

FEDERAL WAY S. 356TH STREET PROJECT: EFFECTIVENESS OF RETROFIT AND EXPANSION

Kate Macneale, WLR Science Section



Funded by Stormwater Action Monitoring Program

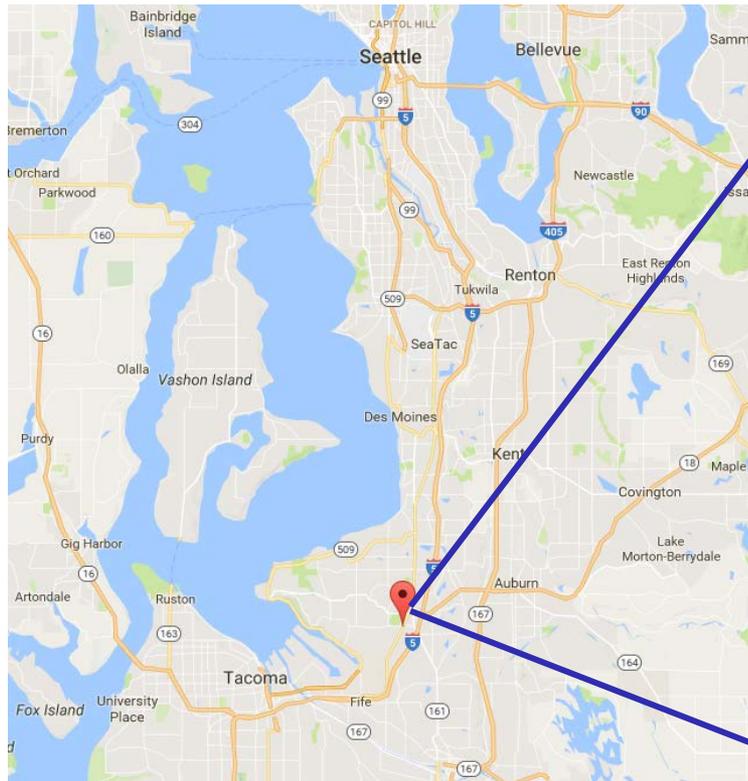


King County

Department of
Natural Resources and Parks
Water and Land Resources Division

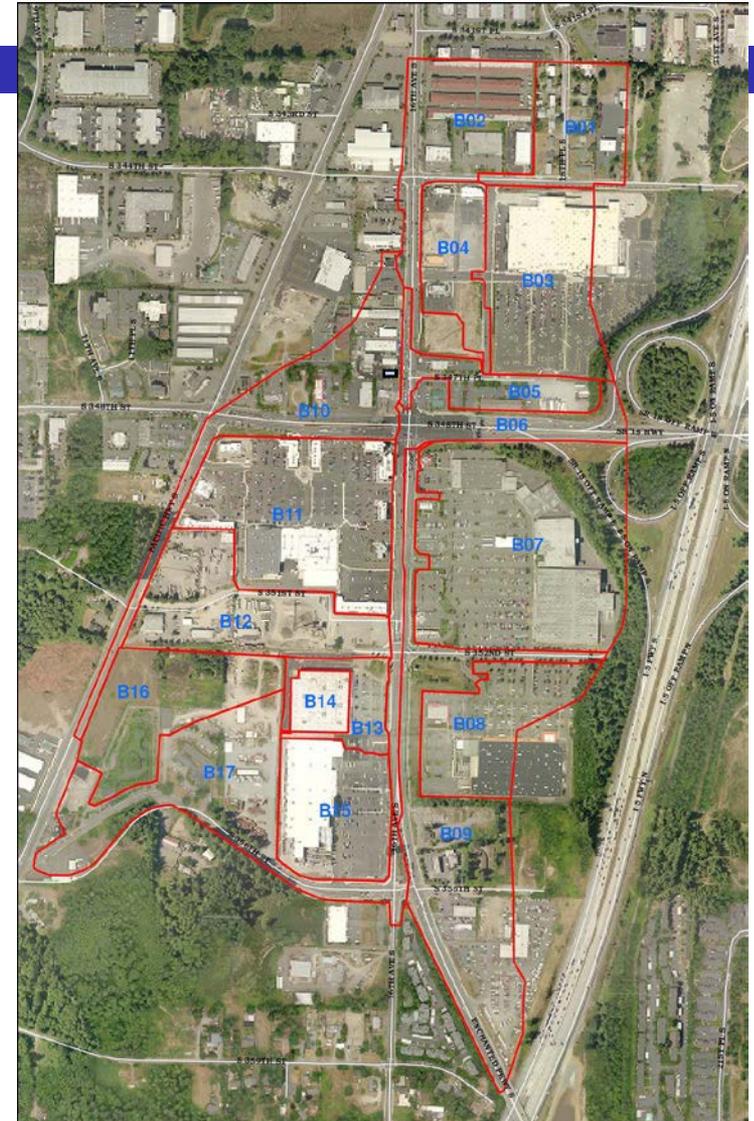
Science Seminar – November 2, 2017

BMPs: Slow down and treat stormwater runoff



