Name_____

Physical Geography
Lab Activity #09

Due date_____

Sketch Maps, Part I

COR Objective 1, 2, 4, & 6, SLO 1, 2, & 4

9.1. Introduction

Geographers have jobs that take them outside of the office and into the field. In fact, that's why most of us become geographers. When something significant is found out in the wilderness, often we need to construct sketch maps for later analysis. The maps must be as accurate as possible, while only being created with a compass and knowledge of one's pacing distance. In this lab you will learn the basics of drawing a sketch map with the data provided below.

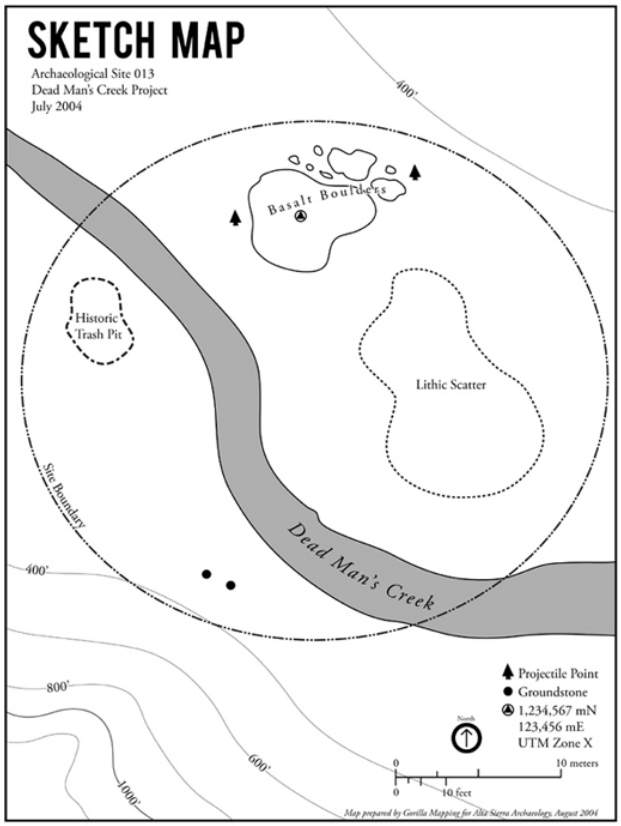

Figure 9.1.Example of an archaeological sketch map.

9.2. The concept

A sketch map is drawn from data taken from compass readings and pacing distances. If you know the direction and distance of everything as it relates to your starting point you can quickly draw a scaled map.

Your first step is to determine the orientation of your map. North is typically set at the top of your map, but should the top be one of the 8.5" sides or one of the 11" sides? This of course depends on the shape of the thing you are trying to map.

Next you will need a scale. Since your map will be on an 8.5"x11" sheet of paper, you must calculate the map's scale so it will completely fit on the paper. Assume you have 7"x10" on which to draw. That means that the longest dimension of your map must fit within 10" of space. For example, if the longest dimension is 275' in reality, 10" must equal 275'. If we simplify it (divide each side of the equation by 10) we get 1" = 27.5'. If we convert the feet to inches we get a fractional scale of 10:3,300 or simplified: 1:330.

Let's say the other dimension of your map is 175'. That means that 7" = 175'. Divide each side by 7 and you get 1" = 25' or 1:300. The scales are close, but you will need to pick one. To be safe you should always pick the smaller scale of the two, which means the larger number on the right of the colon (in this example, 330 is larger than 300 so you would use a scale of 1:330).

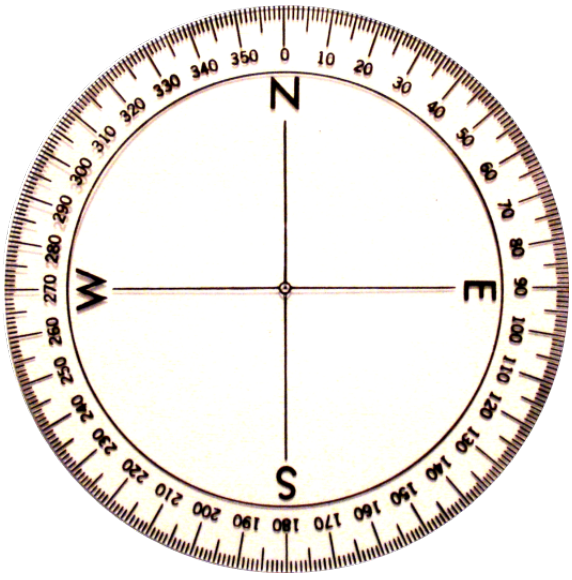

Figure 9.2.360° Protractor.

