

## Lab Exercise 1: Using Online Maps

Geographic Communication Today  
Harvard Extension School ISMT E-155  
Spring, 2015

### Objectives:

Learning how to navigate various online maps, identify places, measure areas and distances, and perform navigation using online maps. Gain the ability to evaluate functionality of various web maps.

### Questions for you to answer are in bold type.

Answer the questions in the Lab 1 Answer Sheet provided with this lab.

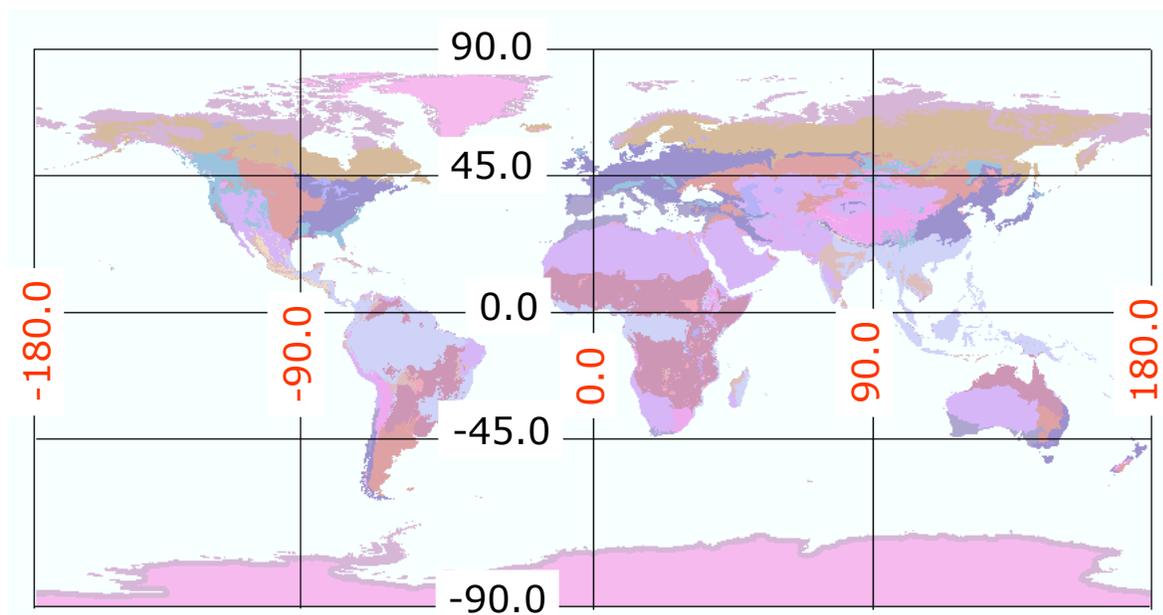
What to turn in:

- 1) The Lab 1 Answer sheet, with your answers and screen shots added, saved as: **GeoComm\_Lab\_1\_<Your first and last name>.doc** and uploaded to the Assignments, Lab 1 portion of the class website: <https://canvas.harvard.edu/courses/1120>

This lab is due **February 4, 2015, at 11:59 p.m.**

### Part 1: Determining longitude and latitude coordinates (18 points total)

A Geographic Coordinate System uses longitude and latitude value pairs to represent a specific position on Earth. In decimal degree format, longitude values range from -180 to 180 and represent changes in the east/west direction; latitude values range from -90 (south pole) to 90 (north pole). See the world map below, with latitude values listed in black, and longitude in red.



Using the map above, and your knowledge of continental locations, answer the following:

**1.1 What continent is the coordinate 90 longitude, 45 latitude in? (2 pts)**

**1.2 Is the coordinate 0 longitude, -45 latitude in the ocean or on land? (2 pts)**

Use the Geographic Position Finder at <http://maps.cga.harvard.edu/gpf> to locate the longitude, latitude values of the following 4 cities **(2 pts each)**:

**1.3 Paris, France Longitude: Paris, France, Latitude:**

**1.4 Tokyo, Japan Longitude: Tokyo, Japan Latitude:**

**1.5 Canberra, Australia Longitude: Canberra, Australia Latitude:**

**1.6 Santiago, Chile Longitude: Santiago, Chile Latitude:**

**1.7 Which is the southernmost city of the 4 listed above? (2 pts)**

**1.8 What city is at 28.97 Longitude, 41.00 Latitude? (2 pts)**

**1.9 What city is at 145.77 Longitude, -16.92, Latitude? (2 pts)**

## **Part 2: Calculating Distances and Areas (28 points total)**

Knowing the distance between two places is important for many reasons. Many web maps have distance measuring functionality. Go to the DistanceFromTo Maps at: <http://www.distancefromto.net/>

Use this mapping tool to determine the distance between Boston, MA, and Atlanta, GA.

