STATE OF NEW HAMPSHIRE

Impairments Removed (i.e. Delisted) from the 2016 303(d) List of Threatened or Impaired Waters (i.e. Category 5)

November 30, 2017

NEW HAMPSHIRE
DEPARTMENT OF
Environmental
Services

STATE OF NEW HAMPSHIRE

Impairments Removed (i.e. Delisted) from the 2016 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. 03302

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NOVEMBER 30, 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 two 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 final of the 2014 Section 303(d) List of impaired waters was submitted to US Environmental Protection Agency (USEPA) on March 27, 2017. Downloadable copies of the past list as well as the 303(d) 2016 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 and parameter combinations that were removed as impairments on the 2016 303(d) List 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 an impairment exists. In each of the new impairments detailed within this document the 2014 and 2016 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					

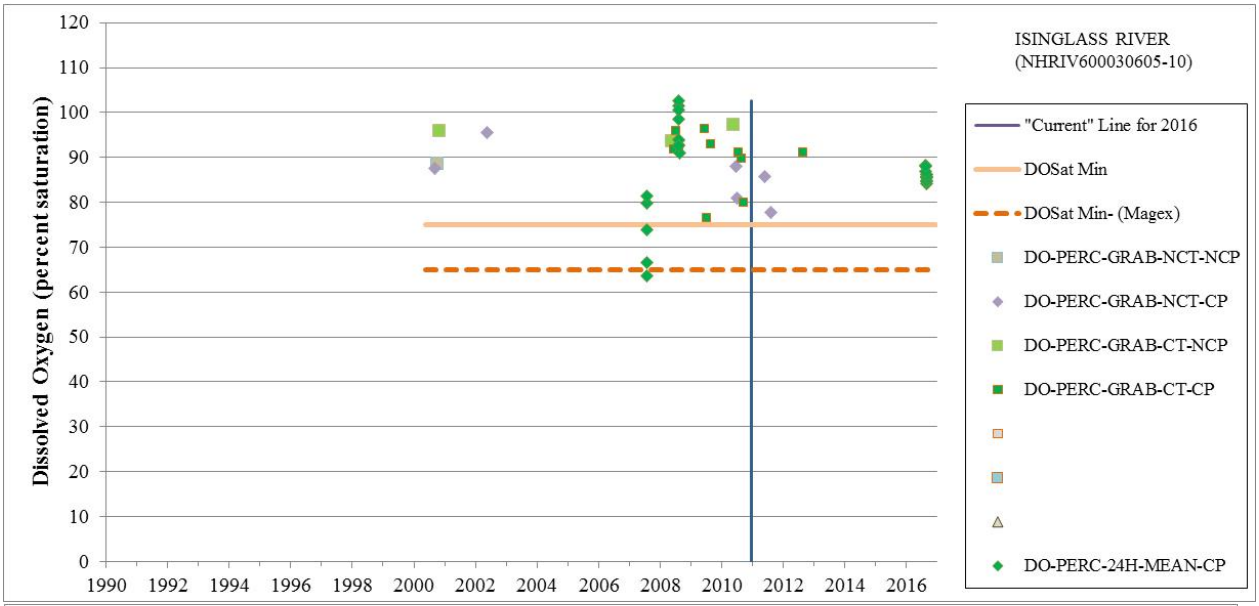
* “Category 1” only exists at the Assessment Unit Level.

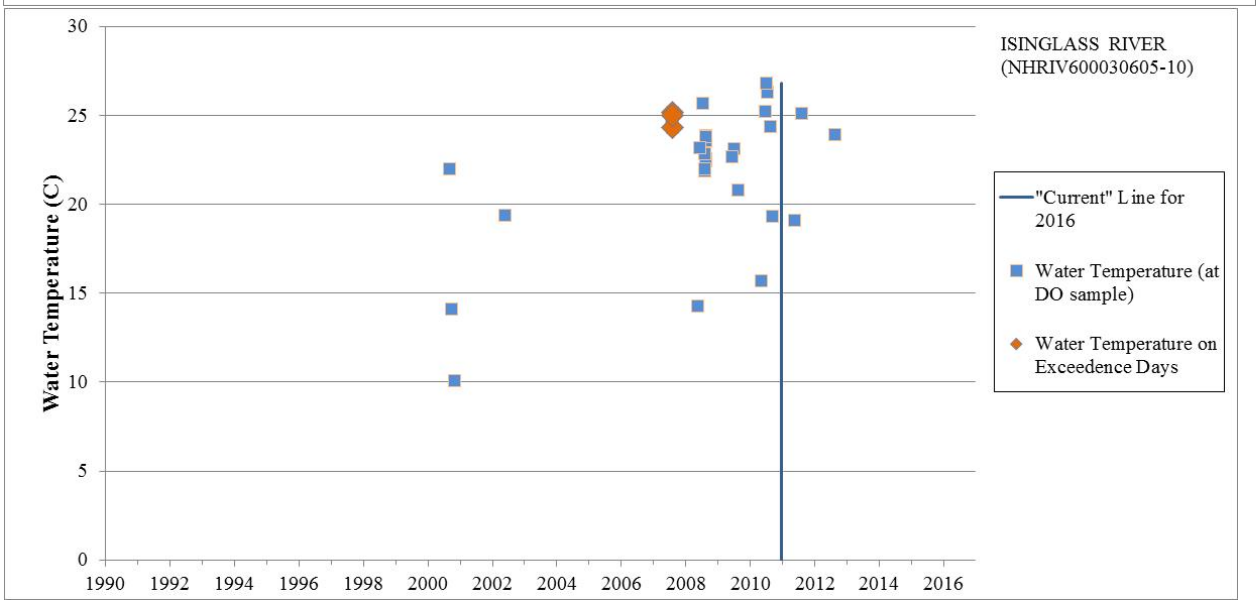
Dissolved Oxygen (Aquatic Life Use Support)

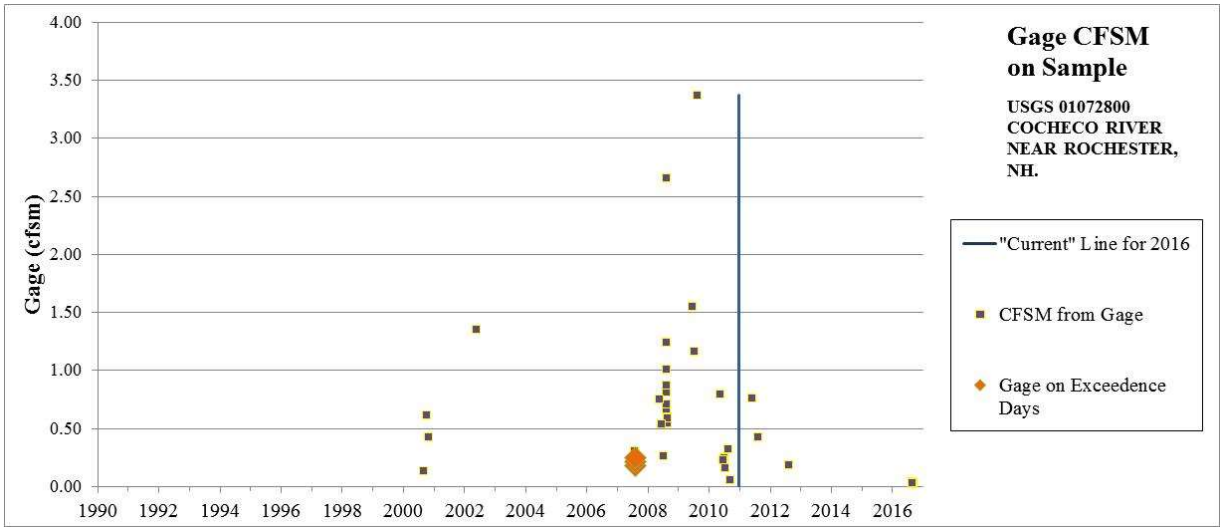
ISINGLASS RIVER (NHRIV600030605-10)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
ISINGLASS RIVER	NHRIV600030605-10	DISSOLVED OXYGEN (% SATURATION)	STRAFFORD	5-M	2-G

Datalogger dataset from 2007 indicated non-support. Logger was deployed under some of the warmest and lowest flow conditions in the dataset. Datalogger datasets from 2009 and 2016 indicate full support. The 2016 datalogger was deployed under low flow condition and dissolved oxygen concentration levels were full support on all occasions. The water temperature during the 2016 deployment was slightly cooler (~ 2 degrees C.) Instantaneous measurements from 2010 – 2012 under high temperatures also indicate full support. All data was collected at station 12-ISG.



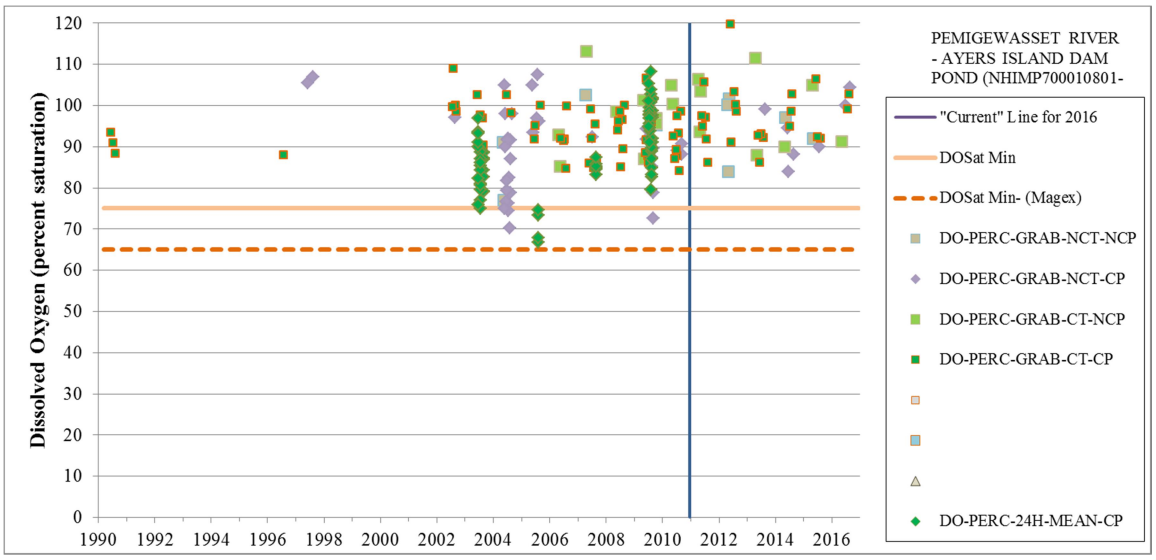


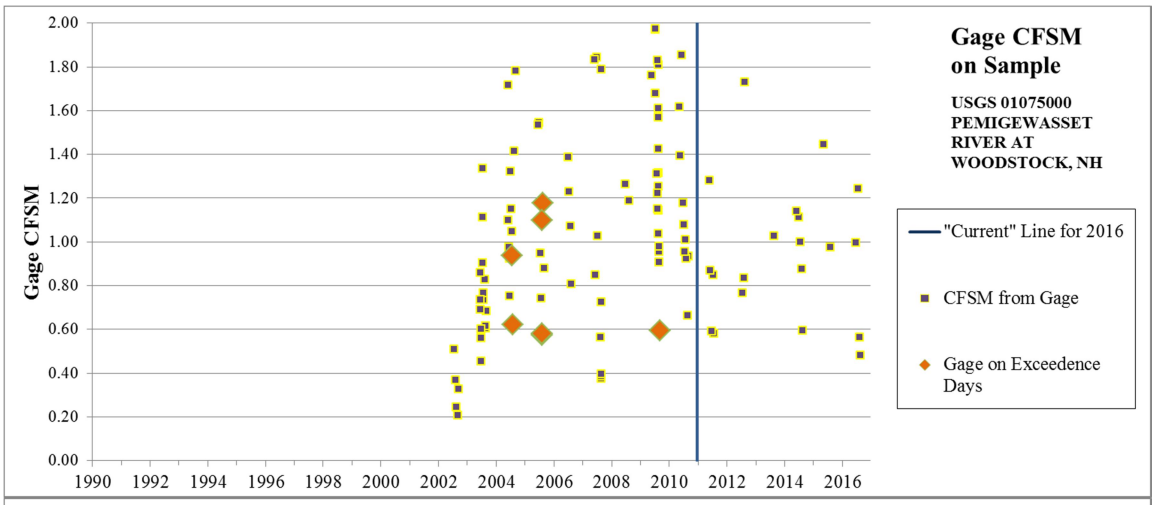


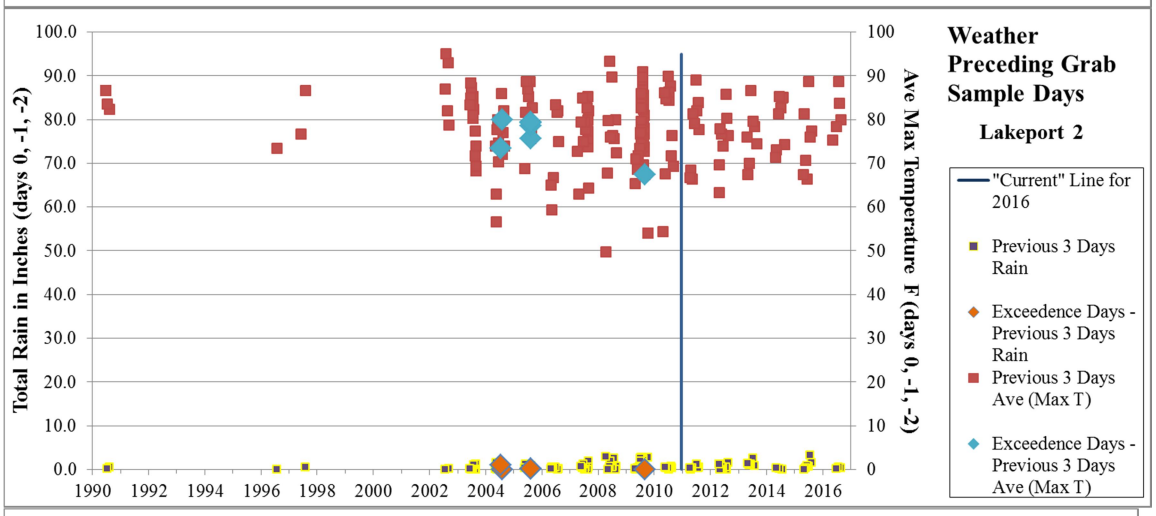
PEMIGEWASSET RIVER- AYERS ISLAND DAM POND (NHIMP700010801-08)

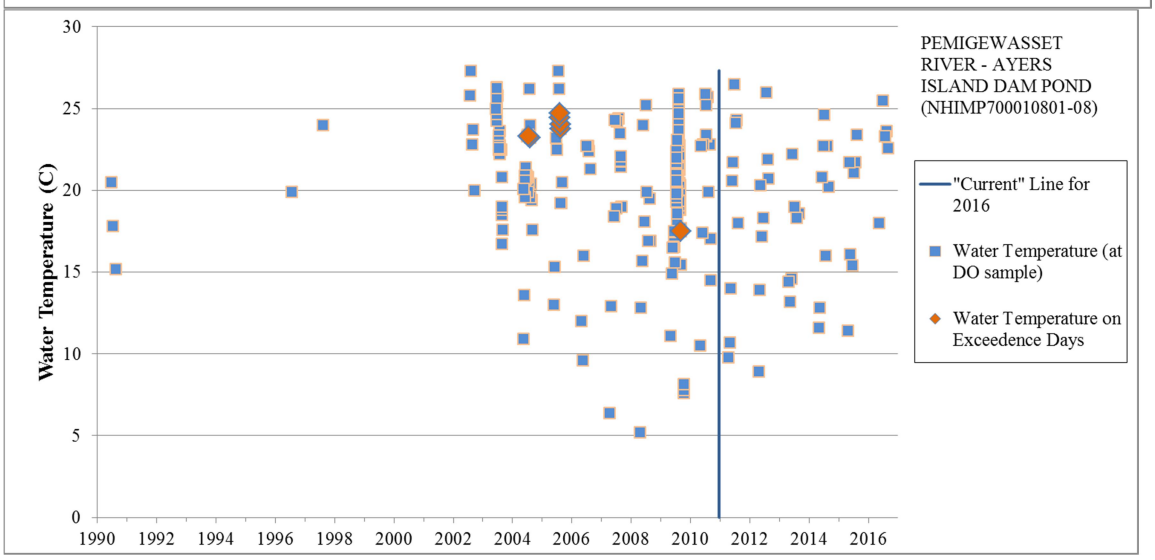
Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
PEMIGEWASSET RIVER- AYERS ISLAND DAM POND	NHIMP700010801-08	Dissolved Oxygen (Percent Saturation)	NEW HAMPTON	5-P	2-G

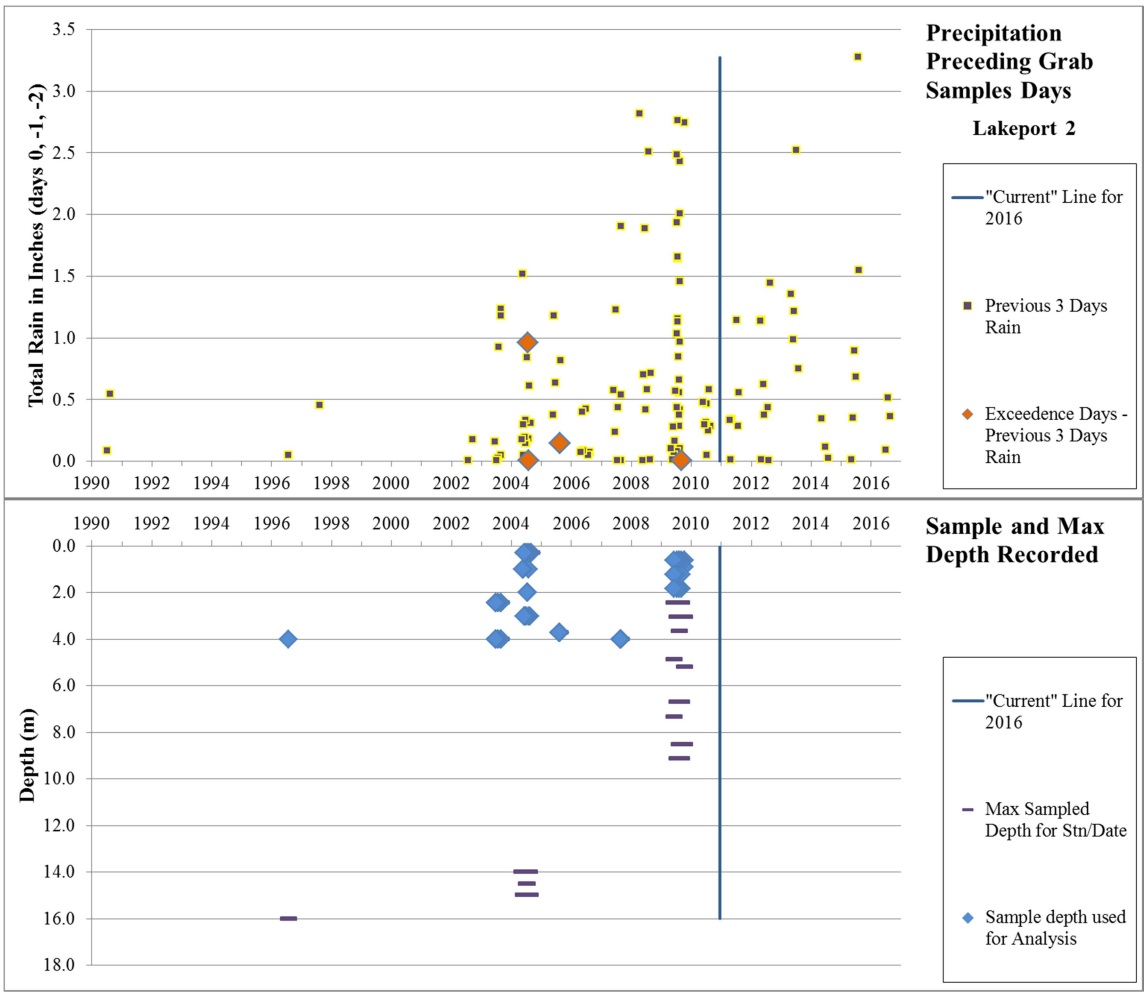
Class B water. 500 acre impoundment. n=144 samples included in assessment from 2006 through 2016, of those, n=1 exceeded the minimum DO% sat threshold. There were no samples that were MAGEX. The last exceedence was in 2009 for a single sample just below the minimum DO % sat threshold, and prior to that there were some exceedences in 2005 which have aged out. Pemigewasset River- Ayers Island Dam Pond has been moved to fully supporting the dissolved oxygen saturation criteria.




Gage CFSM on Sample
USGS 01075000 PEMIGEWASSET RIVER AT WOODSTOCK, NH
Gage CFSM
"Current" Line for 2016
CFSM from Gage
Gage on Exceedence Days


Weather Preceding Grab Sample Days
Lakeport 2
Total Rain in Inches (days 0, -1, -2)
Ave Max Temperature F (days 0, -1, -2)
"Current" Line for 2016
Previous 3 Days Rain
Exceedence Days - Previous 3 Days Rain
Previous 3 Days Ave (Max T)
Exceedence Days - Previous 3 Days Ave (Max T)

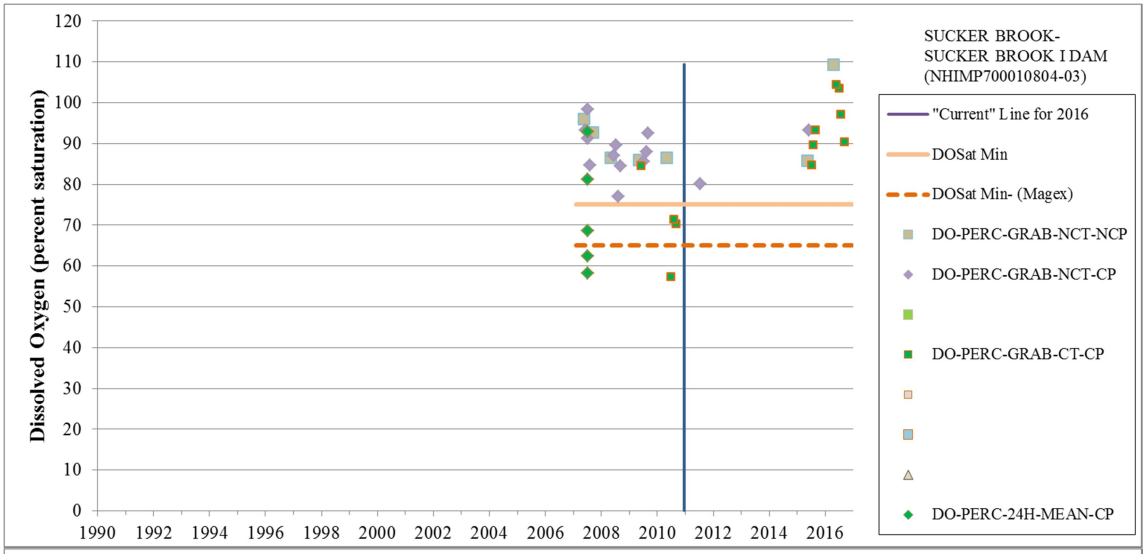

PEMIGEWASSET RIVER - AYERS ISLAND DAM POND (NHIMP700010801-08)
Water Temperature (C)
"Current" Line for 2016
Water Temperature (at DO sample)
Water Temperature on Exceedence Days

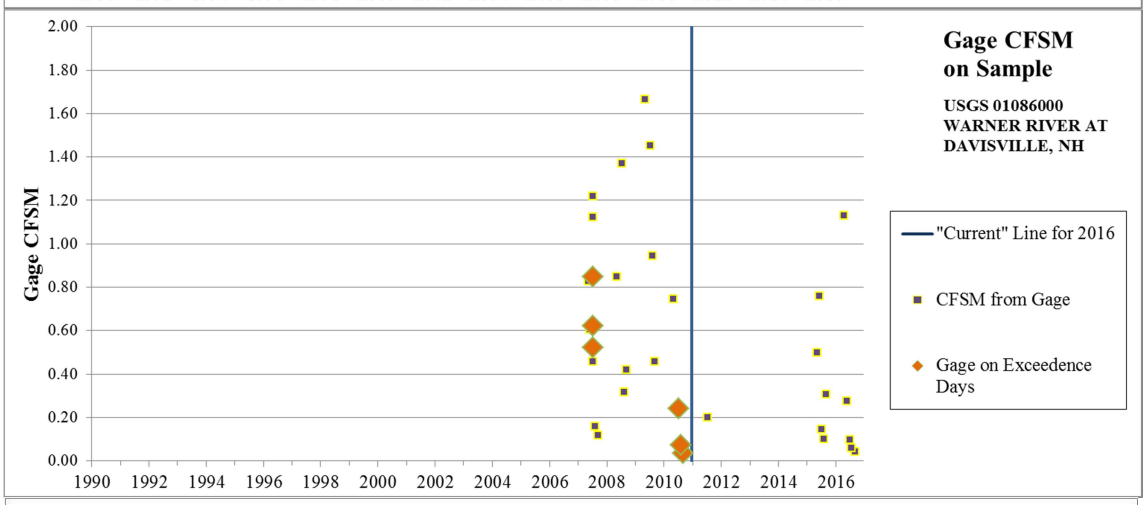


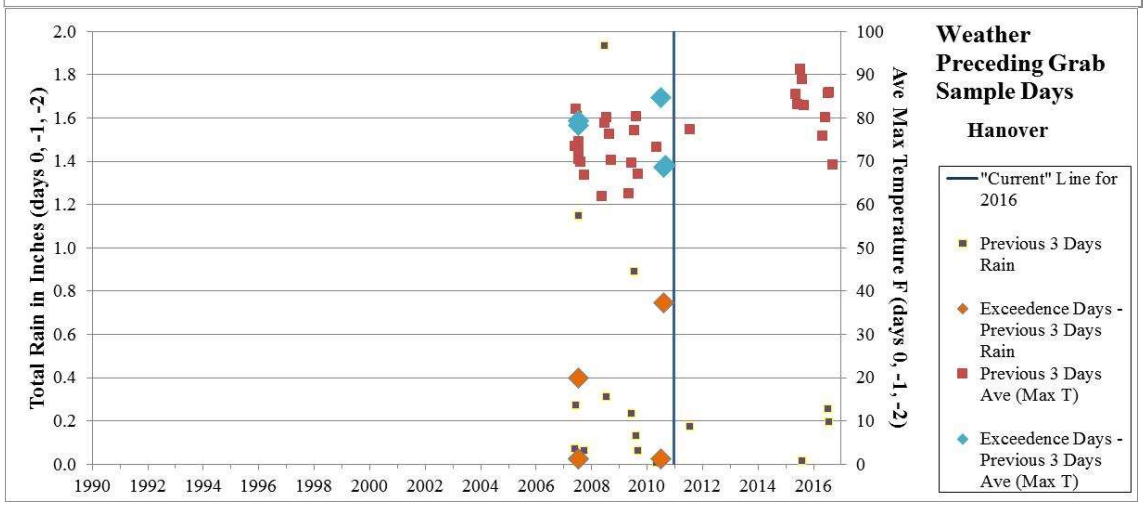
SUCKER BROOK- SUCKER BROOK 1 DAM (NHIMP700010804-03)

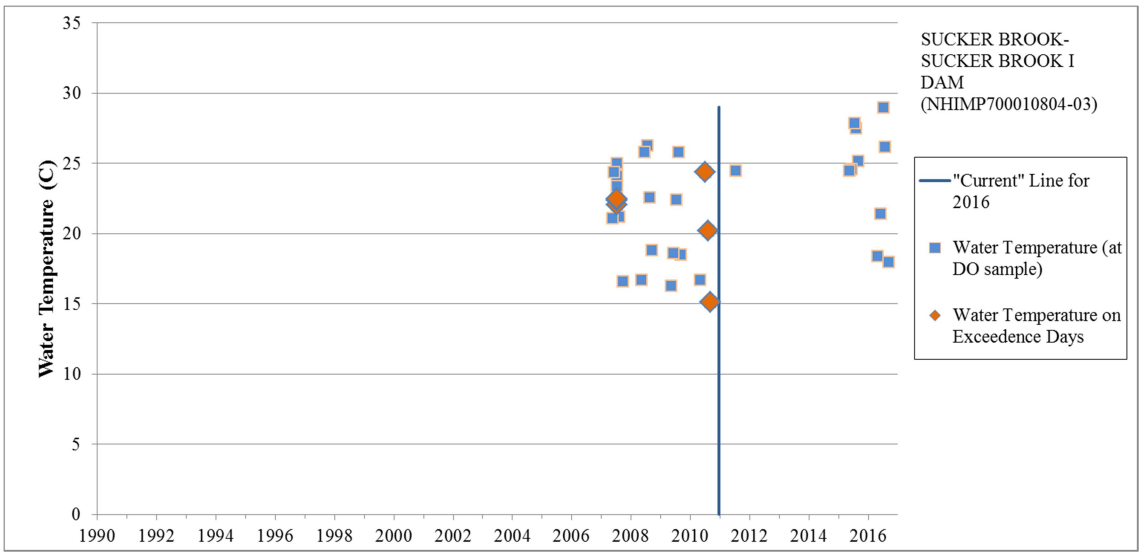
Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
SUCKER BROOK	NHIMP700010804-03	DISSOLVED OXYGEN % SATURATION	ANDOVER	5-M	2-M

Class B waterbody. N=11 sample rounds from 2011-2016. No minimum saturation exceedences or magex results within this timeline. Last exceedences were in 2010, and historic data have aged out for those samples. Recent data were collected under similar timelines and conditions as those for exceedence days, though there were no exceedences under recent sample rounds. Delist Sucker Brook-Sucker Brook 1 Dam and assess as 2-M.


Dissolved Oxygen (percent saturation)
SUCKER BROOK-
SUCKER BROOK I DAM
(NHIMP700010804-03)
"Current" Line for 2016
DOSat Min
DOSat Min- (Magex)
DO-PERC-GRAB-NCT-NCP
DO-PERC-GRAB-NCT-CP
DO-PERC-GRAB-CT-CP
DO-PERC-24H-MEAN-CP


Gage CFSM
Gage CFSM on Sample
USGS 01086000
WARNER RIVER AT
DAVISVILLE, NH
"Current" Line for 2016
CFSM from Gage
Gage on Exceedence Days

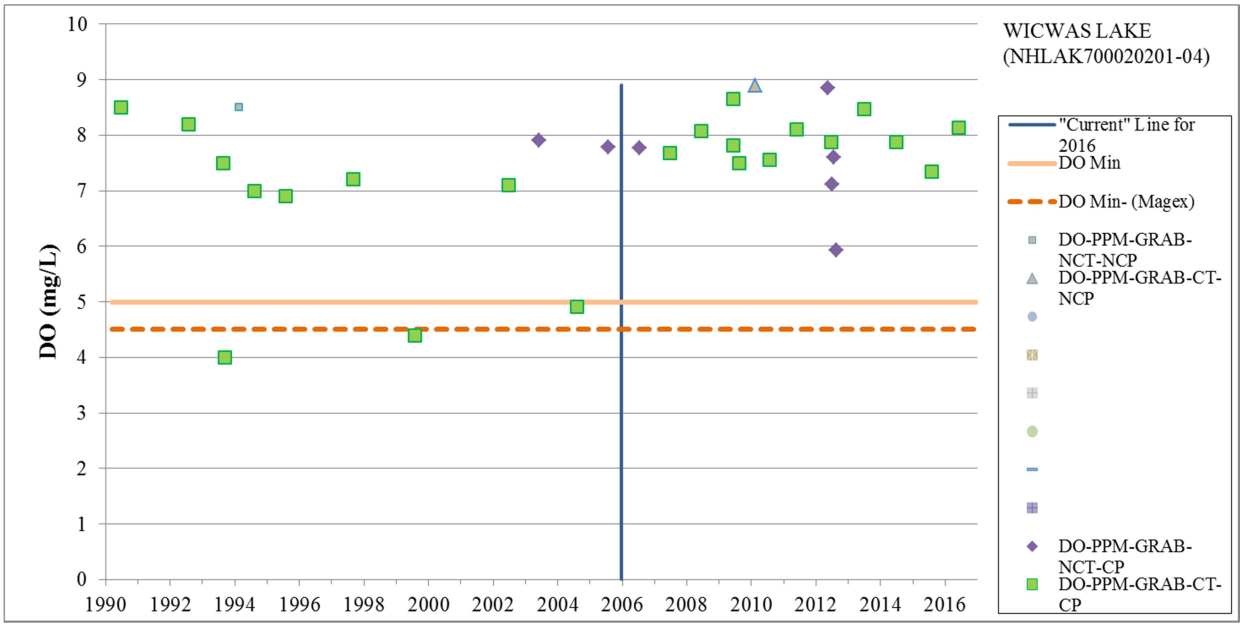

Total Rain in Inches (days 0, -1, -2)
Ave Max Temperature F (days 0, -1, -2)
Weather Preceding Grab Sample Days
Hanover
"Current" Line for 2016
Previous 3 Days Rain
Exceedence Days - Previous 3 Days Rain
Previous 3 Days Ave (Max T)
Exceedence Days - Previous 3 Days Ave (Max T)

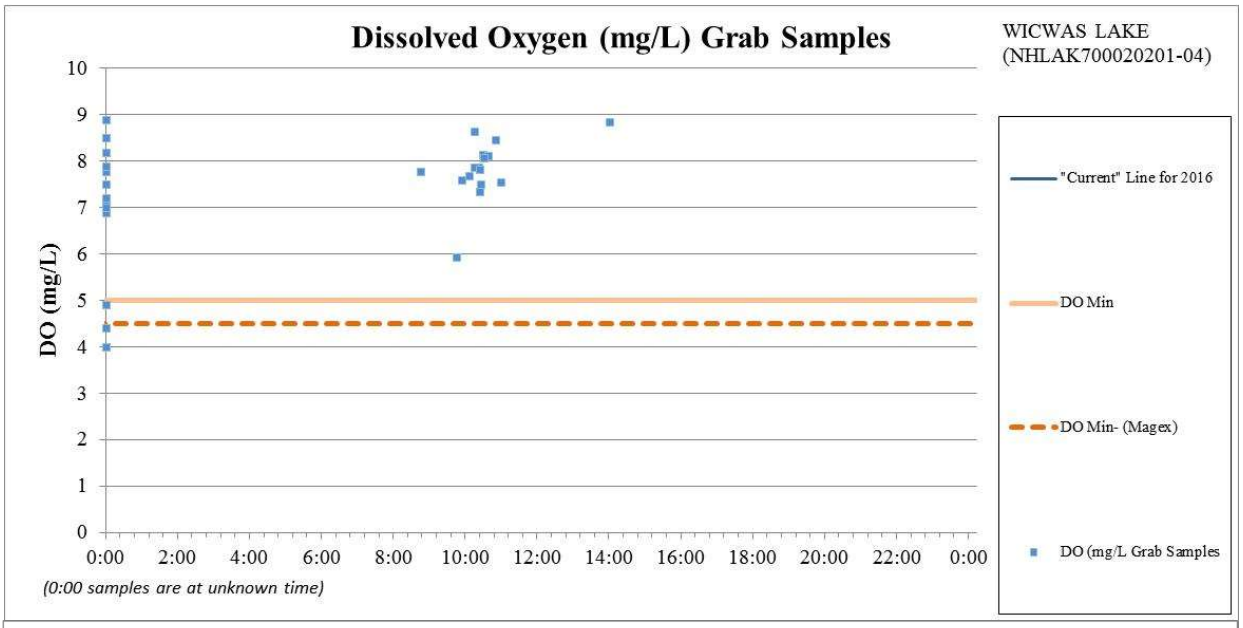


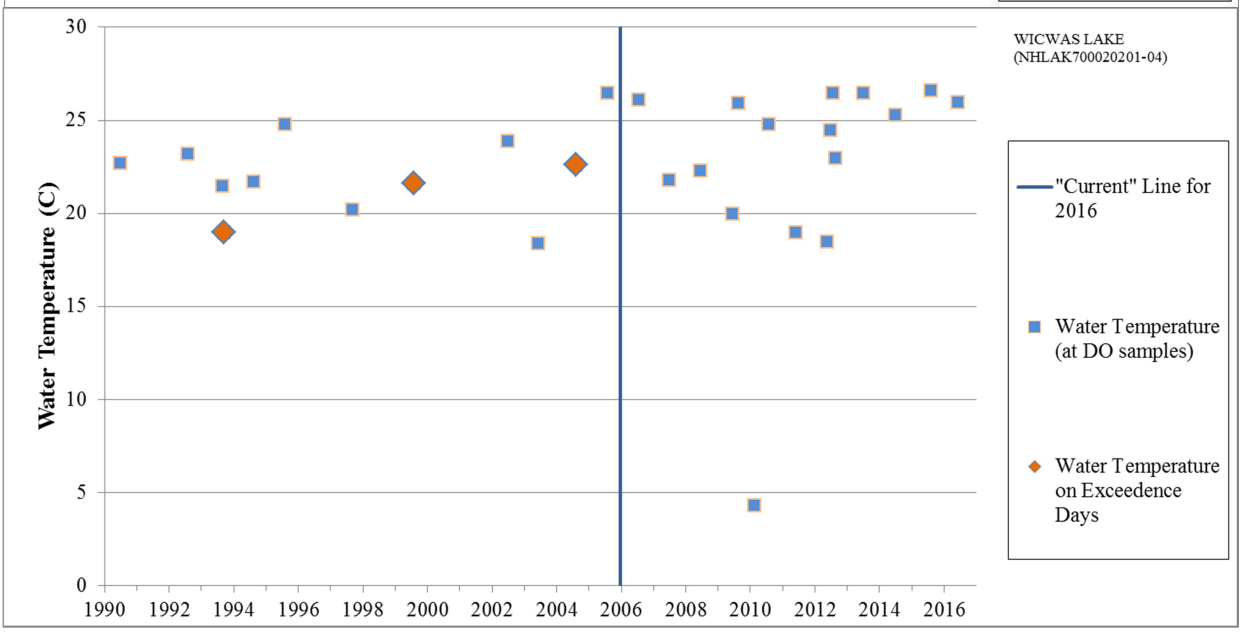
WICWAS LAKE (NHLAK700020201-04)

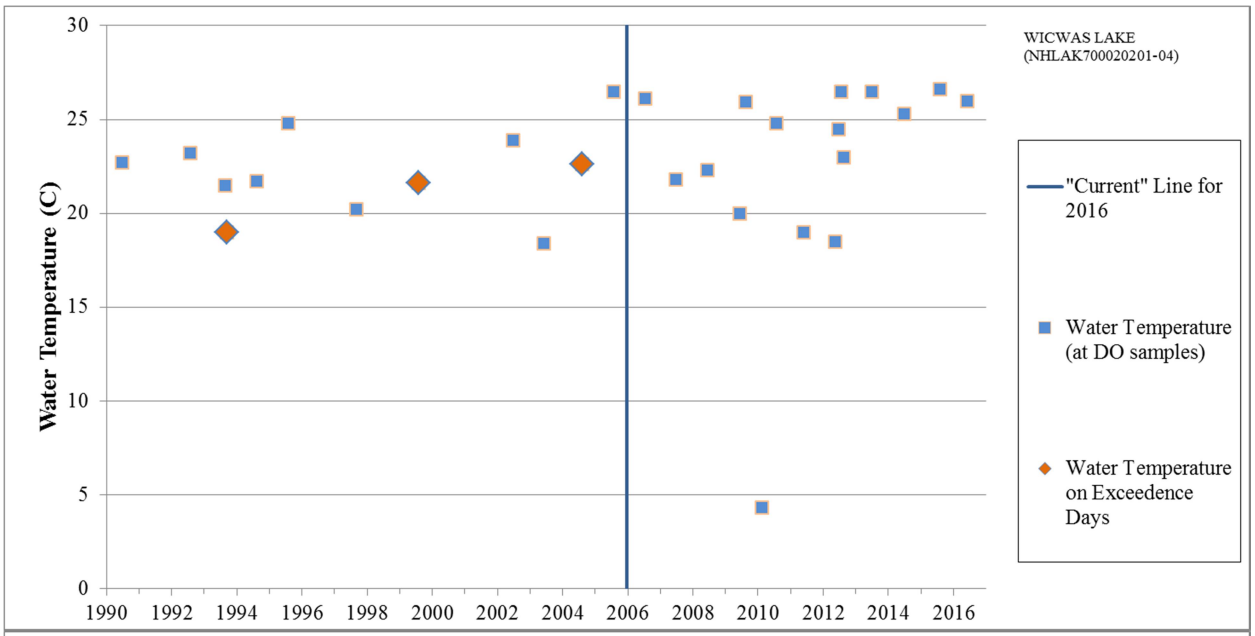
Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
WICWAS LAKE	NHLAK700020201-04	Dissolved Oxygen (mg/L)	MEREDITH	5-M	2-G

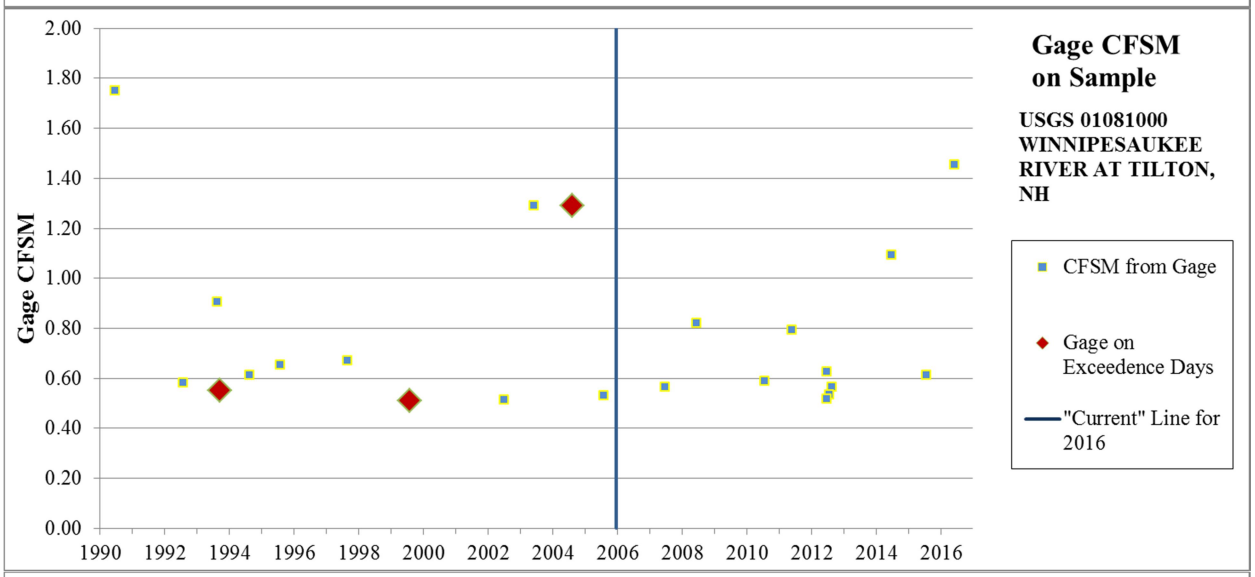
Class B waterbody. A total of 18 samples have been collected over the last 10-year period from 2006 to 2016. During this timeframe there have be no exceedences, and all data support water quality standards. Historic exceedences from 2004 and prior years have aged out, and there has been no recurring pattern of low DO concentrations. Epilimnetic DO ppm concentrations have been meeting standards since old data aged out. Wicwas Lake is deimpaired and assessed as fully supporting.

