



Infiltration BMP Design and Maintenance Optimization

Preliminary Results

Lake Tahoe Basin Science Conference

May 23, 2012

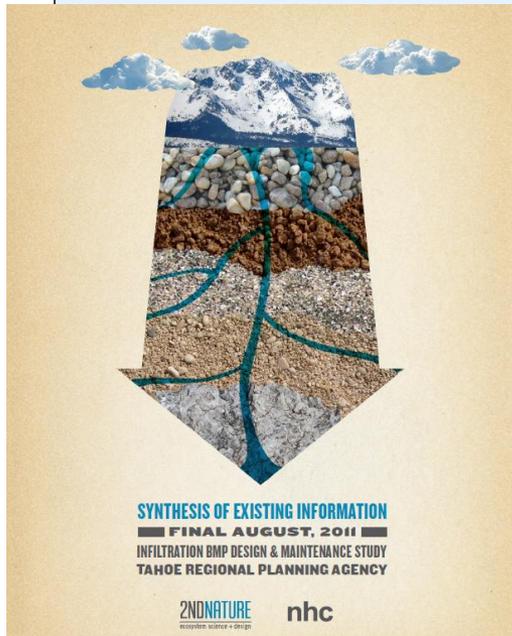


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Literature Review



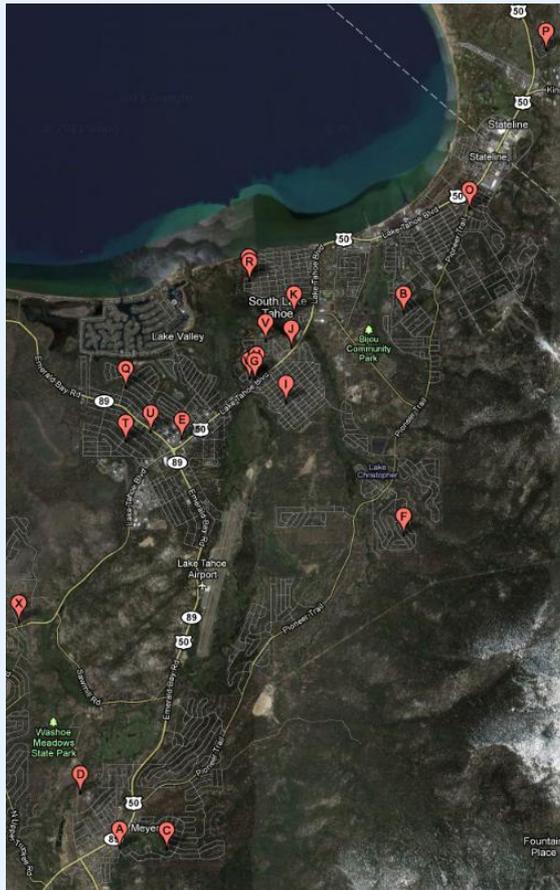
Field BMP Survey



Stormwater Loading Simulations



Study Sites

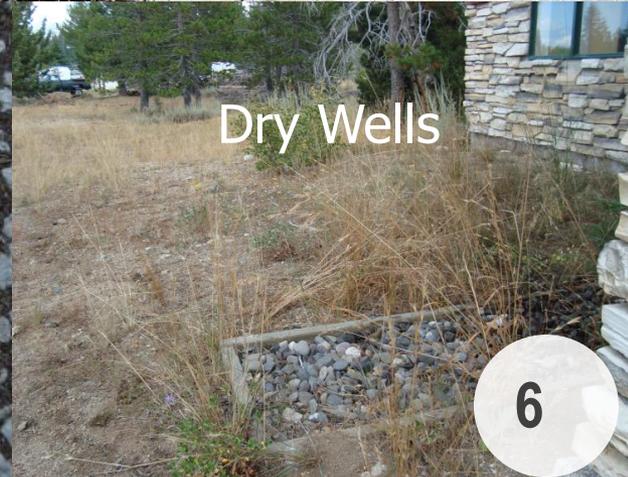


- Concentrated in the South Lake area
- Coordinated with TRPA and landowners
- 45 Sites
 - 45% Single and Multi Residential
 - 45% Commercial
 - 10% other

