

## **Trees in Green Infrastructure: Their Health and Growth in Relation to "Soil" Conditions in Street-Side Bioswales**

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Street-side stormwater management facilities (“bioswales”) are an essential element of the stormwater infrastructure, and while most include small plants, many are also planted with trees. The growth and continued good health (“performance”) of these trees is presumed, but has not been documented or evaluated, whereas the unique conditions of bioswale “soil” – a specific, rapid-draining soilless substrate – potentially present challenges to tree performance. This poster presents preliminary results (2015-2017) on bioswale substrate conditions (temperature and moisture, recorded by dataloggers) and tree growth and health from four Bay Area cities that installed bioswales from 2009 to 2013, and results from Portland (OR) are shown for comparison (from bioswales as old as 2000). No prolonged waterlogging was recorded in any of the Bay Area bioswales, whereas long dry periods during the summer were recorded in bioswales without functioning irrigation systems (contrasting with Portland, where some substrate moisture persisted throughout the summer). Tree growth in bioswales was generally slow, but comparable to those of trees in adjacent sidewalk planting strips. A notable preliminary finding is that the urban foresters’ concern over waterlogging (in winter) was not confirmed by the data; instead, the issue of summer drying of the substrate may be more consequential in our Mediterranean climate (in contrast to Portland, OR).

**Keywords:** tree, bioswale, rain, garden, urban, forestry, arboriculture, soil, infiltration, carbon

**Poster Topic** Storm Water