Lake Armington Association, Inc.
P.O. Box 143  Piermont, NH 03779
www.lakearmington.org

# LAKE ARMINGTON WATER QUALITY REPORTS

# 1987 – 2019

**Mike Poole, Water Quality Program Lead**

**Alice Wellington, LAA Communications**

# LAKE ARMINGTON WATER QUALITY REPORTS 1987 – 2019

## INTRODUCTION

This document updates the 2013 Water Quality Report by Brad Caswell with new data for 2014 through 2019 compiled and summarized from NHDES annual reports by Mike Poole.

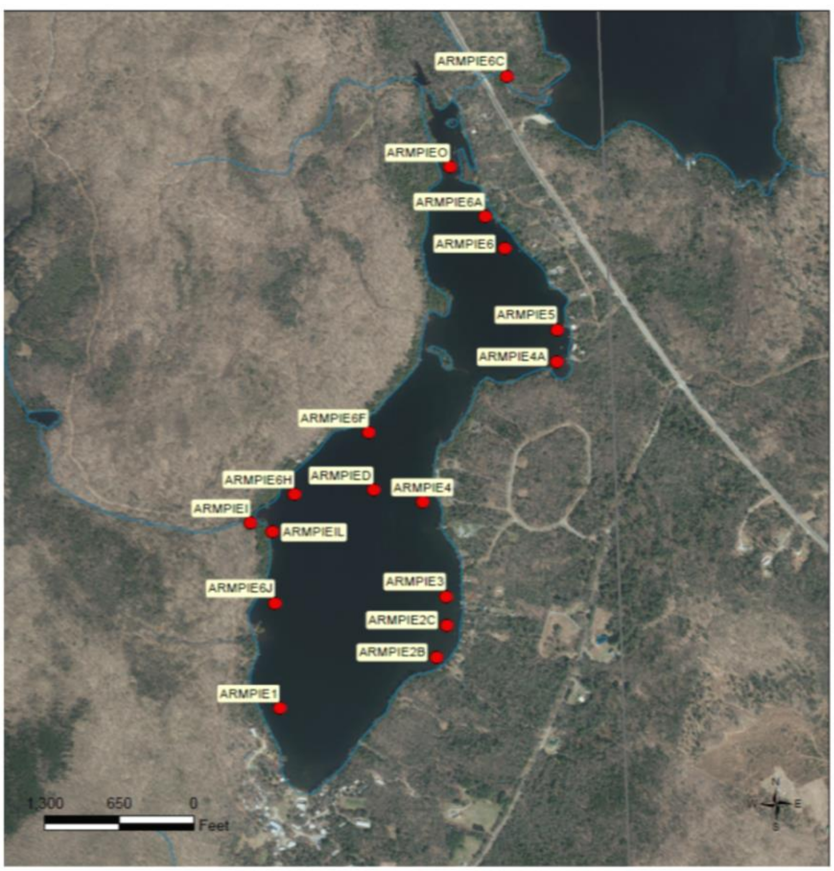
The Water Quality Testing program led by Mike works with the NHDES Volunteer Lake Assessment Program (VLAP) taking water samples on Lake Armington three times during the summer at designated sampling sites around the lake (see map below) and transporting them to the State Lab for yearly analysis.

Water analysis currently measures nine lake water characteristics: Chlorophyll, Transparency, Acid Neutralizing Capacity, Conductivity, pH, Total Phosphorus, Dissolved Oxygen and Water Temperature, Turbidity, and Escherichia coli (E. coli).

Mike communicates the lake's Water Quality status and any related issues at the Lake Armington Association (LAA) annual meeting and [www.lakearmington.org](http://www.lakearmington.org).

Mike Poole, Water Quality Program Leader
Alice Wellington, LAA Communications
February 2021

## SAMPLING SITES – NHDES, VOLUNTEER LAKE ASSESSMENT PROGRAM (VLAP)




ARMINGTON LAKE
PIERMONT
VOLUNTEER LAKE ASSESSMENT PROGRAI

| STATIONID | STATION NAME |
|---|---|
| ARMPIED | DEEP SPOT |
| ARMPIEI | INLET |
| ARMPIEO | OUTLET |
| ARMPE1 | SITE 1 |
| ARMPE2 | SITE 2 |
| ARMPE3 | SITE 3 |
| ARMPE4 | SITE 4 |
| ARMPE5 | SITE 5 |
| ARMPE6 | SITE 6 |
| ARMPE2B | SITE 2B |
| ARMPE2C | SITE 2C |
| ARMPE4A | SITE 4A |
| ARMPE6A | SITE 6A |
| ARMPE6C | SITE 6C |
| ARMPE6F | SITE 6F |
| ARMPE6H | SITE 6H |
| ARMPE6J | SITE 6J |
| ARMPEIL | INLET LEFT |

Source: The data layers are derived from NHDES data and are under constant revision. NHDES is not responsible for the use or interpretation of this information. Not intended for legal use.

# TABLE OF CONTENTS

# CHLOROPHYLL-A

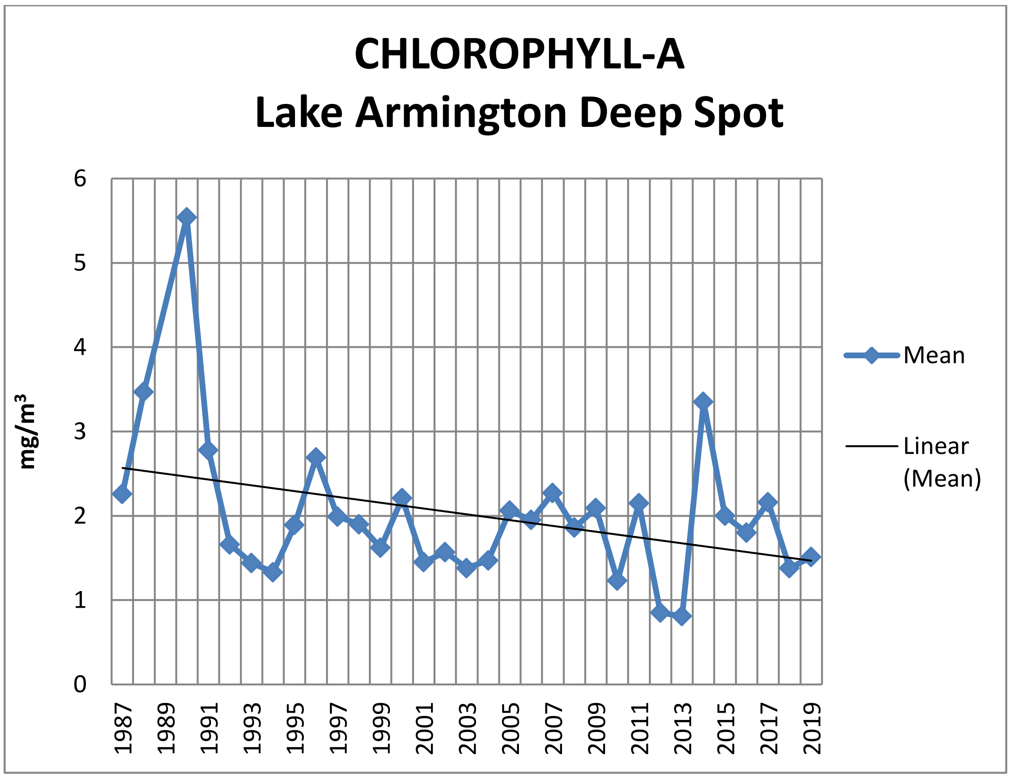
**Chlorophyll-a** is the green pigment that is responsible for the ability of a plant to convert sunlight into the chemical energy needed to fix carbon dioxide into carbohydrates.

The green pigment is much easier to measure than attempting to microscopically identify and count the dozens of species of algae present in lake water. This indicator value is measured by collecting a volume of lake water and passing it through a 1-micron filter from which the chlorophyll-a is extracted using a solvent such as acetone or alcohol, and then quantified using a spectrophotometer or flurometer. The median summer chlorophyll-a concentration for New Hampshire lakes and ponds is 4.58 milligrams per cubic meter ($mg/m^3$).

**Composite sample of epilimnion and hypolimnion (shallow and deep water depth)**

**Units: $mg/m^3$, milligrams per cubic meter**

| Year | Mean |
|---|---|
| 1987 | 2.26 |
| 1988 | 3.47 |
| 1989 | |
| 1990 | 5.54 |
| 1991 | 2.78 |
| 1992 | 1.66 |
| 1993 | 1.44 |
| 1994 | 1.33 |
| 1995 | 1.89 |
| 1996 | 2.69 |
| 1997 | 1.99 |
| 1998 | 1.90 |
| 1999 | 1.62 |
| 2000 | 2.21 |
| 2001 | 1.45 |
| 2002 | 1.57 |
| 2003 | 1.38 |
| 2004 | 1.47 |
| 2005 | 2.06 |
| 2006 | 1.95 |
| 2007 | 2.27 |
| 2008 | 1.86 |
| 2009 | 2.09 |
| 2010 | 1.23 |
| 2011 | 2.15 |
| 2012 | 0.85 |
| 2013 | 0.81 |
| 2014 | 3.35 |
| 2015 | 2.00 |
| 2016 | 1.80 |
| 2017 | 2.16 |
| 2018 | 1.38 |
| 2019 | 1.51 |

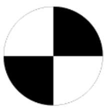



The above numbers were updated from NHDES reports, 2014 to present, by Mike Poole

# SECCHI DISK TRANSPARENCY

**Transparency** is a measure of water clarity. It is affected by the amount of algae and sediment in the water as well as by the natural color of the water.

