Our County

Water Briefing

Acknowledgments

Our County Water Briefing was developed by UCLA, LARC, Liberty Hill, and BuroHappold in June 2018.

Content derived from the Los Angeles Regional Collaborative for Climate and Sustainability (LARC) A Greater LA: Climate Action Framework (December 2016) and the Sustainable LA Grand Challenge Environmental Report Card for L.A. County - Water (in review).

Background

About Our County

Our County - the countywide sustainability plan - is an effort to outline a bold, inclusive vision for growth that balances the co-equal values of environment, equity, and economy. In a region as large and urbanized as Los Angeles County, many of the most pressing sustainability issues are best solved using a regional approach through collaboration across city and county boundaries. Recognizing this, Our County will be countywide in scope, setting regional goals, targets, and strategies. With contributions from residents who live and work throughout the County, the plan will present actionable strategies that support healthy communities, environmental stewardship, and a just economy.

What will the plan address?

Our County will present a comprehensive pathway to sustainability addressing a wide range of subjects including climate change, water, energy, resource management, land use, transportation, open space, biodiversity, public health, economy and workforce development, housing, resilience, and governance. Countywide goals and strategies will be informed by data as well as stakeholder and community engagement. The planning team will seek input and feedback from community-based organizations and advocacy groups, County agencies and incorporated cities, the private sector, academic researchers, and the general public.

Who is preparing the plan?

The Chief Sustainability Office of Los Angeles County is leading the development of the plan, working with an interdisciplinary team of consultants, led by BuroHappold Engineering and researchers at the University of California Los Angeles (UCLA), with stakeholder engagement co-leadership from UCLA and Liberty Hill Foundation. Additional support is being provided by Estolano LeSar Advisors; Fehr & Peers; Gladstein, Neandross & Associates; Global Green; Studio-MLA; and Raimi + Associates.

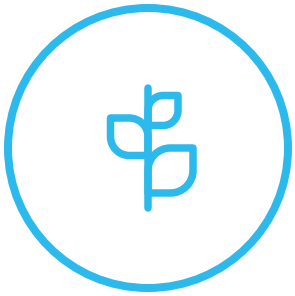
Why should I participate?

Our County is an opportunity to shape the future of Los Angeles County. In order for it to represent the entire region, we need to hear about your priorities for the future. Your input will guide the recommendations that arise from this process.

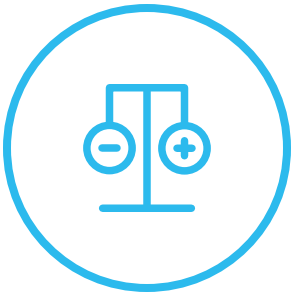
Our County Visions (Draft)

The following vision statements will guide the development of Our County:

Nurturing Healthy Communities



Fostering a Healthy Relationship with the Environment



Cultivating a Just Economy

Making It Happen

1. Introduction

Water Workshop Objective

The L.A. County Chief Sustainability Office - in partnership with BuroHappold Engineering, UCLA, and Liberty Hill Foundation - is hosting a series of workshops to inform Our County, the countywide sustainability plan. Our County is an effort to outline a bold, inclusive vision for growth that balances the co-equal values of environment, equity, and economy.

The objective for these workshops will be to discuss water issues and opportunities for the region, and take a deep dive into where and how water intersects with equity, public health, labor, housing, and other issues.

Briefing Document Contents

Water has been a critical factor in the history and growth of Los Angeles, and it remains one of the most important issues in the region's transition to a sustainable future. The realities of climate change, population growth, and earthquake risks, demand a new approach to water management in the region.

2. Where We Get Our Water

Local Precipitation

L.A. County has a Mediterranean climate defined by hot, dry summers and cool winters; precipitation varies greatly from year to year and falls almost exclusively between November and April. Furthermore, the region's geography leads to wide spatial variations in climate, precipitation and flood risk.