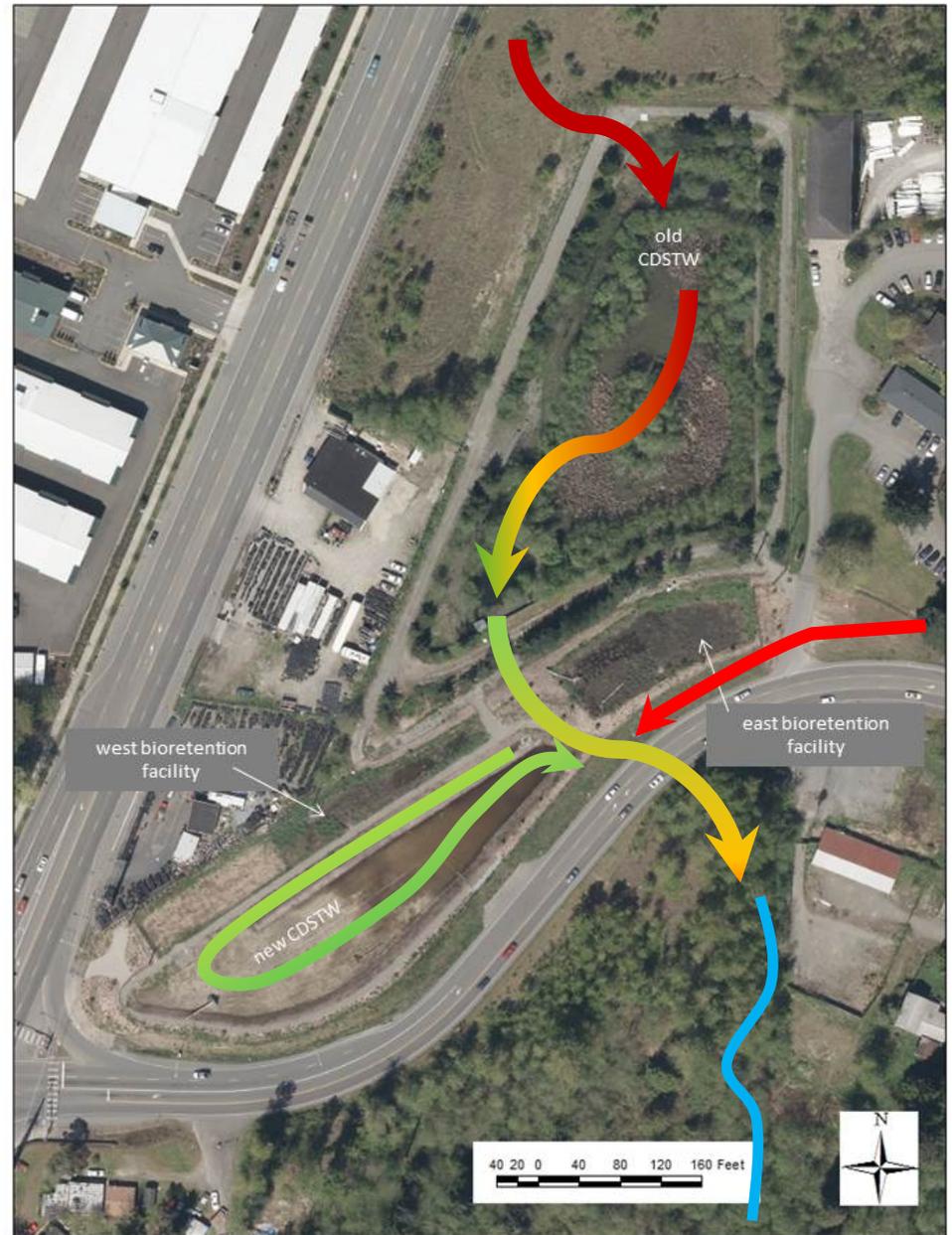
S. 356th Street Detention Facility

- Built 1997 to treat runoff from 189-acre basin
 - ▣ combined detention and stormwater treatment wetland (“wetland”)
- Expanded in 2014
- In-series “wetland” to increase treatment
- 2 new bioretention facilities to treat runoff from 22-acre basin that hadn’t been treated previously



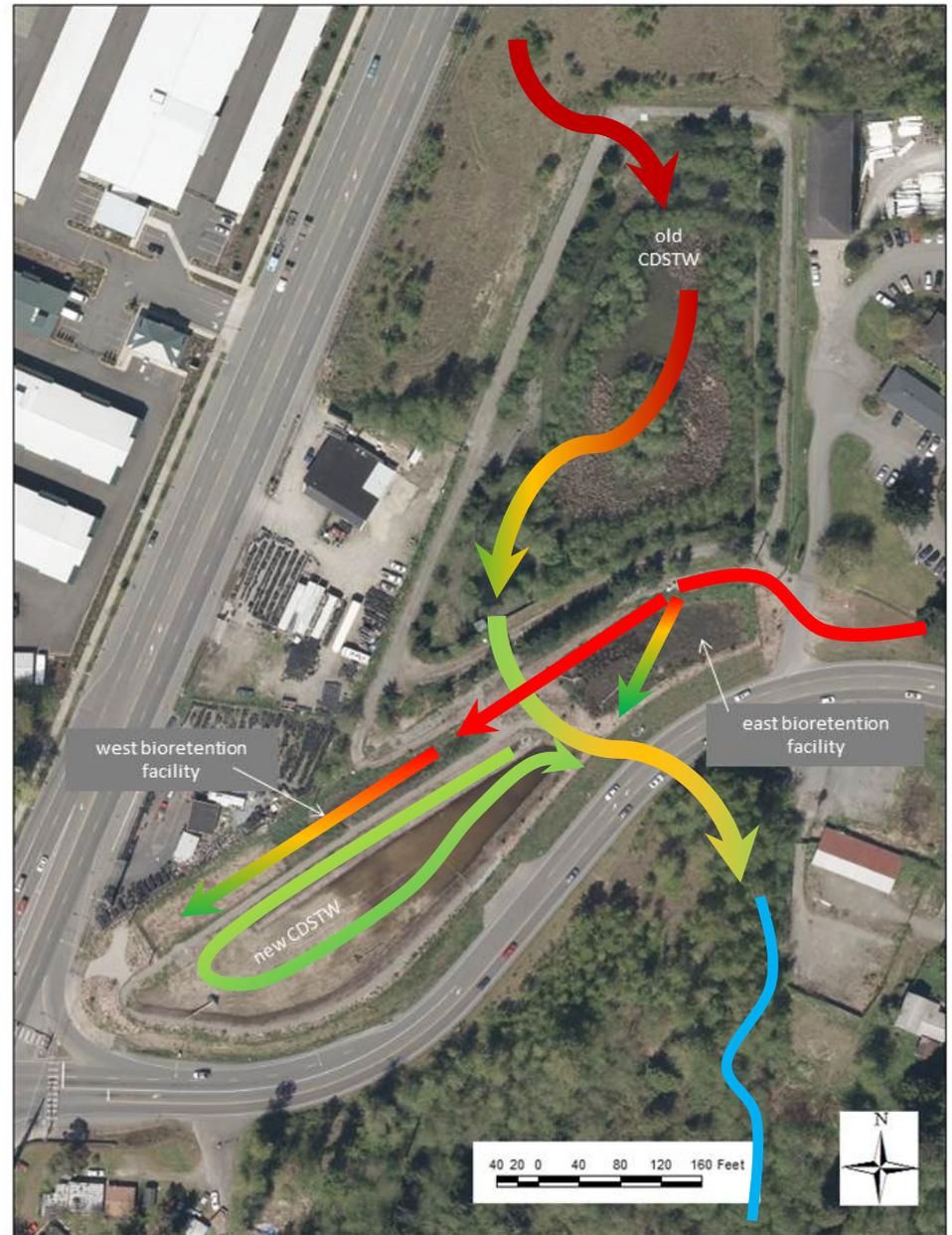
New “wetland”