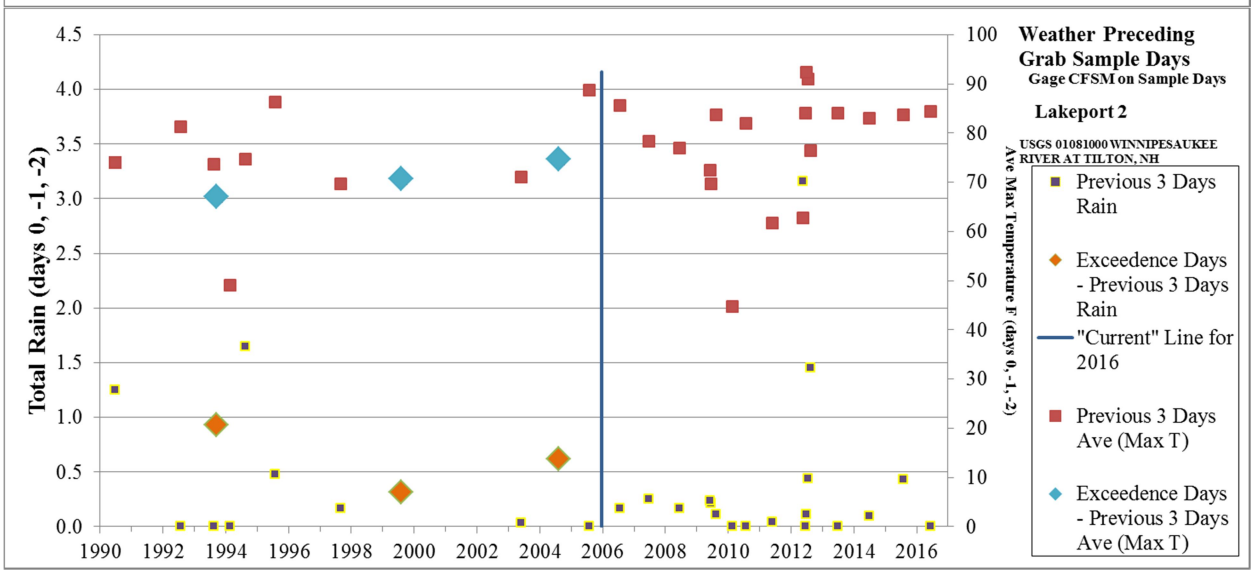


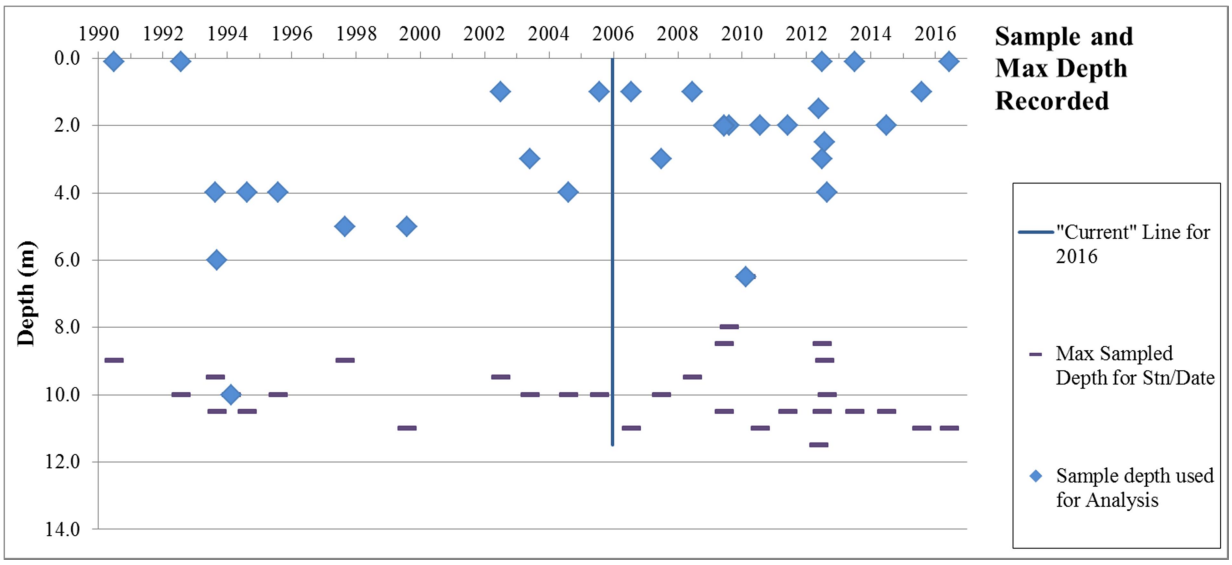

Dissolved Oxygen (mg/L) Grab Samples
WICWAS LAKE
(NHLAK700020201-04)
DO (mg/L)
10
9
8
7
6
5
4
3
2
1
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
(0:00 samples are at unknown time)
"Current" Line for 2016
DO Min
DO Min- (Magex)
DO (mg/L Grab Samples


WICWAS LAKE
(NHLAK700020201-04)
Water Temperature (C)
30
25
20
15
10
5
0
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
"Current" Line for 2016
Water Temperature (at DO samples)
Water Temperature on Exceedence Days


WICWAS LAKE
(NHLAK700020201-04)
Water Temperature (C)
"Current" Line for 2016
Water Temperature (at DO samples)
Water Temperature on Exceedence Days


Gage CFSM on Sample
USGS 01081000 WINNIPESAUKEE RIVER AT TILTON, NH
Gage CFSM
CFSM from Gage
Gage on Exceedence Days
"Current" Line for 2016

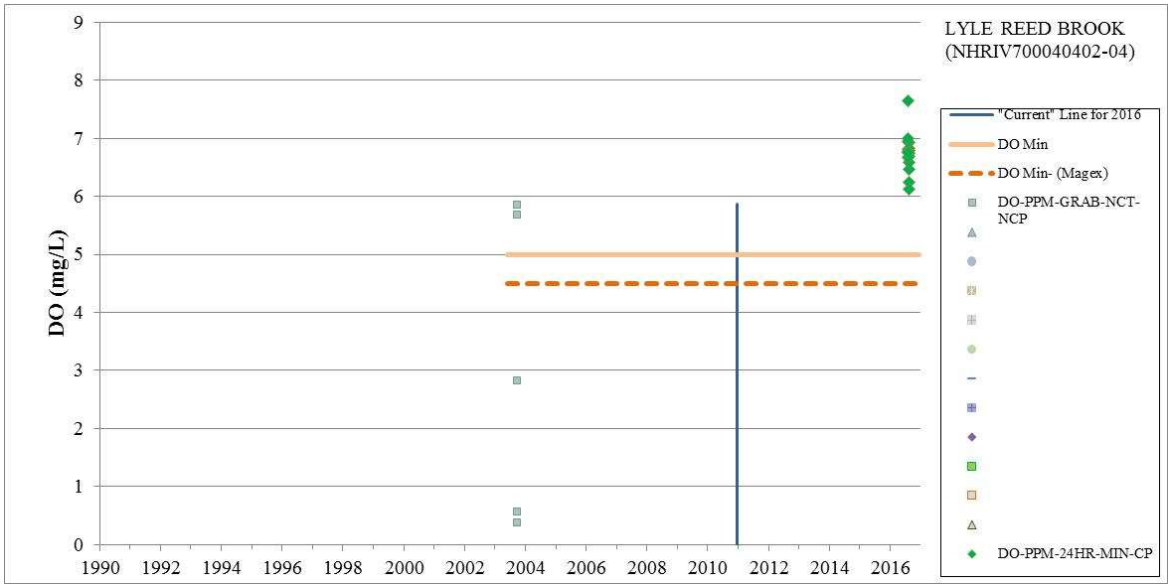

Weather Preceding Grab Sample Days
Gage CFSM on Sample Days
Lakeport 2
USGS 01081000 WINNIPESAUKEE RIVER AT TILTON, NH
Total Rain (days 0, -1, -2)
Ave Max Temperature F (days 0, -1, -2)
Previous 3 Days Rain
Exceedence Days - Previous 3 Days Rain
"Current" Line for 2016
Previous 3 Days Ave (Max T)
Exceedence Days - Previous 3 Days Ave (Max T)

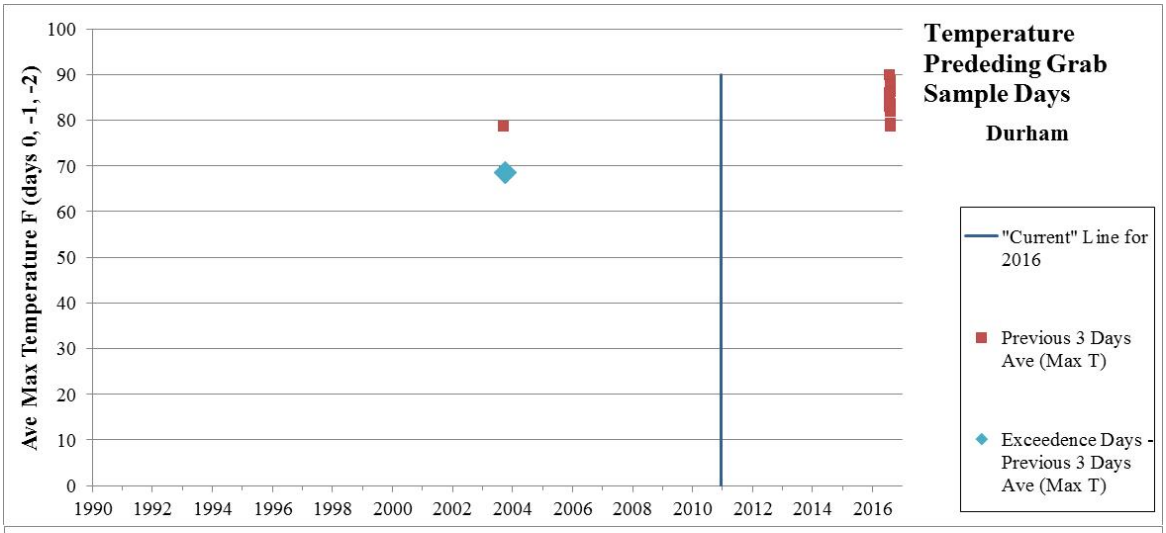


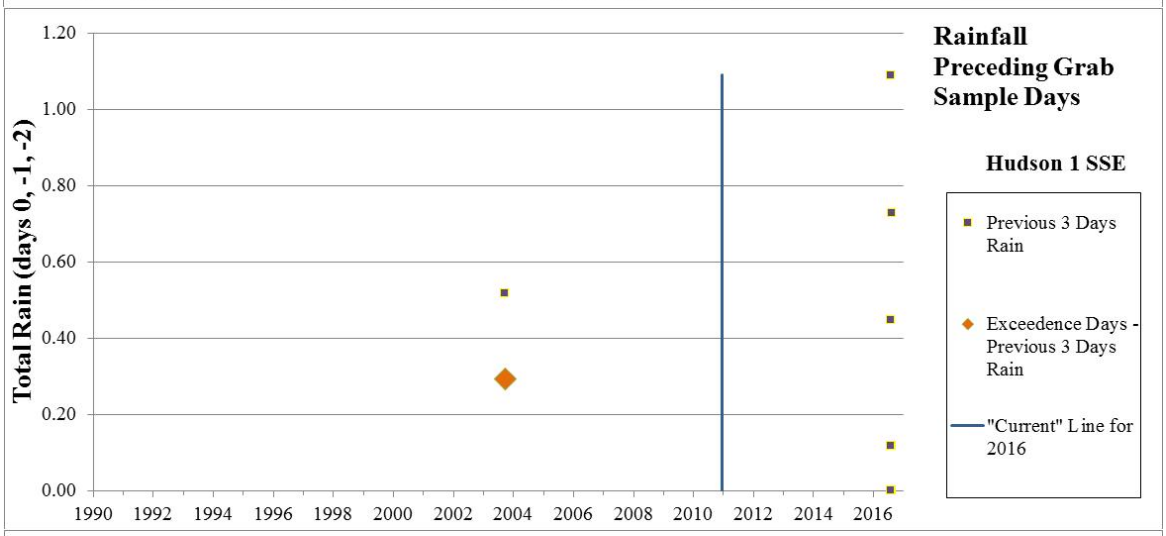
LYLE REED BROOK (NHRIV700040402-04)

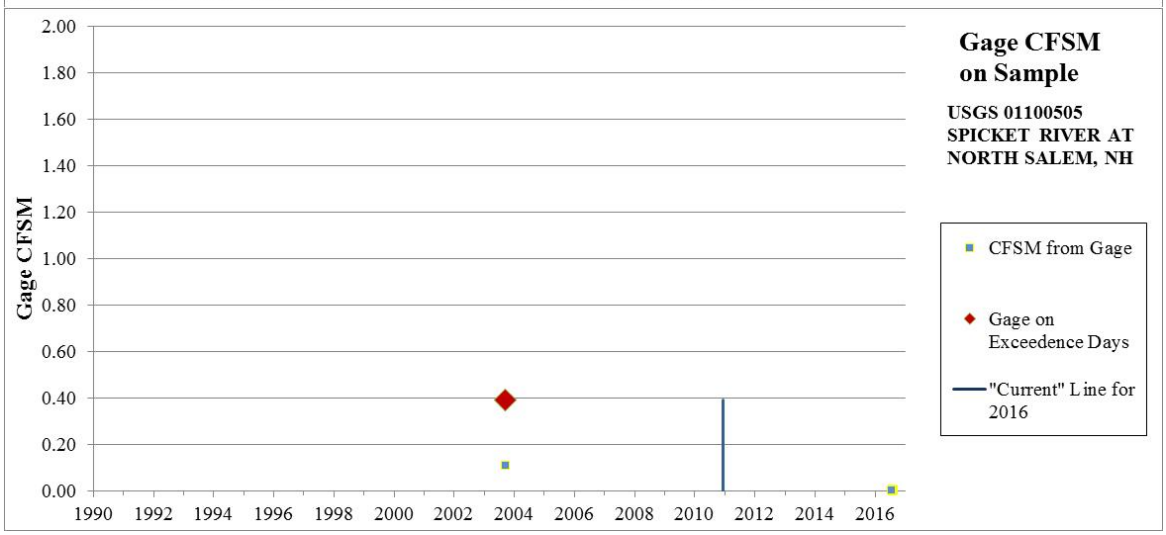
Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
LYLE REED BROOK	NHRIV700040402-04	DISSOLVED OXYGEN (MG/L)	NASHUA	5-P	2-G

Impairment due to non support grab samples from 2003. In 2016 a datalogger was deployed at station 01-LRB (03M-G04), which was one of the stations with the lowest dissolved oxygen concentration measurement in 2003. Conditions during the 2016 datalogger deployment were warm water and low flow. During all occasions of the datalogger deployment the dissolved oxygen concentration indicated full support.



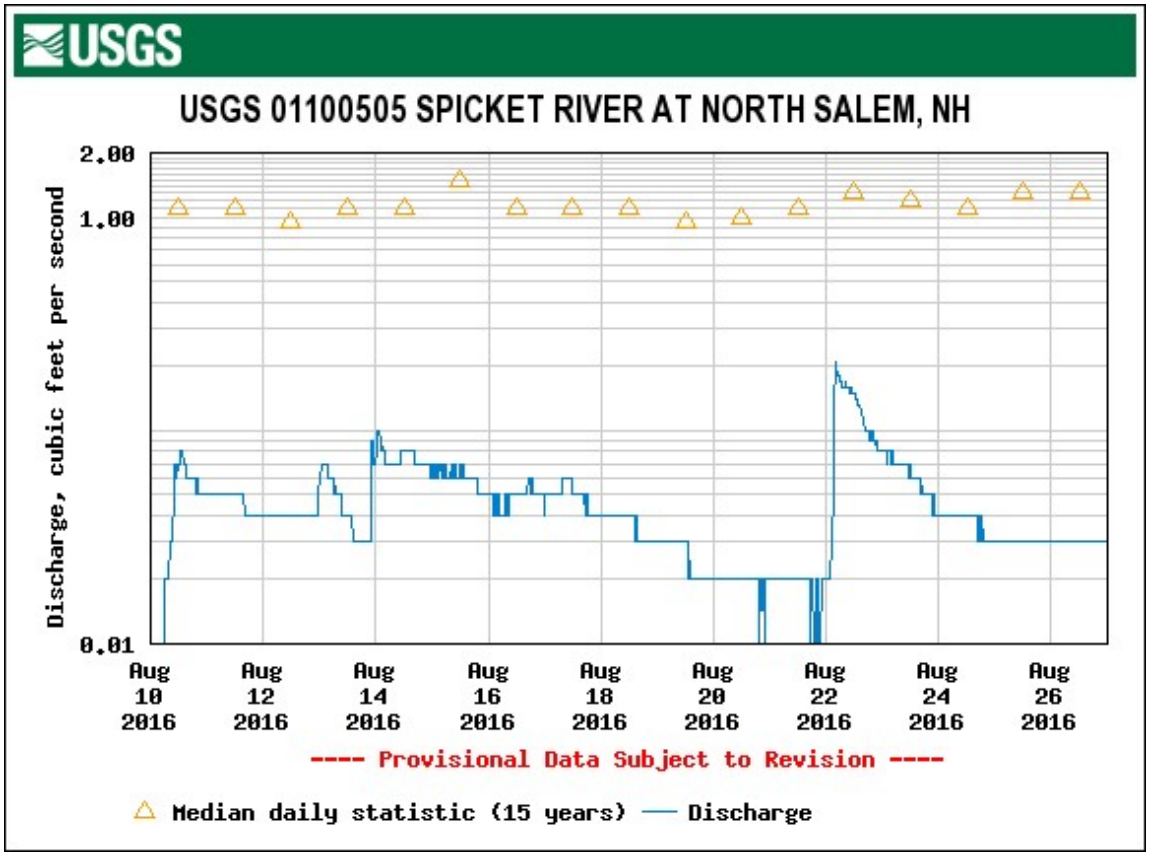






The plotting tool was not showing the CFSM for the days of the 2016 datalogger deployment but does show the flow conditions during the time of the non support measurements from 2004.

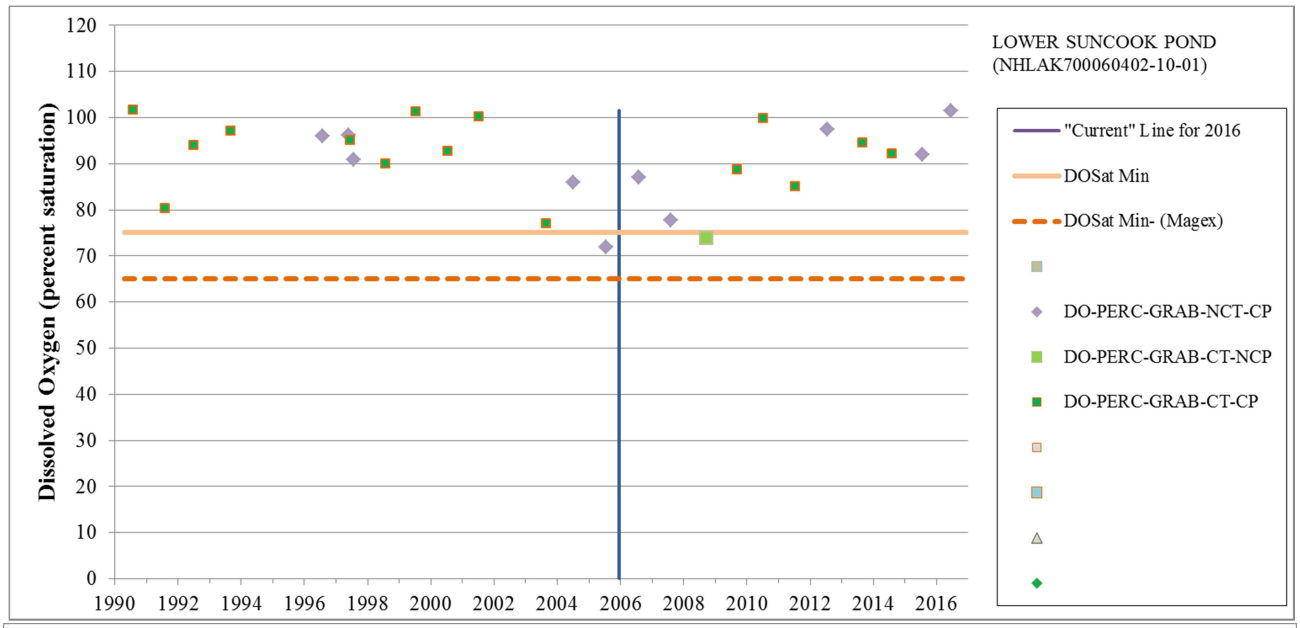
Below are the flow conditions during the 2016 datalogger deployment at the surrogate stream gage that was used to estimate flows at the site.

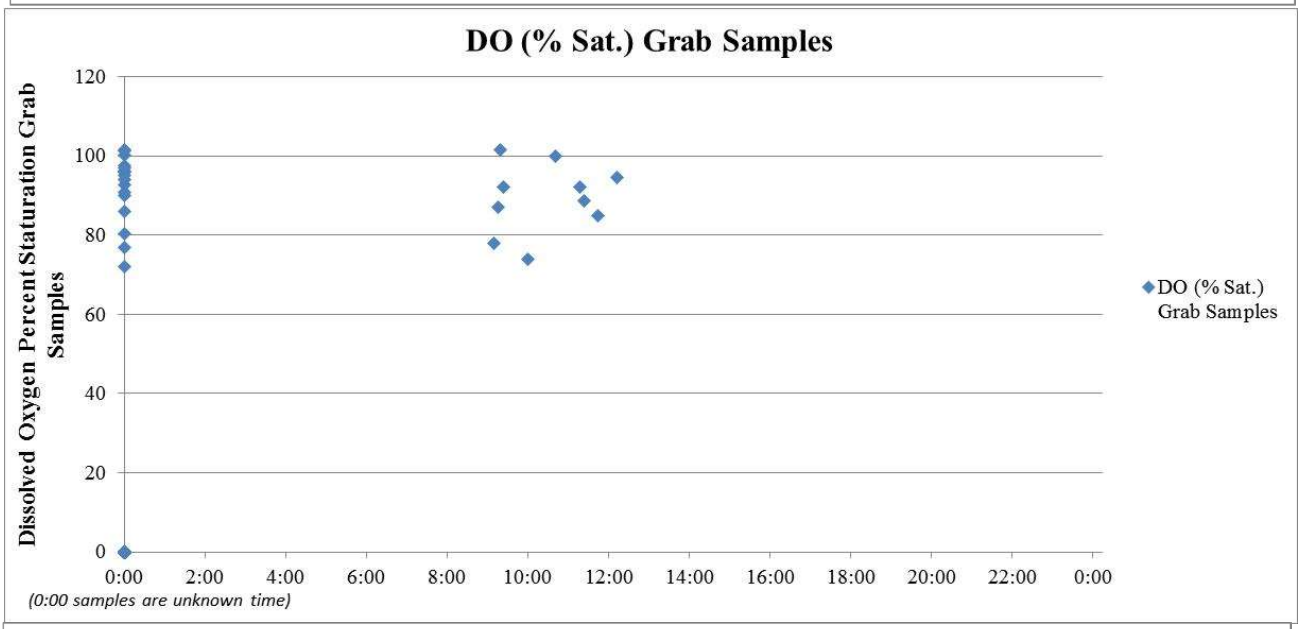


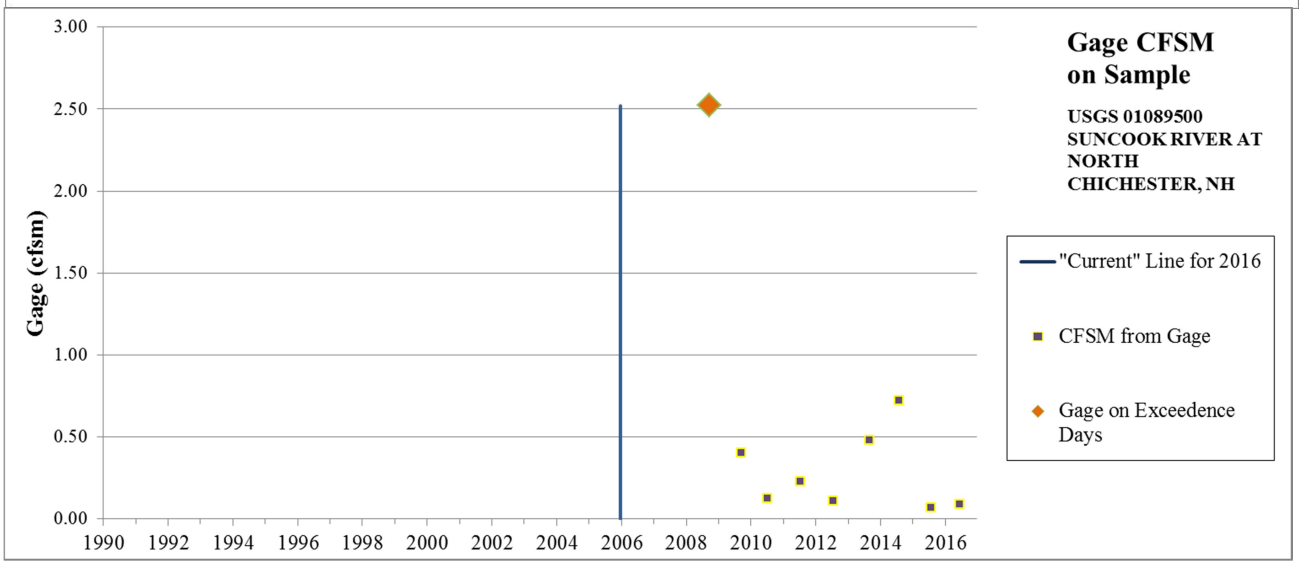
LOWER SUNCOOK POND (NHLAK700060402-10-01)

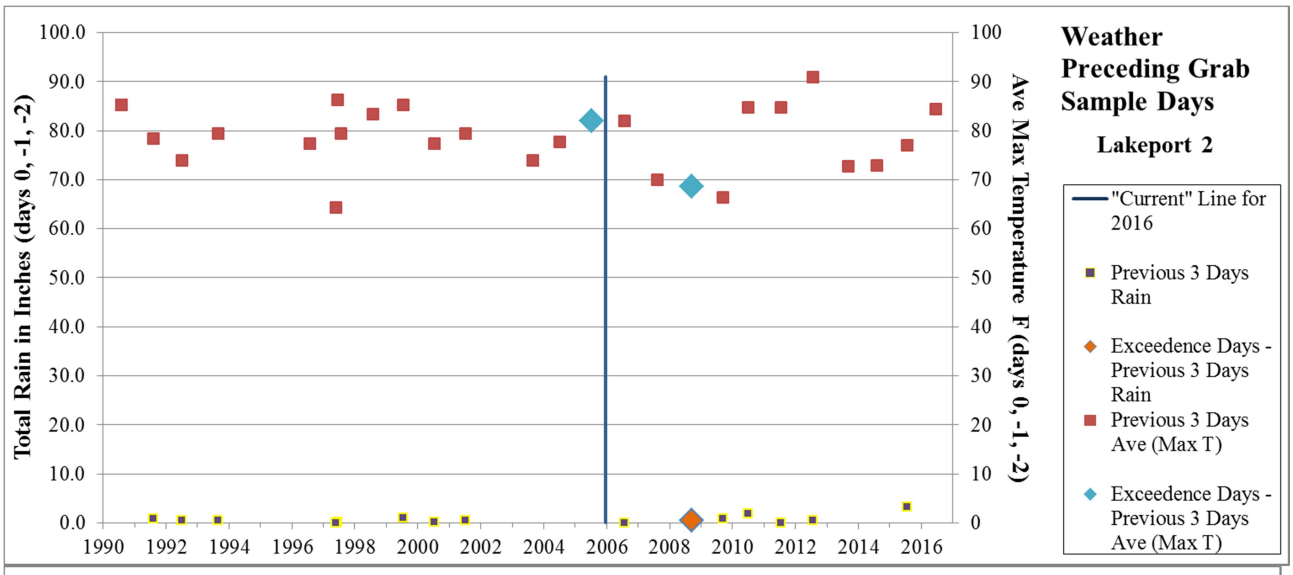
Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
LOWER SUNCOOK POND	NHLAK700060402-10-01	DISSOLVED OXYGEN % SATURATION	BARNSTEAD	5-M	2-M

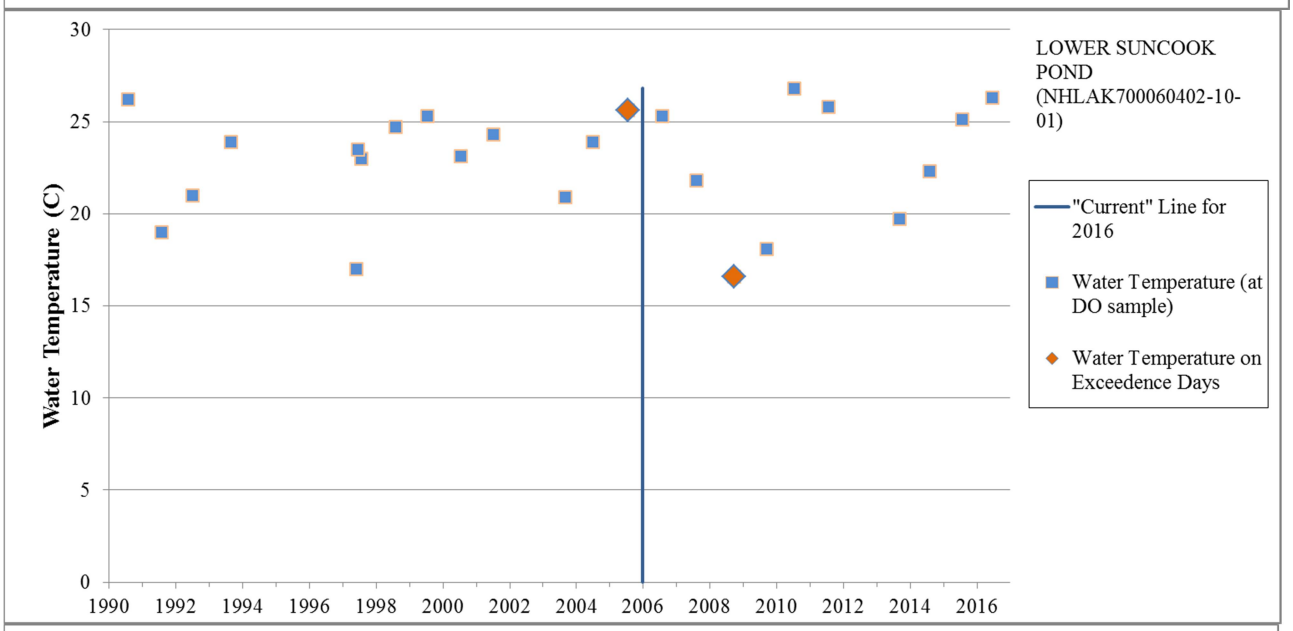
2016: Class B waterbody. Most recent exceedence was in 2008. Eleven sampling events between 2006 and 2016, of which only five were collected during CP and CT. n=5 were collected outside of the critical time, and n=1 was collected outside of the CP. One exceedence of DO%sat minimum threshold in this time period. When looking at the time of day for the samples we see that there is not a pronounced diel DO swing. This waterbody was originally impaired in 2010, based on data collected outside of CP and CT. Overall this waterbody supports water quality standards and does not meet the 10% rule. Based on the data set and historic DO%sat levels, Lower Suncook Pond is delisted and assessed as 2-M.

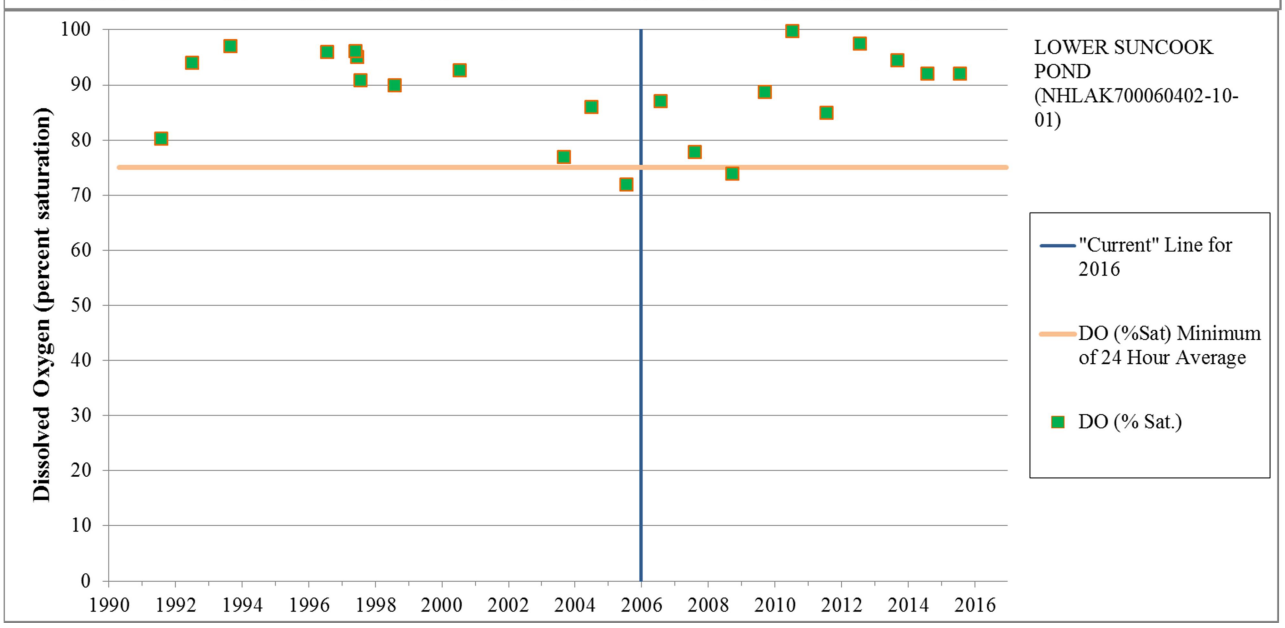

LOWER SUNCOOK POND
(NHLAK700060402-10-01)
Dissolved Oxygen (percent saturation)
"Current" Line for 2016
DOSat Min
DOSat Min- (Magex)
DO-PERC-GRAB-NCT-CP
DO-PERC-GRAB-CT-NCP
DO-PERC-GRAB-CT-CP

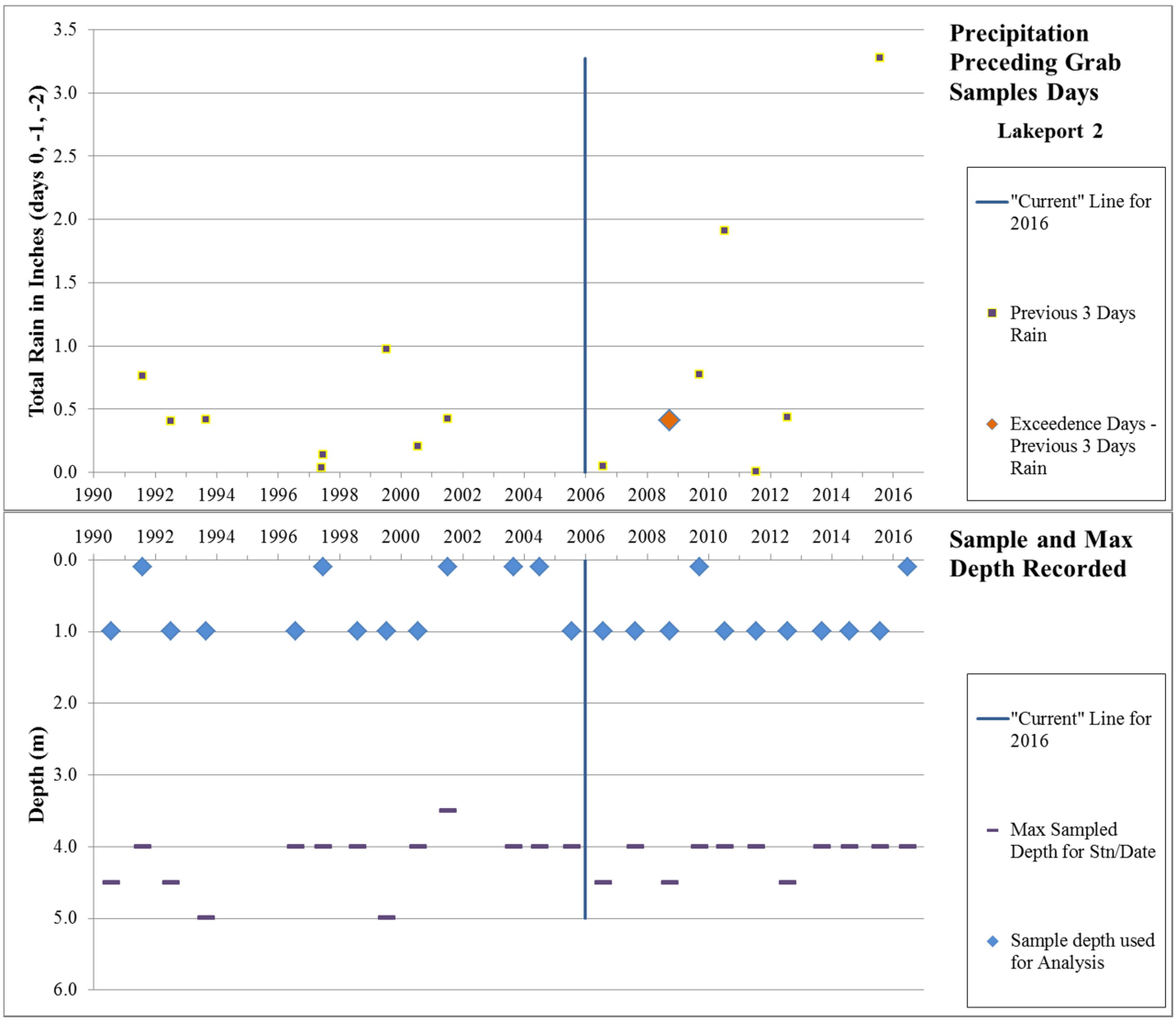

DO (% Sat.) Grab Samples
Dissolved Oxygen Percent Staturation Grab Samples
DO (% Sat.) Grab Samples
(0:00 samples are unknown time)


Gage CFSM on Sample
USGS 01089500 SUNCOOK RIVER AT NORTH CHICHESTER, NH
Gage (cfsm)
"Current" Line for 2016
CFSM from Gage
Gage on Exceedence Days


Weather Preceding Grab Sample Days
Lakeport 2
Total Rain in Inches (days 0, -1, -2)
Ave Max Temperature F (days 0, -1, -2)
"Current" Line for 2016
Previous 3 Days Rain
Exceedence Days - Previous 3 Days Rain
Previous 3 Days Ave (Max T)
Exceedence Days - Previous 3 Days Ave (Max T)


LOWER SUNCOOK POND (NHLAK700060402-10-01)
Water Temperature (C)
"Current" Line for 2016
Water Temperature (at DO sample)
Water Temperature on Exceedence Days

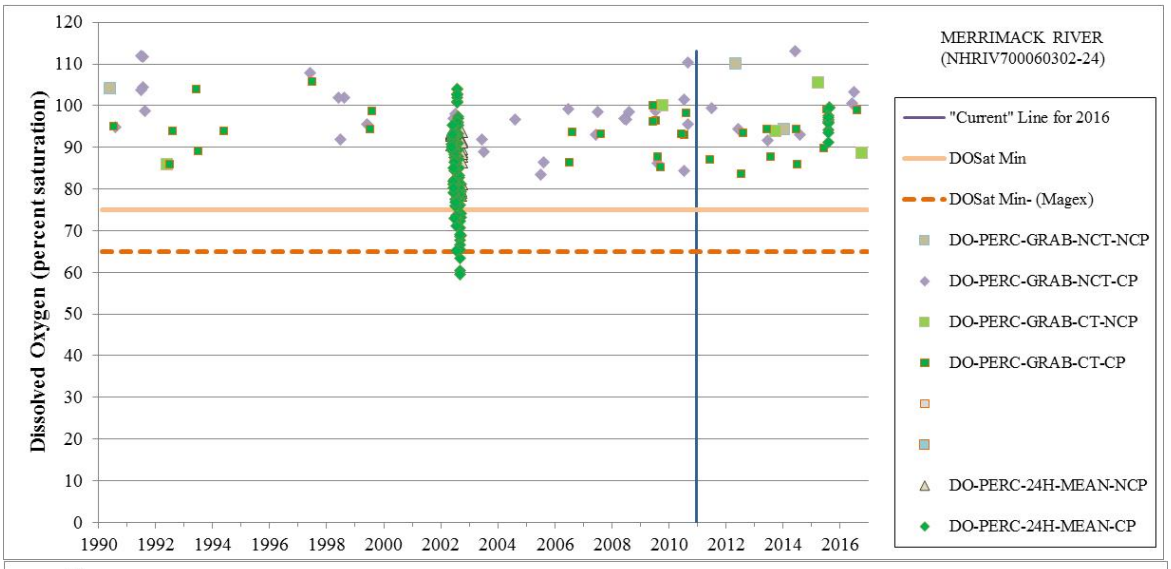

LOWER SUNCOOK POND (NHLAK700060402-10-01)
Dissolved Oxygen (percent saturation)
"Current" Line for 2016
DO (%Sat) Minimum of 24 Hour Average
DO (% Sat.)

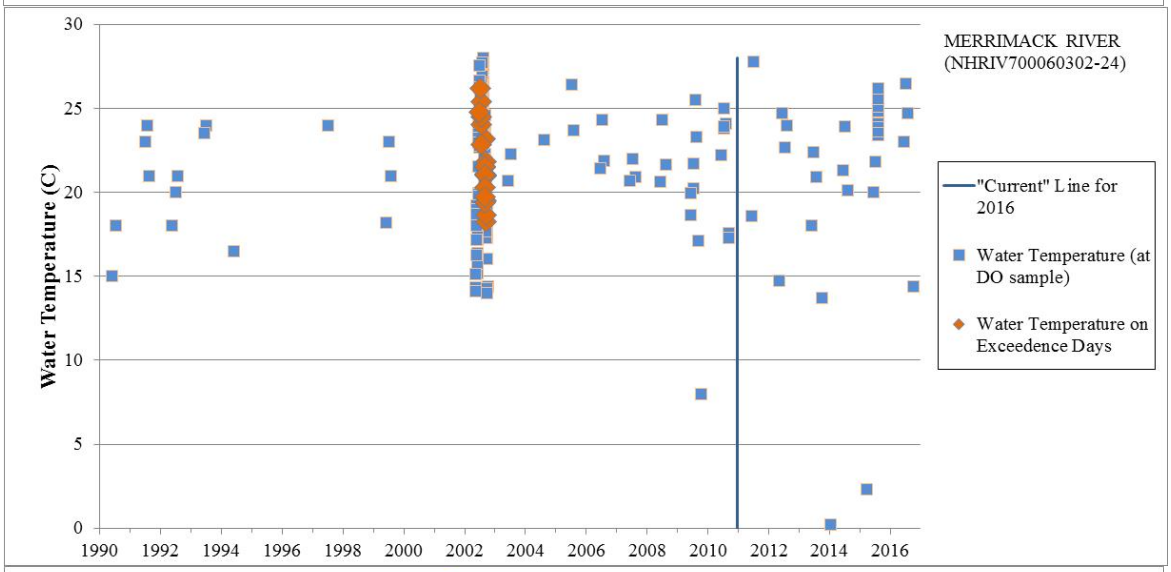


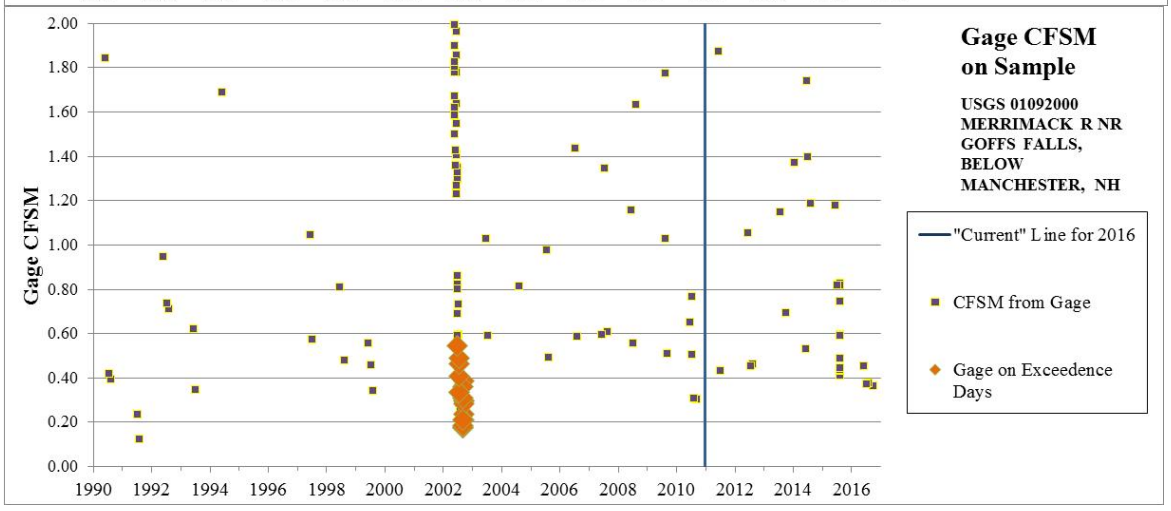
MERRIMACK RIVER (NHRIV700060302-24)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
MERRIMACK RIVER	NHRIV700060302-24	DISSOLVED OXYGEN (%SATURATION)	CONCORD	5-P	2-G

From 2001 – 2016 there were 23 instantaneous measurements of dissolved oxygen (% saturation), all of which were above 75%. In August of 2015 a datalogger was deployed at station P1893-01. This station was the source of the listing in 2002. The DO% saturation measurements were above the water quality standard throughout the deployment. During the deployment the water temperature was above 25 degrees C. Flow conditions were slightly higher than those that occurred during datalogger non-support measurements at station P1893-01 in 2002.



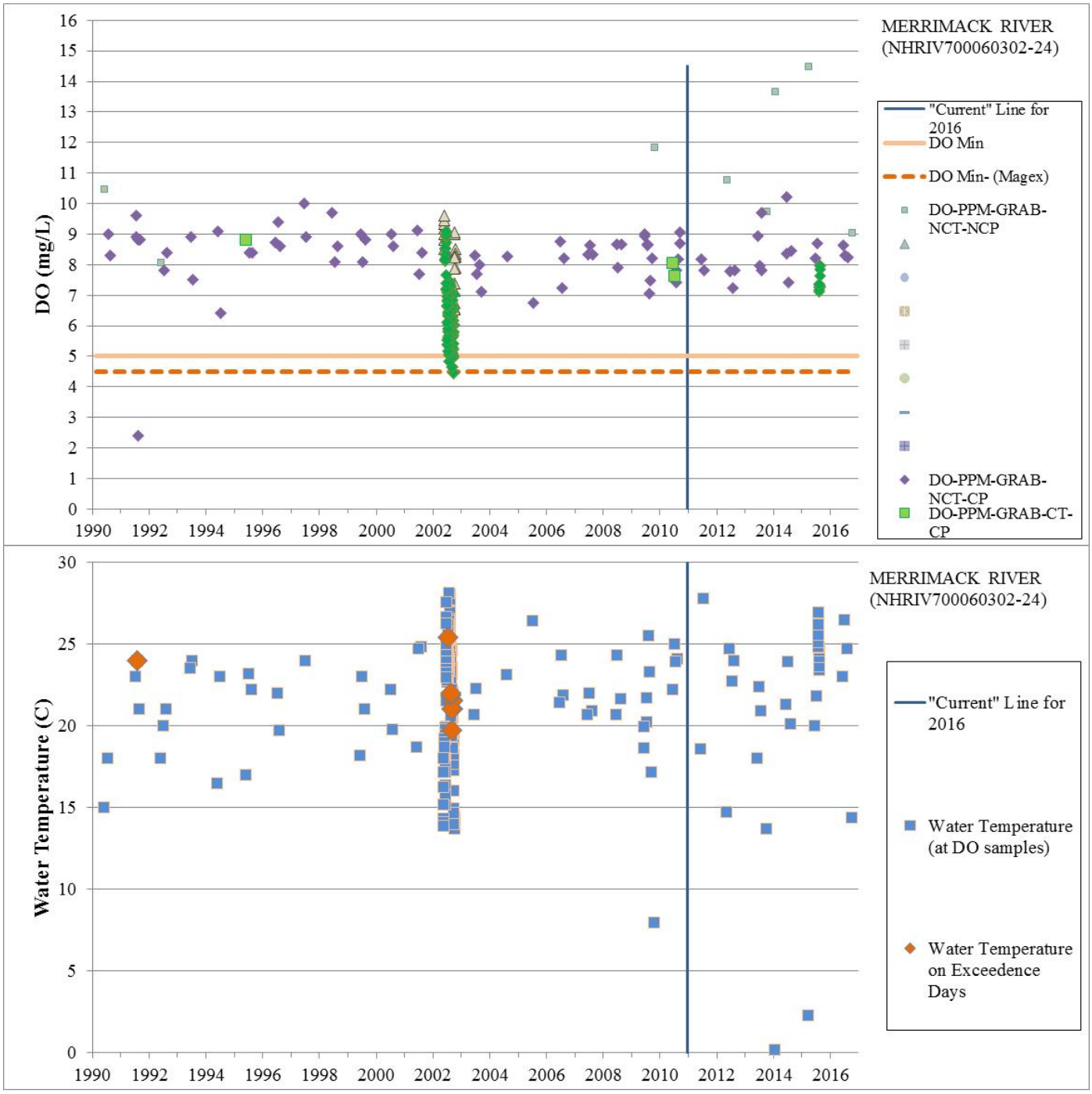


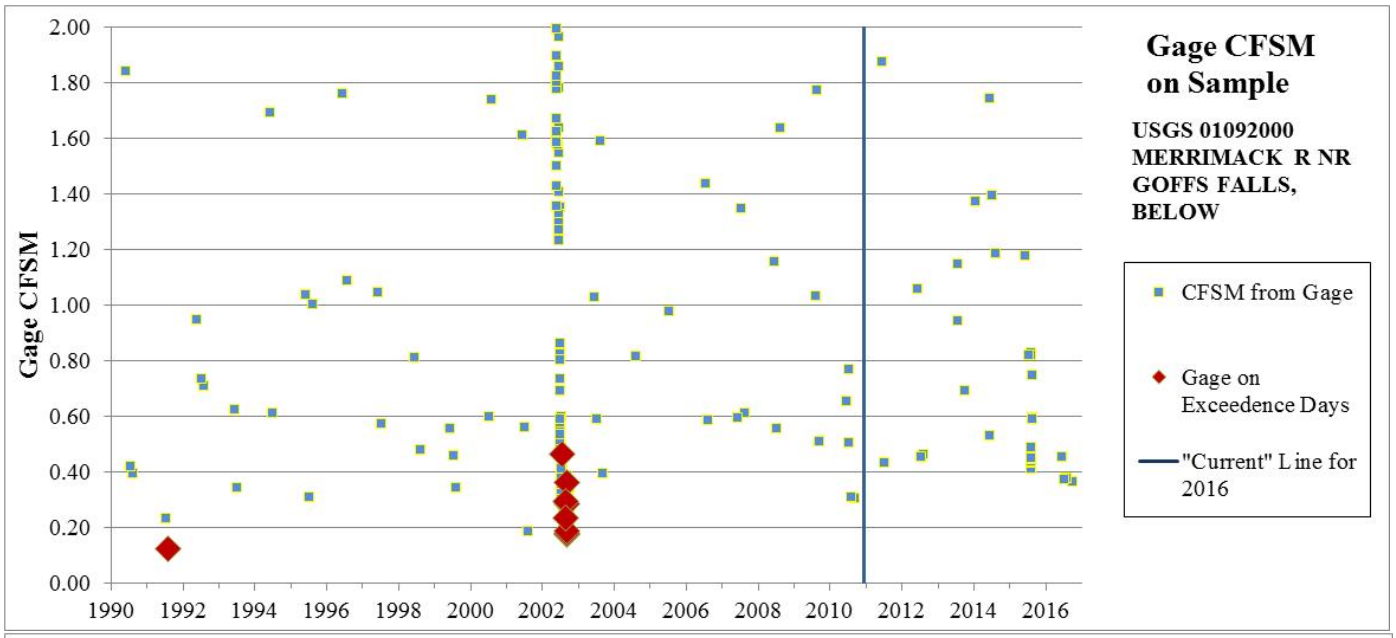


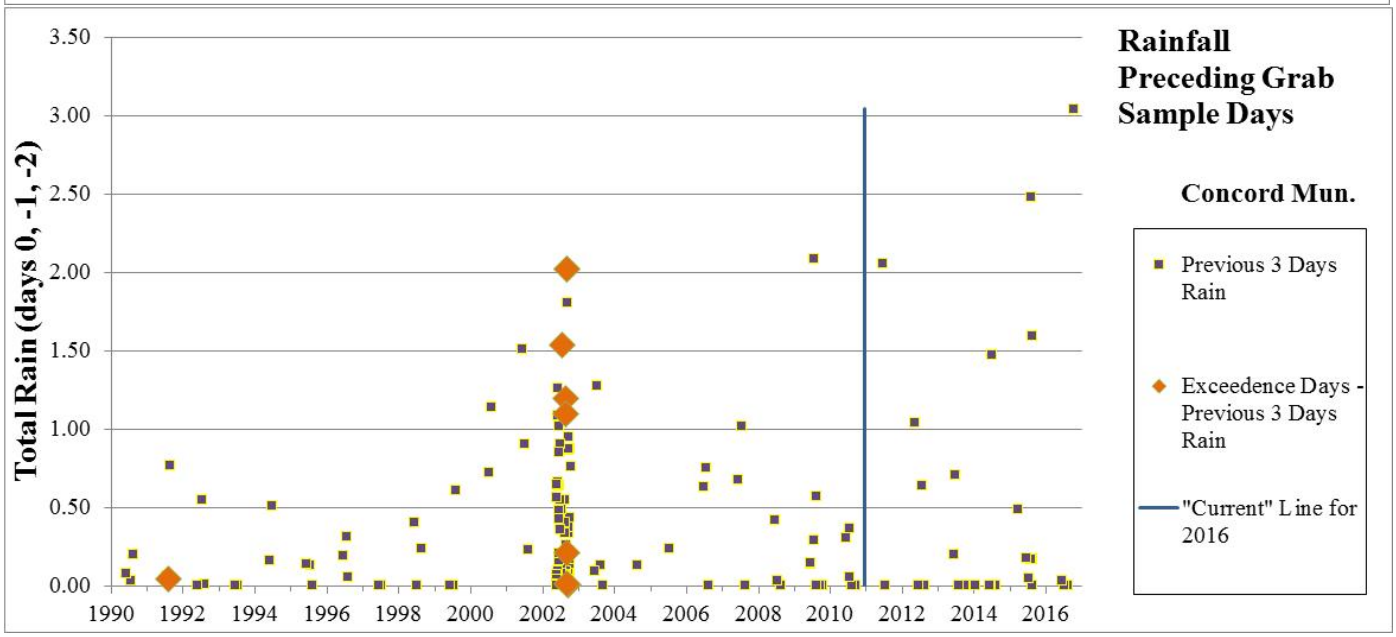
MERRIMACK RIVER (NHRIV700060302-24)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
Merrimack River	NHRIV700060302-24	Dissolved Oxygen (mg/L)	Concord	5-P	2-G

From 2001 – 2016 there were 23 instantaneous measurements of dissolved oxygen (mg/L), all of which indicated full support. In August of 2015 a datalogger was deployed at station P1893-01. This station was the source of the listing in 2002. The DO concentration levels were above the water quality standard throughout the deployment. During the 2015 deployment the water temperature was 23-27 degrees C, which is at or above the water temperatures during the 2002 non support dissolved oxygen measurements. In 2015 the flow conditions were slightly higher than those that occurred during datalogger non-support measurements at station P1893-01 in 2002.