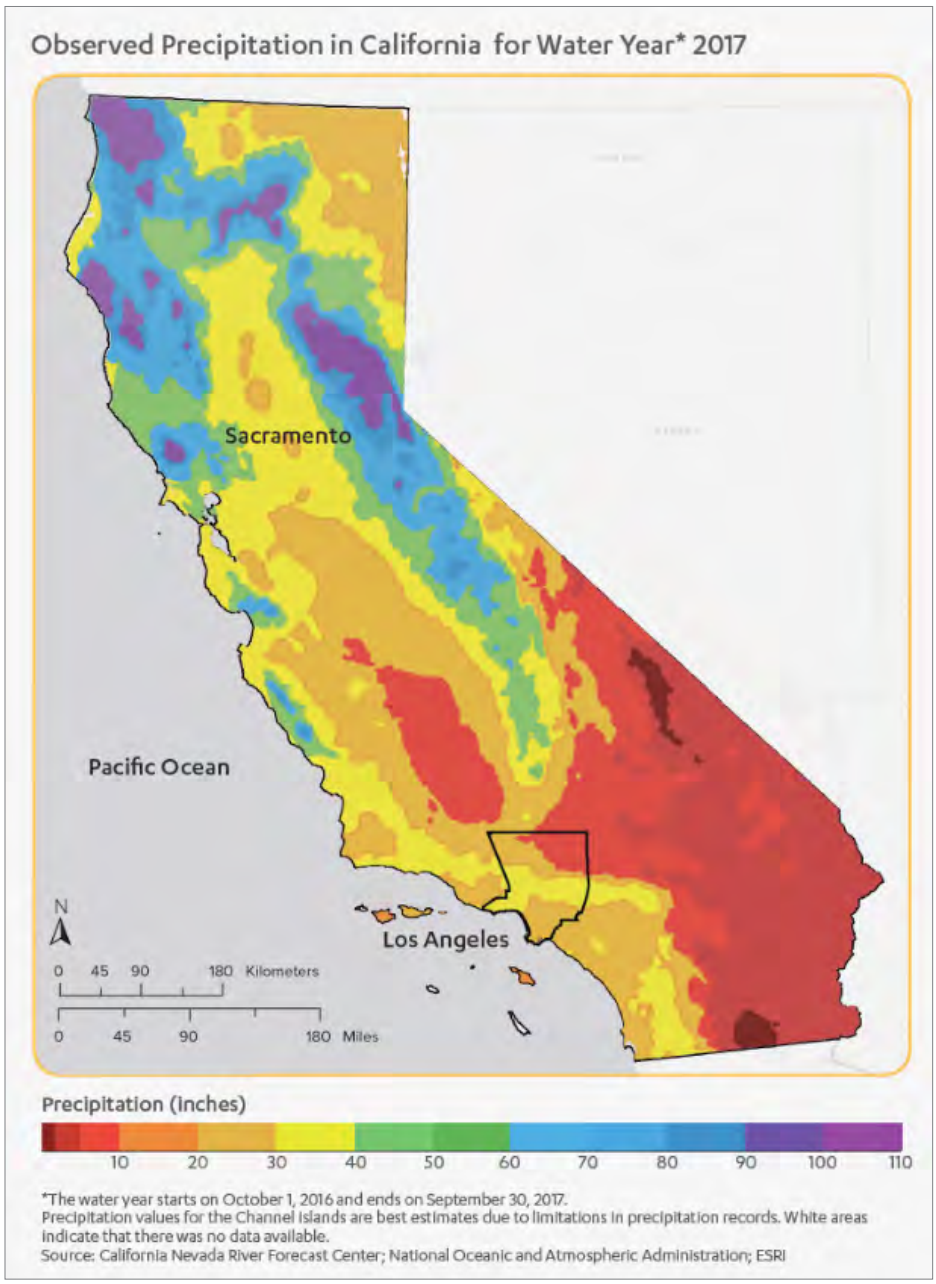


Figure 1. There is great spatial variation in precipitation throughout the state, ranging from a couple of inches to over 100 inches annually, with northern California generally receiving greater rainfall than southern California.

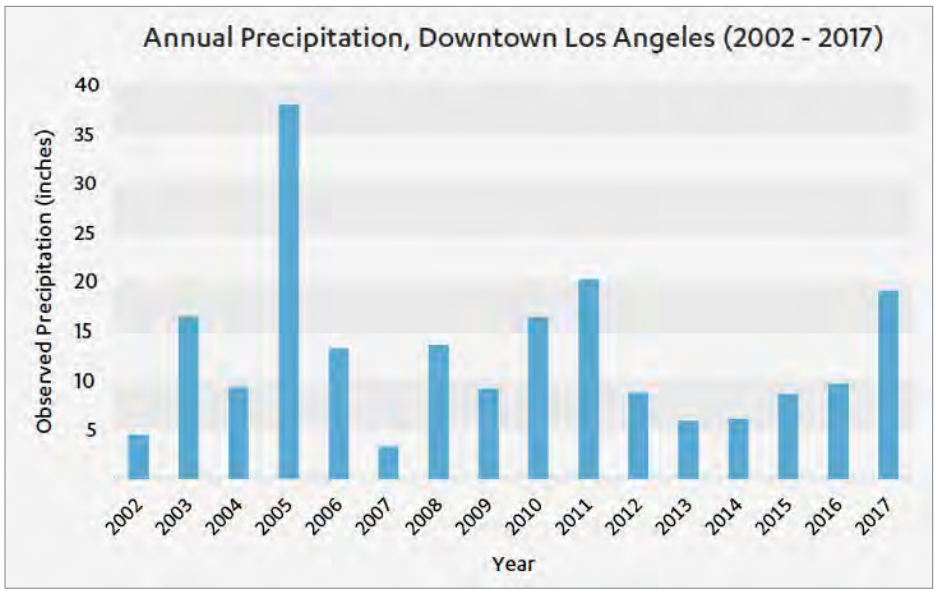


Figure 2. There is great variation in annual rainfall within Los Angeles, with record droughts and record wet years occurring over the past decade. After California's 5-year record drought, the winter of 2016-17 was one of the wettest on record with annual precipitation reaching 18 inches in downtown Los Angeles.

L.A. County Water Sources

The region's water management strategy has historically relied heavily on imported water, which primarily comes from the Sierra Nevada snowpack. This snowpack feeds Northern California rivers and the Bay Delta, and is transported to Southern California through the California Aqueduct. The Colorado River is the second major source of imported water to the County. The L.A. Aqueduct provides water from the Owens Valley to the City of Los Angeles.

Figure 3. L.A. County's imported water comes from Northern California, the Sierra Nevadas, the Owens Valley, and the Colorado River. The Northern California water is primarily collected as runoff and snowmelt.

L.A. County Water Sources

Approximately 55% of the water consumed in L.A. County in 2016 was sourced from outside the region. Groundwater resources provided 35% of total supply, whereas local recycled water provided 10%. Within the City of Los Angeles, over 85% of the water supply was imported from outside the region. Just under 1.5 million acre-feet of water was supplied to L.A. County in 2016 - nearly half a million acre-feet less than in the year 2000.

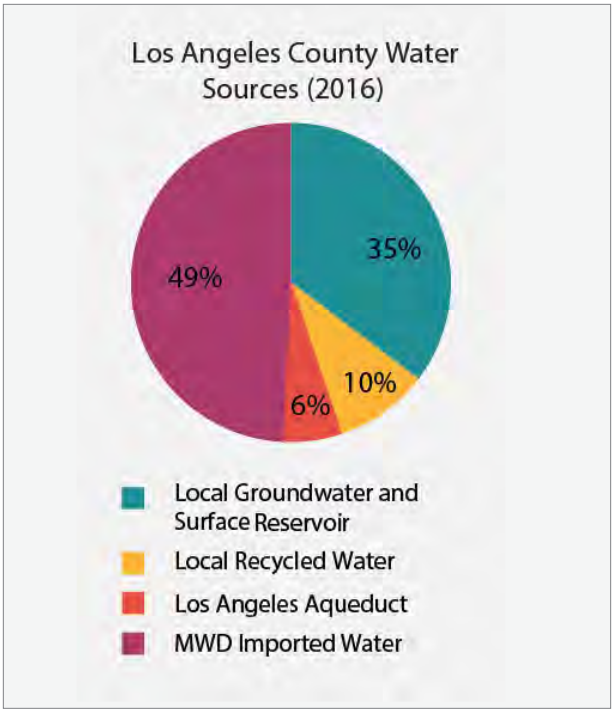


Figure 4. Approximately 55% of the water consumed in L.A. County in 2016 was sourced from outside the region. Groundwater resources provide 35% of total supply, whereas local recycled water provides 10%.

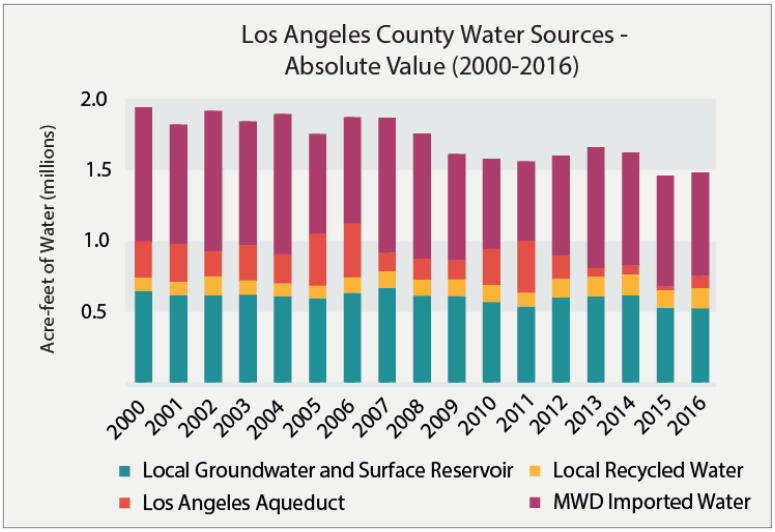


Figure 5. Just under 1.5 million acre-feet of water was supplied to L.A. County in 2016 - nearly half a million acre-feet less than in the year 2000.

