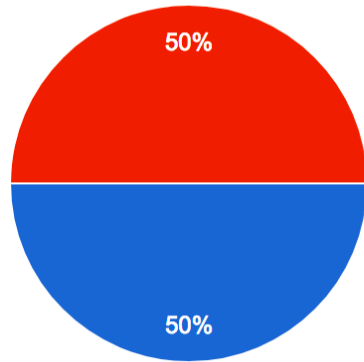


# Metadata

Lind & Cariveau Spring 2018

## Monday's class (git & QC) was...

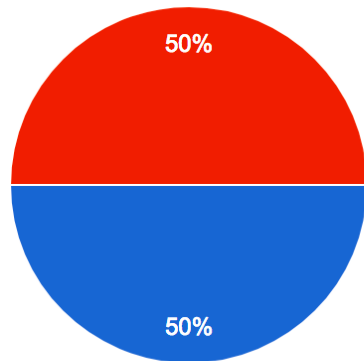
12 responses



- Too slow
- Just right
- Too fast

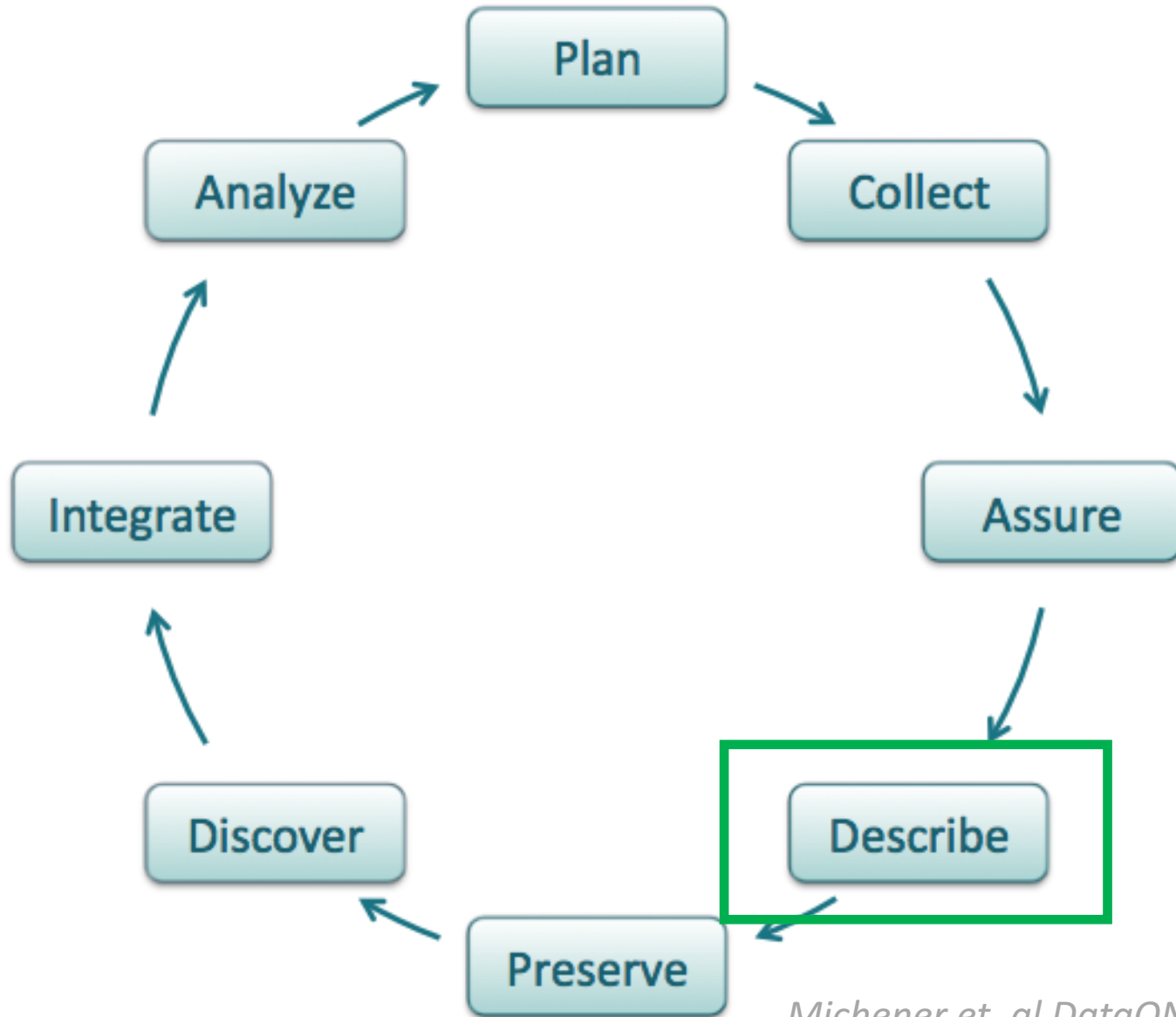
## The first two sessions of class were...

