



● **Integrated Water Resources Plan Implementation Report 2018**

Summary

This report provides a progress update on achieving the resource development goals established in the 2015 Integrated Water Resources Plan (IRP) Update for the Colorado River, the State Water Project (SWP), local resources, and conservation. Despite long-term challenges, including regulatory and institutional constraints, climate change, growth in population and economy, groundwater overdraft, and infrastructure needs, the Metropolitan Water District of Southern California and its member agencies are making progress towards meeting the 2040 resource targets.

Significant progress has been made toward meeting the 2015 IRP Update's future targets with both short-term and long-term actions:

- Imported supplies from the Colorado River and SWP were sufficient to meet demands of Metropolitan in 2018. Metropolitan has worked closely with other agencies to improve reliability for the Colorado River and SWP with the Lower Colorado River Basin Drought Contingency Plan and funding commitments for the California WaterFix Project, respectively.
- Local supply production has increased following two years of improved hydrology. Metropolitan's Board adopted an interim Local Resources Program funding target of 170,000 acre-feet per year to encourage development of new local projects.
- Metropolitan modified its conservation programs to emphasize outdoor water savings through landscape transformation and training.
- Regional water demand remained relatively low due to conservation efforts and lasting effects of consumer awareness following the recent drought. Regional potable water use in 2017 remained relatively low at 130 gallons per capita per day.

Attachment 1 provides an account of activities, opportunities, and challenges for various components of the IRP strategy.

Purpose

Informational

Attachment

Attachment 1: Integrated Water Resources Plan Implementation Report 2018

Integrated Water Resources Plan Implementation Report 2018

Introduction

This attachment provides detailed information on programs and activities by the Metropolitan Water District of Southern California and member agencies in 2018 to further the region's water supply reliability to meet the 2040 Integrated Water Resources Plan (IRP) goals and targets. Significant progress has been made toward meeting the IRP's future targets with both short-term and long-term actions. This report provides an account of activities, opportunities, and challenges, along with the outlook for various components of the IRP strategy.

Background

In January 2016, Metropolitan's board adopted the 2015 IRP Update as the latest in an ongoing series of updates to its long-term adaptive management strategy. As with its predecessors, this update serves as a framework for future activity by Metropolitan and its member agencies. Specifically, the 2015 IRP Update identifies regional targets for water resource development to ensure water supply reliability for its service area through the year 2040. To that end, the 2015 IRP Update continues with the portfolio approach for water management. This approach includes a balanced mix of imported supplies from the Colorado River and the SWP, as well as maintenance and further development of the region's base of local supplies and conservation. If fully implemented, the 2015 IRP Update should lead to a low probability of water shortages or mandatory restrictions under planned conditions.

In July 2017, Metropolitan's Board adopted policy principles guiding Metropolitan's role in regional implementation of IRP targets for local supplies and conservation. The adopted policy principles direct Metropolitan to take an active role in identifying and evaluating opportunities for local supply and conservation within its service area.

2018 Conditions

Colorado River System

Drought conditions persisted in the Upper Colorado River Basin in water year 2018 with a runoff projection of 43 percent of normal. Snow accumulation peaked in early April measuring 74 percent of the seasonal peak average. August 2018 recorded its second lowest inflow to Lake Powell since 2002 with total reservoir system storage of 49 percent of capacity. Lake Mead storage level dropped by three feet during the year. However, because of the efforts of Lower Basin agencies, including Metropolitan, to store water in Lake Mead, there will be no shortages of Colorado River water through at least 2019.

State Water Project

Following record breaking precipitation in water year 2017, northern California experienced below normal conditions in water year 2018 with a runoff projection of 72 percent of normal. Snow accumulation peaked in late March measuring only 50 percent of the seasonal peak average. Cumulative rainfall at the end of the water year measured 79 percent of normal. The State Water Project Table A allocation to the State Water Contractors for calendar year 2018 was 35 percent of contracted amounts. Water levels at Lake Oroville, the principal SWP reservoir, were lowered as required in the Interim Flood Control Operations Plan to facilitate the ongoing reconstruction of the reservoir spillways and ensure safe working conditions.

Southern California

The first eight months of 2018 were hot and dry in southern California. The region experienced above-average temperatures with record temperature summer heat waves. For example, in July, downtown Los Angeles recorded its third-highest average temperatures while many other southland communities experienced their hottest July on record. Only 4.7 inches of precipitation were measured in downtown Los Angeles during water year 2017/18 (October 2017 through September 2018). This was only 32 percent of normal and was the third driest year since record-keeping began in 1877. However, regional water demand remained relatively low due to conservation efforts and lasting effects of consumer awareness following the recent drought. Regional potable water use in 2017 remained relatively low at 130 gallons per capita per day.

Colorado River Aqueduct

IRP Goal: Maintain Colorado River Aqueduct Supplies

The goal for managing Colorado River supplies is to protect and maintain base water supplies from existing programs, while also being able to fill the Colorado River Aqueduct (CRA) when needed through the development of dry-year programs and management of storage. This involves protecting existing supply and storage programs in the face of risks that could impact program yields and the ability to access storage in the future. The 2015 IRP Update calls for ensuring that a minimum supply availability of 900,000 acre-feet is available in all years and to be able to ramp up diversions to 1.2 million acre-feet in dry years.

Metropolitan has achieved its target of ensuring 900,000 acre-feet of available supplies for delivery through its basic apportionment and established long-term water supply programs. There is no risk of a supply reduction in 2018 except for a potential adjustment to Metropolitan’s basic apportionment caused by higher priority Colorado River water users. If an adjustment is warranted, it will impact Metropolitan’s 2019 supply. Metropolitan, however, did not require all of the available supplies on the Colorado River system in 2018 because of low demands within the service area, other adequate supplies, and healthy Metropolitan storage levels. As a result, less than the IRP target amount was delivered via the CRA. Metropolitan has sufficient water stored in Lake Mead to ramp up deliveries to 1.2 million acre-feet in the current and next year.

Recent CRA Supplies vs. IRP Targets

The following table shows estimated Colorado River supplies for calendar year 2018 and the IRP future supply targets. This table does not depict any potential impacts of the Lower Colorado River Basin Drought Contingency Plan, which is expected to be approved in late 2018. Metropolitan staff will evaluate potential impacts to operations and CRA diversions.

