

2018-2019 Report to Governor Brown



Implementation of Executive Order No. 15-09 by Oregon's State Agencies

Conserving Water Even When it Rains

Report to Governor Kate Brown

Implementation of Executive Order No. 15-09

Directing State Agencies to Plan for Resiliency to Drought

September 24, 2020



The Department of Administrative Services, in collaboration with the Oregon Water Resources Department, prepared this report regarding water conservation and drought resiliency efforts on behalf of Oregon's state agencies.

Copies of individual agency reporting forms and water use consumption calculations are available from the Department of Administrative Services.

Table of Contents

Executive Summary	1
Section I – Background	3
Guiding Principles	7
Defining Non-Essential Water Use	7
Dept. of Administrative Services	8
Dept. of Fish and Wildlife	8
Dept. of Corrections	8
Dept. of Public Safety Standards and Training	8
Dept. of Transportation	9
Dept. of Forestry	9
Military Dept.	9
Youth Authority	10
Dept. of Parks and Recreation	10
Section II – Summary of Agency Water Use	12
Methodology.....	12
Results	13
Data Reporting Challenges.....	14
Section III – Agency Actions to Reduce Water Use.....	15
Water Conservation Education and Outreach.....	15
Dept. of Administrative Services	15
Dept. of Corrections	16
Dept. of Public Safety Standards and Training	16
Dept. of Forestry	17
Dept. of Fish and Wildlife	17
Dept. of Transportation	17
Dept. of Parks and Recreation	18
Health Authority- Oregon State Hospital.....	18
Youth Authority	18
Dept. of Administrative Services	18
Heath Authority (State Hospital).....	19
Dept. of Parks and Recreation	19

Dept. of Forestry	19
Dept. of Transportation	19
Military Dept.	20
Dept. of Fish and Wildlife	20
Dept. of Corrections	20
Dept. of Public Safety Standards and Training	21
Youth Authority	21
Dept. of Administrative Services	16
Dept. of Public Safety Standards and Training	16
Dept. of Transportation	16
Dept. of Parks and Recreation	16
Dept. of Corrections	17
Dept. of Fish and Wildlife	17
Dept. of Forestry	18
Health Authority	18
Military Dept.	18
Youth Authority	18
Dept. of Corrections	18
Dept. of Administrative Services	19
Dept. of State Lands	19
Dept. of Transportation	19
Dept. of Public Safety Standards and Training	19
Dept. of Forestry	19
Dept. of Parks and Recreation	20
Dept. of Fish and Wildlife	20
Health Authority -State Hospital	20
Youth Authority	20
Section IV – Drought-Related Planning.....	21
Oregon’s Drought Incident Annex and Related Activities	21
Oregon’s 2017 Integrated Water Resources Strategy.....	21
Section V – Opportunities and Next Steps	23
Appendix A – Executive Order 15-09	25

List of Tables

Table 1. Summary of Reported Agency 2018 Water Use	2
Table 2. Agency Water Use Measurement Approaches	13
Table 3. Agency Reported Water Use	15

Executive Summary

According to the National Oceanic and Atmospheric Administration, 2019 was the second hottest year since record keeping began, following the hottest year recorded in 2016, the third hottest year in 2017, and the fourth hottest year in 2018¹. These climate observations reflect a continuing trend toward hotter temperatures and more frequent drought in the Pacific Northwest². Governor Brown's Executive Order (EO) 15-09 directs 11 of Oregon's state agencies to prepare for a changing climate and plan for long-term resilience to drought (Appendix A).

Since Governor Brown issued the EO in July 2015, Oregon's state agencies have stepped up to find new ways to conserve water and use it more efficiently. Agencies are leading by example, focusing on a wide range of strategies, from cutting back on irrigation and using recycled water to educating staff and changing behavior. Water efficiency and conservation helps make Oregon's water supplies more resilient to population growth, increasing demands, and a changing climate.

Water Year (WY) 2019 - October 2018 through September 2019 - is the third year that agencies have reported water use data for this annual report. While many agencies have made great strides in defining and measuring essential and non-essential water uses, some agencies are still challenged to collect complete data on end uses due to various complexities in water management. This includes a continued lack of metering, decentralized operations, the difficulty of separating essential from non-essential use, and other factors. The process of collection and analyzing data, however, continues to help agencies identify priorities and a path forward for measuring and managing current and future water use.

State agencies subject to EO 15-09 collectively decreased water use 12 percent in WY 2019 compared to the 2014 baseline³, and several agencies continued to make notable progress in reducing water use. Using both 2018 and 2019 data, five agencies – DAS, DSL, ODFW, OMD, and ODOT- have met the goal in one or both water years⁴, and 7 of the 11 agencies have reduced their water use (Table 1). Other agencies continue to be challenged by factors such as growing campus populations, client base, visitor use, and fire season. One notable change in this report compared to the 2018 report is the change by DSL in the agency's definition of essential vs. non-essential use, greatly reducing the agency's non-essential water use as explained in this report.

¹ <https://www.noaa.gov/news/2019-was-2nd-hottest-year-on-record-for-earth-say-noaa-nasa>

² <https://nca2018.globalchange.gov/chapter/24/>

³ Some agencies used 2015 as the baseline year due to a lack of complete data for 2014.

⁴ DPSST met the goal in the prior water year, but use in WY 2018 increased.

Table 1. Summary of Reported Agency 2019 Water Use

Agency	2014 Baseline Water Year (kgals*)	2019 Water Year (kgals*)	Percent change
Dept. of Public Safety Standards and Training	5,263	4,937	-6%
Military Dept.	41,346	40,340	-2%
Dept. of Fish and Wildlife	301	255	-15%
Dept. of Administrative Services	125,572	57,236	-54%
Dept. of Transportation	31,380	25,747	-18%
Dept. of Corrections	739,511	675,757	-9%
Dept. of Forestry	14,935†	15,041	1%
Dept. Parks and Recreation	43,660	47,314	8%
Youth Authority	31,106†	35,281	13%
Dept. of State Lands	48†	39	-18%
Health Authority - Hospital	31,676	32,787	4%
Total Reported Consumption	1,064,798	934,734	-12%

*Kgals= 1,000 gallons

†: Due to insufficient data from 2014, agency is using 2015 as the baseline water year.

^: Baseline numbers changed from previous year report due to agency refinements water use definitions

Moving forward, agencies have the opportunity to continue to improve their data collection efforts, as well as prioritize projects to make more progress toward the EO reduction goal. This includes identifying priority metering of end uses, creating strategic plans for water efficiency and conservation, and weaving an ethic of water stewardship into long-term programs well beyond the EO's 2020 timeline.

Section I – Background



*Wallowa Lake by Gary Halvorson
Oregon State Archives*

Record warm temperatures in 2015 pushed Oregon into a severe record-breaking drought, with 25 out of 36 counties under a state drought declaration. For parts of southern and eastern Oregon, 2015 was the third or fourth year of drought. Due to the statewide conditions of low snowpack and high temperatures, Governor Brown issued Executive Order (EO) 15-09 and directed state agencies to conserve water.

The EO calls on agencies that own or manage land or facilities to work towards a goal of reducing non-essential water use by 15 percent or more by December 31, 2020. The EO directs these agencies to work with the Oregon Water Resources Department (WRD) to establish a baseline use of

water and develop communication materials.

