

Web Exercise 05: ArcGIS Online and Group Project Website

DUE Date: October 22 (Thursday), 5:30pm (on Blackboard).

Grade: 15 points (Two weeks)

Part 1: ArcGIS Online

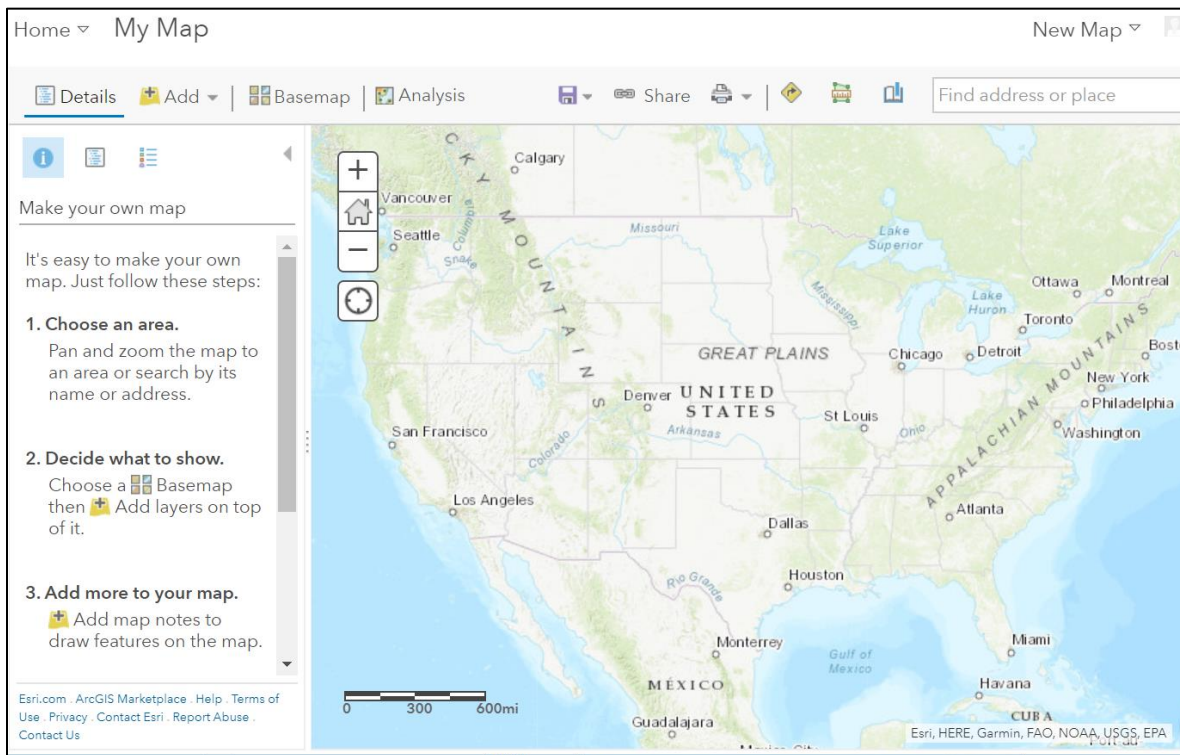
ArcGIS online is a Cloud computing GIS framework. **Cloud computing** is a new Web technology which can allow many users to utilize web computing resources (disk storage, software programs, virtual machines, databases, and GIS maps). For example, if you are using Google's Gmail and Google Docs, they are typical Cloud computing applications. To know more about Cloud computing in GIS, read this article:


<http://www.esri.com/news/arcwatch/0110/feature.html>

1. Go to <https://sdsugeo.maps.arcgis.com>
2. Click the “Sign In” dropdown in the upper right
3. Select the blue “San Diego State University” button - this take you to the SDSU ID login window
4. Use your SDSU ID username and password.
5. When you login, go to the “Groups” menu on the top.
 - You can join a GROUP inside your organization and share your maps and data among your group members or the whole organization members. In this exercise, you will join the **BDA594-2020** group first.
 - On the **Groups** menu, select “**My Organization’s Group**” Tab (the third one). In the Search My Group textbox, type “BDA594” →
 - Then select “**BDA594-2020 Group**”, Select “Join This Group”. Then click on “Submit Request” button. Your request will be reviewed by the Instructor. The Instructor will approve your request ASAP (within one day) to add you into the BDA594-2020 Group.

