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2016 Goosefare Brook MST Summary and Next Steps

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April 27, 2017



2016 SUMMARY

Marsh

Sources tested (presence/absence): General mammal, human, bird, dog, ruminant

- Source strength tested (quantity): general mammal, human, bird

Sites: Marsh-1, Marsh-2, GFB-05-1, GFB-05-0

Key findings:

- Mammal DNA present in every sample. This appears to be true for other regions tested. Peak copy number in September/October but fairly consistent number throughout.
- Human signal early in the season, dissipates, and picks back up in September.
 - Confirmation of “hot-spot” with lower priority due to inconsistent human signal detection.
 - Pulses possibly consistent with an issue with a seasonal residence contributing.
 - May be associated with water table/groundwater and overland flow. These tend to be drier during summer conditions (evapotranspiration, plant uptake, etc.). This would mean more delivery during spring/fall when conditions for transport are better.
 - Source may be further away if ideal transport conditions are needed to see the source.
- Consistent bird signal detected throughout season. No major fluctuations.
- Consistency in bird and mammal copies with major changes in enterococci may indicate regrowth/persistence in sediments.

Mouth

Sources tested (presence/absence): General mammal, human, bird, dog

- Source strength tested (quantity): general mammal, human, bird

Sites: GFB-01, GFB-01-0, GFB-01-B, GFB-01-C

Key findings:

- Mammal DNA present in every sample. This appears to be true for other regions tested.
- Seasonal trend in mammal copy number with strength increases in July and September.
- Human trend mirrors that of mammal trend.
 - This may indicate the human source at the mouth of GFB is driving the observed change in mammal concentrations. Therefore, human may be the primary source contributing.
- Consistent bird signal throughout season. No major fluctuations.
- Moderate increase in copy number for all markers indicates source is upstream from the mouth. Need to better understand strength of signal.

Comparison

Key findings:

- Bird signal is consistent for both regions but significantly higher in the marsh (low sample number). Also, marsh sites displayed the highest geometric mean compared to other locations tested.
 - Bird DNA is not associated with the mammal marker detection. Human contributes to general mammal numbers but bird does not.
- Mammal signal is greater at the mouth vs the marsh.
- Human signal consistently present at the mouth with seasonal increases whereas human DNA only detected in two portions of the season in the marsh and not detected otherwise.

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RECOMMENDATIONS

Prioritize investigations at mouth of Goosefare Brook

- Human sources were observed to persist throughout the monitoring season (May-October) with seasonal increases in signal strength.
- Strength appears to increase moving upland, indicating human source just upland from mouth.
 - Target region: **West Grand from New Salt Rd to Colby Ave**
 - Recommend follow-up investigations of sanitary infrastructure during peak summer months as well as investigations of known septic systems in the region (see handout) to ensure they are functioning properly.
 - Parcels with known septics in Mouth region: **6 & 8 Marshview Rd.**
 - Recommend follow-up DNA monitoring to further isolate the human signal

Further investigate potential sources in Marsh

- Elevated bacteria in marsh is likely impacted by regrowth/persistence in sediments, but human sources are still present, just not consistently.
- Also possible that another mammal source is contributing that hasn't been tested.
 - **Tested for:** humans, dogs, ruminants.
- It is possible that human sources are due to the use of seasonal residences. The signal is not detected for several months and then reappears later in the season (human signal can only survive at most a week).
 - **24 Oceana Ave** has been identified as a potential contributor.
 - Recommend testing service connections and any other potential illicit discharges from the property (home and shed on property).
 - Property is directly adjacent to both marsh hot spot locations (Marsh-1 &2) and has been used as a seasonal property (local observations).
 - May contribute to human source pulses in the Marsh region.
 - Recommend follow-up investigations of known septic systems.
 - Specifically those along Roanoke Ave, W Casco Ave, and Tioga Ave
 - **4 Roanoke Ave; 3 W Casco Ave Ext; 6, 9, & 15 W Tioga Ave**
 - Recommend follow-up DNA monitoring to further isolate the human signal.

Structural/connection issues from 2015 smoke testing

- We recommend following-up on any structural/connection issues identified via smoke tests that have not been addressed to date. Specifically:
 - Mouth Region
 - **17 Randall Ave**-smoke under stairs and vent stack
 - **C/O located behind 93 New Salt at tidgate**-Broken cap line had water at the bottom and line is supposed to be abandoned.
 - Marsh Region
 - **16 Winona**-smoke from C/O not vent pipe
 - **17 Tioga**-No smoke in vent stack
 - **14 Casco & west corner of Tioga**-no smoke in vent stack
 - **11 Casco**-no smoke in vent stack
 - **1 Roanoke**-no smoke in vent stack
 - Could be 17 Roanoke. Hard to tell.