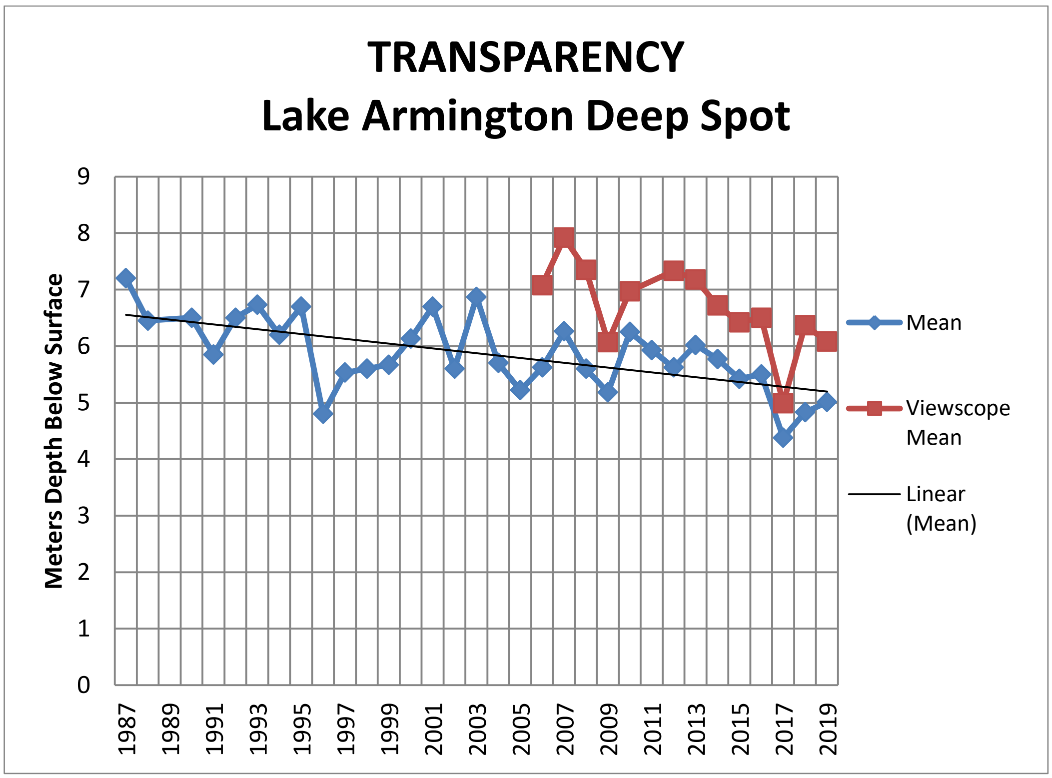
Transparency is measured using a **Secchi disk**, a 20 cm (7.9 inch) diameter disk with alternating black and white quadrants that is lowered into the lake water until it vanishes from site. The distance to the vanishing point is the transparency value recorded. Two methods to view the vanishing point are used. The first is the naked eye simply looking into the water. The second is the view scope, which is a tube with a glass bottom that eliminates reflections of the sky and interference by large and small waves. With the view scope, the depth to the vanishing point is greater, making the measurement by this method more accurate and comparable from one year to the next. The median transparency of New Hampshire lakes is 3.2 meters (10.5 feet).



Secchi Disk measurement**:** The depth below the water surface at which this standard 20 centimeter diameter disk can be seen.

**Units: Meters (below water surface)**

| Year | Mean | Viewscope Mean |
|---|---|---|
| 1987 | 7.20 | |
| 1988 | 6.45 | |
| 1989 | | |
| 1990 | 6.50 | |
| 1991 | 5.85 | |
| 1992 | 6.50 | |
| 1993 | 6.73 | |
| 1994 | 6.20 | |
| 1995 | 6.70 | |
| 1996 | 4.80 | |
| 1997 | 5.53 | |
| 1998 | 5.60 | |
| 1999 | 5.67 | |
| 2000 | 6.13 | |
| 2001 | 6.70 | |
| 2002 | 5.60 | |
| 2003 | 6.87 | |
| 2004 | 5.70 | |
| 2005 | 5.22 | |
| 2006 | 5.62 | 7.08 |
| 2007 | 6.26 | 7.92 |
| 2008 | 5.60 | 7.35 |
| 2009 | 5.18 | 6.07 |
| 2010 | 6.25 | 6.97 |
| 2011 | 5.93 | |
| 2012 | 5.62 | 7.33 |
| 2013 | 6.02 | 7.18 |
| 2014 | 5.77 | 6.72 |
| 2015 | 5.42 | 6.42 |
| 2016 | 5.50 | 6.50 |
| 2017 | 4.38 | 4.99 |
| 2018 | 4.83 | 6.37 |
| 2019 | 5.01 | 6.08 |



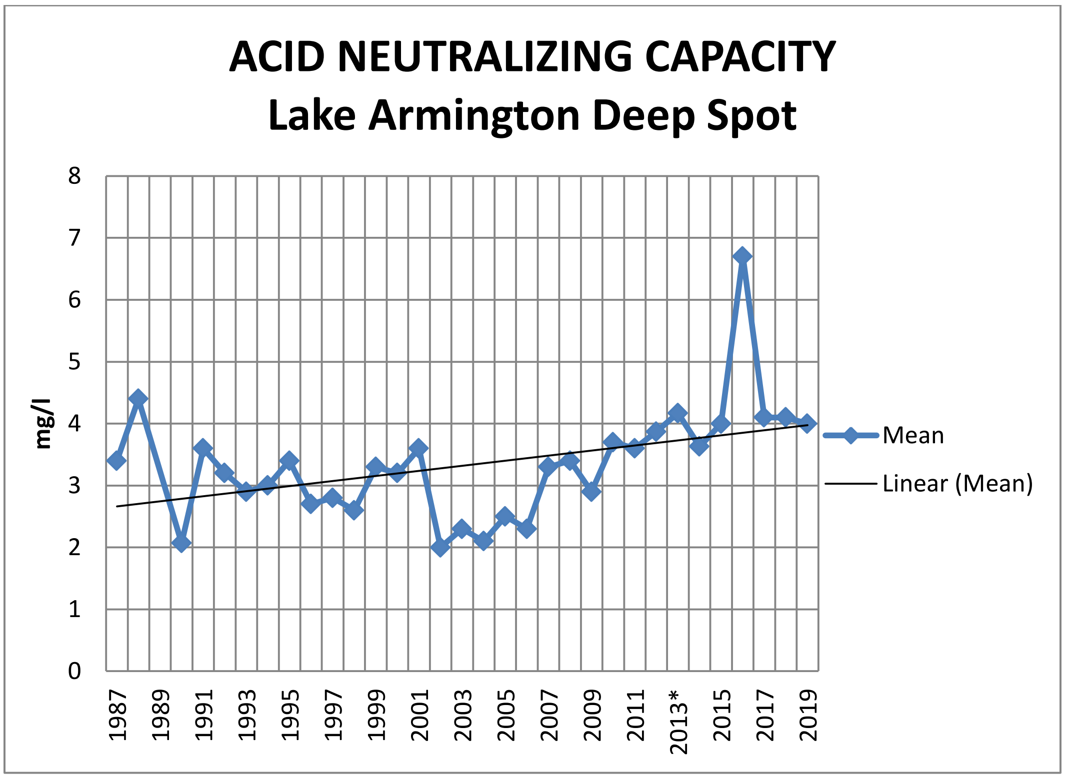
# ACID NEUTRALIZING CAPACITY

**Acid Neutralizing Capacity** (**abbreviated ANC**) is a measure of the overall buffering capacity of a lake to resist acidification. New Hampshire lakes and ponds typically have only modest acid neutralizing capacity because of the lack of calcium in the granitic bedrock that underlies much of the state. Lakes and ponds with low acid neutralizing capacity are vulnerable to the effects of acid rain. The acid neutralizing capacity of New Hampshire lakes is categorized as follows:

| ANC Categories of New Hampshire lakes | ANC measurement (mg/L) |
|---|---|
| Acidified | less than 0 |
| Extremely Vulnerable | 0 – 2 |
| Moderately Vulnerable | 2.1 – 10 |
| Low Vulnerability | 10.1 – 25 |
| Not Vulnerable | Greater than 25 |
| Median ANC | 4.8 |

**Units: mg/l, milligrams per liter**

| Year | Mean |
|---|---|
| 1987 | 3.4 |
| 1988 | 4.4 |
| 1989 | |
| 1990 | 2.07 |
| 1991 | 3.6 |
| 1992 | 3.2 |
| 1993 | 2.9 |
| 1994 | 3.0 |
| 1995 | 3.4 |
| 1996 | 2.7 |
| 1997 | 2.8 |
| 1998 | 2.6 |
| 1999 | 3.3 |
| 2000 | 3.2 |
| 2001 | 3.6 |
| 2002 | 2.0 |
| 2003 | 2.3 |
| 2004 | 2.1 |
| 2005 | 2.5 |
| 2006 | 2.3 |
| 2007 | 3.3 |
| 2008 | 3.4 |
| 2009 | 2.9 |
| 2010 | 3.7 |
| 2011 | 3.6 |
| 2012 | 3.87 |
| 2013* | 4.17 |
| 2014 | 3.63 |
| 2015 | 4.0 |
| 2016 | 6.7 |
| 2017 | 4.1 |
| 2018 | 4.1 |
| 2019 | 4.0 |




The above numbers were updated from NHDES reports, 2014 to present, by Mike Poole

# CONDUCTIVITY

**Electrical Conductivity, or simply Conductivity**, is a measure of water's ability to conduct an electric current. The ability to conduct electric current increases with the amount of total dissolved ions (atoms or molecules with an electrical charge) from metals, salts, and minerals. The measurement is important for what it indicates about the concentration of dissolved ions in the water, which in turn reflects groundwater input, watershed geology, and diverse human impact including, wastewater runoff from septic systems, highway runoff particularly where winter deicing salt is used, yard and farm runoff where fertilizers and pesticides are used, and soil in general from the watershed.

