Wallkill Reporting Draft

NYSDEC SMAS

2020-12-21

# Section 1 - Background

         The Wallkill River flows approximately 90 miles north and drains approximately 760 square miles throughout New York State (NYS) and northern New Jersey. In NYS alone, the Wallkill flows approximately 66 miles and drains 552 square miles across 48 municipalities. With only the Mohawk River larger, the combined watersheds of the Wallkill and Rondout Creek form the second largest tributary to the lower Hudson River. With a highly complex and variable land use coverage across the basin, agriculture, urban stormwater, and wastewater treatment facilities (WWTF) drive water quality concerns related to nutrients, algal blooms, and low dissolved oxygen.  
  
          Between 2017 and 2019, a Stream Assessment Survey was conducted by the Rotating Integrated Basin Studies (RIBS) Program throughout the mainstem Wallkill and its tributaries (Figure 1). The RIBS Program operates on a five-year, rotational schedule to generate statewide water quality data in support of the Waterbody Inventory/Priority Waterbody List (WI/PWL) towards the goal of protection and restoration of water quality resources (RIBS QAPP, 2017-2019). The RIBS Program also conducts special surveys outside of this five-year cycle to support Department-initiated priorities related to water quality (RIBS QAPP, 2017-2019). The objectives of the Wallkill watershed survey were to 1) update condition assessments for Waterbody Inventory/Priority Waterbody List (WI/PWL) segments throughout the basin, 2) identify areas of elevated nutrient concentrations, 3) assess biological community condition and, 4) collect data to inform watershed planning efforts to mitigate nutrient impacts.  
         Details on numbers of sites – mainstem and tribs AND Sturgeon Pool – need to include PEERS discussion here  
         To characterize the Wallkill watershed, Bureau of Water Assessment and Management’s Stream Monitoring and Assessment Section (SMAS), Hudson River Estuary Program, and participants in the Professional External Evaluations of Rivers and Streams (PEERS) Program collected several measures of water quality at each of the 39 sampling locations across 19 WI/PWL segments between the months of July and October during 2017, 2018, and 2019 (Table 1, Figure 1 and Figure 2). Measures of water and habitat quality included:

1. Water Chemistry and Stream Discharge
2. Benthic Macroinvertebrate Community
3. Stream Reach Physical Habitat Characteristics
4. Observer Ranking of Recreational Ability
5. Sediment and Porewater Microtox Analysis

         This data report provides water quality information in a format designed to update the WI/PWL and document water quality violations. It has been structured into two primary sections: I) an overview to convey results from the five measures of water quality described above at the watershed and WI/PWL scale, and II) a site-specific data summary to present all major findings for each sampling location. Additional sections (III, IV) include literature cited and appendices covering all references and additional source material.

Table : Wallkill River (WALK) sampling locations. Locations are ordered from upstream to downstream according to river mile and mainstem confluence

| **Location ID** | **Group** | **Rivermile** | **WI/PWL** | **Waterbody   Classification** | **Description** | **Latitude** | **Longitude** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 13-WALK-60.1 | Wallkill Main Stem | 60.1 | 1306-0017 | C | OIL CITY RD. AT USFWS WILDLIFE REFUGE (BEFORE 2017. SAMPLES WERE TAKEN 0.4 MILES OFF STATE LINE RD. ON FARM RD.). | 41.29083 | -74.53056 |
| 13-POCH-2.6 | Upper Wallkill Trib | NA | 1306-0078 | C | LIBERTY CORNERS ROAD/PINE ISLAND TPKE IN PINE ISLAND | 41.29801 | -74.47060 |
| 13-POCH-1.8 | Upper Wallkill Trib | 1.8 | 1306-0078 | C | TRANSPORT LN OFF COUTNY ROUTE 1. ACCESS BEHIND BARN NEXT TO CALF PEN. FOLLOW PEN OM THE LEFT SIDE AND ACCESS RIVER FROM BEHIND. | 41.30042 | -74.47224 |
| 13-RUTG-9.3 | Upper Wallkill Trib | NA | 1306-0006 | C | RTE 1 IN WESTTOWN | 41.34120 | -74.54362 |
| 13-RUTG-1.5 | Upper Wallkill Trib | 1.5 | 1306-0006 | C | 20 METERS DOWNSTREAM OF COUNTY RTE 12. | 41.33579 | -74.48799 |
| 13-QKER-0.9 | Upper Wallkill Trib | 0.9 | 1306-0025 | C | 30 M BELOW RT. 6 BRIDGE. | 41.32722 | -74.41639 |
| 13-RIOG-0.7 | Upper Wallkill Trib | 0.7 | 1306-0061 | C | AT 6 1/2 STATION RD. OVERPASS. DOWNSTREAM OF VILLAGE OF GOSHEN. | 41.40115 | -74.35923 |
| 13-RIOG\_T1-0.8 | Upper Wallkill Trib | NA | 1306-0061 | C | RIO GRANDE AT HERTIAGE TRAIL IN GOSHEN | 41.40190 | -74.34147 |
| 13-WCHEE-0.6 | Upper Wallkill Trib | 0.6 | 1306-0061 | C | HARTLEY RD. | 41.40860 | -74.37299 |
| 13-WALK-46.6 | Wallkill Main Stem | 46.6 | 1306-0017 | C | AT ECHO LAKE RD. BRIDGE. | 41.41222 | -74.37805 |
| 13-MONH-4.1 | Upper Wallkill Trib | 4.1 | 1306-0074 | C | 200 M UPSTREAM OF MIDDLETOWN STP DISCHARGE. | 41.42833 | -74.42389 |
| 13-MONH-0.4 | Upper Wallkill Trib | 0.4 | 1306-0074 | C | 20 M ABOVE GOLF LINKS RD. BRIDGE. 4.1 MI. BELOW STP. | 41.42361 | -74.38111 |
| 13-LGUN-6.0 | Upper Wallkill Trib | 6.0 | 1306-0059 | B | AT MAPES RD. BRIDGE. | 41.45587 | -74.49380 |
| 13-GUNK-40.3 | Upper Wallkill Trib | 40.3 | 1306-0048 | A | AT KOHLER RD. | 41.42198 | -74.56069 |
| 13-GUNK-37.7 | Upper Wallkill Trib | 37.7 | 1306-0047 | B | AT RTE 24 BRIDGE. | 41.44134 | -74.52977 |
| 13-GUNK\_T35-0.2 | Upper Wallkill Trib | 0.2 | 1306-0047 | B | AT RTE 24 BRIDGE. | 41.43961 | -74.53890 |
| 13-MASO-2.8 | Upper Wallkill Trib | NA | 1306-0072 | B | UPSTREAM OF SILVER LAKE IN MIDDLETOWN | 41.46532 | -74.38695 |
| 13-MASO-0.2 | Upper Wallkill Trib | 0.2 | 1306-0072 | B | AT COUNTY ROUTE 50 (GOLF LINKS RD.) OVERPASS. UPSTREAM OF CONFLUENCE WITH WALLKILL RIVER. | 41.43765 | -74.37287 |
| 13-WALK-44.4 | Wallkill Main Stem | 44.4 | 1306-0038 | B | AT MIDWAY RD. BRIDGE. | 41.43879 | -74.36565 |
| 13-WALK-35.6 | Wallkill Main Stem | 35.6 | 1306-0038 | B | 20 M BELOW RT. 211 BRIDGE. | 41.50250 | -74.26334 |
| 13-WALK-29.9 | Wallkill Main Stem | 29.9 | 1306-0038 | B | ACCESS VIA PARK ON FARM MEADOW LANE. | 41.54217 | -74.20946 |
| 13-TINW-0.5 | Middle Wallkill Trib | 0.5 | 1306-0068 | A | AT ULSTER AVE./RTE 208 BRIDGE. | 41.57325 | -74.18353 |
| 13-WALK-26.9 | Wallkill Main Stem | 26.9 | 1306-0038 | B | DOWNSTREAM OF TIN BROOK. SR 208. | 41.57630 | -74.19071 |
| 13-TINW\_T3-2.1 | Lower Wallkill Trib | NA | 1306-0068 | B | BEREA ROAD CROSSING IN WALDEN | 41.53659 | -74.17153 |
| 13-TINW-4.5 | Middle Wallkill Trib | NA | 1306-0069 | A | NEAR ROUTE 52/ROUTE 85 INTERSECTION IN WALDEN | 41.55868 | -74.15782 |
| 13-DWAR-2.0 | Middle Wallkill Trib | 2.0 | 1306-0062 | C | 10 M ABOVE BATES RD. BRIDGE. | 41.62444 | -74.19945 |
| 13-WALK\_T13-0.7 | Middle Wallkill Trib | NA | 1306-0040 | A | MILL BROOK AT HUGENOT STREET IN NEW PALTZ | 41.76295 | -74.08449 |
| 13-WALK\_T15-0.1 | Middle Wallkill Trib | NA | 1306-0040 | A | SAW MILL BROOK AT SOJOURNER TRUTH BOAT LAUNCH IN NEW PALTZ | 41.74327 | -74.09239 |
| 13-WALK-22.8 | Wallkill Main Stem | 22.8 | 1306-0038 | B | 10 M ABOVE BRIDGE. | 41.63500 | -74.18889 |
| 13-WALK-19.0 | Wallkill Main Stem | 19.0 | 1306-0038 | B | LAZY RIVER CAMPGROUND-20 M ABOVE SHAWANGUNK CONFL. | 41.68306 | -74.16444 |
| 13-GUNK-0.4 | Middle Wallkill Trib | 0.4 | 1306-0045 | B | 150 M BELOW CO. RT. 9 BRIDGE. | 41.68722 | -74.17278 |
| 13-PKIL-5.7 | Middle Wallkill Trib | NA | 1306-0044 | B(T) | RTE 44 IN MODENA | 41.67009 | -74.11449 |
| 13-PKIL-0.4 | Middle Wallkill Trib | 0.4 | 1306-0044 | B(T) | 10 M ABOVE RTE 208 BRIDGE. | 41.72528 | -74.10472 |
| 13-WALK-9.8 | Wallkill Main Stem | 9.8 | 1306-0027 | B | (MULTIPLATE) UPSTREAM OF NEW PALTZ GOLF COURSE. BOAT LAUNCH UPSTREAM OF RTE 209 AT 41.743779 / -74.092916. | 41.76574 | -74.09297 |
| 13-WKLEI-0.6 | Lower Wallkill Trib | 0.6 | 1306-0042 | C | DUG RD. | 41.77490 | -74.09750 |
| 13-WALK-2.1 | Wallkill Main Stem | 2.1 | 1306-0027 | B | OFF SR 213. NEAR DASHVILLE. | 41.82530 | -74.04720 |
| 13-SWAK-1.7 | Lower Wallkill Trib | 1.7 | 1306-0039 | B |  | 41.83242 | -74.03169 |
| sturgeon\_pool\_epilimnion | Wallkill Main Stem-Ponded | 0.0 | 1306-0037 | B |  | 41.84360 | -74.04260 |
| sturgeon\_pool\_hypolimnion | Wallkill Main Stem-Ponded | 0.0 | 1306-0037 | B |  | 41.84360 | -74.04260 |