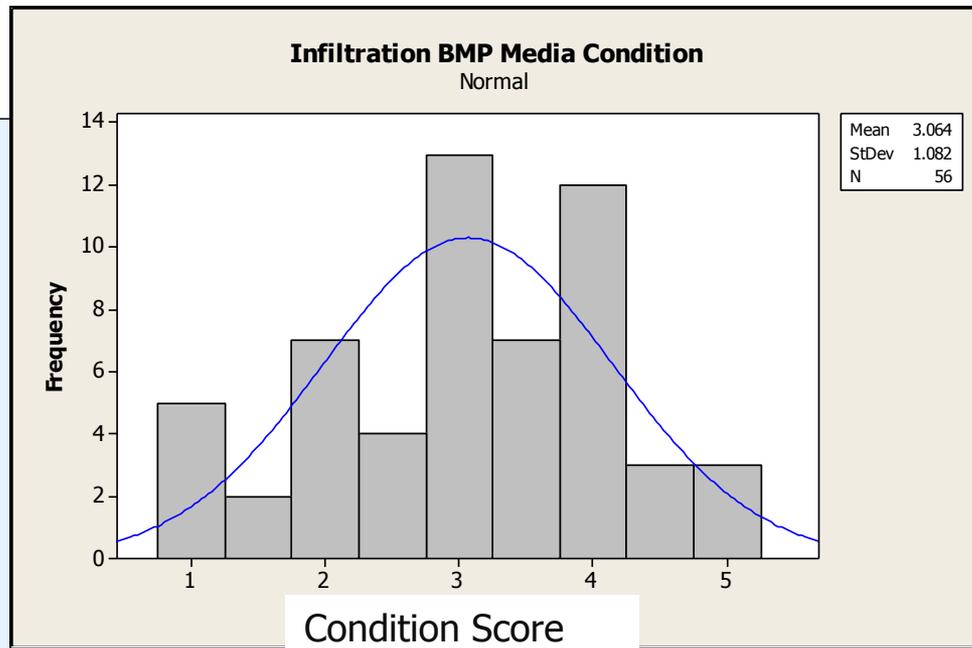


Observations and Measurements:

