IMPORTANT: *Please refer to the Preface for Topographic Map Activities for preliminary instructions and information common to all Topographic Map Activities in the series.*

Topographic Map Activity 10 - UTM Conversion to Latitude and Longitude (Revision 061620)

Objective: Convert Universal Transverse Mercator (UTM) points to latitude and longitude using points from Red Rock Canyon Topographic Maps.

Background: Topographic (Topo) Maps show geographical locations with UTM grid lines and latitude and longitude coordinates. In previous activities we have learned that UTM grid points are alternative location coordinate points to latitude and longitude coordinate points. We've learned how to read UTM grid lines to determine the points of a UTM grid. Additional information on UTM lines may be found here.

UTM lines are represented by grids, seen on Topo maps as brown grid lines. UTM coordinates are written as Grid Zone Designation (11S) Easting (E) in meters, Northing (N) in meters. For example: 11S 123456m E, 1234567m N. Similar to an x,y graph, Eastings are the x-axis and Northings are the y-axis.

Activity: We will learn how to convert UTM coordinates to latitudes and longitude coordinates, and ensure the points are correct by checking with the Topo map.

Step 1. Open the Blue Diamond Topographic Map with a Ctrl + Click on the hyperlink: Blue Diamond

Step 2. Once the map opens, ensure that all layers are being shown (refer to instructions in Preface for assistance).

Step 3. Take the coordinates for the Pine Creek Spring UT grid form the previous activity. Simplified UTM coordinates for the UTM grid box that Pine Creek Spring occurs in are 11S 635000m E, 3998000m N. This can be simplified to 11S 635000, 3998000 removing meters and E or N or further simplified as 35 x 98.

Step 4. Open this online UTM latitude/longitude conversion calculator- https://www.ngs.noaa.gov/NCAT/. In the calculator, in "Convert/Transform" ensure Horizontal is clicked. In "Select the type of horizontal coordinate" click "UTM".

Step 5. For the UTM grid with Pine Creek Spring UTM grid point 11S 635000, 3998000. Insert the Northing, Easting, and UTM Zone into the calculator.

Step 6. Did the small map change to look like southern Nevada? If the map did not change, you may want to try again. Click "Submit" after seeing the map relocate to southern Nevada.

Step 7. From Results, what is the latitude and longitude?

Step 8. We'll double check the latitude and longitude found. In the Blue Diamond Topo Map, click "Tools" then "Measure" then click "Geospatial Location Tool". You'll see latitude and longitude coordinates of the pointer displayed in the lower right corner in a grey box.

Step 9. Hover your pointer to the lower left corner of the UTM grid that contains the Pine Creek Spring. What is the Latitude and Longitude of this point?

Step 10. Do the coordinates in Step 9 and Step 7 match closely?

You have taken UTM coordinates from near Pine Creek Spring and converted them to latitude and longitude!

Feedback

Answers (AS stands for answer step):

AS3   11S 635000m E, 3998000m N

AS7   (N360702.25846 or 36.1172940162) & (W1152959.82815 or -115.4999522633)

AS9   36.1172, -115.499

AS10   They match to the 3rd and 4th digit.