R-WD-15-14

STATE OF NEW HAMPSHIRE

Impairments Removed (i.e. Delisted) from the 303(d) List of Threatened or Impaired Waters (i.e. Category 5)

March 27, 2017

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

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Impairments Removed (i.e. Delisted) from the 303(d) List of Threatened or Impaired Waters (i.e. Category 5)

STATE OF NEW HAMPSHIRE
DEPARTMENT OF ENVIRONMENTAL SERVICES
29 HAZEN DRIVE
CONCORD, N.H. 03301

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March 27, 2017

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Introduction

In accordance with Section 303(d) of the federal Clean Water Act, States must prepare a list of impaired waters that require a Total Maximum Daily Load study every 2 years (i.e., the 303(d) List). The last approved 303(d) List was prepared by the New Hampshire Department of Environmental Services (NHDES) in 2012. A draft of the 2012 Section 303(d) List of impaired waters has been issued for public comment. Downloadable copies of the draft list are available on the NHDES website for review (http://des.nh.gov/organization/divisions/water/wmb/swqa/index.htm). This document provides a list of all surface waters that were on the 2012 303(d) List and have been removed for the 2014 303(d) List (i.e., "delisted") and the reasons why they were removed.

Assessment outcomes cover a spectrum from very good to very bad coded as an alpha numeric scale that provides additional distinctions in cases where and impairment exists. In each of the delistings detailed within this document the 2012 and 2014 assessment status is highlighted applying the categories in the table below.

		Severe Not Supporting, Severe	**Poor** Not Supporting, Marginal	**Likely Bad** Insufficient Information – Potentially Not Supporting	**No Data** No Data	**Likely Good** Insufficient Information – Potentially Full Supporting	**Marginal** Full Support, Marginal	**Good** Full Support, Good
CATEGORY	**Description**							
*Category 2	Meets standards						2-M or 2-OBS	2-G
Category 3	Insufficient Information			3-PNS	3-ND	3-PAS		
Category 4	Does not Meet Standards;							
4A	TMDL Completed	4A-P	4A-M or 4A-T					
4B	Other enforceable measure will correct the issue.	4B-P	4B-M or 4B-T					
4C	Non-pollutant (i.e. exotic weeds)	4C-P	4C-M					
Category 5	TMDL Needed	5-P	5-M or 5-T					

GROUP 1. Biological Assessments

Measuring whether a waterbody has a balanced, integrated, and adaptive community of benthic organisms is one of the direct measures of the Aquatic Life designated use. Env-Wq 1703.19 'Biological and Aquatic Community Integrity' provides the framework for what the biological community in New Hampshire's waters should look like and requires that those communities be subject to only non-detrimental differences in structure and function from naturally occurring conditions. For the purposes of assessment, the methodologies in the Consolidated Assessment and Listing Methodology will be used to identify which benthic communities are, or are not, meeting Env-Wq 1703.19.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Academy Brook - Loon Pond Brook	Gilmanton	NHRIV700060201-04	Benthic-Macroinvertebrate Bioassessments (Streams)	5-P	**2-G**	Applicable WQS attained; original basis for listing was incorrect

Station SP04M-102 should have been associated to AUID NHRIV700060201-09 which is already listed as impaired based on other samples at SP04M-100 and SP04M-101. Station SP04M-104 should have been associated to AUID NHRIV700060201-10 which is already listed as impaired based on other samples at SP04M-103 and SP04M-105. Station 05-ACA which is correctly on NHRIV700060201-04 was sampled on 9/26/2011 and had a B-IBI score of 71 (threshold=55.2). With a B-IBI ratio of 1.28 (>1.2) this site meets the benthic macroinvertebrate indicator for aquatic life use support. Change assessment from NHDES category 5-P (incorrect entry) to NHDES category 2-G.

Academy Brook - Loon Pond Brook (NHRIV700060201-04) has been removed from the 303(d) List for impairment of Aquatic Life Use due to degraded Benthic-Macroinvertebrate Bioassessments (Streams) and placed in Category 2 (Fully Supporting).

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Exeter River	Fremont	NHIMP600030803-03	Benthic-Macroinvertebrate Bioassessments (Streams)	5-P	3-ND	Data and/or information lacking to determine water quality status; original basis for listing was incorrect (Category 3)

Exeter River (NHIMP600030803-03) was listed as impaired in 2012 based on Benthic-Macroinvertebrate sampling at station FW08NH166. However, FW08NH166 is well within the backwater of an impoundment hence the impoundment assessment unit ID. The benthic IBI is calibrated for flowing waters, not impounded water. On deployment, the water velocity readings at each basket were 0.04, 0.09, and 0.02 ft/sec while at retrieval the readings were -0.04, -0.05, and 0.00 ft/sec.

Exeter River (NHIMP600030803-03) has been removed from the 303(d) List for impairment of Aquatic Life Use due to degraded Benthic-Macroinvertebrate Bioassessments (Streams) and placed in Category 3 (No Data).

GROUP 2. Manufactured Gas Plant (MGP) Remediation

The General Water Quality Criteria (Env-Wq 1703.03) require that surface waters be free of substances which: float as foam, debris, or scum; produce odor, color, taste, or turbidity making the water unsuitable for the designated use; or interfere with recreational activities (Env-Wq 1703.03 (c)(1) b, c, & e). Two common examples of scums are those produced by cyanobacteria blooms which produce a human health risk and iron scums that may be the result on landfill leachate or fill activities.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason

Mill Creek	Keene	NHRIV802010301-12	Benzo(a)pyrene (PAHs)	5-M	2-G	Applicable WQS attained; due to restoration activities

Mill Creek (NHRIV802010301-12) was added to the impaired waters list in 2004 due to "...tar blebs and staining, sheen, MGP odor,.." associated with the former Manufactured Gas Plant (MGP). From 2006 to 2009, Public Service of New Hampshire (PSNH) and parent company Northeast Utilities (NU) conducted several investigations within Mill Creek, which led to the development of the Phase II Remedial Action Plan (water based cleanup). State/Federal permits were obtained, and 14 access agreements with abutting property owners were secured. The Phase II remediation targeted Mill Creek and was completed in 2012 (http://des.nh.gov/organization/commissioner/pip/newsletters/en/documents/2013-mar-april.pdf). The first rounds of reports on the post remediation bank stabilization, plantings health, and water quality monitoring data has shown that all of the original reasons for the impairment listing have been successfully removed. There are no longer "...tar blebs and staining, sheen, MGP odor,..." and the site no longer registers on the hydrocarbon photoionization detector (PID).

Mill Creek (NHRIV802010301-12) has been removed from the 303(d) List for impairment of Aquatic Life Use due to Benzo(a)pyrene (PAHs) and placed in Category 2 (Full Support).

GROUP 3. Chlorophyll-a – Swimming Use Support (i.e. Primary Contact Recreation)

Excessive algal growth (high biomass and high chlorophyll-a values) can impair the public safety and aesthetic enjoyment of surface waters. The General Water Quality Criteria (Env-Wq 1703.03) require that surface waters be free of substances which: produce color or turbidity making the water unsuitable for the designated use, or interfere with recreational activities (Env-Wq 1703.03 (c)(1) c & e). For assessment purposes, chlorophyll-a concentrations in excess of 15 ug/L in fresh water and 20 ug/L in salt water are indicators of excessive algal growth that interferes with recreational activities.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Gould Pond	Hillsborough	NHLAK700030501-01	Chlorophyll-a	5-M	2-G	Applicable WQS attained; reason for recovery unspecified

Gould Pond (NHLAK700030501-01) was listed as impaired due to elevated chlorophyll-a and a particularly high epilimnetic reading of 79.4ug/L on 8/1/2002. There were no measurements over the 15 ug/L chlorophyll-a indicator in the 13 summer samples covering 2003, 2004, 2005, and 2006 with at least two collected under similar dry, hot weather conditions and season (7/31/2003 and 7/26/2005) and no measurements since that time. Further, on closer inspection, the 8/1/2001 reading is suspect in that corresponding epilimnetic total phosphorus (9 ug/L) and turbidity (0.6 ntu) measurements were low and not indicative of an algal bloom.

Gould Pond (NHLAK700030501-01) has been removed from the 303(d) List for impairment of Primary Contact Recreation (i.e. swimming) due to elevated chlorophyll-a and placed in Category 2 (Full Support).

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Nashua River - Mine Falls Dam Pond	Nashua	NHIMP700040402-02	Chlorophyll-a	5-P	2-M	Applicable WQS attained; original basis for listing was incorrect

The initial impairment to Mine Falls Dam Pond (NHIMP700040402-02) was in the 2004 cycle based on data collected at station MINNASD. Between the 2006 and 2008 assessment cycles, it was discovered that the data for MINNASD should have been assigned to NHIMP700040402-03 (Nashua Canal Dike). As of the 2008 assessment, the chlorophyll-a measurements over 15 ug/L at MINNASD, now assigned to NHIMP700040402-03 (Nashua Canal Dike), had aged out such that the assessment unit did not appear as impaired. In fact, with the 2008 assessment, NHIMP700040402-03 (Nashua Canal Dike) appears as insufficient information for chlorophyll-a to protect the primary contact designated use. Also in the 2008 assessment, it appeared to the assessor that the data for NHIMP700040402-02 (Mine Falls Dam Pond) had simply aged out and a waterbody cannot have an impairment removed solely based on data age in the absence of new data to take its place. Hence, the chlorophyll-a impairment was maintained. Now in the 2014 there are 10 samples from the summer of 2013 at a new station,

NSH-MF-1 which is correctly assigned to NHIMP700040402-02 (Mine Falls Dam Pond) and triggered a review of the older data, thereby uncovering the mis-assignment described above. The new NSH-MF-1 samples range from 1.6 to 15.2 ug/L chlorophyll-a resulting an assessment of category 2-M (full support - marginal). Since the data for MINNASD rightfully belongs on NHIMP700040402-03 (Nashua Canal Dike), the chlorophyll-a impairment has been transferred to that assessment unit and station MINNASD should receive follow-up monitoring to determine if the high chlorophyll-a values persist still occur under the moderate to low flows of the original dataset.

Mine Falls Dam Pond (NHIMP700040402-02) has been removed from the 303(d) List for impairment of Primary Contact Recreation (i.e. swimming) due to elevated chlorophyll-a and placed in Category 2 (Full Support).

GROUP 4. Cyanobacteria

The General Water Quality Criteria (Env-Wq 1703.03) require that surface waters be free of substances which: float as foam, debris, or scum; produce odor, color, taste, or turbidity making the water unsuitable for the designated use; or interfere with recreational activities (Env-Wq 1703.03 (c)(1) b, c, & e). Two common examples of scums are those produced by cyanobacteria blooms which produce a human health risk and iron scums that may be the result on landfill leachate or fill activities.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Lake Winnisquam	Laconia	NHLAK700020201-05-01	Cyanobacteria hepatotoxic microcystins	5-M	2-M	Applicable WQS attained; reason for recovery unspecified
Lake Winnisquam - Sanbornton Town Beach	Sanbornton	NHLAK700020201-05-02	Cyanobacteria hepatotoxic microcystins	5-M	2-M	Applicable WQS attained; reason for recovery unspecified
Lake Winnisquam - Bartletts Beach	Laconia	NHLAK700020201-05-03	Cyanobacteria hepatotoxic microcystins	5-M	2-M	Applicable WQS attained; reason for recovery unspecified
Lake Winnisquam - Belmont Town Beach	Belmont	NHLAK700020201-05-04	Cyanobacteria hepatotoxic microcystins	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

Lake Winnisquam (NHLAK700020201-05-01), Lake Winnisquam - Sanbornton Town Beach (NHLAK700020201-05-02), Lake Winnisquam - Bartlett's Beach (NHLAK700020201-05-03), and Lake Winnisquam - Belmont Town Beach (NHLAK700020201-05-04) were listed for Primary Contact Recreation due to Cyanobacteria hepatoxic microcystins in 2010. The 2010 listing was due to a cyanobacteria bloom initially reported by volunteer samplers in 2008, during a routinely scheduled sampling trip. Lake Winnisquam participates it the departments Volunteer Lake Assessment Program (VLAP). Like most, VLAP lakes, a large number of the volunteers live right on the lake and are on a constant look-out for issues. Additionally, several beaches on Lake Winnisquam are designated beaches sampled several times a year by NHDES staff trained to watch for cyanobacteria. The summer median total phosphorus (stressor variable) is 6.8 ug/L. Chlorophyll-a (response variable) has always remained well below 15 ug/L (the indicator threshold for swimming). Dissolved oxygen fully supports water quality criteria and from the annual profiles we see that the hypolimnetic waters do not typically go anoxic indicating unlikely internal loading of phosphorus.

One cause for excessive summer cyanobacteria growth in a lake is an excessive influx of nutrients in the spring. The April to July rainfall recorded in nearby Lakeport, NH (GHCND: USC00274480) was 16.6 inches in 2008. The local spring rainfall previous to the 2008 bloom in Lake Winnisquam was average when compared to the spring rainfall of all subsequent years (April to July rainfall; 2009 = 22.4, 2010 = 11.6, 2011 = 16.6, 2012 = 14.8, & 2013 = 22.3 inches). With both similar and elevated rainfall, there have been no repeated cyanobacteria bloom event in five years.

Lake Winnisquam (NHLAK700020201-05-01), Lake Winnisquam - Sanbornton Town Beach (NHLAK700020201-05-02), Lake Winnisquam - Bartlett's Beach (NHLAK700020201-05-03), and Lake Winnisquam - Belmont Town Beach (NHLAK700020201-

05-04) have been removed from the 303(d) List for impairment of Primary Contact Recreation due to Cyanobacteria hepatoxic microcystins and placed in Category 2 (Fully Supporting).

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Opechee Bay	Laconia	NHLAK700020201-06-01	Cyanobacteria hepatotoxic microcystins	5-M	2-M	Applicable WQS attained; reason for recovery unspecified
Opechee Bay - Bond Beach	Laconia	NHLAK700020201-06-02	Cyanobacteria hepatotoxic microcystins	5-M	2-M	Applicable WQS attained; reason for recovery unspecified
Opechee Bay - Opechee Park Cove Beach	Laconia	NHLAK700020201-06-04	Cyanobacteria hepatotoxic microcystins	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

Opechee Bay (NHLAK700020201-06-01) and Opechee Bay - Bond Beach (NHLAK700020201-06-02) and Opechee Bay - Opechee Park Cove Beach (NHLAK700020201-06-04) were listed for Primary Contact Recreation due to Cyanobacteria hepatoxic microcystins in 2010. The 2010 listing was due to a cyanobacteria bloom initially reported by City of Laconia staff in 2008. While Opechee Bay does not have an active group in the departments Volunteer Lake Assessment Program (VLAP) however there are three designated beaches sampled several times a year by NHDES staff trained to watch for cyanobacteria. Neither program has detected a bloom since 2008. The summer median total phosphorus (stressor variable) is 6 ug/L. Chlorophyll-a (response variable) has not exceeded 4 ug/L since 1999. There is currently insufficient information to assess dissolved oxygen but given a mean water depth of 6.9 meters, busy boat traffic, low total phosphorus, low chlorophyll-a, and a high turnover rate of 35 times per year there is no reason to suspect that the hypolimnetic waters might experience hypoxia which could otherwise indicating possible internal loading of phosphorus.

One cause for excessive summer cyanobacteria growth in a lake is an excessive influx of nutrients in the spring. The April to July rainfall recorded in nearby Lakeport, NH (GHCND: USC00274480) was 16.6 inches in 2008. The local spring rainfall leading to the 2008 bloom in Lake Winnisquam was average when compared to the spring rainfall of all subsequent years (April to July rainfall; 2009 = 22.4, 2010 = 11.6, 2011 = 16.6, 2012 = 14.8, & 2013 = 22.3 inches). With both similar and elevated rainfall, there have been no repeated cyanobacteria bloom event in five years.

Opechee Bay (NHLAK700020201-06-01) and Opechee Bay - Bond Beach (NHLAK700020201-06-02) and Opechee Bay - Opechee Park Cove Beach (NHLAK700020201-06-04) have been removed from the 303(d) List for impairment of Primary Contact Recreation due to Cyanobacteria hepatoxic microcystins and placed in Category 2 (Fully Supporting).

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Forest Lake	Dalton	NHLAK801030101-02-01	Cyanobacteria hepatotoxic microcystins	5-M	2-M	Applicable WQS attained; original basis for listing was incorrect
Forest Lake - Forest Lake State Park	Dalton	NHLAK801030101-02-02	Cyanobacteria hepatotoxic microcystins	5-M	2-M	Applicable WQS attained; original basis for listing was incorrect

Forest Lake and Forest Lake State Park (NHLAK801030101-02-01 and NHLAK801030101-02-02) were listed for Primary Contact Recreation due to Cyanobacteria hepatoxic microcystins in 2008. The 2008 listing appears to have been accidental as it is Forest Lake, Winchester (NHLAK802010401-01-01) that has had and continues to have cyanobacteria blooms. With that said, Forrest Lake participates it the departments Volunteer Lake Assessment Program (VLAP). Like most, VLAP lakes, a large number of the volunteers live right on the lake and are on a constant look-out for issues. Additionally, Forest Lake State Park is a designated beach and is sampled several times a year by NHDES staff. Neither program has detected a bloom since 2008. The summer median total phosphorus (stressor variable) is 7 ug/L. Chlorophyll-a (response variable) has always remained well below 15 ug/L. Dissolved oxygen fully supports water quality criteria and from the annual profiles we see that the hypolimnetic waters do not typically go anoxic indicating unlikely internal loading of phosphorus.

Forest Lake and Forest Lake State Park (NHLAK801030101-02-01 and NHLAK801030101-02-02) have been removed from the 303(d) List for impairment of Primary Contact Recreation due to Cyanobacteria hepatoxic microcystins and placed in

Category 2 (Fully Supporting).

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Little Sunapee Lake	New London	NHLAK801060402-04-01	Cyanobacteria hepatotoxic microcystins	5-M	2-M	Applicable WQS attained; reason for recovery unspecified
Little Sunapee Lake - Bucklin Town Beach	New London	NHLAK801060402-04-02	Cyanobacteria hepatotoxic microcystins	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

Little Sunapee Lake (NHLAK801060402-04-01) and Little Sunapee Lake - Bucklin Town Beach (NHLAK801060402-04-02) were listed for Primary Contact Recreation due to Cyanobacteria hepatoxic microcystins in 2010. The 2010 listing was due to a cyanobacteria bloom initially reported by volunteer samplers in 2008, during a routinely scheduled sampling trip. Lake Winnisquam participates it the departments Volunteer Lake Assessment Program (VLAP). Like most, VLAP lakes, a large number of the volunteers live right on the lake and are on a constant look-out for issues. Additionally, two beaches on Little Sunapee Lake are designated beaches sampled several times a year by NHDES staff trained to watch for cyanobacteria. Neither program has detected a bloom since 2008. The summer median total phosphorus (stressor variable) is 6 ug/L. Chlorophyll-a (response variable) has always remained well below 15 ug/L. While dissolved oxygen does not fully support water quality criteria it should be noted that Little Lake Sunapee is designated as a Class A waterbody in Chapter law. Due to the Class A designation, the lake is expected to meet 6 mg/L and a 24 hour average saturation throughout the water column as compared to 5 mg/L and a 24 hour average saturation in just the upper 25 percent of depth or epilimnion of thermally stratified lakes. From the annual profiles we see that the hypolimnetic waters do not typically experience hypoxia which would otherwise indicating possible internal loading of phosphorus.

One cause for excessive summer cyanobacteria growth in a lake is an excessive influx of nutrients in the spring. The April to July rainfall recorded in nearby Mount Sunapee, NH (GHCND: USC00275629) was 13 inches in 2008. The local spring rainfall leading to the 2008 bloom in Little Sunapee Lake was average when compared to the spring rainfall of all subsequent years (April to July rainfall; 2009 = 19.6, 2010 = 11.5, 2011 = 18.9, 2012 = 13.2, & 2013 = 21.6 inches). With both similar and elevated rainfall, there have been no repeated cyanobacteria bloom event in five years.

Little Sunapee Lake (NHLAK801060402-04-01) and Little Sunapee Lake - Bucklin Town Beach (NHLAK801060402-04-02) have been removed from the 303(d) List for impairment of Primary Contact Recreation due to Cyanobacteria hepatoxic microcystins and placed in Category 2 (Fully Supporting).

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Granite Lake	Stoddard	NHLAK802010201-05	Cyanobacteria hepatotoxic microcystins	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

Granite Lake (NHLAK802010201-05) was listed for Primary Contact Recreation due to Cyanobacteria hepatoxic microcystins in 2008. The 2008 listing was due to a cyanobacteria bloom initially reported by volunteer samplers in July 2007, during a routinely scheduled sampling trip. Granite Lake participates it the departments Volunteer Lake Assessment Program (VLAP). Like most, VLAP lakes, a large number of the volunteers live right on the lake and are on a constant look-out for issues. Since July 2007, the lake has received focused sampled by the volunteer lake assessment program 16 times and no additional cyanobacteria blooms were spotted. Each summer, the deep spot and three tributary streams to the lake have been sampled 2 or 3 times for a variety of water quality parameters. No excessive cyanobacteria growth has been seen since 2007 during the focused sampling or any other day.

One cause for excessive summer cyanobacteria growth in a lake is an excessive influx of nutrients in the spring. The April to July rainfall recorded in nearby Keene, NH (GHCND:USC00274399) was 15.5 inches in 2007. The local spring rainfall leading to the 2007 bloom in Granite Lake was average when compared to the spring rainfall of all subsequent years (April to July rainfall; 2008 = 17.3, 2009 = 20.9, 2010 = 10.4, 2011 = 15.8, 2012 = 15.6, & 2013 = 22.0 inches). With both similar and elevated rainfall, there have been no repeated cyanobacteria bloom event in six years.

Granite Lake (NHLAK802010201-05) has been removed from the 303(d) List for impairment of Primary Contact Recreation

due to Cyanobacteria hepatoxic microcystins and placed in Category 2 (Fully Supporting).

