



SUSTAINABLE and HEALTHY COMMUNITIES RESEARCH PROGRAM

# Leveraging Citizen Science for Assessing Biodiversity, While Increasing our Appreciation of (and Sense of) Place: **Assessing Great Lakes Biodiversity with CitSci.**



**Tom Hollenhorst, United States Environmental Protection Agency, Duluth, MN**

Interagency Ecological Restoration  
Quality Committee (IERQC) 4/30/2020



SUSTAINABLE and HEALTHY COMMUNITIES RESEARCH PROGRAM

# It's Time to embrace the Abundance of Citizen Science: Assessing Great Lakes Biodiversity with CitSci.



Citizen Science - Research Learning Centers (U.S. N...

National Park Service

Citizen Science

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**Tom Hollenhorst**, United States Environmental Protection Agency, Duluth, MN

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# ~~It's Time to~~ **Lets** embrace the Abundance of Citizen Science: Assessing Great Lakes Biodiversity with CitSci.



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Tom Hollenhorst, United States Environmental Protection Agency, Duluth, MN

# Citizen Science is Awesome!

- Citizen science activities and applications have increased by leaps in bounds in recent years, propelled by many different local, state, and federal initiatives.



The screenshot shows a White House blog post. The header includes the White House logo and navigation links: BRIEFING ROOM, ISSUES, THE ADMINISTRATION, and 1600 PENN. The post title is "Accelerating Citizen Science and Crowdsourcing to Address Societal and Scientific Challenges". Below the title is the date and author: "SEPTEMBER 30, 2015 AT 6:00 AM ET BY TOM KALIL AND DAVE WILKINSON". There are social media icons for Twitter, Facebook, and Email. The summary states: "Summary: Today, the White House is hosting a forum on citizen science and crowdsourcing." The main text begins with: "While only a fraction of Americans are formally trained as professional scientists and engineers, everyone can contribute to science, engineering, and technology through open science and innovation approaches, such as citizen science and crowdsourcing projects." It then defines "Citizen science" and "crowdsourcing".

the WHITE HOUSE  
PRESIDENT BARACK OBAMA

BRIEFING ROOM | ISSUES | THE ADMINISTRATION | 1600 PENN

HOME · BLOG

## Accelerating Citizen Science and Crowdsourcing to Address Societal and Scientific Challenges

SEPTEMBER 30, 2015 AT 6:00 AM ET BY TOM KALIL AND DAVE WILKINSON

Summary: Today, the White House is hosting a forum on citizen science and crowdsourcing.

While only a fraction of Americans are formally trained as professional scientists and engineers, everyone can contribute to science, engineering, and technology through open science and innovation approaches, such as citizen science and crowdsourcing projects.

**Citizen science** encourages members of the public to voluntarily participate in the scientific process. Whether by asking questions, making observations, conducting experiments, collecting data, or developing low-cost technologies and open-source code, members of the public can help advance scientific knowledge and benefit society.

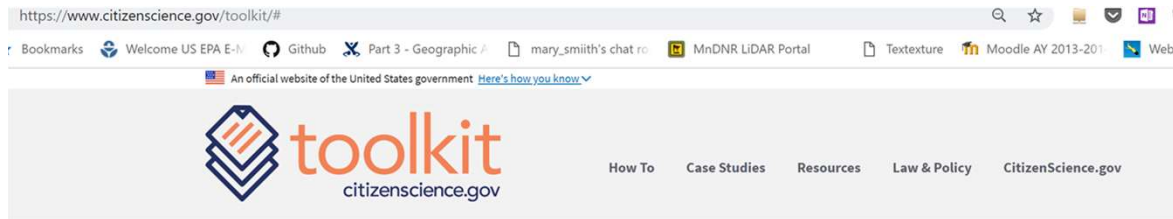
Through **crowdsourcing** – an open call for voluntary assistance from a large group of individuals – Americans can study and tackle complex challenges by conducting research at large geographic scales and over long periods of time in ways that professional scientists working alone cannot easily duplicate. These challenges include understanding the structure of proteins related viruses in order to support development of new medications, or [preparing for, responding to, and recovering from disasters](#).

“Open Science and Innovation: Of the People, By the People, For the People,” a live-webcast White House forum on citizen science


releasing the first-ever [Federal Crowdsourcing and Citizen Science Toolkit](#) to help Federal agencies design, carry out, and manage citizen science and crowdsourcing projects. The toolkit, which was developed by OSTP in partnership with the [Federal Community of Practice for Crowdsourcing and Citizen Science](#) and GSA’s [Open Opportunities Program](#), reflects the input of more than 125 Federal employees from over 25 agencies on ideas, case studies, best management practices, and other lessons to facilitate the successful use of citizen science and crowdsourcing in a Federal context.



# Citizen Science is Awesome!




## Federal Crowdsourcing and Citizen Science Toolkit



### How To: Step by Step

This toolkit shows five basic process steps for planning, designing and carrying out a crowdsourcing or citizen science project. At each step, you'll find a list of tips you can use to keep your project on track.

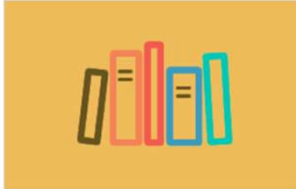
[See the process steps](#)



### Case Study Overview

Case studies in this toolkit serve as models and provide success stories and challenges to consider while planning a project. You can browse through agency case studies to get ideas for a project of your own.

[Browse Case Studies](#)

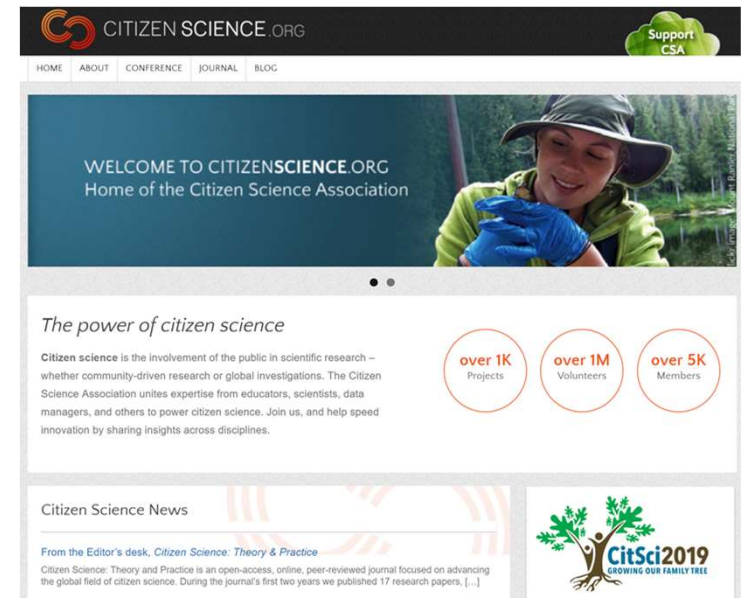


### Resource Library

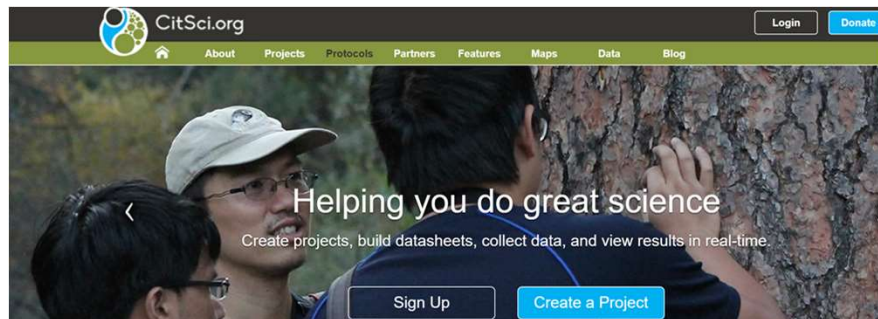
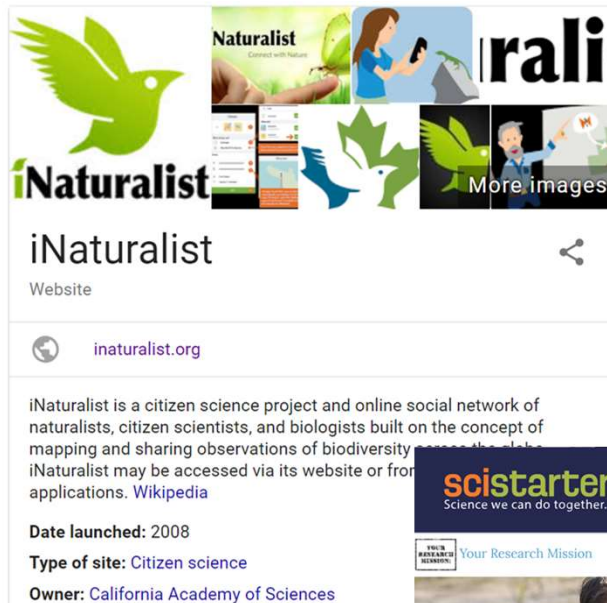
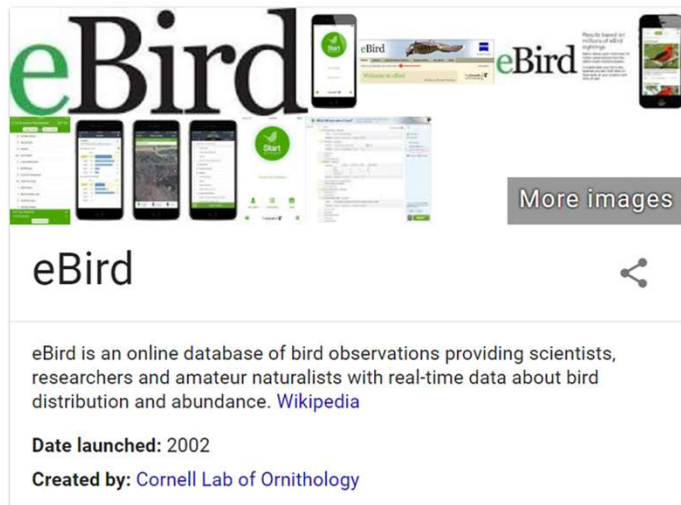
The resource library provides a list of all resources in this toolkit which you can browse through by category. You can also find resources within each of the process steps in the "How To" section of the toolkit.

[View Resources](#)

Visit [CitizenScience.gov](https://www.citizenscience.gov) to also learn about a catalog of projects and communities to join!



# Citizen Science is Awesome!



# Citizen Science is Awesome!

## Project Finder

Enter a word or phrase

Houghton, MI, USA

All Activities

All Topics

only for projects that...

only show projects for...



1-10 of 679 (Order by: match quality, newest, oldest)



Herpetological Resource and Management

[Bookmark](#)

### Michigan Herp Atlas

☆☆☆☆☆ (0)

Goal: Provide information on the status of Michigan's herpetofauna

Task: No Task was listed but it's probably doable

Where: See project description

[Add a Project](#)

[Learn More >](#)



Kalamazoo Nat...

[Bookmark](#)

### Michigan Butterfly Network

☆☆☆☆☆ (0)

Goal: Assess changing population of Michigan's butterfly species.