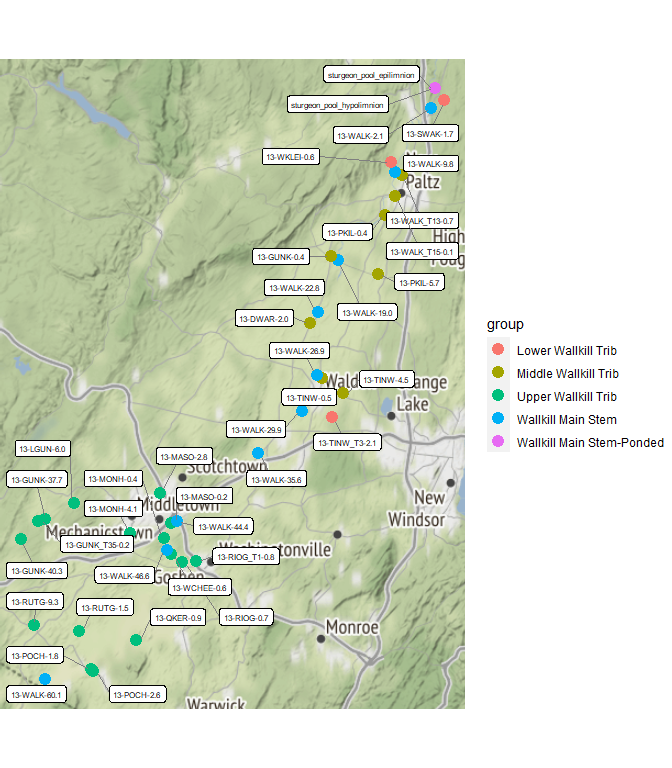


Figure : Map of Wallkill River (WALK) sampling locations. Site names reference the Location ID and River Mile presented in

# Section 1A - Water Chemistry and Stream Discharge

## Analyte Table

Table : Water chemistry analytes sampled as part of the Wallkill River Stream Assessment Survey. Table lists sampled analytes and analytical specifications. ^ Precision objectives are defined by results of duplicate samples as described in Appendix III

| **Analytes** | **Analytical  Lab** | **Method** | **Precision** | **Accuracy** | **Calibration:   Initial** | **Calibration:   Ongoing** | **Calibration:   Blanks** | **Detection   Limit** | **Reporting   Limit** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Temperature | in situ | 2550 B | ± 1oC | ± 1.5oC | Factory Set | ~ | ~ | ~ | ~ |
| Dissolved Oxygen | in situ | 4500-O G | ± 1% | ± 2% | Daily | ~ | ~ | ~ | ~ |
| pH | in situ | 4500-H+B | ± .05 SU | ± .2 SU | Weekly | ~ | ~ | ~ | ~ |
| Salinity | in situ | Calculated | 0.001 ppt | ± 1% | N/A | ~ | ~ | ~ | ~ |
| Specific Conductance | in situ | 2510 B | ± 1µs/cm | ± 1% | Weekly | ~ | ~ | ~ | ~ |
| Ammonia | ALS | D6919-09 | ^ | ± 20% | As needed | Every 10 | Every 10 | 0.008 mg/L | 0.01 mg/L |
| Total Kjeldahl Nitrogen | ALS | EPA 351.2 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.08 mg/L | 0.1 mg/L |
| Nitrogen, Nitrate | ALS | EPA 353.2 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.02 mg/L | 0.05 mg/L |
| Nitrogen, Total | ALS | Calculated | ^ |  |  |  |  |  |  |
| Total Phosphorus | ALS | EPA 365.1 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.002 mg/L | 0.003 mg/L |
| Ortho-phosphate | ALS | EPA 365.1 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.001 mg/L | 0.005 mg/L |
| Total Dissolved Solids | ALS | SM 2540C | ^ | ± 20% | Daily | Every 20 | Every 20 | 4.0 mg/L | 10 mg/L |
| Turbidity | ALS | EPA 180.1 | ^ | ± 10% | Daily | Every 10 | Every 10 | 0.06 NTU | 0.1 NTU |
| Dissolved Organic Carbon | ALS | 5310C | ^ | ± 20% | As needed | Ever 10 | Every 10 | 0.4 mg/L | 10 mg/L |
| Alkalinity | ALS | SM 2320B | ^ | ± 20% | Daily | Every 10 | Every 10 | 1.0 mg/L | 2.0 mg/L |
| Hardness | ALS | SM 2340C | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.3 mg/L | 2.0 mg/L |
| Calcium | ALS | EPA 200.7 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.1 mg/L | 1.0 mg/L |
| Magnesium | ALS | EPA 200.7 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.04 mg/L | 1.0 mg/L |
| Potassium | ALS | EPA 200.7 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.06 mg/L | 2.0 mg/L |
| Sodium | ALS | EPA 200.7 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.03 mg/L | 1.0 mg/L |
| Chloride | ALS | EPA 300.0 | ^ | ± 20% | As needed | Every 10 | Every 10 | 0.02 mg/L | 0.2 mg/L |
| Fluoride | ALS | EPA 300.0 | ^ | ± 20% | As needed | Every 10 | Every 10 | 0.004 mg/L | 0.1 mg/L |
| Sulfate | ALS | EPA 300.0 | ^ | ± 20% | As needed | Every 10 | Every 10 | 0.02 mg/L | 0.2 mg/L |
| Iron (total) | ALS | EPA 200.7 | ^ | ± 20% | Daily | Every 10 | Every 10 | 6 µ/L | 100 µ/L |
| Manganese (total) | ALS | EPA 200.7 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.5 µ/L | 10 µ/L |
| Arsenic (total) | ALS | EPA 200.8 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.3 µ/L | 1 µ/L |
| Silver (total) | ALS | EPA 200.8 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.07 µ/L | 1 µ/L |
| Aluminum (total) | ALS | EPA 200.8 | ^ | ± 20% | Daily | Every 10 | Every 10 | 4.0 µ/L | 50 µ/L |
| Cadmium (total) | ALS | EPA 200.8 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.03 µ/L | 1 µ/L |
| Copper (total) | ALS | EPA 200.8 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.04 µ/L | 1 µ/L |
| Lead (total) | ALS | EPA 200.8 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.08 µ/L | 1 µ/L |
| Nickel (total) | ALS | EPA 200.8 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.04 µ/L | 1 µ/L |
| Zinc (total) | ALS | EPA 200.8 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.7 µ/L | 10 µ/L |
| Aluminum (dissolved) | ALS | EPA 200.8 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.9 µ/L | 10 µ/L |
| Cadmium (dissolved) | ALS | EPA 200.8 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.02 µ/L | 1 µ/L |
| Copper (dissolved) | ALS | EPA 200.8 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.02 µ/L | 1 µ/L |
| Lead (dissolved) | ALS | EPA 200.8 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.02 µ/L | 1 µ/L |
| Nickel (dissolved) | ALS | EPA 200.8 | ^ | ± 20% | Daily | Every 10 | Every 10 | 0.1 µ/L | 1 µ/L |
| Zinc (dissolved) | ALS | EPA 200.8 | ^ | ± 20% | Daily | Every 10 | Every 10 | 3 µ/L | 5 µ/L |

