# Section 5-3
# Kennebunk River (Mousam and Kennebunk Rivers Alliance)

*Refer to Chapter 4 of this document for information about sampling methods, sampling sites, and quality assurance.*

## Overview

The Mousam and Kennebunk Rivers Alliance began in 2009 with assistance from the Wells National Estuarine Research Reserve (NERR) and Maine Rivers, for the purpose of monitoring the Kennebunk and Mousam rivers. The Kennebunk River is located in Southern Maine and originates in Kennebunk Pond in Lyman. The river is 15 miles long and flows from Lyman in York County to the Gulf of Maine in Kennebunk. The primary impacts to the river come from development of the landscape, recreational use, and agriculture. In recent years, the Kennebunk River has experienced high bacteria counts believed to be associated with faulty septic systems, livestock, and overboard discharges. The Maine Healthy Beaches Program has collected fluorometry data to identify sources of bacterial contamination. The statutory water class of the Kennebunk River is Class B and below head of tide, the river is Class SB. In a 2005 DEP biomonitoring assessment, a monitoring location on the lower half of the river between Arundel and Kennebunk did not attain Class B standards.

The overall purpose of monitoring is to assess water quality data to determine whether the river is meeting water quality classification standards. The Kennebunk River Sampling and Analysis Plan states that the objectives of monitoring are (1) develop baseline data for expanded long term water quality monitoring efforts; (2) provide information on current watershed conditions and (3) identify areas with degraded water quality to focus best management practices.

