



# Structural BMP Performance Index



Elizabeth Fassman-Beck, Ph.D.  
Engineering Department Head

[elizabethfb@sccwrp.org](mailto:elizabethfb@sccwrp.org)

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# Background

- ▶ Structural BMPs are the go-to solution for runoff water quality problems
- ▶ California is investing \$MM
  - ▶ BMPs key tool for achieving >1200 TMDLs in California
  - ▶ Los Angeles County:  $\geq$  \$280 M annually for stormwater quality design, construction, & maintenance projects

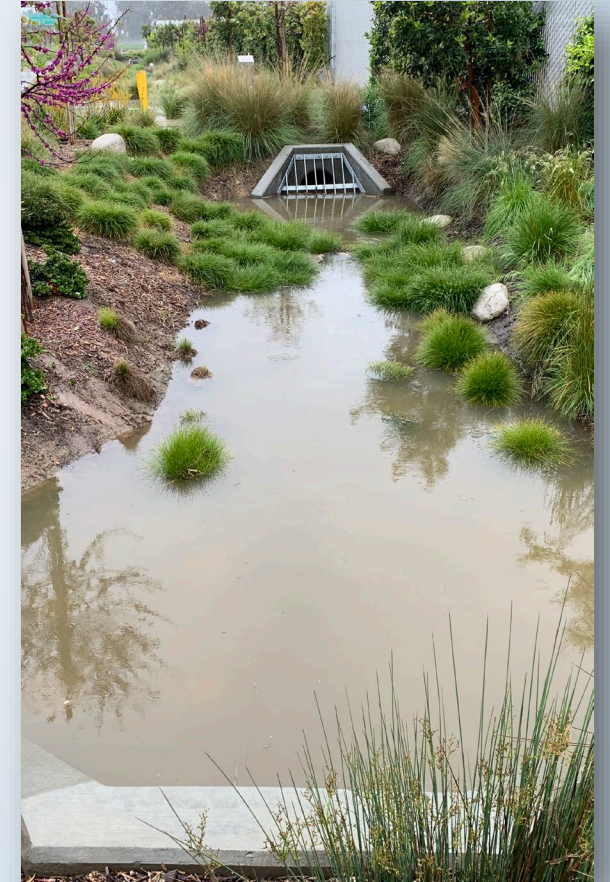


**SAFE CLEAN WATER PROGRAM**



# Problem

- ▶ We're not sure if they work
- ▶ Variable BMP & pollutant characteristics.
- ▶ Subjective judgement of “performance” or “effectiveness”
- ▶ Obligation to the public to ensure that BMPs will “solve” the stormwater quality problem

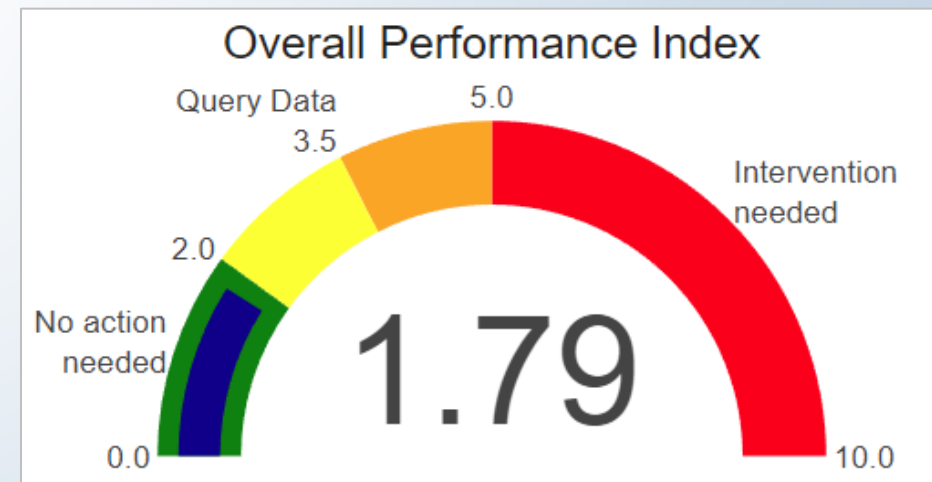


Arlington Channel, Costa Mesa



# Solution: A Multi-Metric BMP Performance Index

- Transferable, quantitative evaluation
  - All BMPs, under all conditions
- Customizable to watershed-specific concerns
  - Water quality & quantity
- One-off storms or a time history





