

EQUINOX • CENTER

HEALTHY ENVIRONMENT STRONG ECONOMY CIVIC ENGAGEMENT

H2OVERVIEW SERIES

San Diego County Residential Water Use Trends

February 2015



EQUINOX CENTER

HEALTHY ENVIRONMENT STRONG ECONOMY CIVIC ENGAGEMENT

H2OVERVIEW SERIES

San Diego County Residential Water Use Trends

February 2015

ABOUT H2OVERVIEW

[H2Overview](#) is a series of reports by Equinox Center that provide balanced, easy-to-understand research on San Diego County's water supply to better inform regional stakeholders and the public. Recognizing that water is likely to be the most critical resource challenge that the San Diego region will face during the coming two decades, H2Overview reports serve to provide an overview of current and potential sources of water, as well as in-depth policy analysis on seawater desalination and purified water recycling. The reports have focused on the benefits, costs and challenges associated with the development of these water supply sources with the intent of spurring informed public dialogue and influencing decision-making about the region's future water portfolio.

ABOUT EQUINOX CENTER

Equinox Center is an independent, non-partisan, nonprofit research and policy center helping the San Diego region achieve a more prosperous economy and healthy environment for all its residents. Through in-depth research, policy analysis, communications and public forums, Equinox inspires, informs and engages the public and decision makers in crafting better solutions to address our region's growth challenges.

BACKGROUND

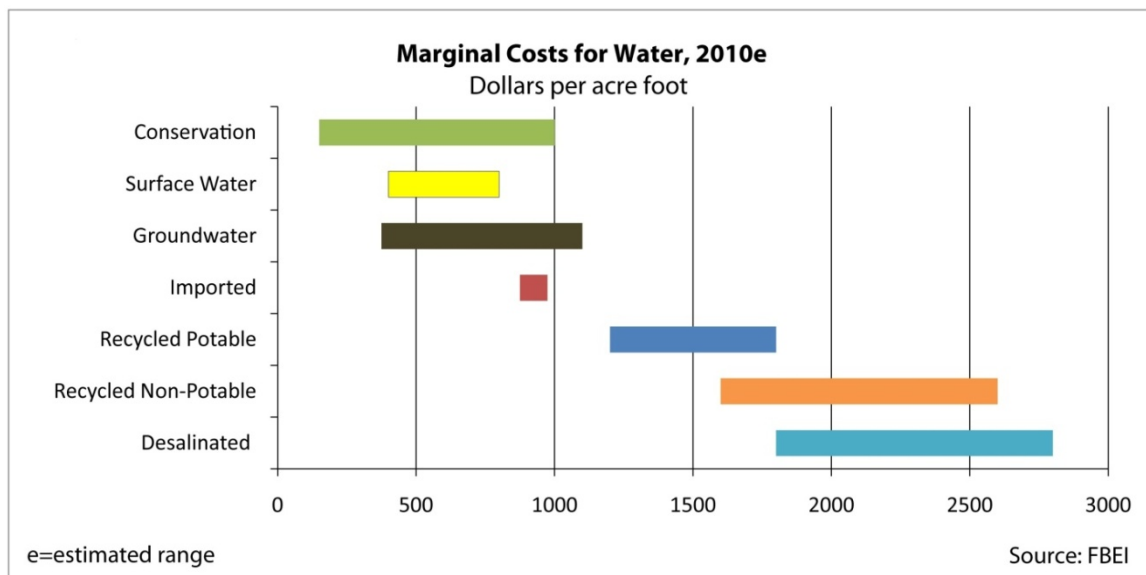
California is currently facing a drought of historic intensity, and following two consecutive years of increasingly serious dry weather conditions, Governor Jerry Brown proclaimed a Drought State of Emergency for California on January 17,

2014.¹ As months passed, and summer arrived with the drought showing no signs of letting up, the state, as well as some water agencies approved increasingly strict pieces of legislation, including fines for wasteful water use.^{2,3}

As the region continues to grow and accommodate the 500,000 new residents expected by 2030,⁴ the severe drought California faces has combined with uncertainty about future weather conditions brought by climate change to create a challenge without a clear solution. Climate change studies from the Scripps Institution of Oceanography at University of California, San Diego indicate that Southern California will endure more frequent, more intense and more durable heat waves, and longer and extended droughts,⁵ which will have a measurable impact on both the supply of and demand for water in our region.