The agencies involved in water conservation planning through the EO include:

- Oregon Department of Administrative Services (DAS)
- Oregon Department of Corrections (DOC)
- Oregon Department of Fish and Wildlife (ODFW)
- Oregon Department of Forestry (ODF)
- Oregon Department of Public Safety Standards and Training (DPSST)
- Oregon Department of State Lands (DSL)
- Oregon Department of Transportation (ODOT)
- Oregon Health Authority—State Hospital (OHA)
- Oregon Military Department (OMD)
- Oregon Parks and Recreation Department (OPRD)
- Oregon Youth Authority (OYA)

From 2015-2017, OWRD convened the Agency Water Users Group, comprised of facility managers from the state agencies listed above, to carry out EO 15-09. The Group agreed to employ a collaborative process to develop a path toward the 2020 goal.

The following is a snapshot of structures and facilities owned by the State of Oregon:

- The State owns 21.5 million gross square feet of facilities and more than 5,000 structures
- The mean age of these facilities is over 50 years
- Dept. of Corrections manages about 5.1 million gross square feet (GSF)

- Dept. of Administrative Services owns 4.3 million GSF
- Dept. of Transportation owns 3.2 million GSF in more than 1,000 facilities
- Military Department owns about 2.9 million GSF
- Oregon Health Authority owns 1.2 million GSF
- Dept. of Parks and Recreation owns 1.1 million GSF



Executive Building by Gary Halvorson, Oregon State Archives

State buildings vary widely in their operation.

Some buildings contain people for 8 to 10 hours a day, five days a week, while others house people for 24 hours a day, seven days a week. Some field offices have a handful of employees who work outside most of the day. The types of facilities and surrounding landscape covered by the EO include:

- Office buildings
- State Hospital
- Public Safety Training Academy
- National Guard armories
- Correctional facilities
- Forestry guard stations
- State park facilities
- Visitor centers

State agencies also use water to serve their customers, clients, patients, visitors, and others to fulfill their missions. Water use covers a variety of functions, including:

- | | |
|---|--|
| • Fire protection | • Forest management |
| • Consumption (cooking, drinking, and sanitation) | • Campsites |
| • Recreation | • Geothermal heating and cooling |
| • Fish and wildlife | • Livestock |
| • Irrigation | • Road construction and dust abatement |

Guiding Principles

Part of the multi-year effort of the Agency Water Users Group was to develop a number of “agreements and commitments” in their work to comply with EO 15-09. The main purpose of this was to acknowledge that, although there are vast differences in agency missions, structure and use of water, common elements exist among all agencies.

The agencies developed the following agreements and commitments:

- We will work to reduce all water use, essential and non-essential. However, with unique water needs and uses, each agency will establish its own definition of essential and non-essential water use.
- We will practice water conservation during all water conditions, not just drought.
- We acknowledge alternative water sources, such as rainwater harvest and using reclaimed water, are an option for some agencies.
- We will support our fellow agencies and share lessons learned through regular meetings.
- We will work to incorporate an established set of building and landscape Best Management Practices (BMPs) used by other states and at the federal level, such as EPA's guidebook *WaterSense® at Work—Best Management Practices for Commercial and Institutional Facilities*. These BMPs include regular inspections of water supply systems, asking for staff help in reporting leaks and maintaining irrigation systems.

Defining Non-Essential Water Use

The 11 state agencies that own or manage buildings and land have looked at many ways to classify non-essential water use. The Agency Water Users Group initially described non-essential water use as leaks, waste, and inefficient fixtures, recognizing that these are difficult to measure and not separately accounted for in water utility bills.

The Group also identified a category of water use called “non-essential with conditions,” depending on an agency's needs. These activities include lawn watering, exterior pressure washing, window washing, and light fleet washing.

Rather than creating one definition of non-essential use for all agencies to use, the Group concluded that each agency should define its essential and non-essential uses of water consistent with its mission and the people it serves, and that conservation of all water use should be the goal.

In this third year of reporting on water use data and as discussed below, some agencies have continued to internally refine definitions of essential and non-essential water uses, while others have developed

The Agency Water Users Group concluded that each agency should define its essential use of water consistent with its mission and the people it serves, and that conservation of all water use should be the goal.

consistent year-to-year definitions. The following are examples of how some of the agencies are defining essential and non-essential water use.

Dept. of Administrative Services

Essential water use is defined as water needed to accomplish the agency's mission in a safe, sustainable, and environmentally responsible manner. In DAS building facilities and operations, non-essential water use mainly consists of the following:

- Inefficient end-use fixtures in buildings
- Landscape irrigation and decorative fountains
- Power washing buildings and external walk surfaces
- Waste through leaks
- Wasteful use practices
- Window washing

Dept. of Fish and Wildlife

Non-essential water use is defined by ODFW as leaks, excessive water use for washing vehicles, irrigating/beautification of office fronts, and pressure washing/cleaning of owned facilities. Considering the necessity of using water to meet ODFW's mission (i.e., fish hatchery facilities), non-essential water use is less than 1 percent of the entire amount of water used by the agency. Non-essential water use is calculated by the total volume of water consumed by all ODFW locations, a questionnaire for each location based on all water use, and a calculation of each location's percentage of non-essential water or leaked water.

Dept. of Corrections

The DOC updated its water conservation action plans and chose to define essential use first, and then focus on non-essential use conservation opportunities. It identified essential water use as follows:

- Typical domestic use as outlined in institution conservation strategies in the action plans
- Gardens/agricultural programs for adults in custody
- Inside perimeter recreational yards and designated areas for safety and wellness of adults in custody
- Designated landscaping around flag poles and veteran memorial areas
- Conservation programs with endangered plants grown for habitat restoration and for identified endangered species
- General maintenance cleaning of HVAC and building systems
- Evaporative cooling systems maintenance
- Commercial laundry services
- *Executive Building by Gary Halvorson, Oregon State Archives*

Dept. of Public Safety Standards and Training

Essential water use is defined as water needed to accomplish the agency's mission in a safe, sustainable, and environmentally responsible manner. Similar to DAS, non-essential use mainly consists of the following:

- Inefficient fixtures
- Landscape irrigation (with areas around police and fire memorials deemed essential)
- Power washing external walk surfaces
- Waste through leaks
- Wasteful use practices
- Window washing



DPSST Building

Dept. of Transportation

Essential water use is defined as water needed to accomplish the agency's mission in a safe, sustainable, and environmentally responsible manner. Similar to other agencies, non-essential use mainly consists of the following:

- Inefficient fixtures
- Landscape irrigation
- Power washing external walk surfaces
- Waste through leaks
- Wasteful use practices
- Window washing

Dept. of Forestry

In prior reporting years, ODF did not separate out non-essential water use from essential water use. Separating essential from non-essential use from what are deemed essential facilities, such as fire operations buildings and structures and typical administrative buildings, is a challenge since many of the buildings are connected to a single meter.

For the 2019 reporting year, ODF utilized the designated fire season months (May - Oct typically) to delineate water use, and to facilitate a clearer snapshot with respect to monitoring trends. The objective was to further refine the data collected, and in the spirit of normalizing the data to reflect essential and non-essential use agency wide. The current trend supports both increases and decreases statewide – all of which can be associated with active fire season preparations, support and suppression, plumbing infrastructure leaks, and an increase in typical daily operational use (e.g., increase in FTE, programming changes, etc.).

Military Dept.

Military recently performed comprehensive energy and water evaluations of most locations that identify energy and water conservation measures that can be implemented to reduce consumption.

Irrigation has been deemed as non-essential. All other functions are deemed essential per Army regulations. Essential water uses are:

- Troop shower facilities (converted to low-flow fixtures)
- Troop kitchen use
- Military ground vehicle wash rack
- Helicopter wash rack
- Firefighting and protection
- Watering of veteran memorial gardens
- Cleaning of veteran memorials

Youth Authority

Youth Authority continues to grow its culture-change initiative, Positive Human Development (PHD), where everyone at the agency works collaboratively to support youth, staff, and the community. The developmental approach at the heart of PHD has been proven by research to be most effective in rehabilitating youth.