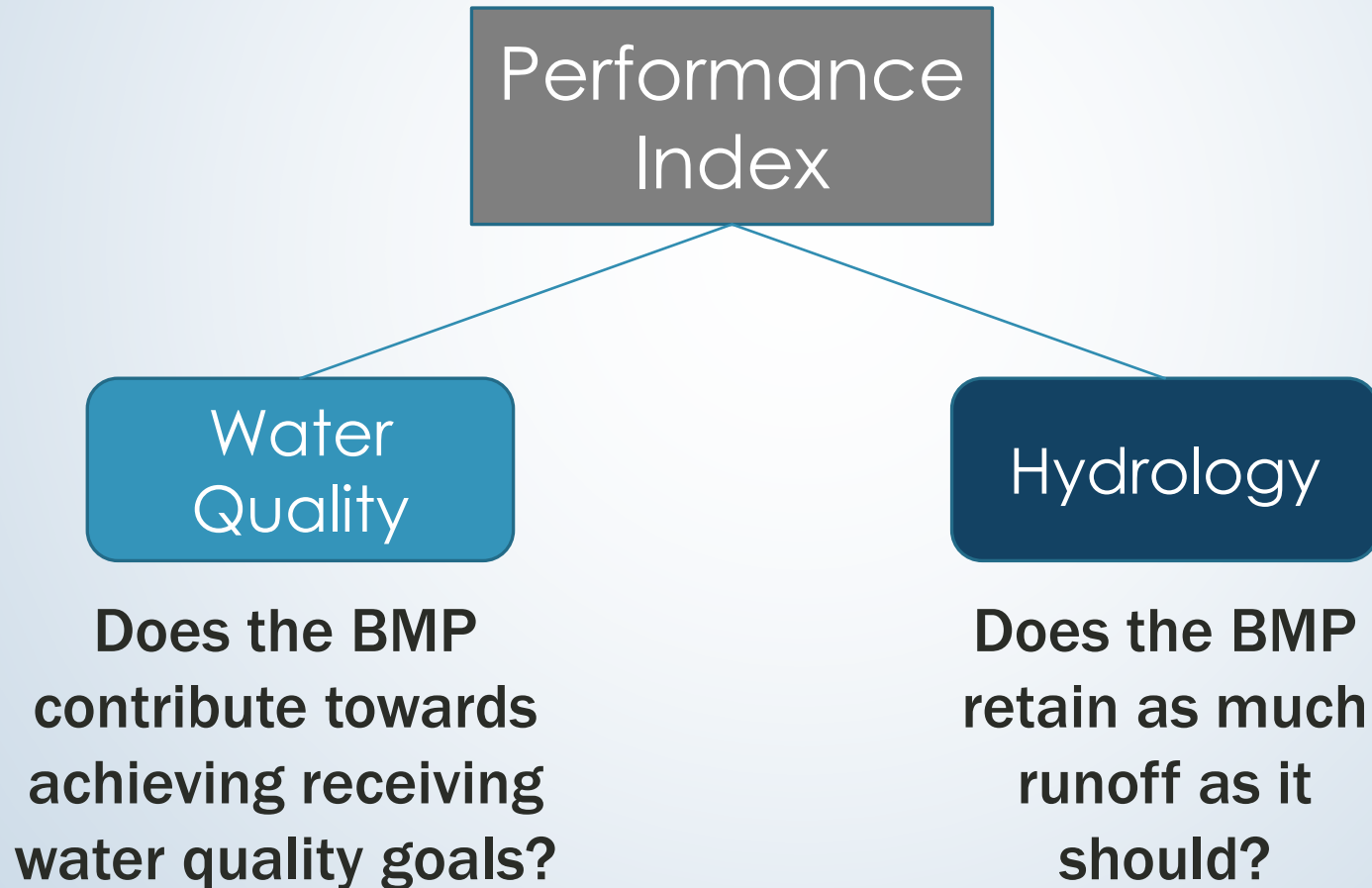
# Interpreting the Index Score

Score	Suggested Actions & Data Queries
0-2.0	No action needed. 0-0.5 BMP is successfully achieving treatment goals. 0.5-1.0 Untreated runoff is not an important source for the pollutant of interest, for the storms monitored. 1.0-2.0 Majority data are “clean” effluent. Watch data for declining trend.
2.0-5.0	Query data: Are all/most of data of concern from a single BMP?