The median conductivity value for New Hampshire's lakes and ponds is 40 micromhos per centimeter (uMhos/cm). Values greater than 100 micromhos per centimeter typically indicate the influence of pollutant sources associated with human activities.

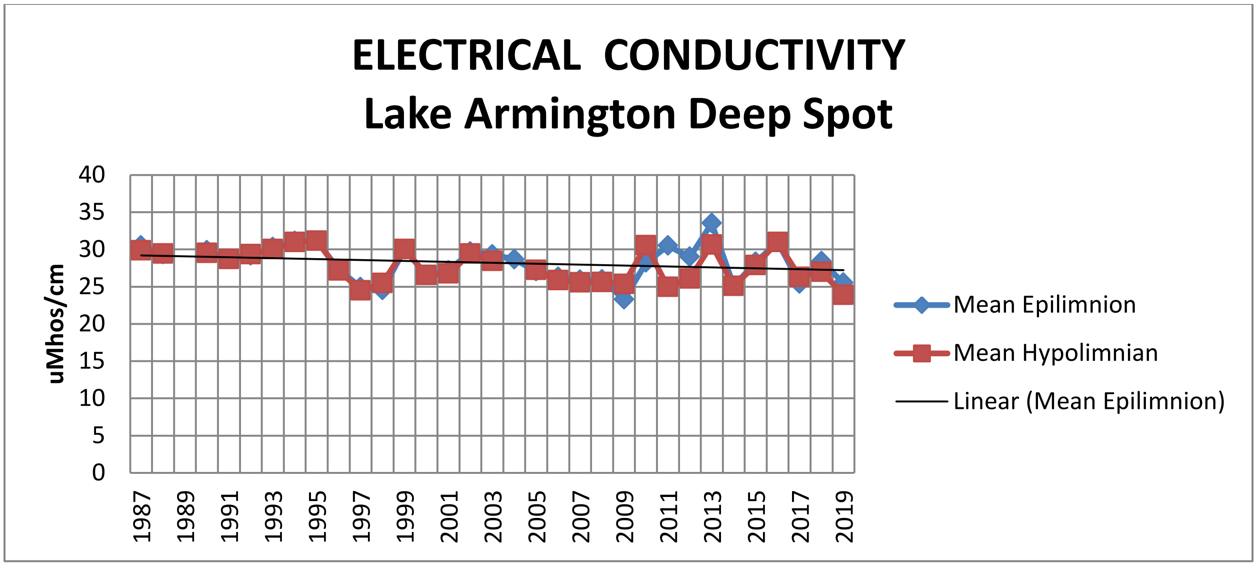
**Units: uMhos/cm, micromhos per centimeter**

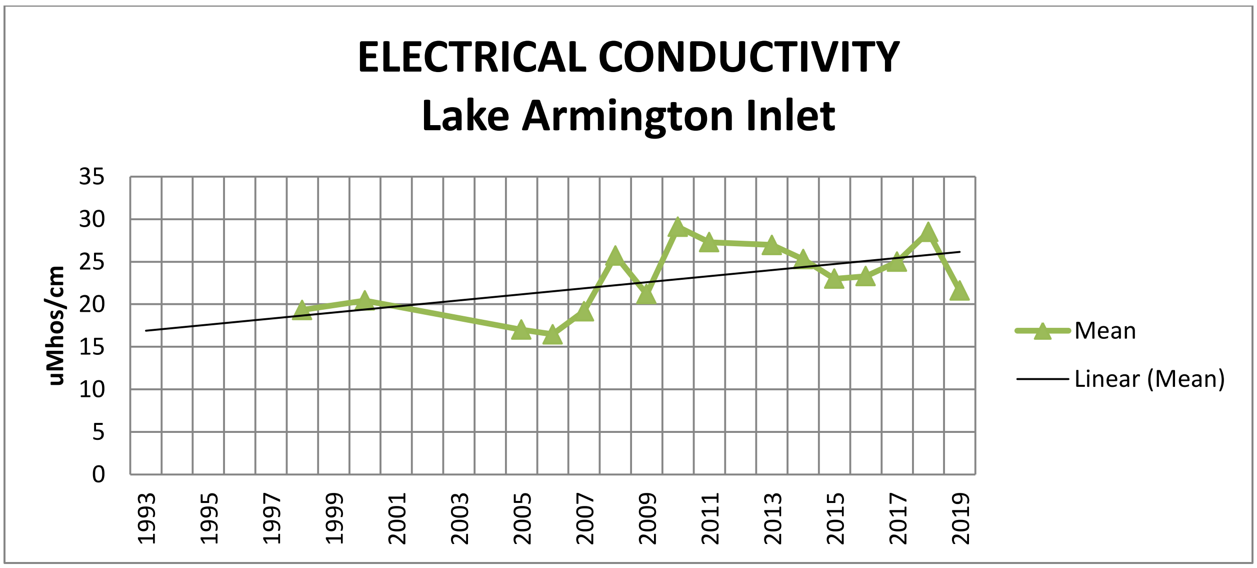
| Year | Deep Spot | | Inlet | Outlet |
|---|---|---|---|---|
| | Mean Epilimnion | Mean Hypolimnian | Mean | Mean |
| 1987 | 30.5 | 29.88 | 29.48 | 30.1 |
| 1988 | 29.33 | 29.43 | 28.49 | 32.53 |
| 1989 | | | | |
| 1990 | 29.87 | 29.5 | 26.9 | 63.23 |
| 1991 | 28.7 | 28.71 | | 37.73 |
| 1992 | 29.17 | 29.33 | | 28.9 |
| 1993 | 30.3 | 30.03 | | 38.3 |
| 1994 | 31.1 | 31 | | 42.97 |
| 1995 | 31.17 | 31.17 | | 36.9 |
| 1996 | 27.32 | 27.16 | | 32.71 |
| 1997 | 24.93 | 24.5 | | 44.2 |
| 1998 | 24.53 | 25.47 | 19.33 | 32.75 |
| 1999 | 30 | 30.03 | | |
| 2000 | 26.54 | 26.57 | 20.43 | 33.71 |
| 2001 | 27.14 | 26.75 | | |
| 2002 | 29.67 | 29.42 | | |
| 2003 | 29.32 | 28.45 | | |
| 2004 | 28.67 | | | |
| 2005 | 27.06 | 27.22 | 17.01 | 35.02 |
| 2006 | 26.3 | 25.85 | 16.47 | 36.04 |
| 2007 | 25.92 | 25.56 | 19.17 | 32.51 |
| 2008 | 25.97 | 25.61 | 25.72 | 43.9 |
| 2009 | 23.28 | 25.36 | 21.2 | 32.88 |
| 2010 | 28.22 | 30.56 | 29.1 | 31.74 |
| 2011 | 30.5 | 24.95 | 27.29 | |
| 2012 | 29 | 26.1 | | |
| 2013 | 33.5 | 30.64 | 26.97 | 37.78 |
| 2014 | 25.1 | 25.1 | 25.3 | 36.7 |
| 2015 | 28.3 | 27.9 | 23 | 51.3 |
| 2016 | 31 | 31 | 23.3 | 34.2 |
| 2017 | 25.4 | 26.3 | 25 | 33.2 |
| 2018 | 28.4 | 27 | 28.5 | 32.2 |
| 2019 | 25.5 | 23.9 | 21.6 | 40 |

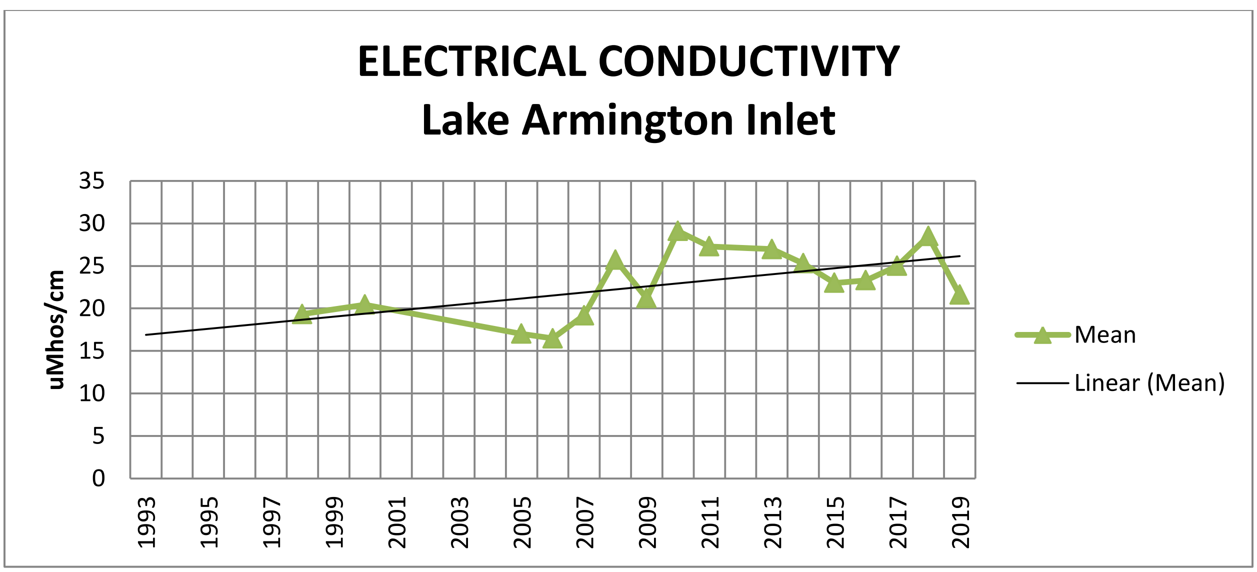
The above numbers were updated from NHDES reports, 2014 to present, by Mike Poole