GROUP 5. Dissolved Oxygen

Dissolved oxygen is critical to the balanced, integrative, and adaptive community of organisms as described in Env-Wq 1703.19. As such, the water quality standard provide criteria for Class A waters, Class B waters, waters with cold water fish species, and in both thermally stratified and unstratified lakes, impoundments, and reservoirs in Env-Wq 1703.07 (a), (b), (c), and (d). For the purposes of assessment, the methodologies in the Consolidated Assessment and Listing Methodology will be used to make the greatest use of all available valid data.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Broad Bay	Freedom	NHLAK600020804-01-03	Dissolved oxygen saturation	5-M	2-G	Applicable WQS attained; original basis for listing was incorrect

Between the 2008 and 2010 Station OL-10 was reassigned, incorrectly, to Broad Bay (NHLAK600020804-01-03). The description for OL-10 is clearly not within Broad Bay but rather says, "This **brook** flows into Danforth Pond from Huckins Pond, which is undeveloped." The Danforth Ponds; Upper, Middle, and Lower are all upstream of Broad Bay. With the removal of this erroneously assigned data there still is ample Broad Bay data to make an assessment and that data indicates that Broad Bay fully meets the dissolved oxygen saturation criteria.

Broad Bay (NHLAK600020804-01-03) has been removed from the 303(d) List for impairment of Aquatic Life Use due to low Dissolved Oxygen Saturation and placed in Category 2 (Fully Supporting).

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Mirror Lake	Tuftonboro	NHLAK700020106-02-01	Dissolved oxygen saturation	5-M	2-G	Applicable WQS attained; original basis for listing was incorrect
Mirror Lake	Tuftonboro	NHLAK700020106-02-01	Oxygen, Dissolved	5-P	2-G	Applicable WQS attained; original basis for listing was incorrect

Mirror Lake (NHLAK700020106-02-01) dissolved oxygen concentration and saturation were listed as impaired in the 2012 assessment in error. The assessment category assigned date for both parameters was January 20, 2012 which is the date of the bulk database build. In 2010, a series of high resolution DO profile sampling events were conducted at Mirror Lake using a depth recording datalogger. During some of these profiles, measurements were recorded at vertical increments as small as seven centimeters. Further, these sampling events were entered into the time series datalogger module of the database rather than as a grab sample series like all other profiles up to that point in time. At the time, the assessment database could not properly handle that dataset and a manual fix was conducted in the weeks after January 20, 2012. Unfortunately, after the manual fixes were implemented, the final assessment was not corrected.

Looking at the data, now properly flagged for the lowest dissolved oxygen reading in the epilimnion, it is clear that the waterbody meets the water quality criteria for both concentration and saturation. The lowest readings in the 21 sampling events (weekly from May 27 to October 13, 2010) occurred as the epilimnion was extending into the deeper waters, just before the lake turned over. On October 5, 2010 the dissolved oxygen concentration was 5.1 mg/L at 10 meters and on September 29, 2010 dissolved oxygen saturation was 76.1 percent at 7.7 meters.

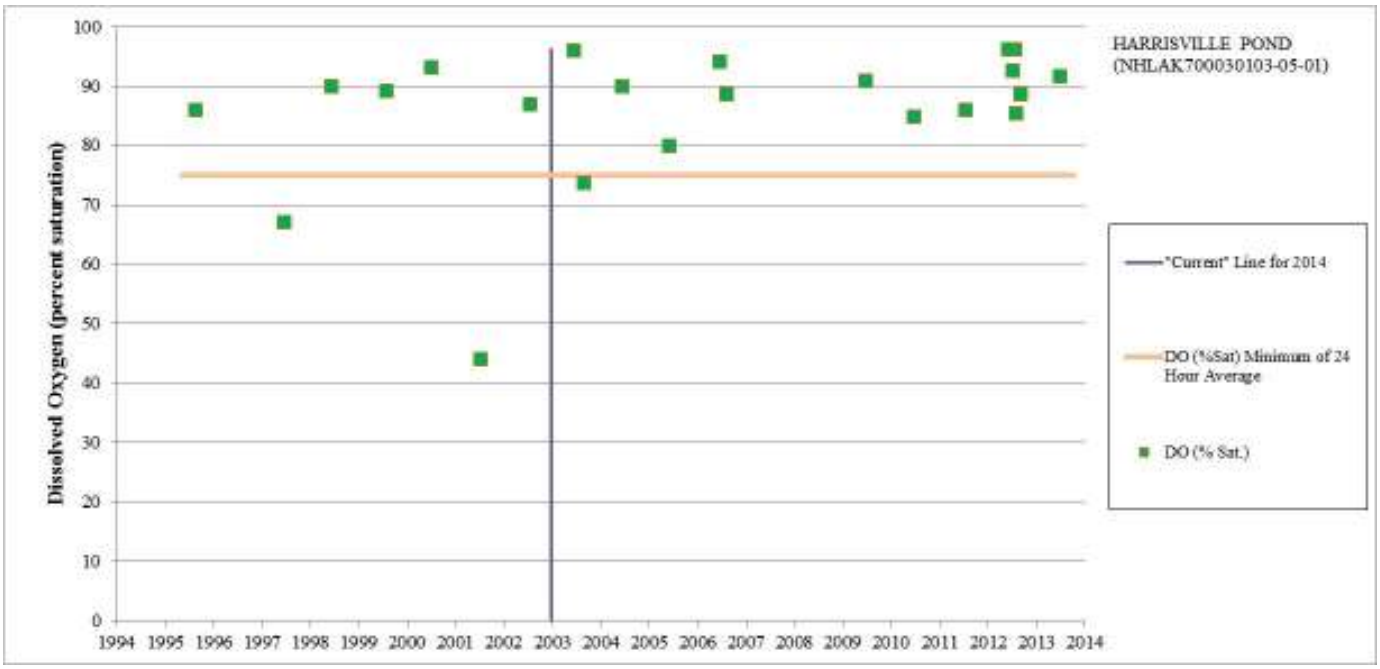
Mirror Lake (NHLAK700020106-02-01) has been removed from the 303(d) List for impairment of Aquatic Life Use due to low Dissolved Oxygen Concentration and Saturation and placed in Category 2 (Fully Supporting).

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason

Harrisville Pond	Harrisville	NHLAK700030103-05-01	Dissolved oxygen saturation	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

Harrisville Pond (NHLAK700030103-05-01) was added to the 2006 303(d) for low dissolved oxygen saturation based on low epilimnetic readings in 1997, 2001, and 2003. Since 2003, no epilimnetic reading has been below 80 percent dissolved oxygen saturation. The weather and flow conditions present during the earlier low readings have been repeated in the newer datasets. With an epilimnetic chlorophyll-a of 3.95 ug/L and total phosphorus of 7 ug/L this lake will not have a sufficient diurnal productivity cycle to result in a 24 hour average dissolved oxygen saturation below 75 percent.

Harrisville Pond (NHLAK700030103-05-01) has been removed from the 303(d) List for impairment of Aquatic Life Use due to low Dissolved Oxygen Saturation and placed in Category 2 (Fully Supporting).



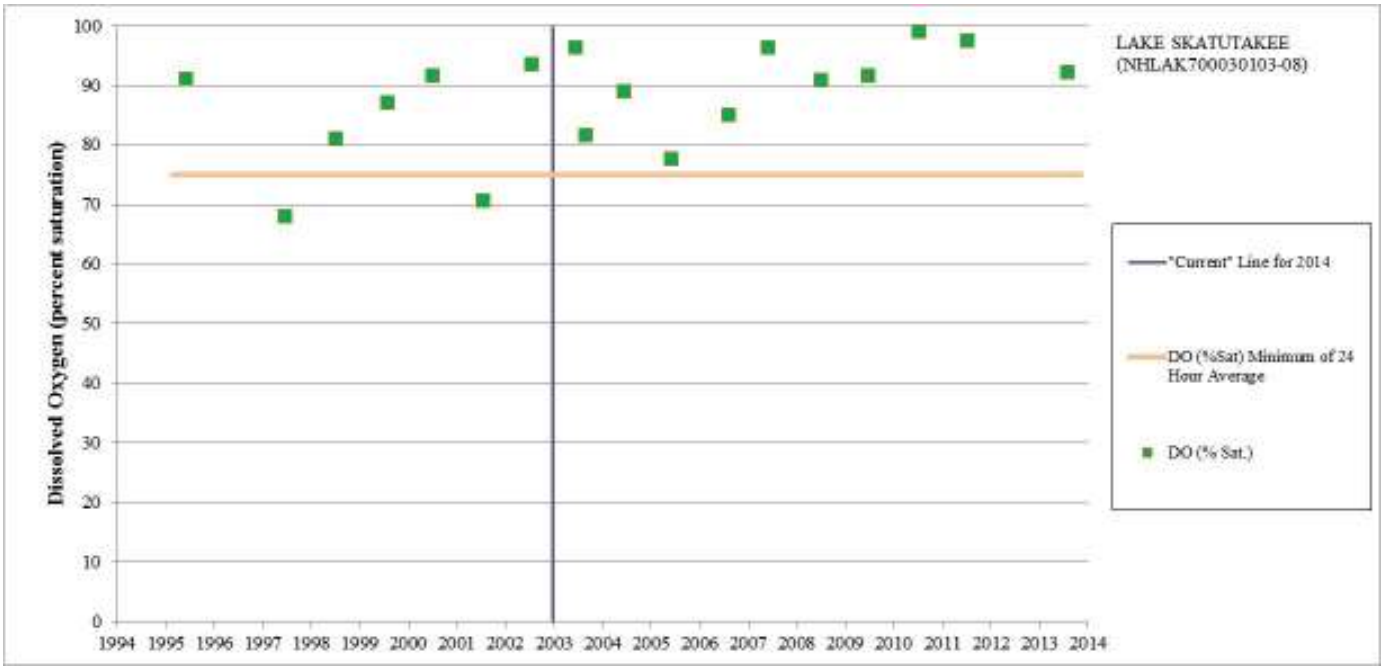
Notes:

"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Lake Skatutakee	Harrisville	NHLAK700030103-08	Dissolved oxygen saturation	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

Lake Skatutakee (NHLAK700030103-08) was added to the 2006 303(d) for low dissolved oxygen saturation based on low epilimnetic readings in 1997 and 2001. Since 2001, no epilimnetic reading dropped below 78 percent dissolved oxygen saturation. The weather and flow conditions present during the earlier low readings have been repeated in the newer datasets With an epilimnetic chlorophyll-a of 5 ug/L and total phosphorus of 9.6 ug/L this lake does not have a sufficient diurnal productivity cycle to result in a 24 hour average dissolved oxygen saturation below 75 percent.

Lake Skatutakee (NHLAK700030103-08) has been removed from the 303(d) List for impairment of Aquatic Life Use due to low Dissolved Oxygen Saturation and placed in Category 2 (Fully Supporting).



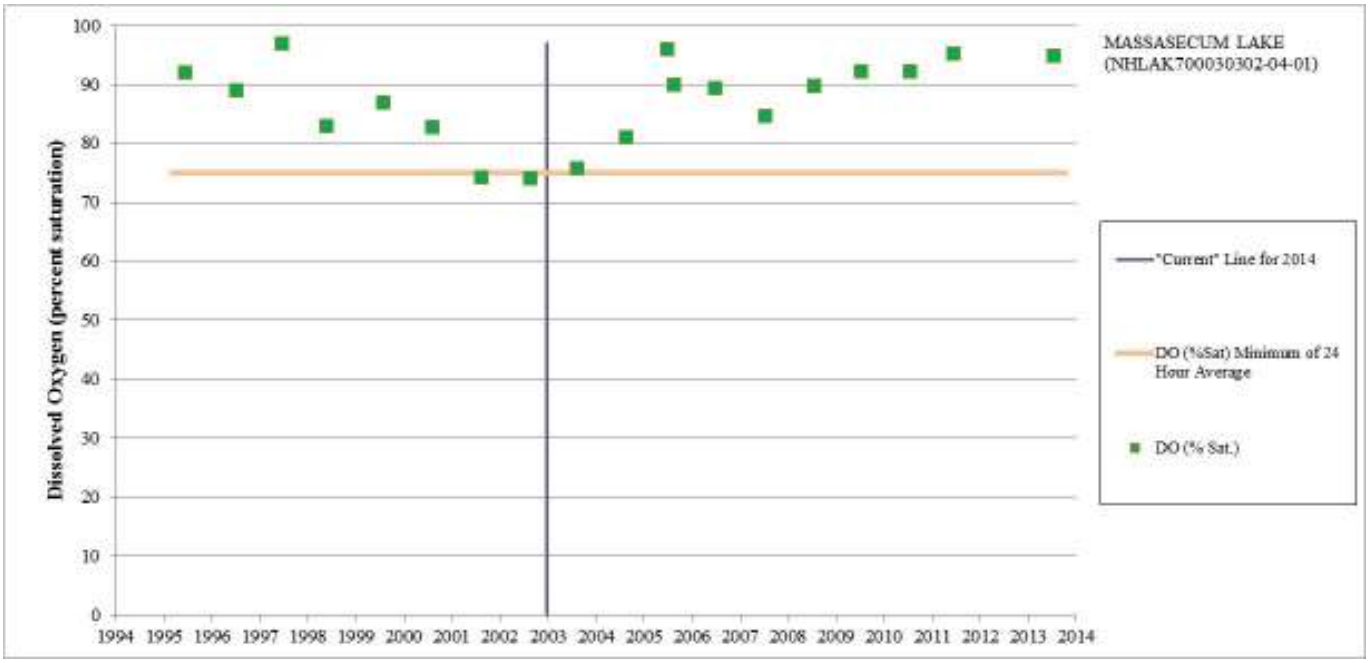
Notes:

"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Massasecum Lake	Bradford	NHLAK700030302-04-01	Dissolved oxygen saturation	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

Massasecum Lake (NHLAK700030302-04-01) was added to the 2006 303(d) for low dissolved oxygen saturation based on low epilimnetic readings in 2001 and 2002. Since 2002, no epilimnetic reading dropped below 75 percent dissolved oxygen saturation. The weather and flow conditions present during the earlier low readings have been repeated in the newer datasets. With an epilimnetic chlorophyll-a of 3.3 ug/L and total phosphorus of 5.75 ug/L, this lake does not have a sufficient diurnal productivity cycle to result in a 24 hour average dissolved oxygen saturation below 75 percent.

Massasecum Lake (NHLAK700030302-04-01) has been removed from the 303(d) List for impairment of Aquatic Life Use due to low Dissolved Oxygen Saturation and placed in Category 2 (Fully Supporting).



Notes:

"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Upper Moose Falls Pond	Pittsburg	NHLAK801010101-04	Dissolved oxygen saturation	5-M	3-ND	Applicable WQS attained; original basis for listing was incorrect
Upper Moose Falls Pond	Pittsburg	NHLAK801010101-04	Oxygen, Dissolved	5-P	3-ND	Applicable WQS attained; original basis for listing was incorrect

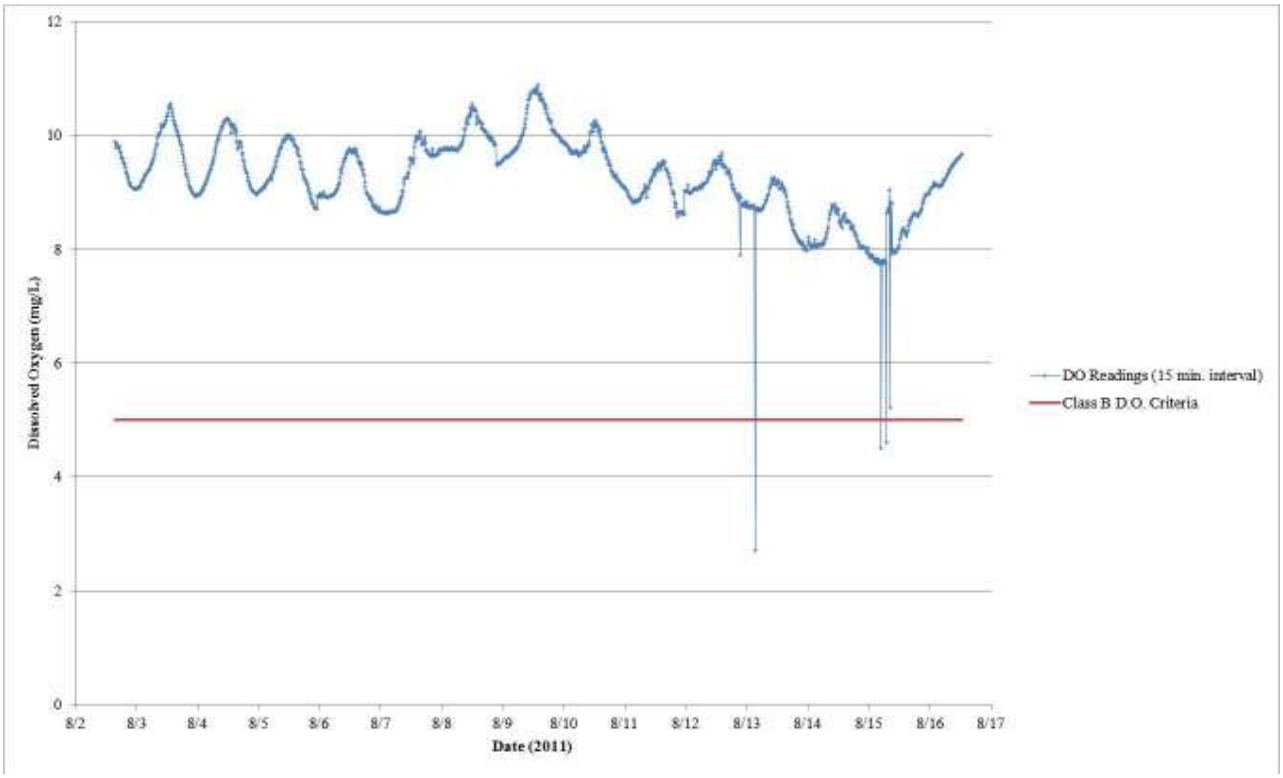
Upper Moose Falls Pond (NHLAK801010101-04) was added to the 2006 303(d) for low dissolved oxygen saturation and concentration based on apparent low readings in 2004. The 2006 assessment cycle used the May 27, 2004 to June 1, 2004 datalogger deployment. However around 9AM May 31, 2004 the logger rapidly failed as indicated by a 52 percent saturation drop in 30 minutes and post-deployment calibration checks. This error was not properly flagged in the database and the data for the last two days of deployment used to make an impairment determination when it should not have been. All valid data was well over the 75 percent dissolved oxygen 24 hour average saturation criteria. As no data has been collected since 2004 on this waterbody, the assessment converts to 3-ND, that is, unassessed due to no data.

Upper Moose Falls Pond (NHLAK801010101-04) has been removed from the 303(d) List for impairment of Aquatic Life Use due to low Dissolved Oxygen Saturation and Concentration and placed in Category 2 (Fully Supporting).

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Clark Brook - Unnamed Brook	Haverhill	NHRIV801030703-02	Oxygen, Dissolved	5-M	2-G	Applicable WQS attained; original basis for listing was incorrect

Clark Brook - Unnamed Brook (NHRIV801030703-02) was added to the 2012 303(d) for low dissolved oxygen concentration based on apparent low readings in 2011. The impairment for DO (mg/L) added in 2012 based on an August 2011 Datalogger at 02-CKB. When the datalogger was uploaded there were known erratic readings that should have been marked as invalid before data upload. However, that invalid flag was only tied to the water temperature rather than all parameters. In the absence of those invalid data points there are 13 daily minimum readings well above the Class B Dissolved Oxygen criteria of 5 mg/L. As such, this waterbody has been moved to Fully Supporting the Dissolved Oxygen criteria in support of the Aquatic Life Designated Use.

Clark Brook - Unnamed Brook (NHRIV801030703-02) has been removed from the 303(d) List for impairment of Aquatic Life Use due to low Dissolved Oxygen Concentration and placed in Category 2 (Fully Supporting).



Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Merrimack River	Merrimack	NHRIV700060804-11	Oxygen, Dissolved	5-P	2-G	Applicable WQS attained; original basis for listing was incorrect

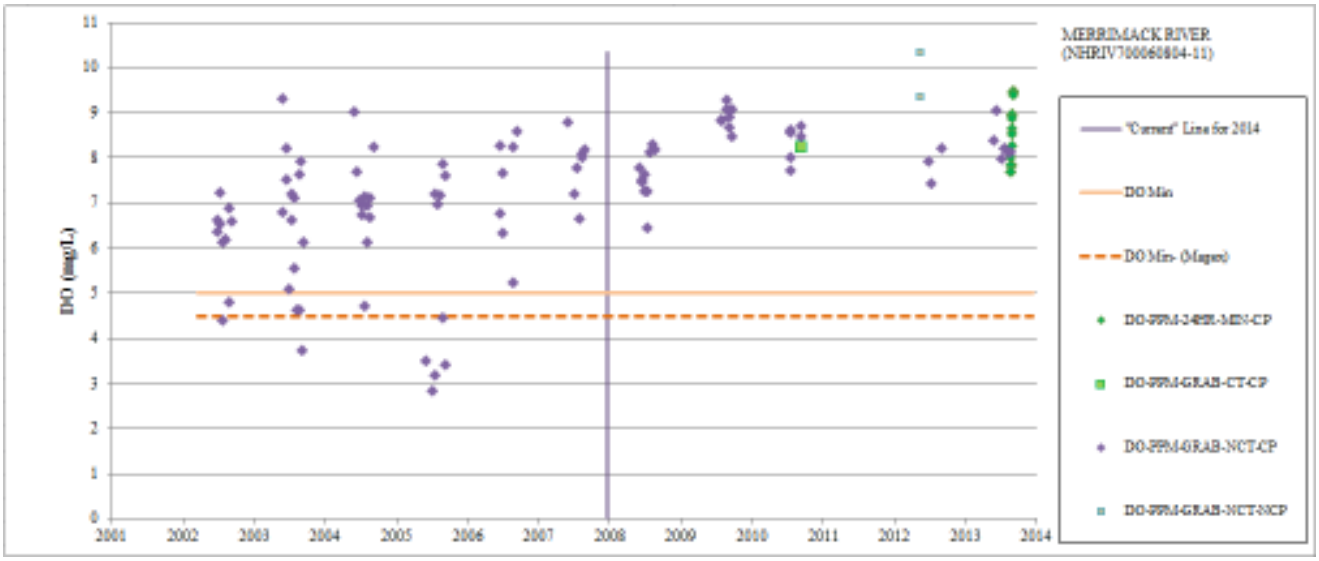
The Merrimack River (NHRIV700060804-11) was listed as impaired in the 2006 303(d) for Aquatic Life Use Support due to low dissolved oxygen concentration. Exceedences of the water quality criteria for dissolved oxygen concentration are defined as < 5 mg/L and exceedences of the magnitude of exceedence criteria are < 4.5 mg/L. The 2006 listing was due to dissolved oxygen concentrations collected between 2002 and 2005 at station SWA-MER550.