Learn ArcGIS with the Online Tours (One hour).

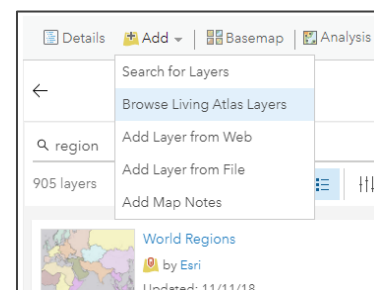
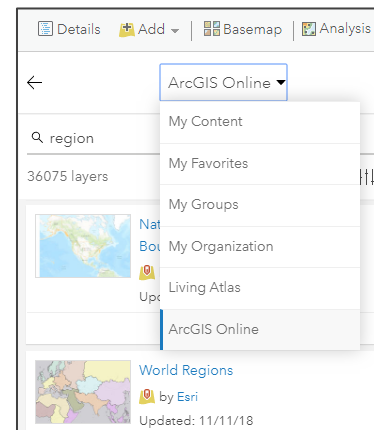
1. On the top menu, select “Map”. A map viewer will display.



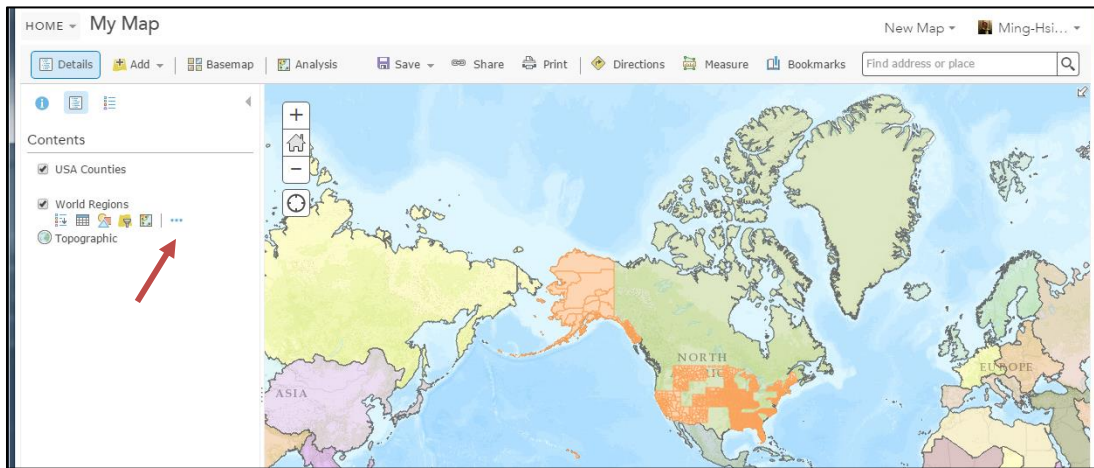
2. On the left side of map, there are basic instructions about make your own map.
3. Click “New Map” on the top right corner.
4. In this new map, the first task is to search for World Region boundaries and US State boundaries. Click on “Add” on the top menu → Click “Search for Layers”
5. Select “ArcGIS Online” from the drop down list and search “USA Counties (Generalized)” by Esri and “World Regions” by Esri layers. (You can also find these layers from “Browse Living Atlas Layers”)
6. Click on the bottom black icon  to add each layer into My Map.

When you zoom out to see the whole world region, USA Counties may not draw completely because there are too many features to display in this area of the map.


