

Bight '13 Microbiology Preliminary Findings

Presentation to SCCWRP Commission

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Background

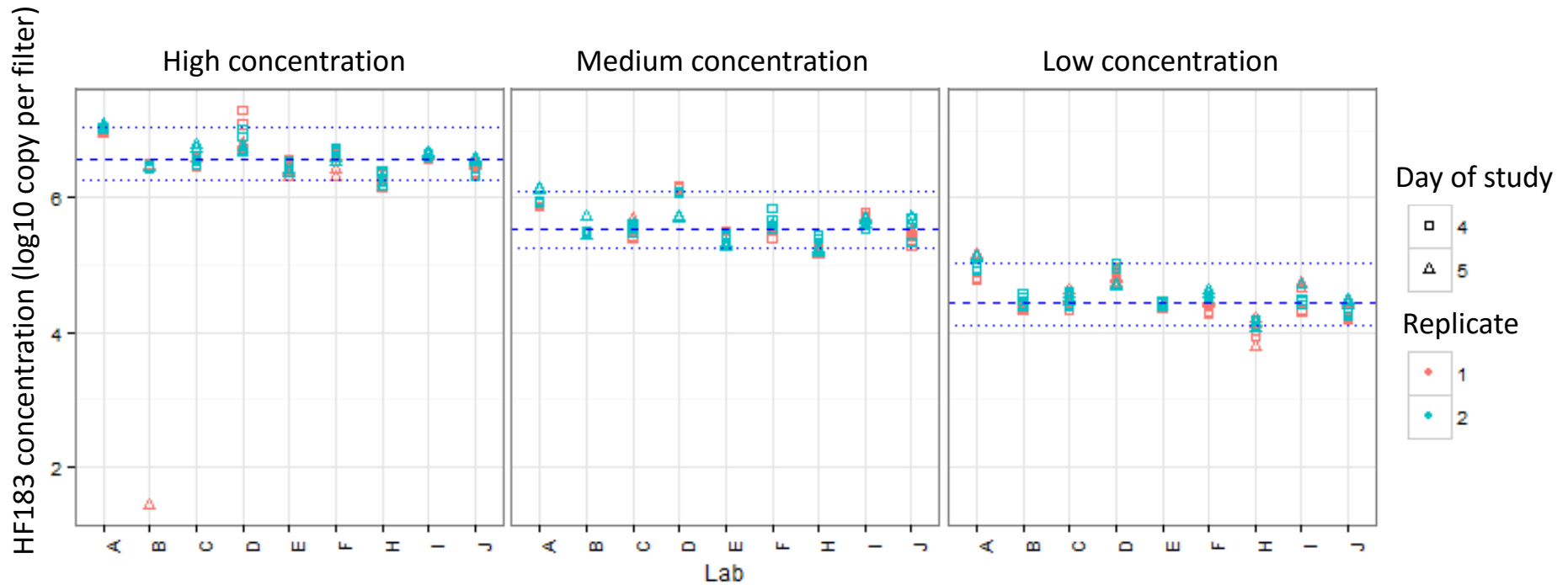
- Molecular tools such as qPCR have been developed and showed great advantage over culture methods in microbial water quality testing
 - Faster *Enterococcus* monitoring
 - Specific identification of fecal sources
- Bight'13 Microbiology is an opportunity
 - To transition these tools to local labs
 - To use these tools to answer regional management questions

Prelude

- Our member agency labs can do it
 - 2 dozen staff from 14 California labs graduated from SCCWRP 3-day training workshop
 - 1-2 month hands-on practice in each lab
 - Labs demonstrated proficiency via inter-lab calibration study



Good accuracy and reproducibility



Two research questions

- At how many beaches is it appropriate to use qPCR?
 - Prevalence of sample interference of qPCR
 - Comparability of qPCR and culture results

Two research questions

- At how many beaches is it appropriate to use qPCR?
 - Prevalence of sample interference of qPCR
 - Comparability of qPCR and culture results
- How many streams/drains discharging to beaches have a substantial human component to their bacterial contamination?

Study plan

- Local agencies sample drainages throughout southern California
 - Summer dry and winter storm conditions
- Assess extent of human contamination
 - Use HF183 human marker
 - HF183 performed exceptionally well in SCCWRP MST Marker Evaluation Study
- Design
 - Sample within the drain/stream above tidal influence
 - 50 samples per site per season
 - Sample collection and human marker analysis by qPCR by local labs

Good participation = good coverage

County	Dry Weather Sites	Wet Weather Sites
Ventura	4	3
Los Angeles	8	8
Orange	7	7
San Diego	5	5
Total	24	23

- Participating Agencies

- Ventura Countywide Stormwater Quality Management Program
- Ventura County Public Health Lab
- City of Malibu
- City of Los Angeles
- LA County Sanitation District
- LA County Flood Control
- Orange County Sanitation District

- Orange County DPW
- Orange County Public Health Lab
- City of Oceanside
- City of Encinitas
- City of San Diego
- Weston Solution
- NOAA

The challenge

- How much is “too much”
 - This is currently no definition for “too much”
- EPA suggested 20% human component is too much
- EPA did not define 20% of what
 - Frequency at which human contamination is detected
 - Concentration at which human contamination is detected

Preliminary findings

- The Bight'13 Microbiology committee is still helping refining data analysis
- Only data from 19 out of 24 sites are available
- Sufficient work has been done to give you a preview of main findings

Frequency-based Criteria

Concentration-based Criteria

	Minimally Human Influenced	Intermediate	Clearly Human Influenced
Minimally Human Influenced	8	6	3
Intermediate	0	0	2
Clearly Human Influenced	0	0	0

Sensitivity to the EPA suggested 20% rule

Frequency-based Criteria

		Minimally Human Influenced	Intermediate	Clearly Human Influenced	
Concentration-based Criteria	Minimally Human Influenced	3	10	1	10%
	Intermediate	0	0	5	
	Clearly Human Influenced	0	0	0	
	Minimally Human Influenced	8	6	3	20%
	Intermediate	0	0	2	
	Clearly Human Influenced	0	0	0	
	Minimally Human Influenced	14	1	3	30%
	Intermediate	0	0	1	
	Clearly Human Influenced	0	0	0	

Dry and wet seasons differ greatly

Frequency-based Criteria

Concentration-based
Criteria

	Minimally Human Influenced	Intermediate	Clearly Human Influenced
Minimally Human Influenced	25%	0	25%
Intermediate	0	0	50%
Clearly Human Influenced	0	0	0
Minimally Human Influenced	42%	32%	15%
Intermediate	0	0	11%
Clearly Human Influenced	0	0	0

Wet

Dry

Timeline

Task	Expected Completion
Receiving remaining data	October, 2016
Draft report	February, 2017
Final report	May, 2017

Thank you!