**See the related Conductivity charts on the next page**

## CONDUCTIVITY CHARTS



# pH

**pH** is a measure of how acidic or alkaline a solution is. Baking soda is alkaline, while vinegar is acidic for example. pH is measured on a logarithmic scale of 0 to 14, with 0 be the most acidic and 14 being the most alkaline. A pH of 7 is considered neutral. The difference between each pH value is a 10-times change. For example an increase in pH from 5 to 6, is a 10-times decrease in acidity. The pH of water determines the solubility and biological availability of chemical constituents including nutrients and heavy metals. pH affects how much phosphorus is available in water and whether or not aquatic life can use it. At low pH, metals are more abundant in water because they are more soluble. High metal concentrations can be toxic to fish. New Hampshire classifies the pH of lakes as follows:

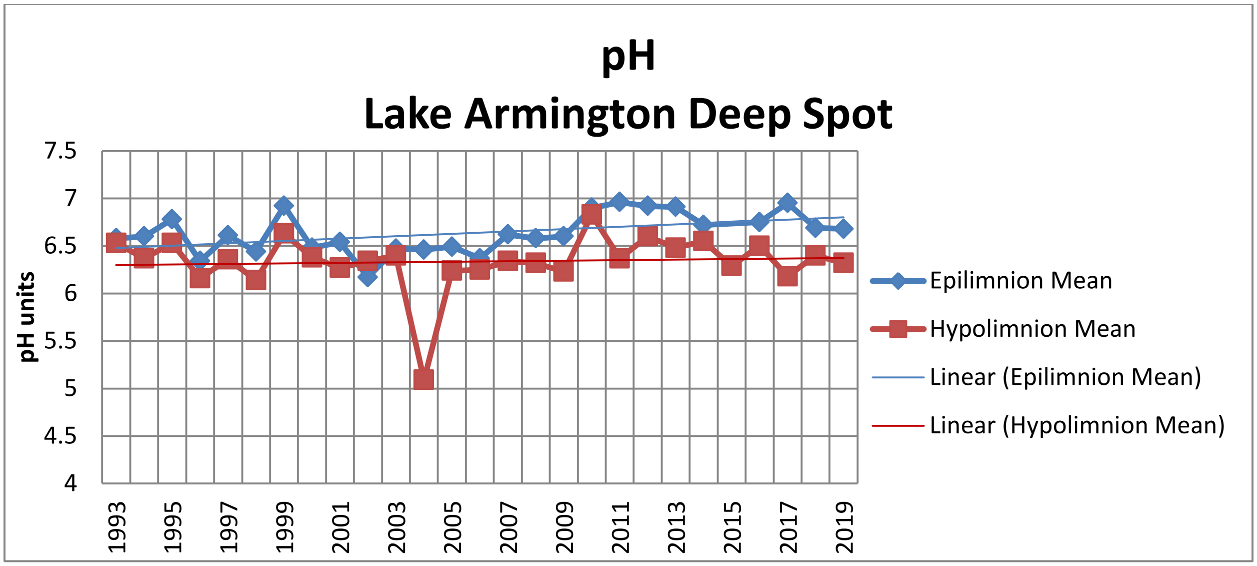
| pH Categories of New Hampshire Lakes | pH Measurement |
|---|---|
| Critical (toxic to most fish) | Less than 5 |
| Endangered (toxic to some aquatic organisms) | 5-6 |
| Satisfactory | Greater than 6 |

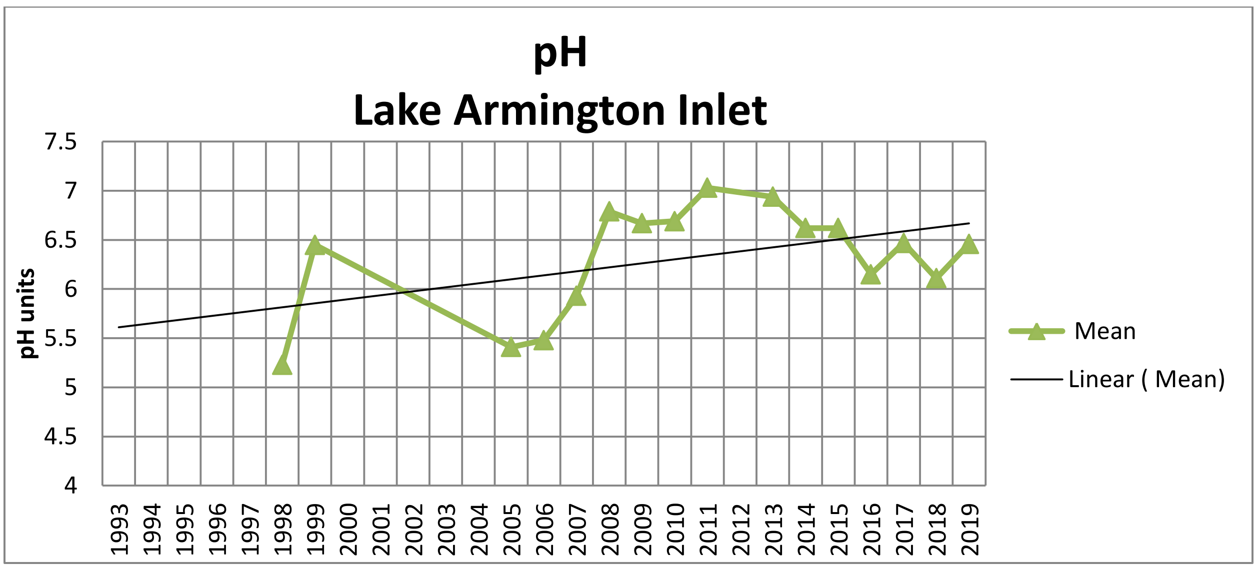
| Year | Deep Spot | | Inlet | Outlet |
|---|---|---|---|---|
| | Epilimnion Mean | Hypolimnion Mean | Mean | Mean |
| 1987 | 6.49 | 6.46 | 6.54 | 6.43 |
| 1988 | 6.57 | 6.59 | 6.5 | 6.4 |
| 1989 | | | | |
| 1990 | 6.49 | 6.48 | 6.2 | 6.51 |
| 1991 | 6.73 | 6.67 | | 6.63 |
| 1992 | 6.63 | 6.73 | | 6.64 |
| 1993 | 6.58 | 6.53 | | 6.48 |
| 1994 | 6.6 | 6.37 | | 6.35 |
| 1995 | 6.78 | 6.53 | | 6.57 |
| 1996 | 6.34 | 6.16 | | 6.3 |
| 1997 | 6.61 | 6.36 | | 6.39 |
| 1998 | 6.44 | 6.14 | 5.23 | 6.26 |
| 1999 | 6.92 | 6.63 | 6.45 | 6.49 |
| 2000 | 6.48 | 6.38 | | |
| 2001 | 6.54 | 6.27 | | |
| 2002 | 6.17 | 6.34 | | |
| 2003 | 6.47 | 6.4 | | |
| 2004 | 6.46 | 5.09 | | |
| 2005 | 6.49 | 6.24 | 5.41 | 6.38 |
| 2006 | 6.37 | 6.25 | 5.48 | 6.39 |
| 2007 | 6.62 | 6.34 | 5.93 | 6.53 |
| 2008 | 6.58 | 6.32 | 6.79 | 6.51 |
| 2009 | 6.60 | 6.23 | 6.67 | 6.5 |
| 2010 | 6.90 | 6.83 | 6.69 | 6.68 |
| 2011 | 6.96 | 6.37 | 7.03 | |
| 2012 | 6.92 | 6.60 | | |
| 2013 | 6.91 | 6.48 | 6.94 | 6.39 |
| 2014 | 6.72 | 6.55 | 6.62 | 6.47 |
| 2015 | | 6.29 | 6.62 | 6.46 |
| 2016 | 6.75 | 6.50 | 6.15 | 6.61 |
| 2017 | 6.95 | 6.18 | 6.47 | 6.42 |
| 2018 | 6.69 | 6.40 | 6.11 | 6.53 |
| 2019 | 6.68 | 6.32 | 6.46 | 6.57 |

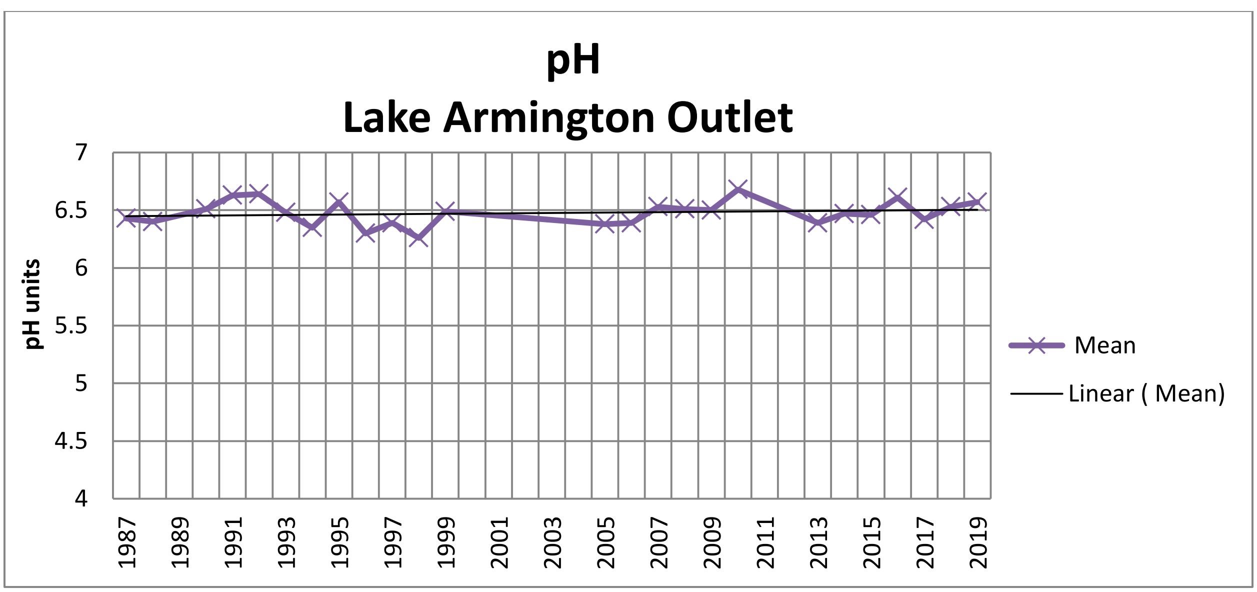
The above numbers were updated from NHDES reports, 2014 to present, by Mike Poole