To support the developmental model, it is important for OYA to maintain green grass in its facilities' recreational areas throughout the summer. These areas are used by numerous athletic and recreational programs that are integral to keeping youth in custody healthy and helping them develop positive social skills and accountability. Water use to maintain these areas is considered essential.

OYA facilities offer many vocational training programs that help youth learn important job skills while also supporting local communities, and many of these programs require more water. Examples include a tree farm at OYA's Tillamook facilities, which grows trees for Northwest Oregon Restoration; a wildland firefighting training academy at OYA's La Grande facility that partners with ODF to fight wildfires and help youth gain firefighting certifications; and several greenhouse - or farming-related programs at facilities that teach horticulture while producing food and plants for the community. Water use for these programs is also considered essential.

Dept. of Parks and Recreation

Parks and Recreation considers the following to be essential uses of water:

- Fire protection breaks for lands
- Fire protection of historical structures
- Protection of significant investments (high value shrubs and trees)
- Areas where reductions will result in significant reduction of visitors (high recreation value)
- Establishment or needed maintenance of natural resource restoration projects
- Other circumstances that would have significant impact on OPRDs ability to operate

Department of State Lands (DSL)

DSL is committed to conserving water wherever feasible. In prior reporting years, DSL did not distinguish essential use from non-essential use. For this reporting year, the agency has determined that

quantifying conservation measures on state-owned lands may only be useful over long periods of time (e.g. decades). Shorter-term comparisons, like water years, are much more challenging, for the reasons stated below and because an extensive network of metering stations would need to be installed and monitored.

In the past, annual water use reporting had not been consistently completed by DSL for uses with water rights requiring such reporting. In addition, as other agencies such as the U.S. Bureau of Land Management update their records, water rights are transferred to DSL. These water right transfers are often lingering issues related to land exchanges that occurred as far back as the 1930s, where not all records were transferred at the time of the land exchange. As record backlogs are updated, it is anticipated that the number of water rights held by DSL will increase, thus showing an increase in what the agency now deems to be essential water use on DSL lands. Conversely, DSL has identified several water rights being reported under DSL's name for lands that the agency no longer owns. In these cases, DSL is working to transfer these water rights to the appropriate landowner and, once complete, would somewhat reduce water use reported under its name.

For this reporting year, DSL re-examined its facilities, including the DSL building in Salem (Salem Office) and the South Slough Reserve in Charleston (South Slough). The Salem office has no irrigation or ornamental water feature use and all water consumption is for restrooms, cooling tower operations, or custodial maintenance. The Salem office building is retrofitted entirely with low-flow, high-efficiency sink fixtures, and toilets have been replaced, as-needed for general maintenance, with modern models that meet the "high efficiency" standard. Fleet vehicles are washed at the DAS-owned Salem Motor Pool. Other water uses include annual or biannual pressure washing of patios. These uses are all essential to the ongoing operation and maintenance of the building. At the South Slough Reserve, water is used for essential purposes such as drinking and sanitation (i.e. flushing toilets, cleaning the kitchen and bathrooms). South Slough has not replaced any plumbing fixtures since the water resources report was started in 2014, and plans to replace toilets with low-flow, high-efficiency fixtures as needed for maintenance. DSL is exploring plans to replace sink fixtures and shower head fixtures at the South Slough facilities during the next one to two years.

Section II – Summary of Agency Water Use

Methodology

To identify progress toward the EO 2020 goal, agencies were provided three ways to report water use: by water right in OWRD's water use reporting system database, by metered building facilities, or by estimating water use where no meters exist (Table 2). Agencies provided WY 2019 data to OWRD and DAS on spreadsheets and in summary documents. Some agencies chose to report on only identified non-essential water use, while others reported on total water use because splitting out non-essential from essential water use has, in some cases, proven challenging (e.g., separating out efficient vs. inefficient building water fixtures).



The Agency Water Users Group considered options for establishing a baseline to compare water savings, including a three-year average or using a single water year or calendar year. The Group selected the 2014 water year (October 1, 2013 through September 30, 2014) and looked at calculating consumption by gallons per person per day, or by gallons per square foot, but found it difficult to compare buildings. Some highly efficient buildings may use about 10 gallons per person per day, while older buildings – correctional facilities, for example - may operate at 110 gallons per adult-in-custody per day.

Agencies can use a variety of methods to track water use (Table 2). Some enter information from water utility bills into the U.S. Environmental Protection Agency's (EPA) Portfolio Manager System, or a similar utility bill tracking software. The OMD's water and energy use reporting requirements must align with the U.S. Department of Defense regulations. Agencies also report monthly water use for diversions and wells authorized by water rights to OWRD. Reporting requirements are found in [Oregon Administrative Rule, Chapter 690, Division 85](#). The OWRD recommends that state agencies use Portfolio Manager to also track building-related water use for the following reasons:

- The EPA provides Energy Star Portfolio Manager at no cost to users
- It allows agencies to track and assess energy and water consumption across their entire portfolio of facilities
- Data is entered online through a secure website
- It is currently being used by numerous agencies to document their facility energy usage

Table 2. Agency Water Use Measurement Approaches

Agency	Water Rights	Metered Use	Estimation of Non-metered Use
Dept. of Administrative Services		X	
Dept. of Public Safety Standards and Training		X	
Dept. of Corrections		X	
Dept. of Fish and Wildlife	X	X	X
Dept. of Forestry		X	
Dept. of State Lands	NA	X	NA
Health Authority - Hospital		X	
Military Dept.		X	
Parks and Recreation Dept.		X	
Dept. of Transportation		X	
Youth Authority		X	

Agencies were offered several tools to estimate water use where no meter data was available. While these tools can provide a proxy for measurement, their limitations have prevented widespread use by agencies (for example, the inability to discern between baseline and reporting years if variables such as landscaped area or occupants per building did not change). These tools included:

- The guidance in the OWRD's rules, which is found in 690-085-0015, Methods for Measuring and Computing Water Use.
- Federal Guidelines for Estimating Unmetered Landscaping Water Use.⁵
- Federal Estimating Methods for Determining End-Use Water Consumption of plumbing fixtures, steam heating systems and vehicle wash systems.⁶
- The Oregon Reach Code, Chapter 7—Water Resource Conservation and Efficiency, which provides a baseline rating of fixtures that allows comparison of flow rates of replacement fixtures with old fixtures.
- The U.S. EPA's *WaterSense® at Work*, which includes Section 2.3, Leak Detection and Repair to estimate leaks.⁷

Results

As shown in Table 3, state agencies subject to EO 15-09 collectively decreased water use 12 percent for WY 2019 compared to the 2014 baseline⁸. Using 2018 and 2019 data, five agencies – DAS, DSL, ODFW, OMD and ODOT- have met the goal in either or both water years⁹, and 7 of the 11 agencies have reduced their water use.

⁵ <https://www.energy.gov/eere/femp/downloads/guidelines-estimating-unmetered-landscaping-water-use>

⁶ <https://www.energy.gov/eere/femp/estimating-methods-determining-end-use-water-consumption>

⁷ https://www.epa.gov/sites/production/files/2017-02/documents/watersense-at-work_final_508c3.pdf

⁸ Some agencies used 2015 as the baseline year due to a lack of complete data for 2014.

⁹ OMD met the goal in the prior water year, but use in WY 2019 increased.

The ODFW was able to achieve at least a 15 percent reduction over the 2014 baseline through improved reduction practices and upgrades to more efficient equipment. Similarly, both OMD and DAS identified significant savings in outdoor water use by curtailing irrigation. ODOT was able to reduce water use by 22 percent compared to the 2014 baseline through upgrades to more efficient equipment and reduced landscape irrigation.