In the 2010 [Assessing the Options paper](#), working with the Fermanian Business Enterprise Institute (FBEI) at Point Loma Nazarene University, Equinox Center determined that conservation is one of the lowest cost and most environmentally beneficial ways to address San Diego County’s water challenges. (Figure 1)

Figure 1



Thus, one of the most cost-effective means of enduring this drought, and preparing for those in the future, is improving our ability to conserve water among residential users, the customer class consuming most of the region’s water.

Equinox Center’s 2012 H2Overview report, [The Potential of Water Efficiency and Conservation: Opportunities in Single-Family Homes](#) (2012 H2Overview report),

¹ See: <http://gov.ca.gov/news.php?id=18379>
² See: http://www.swrcb.ca.gov/press_room/press_releases/2014/pr071514.pdf
³ See: <http://www.acwa.com/content/local-drought-response>
⁴ See: <http://datawarehouse.sandag.org/Forecast/PopulationByAge/2030/4/1>
⁵ See: <https://scripps.ucsd.edu/news/8155>

highlighted that in the single-family residential sector alone, there was opportunity to use 20 to 30 percent less water primarily by employing technologies already in existence. The report included a series of policy recommendations and noted additional research was needed to determine how much potential for conservation and efficiency remain in the region.

INTRODUCTION

The original intent of this report was to review San Diego County's water consumption by agency, specifically by customer class. Customer classes often include single-family residential, multi-family residential, commercial and industrial, agriculture and irrigation. However, regional water consumption is frequently reported, including in Equinox Center's [2014 Quality of Life Dashboard](#), in aggregate amounts among all water classes or a combination of "municipal and industrial" which is defined as residential, commercial and industrial (minus recycled water).

Until very recently there were no publicly available sources of region-wide water consumption data based on customer class. In July 2014, the State Water Resources Control Board adopted water use reporting requirements for water agencies across the state. Even with these new requirements, estimate data is available only for residential consumption and only covering the last half of 2014 (with estimated comparisons to the previous year).

Due to inconsistencies in how customer classes are defined and/or how data is collected and maintained among the County's water agencies, it was not feasible to report on usage by all the customer classes. These inconsistencies are significant and will be discussed further in the Policy Recommendations section of the paper.

Nevertheless, this report is unique in that it looks specifically at residential water use, rather than aggregate data for a blend of customer classes and covers trends including the last five fiscal years⁶.