Once you have your scale, locate the first point or "datum" and begin drawing the boundary of your site. To do so you will need a 360° protractor (figure 9.2). Align 0° with North on your map and make a temporary mark in the direction of the next

boundary point. Using a ruler and your map's scale draw a line in the proper direction at the exact length it should be. Continue this until you have your complete site boundary. Then using the azimuth information you will triangulate the items inside the site. You are given two azimuths for each item. When properly drawn, the two azimuths should intersect exactly where the item exists in space.

Figure 9.3 shows an example sketch map to help you format your own. Be as accurate as possible and make your map as neat and legible as you can.

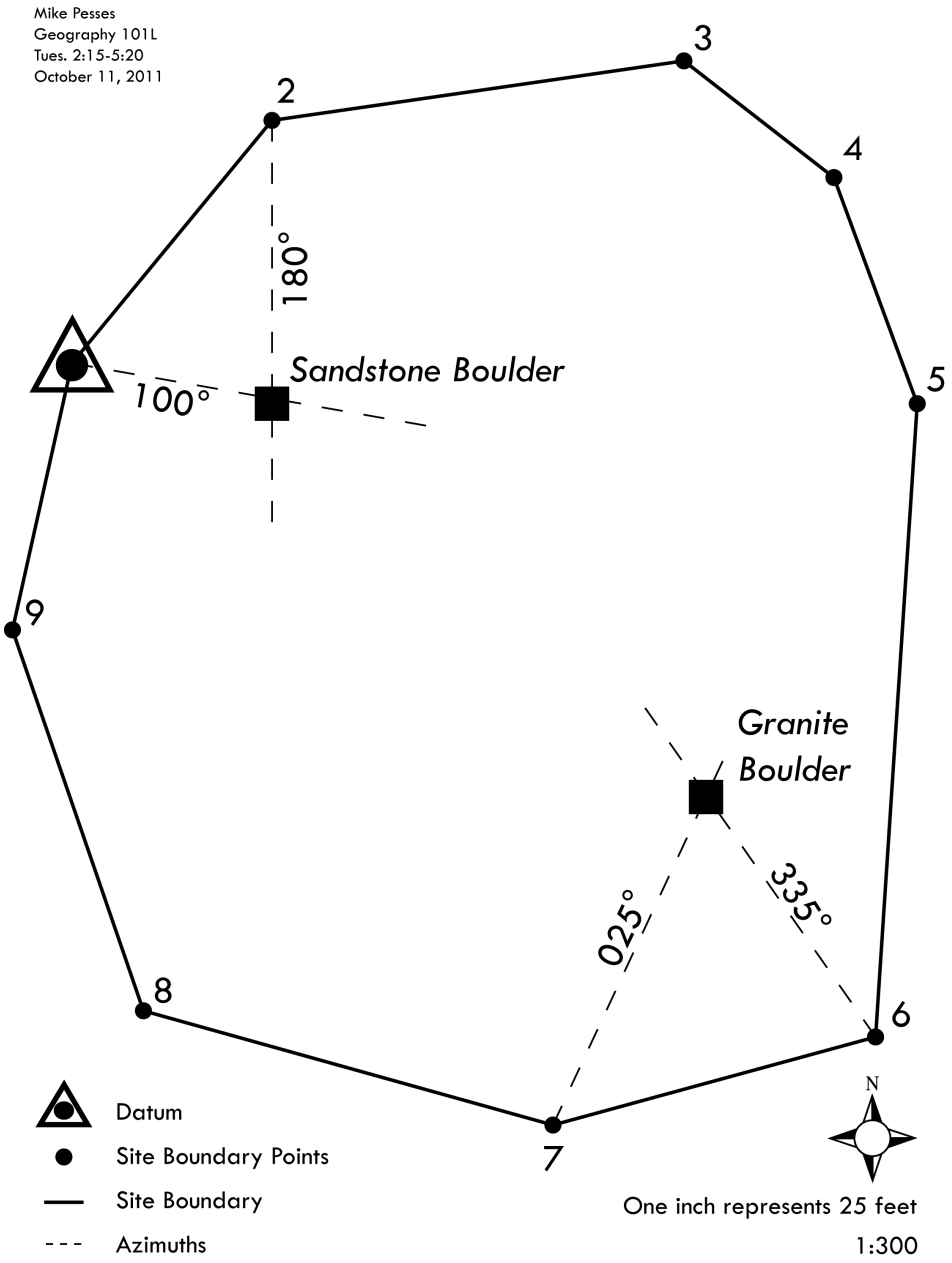

Figure 9.3. Example Sketch Map

9.3. Map 1 – Plane crash

You are part of a team responsible for locating and mapping the remains of a plane crash that took place in the Mojave Desert. While hiking transects, your team finds a portion of the wreckage in an area roughly spanning 250' from east to west by 175' from north to south. You find a tall Joshua tree near the southeast corner of the site to use as a datum, which is roughly two miles, at 065° from the intersection of County Line Road and Cypress Road. *From there you create a site boundary using the following trees in the area:*

- Joshua Tree 2 (from tallest tree): 015°, 56.25 ft
- Joshua Tree 3: 030°, 28.125 ft
- Joshua Tree 4: 355°, 50 ft
- Joshua Tree 5: 246°, 31.25 ft
- Joshua Tree 6: 281°, 75 ft
- Joshua Tree 7: 259°, 100 ft
- Joshua Tree 8: 220°, 37.5 ft
- Joshua Tree 9: 120°, 43.75 ft
- Joshua Tree 10: 200°, 75 ft
- Joshua Tree 11: 090°, 150 ft
- Back to datum: 070°, 37.5 ft

Within this site boundary you found the following pieces of wreckage:

- Metal from fuselage at 020° from J. Tree 9, 090° from J. Tree 8
- Metal from fuselage at 046° from J. Tree 10, 304° from J. Tree 11
- Engine component at 225° from J. Tree 5, 172° from J. Tree 6
- Portion of vertical stabilizer 023° from J. Tree 11, 270° from J. Tree 2
- Computer debris at 094° from J. Tree 8, 050° from J. Tree 9
- Electrical wiring at 102° from J. Tree 9, 188° from J. Tree 6