3. Current Water Consumption and Recent Trends

Per capita water use in Southern California decreased during the drought period; however, use is rising again. Many water utilities pulled back on aggressive water conservation messaging and enforcement programs after the Governor's rescindment of mandatory drought restrictions. Rainfall in the winter of 2016-17 refilled surface reservoirs and buoyed water supplies, leading to the end of mandatory restrictions. By early 2018, many parts of Southern California showed signs of returning to historic (2013) levels of water consumption, part of a general statewide trend. The extremely hot conditions in SoCal in the summer and fall of 2017 as well as below average precipitation (approximately 5 inches in the last 16 months) contributed to increased water use.

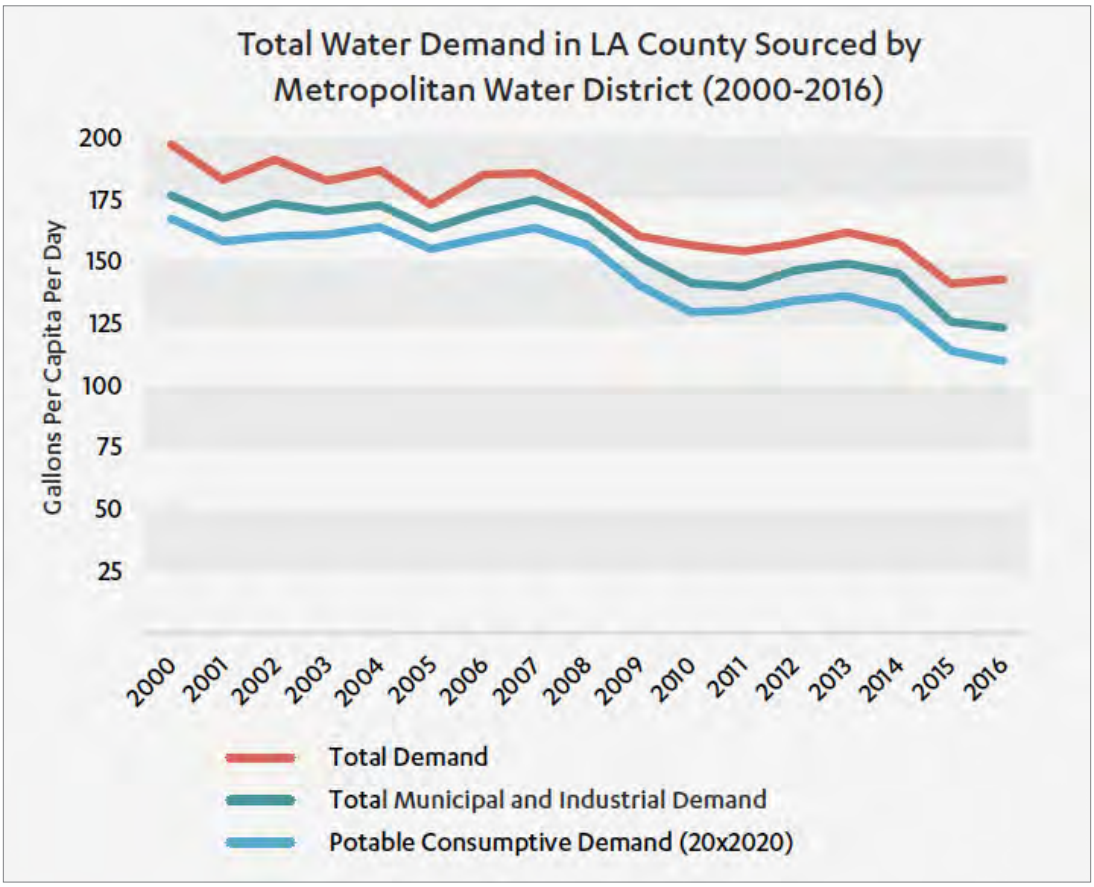


Figure 6. Total water demand decreased by over 25% in 16 years, dropping from 200 gallons per capita per day (GPCD) in 2000 to approximately 146 GPCD in 2016 (with potable consumptive demand down to 110 GPCD). In response to the record drought, total annual water use decreased by 16% in 2015 compared to 2013, and another 1% in 2016, but then rose in 2017 when water reduction mandates were lifted.

4. Current Water Management

Potable Water Supply

Over 200 active water systems (public and private) are involved in the management and distribution of potable water in the region. Many small private water companies and special districts are not adequately equipped to meet climate change challenges or other potential disruptions to the system. Water pricing varies widely across these different entities and disadvantaged communities often pay higher rates, have less access to capital for new investments, and have limited authority over water management systems.

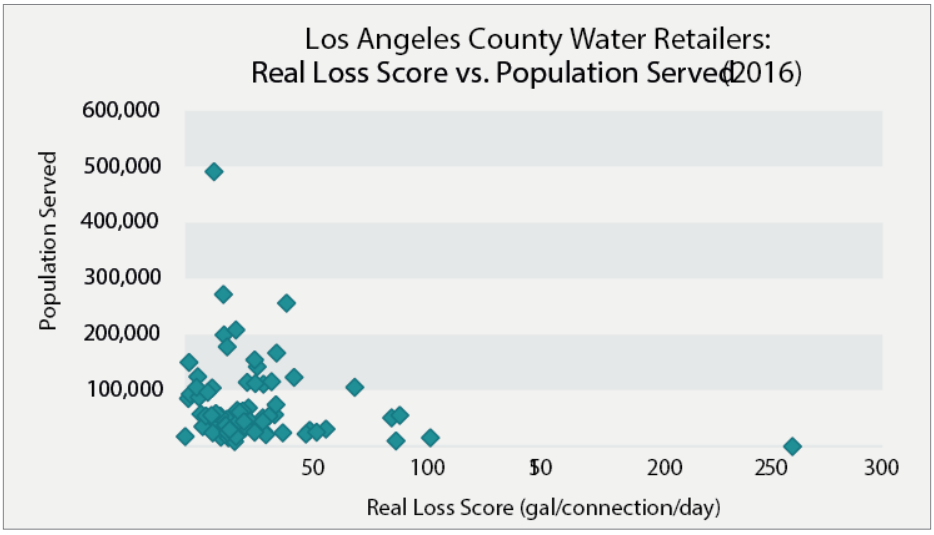


Figure 7. The challenge of maximizing local water resources and meeting water demand for a growing population in L.A. County's arid climate is made harder by the aging pipe infrastructure. Of the 77 water retailers (small and large) evaluated here, the smaller retailers had much greater water loss in their systems compared to larger retailers.

