Name:

Date:

Lab 2 Questions—due Tuesday, 13 September, 2011

1.1.1 What is the spatial extent of the view shown in degrees of latitude and longitude?

1.1.2 Where is the point (0,0) (deg. longitude, deg. latitude) located?

1.1.3 Using the New Rectangle tool http://www.geo.utexas.edu/courses/371c/Labs/Lab2/images/draw_rectangle.jpg in the Drawing toolbar, draw a box around Australia. What is the extent of this box? Give the coordinates of the lower left corner and upper right corner in decimal degrees.

***To be turned in***: a color layout showing the world in geographic coordinates, in Robinson projection, and a projection of your choosing. Before finalzing your layout, drag the lat-long grids below the countries to enhance map readability. Title the layout "Map 1: Projected And Unprojected Maps Of The World".

2.1.1 What is the geographic extent of the United States? Give the eastern and western limits of longitude and the northern and southern limits of latitude of the continental US (not including Alaska or Hawaii) to the nearest degree.

2.1.2 Which parallel defines much of the border between the United States and Canada?

2.1.3 If we removed a wedge out of the earth cut along the meridians defining the most eastern and western points in the continental United States, how much of the globe would we have cut out? Give your answer as a percent of the total volume of the earth (assume the earth is a sphere for this problem).

***To be turned in***: A layout showing the United States in geographic coordinates and in the Albers Equal Area projection. Before finalizing your layout, drag the lat/long grids below the countries to enhance map legibility. Title the map "Map 2: Projected And Unprojected Maps of the Conterminous United States".

3.1.1 What is the geographic extent of Texas to the nearest degree in North, South, East and West?

3.1.2 What meridian runs down the East side of the Texas Panhandle? (The Panhandle is the northernmost part of Texas bounded by three lines meeting at right angles.)

3.4.1 How many UTM zones are there in Texas? Note that the meridians in the graphic above are not UTM zone boundaries. You may wish to consult your notes.

3.4.2 Which zone covers West Texas? Central Texas? East Texas?

3.4.3 In the lab procedure, you referenced the UTM coordinates for Texas to Zone 14. Why was this zone chosen instead of the others?

3.4.4. Recall that UTM zones use a false easting for the central meridian to avoid negative numbers. Place the cursor over the westernmost tip of Texas in the UTM Zone 14N data frame, and read the coordinates from the lower right part of the window. Why is the first number negative?

***To be turned in:*** A color layout showing Texas in Geographic, Lambert Conformal Conic, Texas Centric and UTM projections. Before finalizing your layout, drag the latlong grids below the countries to enhance map legibility. Be sure to save your map document after you complete the layout. Title the layout "Map 3: Projected And Unprojected Maps Of Texas".

4.1.1 How many 7.5' quadrangle sheets are there in a 1 degree by 1 degree box?

4.1.2 How many 7.5' quadrangle sheets are needed to cover Austin? Hint: Open the Attribute table for the AustinMaps layer and examine the bottom of the window. The number of records (there is one record for each quad) in this file is given.

4.1.3 Just Southwest of Austin there is an intersection of a 1º parallel and a 1º meridian. What is the latitude and longitude of this location?

4.1.4 By opening the AustinMaps.dbf in Excel, make a list of the names of the 1:24,000 scale map sheets (7.5' quads) that are needed to cover Austin. Cut and paste this list into your answer sheet.

***To be turned in:*** A Layout showing Austin in geographic coordinates and in State Plane coordinates. Before finalizing your layout, drag the lat/long grid below the countries to improve map legibility. Title you map "Map 4: Projected And Unprojected Maps Of Austin, Texas".

5.1.1 The area where the City of Austin has "Full Purpose" jurisdiction is the area in the center of this map. The areas around it are areas where the City has limited jurisdiction, or that are within surrounding cities. Over what percent of the area shown in the *Juris* polygons does the City of Austin have "Full Purpose" jurisdiction? Briefly explain how you got the answer, and show any calculations you use.

6.2.1 Give two plausible reasons why the shores of Town Lake on the photo do not exactly coincide with the Town Lake outline of the shapefile.

6.3.1 You have downloaded digital orthophotographs and several shapefiles from the web. List the general steps (not the detailed procedures) that you will do to assure that the data will display properly (i.e. with the proper coordinates) in ArcMap.

***Four Map Layouts to be turned in:***

(\*Make sure all layouts are printed IN COLOR\*)

1. A color layout showing the world in geographic coordinates, in Robinson projection, and a projection of your choosing. Before finalizing your layout, drag the lat/long grids below the countries to enhance map readability. Title the layout "Map 1: Projected and Unprojected Maps of The World".

2. A layout showing the United States in geographic coordinates and in the Albers Equal Area projection. Before finalizing your layout, drag the lat/long grids below the countries to enhance map legibility. Title the map "Map 2: Projected and Unprojected Maps of the Conterminous United States".

3. A color layout showing Texas in Geographic, Lambert Conformal Conic, Texas Centric and UTM projections. Before finalizing your layout, drag the lat/long grids below the countries to enhance map legibility. Be sure to save your map document after you complete the layout. Title the layout "Map 3: Projected and Unprojected Maps of Texas".

4. A Layout showing Austin in geographic coordinates and in State Plane coordinates. Before finalizing your layout, drag the lat/long grid below the countries to improve map legibility. Title you map "Map 4: Projected and Unprojected Maps of Austin, Texas".