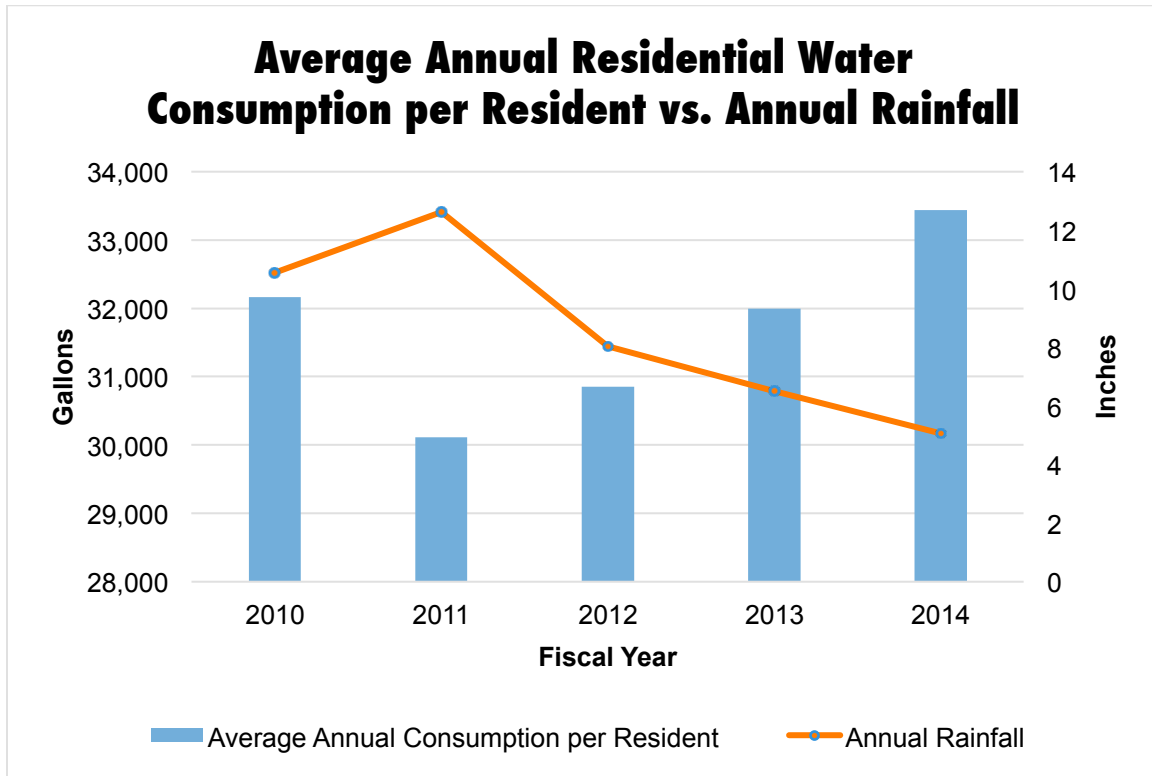
RESIDENTIAL WATER CONSUMPTION

Through the collection and analysis of historical residential water consumption data, Equinox Center's research has revealed that between fiscal years 2010 and 2014 (the study period), San Diego County Water Authority's (SDCWA) member agencies experienced a four percent (4%) increase in annual average residential water consumption on a per resident basis.⁷ This overall increase in

⁶ Note: For this report's purposes, fiscal years (FY) start in July and end in June, e.g. fiscal year 2014 started July 1, 2013 and ended June 30, 2014

annual average residential water consumption per resident during the study period, is correlated with hotter than average annual mean temperatures⁸ and negatively correlated with a decrease in annual precipitation. A SDCWA-wide decrease in overall water consumption per resident only surfaced one year during the study period: FY 2011. This was also the same year within the study period with the highest annual precipitation, as measured at San Diego's Lindbergh Field. (Figure 2)

Figure 2



During the study period, agencies with the highest increase in residential water consumption were the Santa Fe Irrigation District, with a thirty percent (30%) increase, City of Ramona with a nineteen percent (19%) increase and City of Poway with a seventeen percent (17%) increase. (Figure 3)

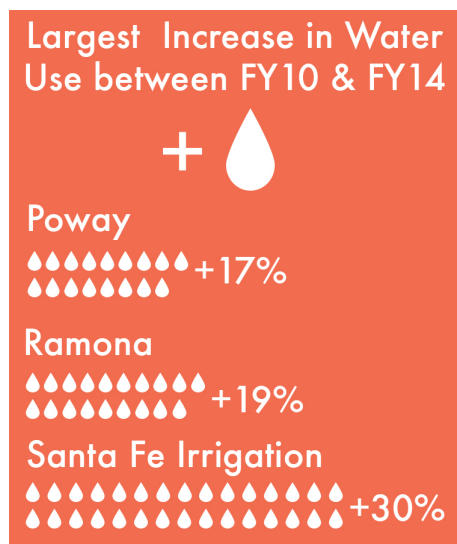
Additionally, a number of agencies reduced consumption during the study period, most notably, the Rainbow Water District at twenty-one percent (21%) and

⁷ Note: Single family and multi-family water consumption data across all SDCWA member agencies was provided to Equinox Center by SDCWA member agencies, with the exception Camp Pendleton. The number of residents per member agency for each fiscal year is self-reported to the SDCWA and published in the SDCWA's Annual Reports (see: <http://www.sdcwa.org/publications>). Residential water consumption data for Yuima M.W.D. also includes consumption by agricultural customers who opted out of the Interim Ag Water Program (IAWP) and the SDCWA Special Ag Water Rate Program (SAWR), and due to these variables, Yuima is not included in rankings in Figures 3 and 4.

⁸ See: <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca7740>

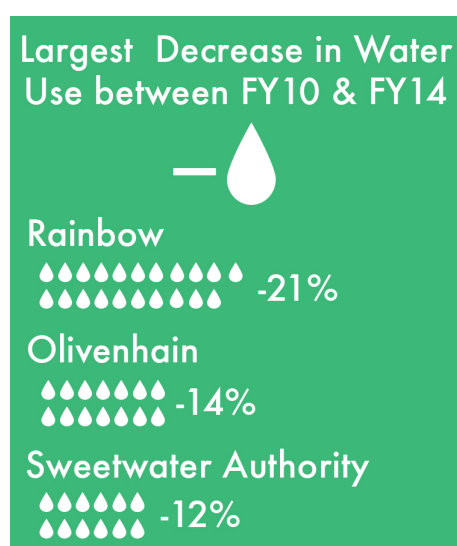
Olivenhain Water District conserving fourteen percent (14%) over the \period. (Figure 4)

Figure 3



During the most severe times of drought within the study period (between FY 2013 and FY 2014), and despite the declaration of a Drought State of Emergency by Governor Brown in January 2014, residential water consumption only decreased in two member agencies (Vista Irrigation District and Sweetwater Authority), with each experiencing approximately a one percent (1%) decrease in annual average water consumption per resident from FY 2013 to FY 2014.

