# EDI Metadata Template (2016)[[1]](#footnote-1)

## Dataset Title

**LAGOS-NEGEO v1.05:** A module for LAGOS-NE, a multi-scaled geospatial and temporal database of lake ecological context and water quality for thousands of U.S. lakes

## Short name or nickname you use to refer to this dataset:

**LAGOS-NEGEO v1.05**

## Data Use Policy

**CC BY.** This license lets others distribute, remix, tweak, and build upon your work, even commercially, as long as they credit you for the original creation.

## Abstract

This data package, LAGOS-NEGEO v1.05, is 1 of 5 data packages associated with the LAGOS-NE database-- the LAke multi-scaled GeOSpatial and temporal database. Three of the data packages each contain different types of data for 51,101 lakes and reservoirs larger than 4 ha in 17 lake-rich U.S. states to support research on thousands of lakes. These three package are: (1) LAGOS-NELOCUS: lake location and physical characteristics for all lakes. (2) LAGOS-NEGEO: ecological context (i.e., the land use, geologic, climatic, and hydrologic setting of lakes) for all lakes. These geospatial data were created by processing national-scale and publicly-accessible datasets to quantify numerous metrics at multiple spatial resolutions. And, (3) LAGOS-NELIMNO: in-situ measurements of lake water quality from the past three decades for approximately 2,600-12,000 lakes, depending on the variable. This module was created by harmonizing 87 water quality datasets from federal, state, tribal, and non-profit agencies, university researchers, and citizen scientists. The other two data packages contain supporting data for the LAGOS-NE database: (4) LAGOS-NE-GIS v1.0: the GIS data layers for lakes, wetlands, and streams, as well as the spatial resolutions that were used to create the LAGOS-NEGEO module. (5) LAGOS-NE-RAWDATA: the original 87 datasets of lake water quality prior to processing, the R code that converts the original data formats into LAGOS-NE data format, and the log file from this procedure to create LAGOS-NE. This latter data package supports the reproducibility of LAGOS-NELIMNO.

The LAGOS-NEGEO v1.05 module includes information on the ecological context of the census lakes, all lakes > 4 ha in the study extent, their watersheds, and their regions. The information provided in the data tables for this module is organized into three main themes: CHAG - climate, hydrology, atmospheric deposition of nitrogen and sulfur, and surficial geology; LULC - land use/cover, impervious cover, canopy cover, slope and terrain indices, and dam density; and CONN - lake, stream, and wetland abundance and connectivity measures.

Citation for the full documentation of this database:

Soranno, P.A., E.G. Bissell, K.S. Cheruvelil, S.T. Christel, S.M. Collins, C.E. Fergus, C.T. Filstrup, J.F. Lapierre, N.R. Lottig, S.K. Oliver, C.E. Scott, N.J. Smith, S. Stopyak, S. Yuan, M.T. Bremigan, J.A. Downing, C. Gries, E.N. Henry, N.K. Skaff, E.H. Stanley, C.A. Stow, P.-N. Tan, T. Wagner, K.E. Webster. 2015. Building a multi-scaled geospatial temporal ecology database from disparate data sources: Fostering open science and data reuse. GigaScience 4:28 doi:10.1186/s13742-015-0067-4

Citation for the data paper for this database:

Soranno, P.A., L.C. Bacon, M. Beauchene, K.E. Bednar, E.G. Bissell, C.K. Boudreau, M.G. Boyer, M.T. Bremigan, S.R. Carpenter, J.W. Carr, K.S. Cheruvelil, S.T. Christel, M. Claucherty, S.M.Collins, J.D. Conroy, J.A. Downing, J. Dukett, C.E. Fergus, C.T. Filstrup, C. Funk, M.J. Gonzalez, L.T. Green, C. Gries, J.D. Halfman, S.K. Hamilton, P.C. Hanson, E.N. Henry, E.M. Herron, C. Hockings, J.R. Jackson, K. Jacobson-Hedin, L.L. Janus, W.W. Jones, J.R. Jones, C.M. Keson, K.B.S. King, S.A. Kishbaugh, J.-F. Lapierre, B. Lathrop, J.A. Latimore, Y. Lee, N.R. Lottig, J.A. Lynch, L.J. Matthews, W.H. McDowell, K.E.B. Moore, B.P. Neff, S.J. Nelson, S.K. Oliver, M.L. Pace, D.C. Pierson, A.C. Poisson, A.I. Pollard, D.M. Post, P.O. Reyes, D.O. Rosenberry, K.M. Roy, L.G. Rudstam, O. Sarnelle, N.J. Schuldt, C.E. Scott, N.K. Skaff, N.J. Smith, N.R. Spinelli, J.J. Stachelek, E.H. Stanley, J.L. Stoddard, S.B. Stopyak, C.A. Stow, J.M. Tallant, P.-N. Tan, A.P. Thorpe, M.J. Vanni, T. Wagner, G. Watkins, K.C. Weathers, K.E. Webster, J.D. White, M.K. Wilmes, S. Yuan. *In Review.* LAGOS-NE: A multi-scaled geospatial and temporal database of lake ecological context and water quality for thousands of U.S. lakes. In Review at GigaScience. Submitted April 2017.