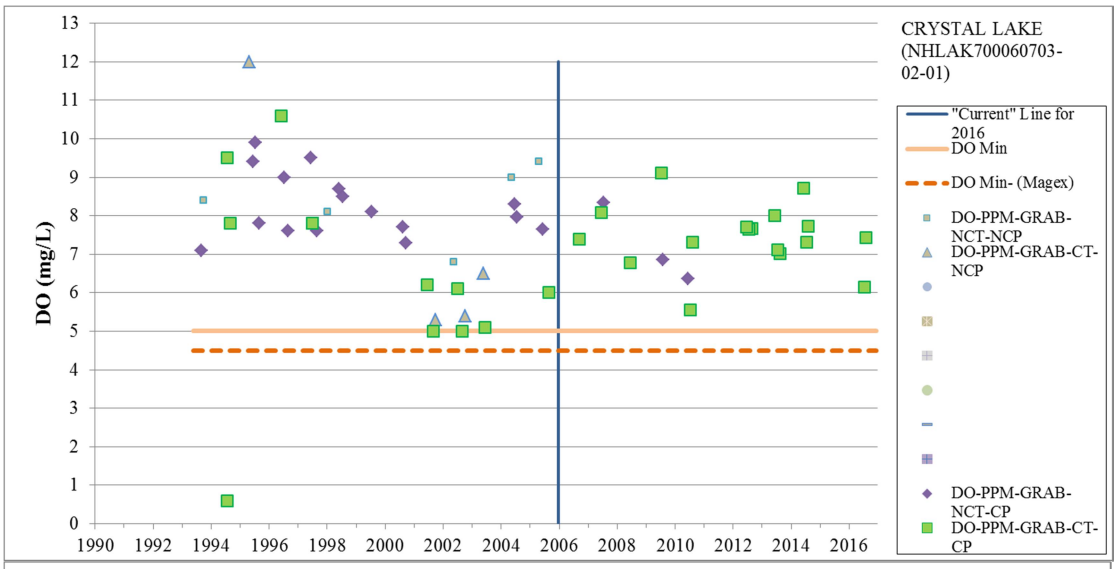


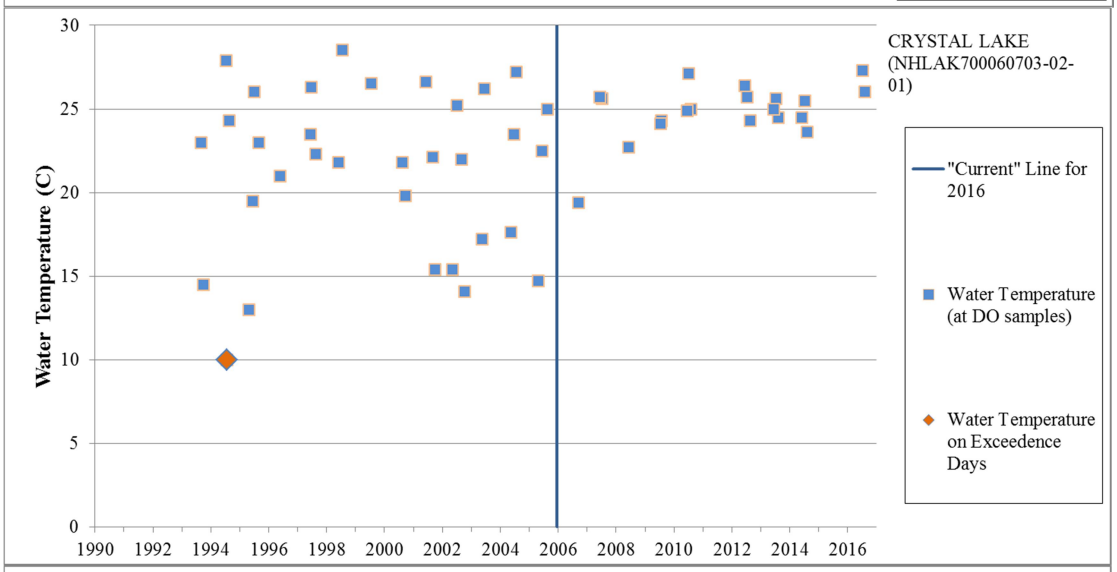


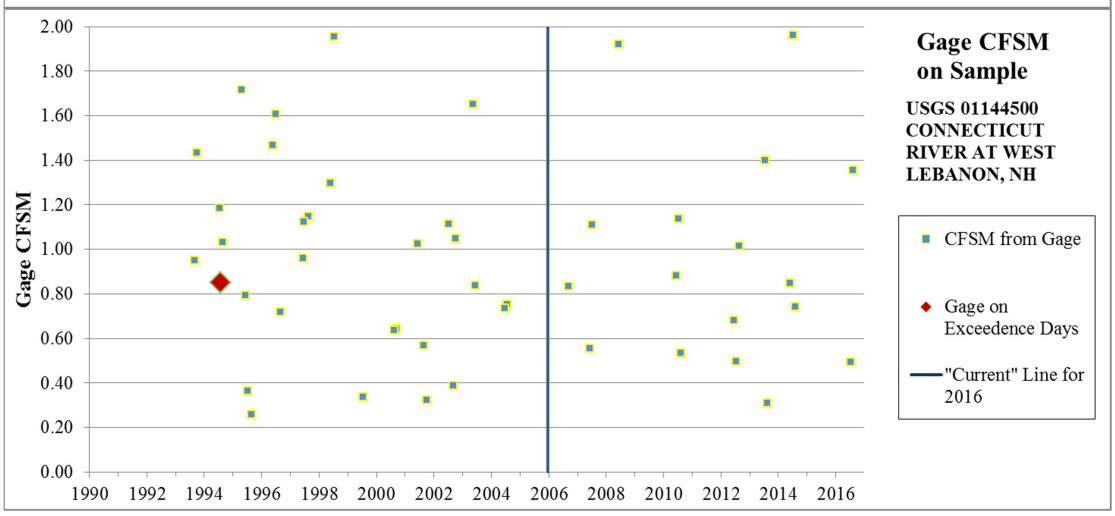
CRYSTAL LAKE (NHLAK700060703-02-01)

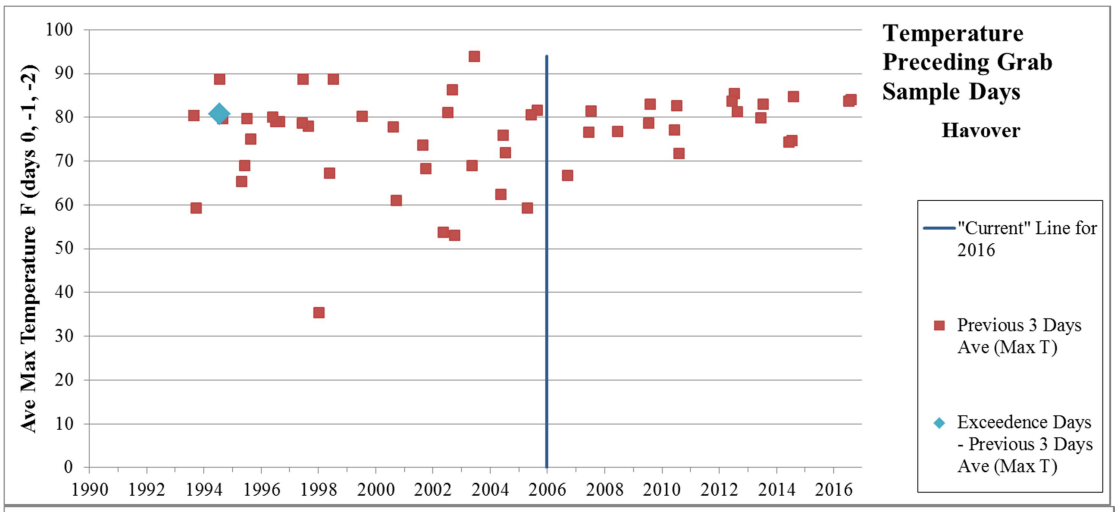
Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
CRYSTAL LAKE	NHLAK700060703-02-01	Dissolved Oxygen (mg/L)	MANCHESTER	5-M	2-G

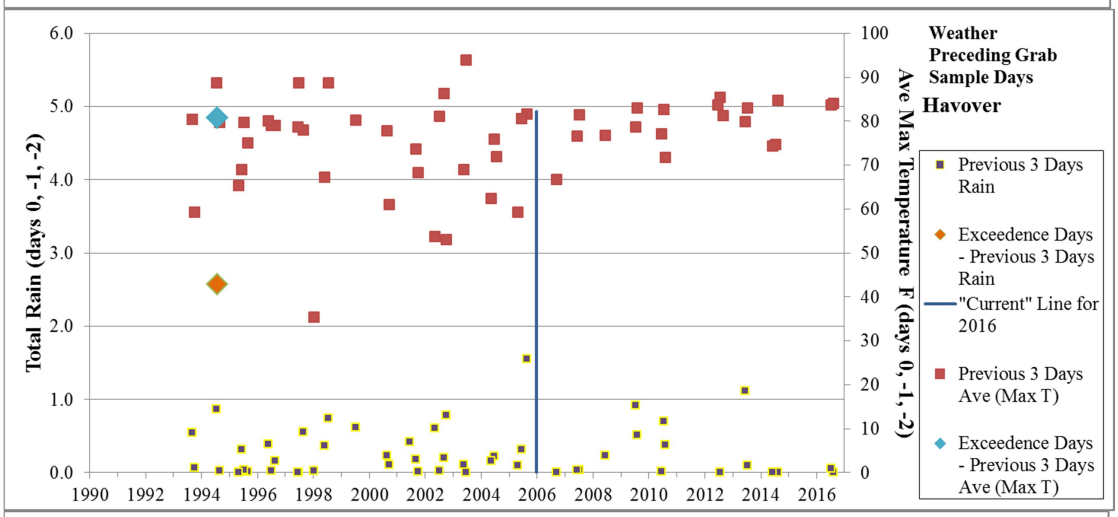
2016: Class B waterbody. Data collected from the past 10 years are primarily within Critical Period and Critical Time, and are all fully supporting. Crystal Lake is delisted and assessed as 2-G.

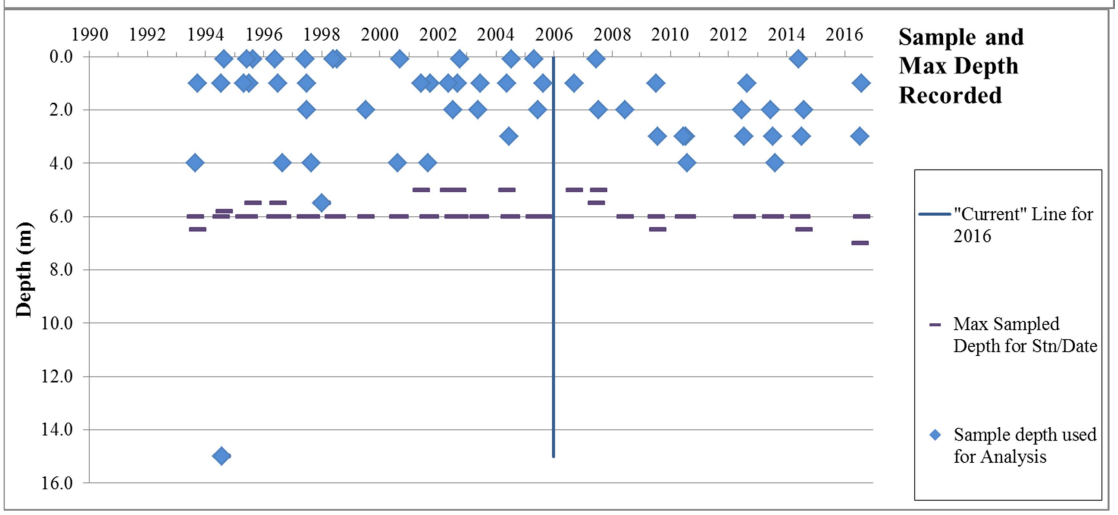

DO (mg/L)
CRYSTAL LAKE (NHLAK700060703-02-01)
"Current" Line for 2016
DO Min
DO Min- (Magex)
DO-PPM-GRAB-NCT-NCP
DO-PPM-GRAB-CT-NCP
DO-PPM-GRAB-NCT-CP
DO-PPM-GRAB-CT-CP


Water Temperature (C)
CRYSTAL LAKE (NHLAK700060703-02-01)
"Current" Line for 2016
Water Temperature (at DO samples)
Water Temperature on Exceedence Days


Gage CFSM
Gage CFSM on Sample
USGS 01144500 CONNECTICUT RIVER AT WEST LEBANON, NH
CFSM from Gage
Gage on Exceedence Days
"Current" Line for 2016



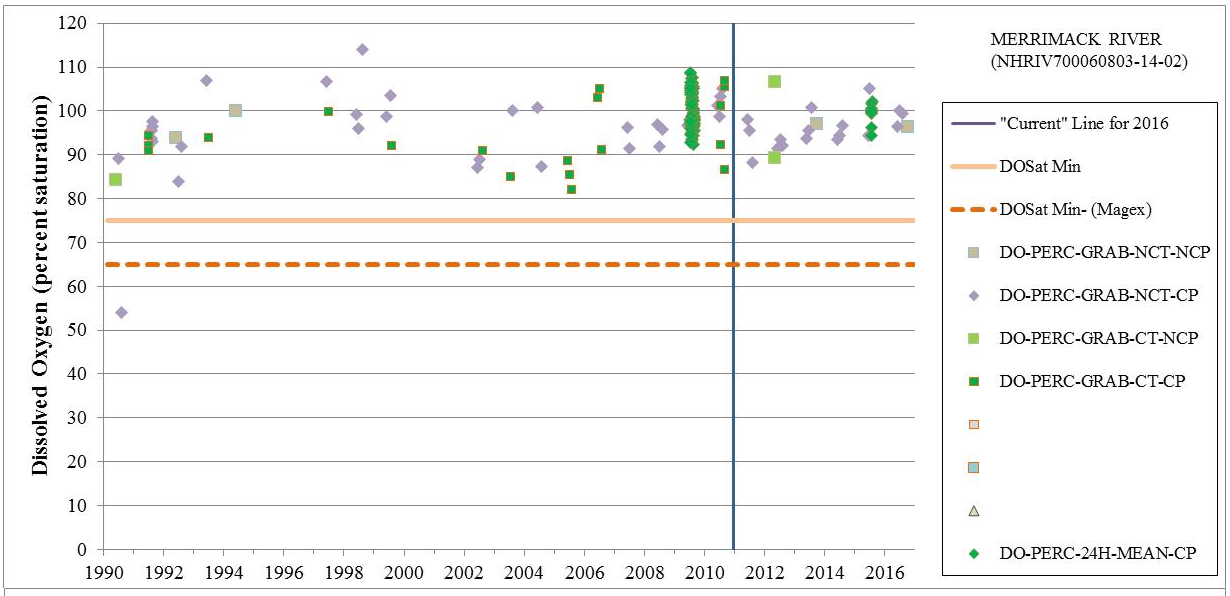


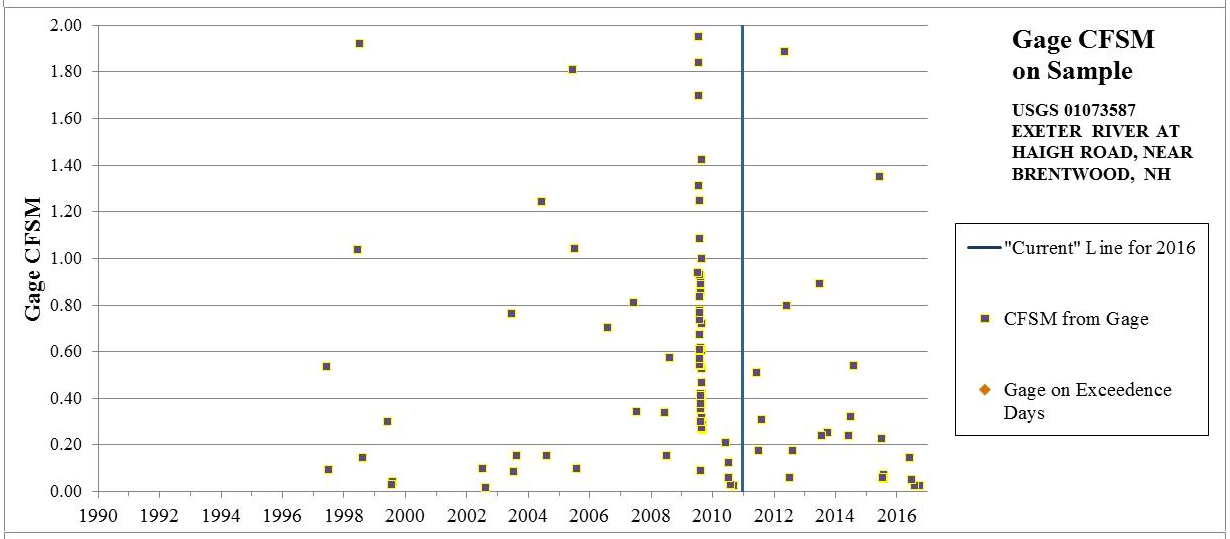


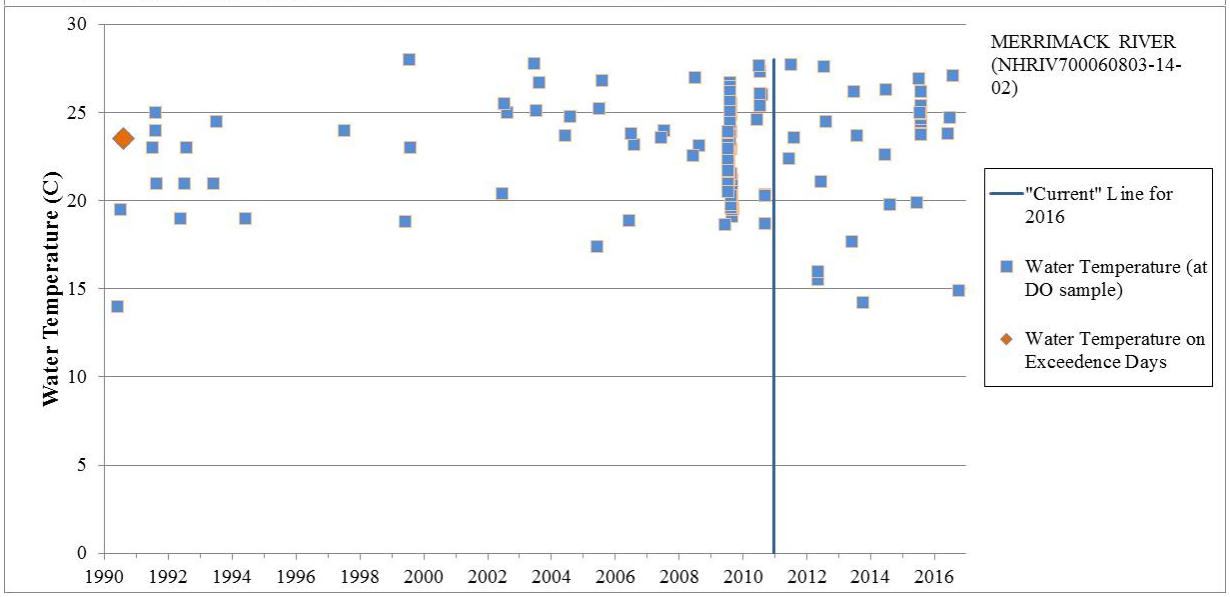
MERRIMACK RIVER (NHRIV700060803-14-02)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
Merrimack River	NHRIV700060803-14-02	Dissolved Oxygen (%Sat)	Concord	5-P	2-G

The original impairment data only exists in paper format as part of FERC#1893 - Final Report, PSNH WQ, December 2003 - Station #7 - Figure 4.2.4-4. Datalogger deployments from 2009 and 2015 show full support on all days. All 21 grab samples from 2011 to 2016 were full support.


Dissolved Oxygen (percent saturation)
MERRIMACK RIVER (NHRIV700060803-14-02)
"Current" Line for 2016
DOSat Min
DOSat Min- (Magex)
DO-PERC-GRAB-NCT-NCP
DO-PERC-GRAB-NCT-CP
DO-PERC-GRAB-CT-NCP
DO-PERC-GRAB-CT-CP
DO-PERC-24H-MEAN-CP

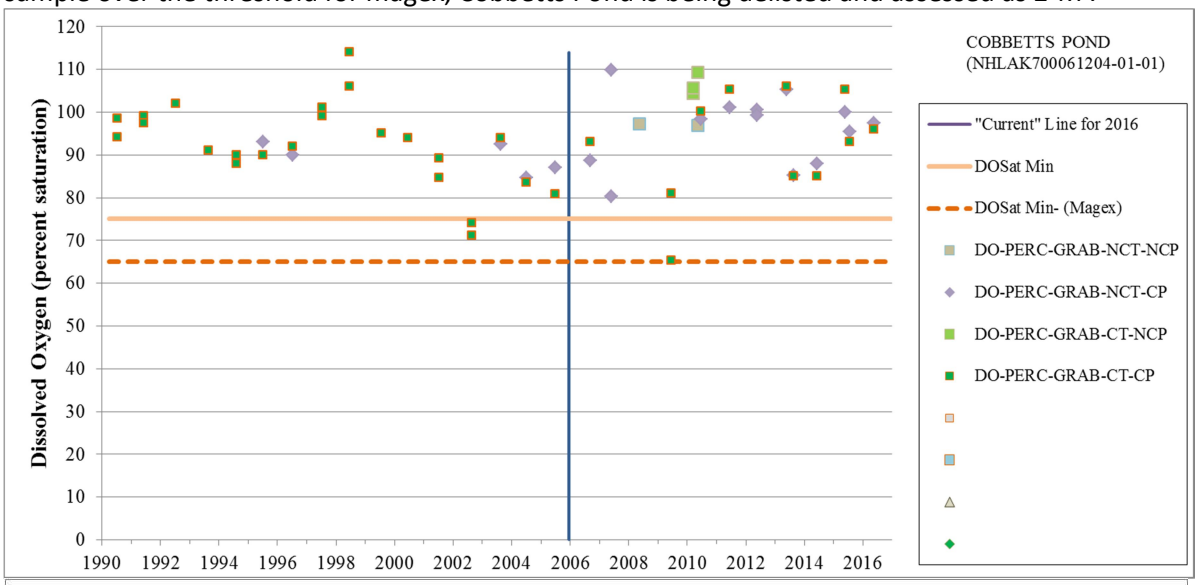

Gage CFSM
Gage CFSM on Sample
USGS 01073587 EXETER RIVER AT HAIGH ROAD, NEAR BRENTWOOD, NH
"Current" Line for 2016
CFSM from Gage
Gage on Exceedence Days

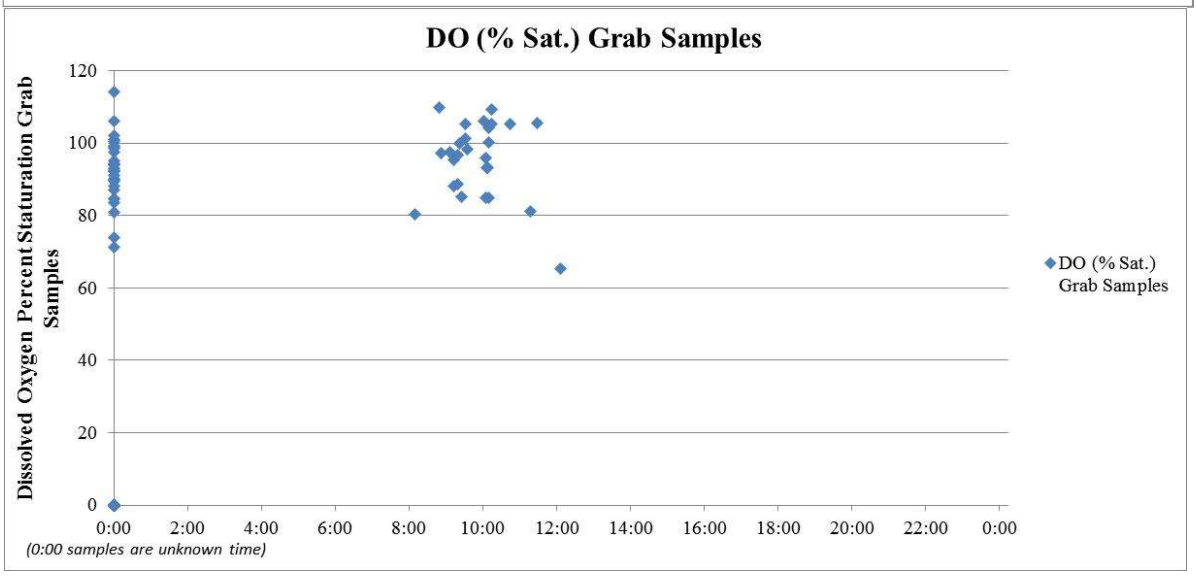

Water Temperature (C)
MERRIMACK RIVER (NHRIV700060803-14-02)
"Current" Line for 2016
Water Temperature (at DO sample)
Water Temperature on Exceedence Days

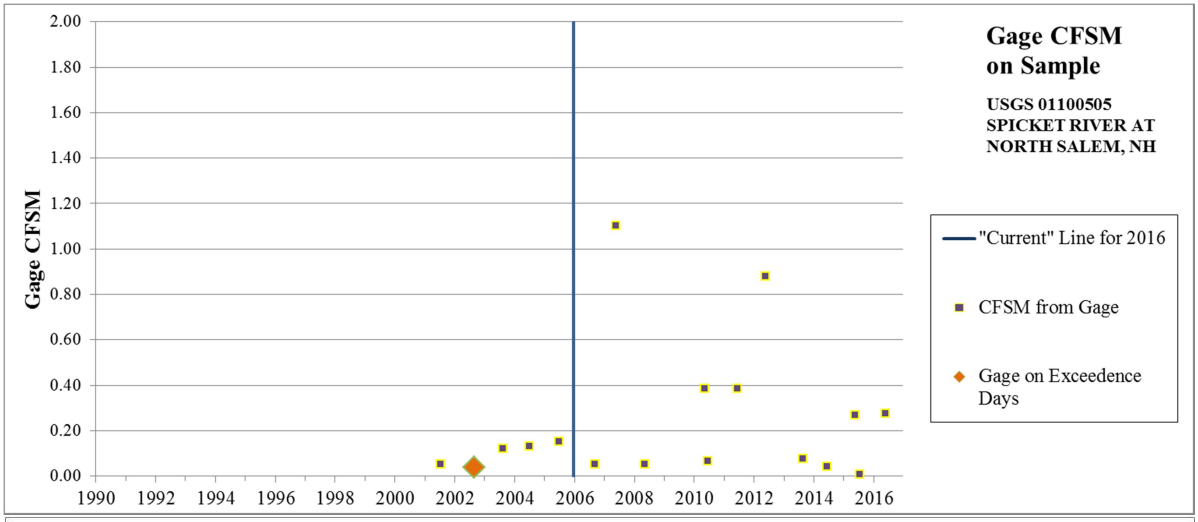
COBBETTS POND (NHLAK700061204-01-01)

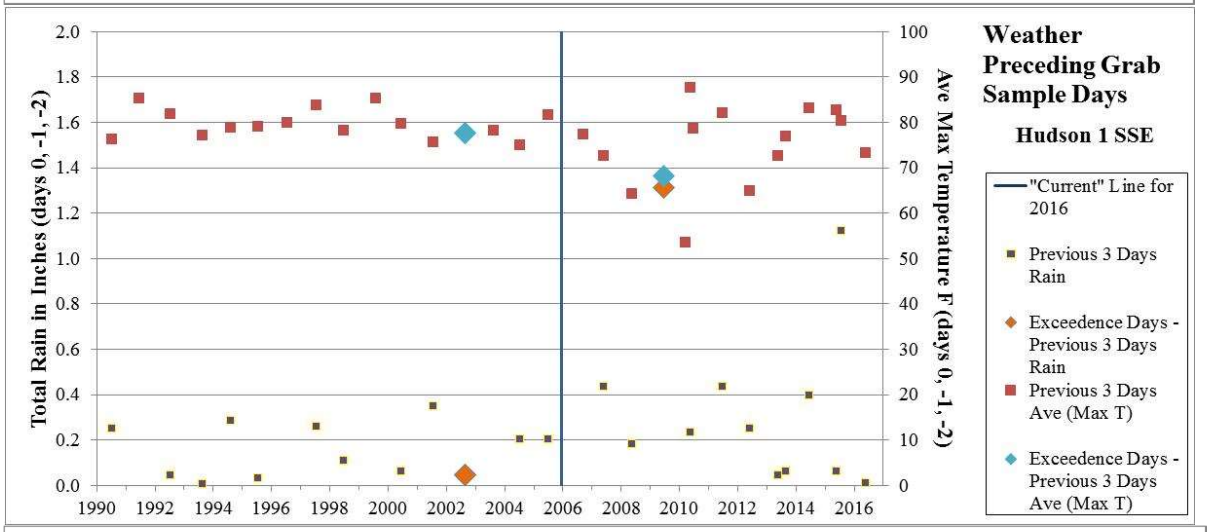
Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
COBBETTS POND	NHLAK700061204-01-01	Dissolved Oxygen (Percent Saturation)	WINDHAM	5-M	2-M

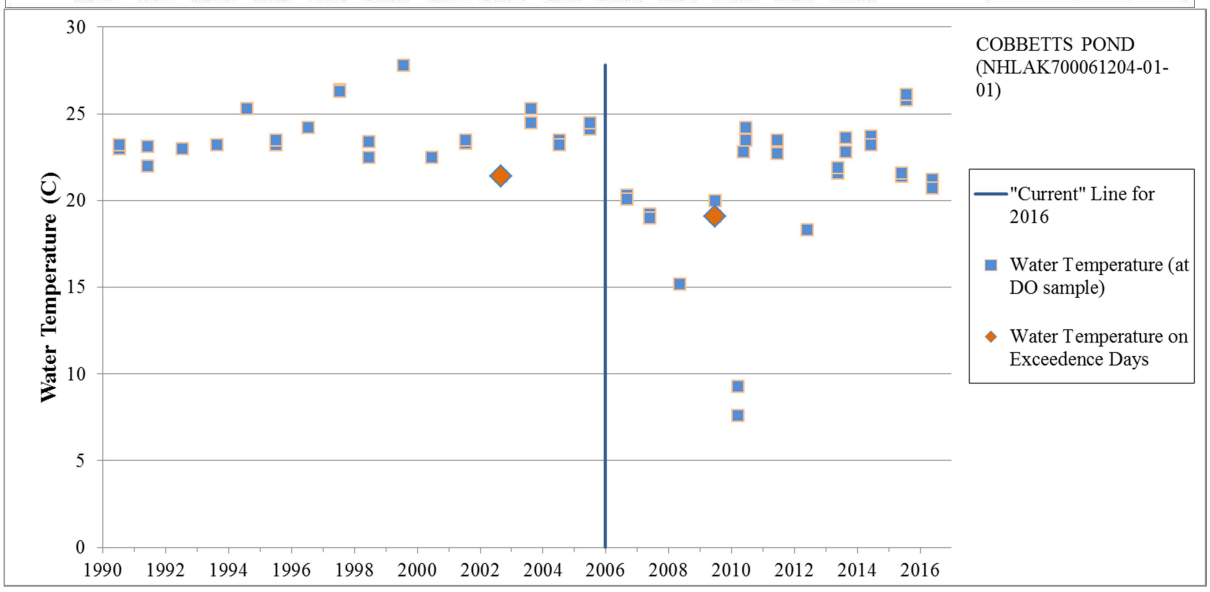
2016: Class B waterbody. Monitored through the Volunteer Lake Assessment Program (VLAP). DO%sat is generally good in the epilimnion, n=0 exceedences of the minimum standard, though there was n=1 magex in the last 10 years of data collection (2009). Prior to 2006, DO%sat was also good, barring two exceedences of the minimum DO%sat in 2002. From 2006 to 2016, based on the generally good DO%sat values, no minimum DO%sat exceedences, and just one sample over the threshold for magex, Cobbetts Pond is being delisted and assessed as 2-M .

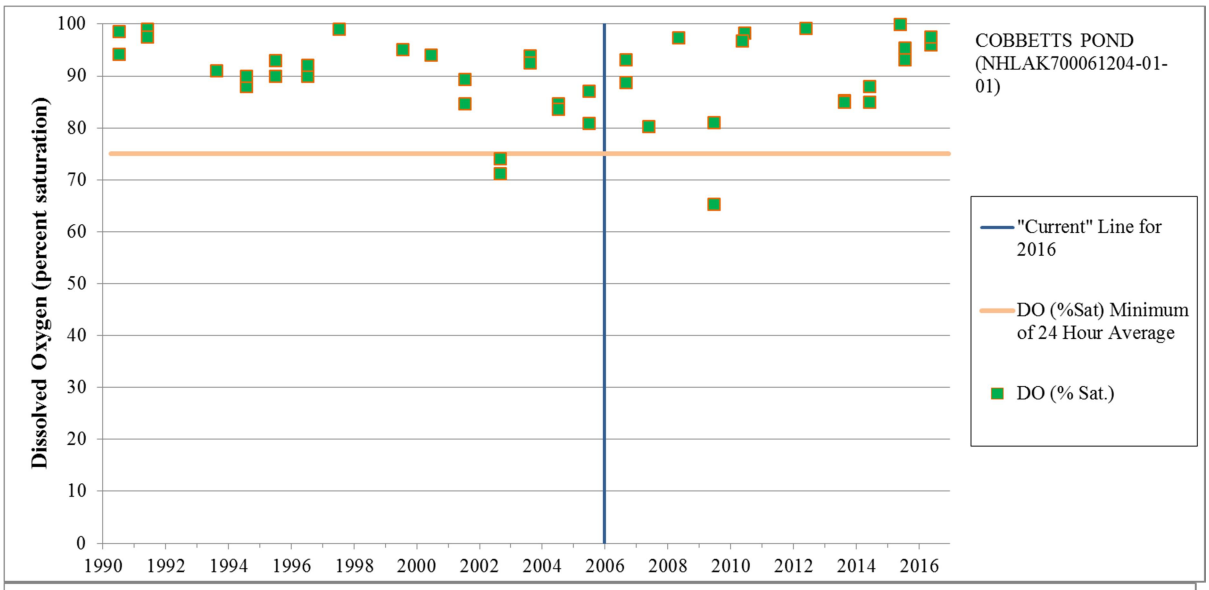


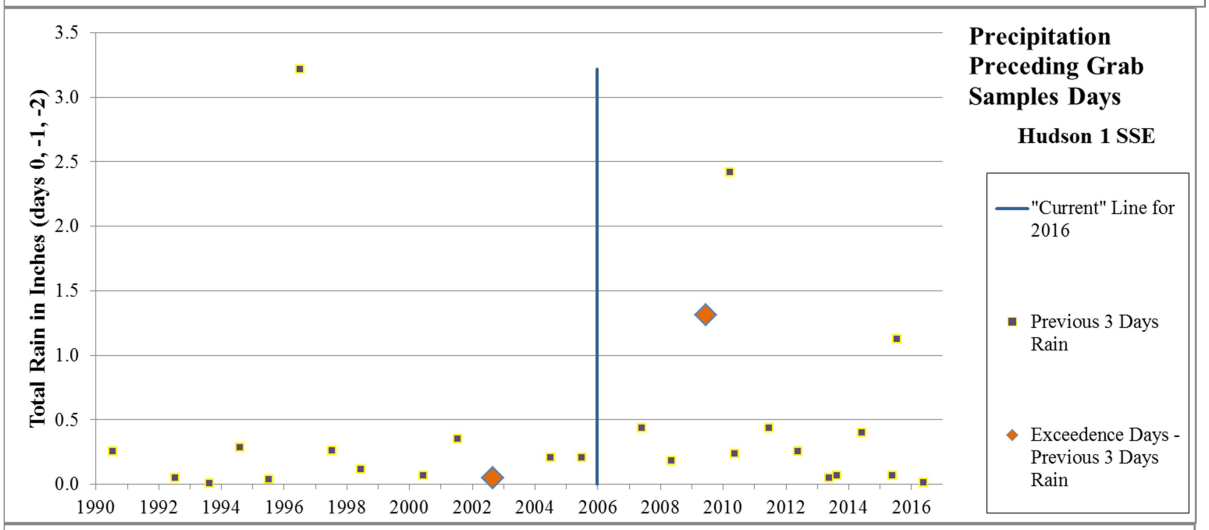


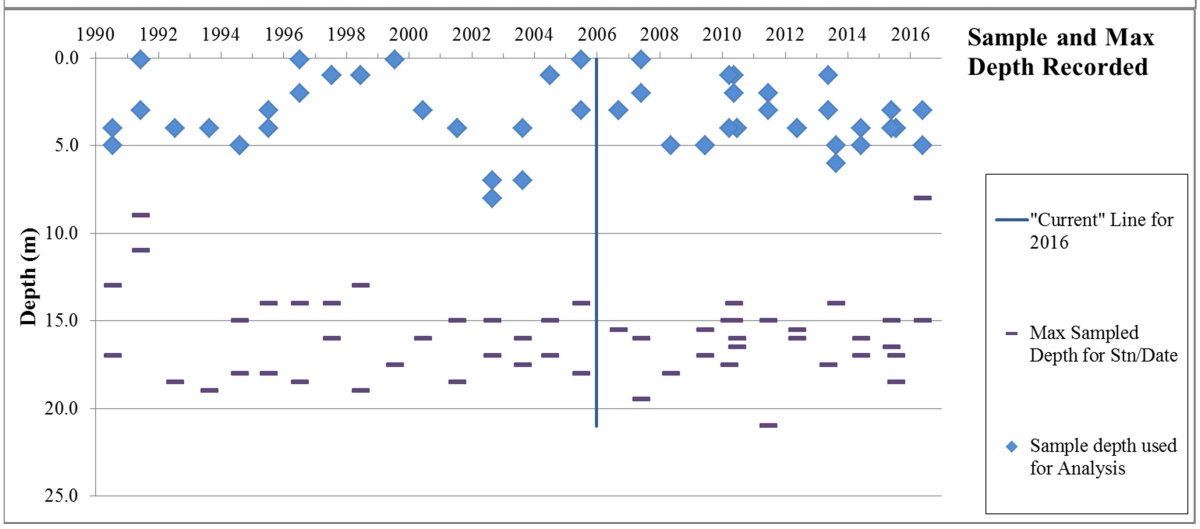

Gage CFSM on Sample
USGS 01100505 SPICKET RIVER AT NORTH SALEM, NH
Gage CFSM
"Current" Line for 2016
CFSM from Gage
Gage on Exceedence Days


Weather Preceding Grab Sample Days
Hudson 1 SSE
Total Rain in Inches (days 0, -1, -2)
Ave Max Temperature F (days 0, -1, -2)
"Current" Line for 2016
Previous 3 Days Rain
Exceedence Days - Previous 3 Days Rain
Previous 3 Days Ave (Max T)
Exceedence Days - Previous 3 Days Ave (Max T)


COBBETTS POND (NHLAK700061204-01-01)
Water Temperature (C)
"Current" Line for 2016
Water Temperature (at DO sample)
Water Temperature on Exceedence Days





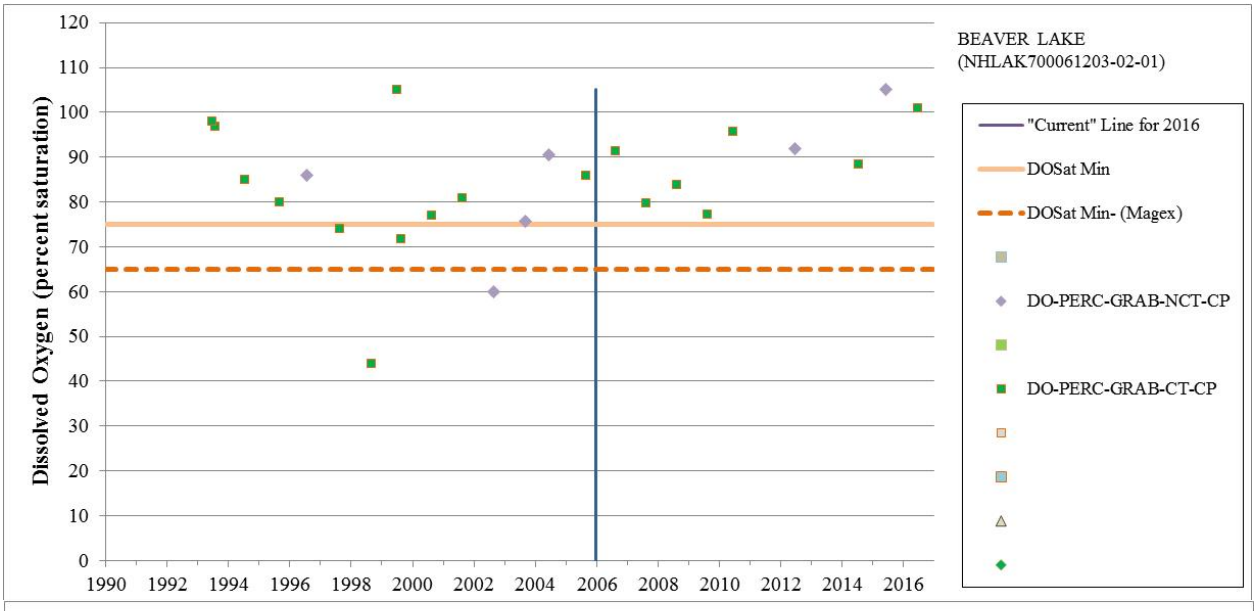


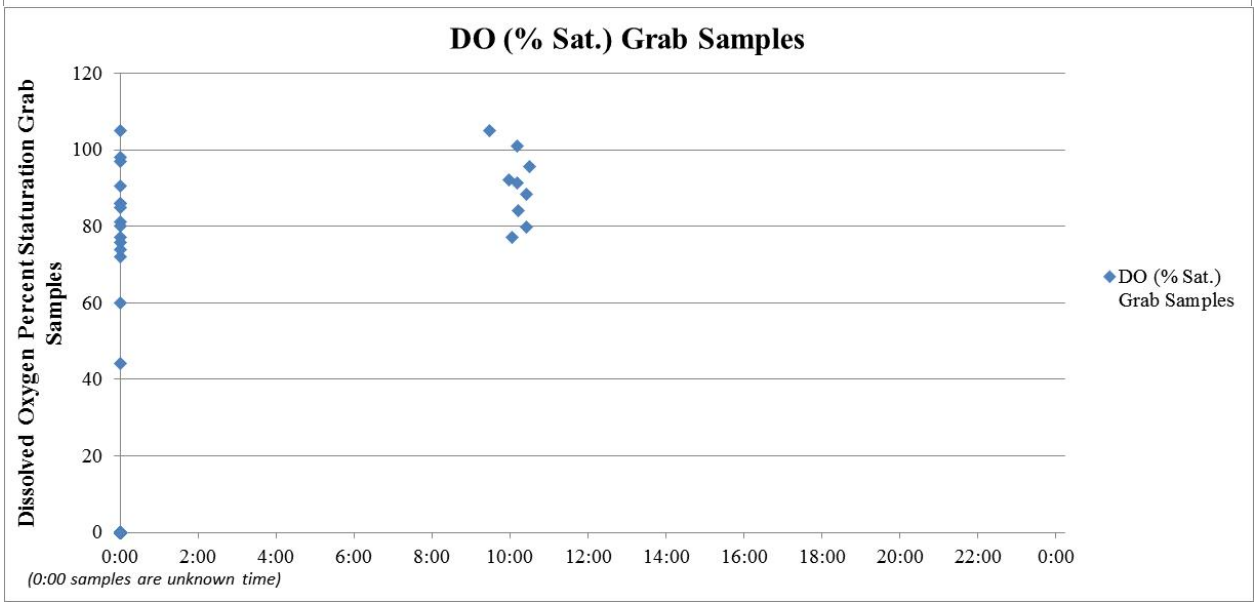
BEAVER LAKE (NHLAK700061203-02-01)

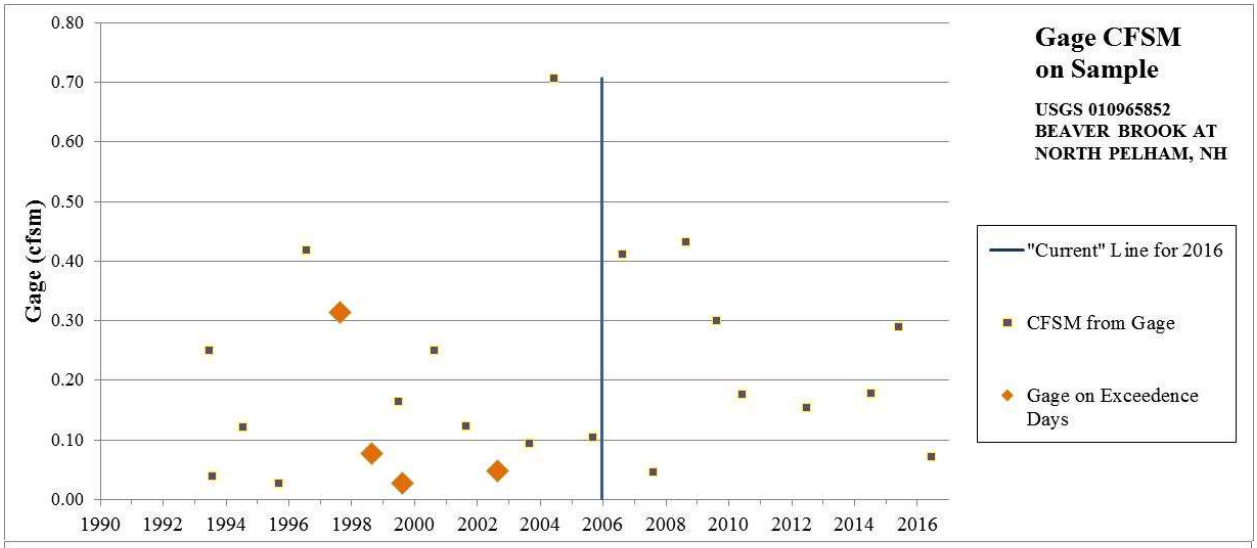
Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016

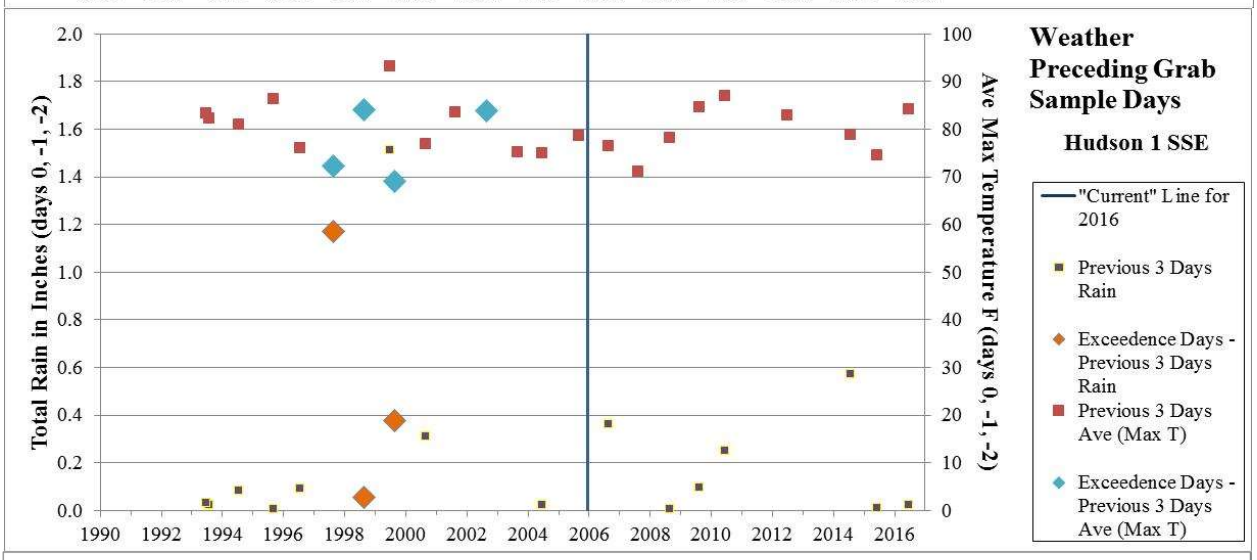
BEAVER LAKE	NHLAK700061203-02-01	DISSOLVED OXYGEN % SATURATION	DERRY	5-M	2-M

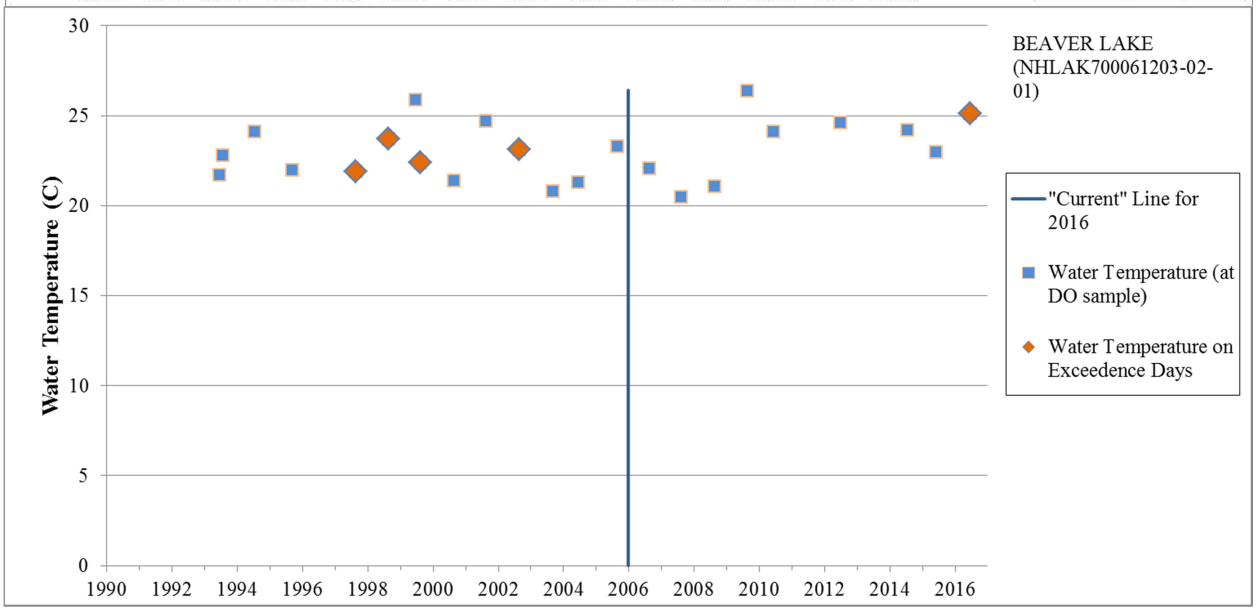
2016: Class B waterbody. Most recent exceedence in 2016, however that data point of 4% sat at 3 m depth in the water column appears to be an anomaly or data entry error, as the dissolved oxygen concentration at that depth was normal at 8.3mg/L. DO %sat at 2m was 101% and DOppm was 8.2 mg/L. At 4m depth, %sat was 101 and DO ppm was 8.6 mg/L; therefore there was no reason for DO%sat to be as low as 4%. This reading was omitted from the assessment data in the ADB, and substituted with data at the 2m depth. Notes from the 2014 assessment indicated need for additional rounds of early data collection and that the waterbody was looking better. Based on data from the past 10 years (2006-2016), all samples are supporting standards, and there were no exceedences of DO%sat standards. Based on the data, Beaver Lake is attaining standards, and delisted and assessed as 2-M. This waterbody was subject to a Diagnostic Feasibility Study and Implementation Project to improve watershed land uses and historic loadings, and it appears that water quality, at least for the DO%sat category is once again attaining standards.