Collection Date	Concentration	Station	Sample Type	Period of Collection
09/20/2005	3.4 mg/L	SWA-MER550	Grab	Non-Critical Time / Critical Period
09/06/2005	4.4 mg/L	SWA-MER550	Grab	Non-Critical Time / Critical Period
07/26/2005	3.2 mg/L	SWA-MER550	Grab	Non-Critical Time / Critical Period
07/12/2005	2.8 mg/L	SWA-MER550	Grab	Non-Critical Time / Critical Period
06/14/2005	3.5 mg/L	SWA-MER550	Grab	Non-Critical Time / Critical Period
08/03/2004	4.7 mg/L	SWA-MER550	Grab	Non-Critical Time / Critical Period
09/16/2003	3.7 mg/L	SWA-MER550	Grab	Non-Critical Time / Critical Period
09/02/2003	4.6 mg/L	SWA-MER550	Grab	Non-Critical Time / Critical Period
08/19/2003	4.6 mg/L	SWA-MER550	Grab	Non-Critical Time / Critical Period
09/03/2002	4.8 mg/L	SWA-MER550	Grab	Non-Critical Time / Critical Period
08/06/2002	4.4 mg/L	SWA-MER550	Grab	Non-Critical Time / Critical Period

There have been no exceedences of the water quality standards from 2006 to the present. In 2013, a datasonde was deployed at station SWA-MER550 to help confirm if the improved water quality being observed from the grab samples was representative of the diurnal conditions at the site. The datasonde was deployed on 8/29/2013 and recorded measurements every 15 minutes until its removal on 9/11/2013. Deployment of a datasonde during this timeframe ensures that samples will be taken during the critical time of day and season (when DO is most apt to be lowest due to high temperatures and low flow). All of the datasonde data shows dissolved oxygen concentrations ≥ 7.7 mg/L. The higher resolution data obtained from the datasonde confirms that the conditions at station SWA-MER550 have improved over the last eight years. The weather and flow conditions present during the earlier low readings have been repeated in the newer datasets. The non-

support data collected in 2002-2005, which has already aged out of the assessment process, is no longer representative of current conditions.

The Merrimack River (NHRIV700060804-11) has been removed from the 303(d) List for impairment of Aquatic Life Use due to low Dissolved Oxygen Concentration and placed in Category 2 (Fully Supporting).



Notes:

DO-PPM-24HR-MIN-CP = 24 hour minimum dissolved oxygen from a datalogger deployed during the summer critical period.
DO-PPM-GRAB-CT-CP = Grab samples of dissolved oxygen during the early morning hours of the summer critical period.
DO-PPM-GRAB-NCT-CP = Grab samples of dissolved oxygen not in the early morning hours of the summer critical period.
DO-PPM-GRAB-NCT-NCP = Grab samples of dissolved oxygen nt in the early morning hours and outside the summer critical period.
"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

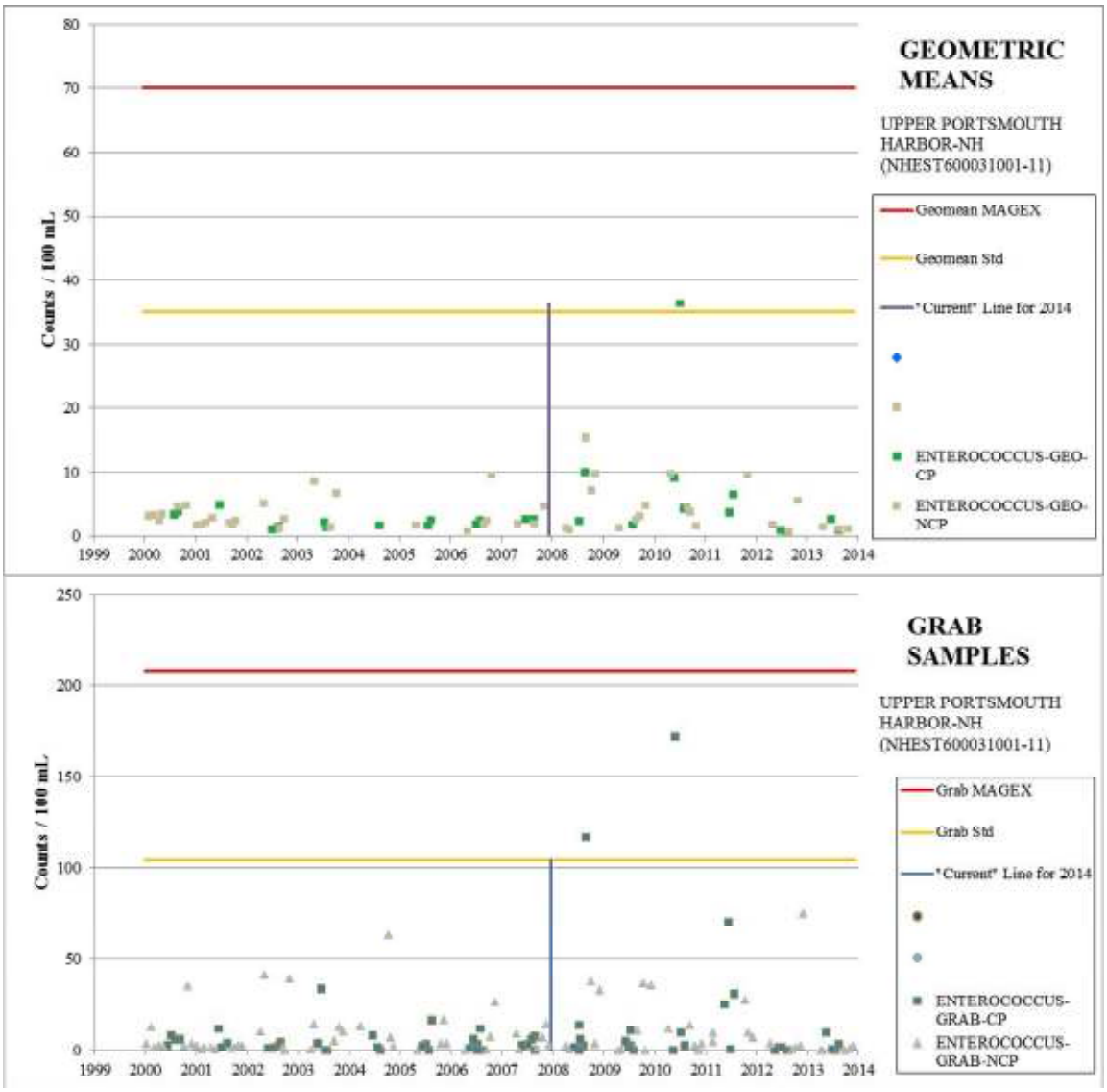
GROUP 6. Bacteria

Elevated bacteria levels in waters present a public health risk to people who have contact with those waters. Acceptable bacteria levels to protect primary contact recreation (i.e. swimming) reside in Env-Wq 1703.06 and RSA 485-A:8, I, II, & V.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Upper Portsmouth Harbor-NH	New Castle	NHEST600031001-11	Enterococcus	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

The Upper Portsmouth Harbor-NH (NHEST600031001-11) was added to the 2012 303(d) due to elevated Enterococcus. This assessment unit was listed as impaired based on collection of grab sample exceedences in 2008 and 2010 and a single geometric mean exceedence in 2010. From 2000 through 2014, 1.4% of samples (n=138) exceeded the grab sample criteria for enterococcus. Since 2010, the site has been sampled every year without a single grab sample exceedence or geometric mean criteria exceedences. During that time, both the freshwater inflow and preceding precipitation conditions experienced during the historic grab sample exceedences have been repeated. Since the last exceedence in 2010, three years and 33 additional grab samples have been collected which have been used to calculate 17 geometric means and no enterococcus exceedences have occurred.

The Upper Portsmouth Harbor-NH (NHEST600031001-11) has been removed from the 303(d) List for impairment of Primary Contact Recreation (i.e. swimming) due to elevated Enterococcus and placed in Category 2 (Fully Supporting).



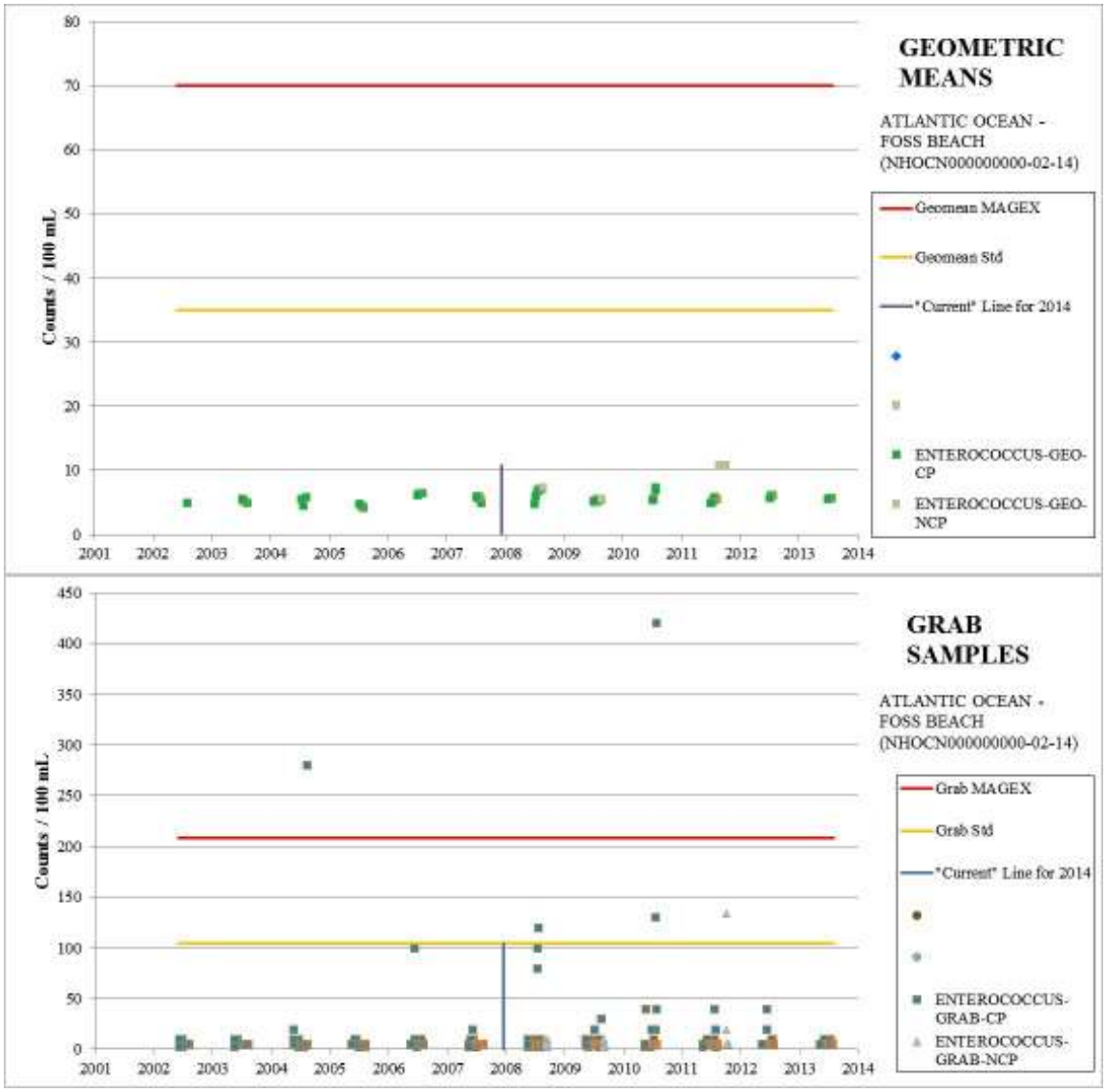
Notes:

ENTEROCOCCUS-GEO-CP = Enterococcus geometric mean calculated from samples collected during the summer critical period.
ENTEROCOCCUS-GEO-NCP = Enterococcus geometric mean calculated from samples collected outside the summer critical period.
ENTEROCOCCUS-GRAB-CP = Enterococcus grab samples collected during the summer critical period.
ENTEROCOCCUS-GRAB-NCP = Enterococcus grab samples collected outside the summer critical period.
"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Atlantic Ocean - Foss Beach	Rye	NHOCN000000000-02-14	Enterococcus	5-P	2-G	Applicable WQS attained; reason for recovery unspecified

The Atlantic Ocean - Foss Beach (NHOCN000000000-02-14) was added to the 2012 303(d) list due to elevated Enterococcus. This assessment unit was listed because of an assortment of grab sample exceedences in 2004, 2008, 2010, and 2011. However, at no time before, during, or after that period did the sampling result in a geometric mean criteria exceedence. Specifically, there have been 37 geometric means in the most recent five years of data with no exceedences, and only five grab sample exceedences in the 267 grab samples since 2008 (1.5 percent). Based on the estimated freshwater inflow based on a nearby stream gage and precipitation gage and the preceding temperature information from the nearby weather gage, there appear to be no patterns to the five apparent exceedences suggesting neither stormwater nor low flow issues. In the last two years, both the flow and preceding precipitation conditions experienced during the historic samples have been repeated and in the 69 grab samples and 8 geometric means there have been no exceedences.

The Atlantic Ocean - Foss Beach (NHOCN000000000-02-14) has been removed from the 303(d) List for impairment of Primary Contact Recreation (i.e. swimming) due to elevated Enterococcus and placed in Category 2 (Fully Supporting).



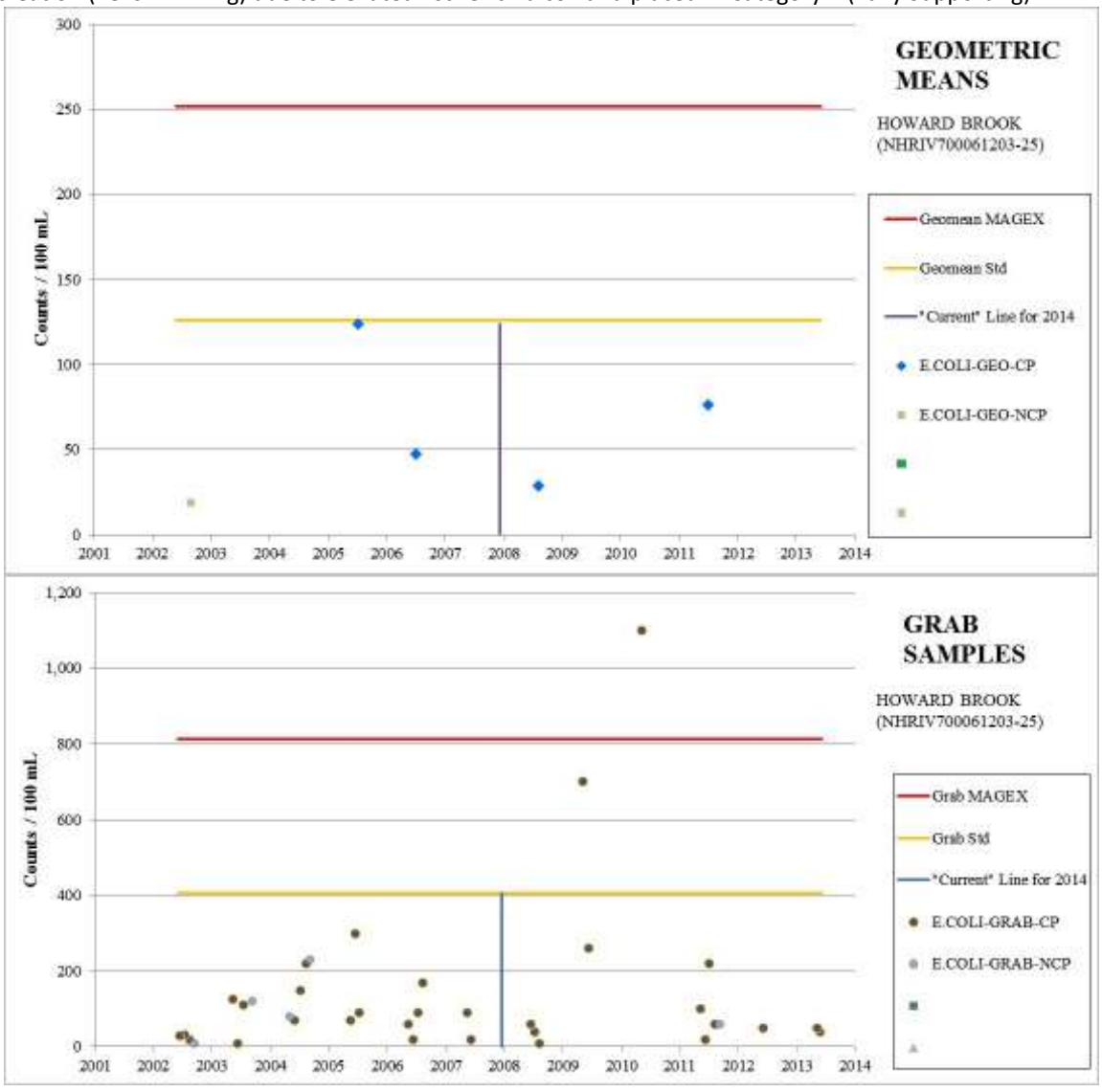
Notes:

ENTEROCOCCUS-GEO-CP = Enterococcus geometric mean calculated from samples collected during the summer critical period.
ENTEROCOCCUS-GEO-NCP = Enterococcus geometric mean calculated from samples collected outside the summer critical period.
ENTEROCOCCUS-GRAB-CP = Enterococcus grab samples collected during the summer critical period.
ENTEROCOCCUS-GRAB-NCP = Enterococcus grab samples collected outside the summer critical period.
"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Howard Brook	Hudson	NHRIV700061203-25	Escherichia coli	5-P	2-M	Applicable WQS attained; reason for recovery unspecified

Howard Brook (NHRIV700061203-25) was added to the 2012 303(d) due to elevated Escherichia coli. Howard Brook was listed in 2012 based on two grab sample exceedences, one in 2009 and one in 2010 at station ROBHUDH3. This station has been sampled nine times covering 2011, 2012, 2013 and 2014 with no single sample exceedences. One geometric mean is calculable from the 2011 data and that too is below the water quality criteria. The newer data covers the range of flows and precipitation seen with the earlier exceedences. (note that the 2014 data is not in the SADB due to the timing of the data pull).

Howard Brook (NHRIV700061203-25) has been removed from the 303(d) List for impairment of Primary Contact Recreation (i.e. swimming) due to elevated Escherichia coli and placed in Category 2 (Fully Supporting).



Notes:

E.COLI-GEO-CP = Escherchia coli geometric mean calculated from samples collected during the summer critical period.
E.COLI-GEO-NCP = Escherchia coli geometric mean calculated from samples collected outside the summer critical period.
E.COLI-GRAB-CP = Escherchia coli grab samples collected during the summer critical period.
E.COLI-GRAB-NCP = Escherchia coli grab samples collected outside the summer critical period.
"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

On September 30th, 2013 EPA approved the 'Total Maximum Daily Load (TMDL) Report for 44 Bacteria Impaired Waters in New Hampshire'. The purpose of the TMDL is to address impairment of primary contact recreation (i.e. swimming) and in some cases secondary contact recreation due to bacteria from improperly treated human waste and stormwater runoff. The TMDL report covers 48 distinct bacterial impairments on 44 assessment units from the 2012 303(d) list due to *E. coli* (freshwaters primary contact and secondary contact recreation).

A copy of the EPA TMDL approval letter can be found at http://des.nh.gov/organization/divisions/water/wmb/tmdl/documents/44-epaapproval.pdf and additional detail documents may be found in http://des.nh.gov/organization/divisions/water/wmb/tmdl/categories/publications.htm.

Since the TMDL has been approved by EPA, NHDES has placed most assessment units included in the TMDL in impairment Category 4A instead of on the 303(d) list (Category 5) for primary contact recreation (i.e. swimming) in some cases secondary contact recreation due to *E. coli* (fresh waters) (*see table below*). In four cases NHDES has placed assessment units included in the TMDL in Category 2 instead of on the 303(d) list (Category 5) for primary contact recreation (i.e. swimming) (*see further details below the table*).