Colorado River Programs	2018 Actuals*	Projections (Acre-Feet)					2040 IRP Target
		2018	2020	2025	2030	2035	
Basic Apportionment	550,000	550,000	550,000	550,000	550,000	550,000	550,000
Present Perfected Rights	0	0	-2,000	-2,000	-2,000	-2,000	-2,000
SNWA Return Obligations	0	0	0	0	0	-5,000	-10,000
IID-MWD Conservation Program	105,000	105,000	85,000	85,000	85,000	85,000	85,000
Palo Verde Program Minimum	76,000	76,000	30,000	30,000	30,000	30,000	30,000
IID-SDCWA Transfer and Exchange	130,000	130,000	193,000	200,000	200,000	200,000	200,000
Canal Lining Projects – SDCWA	79,000	79,000	80,000	80,000	80,000	80,000	80,000
Canal Lining Projects – San Luis Rey Indian Water Rights Settlement	16,000	16,000	16,000	16,000	16,000	16,000	16,000
Lower Colorado Water Supply Project	9,000	9,000	8,000	7,000	6,000	5,000	4,000
IID Exchange	0	0	-20,000	-20,000	-20,000	-20,000	-20,000
Bard Program	0	0	5,000	5,000	5,000	5,000	5,000
Agricultural Adjustment	-73,000	-	-	-	-	-	-
Total Colorado River Supplies	892,000	965,000	945,000	951,000	950,000	944,000	938,000
Minimum Diversion		900,000	900,000	900,000	900,000	900,000	900,000
Dry-Year Diversion		1,200,000	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000

*Based on best available data

Long-Term Challenges

While Metropolitan has been successful in managing Colorado River supplies over the past 15 years, several challenges must be overcome to ensure future supply reliability. Identified risks to future Colorado River supplies include increased demands from higher priority Colorado River water users and climate change. Climate change can worsen droughts and impact the frequency and magnitude of shortages declared by the U.S. Bureau of Reclamation (USBR).

Metropolitan holds the lowest priority Colorado River rights to California's normal apportionment of 4.4 million acre-feet per year. In recent years, there has been increased use by higher priority water users, reducing supplies to Metropolitan. In addition, the Colorado River Basin is experiencing a period of prolonged drought. Combined with the long-term challenge that the river system demands exceed available supply, Lake Mead storage levels are projected to drop. Deliveries to Lower Basin Colorado River users begin to be impacted when Lake Mead surface elevation falls below 1,075 feet (about one-third of capacity), the trigger for shortage declaration by the federal government. Absent implementation of a Lower Colorado River Basin Drought Contingency Plan, Metropolitan could lose its ability to recover Intentionally Created Surplus (ICS) supplies previously stored in Lake Mead. At the beginning of the year, Lake Mead's elevation was at 1,082.5 feet and is expected to be at 1,079.2 feet by the end of the year.

CRA Activities

The following section describes recent notable activities by Metropolitan with respect to the Colorado River system to maintain and augment supplies.

Intentionally Created Surplus

In 2017, wet conditions within California allowed Metropolitan to store over 300,000 acre-feet of water in Lake Mead to help meet the IRP target in future years. It was the largest amount of water ever added to Lake Mead storage by Metropolitan in one year. In 2018, Metropolitan is looking to maintain its storage in Lake Mead for future dry conditions. Any changes to Metropolitan's storage in Lake Mead are expected to be for the result of late season changes in the water use by higher priority users.

Metropolitan also worked with USBR to correctly account for return flows from the Palo Verde Ecological Reserve. Between 2006 and 2015, return flows from the reserve were not properly accounted for by USBR, thus artificially increasing Palo Verde Irrigation District's water use and decreasing the amount of water available to Metropolitan. USBR corrected the past accounting discrepancies and included an adjustment for the water that was available to Metropolitan, resulting in an additional 70,000 acre-feet in Metropolitan's ICS. ICS is water stored in Lake Mead created through extraordinary conservation.

Lower Colorado River Basin Drought Contingency Plan

The agreements necessary to implement the Lower Colorado River Basin Drought Contingency Plan are being finalized in 2018. The plan is intended to provide a level of stability with respect to operation of USBR's Colorado River system reservoirs through creation of additional ICS water or reductions in water deliveries. These changes would increase the elevation of Lake Mead and reduce the likelihood of a shortage declaration, which could trigger significant water curtailments to Lower Basin Colorado River water users, as well as enhance energy generation at Hoover Dam Powerplant. Implementation of the plan would provide additional flexibility by allowing ICS delivery at lower Lake Mead elevations, by increasing ICS storage limits for each Lower Division State by 200,000 acre-feet, and by extending the ability for interstate banking in Lake Mead from 1,075 feet down to 1,045 feet elevation. Metropolitan would also benefit from the plan as a recipient of water for storage off-stream.

State of the Science Report

Metropolitan and over a dozen other Colorado River stakeholders, including utilities, state, and federal agencies, provided funding for a State of the Science Report that will focus on variables that drive streamflow outcomes in the Colorado River Basin. This report will provide needed information to improve and guide short-term forecasting, as well as longer-term planning and water management. Once completed in 2019, Metropolitan can use this report to make more informed decisions regarding management of its Colorado River supplies

Colorado River System Conservation Pilot Program

The July 2014 Colorado River System Conservation Pilot Program was extended with activities into 2018. This pilot program pays Colorado River water users to conserve water on a voluntary basis that will remain in Lake Mead or Lake Powell to benefit the overall Colorado River system. In 2018, 25 new projects were selected across both the Upper and Lower Colorado River Basins. The total conservation expected from these projects exceeds 75,000 acre-feet, with some conservation activities continuing to occur through 2019.

The two-year Metropolitan/Bard Seasonal Fallowing Pilot Program in 2016 and 2017 yielded 2,939 acre-feet of water saved. After the conclusion of the Metropolitan/Bard pilot program, Bard Water District continued seasonal fallowing for an additional two years under the Colorado River System Conservation Pilot Program. The first of those two years of seasonal fallowing was completed in 2018, with an enrollment of 972 acres. As for all projects within the Colorado River System Conservation Pilot Program, all savings will remain in the Colorado River system reservoirs.

Minute No. 319/323 Implementation

Minute No. 319 of the International Boundary and Water Commission was an effort between the United States and Mexico to increase cooperation and management of the Colorado River. As a part of Minute No. 319, Metropolitan provided \$2.5 million in funding to USBR for conservation projects in Mexico. In return, 24,000 acre-feet of Binational Intentionally Created Surplus was made available to Metropolitan in 2018.

Minute No. 323 was signed to continue the cooperative efforts of Minute No. 319, which ended in 2017. It provides Metropolitan with similar opportunities for providing funding for conservation projects in Mexico in exchange for a portion of the conserved water provided as Binational Intentionally Created Surplus.

Palo Verde Land Management Program

Metropolitan owns and manages 21,000 acres of farmland in the Palo Verde Valley. New leases were signed in 2017 to encourage farmers to reduce consumptive water use. Metropolitan's board authorized temporary amendments to the leases that will tie the annual rent to cropping rather than measured water use. The new rent structure discourages high water-using crops such as alfalfa. The rent structure will be in effect until 2021. In the meantime, Metropolitan is studying a range of technologies including evapotranspiration models based on satellite imagery, ground-based evapotranspiration measurement and open-channel irrigation flow measurement that will improve accuracy in measuring consumptive water use.