**2.1 What is the distance by air between Boston and Atlanta (in miles)? (2 pts)**

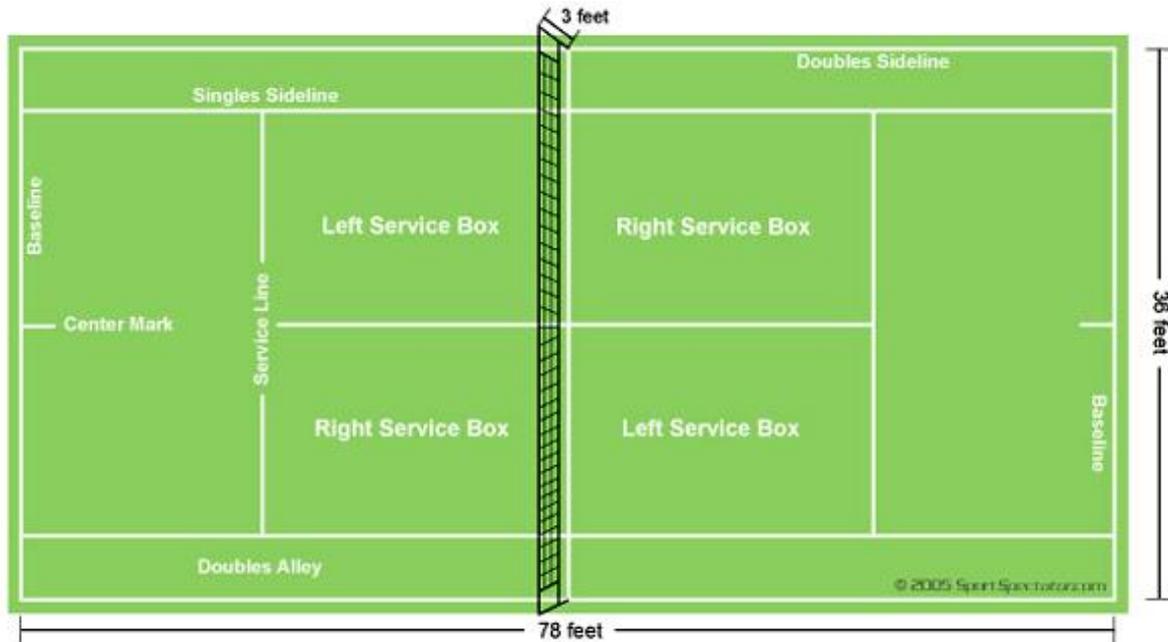
**2.2 What is the distance by road between Boston and Atlanta (in miles)? (2 pts)**

Reset the Distance Calculator, and then find the following:

**2.3 What is the distance by air between London, England, and Chicago? (2 pts)**

**2.4 Why do you think the line between Chicago and London appears to be curved? (no more than a two line answer, please) (2 pts)**

Area is a quantity that expresses the extent of a two-dimensional surface or shape in the plane<sup>1</sup>. The formula to calculate the area of a rectangle is Length \* Width. The resulting areal units are the square of the length and width measurement units (e.g. feet \* feet = square feet).



2.5 What is the total area of the tennis court contained in the white lines on the image depicted above (use a calculator)? Note the units used in your answer (2 pts):

Now you will find a tennis court on a Google Map and measure it using an area measurement tool. Go to: <http://www.freemaptools.com/area-calculator.htm>. Use the Pan Zoom controls (circled in red on the image below) to find a tennis court, with your map displayed as Satellite or Hybrid map style (highlighted in yellow below).

## Free Map Tools

Maps you can make use of...



Like 144 people like this. Be the first of your friends.

+7 7

Tweet 14

### Area Calculator

This planimeter tool can be used to measure the enclosed area of a defined polyline on a map.

### Measure an Area

Search For Location :

### Navigate:

#### Popular Map Tools

- ZIP Codes Inside a Radius
- How Far Can I Travel
- How Far is it Between
- Radius From UK Postcode
- Radius Around Point
- Distance Between UK Postcodes
- UK Postcodes Inside Radius
- Map Tunnelling Tool

#### Map Resources

Download UK Postcodes

#### About

#### News

#### Contact

#### FAQs

Download



Once you're zoomed into a tennis court on the map, click on each of the 4 corners to measure the area, which is reported below the map on the website under "Output".

**2.6 What is the area of the tennis court in square meters? (4 pts)**

**2.7 Insert a screenshot below of the tennis court with area measurement. (2 pts)**

(On a PC use ctrl+alt+PrtSc to capture the screen, and ctrl+v to paste. On a Mac, instructions are here: <http://graphicssoft.about.com/od/screencapturemac/ht/macsscreenshot.htm> )

Use the Free Map Tools Area Calculator tool to measure the area of Utah (a state in the southwestern U.S.)

**2.8 What is the area of Utah that you measured (4 pts)?**

**2.9 Paste a screenshot below of your Utah measurement (2 pts):**

Search for the area of Utah on the web.

