



C U Y A M A C A
· C O L L E G E ·

Water & Wastewater Technology

Data / Water Industry

California's Water Industry Today

- California's water industry employs 52,811 people
- 40,957 of the 52,811 people are employed in local water and wastewater agencies.
 - Other job areas are flood control, stormwater management and ecosystem management
- California's water industry spends \$33.8 billion annually
 - \$19.9 billion for operations and maintenance
 - \$13.9 billion for engineering and construction

Source Data:

Water and the California Economy, Public Policy Institute of California, May 2012, p. 4
http://ppic.org/content/pubs/report/R_512EHR.pdf

Employment Potential / Statewide

- California's current population of 37 million is expected to grow to 50 million by 2049, and urban and housing development will require development of new water and wastewater infrastructure, as well
- Southern California will lead statewide growth from 2010 to 2060, with 8 million additional people raising the region's total population to 31 million.

Source Data:

Report P-1 (County): State and County total Population Projections, 2010-2060, State of California Department of Finance, January 2013
<http://www.dof.ca.gov/research/demographic/reports/projections/p-1/>

- An investment of \$45.8 billion in California's water systems and \$27.8 billion in wastewater systems is needed over the next 20 years. Based on annual investment levels, local water and wastewater agencies are meeting and exceeding these needs.

Source Data:

Paying for Water in California, Public Policy Institute of California, March 2014, p. 25
http://ppic.org/content/pubs/report/R_314EHR.pdf

Sector Relevance to San Diego Region

Employment potential

Short Term View

Retirement and hiring projections included in the following labor market data were likely delayed by economic recession from 2009 to 2013.

Data Source:

Centers of Excellence

Water and Wastewater Occupations in Southern California

2011 / Environmental Scan

http://www.coecc.net/Environmental_Scans/w-ww_scan_socal_11.pdf

Data Source:

San Diego Workforce Partnership

Water and Wastewater Industry Occupational Outlook

2010

http://media.wix.com/ugd/fb0197_abcb2927517949ae9c20b7717f584002.pdf

Long Term View

Growth in the water and wastewater industry is driven by growth in population, housing and the economy.

Projected growth in San Diego County from 2008 to 2050:

- Population will grow 40% to 4.3 million
- 69,000 new single family homes will be built
- 327,000 apartments and condominiums will be built, an 81% increase
- 295,307 acres of residential development, an 88% increase

Data Source:

Board Report – 2050 Regional Growth Forecast, SANDAG, February 2010, p. 12

http://www.sandag.org/uploads/projectid/projectid_355_10794.pdf

- Residential water use is 61% of total water use in the San Diego County Water Authority's service area (97% of San Diego County population)
- Total regional water use in the San Diego County Water Authority's service area is expected to increase from 566,443 acre feet to 785,685 acre feet in 2035.
- The San Diego County Water Authority and its 24 member water agencies will invest in new water resources and infrastructure projects to meet the increased demand (see Financial Value below).

Data Source:

2010 Urban Water Management Plan, San Diego County Water Authority, pp. 2-3 – 2-9

<http://www.sdcwa.org/sites/default/files/files/water-management/2010UWMPfinal.pdf>

Financial value

The water industry is often valued based on its annual operating (operations and maintenance) and capital (engineering and construction) expenditures, both of which can be found in an agency's budget.

Carlsbad Municipal Water District

<http://web.carlsbadca.gov/services/departments/finance/Pages/default.aspx>

City of Del Mar

<http://www.delmar.ca.us/ArchiveCenter/ViewFile/Item/50>

City of Escondido

<http://www.escondido.org/Data/Sites/1/media/PDFs/Finance/AOB2014-15.pdf>

Fallbrook PUD

http://www.fpud.com/PDFDocuments/Budget/2014-2015_FinalBudget.pdf

Helix WD:

<http://www.hwd.com/about/budget.pdf>

Lakeside WD

Budget: n/a

National City

<http://www.sweetwater.org/Modules/ShowDocument.aspx?documentid=5835>

City of Oceanside

<http://www.ci.oceanside.ca.us/civica/filebank/blobload.asp?BlobID=27829>

Olivenhain MWD

http://www.olivenhain.com/files/docs/finance_billing/budget.pdf

Otay WD

http://www.otaywater.gov/otay/documents/FY14_Budget.pdf

Padre Dam MWD

<http://www.padredam.org/DocumentCenter/View/37>

City of Poway

<http://www.poway.org/Index.aspx?page=467>

Rainbow MWD

<http://www.rainbowmwd.com/Uploads/Budget for Fiscal Year 2014-2015.pdf>

Ramona MWD

http://www.rmwd.org/files/PDF/Finance/F.1_Budget FY 13-14 Exhibit A.pdf

Rincon Del Diablo MWD

<http://www.rinconwater.org/images/Rincon/budget-13-14and14-15.pdf>

City of San Diego

<http://www.sandiego.gov/publicutilities/dollarsatwork/>

Santa Fe ID

<http://www.sfidwater.org/index.aspx?page=131&parent=843>

South Bay ID

<http://www.sweetwater.org/Modules/ShowDocument.aspx?documentid=5835>

Sweetwater Authority

<http://www.sweetwater.org/Modules/ShowDocument.aspx?documentid=5835>

Vallecitos WD

<http://www.vwd.org/departments/budget-finance>

Valley Center MWD

<http://www.vcmwd.org/en/Documents/Budget.aspx>

Vista ID

http://www.vid-h2o.org/pdf/publication/2013-14_Budget.pdf

Yuima MWD

<http://www.yuimamwd.com/content.php?ID=37>

Need for Training

Identified skill gaps

Cuyamaca's Water and Wastewater Technology Program hosted a statewide, two day skills panel in February, 2013. The panel identified two skill gaps:

- Panelists asked for job candidates with stronger academic skills, including reading, writing, math, analysis, data interpretation, speaking and presentation skills.
- Panelists also asked for job candidates who work with their hands and have basic carpentry skills and mechanical aptitude, and can disassemble, repair, and reassemble aging infrastructure. Note that California Community College water programs focus on training for distribution and treatment operator positions, not on training for electrical and mechanical maintenance technicians.

Source Data:

How to Train the Next Generation of Water Industry Professionals, Cuyamaca College, 2013

[http://www.cuyamaca.edu/preview/water/Skill_Panel_Report_052013\(1\).pdf](http://www.cuyamaca.edu/preview/water/Skill_Panel_Report_052013(1).pdf)

Note that other studies have identified a shortage of "middle skill workers" who do not have a degree, but do have some college training and academic and mechanical skills. The shortage has been documented nationally and in California and is affecting the industries that rely on these workers, including manufacturing, energy, water, IT and healthcare.

Source Data:

2011 Skills Gap Report, The Manufacturing Institute

<http://www.themanufacturinginstitute.org/Research/Skills-Gap-in-Manufacturing/2011-Skills-Gap-Report/2011-Skills-Gap-Report.aspx>

Who Can Fix the Middle Skills Gap?, Harvard Business Review, 2012

http://doingwhatmatters.cccco.edu/Portals/6/docs/hbr_trainng_reprint_12_24_12.pdf

Can California Compete?, America's Edge, 2011

<http://cdn.americasedge.org/clips/CAAESkillsReport-5.pdf>

Living wage potential

Entry level positions pay \$20/hour or more at most California water and wastewater agencies and provide health insurance, retirement, vacation and tuition reimbursement.

Source Data:

Compared cost of living and salaries in various California cities.

Cost of living index in Modesto, CA is 93.9 (low, U.S. avg. is 100)

<http://www.city-data.com/city/Modesto-California.html>

Cost of living index in Oakland, CA is 137.7 (high, U.S. avg. is 100)

<http://www.city-data.com/city/Oakland-California.html>

Salary Range (low end)

Salaries for entry level positions: Water Utility Worker, Water Treatment Operator (Grade I) at City of Modesto, Stanislaus County

<http://agency.governmentjobs.com/modesto/default.cfm?action=agencyspecs>

Salary Range (high end)

Salaries for entry level positions: Water Utility Worker, Water Treatment Operator (Grade I) at East Bay Municipal Utility District, in Oakland, Alameda County

<https://www.ebmud.com/about/jobs/job-descriptions-and-salary-information>

Community college can meet needs

Water technology programs in the California Community Colleges are designed to train students for industry certification examinations. Most programs have core courses that prepare students for specialized courses. Upon completing the core courses, a student can explore different specialties and stack industry certificates.

Students at Cuyamaca College, for example, are encouraged to take Fundamentals of Water and Wastewater Technology, Water and Wastewater Calculations and Water Distribution I, and then take the Department of Public Health's Grade 1 or 2 Distribution Operator Exam and apply for an entry level position.

Students continue taking college courses to prepare for Grade 3, 4 and 5 certification exams and certification in other specialties.

