

LINKING INDICATORS OF FECAL CONTAMINATION TO HUMAN HEALTH RISK



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BACKGROUND

- Regulators have prioritized human sources
- We have developed the ability to effectively differentiate between human and non-human sources
- HFI83 is the most utilized human genetic marker, with EPA recently promulgating an approved method
- HFI83 currently used for management purposes

PROBLEM STATEMENT

- No HFI83 critical thresholds developed to date
- No HFI83 health-related guidelines
- Limits ability to interpret HFI83 levels and utilize those levels in a prioritization step

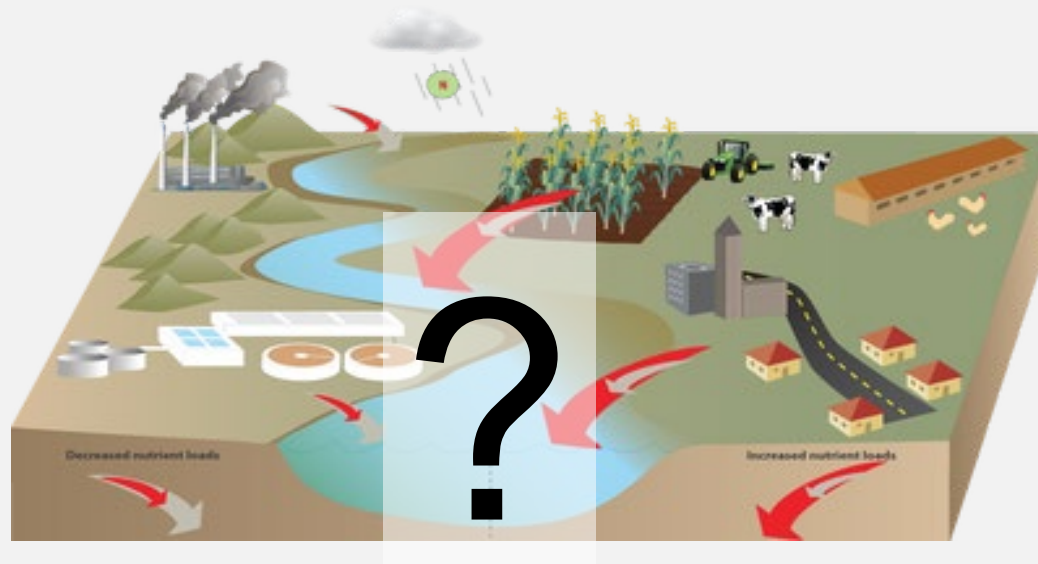
HF183 IN LOCAL WATERS

- Ubiquitous detection of HF183 in wet weather discharges
- Stormwater represents a complicated mixture of human sources
- We don't have all of the appropriate information to use HF183 for management decisions

MAIN OBJECTIVE

Develop risk-based thresholds for HFI83 in stormwater

- Thresholds can be used for multiple purposes including site prioritization



APPROACH

- Utilize Quantitative microbial risk assessment (QMRA) framework to develop risk-based thresholds for HFI83 in stormwater

QMRA
Framework:



Hazard
Identification



Dose
Response



Exposure
Assessment



Risk
Characterization

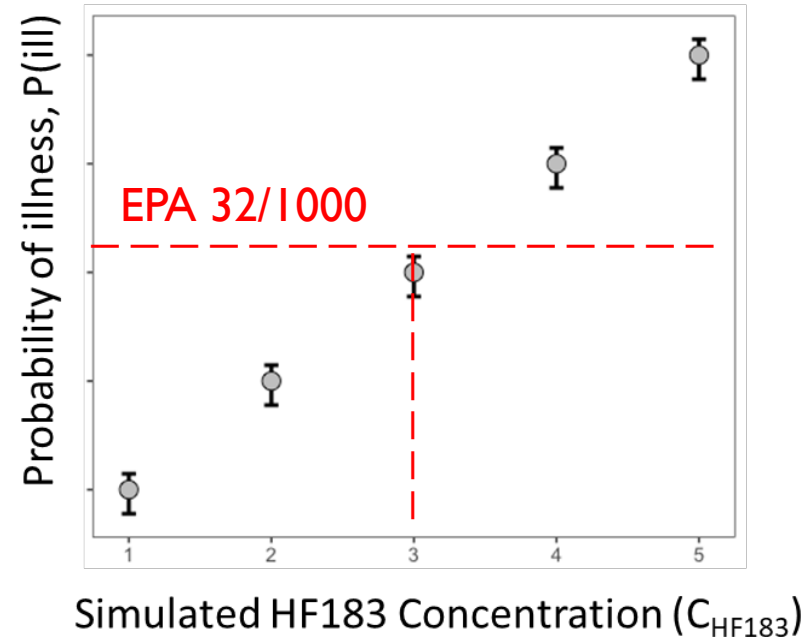
*Source: QMRAwiki.org

APPROACH

- QMRA to model scenario where stormwater is the contamination source
- This scenario will utilize paired HFI83 and pathogen concentration data from stormwater
- We will simulate this scenario multiple times with different concentrations of HFI83 and different ingestion volumes