This problem is important for web map display because of limited screen resolution and screen size in your computer,



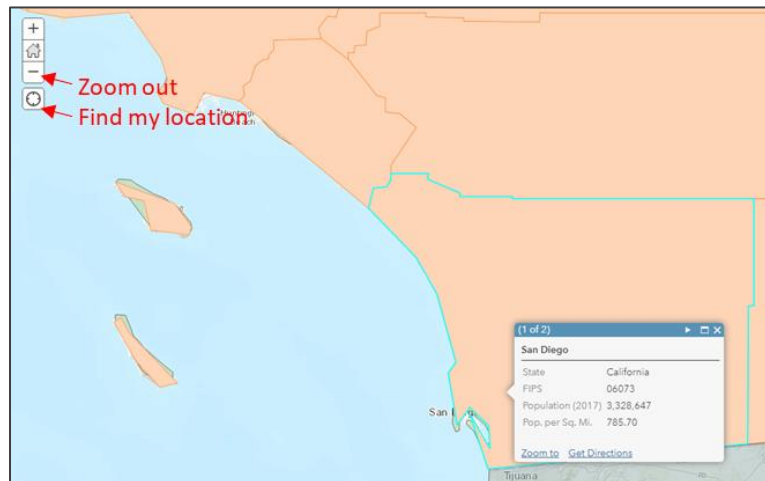
each map layer should be displayed at different scale – setting up visible range for each layer. Your Map will look like the following figure or you will see an Error message on the left bottom corner.




7. Do you know how to set up visible range for each map layer? (Ask the Instructor for the answer). (Tips: In the left side of window, click on the “...” under the layer’s name. Then select “Set Visibility Range”.)

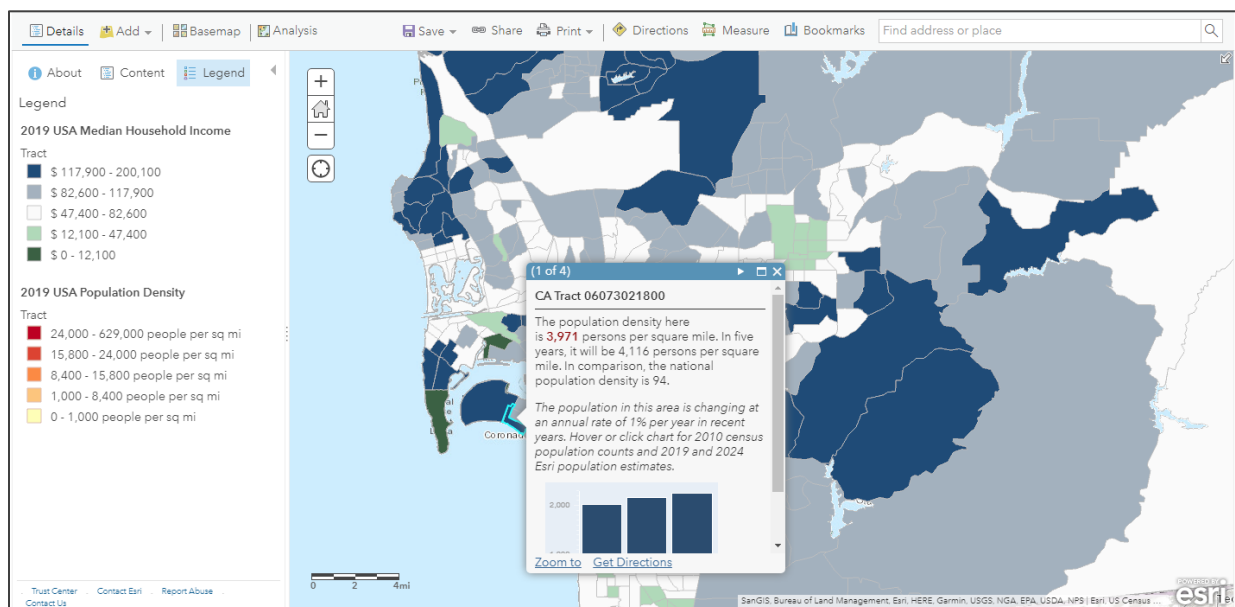
8. Now, let’s zoom into San Diego. Click on the “Find my Location”  icon below the **minus** sign. The map will automatically Zoom-in into your location (based on your computer’s location- Your web browser might ask you to allow access your location)

9. If you see a blank orange page, don’t panic. My Map just ZOOM-INS too much. Click on the **minus** sign to **ZOOM-OUT slowly** until you see the boundary of San Diego County.