State Water Project

IRP Goal: Stabilize State Water Project Supplies

The 2015 IRP Update calls for managing State Water Project (SWP) supplies in compliance with regulatory restrictions in the near term for an average of 984,000 acre-feet per year. In 2030, the target increases to 1.2 million acre-feet per year on average when a long-term Delta solution is estimated to be in place. The IRP’s framework for a reliable water supply depends on the continued capability to move water into storage in wet periods and flexibility to address fishery needs. Metropolitan is involved in several initiatives supporting the state’s established coequal goals for providing more reliable water supply for California and protecting, restoring, and enhancing the Delta ecosystem.

Recent SWP vs. IRP Targets

SWP supplies in calendar year 2018 were less than average. The following table shows projected SWP Table A allocation supply for calendar year 2018 and the IRP targets. In 2018, the final Table A allocation was 35 percent, or 669,000 acre-feet for Metropolitan.

2018 Actuals		Projections (Acre-Feet)					2040 IRP Target
		2018	2020	2025	2030	2035	
669,000	Minimum	203,000	229,000	229,000	314,000	314,000	314,000
	Average	1,198,000	984,000	984,000	1,213,000	1,213,000	1,213,000
	Maximum	2,020,000	1,695,000	1,695,000	1,863,000	1,863,000	1,863,000

The long-term trend has been toward increased environmental regulation and reduced supply. The 2015 IRP Update targets anticipate pumping and export restrictions to become more restrictive in 2020, consistent with the scheduled timetable for review of the biological opinions for key fisheries in the Sacramento-San Joaquin Delta.

Metropolitan’s annual SWP supply is significantly affected by weather and hydrologic conditions in the SWP’s watersheds and environmental constraints in the Delta. In 2018, SWP water supply was impacted due to below average conditions and damage to Lake Oroville’s spillway. Late winter storms resulted in the California Department of Water Resources (DWR) increasing the Table A allocation from 15 percent to 35 percent. Throughout 2018, repair and reconstruction of the spillway structures continued at Lake Oroville.

Long-Term Challenges

The current SWP delivery system is susceptible to earthquakes, floods, subsidence, climate change, rising sea levels, salt water intrusion, aging facilities, environmental degradation and increasing regulatory constraints on water operations, as well as other risks and uncertainties in the Delta. All of these factors contribute to a decline in water supply.

The U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the California Department of Fish and Wildlife have issued biological opinions (BiOps) to protect endangered species in the Delta. The BiOps include incidental take permits in an effort to reduce harm to protected fish and their habitat. The SWP and the Central Valley Project achieve the fishery protection measures prescribed in the BiOps. As a result, water supply reliability for SWP and CVP will continue to decline unless actions are taken to improve conveyance.

SWP Activities

The following section describes recent activities by Metropolitan to stabilize SWP supplies in the near and long term.

California WaterFix

California WaterFix is intended to address the problems noted above and improve both the reliability and quality of exports from the Delta which is critical to ensuring reliable deliveries of SWP supplies to Metropolitan in the future. It modernizes and improves the SWP's water delivery system in the Delta by building three new intakes in the northern Delta along with two main tunnels to carry water to new pumping facilities and the existing aqueduct system in the southern Delta that will provide high quality water and reduce impacts to fish.

In July 2018, Metropolitan's board voted to approve funding for up to 64 percent, or \$10.8 billion, of the full California WaterFix project. Subsequently, Metropolitan and participating public water agencies formed two joint powers authorities – the Delta Conveyance Design and Construction Authority and the Delta Conveyance Finance Authority – to manage, design, construct, and finance the project.

California EcoRestore

EcoRestore is an initiative to support the long-term health of the Delta and the native fish and wildlife species and to support upland ecosystem projects. Since its initiation three years ago, seven projects have been completed with other projects under construction or scheduled to start in calendar year 2018. Three of the new projects are required mitigation for the SWP and CVP, while another three support landscape-level tidal and floodplain restoration in the Delta. Additional projects have also been scheduled for construction in 2019.

Another notable development that will help further the California EcoRestore initiative's goals and the state's California Water Action Plan is the awarding of \$18.9 million of Proposition 1 funding by the Delta Conservancy to fund projects that will provide watershed benefits to the Delta region.

Regulatory Activities

The Bay-Delta Water Quality Control Plan (WQCP) protects water quality in the Bay-Delta watershed by identifying the beneficial uses of water and setting water quality standards to protect those uses. The State Water Resources Control Board (SWRCB) is responsible for developing and modifying the WQCP. In July 2018, the SWRCB issued proposed Plan Amendments and a final Substitute Environmental Document (SED) for updates to the WQCP relating to the Lower San Joaquin River and Southern Delta. The SWRCB also released a framework document outlining proposed Plan Amendments to the WQCP for the Sacramento River, Delta tributaries, cold water habitat, and interior Delta flows. The SWRCB indicated that a draft SED for this phase of the WQCP update will be released by the end of 2018. Metropolitan has been engaged throughout the WQCP review process, working with the State Water Contractors to provide input at every available opportunity since the process began in 2009.

Science Activities

The Delta Reform Act of 2009 identified adaptive management as the desired approach to improve the management of the Delta and its resources. Metropolitan supports this science-based, flexible approach to resource management decision-making through collaboration with state and federal agencies and science experts. Metropolitan achieves this by funding and participating in the Municipal Water Quality Investigation effort that provides source water quality data used for assessing conditions that could impact the Delta. In addition, Metropolitan is committed to filling information gaps in the areas of integrated monitoring and research, mechanistic studies and models, and information synthesis to address Delta water supply reliability through the various efforts described below.

Salmon Predation Study – Metropolitan worked with Cramer Fish Sciences to conduct the second year of field studies for the Salmon Predation Study at Bouldin Island. Funded by a grant from the California Department of Fish and Wildlife with matching funds from Metropolitan, the study examined how the number of predators and the interaction between predators and habitat features impact juvenile salmon survival. Field work was completed in May 2018 and a draft report of findings will be available by December 2018.

Longfin Smelt Management Analysis and Synthesis Team – The multi-agency Longfin Smelt Management Analysis and Synthesis Team synthesized monitoring and science studies related to longfin smelt including Metropolitan’s studies evaluating larval distribution and vertical distribution. Metropolitan contributed to the development of the overall conceptual model and report describing the biology and ecology of longfin smelt in the San Francisco Estuary. The team is expected to complete a draft report in 2019.

Flow Alteration Management Analysis and Synthesis Team – Metropolitan participates in the Flow Alteration Management Analysis and Synthesis Team which evaluates how high flow conditions in 2017 affected the physical habitat and food web for Delta smelt by analyzing water quality, productivity, and fish health data collected during the fall outflow studies in 2017, and comparing conditions to previous wet years. The draft final report is expected by the end of 2018.