BMP design, condition, performance
Drainage size, surfaces, condition



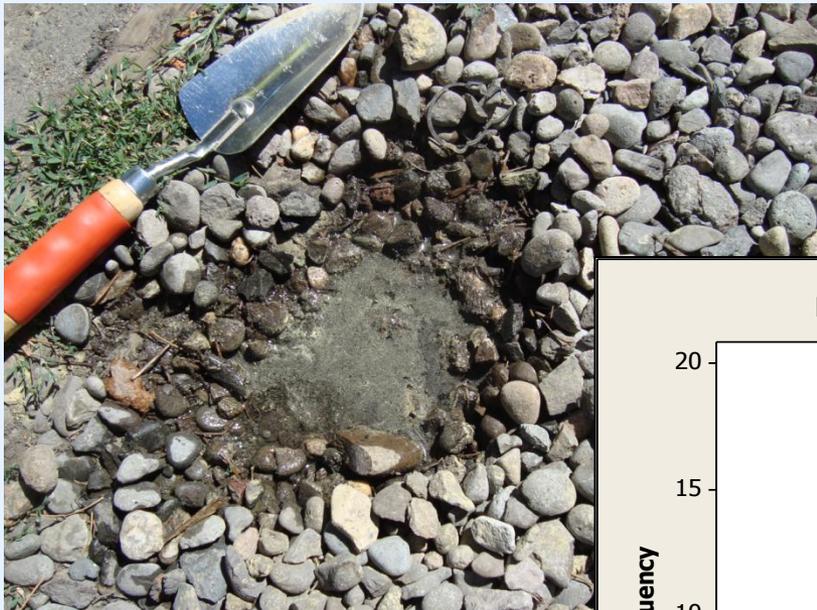
Field data analysis



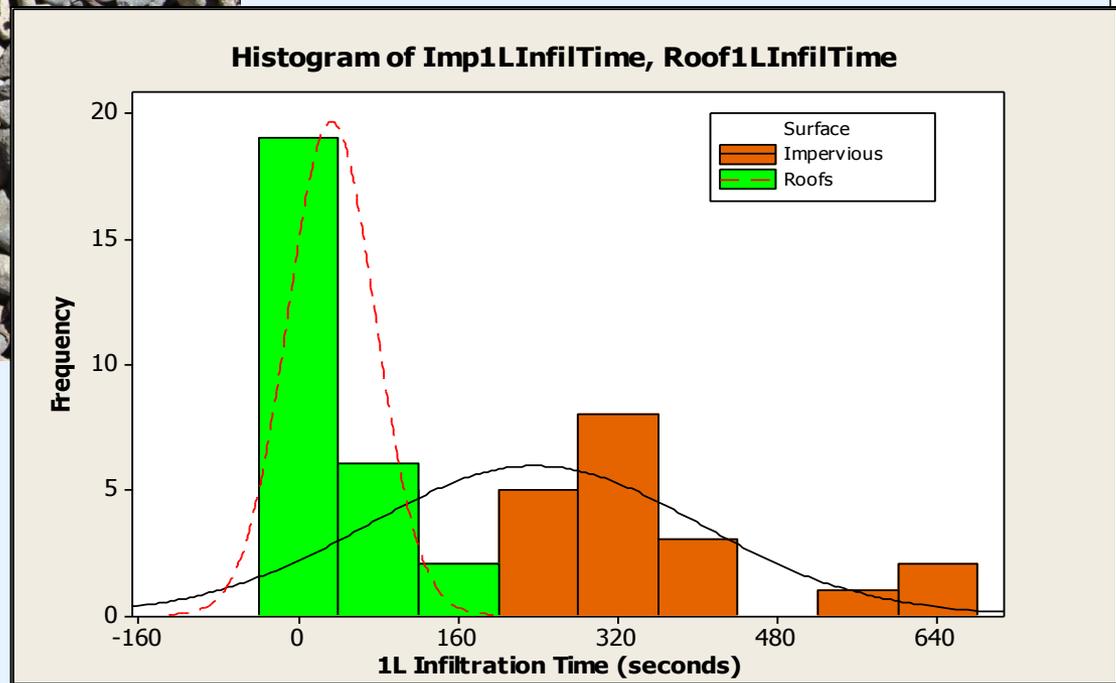
Condition: Visual estimate of sediment accumulation



Drainage Surface and Infiltration Performance



Performance diagnostic - time for infiltration of 1L water.



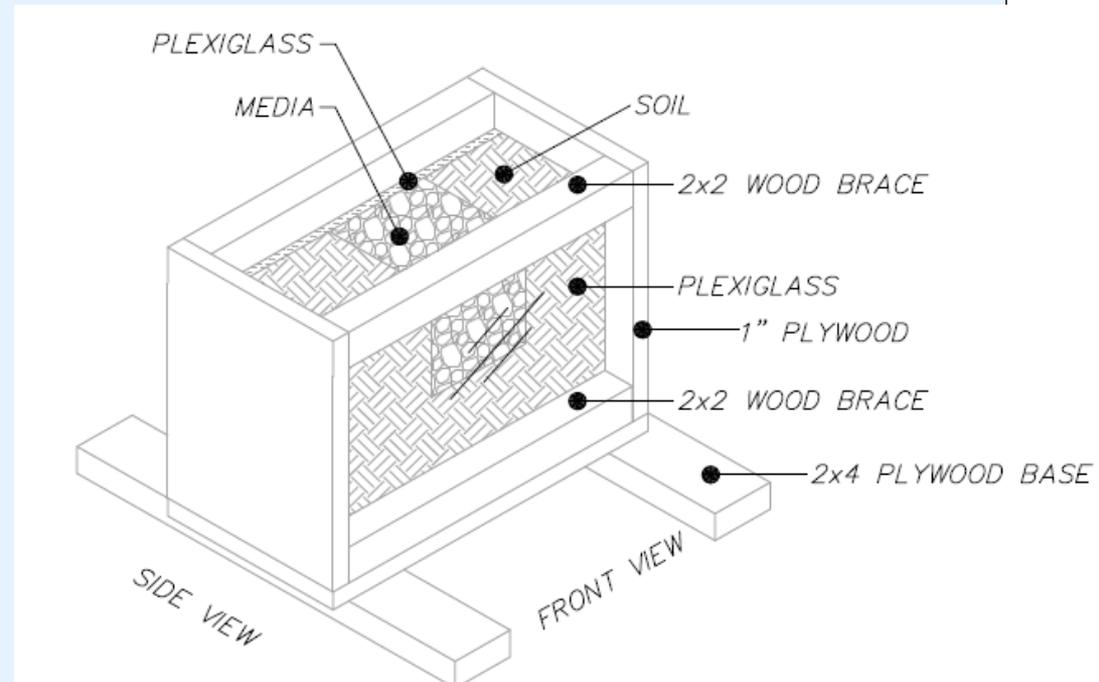
Field Survey Insights

- Visual condition estimate is a poor indicator of performance
- Non-design runoff results in severe declines