WY 2019 numbers, as well as cumulative reduction by all agencies, are influenced by DSL's changes in its definitions of essential and non-essential water use. In prior years, irrigation water for agriculture was included in the agency's water use calculations; however, in 2019, after revisiting the topic, the agency has removed this data for reasons described in Section I. The net effect of these changes was to show greater cumulative agency reductions in non-essential water use compared to prior reporting years.

Agencies such as OPRD, OHA (State Hospital), and OYA remain challenged to reduce water use in the face of growing demand from visitors, patients, and served youth populations. These agencies continue to strive for more efficient water use on a per visitor, or per population, basis.

Data Reporting Challenges

In this second year of reporting water use data, agencies continued to encounter a number of data measurement and reporting challenges. ODF has several wells that serve both guard stations and provide water for firefighting, making tracking of water use challenging. OPRD's state parks are served by many unmetered wells, some of which are still tied to previous landowners in the water rights database. Many ODFW locations use river water, wells, estuaries, and independent vendors, all of which are tracked and reported differently. With three years of reporting now complete, agencies continue to better understand such challenges and are taking steps and making improvements for future reporting cycles.

Table 3. Agency Reported Water Use, Water Year 2019

Agency	2014 Baseline Water Year (kgals*)	2019 Water Year (kgals*)	Percent Increase or Decrease	Comments
Dept. of Public Safety Standards and Training	5,263	4,937	-6%	In WY 2019, DPSST reduced overall use for both essential and non-essential water by approximately 6 percent. The agency reduced (non-essential) water use 77% from the 2014 baseline (from 2,989 kgals to 680 kgals).
Military Dept.	41,346	40,340	-2%	Reduction due to revised watering schedules and employee engagement. OMD’s square footage has increased considerably over the 2014 baseline water year
Dept. of Fish and Wildlife	301	255	-15%	Two facilities had significant increases in water use during WY 2019. Otherwise, the agency saw slow reductions throughout the year for multiple locations using better reduction practices and efficiency upgrades to water using equipment.
Dept. of Administrative Services	125,572	57,236	-54%	Decrease in water use by 54.4% when compared to the 2014 baseline, mainly due to continued significant reductions in irrigation, but also due to some building fixture retrofits.
Dept. of Transportation	31,380	25,747	-18%	Includes metered water use in office and maintenance facilities. Does not include water in leased facilities, for highway maintenance/operations, or un-metered wells. Reductions from increase irrigation efficiency and fixture retrofits.
Dept. of Corrections	739,511	675,757	-9%	DOC made strides in converting some landscaping to drought tolerant plants and rock gardens. Some landscaping and institution gardens were converted to drip irrigation. DOC discovered a few water leaks, expanded garden sizes at a few sites, and continues to perform flow testing at all prisons for fire sprinklers.
Dept. of Forestry	<u>Total</u> 14,935† Non-Fire Season 2,156† Fire Season 12,778†	<u>Total</u> 15,041 Non- Fire Season 2,691 Fire Season 12,350	<u>Total</u> +1% Non-Fire Season +25% Fire Season -3%	Separating water consumption totals from what are deemed essential facilities, such as fire operations buildings and structures, and typical administrative buildings is a challenge since many of the buildings are connected to a single meter. Currently ODF has utilized the designated fire season months (May - Oct typically) to delineate water use, and to facilitate a clearer snapshot with respect to monitoring trends. The objective is to further refine the data collected and normalize the data to reflect essential and non-essential use agency wide. The current trend supports both increases and decreases statewide – all of which can be associated with active fire season preparations, support and suppression, plumbing infrastructure leaks, and an increase in typical daily operational use (e.g. increase in FTE, programming changes, etc.).
Dept. Parks and Recreation	43,660	47,314	+8%	Increase is a result of increased visitation, but this was offset by lower temperatures in WY 2019 (2,347 kgal decrease from WY 2018).

Youth Authority	31,106 [†]	35,281	+13%	Numbers are reported as total water use. OYA recently completed a high school in Grants Pass and six new living units in Woodburn. Construction included landscaping that needs a season or two to become established. In addition, agricultural programs are growing and require additional irrigation.
Dept. of State Lands	48 ^{^†}	39	N/A	Reductions are accounted for by the retrofit of water fixtures (sinks) and replacement of some toilets.
Health Authority - Hospital	31,676	32,787	+3%	OSH continues to identify water leaks in its systems, excess landscaping, and programming of the irrigation system to run as efficiently as possible. While OSH finished 2019 with an increase of 3.5% over 2014 use, the agency did see a drastic drop of water use over 2018 water year by nearly 11.5%. This reduction of water use was due in part by two large leaks being identified and repaired in May of 2019.
Total Reported Consumption	1,064,798	934,734	-12%	

*Kgals= 1,000 gallons

†: Due to insufficient data from 2014, agency is using 2015 as the baseline water year.

^: Baseline numbers changed from previous year report due to agency refinements in data.

Section III – Agency Actions to Reduce Water Use

Agencies continue to take a number of actions to reduce water use and become more efficient. Examples of these actions are shared below and include changes to irrigation practices, retrofits of end use fixtures, alteration of practices such as vehicle washing, and employee education campaigns.

The 2019 reporting year also presented some continuing challenges. Wildland fires in 2019 continued to affect several agencies and their water use. OPRD's water use increased in some areas to keep "green zones" and structures safe. Similarly, ODF's fire suppression efforts required a tremendous amount of staff engagement and resources, where water plays an integral part in suppression. In some locations, ODOT water tanks were used in support of fire suppression activities.

Water Conservation Education and Outreach

To communicate water conservation both internally and externally, agencies have:

- Developed water conservation information for employees or residents
- Shared water conservation information with partners, stakeholders, and visitors
- Encouraged owners of leased facilities to conserve water
- Displayed drought posters in their buildings, campgrounds, and other facilities
- Developed an easy way for employees to report water leaks
- Put information on websites or used social media for outreach



Dept. of Administrative Services

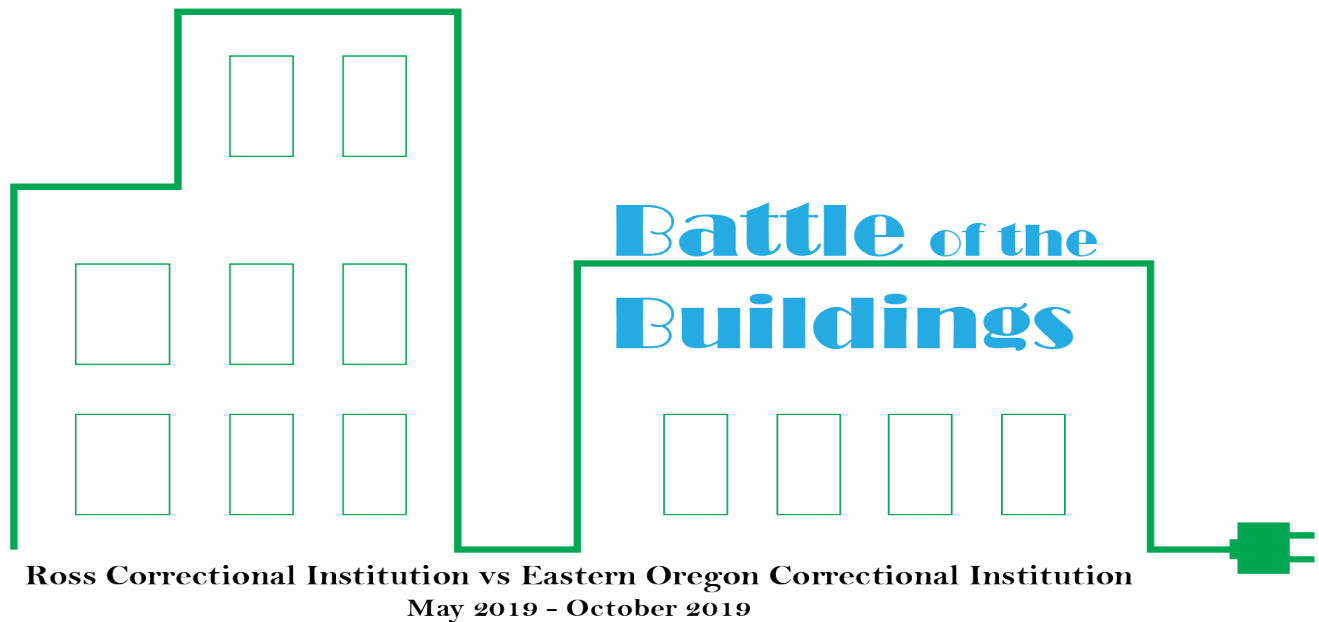
The agency continues to emphasize water conservation in building signage, newsletters through green teams, and other messaging. The agency's DASH internal web site was refreshed on several occasions with information about water consumption and conservation. A "green team toolkit" was developed for DAS building tenants that included several strategies for conserving water. Upgrades to buildings include