Collaborative Science and Adaptive Management Program – Metropolitan continued to participate in the Collaborative Science and Adaptive Management Program (CSAMP) addressing issues related to protecting Delta smelt and salmon. As part of CSAMP, Metropolitan was active on the Collaborative Adaptive Management Team which utilized the Structured Decision Making process to evaluate the benefits and costs of Delta smelt management actions. With funding contributions from the State Water Contractors, the team initiated a project to develop the Delta Smelt Science Plan to assess the effects of ambient conditions and management actions on Delta smelt habitat quality and vital rates. In July 2018, the CSAMP Policy Group received a presentation on the results of the Delta Smelt Entrainment Study, evaluating factors associated with salvage adult Delta smelt.

Interagency Ecological Program – The Interagency Ecological Program (IEP) is a consortium of State and federal agencies that has been conducting cooperative ecological investigations since the 1970s. The IEP provides and integrates relevant and timely ecological information for management of the Bay-Delta ecosystem and the water that flows through it. IEP relies upon multidisciplinary teams of agency, academic, nongovernmental organizations, and other scientists to conduct collaborative and scientifically sound monitoring, research, modeling, and synthesis efforts for various aspects of the aquatic ecosystem. Metropolitan participated in the analysis of the IEP Spring-Run Project work team meeting focusing on the San Joaquin River Restoration efforts to reintroduce spring-run into the San Joaquin River.

Several scientific activities supported by Metropolitan were published in 2018, including:

- Metropolitan staff coauthored a January 2018 article published in the journal *Biological Conservation* about Winter-run Chinook salmon and the implications of the discovery of previously unidentified rearing habitats for this endangered population.
- Metropolitan developed a Delta smelt eDNA sampling and reporting study to support management decisions regarding entrainment risk for water operations during January to March 2018. SWC provided financial support to the study and it is being conducted by consultant Cramer Fish Sciences.
- Metropolitan collaborated with researchers at the Anchor QEA consulting firm to conduct a modeling study evaluating wind trends in the Bay-Delta estuary and effects on turbidity conditions. Study results showed that wind speeds have dropped in the estuary during the late fall and early winter over the past twenty years. In April 2018, results from the study were published in the journal *Estuaries and Coasts*.

Local Resources

IRP Goal: Develop and Protect Local Water Supplies

Local resources include supplies from groundwater, recycled water, seawater desalination, the Los Angeles Aqueduct, local surface water, and other identified resources. Together, local resources provide about half of the region’s water supplies. These resources are crucial as imported supplies face inherent vulnerabilities despite widespread efforts to maintain their reliability.

The IRP strategy calls for current local supply production to be maintained into the future and for additional local supplies to be developed for future demands and protecting against losses. Mitigation against any yield reduction is a primary area of concern for the IRP. By 2040, the IRP calls for a total local supply target of 2.43 million acre-feet per year that will come from a combination of existing and new local supplies.

Recognizing the regional benefits of local resources, the IRP sets targets to maintain local supply production into the future and develop new supplies to meet future demands. Local water agencies continue to play an integral role in developing new local supplies which Metropolitan continues to support by providing technical and financial assistance to help bring projects to fruition.

Recent Production vs IRP Target

The following table shows 2017 actual production from local resources and the IRP targets. In calendar year 2017, the region produced 2.154 million acre-feet which was below the IRP projection, partially influenced by low overall demand. This was more than the previous year’s production of 1.854 million acre-feet. A significant increase in 2017 was attributed to the near record snowpack in the Eastern Sierra Nevada Mountains resulted in the Los Angeles Aqueduct deliveries of 381,000 acre-feet, which is 150 percent of average. Despite improvements in surface water supplies, groundwater production was still impaired due to previous drought conditions. The 2015 IRP Update average-year forecast for local supplies was more than 2.2 million acre-feet. Local supply production data are compiled from member agencies and are reported for the previous year.

Local Supply Production	2017 Actuals*	Projections (Acre-Foot) (Existing and Under Construction)					2040 IRP Target
		2017	2020	2025	2030	2035	
Groundwater Production	1,122,000	1,281,000	1,290,000	1,288,000	1,288,000	1,288,000	1,289,000
Surface Production	106,000	110,000	110,000	110,000	110,000	110,000	110,000
Los Angeles Aqueduct	381,000	254,000	261,000	264,000	264,000	266,000	268,000
Seawater Desalination	34,000	51,000	51,000	51,000	51,000	51,000	51,000
Groundwater Recovery	100,000	131,000	143,000	157,000	163,000	165,000	167,000
Recycling	402,000	404,000	436,000	466,000	486,000	499,000	509,000
<i>Recycling - M&I</i>	<i>217,000</i>	<i>224,000</i>	<i>243,000</i>	<i>267,000</i>	<i>285,000</i>	<i>298,000</i>	<i>308,000</i>
<i>Recycling - Replenishment</i>	<i>142,000</i>	<i>117,000</i>	<i>126,000</i>	<i>129,000</i>	<i>131,000</i>	<i>131,000</i>	<i>131,000</i>
<i>Recycling - Seawater Barrier</i>	<i>43,000</i>	<i>63,000</i>	<i>67,000</i>	<i>70,000</i>	<i>70,000</i>	<i>70,000</i>	<i>70,000</i>
Other Non-Metropolitan Import	9,000	13,000	13,000	13,000	13,000	13,000	13,000
New Local Supply	0	0	3,000	8,000	12,000	16,000	20,000
Total Local Supplies	2,154,000	2,244,000	2,307,000	2,357,000	2,387,000	2,408,000	2,427,000

* Actuals based on best available data, subject to revision. Groundwater production includes Metropolitan’s in-lieu delivery. Total may not foot due to rounding.

Long-Term Challenges

Groundwater basin yields are dependent upon local rainfall, replenishment with imported supplies, and locally recycled water. Four years of drought leading up to 2016 placed significant stress on local groundwater basins. Some local groundwater basins are in overdraft conditions. Rainfall and replenishment deliveries in the basins have not been sufficient to maintain groundwater basin levels. Several issues have affected replenishment, including water quality, spreading basin capacity, and maximum storage limits in basin conjunctive use and cyclic storage agreements. In the long term, climate change may affect the availability of imported replenishment deliveries and the natural recharge of groundwater and surface water supplies.

Another local supply challenge is ramping up and maintaining production of recycling projects at planned capacity levels. Some recycling projects are built in phases and may be slow to convert new customers to take recycled water. Among the reasons for this are: extending the delivery pipeline to a new customer may be cost-prohibitive, funding may be limited, and in some cases, water conservation lowers recycling production by reducing both the wastewater effluent and consumer demands.