## Investigators

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| First Name | Last Name | Organization | e-mail address | ORCID ID (optional) |
| Patricia A. | Soranno | Michigan State University | [soranno@msu.edu](mailto:soranno@msu.edu) | 0000-0003-1668-9271 |
| Kendra S. | Cheruvelil | Michigan State University | [ksc@msu.edu](mailto:ksc@msu.edu) | 0000-0003-1880-2880 |
|  |  |  |  |  |

## Other personnel names and roles

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| First Name | Last Name | Organization | e-mail address | ORCID ID (optional) | Role in project |
| Edward G. | Bissell | Michigan State University | [Bissell3@msu.edu](mailto:Bissell3@msu.edu) |  | Database administrator |
| Nicole J. | Smith | Michigan State University | [Nicole.j.smith@gmail.com](mailto:Nicole.j.smith@gmail.com) |  | GIS analyst |

## Keywords

LAGOS-NE, Lakes, nutrients, water quality, water clarity, chlorophyll, ecological context, lake trophic state, eutrophication

## Funding of this work:

Title of grant: **The effect of cross-scale interactions on freshwater ecosystem state across space and time**

Principal Investigator: **Patricia A. Soranno**

Co-investigators: **Kendra S. Cheruvelil, Emily H. Stanley, Noah Lottig, John A. Downing, Pang-Ning Tan**

Granting agency: **National Science Foundation**

Grant identification number: **EF-1065786, EF-1065818, EF-1065649**

## Timeframe

* Begin date: **May 2011**
* End date: **May 2017**
* Data collection ongoing/completed: **Completed**

## Geographic location

* Verbal description: Northeastern and upper Midwestern U.S. states, including: Minnesota, Iowa, Wisconsin, Illinois, Indiana, Missouri, Michigan, Ohio, Pennsylvania, New York, Connecticut, Rhode Island, New Hampshire, Vermont, Maine, New Jersey, New YOrk
* North bounding coordinates (decimals) – PLEASE FILL IN
* South bounding coordinates (decimals) – PLEASE FILL IN
* East bounding coordinates (decimals) – PLEASE FILL IN
* West bounding coordinates (decimals) – PLEASE FILL IN

## Taxonomic species or groups

NA

## Methods

Please see the following manuscript for detailed methods used to harmonize the datasets in LAGOS-NE; in particular, many of the specific methods and procedures are found in the online ‘Additional Files’ available at: <https://gigascience.biomedcentral.com/articles/10.1186/s13742-015-0067-4>

Soranno, P.A., E.G. Bissell, K.S. Cheruvelil, S.T. Christel, S.M. Collins, C.E. Fergus, C.T. Filstrup, J.F. Lapierre, N.R. Lottig, S.K. Oliver, C.E. Scott, N.J. Smith, S. Stopyak, S. Yuan, M.T. Bremigan, J.A. Downing, C. Gries, E.N. Henry, N.K. Skaff, E.H. Stanley, C.A. Stow, P.-N. Tan, T. Wagner, K.E. Webster. 2015. Building a multi-scaled geospatial temporal ecology database from disparate data sources: Fostering open science and data reuse. GigaScience 4:28 doi:10.1186/s13742-015-0067-4

Detailed information on data sources are found in ‘Additional File 5’ in Soranno et al. (2015). Almost all data sources for this module are from national-scale datasets and thus use standardized methods throughout the study extent.

All methods to create this module are described in ‘Additional files 5, 7, 8, 13, and 14’ in Soranno et al. (2015). Briefly, we calculated the metrics for this module by developing project-specific GIS tools in the ArcGIS environment, which are referred to as the LAGOS GIS Toolbox (and made available here: <https://github.com/soranno/LAGOS_GIS_Toolbox>). The toolbox outputs multiple individual data tables of calculated values organized by the above three data themes that are then imported into LAGOS-NEGEO for different spatial classifications, including values calculated at the level of the individual lake, 100 m and 500 m buffers around each lake, the lake IWS, states and counties, hydrologic units, and ecological drainage units (an ecoregion spatial classification). The unique identifiers for this data module are the zone ID’s for each spatial classification for which we calculate these metrics. In other words, we calculate land use around a lake in each of the zones of the many spatial classifications in LAGOS-NE. However, the data are exported into individual tables by spatial classification. Therefore, there are different numbers of rows in each table; for example, there are 51,101 rows for the land use metrics calculated for the 100 m lake buffer because there are 51,101 lakes that have a 100 m buffer area, but only 17 rows for the land use metrics calculated for the state spatial classification.

## Data Table

* INSERT LAGOS-NE-GEO Metadata tables

1. This document liberally borrows from similar documents at SBC and GCE [↑](#footnote-ref-1)