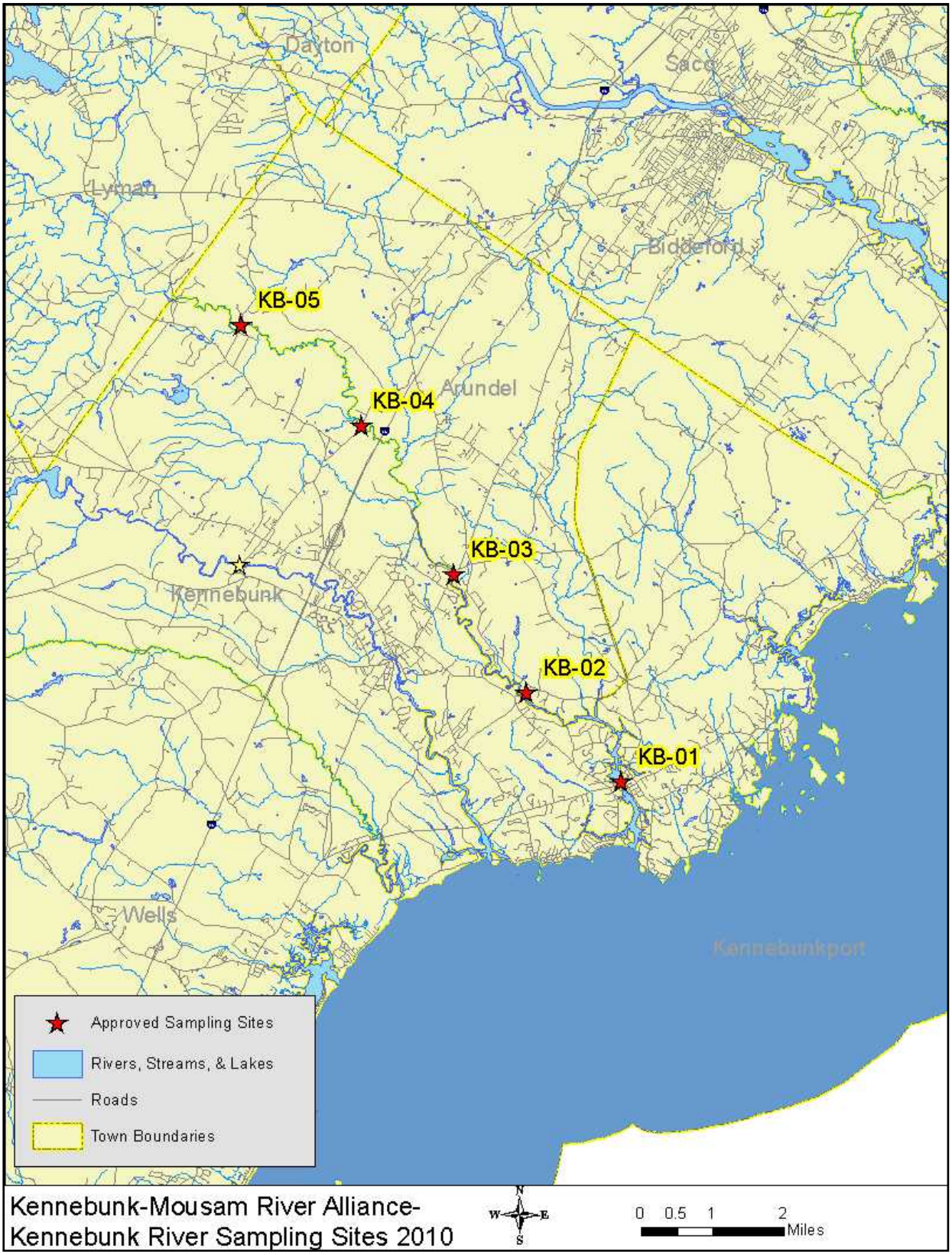
## Methods

The volunteers monitored the Kennebunk River in 2010 at five stations on the main stem. Two of the stations [KB-01 and KB-02] are below head of tide and three [KB-03, KB-04 and KB-05] are freshwater sites. All of the Kennebunk River sites are VRMP approved sites. Table 1 provides a list of the sites and Figure 1 is a map of sampling site locations.

**Table 1: Sampling Sites**

| VRMP Site ID | Organization Site Code | Sample Location | Class |
|---|---|---|---|
| Kennebunk River-SKE11-VRMP | KB-01 | Route 9 Bridge | SB |
| Kennebunk River-SKE35-VRMP | KB-02 | Durrell's Bridge | SB |
| Kennebunk River-SKE66-VRMP | KB-03 | Route 1 Bridge | B |
| Kennebunk River-SKE103-VRMP | KB-04 | Downing Road | B |
| Kennebunk River-SKE148-VRMP | KB-05 | Perkins Lane | B |

**Figure 1: Map of Sampling Sites**



Monitoring was conducted from June through September 1-2 times per month. At each site, the monitors made direct measurements of water temperature and dissolved oxygen using a handheld YSI 550A meter. Conductivity was directly measured at the freshwater sites using an Oakton EC 11+ Testr conductivity pen. Grab samples were collected for E. Coli bacteria at the freshwater sites and Enterococcus bacteria at the sites below head of tide. Bacteria samples were transported to Nelson Labs for analysis.

## Results

### *Dissolved Oxygen*

Dissolved oxygen was measured 5-6 times at each of the five sampling sites. Monitoring occurred from June through September. Class B criteria for dissolved oxygen are a minimum of 7 mg/l (milligrams/liter) or 75% saturation. To meet water quality criteria, both concentration and saturation standards must be met. Class SB standards are 85% saturation. Table 2 and Table 3 provide a summary of dissolved oxygen concentration and % saturation for each site including minimum, maximum and average values.