12 responses



- Too slow
- Just right
- Too fast

# The Data Life Cycle



# Metadata

- Data description & reporting
  - WHO created the data?
  - WHAT is the content of the data?
  - WHEN were the data created?
  - WHERE is it geographically?
  - *HOW were the data developed?*
  - *WHY were the data developed?*

# Who uses Metadata?

- You (the originator) – maybe primary reason
- Somebody else
  - Meta-analysis
  - Web aggregators ('the semantic web')
  - future scientists
- Why should you write metadata?
  - **Data citation**
  - Lasting contribution to knowledge
  - because you are required to



## Availability of data and materials

All manuscripts must include an 'Availability of data and materials' statement. Data availability statements should include information on where data supporting the results reported in the article can be found including, where applicable, hyperlinks to publicly archived datasets analysed or generated during the study. By data we mean the minimal dataset that would be necessary to interpret, replicate and build upon the findings reported in the article. We recognise it is not always possible to share research data publicly, for instance when individual privacy could be compromised, and in such instances data availability should still be stated in the manuscript along with any conditions for access.



## Data Archiving

The *Journal of Fish and Wildlife Management* has implemented a data archiving policy that applies to all papers. The policy was formally introduced in the editorial for Issue 2, Number 1 published in June 2011. See the [editorial](#) for more details. The policy reads:

The *Journal of Fish and Wildlife Management* requires, as a condition for publication, that data supporting the results in papers published be provided either directly in the paper, in the associated supplemental materials (electronic files that provide information associated with a paper; Internet links to these files are given in the published paper), or archived in an appropriate public archive. Data are important products of the scientific enterprise, and they should be preserved and usable for decades in the future. Exceptions, especially for sensitive information such as human subject data or the location of endangered species, and short-term embargoes, may be granted at the discretion of the Editor-In-Chief.

Every manuscript submitted must include a cover letter with a Data Access section. In your cover letter, include a Data Access section detailing how you are providing the data supporting the results in your manuscript. Include specifics on where all data are located (e.g., directly in the manuscript, Supplemental Material, public data archive), give specific access details as needed for public data archives (e.g., passwords, internet links) and detail any exemptions to the Data Archiving policy granted by the Editor-In-Chief. Alternatively, explain why no data are required to reproduce the results in your manuscript (e.g., some opinion or synthesis papers).

It is not acceptable to state that data "will be provided upon acceptance", such manuscripts will be returned without review. However, some public archives (e.g., Dryad [www.datadryad.org](http://www.datadryad.org)) require that manuscripts be formally accepted before information can be archived. If you plan to use this type of service, which we encourage, you should still provide the data as [Supplemental Material](#) for review upon submission of the manuscript following all guidelines given in the Supplemental Material section above. Upon formal acceptance of the manuscript, authors can choose to leave the information uploaded as Supplemental Material as is for publication, switch the information to a public archive and provide access information in an Archived Material section (and delete it from Supplemental Material), or use a combination of both methods and the titles of the section(s) will be changed accordingly.

[Home](#) / [Author Resources](#) / [Publication Policies](#) / [AGU Publications Data Policy](#)

## AGU PUBLICATIONS DATA POLICY

First adopted by Publications Committee November 1993 [Revised March 1994, December 1995, October 1996, October 2013]. Adopted by Council December 2013. Updated in 2016.

AGU affirmed in its 2012 **position statement** that "Earth and space science data should be widely accessible in multiple formats and long-term preservation of data is an integral responsibility of scientists and sponsoring institutions." Following this statement and to advance scientific exploration and discovery, and allow a full assessment of results presented in AGU's journals, all data necessary to understand, evaluate, replicate, and build upon the reported research must be made available and accessible whenever possible.

