CATALOG DOCUMENTATION
NATIONAL LAKE ASSESSMENT DATABASE
NORTHEAST REGION 2007
REPORTED CONDITION CLASSES FOR LAKES

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1. DATASET IDENTIFICATION

1.1 Title of Catalog document

National Lake Assessment (NLA) Database
Northeast Region 2007
Reported Condition Classes for Lakes

1.2 Author of the Catalog entry

Melissa Hughes, Raytheon MOS

1.3 Catalog revision date

July 2011

1.4 Dataset name

Reported Condition Classes for Lakes

1.5 Task Group

National Lake Assessment

1.6 Dataset identification code

NA

1.7 Version

NA

1.8 Request for Acknowledgment

EPA requests that all individuals who download National Lake Assessment data acknowledge the source of these data in any reports, papers, or presentations. If you publish these data, please include a statement similar to: "Some or all of the data described in this article were produced by the U. S. Environmental Protection Agency through its National Lake Assessment (NLA) Program".

2. INVESTIGATOR INFORMATION

2.1 Principal Investigators

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2.2 Sample Collection Investigators
NA

2.3 Sample Processing Investigators
NA

3. DATASET ABSTRACT

3.1 Abstract of the Dataset

The objective of the National Lakes Assessment (NLA) is to characterize the ecological condition of the nation’s lakes throughout the conterminous United States. The NLA is an ecological assessment of lakes based on chemical, physical, and biological data. It employs a statistically-valid probability design stratified to allow estimates of the condition of lakes on a national and regional scale. The two key questions the NLA addresses are: 1) To what degree are the Nation's lakes in good, fair, and poor condition? and 2) What is the relative importance of the different stressors evaluated in the NLA? This Technical Addendum is a supplemental document used to support the results in a national NLA report. It describes the process used to collect, evaluate, and analyze data for the NLA to report condition classes for lakes. It outlines steps taken to assess the biological condition of the nation's freshwater lakes and identify the relative impact of stressors on this condition. The NLA data analysis procedures described in this technical report were developed from the input and experience of participating cooperators and technical experts. NLA analysts used two processes for establishing the good/fair/poor findings in the NLA report. For trophic status and recreational indicators, analysts used fixed, nationally consistent thresholds. The second approach was to establish regionally consistent reference-based thresholds.

3.2 Keywords for the Dataset

National Lakes Assessment, Lakes Ecosystem Services, Chemical condition class, Condition class, Cyanophyta, Diatom Condition Index, Ecosystem Services, Microcystis, Nutrient condition class, Recreational Condition Class, microcystin, Trophic state, Vegetation Cover Condition Class

4. OBJECTIVES AND INTRODUCTION

4.1 Program Objective

The U.S. Environmental Protection Agency (EPA), in partnership with state and tribal organizations, has designed the Survey of the Nation’s Lakes to periodically assess the condition of the Nation's surface waters. The National Lake Assessment is a statistical assessment of the condition of our Nation’s lakes, ponds, and reservoirs and is designed to: 1) Assess the condition of the Nation’s Lakes; 2) Establish a baseline to compare future surveys for trends assessment and evaluate trends since the 1970’s National Eutrophication Survey Study and 3) Help build State and Tribal capacity for monitoring and assessment and promote collaboration across jurisdictional boundaries. This survey will generate a statistically-valid report on the condition of our Nation’s water resources and identify key stressors to this system. The goal of the Nation's Lakes project is to address two key questions about the quality of the Nation’s lakes, ponds, and reservoirs: 1) What percent of the Nation’s lakes are in good, fair, and poor condition for key indicators of trophic state, ecological health, and recreation? and 2) What is the relative importance of key stressors such as nutrients and pathogens?

The Survey is designed to be completed during the summer growing season before lake turnover (June through September). Field crews will collect a variety of measurements and indicators from an “index site” located at the deepest point

of the lake (≤50 meters, and near the center if sampling a reservoir), and document conditions of the littoral zone and shoreline from stations around the lake.