Figure 4



For FY14 alone, SDCWA member agencies with the highest average water consumption per resident were Santa Fe Irrigation District, Rainbow Municipal Water District, and Valley Center Municipal Water District. SDCWA member agencies with the lowest average water consumption per resident in FY 2014 were Sweetwater Authority, City of San Diego, and City of Escondido (Figure 6).

These diverse levels of water consumption among member agencies can be attributed to many factors, including:

- Different rainfall, temperature and evaporation rates among member agencies;
- Variable population growth rates;
- The degree of population density among member agencies;
- Various socio-economic factors;
- Varying water prices⁹

Notably, during the first three years of the Study period, Yuima Municipal Water District had been one of the SDCWA member agencies with the lowest average water consumption per resident, but as drought conditions worsened and as wells and groundwater resources dried up, its residents were forced to purchase more water from SDCWA, pushing the agency’s consumption up to one of the highest in the SDCWA.

⁹ See: http://www.swrcb.ca.gov/waterrights/water_issues/programs/drought/conservation_reporting_info.shtml

Figure 5

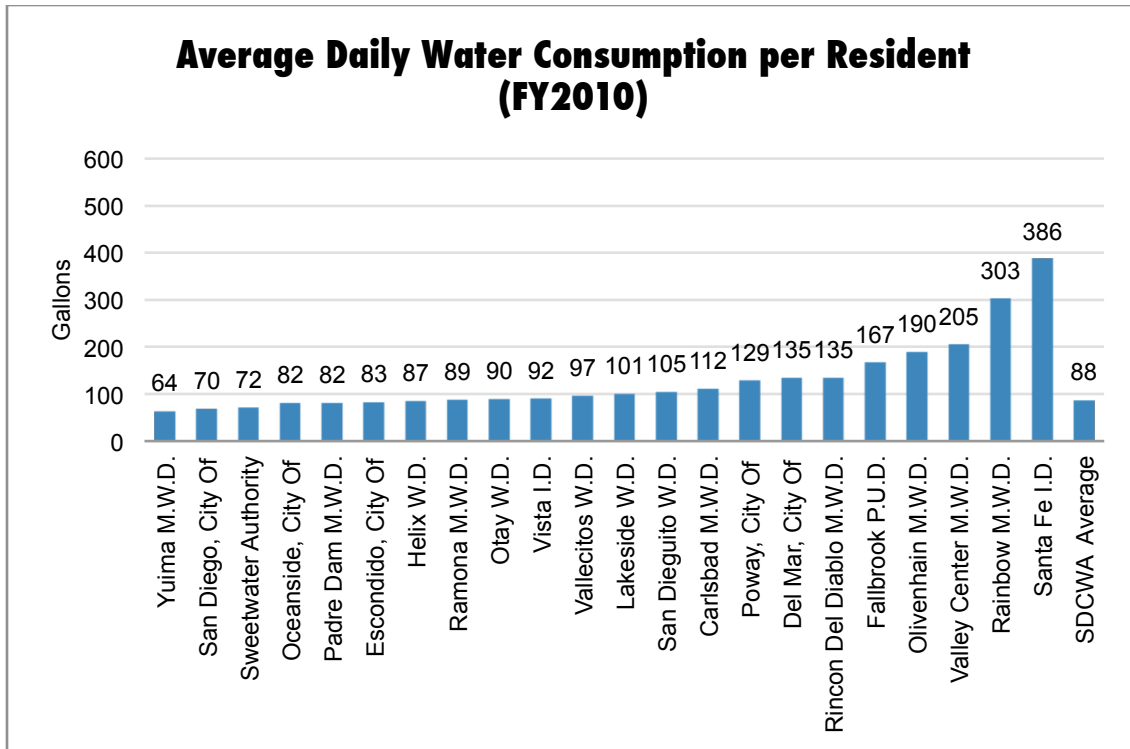
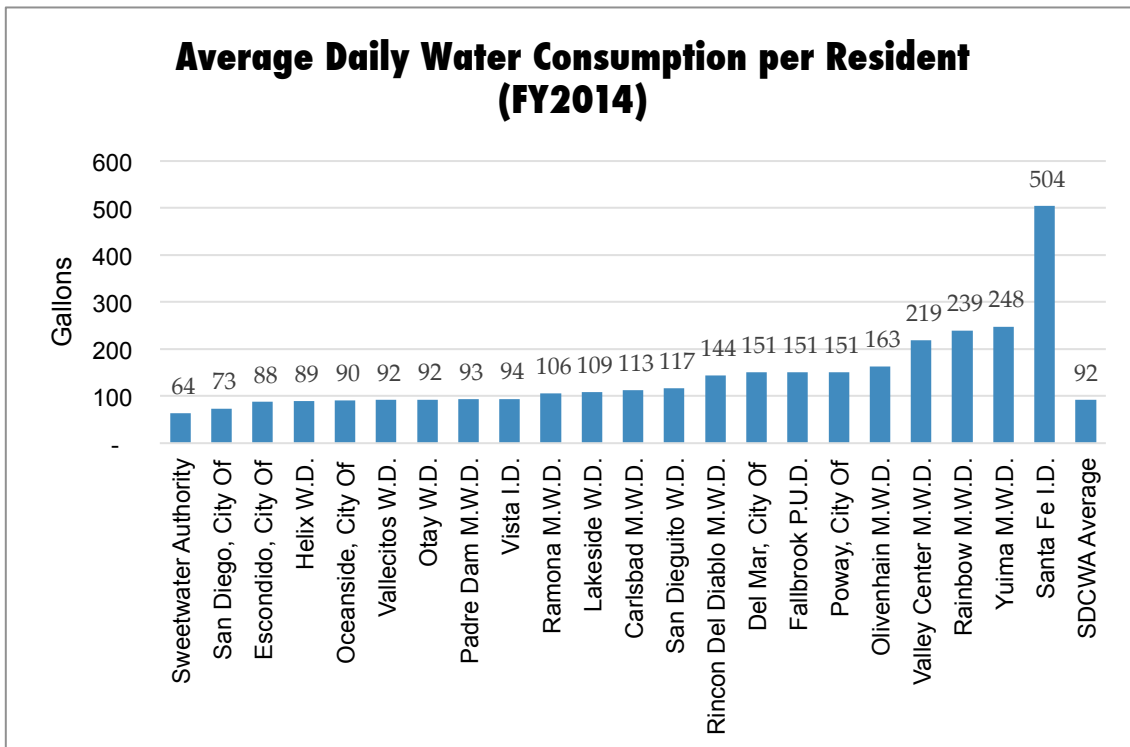


