

Appendix 2: About Water Quality Standards

This appendix describes the water quality standards that apply to the Merrimack River Watershed. They are contained in the “Surface Water Quality Regulations” issued by the NH Department of Environmental Services (NH DES) and the “Surface Water Quality Standards” issued by the MA Department of Environmental Protection (MA DEP).

Uses, Classifications and Criteria

The water quality standards contain *designated uses*, *classifications*, and *criteria*:

Designated uses: The uses of the water -- such as swimming, public water supply, fishing, aquatic life habitat, irrigation, and industrial processing and cooling -- that are to be achieved and protected.

Classifications: All the waters in the watershed are segmented and each segment is assigned to a classification: A or B (in NH) and A, B, or C in (MA). Designated uses are assigned to each classification. It’s important to note that the uses assigned to each classification are not necessarily uses that are *actually achieved*. Rather, they are uses *to be achieved* and protected.

Criteria: For each classification, water quality criteria describe the conditions which need to be achieved in order to support the designated uses. These conditions are described for various water quality indicators such as bacteria, temperature, dissolved oxygen, pH, etc. There are two types of criteria: numerical and narrative

- * Numerical Criteria specify a level or a range of levels for each indicator needed to support the designated uses for each class. For example, in New Hampshire, Class B waters can contain no more than 406 *Escherichia coli* bacteria per 100 mL to support swimming.
- * Narrative Criteria are general statements about the conditions for each indicator needed to support the designated uses for each class. For example, for color and turbidity in Massachusetts for Class B waters: “These waters shall be free from color and turbidity in concentrations or combinations that are aesthetically objectionable or would impair any use assigned to this Class. ”

See *The State Water Quality Standards* section below for a description of the designated uses, classifications, and criteria for Massachusetts and New Hampshire.

Monitored and Evaluated Waters

To determine whether the waters support their designed uses, waters are either *monitored* or *evaluated* for each of the indicators listed in the water quality criteria.

Unfortunately, these terms are defined differently in each state. However, the following will serve as basic definitions:

Monitored Waters: The water quality indicators are measured and the results are compared with the numeric criteria.

Evaluated Waters: If monitoring data are not available (or are out of date), the states may determine the level of use support with land use data, pollution source inventories, citizen complaints, fish and game surveys, and predictive models.

Volunteer monitoring programs can be a valuable source of data to determine the extent to which our rivers and lakes actually support their designated uses.

About 305(b) Reports

The US EPA is required by section 305(b) of the Clean Water Act to report to Congress on the status of the Nation's surface water every two years.¹ EPA compiles reports from all the states into a national assessment of whether our surface waters are meeting the requirements of the Clean Water Act. These state and EPA reports are known as "305(b) Reports."

305(b) reports use the most recent and best available water quality data and compare the results to the criteria in the water quality standards. They assess whether each use in each class is supported by current water quality conditions. The reports consolidate these individual assessments into an overall assessment for each waterbody. Finally, each waterbody is placed in one of the following use support categories:

Fully Supporting: All designated uses are fully supported. In other words, there are no known violations of state water quality standards.

Threatened: One or more designated uses are threatened and the remaining uses are fully supported.

Partially Supporting: One or more designated uses are partially supported and the remaining uses are fully supported. In other words, the actual water quality does not meet the all of the criteria some of the time (e.g. when combined sewer overflows occur).

Not Supporting: One or more designated uses are not supported. In other words, there are known violations of the state's water quality standards.

Not Attainable: The State performs a study and documents that support of one or more designated uses is not achievable due to natural conditions or human activity that cannot be reversed without imposing widespread economic and social impacts.

¹This will probably be changed to every 5 years when the Clean Water Act is re-authorized.

305(b) reports are used to determine pollution control and management priorities at the state and national level.

Volunteer monitoring programs can be a valuable source of data for these reports, particularly as state and federal resources devoted to monitoring dwindle. According to Greg Comstock (the NH 305(b) Officer), the most important things for volunteer groups to remember when carrying out water quality standards assessments (if they wish their data to be incorporated into 305(b) reports) are:

1. develop and implement effective quality (QA/QC) control measures, and
2. be in touch with state agencies and deliver data to them in a timely manner, and in a format that they can use.

If adequate quality control measures are not used for sampling and lab analysis, state agencies may still be able to use volunteer data for 305(b) reports. However, your river or lake may be considered as *evaluated* rather than *monitored*.