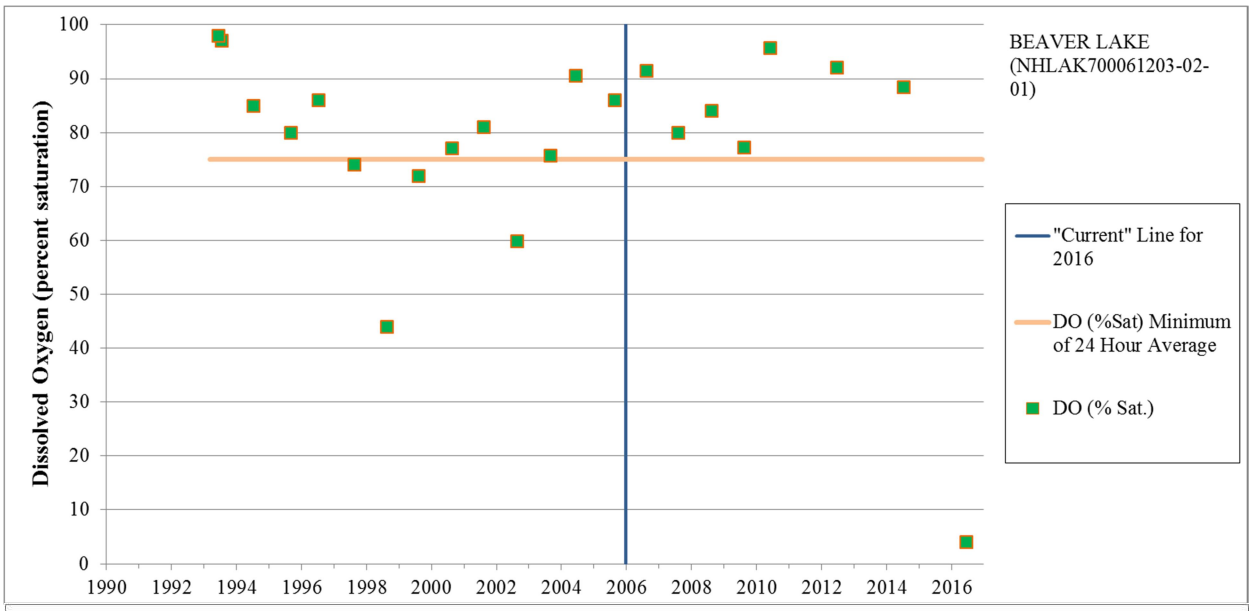


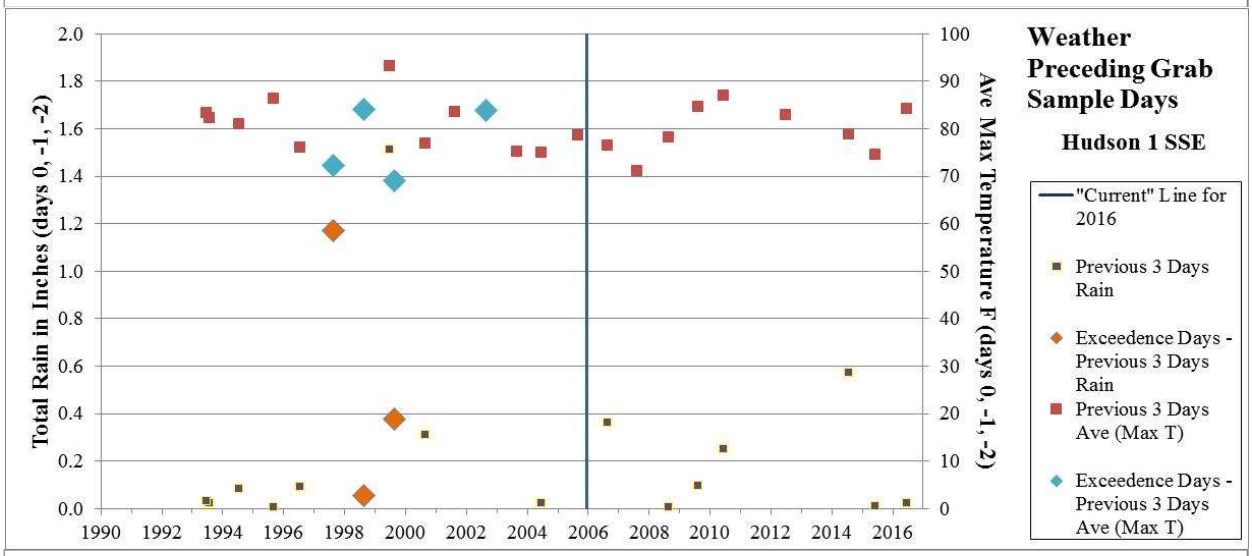


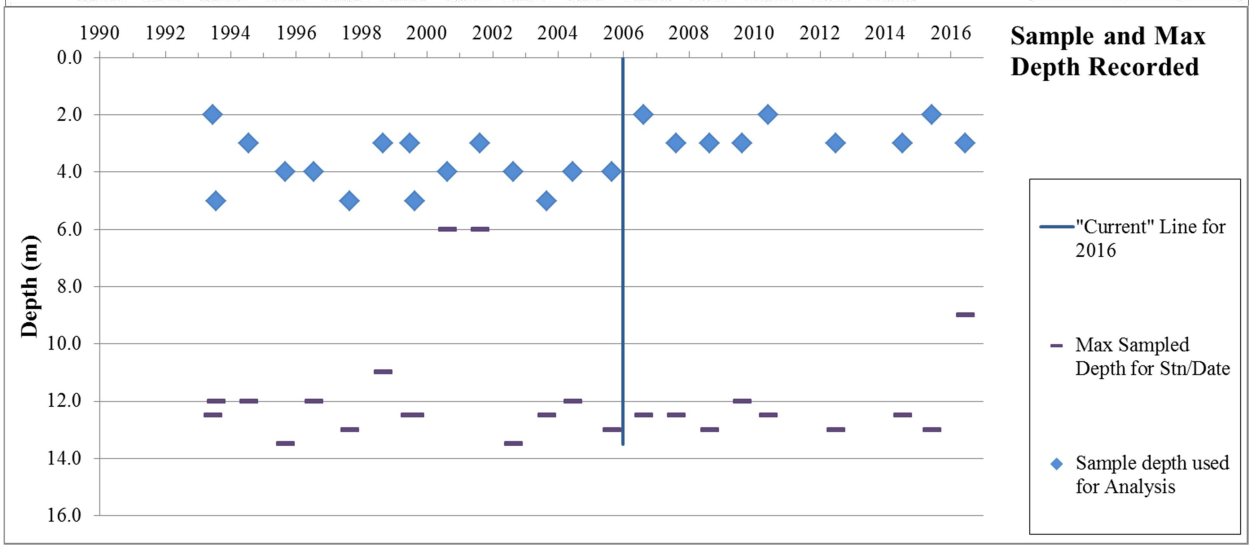

Gage CFSM on Sample
USGS 010965852 BEAVER BROOK AT NORTH PELHAM, NH
Gage (cfsm)
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
"Current" Line for 2016
CFSM from Gage
Gage on Exceedence Days


Weather Preceding Grab Sample Days
Hudson 1 SSE
Total Rain in Inches (days 0, -1, -2)
Ave Max Temperature F (days 0, -1, -2)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
100
90
80
70
60
50
40
30
20
10
0
1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
"Current" Line for 2016
Previous 3 Days Rain
Exceedence Days - Previous 3 Days Rain
Previous 3 Days Ave (Max T)
Exceedence Days - Previous 3 Days Ave (Max T)


BEAVER LAKE (NHLAK700061203-02-01)
Water Temperature (C)
30
25
20
15
10
5
0
1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
"Current" Line for 2016
Water Temperature (at DO sample)
Water Temperature on Exceedence Days





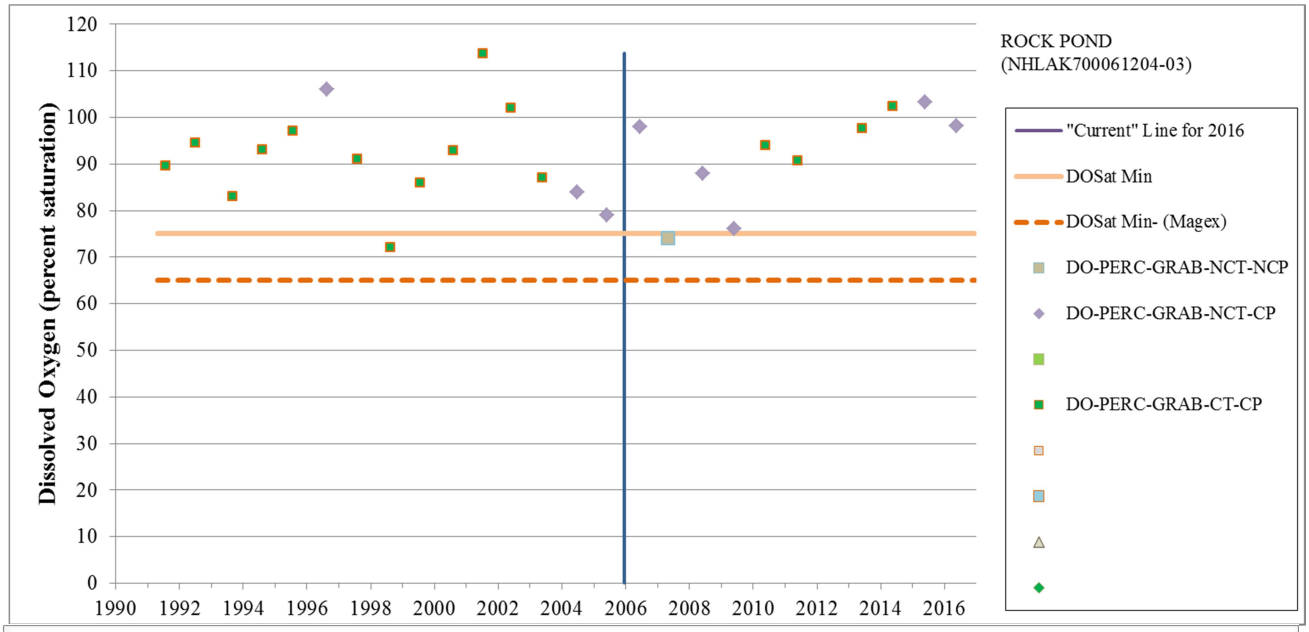


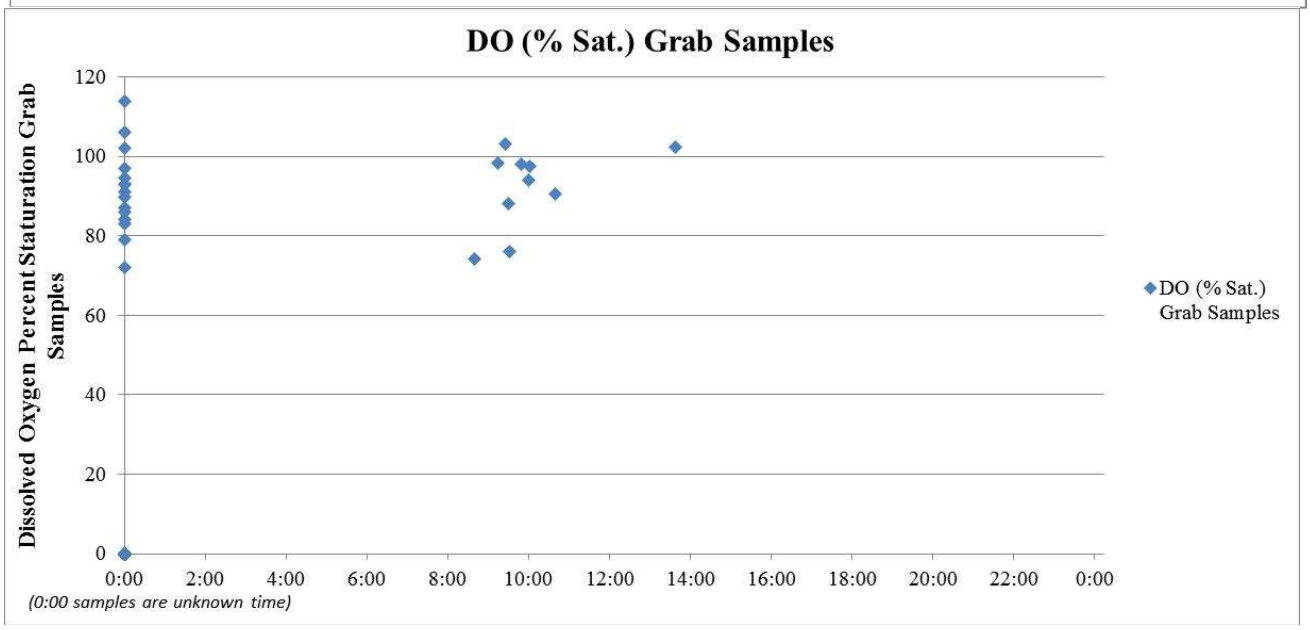
ROCK POND (NHLAK700061204-03)

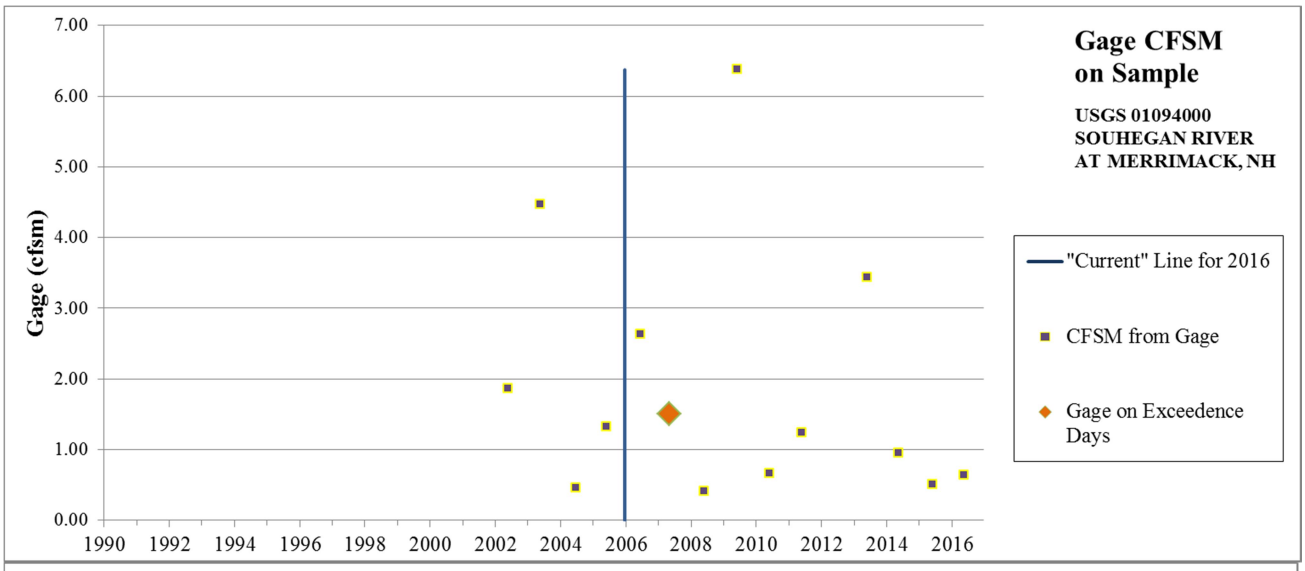
Assessment Unit Name	Assessment Unit ID	Parameter	Primary Town	2014	2016

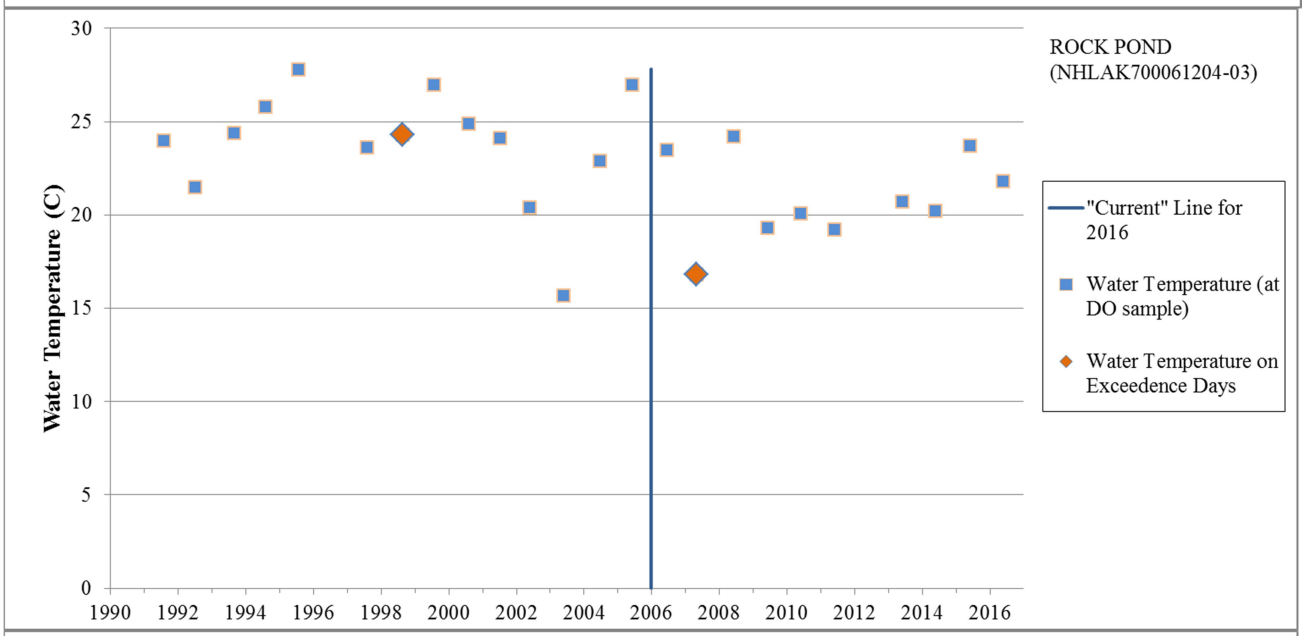
		Name			
ROCK POND	NHLAK700061204-03	DISSOLVED OXYGEN % SATURATION	WINDHAM	5-M	2-M

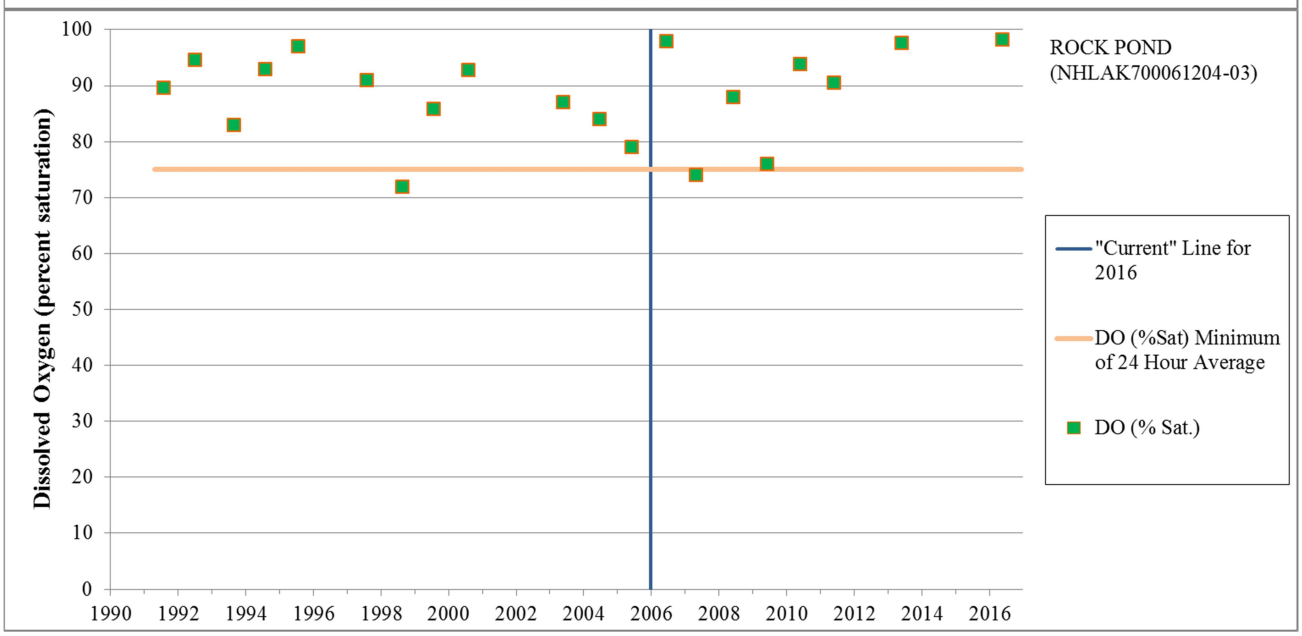
2016: Class B waterbody. Most recent exceedence was in 2007. In the current sampling period (2006 to 2016), a total of 10 sample dates occurred. Of these, n=4 were within the CP and CT; n=5 were in the CP but outside of CT, and n=1 was outside of both CP and CT. Of the ten data points, n=1 was a minimum DO%sat exceedence at 74% sat. While the data show that the waterbody is attaining standards, the majority of the recent data are outside of the CP and CT, and may not be reflective of conditions under which DO%sat exceedences may occur; however based on the historical trends of this waterbody, mostly attaining standards and not exceeding the 10% rule, Rock Pond is delisted and assessed as 2-M.

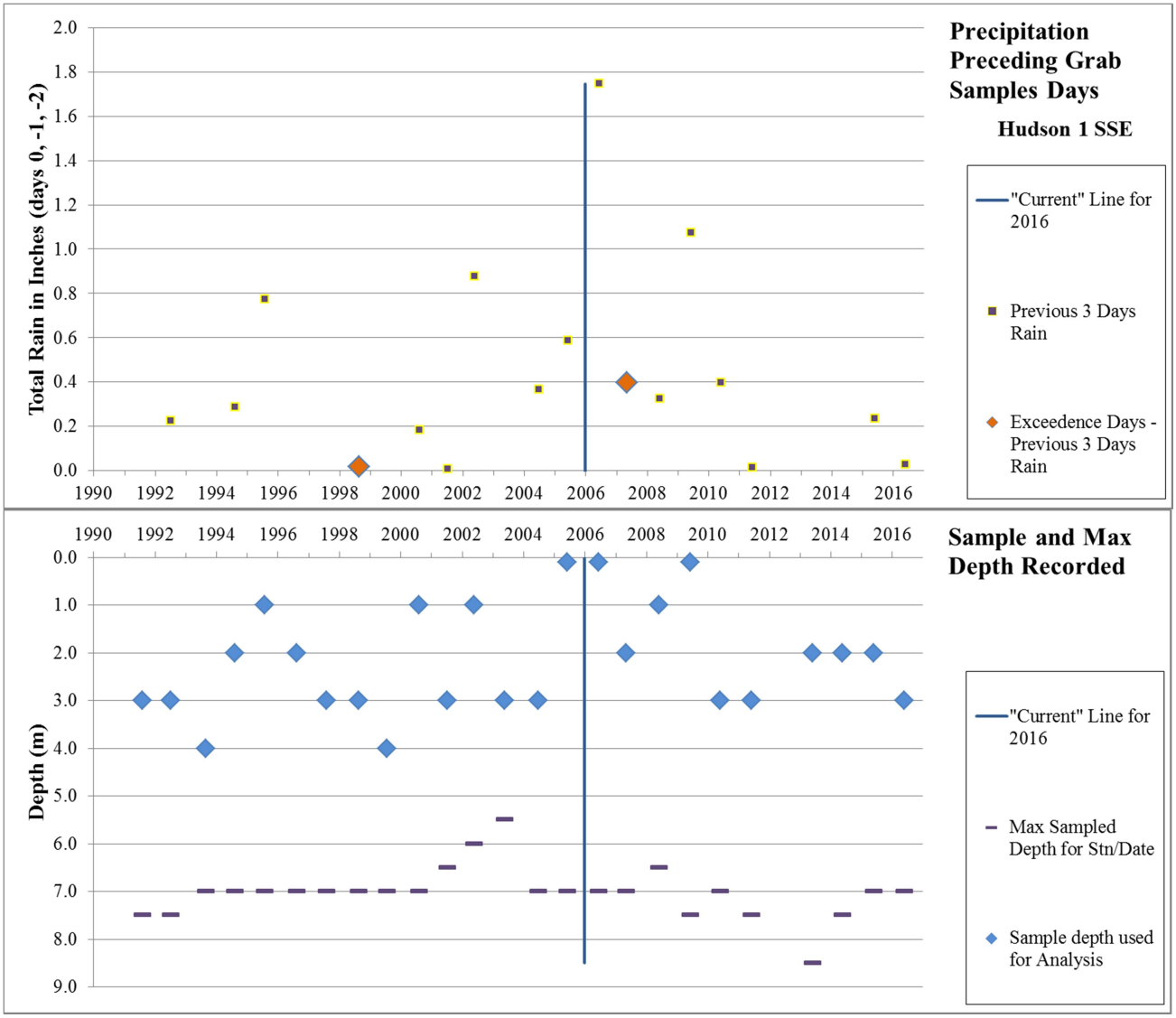





Gage CFSM on Sample
USGS 01094000
SOUHEGAN RIVER
AT MERRIMACK, NH
Gage (cfsm)
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
"Current" Line for 2016
CFSM from Gage
Gage on Exceedence Days


ROCK POND
(NHLAK700061204-03)
Water Temperature (C)
30
25
20
15
10
5
0
1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
"Current" Line for 2016
Water Temperature (at DO sample)
Water Temperature on Exceedence Days

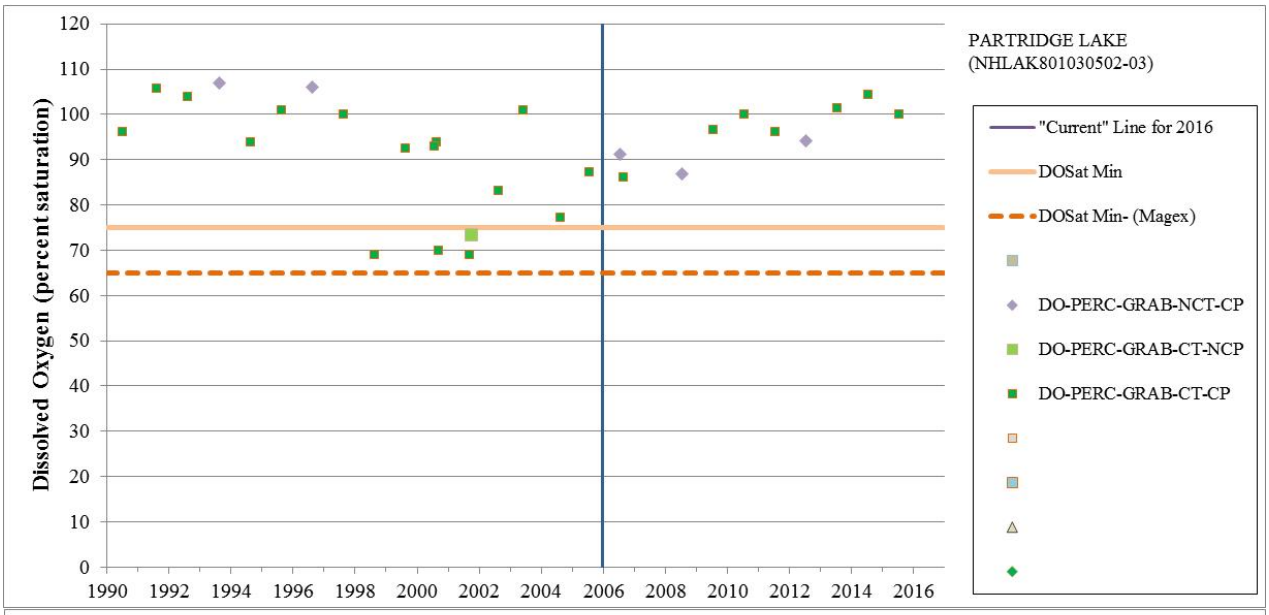

ROCK POND
(NHLAK700061204-03)
Dissolved Oxygen (percent saturation)
100
90
80
70
60
50
40
30
20
10
0
1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
"Current" Line for 2016
DO (%Sat) Minimum of 24 Hour Average
DO (% Sat.)

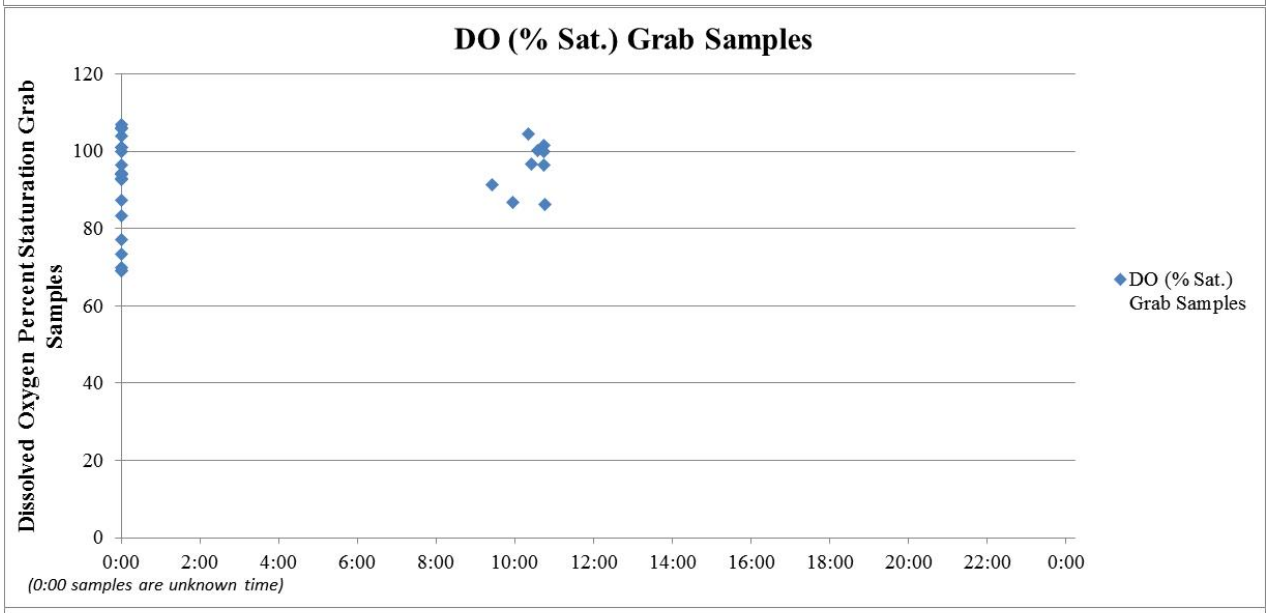


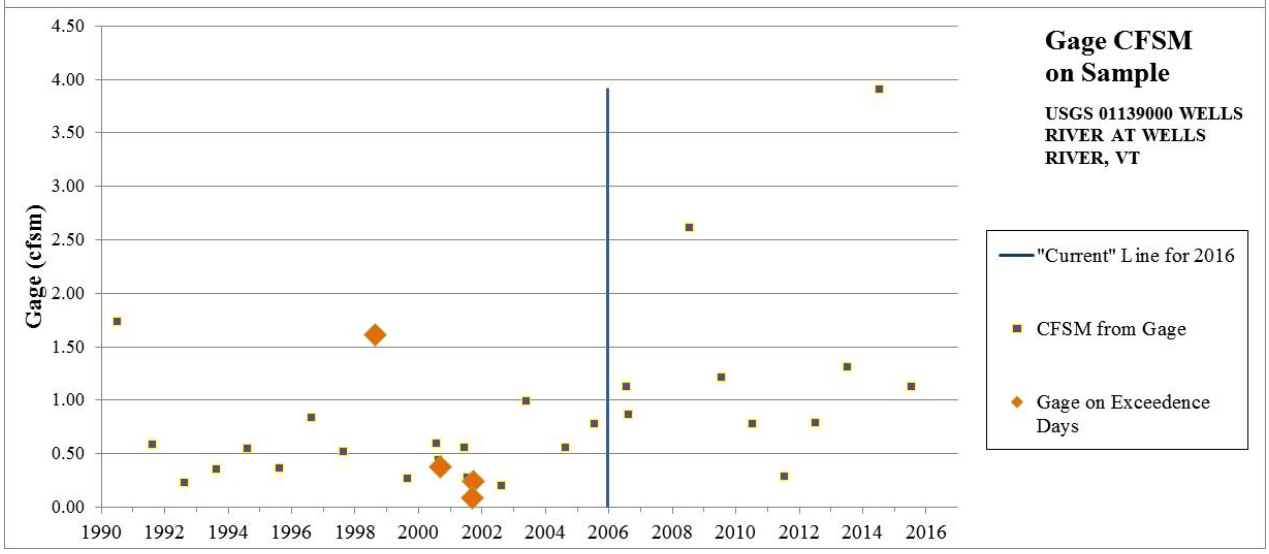
PARTRIDGE LAKE (NHLAK801030502-03)

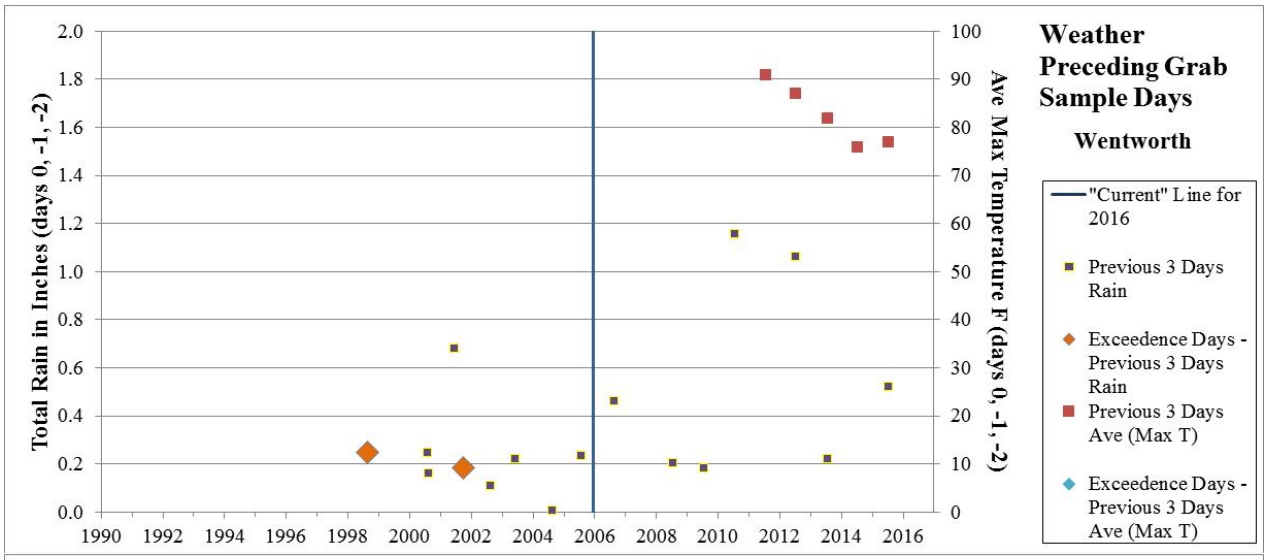
Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
PARTRIDGE LAKE	NHLAK801030502-03	DISSOLVED OXYGEN % SATURATION	LITTLETON	5-M	2-M

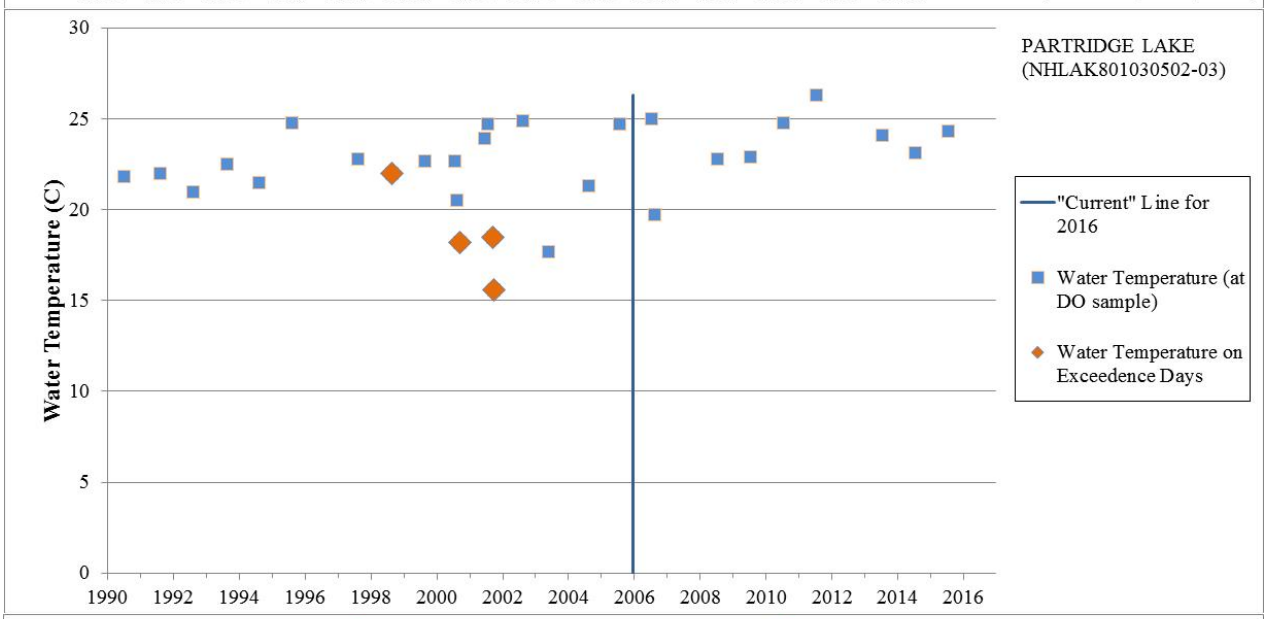
2016: Class B waterbody. Data for this assessment period were collected between 2006 and 2016, during which time 11 samples were collected. Of those, n=7 were collected within the CP and CT; n=1 was collected in the CT but NCP; and n=3 were collected outside of the CT, but within CP. Historic exceedences occurred in 1998, 2000 and 2001. The majority of samples for this waterbody over time have attained standards. All other samples within this assessment period are fully support, including all seven samples collected within CP and CT, and the 10% rule is not met. Partridge Lake was part of a Diagnostic Feasibility Study, which resulted in identifying various watershed areas for restoration/improvement. Water quality is likely improving as a result of the implementation of Best Management Practices in the watershed. Based on this, Partridge Lake is delisted and assessed suggest moving this waterbody to 2-M and continue monitoring for any anomalies.