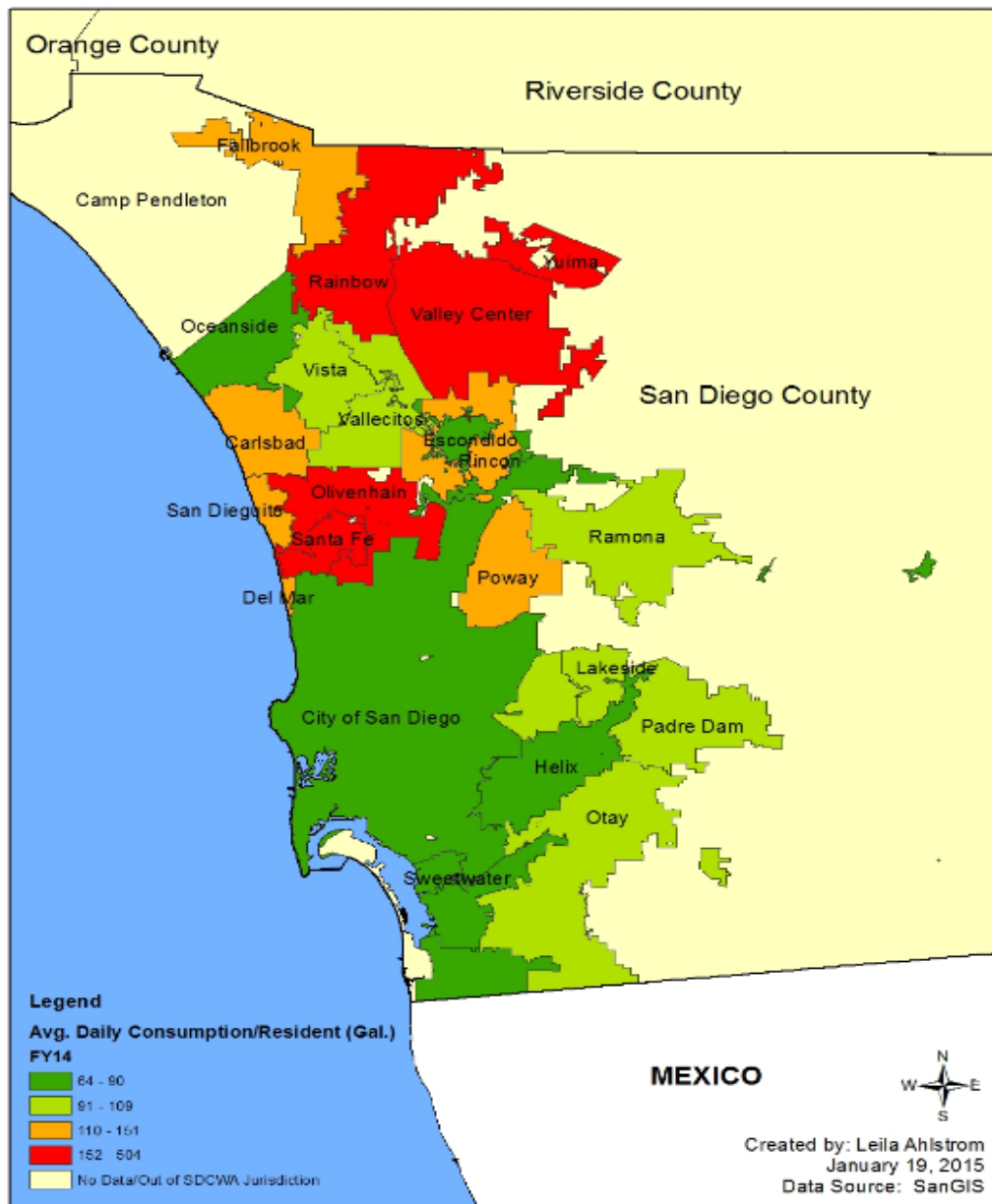
Figure 6



Additionally, some might assume that people living inland, where temperatures and evaporation rates are higher, use more water than coastal residents, but that is not what Equinox Center's analysis found. Residents in the City of Del Mar, for example, were among the highest water users in FY 2014. That same year, agencies further inland, like Escondido and Padre Dam, reported much lower daily consumption of 88 and 93 gallons per resident, respectively. (Figures 6 and 7)

Average Daily Water Consumption (Gal.) Per Resident, Per Agency FY2014

Figure 7



WATER AGENCY & UTILITY WEBSITE RESOURCES

Equinox Center also reviewed water agency websites to determine whether conservation resources and other pertinent information are being made available to ratepayers.¹⁰ While an agency's website is not the only way to communicate with ratepayers, it is a cost-effective means to provide helpful tools and data that may result in reduced water use by customers. (Table 1)

Table 1

San Diego County Water Agencies ¹¹	Up-to-Date Consumption & Conservation Data	Prominent Home Page Drought Notification	Conservation Tips	Landscape Conservation Education Resource	Rebate Information	Posted Water Restrictions	Multi-lingual Water-Related Communication