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	Designated Use(s)	2012	2014	Short Delist Reason
Cocheco River - Hatfield Dam	Rochester	NHIMP600030603-02	*Escherichia coli*	Primary Contact	5-M	4A-M	TMDL approved or established by EPA (4A)
Kimball Pond - Kimball Pond Town Beach	Hopkinton	2012: NHIMP700030507-01-02 2014: NHIMP700030507-02-02 (*see discussion below*)	*Escherichia coli*	Primary Contact	5-P	2-M	TMDL approved or established by EPA (4A)
Lake Winnipesaukee - Ellacoya Rv Park Beach	Gilford	NHLAK700020110-02-39	*Escherichia coli*	Primary Contact	5-P	4A-P	TMDL approved or established by EPA (4A)
Lake Winnisquam - Sanbornton Town Beach	Sanbornton	NHLAK700020201-05-02	*Escherichia coli*	Primary Contact	5-P	4A-P	TMDL approved or established by EPA (4A)
Gould Pond - Eastman Park Beach	Hillsborough	NHLAK700030501-01-02	*Escherichia coli*	Primary Contact	5-M	4A-M	TMDL approved or established by EPA (4A)
Gould Pond - Emerald Beach	Hillsborough	NHLAK700030501-01-04	*Escherichia coli*	Primary Contact	5-P	4A-P	TMDL approved or established by EPA (4A)
Clement Pond - Camp Merrimac Beach	Hopkinton	NHLAK700030505-01-02	*Escherichia coli*	Primary Contact	5-P	2-M	TMDL approved or established by EPA (4A)
Pleasant Lake - Veasey Park Beach	Deerfield	NHLAK700060502-09-02	*Escherichia coli*	Primary Contact	5-P	2-M	TMDL approved or established by EPA (4A)
Pleasant Lake - Public Access Beach	Henniker	NHLAK700060601-03-02	*Escherichia coli*	Primary Contact	5-P	2-M	TMDL approved or established by EPA (4A)
Arlington Mill Reservoir-Arlington Pond Improvement Association	Salem	NHLAK700061101-04-03	*Escherichia coli*	Primary Contact	5-P	4A-P	TMDL approved or established by EPA (4A)
Hedgehog Pond - Town Beach	Salem	NHLAK700061102-13	*Escherichia coli*	Primary Contact	5-P	4A-P	TMDL approved or established by EPA (4A)
Cobbetts Pond - Town Beach	Windham	NHLAK700061204-01-03	*Escherichia coli*	Primary Contact	5-P	4A-P	TMDL approved or established by EPA (4A)
Sandy Pond - Camp Wiyaka Beach	Richmond	NHLAK802010402-01-02	*Escherichia coli*	Primary Contact	5-P	4A-P	TMDL approved or established by EPA (4A)
South River - to Province Lake	Effingham	NHRIV600020902-07	*Escherichia coli*	Primary Contact	5-M	4A-M	TMDL approved or established by EPA (4A)
Jones Brook - Hart Brook	Milton	NHRIV600030402-04	*Escherichia coli*	Primary Contact	5-M	4A-M	TMDL approved or established by EPA (4A)
Eel Pond Outlet to Atlantic Ocean	Rye	NHRIV600031002-10	*Escherichia coli*	Primary Contact	5-P	4A-M	TMDL approved or established by EPA (4A)
Trib To Chapel Brook	North Hampton	NHRIV600031002-23	*Escherichia coli*	Primary Contact	5-P	4A-P	TMDL approved or established by EPA (4A)
Chapel Brook	North Hampton	NHRIV600031002-24	*Escherichia coli*	Primary Contact	5-P	4A-P	TMDL approved or established by EPA (4A)
Unnamed Brook - to Loon Lake	Plymouth	NHRIV700010307-13	*Escherichia coli*	Primary Contact	5-P	4A-P	TMDL approved or established by EPA (4A)
Unnamed Brook Along Meadowview Dr	Holderness	NHRIV700010404-01	*Escherichia coli*	Primary Contact	5-M	4A-M	TMDL approved or established by EPA (4A)
Lake Ave Trib	Franklin	NHRIV700010804-18	*Escherichia coli*	Primary Contact	5-M	4A-M	TMDL approved or established by EPA (4A)
Badger Brook	Gilmanton	NHRIV700020202-11	*Escherichia coli*	Primary Contact	5-P	4A-M	TMDL approved or established by EPA (4A)

Impairments Removed (i.e. Delisted) from the 303(d) List of Threatened or Impaired Waters (i.e. Category 5)

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	Designated Use(s)	2012	2014	Short Delist Reason
Northern Inlet To Sawyer Lake	Gilmanton	NHRIV700020202-18	*Escherichia coli*	Primary Contact & (Secondary Contact)	5-P (5-M)	4A-M (4A-M)	TMDL approved or established by EPA (4A)
Sunset Lane Brook	Jaffrey	NHRIV700030101-37	*Escherichia coli*	Primary Contact	5-P	4A-P	TMDL approved or established by EPA (4A)
Blackwater River	Salisbury	NHRIV700030403-17	*Escherichia coli*	Primary Contact	5-P	4A-M	TMDL approved or established by EPA (4A)
Squannacook River - Walker Brook	Mason	NHRIV700040301-05	*Escherichia coli*	Primary Contact	5-P	4A-M	TMDL approved or established by EPA (4A)
Flints Brook	Hollis	NHRIV700040402-03	*Escherichia coli*	Primary Contact & (Secondary Contact)	5-P (5-M)	4A-M (4A-M)	TMDL approved or established by EPA (4A)
Lynn Grove Brook	Northwood	NHRIV700060502-30	*Escherichia coli*	Primary Contact	5-M	4A-M	TMDL approved or established by EPA (4A)
Taylor Brook	Derry	NHRIV700061101-05	*Escherichia coli*	Primary Contact	5-P	4A-M	TMDL approved or established by EPA (4A)
Robinson Detention Pond East Inlet	Lyme	NHRIV801040204-06	*Escherichia coli*	Primary Contact & (Secondary Contact)	5-P (5-M)	4A-M (4A-M)	TMDL approved or established by EPA (4A)
Hewes Brook	Lyme	NHRIV801040402-04	*Escherichia coli*	Primary Contact	5-P	4A-M	TMDL approved or established by EPA (4A)
Unnamed Brook - to North Inlet Of Canaan Street Lake	Canaan	NHRIV801060101-09	*Escherichia coli*	Primary Contact	5-P	4A-M	TMDL approved or established by EPA (4A)
Canaan Street Lake-Inlet At Fernwood Farms	Canaan	NHRIV801060101-16	*Escherichia coli*	Primary Contact	5-M	4A-M	TMDL approved or established by EPA (4A)
Mascoma River - Unnamed Brook	Enfield	NHRIV801060105-11	*Escherichia coli*	Primary Contact	5-M	4A-M	TMDL approved or established by EPA (4A)
Cold River	Unity	NHRIV801070201-01	*Escherichia coli*	Primary Contact	5-M	4A-M	TMDL approved or established by EPA (4A)
Unnamed Brook - to Crescent Lake From Northeast Inlet	Unity	NHRIV801070201-03	*Escherichia coli*	Primary Contact	5-P	4A-M	TMDL approved or established by EPA (4A)
Chickering Farm Brook	Westmoreland	NHRIV801070502-04	*Escherichia coli*	Primary Contact & (Secondary Contact)	5-P (5-M)	4A-M (4A-M)	TMDL approved or established by EPA (4A)
Wases Grove Inlet	Chesterfield	NHRIV801070503-07	*Escherichia coli*	Primary Contact	5-P	4A-M	TMDL approved or established by EPA (4A)
Camp Spofford Inlet - Unnamed Brook	Chesterfield	NHRIV801070503-08	*Escherichia coli*	Primary Contact	5-P	4A-M	TMDL approved or established by EPA (4A)
Aldridge	Dublin	NHRIV802010202-44	*Escherichia coli*	Primary Contact	5-P	4A-M	TMDL approved or established by EPA (4A)
Ashuelot River - Otter Br To Keene Wwtf	Swanzey	NHRIV802010301-11	*Escherichia coli*	Primary Contact	5-M	4A-M	TMDL approved or established by EPA (4A)
Unnamed Brook - Pine Inlet B	Swanzey	NHRIV802010302-06	*Escherichia coli*	Primary Contact	5-M	4A-M	TMDL approved or established by EPA (4A)
Pine Inlet A	Swanzey	NHRIV802010302-07	*Escherichia coli*	Primary Contact	5-P	4A-M	TMDL approved or established by EPA (4A)
Laurel Lake-Keene Ave Trib	Fitzwilliam	NHRIV802020202-07	*Escherichia coli*	Primary Contact	5-P	4A-M	TMDL approved or established by EPA (4A)

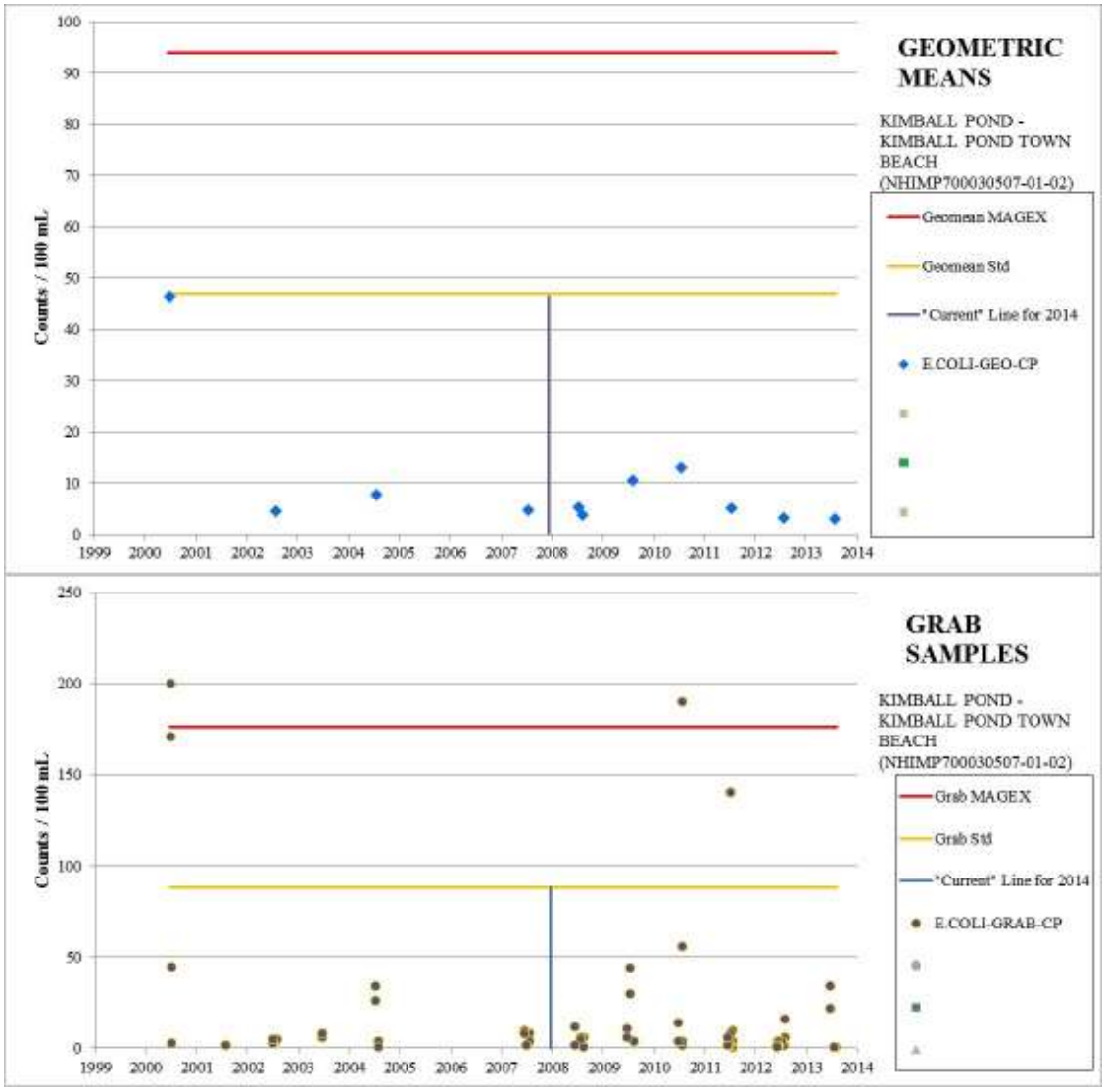
Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Kimball Pond - Kimball Pond Town Beach	Hopkinton	NHIMP700030507-01-02	Escherichia coli	5-P	2-M	Applicable WQS attained; reason for recovery unspecified

Kimball Pond - Kimball Pond Town Beach (NHIMP700030507-01-02) was added to the 2002 303(d) due to elevated Escherichia coli. Upon review of the data for a possible delisting during the 2014 assessment cycle it was discovered that there are multiple waterbodies in Hopkinton carrying the 'Kimball' name. NHIMP700030507-01-01 is Kimball Lake and NHIMP700030507-02 is Kimball Pond. When the assessment unit IDs was originally created in 2001 for the Hopkinton Town Beach, it was mistakenly placed on Kimball Lake (NHIMP700030507-01-02) instead of Kimball Pond (NHIMP700030507-02). Kimball Pond is roughly a quarter mile away from Kimball Lake. The correction of the beach location (from Kimball Lake to

Kimball Pond) necessitated a correction to the assessment unit ID from NHIMP700030507-01-02 to NHIMP700030507-02-02. Despite the miss-assignment of locational data, all of the samples were collected at the correct beach on Kimball Pond.

The beach was listed as impaired in 2012 based on a pair of single sample exceedences, one in 2010 and one in 2011. Sufficient data was collected to calculate geometric means in 2000, 2002, 2004, 2007, 2008, 2009, 2010, 2011, 2012, and 2013 without an exceedence. There were no single sample exceedences in the 16 samples covering 2011-2014 since the 2011 exceedence. Weather and flow conditions in the newer data are similar to those during the earlier single sample exceedences.

Kimball Pond - Kimball Pond Town Beach (NHIMP700030507-02-02 formerly NHIMP700030507-01-02) has been removed from the 303(d) List for impairment of Primary Contact Recreation (i.e. swimming) due to elevated Escherichia coli and placed in Category 2 (Fully Supporting).



Notes:

E.COLI-GEO-CP = Escherchia coli geometric mean calculated from samples collected during the summer critical period.

E.COLI-GRAB-CP = Escherchia coli grab samples collected during the summer critical period.

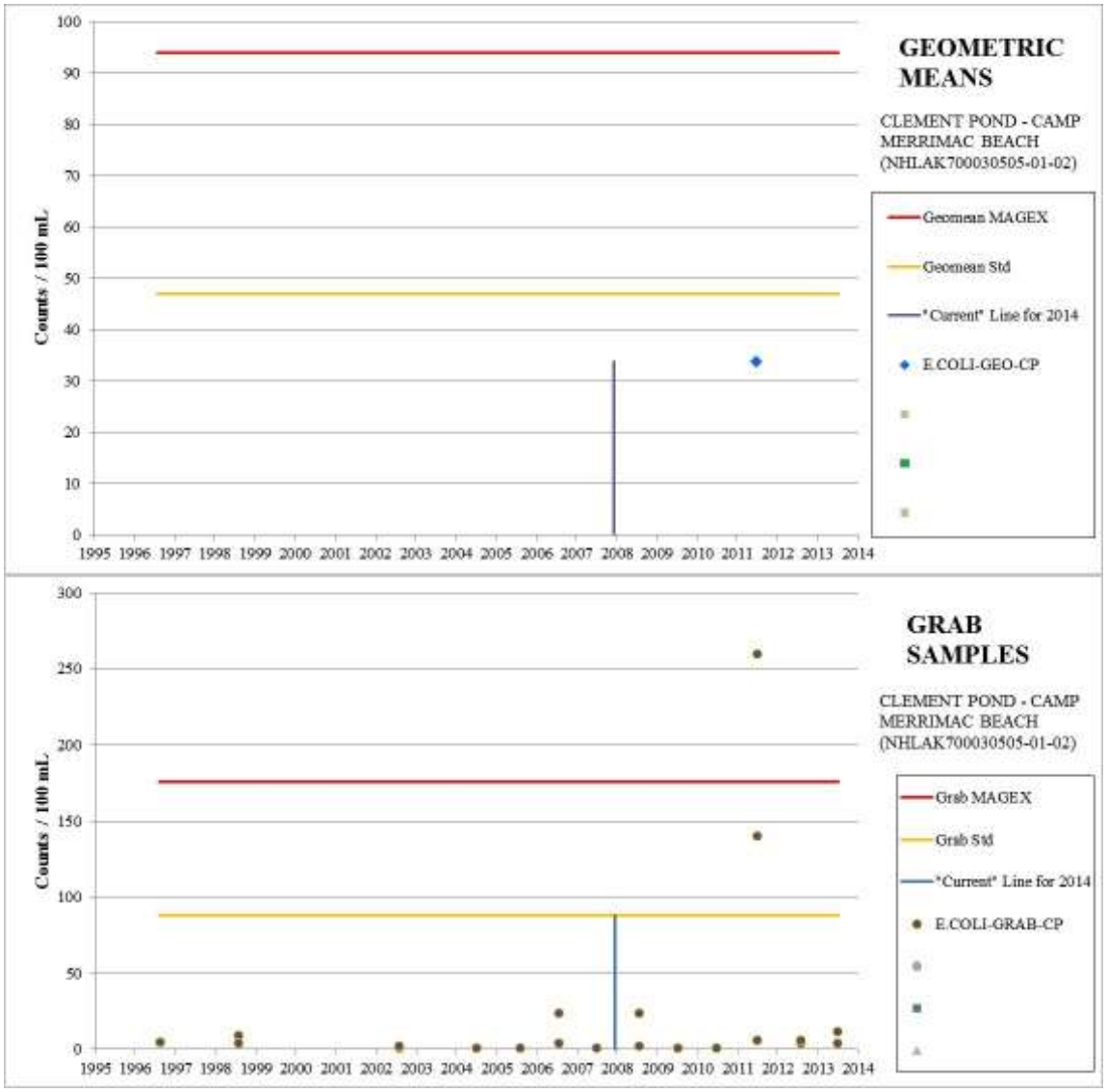
"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason

Clement Pond - Camp Merrimac Beach	Hopkinton	NHLAK700030505-01-02	Escherichia coli	5-P	2-M	Applicable WQS attained; reason for recovery unspecified

Clement Pond - Camp Merrimac Beach (NHLAK700030505-01-02) was added to the 2012 303(d) due to elevated Escherichia coli. This assessment unit was listed as impaired based on two samples collected on the same day in 2011. At no time before, during, or after that period did the sampling result in a geometric mean criteria exceedence. Since 2011, both the flow and preceding precipitation conditions experienced during the grab sample exceedences of 2011 have been repeated.

Clement Pond - Camp Merrimac Beach (NHLAK700030505-01-02) has been removed from the 303(d) List for impairment of Primary Contact Recreation (i.e. swimming) due to elevated Escherichia coli and placed in Category 2 (Fully Supporting).



Notes:

E.COLI-GEO-CP = Escherchia coli geometric mean calculated from samples collected during the summer critical period.

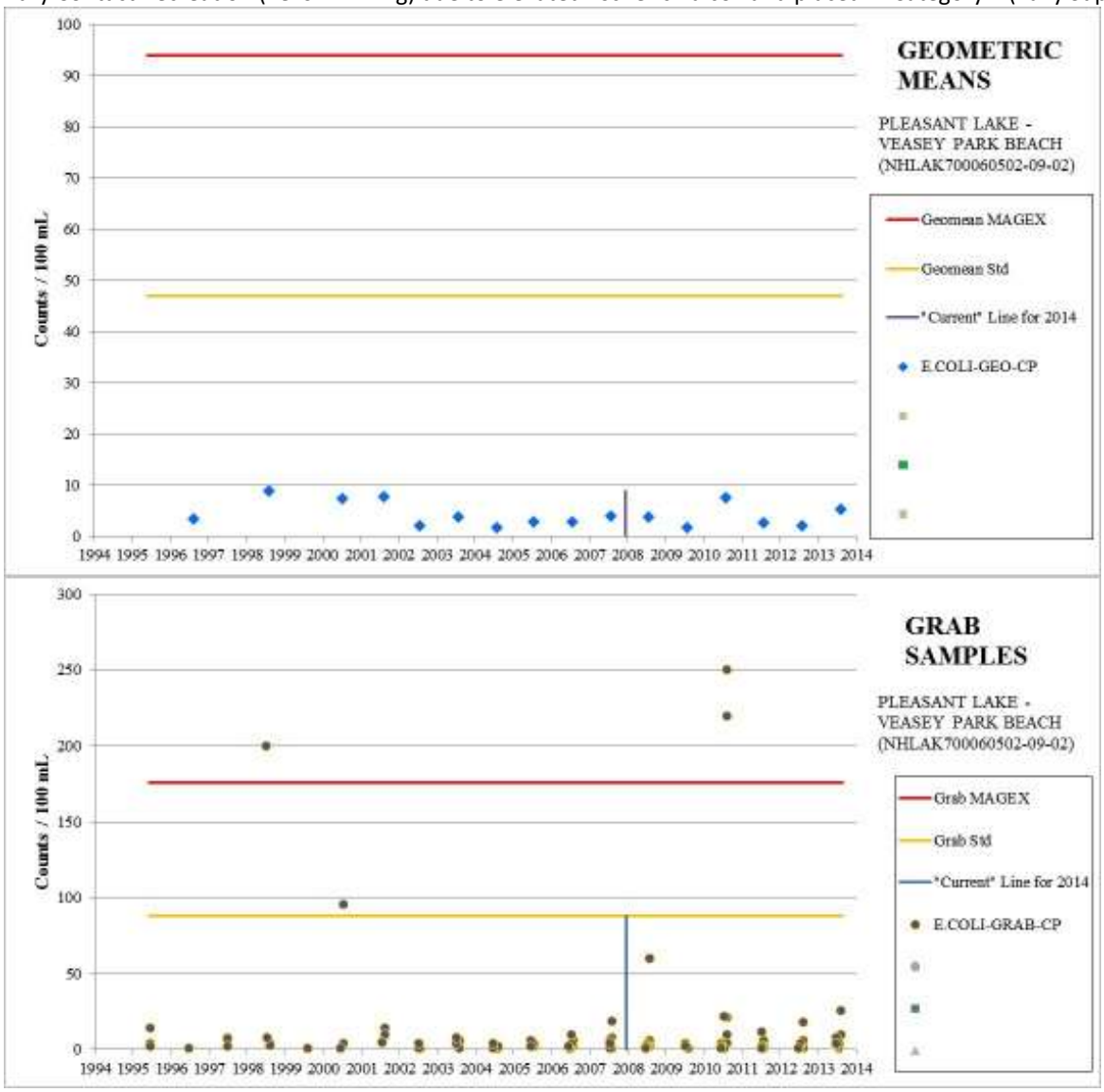
E.COLI-GRAB-CP = Escherchia coli grab samples collected during the summer critical period.

