



TO: 2023 Metro Area Envirothon Teachers/Advisors

FROM: Franny Gerde  
Metro Area Envirothon Coordinator

DATE: January 31st, 2023

RE: 2023 Metro Area Envirothon Study Guide

The 2023 Metro Area Envirothon for Junior High (grades 6-8) and Senior High (grades 9-12) teams will be held on **Thursday, April 27, 2023**, at the Elm Creek Park Chalet located at 12400 James Deane Pkwy, Maple Grove, MN 55369. This packet is the official study guide for the event.

Page 2 is a tentative schedule of events for the day, as well as a list of what the students should wear, and bring to the event. Students should be prepared for warm or cold weather.

On pages 3-5, you will find the study guides for each of the stations that the students will be expected to be familiar with. At each station, students will complete a 25-point test, which is based off these materials.

**Senior High Teams** (Grades 9-12) will also be required to give a 10-minute oral presentation. The oral presentation station will be worth 30 points. The link to the scenario and supporting documents can be found [here](#).

**Junior High Teams** will NOT give an Oral Presentation.

The top 3 Senior Division Envirothon teams will advance to the Minnesota State Envirothon, held on Monday, May 15, 2023, tentative location is Prairie Wetlands Learning Center in Fergus Falls. The winner of the State Envirothon will be representing Minnesota at the **NCF-Envirothon** in New Brunswick, Canada, July 23-29, 2023.

The Metro Area Envirothon registration will begin promptly 8:30 a.m. on Thursday, April 27, 2023, so please be on time. We will be taking team pictures in the morning after you register, which will take a few extra minutes. If you have any questions or concerns, please e-mail at [fgerde@sherburneswcd.org](mailto:fgerde@sherburneswcd.org) or call at **763-220-3434 x104**.

### Want more Envirothon Information?

Minnesota Envirothon [Website](#)

NCF-Envirothon (national event) [Website](#)

### *Sponsored by the Metro Area Soil and Water Conservation District's*

#### **Anoka CD**

1318 McKay Dr NE, STE 300  
Ham Lake, MN 55304

#### **Carver SWCD**

11360 Hwy. 212, STE 6  
Cologne, MN 55322

#### **Chisago SWCD**

33814 Third Ave  
North Branch, MN 55056

#### **Dakota SWCD**

4100 220th St. W  
Farmington, MN 55024

#### **Hennepin County**

701 4th Ave. S, STE 700  
Minneapolis, MN 55415

#### **Isanti SWCD**

110 Buchanan St. N.  
Cambridge, MN 55008

#### **Ramsey County**

2015 Van Dyke St.  
Maplewood, MN 55109

#### **Scott SWCD**

7151 W. 190th St.  
Jordan, MN 55352

#### **Sherburne SWCD**

425 Jackson Ave NW  
Elk River, MN 55330

#### **Washington CD**

455 Hayward Ave. N  
Oakdale, MN 55128

#### **Wright SWCD**

311 Brighton Ave. STE C  
Buffalo, MN 55313



**METRO AREA ENVIROTHON  
THURSDAY, APRIL 27, 2023**

Elm Creek Park Chalet  
12400 James Deane Pkwy  
Maple Grove, MN 55369

[Elm Creek Website](#)

**Tentative Schedule of Events**

8:30-9:00	Registration and Pictures
9:05-9:10	Overview and Introduction
9:15-9:45	First Learning Station
9:50-10:20	Second Learning Station
10:25-10:55	Third Learning Station
11:00-11:30	Fourth Learning Station
11:35-12:05	Fifth Learning Station (Junior Teams Last Station)
12:10-12:40	Sixth Learning Station (Junior Teams Eat Lunch—Bring your own)
12:45-1:15	Senior Teams Lunch—Bring your own <b>Junior Teams Awards Ceremony</b>
Approx. 1:15	<b>Senior Teams Awards Ceremony</b>

**Day of Envirothon Check-List:**

1. Students should wear comfortable shoes and appropriate clothing (i.e. boots, jackets, rain gear)
2. They should bring:
  - **LUNCH**
  - Pencils/Pens
  - Clipboards (paper for quiz answers will be provided)
3. There are 6 stations students will visit:
  - Aquatics
  - Forestry
  - Soils
  - Wildlife
  - Current Events—Adapting to a Changing Climate in MN
  - Oral Presentation (Senior Teams Only)

A 25 point test will be prepared by presenters at each of the 5 learning stations.