**2.10 What does the web list as the area of Utah? (2 pts)**

**2.11 What website is this from? (2 pts)**

**2.12 What is the percentage difference between the area you measured for Utah and the area for Utah as published on the website? (2 pts)**

### Part 3 – Evaluating the 4 major web maps (30 pts, 33%).

Mapquest, Yahoo!, Google, and Microsoft all publish address matching and routing web maps. These maps are also useful to create quick and easy location maps. In this portion of the lab you will produce different maps using these websites, and compare/contrast their basemaps and functionality.

Let's imagine you need a quick map of North America that clearly shows where Canada and Mexico are in relation to the United States. Go to these 4 web maps: Mapquest

(<http://mapquest.com>), Yahoo! Maps (<http://maps.yahoo.com/>), Google

(<http://maps.google.com>), and Microsoft/BingMaps (<http://bing.com/maps>).

**Use the pan/zoom map controls to produce 4 North American maps, taking screenshots of each.** It is OK if Alaska, northern Canada, and southern Mexico are cut off from the maps.

For reference, the pan/zoom controls for each map are shown below.

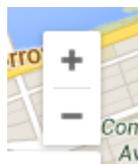
Mapquest



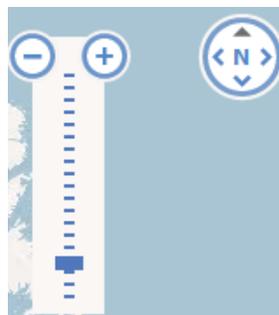
Yahoo!



Google



Microsoft/BingMaps



**3.1 Mapquest North American map screenshot (2 pts):**

**3.2 Yahoo! North American map screenshot (2 pts):**

**3.3 Google North American map screenshot (2 pts):**

**3.4 Microsoft/Bing Maps North American map screenshot (2 pts):**

**3.5 In terms of clarity and legibility, which map do you think is the best map, and why? (2 pts)**

Spend a few minutes interacting with each of the 4 web maps. Experiment with the different buttons and options on the map interface. Try right clicking, double clicking, and scrolling your mouse wheel on the different maps to see what they do.

**3.6 Based on your experimentation, write a paragraph comparing and contrasting the functionality and utility of the Mapquest, Yahoo!, Google, and Bing Maps. (10 pts)**

Do a web search for “map of North America”. Your search results should return several links for “map of north America”. Click on one of these images to view it. For the most part, these are non-interactive, maps, produced and published for a specific purpose. As opposed to being an interactive map that can be panned and zoomed, these are static images in .jpg or other image format.

**3.7 Insert the web URL of the map you chose by the search (1 pt)**

**3.8 How does this “static” map compare to the web maps produced above in terms of clarity and legibility? (3 pts)**

In Google maps, type “53 Church Street, Cambridge, MA” in the search maps text box, and click

the Search Maps button: . The map will zoom to this address, and a red “pushpin”

will appear on the map. Drag the “pegman”:  (located on the lower right of the map) on to the map and drop him at the pushpin.

**3.9 How does this change the map? (2 pts)**

In Bing Maps, zoom to 53 Church Street, Cambridge, MA. Change the map type from “Road” to “Automatic”. Zoom in as close as possible.

**3.10 How does this most detailed view in Bing Maps differ from the most detailed view in Google Maps? (2 pts)**

## Part 4 – The Geospatial Revolution (15 pts., 16%).

The geospatial industry consists of individuals, private companies, non-profit organizations, academic and research institutions, and government agencies that research, develop, manufacture, implement, and employ geospatial technology.....and gather, store, integrate, manage, map, analyze, display, and distribute geographic information — i.e., information that is tied to a particular location on Earth<sup>2</sup>. The geospatial industry is very diverse, dynamic, and

growing rapidly. Penn State's "Geospatial Revolution" video series presents various aspects of this phenomena. Watch the Geospatial Revolution Part 1 video (13 minutes) at: <http://geospatialrevolution.psu.edu/episode1> and answer the following questions.

**4.1 The video mentions several ways mapping is performed. Name two of these (4 pts):**

**4.2 In the late 1980's, what group mapped all streets in the United States? (2 pts)**

**4.3 Does the material presented in the video warrant the video being named the "geospatial revolution"? Write two sentences to back up your answer (3 pts).**

Speakers on this video are from several different academic, commercial, and governmental entities (listed next to the speaker name when introduced). Pick one of these entities, go to their website, and answer the following questions in two sentences or less:

**4.4 What entity did you research? (1 pt)**

**4.5 What does this entity do (i.e. what is their mission)? (2 pts)**

**4.6 How does the use of geospatial technology benefit this entity? (3 pts)**

End of Lab Exercise 1.

## References

1 – Wikipedia.org

2 - <http://metacarta.wordpress.com/2008/08/07/what-is-the-geospatial-industry/>