email marketing • Webinars • Community workshops 	
<p>Curriculum</p>	<p>Coordinate curriculum development:</p> <ul style="list-style-type: none"> • K-12 • Community colleges • On-the-job training • California State University 	
	<p>College Curriculum</p> <ul style="list-style-type: none"> • Develop hands-on training OR collaborate with water industry to develop apprenticeship programs • Build student foundation skills through new teaching methods and instructor training • Explore how to provide instruction for more specialized industry certificates • Explore establishing a lead college to coordinate curriculum and program development 	<p>K-12 Curriculum</p> <ul style="list-style-type: none"> • Develop water context for math, science and social studies curriculum • Develop educational partnerships between schools and skill panels
	<p>On-the-Job Training</p> <ul style="list-style-type: none"> • Coordinate AWWA, CWEA, college and utility training • Develop training to prepare Boomers for mentoring and teaching • Develop in-house pathways to experience for Millennials 	<p>Cal State University Curriculum</p> <ul style="list-style-type: none"> • Explore four year degree in water technology
	<p>Articulation</p> <p>Explore how to use Perkins and SB1070 to develop courses that articulate from high school to community college, and from community college to Cal State University</p>	

Certification | **Assess water industry practices and standards**

- Survey water industry
- Survey water industry stakeholders

Assess water industry certificates

- Analyze each certificate's recommended range of knowledge and compare to water industry survey results

**Regional
Skill Panels**

- Develop regional water industry skill panels
- Develop regional water industry clusters
- Invest in workforce development

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