## Water Chemistry by PWL ID

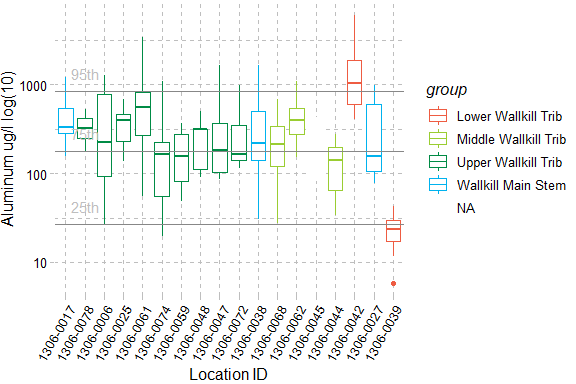


Figure : Aluminum, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

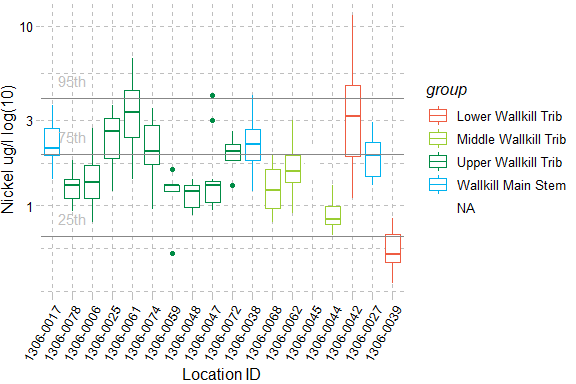


Figure : Nickel, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

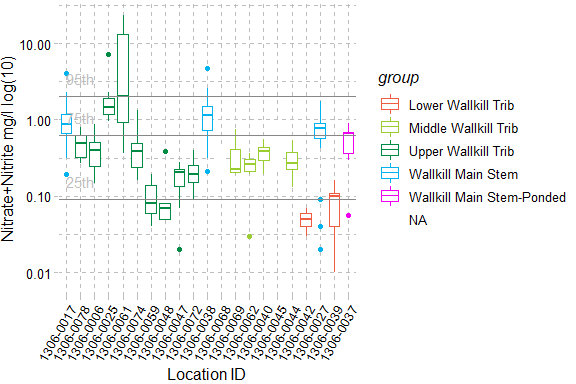


Figure : Nitrate+Nitrite, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

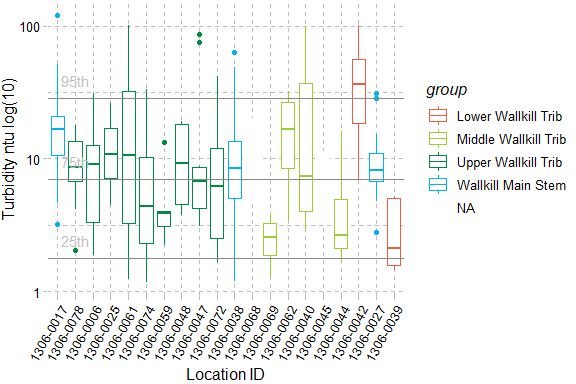


Figure : Turbidity, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

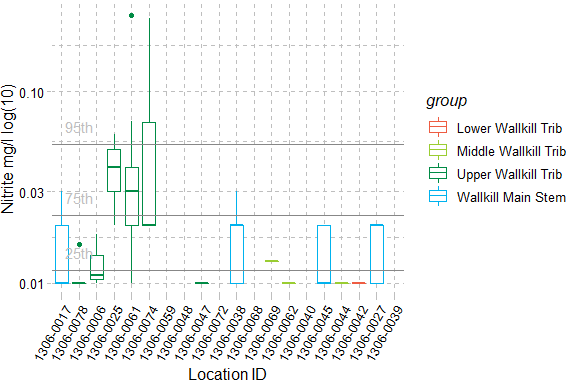


Figure : Nitrite, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

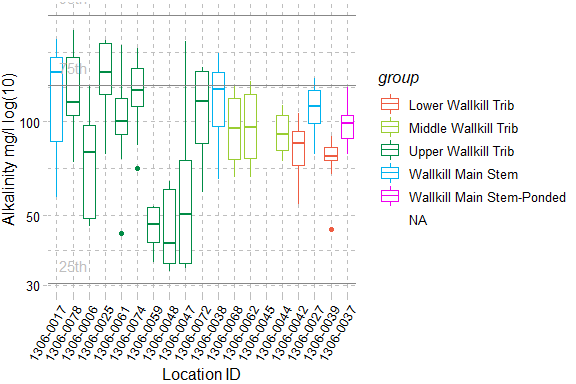


Figure : Alkalinity, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

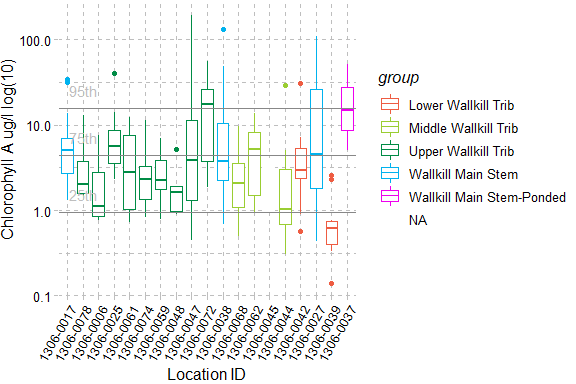


Figure : Chlorophyll A, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

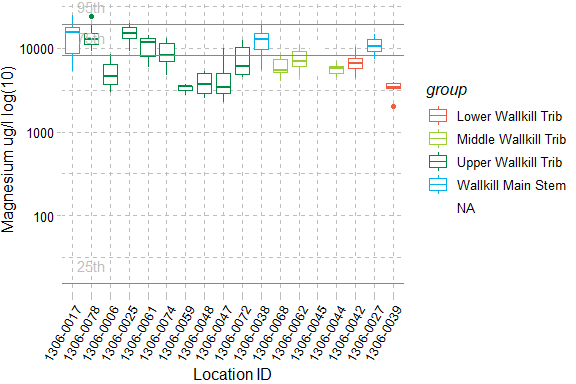


Figure : Magnesium, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

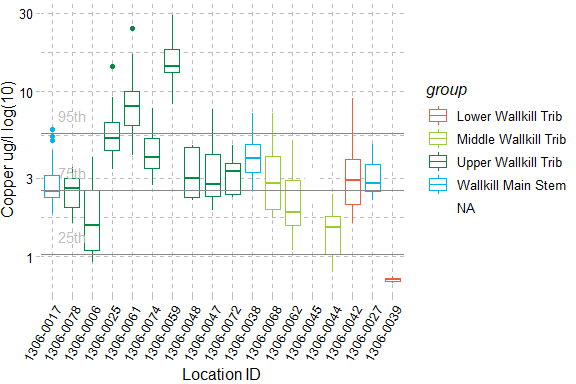


Figure : Copper, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

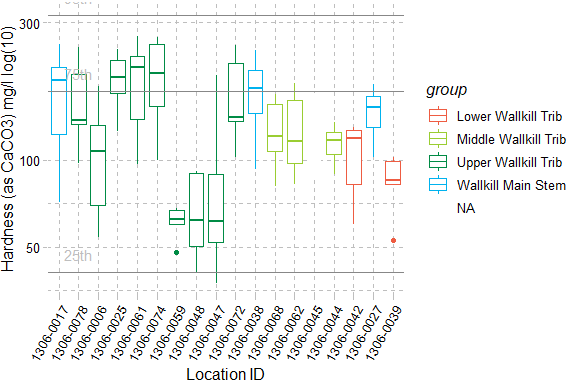


Figure : Hardness (as CaCO3), The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