Task: Map butterflies within your community.

Where: Michigan, United States of America

[Learn More >](#)



Colorado Geographic Alliance

[Bookmark](#)

### National Geographic's Giant State Maps

☆☆☆☆☆ (0)

Goal: Offer students and community members background about states

Task: Support visits of giant state maps to schools & community groups

Where: United States of America

[Learn More >](#)



McCorps photo

[Bookmark](#)

### Volunteer Stream Monitoring Program

☆☆☆☆☆ (0)

Goal: Monitor health of Michigan's streams and rivers

Task: Monitor invertebrates, habitat, flow, and road-stream crossings

Where: Michigan, United States of America

[Learn More >](#)



Michigan photo

[Bookmark](#)

### Cooperative Lakes Monitoring Program

☆☆☆☆☆ (0)

Goal: Record of lake water quality, plants, and shoreline habitat

Task: Monitor lake water quality, plants, and/or shoreline habitat

Where: Michigan, United States of America

[Learn More >](#)



MI-MAST photo

[Bookmark](#)

### MI-MAST: Wildlife Food Tracker

☆☆☆☆☆ (0)

Goal: Understand the cycles of production of wild fruit produced.

Task: Record mast production of plants.

Where: Michigan, United States of America

[Learn More >](#)



MISIN photo

[Bookmark](#)

### Midwest Invasive Species Information Network

☆☆☆☆☆ (0)

Goal: EDRR resource for invasive species in the Midwest region of U.S.

Task: report sightings of invasive species in their area

Where: See project description

[Learn More >](#)



PSU photo

[Bookmark](#)

### Penn State Astrobiology Citizen Science Project

☆☆☆☆☆ (0)

Goal: No Goal was listed but it's probably amazing

Task: No Task was listed but it's probably doable

Where: See project description

[Learn More >](#)



Don Frazier photo

[Bookmark](#)

### Mourning Warbler Song Mapper

★★★★☆ (1)

Goal: Better understand the nature of migration of this elusive bird

Task: Use your smartphone and the song mapper to track migrating males

Where: See project description

[Learn More >](#)



mission monarch photo

[Bookmark](#)

### Mission Monarch

★★★★☆ (1)

Goal: Locate monarch breeding hotspots

Task: Examine milkweed plants and look for monarchs on them

Where: North America

[Learn More >](#)

[prev](#)

1-10 of 679

[next](#)

# Citizen Science is Awesome!

<https://superiorcitsci.org>

Superior Citizen Science

Lake Superior Regional Citizen Science Collaborative

[Home](#) [Citizens](#) [Educators](#) [Researchers](#) [Our Team](#) [Get Involved](#) [Contact Us](#) [About](#)

## Lake Superior Initiatives:



### The Lake Superior Regional Citizen Science Collaborative (LSRCSC)

LSRCSC seeks to identify citizen science efforts and opportunities in the Western Lake Superior Region in order to create an opportunity for communication and collaboration among researchers, educators and volunteers who want to engage in citizen science in our region.



# Citizen Science is Awesome!

EPA  
Initiatives:



HOME BLOOMWATCH CYANOSCOPE MONITORING BLOG

## CYANOBACTERIA MONITORING COLLABORATIVE

THREE COORDINATED MONITORING PROJECTS TO LOCATE AND UNDERSTAND HARMFUL CYANOBACTERIA

GET INFORMED	GET INVOLVED	GET IN TOUCH
CONTACT US	OUR PROGRAMS	GET THE KIT

We work with citizen scientists, trained water professionals, and the general public to find and study cyanobacteria in waterbodies.

# Citizen Science is Awesome!

## HOW DOES CYANOSCOPE WORK?



### Collect cyanobacteria

1) collect cyanobacteria with a net tow, 2) prepare your microscope slides, 3) identify cyanobacteria found in your sample

[LEARN ABOUT THE KIT](#)

[GET METHODS](#)

[IDENTIFY CYANOBACTERIA](#)



### Submit your images

1) take pictures of cyanobacteria found in your sample, 2) upload the images and relevant info on iNaturalist.org

NOTE: Be sure include basic information about where and when the sample was collected.

NOTE: If not sure what cyanobacteria you have, that's fine! Go ahead and upload your image.

To submit your images, sign in or register at:

[CYANOSCOPE ON INATURALIST](#)



### Interact online

1) the iNaturalist community can help confirm the identity of cyanobacteria, 2) you can view and comment on images submitted by others, 3) everyone can explore patterns of the appearance of cyanobacteria

To view and comment on images, sign in or register at:

[CYANOSCOPE ON INATURALIST](#)



cyanoScope

## Stats

### Totals

1092

Observations »

101

Species »

123

People »

### Most Observations



lanabluege

198 observations



willbmisted

105 observations



townofbarnstable

90 observations



larryzsherman

59 observations



sharpthorn

50 observations

### Most Species



larryzsherman

10 species



willbmisted

10 species



skmayer

8 species



hdliv

7 species



karolina

7 species

### Most Observed Species



Microcystis aeruginosa

49 observations



Oscillatoria

29 observations



Woronichinia naegeliana

23 observations



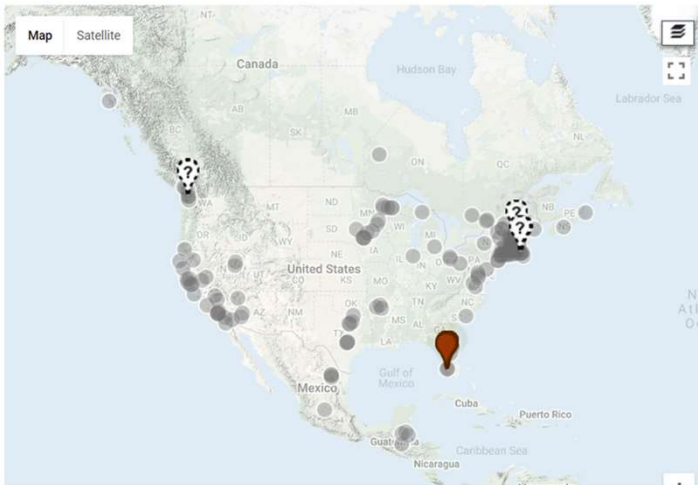
Dolichospermum lemmermannii

19 observations



Aphanizomenon flos-aquae

14 observations



## Members



106 members

[View All Members »](#)

## Export Observations

[Atom](#) / [CSV](#)

## About

Valentines Day 2018

News: cyanoScope now has its own guide to the cyanobacteria. Please check it out:

<https://www.inaturalist.org/guides/6092>

What is cyanoScope?

cyanoScope uses modern technologies and social media platforms to learn more about cyanobacteria.

By participating you ...[more](#) ↓



Start a business made easy

**Top 4 Crowdsourced Logo Design Sites for Small Businesses**

by: Anthony St. Clair [MANAGING](#) 0 Shares: [f](#) [p](#) [t](#) [in](#) [e](#)

**What Type of Business Plan is Right for Me?**

**LivePlan**

Create your plan in half the time with twice the impact

[GET STARTED](#)

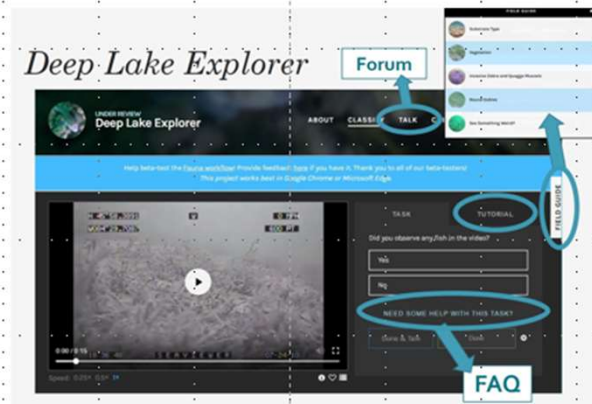
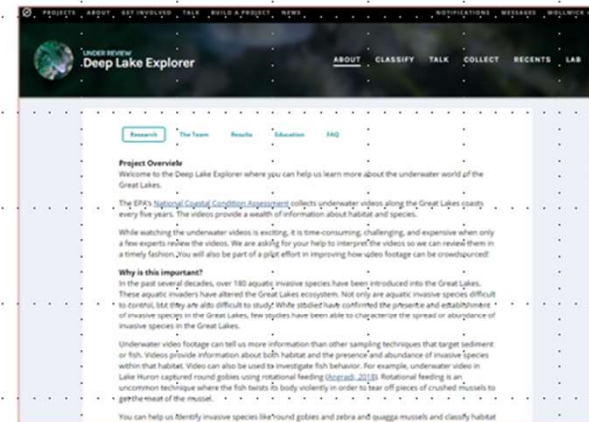
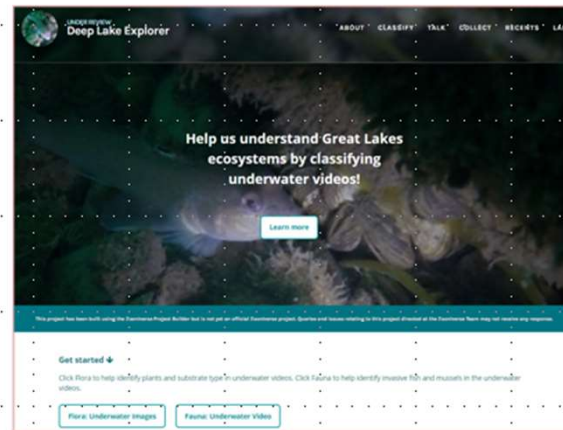
Your logo is the key to your small business brand.

Whether you are setting up shop or rebranding, designing your logo is just as important as getting things right on other aspects of your business.

## EPA Initiatives:

- Citizen scientists can help classify benthic flora, fauna and substrate in underwater video at:

<https://www.zooniverse.org/projects/USEPA/deep-lake-explorer>





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Environmental Topics

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## Innovation

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Projects

Technology Innovation

Science Innovation

Innovation Awards

Clean Air Excellence Awards

Green Power Leadership  
Awards

National Award for Smart  
Growth Achievement

President's Environmental  
Youth Award

## Montana's Smith River Algae Crowdsourcing Project

### Montana's Smith River Algae Crowdsourcing Project

*EPA Region 8, EPA, Montana Department of Environmental Quality, and Montana Fish, Wildlife and Parks*

State environmental agencies in Montana have received messages of public concern about the state of algae growth along the Smith River, a premier river recreation destination. Nitrogen and phosphorous pollution is a serious and pervasive problem throughout the US, resulting in nuisance algae growth and other water quality impacts. Collecting the information needed to evaluate algae growths along a 59-mile stretch of the river is a challenge. This project involves capturing crowdsourced data by asking the public to provide critical information about the river during float season. By collecting photographs and documenting algae along the river, citizen scientists will provide information that state agencies can use to determine potential causes and solutions. Project success will demonstrate that a collaborative partnership between citizens and state and federal programs can contribute meaningfully to scientific investigation and problem-solving.