"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Pleasant Lake - Veasey Park Beach	Deerfield	NHLAK700060502-09-02	Escherichia coli	5-P	2-M	Applicable WQS attained; reason for recovery unspecified

Pleasant Lake - Veasey Park Beach (NHLAK700060502-09-02) was added to the 2012 303(d) due to elevated Escherichia coli. This assessment unit was listed as impaired based on a pair samples collected on the same day in 2010 and a historic grab sample exceedence in each 1997, and 2000. However, at no time before, during, or after that period did the sampling result in a geometric mean criteria exceedence. Since 2010, both the flow and preceding precipitation conditions experienced during the grab sample exceedences of 2010 have been repeated and in the 27 grab samples since 2010 there have been no grab sample exceedences.

Pleasant Lake - Veasey Park Beach (NHLAK700060502-09-02) has been removed from the 303(d) List for impairment of Primary Contact Recreation (i.e. swimming) due to elevated Escherichia coli and placed in Category 2 (Fully Supporting).



Notes:

E.COLI-GEO-CP = Escherchia coli geometric mean calculated from samples collected during the summer critical period.

E.COLI-GRAB-CP = Escherchia coli grab samples collected during the summer critical period.

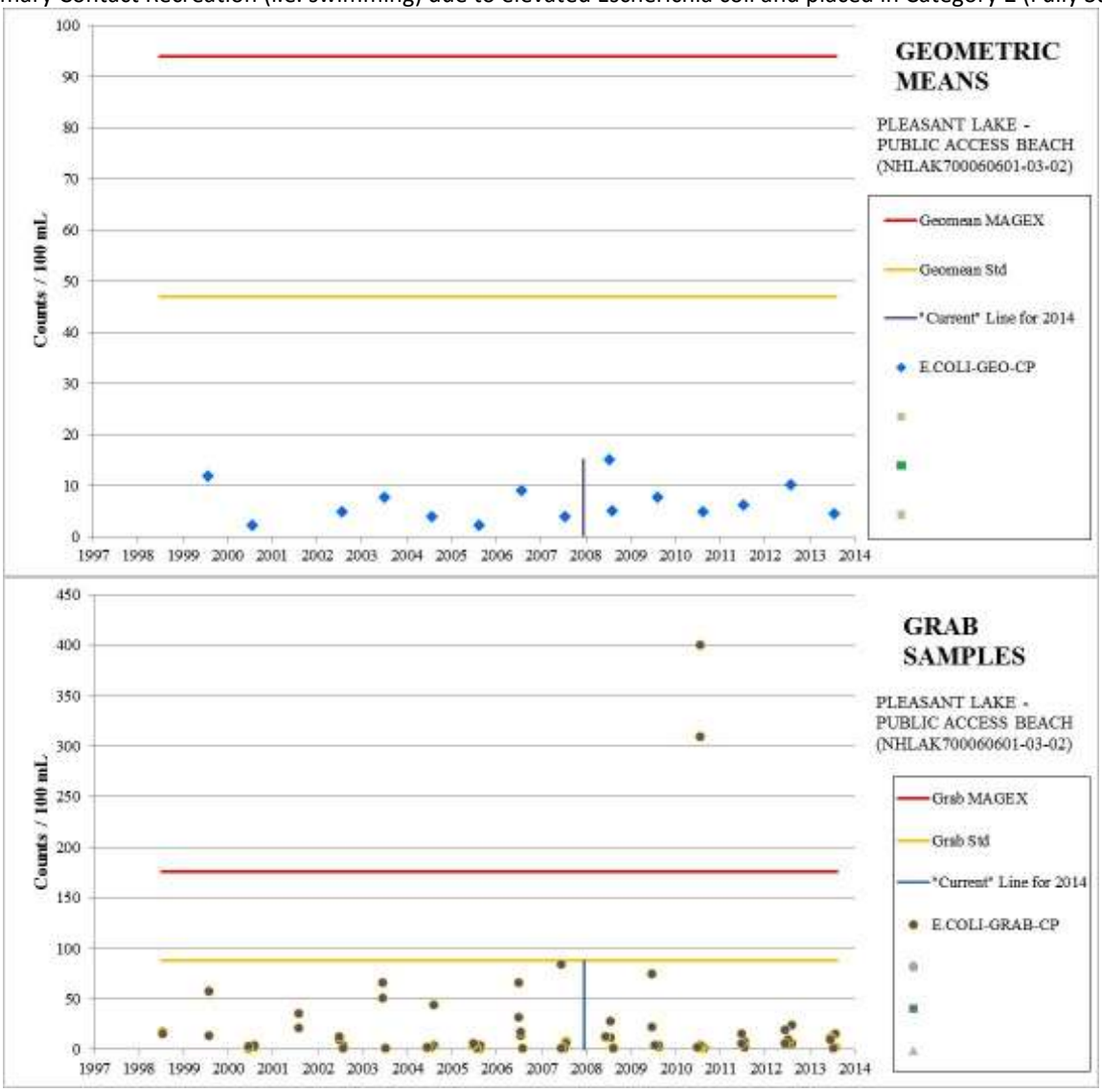
"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Pleasant Lake - Public Access Beach	Henniker	NHLAK700060601-03-02	Escherichia coli	5-P	2-M	Applicable WQS attained; reason for recovery unspecified

Pleasant Lake - Public Access Beach (NHLAK700060601-03-02) was added to the 2012 303(d) due to elevated Escherichia coli. This assessment unit was listed as impaired based on a pair samples collected three days apart in 2010. However, at no

time before, during, or after that period did the sampling result in a geometric mean criteria exceedence. Since 2010, both the flow and preceding precipitation conditions experienced during the grab sample exceedences of 2010 have been repeated and in the 21 grab samples since 2010 there have been no grab sample exceedences.

Pleasant Lake - Public Access Beach (NHLAK700060601-03-02) has been removed from the 303(d) List for impairment of Primary Contact Recreation (i.e. swimming) due to elevated Escherichia coli and placed in Category 2 (Fully Supporting).



Notes:

E.COLI-GEO-CP = Escherchia coli geometric mean calculated from samples collected during the summer critical period.

E.COLI-GRAB-CP = Escherchia coli grab samples collected during the summer critical period.

"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

On September 30th, 2015 EPA approved the 'Total Maximum Daily Load (TMDL) Report for 3 Bacteria Impaired Waters in New Hampshire'. The purpose of the TMDL is to address impairment of primary contact recreation (i.e. swimming) due to bacteria from improperly treated human waste and stormwater runoff. The TMDL report cover three distinct bacterial impairments on three assessment units from the 2010 303(d) list due to *E. coli* (freshwaters primary contact {i.e. swimming}). NH in impairing these waters in the 2014 assessment proposes for comment that these waters be included in the approved bacteria TMDL (and put in category 4a).

A copy of the EPA TMDL approval letter and additional detail documents may be found in http://des.nh.gov/organization/divisions/water/wmb/tmdl/categories/publications.htm.

Since the TMDL has been approved by EPA, NHDES has placed all assessment units included in the TMDL in impairment Category 4A instead of on the 303(d) list (Category 5) for primary contact recreation (i.e. swimming) due to *E. coli* (fresh waters).

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Jewett Brook	Laconia	NHRIV700020201-16	*Escherichia coli*	3-ND	4A-M	TMDL approved or established by EPA (4A)
Locke Lake – Colony Beach	Barnstead	NHIMP700060402-02-05	*Escherichia coli*	2-G	4A-M	TMDL approved or established by EPA (4A)
Great Pond – Great Pond Park Association Beach	Kingston	NHLAK700061403-06-05	*Escherichia coli*	2-M	4A-M	TMDL approved or established by EPA (4A)

GROUP 7. Mercury

Toxic substances are taken up and may accumulate in aquatic organisms. Env-Wq 1703.21(a)(2) specifies that surface waters be free from toxic substances or chemical constituents in concentrations or combinations that persist in the environment or accumulate in aquatic organisms to levels that result in harmful concentrations in edible portions of fish, shellfish, other aquatic life. The New Hampshire Department of Environmental Services, Environmental Health Program performs detailed fish consumption assessments and where warranted publishes fish consumption advisories. For assessment purposes, these published advisories qualify as indicators that the criteria in Env-Wq 1703.21(a)(2) are not being met.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Unnamed Pond	Rochester	NHLAK600030608-02	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Whites Park Pond	Concord	NHLAK700060302-20	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Wood Road Brook	Barrington	NHRIV600030707-18	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Powerline Brook	Barrington	NHRIV600030707-19	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Unnamed Brook	Greenland	NHRIV600030904-27	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Unnamed Brook	New Castle	NHRIV600031001-23	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Unnamed Brook	Portsmouth	NHRIV600031001-24	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Unnamed Brook To The Outlet Of Little Squam Lake	Ashland	NHRIV700010502-13	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Unnamed Brook	Sanbornton	NHRIV700010802-13	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Unnamed Brook	Gilford	NHRIV700020110-08	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Unnamed Brook	Gilford	NHRIV700020110-09	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Unnamed Brook	Strafford	NHRIV700060501-47	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Unnamed Brook	Northwood	NHRIV700060502-49	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Unnamed Trib. To The Souhegan River	Greenville	NHRIV700060902-21	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)

Unnamed Trib. To The Souhegan River	Merrimack	NHRIV700060906-44	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Unnamed Trib. To The Souhegan River	Amherst	NHRIV700060906-45	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Unnamed Brook	Nashua	NHRIV700061001-21	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Unnamed Brook	Harrisville	NHRIV802010202-55	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)

The above list contains new freshwater assessment units for the 2014 cycle with no other sources of mercury. NH in listing this new water on the 2014, 303(d) list proposes for comment that these waters be included in the previously approved mercury TMDL (and put in category 4a). Section 5.1 of the Northeast Regional Mercury TMDL states. In addition to the impaired waters listed in Appendix A, the TMDL may, in appropriate circumstances, also apply to waterbodies that are listed for mercury impairment in subsequent Clean Water Act Section 303(d) Lists of Impaired Waters. For such waterbodies, this TMDL may apply if, after listing the waters for mercury impairment and taking into account all relevant comments submitted on the Impaired Waters List, a state determines with EPA approval of the list that this TMDL should apply to future mercury impaired waterbodies.
(http://des.nh.gov/wmb/tmdl/documents/NortheastRegional/FINAL_Northeast_Regional_Mercury_TMDL.pdf)

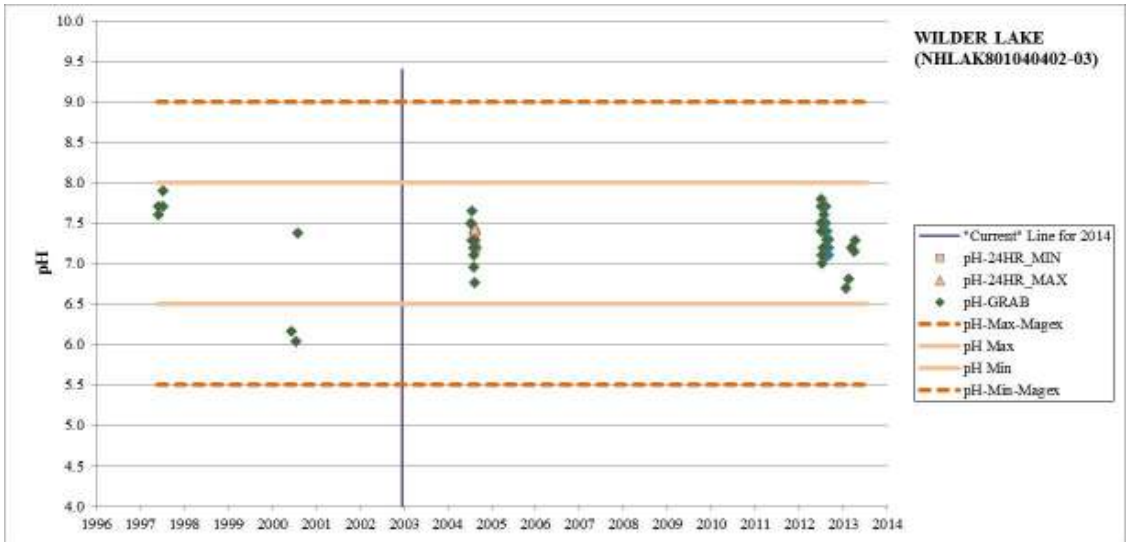
GROUP 8. pH

pH is an important controlling factor is the chemical and biological processes. The toxicity of some material is impacted by pH shifts which also partially controls the solubility of toxic metals. RSA 485-A, II and Env-Wq 1703.18 define the acceptable pH range of surface waters. For the purposes of assessment, the methodologies in the Consolidated Assessment and Listing Methodology will be used to make the greatest use of all available valid data.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Wilder Lake	Lyme	NHLAK801040402-03	pH	5-M	2-G	Applicable WQS attained; reason for recovery unspecified

The Connecticut River - Wilder Lake (NHLAK801040402-03) was listed in 2008 for Aquatic Life Use Support due to low pH readings in 2000. The lower threshold for pH in the water quality standards is 6.5 and the upper threshold in the water quality standards is 8.0. The samples from 2000 were collected at 30-CNT, West Wheelock Street Bridge in June and July when the Connecticut River was flowing at 4,000-6,000 cfs based on USGS gage #01144500, Connecticut River at West Lebanon. Some additional samples were collected in 2004 from 30-CNT at similar flow suggesting that the waterbody met the pH thresholds. In the summer of 2012 a 64 days of sampling were collected at W-01 in the forebay of the Wilder dam. Those W-01 samples covered a wide range of flow conditions, 1,000-6,000 cfs and all samples were between 7.0 and 7.5 pH. In the spring of 2013, additional samples were collected at 30-CNT under what are considered the period of seasonal pH minimum due to snowmelt runoff, February through April, and those samples were above the 6.5 minimum.

The Connecticut River - Wilder Lake (NHLAK801040402-03) has been removed from the 303(d) List and placed in Category 2 (Fully Supporting) for pH to support the Aquatic Life Designated Use Support.



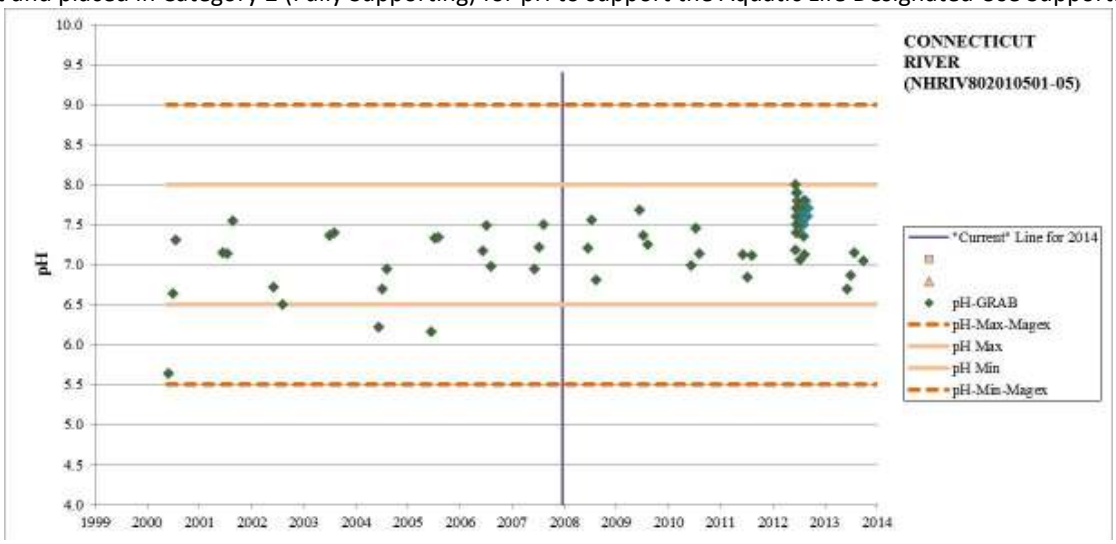
Notes:

pH-24HR_MIN = pH minimum value from a datalogger deployment.
pH-24HR_MAX = pH maximum value from a datalogger deployment.
pH-GRAB = pH value from a grab sample.
"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.
"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Connecticut River	Hinsdale	NHRIV802010501-05	pH	5-M	2-G	Applicable WQS attained; reason for recovery unspecified

The Connecticut River (Vernon dam to Massachusetts border) (NHRIV802010501-05) was listed in 2006 for Aquatic Life Use Support due to low pH readings in 2000, 2004, and 2005. The lower threshold for pH in the water quality standards is 6.5 and the upper threshold in the water quality standards is 8.0. The samples from 2000, 2004, and 2006 were collected at 01-CNT, Rte 10 bridge, Northfield Massachusetts. 01-CNT has been samples three to four times per year, every year since the last low reading with no samples falling below 6.5. Additionally, in 2012, a 76 day datalogger deployment was conducted at station V-TR below the Vernon Dam and powerhouse with neither a daily minimum nor maximum exceeding water quality criteria. The samples since 2006 cover the range of conditions during which the original low reading occurred.

The Connecticut River (Vernon dam to Massachusetts border) (NHRIV802010501-05) has been removed from the 303(d) List and placed in Category 2 (Fully Supporting) for pH to support the Aquatic Life Designated Use Support.



Notes:

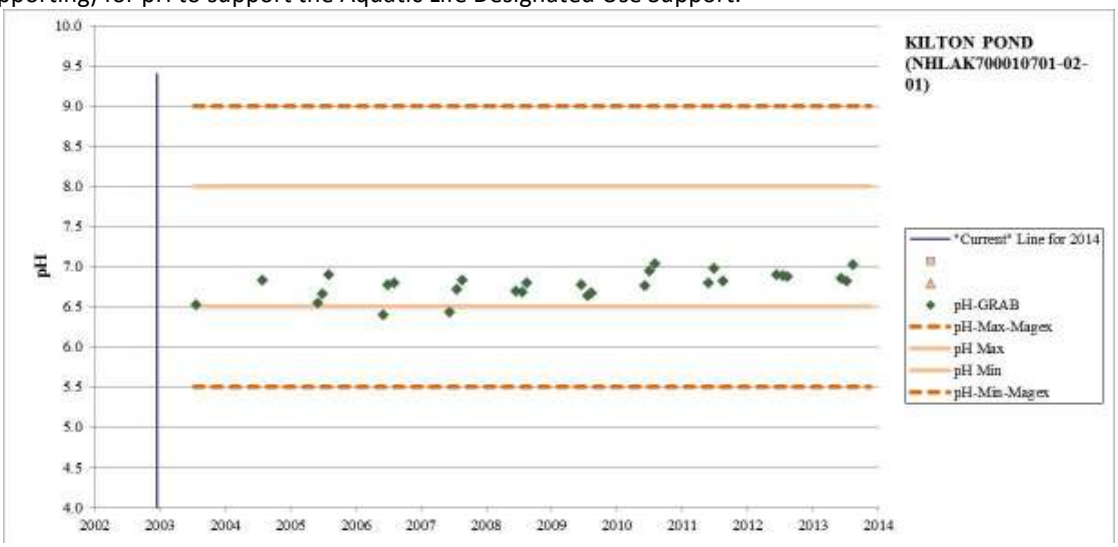
pH-GRAB = pH value from a grab sample.

"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.
"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Kilton Pond	Grafton	NHLAK700010701-02-01	pH	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

The Kilton Pond (NHLAK700010701-02-01) was listed in 2008 for Aquatic Life Use Support due to low pH readings in 2000. All samples for this waterbody are from station KILGRAD and pH there has shown a steady improvement since the last pH below 6.5 in 2007. Since that time, samples have been collected in the most recent six years capturing both similar precipitation and flow conditions and during that time all nineteen samples have been above a pH of 6.5.

The Kilton Pond (NHLAK700010701-02-01) has been removed from the 303(d) List and placed in Category 2 (Fully Supporting) for pH to support the Aquatic Life Designated Use Support.



Notes:
pH-GRAB = pH value from a grab sample.
"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.
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Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Perry Brook	Wolfboro	NHRIV700020101-12	pH	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

Perry Brook (NHRIV700020101-12) was listed in 2010 for Aquatic Life Use Support due to low pH readings in 2004 and 2009. Most samples have been collected at RUSWOLP in June, July, August, and September. Apparent exceedences leading to the original impairment were at RUSWOLP on 7/23/2004 (6.42) and 7/15/2009 (5.62). Of the 34 samples collected in the last ten years the average pH was 6.82 and it is clear looking at the time series that those two low readings were likely in error. Sampling before and after the two low readings captures both similar precipitation and flow conditions.

Perry Brook (NHRIV700020101-12) has been removed from the 303(d) List and placed in Category 2 (Fully Supporting) for pH to support the Aquatic Life Designated Use Support.

Notes:

pH-GRAB = pH value from a grab sample.