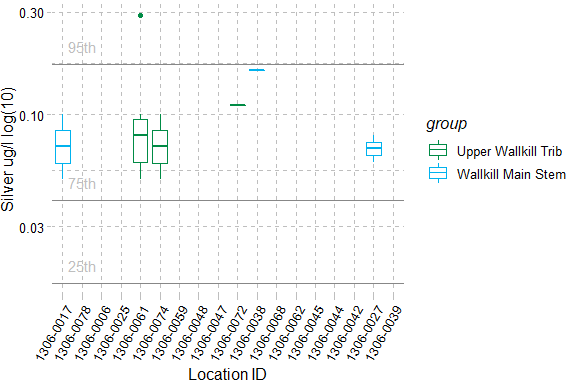


Figure : Silver, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

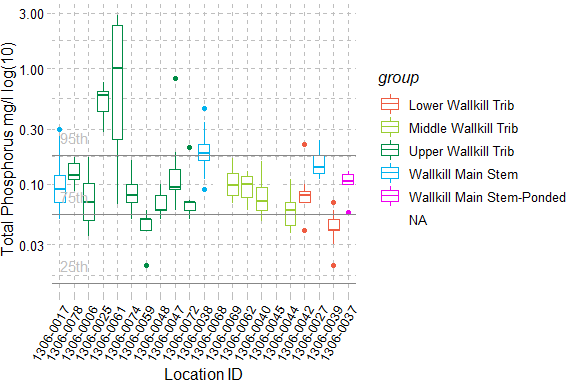


Figure : Total Phosphorus, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

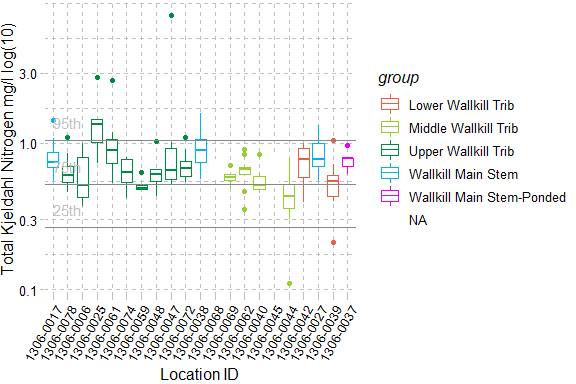


Figure : Total Kjeldahl Nitrogen, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

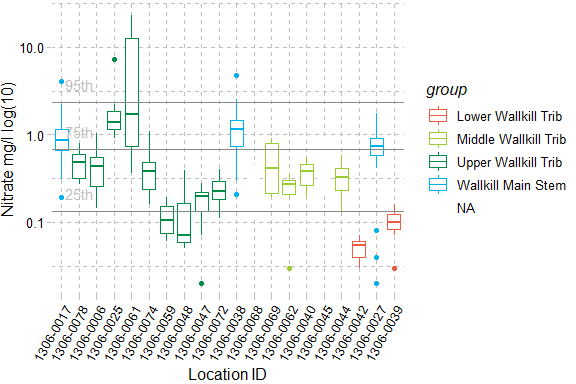


Figure : Nitrate, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

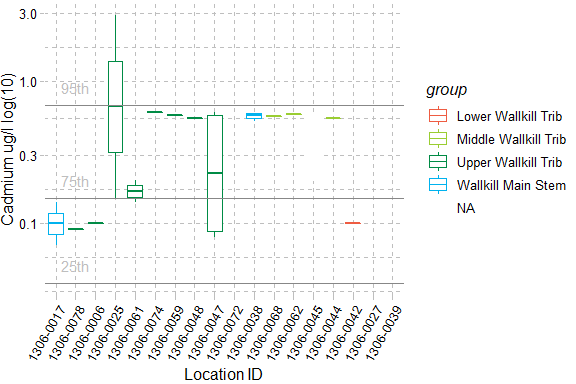


Figure : Cadmium, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

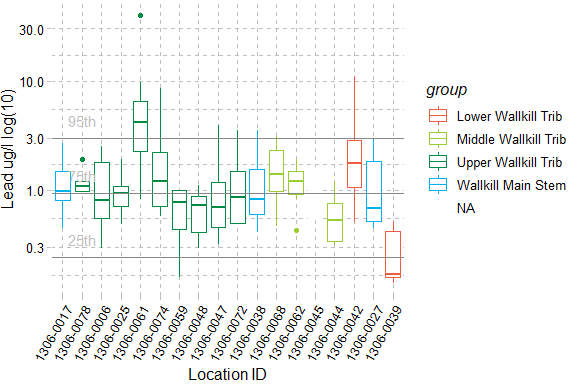


Figure : Lead, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

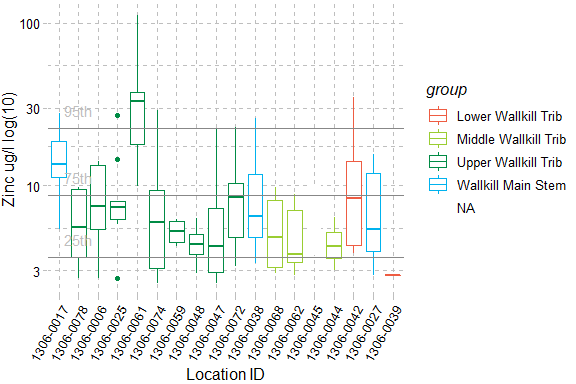


Figure : Zinc, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

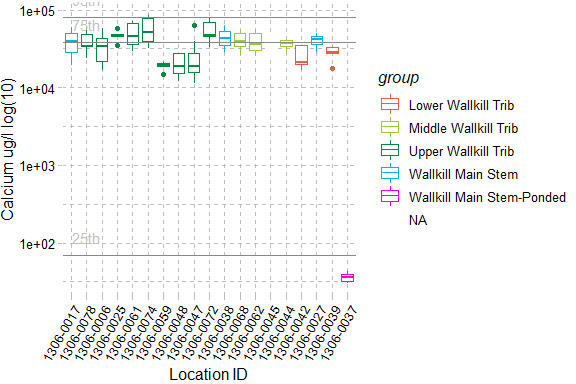


Figure : Calcium, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

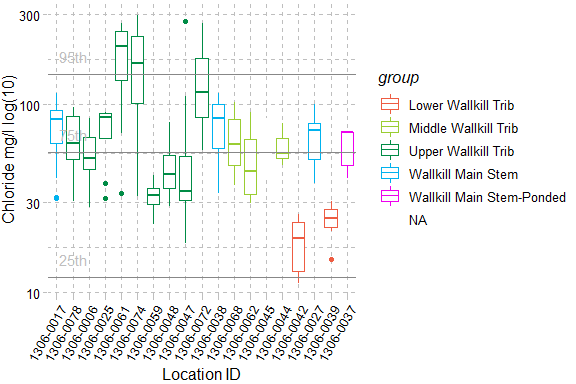


Figure : Chloride, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

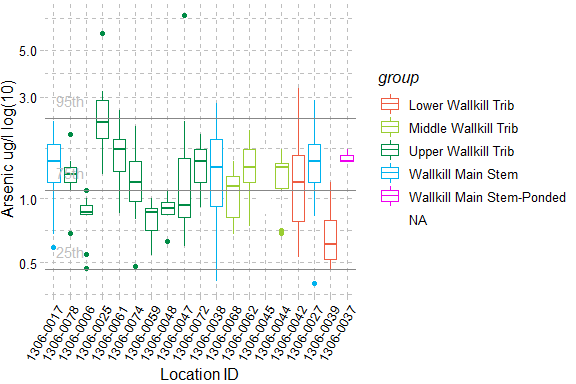


Figure : Arsenic, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

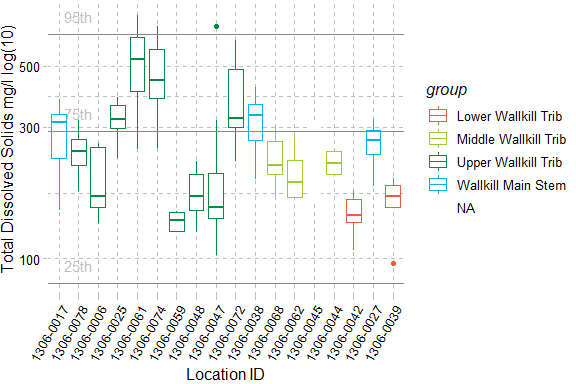


Figure : Total Dissolved Solids, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