Local Resources Activities

The following section describes activities by Metropolitan and local water agencies to maintain and improve local supply production.

Local Resources Program

Metropolitan provides financial incentives to member agencies through the Local Resources Program (LRP) to develop local water recycling, groundwater recovery, and seawater desalination projects that offset a demand on Metropolitan's imported supplies. Since 1982, the LRP has provided financial support for 107 water recycling and groundwater recovery projects. Local supply projects eligible for LRP incentives include local water recycling, groundwater recovery, and seawater desalination projects. The LRP currently supports almost half of the total recycled water and groundwater recovery production in the region. As of fiscal year 2017/18, Metropolitan had provided about \$474 million to produce about 2.8 million acre-feet of recycled water and about \$155 million to recover about 917,000 acre-feet of degraded groundwater. As of June 2018, Metropolitan had received applications requesting funding for additional projects totaling approximately 105,000 acre-feet per year. This total only includes application for projects not already in operation.

Program Refinements

Metropolitan staff began a comprehensive review of the LRP program and possible refinements. Throughout 2018, staff worked with the member agencies and presented updates to the Board on identifying approaches for increasing local supplies. In October 2018, Metropolitan's Board adopted an interim Local Resources Program funding target of 170,000 acre-feet per year to encourage development of new local projects. Additionally, staff is working on other refinements to the program criteria and is evaluating the potential for stormwater and other resources to be included as part of LRP or other programs which is anticipated to be completed in 2019. These actions are consistent with the IRP Policy Principles on Conservation and Local Resources.

On-Site Retrofit Program

Metropolitan's On-Site Retrofit Program provides incentives for landowners to convert potable water irrigation and industrial systems to recycled water. These conversions benefit the region's overall water reliability by offsetting demands for potable water. Launched in July 2014, the pilot program was converted to regular status in April 2018 with an annual budget of \$3 million. At the time of this report, the On-site Retrofit Program had provided funding to replace 11,800 acre-feet per year of potable water

with recycled water for 354 sites. Sites converted to recycled water use include parks, schools, golf courses, cemeteries, housing developments, and industrial facilities.

Based on input from member agencies, Metropolitan staff worked on program refinements, which are expected to be implemented in early 2019, that include:

- Providing additional construction time on a case-by-case basis;
- Allowing project construction to occur simultaneously with the construction of recycled water infrastructure;
- Launching more aggressive targeted marketing outreach;
- Creating a member agency funding component; and
- Developing an automated dashboard system for monitoring and reporting (expected to come on-line in late 2018).

Groundwater

Effective use of local groundwater basins is a significant component of comprehensive water supply planning for Southern California. Many people in Southern California depend on groundwater as a primary source of water supply. Groundwater basins within Metropolitan's service area provide an average of 1.36 million acre-feet per year in the past 10 years or over one-third of total water use.

Groundwater basins provide the potential for operational flexibility to manage water supplies. Many local groundwater storage programs have been implemented over the years to maximize the use of in-region water supplies.

In 2007, Metropolitan published the Groundwater Assessment Study Report in collaboration with member agencies and groundwater basin managers to assess groundwater conditions in the region. Since then, Metropolitan updated the board on the regional groundwater conditions with board reports in 2011 and 2015. Metropolitan is preparing another report for the Board in late 2018.

Health of Groundwater Basins in the Service Area

Long-term balance of production and recharge is an integral part of ensuring long-term reliability in the region. In the past 20 years, there has been an imbalance in recharge, leading to more available groundwater storage space, or less water in the ground. Available groundwater storage space is one metric to determine the overall groundwater basin health. The healthy regional storage space range is estimated at between 3.1 to 4.3 million acre-feet. Since the available groundwater space reached its height of 5.3 million acre-feet in 2016, improved hydrologic conditions in the region helped reduce space slightly to 5.1 million acre-feet in 2017. Despite this improvement, it was not enough to bring the basins up to the healthy range.

Metropolitan's In-Region Groundwater Programs

To improve water supply reliability, Metropolitan works with member agencies to store imported water locally in the region's groundwater basins through the Conjunctive Use and Cyclic Storage programs, as described below.

Conjunctive Use Program – Metropolitan's water management strategy includes conjunctive use of local groundwater resources. Conjunctive use refers to the practice of storing imported surface water in groundwater basins during years when there is a surplus of supply for use in times of drought or other supply interruptions. Metropolitan has nine storage projects with nearly 212,000 acre-feet of storage capacity and can store up to 53,000 acre-feet per year and withdraw up to 71,000 acre-feet annually during shortage years. Due to improved hydrologic conditions, Metropolitan stored about 41,000 acre-feet in fiscal year 2017/18.

Cyclic Storage Program – The Cyclic Storage Program allows Metropolitan to pre-deliver water to either member agency surface water reservoirs or groundwater storage. This water is then purchased at a later time when the member agency has a need for it. Four new cyclic storage agreements were executed as of June 30, 2018 with the City of Burbank, Calleguas Municipal Water District, Eastern Municipal Water District, and the Municipal Water District of Orange County. These cyclic agreements are in addition to the existing agreements with Upper San Gabriel Valley Municipal Water District and Three Valleys Municipal Water District. During fiscal year 2017/18, 120,000 acre-feet was stored under the program.

Groundwater Basin Management Activities

In 2018, many agencies reviewed options for increasing groundwater recharge in their areas including:

- In January 2018, the Los Angeles Department of Water and Power began construction on the \$92 million North Hollywood West Groundwater Treatment Plant, the first of four remediation projects in the San Fernando Valley Groundwater Basin. Construction is expected to be completed by 2020.
- In September 2016, the Water Replenishment District began construction on its Groundwater Reliability Improvement Project (recently renamed to the Albert Robles Center for Water Recycling or the ARC Project) to increase recycled water recharge in the Central Basin. Construction is expected to be completed by the end of 2018.
- The Chino Basin stakeholders continued development of a storage framework for the Chino Basin.

Conservation

IRP Goal: Achieve Additional Conservation Savings with Increased Outdoor Emphasis

The IRP target for conservation is to achieve 1.519 million acre-feet per year of savings by 2040 through an emphasis on outdoor water-use efficiency. Meeting this will require continued efforts by Metropolitan and its member agencies to effectively implement indoor and outdoor water efficiency devices and programs and to develop new outdoor efficiency programs to produce at least 180,000 acre-feet of additional savings per year.

Recent Savings vs. IRP Targets

The following table shows conservation savings for fiscal year 2017/18 and the IRP target. Fiscal year 2017/18 conservation savings were estimated at 1.034 million acre-feet.