	2.0-3.5 Does “insufficient” exceed 50% of data? YES: Additional treatment needed. NO: Score is due to mostly marginal and/or a few fails. If failures are present, are there site- or storm-specific reasons?
	3.5-5.0 Additional treatment needed. Inspect for maintenance condition. Investigate design/construction. $\geq 50\%$ of data are insufficient or significant % of failures.
5.0-10.0	Intervention needed. $\geq 50\%$ of data are failures.



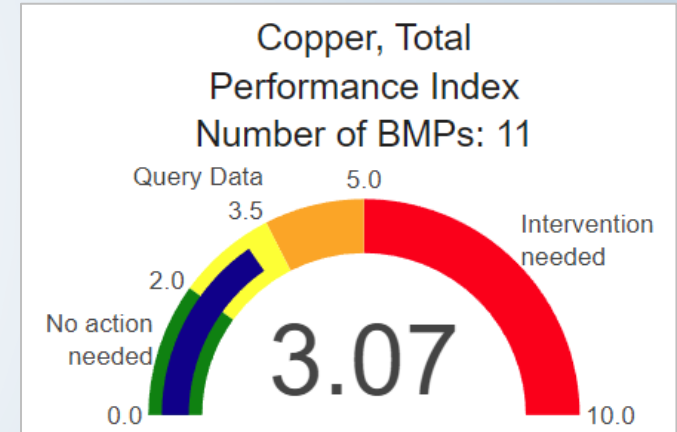
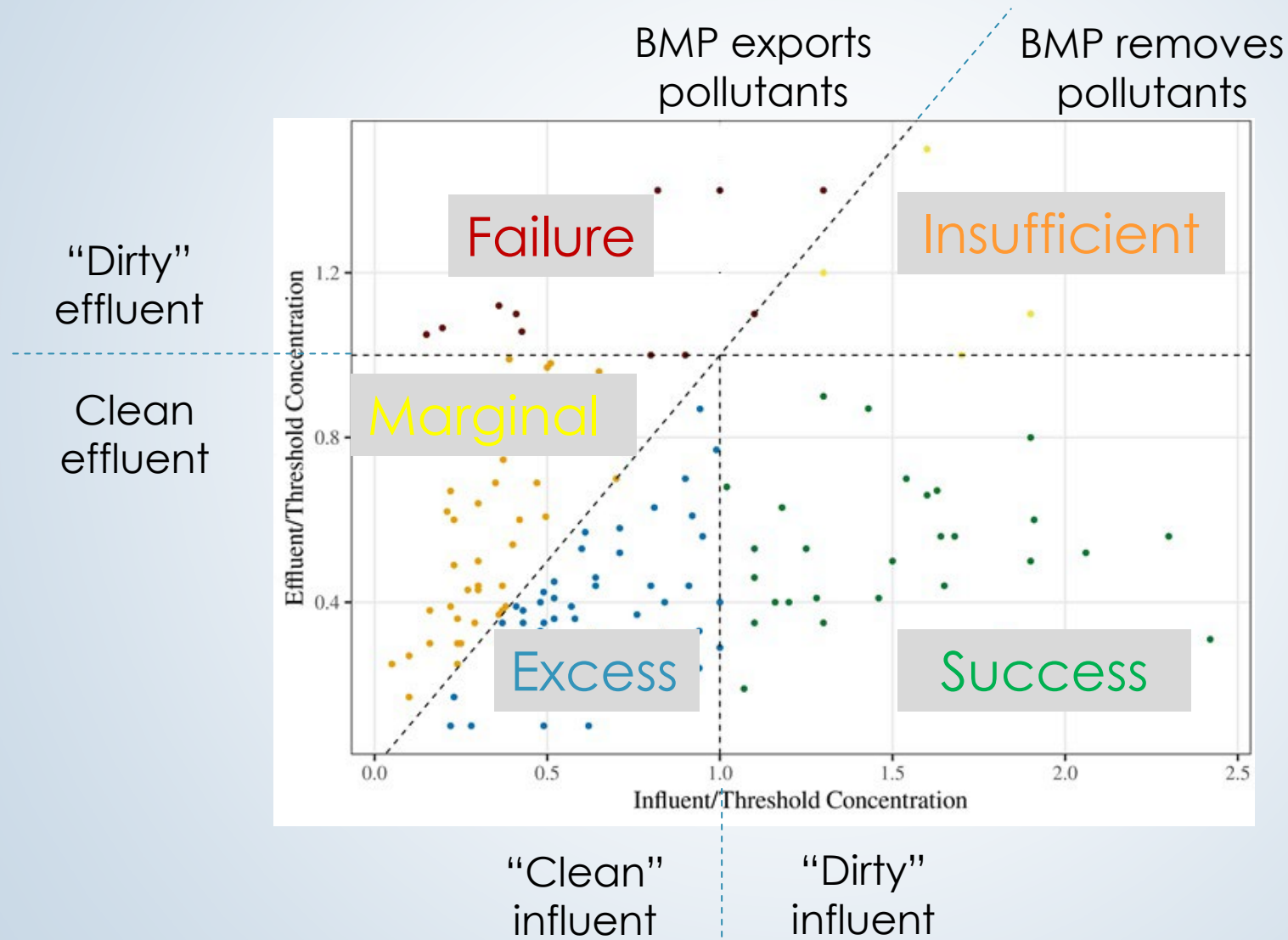