**See the related pH charts on the next page**

# pH CHARTS


pH
Lake Armington Deep Spot
pH units
7.5
7
6.5
6
5.5
5
4.5
4
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
Epilimnion Mean
Hypolimnion Mean
Linear (Epilimnion Mean)
Linear (Hypolimnion Mean)


pH
Lake Armington Inlet
pH units
7.5
7
6.5
6
5.5
5
4.5
4
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Mean
Linear ( Mean)


pH
Lake Armington Outlet
pH units
7
6.5
6
5.5
5
4.5
4
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
Mean
Linear ( Mean)

# TOTAL PHOSPHORUS

**Total Phosphorus** is a measure of all the forms of phosphorus, dissolved or particulate (small bits of solid), found in a sample of water. Phosphorus is considered the nutrient that limits the growth and biomass of algae in New Hampshire lakes. Its sources include septic system effluent, animal waste, lawn fertilizer, eroding roadways and construction sites (because phosphorus clings to fine particles of soil), natural wetlands, and atmospheric deposition. The median summer total phosphorus concentration in the epilimnion (upper layer) of New Hampshire lakes is 12 micrograms per liter (ug/L), while in the hypolimnion (lower layer) it is 14 micrograms per liter.

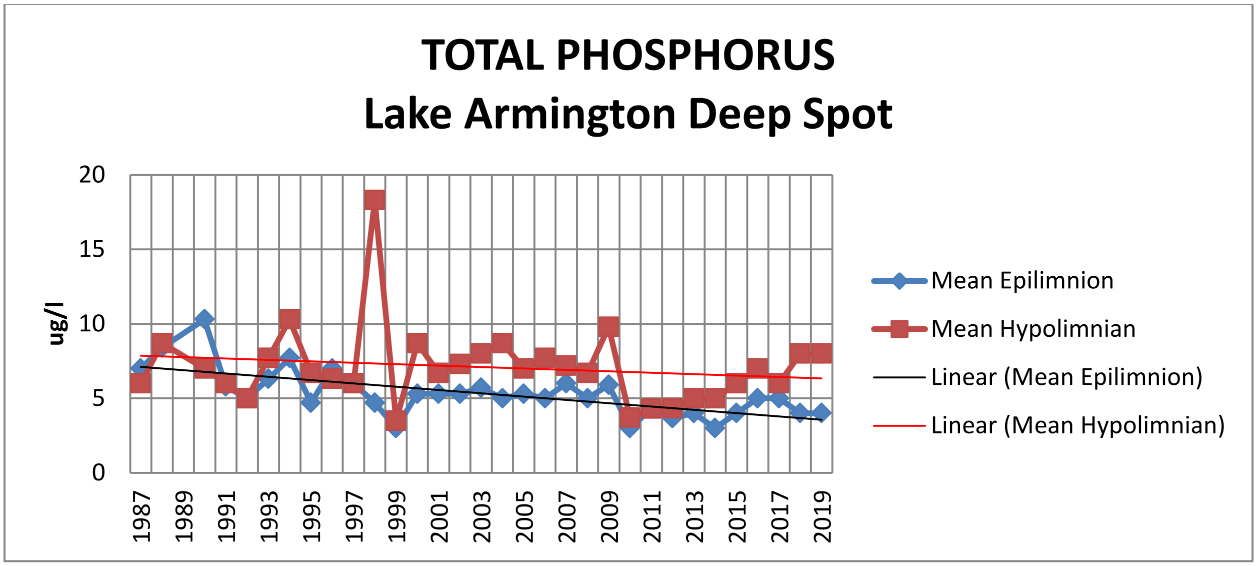
**Units: ug/l, micrograms per liter**

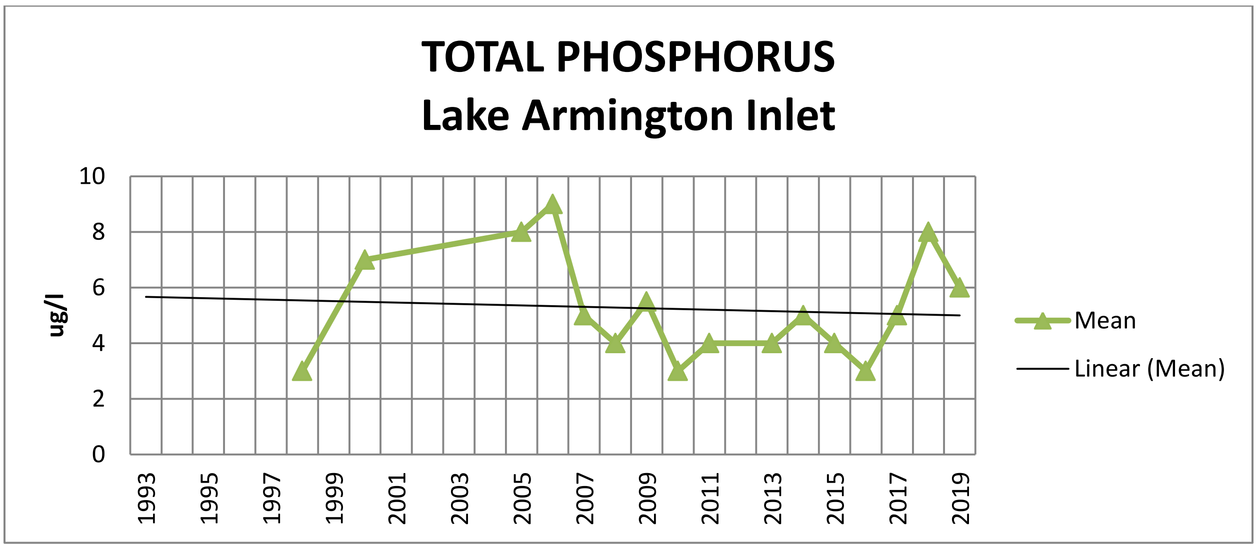
| Year | Deep Spot | | Inlet | Outlet |
|---|---|---|---|---|
| | Mean Epilimnion | Mean Hypolimnian | Mean | Mean |
| 1987 | 7 | 6 | 2 | 8 |
| 1988 | 8.4 | 8.7 | 7.7 | 10 |
| 1989 | | | | |
| 1990 | 10.3 | 7 | 7 | 6 |
| 1991 | 5.8 | 6 | | 7 |
| 1992 | 5 | 5 | | 80 |
| 1993 | 6.3 | 7.7 | | 7 |
| 1994 | 7.7 | 10.3 | | 27.3 |
| 1995 | 4.7 | 6.7 | | |
| 1996 | 7 | 6.3 | | 8.5 |
| 1997 | 6 | 6 | | 5.5 |
| 1998 | 4.7 | 18.3 | 3 | 4 |
| 1999 | 3 | 3.5 | | |
| 2000 | 5.3 | 8.7 | 7 | 6 |
| 2001 | 5.3 | 6.7 | | |
| 2002 | 5.3 | 7.3 | | |
| 2003 | 5.7 | 8 | | |
| 2004 | 5 | 8.7 | | |
| 2005 | 5.3 | 7 | 8 | 7 |
| 2006 | 5 | 7.7 | 9 | 5 |
| 2007 | 6 | 7.2 | 5 | 8.1 |
| 2008 | 5 | 6.7 | 4 | 7.6 |
| 2009 | 5.9 | 9.8 | 5.5 | 7.9 |
| 2010 | 3 | 3.7 | 3 | 5 |
| 2011 | 4.3 | 4.3 | 4 | |
| 2012 | 3.67 | 4.33 | | |
| 2013 | 4 | 5 | 4 | 4 |
| 2014 | 3 | 5 | 5 | 4 |
| 2015 | 4 | 6 | 4 | 6 |
| 2016 | 5 | 7 | 3 | 5 |
| 2017 | 5 | 6 | 5 | 6 |
| 2018 | 4 | 8 | 8 | 8 |
| 2019 | 4 | 8 | 6 | 7 |
| 2020 | | | | |