# typical Metadata contents

- Identification Information
  - People
  - project identifiers
- Purpose
  - original collection motivation
  - associated methods

<b>Originator:</b>	Minnesota Department of Natural Resources (MNDNR)
<b>Title:</b>	Scientific and Natural Area Units
<b>Abstract:</b>	<p>This dataset includes the main MNDNR Scientific and Natural Areas (SNA) feature class, along with ancillary feature classes such as annotation and parking lots. These feature classes support MNNR's SNA Work Planning application.</p> <p>scientific_and_natural_area_boundaries: A polygon feature class delineated on and digitized from 1:24,000 U.S.G.S. quad maps of Minnesota Scientific and Natural Areas (SNAs).</p> <p>Scientific and natural areas are established to protect and perpetuate in an undisturbed natural state those lands and waters embracing natural features of exceptional scientific and educational value. The SNA Program's goal is to ensure that no single rare feature is lost from any region of the state. This requires protection and management of each feature in sufficient quantity and distribution across the landscape. The Programs' Long Range Plan is to protect at least five locations of plant communities known to occur in each landscape region, and three locations per region of each rare species, plant or animal, and geologic feature. It is estimated that 500 natural areas are needed throughout the state to adequately protect significant features. Because over 40 percent of these rare features occur in prairies, 200 SNAs would be in the prairie area of the state. Of the remainder, approximately 135 are estimated to be needed in the deciduous and 165 in coniferous forest landscape communities in the next 100 years. Protection of multiple sites in each landscape region is a vital means of capturing the genetic diversity and preventing the loss of important species, communities, and features. This strategy observes the wisdom of not putting all our eggs in one basket.</p> <p>In addition to SNA, Itasca and Crow Wing Counties have established county natural areas. Itasca County's natural areas were established in 1966. Sites are set aside as SNAs because of their natural attributes and rare resources, which warrant protection for their inherent values and as places for scientific and educational use. Protection guards against developments such as trails, campgrounds, picnic sites, logging, mineral exploration and development, cultivation, and other uses of land, public or private, that interfere with the preservation of its natural features</p>
<b>Purpose:</b>	<p>To provide a multi-part polygon view of SNA Units for use in the SNA Work Planning - Activities application.</p> <p>The original purpose for digitizing SNAs was to include them on the Minnesota County Biological Survey's maps of natural communities and rare species. This began in 1989. The Peatland SNAs were digitized 1993 for the generation of a series of maps showing existing trails within these SNAs. Many prairie SNAs with burn units were digitized in 1995-6 for management purposes. The remaining SNAs were digitized in 1996-99 to complete the SNA cover statewide.</p>

# typical Metadata contents

- Dates, times, and locations
  - *where* and *when* are fundamental to utility of all data
  - details vary based on data type

<b>Time Period of Content Date:</b>	02/09/2018
<b>Currentness Reference:</b>	Time Period of Cont
<b>Progress:</b>	Complete
<b>Maintenance and Update Frequency:</b>	Bi-Yearly
<b>Spatial Extent of Data:</b>	
<b>Bounding Coordinates:</b>	-96.594773 -89.922535 48.995304 43.455332
<b>Place Keywords:</b>	Minnesota, MN



# typical Metadata contents

- Data dictionary
  - table by table, column by column
  - for each vector or element of information:
    - what is it called?
    - what is its type?
      - character (length? allowable values?)
      - numeric (integers? precision? decimal place limit?)
      - Logical
      - null?
    - what is its description?

## Table Detail:

scientific\_and\_natural\_area\_boundaries

Field Name	Valid Values	Definition	Definition Source
SITE_NAME	-	Name of SNA Site	
SITE_ID	-	Numeric ID corresponding to the site name.	
BREMCODE	-	Bureau of Real Estate Management (BREM) Code. This code references the corresponding entry for this site in the DNR Land Records system.	

sna\_parking - designated places to park for SNAs

Field Name	Valid Values	Definition	Definition Source
PGRM_PROJE	-		
DIRECTIONS	-	How to find the parking location	
Notes	-	Further details about the parking location	

# typical Metadata contents

- Constraints, Liabilities, and Citation instructions.
  - What if any are the limits on use of the data?
  - What responsibility do the named people in the metadata document have for the underlying data?
  - How should users cite this data package?

<b>Distribution Liability:</b>	The Minnesota Department of Natural Resources General Geographic Data License Agreement is online: <a href="http://www.dnr.state.mn.us/sitertools/data_software_license.html">http://www.dnr.state.mn.us/sitertools/data_software_license.html</a>
<b>Ordering Instructions:</b>	Please visit the download page for this dataset on the Minnesota Geospatial Commons website using the web link below (Online Linkage).
<b>Online Linkage:</b>	<b>I AGREE</b> to the notice in "Distribution Liability" above. Clicking to agree will either begin the download process, link to a service, or provide more instructions. See "Ordering Instructions" above for details.