- Increase capacity
- Unlined, but infiltration limited



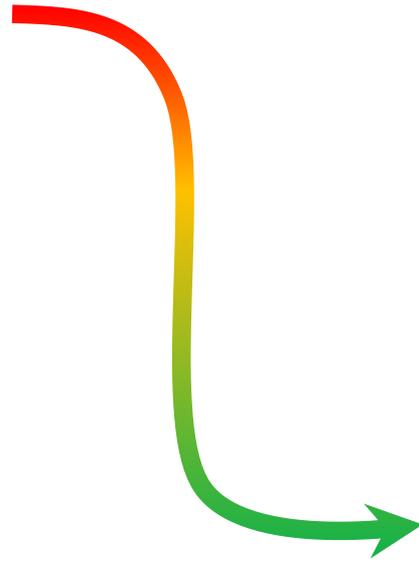
Bioretention facilities

- New capacity
- Underdrained
 - ▣ East: drains quickly
 - ▣ West: drains slowly





Untreated In



- East bioretention
- West bioretention
- Wetland complex

Treated Out



Why We Care



Receiving waters:
North Fork West Hylebos Creek

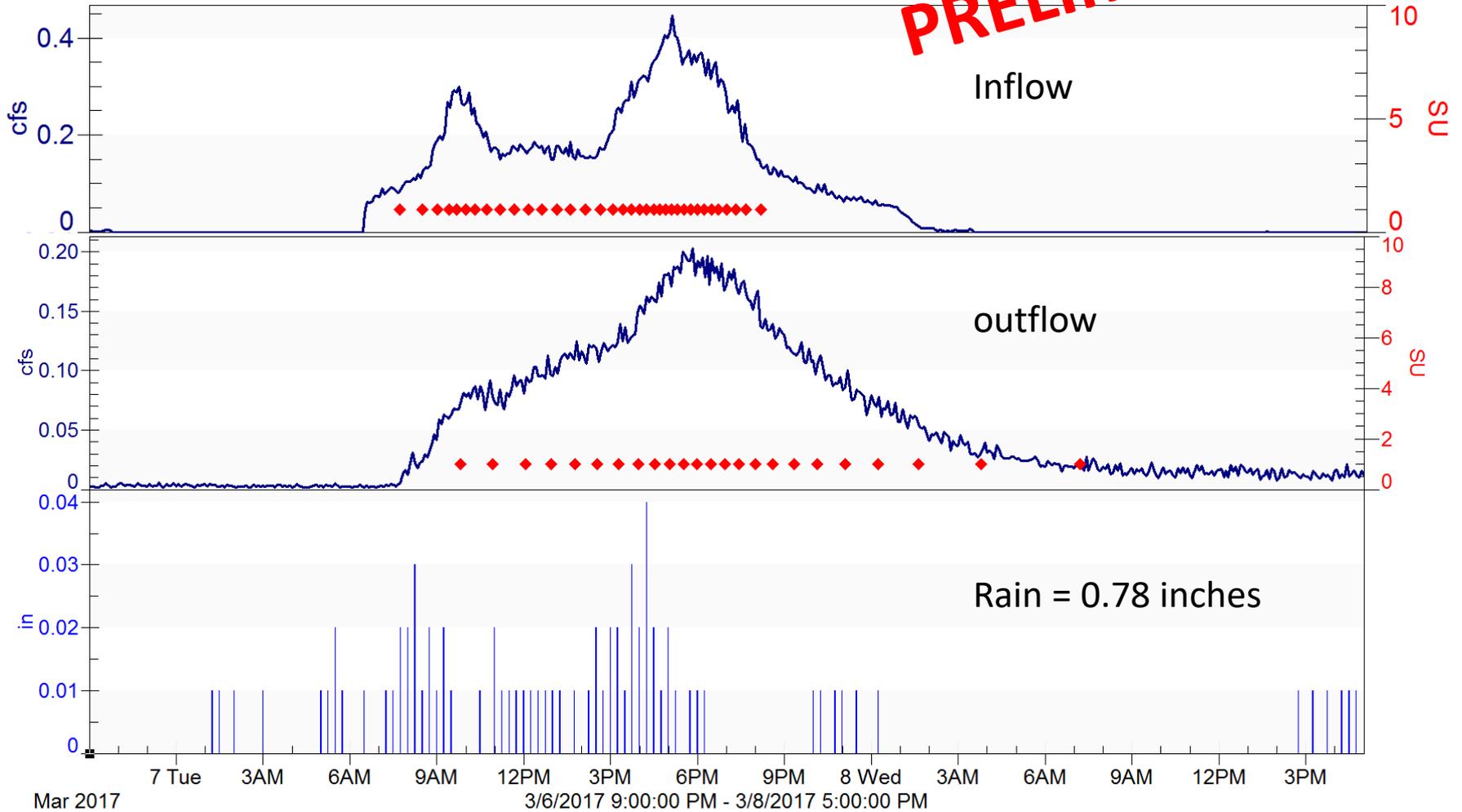
Sampling Complete

- Flow at 7 locations
- 18 storms sampled for TSS, metals, nutrients, PAHs
- 10 storms for PCBs, fecal coliforms
- 5 storms for toxicity
- Pre- and post-retrofit turbidity data

