

# Ammonoosuc River, Bath, NH

NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES

RM-027

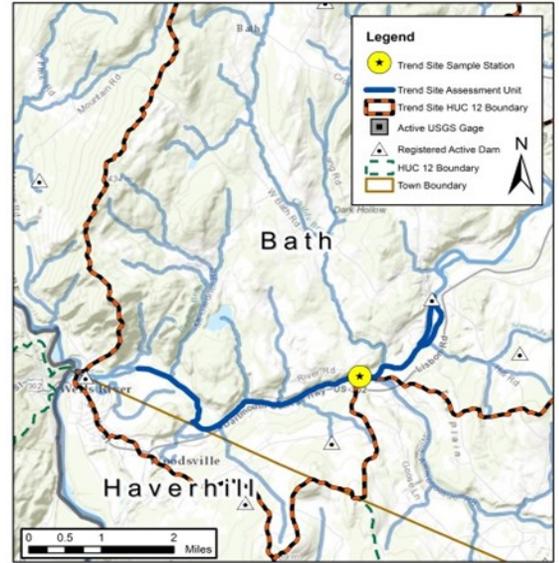
Station: **03-AMM**

Current reporting period: **2012-2016**

Start year: **2013**

Water Quality Summary (Data from May - September)			
Parameter	Trend	Current Condition	Overall Rating
Specific Conductance	Stable	Intermediate	Good
Total Phosphorus	⊗	Intermediate	⊗
Total Nitrogen	⊗	Low	⊗
pH	Stable	High	Good
Invertebrates	⊗	Good	⊗
Temperature	⊗	⊗	⊗

⊗ - no or limited data. For Current Condition: High>75th percentile, Intermediate=25th-75th percentile, Low <25th percentile of statewide conditions. Overall rating requires trend analysis and current condition. Shaded cells indicate that conditions are not as good as expected.



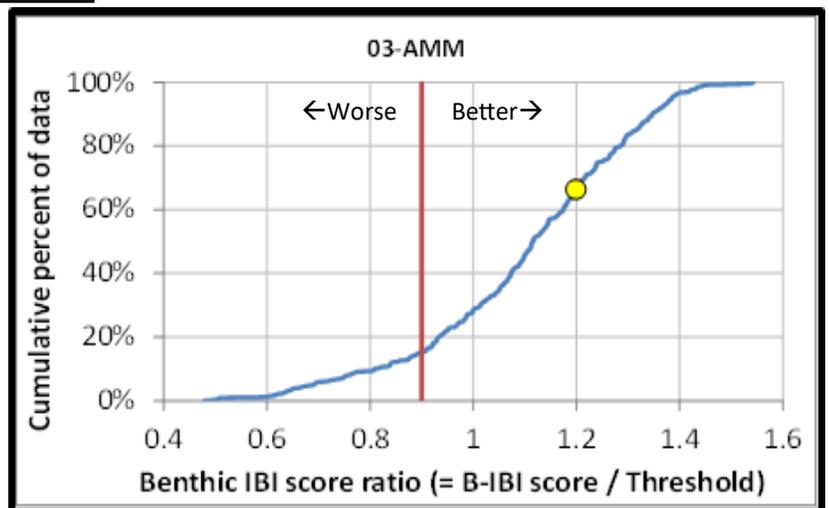
## Sample station characteristics

Assessment unit	NHRIV801030506-10
Latitude	44.1548
Longitude	-71.9819
Drainage area (Sq. Mi.)	395
Elevation (FT)	466
Development category	Moderate
Drainage area size category	Large
Coldwater fish probability	0%
Fish community type	WARMWATER
8 digit hydrologic unit code	01080103