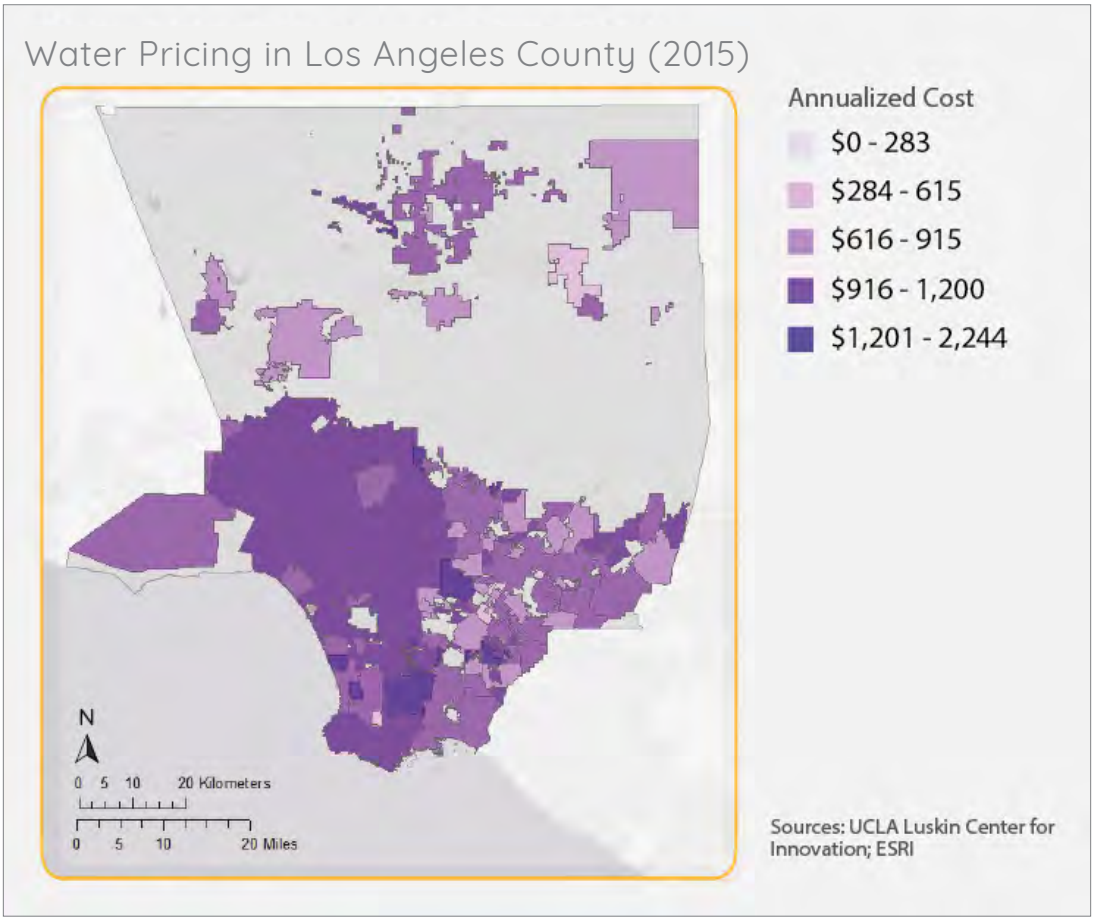


Figure 8. Water pricing varies widely across L.A. County (see map). In a study of California in 2015, single-family households earning less than $25,000 spent on average 1.8% of their income on basic water services before drought-related charges; those charges brought the rate up to 2.1 percent of income, more than what both the California and US EPA consider to be affordable.

Groundwater Basins

California, unlike other states, has no comprehensive legal regime for regulating rights to groundwater. The majority of the County's groundwater resources lie in adjudicated basins -- those for which a court has approved an agreement among water rights holders, and for which a groundwater master has been appointed to oversee management. Some regional basins are not currently adjudicated: for example, the Santa Monica Basin, the Hollywood Basin, and a small part of the Central Basin are not covered by court-approved management agreements.

Despite the significant achievements of the adjudication processes over decades, there are still many municipalities and water utilities in the region that do not have access to groundwater. Given the importance of groundwater as a long-term supply, such entities will need access.

Many of the region's groundwater basins have significant additional storage capacity that is not utilized. Overall, there is the potential for 850,000 acre-feet or more of additional groundwater to be stored in regional basins, but there are currently no processes in place to allocate the stored water to users outside of current pumpers, nor pathways to systematically fill the basins to capacity. However, the re-adjudication of the Central and West Coast groundwater basins includes a new and promising provision for an exchange pool for rights' holders to purchase additional water.

A further groundwater management challenge is the prevention of saltwater intrusion. The Los Angeles County Flood Control District is one of the lead agencies managing an extensive system of freshwater injection wells that controls saltwater intrusion to drinking water basins. Sea level rise is anticipated to increase saltwater intrusion and will, therefore, require an adaptive response by agencies responsible for the coastal barrier system.

Figure 9 L.A. County's 35 spreading grounds replenish the County's groundwater basins that provide local water supplies for much of the region. There are adjudicated and non-adjudicated groundwater basins in L.A. County, with the largest four adjudicated basins being the West, Central, San Fernando Valley, and Antelope Valley basins.

Wastewater Treatment and Recycling

The large treatment plants in the region are owned either by the Los Angeles County Sanitation Districts or the City of Los Angeles. Combined, all of the large treatment plants treat and discharge ~247 billion gallons a year to the ocean and local waterways like the L.A. and San Gabriel Rivers. Many plants also produce recycled water that is being used in place of potable water for non-consumptive uses such as industrial, landscape, and recreational purposes, as well as for indirect potable reuse through groundwater recharge. Wastewater recycling offers an additional source of local water for the region and the current production can be significantly expanded.