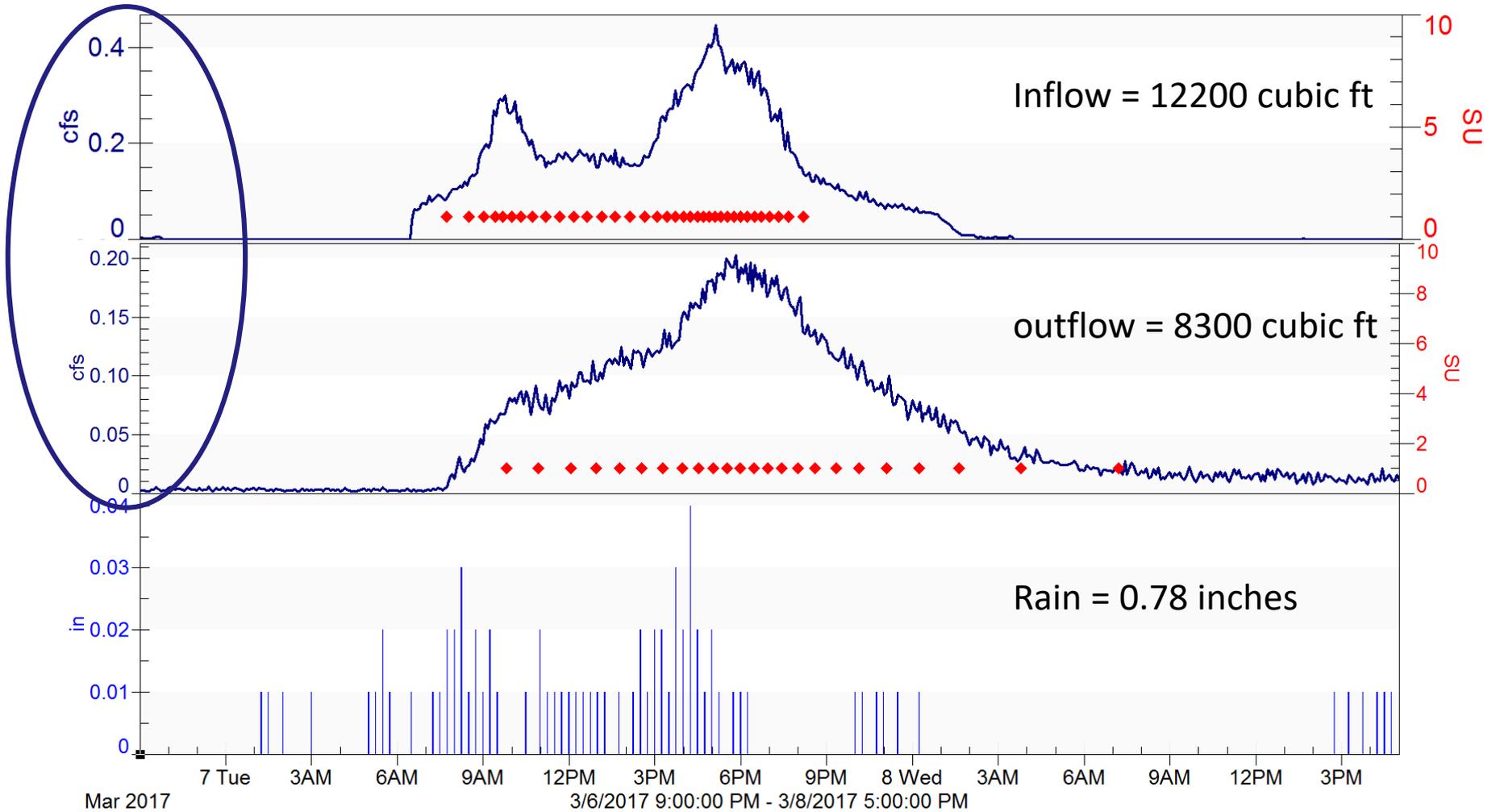


Example: Storm #10 East bioretention facility

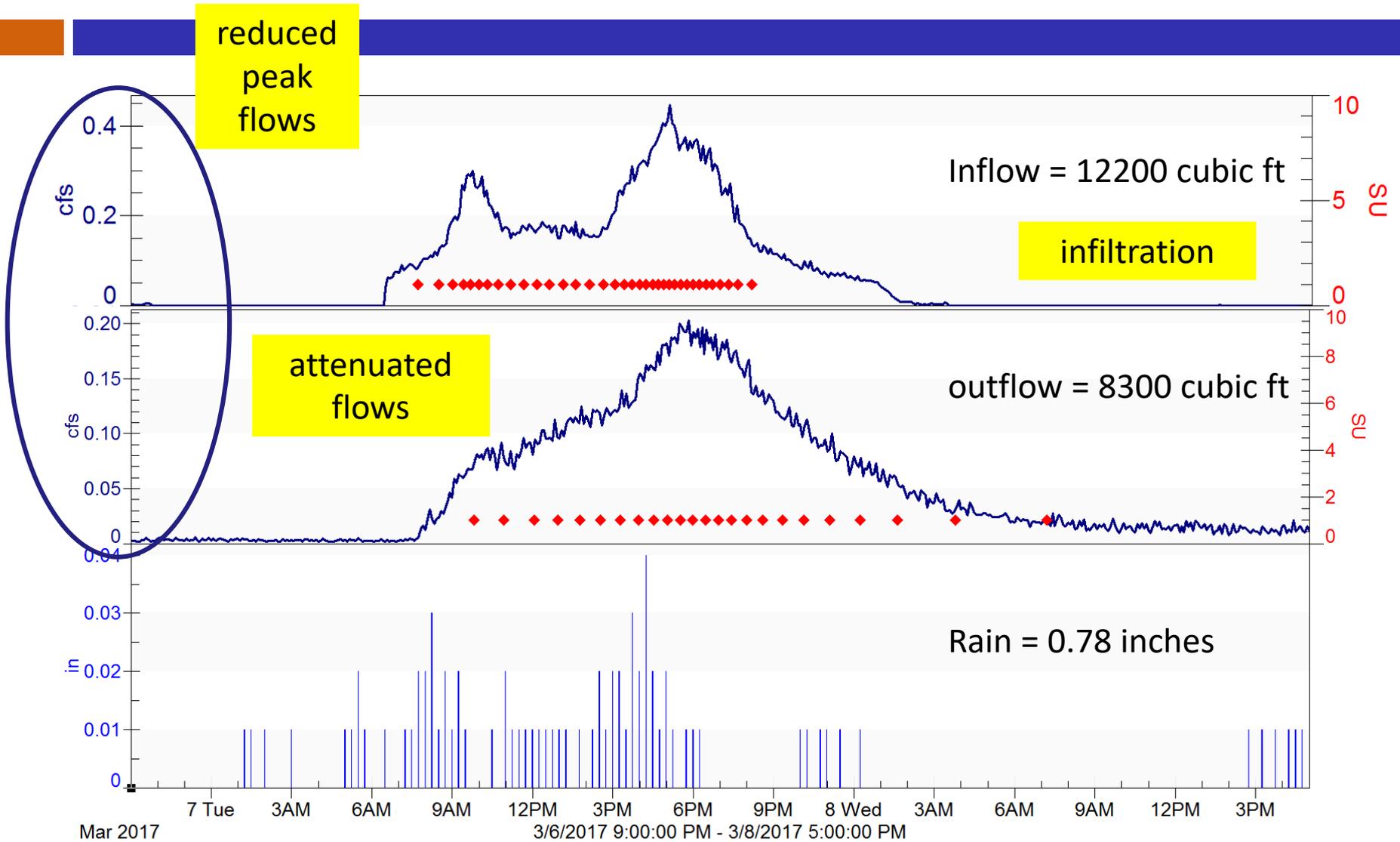
PRELIMINARY!



Example: Storm #10 East bioretention facility

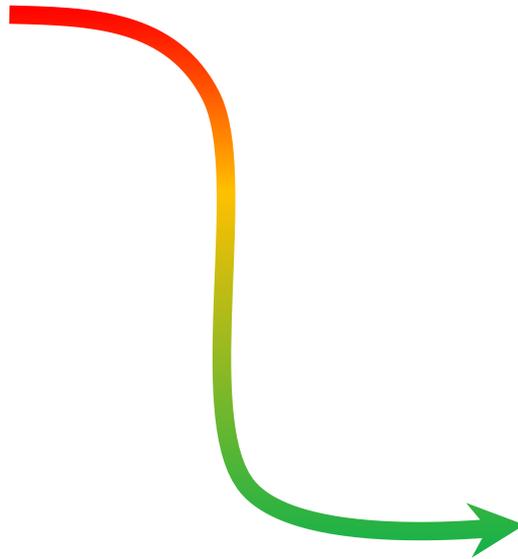


Example: Storm #10 East bioretention facility



Treatment?