## Section 7: Metadata Reference

<b>Metadata Date:</b>	2014-09-26 01:00:35
<b>Contact Person Information:</b>	Zeb Thomas, GIS Data Systems Coordinator Minnesota Department of Natural Resources 500 Lafayette Rd St. Paul, MN 55155-4011 Phone: 651-259-5637 Email: <a href="mailto:zeb.thomas@state.mn.us">zeb.thomas@state.mn.us</a>
<b>Metadata Standard Name:</b>	Minnesota Geographic Metadata Guidelines
<b>Metadata Standard Version:</b>	1.2
<b>Metadata Standard Online Linkage:</b>	<a href="http://www.mngeo.state.mn.us/committee/standards/mgmg/metadata.htm">http://www.mngeo.state.mn.us/committee/standards/mgmg/metadata.htm</a>

The nice thing about standards is that you have so many to choose from.

- Andrew Tanenbaum, *Computer Networks*

Nucleotide

Nucleotide

Advanced

Search

Help

GenBank

Send to:

Change region shown

# Lymantria dispar mitochondrial COI gene for cytochrome c oxidase subunit I, partial cds, haplotype:H9

GenBank: AB244668.1

[FASTA](#) [Graphics](#)

Go to:

LOCUS AB244668 378 bp DNA linear INV 14-JUL-2016  
 DEFINITION Lymantria dispar mitochondrial COI gene for cytochrome c oxidase subunit I, partial cds, haplotype:H9.

ACCESSION AB244668

VERSION AB244668.1

KEYWORDS .

SOURCE mitochondrion Lymantria dispar (gypsy moth)

ORGANISM [Lymantria dispar](#)

Eukaryota; Metazoa; Ecdysozoa; Arthropoda; Hexapoda; Insecta; Pterygota; Neoptera; Holometabola; Lepidoptera; Glossata; Ditrysia; Noctuoidea; Lymantriidae; Lymantria.

REFERENCE 1

AUTHORS Yamaguchi,H., Ono,N., Ishihara,M., Tokishita,S., Yamagata,H. and Higashiura,Y.

TITLE The genetic structure of populations containing two widely diverse lineages in the gypsy moth, Lymantria dispar, in Hokkaido, Japan

JOURNAL Unpublished

REFERENCE 2 (bases 1 to 378)

AUTHORS Yamaguchi,H., Tokishita,S. and Higashiura,Y.

TITLE Direct Submission

JOURNAL Submitted (15-DEC-2005) Hirofumi Yamaguchi, Tokyo University of Pharmacy and Life Science, department of life science; Horinouchi 1432-1, Hachioji, Tokyo 192-0355, Japan (E-mail:s998079@educ.ls.toyaku.ac.jp, Tel:81-426-76-7095)

FEATURES

source

Location/Qualifiers

1..378

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Customize view

Analyze this sequence

Run BLAST

Pick Primers

Highlight Sequence Features

Find in this Sequence

Related information

Protein

Taxonomy

LinkOut to external resources

BOLD Link [GBGL4423-07]

[Barcodes of Life]

Recent activity

Turn Off Clear

Lymantria dispar mitochondrial COI gene for cytochrome c oxidase subunit I, partial cds, haplotype:H9

lymantria dispar (3715)

Nucleotide

The GenBank Submissions Handbook

See more...

## Darwin Core

<b>Title:</b>	Darwin Core
<b>Date Issued:</b>	2009-02-12
<b>Date Modified:</b>	2015-06-05
<b>Abstract:</b>	This document is a cover page, an entry-level document to the Darwin Core standard. It describes the purpose of the standard and orients the reader to the documents that cover specific topics within the standard, such as the quick guide to the list of terms.
<b>Contributors:</b>	John Wieczorek (MVZ), Markus Döring (GBIF), Renato De Giovanni (CRIA), Tim Robertson (GBIF), Dave Vieglais (KUNHM)
<b>Legal:</b>	This document is governed by the standard legal, copyright, licensing provisions and disclaimers issued by the Taxonomic Databases Working Group.
<b>Part of TDWG Standard:</b>	<a href="http://www.tdwg.org/standards/450/">http://www.tdwg.org/standards/450/</a>
<b>Creator:</b>	Darwin Core Task Group
<b>Identifier:</b>	<a href="http://rs.tdwg.org/dwc/2014-11-08/">http://rs.tdwg.org/dwc/2014-11-08/</a>
<b>Latest Version:</b>	<a href="http://rs.tdwg.org/dwc/">http://rs.tdwg.org/dwc/</a>
<b>Replaces:</b>	<a href="http://rs.tdwg.org/dwc/2013-10-25/">http://rs.tdwg.org/dwc/2013-10-25/</a>
<b>Document Status:</b>	Current Standard

### 1. Introduction

**Audience:** This document is an introduction to the Darwin Core standard and is meant to provide the background, reasons, and basic information about sharing (either as a publisher or user of) biodiversity information. Further details on specific aspects of the standard and its use can be found in the pages shown in the Table of Contents in the upper left of every page or in the [References](#) section of this page.