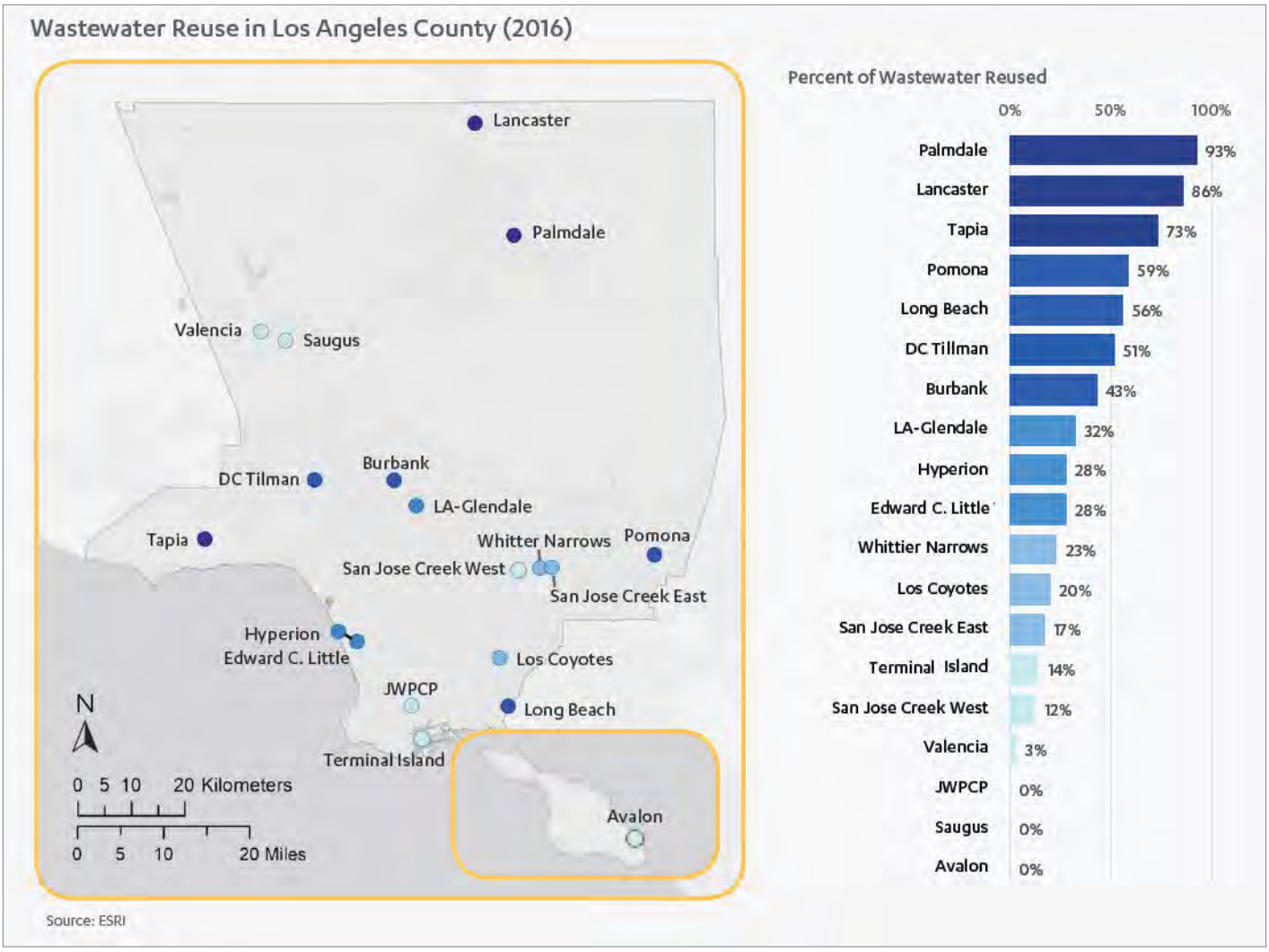


Figure 10. Treatment and reuse of wastewater is critical to support a reduction in the County's reliance on imported water. Of the 19 treatment plants in L.A. County shown on this map, Palmdale, Lancaster and Tapia reuse most of their wastewater (93%, 86% and 73% respectively), whereas three do not reuse any. The volume of reused water in the County has increased approximately 16% between 2007 and 2016 (from 63.2 billion gallons to 73.5 billion gallons, annually).

5. The Quality of Surface Water, Groundwater, and Drinking Water

The LA region has long struggled with water quality problems in both surface water and groundwater. The vast majority of L.A. County surface waters do not meet one or more of their beneficial uses (e.g., recreation, warm water habitat, municipal supply) due to high concentrations of one or more pollutants.

Studies have identified industrial chemicals prevalent throughout the County's groundwater basins at levels above threshold concentrations. Some cities, such as Santa Monica, are pumping contaminated groundwater, treating it, and then distributing it for use. A similar approach is being used and will be expanded to utilize more water from the San Fernando groundwter basin, which could provide up to 20% of the City of LA's water supply. This approach can be much less expensive than full cleanup of the groundwater aquifer, depending on the extent of contamination and type of pollutant.

Despite these widespread problems, based on existing monitoring data, nearly all L.A. County residents have been provided with clean drinking water, based upon primary contaminant concentrations. However, concerns remain about secondary taste, color, and odor problems in some communities.

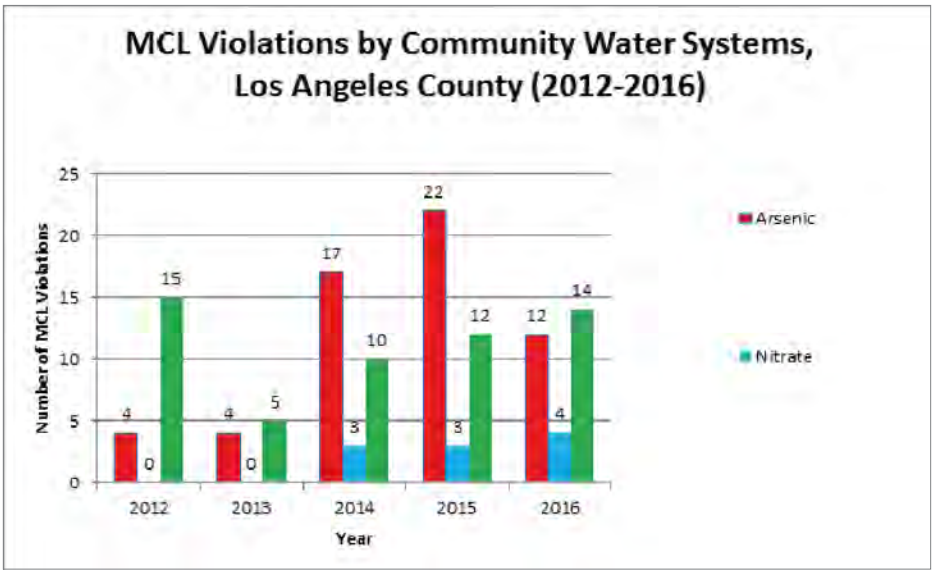


Figure 11. All public water systems are required to monitor water quality for compliance with maximum contaminant levels (MCLs). From 2012 through 2016, 46 water systems, nearly all of them small systems, had violations of at least one MCL, concerning either arsenic, nitrate, or total coliform bacteria.