EPA selected sampling locations using a probability based survey design. Sample Surveys have been used to determine the status of a population or resources of interest using a representative sample of a relatively few members or sites. Using this survey design allows data from the subset of sampled lakes to be applied to the larger target population and assessments with known confidence bounds to be made.

4.2 Dataset Objective

The objective of the Reported Condition Class data set is to describe the processes used to collect, evaluate, and analyze data from the NLA to report condition classes for lakes.

4.3 Dataset Background Discussion

The data set contains data derived from measurements collected in 2007 from Northeast region lakes from the states of Maine to West Virginia.

NLA analysts used two processes for establishing the good/fair/poor findings in the NLA report. For trophic status and recreational indicators, analysts used fixed, nationally consistent thresholds. The second approach was to establish regionally consistent reference-based thresholds. To assess current ecological condition, it is necessary to compare measurements today to an estimate of 'good' quality. Setting reasonable expectations for each indicator was one of the greatest challenges for NLA analysts. Because of the difficulty in estimating historical conditions for many NLA indicators, the 2007 NLA used 'least-disturbed condition' as the reference condition. Least-disturbed condition can be defined as the best available chemical, physical, and biological habitat conditions given the current state of the landscape – or 'the best of what’s left'. Data from reference sites were used to develop seven regional specific reference conditions against which test results could be compared. Sites sampled during the NLA index period using consistent sampling protocols and analytical methods were screened to meet regional specific physical and chemical criteria. These included both sites selected from the probability sample sites and an additional 124 hand-picked sites thought to be reference by best professional judgment. Like the probability sample sites, the hand-picked sites were sampled using the NLA methods. These sites were obtained from a number of sources. Some states submitted their best reference sites to be sampled as part of the NLA while other sites from the west and northeast were selected in a prescreening analysis utilizing land use to find least-disturbed lake watersheds. Regardless of whether sites were probability-based or hand-selected, only those that met the final screening criteria were used in developing the reference condition.

4.4 Summary of Dataset Parameters

Lake condition classes are reported.

5. DATA ACQUISITION AND PROCESSING METHODS

5.1 Data Acquisition

The sample collection methods used by USEPA NLA trained field crews will be described here.

5.1.1 Sampling Objective

NA

5.1.2 Sample Collection: Methods Summary
Water quality and nutrient samples were collected as a basis for calculation of condition classes.

5.1.3 Beginning Sampling Dates
5/8/2007

5.1.4 Ending Sampling Dates
10/18/2007

5.1.5 Sampling Platform
Samples were collected from gasoline or diesel powered boats.

5.1.6 Sampling Equipment
Not applicable

5.1.7 Manufacturer of Sampling Equipment
Not applicable

5.1.8 Key Variables
Not applicable

5.1.9 Sample Collection: Calibration
NA

5.1.10 Sample Collection: Quality Control
NA

5.1.11 Sample Collection: References
USEPA. 2007. Survey of the Nation's Lakes. Field Operations Manual. EPA 841-B-07-004. US Environmental Protection Agency, Washington, DC. (http://water.epa.gov/type/lakes/lakessurvey_index.cfm#CP_JUMP_474534)

5.1.12 Sample Collection: Alternate Methods
NA

5.2 Data Preparation and Sample Processing
NA

5.2.1 Sample Processing Objective
NA

5.2.2 Sample Processing: Methods Summary
NA

5.2.3 Sample Processing: Calibration
NA

5.2.4 Sample Processing: Quality Control
NA

5.2.5 Sample Processing: References
NA

5.2.6 Sample Processing: Alternate Methods
Not Applicable

6. DATA ANALYSIS AND MANIPULATIONS

6.1 Name of New or Modified Value

NA

6.2 Data Manipulation Description

Descriptions reported in:
USEPA. 2010. National Lakes Assessment. Technical Appendix. EPA 841-R-09-001a. US Environmental Protection Agency, Office of Water, Office of Research and Development, Washington, D.C. 20460