#### What is the Darwin Core?

The Darwin Core is body of standards. It includes a glossary of terms (in other contexts these might be called properties, elements, fields, columns, attributes, or concepts) intended to facilitate the sharing of information about biological diversity by providing reference definitions, examples, and commentaries. The Darwin Core is primarily based on taxa, their occurrence in nature as documented by observations, specimens, samples, and related information. Included are documents describing how these terms are managed, how the set of terms can be extended for new purposes, and how the terms can be used. The normative document for the terms [[RDF-NORMATIVE](#)] is written in the Resource Description Framework [[RDF](#)] and is the definitive resource to understand the term definitions and their relationships to each other. The *Simple Darwin Core* [[SIMPLEDWC](#)] is a specification for one particular way to use the terms - to share data about taxa and their occurrences in a simply structured way - and is probably what is meant if someone suggests to "format your data according to the Darwin Core".

**Motivation:** The Darwin Core standard was originally conceived to facilitate the discovery, retrieval, and integration of information about modern biological specimens, their spatiotemporal occurrence, and their supporting evidence housed in collections (physical or digital). The Darwin Core today is broader in scope and more versatile. It is meant to provide a stable standard reference for sharing information on biological diversity. As a glossary of terms, the Darwin Core is meant to provide stable semantic definitions with the goal of being maximally reusable in a variety of contexts.

**Rationale:** The Darwin Core is based on the standards developed by the *Dublin Core Metadata Initiative* [[DCMI](#)] and can be viewed as an extension of the Dublin Core for biodiversity information. The purpose of these terms is to facilitate data sharing by providing a well-defined standard core vocabulary in a flexible framework to minimize the barriers to adoption and to maximize reusability. The terms described in this standard are a part of a larger set of vocabularies and technical specifications under development [[TDWG-DEV](#)] and maintained by *Biodiversity Information Standards (TDWG)* [[TDWG-STANDARDS](#)].

KNB Data :: Morpho

knb.ecoinformatics.org/morphoportals.jsp

Google

# The Knowledge Network for Biocomplexity

Home Data People Informatics Biocomplexity Education Software

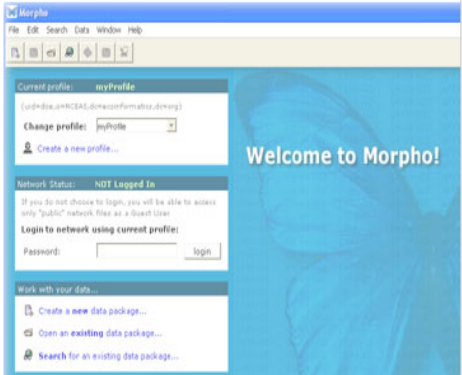
## Morpho Data Management Software

Morpho allows you to create and manage your data, and to share it with others. It was created to provide an easy-to-use, cross-platform application for accessing and manipulating metadata and data (both locally and on the network).

Morpho allows ecologists to create metadata, (i.e. describe their data in a standardized format), and create a catalog of data & metadata upon which to query, edit and view data collections. In addition, It also provides the means to access network servers, in order to query, view and retrieve all relevant, public ecological data! Check the **Morpho User Guide** for details.

The basic operations that can be carried out using Morpho are:

- Create and Edit Metadata
- Search and Query Metadata Collections
- View Data and Data Collections
- Verify/Edit Data
- Provide Access Control
- Share Data via the KNB



## Download Morpho


Download the Morpho data management application. Easy-to-use installers are available for various platforms. For windows and mac versions, users need to double click the installers. For linux version, users need to run "java -jar morpho-version-linux.jar".

To run Morpho, you must have Java 1.6 or later installed on your computer.

- Read the **README** for a change log
- **Download a Morpho installer:**  
**Windows :: Linux :: Mac OSX**

Note: If the Morpho Uninstaller can't remove Morpho installed in C:\Program Files on Windows Vista, you may have to use one of the following two ways to uninstall Morpho.