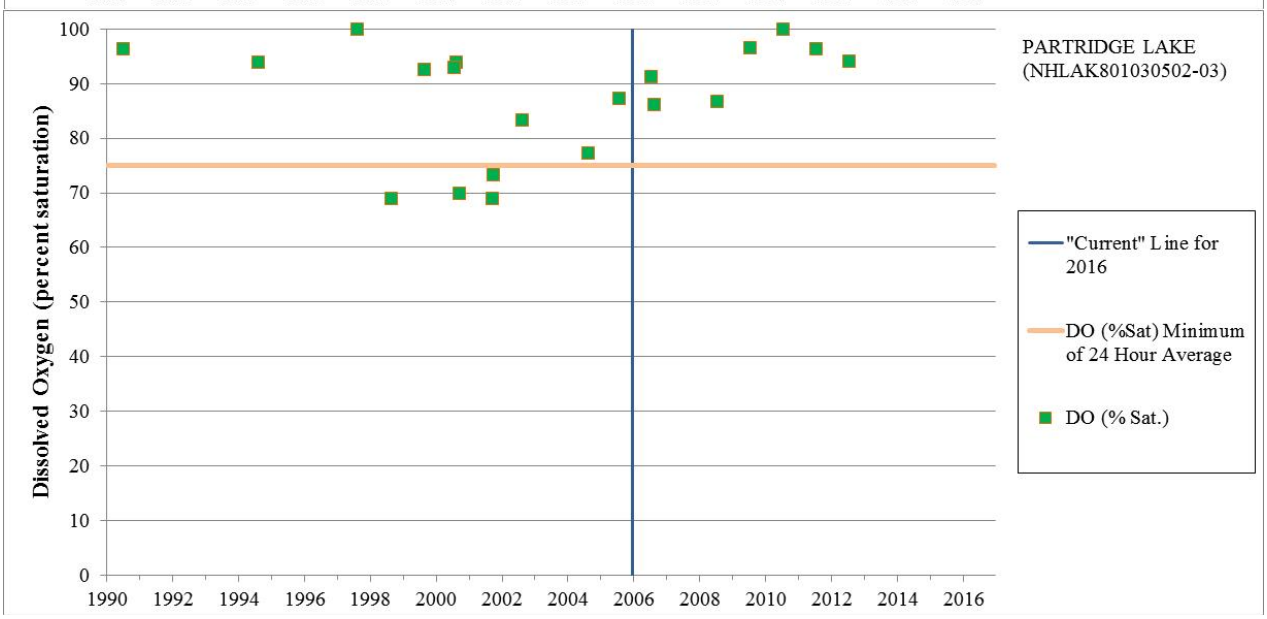

PARTRIDGE LAKE
(NHLAK801030502-03)
Dissolved Oxygen (percent saturation)
"Current" Line for 2016
DOSat Min
DOSat Min- (Magex)
DO-PERC-GRAB-NCT-CP
DO-PERC-GRAB-CT-NCP
DO-PERC-GRAB-CT-CP

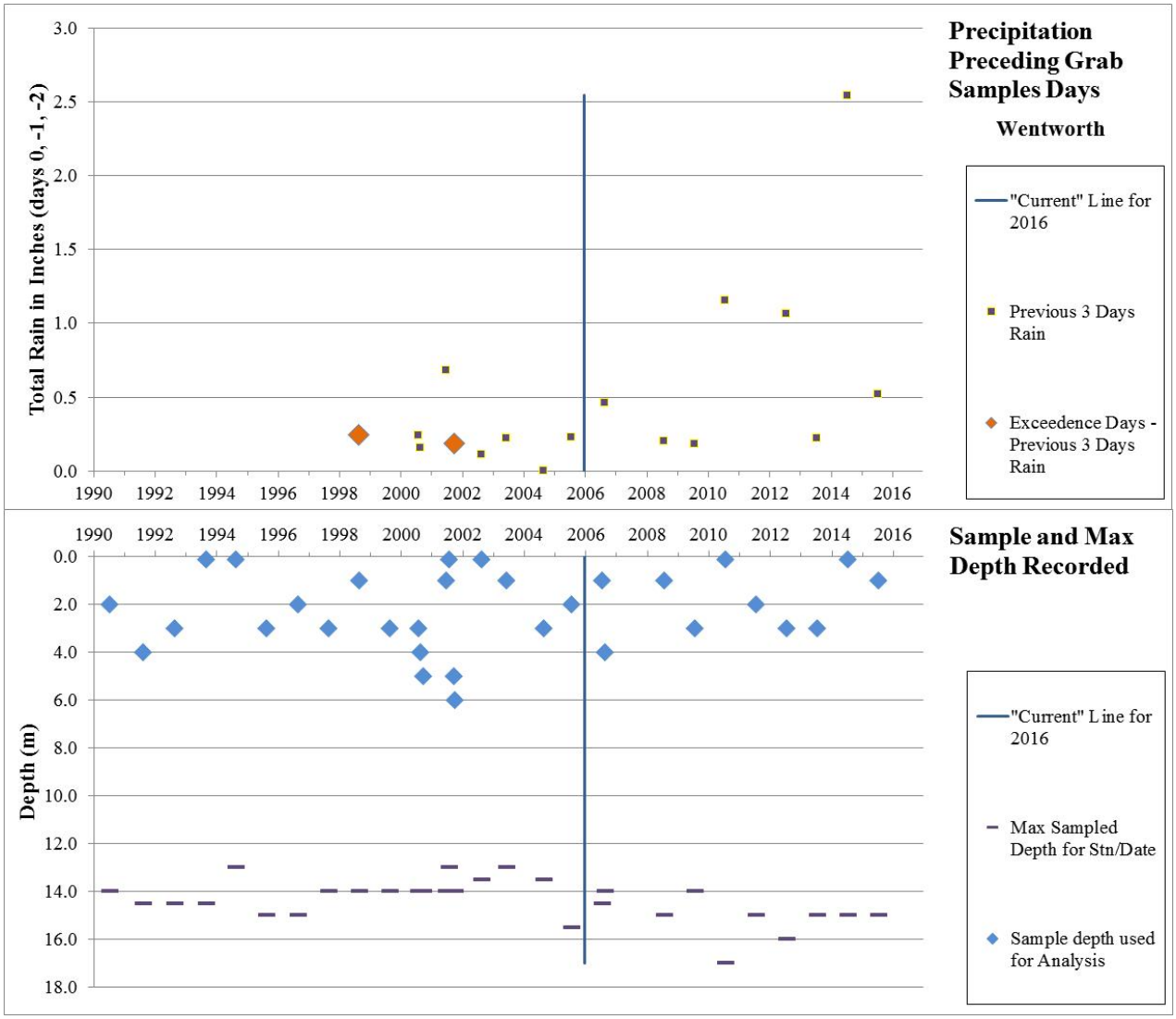

DO (% Sat.) Grab Samples
Dissolved Oxygen Percent Staturation Grab Samples
DO (% Sat.) Grab Samples
(0:00 samples are unknown time)


Gage CFSM on Sample
USGS 01139000 WELLS RIVER AT WELLS RIVER, VT
Gage (cfsm)
"Current" Line for 2016
CFSM from Gage
Gage on Exceedence Days


Weather Preceding Grab Sample Days
Wentworth
Total Rain in Inches (days 0, -1, -2)
Ave Max Temperature F (days 0, -1, -2)
"Current" Line for 2016
Previous 3 Days Rain
Exceedence Days - Previous 3 Days Rain
Previous 3 Days Ave (Max T)
Exceedence Days - Previous 3 Days Ave (Max T)


PARTRIDGE LAKE (NHLAK801030502-03)
Water Temperature (C)
"Current" Line for 2016
Water Temperature (at DO sample)
Water Temperature on Exceedence Days

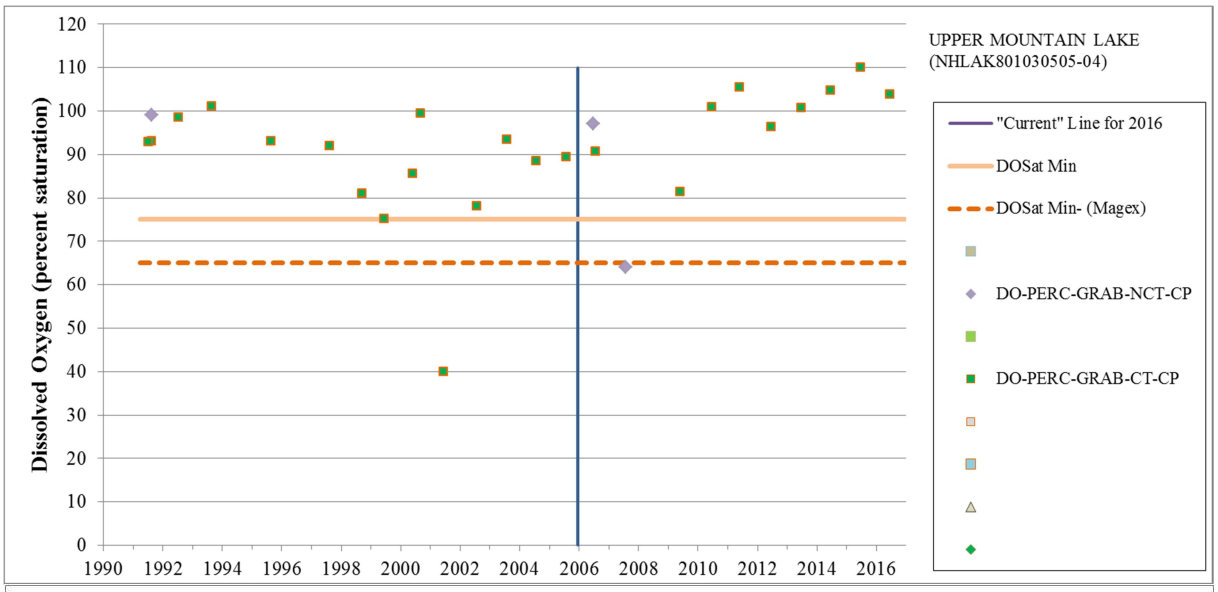

PARTRIDGE LAKE (NHLAK801030502-03)
Dissolved Oxygen (percent saturation)
"Current" Line for 2016
DO (%Sat) Minimum of 24 Hour Average
DO (% Sat.)

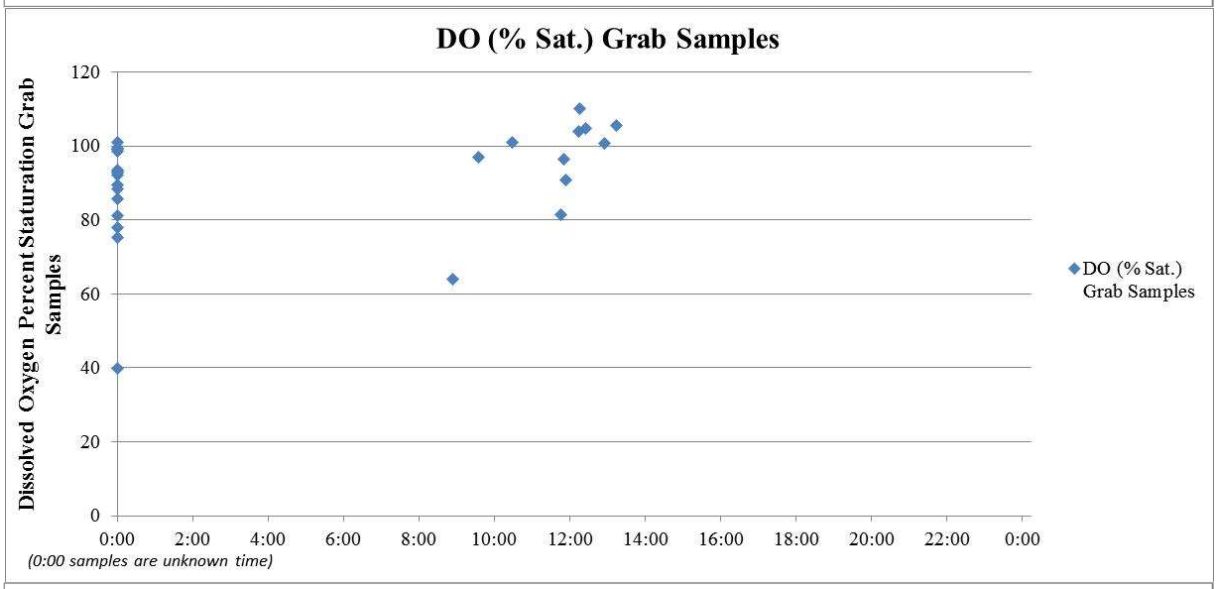


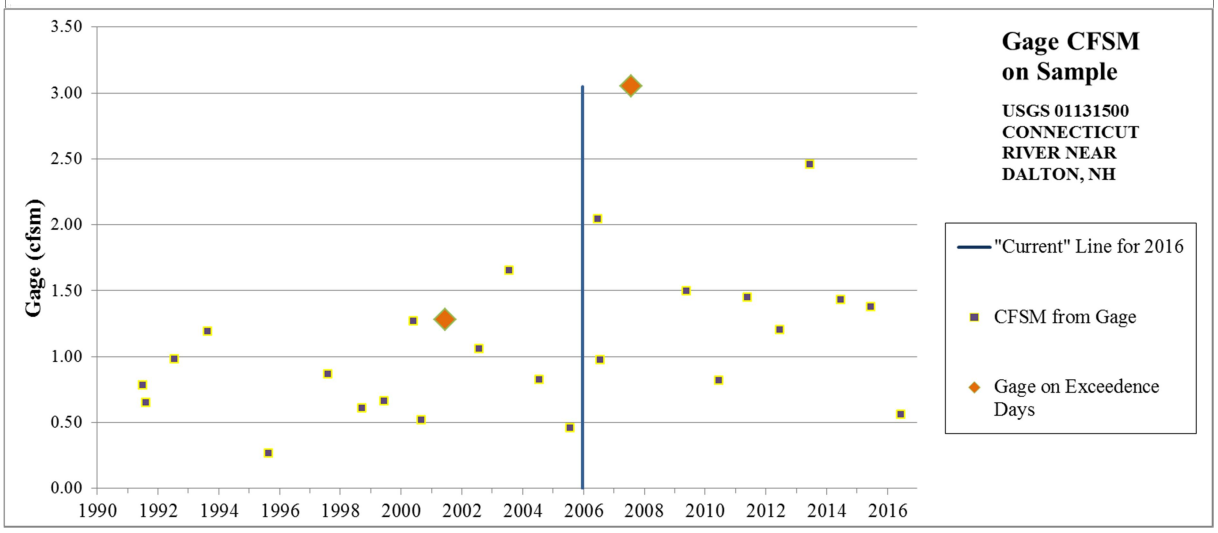
UPPER MOUNTAIN LAKE (NHLAK801030505-04)

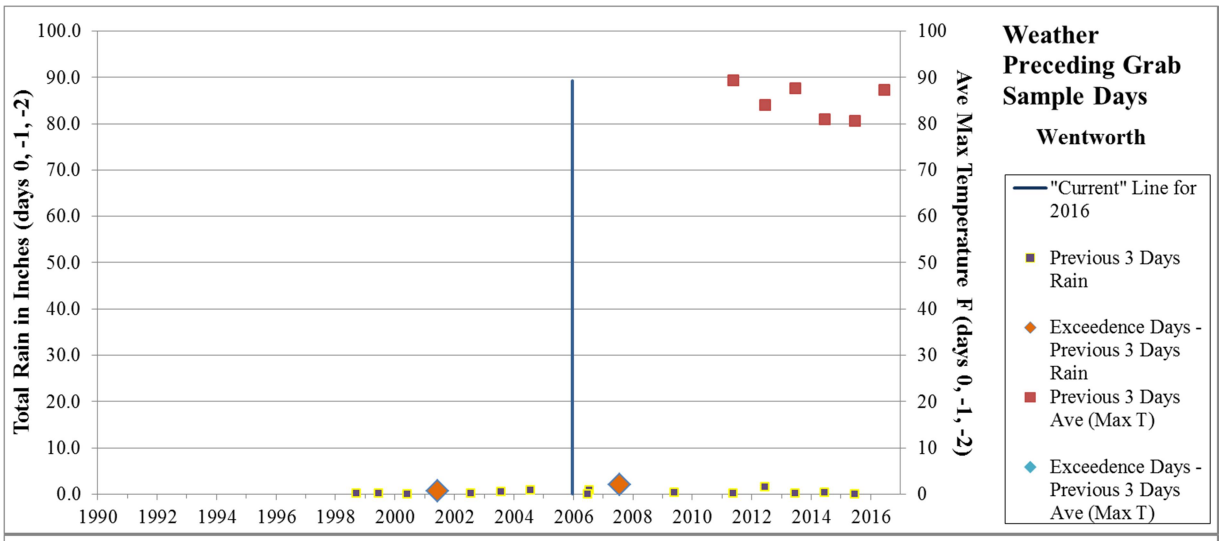
Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
UPPER MOUNTAIN LAKE	NHLAK801030505-04	DISSOLVED OXYGEN % SATURATION	HAVERHILL	5-M	2-M

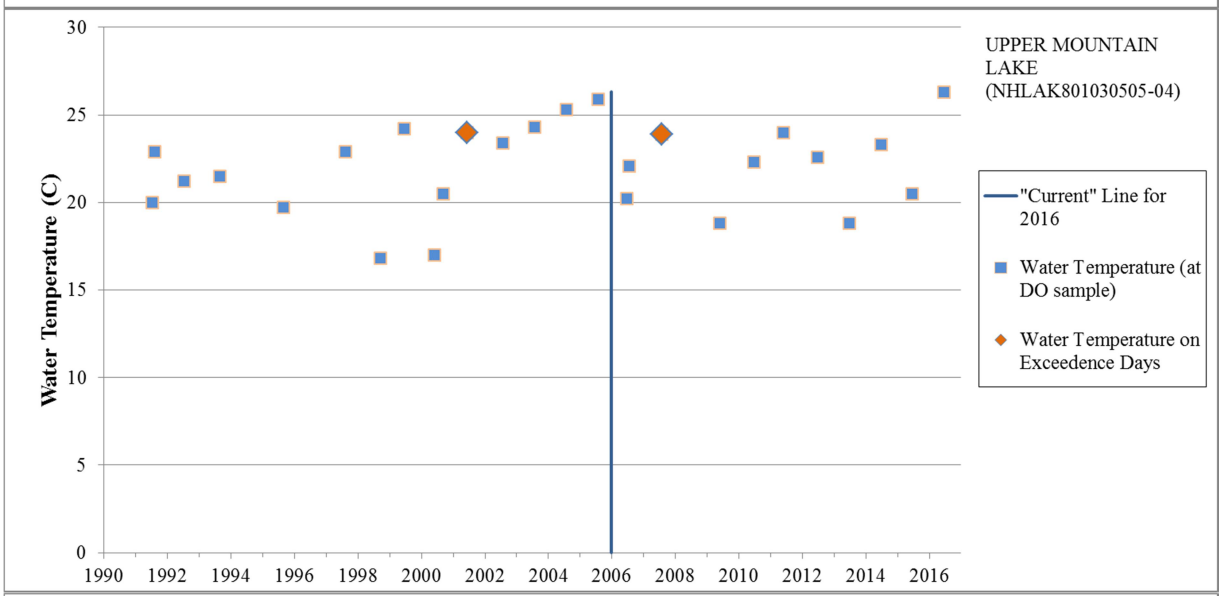
2016: Class B waterbody. Eleven sampling events during the 2006 to 2016 timeframe, of which n=9 were collected within the CP and CT, and n=2 were collected in CP but outside of CT. Of the data used in this assessment, all but one were fully support, the n=1 sample that was a magex occurred outside of the CT on 8/9/07 at 8:53am. The number of exceedences did not meet the 10% rule, and the majority of the data for this waterbody are fully support. Based on the dataset, Upper Mountain Lake is delisted and assessed as 2-M.

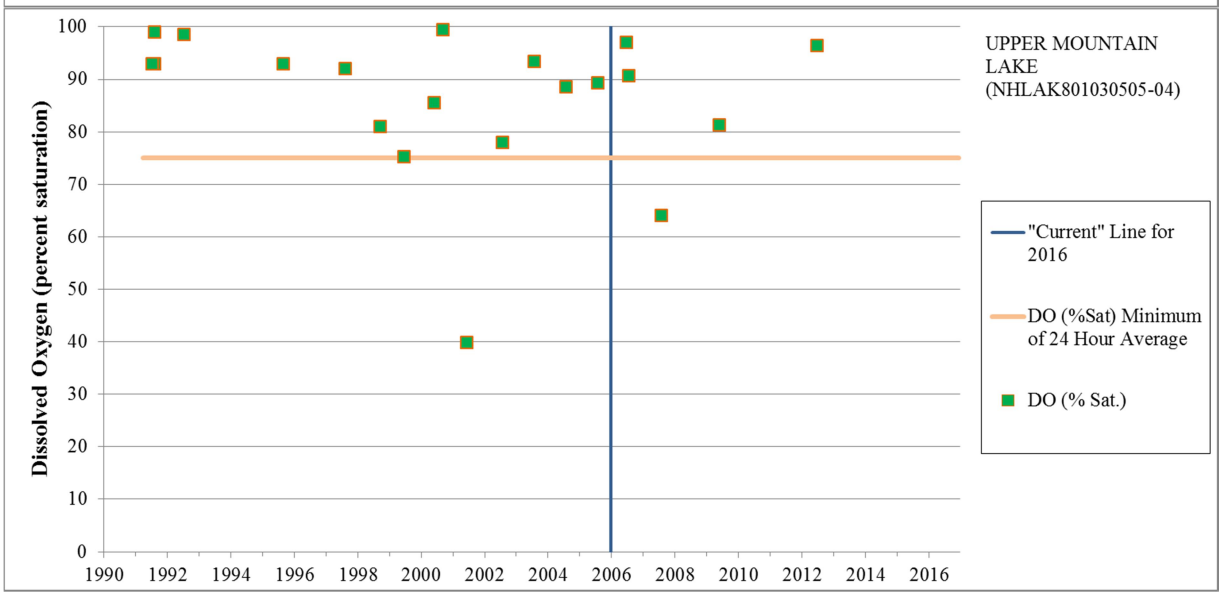

UPPER MOUNTAIN LAKE
(NHLAK801030505-04)
Dissolved Oxygen (percent saturation)
"Current" Line for 2016
DOSat Min
DOSat Min- (Magex)
DO-PERC-GRAB-NCT-CP
DO-PERC-GRAB-CT-CP

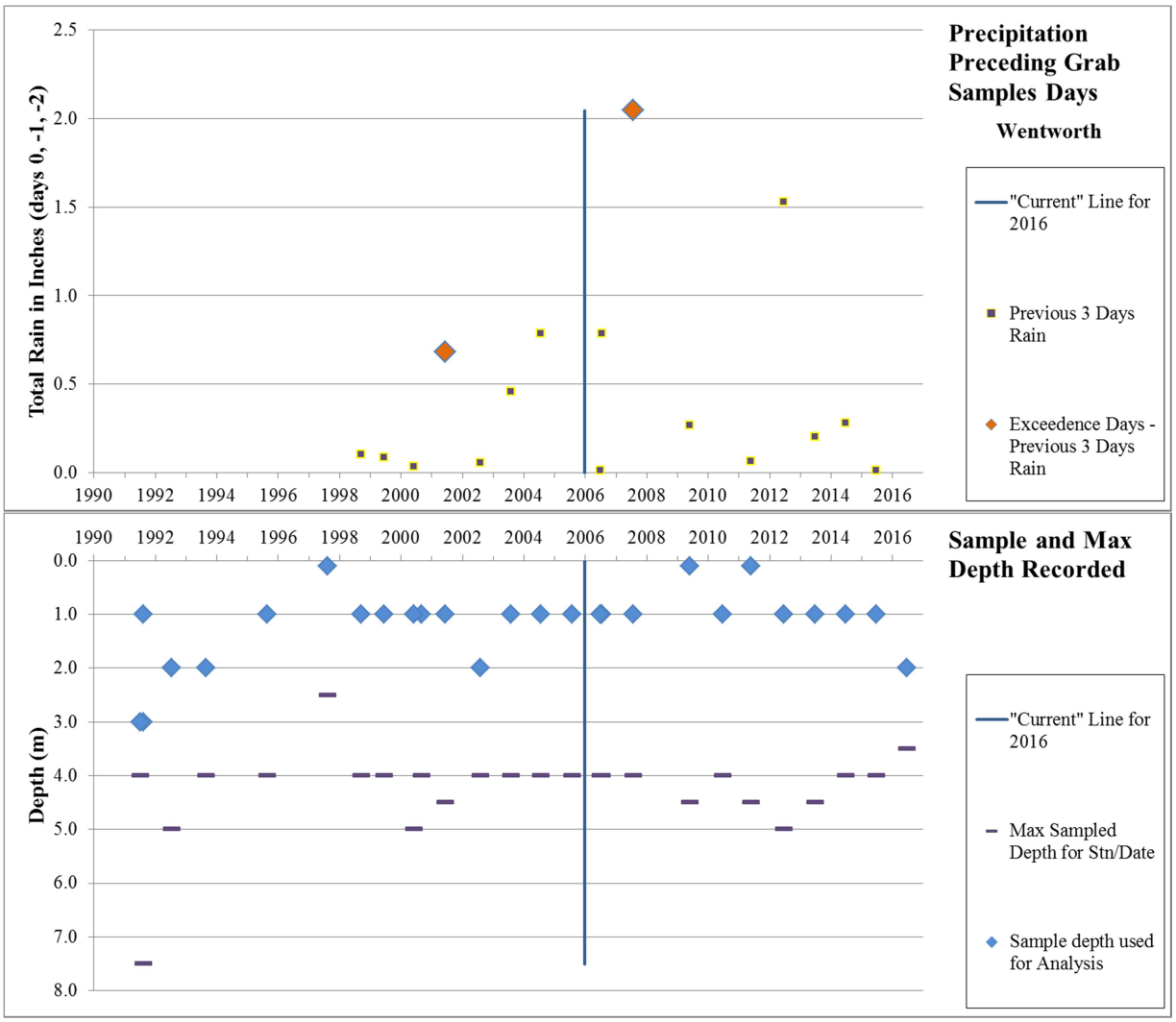

DO (% Sat.) Grab Samples
Dissolved Oxygen Percent Staturation Grab Samples
DO (% Sat.) Grab Samples
(0:00 samples are unknown time)


Gage CFSM on Sample
USGS 01131500 CONNECTICUT RIVER NEAR DALTON, NH
Gage (cfsm)
"Current" Line for 2016
CFSM from Gage
Gage on Exceedence Days


Weather Preceding Grab Sample Days
Wentworth
Total Rain in Inches (days 0, -1, -2)
Ave Max Temperature F (days 0, -1, -2)
"Current" Line for 2016
Previous 3 Days Rain
Exceedence Days - Previous 3 Days Rain
Previous 3 Days Ave (Max T)
Exceedence Days - Previous 3 Days Ave (Max T)


UPPER MOUNTAIN LAKE (NHLAK801030505-04)
Water Temperature (C)
"Current" Line for 2016
Water Temperature (at DO sample)
Water Temperature on Exceedence Days

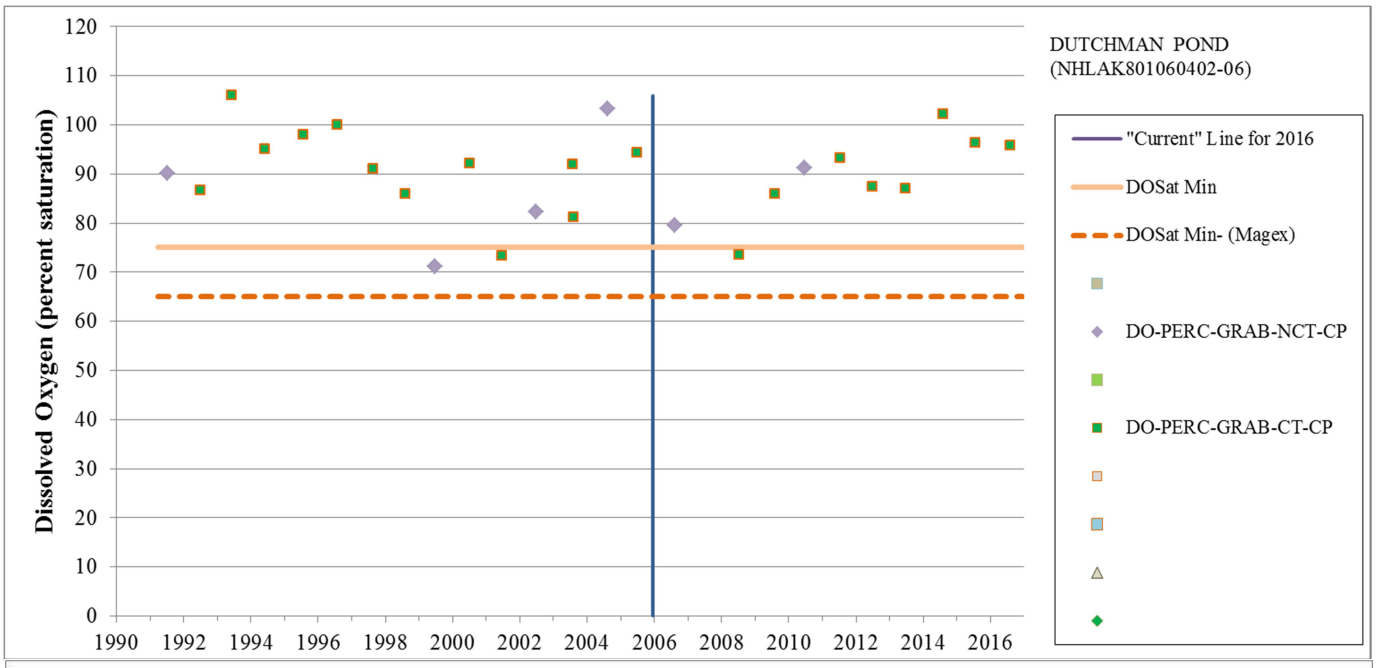

UPPER MOUNTAIN LAKE (NHLAK801030505-04)
Dissolved Oxygen (percent saturation)
"Current" Line for 2016
DO (%Sat) Minimum of 24 Hour Average
DO (% Sat.)

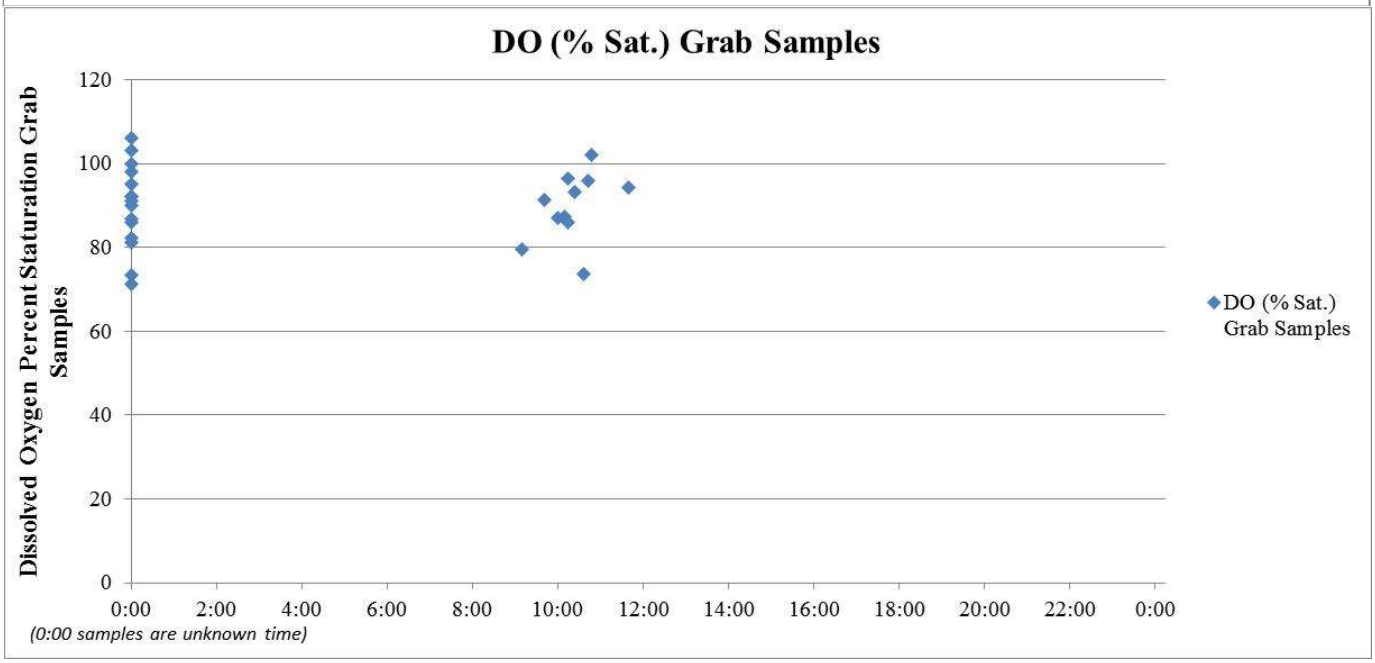


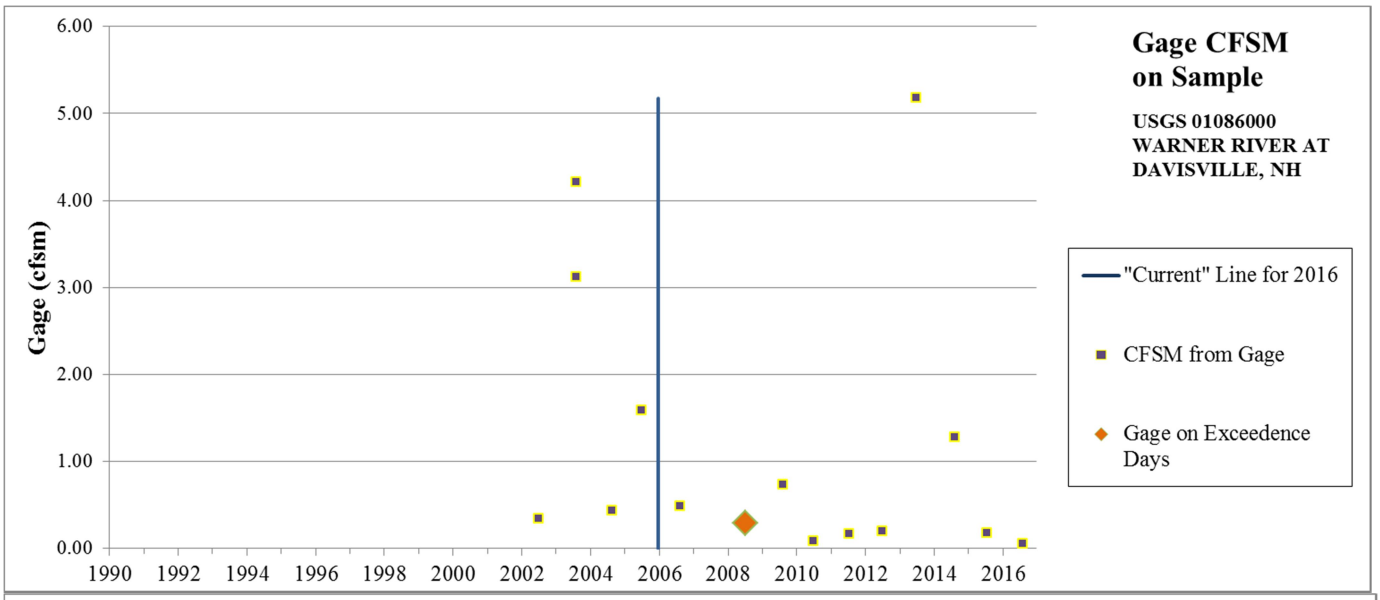
DUTCHMAN POND (NHLAK801060402-06)

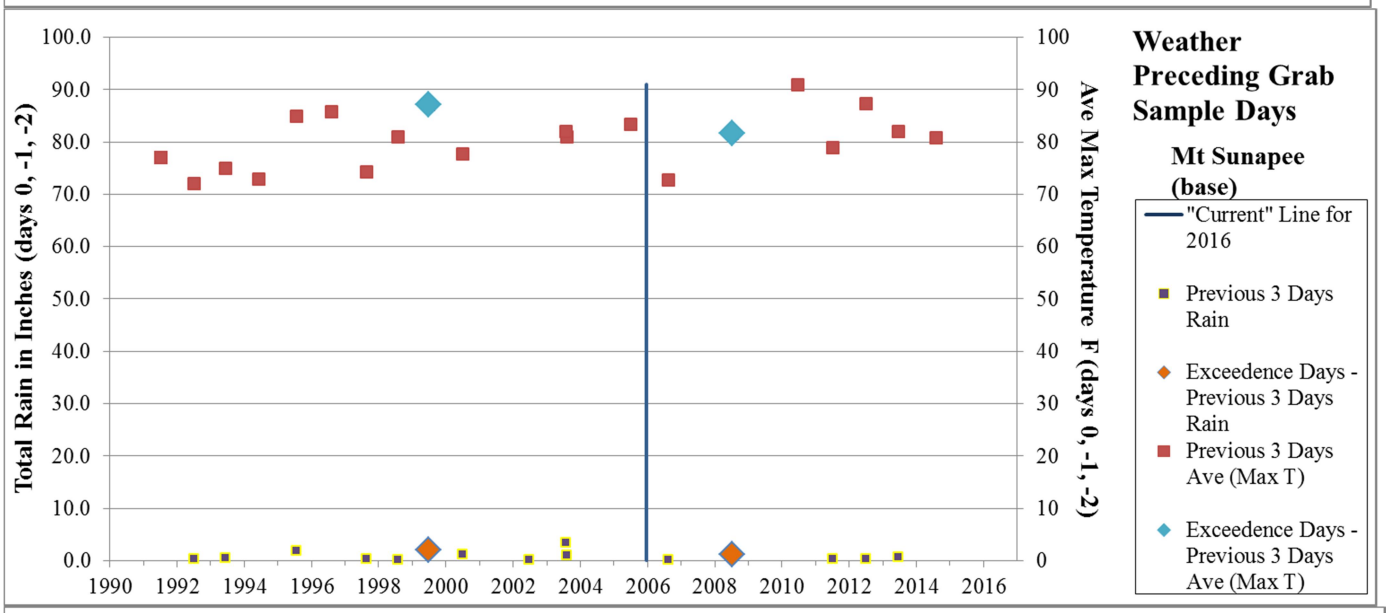
Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
DUTCHMAN POND	NHLAK801060402-06	DISSOLVED OXYGEN % SATURATION	SPRINGFIELD	5-M	2-M

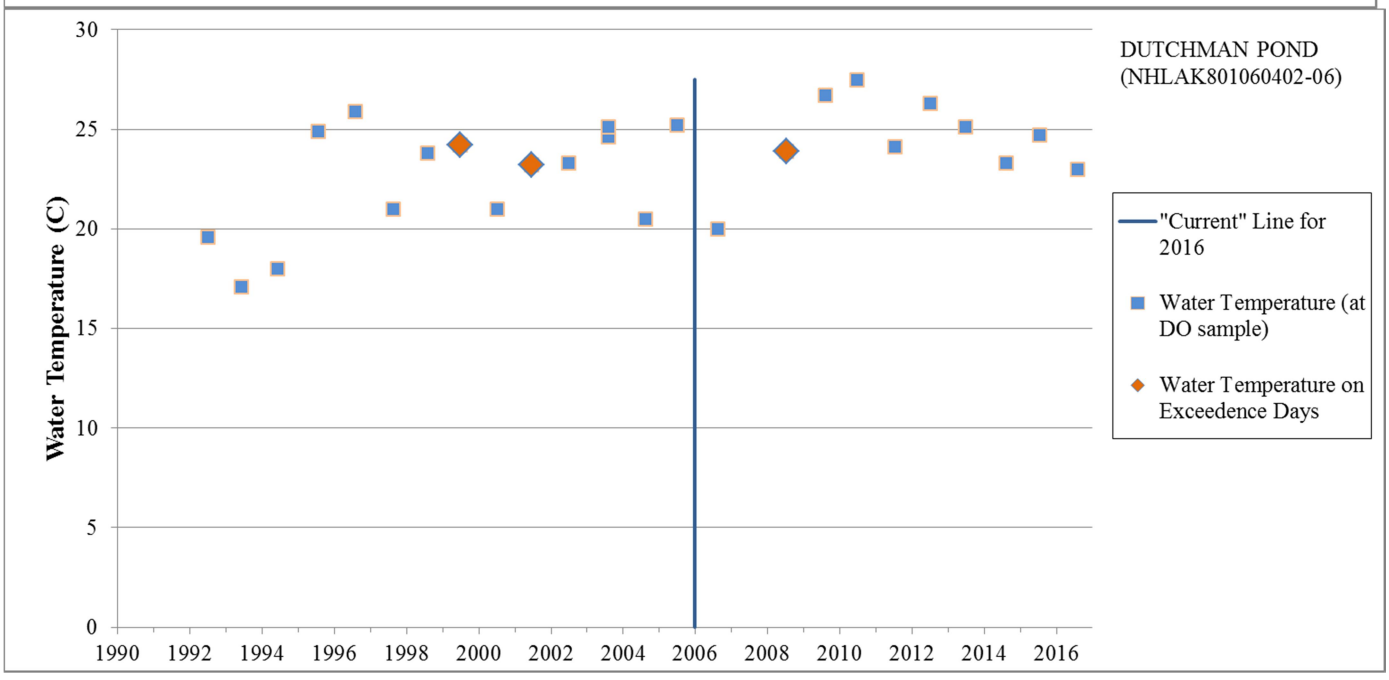
2016: Class B waterbody. Ten sampling events between 2006 and 2016, of which n=8 were within CT and CP, and n=2 were outside of CT but within CP. The most recent exceedence was in 2008. Note from 2014 assessment singled out 07/21/08 DO%sat result from 10:36am that was below 75%sat, indicating DO% likely still below 24 hour percent sat criteria of 75 percent. Data from 2009 through 2016 were collected in the same month and same time of morning and were all fully attaining DO%sat standards. Historic exceedences from 2001 and 1999 have aged out. Based on recent data and the fact that the exceedences do not meet the 10% rule, as such, Dutchman Pond is delisted and assessed as 2-M, with the recommendation to continue to monitor.

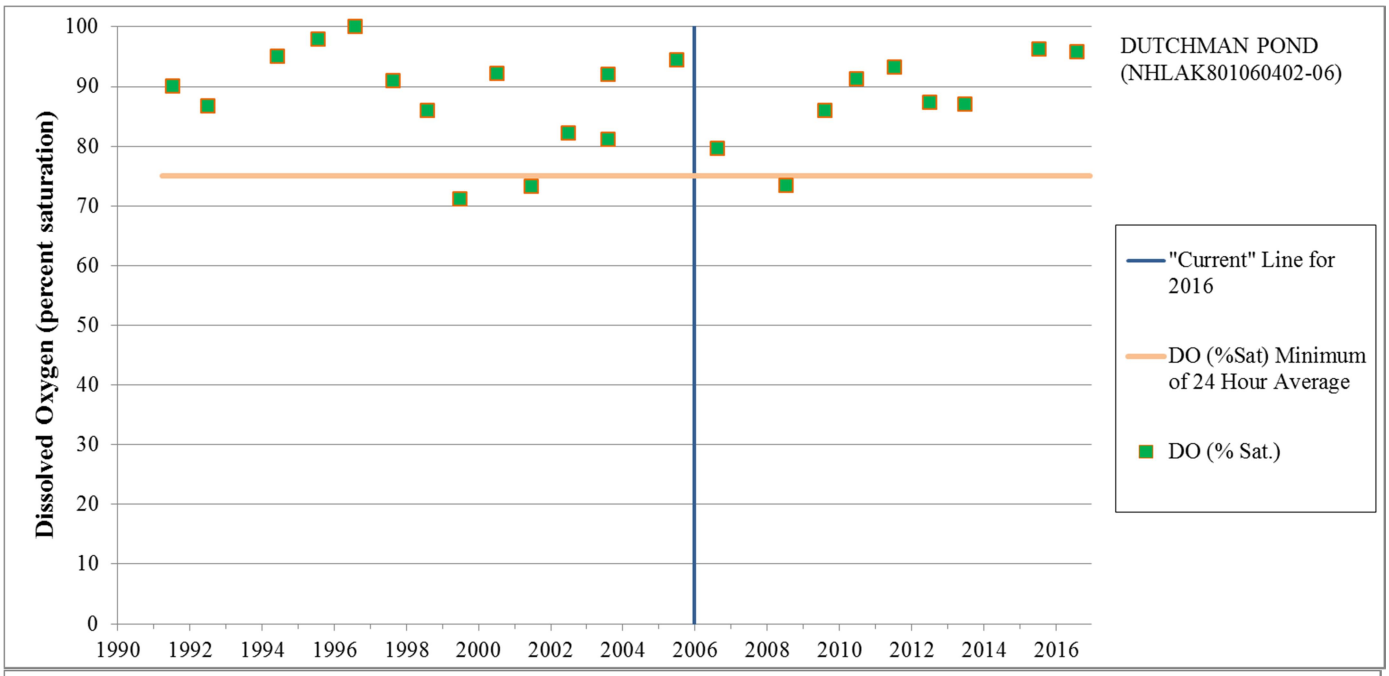

DUTCHMAN POND
(NHLAK801060402-06)
Dissolved Oxygen (percent saturation)
"Current" Line for 2016
DOSat Min
DOSat Min- (Magex)
DO-PERC-GRAB-NCT-CP
DO-PERC-GRAB-CT-CP
120
110
100
90
80
70
60
50
40
30
20
10
0
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016

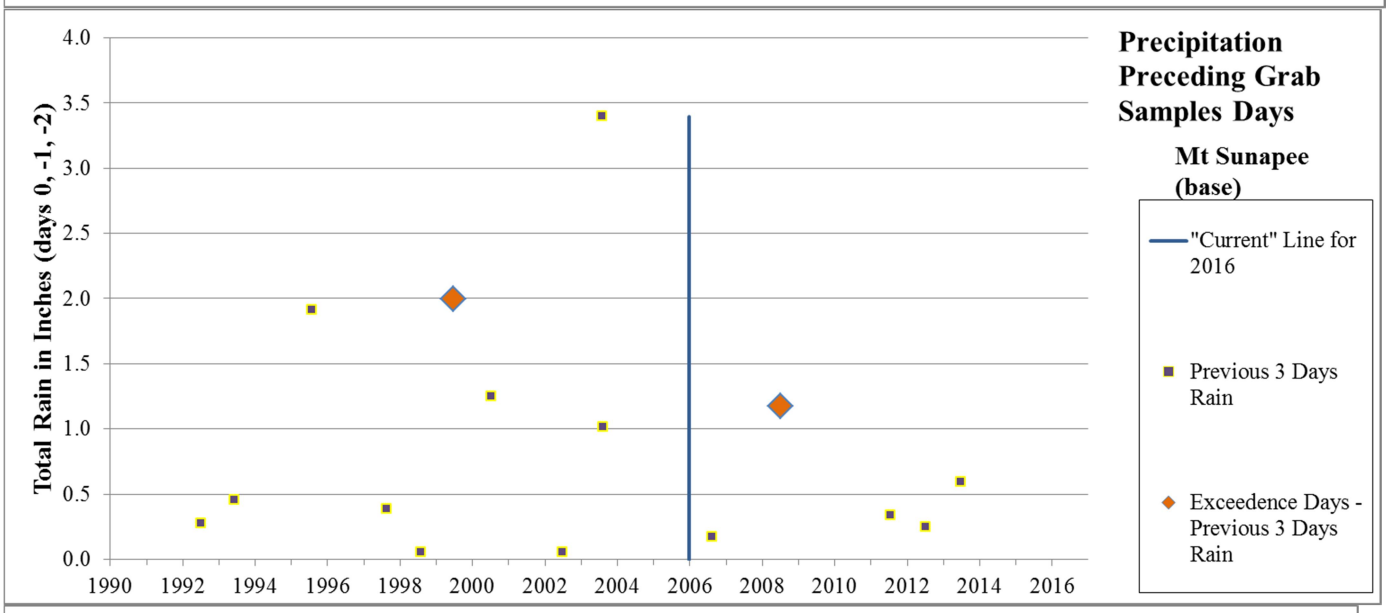

DO (% Sat.) Grab Samples
Dissolved Oxygen Percent Staturation Grab Samples
DO (% Sat.) Grab Samples
120
100
80
60
40
20
0
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
0:00
(0:00 samples are unknown time)

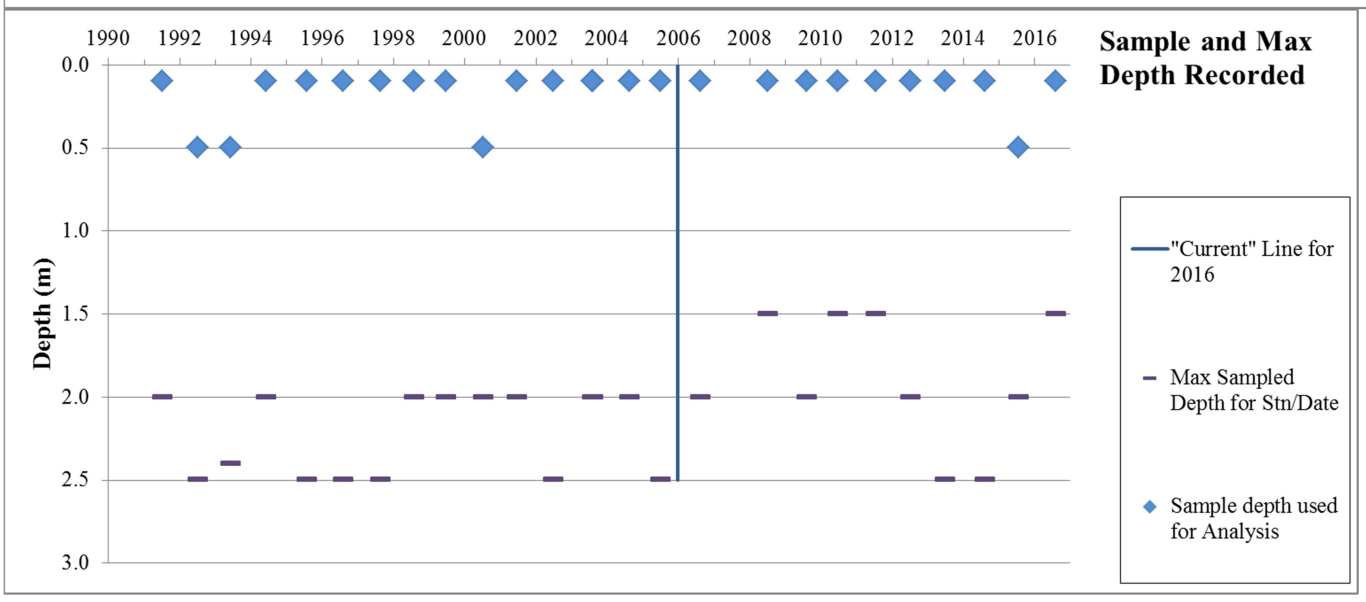

Gage CFSM on Sample
USGS 01086000
WARNER RIVER AT DAVISVILLE, NH
Gage (cfsm)
6.00
5.00
4.00
3.00
2.00
1.00
0.00
1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
"Current" Line for 2016
CFSM from Gage
Gage on Exceedence Days


Weather Preceding Grab Sample Days
Mt Sunapee (base)
Total Rain in Inches (days 0, -1, -2)
Ave Max Temperature F (days 0, -1, -2)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
100
90
80
70
60
50
40
30
20
10
0
1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
"Current" Line for 2016
Previous 3 Days Rain
Exceedence Days - Previous 3 Days Rain
Previous 3 Days Ave (Max T)
Exceedence Days - Previous 3 Days Ave (Max T)


DUTCHMAN POND
(NHLAK801060402-06)
Water Temperature (C)
30
25
20
15
10
5
0
1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
"Current" Line for 2016
Water Temperature (at DO sample)
Water Temperature on Exceedence Days


DUTCHMAN POND
(NHLAK801060402-06)
Dissolved Oxygen (percent saturation)
"Current" Line for 2016
DO (%Sat) Minimum of 24 Hour Average
DO (% Sat.)