## 2023 Station Topics and Study Guide

### Aquatics

#### Station Topics

1. Wetlands and Groundwater

#### Study Guide List

##### **Wetlands**

1. <http://en.wikipedia.org/wiki/Wetland>
2. <https://www.nrcs.usda.gov/resources/guides-and-instructions/field-indicators-of-hydric-soils>
3. [https://bwsr.state.mn.us/sites/default/files/2018-12/WETLANDS\\_delin\\_Circular\\_39\\_MN.pdf](https://bwsr.state.mn.us/sites/default/files/2018-12/WETLANDS_delin_Circular_39_MN.pdf)
4. [https://bwsr.state.mn.us/sites/default/files/2018-12/WETLANDS\\_Delin\\_2015\\_Guidance\\_for\\_Submitting\\_Delineation\\_Reports\\_in\\_Minnesota.pdf](https://bwsr.state.mn.us/sites/default/files/2018-12/WETLANDS_Delin_2015_Guidance_for_Submitting_Delineation_Reports_in_Minnesota.pdf)
5. [https://bwsr.state.mn.us/sites/default/files/2021-01/WETLANDS\\_delin\\_Hydrologic\\_Monitoring\\_of\\_Wetlands\\_Guidance\\_BWSR.pdf](https://bwsr.state.mn.us/sites/default/files/2021-01/WETLANDS_delin_Hydrologic_Monitoring_of_Wetlands_Guidance_BWSR.pdf)

##### **Groundwater**

1. <http://en.wikipedia.org/wiki/Groundwater>
2. <http://ga.water.usgs.gov/edu/watercycle.html>
3. <http://www.lenntech.com/groundwater/pollution-sources.htm>

### Forestry

#### Station Resources

1. <http://hennepinfoest.weebly.com/>

### Soils

#### Station Topics

##### **1. Learn the basics of soil formation and composition**

Study how the 5 soil forming factors influence soil appearance and properties. Learn to identify basic soil horizons (O, A, E, B, C) and which are organic layers, topsoil, and subsoil.

##### **2. Learn the basics of soil properties**

Study basic soil properties such as texture, structure, and color. Learn how soil scientists determine the color of soil. Learn and practice the "feel" method for texturing a soil sample. Be able to identify the difference between loamy sand, loam, clay loam, and organic soils. Learn how to use a textural triangle. Study the influence of texture on permeability. Study the color characteristics of horizons.

### 3. Learn about soil erosion and soil conservation

Learn to identify types of soil erosion. Study the influence of slope on runoff and water erosion. Be able to identify some basic conservation practices that control soil erosion in both an agricultural and urban setting. Learn about essential plant nutrients and how to read a fertilizer recommendation.

### 4. Learn about soil survey and landuse interpretations

Learn how to use the Web Soil Survey for your county or local area. Learn about soil maps and other soil information that can be found in the reports.

### 5. Learn about resource concerns

Define resource concerns related to soils and describe why they are a problem, how they can be identified, and contributing factors. Concerns may include compaction, erosion, sediment deposition, etc. Identify specific best management practices to address resource concerns.

## Study Guide List

### Website Resources

1. Soil Science Society of America—Basics: <https://www.soils.org/about-soils/basics/>
2. USDA Web Soil Survey: <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>
3. NRSC Soil Health Key Points: <https://www.nrcs.usda.gov/sites/default/files/2022-12/soil-health-key-points.pdf>
4. USDA Soils: <https://www.nrcs.usda.gov/resources/data-and-reports/soils>
5. Soil Science Society of America—Soil Chemistry: <https://www.soils4teachers.org/chemistry/>
6. U of M Extension—Soils Management and Health: <https://extension.umn.edu/soil-and-water/soil-management-and-health>

### Video Resources

1. How to Differentiate Soil Horizons in the Field: <https://www.youtube.com/watch?v=ZlyDyQT6 WE>
2. Agriculture: Soils W/ Dr. Verb Cardwell: <https://www.youtube.com/watch?v=CEEiXcpCzjY>
3. Soil Health Principles: <https://www.youtube.com/watch?v=9uMPuF5oCPA>

## Wildlife

### Station Topics

#### 1. Wildlife Identification

- a. Students should be able to identify Minnesota select mammal, bird, reptile, and amphibian species. Identifications could be from pictures, live or preserved specimens, tracks, vocalizations, signs, or skulls
- b. Students can describe how to identify the male and female of wildlife species, if the species has clear ways to tell male vs females from external viewing or monitoring of behavior.