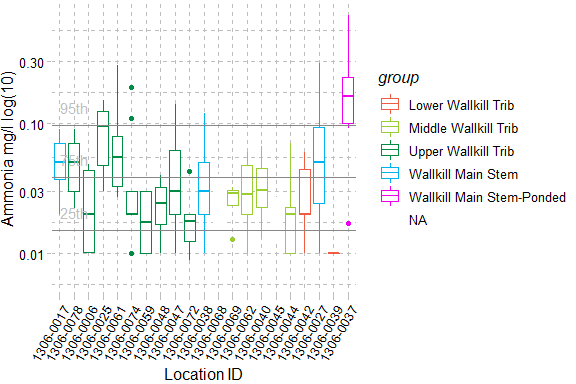


Figure : Ammonia, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

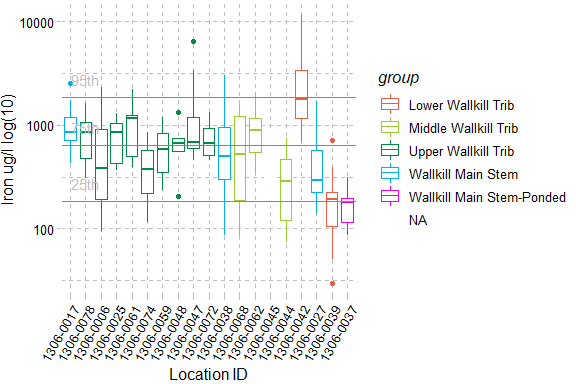


Figure : Iron, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

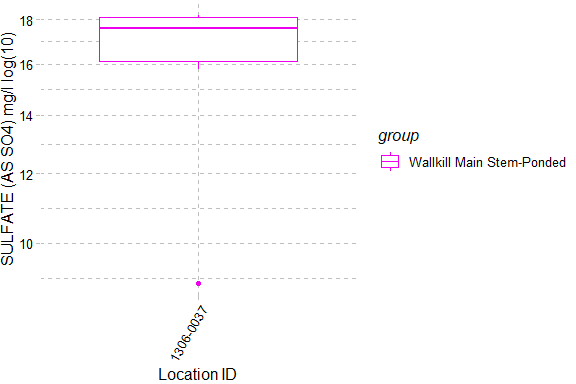


Figure : SULFATE (AS SO4), The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

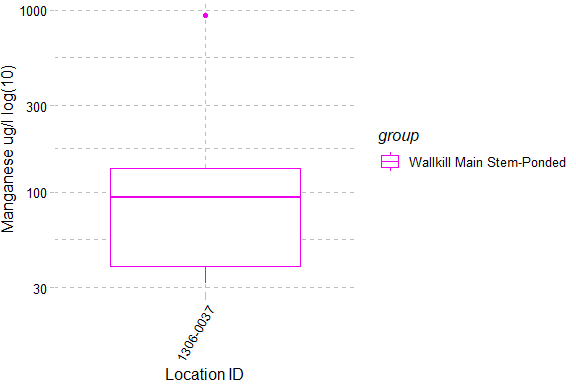


Figure : Manganese, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

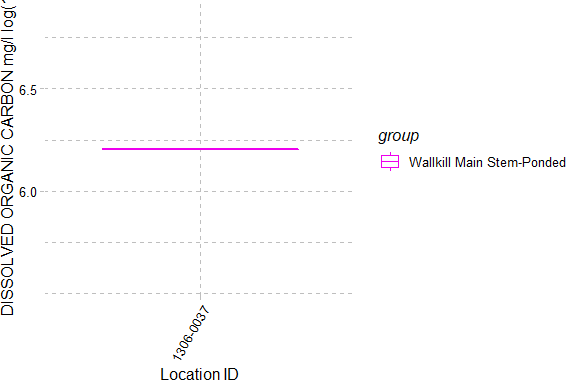


Figure : DISSOLVED ORGANIC CARBON, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

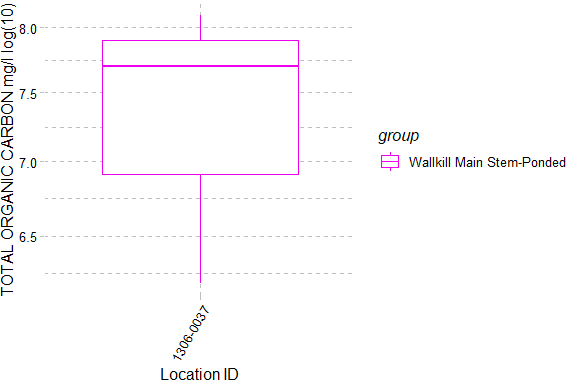


Figure : TOTAL ORGANIC CARBON, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. Note that the percentiles do not apply to the ponded WI/PWL segment. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

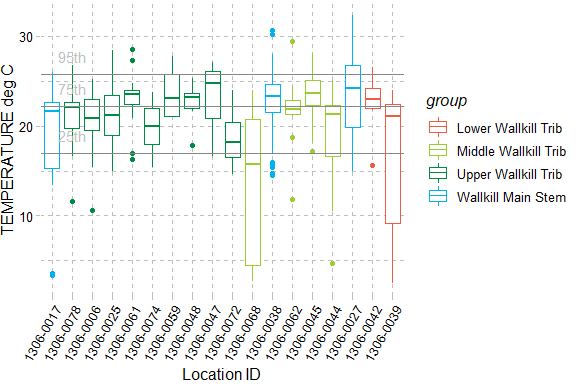


Figure : TEMPERATURE, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream and axis labels correspond with Table 1, Figure 1 and Figure 2. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

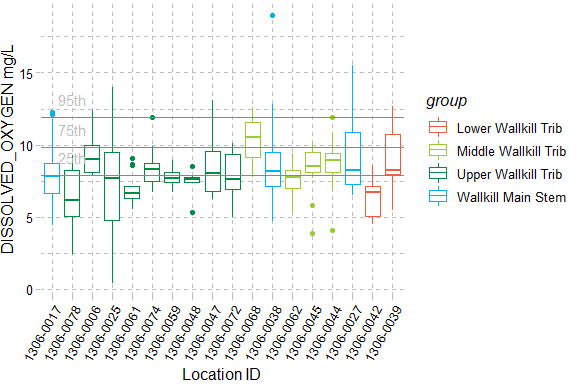


Figure : DISSOLVED\_OXYGEN, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream and axis labels correspond with Table 1, Figure 1 and Figure 2. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

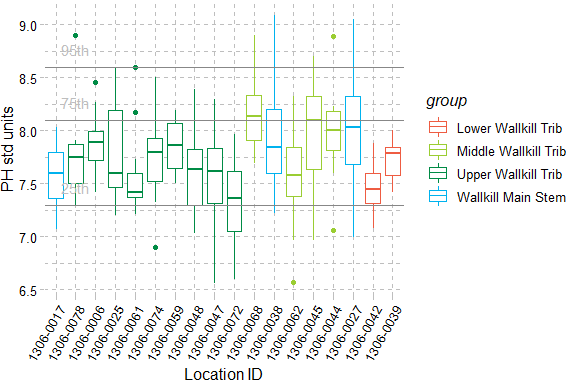


Figure : PH, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream and axis labels correspond with Table 1, Figure 1 and Figure 2. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

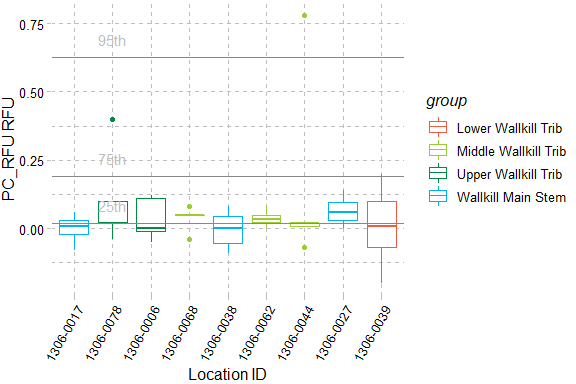


Figure : PC\_RFU, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream and axis labels correspond with Table 1, Figure 1 and Figure 2. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

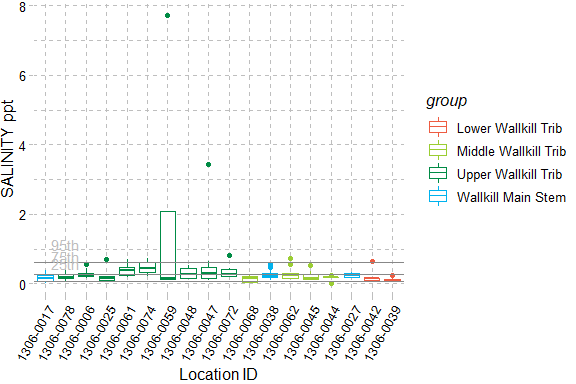


Figure : SALINITY, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream and axis labels correspond with Table 1, Figure 1 and Figure 2. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

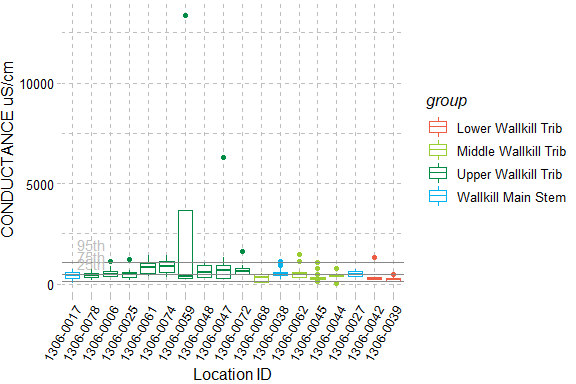


Figure : CONDUCTANCE, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream and axis labels correspond with Table 1, Figure 1 and Figure 2. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

