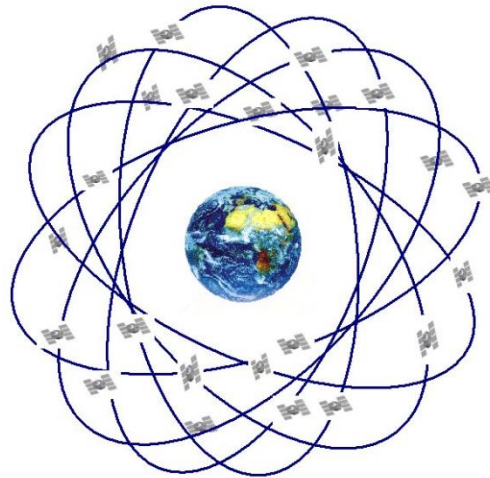


Geocaching II: Scavenger Hunt in the Queen City

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Today's Session

- **All notes including coordinates are on the AAHPERD Convention website**
- **If you already know what to do and want the coordinates so you may begin, please be our guest**
- **15 min: Powerpoint introduction, and, instructions for using your Droid or Apple device to navigate via coordinates.**
- **15 min: breakout sessions to assist you in setting up your device**
- **10 min: forms groups and receive one of three versions of the scavenger hunt**
- **We also have a list of caches to discover**
- **Enjoy your 1 mile geocaching tour of the city!**
- **Meet at the “final destination” to receive your own geocoin (between 3:00-4:30 pm)**

What is a GPS?

- The **Global Positioning System (GPS)** is a satellite-based navigation system made up of a network of 24 satellites placed into orbit by the U.S. Department of Defense.
- GPS was originally intended for military applications, but in the 1980s, the government made the system available for civilian use. GPS works in any weather conditions, anywhere in the world, 24 hours a day. There are no subscription fees or setup charges to use GPS.

How does GPS work?

- GPS satellites circle the earth twice a day in a very precise orbit and transmit signal information to earth.
- GPS receivers take this information and use **triangulation** to calculate the user's exact location. Essentially, the GPS receiver compares the time a signal was transmitted by a satellite with the time it was received. The time difference tells the GPS receiver how far away the satellite is.
- With distance measurements from a few more satellites, the GPS receiver can determine the user's position and display it on the unit's electronic map.