#### 2. Wildlife Natural History

- a. Students can provide information on the life histories of select Minnesota wildlife species that they are asked to identify. Aspects of natural history could include (but are not limited to) the following:
  - i. Preferred habitat
  - ii. Diet
  - iii. Reproductive habits

- iv. Range in the state
- v. Potential for migration
- vi. Conservation/population trends over time

### 3. Wildlife Ecology

- a. Students should understand basic tenets of ecology and how wildlife is part of these tenets. These topics can include:
  - i. Ecosystems and populations
  - ii. Food chains, webs, and trophic relationships
  - iii. Habitats, habitat types, habitat management, and threats to habitat
  - iv. Biodiversity
  - v. Classification of wildlife
  - vi. Adaptations of wildlife
  - vii. Managing wildlife populations
  - viii. Laws surrounding wildlife conservation
  - ix. Threats to Wildlife

### 4. Conservation Issues Surrounding Wildlife

- a. Students will be able to describe threats to various wildlife species and how these threats impact wildlife. This can include:
  - i. Endangered and threatened species – federally listed and state listed
  - ii. Exotic and invasive species
  - iii. Impacts of climate change
  - iv. Wildlife diseases

### Study Guide List

#### Wildlife Identification and Natural History Resources

1. DNR Site on Mammals - <https://www.dnr.state.mn.us/mammals/index.html>
2. DNR Site on Birds - <https://www.dnr.state.mn.us/birds/index.html>
3. All About Birds website - great resource for bird identification - look up individual birds for identification by sight and sound - <https://www.allaboutbirds.org/guide/>
4. DNR Site on Reptiles & Amphibians - [https://www.dnr.state.mn.us/reptiles\\_amphibians/index.html](https://www.dnr.state.mn.us/reptiles_amphibians/index.html)
5. Quizlet Decks of Identification Per Animal Group

[MN Mammals](#)

[MN Birds - Woodpeckers](#)

[MN Birds - Waterfowl](#)

[MN Birds - Songbirds 1](#)

[MN Birds - Waterbirds \(non-waterfowl\)](#)

[MN Birds - Songbirds 2](#)

[MN Birds - Shorebirds](#)

[MN Birds - Songbirds 3](#)

[MN Birds - Gamebirds](#)

[MN Birds - Songbirds 4](#)

[MN Birds - Owls](#)

[MN Birds - Songbirds 5](#)

[MN Birds - Hawks and Falcons](#)

[MN Reptiles and Amphibians](#)

## **Wildlife Ecology Resources**

1. Wildlife Resource Guide from Maryland (ignore Maryland specific information) read pages 7-44

<https://mdenvirothon.mascd.net/wp-content/uploads/2021/07/MD-State-Envirothon-Wildlife-Study-Guide.pdf>

## **Conservation Issues Surrounding Wildlife**

1. Endangered and Threatened Species

- a. Federal list of species - <https://www.fws.gov/midwest/endangered/lists/minnesot-spp.html>

- b. State list of species - [https://files.dnr.state.mn.us/natural\\_resources/ets/endlist.pdf](https://files.dnr.state.mn.us/natural_resources/ets/endlist.pdf)

- c. DNR Rare Species Guide – use this to learn about the decline of a species – just enter in the name and read about the species in the profile that comes up. This is the best for getting good information on why species have become rare - <https://www.dnr.state.mn.us/rsg/index.html>

2. Invasive Species – Identify common ones and how they can impact wildlife

- a. <https://www.dnr.state.mn.us/invasives/index.html>

3. Habitat Conversion

- a. Grassland loss

- i. <https://www.startribune.com/minnesota-s-disappearing-grasslands/600109345/>

- ii. <https://www.dnr.state.mn.us/prairieplan/index.html>

- b. Fragmentation

- i. [http://www.museum.state.il.us/muslink/forest/htmls/con\\_frag.html](http://www.museum.state.il.us/muslink/forest/htmls/con_frag.html)

4. MN DNR hunting regulations book – <http://www.dnr.state.mn.us/regulations/hunting/index.html>

## **Current Events and Oral Presentation Topic: *Adapting to a Changing Climate in MN***

### **Station Topics: More to come**

1. Current Events Scenario—[http://www.maswcd.org/Youth\\_Education/Envirothon/2023%20Current%20Issue%20Scenario.pdf](http://www.maswcd.org/Youth_Education/Envirothon/2023%20Current%20Issue%20Scenario.pdf)