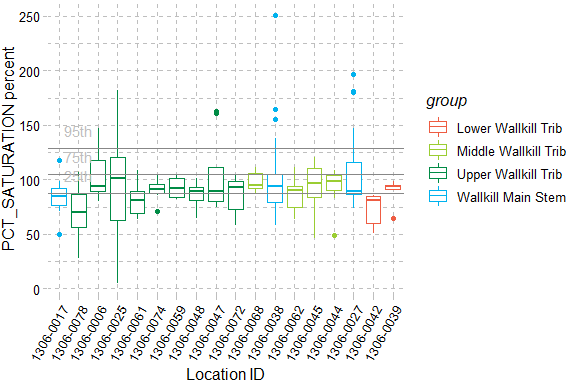


Figure : PCT\_SATURATION, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream and axis labels correspond with Table 1, Figure 1 and Figure 2. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

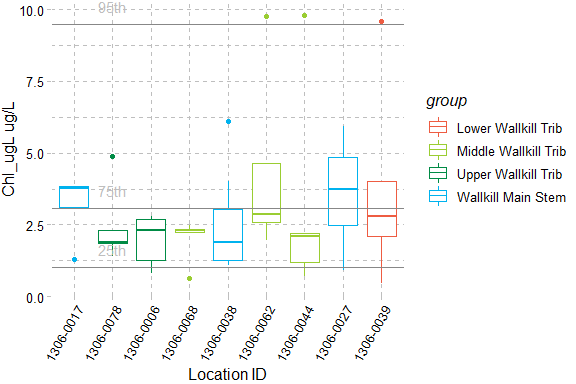


Figure : Chl\_ugL, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream and axis labels correspond with Table 1, Figure 1 and Figure 2. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

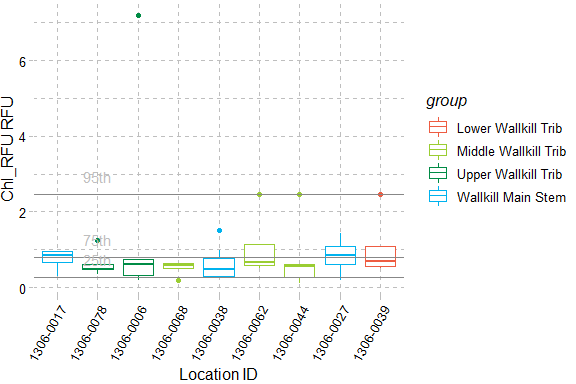


Figure : Chl\_RFU, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream and axis labels correspond with Table 1, Figure 1 and Figure 2. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

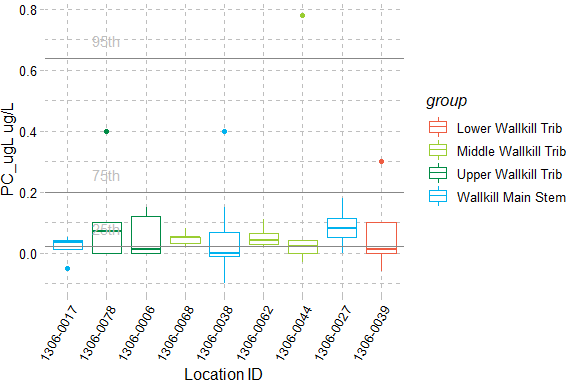


Figure : PC\_ugL, The X-axis presents WI/PWL ID of the sampling locations from upstream to downstream and axis labels correspond with Table 1, Figure 1 and Figure 2. Color of the box represents the location of the WI/WPL in the watershed as indicated in the plot legend. Horizontal lines represent the 95th, 75th, and 25th percentiles of statewide data for each endpoint. The total number of reported values illustrated for each sampling location can vary due to non-detection and QA/QC procedures. Descriptions of removed records are presented in Appendix III.

# Section 1B - Benthic Macroinvertebrate Community

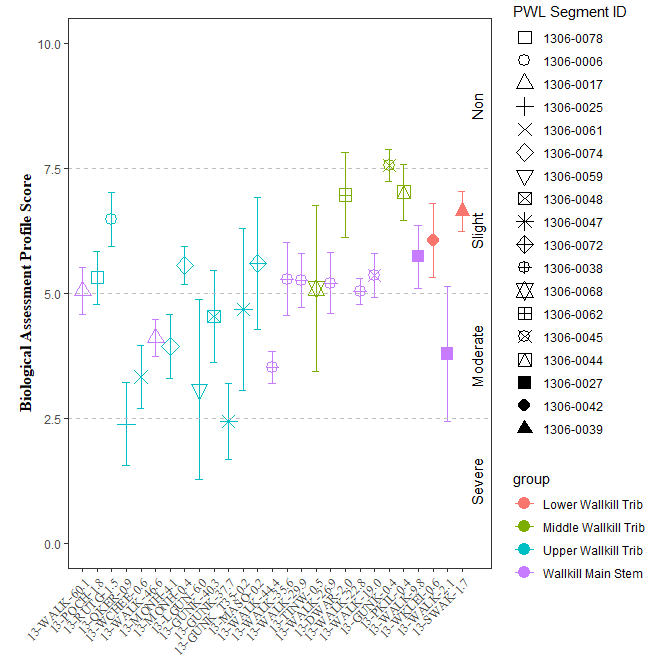


Figure : Biological Assessment Profile (BAP) Scores and 95% confidence intervals for benthic macroinvertebrate community assessment data for the Wallkill River Survey, 2017-2019. Symbology corresponds with WI/PWL segmentation as indicated in the plot legend.

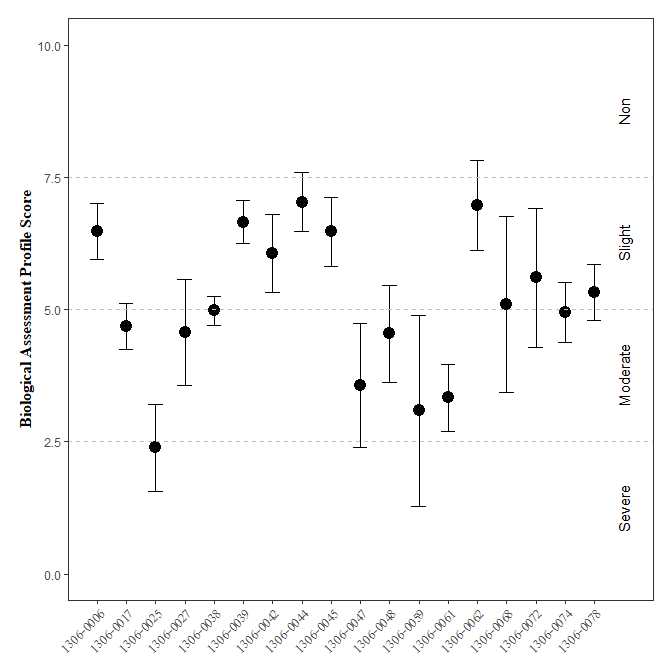


Figure : Biological Assessment Profile (BAP) Scores and 95% confidence intervals for benthic macroinvertebrate community assessment data for the Wallkill River Survey, 2017-2019. Symbology corresponds with WI/PWL segmentation as indicated in the plot legend.

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# Section 1C - Stream Reach Physical Characteristics

Table : Ranked habitat characteristics and calculated HMA for the Wallkill River Survey, 2017-2019. Epifaunal substrate (Epi. Cover); Embeddedness/Pool Substrate Characterization (Embed. Pool.); Velocity Depth Regime/Pool Variability (Vel/Dep Reg.); Sediment Deposition (Sed. Dep.); Channel Flow Status (Flow Status); Channel Alteration (Chan. Alt.); Riffle Frequency/Stream Sinuosity (Rif. Freq.); Left and Right Bank Stability (L.B. and R.B. Stability); Left and Right Bank Vegetation (L.B. and R.B. Veg); Width of Left and Right Bank Vegetative Zone (L.B. and R.B. Veg Zone); Habitat Model Affinity Score (HMA Score); HMA Assessment (HMA Assess.)