Carlsbad M.W.D	No	No	Yes	Yes	Yes	Yes	No
County Water Authority	Yes	Yes	Yes	Yes	Yes	N/A ¹²	Yes
City of Del Mar	Yes	No	Yes	Yes	Yes	Yes	No
City of Escondido	No	Yes	Yes	Yes	Yes	Yes	Yes
Fallbrook Public Utility District	No	Yes	Yes	Yes	Yes	No	No
Helix Water District	No	Yes	Yes	Yes	Yes	Yes	No
Lakeside Water District	No	Yes	Yes	Yes	Yes	Yes	No
Metropolitan Water District of So-CA	No	Yes	Yes	Yes	Yes	N/A ¹³	Yes
City of Oceanside	No	No	Yes	Yes	Yes	Yes	Yes
Olivenhain M.W.D	No	No	Yes	Yes	Yes	Yes	No
Otay Water District	No	No	Yes	Yes	Yes	Yes	Yes
Padre Dam M.W.D	No	Yes	Yes	Yes	Yes	Yes	No
City of Poway	No	No	Yes	Yes	Yes	Yes	No
Rainbow M.W.D	No	No	Yes	Yes	Yes	Yes	Yes
Ramona M.W.D	No	Yes	Yes	Yes	Yes	Yes	No
Rincon Del Diablo M.W.D	No	Yes	Yes	Yes	Yes	Yes	No
City of San Diego	No	Yes	Yes	Yes	Yes	Yes	Yes
San Dieguito Water District	No	Yes	Yes	Yes	Yes	Yes	Yes
Santa Fe Irrigation District	No	Yes	Yes	Yes	Yes	Yes	No
Vallecitos Water District	No ¹³	Yes	Yes	Yes	Yes	Yes	No
Valley Center M.W.D	No	Yes	Yes	Yes	Yes	Yes	Yes
Vista Irrigation District	No	No	Yes	Yes	Yes	Yes	No
Yuima M.W.D	No	Yes	No	No	No	Yes	No
Sweetwater Authority	No	No	Yes	Yes	Yes	Yes	Yes