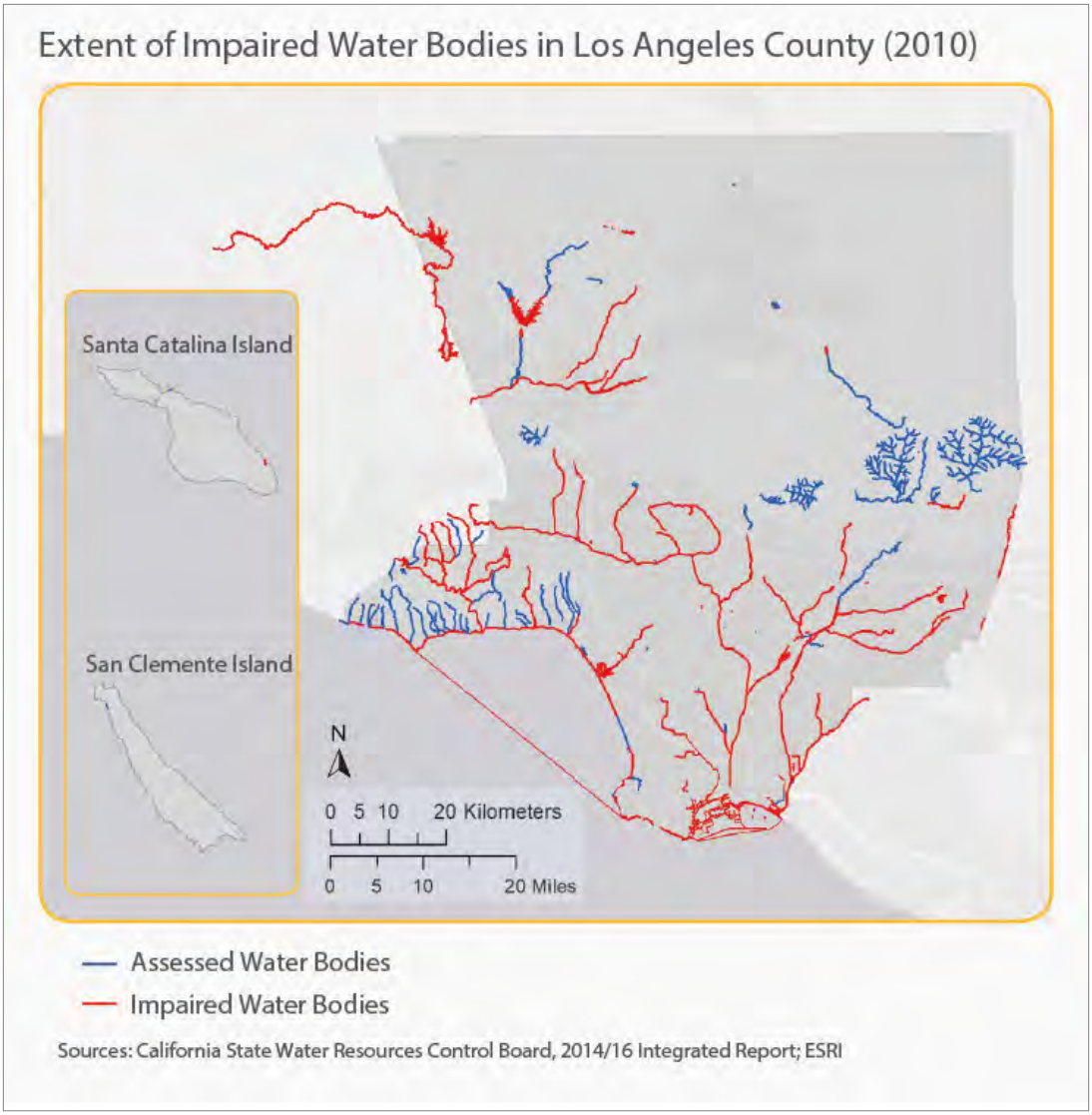


Figure 12. Surface water quality in Los Angeles County is poor. Approximately 85% of L.A. County assessed rivers, streams and shorelines, and essentially 100% of assessed bays, harbors, lakes and estuaries, are impaired for one or more pollutants. Organics, pesticides, metals/metalloids, and trash encompass the vast majority of the impairments (ranging from 87% to 98%). The fecal indicator bacteria, metals /metalloids, and pH + miscellaneous pollutant categories each impair over 20% of the assessed water body lengths.

6. Other Regional Water Management Considerations

Climate Change

Climate change will add further uncertainty to a system that is already highly variable. Climate change is increasing temperatures and altering the amounts and timing of precipitation, snowpack, and runoff, both locally and in regions from which L.A. County imports water.

Specifically, UCLA scientists predict:

1. An increase in temperature of 4-5 degrees Fahrenheit in the L.A. region by 2050;
2. If nothing is done to decrease greenhouse gas emissions, a loss in Sierra Nevada snowpack of 64% by the end of the century;
3. Increasing precipitation extremes (both wet and dry) by the end of the century;.
4. Increase in the likelihood of severe flooding events.; .

These changes are predicted to dramatically decrease water availability statewide. Combined with increased temperatures and evaporation, scientists expect climate change to increase uncertainty year to year in statewide and local supplies and to reduce the overall amount of water available to import to the region over the long term.

Sea level rise caused by climate change, and the need to ensure sufficient water for ecosystem health, will further limit the availability of water from the Bay Delta. Sea level rise is also anticipated to increase the potential for saltwater intrusion into coastal groundwater basins in L.A. County.

California's recent drought has added urgency to ongoing efforts of expanding water conservation measures and boosting reliable local supplies. In 2018, parts of Northern California received better than average precipitation while most of Southern California received below average precipitation.

Scientists conservatively project a loss in Sierra snowpack of at least 25% by 2050.

