Data Dictionary:

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| --- | --- | --- | --- | --- | --- |
| Factor | | | Description | Date | Citations and Websites |
| Data Extracted from Publicly-Available Databases | | | |  |  |
|  | Campgrounds | | | 2018 | www.management-ware.com |
|  |  | Present (camp\_pa) | Were campgrounds present upstream? |  |
|  |  | Density (camp\_density) | Upstream density (no. of per 10 km2) |  |  |
|  |  | Min. distance (camp\_min) | If present, the flow path distance to nearest (km) |  |  |
|  | Culverts: Carrying a waterway under a state highway and have a span of 5 to 20 feet | | | 2014 | (1–3) |
|  |  | Present (culverts\_pa) | Were culverts present upstream? |  |  |
|  |  | Min. distance (culverts\_min) | If was present, the flow path distance to nearest (km) |  |  |
|  | Dams | |  | 2018 | (4) |
|  |  | Present (dams\_pa) | Were dam(s) present upstream? |  |  |
|  |  | Min. distance (dams\_min) | If present, the upstream flow path distance to nearest (km). |  |  |
|  | Livestock Operations: Dataset generated by joining all livestock datasets | | | 2018 | NA |
|  |  | Present (anylivestock\_pa) | Were livestock operations present upstream? |  |  |
|  |  | Density (anylivestock\_density) | Upstream density (no. of per 10 km2) |  |  |
|  |  | Min. distance (anylivestock\_min) | If present, the flow path distance to nearest (km) |  |  |
|  | Dairies | | | 2017 | NA |
|  |  | Present (cattle\_pa) | Were dairies present upstream? |  |  |
|  |  | Density (cattle\_density) | Upstream density (no. of per 10 km2) |  |  |
|  |  | Min. distance (cattle\_min) | If present, the flow path distance to nearest (km) |  |  |
|  | Goat or Sheep Farms | | | 2018 | [www.management-ware.com](http://www.management-ware.com) |
|  |  | Present (livestock\_goatsheep\_pa) | Were goat and/or sheep farms present upstream? |  |  |
|  |  | Density (livestock\_goatsheep\_density) | Upstream density (no. of per 10 km2) |  |  |
|  |  | Min. distance (livestock\_goatsheep\_min) | If present, the flow path distance to nearest (km) |  |  |
|  | Stables | |  | 2018 | [www.management-ware.com](http://www.management-ware.com) |
|  |  | Present (livestock\_horse\_pa) | Were stables present upstream? |  |  |
|  |  | Density (livestock\_horse\_density) | Upstream density (no. of per 10 km2) |  |  |
|  |  | Min. distance (livestock\_horse\_min) | If present, the flow path distance to nearest (km) |  |  |
|  | Pig Farms | |  | 2018 | [www.management-ware.com](http://www.management-ware.com) |
|  |  | Present (livestock\_pigs\_pa) | Were pig farms present upstream? |  |  |
|  |  | Density (livestock\_pigs\_density) | Upstream density (no. of per 10 km2) |  |  |
|  |  | Min. distance (livestock\_pigs\_min) | If present, the flow path distance to nearest (km) |  |  |
|  | Poultry Farms | |  | 2018 | [www.management-ware.com](http://www.management-ware.com) |
|  |  | Present (livestock\_poultry\_pa) | Were poultry farms present upstream? |  |  |
|  |  | Density (livestock\_poultry\_density) | Density of poultry farms upstream (no. per 10 km2). |  |  |
|  |  | Min. distance (livestock\_poultry\_min) | If present, the flow path distance to nearest (km). |  |  |
|  | Road Crossing (  roadsinterx\_min) | | The flow path distance to nearest point upstream where a road crossed the stream (km). | 2015 | (5) |
|  | Outfalls: Municipal stormwater outfalls along or near highways (presence is an indicator of urbanization) | | | 2008 | (6–8) |
|  |  | Present (stormwateroutfalls\_pa) | Were stormwater outfalls present upstream? |  |  |
|  |  | Min. distance (stormwateroutfalls\_min) | If present, the flow path distance to nearest (km). |  |  |
|  | Wastewater Discharge Sites: Based on permits issued under the NYSa Pollutant Discharge Elimination System (SPDES) | | | 2018 | (9) |
|  |  | Present (wastewater\_pa) | Were wastewater discharge sites present upstream? |  |  |
|  |  | Density (wastewater\_density) | Upstream density (no. of per 10 km2) |  |  |
|  |  | Min. distance (wastewater\_min) | If present, the flow path distance to nearest (km) |  |  |
|  | In-stream Waterbodies: Bodies of water within the stream channel (e.g., mill ponds, impoundments, lakes) | | | 2017 | (10) |
|  |  | Present (waterbodiesinterx\_pa) | Were waterbodies upstream? |  |  |
|  |  | Min. distance (waterbodiesinterx\_min) | If present, the flow path distance to nearest (km) |  |  |
|  | Septic System Density (septic\_adj\_sepden\_m2) | | Upstream density (no. per 10 km2). | 2011 | (11) |
|  | Trailer Parks: Based on permits issued by NYS for active mobile home parks (i.e., operating with accommodations for the placement of ≥ 5 homes) | | | 2019 | (13) |