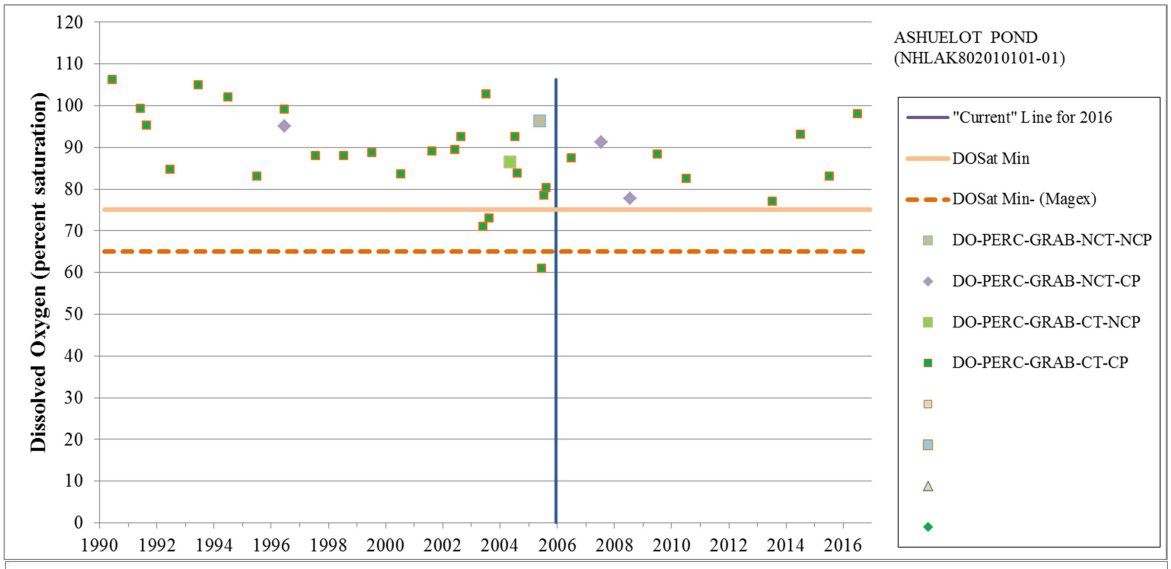

Precipitation Preceding Grab Samples Days
Mt Sunapee (base)
Total Rain in Inches (days 0, -1, -2)
"Current" Line for 2016
Previous 3 Days Rain
Exceedence Days - Previous 3 Days Rain

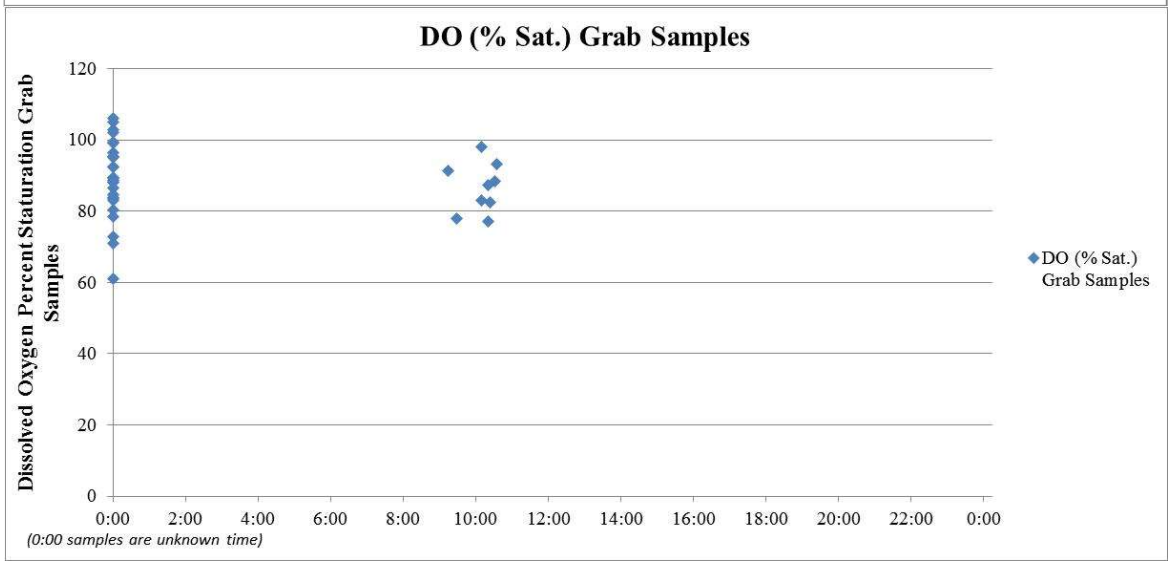

Sample and Max Depth Recorded
Depth (m)
"Current" Line for 2016
Max Sampled Depth for Stn/Date
Sample depth used for Analysis

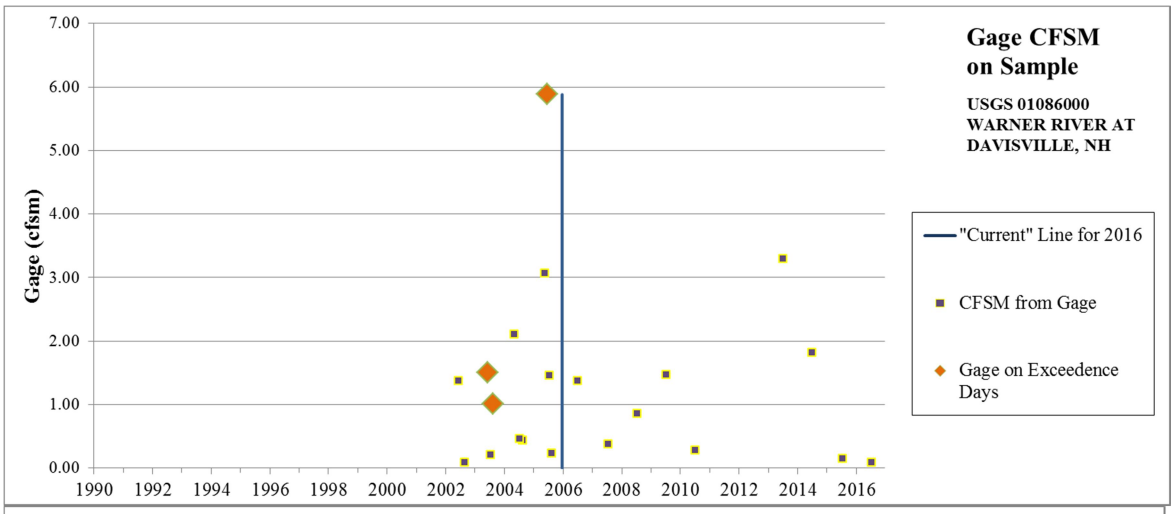
ASHUELOT POND (NHLAK802010101-01)

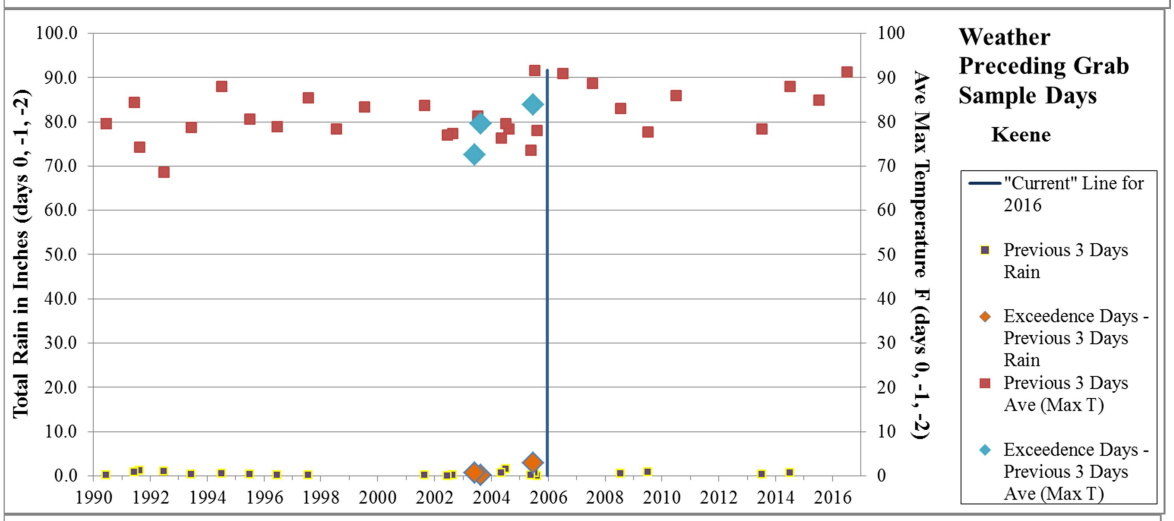
Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
ASHUELOT POND	NHLAK802010101-01	DISSOLVED OXYGEN % SATURATION	WASHINGTON	5-M	2-M

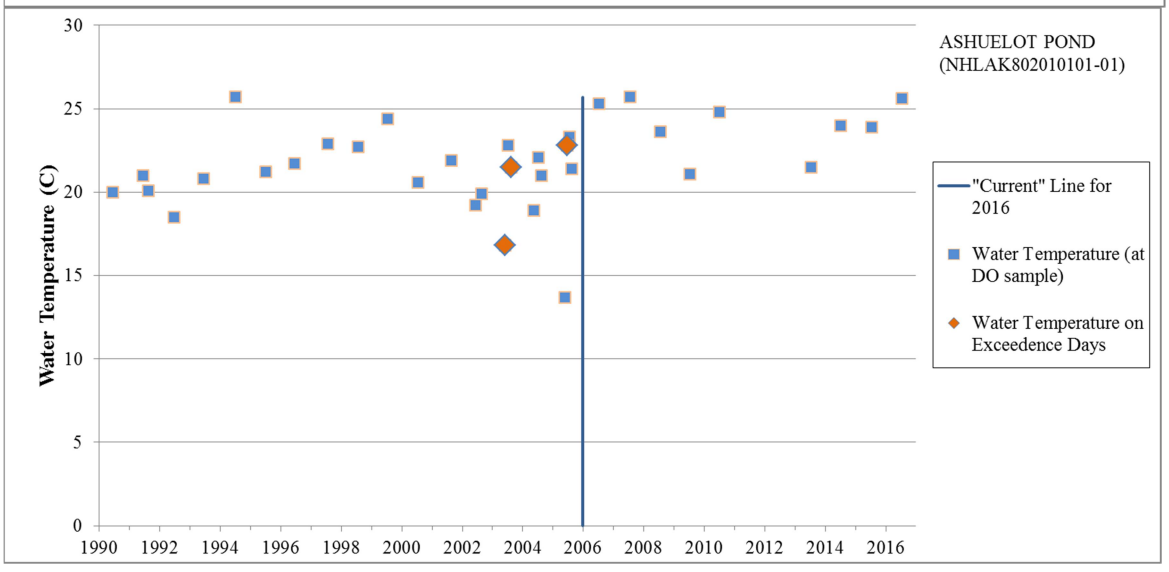
2016: Class B waterbody. Nine samples collected over the 2006 to 2016 timeframe, of which n=7 were within the CP and CT, and n=2 were within the CP and outside of the CT. No exceedences within the past ten years, the most recent exceedence was in 2005, and data for that sample have aged out. Based on data in the last 10 years, it appears as though this waterbody is attaining standards. Ashuelot Pond is delisted and assessed as 2-M, with continued monitoring through VLAP.

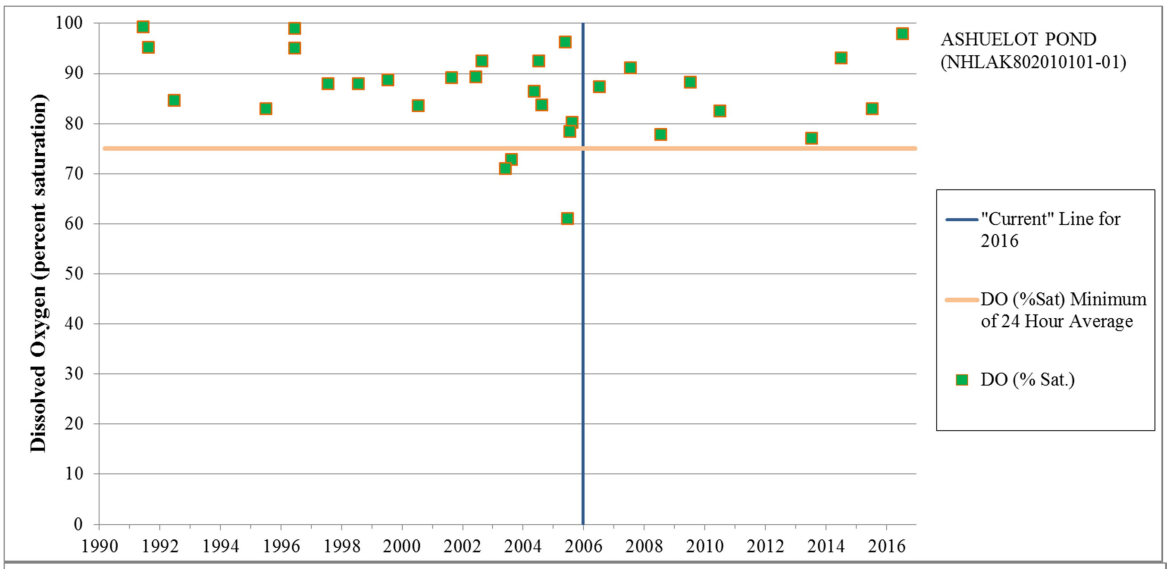


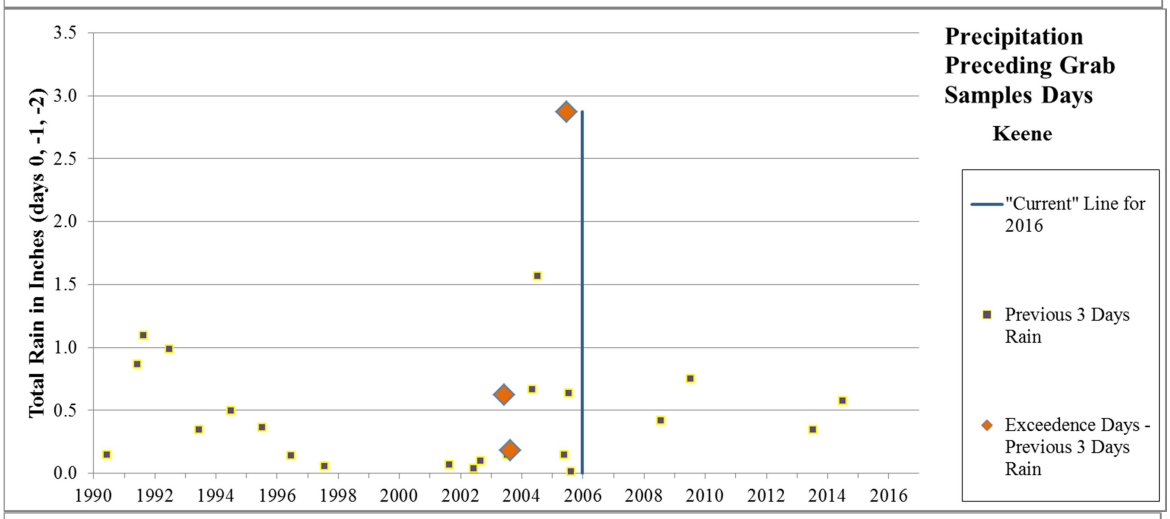


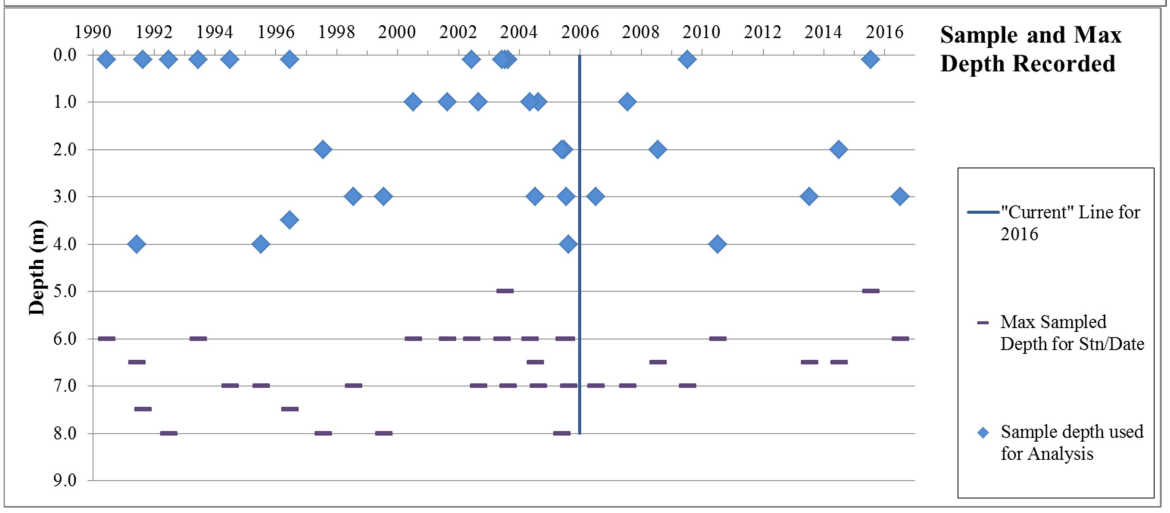

Gage CFSM on Sample
USGS 01086000
WARNER RIVER AT DAVISVILLE, NH
Gage (cfsm)
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
"Current" Line for 2016
CFSM from Gage
Gage on Exceedence Days


Weather Preceding Grab Sample Days
Keene
Total Rain in Inches (days 0, -1, -2)
Ave Max Temperature F (days 0, -1, -2)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
100
90
80
70
60
50
40
30
20
10
0
1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
"Current" Line for 2016
Previous 3 Days Rain
Exceedence Days - Previous 3 Days Rain
Previous 3 Days Ave (Max T)
Exceedence Days - Previous 3 Days Ave (Max T)


ASHUELOT POND
(NHLAK802010101-01)
Water Temperature (C)
30
25
20
15
10
5
0
1990 1992 1994 1996 1998 2000 2002 2004 2006 2008 2010 2012 2014 2016
"Current" Line for 2016
Water Temperature (at DO sample)
Water Temperature on Exceedence Days



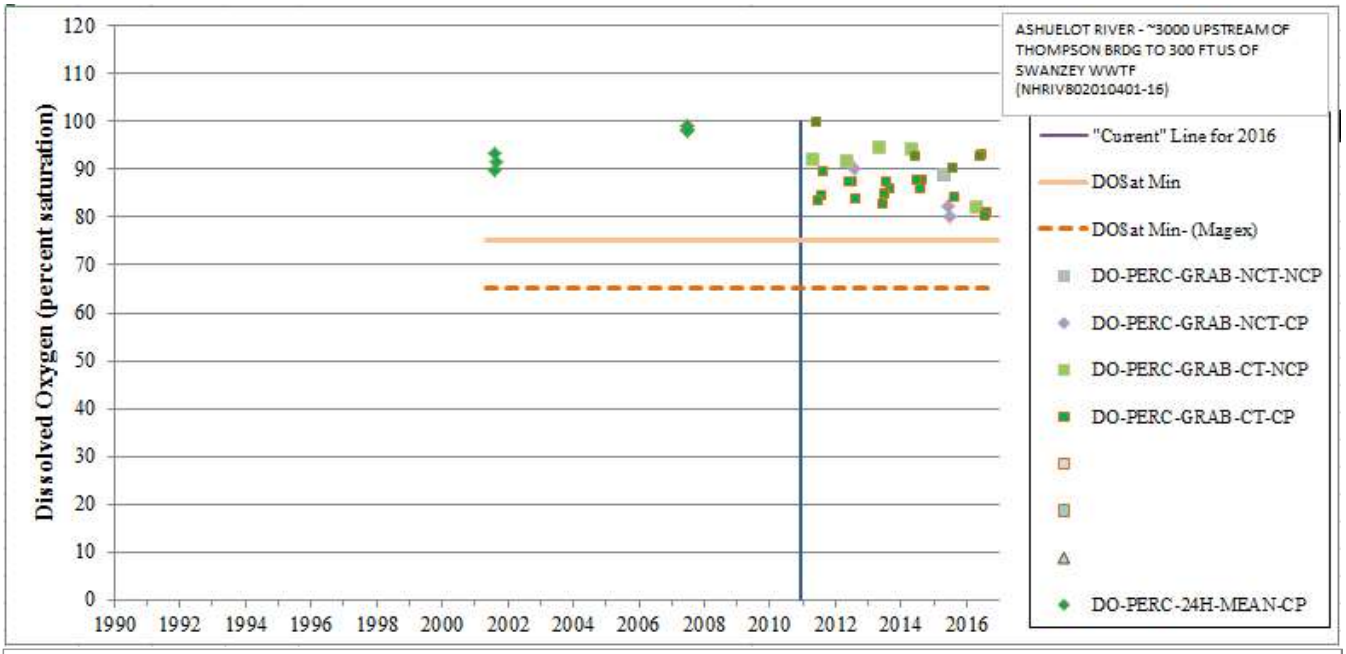


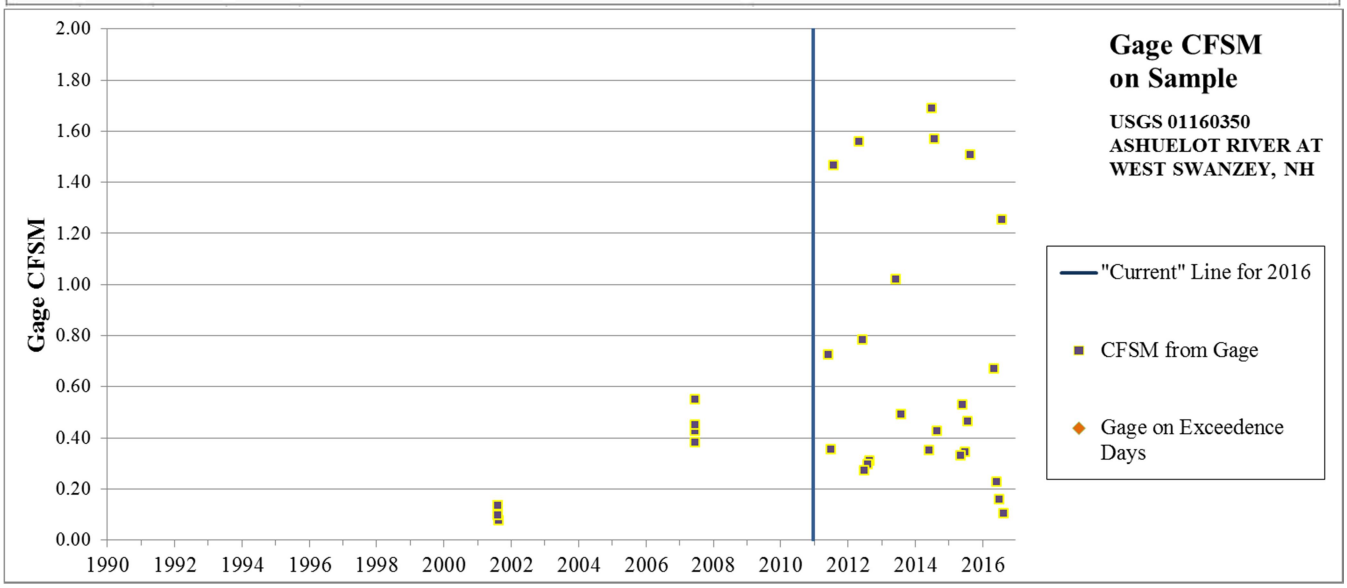


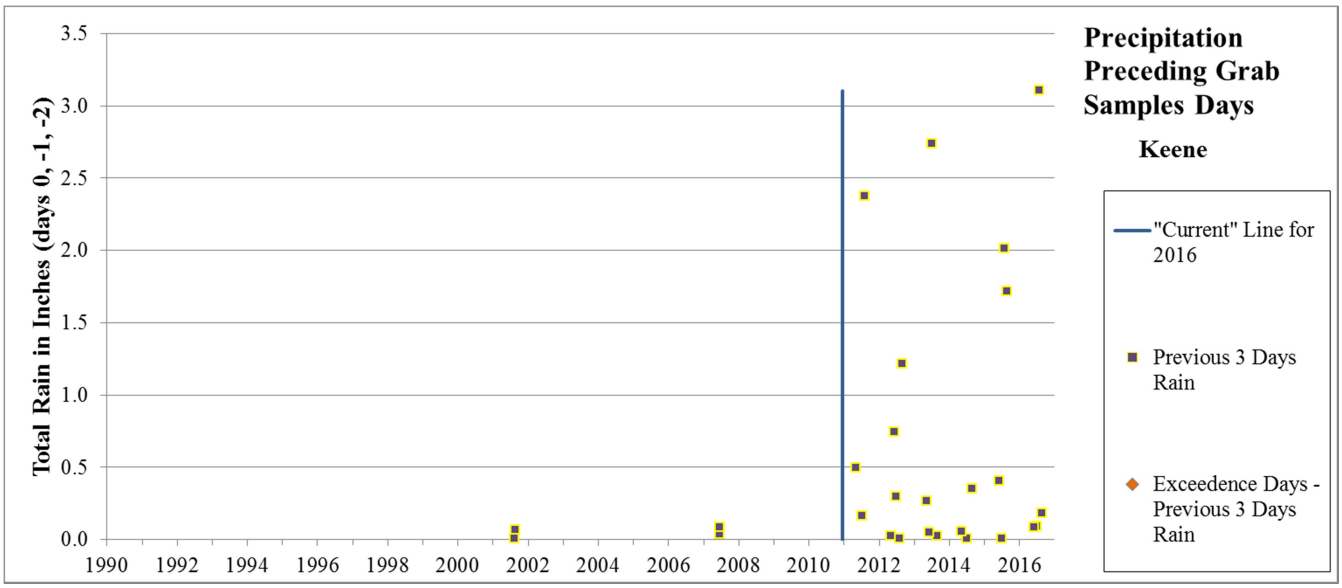
ASHUELOT RIVER - ~3000 UPSTREAM OF THOMPSON BRDG TO 300 FT US OF SWANZEY WWTF (NHRIV802010401-16)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
ASHUELOT RIVER - ~3000 UPSTREAM OF THOMPSON BRDG TO 300 FT US OF SWANZEY WWTF	NHRIV802010401-16	Dissolved Oxygen (Percent Saturation)	SWANZEY	5-M	2-G

2016: The Homestead Woolen mill dam was removed in 2010. Once the dam was removed and the stretch of water became free-flowing the waterbody type was changed form an impoundment (NHIMP802010401-01) to a river (NHRIV802010401-16). All water samples associated with the impounded conditions (station 15-ASH, n=116) are no longer appropriate for use during the assessment of the free-flowing river. The data that has been collected during the current assessment period (2011-2016) and post dam removal, indicate that the river consistently meets water quality standards. Therefore, the assessment unit will be delisted for the 2016 assessment cycle and will now be categorized as fully attaining standards.







Estuarine - Chlorophyll-a (Aquatic Life Use Support)

OYSTER RIVER & OYSTER RIVER MOUTH (NHEST600030902-01-03 & NHEST600030904-06-17)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
OYSTER RIVER	NHEST600030902-01-03	Chlorophyll-a		5-M	2-M
OYSTER RIVER MOUTH	NHEST600030904-06-17				

2016: A full parameter level discussion of the rational used to make the assessment determination for this waterbody is provided by assessment zone in the Technical Support Document for the Great Bay Estuary Aquatic Life Use Support Assessments, 2016 305(b) Report/303(d) List
http://des.nh.gov/organization/divisions/water/wmb/swqa/2016/index.htm

Lake – Chlorophyll-a/Total Phosphorus (Aquatic Life Use Support)

HILLS POND (NHLAK700060401-04)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
HILLS POND	NHLAK700060401-04	Chlorophyll-a	Alton	5-M	2-M
		Total Phosphorus		5-M	2-M

The chlorophyll-a median has shown a slight decline from the 2014 assessment cycle and has remained below the threshold for two consecutive assessment cycles. The total phosphorus median remains below the threshold and was listed as impaired due to the stressor/response matrix. Several activities could have contributed to improved chlorophyll-a levels.

A beaver dam between the outlet of Hills Pond and Sunset Lake was repeatedly causing high water levels throughout the summer months. This resulted in high water levels throughout the summer months flooding shoreline areas (sandy beaches, lawns) and making the shoreline vulnerable to erosion, particularly from boating activities. The addition of nutrients from these sources was likely retained in the pond as the beaver dam prevented the pond from flushing. The pond association has been managing the beaver situation and removed the dam to allow the pond to flush and maintain a normal water level. Along with beaver management, RSA 431 effective

January 2014, limits phosphorus contents of fertilizers and the application of fertilizers containing phosphorus. RSA 485-A:39 effective January 2009, requires any waterfront property for sale to undergo an inspection of the septic system prior to the sale of the property which has likely increased the identification of poorly functioning systems and the number of septic systems replaced. These activities as well as education and outreach activities aimed at stormwater management for the homeowner have likely helped to reduce algal growth.

The elevated chlorophyll levels measured in 2013 and 2014 were likely a result of above average monthly rainfall prior to sampling and resulting high water levels, particularly if beaver dams were impeding the flushing rate. The monthly precipitation information below was obtained from the annual climate report obtained from National Weather Service Climate Data for the Concord, NH station in 2013 and 2014 (http://w2.weather.gov/climate/index.php?wfo=gyx).

...CONCORD NEW HAMPSHIRE 2013 MONTHLY PRECIPITATION DATA...
(RANK: 1 = WETTEST, 146 = DRIEST)

MONTH	PRECIPITATION	DEPATURE FROM NORMAL	RANK
JAN	1.55	MINUS 1.15	124TH
FEB	3.54	PLUS 0.92	30TH (TIED)
MAR	1.72	MINUS 1.55	115TH
APR	1.88	MINUS 1.53	116TH (TIED)
MAY	4.07	PLUS 0.41	39TH
JUN	6.78	PLUS 3.09	10TH
JUL	6.70	PLUS 2.96	8TH

AUG	2.05	MINUS 1.13	107TH (TIED)
SEP	4.81	PLUS 1.43	30TH
OCT	1.28	MINUS 2.76	123RD
NOV	3.02	MINUS 0.70	81ST
DEC	3.39	PLUS 0.19	64TH

MONTHLY PRECIPITATION AND SNOWFALL TOTALS FOR 2014

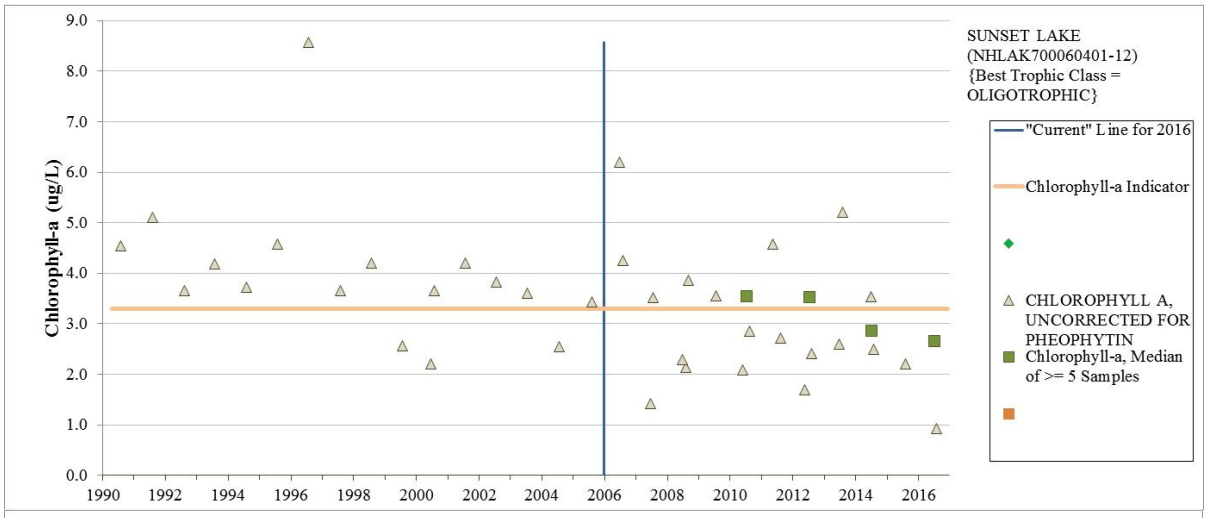
MONTH	PRECIPITATION INCHES (departure)	SNOWFALL INCHES (departure)
JAN	3.21 (+0.51)	14.4 (+0.7)
FEB	4.11 (+1.49)	35.3 (+23.0)
MAR	3.98 (+0.71)	10.4 (-0.7)
APR	2.87 (-0.54)	0.2 (-2.6)
MAY	3.57 (-0.09)	0 (0)
JUN	3.83 (+0.14)	0 (0)
JUL	7.49 (+3.75)	0 (0)
AUG	3.82 (+0.64)	0 (0)
SEP	0.42 (-2.96)	0 (0)
OCT	4.46 (+0.42)	0 (0)
NOV	3.11 (-0.61)	12.9 (+10.3)
DEC	5.16 (+1.96)	3.7 (-10.8)
ANNUAL	46.03 (+5.42)	76.7 (+15.3)

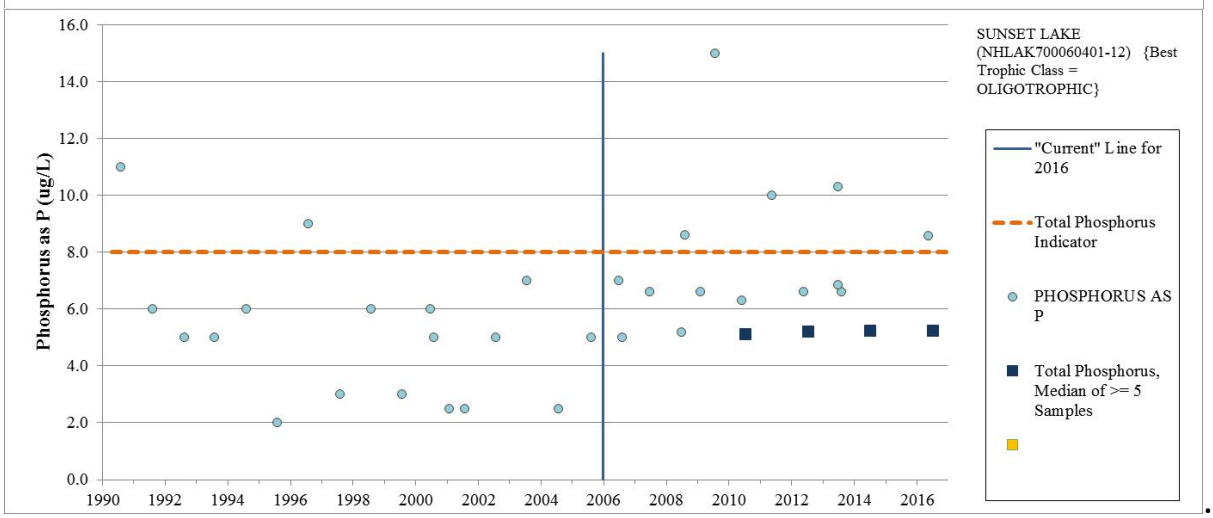
SUNSET LAKE (NHLAK700060401-12)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
SUNSET LAKE	NHLAK700060401-12	Chlorophyll-a	Alton	5-M	2-M
		Total Phosphorus		5-M	2-M

The 2016 median chlorophyll-a value showed another decline from the 2014 assessment cycle and is below the threshold for two consecutive assessment cycles. Total phosphorus remains below the median threshold and has remained stable since the 2010 assessment cycle. Total phosphorus was listed as impaired due to the stressor/response matrix.

Hills Pond (see above) flows into Sunset Lake and along with beaver management at Hills Pond, RSA 431 effective January 2014, limits phosphorus contents of fertilizers and the application of fertilizers containing phosphorus. RSA 485-A:39 effective January 2009, requires any waterfront property for sale to undergo an inspection of the septic system prior to the sale of the property which has likely increased the identification of poorly functioning systems and the number of septic systems replaced. These activities as well as education and outreach activities aimed at stormwater management for the homeowner have likely helped to reduce algal growth.

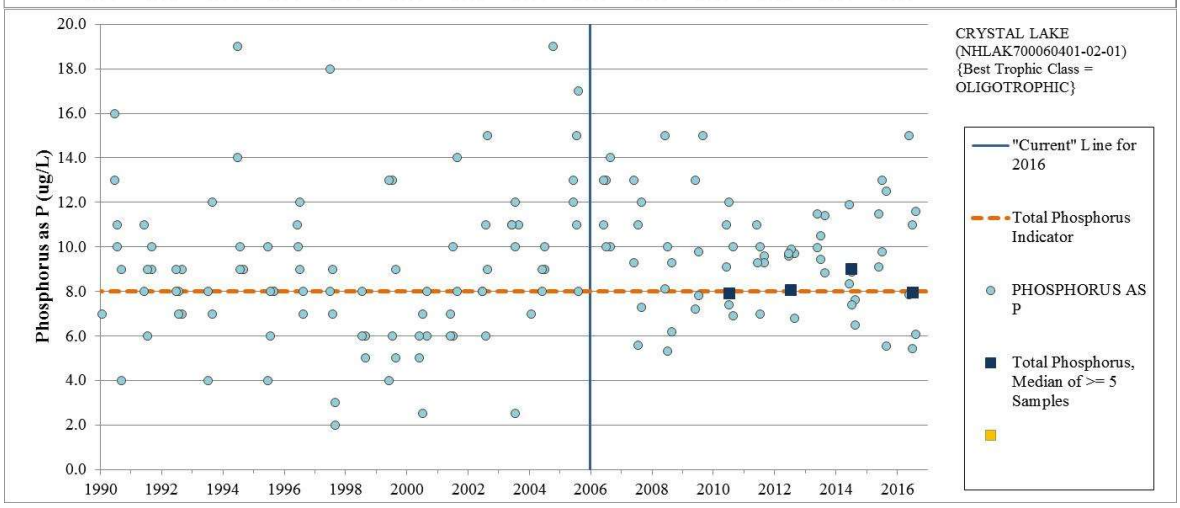

Chlorophyll-a (ug/L)
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
SUNSET LAKE (NHLAK700060401-12) {Best Trophic Class = OLIGOTROPHIC}
"Current" Line for 2016
Chlorophyll-a Indicator
CHLOROPHYLL A, UNCORRECTED FOR PHEOPHYTIN
Chlorophyll-a, Median of >= 5 Samples


Phosphorus as P (ug/L)
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
SUNSET LAKE (NHLAK700060401-12) {Best Trophic Class = OLIGOTROPHIC}
"Current" Line for 2016
Total Phosphorus Indicator
PHOSPHORUS AS P
Total Phosphorus, Median of >= 5 Samples

CRYSTAL LAKE (NHLAK700060401-02-01)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
CRYSTAL LAKE	NHLAK700060401-02-01	Chlorophyll-a	Gilmanton	5-M	2-M
		Total Phosphorus		5-M	2-M

Chlorophyll-a median has continually decreased each assessment cycle reflecting improved conditions; particularly since 2006. The total phosphorus median has hovered around threshold and total phosphorus data have stabilized at a low level after an increasing trend from 2000-2006. This is a very active VLAP lake monitoring since 1989. Education and outreach efforts have been ongoing. The widespread availability and use of phosphate free fertilizers (RSA 431) has likely decreased loading from fertilized lawns. The law requiring the sale of any developed waterfront property (RSA 485-A:39 Waterfront Property Sale; Site Assessment Study) to undergo an inspection of the septic system prior to the sale of the property has likely increased the identification of poorly working systems and the number of septic systems replaced. In recent years, the Town has been active in removing winter sand/salt accumulation along the edge of the lake to reduce siltation to the lake.

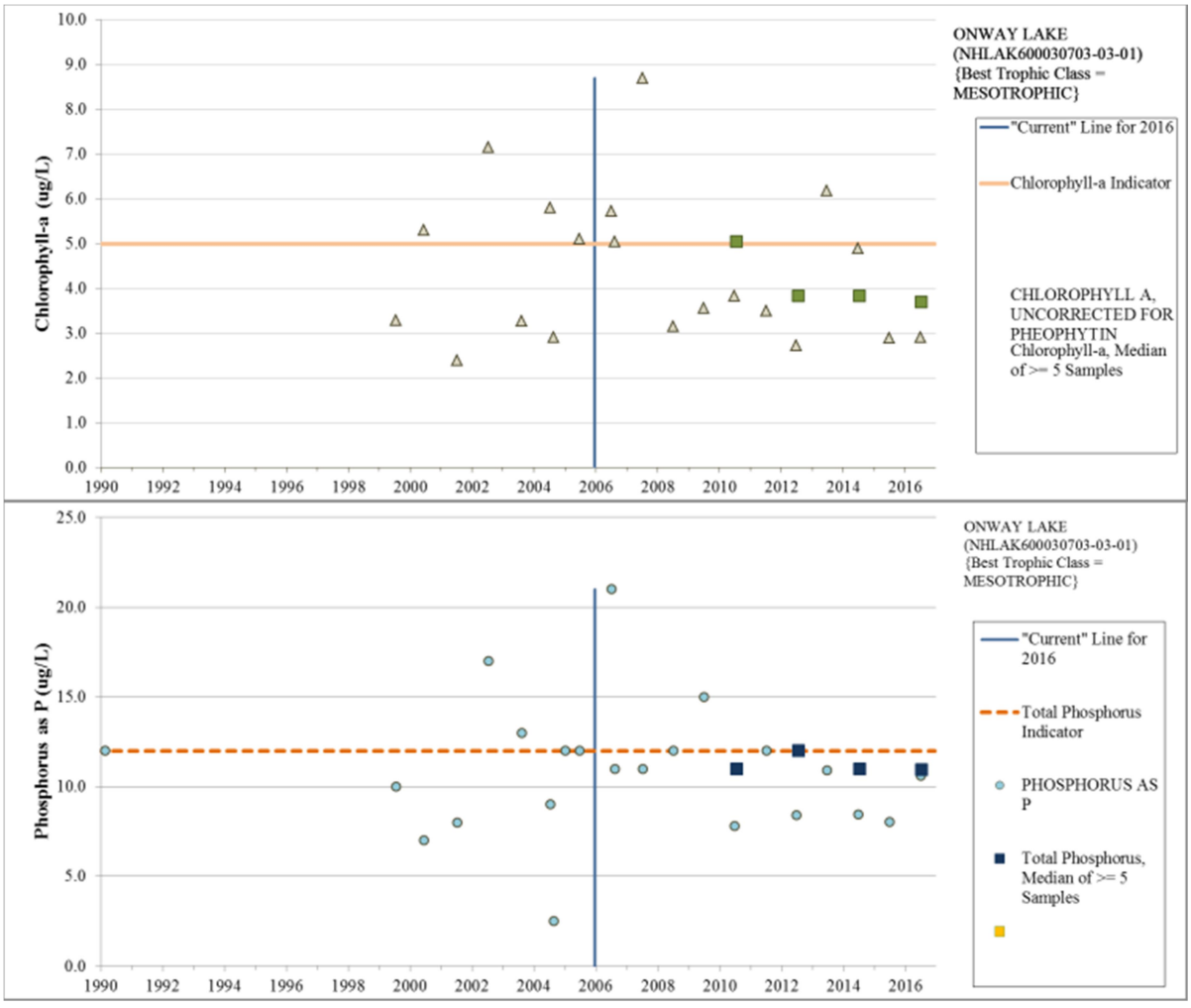


ONWAY LAKE (NHLAK600030703-03-01)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
ONWAY LAKE	NHLAK600030703-03-01	Chlorophyll-a	Raymond	5-M	2-M
		Total Phosphorus		5-M	2-M

The median chlorophyll-a value has remained below the threshold in assessment cycles 2012, 2014 and 2016. This is based on an annual visit that occurs during the same week and month annually. The majority of chlorophyll-a data has been below the threshold in the last 10 years. The median total phosphorus value has remained below the threshold (although by a smaller margin than chlorophyll-a) in assessment cycles 2010, 2014 and 2016, however it appears that the data are more consistently below the threshold than not.

The widespread availability and use of phosphate free fertilizers (RSA 431) has likely decreased loading from fertilized lawns. The law requiring the sale of any developed waterfront property (RSA 485-A:39 Waterfront Property Sale; Site Assessment Study) to undergo an inspection of the septic system prior to the sale of the property has likely increased the identification of poorly working systems and the number of septic systems replaced. Education and outreach activities aimed at stormwater management for the homeowner and availability of the NHDES "NH Homeowner's Guide to Stormwater Management" has likely helped to improved localized nutrient loading.



WILLAND POND (NHLAK600030405-03)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
WILLAND POND	NHLAK600030405-03	Chlorophyll-a	Dover/Somersworth	5-M	2-M
		Total Phosphorus		5-M	2-M

Data indicate the 2014 and 2016 chlorophyll-a and phosphorus medians have remained below the threshold for Mesotrophic lakes. VLAP data indicate both epilimnetic and metalimnetic phosphorus concentrations have decreased

below the assessment threshold supporting lower levels of algal growth. Management actions were taken by the town of Dover to pump municipal groundwater wells which have kept water levels stable (flooding was an issue prior to that), which in turn appears to have helped decrease nutrient loads and algal growth.

Summary of Restoration Activities

- **Watershed Planning**: In response to concerns about water quality and quantity, the City of Dover assembled a pond advisory group in 2007 to evaluate options for restoration. In 2008, the city received funding from the NHDES Watershed Assistance Section to develop the plan. The restoration plan was completed in 2009: https://www.des.nh.gov/organization/divisions/water/wmb/was/documents/willand_pond_water_assess.pdf . The plan provides estimates of phosphorus loading to the lake, discusses alternatives for addressing high water levels in the pond, and includes recommendations for stormwater improvements to reduce pollutant loading, including phosphorus, to the pond. The city has implemented several recommendations in the plan including development of a management approach for water levels, construction of BMPs to reduce phosphorus loading to the pond, volunteer water quality monitoring, and outreach to residents to promote adoption of practices to protect and restore water quality.

- **Stormwater Management**: In 2008, the City of Dover constructed a series of sediment chambers along Route 108 to treat stormwater runoff from drainage areas along the northwest shore of the pond identified as contributing pollutants to the pond. The BMPs treat runoff from approximately two acres of impervious surface (roadways and parking lots). The estimated phosphorus load reduction from this BMP is approximately 5 lbs per year. The city adopted stormwater management regulations in 2016 to promote better management of future and existing stormwater runoff. In addition to managing stormwater runoff from new development, the regulations include stormwater management requirements for redevelopment projects over 20,000 square feet. Additionally, the City of Somersworth recently passed similar stormwater regulations. The regulations will reduce future and existing pollutant loads to the pond.

- **Water Level Management**: After the Mother's Day Flood in 2006, residents and businesses raised concerns about sustained high water levels in the pond. Flooding related to the elevated water levels affected recreational use of the pond including access to trails surrounding the pond. Additionally, sustained high water levels resulted in the loss of many trees in a wetland to the north of the pond. To further evaluate high water conditions in the pond, the city hired Emery & Garrett Groundwater, Inc. (EGGI) in 2010 to determine if reactivation of two groundwater production wells located in a sand and gravel aquifer adjacent to the pond would help meet a growing demand for drinking water while at the same time lowering water levels in the pond. (Use of both wells ceased in the late 1960s after 70 years of production.) During the assessment, EGGI determined that a hydrologic connection between the pond and the aquifer was present and that pumping from the wells would lower surface water elevations in the pond. The Willand Pond Advisory Committee and Friends of Willand Pond met with the city, NHDES, EGGI and others to determine an appropriate water level elevation for the pond – one that would balance recreational, water quality, and ecological needs. The groups agreed that a water level of 189' would support pond ecology and address concerns related to flooding, recreation and water quality. Test pumping was conducted in 2010 and pond levels were lowered to 189' from 192'. Water levels in the pond have stayed stable to date. Currently, the wells are not pumping continuously because city is still working to re-establish the wells as a drinking water supply; however, the city has policies and infrastructure in place to initiate pumping from the wells specifically to address high water levels in the pond should such conditions occur again. High water level elevations (greater than ~189') have not been observed since the test pumping in 2010.