| **SITE\_ID** | **Gradient** | **Epi.  Cover** | **Embed.   Pool.** | **Vel/Dep.   Reg.** | **Sed.   Dep.** | **Flow   Status** | **Chan.   Alt** | **Rif.   Freq** | **L.B.   Stability** | **R.B.   Stability** | **L.B.   Veg** | **R.B.  Veg** | **L.B.   Veg Zone** | **R.B.   Veg Zone** | **HMA   Score** | **HMA   Assess.** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 13-WALK-60.1 | Low | 12.0 | 8.0 | 8.0 | 5.0 | 10.0 | 7.0 | 2.0 | 8.0 | 4.0 | 7.0 | 5.0 | 7.0 | 6.0 | 59.7 | Severe |
| 13-POCH-1.8 | High | 11.5 | 14.5 | 7.5 | 14.0 | 16.0 | 13.5 | 5.0 | 6.5 | 6.0 | 6.0 | 3.0 | 4.0 | 3.0 | 61.0 | Moderate |
| 13-RUTG-1.5 | High | 15.5 | 15.0 | 15.0 | 14.0 | 16.5 | 15.5 | 14.5 | 3.0 | 7.5 | 6.5 | 8.5 | 4.0 | 8.5 | 79.6 | Altered |
| 13-QKER-0.9 | High | 13.0 | 3.0 | 9.0 | 3.0 | 18.0 | 12.0 | 5.0 | 8.0 | 8.0 | 7.0 | 7.0 | 3.0 | 4.0 | 55.2 | Severe |
| 13-QKER-0.9 | Low | 5.0 | 5.0 | 4.0 | 10.0 | 15.0 | 10.0 | 13.0 | 8.0 | 8.0 | 7.0 | 7.0 | 4.0 | 4.0 | 67.1 | Moderate |
| 13-RIOG-0.7 | Low | 17.0 | NA | 14.0 | 15.0 | 15.0 | 16.0 | 13.0 | 6.0 | 6.0 | 6.0 | 6.0 | 4.0 | 4.0 | 85.2 | Natural |
| 13-WCHEE-0.6 | High | 10.5 | 12.5 | 10.5 | 10.5 | 18.5 | 15.5 | 9.5 | 7.5 | 6.5 | 6.5 | 6.0 | 5.0 | 4.0 | 68.0 | Moderate |
| 13-WALK-46.6 | High | 13.5 | NA | NA | 7.5 | 16.5 | 11.5 | 7.5 | 7.0 | 5.5 | NA | 6.5 | 7.5 | 7.0 | 76.0 | Altered |
| 13-MONH-4.1 | High | NA | 12.0 | 10.0 | 14.5 | 15.5 | 16.0 | 16.5 | 7.5 | 7.0 | 8.0 | 3.0 | 8.5 | 2.5 | 76.2 | Altered |
| 13-MONH-0.4 | High | 16.0 | 15.5 | 15.0 | 12.5 | 18.5 | 16.0 | 15.5 | 7.0 | 7.0 | 7.5 | 6.0 | 6.0 | 4.5 | 81.2 | Natural |
| 13-LGUN-6.0 | High | 9.0 | 20.0 | 10.0 | 11.0 | 19.0 | 19.0 | 13.0 | 7.0 | 9.0 | 4.0 | NA | 9.0 | NA | 82.3 | Natural |
| 13-GUNK-40.3 | High | 10.0 | 15.0 | 2.0 | 6.0 | 18.0 | 17.0 | 0.0 | 9.0 | 7.0 | 7.0 | 8.0 | 6.0 | 9.0 | 63.0 | Moderate |
| 13-GUNK-37.7 | High | 11.0 | 15.0 | 10.0 | NA | 19.0 | 8.0 | 9.0 | 7.0 | 7.0 | 5.0 | 4.0 | 5.0 | 5.0 | 68.0 | Moderate |
| 13-GUNK\_T35-0.2 | High | 15.0 | 11.0 | 10.0 | 16.0 | 19.0 | 16.0 | 13.0 | 9.0 | 9.0 | 4.0 | 10.0 | 5.0 | 10.0 | 81.2 | Natural |
| 13-MASO-0.2 | High | 17.0 | 18.0 | 14.0 | 17.0 | 17.0 | 17.0 | 16.0 | 7.0 | 7.0 | 6.0 | 6.0 | 2.0 | 2.0 | 80.1 | Natural |
| 13-WALK-44.4 | High | 14.0 | 13.5 | 9.5 | 15.0 | 19.5 | 14.0 | 14.0 | 8.0 | 7.0 | 5.0 | 6.0 | 5.0 | 6.5 | 75.4 | Altered |
| 13-WALK-35.6 | High | 10.0 | 14.0 | 13.0 | 14.0 | 18.0 | 13.0 | 5.0 | 6.0 | 5.0 | 6.0 | 6.0 | 5.0 | 5.0 | 66.3 | Moderate |
| 13-WALK-35.6 | Low | 11.0 | 12.0 | 18.0 | 17.0 | 19.0 | 19.0 | 9.0 | 9.0 | 7.0 | 8.0 | 6.0 | 9.0 | 6.0 | 90.6 | Natural |
| 13-WALK-29.9 | High | 11.0 | 17.0 | 13.5 | 18.0 | 20.0 | 19.0 | 12.0 | 8.0 | 8.0 | 10.0 | 8.5 | 9.5 | 6.0 | 87.3 | Natural |
| 13-TINW-0.5 | High | 10.5 | 12.5 | 11.0 | 7.5 | 17.0 | 16.5 | 11.0 | 5.0 | 7.5 | 6.5 | 7.0 | 6.5 | 9.5 | 70.7 | Altered |
| 13-WALK-26.9 | High | NA | 15.5 | 17.0 | 17.5 | 19.5 | 18.5 | 11.0 | 9.0 | 8.0 | 8.5 | 5.0 | 9.0 | 3.0 | 87.0 | Natural |
| 13-DWAR-2.0 | High | 13.5 | 18.5 | 14.5 | 16.0 | 15.5 | 18.5 | 15.0 | 9.0 | 7.0 | 8.0 | 8.0 | 6.0 | 5.5 | 84.5 | Natural |
| 13-WALK-22.8 | High | 15.0 | 16.0 | 14.5 | 16.0 | 20.0 | 14.0 | 15.5 | 8.5 | 9.0 | 7.0 | 7.5 | 5.0 | 6.0 | 84.5 | Natural |
| 13-WALK-19.0 | High | 16.0 | 17.0 | 15.0 | 11.0 | 18.5 | 13.5 | 15.5 | 8.5 | 9.0 | 7.0 | 7.0 | 6.0 | 4.5 | 82.0 | Natural |
| 13-GUNK-0.4 | High | 19.0 | 15.5 | 19.0 | 15.5 | 18.5 | 17.5 | 19.0 | 9.0 | 8.5 | 9.0 | 7.0 | 7.0 | 5.5 | 92.8 | Natural |
| 13-PKIL-0.4 | High | 14.5 | 14.0 | 14.0 | 14.5 | 15.5 | 14.5 | 16.0 | 5.5 | 5.0 | 8.0 | 6.0 | NA | 3.5 | 80.4 | Natural |
| 13-WKLEI-0.6 | High | 9.0 | 4.0 | 10.0 | 5.0 | 14.0 | 18.0 | 5.0 | 10.0 | 6.0 | 8.0 | 6.0 | 6.0 | 10.0 | 61.3 | Moderate |
| 13-WKLEI-0.6 | Low | 5.0 | 5.0 | 5.0 | 6.0 | 12.0 | 15.0 | 7.0 | 2.0 | 2.0 | 9.0 | 8.0 | 9.0 | 6.0 | 61.1 | Moderate |
| 13-WALK-2.1 | Low | 15.0 | 13.0 | 11.0 | 11.0 | 17.0 | 15.0 | 14.0 | 9.0 | 8.0 | 8.0 | 6.0 | 10.0 | 1.0 | 91.3 | Natural |
| 13-SWAK-1.7 | High | 13.0 | 15.5 | 16.0 | 17.5 | 17.0 | 17.0 | 18.5 | 9.0 | 9.0 | 8.0 | 8.0 | 9.0 | 7.5 | 91.2 | Natural |

# Section 1D - User Perception

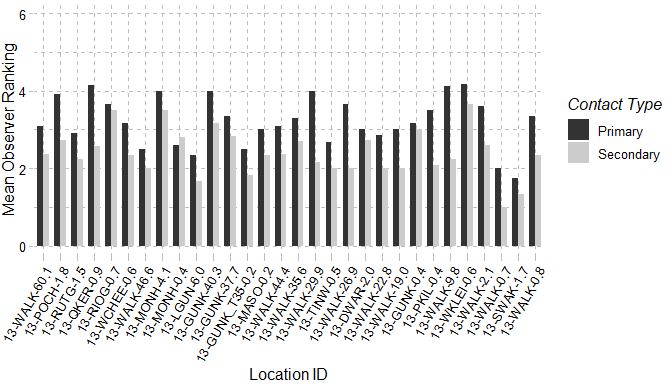


Figure : Mean observer ranking of recreational ability for Wallkill River sampling locations. Columns represent observer rankings for the desire to participate in 1° and 2° contact recreation. Ranking of recreation ability was performed for all locations during each site visit.

