**Lab 4 | Advanced Data Collection**

**Introduction**

In this lab you will work with some of the advanced data collection techniques we discussed in class – offsets, vertex averaging, nesting, and continuing a line feature.

**Instructions**

The output from this lab is a map, which you will create using ArcMap. The Generic data dictionary will be used to enter a description of each feature in the comment box. **You must be able to show the necessary results on the map, *so be sure to export this******comment field*.** Be sure to include all required map elements (i.e. title, north arrow, scale, legend).

**Deliverables**

1. Mission planning screenshots
2. Differential correction report
3. Map of your data
4. Attribute tables of your data (excel file)

***Part I – GPS Survey***

*Step 1: Mission planning*

* Change the elevation cutoff to 15 degrees

* Set the time interval to the four hour time that you are actually collecting data
* Use print screen to capture screenshots and include these in your lab document.
  + Number of satellites
  + DOPs
  + Visibility
  + Skyplot

*Step 2: Data collection set-up*

* Open up TerraSync on the Juno and go into Setup > Logging settings
* Set accuracy based logging to Horizontal, Postprocessed, <80 km, say Yes to Use Accuracy-based logging:, Apply to All Features, Required accuracy: 10m

*Step 3: Data collection*

* Go to a position on the track (one of the white lines).
* Start a rover file and note its file name. For all features, enter a description in the comment field.
* Collect a point feature at this location.
* Go to the west side of the track to the row of trees (towards Lesser Park), which creates some multipath; collect a position for one of the trees using the triple-distance offset technique. (See Lecture Collecting Good Data, Working with Offsets, Precision Technique)
* Collect a line feature along one of the straight (longer) sides of the track using the vertex averaging technique (only collecting two vertices). Follow one of the track lines
* Turn around and collect an offset line feature five meters left of your position while walking the exact path you just walked also doing vertex averaging (one or two track lines from where you want to collect).
* Move to another white line on the track. Begin collecting a line (*not using vertex averaging*). After 20 yards, stop and close the line feature.
* Collect another line perpendicular to this line and about 10 yards long using averaging vertices.
* Then continue your previous line for another 20 yards. Recall that you close the line feature (*but not the rover file*), collect a new feature, and then continue the line feature. (See Lecture Collecting Good Data, Continuing Lines and Polys)
* Turn around and create another line feature back along the same path using vertex averaging; however, offset the line 5 meters to the right, nest a point at 20 yards, and resume the line for the last 20 yards (See Lecture Collecting Good Data, Points can be Nested).
* Close the rover file.
* Add the rover file to the Map view in the Juno; if the data doesn’t look correct, collect additional features.

*Step 4: Transfer data from Juno*

* Transfer this rover file into Pathfinder using the Data Transfer Utility.
* Differentially correct all of the data; ***include the report as an item to turn in***.
  + In the Correct Settings window, click the Change button
  + Under GPS Filtering select Use New Filter Settings
    - Change the minimum elevation to 15 degrees
    - *If you lose a lot of data through this filtering, change the setting back to 5 degrees.*
* Export all the corrected data to shapefiles with these attributes:
  + PDOP
  + Correction Status
  + Receiver Type
  + Date Recorded
  + Time Recorded

*Step 5: Create a map*

* Create a map with the corrected data and symbolize by the comment field. Use the Sylvania aerial (Drone aerial provided by the instructor) as the background image for you map.
* Export the attribute tables to dbase and create a single Excel file with multiple sheets for each of your attribute tables.

**Deliverables:**

* Final map
* Differential Correction report (txt)
* Excel file of attribute tables