**Project lead:** Jason Gildea ([Gildea.jason@Epa.gov](mailto:Gildea.jason@Epa.gov))



AMERICA'S RIVERS

THREATS & SOLUTIONS

DONATE NOW

MAKE AN IMPACT

### OUR OBLIGATION TO THE SMITH

*Guido protects rivers for a living, but when a proposed mine threatens the river his family has recreated on for decades, it hits too close to home.*

Scott Bosse | September 7, 2016



Guest post by Guido Rahr is a part of our America's Most Endangered Rivers® series spotlighting the [Smith River](#).



Our family has had a ranch on the Smith River for almost 40 years. It is nestled in a broad valley, perched 800 feet above the river. From

### THE AUTHOR



**Scott Bosse**  
Director, Northern Rockies  
[Learn more about Scott Bosse](#)

**Outside**  
MAGAZINE • TELEVISION • ONLINE

Outside magazine named American Rivers one of the best groups to support in 2017!

DONATE TODAY >

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www.gbif.org

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GBIF | Global Biodiversity Information Facility

# Free and open access to biodiversity data

OCCURRENCES SPECIES DATASETS PUBLISHERS RESOURCES

Search

WHAT IS GBIF? ABOUT GBIF UNITED STATES OF AMERICA

Polar bears (*Ursus maritimus*) by Sandra Eglite via iNaturalist. Photo

Occurrence records  
1,019,500,078

Datasets  
41,146

Publishing institutions  
1,275

Species  
Learn more about the number of species covered by data in GBIF.org.



Student award winner investigates climate-driven changes to seaweed distribution...

25 September 2018



Global bans on bird trade needed to stop invasions

5 October 2018



Student award winner explores innovative methods of producing more reliable ecological niche models for highly mobile species



Training through e-learning: guiding example from GBIF  
Experiences with choosing and setting up a learning platform for training in the



Big data for biodiversity: GBIF.org surpasses 1 billion species occurrences

6 July 2018



# Citizen Science is Awesome!



## What is GBIF?

*GBIF—the Global Biodiversity Information Facility—is an international network and research infrastructure funded by the world’s governments and aimed at providing anyone, anywhere, open access to data about all types of life on Earth.*



Scarlet Macaw (*Ara macao*) by Yeanina Cruz. Photo licensed under CC BY-NC 4.0.

GBIF—the Global Biodiversity Information Facility—is an international network and research infrastructure funded by the world’s governments and aimed at providing anyone, anywhere, open access to data about all types of life on Earth.

Coordinated through its Secretariat in Copenhagen, the [GBIF network of participating countries and organizations](#), working through participant nodes, provides data-holding institutions around the world with common standards and open-source tools that enable them to share information about where and when species have been recorded. This knowledge derives from many sources, including everything from museum specimens collected in the 18th and 19th century to geotagged smartphone photos shared by amateur naturalists in recent days and weeks.

Occurrence records

1,019,500,078

GBIF | Global Biodiversity Information Facility

# Free and open access to biodiversity data

OCCURRENCES

SPECIES

DATASETS

PUBLISHERS

RESOURCES

Search



WHAT IS GBIF?

ABOUT GBIF UNITED STATES OF AMERICA

*Hycleus versutus* observed in Klein Windhoek, Namibia by Peter Erb. Photo via iNaturalist

Occurrence records  
1,321,853,539

Datasets  
45,082

Publishing institutions  
1,411

Peer-reviewed papers using data  
3,715



News

Angola becomes the newest member of the GBIF network  
20 May 2019



Data use

On the evolution of food customs  
4 June 2019



News

2019 GBIF Ebbe Nielsen Challenge seeks open-data innovations for biodiversity  
Deadline: 1 August 2019



News

Data mobilization and capacity building essential to address global biodiversity crisis  
6 May 2019





# Citizen Science is Awesome!

Search

https://www.gbif.org/occurrence/search?state\_province=minnesota&advanced=1

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Occurrences

SEARCH OCCURRENCES | 3,591,011 RESULTS

TABLE GALLERY MAP TAXONOMY METRICS DOWNLOAD

Scientific name	Country or area	Coordinates	Month & year	Basis of record	Dataset
<i>Sporophoron americanum</i> (Lendeme...	United States of Ameri...	43.5N, 91.4W	2018 January	Preserved specimen	The New York Botanical Garden Herbariu...
<i>Phellinus tremulae</i> (Bondartsev) Bondart...	United States of Ameri...	47.4N, 91.2W	2018 January	Human observation	iNaturalist Research-grade Observations
<i>Passer domesticus</i> (Linnaeus, 1758)	United States of Ameri...	44.6N, 92.5W	2018 January	Human observation	iNaturalist Research-grade Observations
<i>Cygnus buccinator</i> Richardson, 1831	United States of Ameri...	45.3N, 93.8W	2018 January	Human observation	iNaturalist Research-grade Observations
<i>Cypripedium parviflorum</i> Salisb.	United States of Ameri...	46.2N, 93.9W	2018 January	Human observation	iNaturalist Research-grade Observations
<i>Canis lupus</i> Linnaeus, 1758	United States of Ameri...	47.4N, 95.3W	2018 January	Human observation	iNaturalist Research-grade Observations
<i>Thuja occidentalis</i> L.	United States of Ameri...	46.8N, 92.0W	2018 January	Human observation	iNaturalist Research-grade Observations
<i>Acanthis flammea</i> (Linnaeus, 1758)	United States of Ameri...		2018 January	Human observation	iNaturalist Research-grade Observations
<i>Poecile atricapillus</i> (Linnaeus, 1766)	United States of Ameri...	44.9N, 93.4W	2018 January	Human observation	iNaturalist Research-grade Observations
<i>Aplosporina morbosae</i> (Schwein.) Arx	United States of Ameri...	47.4N, 91.2W	2018 January	Human observation	iNaturalist Research-grade Observations
<i>Sitta carolinensis</i> Latham, 1790	United States of Ameri...	46.5N, 95.6W	2018 January	Human observation	iNaturalist Research-grade Observations
<i>Picea mariana</i> Britton, Sterns & Poggenb.	United States of Ameri...	47.7N, 91.5W	2018 January	Human observation	iNaturalist Research-grade Observations
<i>Erethizon dorsatus</i> (Linnaeus, 1758)	United States of Ameri...	46.4N, 93.6W	2018 January	Human observation	iNaturalist Research-grade Observations
<i>Strix varia</i> Barton, 1799	United States of Ameri...	44.9N, 93.4W	2018 January	Human observation	iNaturalist Research-grade Observations

minnesota

CLEAR

Repatiated

Protocol

https://www.gbif.org/occurrence/1805419663

# Citizen Science is Awesome!

Search

https://www.gbif.org/occurrence/search?state\_province=wisconsin&advanced=1

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Occurrences

SEARCH OCCURRENCES | 8,691,827 RESULTS

TABLE GALLERY MAP TAXONOMY METRICS DOWNLOAD

	Scientific name	Country or area	Coordinates	Month & year	Basis of record	Dataset
Type status	<i>Odocoileus virginianus</i> (Zimmermann, 17...	United States of Ameri...	43.0N, 89.6W	2018 January	Human observation	iNaturalist Research-grade Observations
Recorded by	<i>Canis latrans</i> Say, 1823	United States of Ameri...	43.0N, 89.4W	2018 January	Human observation	iNaturalist Research-grade Observations
Record number	<i>Physcia stellaris</i> (L.) Nyl.	United States of Ameri...	42.6N, 88.3W	2018 January	Human observation	iNaturalist Research-grade Observations
Occurrence id	<i>Anas platyrhynchos</i> Linnaeus, 1758	United States of Ameri...	45.0N, 92.8W	2018 January	Human observation	iNaturalist Research-grade Observations
Organism id	<i>Cyanocitta cristata</i> Linnaeus, 1758	United States of Ameri...	43.1N, 89.5W	2018 January	Human observation	iNaturalist Research-grade Observations
Publishing country or area	<i>Celtis occidentalis</i> L.	United States of Ameri...	43.1N, 88.9W	2018 January	Human observation	iNaturalist Research-grade Observations
Elevation	<i>Micropterus salmoides</i> (Lacepède, 1802)	United States of Ameri...	43.0N, 89.7W	2018 January	Human observation	iNaturalist Research-grade Observations
Depth	<i>Canis latrans</i> Say, 1823	United States of Ameri...	43.2N, 87.9W	2018 January	Human observation	iNaturalist Research-grade Observations
Locality	<i>Betula alleghaniensis</i> Britton	United States of Ameri...	43.1N, 88.9W	2018 January	Human observation	iNaturalist Research-grade Observations
Water body	<i>Accipiter</i> Brisson, 1760	United States of Ameri...	44.3N, 88.4W	2018 January	Human observation	iNaturalist Research-grade Observations
State province	<i>Punctelia rufecta</i> (Ach.) Krog	United States of Ameri...	42.6N, 88.3W	2018 January	Human observation	iNaturalist Research-grade Observations
Search	<i>Lepomis macrochirus</i> Rafinesque, 1819	United States of Ameri...	43.0N, 89.7W	2018 January	Human observation	iNaturalist Research-grade Observations
CLEAR	<i>Cardinalis cardinalis</i> Linnaeus, 1758	United States of Ameri...	42.8N, 88.7W	2018 January	Human observation	iNaturalist Research-grade Observations
Repatriated	<i>Canis latrans</i> Say, 1823	United States of Ameri...		2018 January	Human observation	iNaturalist Research-grade Observations
Protocol						



# Citizen Science is Awesome!

Search

https://www.gbif.org/occurrence/search?state\_province=michigan&advanced=1

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Occurrences 1

SEARCH OCCURRENCES | 8,922,659 RESULTS

TABLE GALLERY MAP TAXONOMY METRICS DOWNLOAD

	Scientific name	Country or area	Coordinates	Month & year	Basis of record	Dataset
Catalog number	<i>Baeolophus bicolor</i> (Linnaeus, 1766)	United States of Ameri...	42.5N, 83.9W	2018 January	Human observation	iNaturalist Research-grade Observations
Type status	<i>Junco hyemalis</i> Linnaeus, 1758	United States of Ameri...	42.4N, 83.9W	2018 January	Human observation	iNaturalist Research-grade Observations
Recorded by	<i>Cygnus buccinator</i> Richardson, 1831	United States of Ameri...	42.9N, 86.2W	2018 January	Human observation	iNaturalist Research-grade Observations
Record number	<i>Baeolophus bicolor</i> (Linnaeus, 1766)	United States of Ameri...	42.5N, 83.8W	2018 January	Human observation	iNaturalist Research-grade Observations
Occurrence id	<i>Anas platyrhynchos</i> Linnaeus, 1758	United States of Ameri...	42.5N, 83.8W	2018 January	Human observation	iNaturalist Research-grade Observations
Organism id	<i>Melanerpes erythrocephalus</i> (Linnaeus, 1...	United States of Ameri...	42.4N, 85.4W	2018 January	Human observation	iNaturalist Research-grade Observations
Publishing country or area	<i>Sialia sialis</i> (Linnaeus, 1758)	United States of Ameri...	42.4N, 85.4W	2018 January	Human observation	iNaturalist Research-grade Observations
Elevation	<i>Cygnus olor</i> (Gmelin, 1789)	United States of Ameri...	42.5N, 83.8W	2018 January	Human observation	iNaturalist Research-grade Observations
Depth	<i>Spizelloides arborea</i> (A. Wilson, 1810)	United States of Ameri...	42.4N, 85.4W	2018 January	Human observation	iNaturalist Research-grade Observations
Locality	<i>Branta canadensis</i> (Linnaeus, 1758)	United States of Ameri...	42.5N, 83.8W	2018 January	Human observation	iNaturalist Research-grade Observations
Water body	<i>Cardinalis cardinalis</i> Linnaeus, 1758	United States of Ameri...	42.9N, 85.6W	2018 January	Human observation	iNaturalist Research-grade Observations
State province	<i>Cardinalis cardinalis</i> Linnaeus, 1758	United States of Ameri...	42.4N, 84.0W	2018 January	Human observation	iNaturalist Research-grade Observations
Search	<i>Picoides pubescens</i> (Linnaeus, 1766)	United States of Ameri...	42.5N, 84.2W	2018 January	Human observation	iNaturalist Research-grade Observations
CLEAR	<i>Passer domesticus</i> (Linnaeus, 1758)	United States of Ameri...	42.6N, 82.9W	2018 January	Human observation	iNaturalist Research-grade Observations
Repatriated						
Protocol						

https://www.gbif.org/occurrence/search?state\_province=michigan&advanced=1

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Occurrences 1

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TABLE GALLERY MAP TAXONOMY METRICS DOWNLOAD

Scientific name	Country or area	Coordinates	Month & year	Basis of record	Dataset
<i>Cygnus columbianus</i> Ord, 1815	United States of Ameri...	42.5N, 82.7W	1907 March	Preserved specimen	Ornithology Collection Non Passeriforme...