APPROACH

- Establish a relationship between HF183 and health risk in stormwater
- Can develop risk-based threshold for different risk benchmarks



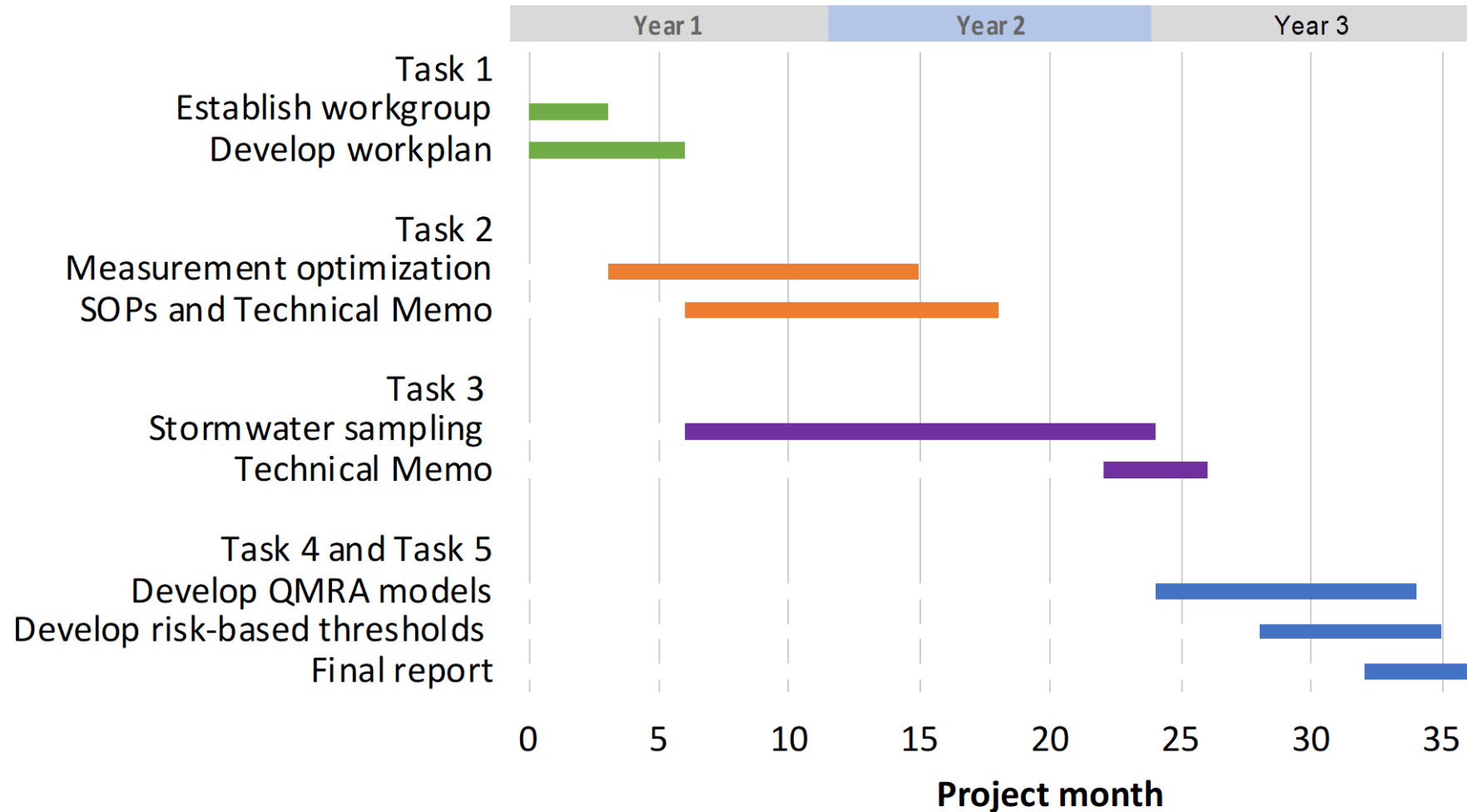
PROJECT FRAMEWORK

1. Measure paired HF183 and pathogens in stormwater
2. Develop QMRA model
3. Use QMRA model to establish HF183 and human health risk relationship in stormwater

CRITICAL STEPS ALONG THE WAY

- Task 1: Refine pathogen measurement methods in stormwater
- Task 2: Paired measurement of pathogens and HFI83 in stormwater
- Task 3: Build QMRA models from pathogen measurements in Task 2
- Task 4: Apply QMRA model framework to establish relationships between HFI83 and health risk

PROPOSED SCHEDULE



QUESTIONS?????

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