Approach

- Load stormwater with typical Tahoe Basin FSP mg/L
- Vary stormwater composition and BMP designs
- Quantify infiltration performance changes



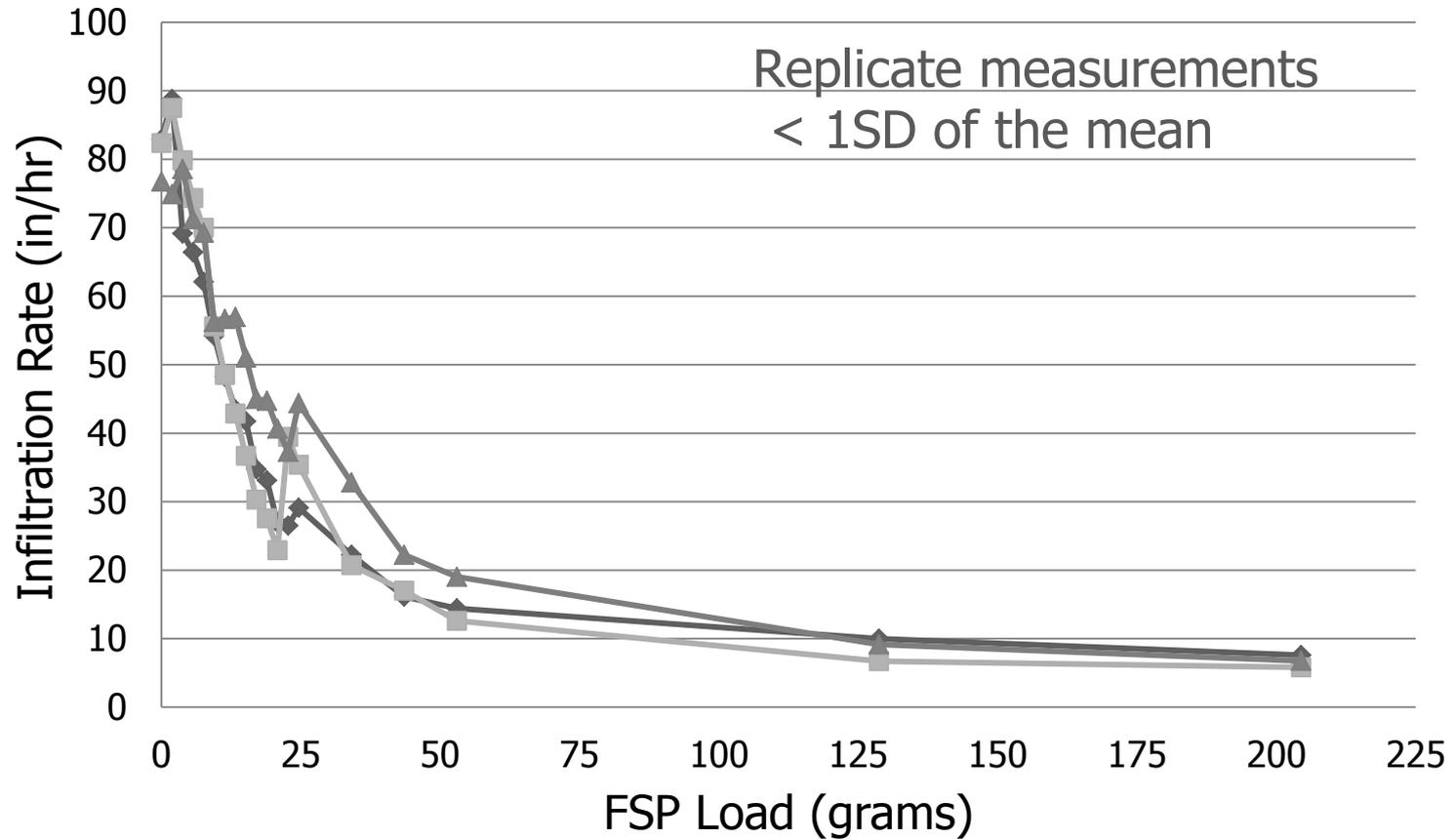
Experimental Challenges



Clogging Mechanisms



Infiltration Performance Decline

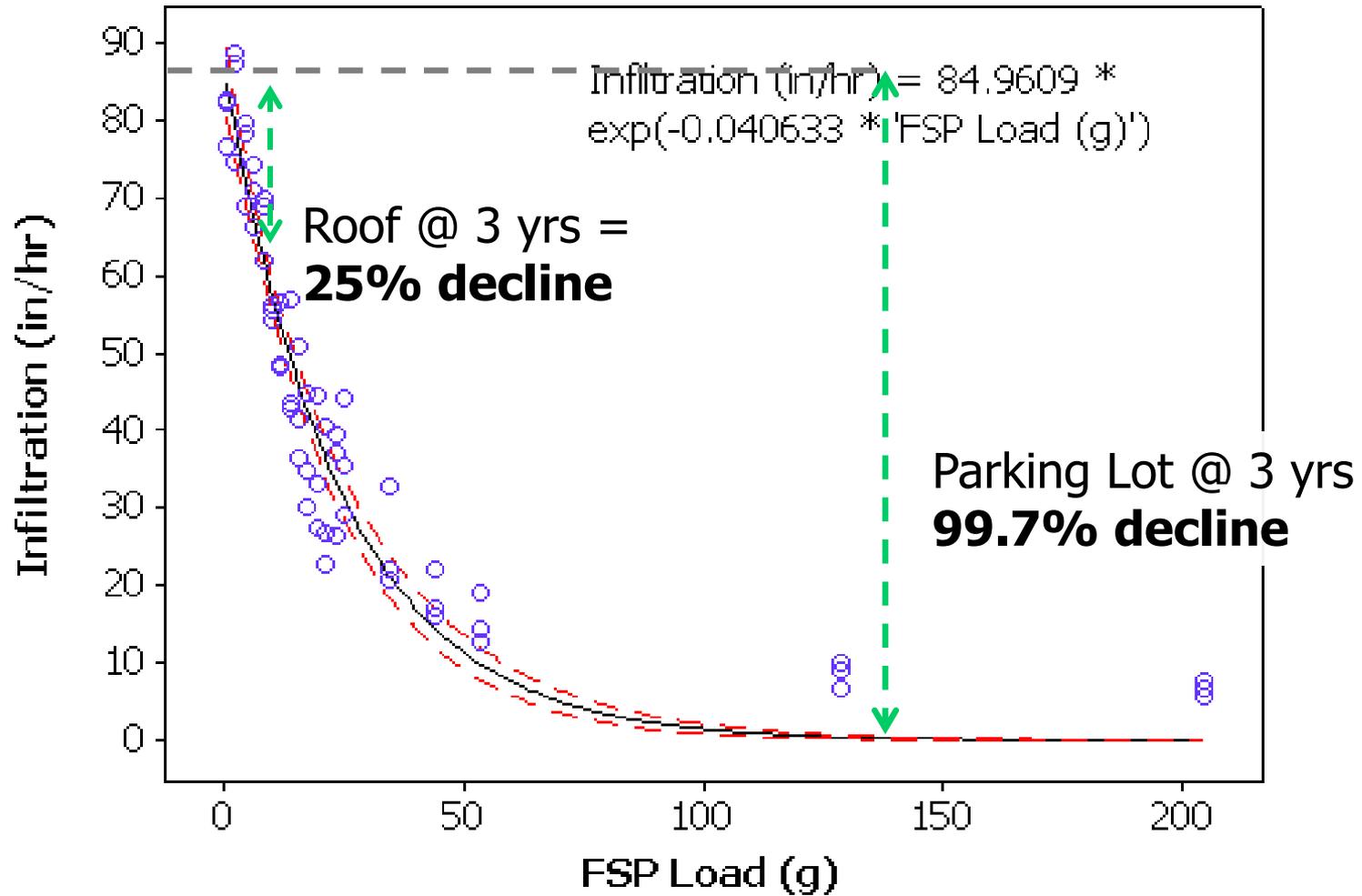


Scaling up to In-Situ BMPs

Assumptions:

- Stormwater with constant FSP concentrations
- Rain = 30 in/yr, RO coef = 1
- BMP = No depth, 12.8 in/hr soil

Surface Type	BMP/ Drainage	FSP (mg/L)	3 year Infiltration Decline (%)
Roof	1:9	5	
Parking Lot	1:9	100	



Findings that we should care about

- All surface types not equal in clogging potential
- Results may indicate severe performance declines within 3 years
- Severe declines also results in loss of stormwater volume reduction benefits



Next steps

- Continue loading simulations
 - Lateral infiltration
 - Stormwater composition
 - BMP designs
- Field verification of performance declines
- Draft BMP design and maintenance recommendations





Questions ?

(www.2ndnaturellc.com)