Institution code  
Collection code  
Catalog number  
Type status  
Recorded by  
Record number  
Occurrence id  
Organism id  
Publishing country or area  
Elevation  
Depth  
Locality  
Water body  
State province  
☒ ontario  
Repatriated  
Protocol

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Occurrences

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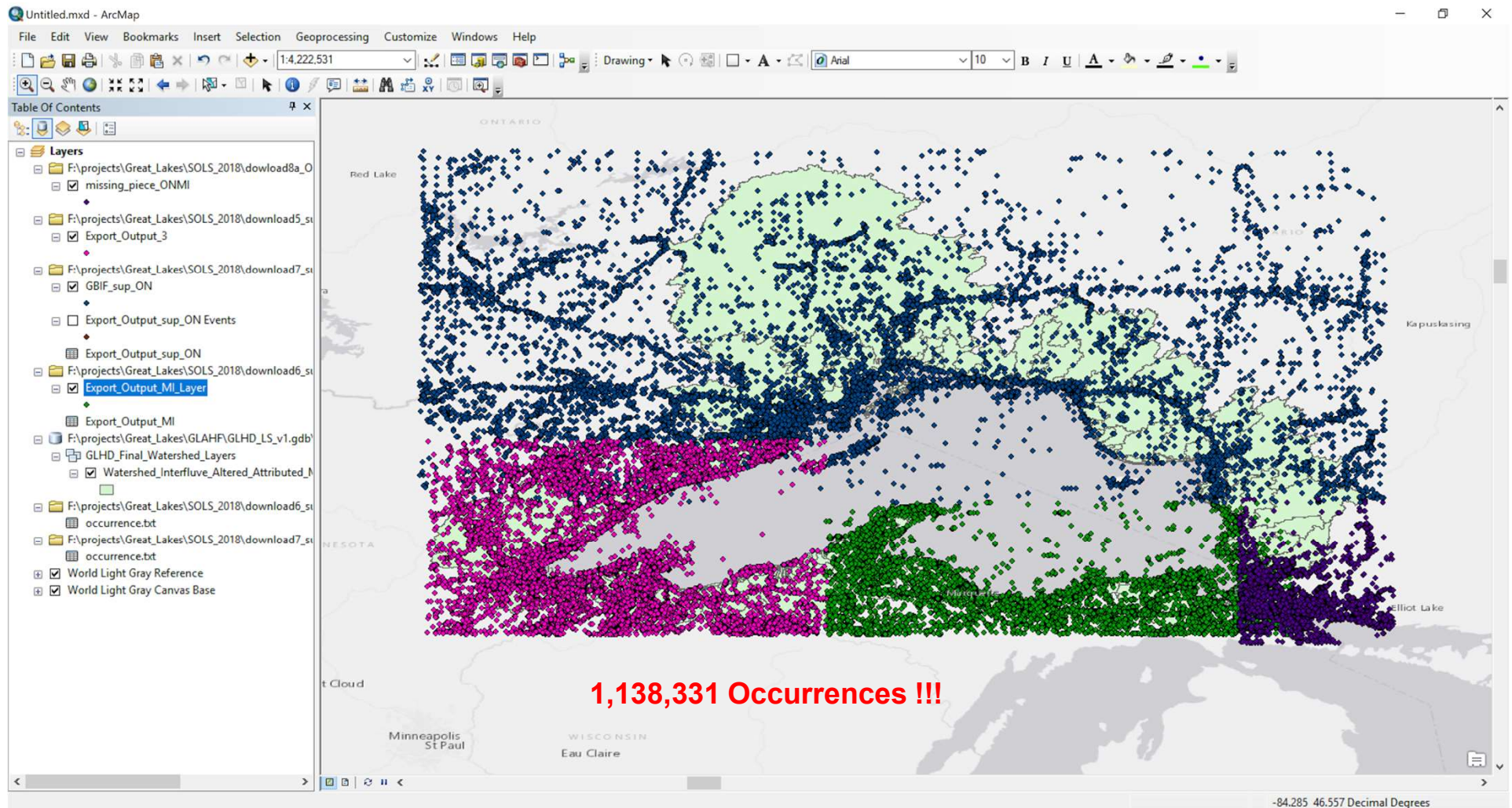
TABLE GALLERY MAP TAXONOMY METRICS DOWNLOAD

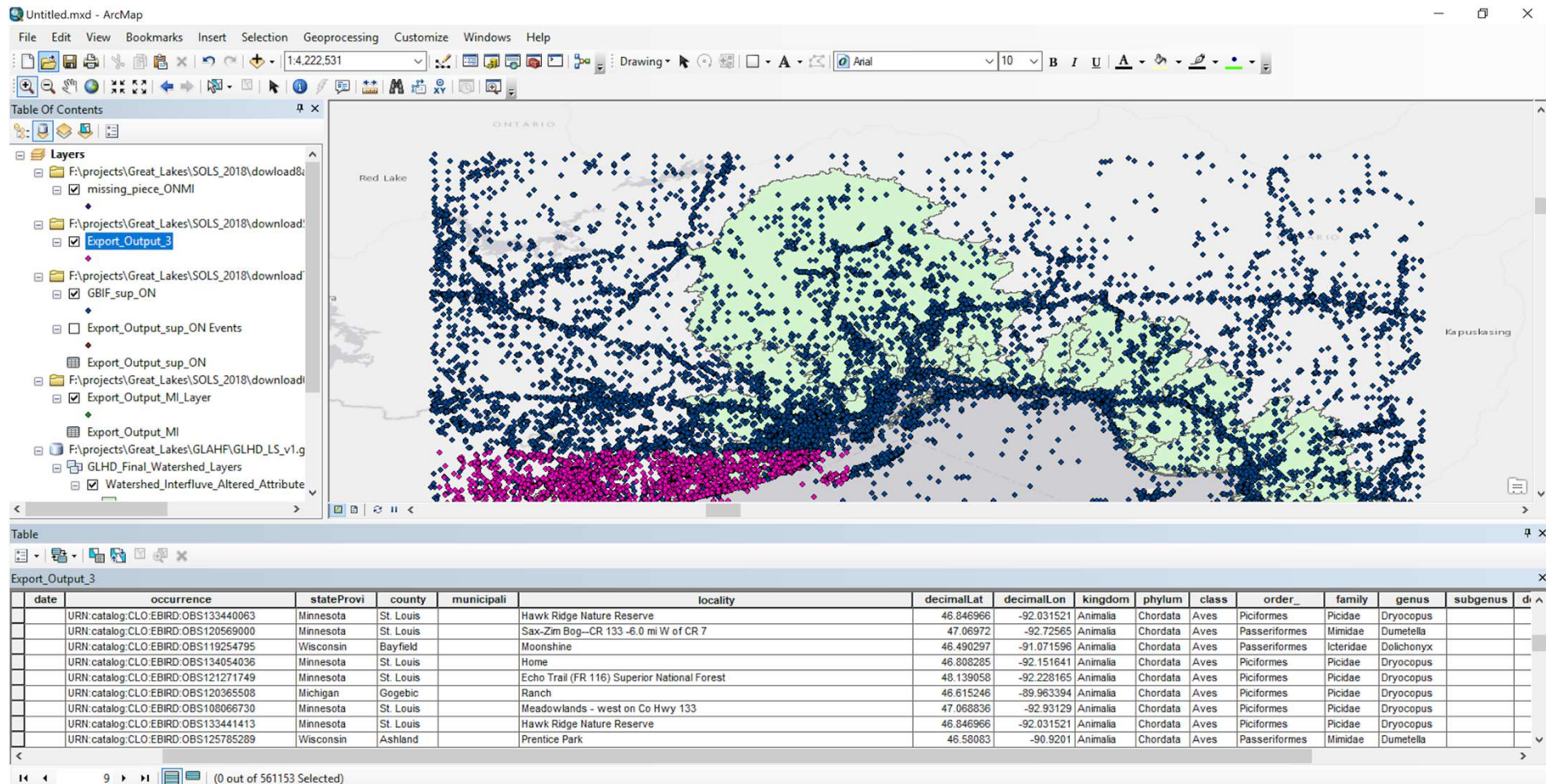
	Scientific name	Country or area	Coordinates	Month & year	Basis of record	Dataset
Collection code	<i>Baeolophus bicolor</i> (Linnaeus, 1766)	Canada	43.3N, 79.8W	2018 January	Human observation	iNaturalist Research-grade Observations
Catalog number	<i>Turdus migratorius</i> Linnaeus, 1766	Canada	43.6N, 79.6W	2018 January	Human observation	iNaturalist Research-grade Observations
Type status	<i>Branta canadensis</i> (Linnaeus, 1758)	Canada	43.3N, 79.8W	2018 January	Human observation	iNaturalist Research-grade Observations
Recorded by	<i>Calcarius lapponicus</i> (Linnaeus, 1758)	Canada	44.5N, 80.2W	2018 January	Human observation	iNaturalist Research-grade Observations
Record number	<i>Plectrophenax nivalis</i> (Linnaeus, 1758)	Canada	44.4N, 80.0W	2018 January	Human observation	iNaturalist Research-grade Observations
Occurrence id	<i>Larus argentatus</i> subsp. <i>smithsonianus</i> C...	Canada	43.3N, 79.8W	2018 January	Human observation	iNaturalist Research-grade Observations
Organism id	<i>Spizelloides arborea</i> (A. Wilson, 1810)	Canada	43.6N, 79.5W	2018 January	Human observation	iNaturalist Research-grade Observations
Publishing country or area	<i>Aythya marila</i> (Linnaeus, 1761)	Canada	43.3N, 79.8W	2018 January	Human observation	iNaturalist Research-grade Observations
Elevation	<i>Phragmites australis</i> subsp. <i>australis</i> (Ca...	Canada	44.3N, 78.2W	2018 January	Human observation	iNaturalist Research-grade Observations
Depth	<i>Phragmites australis</i> subsp. <i>australis</i> (Ca...	Canada	44.3N, 78.1W	2018 January	Human observation	iNaturalist Research-grade Observations
Locality	<i>Phragmites australis</i> subsp. <i>australis</i> (Ca...	Canada	44.3N, 78.2W	2018 January	Human observation	iNaturalist Research-grade Observations
Water body	<i>Schizachyrium scoparium</i> (Michx.) Nash	Canada	44.8N, 78.0W	2018 January	Human observation	iNaturalist Research-grade Observations
State province	<i>Mergus mercans</i> Linnaeus, 1758	Canada	45.4N, 75.8W	2018 January	Human observation	iNaturalist Research-grade Observations
Search	<i>Fagus grandifolia</i> Ehrh.	Canada	45.3N, 75.8W	2018 January	Human observation	iNaturalist Research-grade Observations