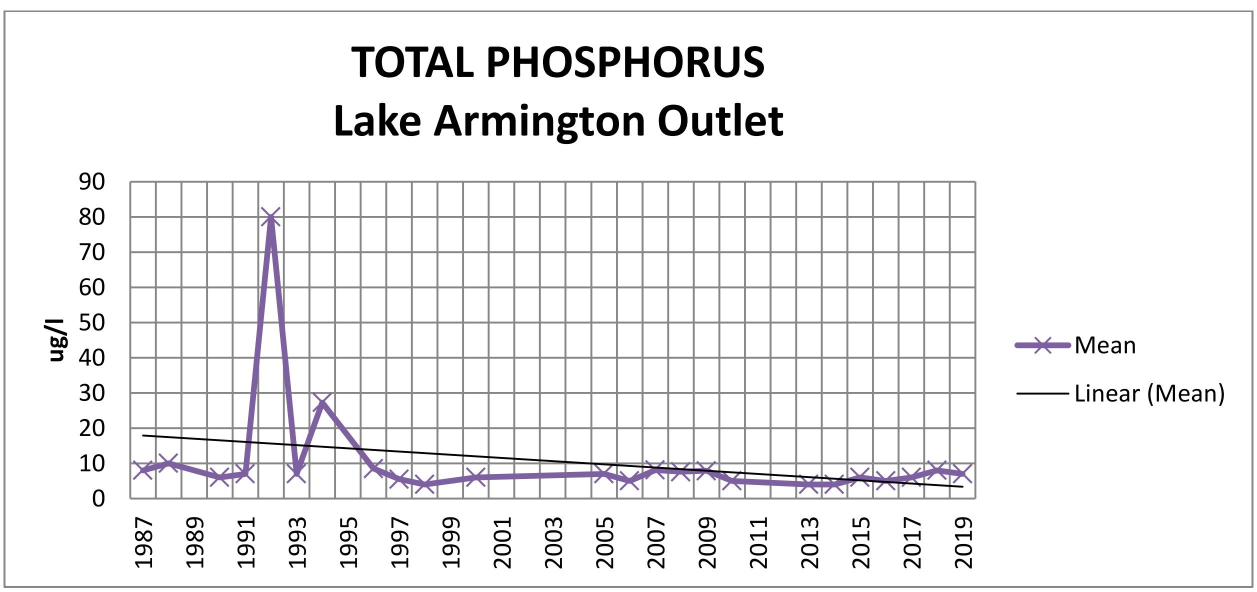
The above numbers were updated from NHDES reports, 2014 to present, by Mike Poole

**See the related Total Phosphorus charts on the next page**

# TOTAL PHOSPHORUS CHARTS



# DISSOLVED OXYGEN and WATER TEMPERATURE

**Dissolved Oxygen (DO)** in lake and pond water is essential for the life of fish, amphibians, and bottom-dwelling organisms. Oxygen is produced during photosynthesis and consumed during respiration and decomposition. Since photosynthesis requires sunlight, oxygen concentration can vary significantly between day and night, and summer and winter. Other sources of oxygen include contact with the atmosphere, and the inflow from streams that are usually aerated by splashing over rocks and other objects such as logs. Wind also influences oxygen uptake because waves create more surface area of lake water to be in contact with the air. Additionally, wind and waves help to mix lake water and maintain a better balance between the oxygen in the upper layer and in the deeper layer.

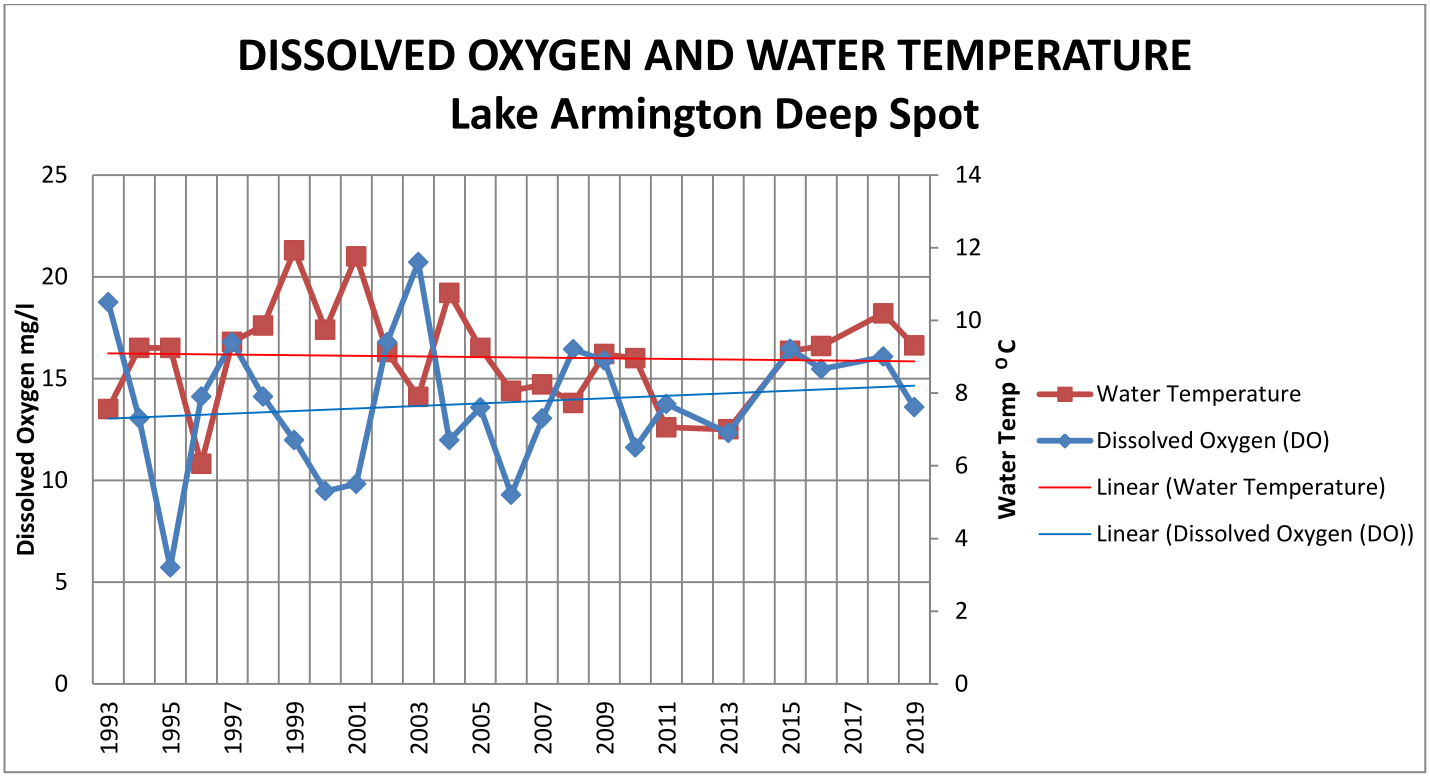
**Water Temperature** affects oxygen concentration in a lake because cold water can hold more oxygen than warm water. During summer months in the hypolimnion (deep layer) of a lake, the water temperature is cooler, there is more decomposition, and mixing by waves is the least. Thus the dissolved oxygen can be significantly less in the hypolimnion than in the epilimnion (shallow layer). This condition can be harmful to fish.

**Units: mg/l, milligrams per liter and $0^{C}$, degrees centigrade**
**Depth of Measurements: 6.5 to 9 meters below lake surface**

| Year | Deep Spot | |
|---|---|---|
| | Dissolved Oxygen (DO) | Water Temperature |
| 1987 | 4.4 | 16.5 |
| 1988 | 9.8 | 11.9 |
| 1989 | | |
| 1990 | 9.2 | 16 |
| 1991 | 10.4 | 13.1 |
| 1992 | 12 | 11.9 |
| 1993 | 10.5 | 13.5 |
| 1994 | 7.3 | 16.5 |
| 1995 | 3.2 | 16.5 |
| 1996 | 7.9 | 10.8 |
| 1997 | 9.4 | 16.8 |
| 1998 | 7.9 | 17.6 |
| 1999 | 6.7 | 21.3 |
| 2000 | 5.3 | 17.4 |
| 2001 | 5.5 | 21 |
| 2002 | 9.4 | 16.3 |
| 2003 | 11.6 | 14.1 |
| 2004 | 6.7 | 19.2 |
| 2005 | 7.6 | 16.5 |
| 2006 | 5.2 | 14.4 |
| 2007 | 7.3 | 14.7 |
| 2008 | 9.2 | 13.8 |
| 2009 | 8.9 | 16.2 |
| 2010 | 6.5 | 16 |
| 2011 | 7.7 | 12.6 |
| 2012 | | |
| 2013 | 6.9 | 12.5 |
| 2014 | | |
| 2015 | 9.21 | 16.35 |
| 2016 | 8.66 | 16.6 |
| 2017 | | |
| 2018 | 9 | 18.2 |
| 2019 | 7.61 | 16.62 |

**See the related Dissolved Oxygen and Water Temperature chart on the next page**

# DISSOLVED OXYGEN and WATER TEMPERATURE CHART



# TURBIDITY

**Turbidity** in water is the cloudiness caused by suspended matter such as clay, silt, and algae as measured by the scattering of light. The more suspended matter, the greater the scattering. In lakes an important reason for an increase in turbidity is the seasonal change in algae growth caused by warm temperatures, prolonged daylight, and release of nutrients from decomposition. Additionally, an increase in turbidity often occurs near construction sites or other areas where disturbed soil erodes during rainstorms or periods of snowmelt and then flows overland as streams or rivulets into the lake. Turbidity values for New Hampshire lakes and ponds range from a minimum of less than 0.1 to a maximum of 22 NTU*. The median value for the State is 1 NTU.

