

## GreenPlan-IT 101 - Where to Improve Water Quality in Your Watershed

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Addressing stormwater runoff and pollution challenges associated with urbanization is complex and relies on costly engineering, especially in highly-developed urban environments. Increasingly, distributed management of stormwater runoff using Green infrastructure (GI) is emerging as a multi-benefit solution that can address both stormwater quality and quantity concerns. Consistent with this trend and under the NPDES Stormwater Municipal Regional Permit (MRP), many local municipalities are required to develop and implement watershed-scale green infrastructure plans to cost effectively achieve quantitative water quality improvements and provide reasonable assurance that GI will achieve the desired load reductions.

GreenPlan-IT, a watershed planning level tool, was developed to support the cost-effective selection and placement of GI in urban watersheds. The GreenPlan-IT ToolKit is comprised of three Modules: a GIS-based Site Locator Tool, a Modeling Tool, and an Optimization Tool. The Site Locator Tool works with ESRI Arc-GIS software to produce customizable, practical, and useful planning-level maps that identify and rank the best locations to implement GI. The Modeling Tool is built on a spatially distributed hydrologic and water quality model to establish baseline conditions; identify high-yield runoff and pollution areas; and quantify any reduction made from GI implementation across a watershed. The Optimization Tool was developed to determine GI scenarios (locations, types, and design configurations) that minimize the total implementation cost while satisfying water quality and quantity objectives and constraints.

The GreenPlan-IT Toolkit has been piloted with the City of San Mateo and the City of San Jose. The City of San Mateo incorporated map outputs into their Sustainable Streets plan. The City of San Jose utilized all three Toolkit modules to support a cost-benefit evaluation of stormwater runoff control. The tool combines the best available science with the best available local and regional data and can be applied to other municipalities throughout the region.

**Keywords:** Green Infrastructure, Watershed Planning, GIS, Water Quality,

**Session Title:** Urban Greening of the Bay Area

**Speaker Biography:** **Pete Kauhanen** is a GIS Specialist and Project Manager at SFEI with over 6 years' experience generating, obtaining, and analyzing GIS data for environmental projects. Pete has a background in watershed ecology, green infrastructure planning, habitat mapping, fire management, utilizing indigenous knowledge to achieve conservation goals, projects and initiatives. Pete has a BA and MA from Stanford University where he focused on ecology, behavioral ecology and environmental anthropology. **Lester McKee** is a Senior Scientist at SFEI, specializing in design and implementation of studies on the sources, transport, transformation, and loadings of sediments, nutrients and trace contaminants in Bay Area watersheds. He also studies hydrology, water quality, geomorphic processes, and resource mapping using geographic information systems (GIS). Dr. McKee has a BSc. in Geology from the University of Canterbury in New Zealand. He conducted his Ph.D. hydrology and nutrient biogeochemistry research at Southern Cross University in Australia.

## Stormwater Infrastructure Funding

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The total water portfolio in California is divided into three sectors, drinking water, wastewater, and stormwater. The stormwater sector includes four service centers: groundwater recharge through infiltration of stormwater, stormwater quality improvement by removing pollutants, local-scale drainage facilities operated by cities and counties, and regional-scale flood protection systems often operated by Flood Control Districts. The stormwater sector has been underfunded for decades and if this disinvestment continues there will be far-reaching consequences. Fortunately, there is an effort underway that could turn around this cycle of disinvestment.

Last year, a coalition of statewide organizations came together to develop a Constitutional Amendment and ballot measure to help fund stormwater services. Currently, the California Constitution (Proposition 218) requires stormwater agencies to receive voter approval to establish or increase “rates” to fund capital and operational needs. Water districts and wastewater districts are able to fund their services with a different public involvement process. The ballot measure would establish a process to raise revenue for stormwater services similar to the process used by water districts and wastewater districts. In the context of this legislative effort, “stormwater” includes all four elements described above: groundwater supply, stormwater quality, local and regional drainage.

The way we manage water today in California and the management tools we will need to manage our water resources in the future are described in various state publications including the California Water Plan. It is a different world today than when Proposition 218 was passed in 1996. A coalition is working to clarify Proposition 218 requirements so all sectors of water are funded through a similar process, to help provide funding for stormwater services.

This presentation will describe the way stormwater services are funded, what’s needed for sustainable funding, and the legislative effort to help provide that funding.