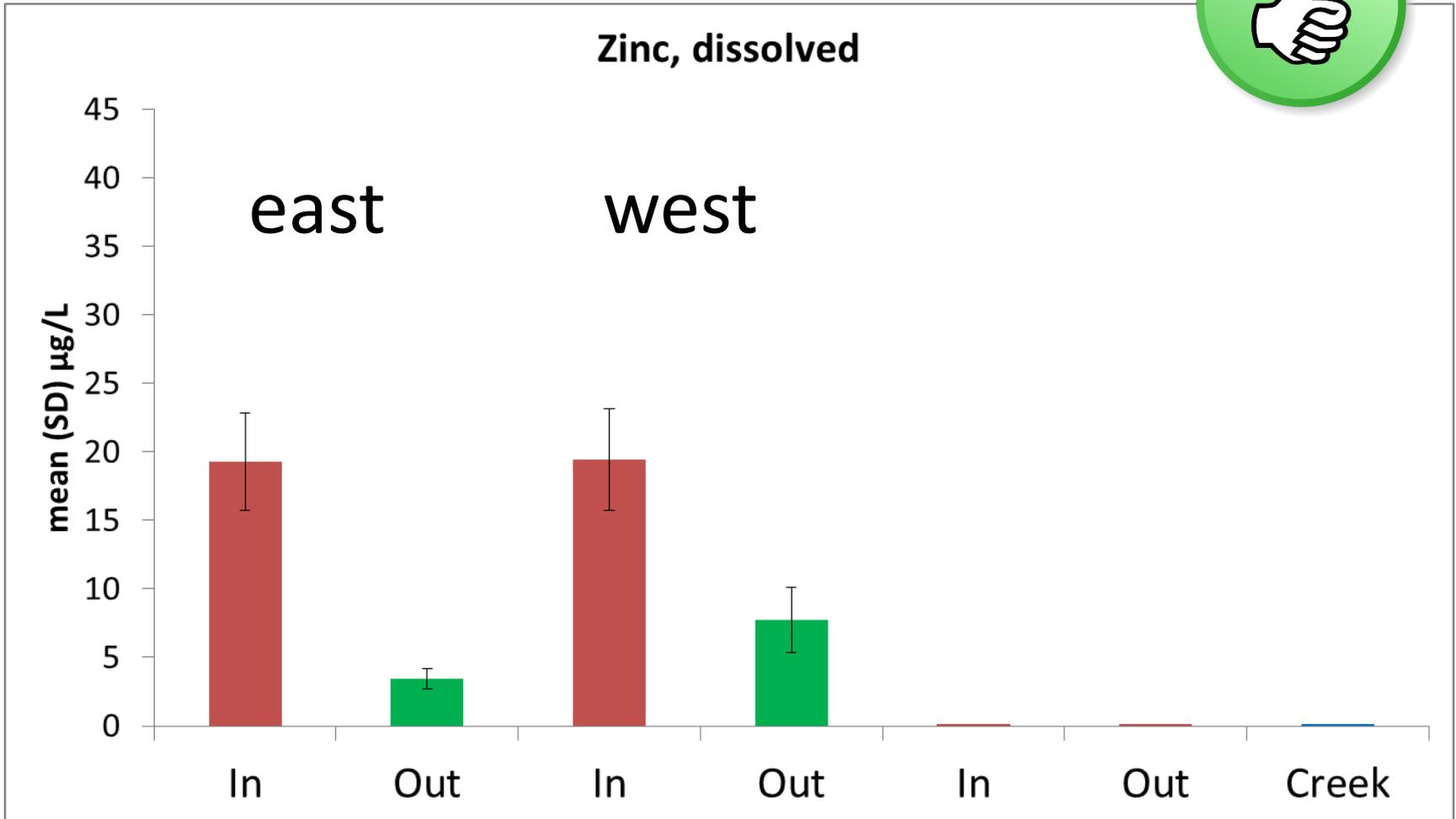
Untreated
In



Treated
Out

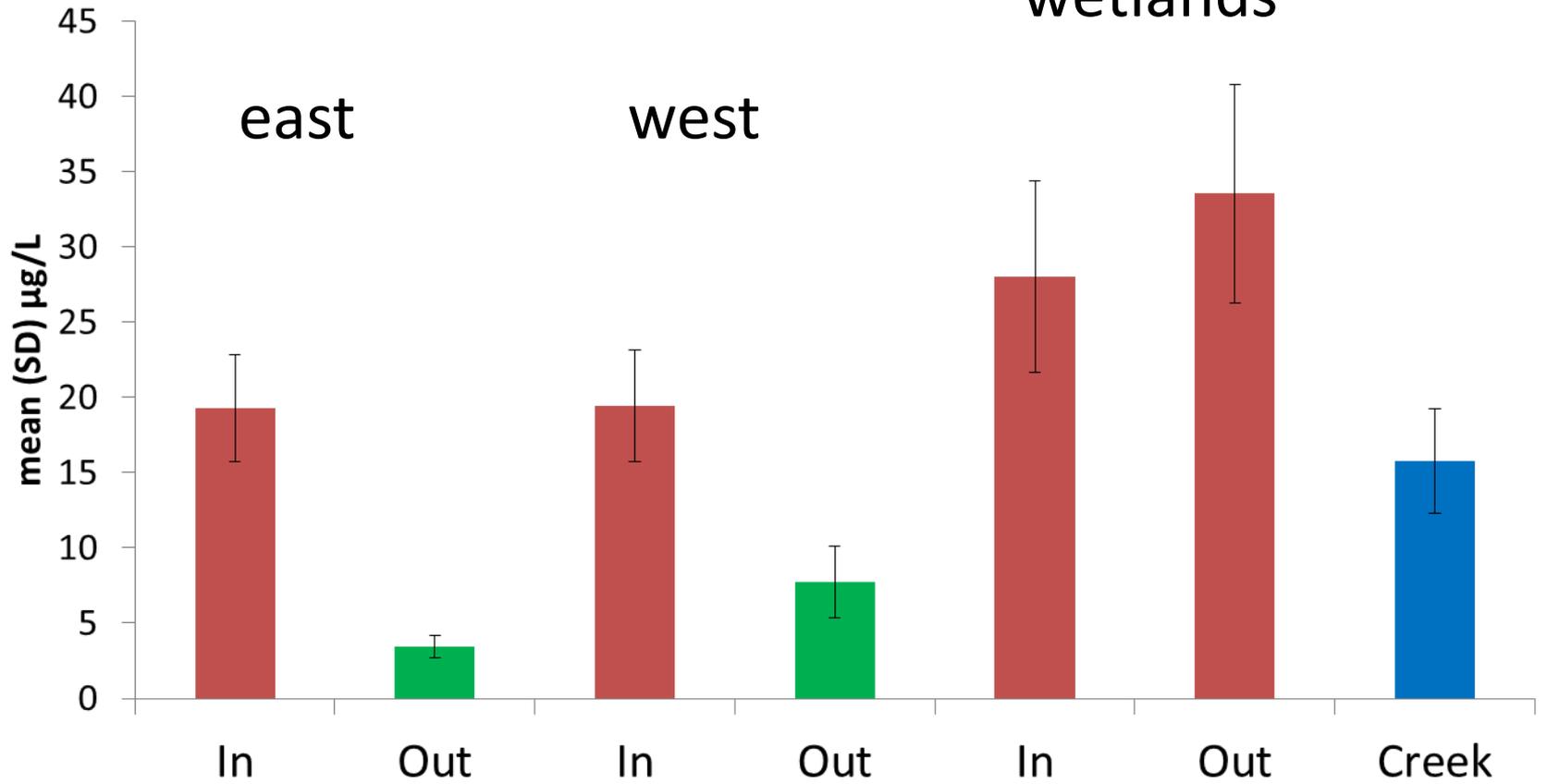


Zinc, dissolved



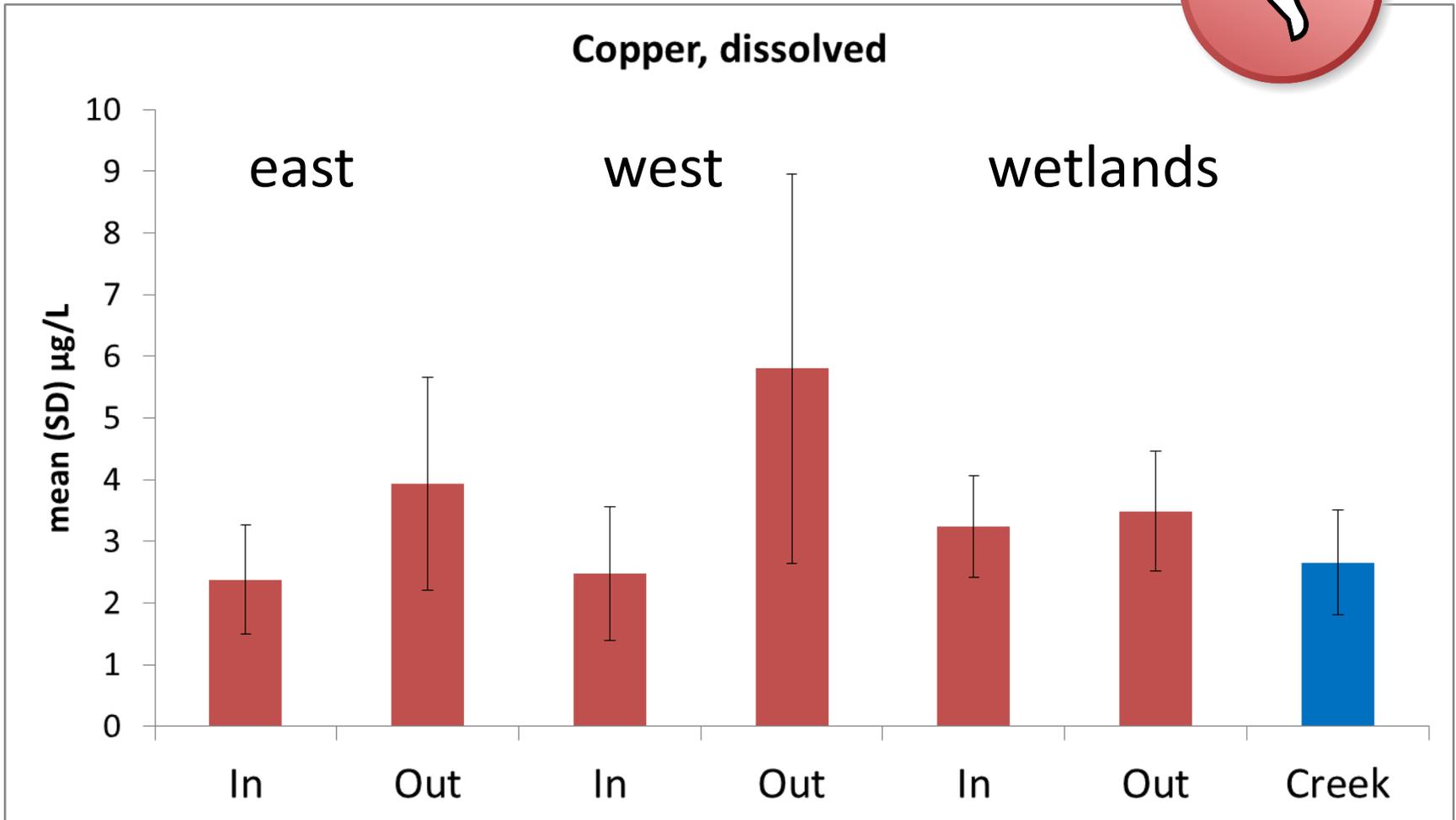
Zinc, dissolved

wetlands



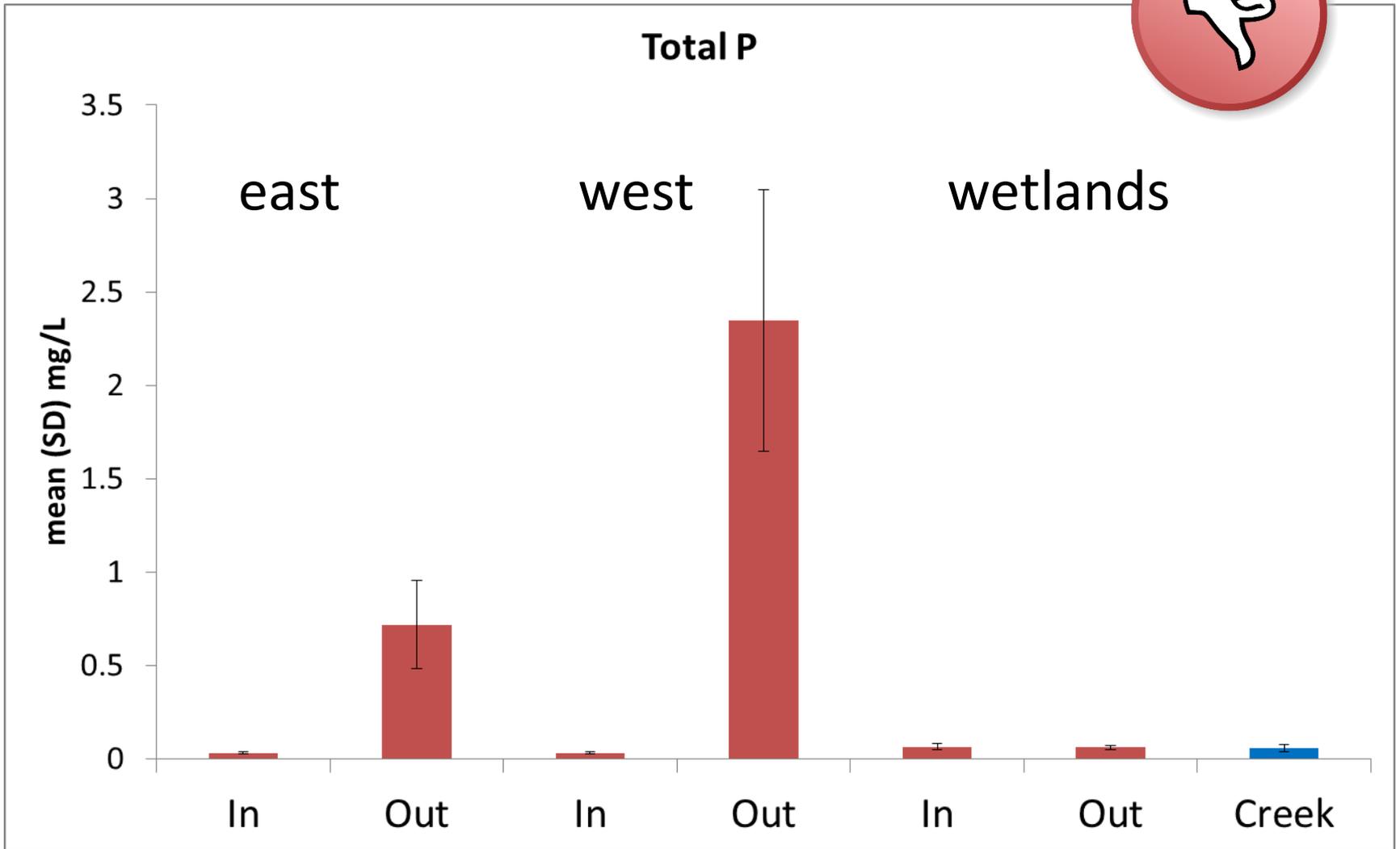


Copper, dissolved





Total P



Bioretention facilities



Zinc

Bacteria

Copper

Nutrients