1. Temporarily disable User Account Control(UAC) on Vista, then run the Morpho Uninstaller program. In this case, everything will be removed. Here is the [link](#) telling you how to turn UAC on or off.



zotero

```

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## 5.1 Vegetation Visit Table

(Oracle table name: VEG\_VISIT)

Subsection	Column name (attribute)	Descriptive name	Oracle data type
5.1.1	CN	Sequence number	VARCHAR2(34)
5.1.2	PLT_CN	Plot sequence number	VARCHAR2(34)
5.1.3	INVYR	Inventory year	NUMBER(4)
5.1.4	STATECD	State code	NUMBER(4)
5.1.5	COUNTYCD	County code	NUMBER(3)
5.1.6	PLOT	Phase 2 plot number	NUMBER(5)
5.1.7	VEG_QA_STATUS	Vegetation quality assurance status	NUMBER(1)
5.1.8	VEG_KINDCD	Vegetation sample kind code	NUMBER(2)
5.1.9	VEG_MANUAL	Vegetation manual (field guide) version number	VARCHAR2(8)
5.1.10	TRACE_COVER_ALLOWED	Trace cover allowed	NUMBER(1)
5.1.11	VEG_MEASYEAR	Vegetation measurement year	NUMBER(4)
5.1.12	VEG_MEASMON	Vegetation measurement month	NUMBER(2)
5.1.13	VEG_MEASDAY	Vegetation measurement day	NUMBER(2)
5.1.14	VEG_SAMPLE_BASIS	Vegetation sample basis	NUMBER(1)
5.1.15	CREATED_BY	Created by	VARCHAR2(30)
5.1.16	CREATED_DATE	Created date	DATE



### 5.1.5 COUNTYCD

**County code.** The identification number for a county, parish, watershed, borough, or similar governmental unit in a state. FIPS codes from the Bureau of the Census are used. Refer to appendix B in the P2 document for codes (The Forest Inventory and Analysis Database: Database Description and User Guide Version 6.0.1 for P2, available at [FIA Data and Tools-Documentation](http://www.fia.fs.fed.us/library/database-documentation/) [http://www.fia.fs.fed.us/library/database-documentation/]).

### 5.1.6 PLOT

**Phase 2 plot number.** An identifier for a plot. Along with STATECD, INVYR, and COUNTYCD, PLOT may be used to uniquely identify a plot.

### 5.1.7 VEG\_QA\_STATUS

**Vegetation quality assurance status.** A code indicating the type of vegetation measurement conducted. Production plots have VEG\_QA\_STATUS = 1 or 7.

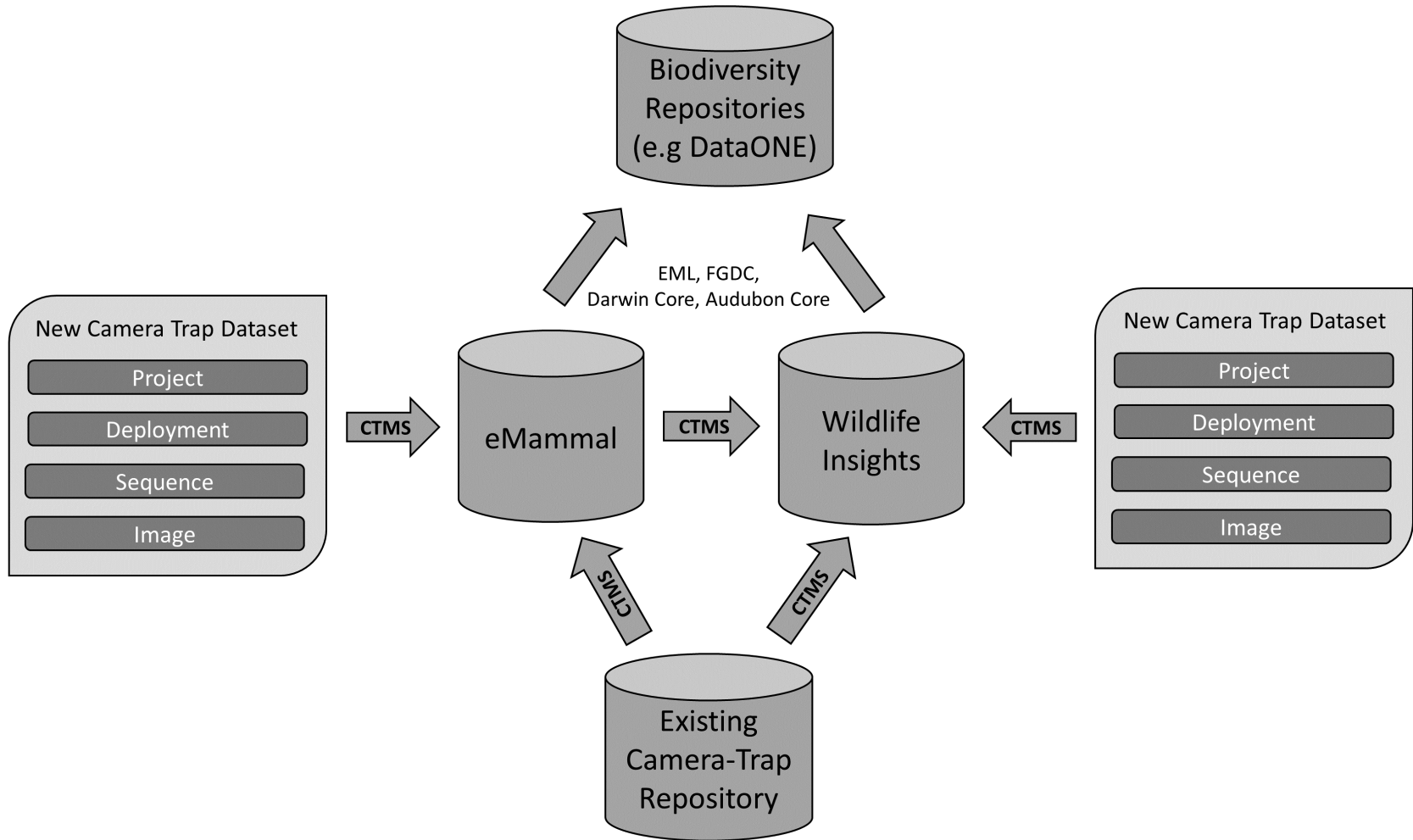
**Codes: VEG\_QA\_STATUS**

Code	Description
1	Standard field production plot.
2	Cold check.
3	Reference plot (off grid).
4	Training/practice plot (off grid).

Code	Description
5	Botched plot file (disregard during data processing).
6	Blind check.
7	Production plot (hot check).

# Camera Trap Metadata Standard (CTMS)

*Forrester et al. 2016*



## Organization



### Metropolitan Council

The Metropolitan Council is the regional policy-making body, planning agency, and provider of essential services for the Twin Cities metropolitan region. [read more](#)

## Social

Google+

Twitter

Facebook

## License

License not specified  