high efficiency plumbing fixtures where wastewater systems allow and faucet aerators in both bathrooms and kitchens.

Dept. of Corrections

In WY 2019, DOC continued to hold annual energy and water conservation challenges. These challenges were designed to help reduce the agency's overall energy and water consumption. The results were tabulated from the percentage of energy and water reduction at each facility from the same months in the previous year, as seen in utility bills and tracked in Energy Star Portfolio Manager.

DOC had two six-month challenges; open to all DOC sites that focused on energy and water conservation. To help support environmental and climate literacy, there were also two green team challenges focusing on energy conservation. The green teams have an opportunity to engage staff and adults in custody (AIC) in opportunities related to sustainability and improving energy/water efficiencies. These challenges provide a platform to educate, provide awareness, and be advocates for environmental behavior changes inside the institutions.



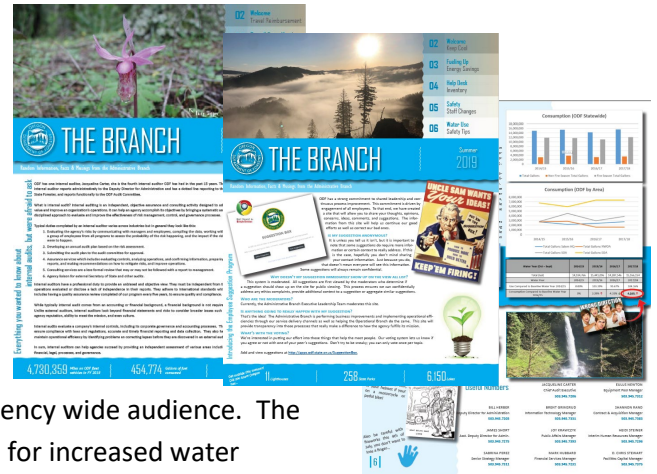
In WY 2019, DOC also participated with the Ohio Department of Rehabilitation and Correction (ODRC) in a better buildings challenge. This included DOC's Eastern Oregon Correctional Institution (EOCI) versus Ross Correctional Institution (RCI) from ODRC. During six challenges over six months, EOCI took the water challenge and reduced gallons per day per AIC by 7.7%.

Dept. of Public Safety Standards and Training

The agency continued to send email updates sharing information on state water conditions and the agency's commitment to water conservation. Rules continued to be integrated into the student handbook for when they lodge on site to reduce water use.

Dept. of Forestry

The ODF continues to spread awareness with respect to the need to continue being good stewards of resources. Changing occupancy behavior takes time, especially within an agency that has a decentralized facilities management business model. In 2017, the Agency's Administration Branch realized that increasing awareness was crucial in achieving long-term water consumption savings, along with all other aspects of sustainability tied to facility management, operations, and use. To facilitate the spread of this awareness, a newsletter was developed to reach an agency wide audience. The objective remains the same - to continue messaging the need for increased water conservation, energy conservation, and recycling; along with providing useful tips and ideas on how to be more sustainable not only at work, but also in staff private lives.



Dept. of Fish and Wildlife

Signage has made a large impact on water use around the agency including field locations and public areas. All new or retrofitted construction projects are using the new Energy Trust of Oregon certification standards and the best management practices for reducing use of resources as a whole. Many hatcheries have upgraded water pumping stations to gravity fed units instead of electric or propane powered units as old equipment is coming to the end of its repairable use.

ODFW had exceeded a 20 percent reduction for non-essential water use in the 2018 water year, but in WY 2019, anomalous spikes in use at two ODFW facilities reduced that to a total overall 15 percent reduction from 2014. The rest of ODFW facilities continued the slight downward trend. The ODFW will focus on monitoring and quickly responding to increasing water use so that corrective action can be taken as needed.

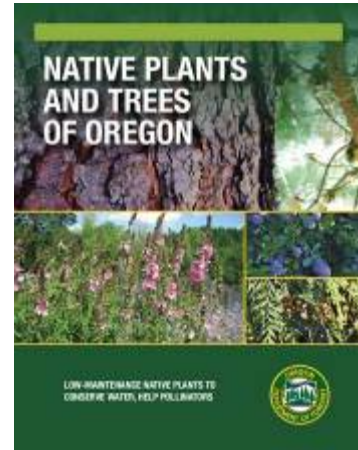
Dept. of Transportation

The ODOT Water Conservation Team held meetings in 2019 to coordinate data collection efforts and strategize around statewide actions and reporting. Team members include program managers and subject experts from Facilities Services, Communications, Financial Services, Geo-Environmental, Sustainability, and Maintenance and Operations.

Regional Water Action Teams (WAT) represent Region offices, Maintenance Districts, and other Divisions. The WAT teams implement local conservation efforts and keep track of best management practices. Information on the importance of water conservation efforts is shared through the agency's internal newsletter, *Inside ODOT*.

Dept. of Parks and Recreation

Park operations managers met with field staff to continue the water conservation message that was delivered in the prior reporting cycle. One focus area has been on quickly identifying and repairing water leaks. Staff also continue to install water efficient fixtures and reduce irrigation. The agency places an emphasis on native drought resistant plant species when landscaping is needed. Other efforts include large-scale wetland restoration to decrease water temperatures and reduce evaporation.



Health Authority - Oregon State Hospital

Communication has continued to be the driving force in identifying processes that need to be updated, with a focus on lowering water use throughout the hospital and grounds.

Youth Authority

Members of OYA's communications and physical plant operations teams stay in close contact about issues that need to be promoted internally, including water conservation. The two teams had discussions over the past year about ways they might better promote water conservation moving forward.

Landscape and Outdoor Water Use

For irrigation and landscaping, agencies took a variety of actions including:

- Reducing watering
- Where applicable, turning off decorative fountains
- Not installing water-intensive landscape projects
- Checking for leaks
- Using recycled water

Dept. of Administrative Services

Water conservation efforts through irrigation increased to a 30 percent water reduction in WY 19 through a continued partial "brown out" strategy. Drought tolerant landscapes are planned for most future projects. DAS also continues to systematically evaluate all irrigation systems, upgrading controllers, valves, and sprinkler heads where possible.