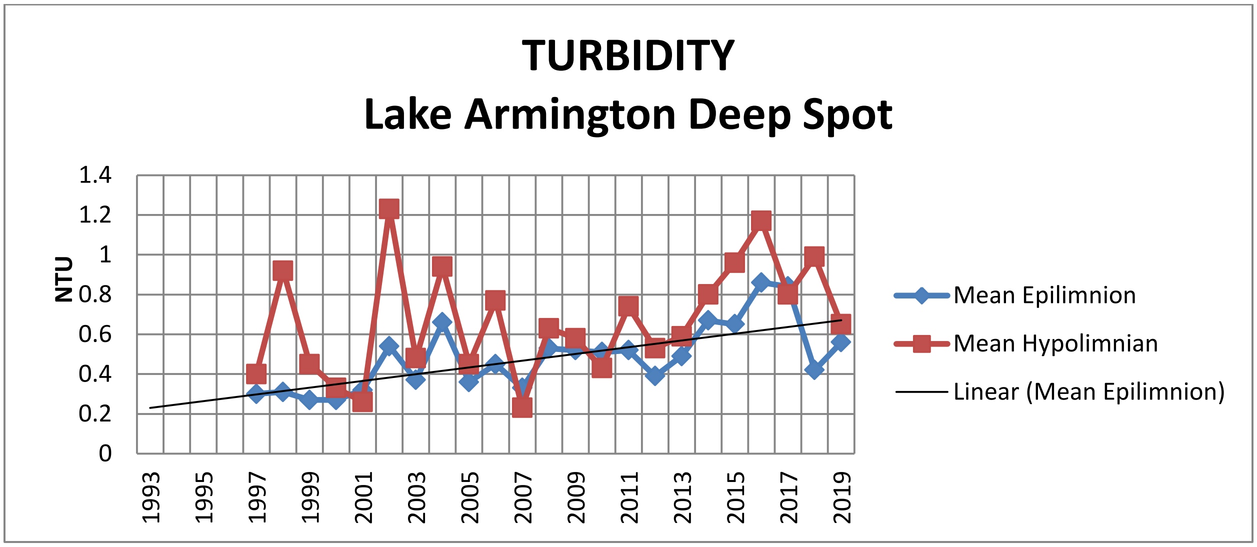
**Units: NTUs, Nephelometric Turbidity Units**

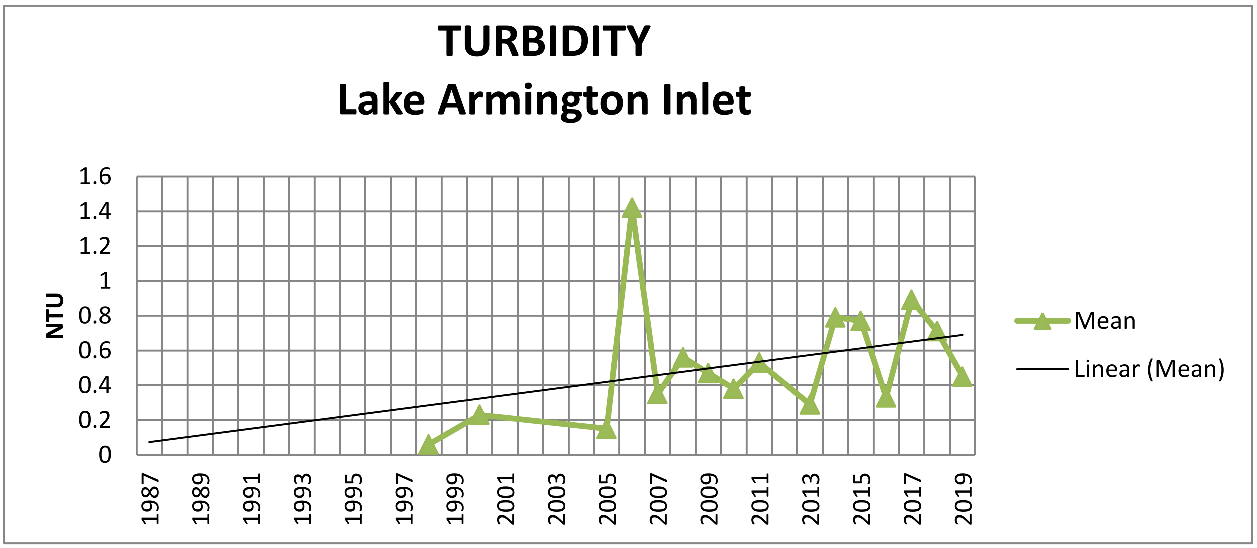
| Year | Deep Spot | | Inlet | Outlet |
|---|---|---|---|---|
| | Mean Epilimnion | Mean Hypolimnian | Mean | Mean |
| 1987 | | | | |
| 1988 | | | | |
| 1989 | | | | |
| 1990 | | | | |
| 1991 | | | | |
| 1992 | | | | |
| 1993 | | | | |
| 1994 | | | | |
| 1995 | | | | |
| 1996 | | | | |
| 1997 | 0.3 | 0.4 | | 0.17 |
| 1998 | 0.31 | 0.92 | 0.06 | 0.25 |
| 1999 | 0.27 | 0.45 | | |
| 2000 | 0.27 | 0.33 | 0.23 | 0.39 |
| 2001 | 0.32 | 0.26 | | |
| 2002 | 0.54 | 1.23 | | |
| 2003 | 0.37 | 0.48 | | |
| 2004 | 0.66 | 0.94 | | |
| 2005 | 0.36 | 0.45 | 0.15 | 0.38 |
| 2006 | 0.45 | 0.77 | 1.42 | 0.5 |
| 2007 | 0.33 | 0.23 | 0.35 | 0.36 |
| 2008 | 0.53 | 0.63 | 0.56 | 0.74 |
| 2009 | 0.52 | 0.58 | 0.47 | 1.05 |
| 2010 | 0.51 | 0.43 | 0.38 | 0.73 |
| 2011 | 0.52 | 0.74 | 0.53 | |
| 2012 | 0.39 | 0.53 | | |
| 2013 | 0.49 | 0.59 | 0.29 | 0.45 |
| 2014 | 0.67 | 0.8 | 0.79 | 0.59 |
| 2015 | 0.65 | 0.96 | 0.77 | 0.72 |
| 2016 | 0.86 | 1.17 | 0.33 | 0.48 |
| 2017 | 0.84 | 0.8 | 0.89 | 0.36 |
| 2018 | 0.42 | 0.99 | 0.71 | 0.78 |
| 2019 | 0.56 | 0.65 | 0.45 | 0.5 |
| 2020 | | | | |

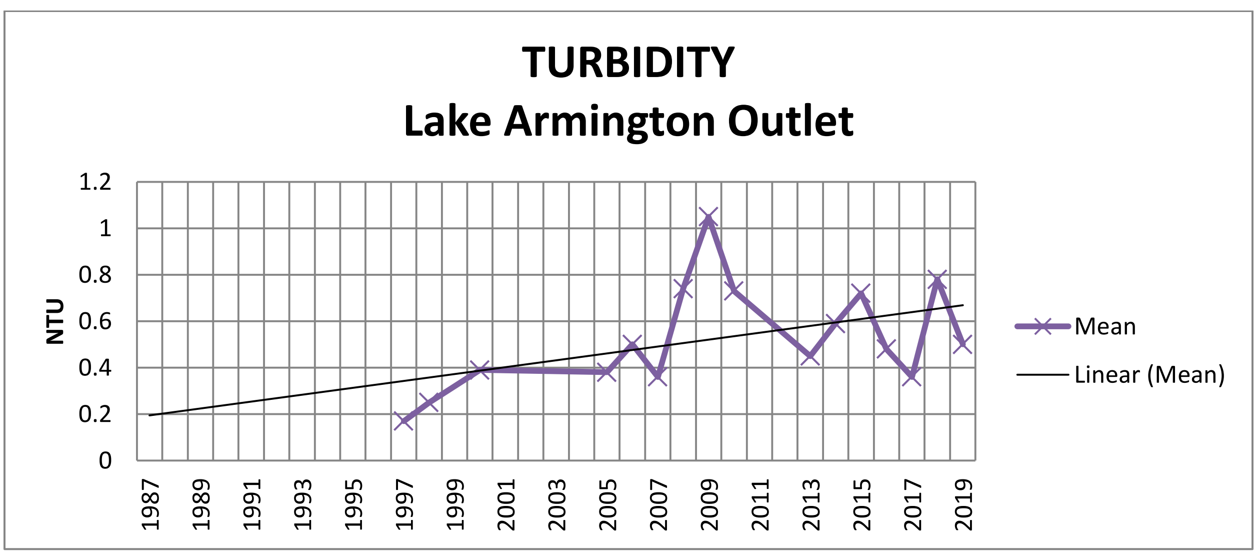
The above numbers were updated from NHDES reports, 2014 to present, by Mike Poole

**See the related Turbidity charts on the next page**

# TURBIDITY CHARTS



# ESCHERICHIA COLI (E. coli)

**Escherichia coli (abbreviated E. coli)** is a rod-shaped bacterium that is commonly found in the lower intestine of humans and other warm-blooded animals. It is used as an indicator that human sewage or animal wastes may be present, and if present, that potentially harmful disease-causing organisms may also be present.  In Lake Armington, E. coli comes from animal waste including that of humans, pets, birds, and wildlife. For example, each gram of dog feces has over twenty million E. coli colonies in it. Drainage from malfunctioning septic tanks or their leach fields, and surface runoff resulting from rainfall will carry E. coli bearing wastes into the lake. New Hampshire considers an E. coli count in excess of 88 per 100 milliliters of water as unacceptable for designated public beaches.