Conservation Savings	2018 Actuals*	Projections (Acre-Feet)					2040 IRP Target
		2018	2020	2025	2030	2035	
Active (Existing)	202,000	221,000	210,000	196,000	184,000	166,000	159,000
New Savings	11,000	24,000	40,000	70,000	110,000	140,000	180,000
Code-Based & Price Effect	821,000	825,000	846,000	931,000	1,016,000	1,097,000	1,180,000
Total Conservation Savings	1,034,000	1,070,000	1,096,000	1,197,000	1,310,000	1,403,000	1,519,000

* Conservation savings actuals and projections are fiscal year (ending on June 30). Total may not foot due to rounding.

Active conservation is water saved directly as a result of conservation programs by Metropolitan and its member agencies. These savings include water efficient devices under Metropolitan’s Conservation Credits Program and member agency administered programs. In fiscal year 2017/18, Metropolitan and its member agencies invested \$12.6 million in conservation, generating more than 11,000 acre-feet of new savings. Active conservation also accounts for savings from previously-installed devices that continued to save water into 2018. Total active conservation savings in fiscal year 2017/18 were estimated at 213,000 acre-feet.

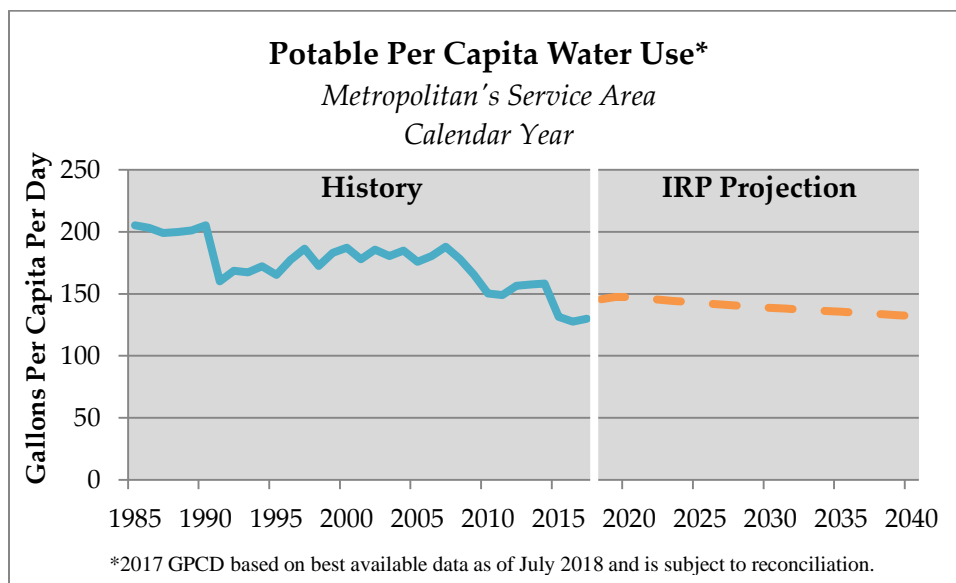
The largest portion of conservation savings come from code-based and price-effect conservation, commonly known as passive conservation. Passive conservation is achieved through legislation, building and plumbing codes, ordinances that require water-efficient devices, and through water saved by retail customers responding to the effects of changes in the price of water. In fiscal year 2017/18, passive conservation resulted in 821,000 acre-feet of savings. Over time, passive conservation is expected to increase as existing households and businesses continue to replace old water fixtures and as new households and businesses are built with efficient fixtures in place.

Conservation savings in the IRP are the expected outcomes when devices perform and consumers behave as expected under normal conditions. However, to the extent that actual device usage departs from normal conditions, these savings estimates may not match the actual conservation that occurs in a given timeframe. There are many reasons why consumers might behave differently from normal including drought awareness, precipitation conditions, abrupt or implied price changes, and advertising/media outreach campaigns and education.

Historical water use can be examined on a per capita basis that also captures consumer behavior. The chart below illustrates the impact of conservation savings and recycled water on the potable use within Metropolitan’s service area. Although factors such as consumer behavior, weather and economic conditions affect per capita water use from year to year, the trend shows continued lower per capita water use over time.

In 2018, under normal conditions, savings from active and code-based conservation were estimated at 1.034 million acre-feet. However, there are additional water savings due to other factors including lasting behavioral conservation following Governor Brown’s emergency declaration in 2015 that cannot be easily quantified but are captured in the GPCD graph.

The forecast years assume per capita use rebound under normal conditions. Based on the 2015 IRP Update’s forecasts of demands, conservation, and recycled water development, potable per capita water use through the year 2040 is expected to continue to decline, not taking into account potential additional savings from behavioral changes.



Long-Term Challenges

The goal for future conservation is to achieve additional savings through an emphasis on outdoor water-use efficiency. Landscape irrigation of existing households and businesses make up most of the water use in the region and has significant potential for new outdoor water savings. The current state Model Water Efficiency Landscape Ordinance, adopted in 2015, provides a standard for outdoor landscape water use. However, there is uncertainty regarding effective compliance due to limited enforcement mechanisms within the model ordinance. The 2015 IRP Update targets the estimated additional savings of 180,000 acre-feet associated with the equivalent of a replacement and retrofit rate of one percent of the existing stock of homes and businesses per year.

Other factors that may impact conservation savings are changes to demographics. Historical demographic data used for calculating passive savings are subject to revision by the California Department of Finance. The DOF provides official demographic estimates for use by many local and state government agencies. In addition, calculation of future savings depends on demographic growth forecasts from regional planning agencies which are updated to reflect demographic and economic trends every four years. Upward or downward revisions to demographic estimates or forecasts will impact the amount of savings accordingly.

Measuring the implementation and effectiveness of conservation programs is also a challenge when evaluating whether the overall IRP conservation goals and targets are being met. Estimating active conservation savings is relatively straightforward by using verified device installations along with estimates of the device usage profile, useful life, and the characteristics of the device being replaced. Passive conservation savings through code-based implementation of conservation devices are calculated

similarly but are also driven by estimates of demographics. Passive conservation savings through price effects have similar issues as they rely on estimates of both consumer response to price and estimated price levels in the future.

“Making Water Conservation a California Way of Life” Legislation

In 2018, the California State Legislature enacted two policy bills – Senate Bill 606 and Assembly Bill 1668 – to establish a new foundation for long-term improvements in water conservation and drought planning to adapt to climate change and the resulting longer and more intense droughts in California. These two bills amend existing law to provide expanded and new authorities and requirements to enable permanent changes and actions for those purposes.

Metropolitan is participating in DWR’s collaborative process to support the implementation of water urban use efficiency standards and establish reporting requirements. Metropolitan staff will further evaluate how the two bills impact Metropolitan’s conservation and drought planning efforts.