- **Community Outreach**: A "Friends of Willand Pond" group was established in 2008 to promote environmentally friendly practices for residents and businesses in the watershed. As part of their efforts to protect and restore the pond, the Friends:

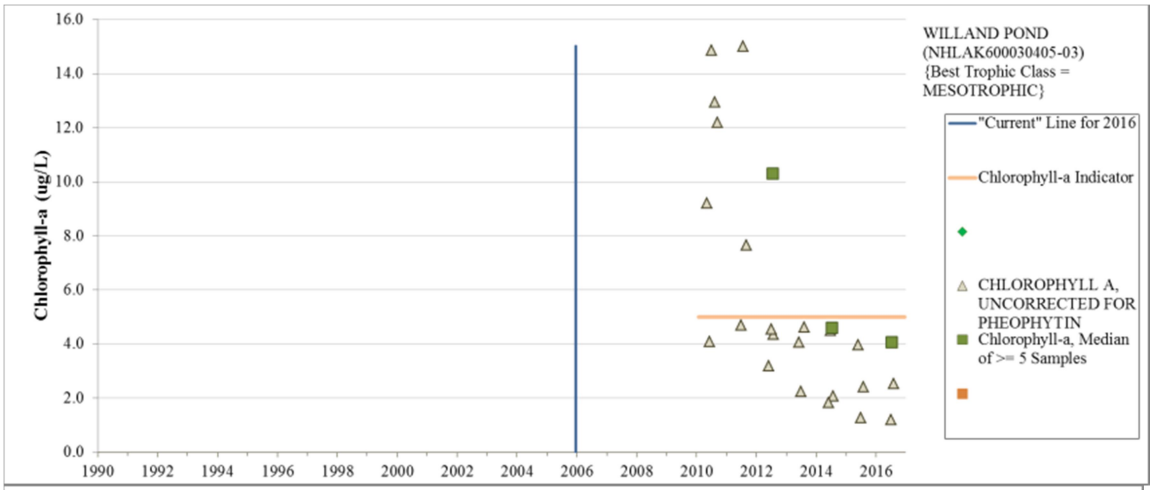
- Conducted two pond cleanups to remove trash from the shoreline near the public boat launch and along trails adjacent to the pond.
- Distributed outreach materials to residents and businesses in the watershed including a "Seven Simple Steps to Help Keep Willand Pond Clean" informational flyer.
- Hosted an educational booth at annual Dover Days festival to promote awareness.
- Held a Willand Pond Day to educate the public and promote awareness
- Identified a volunteer to conduct water quality monitoring through the NHDES Volunteer Lake Assessment Program.

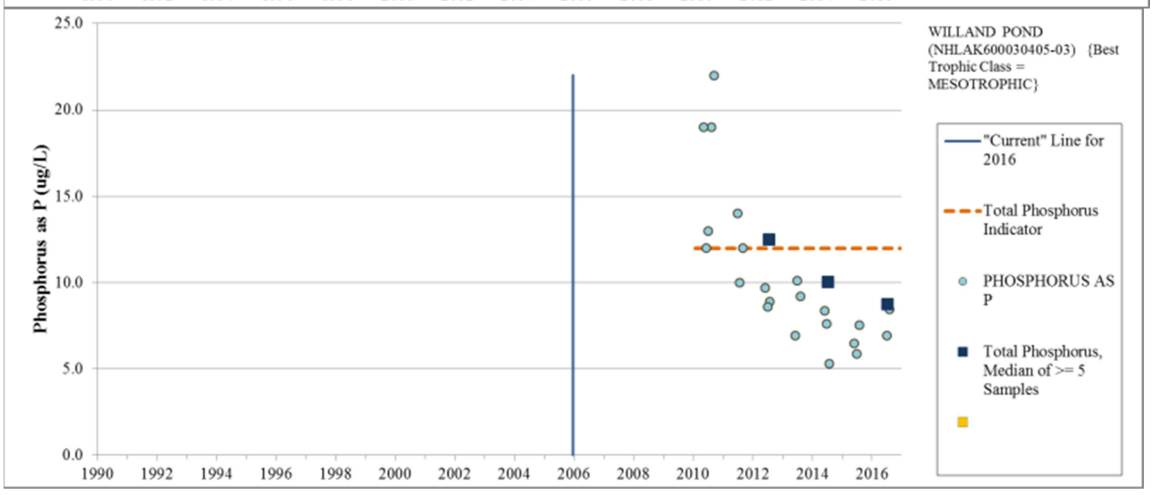
Timeline:

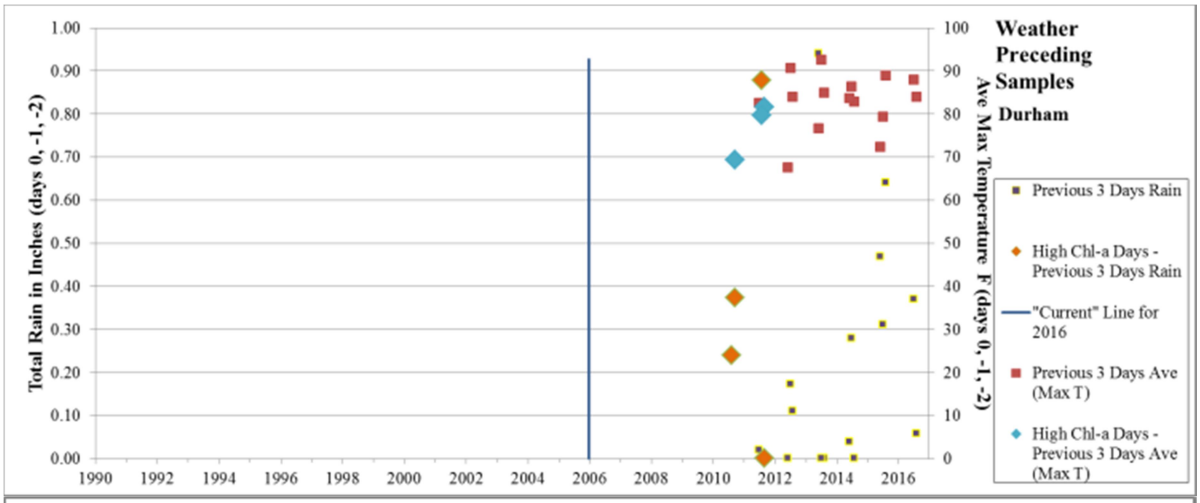
- 2006: Residents raise concerns about high water levels and water quality.
- 2008: City of Dover applies for NHDES Watershed Assistance Grants funding to develop restoration plan for the pond.
- 2008: Stormwater BMPs constructed along Route 108.
- 2009: Watershed plan is published and the Friends of Willand Pond becomes active.
- 2009: Volunteer water quality monitoring begins in cooperation with VLAP.
- 2010: City conducts further research into water level elevations.
- 2010: Test pumping of the wells lowers water level elevations to 189'.
- 2016: Dover adopts stormwater regulations with standards for redevelopment.

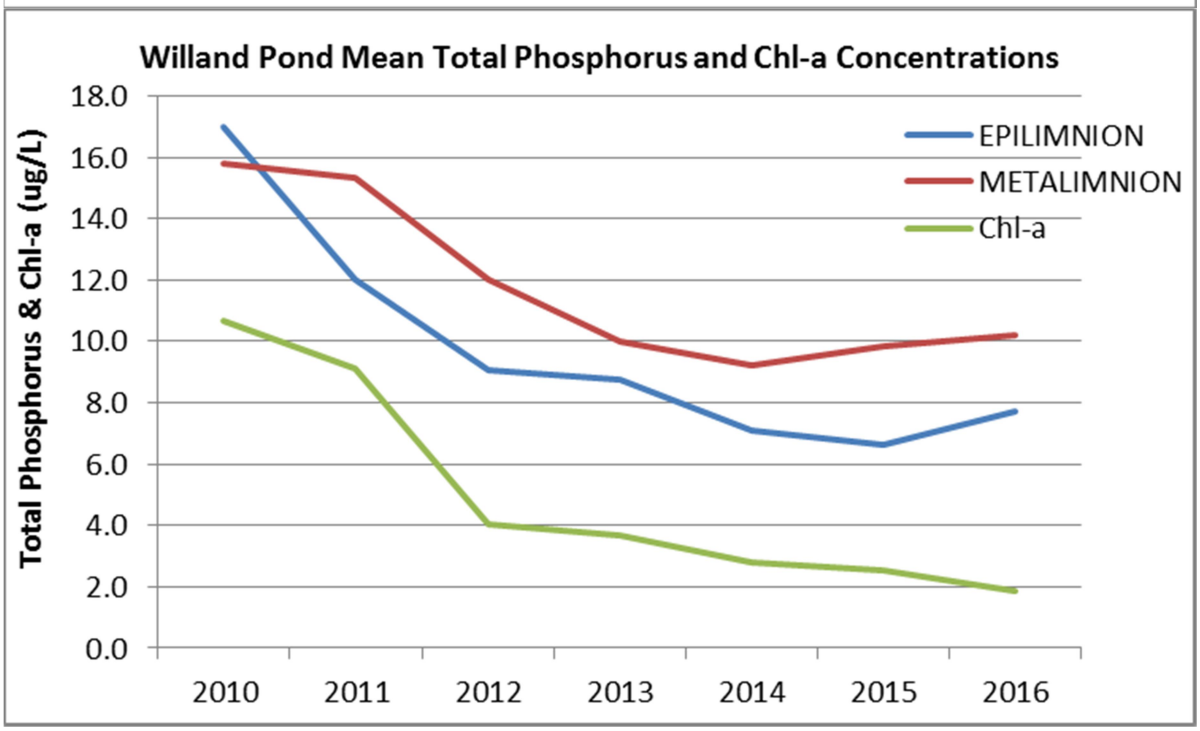
Emery & Garrett Groundwater, Inc. with Underwood Engineers, 2010, *Phases II and III – Project Update Willand Pond Well Investigation Hydrogeologic Assessment*, for the City of Dover.

Cole, S.W. and Horsley Witten Group, 2009, *Willand Pond Engineering Review: Summary of Watershed Assessment and Alternatives and Analysis Report*, for the Cities of Dover and Somersworth with NHDES.





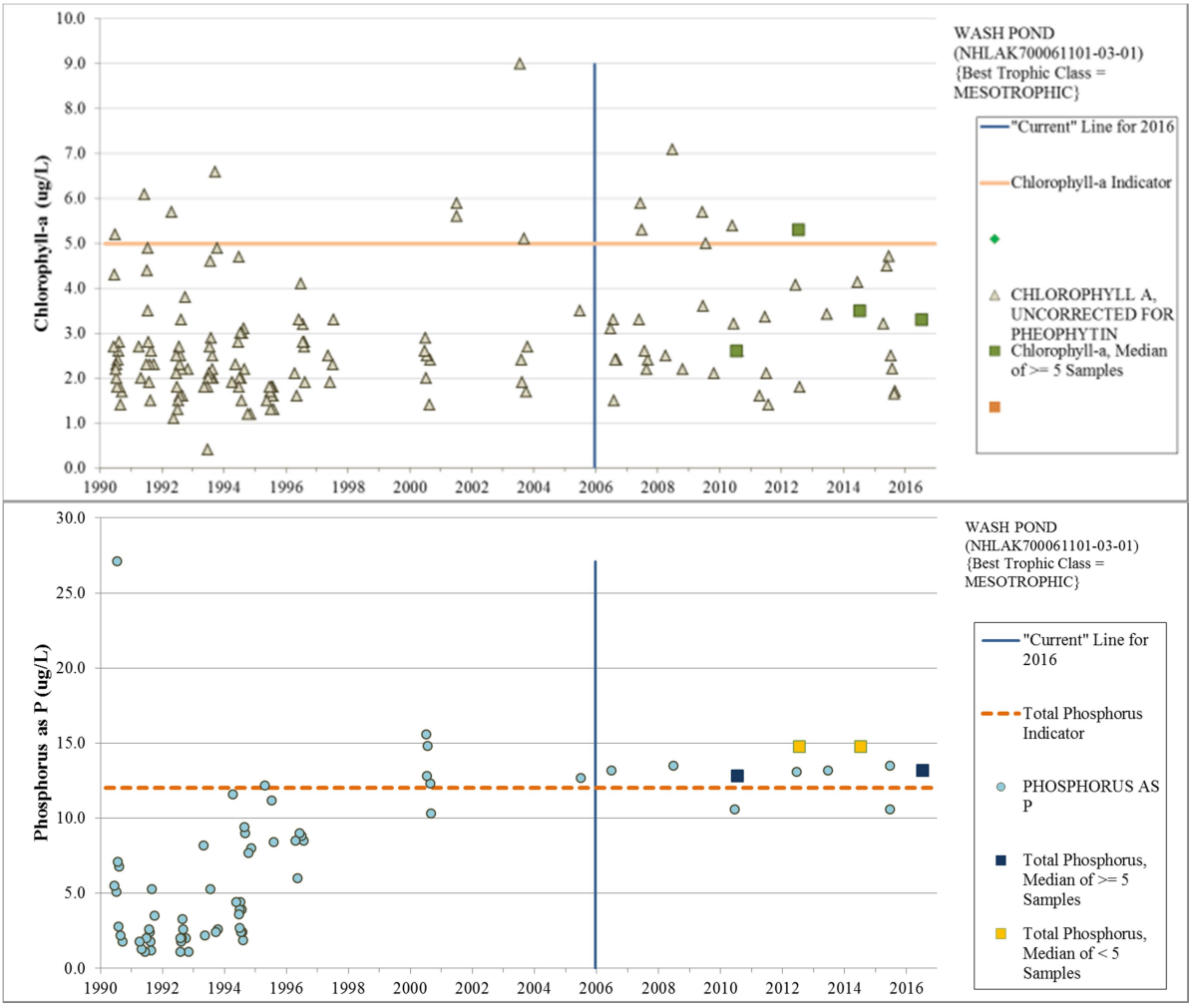

Weather Preceding Samples
Durham
Total Rain in Inches (days 0, -1, -2)
Ave Max Temperature F (days 0, -1, -2)
Previous 3 Days Rain
High Chl-a Days - Previous 3 Days Rain
"Current" Line for 2016
Previous 3 Days Ave (Max T)
High Chl-a Days - Previous 3 Days Ave (Max T)


Willand Pond Mean Total Phosphorus and Chl-a Concentrations
Total Phosphorus & Chl-a (ug/L)
EPILIMNION
METALIMNION
Chl-a

WASH POND (SUNSET LAKE) (NHLAK700061101-03-01)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
WASH POND	NHLAK700061101-03-01	Chlorophyll-a	Hampstead	5-M	2-M
		Total Phosphorus		5-M	3-PNS

UNH data has been uploaded since the last assessment cycle and there are now 28 data points to assess chlorophyll-a, and only 6 data points to assess for total phosphorus. Chlorophyll data indicates full support in the 2014 and 2016 assessment cycles however the total phosphorus median value exceeds the threshold by 1.0 ug/L for mesotrophic lakes and is listed as potentially not-supporting. Current phosphorus samples are collected annually in July.



Cyanobacteria (Primary Contact Recreation [i.e. swimming])

WILLAND POND (NHLAK600030405-03)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
WILLAND POND	NHLAK600030405-03	Cyanobacteria	SOMERSWORTH	5-M	2-M

		hepatotoxic microcystins			

Willand Pond (NHLAK60030405-03) was listed for Primary Contact Recreation due to Cyanobacteria hepatoxic microcystins in 2008. The 2008 listing was based on cyanobacteria blooms with the most recent notable event being a sample on 9/14/2011; 50,538 cells/mL; 88% *Spirulina*, 6% *Anabaena*, 6 % other detritus, dinoflagellates. Willand Pond 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. Those volunteers have not detected a bloom since 2011. The 10 year summer median total phosphorus (stressor variable) is 8.75 ug/L and the chlorophyll-a (response variable) median is 4 ug/L. It is worth noting that both values have greatly improved since 2010 when the management actions were taken by the town of Dover to pump municipal groundwater wells began and have kept water levels stable (flooding was an issue prior to that), which in turn appears to have helped decrease nutrient loads and algal growth. For a more thorough review of management actions, the reader is directed to the delisting for the Aquatic Life Use due to chlorophyll-a and total phosphorus.

Willand Pond (NHLAK60030405-03) 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).

HERMIT LAKE (NHLAK700010802-03-01) and HERMIT LAKE - TOWN BEACH (NHLAK700010802-03-02)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
HERMIT LAKE	NHLAK700010802-03-01	Cyanobacteria hepatotoxic microcystins	SANBORNTON	5-M	2-M
HERMIT LAKE - TOWN BEACH	NHLAK700010802-03-02				

Hermit Lake and Hermit Lake – Town Beach (NHLAK700010802-03-01 and NHLAK700010802-03-02) were listed for Primary Contact Recreation due to Cyanobacteria hepatoxic microcystins in 2010. The 2010 listing was based on a cyanobacteria bloom in 2009. Hermit 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. Those volunteers have not detected a bloom since 2009. The 10-year summer median total phosphorus (stressor variable) is 6.8 ug/L and the chlorophyll-a (response variable) median is 5.8 ug/L. Additionally, the town beach is sampled several times a year by NHDES staff trained to watch for cyanobacteria.

ROCK POND (NHLAK700061204-03)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
ROCK POND	NHLAK700061204-03	Cyanobacteria hepatotoxic microcystins	WINDHAM	5-M	2-M

Rock Pond (NHLAK700061204-03) was listed for Primary Contact Recreation due to Cyanobacteria hepatoxic microcystins in 2012. The 2012 listing was based on a cyanobacteria bloom in 2010. Rock Pond 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. Those volunteers have not detected a bloom since 2009. The 10 year summer median total phosphorus (stressor variable) is 9.1 ug/L and the chlorophyll-a (response variable) median is 3.1 ug/L.

STOCKER POND (NHLAK801060401-02)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
STOCKER POND	NHLAK801060401-02	Cyanobacteria hepatotoxic microcystins	GRANTHAM	5-M	2-M

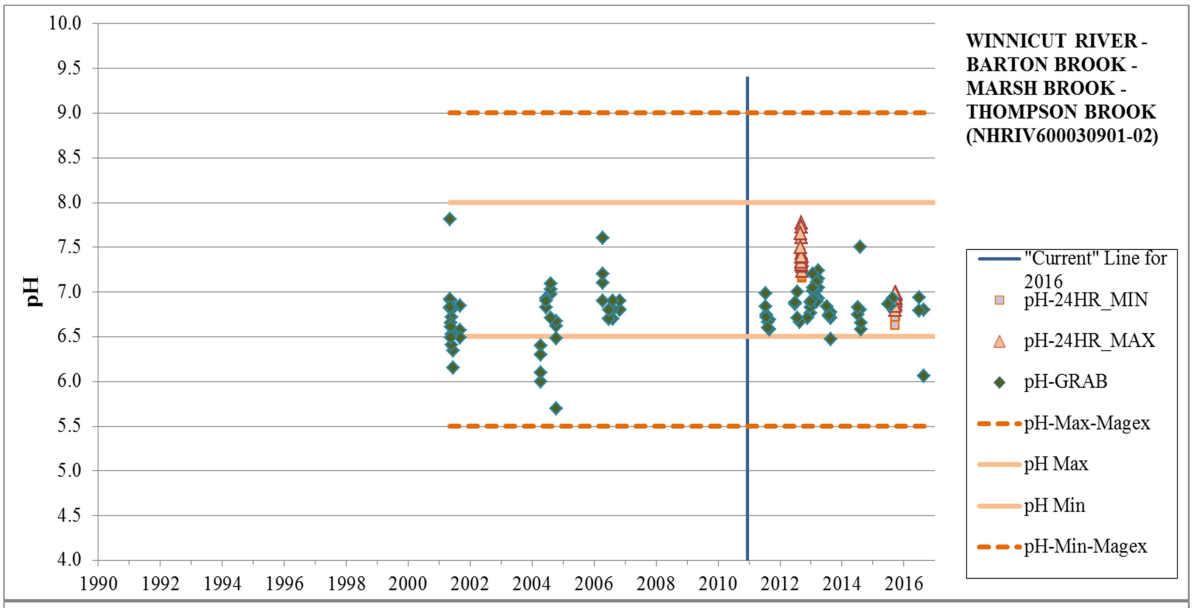
Stocker Pond (NHLAK801060401-02) was listed for Primary Contact Recreation due to Cyanobacteria hepatoxic microcystins in 2008. The 2008 listing was based on a cyanobacteria bloom in 2006. Stocker Pond participates it the departments Volunteer Lake Assessment Program (VLAP). Like most, VLAP lakes, a large number of the volunteers live right on the lake and are on a constant look-out for issues. Those volunteers have not detected a bloom since 2009. The 10 year summer median total phosphorus (stressor variable) is 9.5ug/L and the chlorophyll-a (response variable) median is 4.4 ug/L. While cyanobacteria are present in the phytoplankton community, the 2006 bloom appears to have been a random event. Stocker Pond is tea colored and high in conductivity and which typically promotes Dinoflagellate growth. There has been recent beaver management to improve flow through the pond which should help with nutrient flushing.

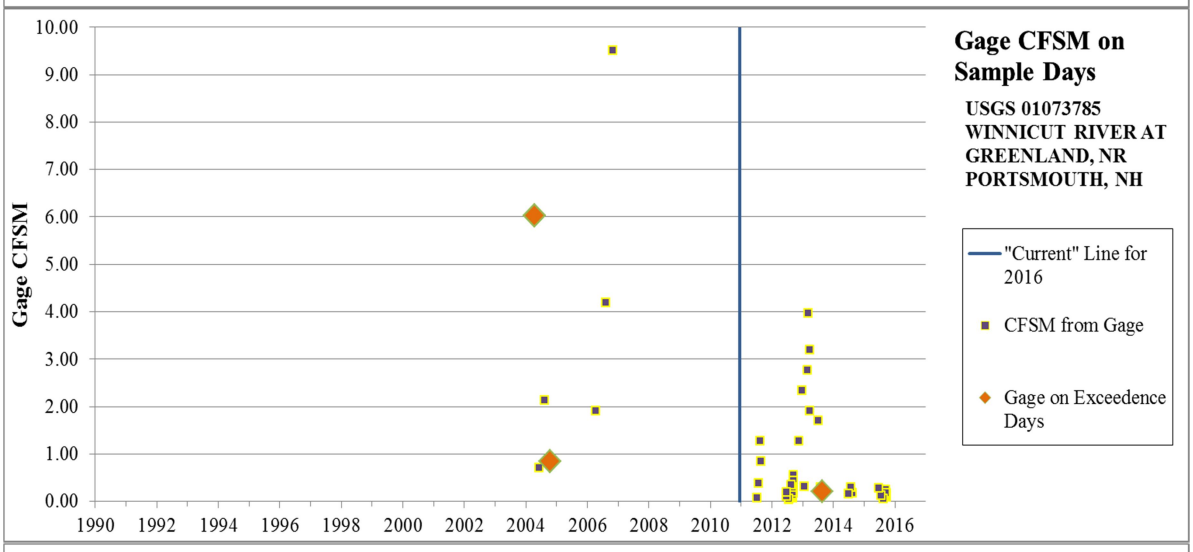
pH (Aquatic Life Use Support)

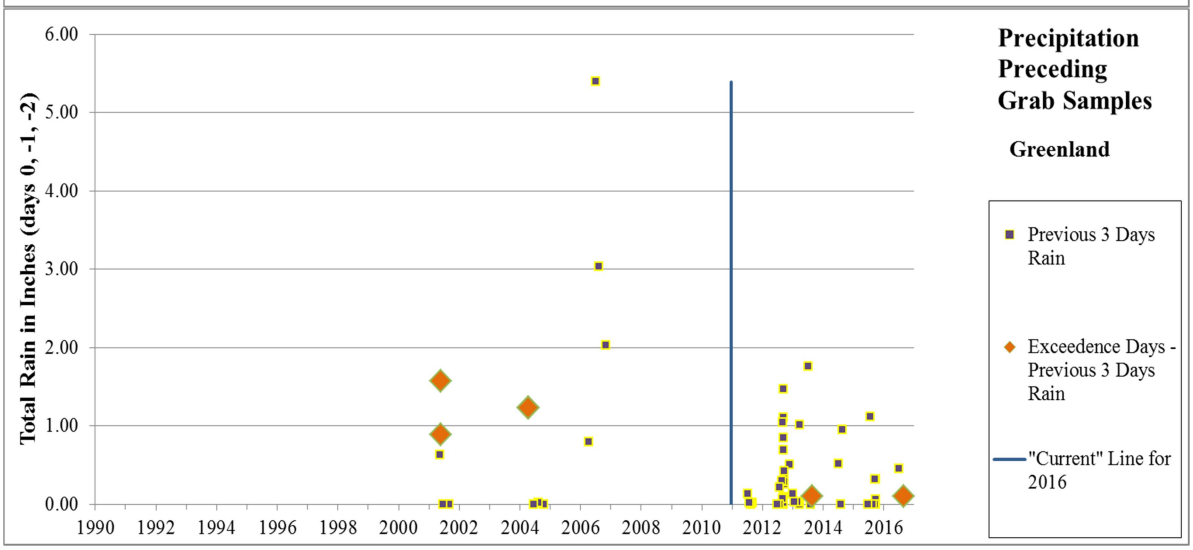
WINNICUT RIVER - BARTON BROOK - MARSH BROOK - THOMPSON BROOK (NHRIV600030901-02)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
WINNICUT RIVER - BARTON BROOK - MARSH BROOK - THOMPSON BROOK	NHRIV600030901-02	pH	GREENLAND	5-M	2-M

2016: The river was original impaired due to data collected in 2001 and 2004 at stations WN-2, 11-WNC, MB-1, and 05-WNC. Grab sample data and daily minimum and maximum logger values collected in 2011 through 2016 at stations 11-WNC, 05-WNC, 02H-TBK, 02-TBK, MB-1, and WN-2 triggered the removal of the impairment status for the 2016 cycle. 2 of 110 (2%) samples taken in September were non-supports (low pH of 6.06 and 6.47) taken at stations 11-WNC and 02-TBK. The non-supporting samples were collected at flows of 0.21 cfsm on the Winnicut River gage (01073785) and during weather conditions of 0.10” preceding three day precipitation. The historic non-supports, from 2001 and 2004, were taken during varying months, flows, and weather conditions. Newer data showing full support was taken during similar conditions and in greater numbers than the historical non-supports. The river has been categorized as 2-M for the 2016 cycle. Stations 05-WNC, 02H-TBK, MB-1, and WN-2 were in full support during the 2016 cycle.







Notes:

pH-24HR_MIN = pH minimum value from a datalogger deployment.

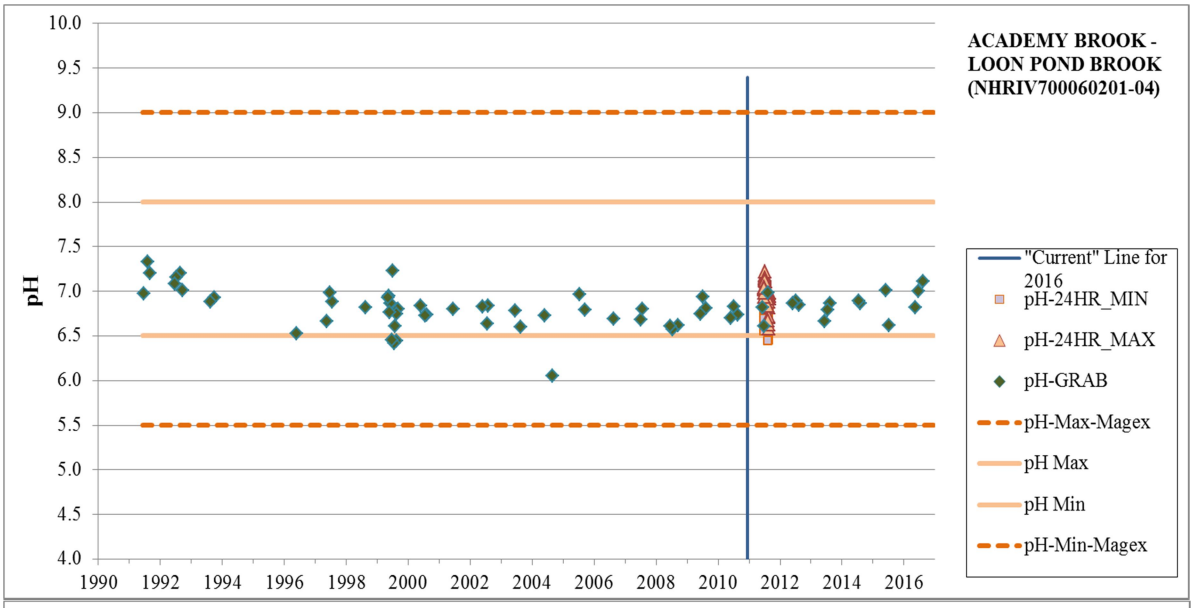
pH-24HR_MAX = pH maximum value from a datalogger deployment.

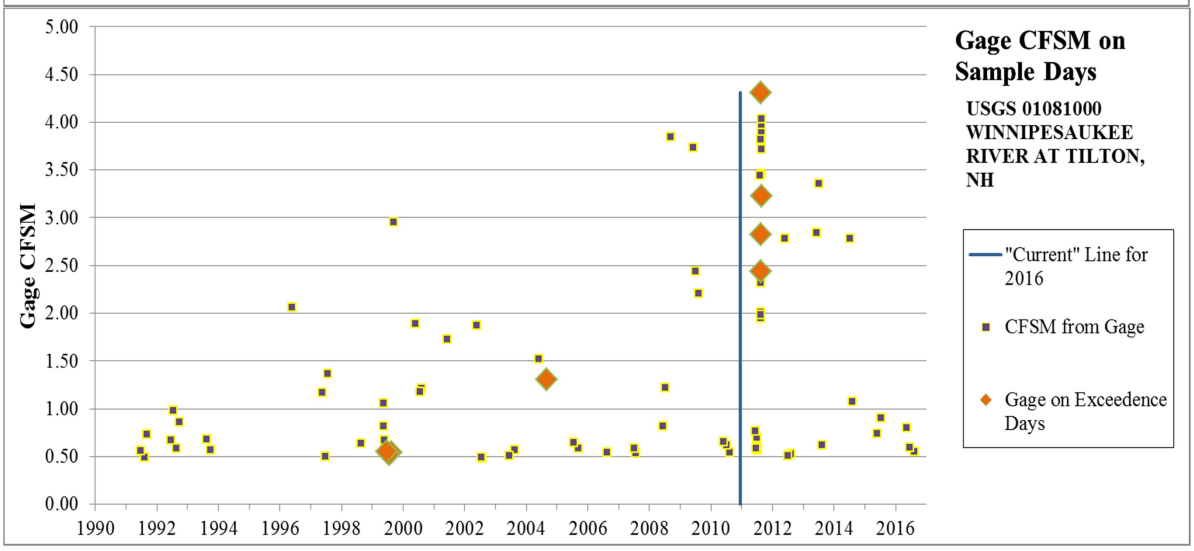
pH-GRAB = pH value from a grab sample.
"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.
"Current" Line for 2016 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current". Available older data is provided for context. See the 2016 CALM for additional details.

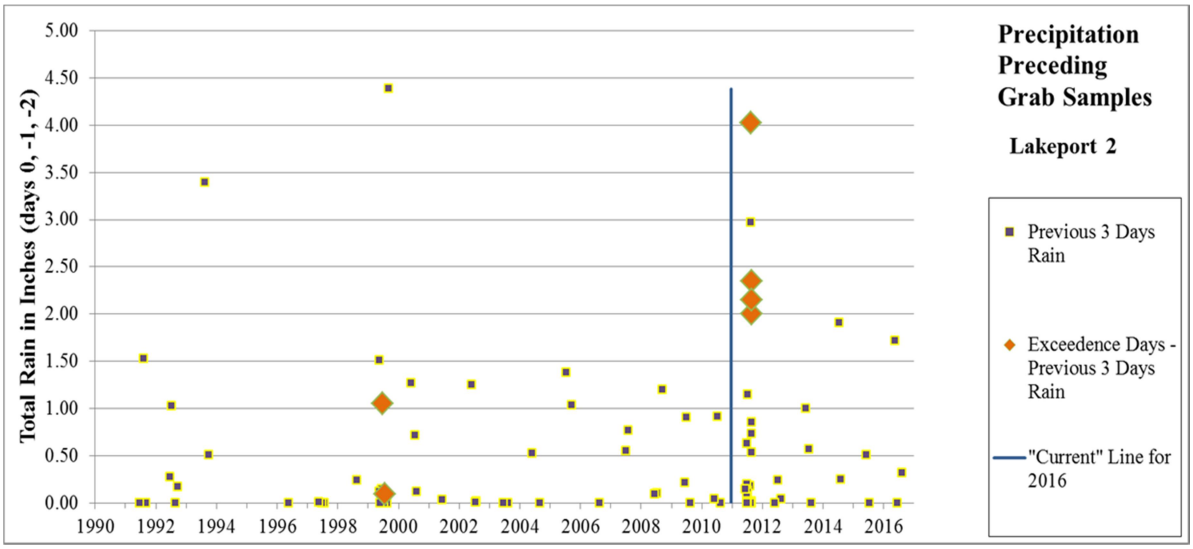
ACADEMY BROOK - LOON POND BROOK (NHRIV700060201-04)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
ACADEMY BROOK - LOON POND BROOK	NHRIV700060201-04	pH	GILMANTON	5-M	2-M

2016: The river was original impaired due to data collected in 1999 at station 03-LOB. Grab sample data and daily minimum and maximum logger values collected in 2011 through 2016 at stations LOOGLMO and 05-ACA triggered the removal of the impairment status in the 2016 cycle. 4 of 82 (5%) grab samples and daily minimum and maximum logger values taken in June through September were non-supports (low pH of 6.44 and 6.47), which were collected at infrequent higher flows of 2.44- 4.31 cfsm on the Winnipesaukee River gage (01081000) and during weather conditions of 2.00- 4.02" preceding three day precipitation. Historic non-supports, from 1999, were taken during varying months, flows, and weather conditions. Newer data showing full support was taken during similar conditions and in greater numbers than the historical non-supports.







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.

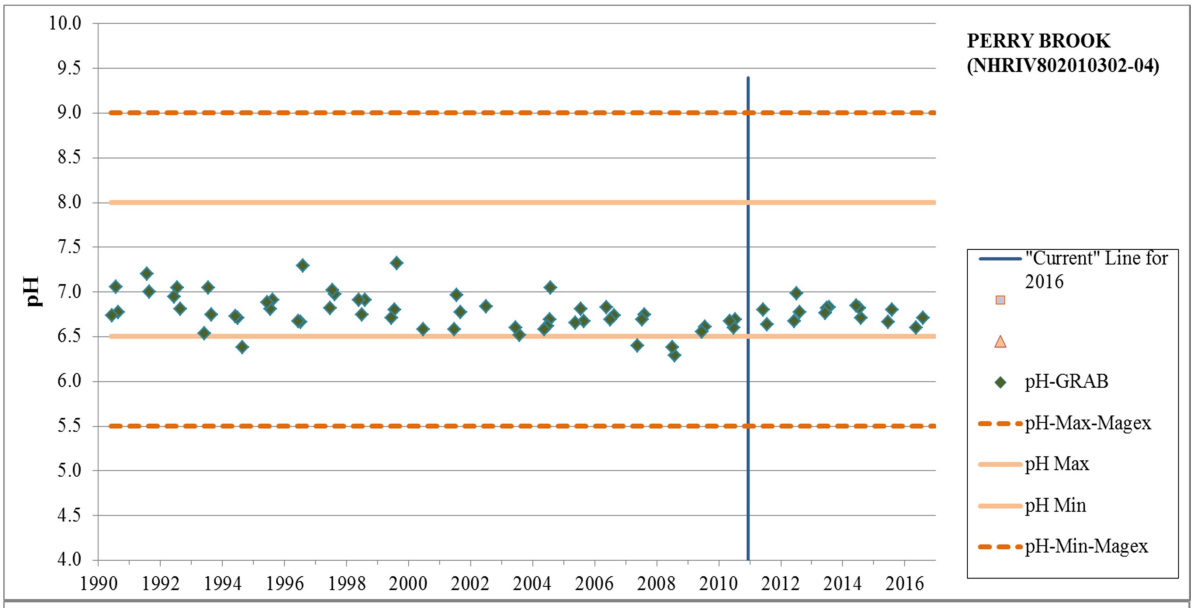
"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

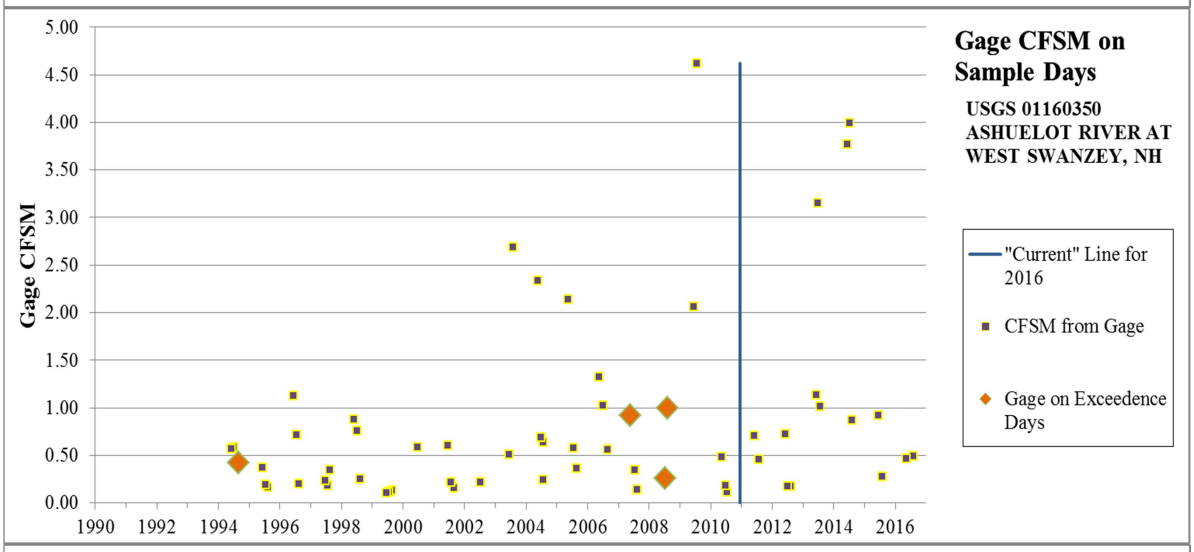
"Current" Line for 2016 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current". Available older data is provided for context. See the 2016 CALM for additional details.

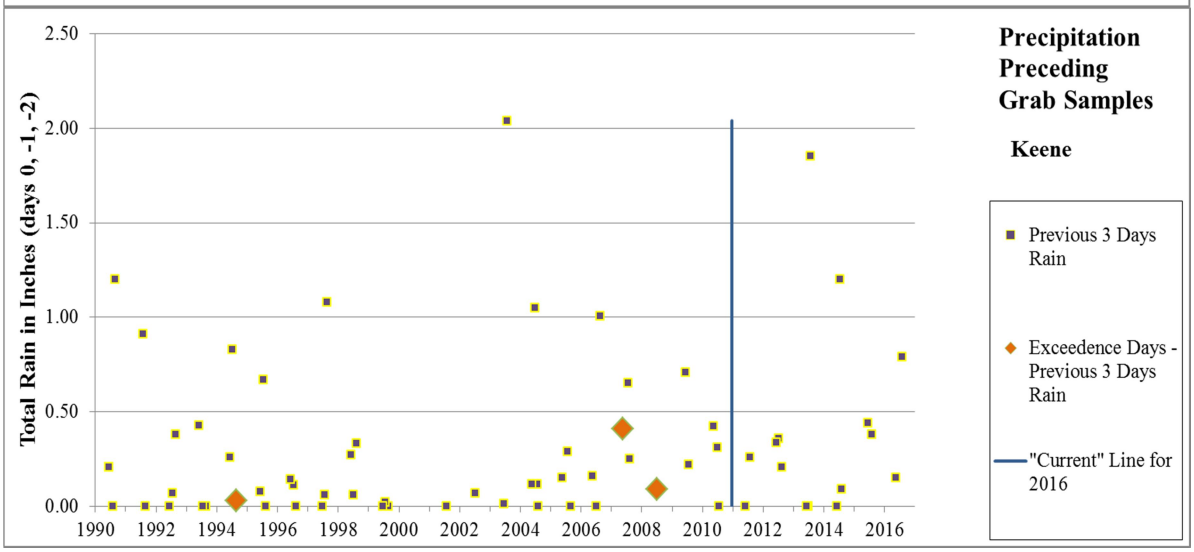
PERRY BROOK (NHRIV802010302-04)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
PERRY BROOK	NHRIV802010302-04	pH	SWANZEY	5-M	2-G

2016: The river was original impaired due to data collected in 2007 and 2008 at station SWASWAO. Grab sample data collected in 2011 through 2016 at station SWASWAO triggered the removal of the impairment status for the 2016 cycle. All 15 grab samples taken in June through August, 2011 through 2016, were in full support. Current samples were collected at flows between 0.17 – 3.99 cfsm on the Ashuelot River gage (01160350) and during varying weather conditions (0.00 – 1.85" preceding three day precipitation). Historical non-supports, from 2007 and 2008, were taken during varying months, flows, and weather conditions. Newer data showing full support was taken during similar conditions and in greater numbers than the historical non-supports. The river has been categorized as 2-G for the 2016 cycle.







Notes:

pH-GRAB = pH value from a grab sample.

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

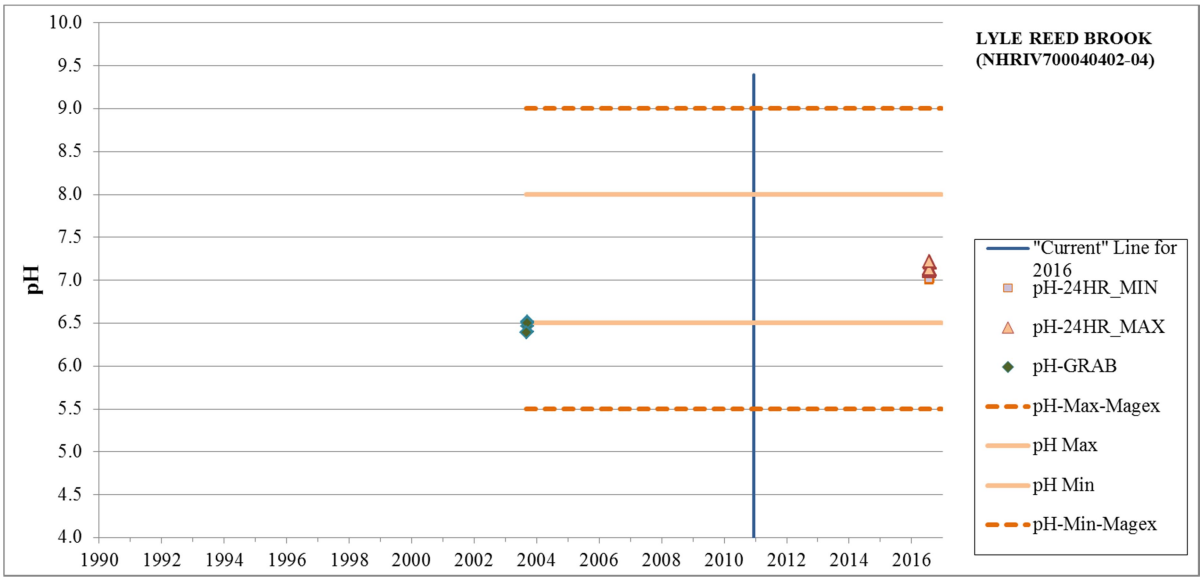
Methodology.
"Current" Line for 2016 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current". Available older data is provided for context. See the 2016 CALM for additional details.

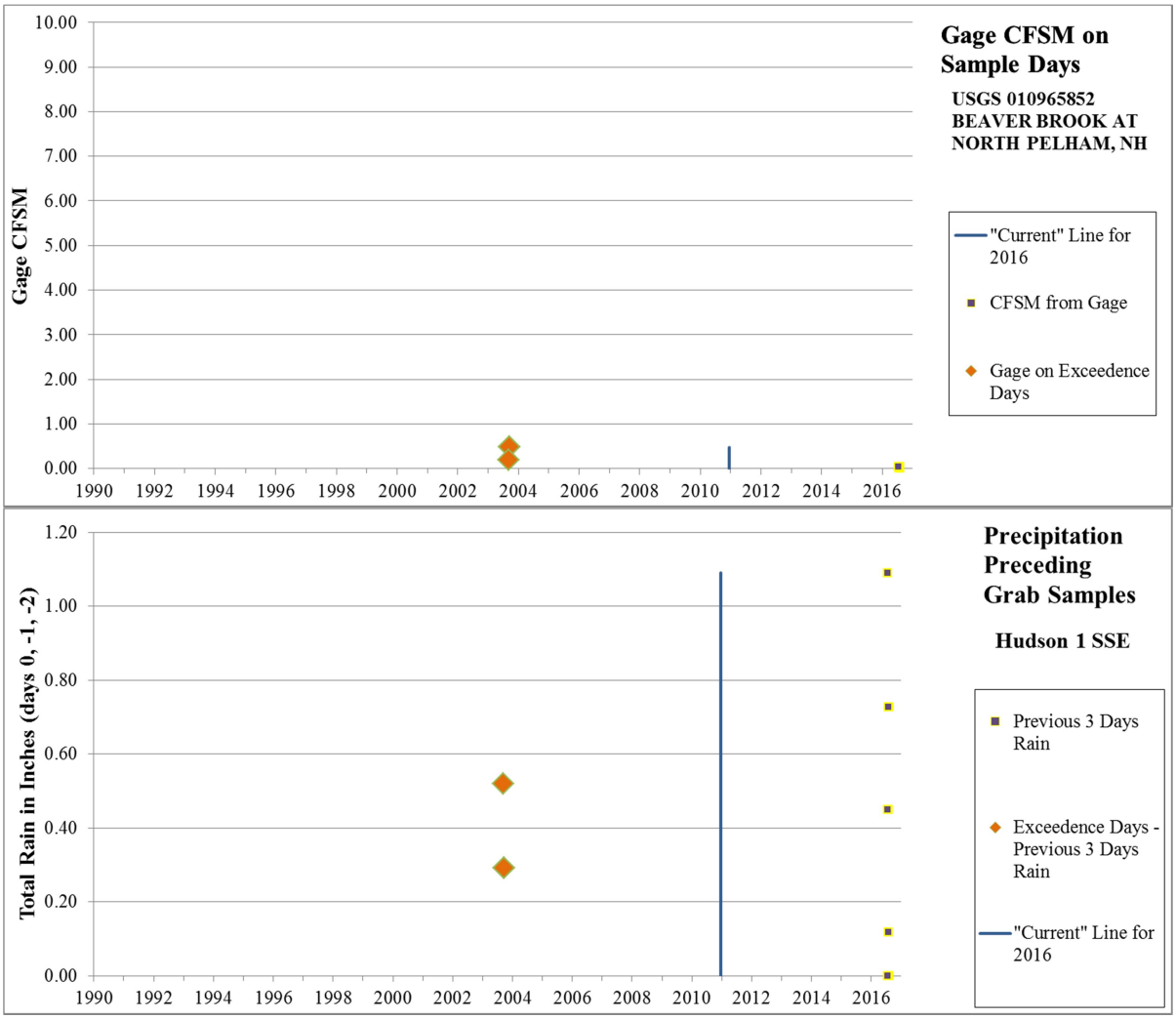
LYLE REED BROOK (NHRIV700040402-04)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
LYLE REED BROOK	NHRIV700040402-04	pH	NASHUA	5-M	2-G

2016: Impairment was originally assigned using data collected in 2003 at stations 02-LRB (03M-G01), 01K-LRB (03M-G02A), and 01M-LRB (03M-G02) during the 2004 assessment. Three of 5 (60%) samples, low pH of 6.46, 6.40, and 6.39, were non-supports, which were all collected on the same day in September during 2003. The river was then categorized as 5-P for the 2004 assessment. Due to the three non-support samples being so close to the pH minimum threshold of 6.5, they should not have counted as non-supports and the river should have been categorized as 3-PNS for the 2004 assessment.

Grab sample data collected in 2016 at station 01-LRB (03M-G04) triggered the removal of the impairment status for the 2016 cycle. All 34 daily minimum and maximum logger values taken in August were in full support. Current samples were collected at flows of 0.01 – 0.04 cfsm on the Beaver Brook gage (010965852) and during weather conditions of 0.00 – 1.09" preceding three day precipitation. Newer data showing full support was taken during similar conditions and in greater numbers than the historic non-supports. The river has been categorized as 2-G for the 2016 cycle.