Source Data:

How to Train the Next Generation of Water Industry Professionals, Cuyamaca College, pp. 26-43

http://www.cuyamaca.edu/wwtr/PDF/How_to_Train_the_Next_Generation_of_Water_Industry_Professionals.pdf

Need for incumbent worker training

Training for incumbent workers is essential:

- They need both classroom and on-the-job training to prepare for Grade 3, 4 and 5 industry certificates in their specialty.
- They need training in new technologies or soft skills, or certification in other specialties to prepare for promotional opportunities.
- They need to complete an Associate's Degree to reduce the cost of the Bachelor's Degree they need for promotion to a management position.

Potential Career Pathway Development And Alignment in Region

Evident career ladder

There are multiple career ladders in the water industry, but the way up the different ladders is the same. The four step plan is a 10 year approach to a Bachelor's Degree, but allows a student/worker to pay for college and support themselves.

Step 1

- Take 2-3 introductory water technology courses
- Pass Grade 1 or 2 industry certification exam
- Apply for entry level positions with a water or wastewater agency
- Enroll in the agency's tuition reimbursement program

Step 2

- Continue college courses and take Grade 3, 4 and 5 industry certification exams as the experience requirement for each exam is met.
- Receive salary increases at each certificate level
- Apply for supervisory position and a salary increase

Step 3

- Prepare for the second half of your career by completing general education requirements for an Associate's Degree
 - Develop the soft skills the industry wants to see
 - Reduce the cost of the Bachelor's Degree needed for a management position

Step 4

- Choose and complete a Bachelor's Degree that is aligned with career goals.
 - If the goal is to move into operations management, consider a degree in public administration or management.
 - Or switch gears within the water industry and pursue a degree in engineering, finance, IT or human resources.
 - It's also possible to use water as a vehicle towards a degree and career outside of water.
- Apply for a management position and a salary increase

Source Data:

How to Train the Next Generation of Water Industry Professionals, Cuyamaca College, pp. 26-43
[http://www.cuyamaca.edu/wwtr/PDF/How to Train the Next Generation of Water Industry Professionals.pdf](http://www.cuyamaca.edu/wwtr/PDF/How%20to%20Train%20the%20Next%20Generation%20of%20Water%20Industry%20Professionals.pdf)

Kate, I also have salary data in an Excel file.

Articulation potential

San Diego State University

- Civil Engineering
- Construction Engineering
- Environmental Engineering
- Environmental Sciences
- Management
- Public Administration
- Sustainability
- Urban Studies

Source Data:

<http://arweb.sdsu.edu/es/admissions/majors.html>

CSU San Marcos

- Finance
- Management
- CIS
- Environmental Studies

Source Data:

<http://www.csusm.edu/explore/academics/majors.html>

Work based learning

San Diego Regional Water/Wastewater Internship Program

- 24 water agencies
- 6 wastewater agencies
- Cuyamaca and Palomar Colleges
- San Diego County Water Authority provides administrative support
- Internship is 33 weeks long
- Interns work 20-30 hours per week and attend evening classes
- Interns earn \$10/hour
- 85% of graduates are hired by agencies in the region

WWTR 290 -- Cooperative Work Experience

- 5 hours paid or 4 hours unpaid work experience per week per unit. Practical application of principles and procedures learned in the classroom to the various phases of water and wastewater treatment, distribution or collection. Work experience will be paid or unpaid at the appropriate curriculum-related work sites. Two on-campus sessions will be scheduled. May be repeated for up to 12 units.

Ability to Support Other Sectors

Currently, water and wastewater agencies employ or support these additional sectors:

Administration

- Accounting
- Finance
- CIT
- Human Resources
- Public Relations

Engineering

- CAD
- GIS
- Construction
- Construction Inspection

Operations

- Welding
- Heavy Equipment Operator
- Mechanic
- Electrician

Water Quality

- Biology
- Chemistry

Source Data:

Organization Chart, Padre Dam Municipal Water District

<http://www.padredam.org/DocumentCenter/Home/View/106>

Changes in the industry are in the early stages, driven by legislative mandates. The goal of the mandates is adaptation to climate change through the integrated management of water, land use and energy. For instance, cities across the country and California are learning that “green infrastructure” is the most efficient method for controlling water pollution, which means more partnerships between water agencies, cities and the landscaping industry. Job descriptions will change and there are entrepreneurial opportunities, as well.

Source Data:

Paying for Water in California, Public Policy Institute of California, 2014, pp. 35-51

http://www.ppic.org/content/pubs/report/R_314EHR.pdf

Letter to Governor and Legislative Leaders – Summit Drought Recommendations, The California Economic Summit, 2014

<https://cafwd.app.box.com/s/azuwkr5ilyb8digu5tz0>