**Keywords:** Stormwater, Funding

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**Speaker Biography:** Mitch Avalon graduated from the University of California, Berkeley, with a degree in Civil Engineering. He worked for the Contra Costa County Public Works Department for 35 years, the last 15 years as the Deputy Chief Engineer for the Flood Control and Water Conservation District, where he developed the “50 Year Plan”, a policy to convert traditional concrete flood control channels into natural stream systems. Mitch retired in 2011 and established his own company. He currently does special projects for Contra Costa County Flood Control District and County Engineers Association of California. Mitch has been chair of the Alhambra Watershed Council since its founding in 1997, is on the Board of Directors of the San Francisco Estuary Institute, and was the founding Chair of the Bay Area Flood Protection Agencies Association. In his free time, Mitch enjoys carpentry, wilderness camping, hiking, and kayaking.

## Greening Oakland: Plans & Projects

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This presentation will highlight how the City of Oakland is helping to improve water quality and watershed health through the implementation of green infrastructure projects and will describe its planning efforts for future opportunities. Case studies will illustrate several recently-completed projects including the retrofit of a parking lot in downtown Oakland that will reduce stormwater runoff volumes and capture runoff from fire truck washing, and a tree well project in West Oakland designed to help reduce the volume of stormwater and pollutants flowing into San Francisco Bay, specifically legacy PCBs. The presentation will also showcase several larger green infrastructure projects currently in design.

The presentation will discuss lessons learned in planning green infrastructure with an emphasis on implementation and design challenges at the local level. Oakland's development of an urban greening plan and recent efforts to incorporate green infrastructure into transportation programs will also be highlighted.

**Keywords:** Green Infrastructure, Lessons Learned, Stormwater, Urban Greening, Transportation

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**Speaker Biography:** **Kristin Hathaway** has worked for the City of Oakland Watershed and Stormwater Management Program since 1998 where she has been a project manager on numerous creek restoration and stormwater projects. She is also currently facilitating development of an urban greening plan for stormwater retrofit opportunities. Ms. Hathaway holds a B.S. in Environmental Science from the University of Vermont and is an APWA Certified Stormwater Manager. **Rebecca Tuden** works for the City of Oakland Watershed and Stormwater Management Program on implementing water quality programs and managing green infrastructure projects. Previously she worked as a professional facilitator in environmental dispute issues and worked for the US EPA on watershed management, wetland regulatory issues and a coordinator on states' clean water programs.

## Beyond Demonstrations: Making Green Streets a Reality

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Green Streets are locations where Green Infrastructure/Low Impact Development practices are applied to the public right-of-way (i.e. streets & sidewalks). When widely implemented within a watershed, Green Streets can address water quality, local flooding, and climate change resiliency challenges, while providing a host of community and environmental benefits. Although Bay Area municipalities have implemented a handful of opportunistic, demonstration projects, more effort is needed to make Green Streets a standard practice throughout the region. The San Francisco Estuary Partnership collaborates with local governments, the scientific community, and the regulatory community to identify and help resolve the many barriers to achieving a new standard paradigm. Our presentation will cover our on-going, multi-pronged efforts to increase local governmental capacity for Green Streets. These include: watershed-based planning and tracking tools, inter-departmental coordination, lessons from implemented projects, hydrologic and water quality monitoring, cost controls, and financing mechanisms for Green Street life-cycle costs.

**Keywords:** Green Infrastructure, Green Streets, Stormwater, Urban Greening, Transportation, Funding, GreenPlan-IT

**Session Title:** Urban Greening of the Bay Area

**Speaker Biography:** Jennifer Krebs is a Principal Environmental Planner with San Francisco Estuary Partnership. She works with local governments and water agencies throughout the Bay Area to plan, design, and build green infrastructure projects. She helped design and implement the EcoWise Certified Program, the Joint Aquatic Resources Permit Application (JARPA), the Bay Area Dioxins Project, and the Bay Area Green Business Program. She has a B.S.F.S. in International Affairs and an M.A. in Geography.

Josh Bradt is an SFEP Project Manager, working on Green Streets projects in seven cities along San Pablo Ave in the East Bay. Prior to this, Josh spearheaded the creation of City of Berkeley's Citywide Watershed Management Plan, which informed local Measure M—formally integrating LID into a \$30M pavement improvement program. Josh was the Executive Director of the Urban Creeks Council and a Watershed Specialist at the Contra Costa Countywide Clean Water Program.