¹⁰ See Appendix C for additional details on the website resource criteria/definitions.

¹¹ See Appendix B for website links for water Agencies.

¹² As wholesale providers, Metropolitan Water District of Southern CA, and SDCWA do not have water restrictions in place.

¹³ Vallecitos W.D. does have FY13 consumption data listed.

CONCLUSIONS & POLICY RECOMMENDATIONS

Within the study period, even after emergency drought conditions were declared, water consumption in the region rose. More than sixty percent (60%) of total reported use in the county for each year during the Study period was multi-family and single-family residential, whose demand for water is far more elastic than that of consumers in the commercial and public sectors.

Moreover, the trend of increased per-resident consumption after reaching conservation goals following the 2009 – 2011 drought period is concerning. Although the County's agencies are heeding the call for conservation during this current, unprecedented drought, long-term conservation should be a priority of decision-makers. Specific recommendations for residential conservation and efficient water use were presented in the 2012 H2Overview report and can be accessed [here](#). Those recommendations are listed in Appendix D and still remain relevant.

Additionally, while the Metropolitan Water District of Southern California and San Diego County Water Authority appear to have robust conservation campaigns, our review of SDCWA member agency websites found that there is inconsistency among agencies in maximizing the presentation of available resources that may lead to additional water savings. It is also unclear how effective the education campaigns are since overall water consumption rose during the Study period while outreach campaigns were taking place.

Finally, Equinox Center strongly supports the concept that, "What gets measured, gets managed better." A lack of consistency in how agencies collect and report water consumption based on customer class, and near complete lack of keeping up-to-date data on consumption and conservation on public websites is evident. Increased consistency and open data can help Equinox Center, policy makers and community members understand the trends and help improve quality of life in the region.

In addition to the recommendations listed in the 2012 H2Overview report, Equinox offers the following policy recommendations:

- 1) Water agencies should use consistent definitions of customer classes and collect usage for each of those customer classes.
- 2) Water usage data by customer class should be posted on water agency websites as frequently as possible and not less than quarterly, for customers, researchers and the media.
- 3) The effectiveness of water conservation and efficiency campaigns should be monitored using quantitative and qualitative metrics. Those metrics

should be made available to the public.

- 4) Water agencies should maximize the opportunity to cost-effectively present current data and conservation resources to their customers by making the information available on their websites.
- 5) Effective conservation messaging should be relatively consistent, from the state all the way down to local member agencies (recognizing that some messaging will be customized for specific audiences).

Appendix A: Reported Water Agency Data

Data can be found on Equinox Center's website, at <http://www.equinoxcenter.org/research-topics/water/overview.html>

Appendix B: Water Agency Website Links

San Diego County Water Agencies	Link
Carlsbad Municipal Water District	www.carlsbadca.gov/services/depts/pw/utills/water/default.asp
County Water Authority	www.sdcwa.org
City of Del Mar	www.delmar.ca.us/167/Clean-Water-Program
City of Escondido	www.escondido.org/water-division.aspx
Fallbrook Public Utility District	www.fpud.com
Helix Water District	www.hwd.com
Lakeside Water District	www.lakesidewaterdistrict.com
Metropolitan Water District	www.mwdh2o.com
City of Oceanside	www.ci.oceanside.ca.us/gov/water
Olivenhain Municipal Water District	www.olivenhain.com
Otay Water District	www.otaywater.gov
Padre Dam Municipal Water District	www.padredam.org
City of Poway	www.poway.org/166/Water-Sewer-Services
Rainbow Municipal Water District	www.rainbowmwd.com
Ramona Municipal Water District	www.rmwd.orgs
Rincon Del Diablo Municipal Water District	www.rinconwater.org
City of San Diego	www.sandiego.gov/water
San Dieguito Water District	www.encinitasca.gov/index.aspx?page=52
Santa Fe Irrigation District	www.sfidwater.org
Vallecitos Water District	www.vwd.org
Valley Center Municipal Water District	www.vcmwd.org
Vista Irrigation District	www.vid-h2o.org/home/index.asp
Yuima Municipal Water District	www.yuimamwd.com
Sweetwater Authority	www.sweetwater.org

Appendix C: Additional Details on Website Resource Criteria/Definitions

Up-To-Date Consumption & Conservation Data: This indicator is based on whether the agency's website provides up-to-date water consumption and conservation data from the previous year or fiscal year, for jurisdictions served by the agency.

