



## Human and Physical Landscape Interaction: North Dakota

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(Stephens and Vandeberg 2020)

This exercise will examine interactions between human and physical systems on the Earth. Geographers use geospatial tools such as Geographic Information Systems (GIS), Global Positioning Systems (GPS) and Remote Sensing such as satellite imagery to gather information about the Earth. Google Earth is a type of online GIS and remote sensing tool using aerial and satellite images. Let's go on a tour of the Earth, and look at some of its properties, and human changes to the Earth's Surface.

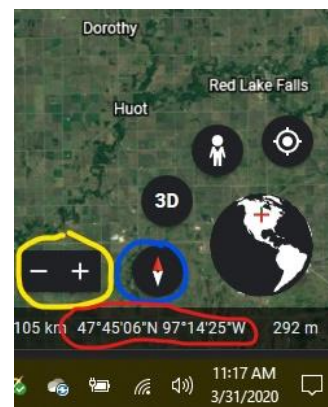
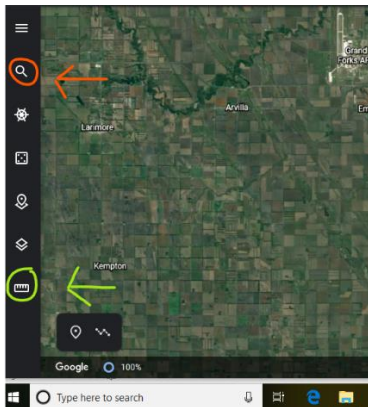
### 1. Accessing Google Earth

Navigate using a web browser to <https://www.google.com/earth/>

The Google Earth menu allows you to work online, or you can download Google Earth Pro <https://www.google.com/earth/versions/#earth-pro> onto your computer. Tutorials on how to use Google Earth can be found at <https://support.google.com/earth/>

#### Online Resources:

Below, there are two screen shots. The first screenshot is showing the left side of the Google Earth Online version showing the search tool circled in orange and the ruler tool circled in green. The second screenshot is from the right side of the screen with the zoom tools circled in yellow and the north arrow circled in blue. The latitude and longitude coordinates are circled in red at the bottom.




### 2. Elevation and Coordinates

**Open Google Earth.** Type "Mount Denali" in the Google Earth Search box. Zoom in, (+/-) located on bottom right of the screen, so that you can see the red marker and green marker on Mount Denali (Mount McKinley), the highest point in North America.

What is the elevation of Mount Denali according to Google Earth? \_\_\_\_\_ ft



Double click on the marker,  to see what the actual elevation of Mount Denali is? \_\_\_\_\_ft

What are the coordinates of Mount Denali (latitude) \_\_\_\_\_ and (longitude) \_\_\_\_\_.

### 3. Using Google Earth Tools to Help Understand Terrain.

Let's look at a local lake and use some of Google Earth tools to examine the dimensions of English Coulee Pond. In the search bar, located on the left side toolbar, and type in-English Coulee Pond Fishing Access, and you should see a lake similar to the link listed below. As google earth "fly's" to Coulee Pond, it gives you a 360-degree view of the lake. We will need to make the map face with north facing the right direction.

<https://gf.nd.gov/gnf/maps/fishing/lakecontours/englishcouleepond2015.pdf>

In the lake's description box on the right-hand side, click the ^ symbol in the upper left-hand corner of the description box to minimize the description box. This allows us to see the "view tools" on the bottom right. There is a globe of the world, crosshairs, a person, 2D symbol, an arrow that is half red and half white (north arrow), and a plus/minus symbols for zooming in and out. Click the red and white arrow (north arrow) once. The red end of the arrow always points north. By clicking the north arrow once the map will be oriented with north facing up. Next click the minus symbol (-) on the bottom right side of the screen, next to the globe, to zoom out until you can see the entire pond.

Look at the tools on the left side of the screen and click on the very bottom tool that looks like a ruler. This opens the measure and distance tool on the right side. Click on the down arrow next to the 0 to select feet as the unit of measurement. Measure the pond from the west shore to the east shore using your mouse and clicking twice on the east shore to complete the measurement.

Record the measurement here, \_\_\_\_\_1787\_\_\_\_\_ ft.

Now use the zoom out button (-) again until you see the interstate (I29) to the east. Switch the units of measurement to miles and measure the distance from the center of English Coulee Pond to the interstate. Record miles here. \_\_\_\_\_9.8\_\_\_\_\_miles.

### 4. Measuring and Coordinates in Google Earth.

In the **Search** tool on the left, type in Crow Flies High Butte Historical Site and hit enter. As Google Earth gives you the aerial view, notice the elevation of the High Butte. Read the description of this and click on the link for more information.

<https://www.parkrec.nd.gov/crow-flies-high-state-recreation-area>

<https://www.onlyinyourstate.com/north-dakota/crow-flies-high-butte-nd/>

Minimize the description box (^) and click the north arrow to orient the map facing north again. Using your mouse, click and drag the map (pan) until you see the red, white, black, and yellow symbol on the hillside, southwest of the Crow flies high butte. Using the measuring tool, measure the width of this symbol in yards, using the white line that is closest to the east and west directions.   25   yards.

Next pan further to the southwest and use the zoom tools until you can see the entire bridge crossing the river. Hover your mouse over the center of the bridge and record the coordinates listed at the very bottom of the screen. Hint: Latitude is always the first set of numbers.

Give the *geographic coordinates* of this evidence (Hint: to add a ° symbol, simply hold down the Alt key and press 0176 on the number pad on the right side of your keyboard):

Latitude 47°58'47"N Longitude 102°33'41"W

Notice when you zoom in on each end of the bridge there is a black mark crossing the road. Measure the length of the bridge from black mark to black mark in miles and record below.

Length of bridge   0.85   miles.

What is the name of the river this bridge is crossing?   Missouri River  

Activate the 3D buildings view (Under Layers panel to left side of screen) to better see the sign.

### **5. Examine detail of Google Earth data.**

Next we will look at a North Dakota site to examine some fine details that Google Earth allows us to see. In the search bar search for White Horse Hill National Game Preserve, Park Drive, Saint Michael, ND. This will provide 2 search results. Take a look at the first search result that is further to the north, along the main highway. On the main highway there are a couple different vehicles. Zoom in to see how much detail you can see on these vehicles. What color do these vehicles seem to be?   Black & White  

Look at the second search result further to the south. Zoom in on the property and look to the lawn just north of the red pin. There are several structures formed in 2 lines on the lawn. What are these structures and how many are there?   Solar panels  

What is the large lake that is next to this Game Preserve?   Devil's Lake  

What is located behind (SE direction) of the south search result? Hint: Used for entertainment purposes.   Amphitheater

How many parking spaces are there for this building? Is the parking lot empty? \_\_\_\_\_ 16-  
one white car \_\_\_\_\_

[https://www.fws.gov/refuge/White\\_Horse\\_Hill/about.html](https://www.fws.gov/refuge/White_Horse_Hill/about.html)

**6. Have a little fun and roll the dice.**

On the left side tools, there is what looks like dice for a board game. If you hover over this icon it is called, I'm feeling lucky. Click this tool and it will take you to a random place of interest around the world. You can click it a couple times if it does not provide a very interesting spot. Below, record what spot Google Earth took you to and make some observations about the area. Click on the link in the description box and give two interesting fact about this place.