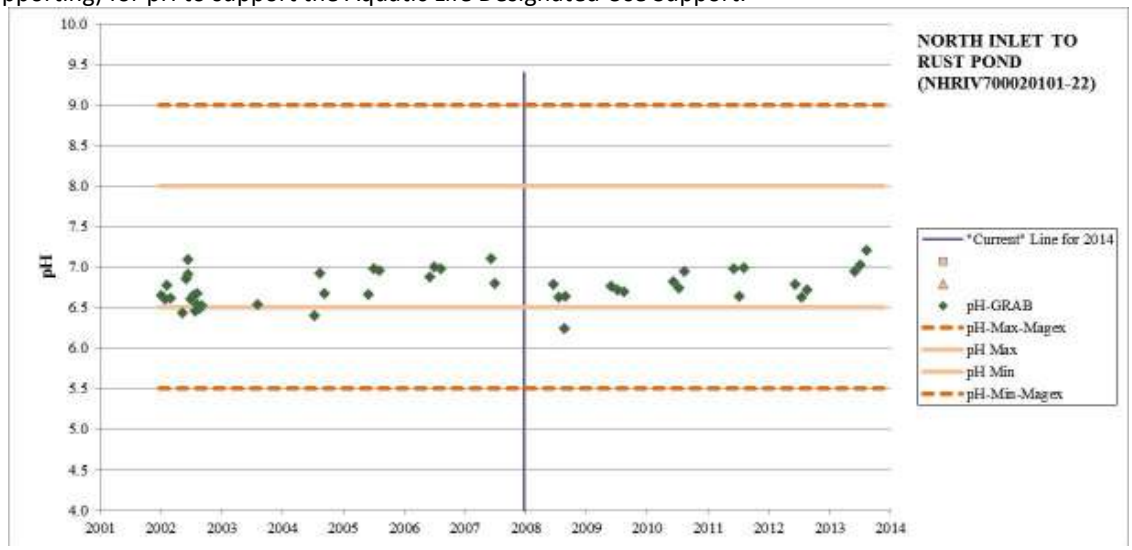
"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
North Inlet To Rust Pond	Wolfboro	NHRIV700020101-22	pH	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

North Inlet To Rust Pond (NHRIV700020101-22) was listed in 2008 for Aquatic Life Use Support due to low pH readings in 2002, 2004, and 2008. All samples have been collected at RUSWOLN in June, July, August, and September. Apparent exceedences leading to the original impairment were on 9/4/2002 (6.49), 7/23/2004 (6.40), and 9/4/2008 (6.24). The sampling site appears to have an overall improving pH condition and the 2008 sample looks to be anomalous. There have been no exceedences in the 15 samples during the last five years with new samples capturing both similar precipitation and flow conditions.

North Inlet To Rust Pond (NHRIV700020101-22) has been removed from the 303(d) List and placed in Category 2 (Fully Supporting) for pH to support the Aquatic Life Designated Use Support.



Notes:

pH-GRAB = pH value from a grab sample.

"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

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Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Colby Brook	Bradford	NHRIV700030302-20	pH	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

Colby Brook (NHRIV700030302-20) was listed in 2012 for Aquatic Life Use Support due to low pH readings in 2006 and 2008. All samples have been collected at MASBRAC2 in June, July, August, and September. The 2012 impairment was due to the reassignment of station MASBRAC2 from NHRIV700030302-07 to NHRIV700030302-20. Apparent exceedences leading to the original impairment were on 6/5/2006 (6.35) and 6/30/2008 (6.38). Sampling site appears to having an improving pH condition with no exceedences in the last 5 years with new samples capturing both similar precipitation and flow conditions.

Colby Brook (NHRIV700030302-20) has been removed from the 303(d) List and placed in Category 2 (Fully Supporting) for pH to support the Aquatic Life Designated Use Support.

Mountain Inn Brook (NHRIV700030302-07) is already impaired for pH based on other data.

Notes:

pH-GRAB = pH value from a grab sample.

"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Hardy Spring Brook	Hopkinton	NHRIV700030505-02	pH	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

Hardy Spring Brook (NHRIV700030505-02) was listed in 2012 for Aquatic Life Use Support due to low pH readings in 2007 and 2011. All samples for this AU have been collected at station CLEHOPO and only two of the 27 samples in the last 10 years fell below 6.5 (6.34 on 7/3/2007 and 6.34 on 6/5/2011). The average of all 27 samples is 6.78 and the two low values look suspect. Sampling since the two low values captures both similar precipitation and flow conditions.

Hardy Spring Brook (NHRIV700030505-02) has been removed from the 303(d) List and placed in Category 2 (Fully Supporting) for pH to support the Aquatic Life Designated Use Support.

Notes:

pH-GRAB = pH value from a grab sample.

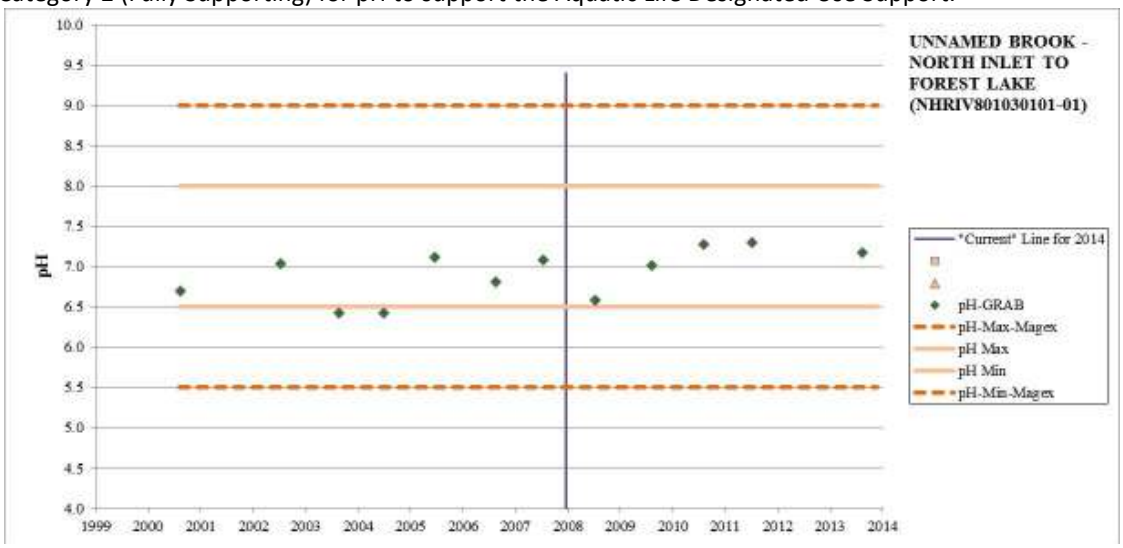
"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Unnamed Brook - North Inlet To Forest Lake	Dalton	NHRIV801030101-01	pH	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

The Unnamed Brook - North Inlet To Forest Lake (NHRIV801030101-01) was listed in 2006 for Aquatic Life Use Support due to low pH readings in 2003 and 2004. There have been no exceedences since 2003 and 2004 and those samples were only slightly below 6.5 pH (both 6.42). Site FORDAL1 has been sampled 8 of the 9 years since the apparent exceedences in 2003 and 2004 capturing similar season, precipitation, and flow conditions.

The Unnamed Brook - North Inlet To Forest Lake (NHRIV801030101-01) has been removed from the 303(d) List and placed in Category 2 (Fully Supporting) for pH to support the Aquatic Life Designated Use Support.



Notes:

pH-GRAB = pH value from a grab sample.

"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

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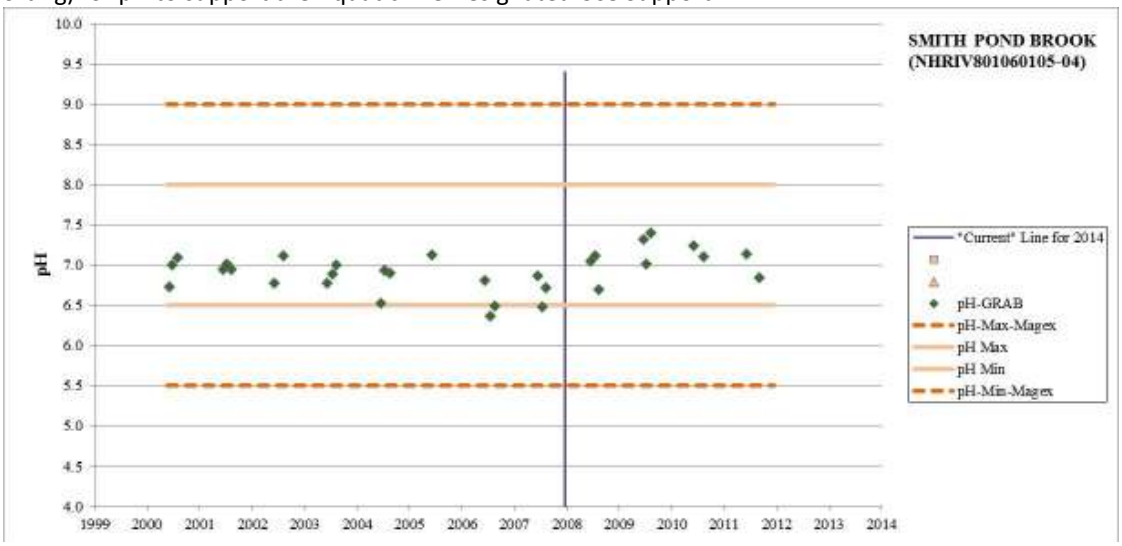
Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Smith Pond Brook	Enfield	NHRIV801060105-04	pH	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

Smith Pond Brook (NHRIV801060105-04) was listed in 2008 for Aquatic Life Use Support due to low pH readings in 2006 and 2007. The original listing was based on minor exceedences, pH of 6.48, 6.49, and 6.37 in 2006 and 2007. Both older and newer data collected at the single station (MASENFS2) used in the assessment of this assessment unit are well within the 6.5 to 8.0 range of the pH criteria. Newer and older samples were collected in the same period of the year at similar flows, and weather conditions.

Smith Pond Brook (NHRIV801060105-04) has been removed from the 303(d) List and placed in Category 2 (Fully Supporting) for pH to support the Aquatic Life Designated Use Support.



Notes:

pH-GRAB = pH value from a grab sample.

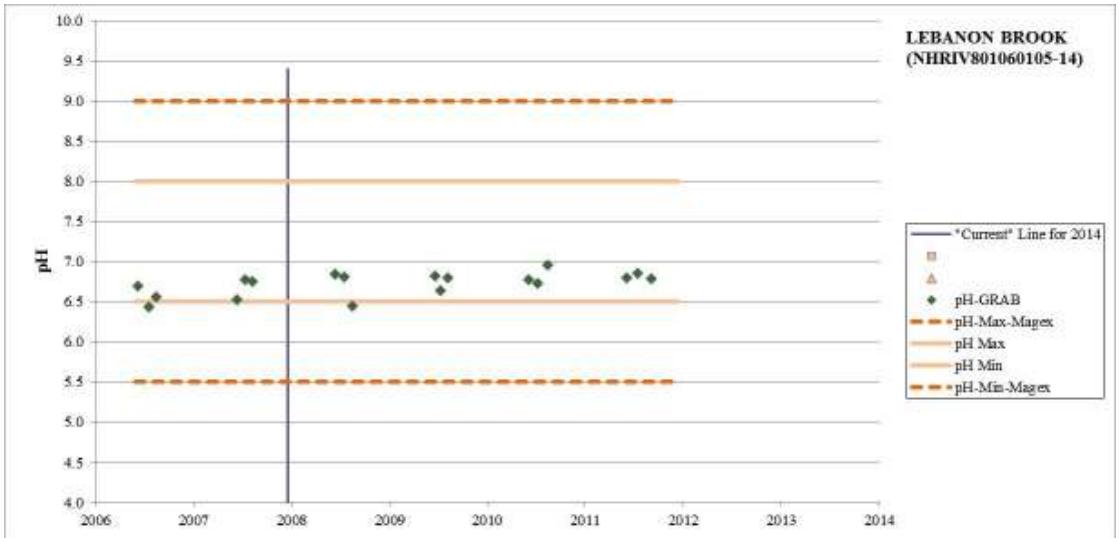
"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Lebanon Brook	Lebanon	NHRIV801060105-14	pH	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

Lebanon Brook (NHRIV801060105-14) was listed in 2012 for Aquatic Life Use Support due to low pH readings in 2006 and 2008. Plot of data over time at the single station (MASENF4A) used for pH assessment on this assessment unit shows consistent improvement with a collection of samples since the apparent 2008 exceedence collected under similar weather and seasonal conditions. The site meets water quality criteria.

Lebanon Brook (NHRIV801060105-14) has been removed from the 303(d) List and placed in Category 2 (Fully Supporting) for pH to support the Aquatic Life Designated Use Support.



Notes:

pH-GRAB = pH value from a grab sample.

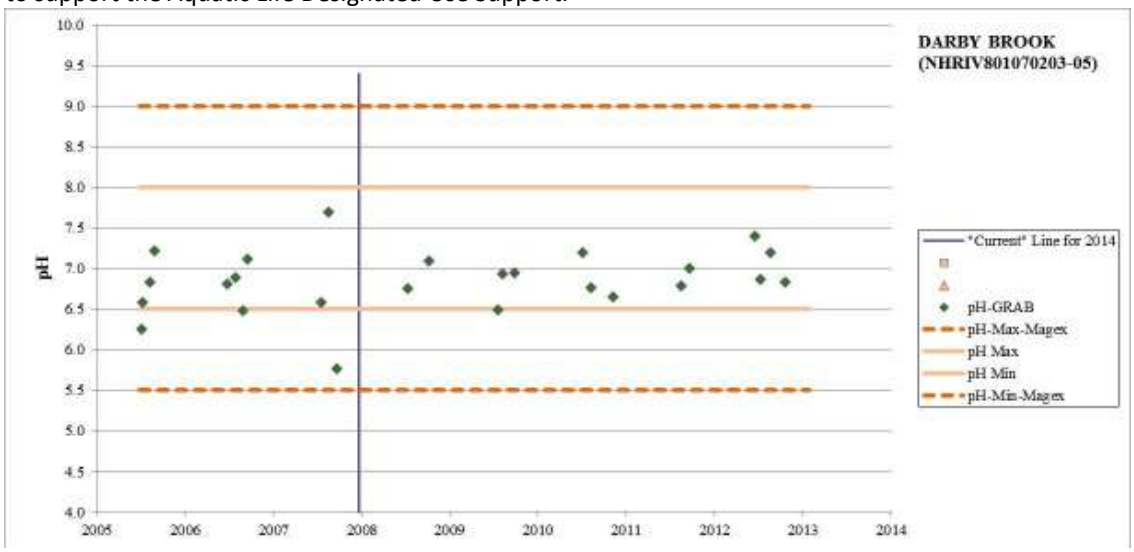
"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Darby Brook	Alstead	NHRIV801070203-05	pH	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

Darby Brook (NHRIV801070203-05) was listed in 2008 for Aquatic Life Use Support due to low pH readings in 2005 and 2007. There have been no exceedences since 2007 with an improving pH trend. Site 01-DAB has had 14 samples in the subsequent 5 years since the apparent exceedences in 2005 and 2007 capturing both similar precipitation and flow conditions.

Darby Brook (NHRIV801070203-05) has been removed from the 303(d) List and placed in Category 2 (Fully Supporting) for pH to support the Aquatic Life Designated Use Support.



Notes:

pH-GRAB = pH value from a grab sample.

"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Beaver Brook	Londonderry	NHRIV700061203-20	pH	5-M	3-ND	Data and/or information lacking to determine water quality status; original basis for listing was incorrect (Category 3)

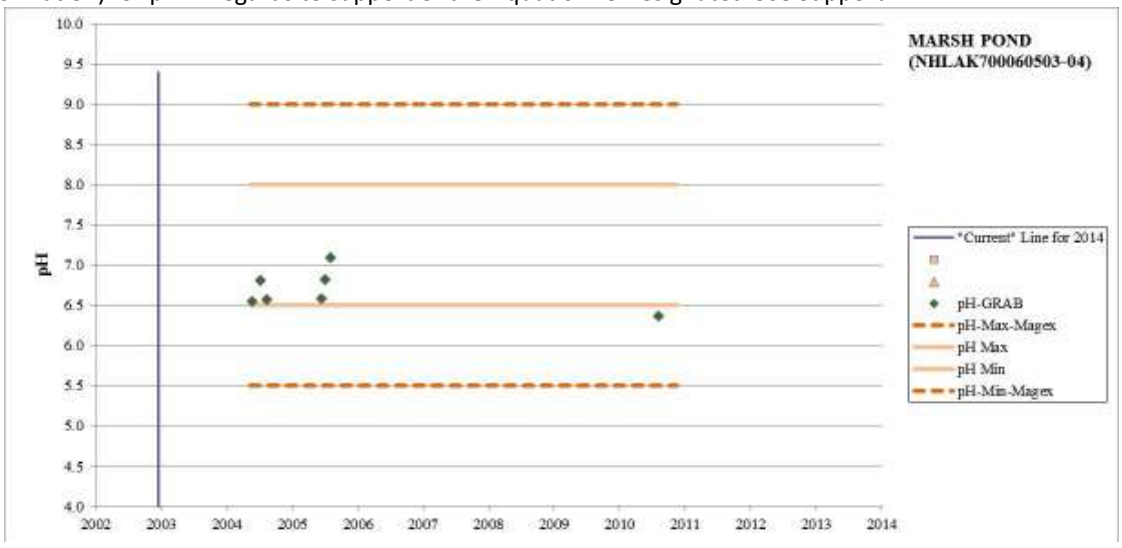
Beaver Brook (NHRIV700061203-20) was listed in 2002 for Aquatic Life Use Support due to low pH readings at station 00M-23. The 00M-23 station corresponds with the current 10-BVR station which is on NHRIV700061203-16. NHRIV700061203-16 is already impaired for pH. Without the miss assigned data, this Beaver Brook (NHRIV700061203-20) converts to 3-ND.

Beaver Brook (NHRIV700061203-20) has been removed from the 303(d) List and placed in Category 3 (No Data) for pH in regards to support the Aquatic Life Designated Use Support.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Marsh Pond	Chichester	NHLAK700060503-04	pH	5-M	3-PNS	Data and/or information lacking to determine water quality status; original basis for listing was incorrect (Category 3)

Marsh Pond (NHLAK700060503-04) was added to the 2008 303(d) list due to low pH for the Aquatic Life Designated Use. While the pH of Marsh Pond had been recorded at the lower end of the acceptable range, no samples had fallen below the State water quality criteria minimum of 6.5. Marsh Pond should not have been included on the 2008 303(d) due to low pH. Since the 2008 cycle, a single sample has been collected, a pH of 6.37 on 8/17/2010. A single low pH, so close to the water quality criteria does not warrant addition on the 303(d) list of impaired waters.

Marsh Pond (NHLAK700060503-04) has been removed from the 303(d) List and placed in Category 3 (Insufficient Information) for pH in regards to support of the Aquatic Life Designated Use Support.



Notes:

pH-GRAB = pH value from a grab sample.

"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason

Contoocook River - 3000 Ft DS Of WWTF To Town Farm Bk - Inc Town Farm Bk	Jaffrey	NHRIV700030101-17	pH	5-P	3-ND	Data and/or information lacking to determine water quality status; original basis for listing was incorrect (Category 3)

The Contoocook River - 3000 Ft DS Of WWTF To Town Farm Bk - Inc Town Farm Bk (NHRIV700030101-17) was listed in 2012 for Aquatic Life Use Support due to low pH readings in 2011. The data collected in 2011 (grab samples and a datalogger deployment) were incorrectly associated with station 31BO-CTC in assessment unit NHRIV700030101-17. This data should have been associated with station 32A-CTC in assessment unit NHRIV700030101-16. In the absence of the incorrectly associated there is no pH data for NHRIV700030101-17.

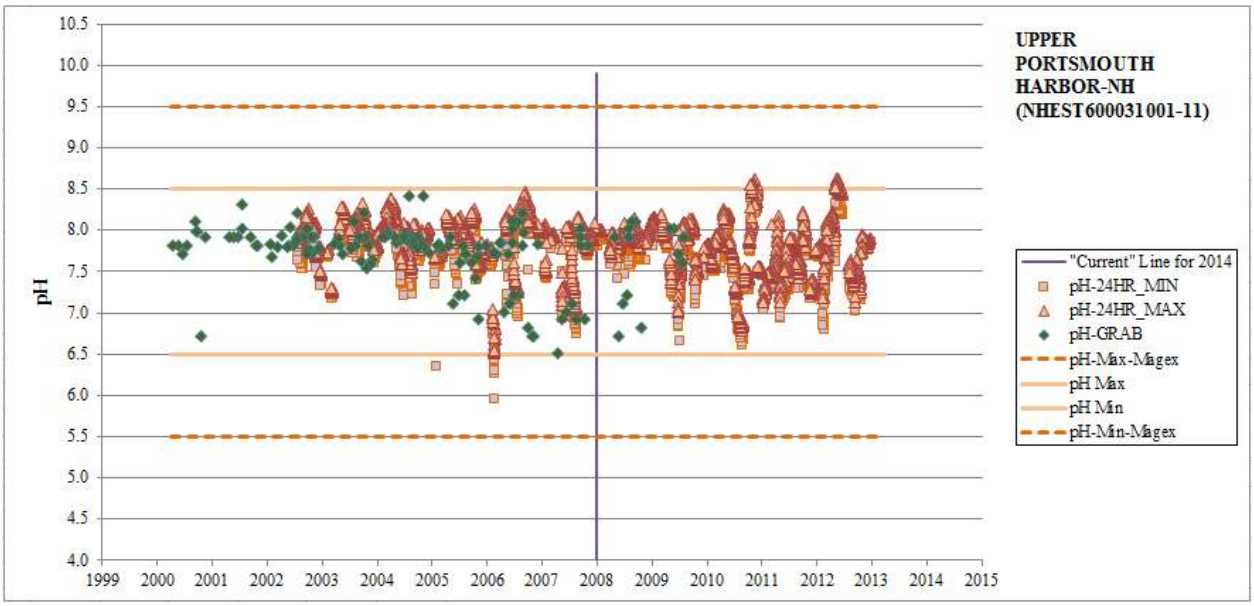
The Contoocook River - 3000 Ft DS Of WWTF To Town Farm Bk - Inc Town Farm Bk (NHRIV700030101-17) has been removed from the 303(d) List and placed in Category 3 (No Data) for pH in regards to support the Aquatic Life Designated Use Support.

