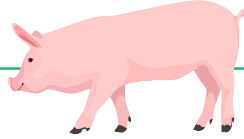


Jonah Ventures Source Tracking

Source Tracking Goal:

To use environmental DNA and quantitative PCR (qPCR) to determine the source of fecal contamination in water samples collected in rivers and streams.



Process:

Water samples are collected and filtered from suspected contaminated rivers and streams. The filters are mailed back to Jonah Ventures, DNA is extracted, and then analyzed to quantify the number of copies of mitochondrial DNA from potential hosts using qPCR.



Example Results

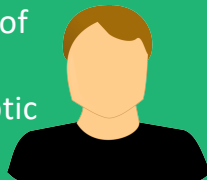
SampleID	Bovine01	Dog01	Human01	Poultry01	Sheep01
1 OE0HBWHR	414	13	33	0	1
2 NS3I0761	205	0	22	0	0
3 PFKWZXGK	615	0	12	3	1
4 Z9A9GKCB	234	0	461	0	0



At this site in North Carolina's dairy country, we saw consistently high levels of bovine DNA.

SampleID	Bovine01	Dog01	Human01	Poultry01	Swine01
1 5AHL6AE	0	0	38	0	0
2 SHZVORYZ	0	52	31	2	0
3 UV344GWO	0	0	12	0	0
4 XISOM88W	41	21	806	24	90

In Alabama, we saw a high level of human DNA downstream from a trailer park with a suspected septic leak.

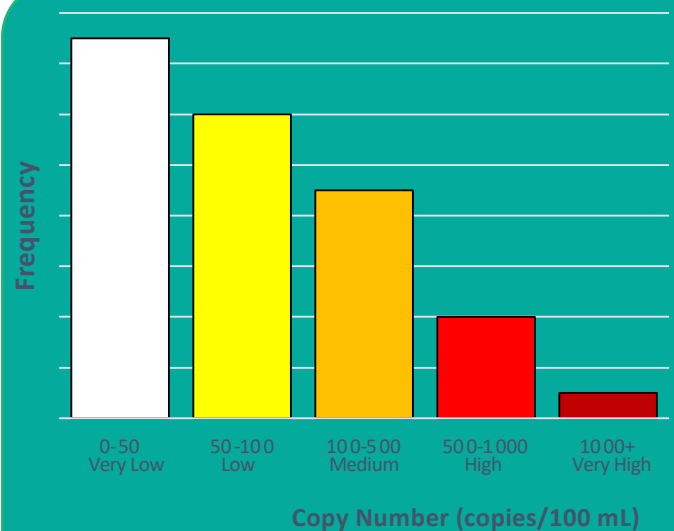


SampleID	Dog01	Human01	Poultry01
1 I6X0L8J5	422	55	6



At the mouth of a river in Maryland, we saw a high amount of dog DNA.

Interpretation



Our work shows that mitochondrial DNA concentrations range from high to very low. Empirically, few samples exceed 1000 copies/100 mL, which are the highest levels we see. The relative amounts of DNA from different hosts indicates the most likely sources.

In areas with high amounts of human DNA, it is not uncommon to see smaller amounts of poultry, swine, and cattle DNA, even when none of the animals are present upstream. This can represent DNA from what people have been eating.



JONAH VENTURES