Your final map should show all of these points in their exact locations, use different symbology for the different elements, indicate the location of the nearest roads, and contain a legend, scale bar, representative fraction scale, verbal scale, north arrow, a title, and your name.

9.4. Map 2 – archaeological site

You got fired from your airplane wreckage job (for stealing compasses), but luckily found work as a field archaeologist. You are out with a team surveying a wilderness area outside of Fall River Mills in Northern California for potentially important prehistoric sites. You discover a lithic scatter with some faunal remains. The site runs approximately 100 ft from north to south by 70 ft from east to west. You select a large granite boulder as your datum, which rests in the northwest of your site. According to your topo map, the coordinates appear to be 615,050 mE, 4,558,420 mN, UTM Zone 10. *From there you map the following site boundary:*

- To Point 2 – Pine tree: 180°, 20 ft
- To Point 3 – Oak tree: 144°, 12.5 ft
- To Point 4 – Oak tree: 210°, 20 ft
- To Point 5 – Oak tree: 175°, 15 ft
- To Point 6 – Granite boulder: 168°, 27.5 ft
- To Point 7 – Basalt boulder: 103°, 21.25 ft
- To Point 8 – Pine tree: 028°, 25 ft
- To Point 9 – Pine tree: 049°, 27.5 ft
- To Point 10 – Basalt boulder: 003°, 32.5 ft
- To Point 11 – Rhyolite boulder: 331°, 20 ft
- To Point 12 – Pine tree: 279°, 25 ft
- Back to Datum – 271°, 25 ft

Within the site you find the following artifacts:

- Debitage (stone tool debris) at 209° from point 11, 269° from point 10
- Small mammal bones at 327° from point 7, 058° from point 6
- Obsidian biface (double-edged blade) at 097° from point 5, 136° from point 4
- Obsidian conical flake core (big hunk of obsidian used for tool making material) at 247° from point 10, 308° from point 9
- Three obsidian flake blanks (raw materials for bifaces) at 176° from point 12, 127° from datum
- Round cobble hammerstone (used to modify obsidian) at 045° from point 2, 156° from datum
- Elk antler tip (for pressure flaking of stone tools) at 075° from point 3, 113° from point 2
- Broken obsidian projectile point at 353° from point 8, 266° from point 9

Your final map should show all of these points in their exact locations, use different symbology for the different elements, indicate the UTM coordinates of your datum, and contain a legend, scale bar, representative fraction scale, verbal scale, north arrow, a title, and your name.

End of Lab 9