The Massachusetts and New Hampshire Water Quality Standards

In most cases, fresh water volunteer monitoring groups monitor Class B waters (recreational waters that people contact directly as in for swimming). Most of the waters in MA and NH fall into that category. Class A waters are usually designated drinking water supplies and are therefore monitored by the drinking water suppliers. For Massachusetts class C waters are designated so because they are too polluted to risk direct human contact and it would be too costly to clean the water to a point where it could be reclassified as B. Most volunteer groups do not need to bother monitoring Class C waters because they are not usually heavily used for recreation and are not considered as valuable a resource as Class A or B waters.² Therefore, the standards shown in the tables below are for Class B waters only.

If your group wishes to know the classification for a water body that you will be monitoring, or the standards for a Class A or C water, in NH call the DES at (603)271-2457 and in MA call the DEP at (508)792-7470.

²New Hampshire does not have a C classification for surface waters and Massachusetts does not currently designate any surface waters in the C classification.

New Hampshire Classes, Uses and Criteria

Designated Uses for Class B waters: Acceptable for fishing, swimming and other recreational purposes and, after adequate treatment, for use as a drinking water supply.

Indicators	Criteria
<i>E. coli</i> Bacteria	<ul style="list-style-type: none">– no more than 126 <i>E. coli</i>/100 mL based on a geometric mean of 3 samples obtained over a 60 day period– no more than 406 <i>E. coli</i>/100 mL in any one sample <p>In designated beach areas:</p> <ul style="list-style-type: none">– no more than 47 <i>E. coli</i>/100 mL based on a geometric mean of 3 samples obtained over a 60 day period– no more than 88 <i>E. coli</i>/100 mL in any one sample
Dissolved Oxygen	<ul style="list-style-type: none">– not less than 75% saturation
pH	<ul style="list-style-type: none">– 6.5 to 8.0 or as naturally occurs
Temperature	<ul style="list-style-type: none">– no increase that would appreciably interfere with the designated uses
Turbidity	<ul style="list-style-type: none">– not to exceed naturally occurring conditions by 10 Nephelometric Turbidity Units (NTUs)

Massachusetts Classes, Uses and Criteria

Designated Uses for Class B waters: These waters are designated as a habitat for fish, other aquatic life, and wildlife, and for primary and secondary contact recreation. Where designated they shall be suitable as a source of public water supply with appropriate treatment. They shall be suitable for irrigation and other agricultural uses and for compatible industrial cooling and process uses. These waters shall have consistently good aesthetic value.

Indicators	Criteria
Fecal Coliform Bacteria	<ul style="list-style-type: none"> - no more than 200 fecal coliform bacteria/100 mL based on a geometric mean in any representative set of samples - no more than 10% of the plates shall exceed 400 fecal coliform bacteria /100 mL in any one sample
Dissolved Oxygen	<ul style="list-style-type: none"> - not less than 6.0 mg/L in cold water fisheries - not less than 5.0 mg/L in warm water fisheries unless background conditions are lower - not below 75% of saturation in cold water fisheries - not below 60% of saturation in warm water fisheries - site-specific criteria may apply where background levels are lower than specified levels, to the hypolimnion (bottom layer) of stratified lakes (see temperature section) or where the Director determines that designated uses are not impaired
pH	<ul style="list-style-type: none"> - 6.5 to 8.3 - not more than 0.5 units outside of the background range - there shall be no change from background conditions that would impair any use assigned this Class

Temperature	<ul style="list-style-type: none"> - not to exceed 68_F (20_C) in cold water fisheries - not to exceed 83_F (28.3_C) in warm water fisheries - the rise in temperature due to a discharge shall not exceed 3_F (1.7_C) in rivers and streams designated as cold water fisheries - the rise in temperature due to a discharge shall not exceed 5_F (2.8_C) in rivers and streams designated as warm water fisheries - the rise in temperature due to a discharge shall not exceed 3_F (1.7_C) in the epilimnion (top layer) of lakes and ponds (see temperature section)
Temperature (cont'd)	<ul style="list-style-type: none"> - natural seasonal and daily variations shall be maintained. There shall be no changes from background conditions that would impair any use assigned to this Class, including site-specific limits necessary to protect normal species diversity, successful migration, reproductive functions or growth of aquatic organisms
Turbidity	<ul style="list-style-type: none"> - free from turbidity in concentrations that are aesthetically objectionable or would impair any use assigned to this Class