7. DATA DESCRIPTION

7.1 Description of Parameters

7.1.1 Components of the Dataset

Attribute Name	Format	Description
WB_ID	NUMBER(10)	Unique Waterbody ID
NLA_ID	VARCHAR2(60 BYTE)	National Lake Assessment study unique ID for each lake
VISIT_NO	NUMBER(4)	Sequential visit number within year
PTL_COND	VARCHAR2(60 BYTE)	Nutrient condition class (Total P)
NTL_COND	VARCHAR2(60 BYTE)	Nutrient condition class (Total N)
CHLA_COND	VARCHAR2(60 BYTE)	Condition class (Chlorophyll a)
TURB_COND	VARCHAR2(60 BYTE)	Condition class (Turbidity)
ANC_COND	VARCHAR2(60 BYTE)	Chemical condition class (Acid neutralizing capacity)
SALINITY_COND	VARCHAR2(60 BYTE)	Chemical condition class (Conductivity/ Salinity)
DO2_COND	VARCHAR2(60 BYTE)	Condition class (mean Dissolved Oxygen in upper 2m)
CORE_CONFIDENCE	VARCHAR2(30 BYTE)	Bottom slice represent pre-disturbance conditions? (YES/NO/UNCERTAIN)
PTL_INF_TOP	NUMBER(8,2)	Diatom-inferred Total Phosphorus (ug/L) in top core sample based on jackknifed values
PTL_INF_BOT	NUMBER(8,2)	Diatom-inferred Total Phosphorus (ug/L) in bottom core sample based on jackknifed values
PTL_INF_DIF	NUMBER(8,2)	Difference (Top-Bottom) in Diatom-inferred Total Phosphorus (ug/L)
PTL_INF_COND	VARCHAR2(60 BYTE)	Top-Bottom difference class for PTL
PTL_INF_COND3	VARCHAR2(60 BYTE)	T-B difference class for PTL (3 level)
NTL_INF_TOP	NUMBER(8,2)	Diatom-inferred Total Nitrogen (ug/L) in top core sample based on jackknifed values
NTL_INF_BOT	NUMBER(8,2)	Diatom-inferred Total Nitrogen (ug/L) in bottom core sample based on jackknifed values
NTL_INF_DIF	NUMBER(8,2)	Difference (Top - Bottom) in Diatom-inferred Total Nitrogen (ug/L)
NTL_SIGTEST	VARCHAR2(25 BYTE)	Is NTL_INF_DIF significantly different from 0? (Yes/No)
NTL_INF_COND	VARCHAR2(60 BYTE)	Top-Bottom difference class for NTL
NTL_INF_COND3	VARCHAR2(60 BYTE)	T-B difference class for NTL (3-level)
LDC_ADJ	NUMBER(9,4)	Lake Diatom Condition Index (Adjusted for natural variation at reference sites)
LDC_COND	VARCHAR2(60 BYTE)	Condition class (Lake Diatom Condition Index)
OE5	NUMBER(10,6)	Plankton Observed/Estimated (O/E) value