Well meters were checked for proper functioning in 2018 and adjustments made to ensure accurate data collection, which includes verification of water reported to OWRD for the baseline year. These practices continued in 2019. Because of this verification process, baseline metrics were adjusted to match data reported to OWRD. Closer monitoring of each well meter and pictures of meter information are now obtained to verify well use. Another reason behind the decrease in water use is the partial decommissioning of the 550 well, which is now padlocked and its use is disabled for portions of the year.

Heath Authority (State Hospital)

OSH facilities continue to reduce landscaping on campus to lower water use during the irrigation season. The courtyards within the patient care area will continue to be maintained for patient use, while the lawns outside of the secure perimeter other than the entrance of the hospital will be allowed to go dormant through the summer. Throughout WY 2019 facility managers had identified and repaired large leaks in both the cottage line and irrigation lines. These two large leaks were identified and repaired in May of 2019, allowing OSH to reduce year-over-year water use significantly. Water use also was reduced in the June through September 2019 irrigation season compared to the 2014 irrigation season by reducing irrigation use and removal of excess landscaping. Activating the irrigation system has been pushed further into the watering season, and the irrigation system is now being shut down no later than October 1 to gain additional water savings.



In WY 2019, OSH is reporting an increase over 2014 numbers of 3.5%, which is a vast improvement over 2018 numbers. The knowledge gained through the last two years focusing on water use will allow OSH to reduce water use significantly in the 2020 water year.

Dept. of Parks and Recreation

In WY 2019, the agency required park facilities to submit irrigation requests that meet OPRD's essential use goals. Areas that were deemed essential were required to start reduction plans to save water. Native plants are used whenever landscaping is needed for erosion control or new construction. Non-native plants are only used at locations where non-native plants are the dominant plants - such as at the State Capitol and Shore Acres State Park. At four state parks, OPRD uses Oregon Department of Environmental Quality (DEQ)-permitted treated wastewater for irrigation of three forested areas and one landscaped area.

Dept. of Forestry

The Salem Campus Headquarters continues to curtail its landscape irrigation. From a statewide perspective, to facilitate actual water consumption at locations that are being served by wells and cisterns, ODF has embarked on installation of water meters at multiple locations: J.E. Schroeder Seed Orchard – St. Paul, Tillamook Forest Center, and the pending Tillamook Forest South Fork Prison Camp installation. The aforementioned locations are considered pilot projects, with the objective of expanding to other locations in the field. Also, as part of the on-going effort to review water data, a significant amount of potable water loss due to plumbing failures was discovered and subsequently repaired, further reducing the overall use load.

Dept. of Transportation

ODOT's facilities continue to eliminate or reduce irrigation for landscaping. Most facilities have shut down their irrigation systems entirely, or have implemented low-volume systems. Review of water

equipment and use occurs during facility inspections every three years. Equipment is replaced as appropriate during facility inspections and work order requests are expedited for all identified water system issues. ODOT requires active participation from facilities staff and building occupants in identifying water issues and reporting corrective action. Replacement or upgrades of equipment are prioritized based on usage and budget.

Outdoor water savings are also occurring on the transportation system where roadside landscaping remains irrigated. For example, last year a team from ODOT's Region 5, La Grande Maintenance Station, completely removed the irrigation systems on the I-84/Highway 261 overpass to support the agency's water conservation efforts.

Military Dept.

The agency has initiated replacement of cool season non-native rhizome grasses with native low water bunch grasses and forbs, and is converting landscaping to more resilient native plants. Current construction projects include native plantings that will only require temporary irrigation for plant establishment. All site managers at existing locations must reach out to the OMD's Energy Manager to receive authorizing to begin watering. All facilities must receive authorization to temporality increase watering from the set watering schedule. Broken watering controls are addressed promptly. Zones with broken heads are shut down until the repairs can be made.

Dept. of Fish and Wildlife

Pipes and other structures used for distribution of water are checked and renewed each season during use. Pressure at the pump is monitored during regular maintenance to detect leaks. Major damage and broken pipes are fixed immediately. Other leaks observed are repaired as time and materials are available.

ODFW partnered with some irrigation districts to replace ditches with pipelines. Old pumps have been replaced with variable frequency drives to adjust the flow and release of water, thereby using less water and power. Replacing ditches with pipelines has helped push water further out for irrigating hay fields and new/renewed habitats, and seepage is more contained.

Dept. of Corrections

The agency achieved significant outdoor water use reductions in 2019. Some examples include:

- Deer Ridge Correctional Institution (DRCI) continued to reduce lawn watering, cutting times in half and only watering in evenings. DRCI removed the garden in the minimum facility and uses only a drip irrigation system. DRCI estimates savings of 32,500 gallons during the season.
- Eastern Oregon Correctional Institution (EOCI) removed 10,000 square feet of existing sprinkler system and planted native drought tolerant plants. This project reduced irrigation by 70,000 gallons annually.
- Oregon State Penitentiary (OSP) discontinued watering their recreation ball fields. This reduced irrigation by 60,000 gallons a year.

- Santiam Correctional Institution (SCI) deactivated lower yard sprinklers. This project reduced irrigation 20,000 gallons annually. SCI repaired a broken yard water pipe and water main leak, where an estimated 3,000 gallons of water had been lost.
- Two Rivers Correctional Institution (TRCI) installed rain sensors on all sprinkler systems, with an estimated savings of 7,500 gallons annually. TRCI removed 2,500 square footage of grass and replaced with gravel, resulting in an estimated savings of 20,000 gallons annually.

Dept. of Public Safety Standards and Training

In WY 2019, the DPSST landscape crew continued to monitor and adjust watering of its campus. The agency increased irrigation to some areas they had turned off in the prior year, but changed out the irrigation to more efficient heads to minimize water use while maintaining the health of the trees.

The DPSST continued its practice of identifying leaks in the irrigation system before the system is winterized. Any leaks will be repaired before irrigation begins again in the summer season. The agency identified several medium to large leaks in its irrigation system during the reporting period. The Facilities division has worked on a procedure to find leaks faster, and to reduce the amount of loss.

Youth Authority

In 2019, OYA is still on a minimal watering plan for landscaping, avoiding watering of grass in areas that are not used by youth. In addition, OYA has removed many landscaping areas where plants required regular watering and installed landscaping rock.

The agency opened a high school in 2018 at their facility in Grants Pass, and it will take several years of watering to establish the new landscaping. However, only native trees, shrubs, and grasses were planted, so that once they are established, they will require little to no water. The 99,000 square feet of landscaping around the school and facility courtyard will use 1,350,000 fewer gallons of water per year than non-native plantings. Native field grasses, which will require no watering, were used in areas away from the school building. As OYA continues with construction and remodeling projects that require landscaping at its facilities, the agency will follow water-saving measures.

Indoor Water Use

For restroom and shower facilities and break rooms, agencies:

- Inspected facilities for leaks
- Replaced or retrofit inefficient equipment
- Installed low-flow showerheads
- Calibrated automatic faucets
- Installed faucet aerators
- Reduced the water used for janitorial purposes
- Inspected facilities for leaks
- Replaced or retrofit inefficient equipment
- Installed an instant hot water dispenser

Dept. of Administrative Services

DAS continued to prioritize installation of low-flow fixtures where plumbing systems allow them to be installed. The agency is finding that some of the older plumbing systems are not able to support the lower amount of water, but it will continue to upgrade plumbing systems to allow for low flow fixtures where possible.

Dept. of Public Safety Standards and Training

Low flow toilets and showerheads are already in use throughout the facility. The agency actively watches for, and acts upon, reported domestic water leaks (i.e., toilets, sinks, and showers). The campus is 14 years old and built with water saving showerheads, toilets, and faucets, but individual fixtures are replaced with newer more efficient models as older equipment breaks.