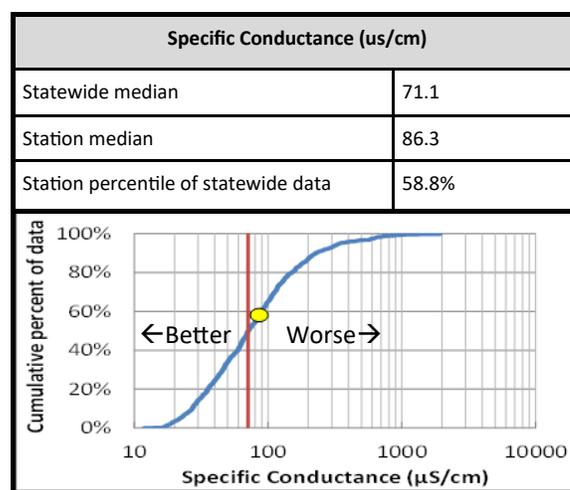
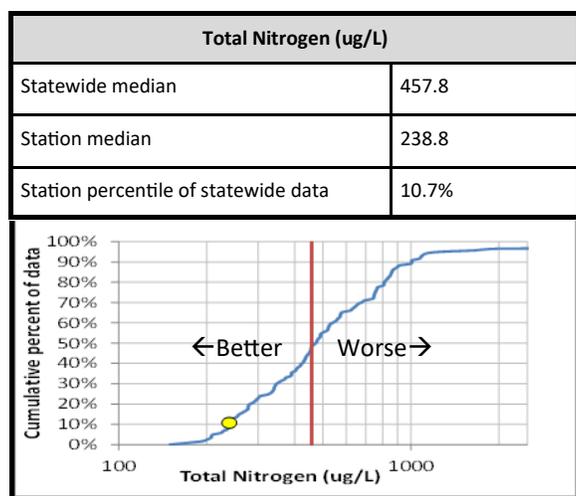
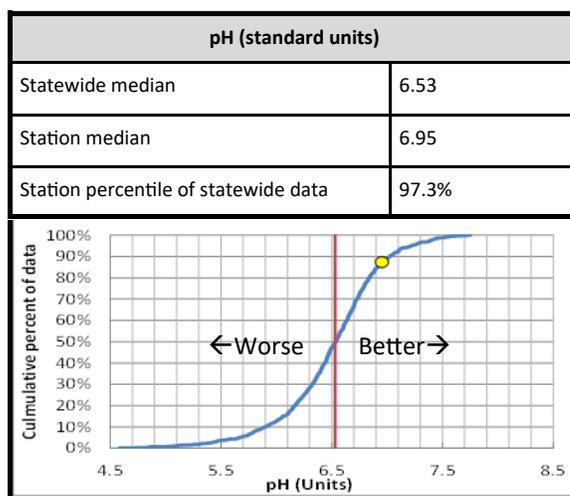
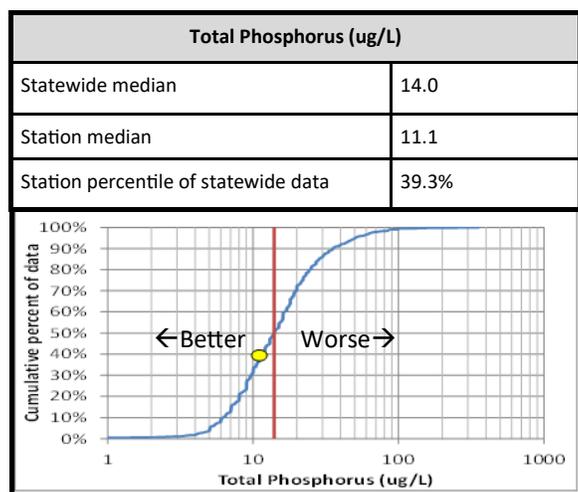
**Station Highlights:** The Ammonoosuc River is a large river at 03-AMM in the Connecticut River Valley of New Hampshire with a moderate percentage of developed land in its watershed. It has low to intermediate nutrient concentrations and a relatively high pH for New Hampshire surface waters.

**Biological indicators** - For 03-AMM benthic macro-invertebrates were used as the primary biological indicator. Samples were collected from 2013-2016. The results, based on B-IBI scores that exceeded the applicable threshold, indicate that the benthic invertebrate community is in good condition (plot at right). Relative the statewide data, the median B-IBI score ratio at 03-AMM was greater than 66% of the B-IBI score ratios statewide (plot at right).

*For plot at the right:* Yellow dot=median score ratio; curved blue line=statewide score ratio distribution; red vertical line=water quality threshold.