|  |  | Present (trailer\_pa) | Were trailer parks present upstream? |  |  |
|  |  | Density (trailer\_density) | Upstream density (no. of per 10 km2) |  |  |
|  |  | Min. distance (trailer\_min) | If present, the flow path distance to nearest (km) |  |  |
|  | Weighted Land Cover | | | 2016 | (14, 15) |
|  |  | Open Water (X11 b) | Class 11 in National Land Cover Database (NLCD) |  |  |
|  |  | Cropland (X82 b) | Cropland; Class 82 in NLCD |  |  |
|  |  | Pasture (X81 b) | Pasture; Class 81 in NLCD |  |  |
|  |  | For-Wet (forwet b) | Natural cover; Classes 41-43, 51-52, 90, and 95 in NLCD (i.e., forest, shrubland or wetland) |  |  |
|  |  | Impervious (impcvr\_idw\_mean) | Percent of upstream watershed that was under impervious cover |  |  |
|  | Watershed Area (area\_10km) | | Total area of upstream watershed (10-km2) | - | - |
| Water Quality and Hydrological Conditions at Time of Sample Collection | | | |  |  |
|  | *E. coli* (ecoli) | | Log10 *E. coli* concentration in the waterway (MPN/100 mL) | - | - |
|  | HF183 (HF183\_pa) | | Microbial source tracking (MST) marker that indicates human fecal contamination | - | - |
|  | Rum2Bac (Rum2Bac\_pa) | | MST marker that indicates ruminant fecal contamination | - | - |
|  | DG3 (DG3\_pa) | | MST marker that indicates canid fecal contamination |  |  |
|  | GFD (GFD\_pa) | | MST marker that indicates avian fecal contamination |  |  |
|  | Conductivity (cond) | | Conductivity (Log10 uS/cm) | - | - |
|  | Dissolved oxygen (do) | | Dissolved oxygen levels (mg/L) | - | - |
|  | Flow rate (flow) | | Flow rate measured 3-6” below the surface (m/s) | - | - |
|  | pH (ph) | | pH | - | - |
|  | Turbidity (turb) | | Turbidity (Log10 NTU) | - | - |
|  | Water Temp. (w\_t) | | Water temperature (°C) | - | - |
| Field-Collected Site Data | | | |  |  |
|  | Ditch (outfall\_ditch) | | Did a roadside ditch intersect the stream < 20 m upstream of the sample site? | ~~-~~ | ~~-~~ |
|  | Road Parallel (rdparallel) | | Was there a road parallel to the stream < 20 m upstream of the sample site? | ~~-~~ | ~~-~~ |
|  | Bottom Substrate: Composition of the stream bottom in the reach 10 m upstream of the sample site. The different categories of substrate were boulder, bedrock, cobble or larger, coarse gravel, fine gravel, sand, clay and organic matter. | | | ~~-~~ | (16) |
|  |  | Rocky (rocky) | Was the substrate that comprised the majority of the bottom rocky (bedrock, boulder, cobble, or gravel) or not rocky (sand, clay, or organic matter/silt)? | - | - |
|  |  | Predominant Substrate (bottom\_collapsed) | What substrate comprised the majority of the bottom (cobble/boulder/bedrock, coarse gravel, fine gravel, sand/organic matter/clay)? | - | - |
|  |  | Sand (sand) | Was sand present along the stream bottom? |  |  |
|  |  | Clay (clay) | Was clay present along the stream bottom? |  |  |
|  |  | Organic Matter (org\_matter) | Was organic matter present along the stream bottom? |  |  |
|  |  | Cobble or Larger (cobbleorbigger) | Were cobble, boulders or bedrock along the stream bottom? |  |  |
|  |  | Fine gravel (fine\_gravel) | Was fine gravel present along the stream bottom? |  |  |
|  |  | Coarse gravel (coarse\_gravel) | Was coarse gravel present along the stream bottom? |  |  |
|  | Submerged Aquatic Vegetation (SAV) | | | - | - |
|  |  | Percent (perc\_SAV) | The percent of the stream bottom 0-10 m upstream covered by SAVS | - | - |
|  |  | Present (SAV\_pa) | Were SAVs present or absent? | - | - |
| Temporal | | |  |  |  |
|  | Week of the Year (woy) | | No. of weeks since the week containing Jan. 1st | - | - |
| Weather | | |  |  |  |
|  | Air Temp. at site (a\_t) | | Air temperature measured at the sampling site at the time of sample collection (°C) | - | - |
|  | Avg. Air Temp. (avg\_temp\_Xd) | | Average temperature (°C) either 0-5, 5-10, 10-20 or 20-30 d before sample collection | - | [newa.cornell.edu](http://newa.cornell.edu/) |
|  | Avg. Solar Radiation (avg\_solar\_Xd) | | Average solar radiation (MJ/m2) either 0-1,1-2, 2-3, 3-4, 4-5, 5-10, 10-20 or 20-30 d before sample collection | - | [newa.cornell.edu](http://newa.cornell.edu/) |
|  | Total rainfall (precip\_Xd) | | Total rainfall (cm) either 0-1,1-2, 2-3, 3-4, 4-5, 5-10, 10-20 or 20-30 d before sample collection | - | [newa.cornell.edu](http://newa.cornell.edu/) |

a New York State = NYS

b For each land cover class we calculated the proportion of (i) the total watershed area (prefix ***idw\_***), and (ii) the stream corridor (i.e., area 0-60 m from the stream corridor; prefix ***buffer\_60m\_idw***).

c Limit of detection = LOD; the upper limit of detection for the *E. coli* and total coliforms assay was 2,419.6 MPN/100-mL.

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