

StreamWatch

Water Quality Assessment Framework

The 2022 StreamWatch Water Quality Assessment primarily uses data collected between January 2015 and December 2021.

1 Chemical/Physical Parameters

All sites have at least 10 measurements for each chemical parameter.

1.1 Water Temperature:

Method: Lamotte Armored Alcohol Thermometer

Measurement range: -5.0 – 50.0 degrees Celsius

Score	Assessment Framework
Excellent	No samples greater than 28 degrees Celsius
Good	No samples at 31 degrees Celsius or greater
Fair	1-2 more samples at 31 degrees Celsius or greater
Poor	3+ samples at 31 degrees Celsius or greater

1.2 pH:

Method: Lamotte Precision pH Test Kit #5858-01

Measurement range: 4.5 – 10.0 standard units

Score	Assessment Framework
Excellent	No samples below 6.5 or above 8.5
Good	1 sample below 6.5 or above 8.5
Fair	2 samples below 6.5 or above 8.5
Poor	3+ samples below 6.5 or above 8.5

1.3 Dissolved oxygen:

Method: Lamotte Dissolved Oxygen Test Kit #5860-01

Measurement range: 0.0 – 20.0 mg/L

Score	Assessment Framework
Excellent	No samples below 5.0 mg/L
Good	0-1 samples at 4.0 mg/L or below
Fair	2 samples at 4.0 mg/L or below
Poor	3+ samples at 4.0 mg/L or below

1.4 Turbidity:

Method: Lamotte Turbidity Test Kit #7519-01

Measurement range: 0 – 200 Jackson Turbidity Units (JTUs)

Score	Assessment Framework
Excellent	No samples greater than 15 JTUs
Good	No samples at 50 JTUs or greater
Fair	1-2 samples at 50 JTUs or greater
Poor	3+ samples at 50 JTUs or greater

1.5 Nitrate (as N):

Method: Lamotte Nitrate-N and Phosphate Low-Range Test Kit #3119-01

Measurement range: <0.2 – 4.0 mg/L

Since there is no existing water quality standard protecting aquatic life and preventing eutrophication from nitrate, the following sources were used to develop this framework:

- <https://nepis.epa.gov/Exe/ZyPDF.cgi/20003CVP.PDF?Dockkey=20003CVP.PDF>
- <http://ceaq-rcqe.ccme.ca/download/en/197>

Score	Assessment Framework
Excellent	No samples greater than 1.5 mg/L
Good	No samples greater than 3.0 mg/L
Fair	1-2 samples greater than 3.0 mg/L
Poor	3+ samples greater than 3.0 mg/L

1.6 Phosphate (Lamotte):

Method: Lamotte Nitrate-N and Phosphate Low-Range Test Kit #3119-01

Measurement range: <0.2 – 4.0 mg/L

Score	Assessment Framework
Excellent	Cannot score due to method detection limit
Good	Cannot score due to method detection limit
Fair	0-2 samples at 0.2 mg/L or greater
Poor	3+ samples at 0.2 mg/L or greater

1.7 Phosphate (Gallery):

Method: Thermo Scientific Gallery colorimetric analysis with ammonium molybdate and antimony potassium tartrate

Measurement range: <0.01 – 10.0 mg/L

Score	Assessment Framework
Excellent	No samples greater than 0.05 mg/L
Good	No samples at or greater than 0.1 mg/L LAKES ONLY: 1 sample greater than 0.05 mg/L
Fair	1-2 samples at 0.1 mg/L or greater
Poor	3+ samples at 0.1 mg/L or greater

1.8 Chloride:

Method: Thermo Scientific Gallery colorimetric analysis with mercury (II) thiocyanate

Measurement range: 20 – 500 mg/L

Score	Assessment Framework
Excellent	No samples greater than 100 mg/L
Good	1 sample at 230 mg/L or greater
Fair	2 samples at 230 mg/L or greater
Poor	3+ samples at 230 mg/L or greater

BACTERIAL PARAMETERS

There must be at least 5 samples within a 30 day period to calculate a geometric mean. Sites with differing scores between years will be assigned its lowest score attained during the assessment period.

1.9 E. coli:

Method: Colisure with Quanti-tray 2000 Most Probable Number Quantification

Measurement range: 0 – >2,419 colonies per 100 mL water

Score	Assessment Framework
Excellent	No samples greater than 235 colonies/100 mL AND geometric mean is 126 colonies/100 mL or less
Good	1 or more samples greater than 235 colonies/100 mL BUT geometric mean is 126 colonies/100 mL or less
Fair	0-2 samples greater than 235 colonies/100 mL AND geometric mean is greater than 126 colonies/100 mL
Poor	3+ samples greater than 235 colonies/100 mL AND geometric mean is greater than 126 colonies/100 mL

2 BIOLOGICAL PARAMETERS

2.1 Macroinvertebrate Population Pollution Tolerance:

Method: Multihabitat D-net sampling

Measurement range: At least 100 organisms

Score	Assessment Framework			
	HGMI GENUS Level Index (used for sites in the piedmont region)	CPMI GENUS Level Index (used for sites in the coastal plain)	HGMI FAMILY Level Index (used for sites in the piedmont region)	New Jersey Impairment Score (used for sites in the coastal plain)
Excellent	63 – 100	22 – 30	63 – 100	22.5 – 30
Good	42 - <63	12 – 20	42 – <63	15 – < 22.5
Fair	21 - <42	6 – 10	21 – <42	7.5 – < 15
Poor	< 21	< 6	< 21	< 7.5

When scores exist for multiple indices, assess sites in this order:

1. HGMI (genus)
2. CPMI (genus)
3. HGMI (family)
4. NJIS (family)

3 IMPERVIOUS COVER

3.1 Percent Impervious Coverage in Subwatershed

Percent impervious coverage estimates were calculated using NJDEP 2012 land use/land cover data. The score and rating are shown as a reference and are not included in the calculation for the overall site and subwatershed scores.

Score	Assessment Framework
Excellent	Impervious cover < 5%
Good	Impervious cover 5 - < 10%
Fair	Impervious cover 10 - < 25%
Poor	Impervious cover 25% or greater

4 SUBWATERSHED ASSESSMENTS

4.1 Minor Subwatershed (HUC-13) Assessments

Sites are scored on a four-unit scale: Excellent, Good, Fair, and Poor. These scores have been assigned a value of 4, 3, 2, and 1, respectively. For subwatersheds with multiple sites, the geometric mean of scored values is calculated to determine the score for the subwatershed as a whole according to the following table. If a site is scored on just one parameter, except if that parameter is for aquatic life, it is not included in the overall site score.

Rating	Geometric Mean of Sites' Scored Values
Excellent	> 3.25
Good	2.50 - 3.25
Fair	1.75 - < 2.50
Poor	< 1.75

4.2 Major Subwatershed (HUC-11) Assessments

HUC-13 subwatersheds are scored individually according to the metric in Section 5 (see above), then averaged together to develop a score for the HUC-11 watershed as a whole according to the following table.

Rating	Average of HUC-14 Scored Values
Excellent	> 3.25
Good	2.50 - 3.25
Fair	1.75 - < 2.50
Poor	< 1.75

4.3 Four-Point to Five-Point Grading Scale

Four-point scores can be translated into a five-point grading scale, from A to F, according to the following table.

Grade	Average of HUC-14 Scored Values
A	> 3.5
B	$> 2.75 - 3.5$
C	$2.25 - 2.75$
D	$1.5 - < 2.25$
F	< 1.5