**Table 2: Dissolved Oxygen Concentration (mg/l) Summary**

| Site | Approved Site | # of Samples | Minimum Value | Maximum Value | Average Value |
|---|---|---|---|---|---|
| KB-01 | Y | 5 | 9.5 | 10.8 | 10.3 |
| KB-02 | Y | 5 | 7.2 | 9.4 | 8.0 |
| KB-03 | Y | 6 | 9.2 | 11.2 | 9.8 |
| KB-04 | Y | 6 | 7.4 | 9.5 | 8.2 |
| KB-05 | Y | 6 | 8.2 | 10.5 | 9.1 |

**Table 3: Dissolved Oxygen Saturation (%) Summary**

| Site | Approved Site | # of Samples | Minimum Value | Maximum Value | Average Value |
|---|---|---|---|---|---|
| KB-01 | Y | 5 | 96 | 117 | 108 |
| KB-02 | Y | 5 | 82 | 97 | 88 |
| KB-03 | Y | 6 | 102 | 114 | 108 |
| KB-04 | Y | 6 | 80 | 93 | 87 |
| KB-05 | Y | 6 | 91 | 98 | 95 |

Dissolved oxygen concentrations measured at Kennebunk River sites ranged from 7.2 milligrams/liter to 11.2 mg/l. At Site KB-01, the lowest readings occurred in early September and highest readings in June. At the other sites, the lowest readings occurred during the summer months (late June-early September) and highest readings in September. The lowest readings occurred at Sites KB-01 and KB-04. Dissolved oxygen never dropped below the Class B standard of 7.0 milligrams/liter. Dissolved oxygen percent saturation ranged from 80% to as high as 117%. It did not go below the Class B standard of 75% for the freshwater sites. Site KB-02 was slightly below the SB standard of 85% saturation on 2 dates.

The fact that dissolved oxygen concentrations and percent saturation never dropped below Class B standards may at least been partly due to the fact that measurements were always made

sometime between mid-morning and mid-day—the time of day when plant photosynthesis peaks. Dissolved oxygen is also affected by flow conditions. During high flow conditions, more oxygen is added to the river from the atmosphere, as the water is moving faster and there is more opportunity for mixing. If flow during the summer months is higher or lower than generally normal, then this will affect the dissolved oxygen.