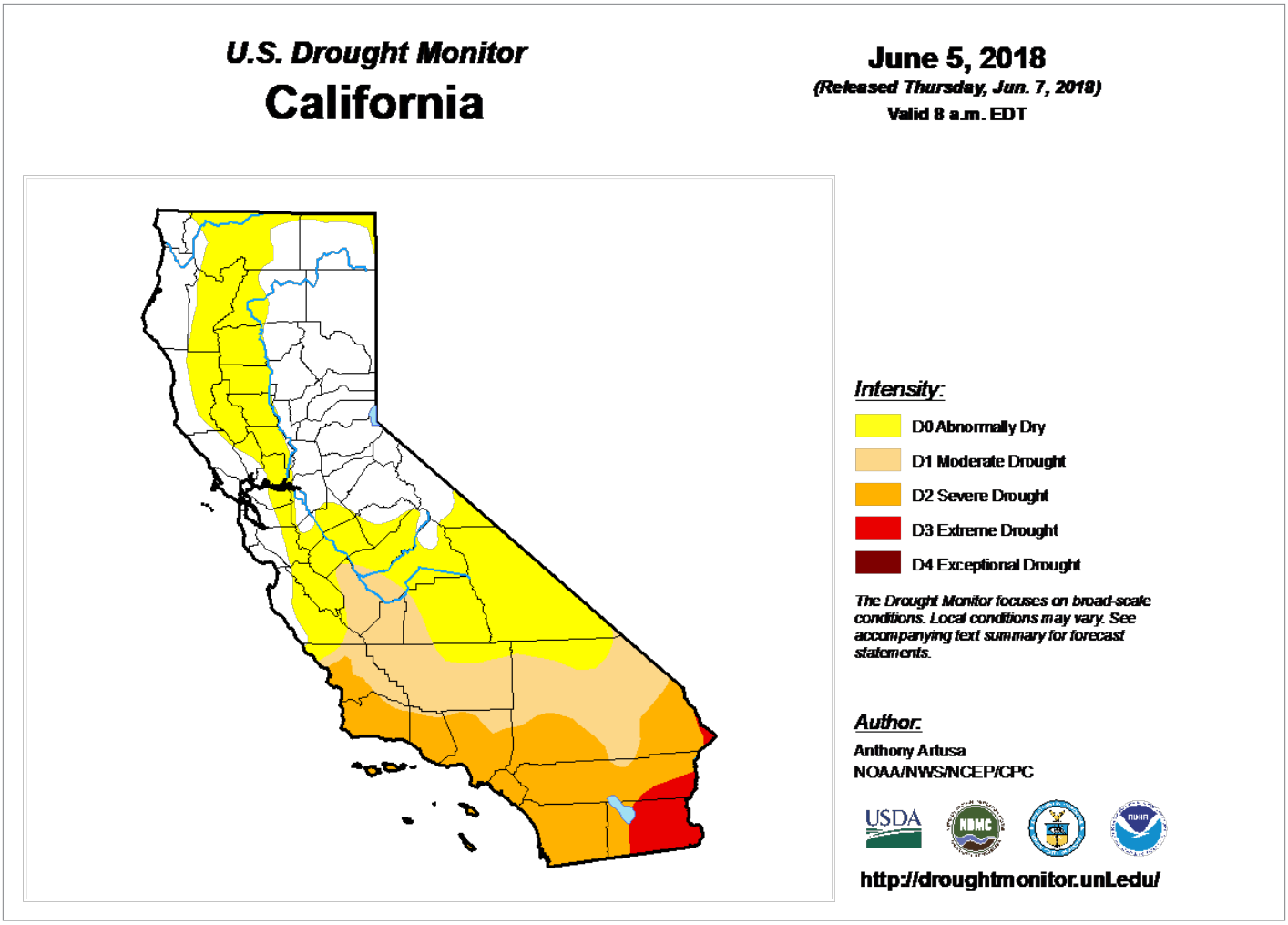


Figure 13. Most of L.A. County remains in severe drought condition.

Earthquake Risk

The potential for extensive damage to Bay Delta levees and to transmission pipes for imported water presents a reliability and resilience challenge. Studies by the USGS, academics and others have demonstrated that the County's water system is at risk from seismic activity. An earthquake of 7.8 or greater could sever the County's connection to imported water supplies through the State Water Project, L.A. Aqueduct, and Colorado River Aqueduct.

The water pipe network within L.A. County is also vulnerable to the impacts of earthquakes. Proactive infrastructure upgrades, such as the installation of earthquake-resistant ductile iron pipes, have been piloted in the City of Los Angeles.

Emergency Storage

The recently completed Resilient Los Angeles Plan by the City of Los Angeles and USGS vulnerability assessment both conclude that the region does not have adequate water storage in the event of an emergency. Response to fire and providing water for hospitals are two extremely high priorities.

Population Increases

Although Los Angeles County utilizes less water today than it did 40 years ago, there is projected to be an additional 1.5 million people in the County by 2050, thereby increasing the potential for higher water demand.

Urban Hydrologic Transformation

Widespread urban land cover transformations have created impervious surfaces that reduce stormwater infiltration, increase the frequency and duration of runoff, increase flood risk, and contribute to increased pollutant loads. Standards for new development and investments in retrofits of existing development can serve in part to mitigate these impacts.

Potential Indicators

Water Consumption and Conservation	Water consumption [need to define scale and units]	TBD - Cost of water		
Water Sources and Supply	Percent local water	TBD - Groundwater supply / management	Percent wastewater reused	
Water Quality	Exceedances of primary and secondary drinking water standards	TBD - Safe and drinkable water in homes	Extent of impaired waterbodies	Exceedances of MCLs in groundwater
Water Infrastructure	Amount of stormwater captured	Amount of water lost to leaks	Number and volume of sewage spills	TBD - Investments in local water infrastructure
	TBD - Flooding	TBD - Jobs related to water supply, distribution and repairs		

7. Draft Goals, Potential Strategies and Indicators

The following are major goals and some of the potential strategies in support of water reliability and resilience. While there are hundreds of possible strategies related to water management, we have focused on those that will benefit most from collaborative planning and implementation across the County. We also intend for each goal to take equity considerations into account, so as to reduce disparate outcomes experienced by disadvantaged communities, particularly low income communities of color, with respect to impacts, benefits, and resources related to water. Additionally, water goals and strategies must take resiliency into consideration, including but not limited to the impacts of a changing climate. Economic benefits and risks are also a key concern.Please note that these goals and strategies are presented as a basis for discussion at the Water and People workshop; our intention is that they be edited, removed, or added to as a result of stakeholder input.

Goal A: Improve Community Benefits and Reduce Disparities in Water-Related Impacts

Potential Strategies:

- Develop creative strategies for reducing or subsidizing rates that include drafting model rate structures and/or water budgeting rate structures for public water retailers to adopt.
- Create financing mechanisms to repair water infrastructure in smaller districts and ensure rates are kept affordable.
- Invest in educating a diverse and inclusive workforce to implement a more sustainable water system.

Goal B: Reduce Water Use

Potential Strategies:

- Implement strong water conservation measures.
- Transition to landscapes that need less water, can thrive in warmer weather, and can withstand potential floods.
- Implement a “Net Zero” water usage policy to reduce anticipated additional demand for new development through onsite reuse or investment in water-saving retrofits in other parts of the region (smart irrigation technologies, turf replacement, replacing old appliances and more).

Goal C: Protect and Improve Water Quality

Potential Strategies:

- Invest in multi-benefit water infrastructure to increase local supplies, manage flooding, improve water quality, and provide additional community benefits.
- Assess regional drinking water systems to identify systemic drinking water quality issues.
- Develop a policy framework for addressing drinking water quality issues that originate from on-site plumbing issues.

