WIND FIELD DATA COLLECTION PROTOCOL
Field Guide

Purpose
This paper documents a standardized protocol for the sampling of wind in various areas using an array of nine anemometers. This protocol seeks to ensure the accuracy and consistency of all field data collected at study areas by GIS Training and Research Center field personnel.

This protocol requires a team of at least two field personnel.

Equipment

- Digital still camera
- Digital video camera
- GPS receiver – used to acquire plot center and perform field data entry. A Trimble GeoXH is preferred or other receiver capable of 1.0m horizontal positional accuracy (@95% CI following post-processing).
- Notebook and pencil to record ancillary data and notes
- Kestrel anemometers (9) – To collect the wind data, including crosswind, head wind, and bearing
- Plastic stakes to place into the ground and attach the anemometers
- Laser range finder
- Compass

Note: 50m = 54 yds; 250m = 274 yds.

In the Field
Part 1: Site location

- Various areas of at least 100x1000 meters in size.
- At least two sites
  - One flat site with little to no change in altitude
  - One hilly site exhibiting high degree of relief
  - The sampling array, when deployed in the field should look that shown in figure 1.

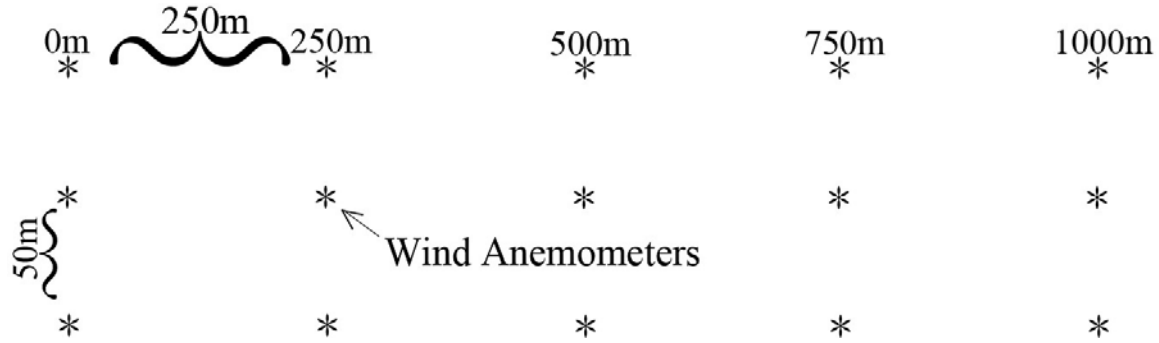

Figure 1. Aerial perspective of sampling array and anemometer spacing.

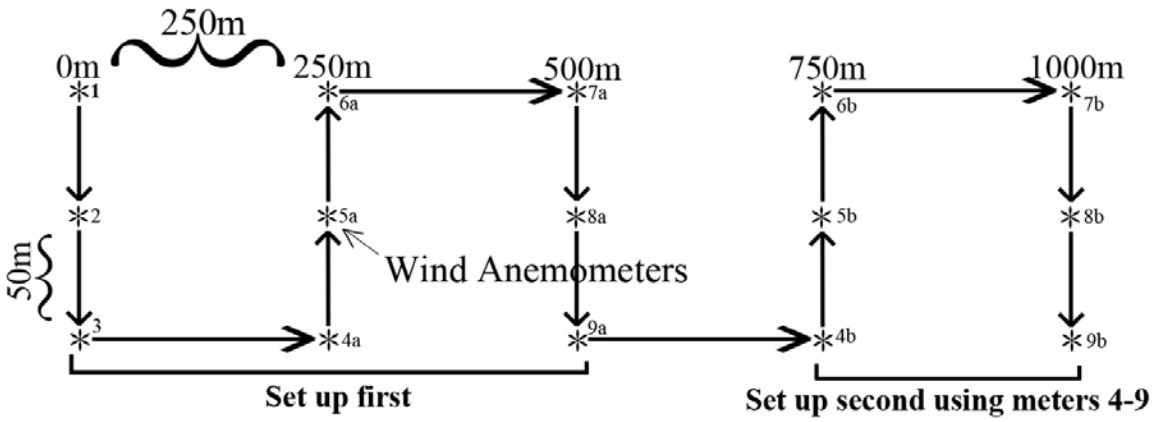

Figure 2. Anemometer Placement

Part 2: Sensor array data collection

1. Start the GPS receiver (cf. GPS collection protocol at http://giscenter.isu.edu/research/Techpg/nasa_postfire/To_PDF/Protocol-%20GPS%20setup.pdf).
2. Navigate to sampling site position no. 1
3. Record the site location using the GPS receiver
4. Place one stake into the ground and insure it is perpendicular to the ground surface.
5. Attach the anemometer with the corresponding tag number.
    a. Open wind port located on top
    b. Press red start button
    c. Navigate to crosswind screen by pressing up or down buttons
    d. Press middle button to set heading
    e. Press middle button again to Auto Set
    f. Press middle button again to confirm set heading

    Next

    g. Using a compass, Person B will take a bearing across range (from point 1-3) and down range (from point 1 to 7b). Person B will calculate and record the back azimuth (from point 3-1).
    h. Using a laser range finder and compass, Person A will aid Person B to navigate to the next sensor position. The laser range finder will help determine distances between sensors of 50m and 250m.
    i. Person B will walk 50m from the existing point to the next point, place a stake in the ground and attach the corresponding anemometer.
    j. Person B will initialize the anemometer and begin recording wind data.

    For anemometers #1-3

        i. Open wind port located on top
        ii. Press red start button

iii. Navigate to crosswind screen by pressing up or down buttons
iv. Press middle button to set heading
v. Press middle button again to Auto Set
vi. Press middle button again to confirm set heading

For anemometers #4-9

vii. Open wind port located on top
viii. Press red start button
ix. Wait for main screen to show

k. Person B will use the GPS receiver to record location of the sensor.
l. Person A will rejoin person B.
m. Repeat steps b-e to place and locate sensor #3.
n. Check azimuth on compass to ensure the same bearing is followed as recorded in step a.
o. Person B will navigate 250 m to sensor location #6a, place a stake in the ground and attach the corresponding anemometer
p. Person B will initialize the anemometer and begin recording wind data.
q. Person B will use the GPS receiver to record location of the sensor.
r. Person A will rejoin person B.
s. This process will be repeated until all nine (9) anemometers are correctly placed, initialized, and located in the field.
t. Wait 30 minutes for the recording period.
u. During this time, take still photos and video of the wind events being sampled.
v. Person A and B will then remove anemometers 4a-9a.
w. Using the same steps described above, place, initialize, and locate the anemometers at locations 4b – 9b.
x. Periodically, check azimuth as described in step a.
y. Wait 30-60 minutes to allow the anemometers to record
z. During this time, take still photos and video of the wind events being sampled.

6. Collect all anemometers and turn them off

7. Download all data from the anemometers once you have returned to the GIS Center.