### *Water Temperature*

Temperature was measured 5-6 times at each of the five sampling sites. Monitoring occurred from June through September. Maine's Regulations Relating to Temperature (06-096 CMR Chapter 582) require that discharge of pollutants not raise the temperature of any river and stream above the EPA criteria for indigenous species (23°C maximum and 19°C weekly average) or 0.3°C (0.5°F) above the temperature that would naturally occur outside a mixing zone established by the Board of Environmental Protection. Pollutant is defined in statute as many things including dirt and heat. For tidal waters, discharge of pollutants may not raise the temperature more than 4°F (2.2°C) or more than 1.5°F (0.8°C) from June 1 to September 1, and may not cause the temperature of any tidal waters to exceed 85°F (29°C) at any point outside a mixing zone established by the Board of Environmental Protection.

Table 4 provides a summary of temperature values for each site including minimum, maximum and average values.

**Table 4: Temperature (˚ Celsius) Summary**

| Site | Approved Site | # of Samples | Minimum Value | Maximum Value | Average Value |
|---|---|---|---|---|---|
| KB-01 | Y | 5 | 14.4 | 17.9 | 15.9 |
| KB-02 | Y | 5 | 15.5 | 23.0 | 19.1 |
| KB-03 | Y | 6 | 15.1 | 22.8 | 18.9 |
| KB-04 | Y | 6 | 13.1 | 20.8 | 17.4 |
| KB-05 | Y | 6 | 11.4 | 19.6 | 16.5 |

Temperatures measured at Kennebunk River sites ranged from 11.4˚ to 23.0˚ C (Celsius). Site KB-01 had the lowest values ranging from 14.9˚ to 17.9˚ C. Site KB-02 had the highest values and from late June through August ranged from 19˚ to 23˚ C. Site KB-03 was similar with temperatures ranging from 19˚ to 22.8˚ C from late June through August. At Sites KB-04 and KB-05, temperatures in late June through July were close to 20˚ C.

### *Specific Conductance*

Specific conductance was measured 6 times at each of the three freshwater sampling sites. Monitoring occurred from June through September. Specific conductance is related to the amount of dissolved materials in the water. While there are no numerical standards, a relationship exists between conductivity and chloride which has numerical criteria. In general, streams located in urban areas tend to have high specific conductance due to polluted urban stormwater runoff. This may also in large part be due to salt buildup in surface and groundwater

from road maintenance practices. Table 5 provides a summary of specific conductance values for each site including minimum, maximum and average values.

**Table 5: Specific Conductance (micro-ohms/centimeter) Summary**

| Site | Approved Site | # of Samples | Minimum Value | Maximum Value | Average Value |
|---|---|---|---|---|---|
| KB-01 | Y | | | | NA-Tidal |
| KB-02 | Y | | | | NA-Tidal |
| KB-03 | Y | 6 | 83 | 133 | 103 |
| KB-04 | Y | 6 | 65 | 1140 | 270 |
| KB-05 | Y | 6 | 112 | 594 | 323 |

At Site KB-03, values ranged from 83 to 133 us/cm, which are considered low to moderate. At Site KB-04, the values were low to moderated also ranging from 65 to 126 us/cm, except for one very high value in late September (1140 us/cm). The reason for the high value here is unknown. Site KB-05 ranged from 112 to 584 us/cm, which are moderate to moderately high.

### *Bacteria*

Enterococcus bacteria were sampled 8 times at sites KB-01 and KB-02. E. Coli bacteria were measured 8 times (1 date was omitted due to lab error) at sampling sites KB-03, KB-04 and KB-05. Monitoring occurred from June through September. Most if not all samples were taken during baseflow conditions. Enterococcus bacteria are used as the indicator organism for marine waters and E. Coli bacteria are used for freshwaters. While these types of bacteria are not pathogens, their presence in the water may indicate the presence of other organisms including bacteria and viruses that can cause gastrointestinal illnesses.

Class B criteria for bacteria are as follows: "Between May 15$^{th}$ and Sept 30$^{th}$, E. Coli of human and domestic origin shall not exceed a geometric mean of 64/100 ml (milliliters) or an instantaneous level of 236/100 ml." Class SB criteria are as follows: "Between May 15$^{th}$ and September 30$^{th}$, the numbers of enterococcus bacteria of human and domestic animal origin in these waters may not exceed a geometric mean of 8 per 100 milliliters or an instantaneous level of 54 per 100 milliliters." Table 6 provides a summary of bacteria values for each site including minimum, maximum and geometric means. Geometric means are calculated instead of average because it is more appropriate to use this calculation for something like bacteria where there may be one or more very high or low values that can skew the mean.