10. **Click on** the center of San Diego County to open the information window (as a function to query map layers). What is the total population in San Diego County? In the window, it shows “1 of 2”, can you see the “2 of 2”? What’s the information about “2 of 2”? (Note: since we have included two map layers, one map layer is World Region. Another map layer is “USA Counties”.)

11. We will add a few more layers to study demography of San Diego. Click on **"Add"** on the top menu. Search for the following two Layers: In **"ArcGIS Online"**
12. Add **"2020 USA Median Household Income"** by Esri and **"2020 USA Population Density"** by Esri.
13. Click on  .
14. Do you see the two new added layers? Why? _____
15. In the Layer [Contents], you can re-arrange the sequence of layers or uncheck the display of top layers to see the other map layer below. Uncheck the [World Regions] and [USA Counties] layers now. Move the USA Median Household Income layer to the top of Population Density layer.
16. What do these colors means in the Household Income map? Click **'Legend'** and switch to the **Map Legend** View. Does the distribution of Household Income make sense in San Diego? (You will need to zoom in to San Diego to see more detail zones (zip code areas or census tracts)).
17. Try to Zoom-In and Zoom out this map to see the overall pattern of Household incomes in U.S. and the patterns in San Diego. Do you notice the differences between county-level maps and States-level maps?
18. You can select your interested neighborhood and query their household Income levels. What's the distribution pattern in your neighborhood? (For example, you can also try the regions in Coronado Island).



19. Now we will add one local GIS data into My Map. Most GIS data layers in San Diego can be downloaded from the SANDAG website:

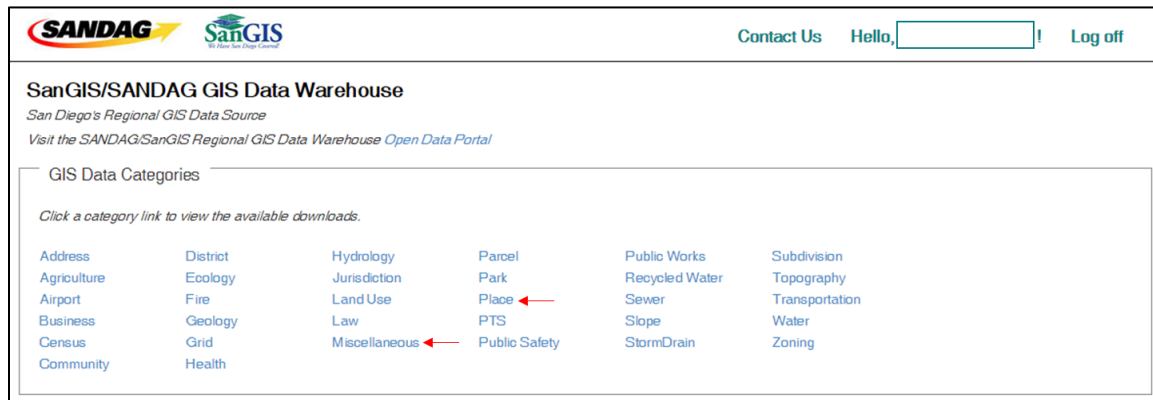
Maps and GIS

<http://www.sandag.org/index.asp?classid=21&fuseaction=home.classhome>

Regional GIS Data Warehouse

<http://www.sandag.org/index.asp?subclassid=100&fuseaction=home.subclasshome>

(You need to create a free account to download these data. It will just take a few seconds).

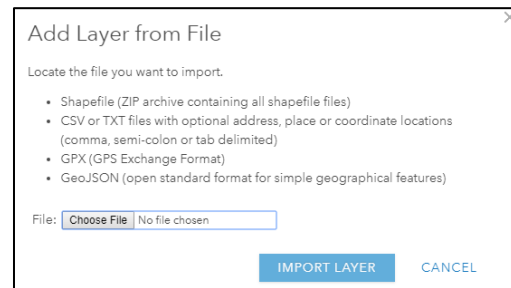


You can download many important GIS layers (in Zip file format) from this website, including Schools (in Place), School Polygons (in Place), Hospital (in Place), Colleges (in Place), Cell_Phone_Towers (in Place), Parks, Street_Lights (in Miscellaneous), ZipCode (in Miscellaneous).