CLEAR

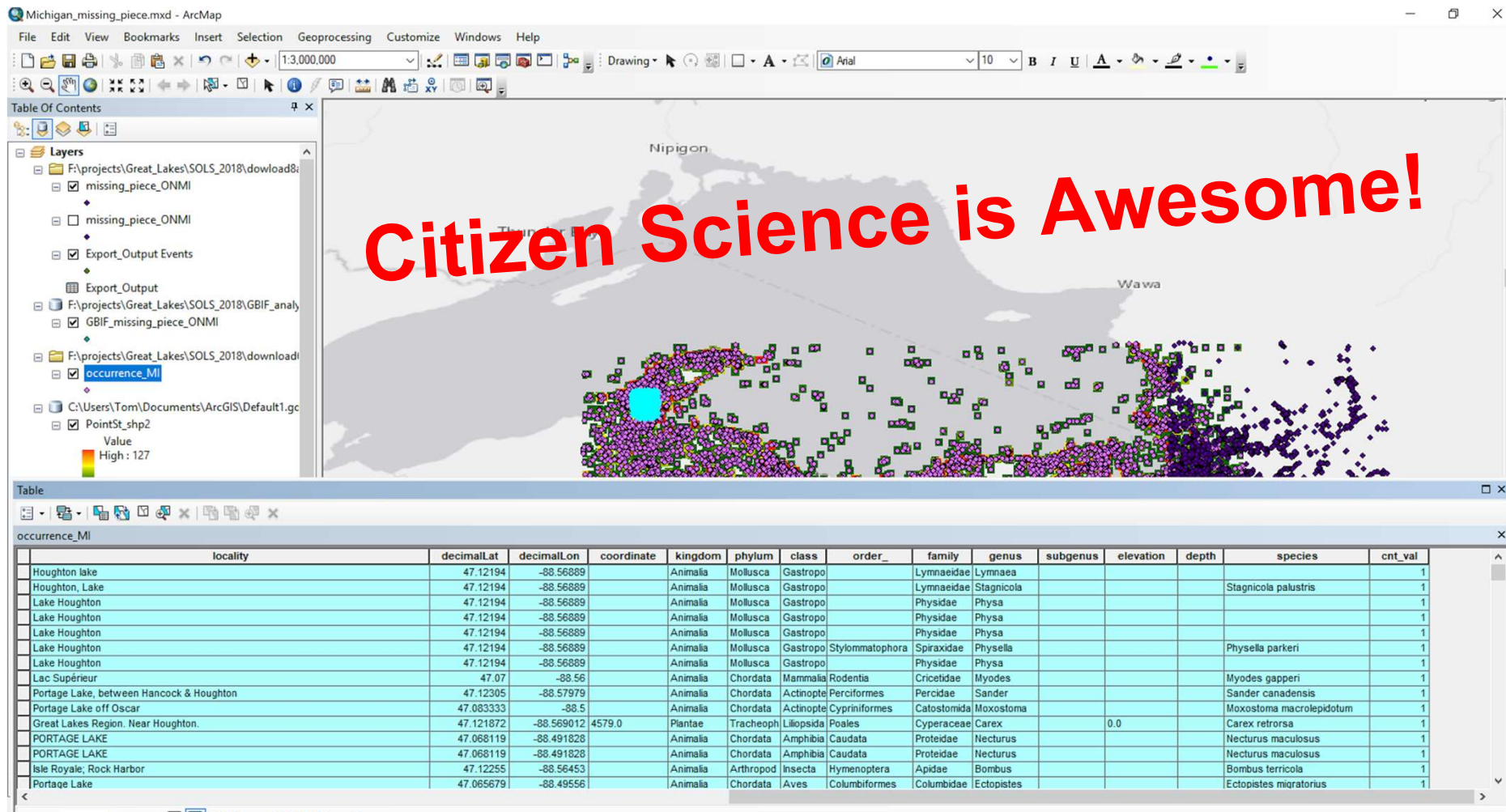
https://www.gbif.org/occurrence/search?state\_province=ontario&advanced=1