**Table 6: Bacteria Most Probable Number (MPN) Summary**

| Site | Bacteria Type | # of Samples | Minimum Value | Maximum Value | Geometric Mean |
|---|---|---|---|---|---|
| KB-01 | Enterococcus | 8 | <10 | 74 | 15 |
| KB-02 | Enterococcus | 8 | <10 | 269 | 67 |
| KB-03 | E. Coli | 8 | 23 | 365 | 92 |
| KB-04 | E. Coli | 7 | 114 | 291 | 205 |
| KB-05 | E. Coli | 7 | 8 | 411 | 103 |

Site KB-01 exceeded the geometric mean criterion and the instantaneous criterion was exceeded on one date. Site KB-02 also exceeded the geometric mean criterion and the instantaneous criterion was exceeded 7 out of 8 sampling events. All of the freshwater sites exceeded the geometric mean criterion. The instantaneous criterion was exceeded 1 time at Site KB-03, 5 times at Site KB-04, and 2 times at Site KB-05.

## Discussion and Recommendations

There are numerous sources of pollution and other stresses to the Kennebunk River sites monitored by the Mousam and Kennebunk Rivers Alliance that could potentially have an impact on water quality. Some of those sources of pollution and stress may include:

- Nonpoint source pollution (e.g., septic systems, eroded soil, fertilizers, pesticides, heavy metals, petroleum residues, road salt, wildlife and pet feces) and polluted stormwater originating from urban impervious surfaces (e.g., streets, parking lots, driveways, rooftops) (even though urban development and roads are fairly sparse in the watershed), agriculture, and forestry.
- Ponds and impoundments (which often create more pond-like aquatic habitat conditions that may have higher water temperatures and lower dissolved oxygen concentrations than free-flowing waters)
- Natural effects of wetlands (such as contributing waters to a stream/river that have low dissolved oxygen levels due to the decomposition of large amounts of organic matter, respiration of abundant plant matter, and low re-aeration rates that is characteristic of many wetlands).

The following are recommendations for future monitoring:

- Monitoring should include some early morning (before 8:00 am) sampling to document potential dissolved oxygen problems. Over a 24 hour period, the lowest readings occur in the early morning and highest readings in mid to late afternoon. This occurs because oxygen is used up during the night due to plant respiration and during the day, plant life is photosynthesizing. This is particularly important during the summer months of July to early September when temperatures are warmest and dissolved oxygen tends to be at the lowest levels.
- If very high specific conductance values are found again, the monitors may want to do some specific conductance readings in the river above the high value to see if a source can be found.
- Further study of the high bacteria may be warranted. It would be worthwhile trying to capture 1 or 2 stormflow events to see how levels compare to baseflow. VRMP and Wells NERR should also follow up with Maine Healthy Beaches (MHB) regarding the fluorometry studies done by MHB.
- Continue monitoring at all stations to develop a long term trend database.

**Appendix A-1. 2010 water quality data for "Approved" and "Non-Approved" sites.** Non-Approved sites do not yet meet official VRMP sample location criteria and/or require further inspection and review.
* Sampling depths are only reported for Tier 1 VRMP sites.
** "N" = normal environmental sample ; "D" = field duplicate; "D.O." = dissolved oxygen; "Spec. Cond" = specific conductance; "TSS" = total suspended solids"
Refer to Appendix A-2 for observational data and quality assurance/quality control (QA/QC) notes.