Goal D: Advance Water Self-Sufficiency

Potential Strategies:

- Invest in multi-benefit stormwater infrastructure to increase local supplies, manage flooding, improve water quality, and provide additional community benefits.
- Increase rates of water recycling at major water treatment plants.
- Prioritize clean up of groundwater aquifers and maximize usage of available groundwater storage.
- Improve resiliency of the water supply in the face of a changing climate and increased climate risks through monitoring, equitable emergency plans, trained response teams, and more.

Goal E: Enhance Water Infrastructure while Prioritizing a Natural Systems / Green Infrastructure Approach

Potential Strategies:

- Ensure that multi-benefit water projects and remediation efforts are prioritized in disadvantaged communities (DACs).
- Address local flooding issues.
- Invest in upgrades of aging water infrastructure to reduce water loss through leaks or breakage.
- Decouple infrastructure maintenance and repair from water sales to enable water retailers to maintain their infrastructure.
- Invest in protection of floodplains/wetlands and other natural buffers to flooding.

Goal F: Improve Governance Structure for Better Accountability and Water Management

Potential Strategies:

- Develop new institutional arrangements for water management in order to increase regional collaboration in local water management.

8. Cross-Cutting Themes

Economy & Workforce Development

- Households are impacted by stressed water supplies. The average percentage of California household income spent on basic water service increased 2.1% in 2015 – more than what is considered to be affordable by CalEPA and the US EPA. Drought-related charges were responsible for this increase in expenditures.
- The quality of tap water provided in L.A. County (perceived and/or actual) can also impact household budgets. There are well documented accounts of discolored, foul-smelling and poor-tasting water coming out of taps in largely disadvantaged communities served by publicly-regulated drinking water systems across the County. Greater than 20% of the population in the County reports mistrust of their tap water, and this percentage is alarmingly higher in communities such as Jordan Downs/Watts, where over 80% of residents do not trust their tap water. This mistrust leads many households to bear out-of-pocket expenditures to purchase expensive non-tap sources such as bottled water or water from retail water shops.
- There is also an important relationship between water, the local economy, and workforce development. Investments in water infrastructure, e.g., storm water capture, water recycling, building retrofits for water efficiency—all have the potential to create jobs while enhancing local water supplies. Investments in these initiatives should consider ways to maximize economic and workforce development.
- Landscape transformation has the potential for significant employment and skill building in expertise for plant selection, landscape preparation for native and Mediterranean plant success, irrigation installation and tree maintenance and preservation. Nursery industry transformation to a more suitable palate will also generate jobs.

Public Health & Safety

- Poor water quality poses serious health risks. Storm water across the LA region is highly polluted with a mix of toxic contaminants, and beach water quality is generally poor during wet weather seasons due to storm water runoff. The majority of LA surface water (rivers, bays, lakes) are also impaired with one or more pollutants.
- Improving the quality of these waters is vital for ensuring public health and safety. Beach water quality is particularly important, given that over 50 million people enjoy swimming and surfing at L.A. County beaches every year. Swimming at beaches with high densities of fecal indicator bacteria can increase the health risks of stomach flu.
- The quality of drinking water is also critical to public health. The lack (or perceived lack) of access to high quality drinking water can lead County residents to reduce water consumption and/or replace it with sugary beverages which can lead to adverse health effects.

Housing

- Water conservation will be essential to decreasing dependence on imported water and increasing resilience to droughts.
- In single-family homes, over 50% of water use comes from landscape irrigation. Reducing irrigation through education for climate appropriate planting, replacing lawns with climate appropriate native plants, water pricing mechanisms, and/or watering restrictions will be important for curbing residential water use.
- A wide range of technologies are available to facilitate conservation in both residential and non-residential buildings, including graywater reuse; drip irrigation and weather-based irrigation controls; advanced meter infrastructure for detecting leaks and high water use; rainwater harvesting; and a myriad of plumbing retrofits for increased efficiency.

Land Use

- The high percentage of impervious surfaces in L.A. County impacts water supply and quality. In addition, transportation sector impacts water quality through direct and aerial deposition.
- The County loses over 100 billion gallons of rainwater each year due to its high percentage of impervious surfaces which prohibits groundwater recharge. This is a massive loss for a water-strained region. Impervious surfaces also increase storm water pollution and can also cause flash flooding and riparian habitat degradation. Initiatives to create more pervious surfaces in the form of parks, infiltration open spaces, and green infrastructure can help capture valuable rainwater while reducing environmental impacts and flood risks.
- Low-density sprawl throughout the County has created inefficiencies in resource distribution and use. It is associated with sprawling water infrastructure as well as high per-capita water use for single-family lawns and gardens. Limiting low-density exurban development will be an important strategy for efficient water use and distribution in the coming decades.

9. Local, Regional and State Targets

Local Targets

City of Los Angeles Sustainable City pLAn	• Reduce per capita potable water use by 20% by 2017, and 25% by 2035 • Reduce the purchase of imported water by 50% by 2025 • Source 50% of water locally by 2035 • Reduce annual sewage spills to 125 by 2017, 100 by 2025, and 67 by 2035 • Capture 150k acre-feet per year of stormwater by 2035 • Achieve GPA of 4.0 dry and 3.5 wet on beach report card by 2035
Santa Monica Sustainable City Plan (updated 2014)	• Increase to sourcing 100% of water locally by 2020 (currently 85%)

Regional Targets

Southern California Association of Governments (SCAG) 2008 Regional Comprehensive Plan	• Reduce regional per capita water demand by 25% by 2030, using land use and local management policies.

State Conservation Targets

Senate Bill X7-7 (Steinberg, 2009)	• Achieve a 20% reduction in per capita water use by 2020, compared to baseline use from 1995–2005.
Executive Order B-29-15 (2014), and corresponding State Board emergency regulations	• Required an immediate 25% reduction in overall potable urban water use. • Prohibited certain uses of water, such as hosing down driveways and sidewalks • Mandated monthly reporting by urban water suppliers.
Executive Order B-36-15 (2015) and B-37-16 (2016)	• Ordered the State Water Board to adopt a statewide water conservation approach mandating urban water suppliers to ensure at least a three-year supply of water to their customers under drought conditions. These emergency regulations only apply to residential gallons per capita per day (R-GPCD), with data from monthly reporting to the State Water Board available for public review.
Assembly Bill 1668 (Friedman, 2018) and Senate Bill 606 (Hertzberg, 2018)	• Sets indoor water use requirements of 55 GPCD by 2022 and 50 by 2030; outdoor water use targets will be developed by 2021.

State Water Recycling Targets

Recycled Water Policy, (State Water Board, 2009)	• Increase use of recycled water by 200,000 ac-ft./yr. by 2020 • Increase an additional 300,000 ac-ft./yr. by 2030.

State Groundwater Management Goal

Sustainable Groundwater Management Act (2014)	• Requires local agencies to adopt groundwater management plans, in order to protect local water sources against drought and climate change. Has a goal of sustainable groundwater management by 2042.


Our County