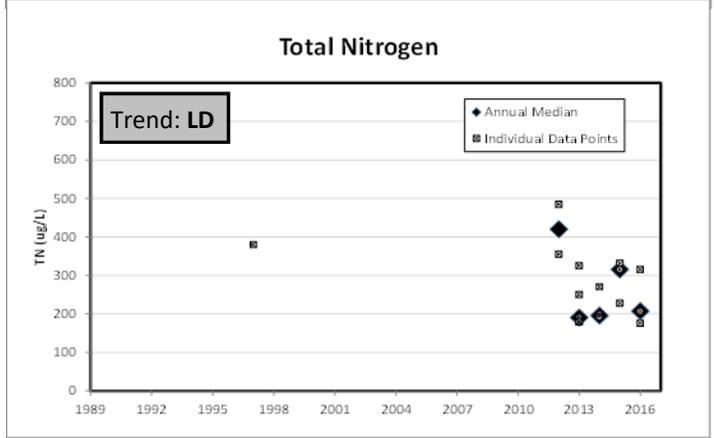
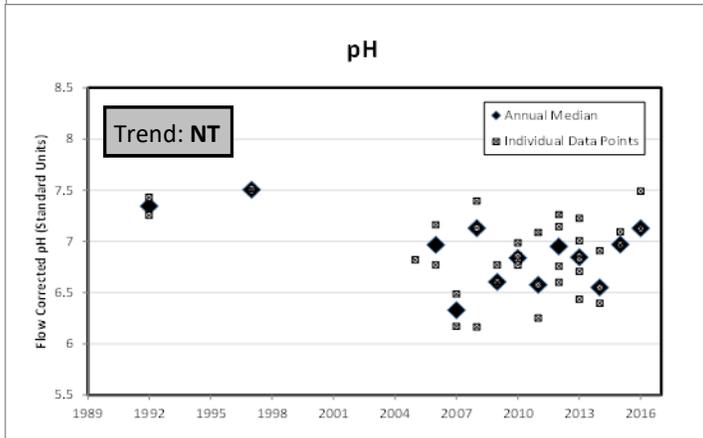
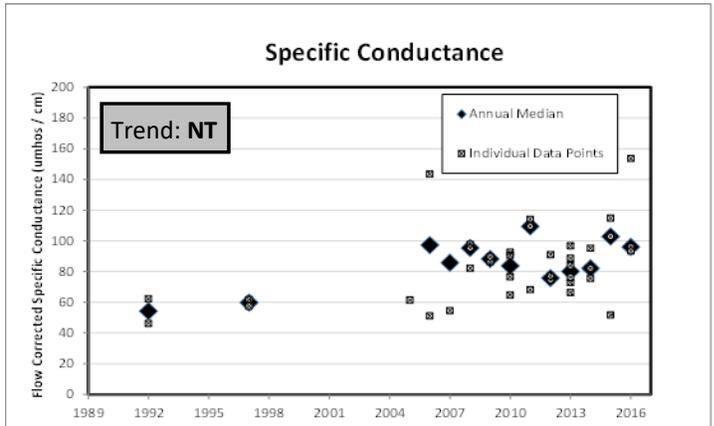
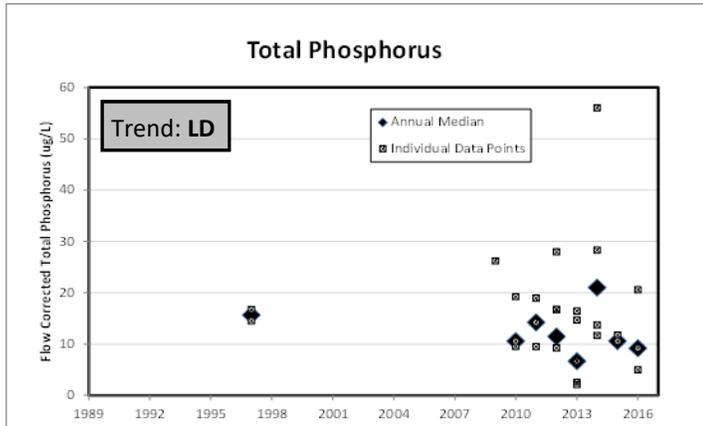
**Statewide Comparison** - The median value of the sampling station for the reporting period (yellow dot) was plotted with respect to water quality data collected from 1990-present as a percentile of the statewide distribution (curved blue line) and the statewide median (vertical red line). The position of the sampling station median on the plot provides an indication of the trend site's water quality compared to that collected around the state. For total phosphorus, total nitrogen, and specific conductance higher percentiles indicate lower water quality. Conversely, a lower percentile for pH indicates lower water quality. Over time, changes in the percentile can be used to track whether water quality is improving or declining at the sampling station with respect to data from around the state.



