

Portland Water Bureau Soil Moisture Sensor Pilot Study



Essex Park in Portland, Oregon

This two-year study investigated the ability of soil moisture sensor-based irrigation controllers to decrease the amount of water used for irrigation at medium to large landscape sites in Portland, Oregon

The study was also designed to determine whether soil moisture sensor based irrigation works as well as ET-based controllers that require third-party communication.

PRODUCT LIST

- BaseStation 3200™ Irrigation Controllers
- Cell Modem
- Ethernet Radio
- BaseManager™ Central Control
- biSensor™ Soil Moisture Sensors
- Baseline WaterTec S100™

The Bureau chose the study participants based on their history of high summer water use. These participants agreed to make any needed upgrades to their irrigation systems to meet the minimum requirements for the study, and, in exchange, the Bureau provided the soil moisture sensors, controllers, and installation and monitoring at no cost to the customers.

The Bureau selected Baseline equipment for use in this study because it works with existing field wiring. They were also impressed with its accuracy, reliability, and advanced features like remote communication and flow monitoring.

The participants will be able to keep the equipment and continue the water-saving benefits after the end of the Pilot Study.

**On average, study participants saw
47% water savings**

McDonald's Restaurant – Before and After



HOW SOIL MOISTURE SENSOR- BASED WATERING COMPARES WITH ET-BASED WATERING

The Portland Water Bureau favors soil moisture sensors because this technology takes moisture readings directly from the soil at the site rather than requiring communication with off-site weather stations, and then estimating moisture depletion based on an equation.

“Soil moisture sensor-based irrigation will definitely be a way to irrigate landscapes efficiently, saving the customer time and money, as well improving the health of the landscape by keeping the soil moisture in the optimal range for plant health.”

The McDonald's Restaurant site was too small to warrant installing a BaseStation 3200 controller, so instead a Baseline WaterTec S100 unit was installed, along with a single Baseline biSensor. After improving the distribution uniformity on the existing sprinkler system and configuring the Baseline equipment, the site **decreased water use by 66% in the first year and 82% in the second year of the study.** Note the marked improvement in turf quality after the moisture sensor installation.

Results at Other Study Locations

Metro Center — Excellent water savings in both irrigation seasons during the pilot program – **44% in 2010 and 24% in 2011.**

Oregon Museum of Science & Industry — After a leak was repaired, the second year of the study showed a **38% water savings.**

PacWest Center — Even though there is no turf at the PacWest Center site, a normalized **water savings of 17% was realized in 2011.**

Port of Portland — The Baseline controller and moisture sensors achieved very good water savings in both years of the study, and the turf and ground cover quality was very good during both summers – **70% in 2010 and 61% in 2011.**

Rose Quarter Complex — Kept the lawn green all summer, which had been difficult to do in the past, and still saved a substantial amount of water in both years of the study – **32% in 2010 and 29% in 2011.**

Reference

Ranton, Judi and Steven C. Carlin, PhD, CLIA, CID. Soil Moisture Sensor Pilot Program Project Summary. Portland Water Bureau. Portland, Oregon. June 30, 2012.