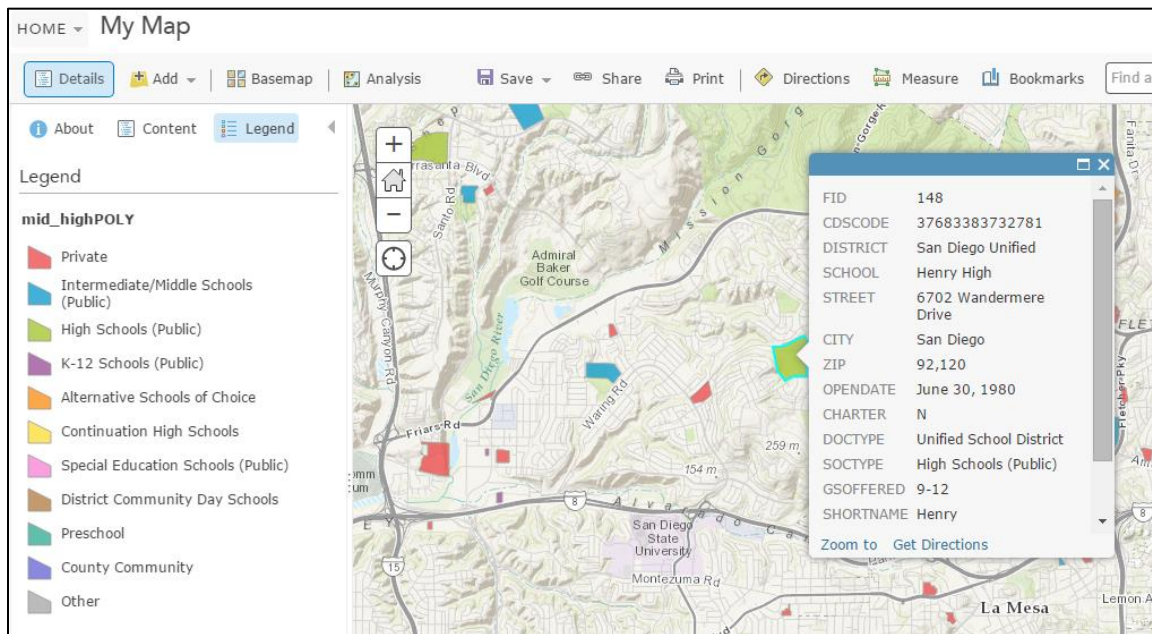
Most of zipped file can be added into ArcGIS online directly. But if the **layer has more than 1000 feature items**, it will have error messages. Since the San Diego School files include 1082 features, we modified the files and keep only High Schools and Middle Schools in the database. The new file is called “**mid_highschools**” and “**mid_highPOLY**”.

The Google Drive Shared folder **BDA-GEOG-594-BigDataScience/Web-Exercises/Data** should has two GIS datasets, “**mid_highschools.zip**” and “**mid_highPOLY.zip**”. Copy the two files into your local computer.

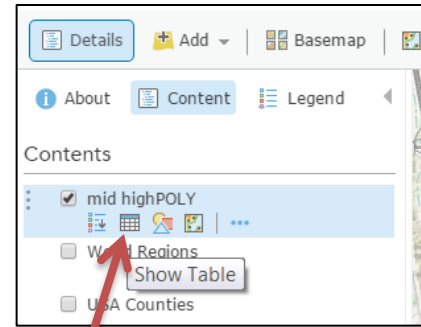
20. Let's add the **mid_highPOLY** into My Map. Click on the **"Add"** and **"Add Layer from File"** from the drop down. Select the **mid_highPOLY (a zip file)** from the workspace folder. Then click on **"IMPORT LAYER"**.