| Organization Site Code | VRMP Site ID | Date | Time | ** Sample Type Qualifier | * Sample Depth | Depth Unit | Water Temp (DEG C) | D.O. % Sat. | D.O. (MG/L) | Spec. Cond. (US/CM) | Salinity( PPTH) | E Coli Bacteria (MPN/ 100ML) | Entero-cocci (MPN/ 100ML) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | |
| **Kennebunk River & Tributaries - Kennebunk Mousam Alliance (Approved Sites)** | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 6/15/2010 | 10:25 AM | N | | | 15.4 | 93.1 | 9 | 65 | | 120 | |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 6/29/2010 | 10:25 AM | N | | | 20.8 | 84.1 | 7.42 | 89 | | | |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 7/13/2010 | | N | | | | | | | | 248 | |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 7/27/2010 | 9:50 AM | N | | | 20.2 | 89.2 | 7.85 | 98 | | 291 | |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 8/10/2010 | 10:30 AM | N | | | | | | | | 260 | |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 8/24/2010 | 9:46 AM | N | | | 17.3 | 83 | 7.8 | 126 | | 185 | |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 9/7/2010 | 10:00 AM | N | | | 17.8 | 80 | 7.4 | 103.4 | | 248 | |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 9/7/2010 | 10:00 AM | D | | | 18.6 | 80 | 7.4 | 103.4 | | 291 | |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 9/21/2010 | 10:35 AM | N | | | 13.1 | 92.2 | 9.46 | 1140 | | 114 | |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 9/21/2010 | 10:35 AM | D | | | 13.1 | 91.8 | 9.45 | 1140 | | 157 | |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 6/15/2010 | 11:40 AM | N | | | | | | | | | 74 |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 6/29/2010 | 11:45 AM | N | | | 16 | 117 | 11 | | | | 10 |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 7/13/2010 | 11:35 AM | N | | | | | | | | | 10 |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 7/27/2010 | 11:02 AM | N | | | 16.1 | 114 | 10.8 | | | | |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 7/27/2010 | 3:00 PM | N | | | | | | | | | 10 |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 8/10/2010 | 11:35 AM | N | | | | | | | | | 10 |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 8/24/2010 | | N | | | | | | | | | 10 |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 8/24/2010 | 10:50 AM | N | | | 17.9 | 104.7 | 9.7 | | | | |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 9/7/2010 | 11:10 AM | N | | | 14.4 | 96.2 | 9.55 | | | | 31 |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 9/21/2010 | 11:45 AM | N | | | 14.9 | 107 | 10.53 | | | | U<10 |
| KR-05 | KENNEBUNK RIVER - SKE148 - VRMP | 6/15/2010 | 9:50 AM | N | | | 15.3 | 98.1 | 9.63 | 112 | | 411 | |
| KR-05 | KENNEBUNK RIVER - SKE148 - VRMP | 6/29/2010 | 9:50 AM | N | | | 19.6 | 92.3 | 8.2 | 373 | | | |
| KR-05 | KENNEBUNK RIVER - SKE148 - VRMP | 7/13/2010 | | N | | | | | | | | 373 | |
| KR-05 | KENNEBUNK RIVER - SKE148 - VRMP | 7/27/2010 | 9:05 AM | N | | | 19.1 | 97.3 | 8.84 | 325 | | 93 | |
| KR-05 | KENNEBUNK RIVER - SKE148 - VRMP | 8/10/2010 | 10:05 AM | N | | | | | | | | 49.5 | |
| KR-05 | KENNEBUNK RIVER - SKE148 - VRMP | 8/24/2010 | 9:20 AM | N | | | 16.9 | 93.6 | 8.8 | 594 | | 135 | |
| KR-05 | KENNEBUNK RIVER - SKE148 - VRMP | 9/7/2010 | 9:30 AM | N | | | 16.5 | 91.5 | 8.7 | 248 | | 161 | |
| KR-05 | KENNEBUNK RIVER - SKE148 - VRMP | 9/21/2010 | 10:10 AM | N | | | 11.4 | 97.7 | 10.46 | 287 | | 8 | |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 6/15/2010 | 11:15 AM | N | | | | | | | | | 85 |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 6/29/2010 | 11:00 AM | N | | | 21.4 | 83.2 | 7.2 | | | | 97 |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 6/29/2010 | 11:00 AM | D | | | 21.4 | 83.2 | 7.2 | | | | 63 |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 7/13/2010 | 11:04 AM | N | | | | | | | | | 98 |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 7/27/2010 | 10:30 AM | N | | | 23 | 86.9 | 7.25 | | | | |

| Organization Site Code | VRMP Site ID | Date | Time | ** Sample Type Qualifier | * Sample Depth | Depth Unit | Water Temp (DEG C) | D.O. % Sat. | D.O. (MG/L) | Spec. Cond. (US/CM) | Salinity( PPTH) | E Coli Bacteria (MPN/ 100ML) | Entero-cocci (MPN/ 100ML) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 7/27/2010 | 10:30 AM | D | | | 23 | 86.9 | 7.25 | | | | |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 7/27/2010 | 3:20 PM | N | | | | | | | | | 187 |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 8/10/2010 | 11:10 AM | N | | | | | | | | | 269 |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 8/24/2010 | 10:30 AM | N | | | 19.2 | 82.2 | 7.4 | | | | 10 |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 9/7/2010 | 10:40 AM | N | | | 16.5 | 89.5 | 8.5 | | | | 121 |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 9/21/2010 | 11:25 AM | N | | | 15.5 | 97 | 9.44 | | | | U<10 |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 6/15/2010 | 10:55 AM | N | | | 17.2 | 101.6 | 9.6 | 82.6 | | 147 | |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 6/29/2010 | 10:46 AM | N | | | 22.8 | 110 | 9.2 | 85 | | | |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 7/13/2010 | | N | | | | | | | | 105 | |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 7/13/2010 | | D | | | | | | | | 78 | |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 7/27/2010 | 10:15 AM | N | | | 22.4 | 112.5 | 9.56 | 89.3 | | | |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 7/27/2010 | 3:40 PM | N | | | | | | | | 93 | |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 8/10/2010 | 10:50 AM | N | | | | | | | | 365 | |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 8/24/2010 | 10:10 AM | N | | | 19 | 108 | 9.8 | 97 | | 108 | |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 8/24/2010 | 10:10 AM | D | | | 19 | 108 | 9.8 | 97 | | 105 | |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 9/7/2010 | 10:25 AM | N | | | 16.8 | 103.8 | 9.45 | 132 | | 57 | |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 9/21/2010 | 11:05 AM | N | | | 15.1 | 114.5 | 11.22 | 133 | | 23 | |