NHRIV700030101-16 was listed in 2010 for Aquatic Life Use Support due to low pH.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Upper Portsmouth Harbor-NH	New Castle	NHEST600031001-11	pH	5-M	2-M	Applicable WQS attained; original basis for listing was incorrect

Upper Portsmouth Harbor-NH (NHEST600031001-11) was listed in 2010 for Aquatic Life Use Support due to low pH in 2005 and 2006. Re-examination of the data revealed that the majority of exceedances were recorded during periods in which the datalogger was malfunctioning (1/27/05 – 2/3/05 and 10/24/06 – 12/6/06). Additionally, there were 12 samples collected at station GBCW-11 in 2004 that were reported rounded to the nearest whole value. These data were invalidated and removed from the dataset. During the current assessment cycle evaluating data for the period of 2008 to 2012, 16 grab samples and 1,480 days of datalogger deployment have been collected that include the same conditions as the older data. The upper threshold for pH in the water quality standards is 8.0 and the lower threshold is 6.5. For marine waters, the pH is buffered near 8.0 by the calcium carbonate system. Review of data from the USEPA National Coastal Assessment indicates that the acceptable pH range is between 7.0 – 8.5. As such, in marine waters, a pH of up to 8.5 is acceptable under the natural clause of Env-Wq 1703.18. Between 2008 and 2012 there were no exceedances of the lower threshold and only 33 exceedances of the upper threshold (2.2% of samples). It is also worth noting that only the absolute minimum and maximum for each day of a datalogger deployment are used for assessment purposes making the assessment inherently conservative. Re-examination of the data indicates that the assessment unit meets water quality standards (i.e. per the CALM, >10% of samples must exceed water quality standards to list as impaired).

Upper Portsmouth Harbor-NH (NHEST600031001-11) has been removed from the 303(d) List and placed in Category 2 (Fully Supporting) for pH to support the Aquatic Life Designated Use Support.



Notes:

pH-24HR_MIN = 24 hour minimum pH from a datalogger

pH-24HR_MAX = 24 hour maximum pH from a datalogger

pH-GRAB = pH value from a grab sample.

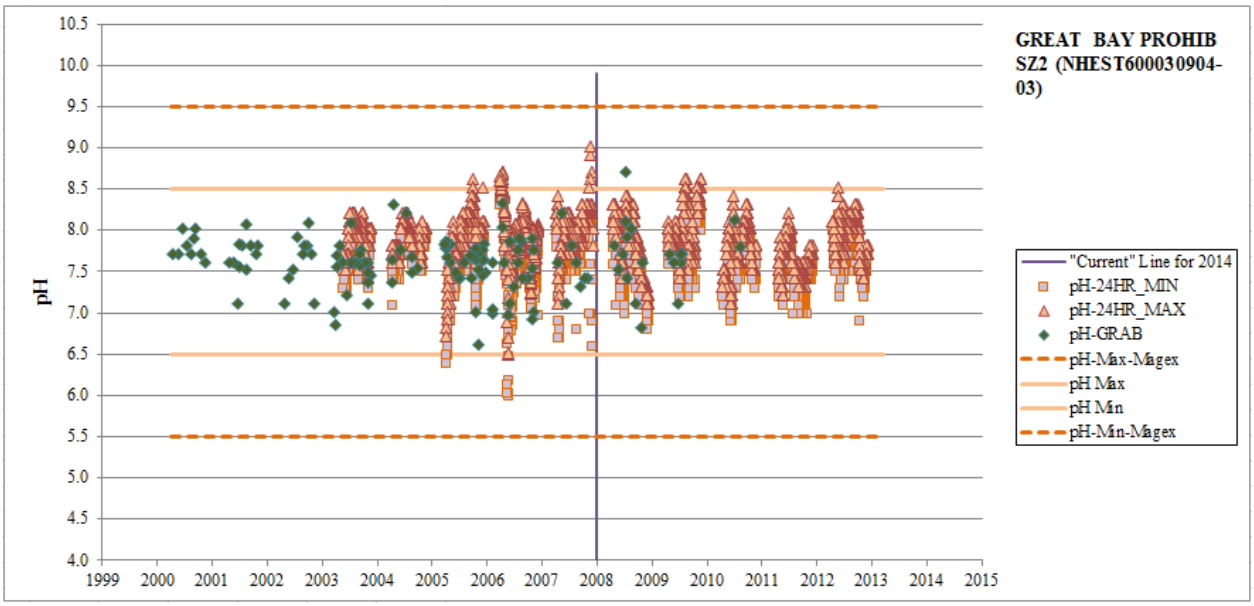
"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Great Bay Prohib SZ2	Newmarket	NHEST600030904-03	pH	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

Great Bay Prohib SZ2 (NHEST600030904-03) was listed in 2006 for Aquatic Life Use Support due to high pH collected at station GRBGB in 2004. Re-examination of the data revealed that the datasonde deployed from 11/24/04 – 12/10/04, appears as though it may have been malfunctioning and giving aberrant readings. During this deployment the minimum reading was 8.3, and maximum was 9.6 with an average reading of 9.2. In addition to the aberrant high readings during the 11/24/04 – 12/10/04 deployment, there were also 1-2 day long periods of data that were invalidated by the technician "caused by temporary fouling or entanglement by eelgrass or algae." The previous deployment had an average reading of 7.9, versus the 9.2 average from 11/24/04 – 12/10/04, and may indicate that the probe was malfunctioning and not fouled. Unfortunately, this was the final deployment of the year, so further comparisons of pH could not be made. There were also 8 samples collected at station GBCW-04 in 2004 that were reported rounded to the nearest whole vales. These data were invalidated and removed from the dataset. During the current assessment cycle evaluating data for the period of 2008 to 2012, 19 grab samples and 1,127 days of datalogger deployment have been collected and cover the same conditions as the older data. The upper threshold for pH in the water quality standards is 8.0 and the lower threshold is 6.5. For marine waters, the pH is buffered near 8.0 by the calcium carbonate system. Review of data from the USEPA National Coastal Assessment indicates that the acceptable pH range is between 7.0 – 8.5. As such, in marine waters, a pH of up to 8.5 is acceptable under the natural clause of Env-Wq 1703.18. Between 2008 and 2012 there were no exceedances of the lower threshold and only seven exceedances of the upper threshold (0.5% of samples). It is also worth noting that only the absolute minimum and maximum for each day of a datalogger deployment are used for assessment purposes making the assessment inherently conservative. Although there are still short term exceedances of the water quality standards, there is sufficient data that indicates that the conditions from 2004 are no longer representative of the conditions at Great Bay Prohib SZ2 (NHEST600030904-03).

Great Bay Prohib SZ2 (NHEST600030904-03) has been removed from the 303(d) List and placed in Category 2 (Fully Supporting) for pH to support the Aquatic Life Designated Use Support.



Notes:

pH-24HR_MIN = 24 hour minimum pH from a datalogger

pH-24HR_MAX = 24 hour maximum pH from a datalogger

pH-GRAB = pH value from a grab sample.

"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Great Bay - Cond Appr	Newington	NHEST600030904-04-05	pH	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

Great Bay - Cond Appr (NHEST600030904-04-05) was listed in 2006 for Aquatic Life Use Support due to high pH collected at station GRBGB in 2004. Re-examination of the data revealed that the datasonde deployed from 11/24/04 – 12/10/04, appears as though it may have been malfunctioning and giving aberrant readings. During this deployment the minimum reading was 8.3, and maximum was 9.6 with an average reading of 9.2. In addition to the aberrant high readings during the 11/24/04 – 12/10/04 deployment, there were also 1-2 day long periods of data that were invalidated by the technician "caused by temporary fouling or entanglement by eelgrass or algae." The previous deployment had an average reading of 7.9, versus the 9.2 average from 11/24/04 – 12/10/04, and may indicate that the probe was malfunctioning and not fouled. Unfortunately, this was the final deployment of the year, so further comparisons of pH could not be made. These data were invalidated and removed from the dataset. During the current assessment cycle evaluating data for the period of 2008 to 2012,12 grab samples and 1,127 days of datalogger deployment have been collected and cover the same conditions as the older data. The upper threshold for pH in the water quality standards is 8.0 and the lower threshold is 6.5. For marine waters, the pH is buffered near 8.0 by the calcium carbonate system. Review of data from the USEPA National Coastal Assessment indicates that the acceptable pH range is between 7.0 – 8.5. As such, in marine waters, a pH of up to 8.5 is acceptable under the natural clause of Env-Wq 1703.18. Between 2008 and 2012 there were no exceedances of the lower threshold and only six exceedances of the upper threshold (0.5% of samples). It is also worth noting that only the absolute minimum and maximum for each day of a datalogger deployment are used for assessment purposes making the assessment inherently conservative. Although there are still short term exceedances of the water quality standards, there is sufficient data that indicates that the conditions from 2004 are no longer representative of the conditions at Great Bay - Cond Appr (NHEST600030904-04-05).

Great Bay - Cond Appr (NHEST600030904-04-05) has been removed from the 303(d) List and placed in Category 2 (Fully Supporting) for pH to support the Aquatic Life Designated Use Support.

Notes:

pH-24HR_MIN = 24 hour minimum pH from a datalogger

pH-24HR_MAX = 24 hour maximum pH from a datalogger

pH-GRAB = pH value from a grab sample.

"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

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GROUP 9. Chlorophyll-a and Total Phosphorus – Aquatic Life Use Support

The acceptable levels of nutrients in surface waters are governed by Administrative Rule Env-Wq 1703.14 which requires that there be a natural level of nutrients in Class A waters or no nutrients in such quantities as to impair any designated uses in Class B waters. Therefore, assessments to determine compliance with Env-Wq 1703.14 need to consider both indicators of nutrients and nutrient-related impairments. In freshwater lakes, the indicators for nutrient levels are Chlorophyll-a and Total Phosphorus concentrations because phosphorus is the limiting nutrient in freshwaters.

In lake systems, the maintenance of a balanced, integrated, and adaptive community of organisms described in Env-Wq 1703.19 is reflected in a stable level of productivity. Phosphorus, as the limiting nutrient in lake systems, controls the ability of algae, the foundation of lake productivity, to grow and reproduce. The biomass of algae is indicated by the concentration of chlorophyll-a. Lakes are commonly categorized into productivity regimes or trophic classes. While trophic class will shift over long geologic periods, it should not shift within the modern era.

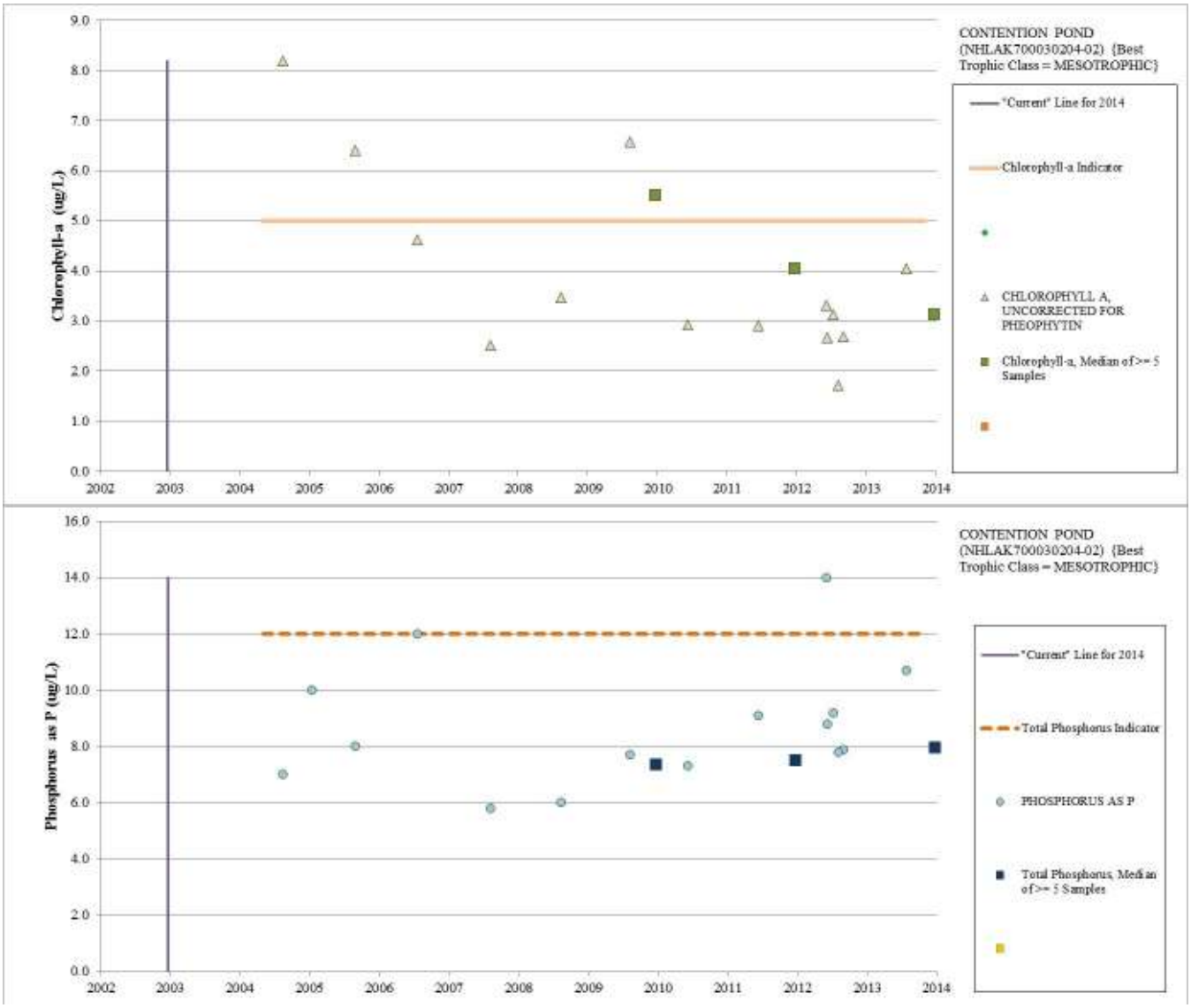
In order to assess compliance with Env-Wq 1703.14 for the freshwater lakes, the indicator of nutrients and nutrient-related impact indicator are combined using a stressor-response decision matrix. The response indicator is chlorophyll-a concentrations (a measure of algae growth). The stressor indicator is total phosphorus concentrations, because phosphorus is the limiting nutrient in freshwater lakes. Following the decision matrix, if there are both elevated nutrients and an adverse response in the same assessment unit, then that assessment unit would be considered to have excess nutrients in violation of Env-Wq 1703.14. For the purposes of assessment, a lake will be considered to have a balanced, integrated, and adaptive community described in Env-Wq 1703.19 if the summer median chlorophyll-a is within the normal range as describe in the methods below. The steps used for this assessment process are discussed in detail in the Consolidated Assessment and Listing Methodology.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Contention Pond	Hillsborough	NHLAK700030204-02	Chlorophyll-a	5-M	2-M	Applicable WQS attained; reason for recovery unspecified
Contention Pond	Hillsborough	NHLAK700030204-02	Phosphorus (Total)	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

Contention Pond (NHLAK700030204-02) was listed in 2010 for Aquatic Life Use Support due to high chlorophyll-a readings from 2004 to 2009 which lead to a high summer median chlorophyll-a concentration over that time period. During the 2010 assessment the stressor total phosphorus was also listed as an impairment to Contention Pond.

Since the 2010 assessment three additional years of summer sampling have demonstrated that the overall Chlorophyll-a concentrations have decreased and remained below the 5.0 ug/L chlorophyll-a indicator threshold used for lakes whose best historic trophic class is 'mesotrophic'.

Contention Pond (NHLAK700030204-02) has been removed from the 303(d) List and placed in Category 2 (Fully Supporting) for Chlorophyll-a and Total Phosphorus to support the Aquatic Life Designated Use Support.



Notes:

"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older

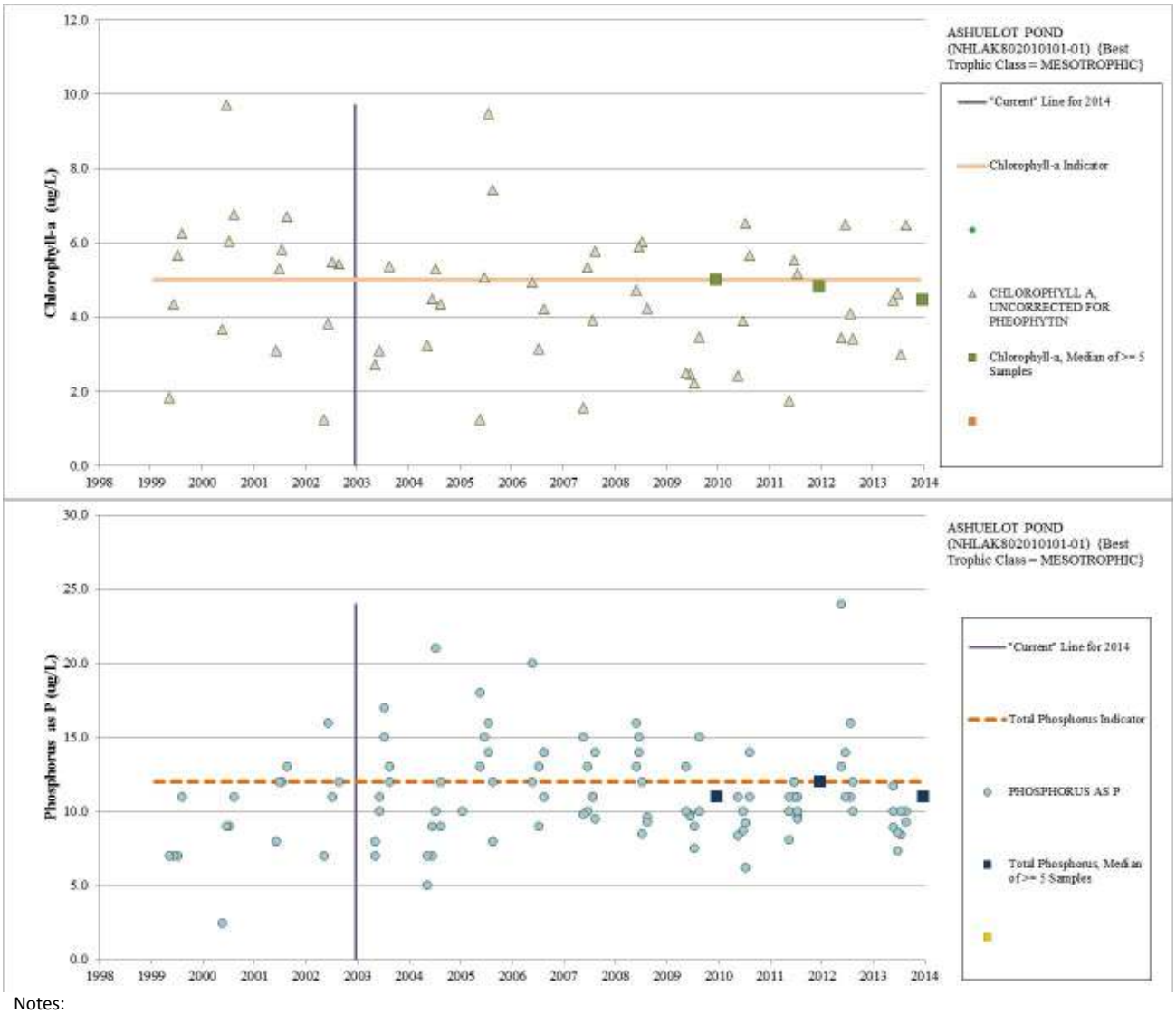
data is provided for context. See the 2014 CALM for addition details.

Assessment Unit Name	Primary Town	Assessment Unit ID	Parameter Name	2012	2014	Short Delist Reason
Ashuelot Pond	Washington	NHLAK802010101-01	Chlorophyll-a	5-M	2-M	Applicable WQS attained; reason for recovery unspecified
Ashuelot Pond	Washington	NHLAK802010101-01	Phosphorus (Total)	5-M	2-M	Applicable WQS attained; reason for recovery unspecified

Ashuelot Pond (NHLAK802010101-01) was listed in 2010 for Aquatic Life Use Support due to May through September monthly chlorophyll-a readings from 1999 to 2009 which lead to a high summer median chlorophyll-a concentration over that time period. During the 2010 assessment the stressor total phosphorus was also listed as an impairment to Ashuelot Pond.

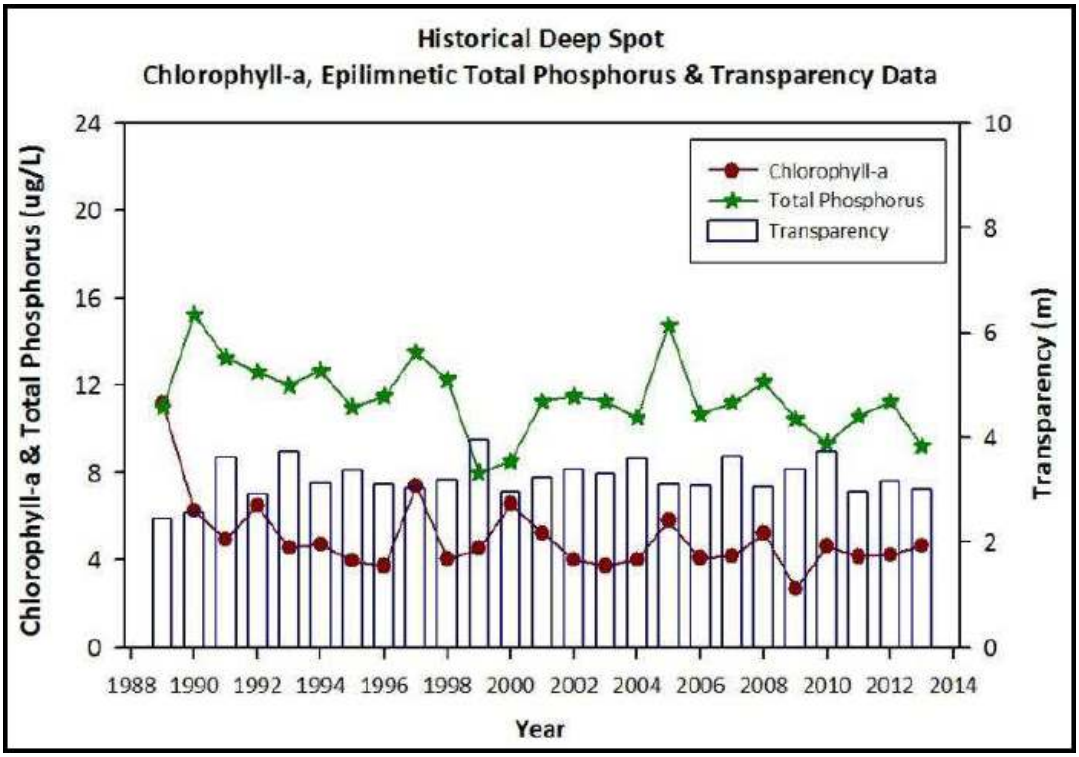
Since the 2010 assessment, three additional years of monthly chlorophyll-a samples have demonstrated that the overall Chlorophyll-a concentrations have decreased and remained below the median 5.0 ug/L chlorophyll-a indicator used for lakes whose best historic trophic class is 'mesotrophic'. The recent chlorophyll-a median trend follows the long term trend as shown in the Volunteer Lake Assessment annual report. The Ashuelot Pond Association is very active in monitoring and educating residents on ways to reduce impact on the lake.