# How does it work?





# Water Quality Performance Categories

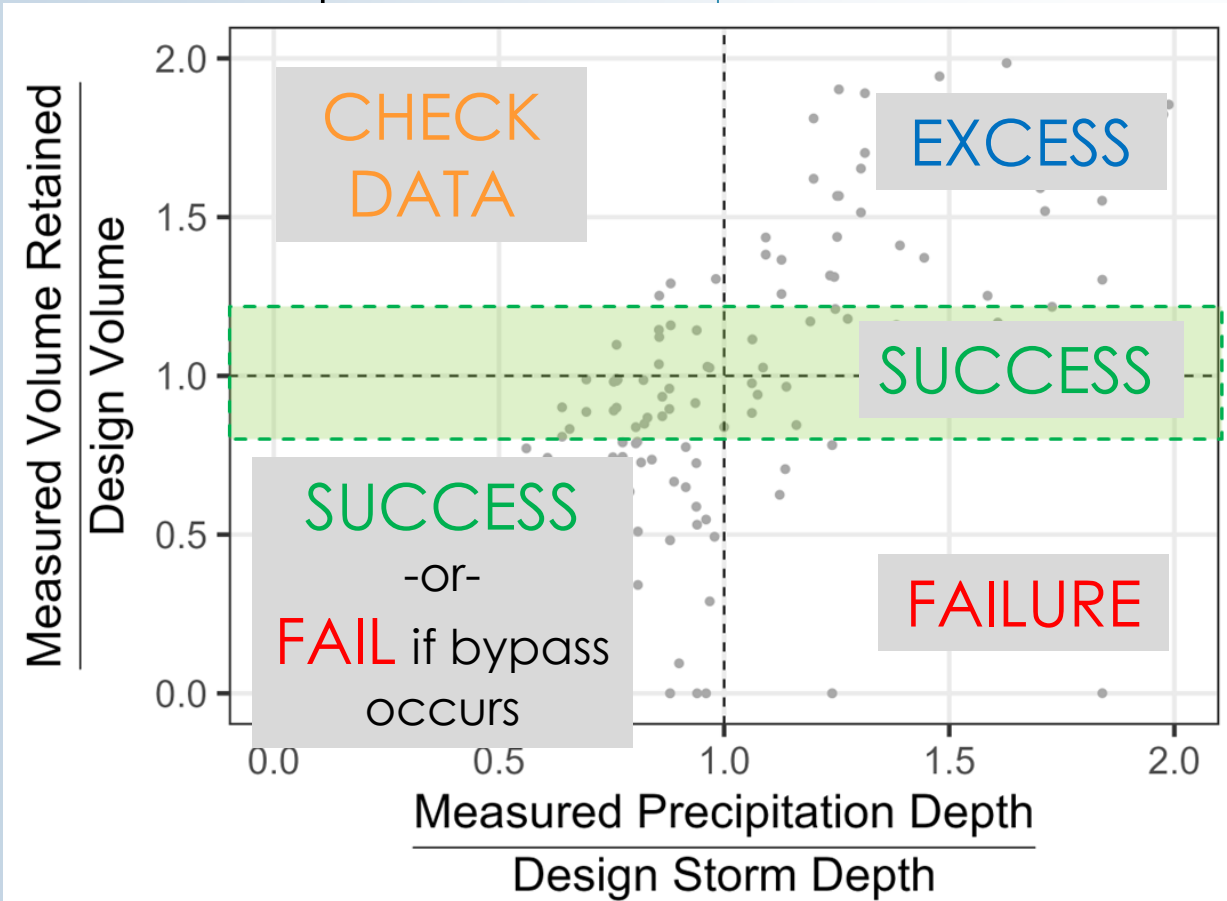




# Hydrology Performance Categories

Small storm  
Expect BMP to capture all runoff

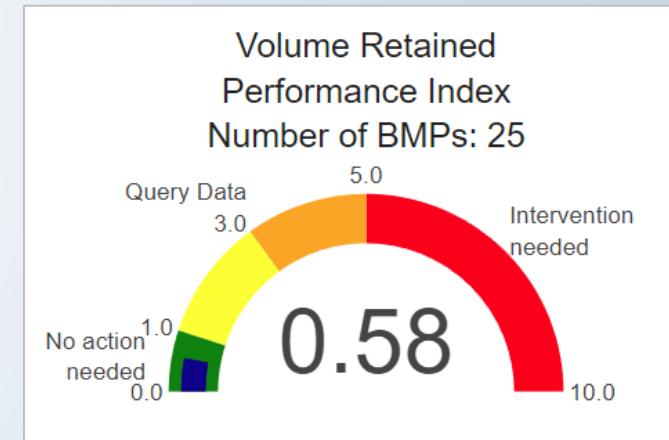
Big storm  
Expect bypass to occur



BMP manages more runoff than it was designed to capture

Measurement Uncertainty  $\pm 20\%$

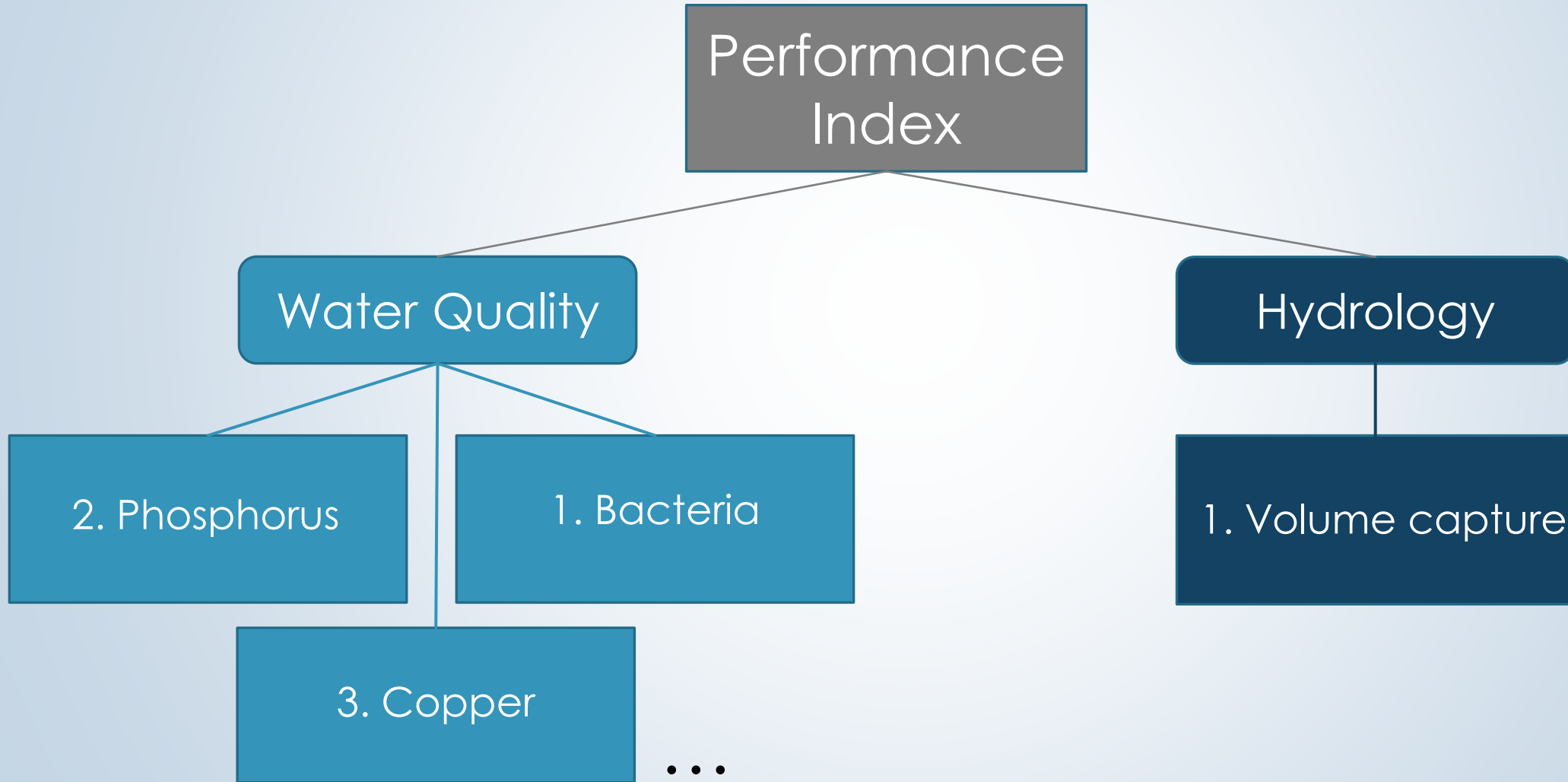
BMP does not fill up entirely







# Multi-Parameter Index Integration





# Implementation – Web App/Calculator

- ▶ Customize your enquiry
- ▶ Explore implications for watershed planning
- ▶ Determine an overall score based on watershed-specific priorities
- ▶ Provide quantitative evidence for decision-making



# Advisory Committee

- ➔ Richard Boon, Riverside County Flood Protection & Water Conservation District
- ➔ Bhaskar Joshi, Caltrans
- ➔ LB Nye, Region 4 Waterboard
- ➔ Chris Beegan, State Water Board
- ➔ Jane Clary, Wright Water Engineers, Inc.
- ➔ Bridget Wadzuk, Ph.D., Villanova University
- ➔ Annelisa Moe, Heal the Bay

Project Manager:  
Frank Cheng



# Questions?

Do you want to see some applications?

Elizabeth Fassman-Beck, Ph.D.  
Engineering Department Head

[elizabethfb@sccwrp.org](mailto:elizabethfb@sccwrp.org)