Facilities has increased its preventive maintenance efforts to look for possible leaks in building systems and installed several more water bottle fillers. DPSST is evaluating building level water monitoring, which it currently does not have, to better identify waste and possible leaks. The plan is to build this monitoring into its existing Building Automation System (BAS) to give the agency live alerts and metrics. Funds have not been allocated at this time.

Dept. of State Lands

The Salem office building was retrofitted entirely with low-flow, high-efficiency sink fixtures in 2017, and toilets have been replaced as needed for general maintenance, with modern models that meet the "high efficiency" standard. South Slough has not replaced any plumbing fixtures since the water resources report was started in 2014, and plans to replace toilets with low-flow, high-efficiency fixtures as needed for maintenance. DSL is exploring plans to replace sink fixtures and shower head fixtures at the South Slough facilities during the next one to two years.

Dept. of Transportation

ODOT installs water-saving devices in all facilities where feasible and appropriate. Review of water equipment and use has been incorporated into facility inspections, which occur every three years. Faulty or leaking equipment is replaced as appropriate during facility inspection. Work order requests are expedited for all water system issues identified, and active participation from facilities staff and building managers is required to identify water issues and report corrective action. Replacement or upgrades of equipment is prioritized based on use and budget. For example, water saving drinking fountains were installed in ODOT's Region 1 headquarters building last year. ODOT's general conditions for facility design and construction contracts also includes provisions for low-flow fixtures during installation, where applicable.

Dept. of Parks and Recreation

The OPRD has a long-standing history of repairing leaks and installing low-flow fixtures wherever possible. The agency has implemented a program where foam sprayers hooked to hoses are no longer used in daily cleaning except in heavily soiled facilities or high-volume shower buildings. This has

resulted in significant savings in water and chemicals used in janitorial services. The agency also installs vault toilets and composting toilets in remote locations, which do not use any water - these restrooms are only suitable in locations where use is limited. The agency's shower vendor has recently reduced the gallons per minute (gpm) that showers use from 2.0 gpm to 1.6 gpm as the standard shower flow.

Dept. of Corrections

Corrections took a number of steps in 2019 to reduce indoor water use:

- DOC continues to implement shower schedules for AICs at various facilities that can accommodate them. Shower length restrictions can be a challenge in a correctional environment. The concern is that it could cause unrest within the population. This takes time in a correctional setting and good communication with the AICs for reasons of operation change.
- DRCI placed high priority on all work orders regarding plumbing to limit water waste. The estimated saving with this prioritization is 12,000 gallons.
- OSP fixed several broken water lines. It is estimated that 40,000 gallons were lost.
- Powder River Correctional Facility (PRCF) communicated with AICs to stop flushing toilets multiple times to reduce wasted water. This is a saving of 1.5 gallons per flush for 336 AICs. PRCF continued having AIC physical plant workers complete weekly inspections of all areas for leaks and plumbing issues. Any issues were immediately reported and fixed.
- SCI had inefficient equipment that was replaced. This included replacing a boiler surface blow system (25,000 gallons saved annually) and two boilers (11,000 gallons saved annually), repairing 15 sinks (2,000 gallons saved annually). SCI also fixed a steam leak on a kitchen makeup unit where an estimated 10,000 gallons of water was lost.
- TRCI replaced leaking steam and hot water valves and completed annual boiler tuning. This resulted in an annual savings of 7,500 gallons.
- Warner Creek Correctional Facility (WCCF) continued to focus on optimizing operations around water use. WCCF replaced aerators in all housing units and staff bathrooms throughout the facility, decreasing faucet flow from 1.5gpm to .5gpm. WCCF also installed water saving shower button timers on 28-unit showers, resulting in an estimated water savings of 55,000 gallons per month. Finally, WCCF reduced backwashes for the softened water system, resulting in a savings of 56,000 gallons per month.



Dept. of Fish and Wildlife

Several offices were able to make changes related to inspections, leaks, and water efficient equipment in 2019. ODFW continues to replace outdated fixtures with new water efficient appliances. All ODFW facilities display signage encouraging water conservation awareness.

Dept. of Forestry

The agency continuously checks for leaking hose bibs, angle stops, and flushometers. In 2018, multiple underground plumbing leaks were discovered and subsequently repaired.

Health Authority

OSH being a newer facility currently uses low-flow devices throughout the hospital.

Military Dept.

OMD has installed low-flow aerators in nearly all showers and sinks. The agency has also brought many bathrooms up to code, but there are additional opportunities if funding is identified. Most troop kitchens have been shut down for drill weekend. Troop meals are catered locally or they use ready to eat meals (MREs). This has made a large impact on reducing water consumption. Water leaks are also promptly addressed.

Youth Authority

Every time the agency needs to change out a toilet or showerhead, they install newer low-flow models. In newly constructed buildings, the newest water-saving plumbing fixtures are used.

Maintenance Water Use—Buildings and Equipment

For building and equipment maintenance, agencies:

- Reduced window washing
- Eliminated window washing
- Reduced pressure washing
- Reduced vehicle washing
- Assessed opportunities in equipment repair and replacement

Dept. of Corrections

- Central Distribution Center (CDC) discontinued washing its semi-truck fleet and trailers (unless needed for safety reasons) in 2019, resulting in nearly 75,000 gallons saved.
- DRCI continued collecting rainwater from their landscaping shop roof to assist with watering gardens. There are eight 55-gallon drums being utilized. DRCI discontinued vehicle washing (unless needed for safety reasons). DRCI is estimating 75,000 gallons saved by not washing vehicles.
- SCI continues to use two bladder bags to collect rainwater from one of their barns. The water is being piped to a greenhouse and garden area. Each bladder bag holds 5,000 gallons of water.
- Snake River Correctional Institution (SRCI) completed an annual analysis of all water heaters and recalibrated them to 82 percent efficiency. There are 18 water heaters ranging from 250 gallons to 1,500 gallons.

Dept. of Administrative Services

The agency is washing windows on an as needed basis at the rate of no more than once a year. Pressure washing is also limited to an as needed capacity. Recycled water is used for the Fleet and Parking Services car wash; 95 percent of the water used for the Motor Pool Car wash is recycled. According to *Carwashing and Detailing Professional*, the average car wash uses approximately 40 gallons per wash.¹⁰ In 2017, Fleet and Parking Services washed approximately 20,400 cars, avoiding an estimated 816 kgals of non-essential water use per year. The car wash system is not separately metered, so only estimates of car wash water consumption are available.

Dept. of State Lands

Window washing is completed using a low water method of a wash brush and squeegee. No continuous use washers are used on the windows. The agency anticipates window cleaning annually and pressure washing every 2 to 3 years depending on moss build up. The building HVAC system uses water as part of its cooling cycle. The agency will explore alternative systems that use less water when the HVAC is ready to be replaced.

Dept. of Transportation

Window washing is done only as needed and does not involve hoses or power washing. ODOT has increased awareness regarding water use during vehicle maintenance. ODOT also continues to incorporate review of water equipment and use into facility inspections (every three years). Work order requests are expedited for all water systems issues where identified. The agency is requiring active participation from facilities staff and building occupants in identifying water issues and reporting corrective action. Replacement or an upgrade of equipment is prioritized based on usage and available budget.

Dept. of Public Safety Standards and Training

The agency will only power wash if it is required for the work being performed (i.e., painting prep for building exteriors), or if a dangerous condition exists, such as slick algae buildup on sidewalks. The custodial team is considering products and tools that use less water inside of buildings. For safety reasons, DPSST must wash its vehicles. When possible, vehicles used for off campus business purposes are routed to the DAS fleet car wash to take advantage of recycled water.