**Appendix A-2. 2010 observational data and quality assurance/quality control (QA/QC) notes for "approved" and "non-approved" sites.**
** "N" = normal environmental sample; "D" = field duplicate; "D.O." = dissolved oxygen; "Spec. Cond" = specific conductance; "TSS" = total suspended solids
Refer to Appendix A-1 for water quality data

| Organization Site Code | VRMP Site ID | Date | Time | Sample Type Qualifier | Flow | Stage | Air Temp. (DEG C) | Sample Location | Current Weather | Air Condi-tion | Past 24HR Weather | Habitat | Tide Stage | Water Appear-ance | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Kennebunk River- Kennebunk Mousam Alliance (Approved Sites)** | | | | | | | | | | | | | | | |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 6/15/2010 | 10:25 AM | N | BASE FLOW | MEDIUM | 19.6 | CULVERT | CLEAR | CALM | MOSTLY CLOUDY, SHOWERS | RIFFLE | | CLEAR | WADEABLE/1.5 FT BELOW SURFACE |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 6/29/2010 | 10:25 AM | N | BASE FLOW | LOW | 20 | CULVERT | PARTLY CLOUDY | CALM | PARTLY CLOUDY, LIGHT RAIN | RIFFLE | | CLEAR | NON-WADEABLE/3 FT BELOW SURFACE |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 7/13/2010 | | N | | | | | | | | | | | |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 7/27/2010 | 9:50 AM | N | BASE FLOW | LOW | 30 | CULVERT | CLEAR | BREEZE | CLEAR, PARTLY CLOUDY | RIFFLE | | MEDIUM STAINE | NON-WADEABLE/3 FT BELOW SURFACE |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 8/10/2010 | 10:30 AM | N | | | | | | | | | | | |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 8/24/2010 | 9:46 AM | N | BASE FLOW | MEDIUM | 18.5 | CULVERT | PARTLY CLOUDY | BREEZE | MOSTLY CLOUDY, LIGHT RAIN | RIFFLE | | CLEAR | DID NOT RECORD DO ¿READING/VALUE AFTER CALIBRATION¿. NON-WADEABLE/3 FT BELOW SURFACE |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 9/7/2010 | 10:00 AM | N | BASE FLOW | LOW | 17.4 | CULVERT | CLOUDY | CALM | CLEAR, PARTLY CLOUDY | RIFFLE | HIGH | CLEAR | DID NOT COMPLETE CHAIN OF CUSTODY FOR DATASHEET. NON-WADEABLE/3 FT BELOW SURFACE |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 9/7/2010 | 10:00 AM | D | | | | CULVERT | | | | | | | DID NOT COMPLETE CHAIN OF CUSTODY FOR DATASHEET. NON-WADEABLE/3 FT BELOW SURFACE |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 9/21/2010 | 10:35 AM | N | BASE FLOW | MEDIUM | 15.6 | CULVERT | PARTLY CLOUDY | BREEZE | CLEAR, PARTLY CLOUDY | RIFFLE | | CLEAR | DID NOT COMPLETE CHAIN OF CUSTODY FOR DATASHEET. NON-WADEABLE/3 FT BELOW SURFACE |
| KR-04 | KENNEBUNK RIVER - SKE103 - VRMP | 9/21/2010 | 10:35 AM | D | | | | CULVERT | | | | | | | DID NOT COMPLETE CHAIN OF CUSTODY FOR DATASHEET. NON-WADEABLE/3 FT BELOW SURFACE |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 6/15/2010 | 11:40 AM | N | | | | | | | | | | | |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 6/29/2010 | 11:45 AM | N | BASE FLOW | HIGH | 20 | BRIDGE | PARTLY CLOUDY | CALM | LIGHT RAIN, PARTLY CLOUDY | RUN | FLOOD | CLEAR | NON-WADEABLE/3 FT BELOW SURFACE |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 7/13/2010 | 11:35 AM | N | | | | | | | | | | | |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 7/27/2010 | 11:02 AM | N | BASE FLOW | MEDIUM | 30 | BRIDGE | CLEAR | BREEZE | CLEAR, PARTLY CLOUDY | RUN | | CLEAR | NON-WADEABLE/3 FT BELOW SURFACE |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 7/27/2010 | 3:00 PM | N | | | | | | | | | | | |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 8/10/2010 | 11:35 AM | N | | | | | | | | | | | |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 8/24/2010 | | N | | | | | | | | | | | |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 8/24/2010 | 10:50 AM | N | BASE FLOW | HIGH | 18.5 | BRIDGE | PARTLY CLOUDY | BREEZE | MOSTLY CLOUDY, LIGHT RAIN | RUN | FLOOD | CLEAR | DID NOT RECORD DO ¿READING/VALUE AFTER CALIBRATION¿. NON-WADEABLE/3 FT BELOW SURFACE |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 9/7/2010 | 11:10 AM | N | BASE FLOW | HIGH | 17.4 | BRIDGE | CLOUDY | CALM | CLEAR, PARTLY CLOUDY | RUN | HIGH | CLEAR | DID NOT COMPLETE CHAIN OF CUSTODY FOR DATASHEET. NON-WADEABLE/3 FT BELOW SURFACE |
| KR-01 | KENNEBUNK RIVER - SKE11 - VRMP | 9/21/2010 | 11:45 AM | N | BASE FLOW | HIGH | 15.6 | BRIDGE | PARTLY CLOUDY | BREEZE | CLEAR, PARTLY CLOUDY | RUN | HIGH EBB | CLEAR | DID NOT COMPLETE CHAIN OF CUSTODY FOR DATASHEET. NON-WADEABLE/3 FT BELOW SURFACE |
| KR-05 | KENNEBUNK RIVER - SKE148 - VRMP | 6/15/2010 | 9:50 AM | N | BASE FLOW | MEDIUM | 19.6 | WADING | CLEAR | CALM | MOSTLY CLOUDY, SHOWERS | RIFFLE | | CLEAR | WADEABLE/1.5 FT BELOW SURFACE |
| KR-05 | KENNEBUNK RIVER - SKE148 - VRMP | 6/29/2010 | 9:50 AM | N | BASE FLOW | LOW | 20 | BANK | PARTLY CLOUDY | CALM | PARTLY CLOUDY, LIGHT RAIN | RIFFLE | | CLEAR | NON-WADEABLE/3 FT BELOW SURFACE |
| KR-05 | KENNEBUNK RIVER - SKE148 - VRMP | 7/13/2010 | | N | | | | | | | | | | | |