Various GPS receivers

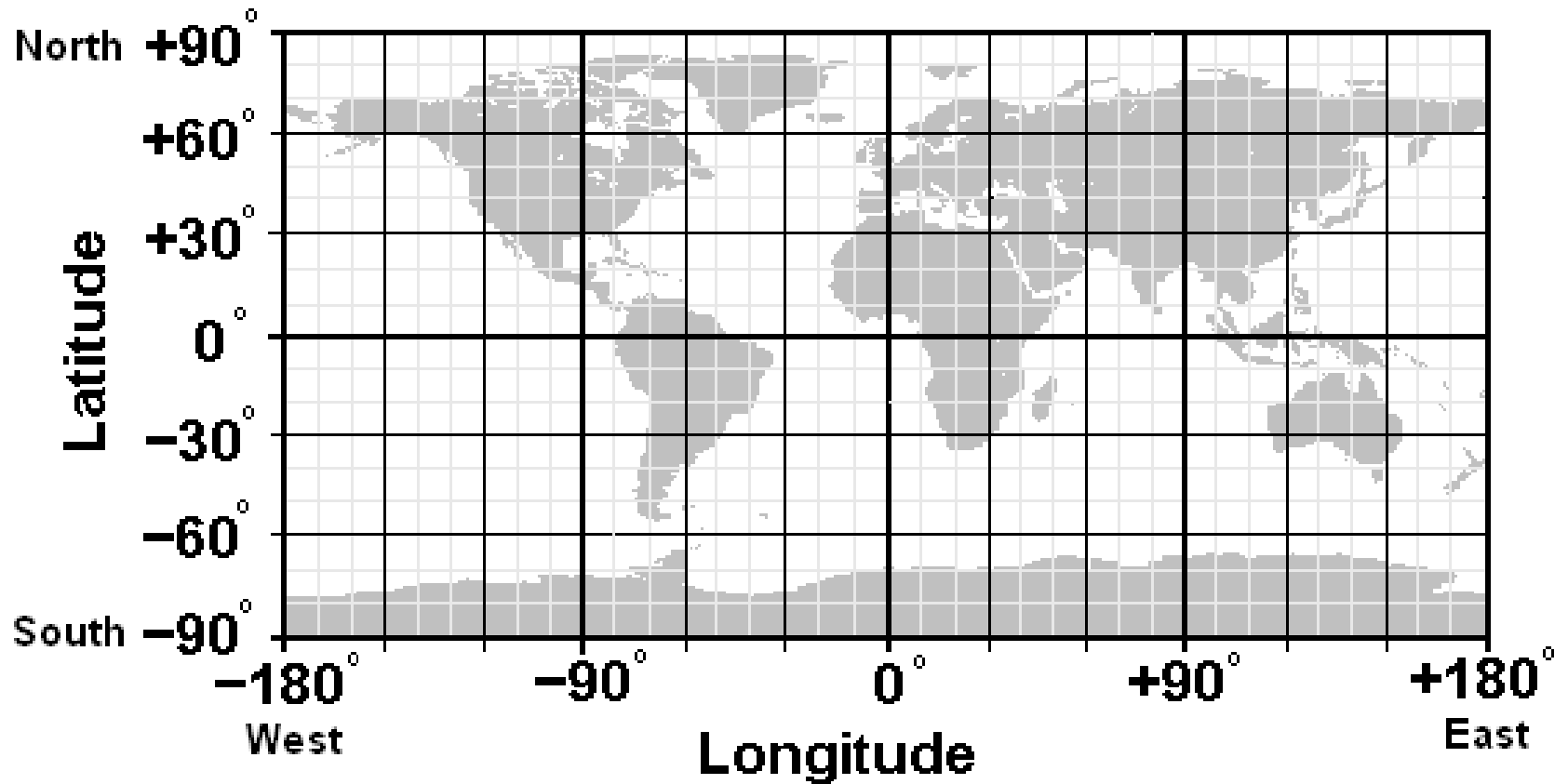


Position on the earth

- A GPS receiver must be locked on to the signal of at least three satellites to calculate a 2D position (***latitude and longitude***) and track movement.
- With four or more satellites in view, the receiver can also determine the user's 3D position (latitude, longitude and altitude).
- Once the user's position has been determined, the GPS unit can calculate other information, such as speed, bearing, track, trip distance, distance to destination, sunrise and sunset time and more.
- A good GPS receiver can indicate one's position up to about 20 yards

Charlotte Convention Center

35.22248,-80.847243



What is Geocaching?

- Geocaching is a real-world, outdoor treasure hunting game using GPS devices. Participants navigate to a specific set of ***GPS coordinates*** and then attempt to find the geocache (container) hidden at that location.



Examples of geocaches



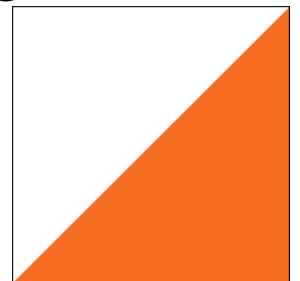
Types of caches

- Traditional cache: includes logbook, pencil, trinkets to trade
- Microcaches: old film canisters work well
- Benchmark caches: permanent markers such as those used by the National Geodetic Society



Some important terms...

- **Orienteering** is a family of sports that requires navigational skills using a map and compass to navigate from point to point in diverse and usually unfamiliar terrain, and normally moving at speed (goals may be to beat a time). Participants are given a topographical map, usually a specially prepared orienteering map, which they use to find *control points*.
- A **control point** (CP, also control and checkpoint) is a marked waypoint used in orienteering and related sports. It is located in the competition area; marked both on an orienteering map and in the terrain; and described on a control description sheet. The control point must be identifiable on the map and on the ground



More types of caches

- **Virtual cache:** uses *waypoints* as the “cache” to be **discovered (what we will be doing during our session today)**
- **Webcam cache:** a location is provided, you “get on camera” while a friend observes the live stream and “saves” your picture



Important terms

- **Waypoints** (also “waymarks”) are sets of coordinates that identify a point in physical space. For GPS activities, these coordinates include longitude and latitude. A waypoint can be a destination, a fix along a planned course, or simply a point of reference useful for navigation.
- You can create “waypoint category.” An outdoor maze category, for example, could contain information like price of admission and days of operation, while a statue category may describe the artist's medium and date of dedication