21. ArcGIS online has detected this GIS layer has a few "attributes" to display. In the Option 1, **Choose an attribute to show** → select **"SOCTYPE"** (school type). So each type of school polygons will be displayed in different colors. The second option is to choose a drawing style with **Types** (unique symbols) or Location (single symbol). The default choice is Types. Keep the default. Then click on **"DONE"**.
22. Now **Turn off** the Median Household layer. Can you see the new mid_highPOLY layer (Middle schools and high schools in San Diego)? Try to Zoom In to see.
23. Click on one color polygons to see the information in the window. Does the color match its TYPE?

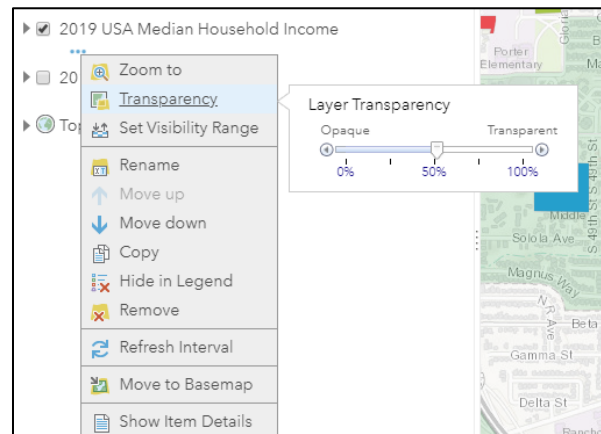


24. There is also a Table View in ArcGIS online. Switch to “Content” view in the Left Panel. Click on the “**Show Table**” icon within the Layer of “**mid_highPOLY**”. You will see a table show up under the map with all attribute information for every school. After viewing these attributes, you can **turn off the Table view**.



25. Zoom-in to one high school polygon. Do you know what's the **median household income nearby that high school?** Turn on the “**USA Median Household Income**”. Now the two map layers are difficult to recognize. To improve the display of the map. You need to change the “**Transparency**” of the “**USA Median Household Income**” layer.

26. Click on the “...” below the 2019 USA Median Household Income” layer. Select Transparency → Change to **50%**.

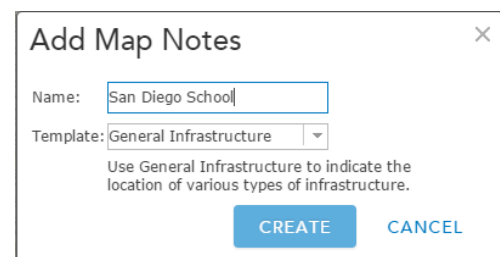


27. Change the Transparency of **mid_highPOLY** to “**0%**”. Now the map looks much better.

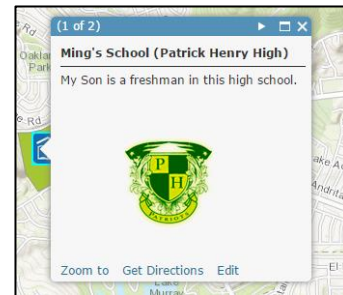
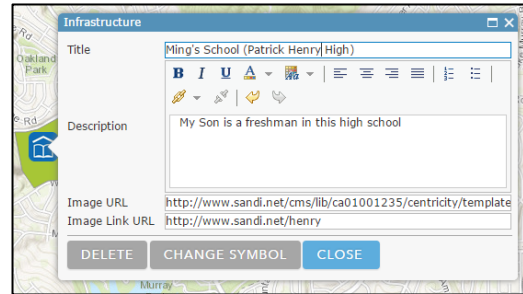
28. Click on the center of your selected school polygon. In the Popup Info window, change the Page to **Second Page** (2 of 2) to see the nearby household incomes. Click on anearby polygon and do the similar analysis. What is the average household income nearby your selected school? _____

29. Use the Measure Tool to measure the area of your selected school. The measure tool is on the top menu. (You should change the unit to **Sq Yards**). How many **Sq Yards** in your School?