[Legal disclaimer](#)

# Transit Stops

The Transit Stops layer contains over 18,000 active and inactive transit stops in the Twin Cities seven county metropolitan area. Stops where boarding and/or alighting occurs are flagged in the busstop\_yn field.

The dataset includes attributes from the primary transit stop database maintained for Metro Transit and for customer information for other transit provider transit services. The locations are mapped referencing NCompass Technologies Inc. street centerline network along with streets generated internally at Metro Transit.

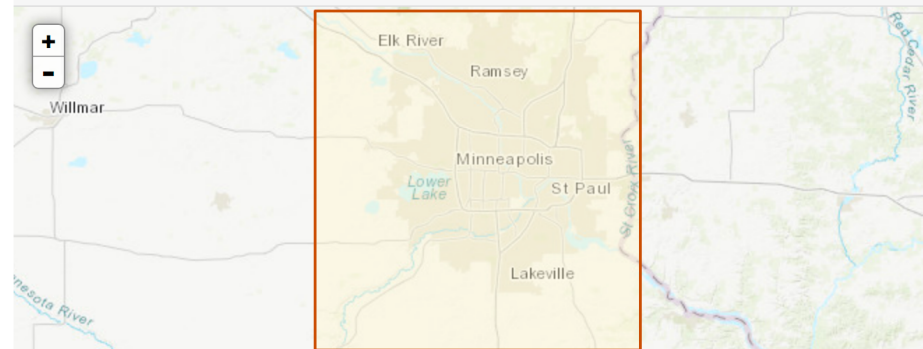
	<b>Esri ArcGIS Server Map Service</b>	<a href="#">View</a>
	<b>Shapefile</b>	<a href="#">Download</a>
	<b>ESRI File Geodatabase</b>	<a href="#">Download</a>
	<b>Full Metadata Record</b>	<a href="#">View</a>

[bus stops](#) [buses](#) [transit](#)

## Additional Info

<b>Access constraints</b>	None
<b>Date details</b>	Transit Stop information is updated weekly
<b>Originating organization</b>	Metropolitan Council - Metro Transit
<b>Purpose</b>	To identify all stop locations in the Twin Cities metropolitan area where transit service exists.

## Dataset extent



# https://ericlind.github.io/data-mgmt-4-biologists/data/e141\_Soil\_nitrogen.txt

BioCON (Biodiversity, CO<sub>2</sub>, and Nitrogen) is an ecological experiment started in 1997 at the University of Minnesota's Cedar Creek Ecosystem Science Reserve. BioCON's goal is to explore the ways in which plant communities will respond to three environmental changes that are known to be occurring on a global scale: increasing nitrogen deposition, increasing atmospheric CO<sub>2</sub>, and decreasing biodiversity.

## Why Biodiversity, CO<sub>2</sub>, and Nitrogen?

While there are many uncertainties in global change biology, there are also some well documented facts. Some of these are:

1. The amount of carbon dioxide (CO<sub>2</sub>) in the atmosphere is rising. Since the industrial revolution, the CO<sub>2</sub> concentration in the atmosphere has increased from approximately 275 parts per million (ppm) to about 378 ppm today. This has been largely the result of fossil fuel burning. It is expected that CO<sub>2</sub> levels will continue to rise, and that by the year 2050 these levels will be approximately 550 ppm. CO<sub>2</sub> is the raw material for photosynthesis and is known to affect plant growth and development.
2. The amount of nitrogen moving through terrestrial ecosystems has increased in the recent past. While natural "background" levels of nitrogen fixation have remained constant, human additions to the system through fertilizer production and fossil fuel use have increased dramatically. Nitrogen is a key nutrient for plant growth and plays a critical role in plant community structure and composition in many environments.
