

Planning for Field Data Collection & Using Handheld GPS Units in the Field – Overview

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Equipment to have with you in the field

- PC Laptop loaded with:
 - DNR GPS (freeware for PCs – download from <http://www.dnr.state.mn.us/mis/gis/DNRGPS/DNRGPS.html>)
 - Google Earth (freeware – download from <http://earth.google.com/>)
 - ESRI ArcMap 10.2.2 (get from Tufts GIS Support) – if you are using GIS – only runs on PCs
- Rechargeable batteries – at least 4 sets – keep two with you at all times
- Battery charger that can recharge the GPS unit batteries; car battery charger if possible
- Extra cable (USB or serial port) to run from the GPS unit to your laptop

Preparing for the field: planning for data collection

At each location, you will be recording the latitude and longitude and also collecting several other pieces of information. The recommended approach is that you manually record this information on a **pre-formatted paper data collection sheet** – one sheet for each location where you will be recording a location with the GPS unit.

It is very important to prepare this data collection sheet carefully well in advance of your field research, and that you **PILOT** it before embarking on field research. To pilot, test record the information in the fields then enter it into an electronic spreadsheet.

You can find a basic sample spreadsheet on the Tufts web site as part of the GPS guide materials.

Design a data collection sheet:

1. Carefully think through all the information you will need to collect in the field and create a list of this information
2. Go through this list and for each item, write down the type of value you will record (e.g.: count, measurement, description, comment, yes/no, etc.)
3. Again for each item, decide whether the information can be coded to ease data collection (e.g., a code for vegetation type, classifying tree cover by percentage class, Y/N for yes/no)

4. Create a one-page paper data collection spreadsheet that contains *all* these information items, *plus* the following critical items:
 - a. GPS Unit ID (if using multiple units)
 - b. Waypoint ID
 - c. Decimal Degrees N (or S depending on your location relative to the equator)
 - d. Decimal Degrees E (or W depending on your location relative to Greenwich, England, the prime meridian)
5. Create a Microsoft **Excel spreadsheet** where this information will be recorded – each site should have its own row, and each item on your information sheet should have its own column

Pilot the data collection process

Test out the entire data collection process and evaluate the following:

1. Average, minimum, and maximum time needed for data collection at each site (including GPS location collection, plus all other site data)
2. Usability of the preformatted data sheets
3. Length of time a battery pack lasts
4. Usability of the information downloaded from the GPS unit (go through download process and the process of bringing data into GIS)
5. Ease/difficulty of data entry from paper sheets

Prepare a data backup schedule

Create a backup schedule by which you back up your data on a regular (daily) basis

Plan field visits

Know where you will be going in the field. **Get a good map of the area.** Mark out the locations you need to go. From your pilot of the data collection process, plan your field visits with adequate time at each site.

If necessary, the GPS unit can be used to help navigate you to a location assuming you have the latitude and longitude coordinates of that location. But you should not depend on that – if possible, get other location information (address, building, landmarks, distance/direction from road/stream, etc.)

If possible, prepare a map using Google Earth or ArcGIS and have printouts of this with you in the field at a resolution that helps you navigate to the needed locations.

The Handheld GPS data collection process

For more specifics on how to use the Tufts GPS units, see the tip for the specific unit you are using. These can be found at the Tufts GIS website home, navigate to Learning GIS → Online Tips & Tutorials → GPS Guides.

Good to know:

If you take the GPS unit to a distant new location, it helps to tell the unit generally where you are- you do this by setting the location. You won't need to worry about this if you are borrowing a GPS unit from Tufts.

If you will be using the GPS unit to navigate to a predetermined location designated by latitude and longitude you will need to know these lat/long coordinates in advance of data collection.

Collecting data:

1. At each site, you will use the GPS to record a “**waypoint**” – meaning the coordinates of that location, typically in **decimal degrees** North or South of the equator and East or West of the prime meridian (which runs through Greenwich, England). This is your location information. In addition to the coordinate information, each waypoint will also be assigned an ID by the GPS unit.
2. Record your GPS unit ID (if using multiple GPS units). Each GPS unit should be labeled with a unique number.
3. Record your waypoint ID and the coordinate information (N/S and E/W decimal degrees) on your paper information sheet.
4. Record the other information you need from each site on your paper information sheet.
5. Repeat this process for each waypoint.
6. At the end of a field data collection session (each night, for example) download your waypoints from your GPS unit to a laptop using DNR Garmin.
7. Record the paper data collection information in a spreadsheet.
8. Back up this data and print your recorded information on a regular basis.