Ashuelot Pond (NHLAK802010101-01) has been removed from the 303(d) List and placed in Category 2 (Fully Supporting) for Chlorophyll-a and Total Phosphorus to support the Aquatic Life Designated Use Support.



Notes:

"Current" Line for 2014 – Per the methodology outlined in the CALM, all data from this referenced data is considered 'current' unless. Available older data is provided for context. See the 2014 CALM for addition details.



(http://des.nh.gov/organization/divisions/water/wmb/vlap/annual_reports/2013/documents/ashuelot-washington.pdf)

Assessment Unit Name	Primary Town	Assessment Unit ID	Designated Use	Parameter Name	2012	2014	Short Delist Reason
Pearly Lake	Rindge	NHLAK802020103-08	Aquatic Life	Chlorophyll-a	5-M	4A-M	TMDL Approved
				Phosphorus (Total)	5-M	4A-M	TMDL Approved
				Dissolved Oxygen	5-M	4A-M	TMDL Approved
			Primary Contact Recreation (i.e. swimming)	Chlorophyll-a	5-M	4A-M	TMDL Approved
				Cyanobacteria	5-M	4A-M	TMDL Approved
Pearly Lake - Pearly Lake Beach	Rindge	NHLAK802020103-08-02	Primary Contact Recreation (i.e. swimming)	Cyanobacteria	5-M	4A-M	TMDL Approved

Pearly Lake (NHLAK802020103-08) was listed in 2010 for Aquatic Life Use Support due to May through September monthly chlorophyll-a readings which lead to a high summer median chlorophyll-a concentration over that time period. During the 2010 assessment the stressor total phosphorus was also listed as an impairment to Ashuelot Pond. Primary Contact Recreation (i.e. swimming) was listed as impaired for chlorophyll-a in the 2004 assessment cycle. Additionally, in the 2004 assessment cycle, Dissolved Oxygen Saturation was added as an impairment to Aquatic Life Use Support. In 2010 cyanobacteria was also added to the list of impairments to Primary Contact Recreation (i.e. swimming) on Pearly Lake (NHLAK802020103-08) and Pearly Lake Beach (NHLAK802020103-08-02) based on blooms on the lake and the associated advisories and warnings.

On September 24th, 2014 EPA approved the 'Lake Phosphorus TMDL for Pearly Lake'. The purpose of this TMDL is to address the phosphorus-related impairments of hepatotoxic cyanobacteria, chlorophyll a, dissolved oxygen and total phosphorus. Since the TMDL has been approved by EPA, NHDES has placed the impairments above which were included in the TMDL into impairment Category 4A instead of on the 303(d) list (Category 5).

GROUP 10. Total Nitrogen – Aquatic Life Use Support

Regarding Numeric Nitrogen Thresholds from the "2009 Report" for the Great Bay Estuary

In response to the worrisome eutrophication trends, the department developed numeric nutrient thresholds for the Great Bay Estuary as numeric translators of the narrative standard to determine compliance with Env-Wq 1703.14 (NHDES, Numeric Nutrient Criteria for the Great Bay Estuary. New Hampshire Department of Environmental Services, Concord, NH. June 2009. (R-WD-09-12), 2009). These translators were site-specific in that they only apply to particular assessment units in the Great Bay Estuary. Numeric translators were developed for chlorophyll-a, light attenuation (a general measure of water clarity), total nitrogen, and eelgrass cover. Translators were not needed for dissolved oxygen and dissolved oxygen saturation because the State already has water quality criteria for these parameters (Env-Wq 1703.07).

The numeric thresholds for the Great Bay Estuary were used as part of a stressor–response decision matrix to determine which water body segments should be included on the 2008, 2010, and 2012 ((NHDES, 2008) Section 303(d) lists of impaired waters for nutrients.

In March 2010, EPA initiated an independent peer review of the nutrient thresholds for the Great Bay estuary. The peer review process was administered by the environmental engineering consulting firm Tetra Tech through the Nutrient Scientific Technical Exchange Partnership and Support (N-Steps) program. The reviewers found the Great Bay nutrient thresholds were well explained and supported by appropriate literature and reasoning.

Due to a high level of interest from stakeholder communities, the nutrient thresholds were reviewed by another external peer review panel consisting of four independent specialists in the fields of estuarine water quality, modeling, dissolved oxygen, and eelgrass biology. The panel completed its work in February 2014. The questions to the panel were focused on whether the report was sufficient to prove that nitrogen was the primary cause of ecological changes in the Great Bay Estuary.

The reviewers indicated that there was a reasonable basis for finding some parts of the Great Bay Estuary system impaired for eelgrass loss. The reviewers also agreed that nitrogen is an important factor related to eelgrass and other response variables in the estuary. However, they concluded that the NHDES 2009 report did not adequately demonstrate that nitrogen is the primary factor causing eelgrass decline in the Great Bay Estuary because the report did not explicitly consider all of the other potentially confounding factors in developing relationships between nitrogen and the presence of eelgrass.

As a result of a court approved settlement agreement, the department will cease using the nitrogen concentration thresholds from the NHDES 2009 Report (NHDES, Numeric Nutrient Criteria for the Great Bay Estuary. New Hampshire Department of Environmental Services, Concord, NH. June 2009. (R-WD-09-12), 2009) to assess nitrogen impairments in its 2014 assessment. The CALM was changed to reflect that the stressor-response matrix previously used to determine total nitrogen impairment status will not be used. In the 2014 assessment, the department will assess the parameters listed above (dissolved oxygen, chlorophyll-a, light attenuation, total nitrogen, and eelgrass cover) independently relative to their respective numeric or narrative water quality standards.

In regards to total nitrogen, the department is in the process of determining new assessment approaches. Because that process is incomplete, the department will utilize existing data for each assessment unit to make a determination of impairment status. Current methods for calculating and making assessments are provided in 2014 CALM. In their comments on the draft 2014 303(d), EPA made reference to

their Technical Support Document which provided EPA's rationale for the September 24, 2015 approval of New Hampshire's 2012 303(d) (USEPA, 2015). Further, EPA questioned whether New Hampshire's administrative record provided an adequate basis for the proposal not to list certain Great Bay Estuary segment/impairment combinations.

NHDES recognizes the concerns raised by EPA regarding the proposed delistings and values the subsequent conversations that occurred. From those EPA discussions it is clear that NHDES cannot make a non-assessment where data is readily available and assessments were previously completed and approved through the 303(d) process. Further, from those discussions about the Draft 2014 303(d) and the 2012 303(d) Approval (USEPA, 2015), it is clear that NHDES must have a clear and rational basis to delist any waterbody segments.

LITTLE BAY

The Little Bay assessment units (NHEST600030904-06-12, NHEST600030904-06-11, NHEST600030904-06-10, NHEST600030904-06-19, NHEST600030904-06-18, NHEST600030904-06-14, NHEST600030904-06-15) were first listed as impaired for excess total nitrogen on the 2008 303(d) based on the August 14, 2009 amendment (http://des.nh.gov/organization/divisions/water/wmb/swqa/2008/index.htm). The August 14, 2009 amendment was based on the numeric nutrient criteria translator document published by NHDES (NHDES, 2009) previously discussed which is no longer being used as a translator for the states narrative criteria.

The median total nitrogen from 2008 through 2013 was 390 ug/L (n=78). New Hampshire is no longer comparing ambient total nitrogen data to the total nitrogen numeric indicators used in the 2012 assessment as translators for the narrative water quality criteria. Although based on only grab samples, the measurements in this assessment zone do not demonstrate dissolved oxygen concentration exceedences and there were occasional grab samples at or below 75 percent saturation. The calculated 90th percentile chlorophyll-a in this assessment zone is 8.9 ug/L (n = 95) and a maximum reading of 16.5 ug/L. Like dissolved oxygen, chlorophyll-a is marginally better than the indicator. The eelgrass beds are severely degraded (86.3% reduction from historic) and the available light attenuation (median=0.948 m^-1 (n=60)) is poor. For shallow systems, it is expected that changes in macroalgae will precede changes in phytoplankton (McGlathery, Sundbäck, & Anderson, 2007) (Valiela, et al., 1997), as appears to be occurring in the Great Bay Estuary. At this time there are some of the classic indicators of nutrient eutrophication present in this assessment zone and Total Nitrogen remains elevated. However, there are insufficient response datasets leading to the determine that eutrophication by total nitrogen is alone is not known to be strong enough to warrant impairment under New Hampshire's narrative standard. As such, this assessment zone has been assessed as Insufficient Information – Potentially Not Supporting (3-PNS) for total nitrogen.

BELLAMY RIVER

The Bellamy River assessment units (NHEST600030903-01-01, NHEST600030903-01-03, NHEST600030903-01-04) were first listed as impaired for excess total nitrogen on the 2008 303(d) based on the August 14, 2009 amendment (http://des.nh.gov/organization/divisions/water/wmb/swqa/2008/index.htm). The August 14, 2009 amendment was based on the numeric nutrient criteria translator document published by NHDES (NHDES, 2009) previously discussed which is no longer being used as a translator for the states narrative criteria.

The median total nitrogen from the very limited 2008 through 2013 data was 557 ug/L (n=3). New Hampshire is no longer comparing ambient total nitrogen data to the total nitrogen numeric indicators used in the 2012 assessment as translators for the narrative water quality criteria. The limited current grab samples for dissolved oxygen concentration (2008 - 2010) indicate that this assessment zone meets the water quality criteria. However, there are no data to evaluate dissolved oxygen percent saturation. The scarcity of data for this assessment zone is also reflected in the three chlorophyll-a samples collected from 2008 through 2013. While there are only three light attenuation measurements from 2008 through 2013 they were 0.807, 1.235, and 1.613 m^-1, all of which are indicative of poor light transmittance. Eelgrass has been absent from this assessment zone since 1981 with small reoccurrence in 2004 (0.8 acres). No sampling efforts have taken place to evaluate the extent of epiphytes and macrophytes. This assessment zone is generally characterized by its lack of eutrophication indicator data. There are not sufficient datasets to determine that eutrophication by total nitrogen is alone is not known to be strong enough to warrant impairment under New Hampshire's narrative standard. As such, this assessment zone has been assessed as Insufficient Information – Potentially Not Supporting (3-PNS) for total nitrogen.

UPPER PISCATAQUA RIVER

The Upper Piscataqua River assessment units (NHEST600031001-01-01, NHEST600031001-01-02, NHEST600031001-01-03) were first listed as impaired for excess total nitrogen on the 2008 303(d) based on the August 14, 2009 amendment (http://des.nh.gov/organization/divisions/water/wmb/swqa/2008/index.htm). The August 14, 2009 amendment was based on the numeric nutrient criteria translator document published by NHDES (NHDES, 2009) previously discussed which is no longer being used as a translator for the states narrative criteria.

The median total nitrogen from 2008 through 2013 was 454 ug/L (n=53). New Hampshire is no longer comparing ambient total nitrogen data to the total nitrogen numeric indicators used in the 2012 assessment as translators for the narrative water quality criteria. While the Dissolved oxygen data shows that this assessment zone experiences short duration concentrations below the 5 mg/L criteria, they do not support an impairment determination for DO. The 24 hour average dissolved oxygen percent saturation did not fall below 75% in the available dataset. The calculated 90th percentile chlorophyll-a in this assessment zone is 7.2 ug/L (n = 73) and a maximum reading of 24.5 ug/L. Although the probe-based chlorophyll-a data (not used in the median above) collected from the UPR stations was qualified as "estimated" per EPA, due to poor correlation between probe and extracted chlorophyll-a grab sample data, the relative biomass is valid and shows large spikes in chlorophyll-a under certain conditions. The grab sample-based light attenuation (median=1.330 m^-1 (n=53)) is quite poor suggesting strong resuspension in the system. For shallow systems, it is expected that changes in macroalgae will precede changes in phytoplankton (McGlathery, Sundbäck, & Anderson, 2007) (Valiela, et al., 1997), as appears to be occurring in the Great Bay Estuary. The foremost authority on macroalgae for this estuary, Dr. Arthur C. Mathieson, commented on the draft 2012 303(d) that he remains concerned about the macroalgae and epiphyte conditions in Great Bay (NHDES, 2013). At this time there are some of the classic indicators of nutrient eutrophication present in this assessment zone and Total Nitrogen remains high. However, there are insufficient response datasets to determine that the eutrophication by total nitrogen alone is not known to be strong enough to warrant impairment under New Hampshire's narrative standard. As such, this assessment zone has been assessed as Insufficient Information – Potentially Not Supporting (3-PNS) for total nitrogen.

PORTSMOUTH HARBOR

The Portsmouth Harbor assessment unit (NHEST600031001-11) was first listed as impaired for excess total nitrogen on the 2008 303(d) based on the August 14, 2009 amendment (http://des.nh.gov/organization/divisions/water/wmb/swqa/2008/index.htm). The August 14, 2009 amendment was based on the numeric nutrient criteria translator document published by NHDES (NHDES, 2009) previously discussed which is no longer being used as a translator for the states narrative criteria.

The median total nitrogen from 2008 through 2013 was 266 ug/L (n=56). New Hampshire is no longer comparing ambient total nitrogen data to the total nitrogen numeric indicators used in the 2012 assessment as translators for the narrative water quality criteria. In the continuous data (2008-2013) there was only one day that had a documented exceedance of the dissolved oxygen concentration and percent saturation criteria. The chlorophyll-a data indicates that this assessment zone meets the chlorophyll-a indicator to protect dissolved oxygen. The eelgrass beds are severely degraded. The available light attenuation data (median=0.600 m^-1 (n=41)) appears inadequate for the 3 m restoration depth but may be reflective the Total Suspended Solids (TSS) load from the Portsmouth WWTF. While total nitrogen is elevated above the estimated offshore total nitrogen concentration of 200 ug/L, the data suggest that Portsmouth Harbor total nitrogen is decreasing. At this time there are some of the classic indicators of nutrient eutrophication present in this assessment zone and total nitrogen remains elevated. However, there is insufficient power in the response datasets to determine that eutrophication by total nitrogen is alone is not known to be strong enough to warrant impairment under New Hampshire's narrative standard. As such, this assessment zone has been assessed as Insufficient Information – Potentially Not Supporting (3-PNS) for total nitrogen.

LITTLE HARBOR/BACK CHANNEL

The Little Harbor/Back Channel assessment units (NHEST600031001-05, NHEST600031001-08, NHEST600031002-02) were first listed as impaired for excess total nitrogen on the 2008 303(d) based on the August 14, 2009 amendment (http://des.nh.gov/organization/divisions/water/wmb/swqa/2008/index.htm). The August 14, 2009 amendment was based on the numeric nutrient criteria translator document published by NHDES (NHDES, 2009) previously discussed which is no longer being used as a translator for the states narrative criteria.

The median total nitrogen from the limited data covering 2008 through 2013 was 465 ug/L (n=4). New Hampshire is no longer comparing ambient total nitrogen data to the total nitrogen numeric indicators used in the 2012 assessment as translators for the narrative water quality criteria. From grab samples only, the dissolved oxygen concentration data in this assessment zone attains standards however there are no usable percent saturation data available. The limited chlorophyll-a data suggests that this assessment zone would meet chlorophyll-a indicator to protect dissolved oxygen. The eelgrass beds are less than half their historic extent. The limited available light attenuation data (median=1.046 m^-1 (n=2)) is inadequate for the 3 m restoration depth. This assessment zone is generally characterized by its lack eutrophication indicator data. Overall, there is insufficient power in the response datasets to determine that eutrophication by total nitrogen is alone is not known to be strong enough to warrant impairment under New Hampshire's narrative standard. As such, this assessment zone has been assessed as Insufficient Information – Potentially Not Supporting (3-PNS) for total nitrogen.

COCHECO RIVER

The Cocheco River assessment unit (NHEST600030608-01) was first listed as impaired for excess total nitrogen on the 2008 303(d) based on the August 14, 2009 amendment (http://des.nh.gov/organization/divisions/water/wmb/swqa/2008/index.htm). The August 14, 2009

amendment was based on the numeric nutrient criteria translator document published by NHDES (NHDES, 2009) previously discussed which is no longer being used as a translator for the states narrative criteria.

The median total nitrogen from 2008 through 2013 was 600 ug/L (n=9). New Hampshire is no longer comparing ambient total nitrogen data to the total nitrogen numeric indicators used in the 2012 assessment as translators for the narrative water quality criteria. This assessment zone experiences occasional dissolved oxygen concentrations below 5 mg/L, however, those apparent exceedences are very short in duration and not frequent. The chlorophyll-a concentration 90th percentile was 36.5 ug/L (n = 14) and a maximum reading of 45 ug/L. Although the probe based chlorophyll-a data (not used in the median above) was qualified as "estimated" per EPA, due to poor correlation between probe and extracted chlorophyll-a grab sample data, the relative biomass is valid and demonstrates that chlorophyll-a biomass can be very high depending upon the timing of the tide cycle. For shallow systems, it is expected that changes in macroalgae will precede changes in phytoplankton (McGlathery, Sundbäck, & Anderson, 2007) (Valiela, et al., 1997), which appears to be occurring in the Cocheco River. Some of the classic indicators of nutrient eutrophication are present in this assessment zone and total nitrogen remains elevated. As the discussion above illustrates, there is a clear nutrient "signature" in the data. It is less clear, at this time, whether the response datasets demonstrate sufficient power to determine that the eutrophication effects on designated uses can be attributed to total nitrogen alone. Given that uncertainty, impairment is not warranted under New Hampshire's narrative standard. As such, this assessment zone has been assessed as Insufficient Information – Potentially Not Supporting (3-PNS) for total nitrogen.

GREAT BAY

The Great Bay assessment units (NHEST600030904-02, NHEST600030904-03, NHEST600030904-04-02, NHEST600030904-04-03, NHEST600030904-04-04, NHEST600030904-04-05, NHEST600030904-04-06) were first listed as impaired for excess total nitrogen on the 2008 303(d) based on the August 14, 2009 amendment (http://des.nh.gov/organization/divisions/water/wmb/swqa/2008/index.htm). The August 14, 2009 amendment was based on the numeric nutrient criteria translator document published by NHDES (NHDES, 2009) previously discussed which is no longer being used as a translator for the states narrative criteria.

The median total nitrogen from 2008 through 2013 was 391 ug/L (n=62) when considering just the stations in the middle of Great Bay; and 410 ug/L (n=176) when including the boundary stations GRBSQ and GRBAP. New Hampshire is no longer comparing ambient total nitrogen data to the total nitrogen numeric indicators used in the 2012 assessment. Per the court settlement (Docket No. 2013-0119), NHDES has agreed to revert to using the narrative water quality criteria, which requires the use of an integrated evaluation. This assessment zone has not demonstrated dissolved oxygen exceedences at station GRBGB in the middle of Great Bay. However, when considering all sampling stations of Great Bay there are areas in the southwest that likely exhibit poor dissolved oxygen. Likewise, the calculated 90th percentile chlorophyll-a in this assessment zone is 8.9 ug/L (n = 249) which is just below the threshold described in the CALM. Chlorophyll-a experiences peak concentrations annually from 10-69 ug/L in the south western area. The eelgrass beds are degraded and the available light attenuation (median=1.180 m^-1 (n=173)) is poor. For shallow systems, it is expected that changes in macroalgae will precede changes in phytoplankton (McGlathery, Sundbäck, & Anderson, 2007) (Valiela, et al., 1997), as appears to be occurring in the Great Bay assessment zone. There is evidence that macroalgae is impacting eelgrass and changing the species composition and diversity in Great Bay. Using data from Great Bay (Pe'eri, Morrison, Short, Mathieson, Brook, & Trowbridge, 2008), NHDES determined that macroalgae mats had replaced nearly 5.7% of the area formerly occupied by eelgrass in Great Bay in 2007 (NHDES, 2009) and that replaced area has not been recolonized by eelgrass. Some of the loss of eelgrass in the intertidal zone is consistent with smothering by macroalgae. The foremost authority on macroalgae for this estuary, Dr. Arthur C. Mathieson, commented on

the draft 2012 303(d) that he remains concerned about the macroalgae and epiphyte conditions in Great Bay (NHDES, 2013). Some of the classic indicators of nutrient eutrophication are present in this assessment zone and total nitrogen remains elevated in portions of the assessment zone. As the discussion above illustrates, there is a clear nutrient "signature" in the data. It is less clear, at this time, whether the response datasets demonstrate sufficient power to determine that the eutrophication effects on designated uses can be attributed to total nitrogen alone. Given that uncertainty, impairment is not warranted under New Hampshire's narrative standard. As such, this assessment zone has been assessed as Insufficient Information – Potentially Not Supporting (3-PNS) for total nitrogen.