Conservation Activities

Water conservation in Southern California is achieved through collaborative efforts among Metropolitan, member agencies, and retail agencies. Since 1990, Metropolitan and its 26 member agencies have developed and refined conservation programs to maximize water savings for indoors and outdoors. To benefit from economies of scale, most of the region’s conservation activities are coordinated and implemented with resources from Metropolitan. Following adoption of IRP Policy Principles on Conservation and Local Resources in June 2017, Metropolitan sought and received extensive input on its program from member and local agencies, board committees, and the 2017 Peer Review by the Alliance for Water Efficiency. Metropolitan incorporated this feedback in a review of its existing water efficiency programs and developed recommendations for refinement. In April 2018, Metropolitan’s Board authorized major modifications to its water efficiency programs, and in July 2018, Metropolitan launched a new water conservation advertisement and outreach campaign.

Modifications to Water Efficiency Programs

Program changes include the modification of two existing programs and the addition of two new programs. These program refinements are described below:

Member Agency Administered Program (Existing Program)

The Member Agency Administered Program was modified to increase flexibility in funding local programs. Prior to this program revision, Metropolitan funds could only be used for local programs and activities that had specific estimates of water savings. The revised program allows up to 25 percent of a member agency’s funding allocation to be used for programs and activities such as consumer landscape education workshops and demonstration gardens that provide outreach and education benefits but whose direct water savings are difficult to quantify. Member agencies with an allocation of less than \$50,000 were eligible to use all of their funding for such programs.

Public Agency Landscape Program (Existing Program)

Metropolitan removed the Public Agency Landscape Program’s sunset date of June 30, 2018, making it a permanent part of Metropolitan’s conservation program. This program encourages public agencies to improve their outdoor irrigation efficiencies by offering upfront financial incentives to install water efficient landscape devices.

Landscape Transformation Program (New Program)

In July 2018, Metropolitan launched a new Landscape Transformation Program following the success of its previous turf removal rebate program which had ended in 2015. Available to both residents and businesses, the new program offered a rebate of \$1.00 per square foot of converted turf landscape.

Member and retail agencies could provide additional incentives on top of Metropolitan's rebate. The program will accept up to \$50 million in applications each year. Among other criteria, the program has a rebate maximum of 1,500 square feet of turf removed for residents and 10,000 square feet for businesses.

Professional Landscape Training (New Program)

Metropolitan provides landscape training to create sustainable landscape that rely less on water. The landscape training includes the Model Water Efficiency Landscape Ordinance and certification for contractors that complete the Qualified Water Efficient Landscaper training. This training program, in partnership with the California Landscape Contractors Association, targets city and county staff and landscape professionals. A list of certified contractors would be available for consumers.

Innovative Conservation Program

Metropolitan's Innovative Conservation Program provides funding in cooperation with the USBR, Western Resource Advocates, Southern Nevada Water Authority, Central Arizona Project, and Southern California Gas Company for research that will document water savings and reliability of innovative water savings devices, technologies, and strategies.

In 2018, a total of \$570,000 was awarded to 12 recipients, which include private businesses, public agencies, and universities. Recipients were chosen from among 55 proposals evaluated by a panel of experts through a competitive review process based on project innovation, research plan, market impact potential, and project preparedness. Some of the selected projects include an online tool to estimate how much water a homeowner can save by converting to California-friendly plants and the use of drones to detect leaks in distribution pipelines. A list of the 2018 Innovative Conservation Program recipients is available at <http://mwdh2o.com/ICP>.

Water Conservation Advertising and Outreach Campaign

Metropolitan implements a variety of conservation and education outreach programs throughout its service area. Since late 2013, the primary focus of these programs has been on the drought and the need for additional conservation in order to maintain the region's water supply reserves. That message has shifted slightly to emphasize conservation as a way of life, rather than a response to dry conditions.

In July 2018, Metropolitan launched a new water conservation campaign, "365", which builds on Metropolitan's award-winning H2Love conservation campaign the previous year. With the tagline, "Every Day is a Chance to Save Water," the campaign encourages Southern Californians to conserve water daily both indoors and outdoors, and reminds them to take advantage of Metropolitan's rebate programs. The campaign was launched in multiple formats, including television commercials to online and social media ads to billboards and even small posters in local convenience stores and on lunch trucks. Additionally, it is translated into Spanish, Chinese, Korean, Vietnamese, and Tagalog to reach diverse audiences.

Increasing Conservation in Disadvantaged Communities

Throughout 2018, Metropolitan engaged in discussions with member agencies on ways to increase awareness, availability, and adoption of water-efficient devices in disadvantaged communities. This would further increase market penetration and promote overall efficiency across the region. Metropolitan also intends to conduct targeted outreach to disadvantaged communities.

Regional Actions for Water Supply Reliability

Metropolitan recognizes many challenges facing the region's water supplies – from institutional and climate-based limitations on SWP and CRA deliveries to persistent overdraft of local groundwater basins. Metropolitan also recognizes that there may be other threats and opportunities that are not yet apparent today. The IRP continues to provide Metropolitan with the framework for addressing them over the long term. This forward-looking framework involves active engagement in innovative research and collaboration with other agencies, universities, and organizations. Regional efforts provide critical information for Metropolitan to adapt and enhance its programs, advance local supply development, and identify opportunities for conservation which helps ensure a reliable, high quality and affordable water supply for the region.

Watershed Initiatives

Metropolitan actively supports watershed initiatives. Part of an integrated approach to planning is taking into account not only water supply conveyance but also the protection of the source of the water, which ultimately comes from the natural environment. Long-term reliability of region's water supplies depends on continued health and maintenance of this natural infrastructure, which includes the watersheds that serve the Colorado River, the Sacramento-San Joaquin Delta, and local water mountains and basins. Protecting watersheds can improve water quality, reducing the need and costs for other water management and treatment options. Metropolitan participates in several efforts including the Southern California Water Committee Stormwater Task Force, and the Council for Watershed Health. More information on these and other efforts can be found in Metropolitan's annual Regional Progress Report to the Legislature, available at online at <http://mwdh2o.com/>.

Regional Recycled Water Program

Metropolitan and the Sanitation Districts of Los Angeles County are exploring the potential of a regional recycled water program which would purify treated wastewater from the Sanitation Districts' Joint Water Pollution Control Plant to produce a safe, high-quality water source that could help replenish groundwater basins across Southern California. The full-scale program, as envisioned, would produce up to 150 million gallons of purified water per day, enough to serve more than 335,000 homes.

A key milestone of the program is the establishment of the Advanced Water Treatment Demonstration Facility. The facility, which will produce 500,000 gallons per day, will generate information needed for the potential full-scale recycled water plant. Construction of the demonstration facility began in September 2017. As of August 2018, construction of the demonstration facility is approximately 60 percent complete and is scheduled to be complete by the end of 2018. Operation is expected to begin in early 2019, with testing spanning at least one year.

Future Supply Actions

The 2015 IRP Update calls for considering Future Supply Actions which are preliminary, low-risk actions the region could take now to prepare for future uncertainties such as climate change. These actions range from exploring the feasibility of new supply options, investing in water-saving technologies, acquiring land, and proposing ways to reduce regulatory impediments to supply development.