3. Biodiversity levels are falling. While the research and data are not as complete as they are for CO<sub>2</sub> and nitrogen, data indicate that the number of species globally, is being reduced. Perhaps more important for ecosystem function, diversity levels on local to regional scales have fallen due to land use change, biotic invasion and many other drivers.

While much is known about how each of these factors affects ecosystem functioning, many questions remain. There is also little data on how these issues affect each other, and what emergent qualities may arise when systems are exposed to these changes simultaneously. BioCON seeks to address these issues with this multi-year study at Cedar Creek Ecosystem Science Preserve.

---

## METHODS AND PROTOCOLS FOLLOW DATA

### Experiment Investigators:

Reich, Peter  
Hobbie, Sarah  
Montgomery, Rebecca

### ATTRIBUTES:

- Field 1 | Name: Year | Definition: Year
- Field 2 | Name: Plot | Definition: Plot
- Field 3 | Name: Ring | Definition: Ring
- Field 4 | Name: CO<sub>2</sub> Treatment | Definition: Cedar Creek CO<sub>2</sub> Treatment
- Field 5 | Name: Nitrogen Treatment | Definition: Cedar Creek Nitrogen Treatment
- Field 6 | Name: CountOfSpecies | Definition: Count Of Species | Unit: dimensionless
- Field 7 | Name: CountOfGroup | Definition: Count of functional Groups | Unit: dimensionless
- Field 8 | Name: Experiment | Definition: Experiment Design
- Field 9 | Name: monospecies | Definition: Singular Species of Plot
- Field 10 | Name: Monogroup | Definition: Singular Functional Group of Plot
- Field 11 | Name: Water Treatment | Definition: Water Treatment
- Field 12 | Name: Depth | Definition: Depth in cm
- Field 13 | Name: Nitrogen(%) | Definition: Percent Nitrogen in Soil | Unit: dimensionless
- Field 14 | Name: Carbon(%) | Definition: Carbon percent in soil | Unit: dimensionless
- Field 15 | Name: C/N Ratio | Definition: Soil Carbon/Nitrogen Ration | Unit: dimensionless

### Data:

Year	Plot	Ring	CO <sub>2</sub> Treatment	Nitrogen Treatment	CountOfSpecies	CountOfGroup	Experiment	<u>monospecies</u>	<u>Monogroup</u>	Water Treatment
2002	1	1	<u>Carbon(%)</u>	<u>C/N Ratio</u>						
2002	1	1	<u>Cenrich Namb</u>	4 2 M		10-20	0.057 0.515	9.04		
2002	1	1	<u>Cenrich Namb</u>	4 2 M		20-40	0.023 0.142	6.17		
2002	1	1	<u>Cenrich Namb</u>	4 2 M		40-60	0.016 0.132	8.25		
2002	1	1	<u>Cenrich Namb</u>	4 2 M		0-10	0.074 0.618	8.35		
2002	2	1	<u>Cenrich Namb</u>	1 1 M	Bouteloua gracilis	C-4	20-40	0.032 0.199	6.22	
2002	2	1	<u>Cenrich Namb</u>	1 1 M	Bouteloua gracilis	C-4	10-20	0.06 0.477	7.95	
2002	2	1	<u>Cenrich Namb</u>	1 1 M	Bouteloua gracilis	C-4	0-10	0.07 0.55	7.86	