Prominent Home Page Drought Notification: This indicator is based on whether the agency's website has a graphic, or written notice, easily seen on the homepage (or water utility main page), about the drought affecting the State of California.

Conservation Tips: This indicator is based on whether the agency provides water conservation tips directly on their website or a link to other websites with published conservation ideas.

Landscape Conservation Education Resource: This indicator is based on whether the agency either offers workshops or provides a link to local workshops that teach how to landscape with drought-tolerant plants or how to water landscaping more efficiently.

Rebate Opportunities: This indicator is based on whether the agency either offers its own rebate program or has an easy to find link to rebate programs accessible to its customers. Rebates include products such as turf removal, rain barrels or water efficient home appliances.

Posted Water Restrictions: This indicator is based on whether the agency's website has water use restrictions, or a link to restrictions, posted.

Multi-lingual Communication: This indicator is based on whether the agency's website can either be translated into multiple languages through a translation tool or has information written in multiple languages.

Appendix D: 2012 H2Overview Report Policy Recommendations

- 1) **Ensure that future demand estimates at the local and regional level include all new green building codes** that would require buildings to have more water efficient technologies installed.
- 2) **Prioritize implementing water pricing structures that incentivize conservation and discourage waste.** There is evidence that steeply tiered and budget based pricing structures do this and also help water utilities keep their revenue and rates more stable during times of drought. More research is needed to better understand the opportunities with this kind of pricing and how to convey its complexities to ratepayers.
- 3) **Consider setting more aggressive conservation targets than those laid out in SBX7-7** and reach those targets by maintaining or expanding incentives and rebate programs and creating financing programs that encourage consumers to retrofit existing homes with the most efficient technologies available.
- 4) **Coordinate regional water consumer education campaigns** using the latest research from social psychology that shows what messaging is most effective in influencing thoughtful water use behavior. Water agencies can also work with the private sector to develop public-private partnerships that can help move the needle on consumer demand.
- 5) **Use and invest in billing and data collection systems** that can help water managers **better assist the residents** that are over watering or have significant leaks.
- 6) **Explore the possibility of working with other water utilities throughout the state to support research on whether/how the sale of water could be decoupled from water efficiency services** as is done in the electric utility industry.
- 7) **Engage with a wide range of stakeholders in the region**, including the private sector, those from the energy industry, land use planners and others **in a regional dialogue to weigh the options of what our**

future water portfolio should look like, and to jointly act to implement solutions.

- 8) **Conduct research better documenting the costs and benefits of conservation measures versus the costs of new infrastructure projects**, and exploring the issue of who pays for such measures and how. More research is also needed to understand how demand hardening would affect water management efforts in times of drought if more aggressive long term water conservation methods were put in place.

Appendix E: Acknowledgements

Equinox Center Research Fellows

- Leila Ahlstrom, UCSD Graduate School of International Relations and Pacific Studies
- Nicholas Beaudoin, UCSD Graduate School of International Relations and Pacific Studies
- Paul Sherman, UCSD Graduate School of International Relations and Pacific Studies

Equinox Center's Team

- [Board of Directors](#)
- Stephen Heverly, Managing Director
- Jocelyn Maggard, Program Administrator
- Responsible Solutions, LLC
- Apex Strategies

San Diego County Water Agencies Responding in Good Faith to Public Records Act Requests

- Carlsbad M.W.D.
- City of Del Mar
- City of Escondido
- Fallbrook P.U.D.
- Helix W.D.
- Lakeside W.D.
- City of Oceanside
- Olivenhain M.W.D.
- Otay W.D.
- Padre Dam M.W.D.
- City of Poway
- Rainbow M.W.D.
- Ramona M.W.D.
- Rincon Del Diablo M.W.D.
- City of San Diego
- San Diego County Water Authority
- San Dieguito W.D.
- Santa Fe I.D.
- Sweetwater Authority
- Vallecitos W.D.
- Valley Center M.W.D.
- Vista I.D.
- Yuima M.W.D.