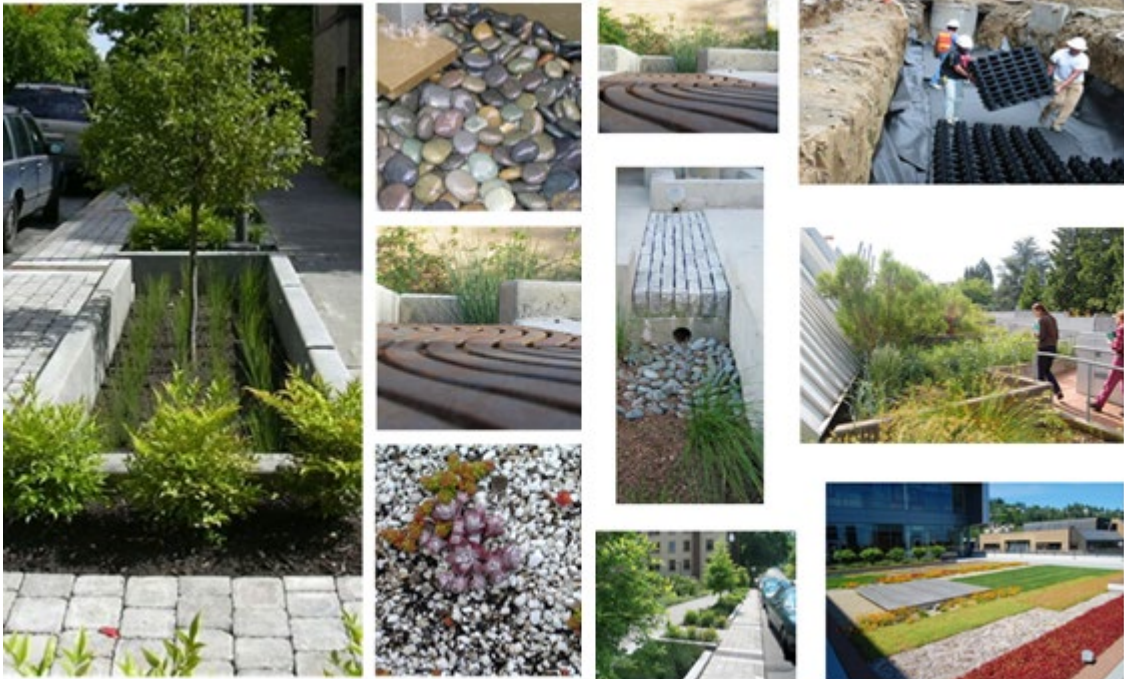


PORTLAND STATE UNIVERSITY

WATER CONSERVATION PLAN

October, 2016



INTRODUCTION

Fresh, clean water is a critical, but limited resource. Portland State acknowledges its impact on the local water supply and strives to conserve this essential resource through careful planning, appropriate maintenance, and efficient practices. To that end, this plan serves to inventory and formalize current best practices and provide guidance on future steps towards reducing water consumption both in our buildings and green space.

INDOOR WATER USE

Current Practices

- New construction and renovations: PSU's [Technical Design Standards](#) specify all fixtures and appliances to be as water efficient as possible, be WaterSense certified where applicable, and assist in achieving Water Efficiency credits in the LEED rating system. See section 22:C and APPENDIX 01.6 – RESTROOM PREFERENCES for more detail.
- Portland State has a stated standard to achieve a LEED Gold minimum for all major renovations and new construction. Rainwater harvesting is considered in every major construction project on campus.
 - Three buildings (Stephen Epler Hall, Engineering Building, Academic and Student Recreation Center) are harvesting rainwater for irrigation and/or flushing toilets, reducing the demand for potable water.
 - In FY15, 405,686 gallons of reclaimed rainwater were used on campus.
- PSU's [Green Revolving Fund](#) was established in 2013 to implement energy and water efficiency projects and is reimbursed through savings in the campus utilities budget. To date, water conservation projects supported through the GRF include:
 - 2013-14: Lavatory fixture upgrades in Millar Library, East Hall, and Cramer Hall.
 - 2020-21: Lavatory fixture upgrades in Science Research and Teaching Center, Urban Center Building, Hoffmann Hall, and Parkmill
- PSU certified four buildings under LEED for Existing Buildings, Operation & Maintenance (LEED O+M); Urban Center Building, Blumel Residence Hall, University Services Building and Richard and Maurine Neuberger Center
 - Process included the installation of faucet aerators in buildings seeking certification and all building across campus.
 - LEED v4 Prerequisite: [Reduce indoor water consumption](#).
 - LEED v4 Credit: [Reduce indoor water consumption](#) (25-50%) (1-5 points).

Planned Practices

- Continue to implement water conserving fixtures and appliances as noted in the Technical Design Standards and update standards at least annually to reflect evolving water efficient technologies.
- PSU will expand building portfolio of LEED for Existing Buildings, Operations & Maintenance to certify an additional four buildings; Parkmill, Cramer Hall, Millar Library, and Hoffmann Hall
- The Planning and Sustainability Office will identify incentive opportunities to fund increased water conservation measures (e.g. through City of Portland Water Bureau).
- Ensure that each annual round of Green Revolving Fund project selection considers at least one water conservation project.
- Prioritize WE credits on all new LEED projects.

OUTDOOR WATER USE

Current Practices

- Drought-tolerant plantings on various campus green roofs, most recently the Collaborative Life Sciences Building and on the Karl Miller Center.
- Removed non-natives / invasives (horsetail, turf, etc.) and replaced with native plantings that are drought tolerant in several locations.
- Installed student-designed permaculture garden along Smith Student Memorial Student Union.