Notes:

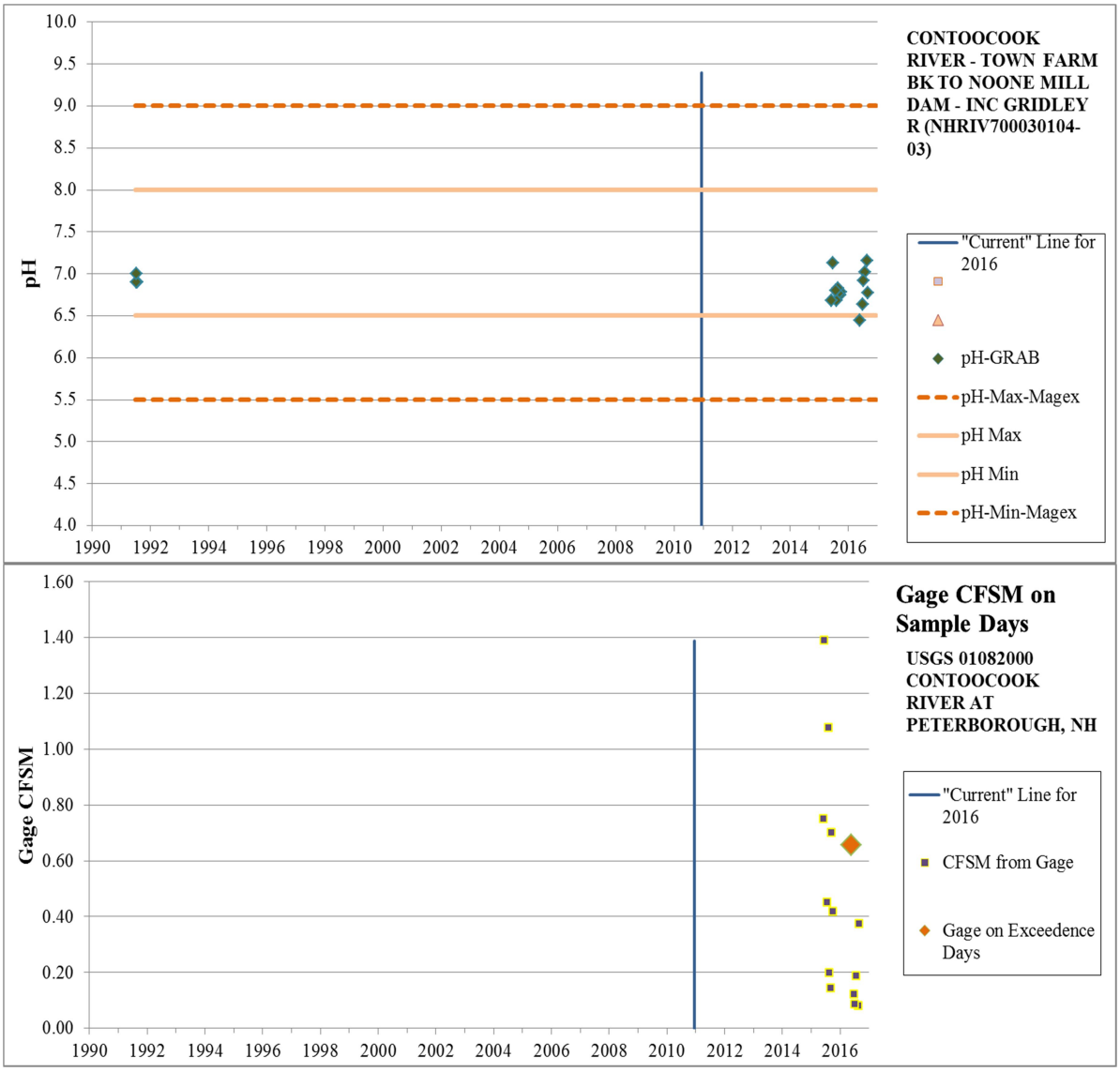
pH-24HR_MIN = pH minimum value from a datalogger deployment.
pH-24HR_MAX = pH maximum value from a datalogger deployment.
pH-GRAB = pH value from a grab sample.
"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.
"Current" Line for 2016 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current". Available older data is provided for context. See the 2016 CALM for additional details.

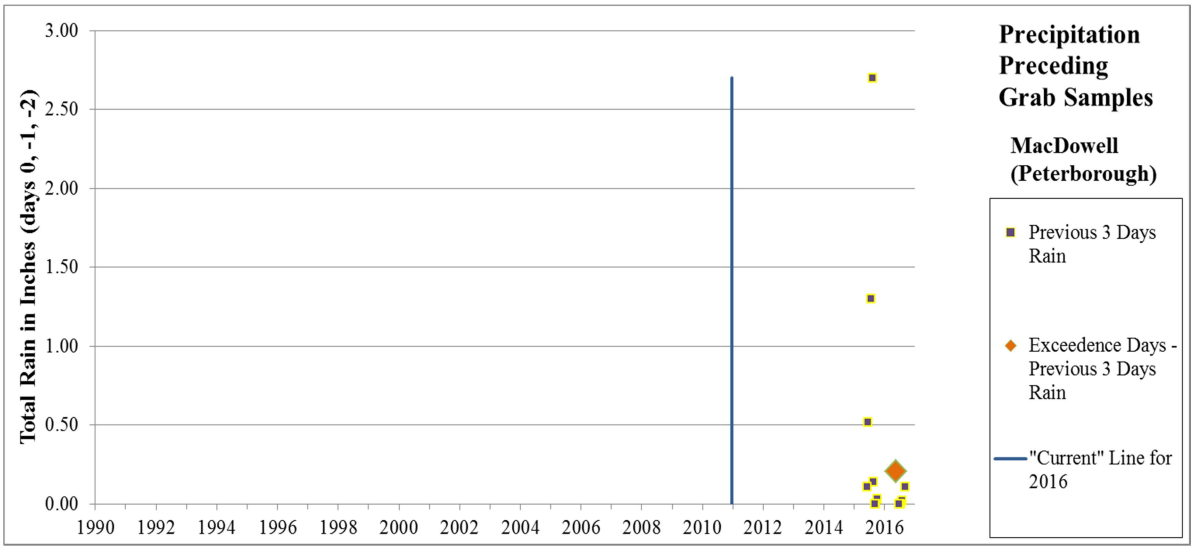
CONTOOCOOK RIVER - TOWN FARM BK TO NOONE MILL DAM - INC GRIDLEY R (NHRIV700030104-03)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
CONTOOCOOK RIVER - TOWN FARM BK TO NOONE MILL DAM - INC GRIDLEY R	NHRIV700030104-03	pH	PETERBOROUGH	5-P	2-G

2016: The original impairment occurred in the 2004 assessment. In the 2010 assessment unit NHRIV700030104-29 was broken off from NHRIV700030104-03. NHRIV700030104-03 was split from 8.4 mile units to 2.1 mile units with stations 01A-GRD, 02-GRD, and 03-GRD now becoming associated with NHRIV700030104-29. NHRIV700030104-29 has been non-support for pH since 2002 and remains that way for the 2016 cycle as well. Grab sample data collected in 2015 and 2016 at station 03M-CTC properly represents the conditions in NHRIV700030104-03 and has triggered the removal of the impairment status for the 2016 cycle. At 03M-CTC, 1 of 14 (7%) grab samples was a

non-support collected in June. The non-support was below the pH minimum of 6.5 with a reading of 6.44. Due to 6.44 being so close to the pH minimum threshold of 6.5, it will not count as a non-support. That one marginal sample was collected at a flow of 0.66 cfsm on the Contoocook River gage (01082000) and during weather conditions of 0.21 preceding three day precipitation. The river has been categorized as 2-G for the 2016 cycle due to no non-supports.





Notes:

pH-GRAB = pH value from a grab sample.

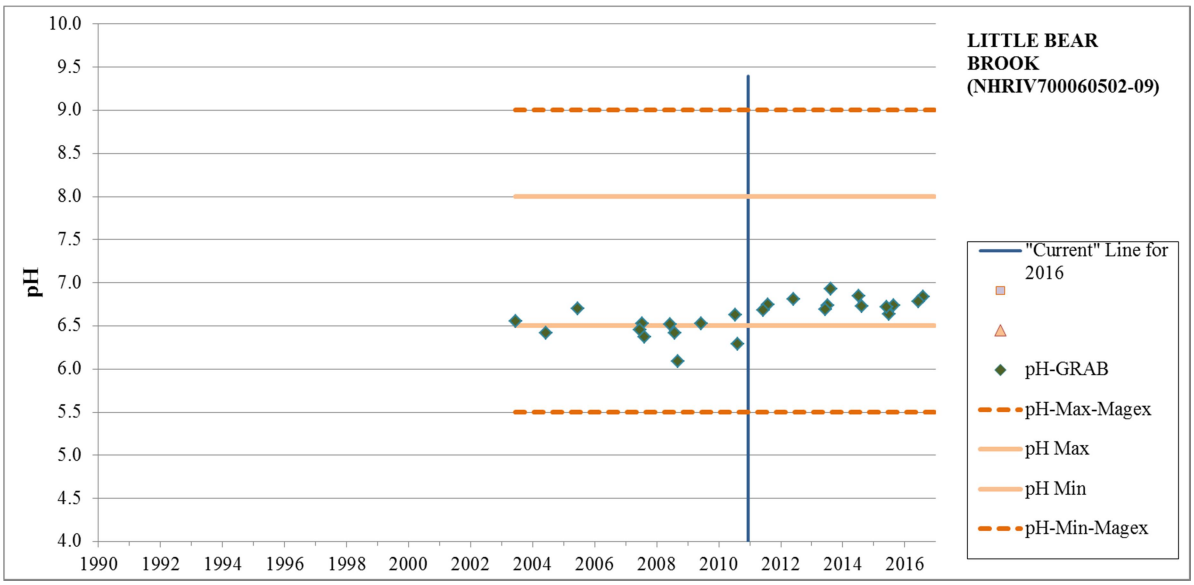
"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.

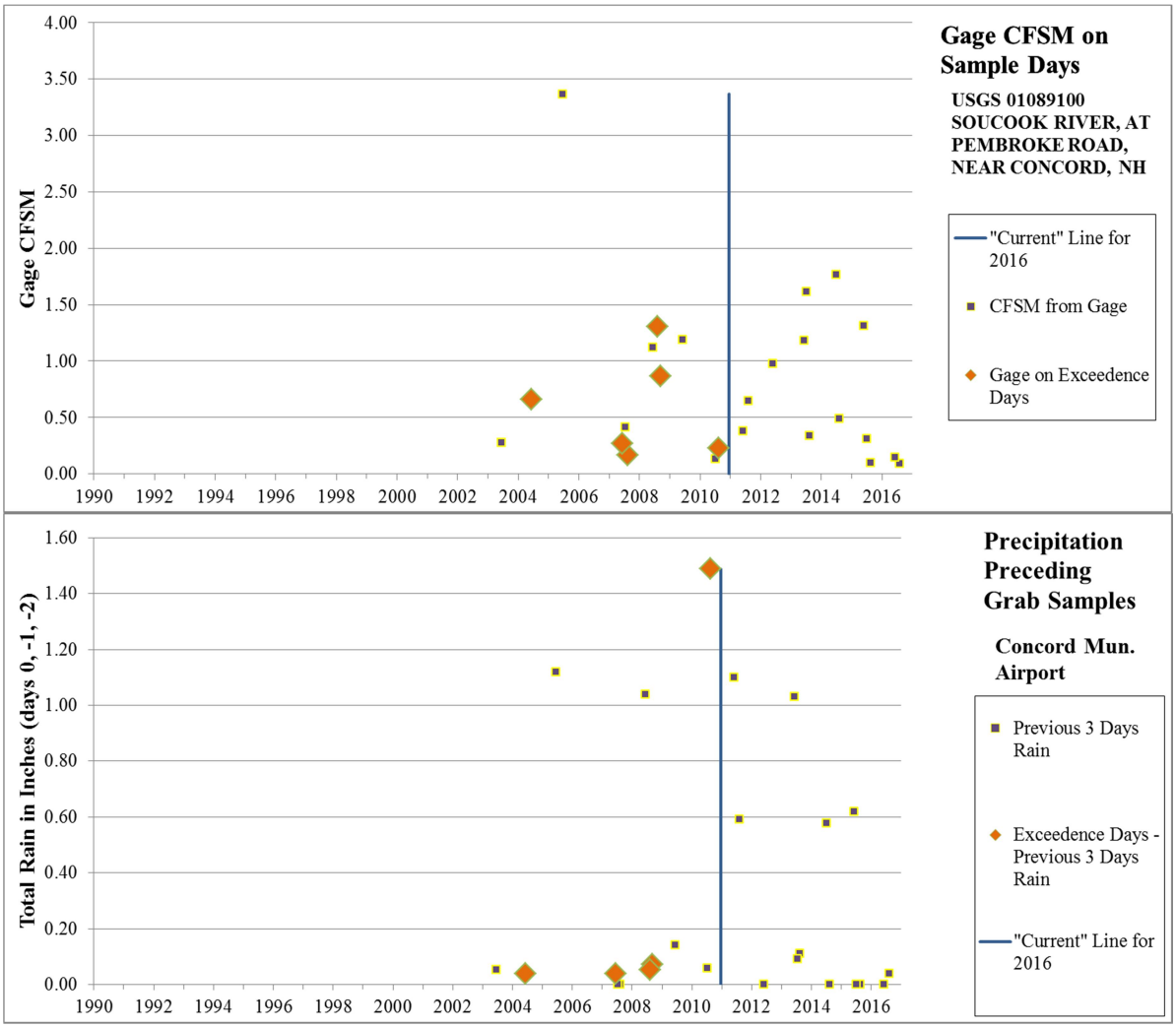
"Current" Line for 2016 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current". Available older data is provided for context. See the 2016 CALM for additional details.

LITTLE BEAR BROOK (NHRIV700060502-09)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
LITTLE BEAR BROOK	NHRIV700060502-09	pH	EPSOM	5-M	2-M

2016: All 13 grab samples collected in 2011 through 2016 were in full support. Though the amount of non-supports is under the 10% threshold as stated in the CALM, the river has been categorized as 2-M for the 2016 cycle. The reason for this is due to the 6 historical non-supports (low pH of 6.09- 6.45) that were taken in 2004 through 2010. Newer data showing full support was taken during similar conditions and in greater numbers than the historical non-supports but the non-supports still needed to be considered in the 2016 cycle. The samples were collected at station CHEEPSO.





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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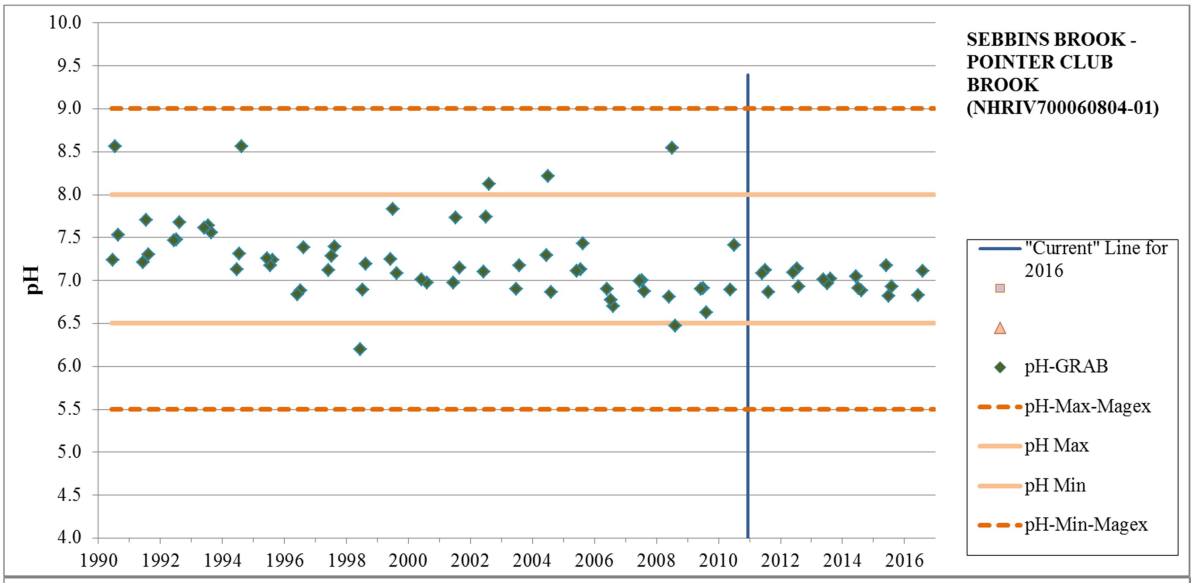
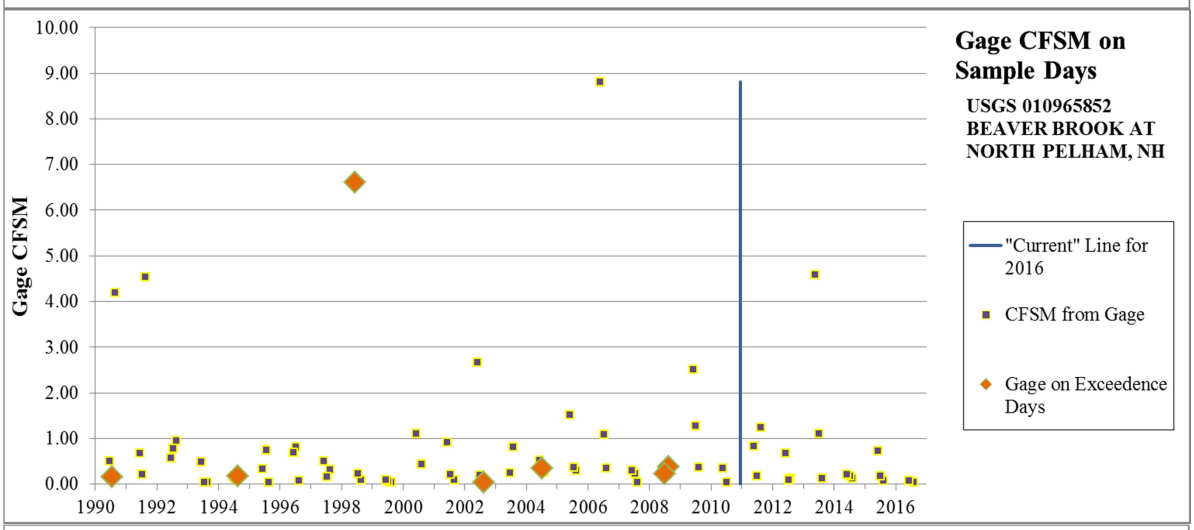
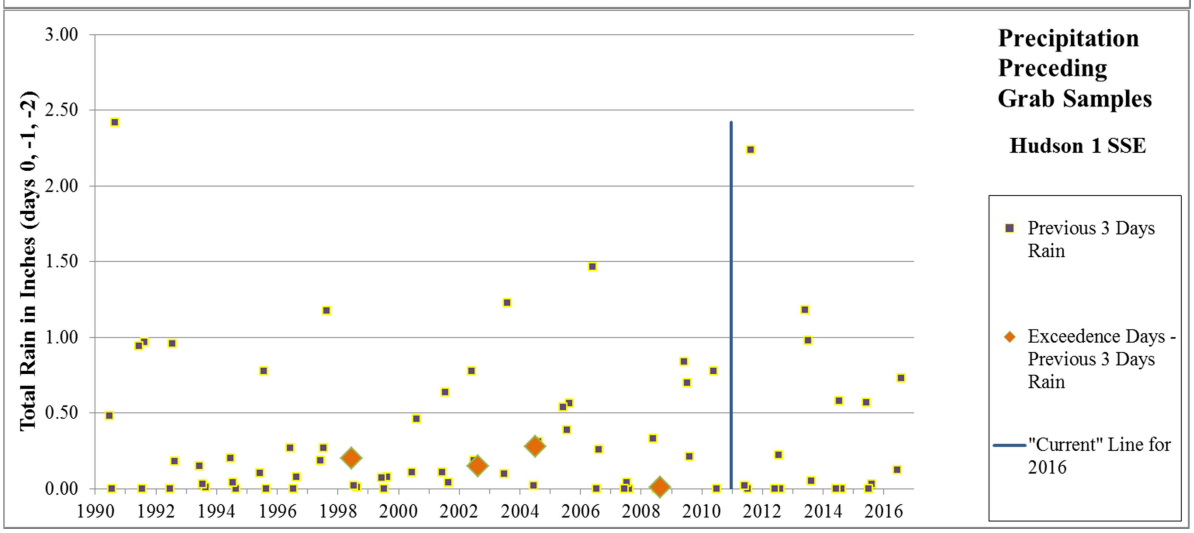
SEBBINS BROOK - POINTER CLUB BROOK (NHRIV700060804-01)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
SEBBINS BROOK - POINTER CLUB BROOK	NHRIV700060804-01	pH	BEDFORD	5-M	2-M

2016: Grab sample data collected in 2011 through 2016 at station SEBBEDO triggered the removal of the impairment status for the 2016 cycle. All 17 grab samples taken in June through August were in full support. Current samples were collected at flows between 0.04 – 4.58 cfsm on the Beaver Brook gage (010965852) and during varying weather conditions (0.00 – 2.24" preceding three day precipitation). Historical non-supports were taken during varying months, flows, and weather conditions. Newer data showing full support was taken during similar conditions and in greater numbers than the historical non-supports which were also taken at station SEBBEDO. The river has been categorized as 2-M for the 2016 cycle.







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.

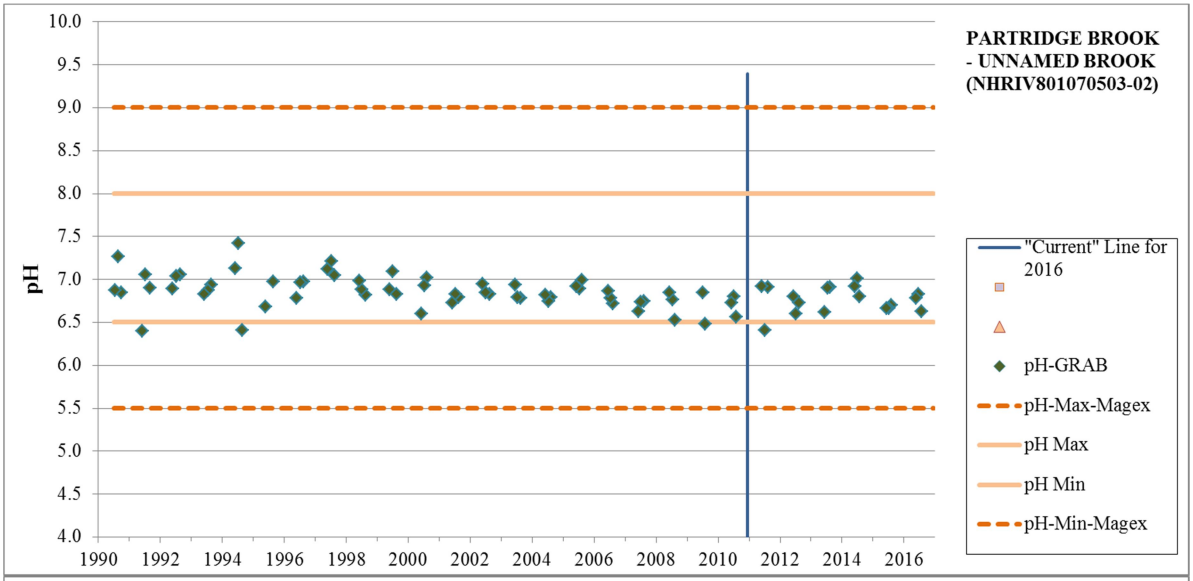
"Current" Line for 2016 – Per the methodology outlined in the CALM, all data from this referenced data is

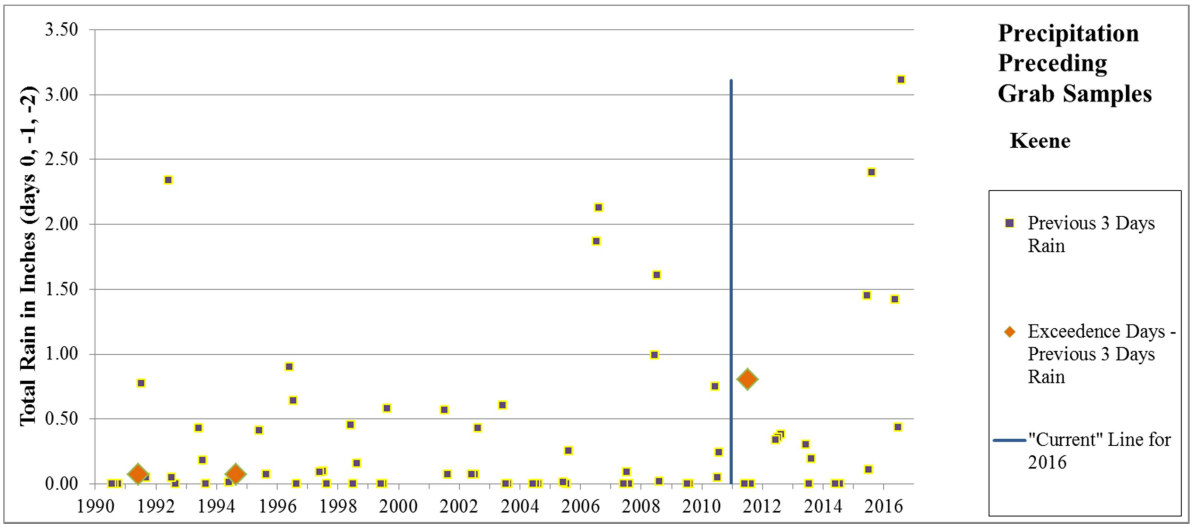
considered “current”. Available older data is provided for context. See the 2016 CALM for additional details.

PARTRIDGE BROOK - UNNAMED BROOK (NHRIV801070503-02)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
PARTRIDGE BROOK - UNNAMED BROOK	NHRIV801070503-02	pH	CHESTERFIELD	5-M	2-M

2016: Grab sample data collected in 2011 through 2016 at station SPOCHEO triggered the removal of the impairment status for the 2016 cycle. One of 18 (6%) grab samples taken in July was a non-support (low pH of 6.41). The non-supporting sample was collected at a flow of 0.35 cfsm on the Ashuelot River gage (01160350) and during weather conditions of 0.80” preceding three day precipitation. Historical non-supports were taken during varying months, flows, and weather conditions. Newer data showing full support was taken during similar conditions and in greater numbers than the historical non-supports which were also taken at station SPOCHEO. The river has been categorized as 2-M for the 2016 cycle.





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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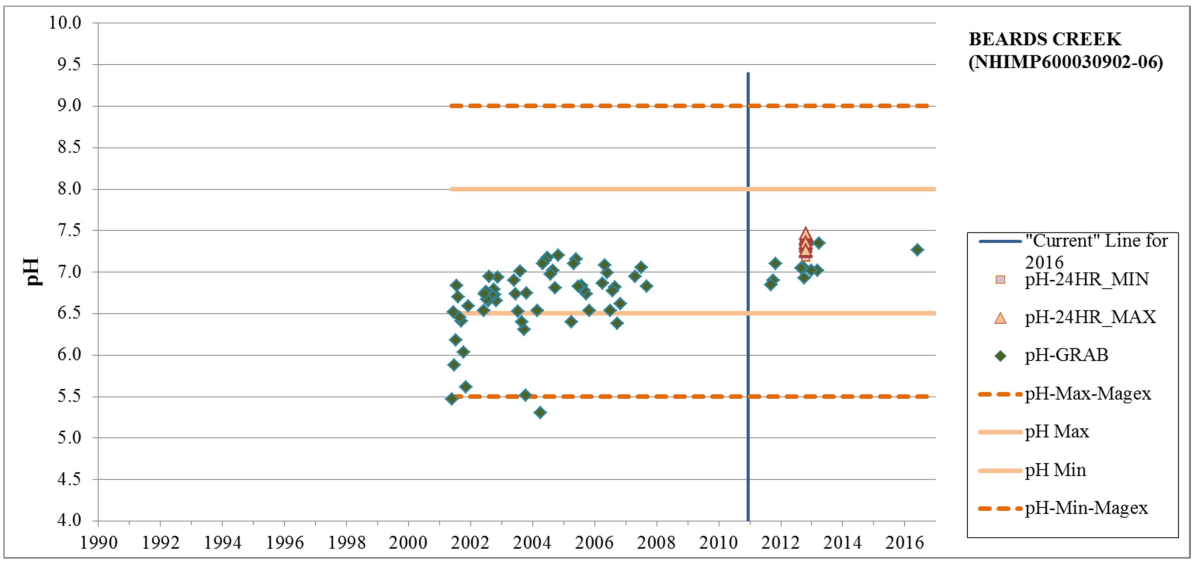
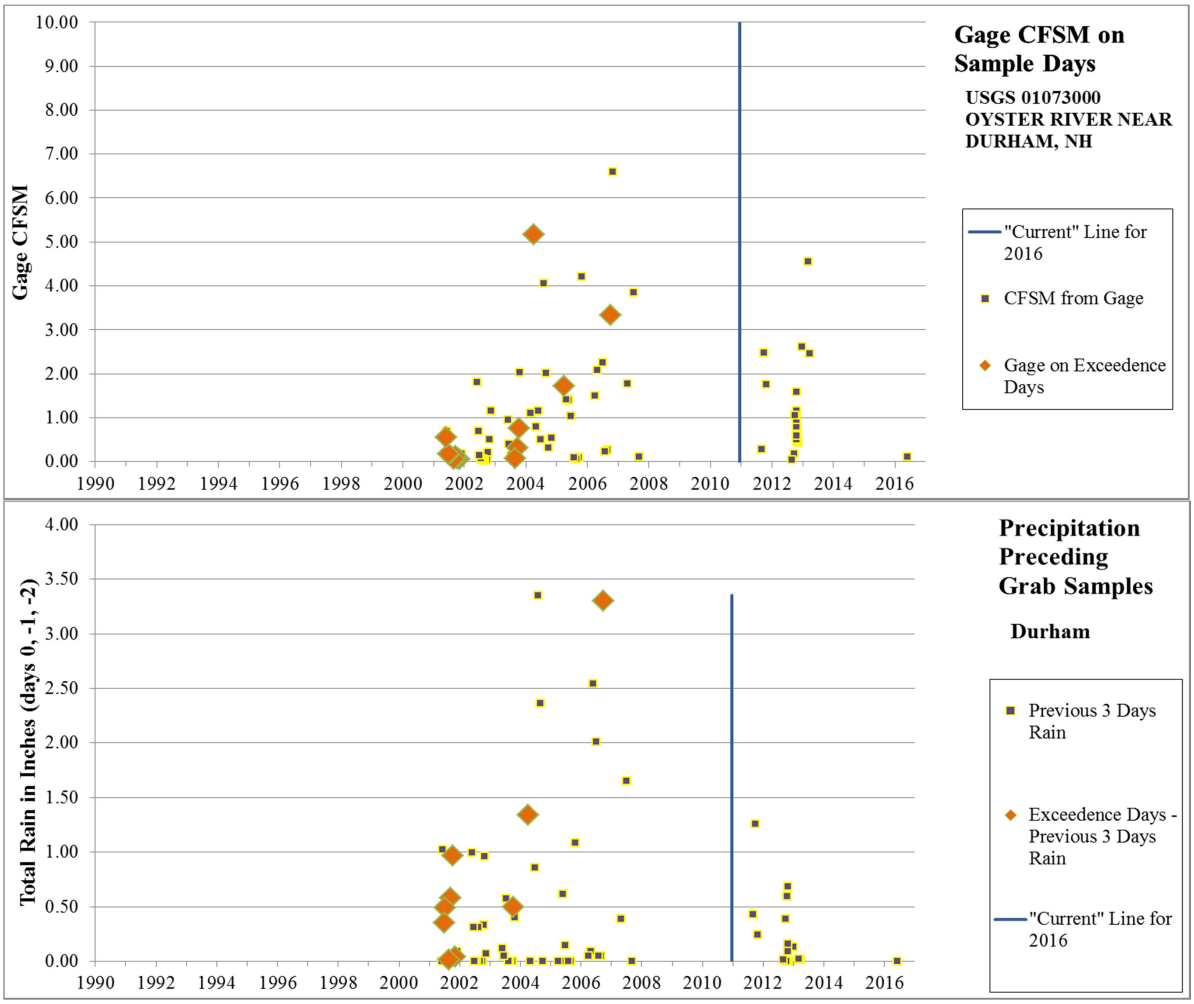
BEARDS CREEK (NHIMP600030902-06)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
BEARDS CREEK	NHIMP600030902-06	pH	Durham	5-P	2-G

2016: All available data for this assessment unit comes from station 02-BRD (Coe Dr/Beards Cr). Grab samples from station 02-BRD, triggered the change in category during the 2016 cycle. Zero of 10 (0%) were below pH 6.5, or above 8.0 (values ranged from 6.85 to 7.47). Collection was done during January, March, April, May, June, July, September, October, and November and under various weather conditions, (0.00 - 1.65)" rain in 3 day period).





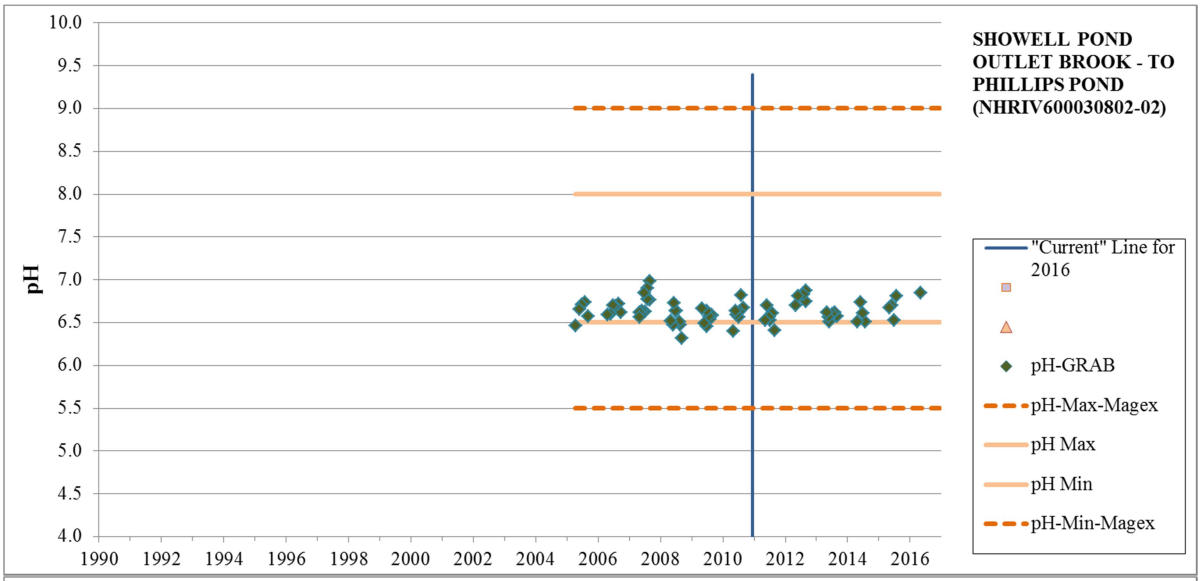
Notes:

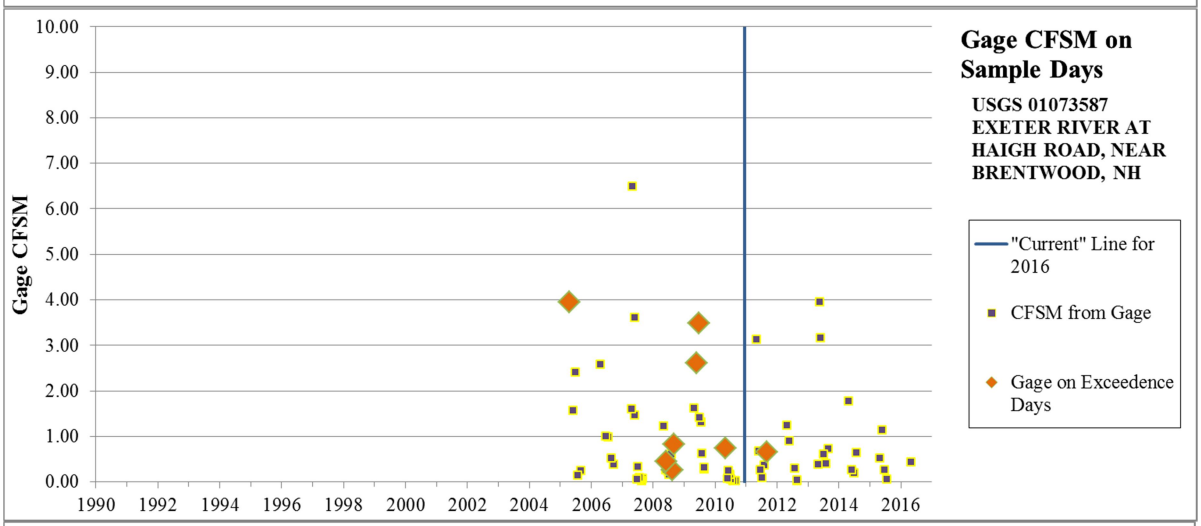
pH-24HR_MIN = pH minimum value from a datalogger deployment.
pH-24HR_MAX = pH maximum value from a datalogger deployment.
pH-GRAB = pH value from a grab sample.
"Magex" refers to the magnitude of exceedence indicator described in the Consolidated Assessment and Listing Methodology.
"Current" Line for 2016 – Per the methodology outlined in the CALM, all data from this referenced data is considered "current". Available older data is provided for context. See the 2016 CALM for additional details.

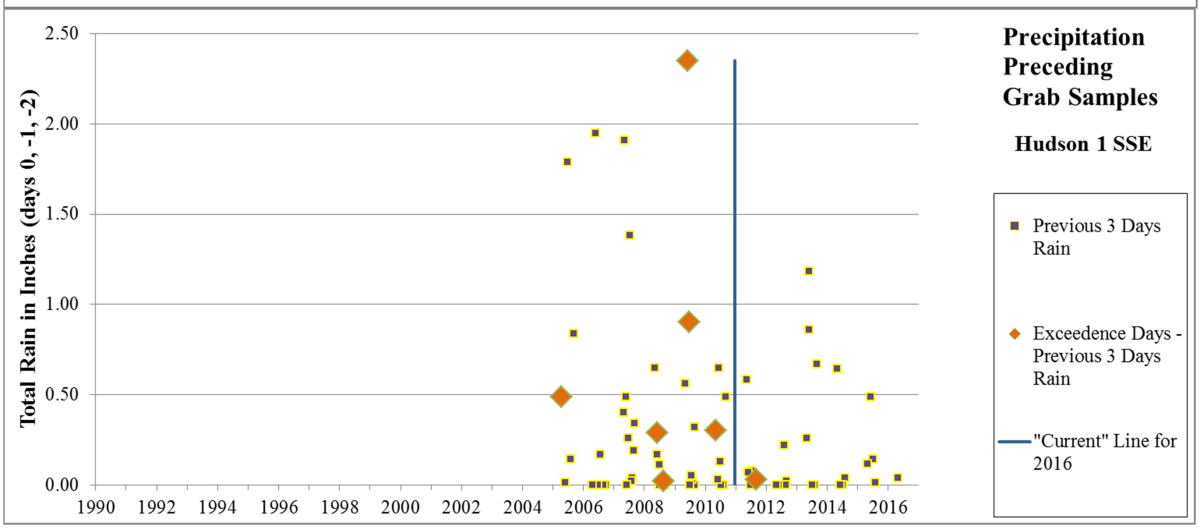
SHOWELL POND OUTLET BROOK - TO PHILLIPS POND (NHRIV600030802-02)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
SHOWELL POND OUTLET BROOK - TO PHILLIPS POND	NHRIV600030802-02	pH	SANDOWN	5-M	2-M

2016: Grab sample data collected in 2011 through 2016 at stations PHISDNI and SHOSDNO triggered the new category 2-M for the 2016 cycle. One of 26 (4%) grab samples taken in September was a non-support (low pH of 6.41). The non-supporting sample was collected at a flow of 0.66 cfsm on the Exeter River gage (01073587) and during weather conditions of 0.03" preceding three day precipitation.







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 2016 – Per the methodology outlined in the CALM, all data from this referenced data is considered

"current". Available older data is provided for context. See the 2016 CALM for additional details.

Total Phosphorus (Aquatic Life Use Support)

Captain Pond (NHLAK700061102-03-01)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
Captain Pond	NHLAK700061102-03-01	Phosphorus (Total)	SALEM	5-M	4A-M

On September 28th, 2017 EPA approved the 'Total Maximum Daily Load for Phosphorus for Captain Pond, Salem, NH'. The purpose of the TMDL is to address impairment of aquatic life due to total phosphorus from atmospheric deposition, internal loading, septic systems (within 125 feet of the lake), waterfowl and watershed loads. The TMDL will result in attainment of surface water quality criteria and thresholds for chlorophyll-a, DO, as well as cyanobacteria.

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, DES has placed Captain Pond (NHLAK700061102-03-01) in impairment Category 4A instead of on the 303(d) list (Category 5) for aquatic life due to total phosphorus.

"Taste and Odor" & "Foam/Flocs/Scum/Oil Slicks" (Secondary Contact Recreation)

LITTLE COHAS BROOK - (NHRIV700060804-05)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
LITTLE COHAS BROOK	NHRIV700060804-05	Taste and Odor	MANCHESTER	5-P	2-M
		Foam/Flocs/Scum/Oil Slicks			

Outfall 12 was evaluated on February 5, 2015. Site visit occurred at the tail end of a moderate snowfall (~4 inches) with air temperature of 20° F. Arrived in the airport area near to Outfall 12 at 11:10 am therefore several hours of flights and deicing had already taken place. There was no foam present in Little Cohas Brook upstream or downstream of the pipe or in the outfall channel. Glycol scent was in the air but this was due to the proximity of the area to the airport deicing location. There was no odor of glycol present in the pipe. As of 2010 deicer is no longer discharged to Outfall 12. Discharge is now at Outfall 19, which is in the Merrimack River. Both the "Taste and Odor" as well as the "Foam/Flocs/Scum/Oil Slicks" have been removed from both the Primary Contact Recreation and Secondary Contact Recreation designated uses.

Photo: Outfall #12 February 5, 2015.

2014: MHT produced a Final Water Quality Report for the USEPA April 2009 Section 308 Information Request regarding NPDES Permit number NHR05BM69. The October 2010 report covered the period from September 2009 through August 2010. The outfall that relates to the original impairment is Outfall Number 12, from which the deicer runoff has been re-routed to Outfall number 19 on the Merrimack River. On two occasions Outfall 12 was evaluated for foam, odor and color. The first occasion was on September 12, 2009, a day in the 60s Fahrenheit with light rain (0.24 inches) (Section D-1, Table 2.3) and on that date there was No foam, a "faint onion odor," and the outfall water was "light orange" (Section D-1, Table 4.3). With no active deicing activities on September 12, 2009, the sampling is of limited utility in addressing this impairment. The second evaluation for foam, odor, and color was on December 9, 2009, a day in the lower 30s Fahrenheit with light to moderate snow (0.98 inches) (Section D-1, Table 2.3) and on that date there was No foam, a "faint musty/metallic odor", and the outfall water was "very light yellow/gray" (Section D-1, Table 2.5). Outfall 12 should be reevaluated during one or more snow/deicer periods in the winter of 2014/2015 for de-impairment documentation.

2008: Source has been relocated but monitoring is needed to confirm that it now meets Water Quality Standards for primary contact recreation.

2006: Airport Deicer Foam

Macroinvertebrates (Aquatic Life Use Support)

COLD RIVER - WARREN BROOK - UNNAMED BROOK (NHRIV801070203-04)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
COLD RIVER - WARREN BROOK - UNNAMED BROOK	NHRIV801070203-04	Benthic-Macroinvertebrate Bioassessments	Alstead	5-P	2-M

(Streams)

Since 1999, four macroinvertebrate samples have been collected along assessment unit NHRIV801070203-04 (table below.) Three of the four scores were greater than the threshold value of 56.91. Scores greater than 56.91 indicate water quality conditions supportive of aquatic life. Following significant flooding in October, 2005, the Warren Brook valley to the east of Alstead, NH, was significantly altered by stream channel erosion and instability. Artificial substrates (rock baskets) were placed in Warren Brook for the collection of macroinvertebrates in 2006. Upon retrieval, the rock baskets were nearly 100% imbedded with sediment transported downstream through the unstable stream reach. This resulted in a low benthic IBI score of 31 for Warren Brook; well below the benthic threshold for healthy aquatic life of 56.91. Modification along more than 1000 feet of Warren Brook with bank stabilization, reestablished floodplains, and channel modifications providing in-channel and floodplain diversity necessary for attenuating mobile sediments has occurred since 2006. In 2014, the site was reevaluated for macroinvertebrates using the same methodology as in 2006. Rock baskets were placed at station 01C-WAB, approximately 150 meters upstream of the site in 2006. The conditions at sites 01-WAB and 01C-WAB are very similar and therefore would yield comparable results. The 2014 sample had a B-IBI score of 69.0, well above the threshold of 56.91. Further, it was noted that rock baskets were less imbedded with sediment (10%-40%) as compared to 2006 (nearly 100% imbedded). Historical B-IBI scores from samples collected in 1999 and 2004, prior to severe flooding, were also above the B-IBI threshold.

Station ID	Activity ID	Waterbody Name	Collection Date	Threshold	NH B-IBI Site Score
01-WAB	BEN99C-52	Warren Brook	17-Nov-99	56.9	76
01C-WAB	BENSP04C204-1	Warren Brook	21-Oct-04	56.9	62
01-WAB	BEN99C-52-02	Warren Brook	28-Sep-06	56.9	31
01C-WAB	BEN-01C-WAB-01	Warren Brook	18-Sep-14	56.9	69

TULLY BROOK - UNNAMED BROOKS (NHRIV802020203-05)

Assessment Unit Name	Assessment Unit ID	Parameter Name	Primary Town	2014	2016
TULLY BROOK - UNNAMED BROOKS	NHRIV802020203-05	Benthic-Macroinvertebrate Bioassessments (Streams)	Richmond	5-P	2-M

Since 2004, four macroinvertebrate samples have been collected along assessment unit NHRIV802020203-05 (table below). Three of the four scores were greater than the threshold value of 62.96. Scores greater than 62.96 indicate water quality conditions supportive of aquatic life. The most recent samples collected annually from 2013 to 2015 were all above the threshold (65 in both 2013 and 2014, 79 in 2015) indicating water quality conditions have improved since 2004.

Station ID	Activity ID	Waterbody Name	Collection Date	Threshold	NH B-IBI Site Score
01-TYB	BEN04C-03-01	Tully Brook	13-Aug-04	62.9	46
01-TYB	BEN-01-TYB-01	Tully Brook	13-Sep-13	62.9	65
01-TYB	BEN-01-TYB-02	Tully Brook	17-Sep-14	62.9	65
01-TYB	BEN-01-TYB-03	Tully Brook	14-Sep-15	62.9	79

Mercury (Fish Consumption Use)

ELEVEN WATERBODIES

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 and other aquatic life. The NHDES 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	2014	2016	Short Delist Reason
Jericho Mountain State Park Beach	Berlin	NHLAK400010606-01-02	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Michawanic Pond	Wakefield	NHLAK600020703-06	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Squam Lake - Wister Point West Beach	Center Harbor	NHLAK700010501-04-06	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Squam Lake - Moon Island South Beach	Holderness	NHLAK700010501-04-07	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Squam Lake - Wister Point East Beach	Center Harbor	NHLAK700010501-04-08	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Dalton Drive Beach	Barnstead	NHLAK700060402-03-03	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Saint Anslems Swimming Pond	Goffstown	NHLAK700060607-06	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Mascoma Lake - Lakeview Condominium Association Beach	Enfield	NHLAK801060105-04-05	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Quimby Brook	Wakefield	NHRIV600020703-17	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Wilder Brook	Peterborough	NHRIV700030104-31	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)
Northwood Lake Inlet	Northwood	NHRIV700060502-50	Mercury	n.a.	4A-M	TMDL approved or established by EPA (4A)

The above list contains new freshwater assessment units for the 2016 cycle with no other sources of mercury. NH in listing this new water on the 2016, 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 USEPA 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)