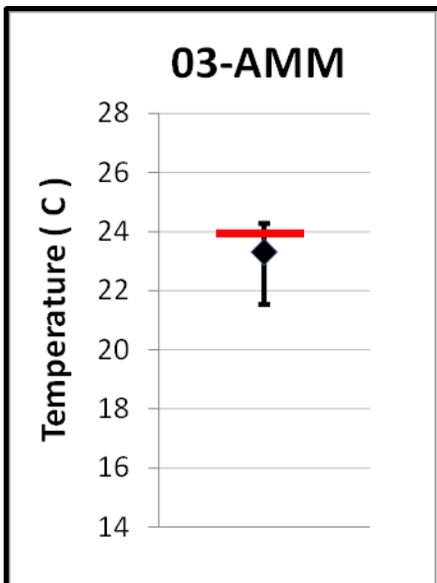
**Current vs. previous water quality conditions**— Data included in the current reporting period was compared to that from the previous reporting period. A Kruskal-Wallis test ( $p=0.05$ ) was used to compare data collected in the respective reporting periods for each parameter. Differences between reporting periods provide a indication of whether short term water quality changes have occurred at the site. For table below, “Different (Y/N)” column indicates if significant change has occurred (Y=yes, N=no, Insufficient data=fewer than five samples contained in either of the reporting periods). “Change” column indicates the direction of change (Increase=water quality indicator higher in current period than previous period, Decrease= water quality indicator lower in current period than previous period, Blank=no change or insufficient data for comparison).

Parameter	Period	Years	Mean C	Range C	Period	Years	Mean P	Range P	Different (Y/N)	Change
pH	Current	2012-2016	6.9	1.1	Previous	2008-2011	6.7	1.2	N	
Specific Conductance			83.0	152.7			86.1	92.4	N	
Total Nitrogen			262.2	310.0					Insufficient data	
Total Phosphorus			15.1	54.0			15.4	16.7	N	

**Trend analyses** - Sites with 10 or more years of data were analyzed for trends. Trends analyses were completed on annual medians using the Mann-Kendell test ( $p=0.05$ ). For 03-AMM, water quality data exist from 1992—2016. The limited amount of data allowed trend analyses for only some water quality parameters at this site. Trend outcomes included in plots below (**NT**=no trend; **(+)**=increasing; **(-)**=decreasing; **LD**=limited data; trend analysis not completed). Significant increasing or decreasing trends include a LOESS trend line for the period of analysis.



**Summary of 7-day maximum water temperature**



**Water temperature** – Water temperature is an important physical characteristic that influences water chemistry and biological community composition. For trend sites where continuous temperature data loggers are deployed, the maximum 7-day rolling mean was used as the primary metric for summarizing the thermal regime at individual sampling stations. The plot (left) summarizes the average (diamond), minimum (lower whisker), and maximum (upper whisker) 7-day maximum water temperature in the current reporting period. The table (below) provides the total number and percent of consecutive days that the 7-day running mean water temperature exceeded temperature benchmarks associated with the expected fish community type. For 03-AMM, the expected fish community type is warm water and the respective temperature benchmark is 24°C.

**Number and percent of consecutive days when the running 7-day mean water temperature exceeded the benchmark**

Year	2012	2013	2014	2015	2016	Total
Number of days			0	3	3	6
Percent of days	no data	no data	0.0%	2.8%	2.6%	1.78%