OE5_COND	VARCHAR2(60 BYTE)	Condition class (Plankton O/E Indicator) based on fixed taxa loss thresholds (0.8, 0.6)
OE5_COND_985	VARCHAR2(60 BYTE)	Condition class (Plankton O/E Indicator) based on fixed taxa loss thresholds (0.9, 0.8, 0.6)
OE5_COND_R	VARCHAR2(60 BYTE)	Condition class (Plankton O/E Indicator) based on thresholds derived from reference sites
RDIS_COND	VARCHAR2(60 BYTE)	Riparian Disturbance Condition Class (RDis_IX)
RVEG_COND	VARCHAR2(60 BYTE)	Riparian Vegetation Condition Class (RVegQ_OE)
LITCVR_COND	VARCHAR2(60 BYTE)	Littoral Vegetation Cover Condition Class (LitCvr_OE)
LITRIPCVR_COND	VARCHAR2(60 BYTE)	Littoral-Riparian Vegetation Cover Condition Class (LitRipCvr_OE)
MCYST_TL_UGL	NUMBER(5,2)	Total microcystin concentration (ug/L)
CYANDENS	NUMBER(16,9)	Cyanophyta density (#/cm2)
REC_CHLA_COND	VARCHAR2(60 BYTE)	Recreational Condition Class (Chl a)
MCYST_PRES	VARCHAR2(60 BYTE)	Recreational Condition Class (Microcystin presence < RL)
MCYST_COND	VARCHAR2(60 BYTE)	Recreational Condition Class (Microcystin)
MCYST_COND_HI	VARCHAR2(60 BYTE)	Recreational Condition Class (Microcystin) High vs. Low+Moderate Risk
CYANO_COND	VARCHAR2(60 BYTE)	Recreational Condition Class (Cyanobacteria density)
TSTATE_TP	VARCHAR2(60 BYTE)	Trophic state based on total P (10, 25, 50 ug/L)
TSTATE_TN	VARCHAR2(60 BYTE)	Trophic state based on total N (0.35, 0.75, 1.4 mg/L)
TSTATE_CHL	VARCHAR2(60 BYTE)	Trophic state based on Chl a (2, 7, 30 ug/L)
TSTATE_SECCHI	VARCHAR2(60 BYTE)	Trophic state based on secchi transparency (4, 2.1, 0.7 m)

7.1.2 Precision of Reported Values

NA

7.1.3 Minimum Value in Dataset / 7.1.4 Maximum Value in Dataset

PARAMETER	MIN	MAX
VISIT_NO	1	2
PTL_INF_TOP	1.25	1576.38
PTL_INF_BOT	1.46	3224.52
PTL_INF_DIF	-3184.72	1139.55
NTL_INF_TOP	76.9	13847.42
NTL_INF_BOT	35.63	20481.2
NTL_INF_DIF	-15698.71	10980.63
LDC_ADJ	-50.3433	38.1558
OE5	0.101585	1.473362
MCYST_TL_UGL	0.05	225
CYANDENS	0	4982222.222

7.2 Data Record Example

7.2.1 Column Names for Example Records

NLA_ID,VISIT_NO,PTL_COND,NTL_COND,CHLA_COND,TURB_COND,ANC_COND,

SALINITY_COND,DO2_COND,CORE_CONFIDENCE,PTL_INF_TOP,PTL_INF_BOT,PTL_INF_DIF,
PTL_INF_COND,PTL_INF_COND3,NTL_INF_TOP,NTL_INF_BOT,NTL_INF_DIF,NTL_SIGTEST,
NTL_INF_COND,NTL_INF_COND3,LDC_ADJ,LDC_COND,OE5,OE5_COND,OE5_COND_985,
OE5_COND_R,RDIS_COND,RVEG_COND,LITCVR_COND,LITRIPCVR_COND,MCYST_TL_UGL,
CYANDENS,REC_CHLA_COND,MCYST_PRES,MCYST_COND,MCYST_COND_HI,CYANO_COND,
TSTATE_TP,TSTATE_TN,TSTATE_CHL,TSTATE_SECCHI,WB_ID