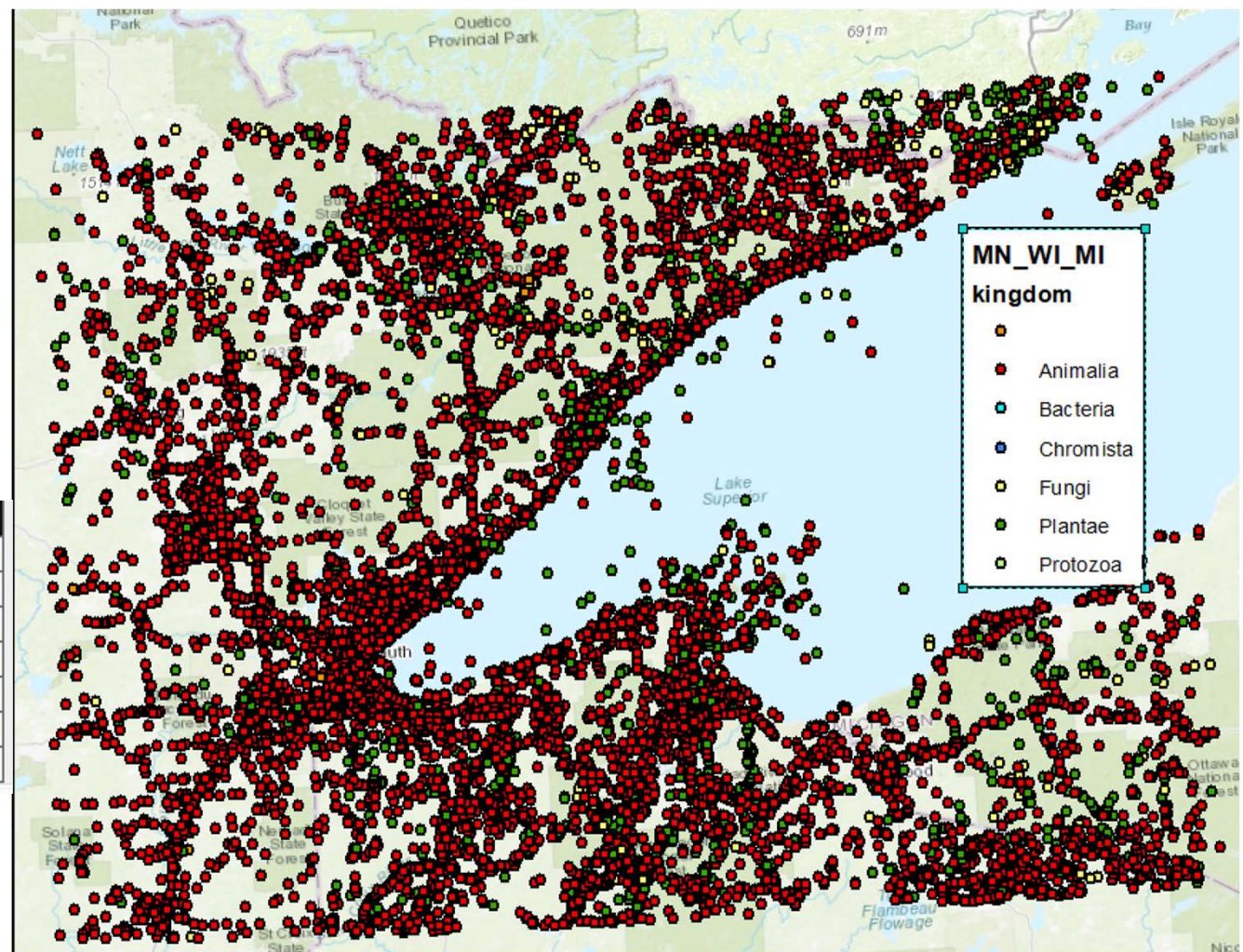


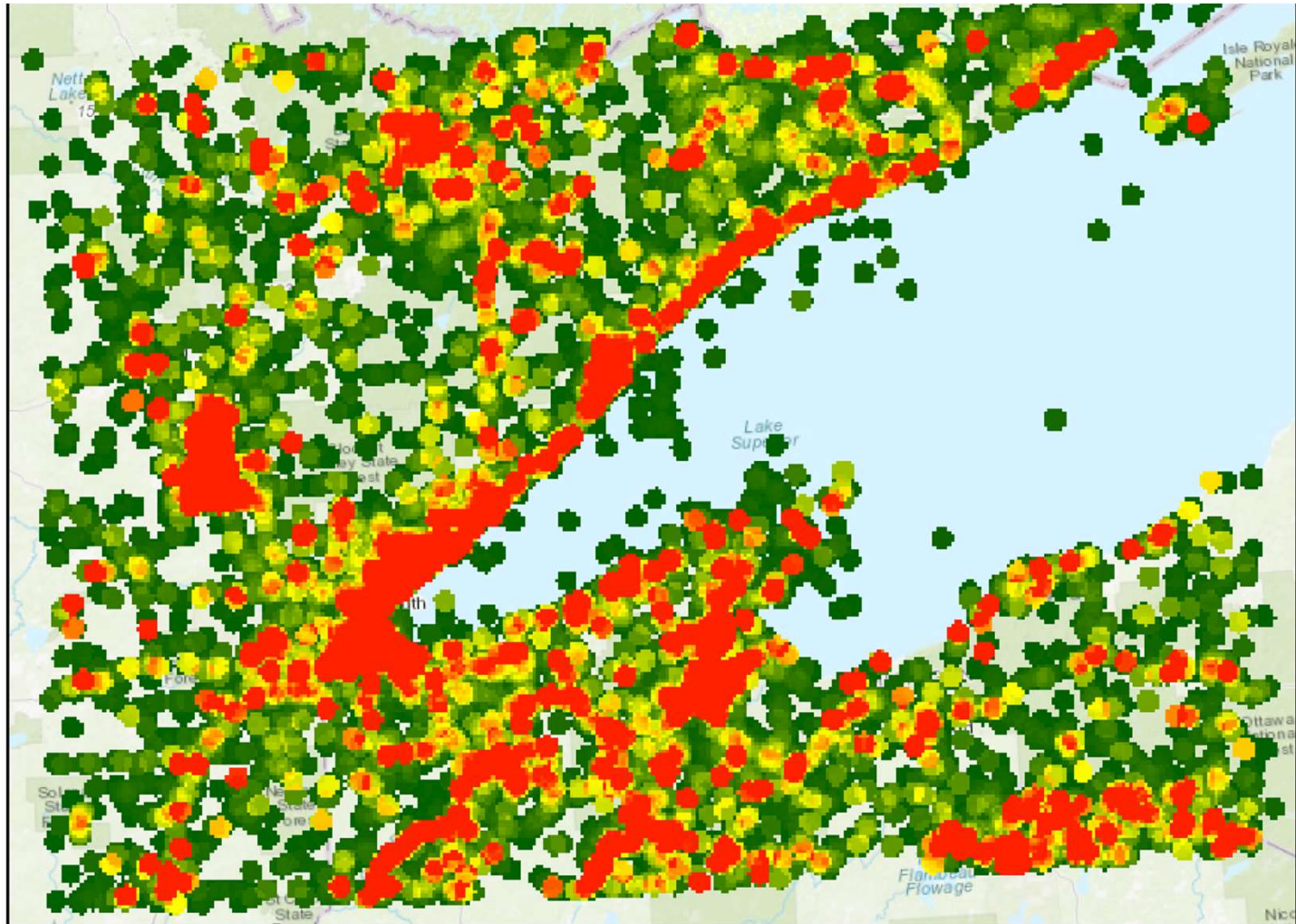




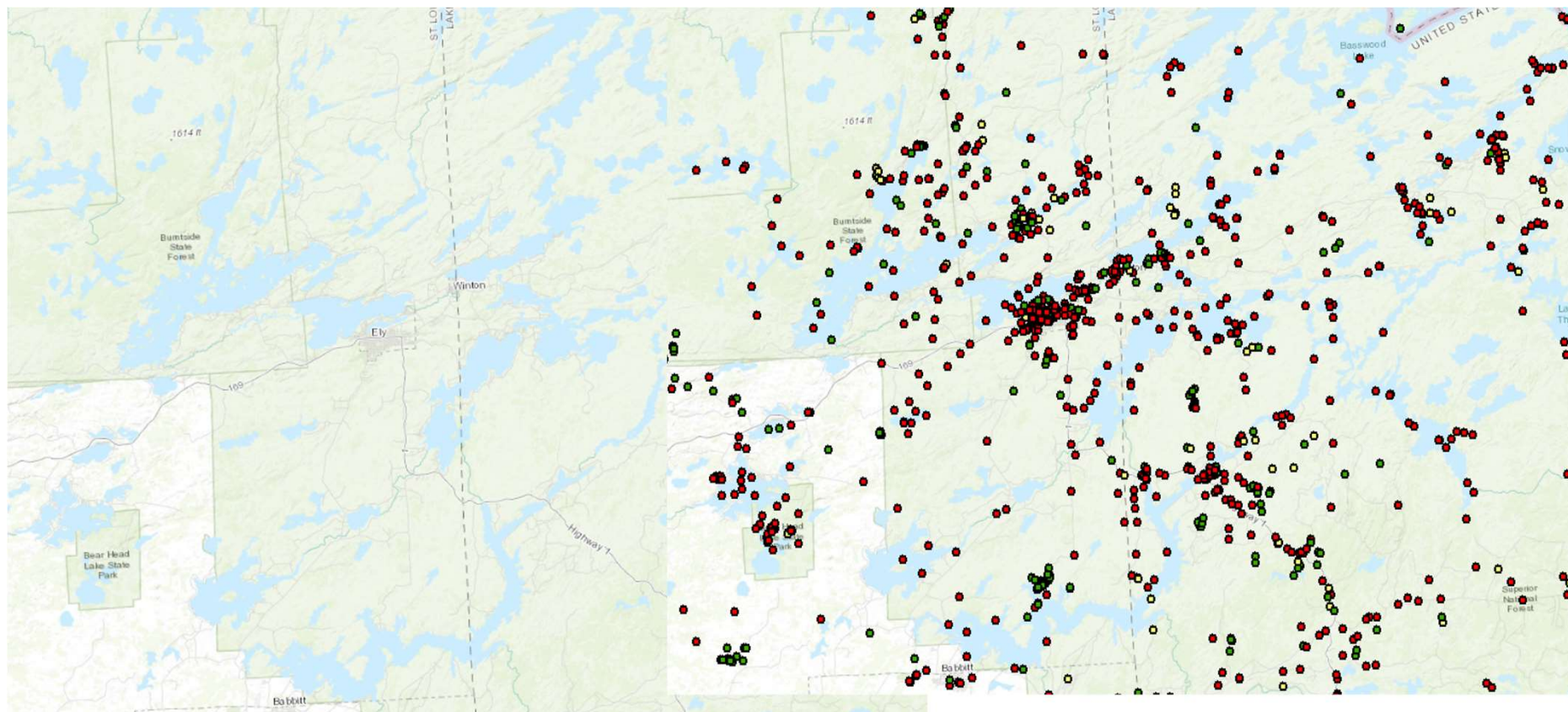
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Fungi	1526
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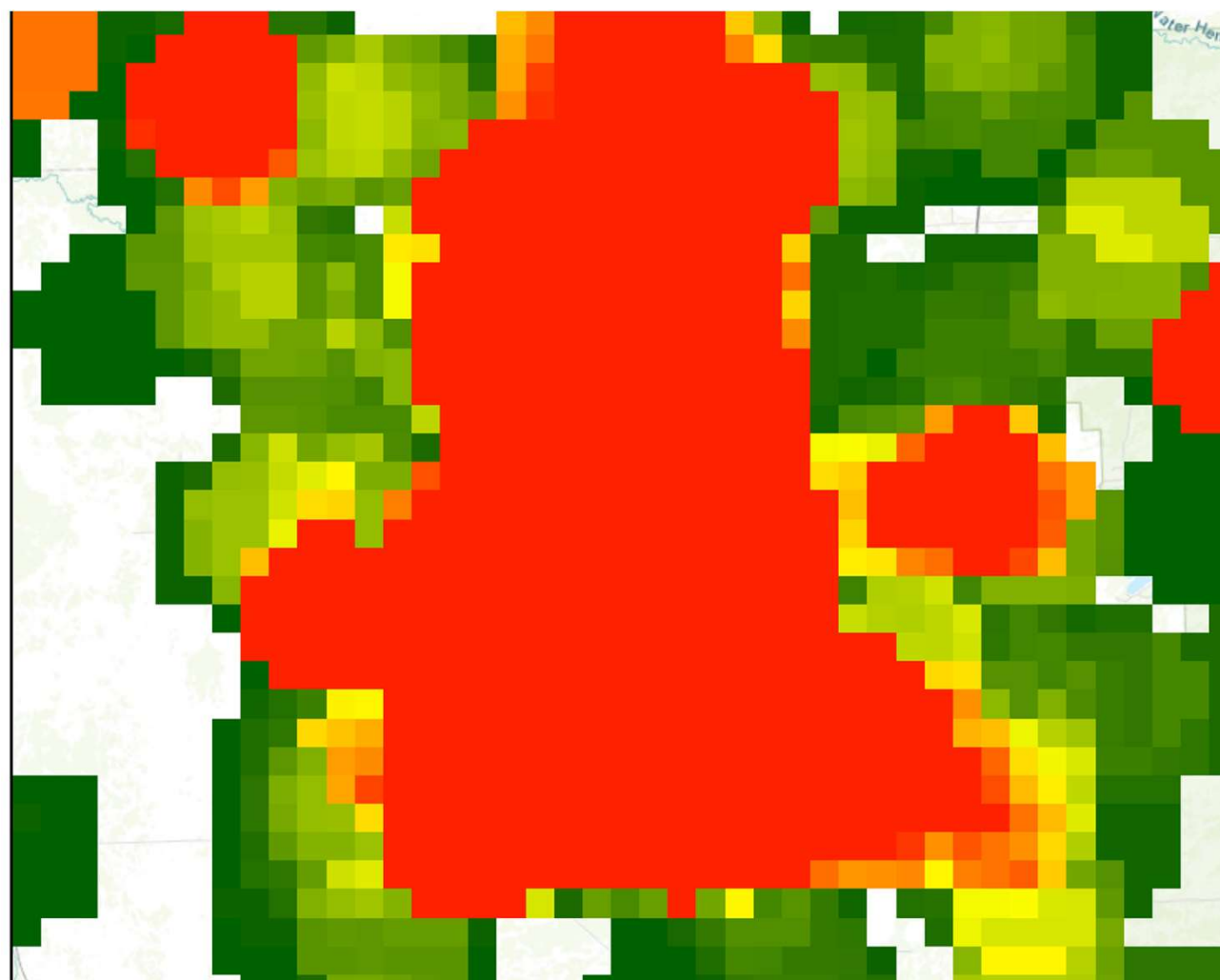