Table : Mean observer ranked value for factors influencing desire to participate in 1° and 2° contact recreation in the Wallkill River. Factors were ranked on a 10 scale (0 – Best/Natural; 10 Worst/Severe) according to perceived impact on a location. Ranking of recreation ability was performed for all locations during each site visit

| **Site   ID** | **Water   Clarity** | **Suspended  Phytoplankton** | **Periphyton** | **Macrophyte** | **Odor** | **Trash** | **Dishcarge   Pipes** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| 13-WALK-60.1 | 5 | 0 | 1 | 1 | 0 | 1 | 0 |
| 13-POCH-1.8 | 6 | 1 | 3 | 0 | 2 | 0 | 0 |
| 13-RUTG-1.5 | 4 | 0 | 4 | 1 | 1 | 2 | 0 |
| 13-QKER-0.9 | 6 | 4 | 4 | 4 | 2 | 1 | 0 |
| 13-RIOG-0.7 | 2 | 0 | 3 | 1 | 3 | 2 | 0 |
| 13-WCHEE-0.6 | 6 | 1 | 2 | 0 | 1 | 1 | 0 |
| 13-WALK-46.6 | 4 | 0 | 3 | 1 | 0 | 1 | 0 |
| 13-MONH-4.1 | 3 | 0 | 6 | 2 | 5 | 2 | 2 |
| 13-MONH-0.4 | 2 | 0 | 3 | 0 | 5 | 2 | 1 |
| 13-LGUN-6.0 | 4 | 2 | 0 | 0 | 1 | 0 | 2 |
| 13-GUNK-40.3 | 5 | 1 | 3 | 2 | 3 | 1 | 2 |
| 13-GUNK-37.7 | 2 | 0 | 4 | 0 | 4 | 4 | 2 |
| 13-GUNK\_T35-0.2 | 5 | 1 | 5 | 1 | 0 | 1 | 1 |
| 13-MASO-0.2 | 2 | 0 | 2 | 0 | 4 | 3 | 1 |
| 13-WALK-44.4 | 6 | 1 | 3 | 1 | 0 | 1 | 0 |
| 13-WALK-35.6 | 6 | 1 | 4 | 0 | 1 | 2 | 1 |
| 13-WALK-29.9 | 7 | 0 | 3 | 1 | 0 | 1 | 0 |
| 13-TINW-0.5 | 1 | 0 | 2 | 0 | 0 | 2 | 0 |
| 13-WALK-26.9 | 6 | 0 | 4 | 1 | 0 | 0 | 0 |
| 13-DWAR-2.0 | 4 | 0 | 4 | 2 | 1 | 3 | 2 |
| 13-WALK-22.8 | 6 | 0 | 3 | 1 | 0 | 2 | 0 |
| 13-WALK-19.0 | 7 | 0 | 4 | 1 | 1 | 3 | 0 |
| 13-GUNK-0.4 | 4 | 0 | 1 | 0 | 1 | 2 | 0 |
| 13-PKIL-0.4 | 3 | 0 | 4 | 2 | 0 | 1 | 0 |
| 13-WALK-9.8 | 7 | 0 | 4 | 1 | 0 | 1 | 0 |
| 13-WKLEI-0.6 | 8 | 1 | 3 | 0 | 1 | 0 | 0 |
| 13-WALK-2.1 | 6 | 0 | 2 | 2 | 0 | 1 | 0 |
| 13-WALK-0.7 | 6 | 0 | 3 | 0 | 0 | 0 | 0 |
| 13-SWAK-1.7 | 2 | 0 | 3 | 1 | 0 | 0 | 0 |
| 13-WALK-0.8 | 8 | 4 | 5 | 0 | 1 | 2 | 0 |

Table : Most frequently ranked factor influencing observer desire to participate in 1° and 2° contact recreation in the Wallkill River. Factors influencing desire to recreate were ranked and a primary factor influencing the desire to participate in 1° and 2° contact recreation was chosen during each site visit. Column values represent the factor selected most frequently at each site.

| **SITE\_ID** | **Primary** | **Secondary** |
| --- | --- | --- |
| 13-WALK-60.1 | Water Clarity | None, Water clarity |
| 13-POCH-1.8 | Water Clarity | Water clarity |
| 13-RUTG-1.5 | Periphyton | Proximity to development roads |
| 13-QKER-0.9 | Water Clarity | Other, Suspended Phytoplankton, Water clarity |
| 13-RIOG-0.7 | Odor, Other | None |
| 13-WCHEE-0.6 | Water Clarity | None |
| 13-WALK-46.6 | Water Clarity | None, Other |
| 13-MONH-4.1 | Odor | Periphyton |
| 13-MONH-0.4 | Odor | Odor |
| 13-LGUN-6.0 | None, Other, Water Clarity | None |
| 13-GUNK-40.3 | Water Clarity | Other |
| 13-GUNK-37.7 | Odor, Periphyton | Trash |
| 13-GUNK\_T35-0.2 | Water Clarity | Other |
| 13-MASO-0.2 | Odor | Other |
| 13-WALK-44.4 | Water Clarity | None, Water clarity |
| 13-WALK-35.6 | Water Clarity | None, Other, Water clarity |
| 13-WALK-29.9 | Water Clarity | Water clarity |
| 13-TINW-0.5 | None, Other, Water Clarity | None |
| 13-WALK-26.9 | Water Clarity | Other |
| 13-DWAR-2.0 | None, Water Clarity | None, Water clarity |
| 13-WALK-22.8 | Water Clarity | Other |
| 13-WALK-19.0 | Water Clarity | Water clarity |
| 13-GUNK-0.4 | Other, Water Clarity | None |
| 13-PKIL-0.4 | Proximity\_to\_Development\_Roads, Water Clarity | None, Proximity to development roads |
| 13-WALK-9.8 | Water Clarity | Water clarity |
| 13-WKLEI-0.6 | Water Clarity | Water clarity |
| 13-WALK-2.1 | Water Clarity | None |
| 13-WALK-0.7 | None, Water Clarity | None |
| 13-SWAK-1.7 | None, Proximity\_to\_Development\_Roads | None |
| 13-WALK-0.8 | Water Clarity | Suspended Phytoplankton |

# Section 1E - Sediment and Porewater Microtox® Analysis

Toxicity testing of surface waters, sediments, porewaters, and effluents are routinely performed as part of the RIBS program (<https://www.dec.ny.gov/chemical/29854.html>). Sediment toxicity was evaluated according to SOP #403-16 Microtox® Acute Toxicity Test for Sediments, Porewaters and Effluents. Testing procedures use a bioassay to assess potential acute toxicity in sediments and surface waters to aquatic life (SOP #403-16). Sediment and extracted sediment porewater samples are tested using a bioluminescent bacterium Vibrio fischeri (V. fischeri). Tests are a measure of light reduction between collected samples and a control following a 15-minute exposure period and expressed as the median effect concentration (EC50) of a sample that causes a 50% reduction in light emission from the V. fischeri. Appendix X (Fact Sheet: Acute & Chronic Toxicity Assessments of NY Streams & Rivers) describes toxicity testing procedures, Assessment criteria and results classifications.

Table : Wallkill River Microtox® sediment and porewater toxicity results for select locations in the Wallkill River Survey. Sediment samples were collected for toxicity testing in baseflow conditions during macroinvertebrate community collection at sampling locations.

| **Station ID** | **Sample Date** | **Sediment   Assessment** | **Porewater   Assessment** | **Sediment   EC50** | **Porewater   EC50** |
| --- | --- | --- | --- | --- | --- |
| 13-QKER-0.9 | 8/2/2017 | Non-toxic | Non-toxic | 78.18 | > 100 |
| 13-WCHEE-0.6 | 8/2/2017 | Non-toxic | Non-toxic | 65.38 | > 100 |
| 13-WALK-46.6 | 8/2/2017 | Severe | Non-toxic | 4.46 | > 100 |
| 13-MONH-4.1 | 7/26/2017 | Moderate | Non-toxic | 24.29 | > 100 |
| 13-MONH-0.4 | 8/2/2017 | Slight | Non-toxic | 42.21 | > 100 |
| 13-WALK-35.6 | 8/2/2017 | Moderate | Non-toxic | 38.73 | > 100 |
| 13-WALK-29.9 | 8/3/2017 | Slight | Non-toxic | 43.07 | > 100 |
| 13-WALK-26.9 | 8/3/2017 | Moderate | Toxic | 36.92 | 69.53 |
| 13-WALK-22.8 | 8/3/2017 | Slight | Non-toxic | 42.33 | > 100 |
| 13-WALK-19.0 | 8/3/2017 | Moderate | Toxic | 37.3 | 84.11 |
| 13-GUNK-0.4 | 8/3/2017 | Non-toxic | Toxic | 64.1 | 42.67 |
| 13-WKLEI-0.6 | 8/3/2017 | Slight | Non-toxic | 59.37 | > 100 |