**Maximum value for the given year**
**Units: counts/100 ml, counts per 100 milliliters**

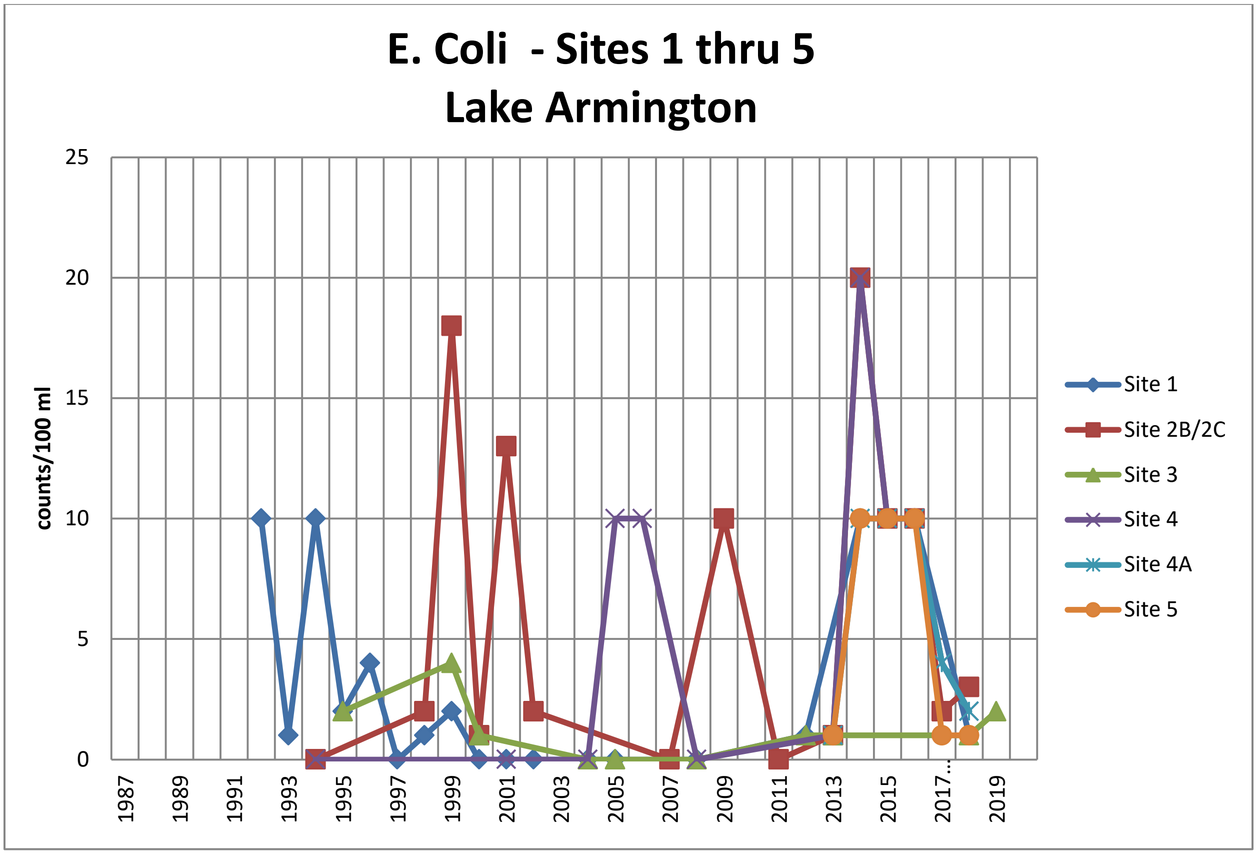
| Year | Sampling Sites | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Site 1 | Site 2B/2C | Site 3 | Site 4 | Site 4A | Site 5 | Site 6 | Site 6A | Site 6C | Site 6F | Site 6H | Site 6J | Inlet | Outlet |
| 1987 | | | | | | | | | | | | | | |
| 1988 | | | | | | | | | | | | | | |
| 1989 | | | | | | | | | | | | | | |
| 1990 | | | | | | | | | | | | | | |
| 1991 | | | | | | | | | | | | | | |
| 1992 | 10 | | | | | | 0 | 0 | | | | | | |
| 1993 | 1 | | | | | | 0 | | | 0 | 0 | | | |
| 1994 | 10 | <10 | | 0 | | | <10 | | | <10 | | | | |
| 1995 | 2 | | 2 | | | | | | | | 0 | | | |
| 1996 | 4 | | | | | | | | | | | | | |
| 1997 | 0 | | | | | | | | | | | | | 0 |
| 1998 | 1 | 2 | | | | | 2 | | | | 0 | 0 | | |
| 1999 | 2 | 18 | 4 | | | | | | | | | | | |
| 2000 | 0 | 1 | 1 | | | | 0 | | | | | | | |
| 2001 | 0 | 13 | | 0 | | | | | | 0 | 1 | | | |
| 2002 | 0 | 2 | | | | | | | | 0 | 1 | | | 0 |
| 2003 | | | | | | | | | | | | | | |
| 2004 | <10 | | <10 | <10 | | | <10 | | | | <5 | | | |
| 2005 | <10 | | <10 | 10 | | | <10 | | | | | | | |
| 2006 | | | | 10 | | | 10 | 10 | | | 20 | | | |
| 2007 | | 0 | | | | | | 0 | | 0 | | | | |
| 2008 | 0 | | 0 | 0 | | | 1 | | | | 1 | | | |
| 2009 | | 10 | | | | | | 30 | | 40 | | <10 | | <10 |
| 2010 | | | | | | | 1 | <1 | | <1 | | <1 | | |
| 2011 | | <1 | | | | | | 1 | | | 3 | 1 | | |
| 2012 | 1 | | 1 | | | | 1 | 1 | | 1 | | | | |
| 2013 | | 1 | 1 | 1 | 1 | 1 | | 1 | | | | 1 | | 1 |
| 2014 | 10 | 20 | | 20 | 10 | 10 | 20 | | | | 10 | | 10 | |
| 2015 | 10 | 10 | | 10 | 10 | 10 | | 10 | | | 10 | | 10 | |
| 2016 | 10 | 10 | | 10 | 10 | 10 | | 10 | | | 10 | | 10 | |
| 2017* | | 2 | | 4 | 4 | 1 | | 2 | 49 | | 2 | | 2 | |
| 2018 | 1 | 3 | 1 | 2 | 2 | 1 | 4 | 2 | 10 | 4 | 2 | | 2 | |
| 2019 | | | 2 | | | | 1 | | 30 | 1 | 5 | | 5 | 1 |
| 2020 | | | | | | | | | | | | | | |

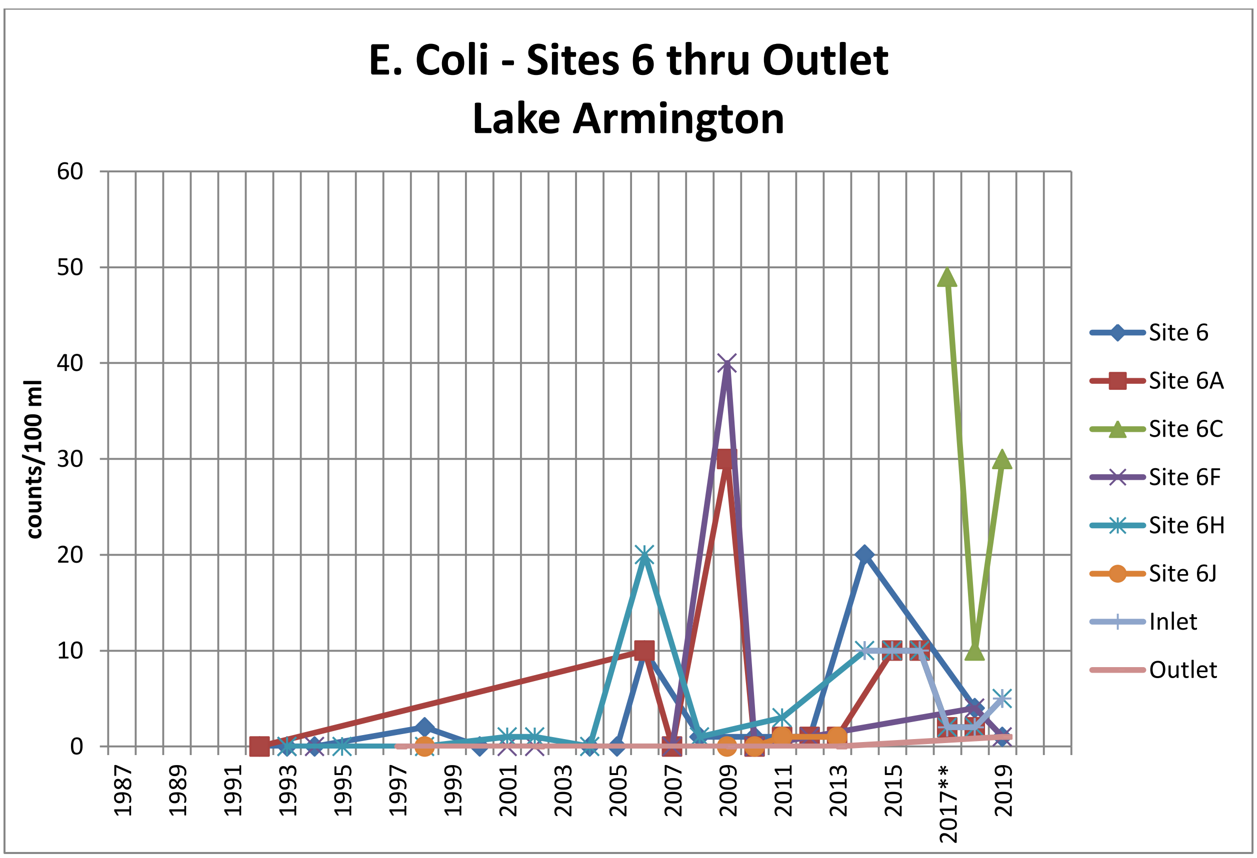
*2017 data is an average as we took two samples that year due to a very heavy rain storm

The above numbers were updated from NHDES reports, 2014 to present, by Mike Poole

**See the related E. Coli charts on the next page**

# ESCHERICHIA COLI (E. coli) CHARTS




*2017 data is an average as we took two samples that year due to a very heavy rain storm