[Geocaching](#) > Waypoint Conversions

N 39° 16.871 W 076° 36.690

Geocode Address

WEB SERVICES BY

Normal GPS Coordinates (WGS84 Datum)	
Decimal	39.28118 -76.6115
DDD MM.MMM	N 39° 16.871 W 076° 36.690
DDD MM SS.SSS	N 39° 16' 52.2588" W 76° 36' 41.4000"

Understanding coordinates in Google Maps

- There are many ways to show a place on a map. For example, the latitude and longitude of the Nascar Hall of Fame in Charlotte can be expressed as:

- **Degrees, minutes and seconds**

35° 13' 17.1186" -80° 50' 36.2436"

- **Degrees and decimal minutes**

35 13.285319 -80 50.60406

- **Decimal degrees**

35.221422,-80.843401

Google Maps coordinates are expressed in decimal degrees to comply with the most common Geographic Information Systems.

Using Google maps

- From Google maps you can type coordinates directly into the **search bar**. A map displaying your coordinates (and a street address) will come up.
- You can find out coordinates of a point by placing your cursor over a map and right clicking on your mouse. Then right click to select **What's here?** and the latitudinal and longitudinal coordinates will be provided.
- You can use the **link icon** to then send that location directly to your phone or other device.
- Convert the coordinates to your specific device input format for manual enter. The rounding applied during the conversion can affect the accuracy of the location displayed on the map.
- An easy to use conversion site provided by the FCC appears on <http://transition.fcc.gov/mb/audio/bickel/DDDMSS-decimal.html> Simply input decimal degrees to generate degree, minutes and seconds

Using Smart Devices with Map Apps

All smart devices come with a Map App, whether it is an Apple product or an Android. It is always recommend that you keep all of your apps up to date.

For this sample an Android was used with Google Maps

1. Open your Maps App

2. Find your search bar (the search icon is traditional this icon)



Using Smart Devices with Map Apps, cont.

3. Within your search box enter your coordinates, once you are done click the next or search icon, Figure 1, should appear. a. If your coordinates are listed in the Degrees, Minutes, Seconds like such:

35° 13' 17.1186" -80° 50' 36.243" enter them without any symbols, but you must keep the negatives otherwise you will end up on the other side of the world!

35 13 17.1186, -80 50 36.2436. You can see in all the figures that an the Coordinates were converted to an actual address.

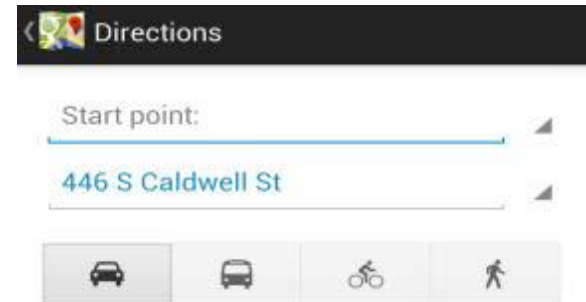


Figure 1

Using Smart Devices with Map Apps, cont.

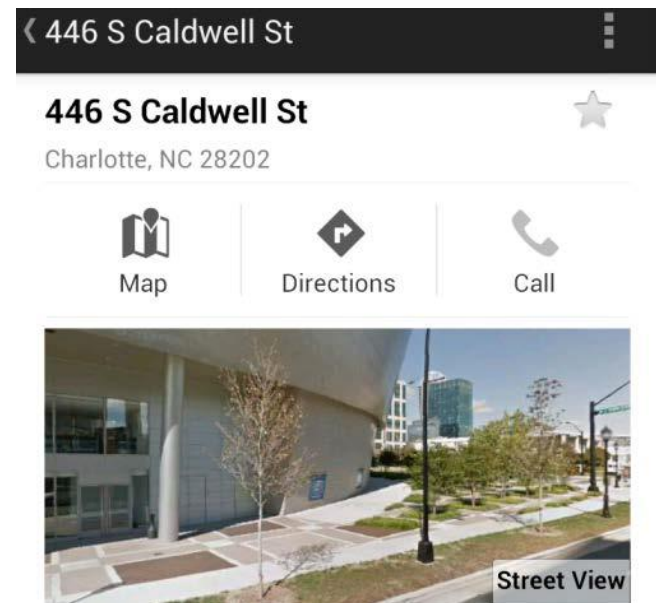
4. If you click on the directional arrow, and your GPS is on (see your devices Settings for the GPS function), you will be promoted to enter a **Start Point** or **My Location**,

The icons displayed show the different modes of transportation. Once you have indicated how you would like to get to your destination click **Get Directions**.