7.2.2 Example Data Records

NLA06608-0001,1,1:LEAST DISTURBED,1:LEAST DISTURBED,
1:LEAST DISTURBED,1:LEAST DISTURBED,1:LEAST DISTURBED,
1:LEAST DISTURBED,1:HIGH (>= 5 mg/L),,,,,02:NO DATA,02:NO DATA,,,,,
02:NO DATA,02:NO DATA,,4:NOT ASSESSED,0.504031,3:> 40% TAXA LOSS,
3:> 20-50% TAXA LOSS,3: MOST DISTURBED,1:LEAST DISTURBED,
1:LEAST DISTURBED,1:LEAST DISTURBED,1:LEAST DISTURBED,0.05,30.11696365,
1:Low Risk,1:LESS THAN RL (0.1 ug/L),1: Low Risk,
1: Low to Moderate Risk,1:Low Risk (< 20,000/mL),
1: OLIGOTROPHIC (<= 10 ug/L),1: OLIGOTROPHIC (<= 0.35 mg/L),
1: OLIGOTROPHIC (<= 2 ug/L),1: OLIGOTROPHIC (> 4 m),
NLA06608-0002,1,2:INTERMEDIATE DISTURBANCE,2:INTERMEDIATE DISTURBANCE,
1:LEAST DISTURBED,1:LEAST DISTURBED,1:LEAST DISTURBED,1:LEAST DISTURBED,
9:NO DATA,,,,,00:NOT ASSESSED,00:NOT ASSESSED,,,,,00:NOT ASSESSED,
00:NOT ASSESSED,8.3991,1:LEAST DISTURBED,0.592696,3:> 40% TAXA LOSS,
3:> 20-50% TAXA LOSS,3: MOST DISTURBED,2:INTERMEDIATE DISTURBANCE,
1:LEAST DISTURBED,1:LEAST DISTURBED,1:LEAST DISTURBED,0.05,6047.380714,
1:Low Risk,1:LESS THAN RL (0.1 ug/L),1: Low Risk,
1: Low to Moderate Risk,1:Low Risk (< 20,000/mL),
3: EUTROPHIC (>25-50 ug/L),2: MESOTROPHIC (>0.35-0.75 mg/,
2: MESOTROPHIC (>2-7 ug/L),4: HYPEREUTROPHIC (<= 0.7 m),

8. GEOGRAPHIC AND SPATIAL INFORMATION

8.1 Minimum Longitude (Westernmost)

-80.208767 decimal degrees

8.2 Maximum Longitude (Easternmost)

-66.99852 decimal degrees

8.3 Minimum Latitude (Southernmost)

36.702015 decimal degrees

8.4 Maximum Latitude (Northernmost)

47.416054 decimal degrees

8.5 Name of area or region

The National Lake Assessment Northeast Region covers the northeastern US from Maine to West Virginia.

9. QUALITY CONTROL AND QUALITY ASSURANCE

9.1 Measurement Quality Objectives

NA

9.2 Data Quality Assurance Procedures

NA

9.3 Actual Measurement Quality

NA

10. DATA ACCESS

10.1 Data Access Procedures

Access data at: http://www.epa.gov/aed/lakesecoservices by clicking on the Database link.

10.2 Data Access Restrictions

None

10.3 Data Access Contact Persons

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10.4 Dataset Format

Comma-delimited ASCII files

10.5 Information Concerning Anonymous FTP

Not available

10.6 Information Concerning WWW

See Section 10.1 for WWW access

10.7 EMAP CD-ROM Containing the Dataset

Data not available on CD-ROM

11. REFERENCES

USEPA. 2007. Survey of the Nation's Lakes. Field Operations Manual. EPA 841-B-07-004. US Environmental Protection Agency, Washington, DC. (http://water.epa.gov/type/lakes/lakessurvey_index.cfm#CP_JUMP_474534)

USEPA. 2009. Survey of the Nation's Lakes: Integrated Quality Assurance Project Plan. EPA/841-B-07-003. US Environmental Protection Agency, Washington, DC. (http://water.epa.gov/type/lakes/lakessurvey_index.cfm#CP_JUMP_474534)

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USEPA. 2010. National Lakes Assessment. Technical Appendix. EPA 841-R-09-001a. US Environmental Protection Agency, Office of Water, Office of Research and Development, Washington, D.C. 20460

12. TABLE OF ACRONYMS

EPA	Environmental Protection Agency
NLA	National Lakes Assessment
QA/QC	Quality Assurance/Quality Control
WWW	World Wide Web

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