Dept. of Forestry

Salem operations and maintenance staff continue to reduce the overall landscaping irrigation load during the summer months, allowing most of the turf to go dormant, and keeping shrubbery watering to a minimum.

¹⁰ <https://www.carwash.com/benchmarking-water-consumption-for-water-efficiency/>

Dept. of Parks and Recreation

Drought education was included in the agency's ongoing green chemistry training.

Dept. of Fish and Wildlife

The agency has reduced pressure washing, excluding the cleaning of hatchery raceways and liberation trucks, which must be clean to protect fish from bacteria. Hatcheries are operated to re-use/recycle water used for fish production.

Many locations have reduced their number of vehicles. Additionally, most vehicles are washed off-site. One location has a collection tank now on site for run-off collection. Sites that use recycled water are encouraged, or if they would like to use recycled water, to submit a project plan.



Health Authority – State Hospital

The facility has reduced vehicle washing by 70 percent.

Youth Authority

All OYA facilities use water hoses with shut-off nozzles and have ceased washing sidewalks and roads during summer months. When replacing appliances and fixtures, all facilities are purchasing low flow/water-efficient products. All the landscaping for new construction projects has focused on drought-resilient native plants. When they are established, these plants will require little to no watering.

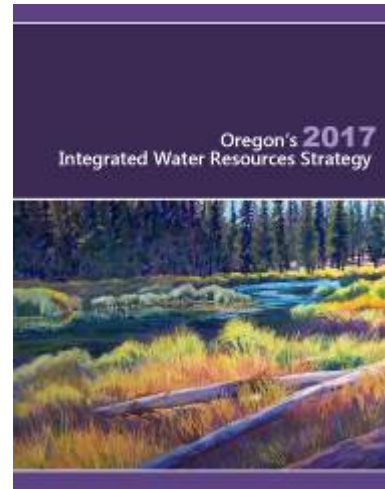
OYA has a process, which is on the agency's intranet website, for facilities to report small water leaks by notifying their maintenance department. Large leaks are treated like an emergency and are addressed immediately. The agency also checks for leaks by monitoring water bills and noting how they compare to previous years.

Section IV – Drought-Related Planning

Governor Brown's EO included additional directives, such as a review and update of the state's drought response plan and incorporating drought measures in the next iteration of state's Integrated Water Resources Strategy.

Oregon's Drought Incident Annex and Related Activities

Following the 2015 drought, several agencies incorporated lessons learned into the state's incident annex on drought. The document outlines the roles and responsibilities of agencies during a drought and serves as a component of the state's Emergency Operations Plan. Updating the drought incident annex in early 2016 helped reinvigorate the role of the state's Drought Readiness Council, which continues to meet on a monthly basis to keep the communication lines open and advance efforts around drought planning and mitigation endeavors. The Council's primary function is to make recommendations to the Governor regarding local requests for state drought declarations. On occasion, the Council uses its collective knowledge to shed light on needed resources, such as the value of programs like Agrimet, a series of federally operated weather stations that monitor temperature, precipitation, soil moisture and other climate variables, all of which are important for drought preparedness.



Much like the state's Drought Readiness Council, the Water Supply Availability Committee meets on a monthly basis to maintain awareness of current conditions and to better anticipate seasonal water supply conditions. The Committee has been instrumental in communicating water conditions between state and federal agencies, as well as with the public, water managers, and other stakeholders. A key communication tool currently in use is a water conditions report containing a summary of snowpack, precipitation, storage at major reservoirs across the state, as well as forecasts on streamflow, runoff, and temperature. Since 2015, the Water Resources Department has issued almost 100 of these reports on a bi-weekly basis.

Oregon's 2017 Integrated Water Resources Strategy

In December 2017, Oregon's Water Resources Commission adopted the state's Integrated Water Resources Strategy, a statewide framework for better understanding and meeting Oregon's instream and out-of-stream water needs - including water quantity, water quality and ecological needs. The revised edition contained a number of recommended actions, including steps for better preparing for drought, improving the measurement of water use, bolstering education and outreach efforts, and messaging around water conservation and water-use efficiency.

The issue of drought was a new addition to the 2017 Strategy and responds to the Governor's directive. Improving the state's drought toolbox will involve assessing and assisting those communities most vulnerable to drought, expanding education and outreach efforts, drought contingency planning, installation of more efficient distribution systems, and carrying out actions to restore streamflows across the state.

Improving water use measurement has long been identified in the state's strategy for better water management. The 2017 Strategy continues to emphasize this, further recommending improvements to existing software and tools, improving the state's authority to require reporting of water use, and updating existing plans aimed at strategically measuring water use within high priority watersheds.

One of the more widely recognized approaches to managing demand for water—and stretching supplies of water—is water conservation. The 2017 Strategy lays out a number of steps for expanding water conservation and water use efficiency, including the establishment of a program that provides technical assistance to all users, conducting an assessment to measure the potential for water conservation, prioritizing agricultural water use efficiency, and lastly, developing an outreach strategy to expand participation in existing programs.

Section V – Opportunities and Next Steps

With a changing climate and growing population, Oregon's water resources will continue to face strains in the coming years. As such, while EO 15-09 set a goal for reducing water use by December 31, 2020, state agencies, water managers, and the public should be looking well beyond the next few years for opportunities to be efficient and resilient in the face of future water shortages. For state agencies, opportunities include the following:

- **Planning** – Create strategic water conservation plans and policies to prioritize the greatest opportunities to increase water use efficiency and reduce water use. These could be done as stand-alone plans, as part of the revised Statewide Climate Adaptation Framework, or as part of a broader sustainability or resource conservation plan. As a whole, reporting agencies are challenged to find additional water savings to achieve the EO's goal.
- **Measurement** – Continue to improve measurement of end uses through additional metering and sub-metering. Individual meters are not particularly cost-prohibitive, but they help provide vital data in water use trends, identify anomalies such as leaks, and track water costs and potential savings from conservation and efficiency projects. Larger agencies, however, may need a dedicated funding source or a longer timeframe for installation in order to procure larger numbers of meters. Agencies will need to plan for a budget for measurement devices, including operation and maintenance needs, or find other innovative ways to achieve this important goal.
- **Data Collection and Reporting** – Improve the collection and management of water use data. For example, ODOT created a water use tracking database. The data was pulled from ODOT's Transportation Environment Accounting Management System (TEAMS), a centralized accounting system used to pay the agency's bills. Using TEAMS allowed water quantities to be isolated based on what the payment processors had entered for each bill. TEAMS captures all metered buildings, compounds, and facilities with water use on a monthly basis. Similarly, DAS uses the EnergyCAP software to track energy and water use, and conduct analyses on trends in water use and costs.
- **Refining Essential Uses** – Refine the conversation on essential versus non-essential water use – and how to parse out non-essential use in the measurement and management of water.
- **Monitoring Long-Term Trends** – Assess and monitor future trends in climate change and impacts to natural resources and people, as well as, support the work of the Oregon Climate Change Research Institute and other similar organizations. Oregon's changing climate points to significant changes in water availability (e.g., reduced snowpack) and increased demands for water. Agencies should prepare now, looking well beyond 2020 – to adapt to these changes.

- **Agency Coordination, Communication and Outreach** – Continue to collaborate, share, and promote best practices in communication to agency staff to conserve this vital resource. Agencies are also encouraged to conduct outreach and education to the public about water conservation – even when it rains.

Appendix A – Executive Order 15-09

The Governor's Executive Order can be found on the following website:

http://www.oregon.gov/gov/Documents/executive_orders/eo_15-09.pdf