Using Smart Devices with Map Apps, cont.

5. If you would have chosen the > icon from Figure 1, a similar page would have showed, see this example. You would have clicked on **Directions** and followed the prompts.



Please note that Apple users can download Google Maps and the sample above would be the same.

If you are using the Map Apps that came on your Apple device, look below

- 1. Open your Maps App
- 2. Find your search bar (the search icon is traditional this icon)
- 3. Within your search box enter your coordinates, once you are done click the next or search icon, Figure 4, should appear.
- a. If your coordinates are listed in the Degrees, Minutes, Seconds like the first sample list on page one it will not work. **You must convert the coordinates into a Decimal Degree it will work. 35.221422, -80.843401.**

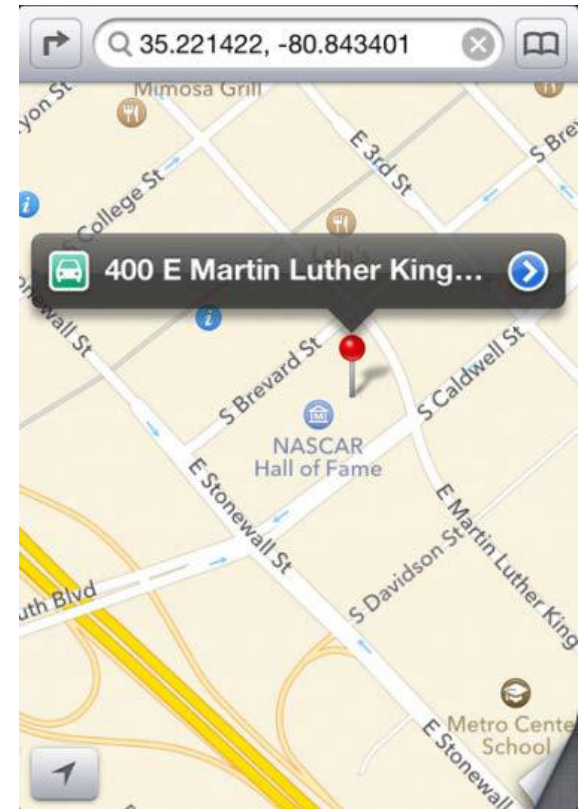


Figure 4

Apple/Mac apps, cont.

4. If you click on the **directional arrow**, and your GPS is on (see your devices Settings for the GPS function), you will be prompted to enter a Start, Figure 5.



Figure 5

The icons displayed show the different modes of transportation. Once you have indicated how you would like to get to your destination click the **Route**, then **Start**.

5. If you click on the **blue > symbol** indicated on Figure 4, Figure 6 will show up and again follow the prompted which will which will take you back to Figure 5.

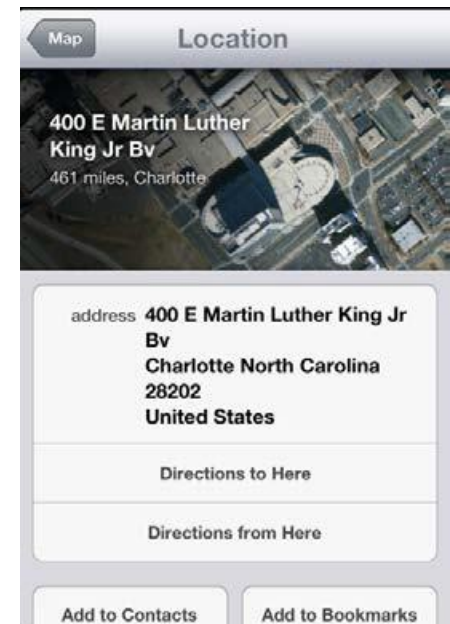


Figure 6