- Irrigation system modernization: Three web-based irrigation controllers and multiple flow sensors have been installed, with more to come.
 - Regulates according to weather conditions
 - Leak detection and total consumption per irrigation zone via flow sensors
- Additional water and irrigation metering added via Economic Development Administration grant.
- Commissioned student-designed projects through [Living Lab Program](#) focused on green roof revitalization and stormwater management.
- Manually water many spaces as-needed, rather than irrigate.

Planned Practices

- Enable water use reduction through improved data: PSU is entering a third party bill pay partnership with ECOVA which will provide meter-level detail for all water and irrigation consumption, and thus more accurate consumption data to assist in meeting quantitative reduction goals.
 - 2016: Set a firm baseline for irrigation water usage
 - Track annual irrigation water usage moving forward
- Establish a quantitative irrigation reduction goal: To be established fall 2018, after modernization of central irrigation system is complete and all controllers are installed, ECOVA partnership is established, and accurate baseline is determined.
- No net increase in irrigated acreage.
- Priority zoning of irrigation in drought conditions, see drought contingency plan below.
- Increase use of native plants with low water requirements.
 - Establish list of preferred plants by fall 2017.
- Continued modernization of central irrigation system to cover over 50% of PSU's irrigation needs: three additional irrigation controllers and several flow sensors will be installed.
 - Regulated according to weather conditions

- Leak detection with flow sensors
- Pursue LEED for Existing Buildings, Operations & Maintenance in at least two campus buildings.
 - LEED v4 Credit: [Reduce outdoor water consumption](#) (50-100%) (1-2 points)
- Improve soil quality as needed in irrigated areas to improve water absorption and reduce reliance on irrigation through:
 - deep spading, plowing, or rototilling compacted soil, allowing for healthy root systems
 - Adding organic matter such as compost and leaf debris
 - Testing soils when feasible to identify beneficial amendments
- Planning for water efficiency in new landscaped spaces: carefully consider characteristics like sun exposure, shade, slopes, and soil types when choosing plants for new spaces.
- Mulch landscaped areas to retain soil moisture, suppress weeds, slow evaporation, and protect roots.
- Update the drought contingency plan to include a decorative fountain (SHAC, Walk of Heroines, Urban Plaza) shut off schedule.
- Turf:
 - Minimize turf areas as much as possible in newly developed spaces
 - Replace existing turf areas with native/drought resistant landscaping when possible
 - If turf must be used, select drought resistant / low water use varieties
 - In summer months, cut only one-third of grass height. Taller grasses cool soil, support deep roots, and make grasses less susceptible to heat and drought.

DROUGHT CONTINGENCY PLAN

In order to conserve the available potable water supply, to preserve public safety and welfare, to protect and maintain healthy habitat function, and to minimize adverse impacts of a water shortage, PSU will follow the steps outlined below in a time of drought. The Landscaping Supervisor will monitor water supply conditions and initiate/terminate drought contingency plan steps in the following sequence and in accordance with the maps included on the following pages:

1. **Low Priority Shut-off:** annual color beds and planters and / or drought resistant areas coded on map as pink. These areas will not be watered.
2. **Moderate / Perceived High Priority Shut-off:** groundcover and some plants, areas coded on map as orange. Irrigation to be determined by Facilities Director and Landscape Supervisor on a case by case basis according to severity of drought
3. **High Priority Shut-off:** new plantings and highly visible locations, areas coded on map as green, including the Park Blocks which require the largest amount of irrigation at PSU. Shut-off in Park Blocks requires permission from the City.

* The Drought Contingency Plan is subject to change

Past estimates of irrigation totals (to be updated in 2017)

PSU Irrigation

Current irrigation practices at PSU:

Estimating a 25 week irrigation season – April through October

Approx. 172 irrigation zones on campus.

Turf zone – Rotor (32 zones)

Approx. 10 heads @ 2.5 GPM = 25 GPM per zone

30 minute run time = 750 gal.

4 days / week = 3000 gal. /zone/week

Turf zone – Spray (11 zones)

Approx. 20 heads @ 1.45 GPM = 29 GPM

15 minute run time = 435 gal.

4 days / week = 1740 gal. /zone/week

Shrub zone – Spray (74 zones)

Approx. 20 heads @ 1.45 GPM = 29 GPM

8 minute run time = 232 gal.

3 days / week = 696 gal. /zone/week

Shrub zone – Drip (9 zones)

Approx. 225 GPH

90 minute run time = 337.5 gal.

2 days / week = 675 gal. /zone/week

Tree zone – Bubblers (1 zone)

15 heads @ 1.7 GPM = 25.5 GPM

15 minute run time = 382.5 gal.

2 days/week = 765 gal.

Irrigation Usage Summary:

Rotors – Turf: 3000 gal. x 32 zones = 96,000 gal/week

Spray – Turf: 1740 gal. x 11 zones = 19,140 gal/week

Spray – Shrubs: 696 gal. x 74 zones = 51,504 gal/week

Drip – Shrubs: 675 gal. x 9 zones = 6,075 gal/week

Bubblers – Trees: 51 gal/week

Estimated Total from 20052014: 172,770 gal/week x 25 weeks = 4,319,250 gallons used per irrigation season

Monitoring

Irrigation water usage is tracked by Landscaping during the irrigating season, and is trended and reported by the Sustainability Office. Specific monitoring may also be required to determine water quality and runoff rates as necessary.

