Supplemental Information File S1

Source tracking swine fecal waste in surface water proximal to swine concentrated animal feeding operations

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**Table S1.** Description of primers and probes tested in this study.

|  |  |  |  |
| --- | --- | --- | --- |
| Primer/Probe | Primer and probe sequence (5’→ 3’)a | Target | Reference |
| P23-2f | TCTGCGACACCGGTAGCCATTGGA | *mcrA* gene of methanogens | Ufnar, 2007 |
| P23-2r | ATACACTGGCGACATTCTTGAGGATTAC |   |  |
| Pig-1-Bac32Fm | AACGCTAGCTACAGGCTTAAC | Pig-specific *Bacteriodales* | Mieszkin, 2009 |
| Pig-1-Bac108R | CGGGCTATTCCTGACTATGGG |  |  |
| Pig-1-Bac44P | (FAM)ATCGAAGCTTGCTTTGATAGATGGCG(BHQ-1) |  |
| Pig-2-Bac41F | GCATGAATTTAGCTTGCTAAATTTGAT | Pig-specific *Bacteriodales* | Mieszkin, 2009 |
| Pig-2-Bac163Rm | ACCTCATACGGTATTAATCCGC |  |  |
| Pig-2-Bac113MGB | (VIC)TCCACGGGATAGCC(NFQ-MGB) |  |  |
| Pig-Bac-2 qBac41F  | TACAGGCTTAACACATGCAAGTCG | Pig-specific *Bacteriodales* | Okabe, 2007 |
| Pig-Bac-2 qPS183R | CTCATACGGTATTAATCCGCCTTT |  |  |
| SketaF2 | GGTTTCCGCAGCTGGG | Salmon sperm | Haugland, 2005 |
| SketaR3 | CCGAGCCGTCCTGGTCTA |  |  |
| SketaP2 | (FAM)AGTCGCAGGCGGCCACCGT(TAMRA) |  |  |

*a* FAM, 6-carboxyfluorescein; BHQ-1, black hole quencher 1; NFQ-MGB, nonfluorescent quencher group-minor groove binder.

**Table S2.** Cumulative rainfall 24 hours and 48 hours before surface water sample collection.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | N | Min | Median | Q3 | Mean | Max |
| Individual sample analysisa |  |  |  |  |  |  |
| Cumulative 24 hour antecedent rainfall | 187 | 0 | 0 | 0.02 | 0.073 | 0.92 |
| Cumulative 48 hour antecedent rainfall | 187 | 0 | 0 | 0.26 | 0.248 | 2.94 |
| Pair-wise sample analysisb |  |  |  |  |  |  |
| Cumulative 24 hour antecedent rainfall | 76 | 0 | 0 | 0.02 | 0.081 | 0.92 |
| Cumulative 48 hour antecedent rainfall | 76 | 0 | 0 | 0.26 | 0.257 | 2.94 |
| aDistribtion of rainfall data in analyses involving the 187 individual water samples. |
| bDistribution of rainfall data in analyses involving the 76 pair-wise water samples.  |

**Table S3.** Relationship between rainfall and fecal indicator bacteria concentrations (log10 CFU/100 ml) in surface water samples at sites proximal to swine concentrated animal feeding operation spray fields in North Carolina.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Fecal coliforms (log10 CFU/100 ml) |  | *E. coli* (log10 CFU/100 ml) |  | *Enterococcus* (log10 CFU/100 ml) |
|  | N | Betaa | 95% CI |  | N | Betaa | 95% CI |  | N | Betaa | 95% CI |
| All sites |  |  |  |  |  |  |  |  |  |  |  |
| Cum. 28 hr. rainfall | 185 | 0.95 | 0.37, 1.54 |  | 185 | 1.22 | 0.76, 1.68 |  | 183 | 1.51 | 1.37, 1.66 |
| Cum. 48 hr. rainfall | 185 | 0.29 | 0.09, 0.49 |  | 185 | 0.43 | 0.27, 0.59 |  | 183 | 0.5 | 0.31, 0.69 |
| aThe beta coefficient is the increase in fecal indicator bacteria concentration (log10 CFU/100 ml) for every 1 inch increase in  |
| cumulative rainfall in the 24 or 48 hours before sample collection. Coefficients are derived from conditional fixed effects linear  |
| regression models adjusted for season. CI=confidence interval.  |  |  |  |  |  |  |