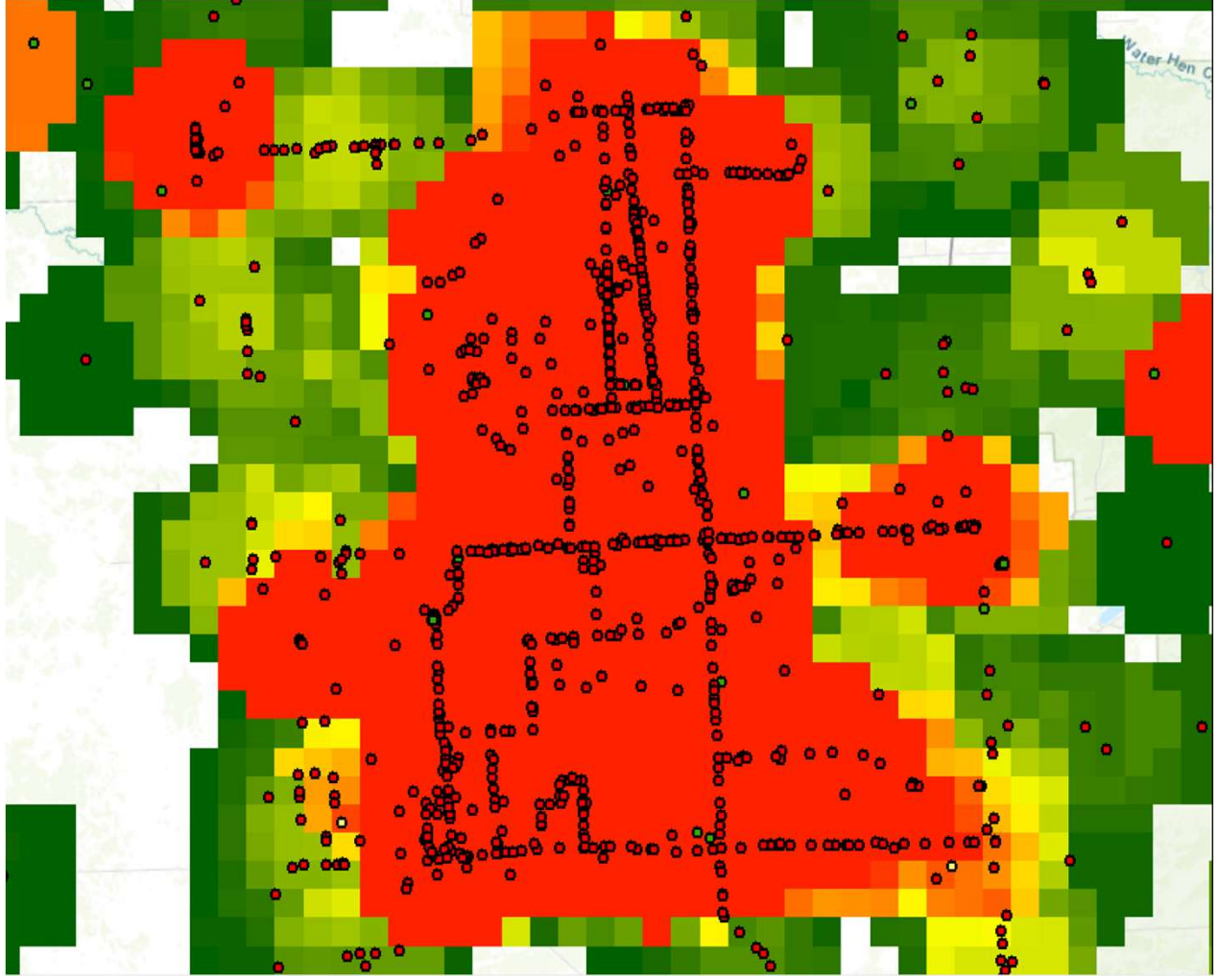


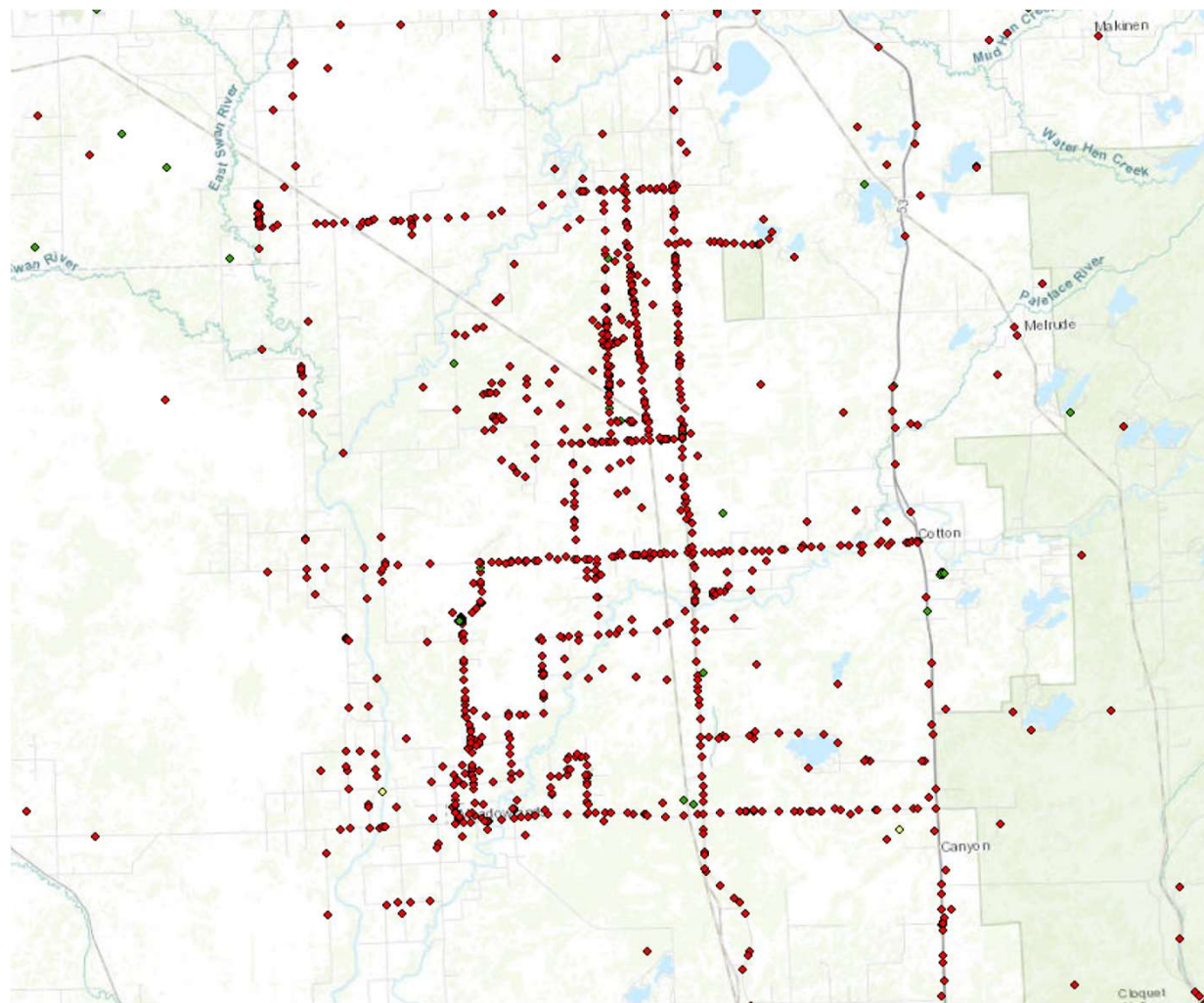














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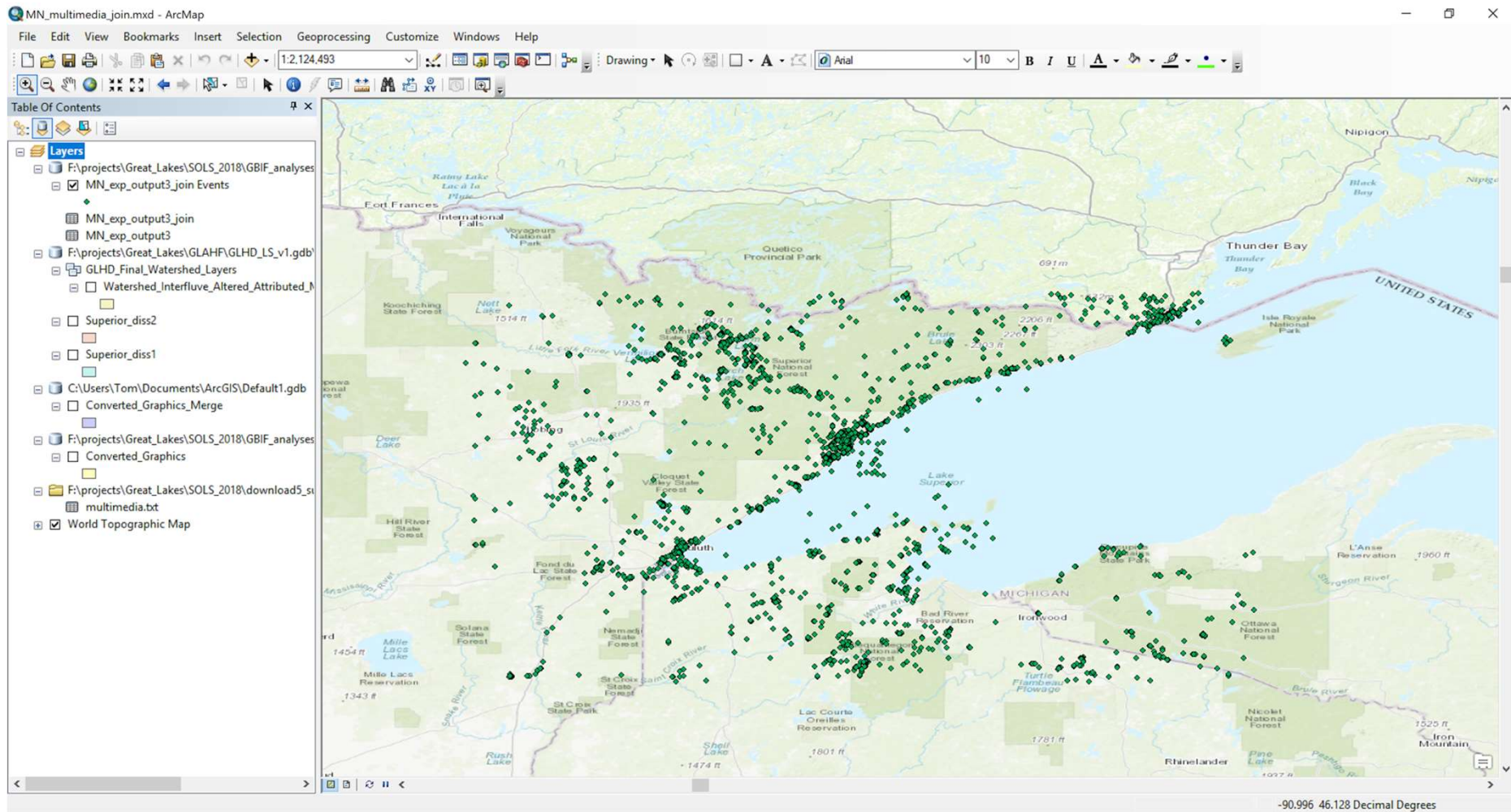
<

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With taxon match: 99.9 %

There are fossils among your results. That can mean species occurrences at unexpected locations





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municipali	
locality	
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scientific	
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phylum	Tracheophyta
class	Magnoliopsida
order	Sapindales
family	Anacardiaceae
genus	Toxicodendron
subgenus	
depth	
species	Toxicodendron rydbergii
change	Print



# Western Poison Ivy (*Toxicodendron rydbergii*)

Research Grade



bruce55803

191 observations

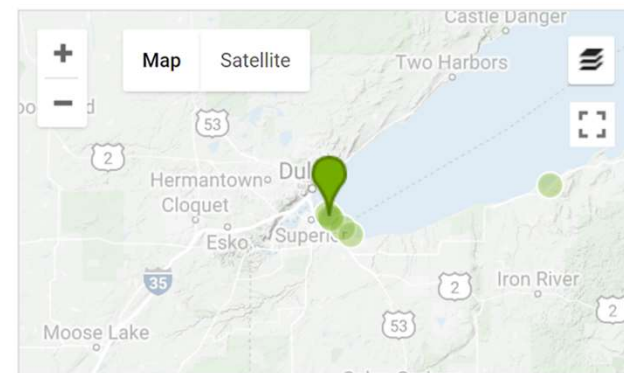


Observed:

Apr 16, 2017 · 10:44 AM CDT

Submitted:

Apr 16, 2017 · 5:45 PM CDT





HERBARIUM OF THE  
UNIVERSITY OF MINNESOTA  
MINNEAPOLIS

Plants of Minnesota Paint.

1681. *Alnus crispa* (Russh) Kuntz

A thicket in a hollow of sand dunes, 18<sup>th</sup> Street, on Minnesota Avenue, Duluth, Minnesota.

Aug. 8, 1936. Olga Lakela.