TSS

Lead

PAHs

Hardness

DOC

Toxicity

Take home messages



Bioretention facilities

- ▣ provided flow control and treatment
- ▣ sources of nutrients, some metals
- ▣ short retention times (east bioretention) sufficient for treatment

Wetland complex

- ▣ Still analyzing net and relative effect

Final report completed by end of 2018

Acknowledgements



- Federal Way – Fei Tang and Theresa Thurlow
- King County Environmental Lab
- Toxicology and Contaminant Assessment Team
- RSMP/SAM Program

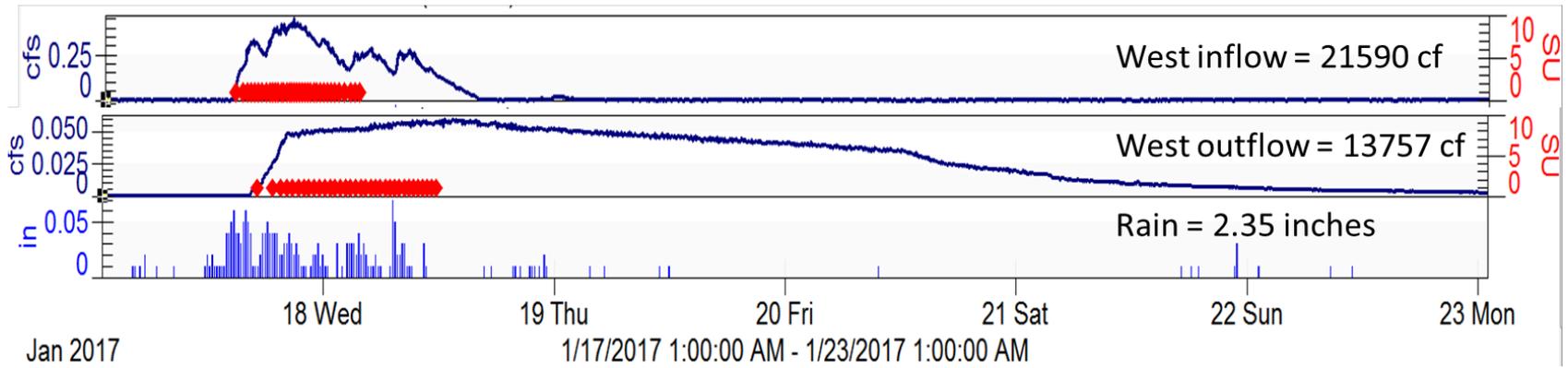


Questions? kate.macneale@kingcounty.gov





Flow control in West bioretention, but much slower





Dissolved Organic Carbon (DOC)