| Organization Site Code | VRMP Site ID | Date | Time | Sample Type Qualifier | Flow | Stage | Air Temp. (DEG C) | Sample Location | Current Weather | Air Condi-tion | Past 24HR Weather | Habitat | Tide Stage | Water Appear-ance | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| KR-05 | KENNEBUNK RIVER - SKE148 - VRMP | 7/27/2010 | 9:05 AM | N | BASE FLOW | LOW | 30 | BANK | CLEAR | BREEZE | CLEAR, PARTLY CLOUDY | RIFFLE | | CLEAR | NON-WADEABLE/MID-DEPTH |
| KR-05 | KENNEBUNK RIVER - SKE148 - VRMP | 8/10/2010 | 10:05 AM | N | | | | | | | | | | | |
| KR-05 | KENNEBUNK RIVER - SKE148 - VRMP | 8/24/2010 | 9:20 AM | N | BASE FLOW | LOW | 18.5 | BANK | PARTLY CLOUDY | BREEZE | MOSTLY CLOUDY, LIGHT RAIN | RIFFLE | | CLEAR | DID NOT RECORD DO ¿READING/VALUE AFTER CALIBRATION¿. NON-WADEABLE/3 FT BELOW SURFACE |
| KR-05 | KENNEBUNK RIVER - SKE148 - VRMP | 9/7/2010 | 9:30 AM | N | BASE FLOW | LOW | 17.4 | BANK | CLOUDY | CALM | CLEAR, PARTLY CLOUDY | RIFFLE | HIGH | CLEAR | DID NOT COMPLETE CHAIN OF CUSTODY FOR DATASHEET. NON-WADEABLE/MID-DEPTH |
| KR-05 | KENNEBUNK RIVER - SKE148 - VRMP | 9/21/2010 | 10:10 AM | N | BASE FLOW | LOW | 15.6 | BANK | PARTLY CLOUDY | BREEZE | CLEAR, PARTLY CLOUDY | RIFFLE | | CLEAR | DID NOT COMPLETE CHAIN OF CUSTODY FOR DATASHEET. NON-WADEABLE/MID-DEPTH |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 6/15/2010 | 11:15 AM | N | | | | | | | | | | | |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 6/29/2010 | 11:00 AM | N | BASE FLOW | MEDIUM | 20 | BRIDGE | PARTLY CLOUDY | CALM | LIGHT RAIN, PARTLY CLOUDY | RIFFLE | LOW FLOOD | CLEAR | NON-WADEABLE/3 FT BELOW SURFACE |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 6/29/2010 | 11:00 AM | D | | | | BRIDGE | | | | | | | NON-WADEABLE/3 FT BELOW SURFACE |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 7/13/2010 | 11:04 AM | N | | | | | | | | | | | |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 7/27/2010 | 10:30 AM | N | BASE FLOW | LOW | 30 | BRIDGE | CLEAR | BREEZE | CLEAR, PARTLY CLOUDY | RIFFLE | | CLEAR | NON-WADEABLE/3 FT BELOW SURFACE |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 7/27/2010 | 10:30 AM | D | | | | BRIDGE | | | | | | | NON-WADEABLE/3 FT BELOW SURFACE |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 7/27/2010 | 3:20 PM | N | | | | | | | | | | | |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 8/10/2010 | 11:10 AM | N | | | | | | | | | | | |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 8/24/2010 | 10:30 AM | N | BASE FLOW | LOW | 18.5 | BRIDGE | PARTLY CLOUDY | BREEZE | MOSTLY CLOUDY, LIGHT RAIN | RIFFLE | FLOOD | CLEAR | DID NOT RECORD DO ¿READING/VALUE AFTER CALIBRATION¿. NON-WADEABLE/3 FT BELOW SURFACE |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 9/7/2010 | 10:40 AM | N | BASE FLOW | HIGH | 17.4 | BRIDGE | CLOUDY | CALM | CLEAR, PARTLY CLOUDY | RUN | HIGH | CLEAR | NON-WADEABLE/3 FT BELOW SURFACE |
| KR-02 | KENNEBUNK RIVER - SKE35 - VRMP | 9/21/2010 | 11:25 AM | N | BASE FLOW | HIGH | 15.6 | BRIDGE | CLEAR, PARTLY | BREEZE | CLEAR, PARTLY CLOUDY | RUN | HIGH | CLEAR | DID NOT COMPLETE CHAIN OF CUSTODY FOR DATASHEET. NON-WADEABLE/3 FT BELOW SURFACE |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 6/15/2010 | 10:55 AM | N | BASE FLOW | MEDIUM | 19.6 | WADING | CLEAR | CALM | MOSTLY CLOUDY, SHOWERS | CASCADE | | CLEAR | WADEABLE/1.5 FT BELOW SURFACE |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 6/29/2010 | 10:46 AM | N | BASE FLOW | MEDIUM | 20 | WADING | PARTLY CLOUDY | CALM | PARTLY CLOUDY, LIGHT RAIN | CASCADE | | CLEAR | WADEABLE/1.5 FT BELOW SURFACE |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 7/13/2010 | | N | | | | | | | | | | | |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 7/13/2010 | | D | | | | | | | | | | | |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 7/27/2010 | 10:15 AM | N | BASE FLOW | MEDIUM | 30 | WADING | CLEAR | BREEZE | CLEAR, PARTLY CLOUDY | CASCADE | | CLEAR | WADEABLE/1.5 FT BELOW SURFACE |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 7/27/2010 | 3:40 PM | N | | | | | | | | | | | |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 8/10/2010 | 10:50 AM | N | | | | | | | | | | | |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 8/24/2010 | 10:10 AM | N | BASE FLOW | LOW | 18.5 | WADING | PARTLY CLOUDY | BREEZE | MOSTLY CLOUDY, LIGHT RAIN | CASCADE | | CLEAR | DID NOT RECORD DO ¿READING/VALUE AFTER CALIBRATION¿. WADEABLE/1.5 FT BELOW SURFACE |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 8/24/2010 | 10:10 AM | D | | | | WADING | | | | | | | DID NOT RECORD DO ¿READING/VALUE AFTER CALIBRATION¿. WADEABLE/1.5 FT BELOW SURFACE |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 9/7/2010 | 10:25 AM | N | BASE FLOW | LOW | 17.4 | WADING | CLOUDY | CALM | CLEAR, PARTLY CLOUDY | CASCADE | HIGH | CLEAR | DID NOT COMPLETE CHAIN OF CUSTODY FOR DATASHEET. WADEABLE/MID-DEPTH |
| KR-03 | KENNEBUNK RIVER - SKE66 - VRMP | 9/21/2010 | 11:05 AM | N | BASE FLOW | MEDIUM | 15.6 | BRIDGE | PARTLY CLOUDY | BREEZE | CLEAR, PARTLY CLOUDY | RIFFLE | | CLEAR | DID NOT COMPLETE CHAIN OF CUSTODY FOR DATASHEET. NON-WADEABLE/3 FT BELOW SURFACE |