# Biology Department

UNIVERSITY OF MINNESOTA DULUTH

## The Olga Lakela Herbarium

### Introduction

The Olga Lakela Herbarium is located in the Department of Biology, Life Science Building, University of Minnesota-Duluth. It is an expanding collection of more than 40,000 dried botanical specimens that are housed in standard herbarium cabinets. Almost all of the specimens were collected from populations of native or naturalized vascular plants. In addition, there are small collections of algae, mosses, lichens, and fleshy fungi. Most of the specimens were collected in northeastern Minnesota, including Voyageurs National Park, Grand Portage National Monument, and Boundary Waters Canoe Area Wilderness. Other areas represented include other portions of Minnesota, Wisconsin, Florida, Illinois, Iowa, Ontario, and various western United States. The herbarium was founded by and is named for Dr. Olga Lakela (1890-1980), a native of Finland who emigrated to northeastern Minnesota as a child. She earned a Ph.D. in botany from the University of Minnesota and was the first Biology Department Head on the Duluth campus. Approximately 30,000 of our specimens were collected by Dr. Lakela, and her extensive work in St. Louis and Lake counties, Minnesota is summarized in her book, *A Flora of Northeastern Minnesota* (1965, University of Minnesota Press). Olga Lakela founded this herbarium in 1935, and the University named it after her in 1960. A bequest from Dr. Lakela supports the maintenance and growth of the collection, as well as botanical research at UMD. In the fall of 1997, development of an electronic database for the collection began.

Dr. Paul Monson (1925-2003) succeeded Dr. Lakela as curator after he earned a Ph.D. in botany from Iowa State University. Thousands of his specimens, mostly from the north-central United States, are deposited in this herbarium.



*Dr. Olga Lakela at the University of Minnesota - Duluth, 1952*



## Audubon Climate Watch

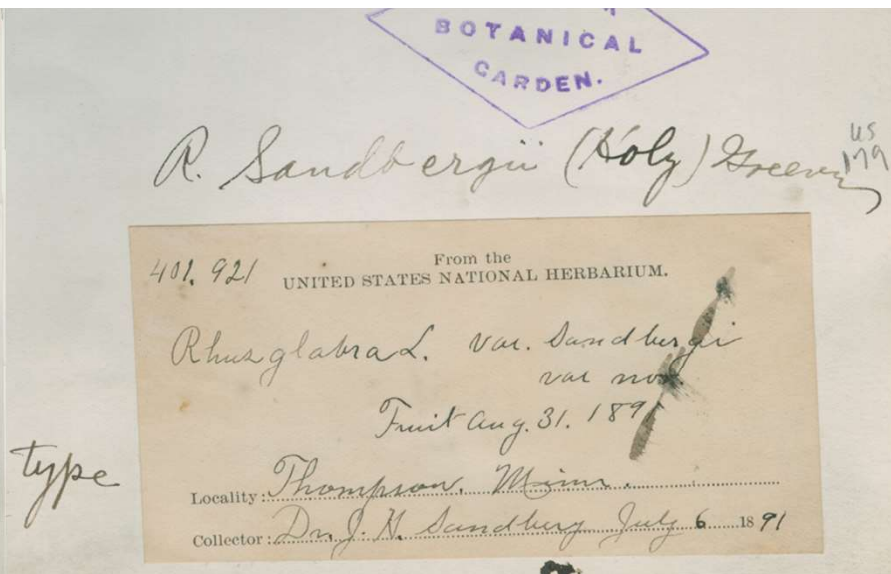
*A new citizen science  
collaboration*











ROGRAM



Kewscience | Plants of the World online

*Rhus sandbergii* Greene

This is a synonym of *Rhus glabra* L.

# Field Book Project

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## April 2011

MONDAY, 25 APRIL 2011

### Preservation Week at the Field Book Project blog

By [Nora Lockshin, Paper Conservator, Smithsonian Institution Archives](#)



Varying formats of journals, shown shelved by author.



Deteriorated journal (Sandberg, J.H. [Idaho 1892]) and its accompanying list of specimens on onionskin letter paper.

### [Field Book Project Website](#)

*The Field Book Project is an initiative to increase accessibility to field book content that documents natural history. Through ongoing partnerships within and beyond the Smithsonian Institution, the Project is making field books easier to find and available in a digital format for current research, as well as inspiring new ways of utilizing these rich information resources.*

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# Josephine Tilden

From Wikipedia, the free encyclopedia

**Josephine Elizabeth Tilden** (March 24, 1869 – May 15, 1957) was an American expert on pacific [algae](#). She was the first woman scientist employed by the [University of Minnesota](#). Tilden established a [research station](#) in British Columbia which lasted only until 1906. When Tilden became an assistant Professor in 1903, she was the first female scientist employed by the [University of Minnesota](#).<sup>[1]</sup> In 1910, despite not having a doctorate, Tilden was promoted to full professor.

Tilden traveled widely and particularly around the Pacific Ocean to collect unusual samples of [flora](#). Tilden also created an important collection of algae which she took from the university and kept in her house for further study after she retired.

Contents [hide]

1 Life

2 Selected Publications

3 Legacy

4 References

5 External links

## Life [ edit ]



Tilden was born in [Davenport, Iowa](#) and grew up in [Minneapolis](#).<sup>[1]</sup> She showed an early interest in plants and she had published a paper on the local [botany](#)<sup>[2]</sup> before she began her association with the University of Minnesota. In 1895, she earned a bachelor's degree followed by a masters the following year from the university.<sup>[3]</sup> In 1897 she wrote a paper on algal stalactites, a phenomenon that she had discovered near a [geyser](#) in [Yellowstone Park](#).<sup>[4]</sup>

She became an instructor at her alma mater, where she took a peculiar interest in [algology](#), becoming the first woman scientist on the staff.<sup>[1]</sup> Her superiors at the university were concerned, but they agreed to fund this interest in return for her promise to commit to the subject for at least five years. In fact, Tilden gave a commitment that would last until she died. Her first trip to the Pacific was a journey to [Vancouver Island](#). On many of these journeys she was accompanied by her mother.

<sup>[1]</sup>

Josephine Tilden



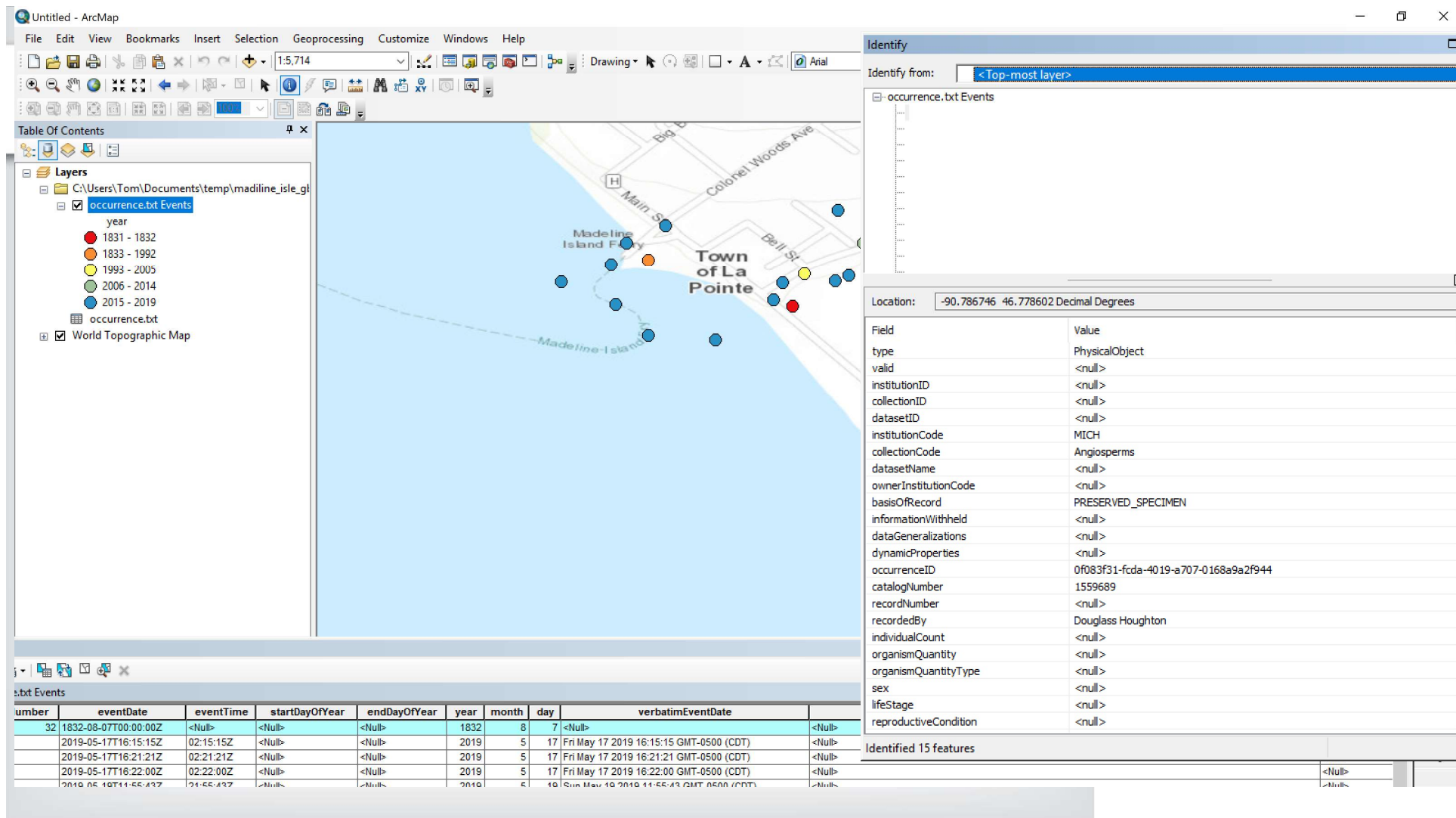
Tilden as part of a survey team

<b>Born</b>	Josephine Elizabeth Tilden March 24, 1869 <a href="#">Davenport, Iowa, US</a>
<b>Died</b>	May 15, 1957 (aged 88) Florida, US
<b>Nationality</b>	American
<b>Education</b>	University of Minnesota
<b>Occupation</b>	Researcher and academic
<b>Employer</b>	University of Minnesota
<b>Known for</b>	Algology and travel

# The Enduring Legacy of Josephine Tilden









# Douglass Houghton

American geologist



Douglass Houghton was an American geologist and physician, primarily known for his exploration of the Keweenaw Peninsula of Michigan. It was the site of a copper boom and extensive copper mining beginning in the 19th century. [Wikipedia](#)

**Born:** September 21, 1809, Troy, NY

**Died:** October 13, 1845

**Education:** Rensselaer Polytechnic Institute

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## Galeopsis tetrahit

Plants

Galeopsis tetrahit is a flowering plant in the family Lamiaceae, native to Europe and northwestern Asia. It is a herbaceous annual plant growing to 1 m tall; it is a pioneer species and thrives on disturbed sites or roadsides. The plant looks like mint but is taller. The stems have reflexed hairs and swollen nodes. [Wikipedia](#)

**Family:** [Lamiaceae](#)

**Scientific name:** Galeopsis tetrahit

**Rank:** Species

**Higher classification:** [Galeopsis](#)

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