Metropolitan's Future Supply Actions Funding Program addresses future uncertainties by funding studies that remove barriers to the development of local groundwater, recycled water, seawater desalination, and stormwater supplies. In April 2018, Metropolitan's Board approved a new round of the program that includes \$3.5 million for member agency studies and a separate \$975,000 funding agreement with the Water Research Foundation. Metropolitan issued a Request for Proposals (RFP) for member agency studies in the summer 2018 and is expecting to bring funding recommendations to the Board in late 2018.

Under the agreement with the Water Research Foundation, Metropolitan is co-funding six potable and one non-potable reuse studies. Metropolitan selected the studies from the foundation's nationwide Advancing Potable Reuse Initiative, which promotes potable reuse as a reliable and sustainable component of integrated water resource management. Metropolitan's co-funding will complement nearly \$7 million in non-Metropolitan funds. The foundation will be issuing individual RFPs for the seven studies beginning in the fall 2018 through the spring 2019.

In addition to the Future Supply Actions Funding Program, Metropolitan also participates in regional organizations that promote the development of new water resources. For example, Metropolitan actively participates in WateReuse, which advocates for the development of recycled water, and CalDesal, which does the same for brackish and seawater desalination in California. Metropolitan also plays an active role in salinity management through participation in the Southern California Salinity Coalition, Colorado River Salinity Control Forum and Multi-State Salinity Coalition.

Conservation Research

Metropolitan engages with the Alliance for Water Efficiency (AWE) and its chapter, the California Water Efficiency Partnership (CalWEP), to improve the efficacy of current and future programs. Both organizations advocate for programs, legislation, standards and products to improve and enhance water efficiency. As a board member of both organizations, Metropolitan benefits from the innovation and research that continue to shape Metropolitan's conservation programs from the California Urban Water Conservation Council's (CUWCC) best management practices for conservation 25 years ago. In March 2018, CalWEP became the successor of CUWCC.

In addition, Metropolitan participates in other conservation research with universities and other organizations. Below is a summary of research activities in 2018.

Methods Report on Detecting Turf Removal – From January 2014 to July 2015, Metropolitan made unprecedented investments to promote turf replacement in response to the state's serious drought. The regional turf program was expected to have "multiplier" or "spillover" effects beyond those who received financial incentives for replacement. Numerous studies have attempted to quantify the multiplier effect over the past several years, resulting in a broad range of estimates from 3.6 percent to 700 percent. In spring 2018, the University of Southern California completed a Metropolitan-funded study titled "Methods Report on Detecting Turf Removal" to identify the existence and extent of the multiplier using satellite imagery and geographic information systems. The study estimated a natural replacement rate of six percent and a seven percent spillover rate attributable to the influence of the program.

Evaluating the Effects of Turf-Replacement Programs – In July 2017, the University of California, Los Angeles and the University of Utah completed a study titled "Evaluating the Effects of Turf-Replacement Programs in Los Angeles County: The Metropolitan Water District of Southern California's Incentive Program Since 2015." Among other things, the study, which focused on Los Angeles County between 2015 and 2017, looked at the impact of Metropolitan's landscape transformation incentive program on landscape choices, developed a typology of landscapes used to replace turf, and analyzed differences in participation among different socio-demographic groups.

Using GPCD as a Water Conservation Measure – Metropolitan remains active with partners on evaluating appropriate methods and uses for gallons per capita per day (GPCD) as a metric to track water use. This measure is anticipated to play a central role in water efficiency guidelines to be developed over the next several years by the State Water Resources Control Board. The California Data Collaborative and several of its members, including Metropolitan, are co-authoring a white paper on the meaning and appropriate use of GPCD. The paper is expected to be completed by early 2019.

Adaptive Management

Metropolitan plans for an uncertain future by engaging experts at the forefront of climate science and robust decision support systems. Below is a summary of Metropolitan’s adaptive management activities.

Robust Decision Making Analytical Approach to Monitor Uncertainty

As with the 2010 IRP update, Metropolitan began a comprehensive technical analysis with the RAND Corporation using Robust Decision Making (RDM) to identify vulnerabilities to the 2015 IRP approach. RDM examines long-term regional reliability to a wide range of plausible futures, including; climate change, different patterns of population growth, varying conditions in the Sacramento-San Joaquin Delta, and differing timelines for bringing on local supplies. In addition to vulnerability identification, the analysis will also identify “signposts” and “triggers” to be monitored and could signal a need for potential adjustments or new adaptation strategies. The RDM analysis is expected to be completed by the end of 2018.

Water Utility Climate Alliance

In 2018, the Water Utility Climate Alliance (WUCA), of which Metropolitan is a founding member, celebrated its tenth year advancing climate change adaptation for the water utility sector. WUCA provides a collaborative avenue for knowledge sharing and research support for its members and monitors and analyzes the development of climate change-related research, technology, programs, and federal legislation.

Two new members joined the alliance this year, Austin Water and Philadelphia Water, bringing membership up to twelve water utilities from across the country serving over 50 million people. In May 2018, WUCA, Austin Water, and Austin’s Office of Sustainability co-hosted a forum entitled “Creating Resilient Cities-Water Utilities on the Front Lines of Climate Change” in Austin, Texas. Sessions explored collaboration on the Colorado River, the potential impacts of climate change and climate-related extremes on water utilities, and offered examples of effective adaptation solutions from utilities around the nation. In August 2018, Metropolitan hosted WUCA’s two-day technical training “Building Resilience to a Changing Climate: A Technical Training in Water Sector Utility Decision Support,” which targeted utility staff and managers, and technical consultants.

Conclusion

Southern California continues to make significant progress toward the regional reliability goals set forth in the 2015 IRP Update with both near-term and long-term actions:

- Imported supplies from the CRA and SWP were sufficient to meet demands of Metropolitan in 2018. Metropolitan has worked closely with other agencies to improve reliability for the CRA and SWP with the Lower Colorado River Basin Drought Contingency Plan and funding commitments for the full California WaterFix Project, respectively.
- Local supply production has increased following two years of improved hydrology. Metropolitan's Board adopted an interim Local Resources Program funding target of 170,000 acre-feet per year to encourage development of new local projects.
- Metropolitan modified its conservation programs to emphasize outdoor water savings through landscape transformation and training.
- Regional water demand remained relatively low due to conservation efforts and lasting effects of consumer awareness following the recent drought. Regional potable water use in 2017 remained relatively low at 130 gallons per capita per day.

Beyond 2018, Metropolitan looks ahead with initiatives to protect watersheds, adaptively plan and manage against emerging challenges, and improve and incorporate available science on water use efficiency, local supply development, and the Bay-Delta ecosystem.