30. Now we can add a Map Note into your School. Click on the “**Add**” on the Top menu, select **Add Map Notes**. Type “**San Diego School**” and select “**General Infrastructure**” template.

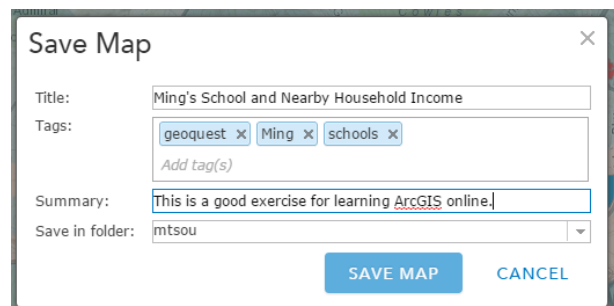


31. Select a school symbol from the list. Then place the symbol on top of your own school. Type-in a title and a description for your school. Add Image URL and the Link URL. The Image URL can be the LOGO of your school. You can open a web browser and search for your selected school website. The school website URL will be the “Image Link URL”. You can right-click on the School’s LOGO and select “Copy Image Address”, then paste the URL into the “Image URL”. Click on “**CLOSE**”.



32. Currently, you are in the “Edit” Mode in ArcGIS online. You can see that the “Edit” icon on the TOP menu is activated. To complete this Edit session, click on the “**Edit**” button to turn off Edit Model.
33. Now you can test your new Map Note. **Click on the School map symbol** to see what happens.
34. Now Zoom-out a little bit to see the Household income layer to display on the map. Click on the Bookmarks (on the Top menu) → **Add bookmark** to bookmark this view. (type in your own description).

35. Now we need to save our work. Click on the **[Save]** on the top menu -> **[Save]**. In the Save Map window, input Title, Tags, and Summary. In the Tags, please add the first one for “GEOG594-Lab-05”. The title and tags are searchable text when you share or publish your maps. So be careful about what kinds of information you put in these fields. Click on “**SAVE MAP**” when you finish. This web map will be saved into your Content associate with your ArcGIS online organization account.



36. One powerful function of ArcGIS online is to share your maps with others. Click on “**Share**” button on the top menu, the Share window will pop-up. You can share your

map to everyone, or to your organization (SDSU), or members of your groups. You can also share this map with your Facebook or Twitter Account.

37. In this exercise, you will share your map with BDA594-2020 group. Click on the “Share” icon (next to the SAVE icon). In the Share window, select “BDA594-2020” as the group to share. Then click on “DONE” in the bottom of window.

Conduct Another ESRI Exercise: “Plan Routes for Food Inspectors” (one hour).

1. Use your browser to open this link:
<https://learn.arcgis.com/en/projects/plan-routes-for-food-inspectors/>
2. Finish the three Lessons (Create layers for analysis, Find the routes and stops, Print directions for the routes).

Create Your OWN Web Map and Share with Our Group! (30 mins)

Now you can modify your current maps by adding other map layers you found from ArcGIS online or SANDAG website. Please **add at least TWO new map layers in your new map**. Save your map and Share your new map with a new name to the Group of “BDA594-2020”.

You can see other’s nice web maps from our “BDA594-2020” group. On the Top left corner, Click on “Home” menu, select “Group”. Then select the “BDA594-2020” group. Have fun!

Part 2: Create your Group Project on Google Site

1. Learning HTML basic:

- Watch this short video: <https://www.youtube.com/watch?v=bWPMSSsVdPk>

- Please spend 30 mins to finish this HTML5 Tutorial:
<https://www.w3schools.com/html/default.asp>
- In your local computer, create one HTML file using Notepad or other text edit tools, called “myfirstHTML.htm”, including the title information (in the <head> section), one picture, one hyperlink to SDSU Geography website, one <h1> text, one <h2> text with RED color (in the <body> section). Please save the source code of *myfirstHTML.htm* and copy the screenshot of the HTML file from a Web Browser (IE or Chrome, or Firefox). You can print out the source code using Notepad or other text edit tools.

Note: DO NOT COPY Any Internet photos without asking owners’ permission!

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Source: <http://www.copyright.gov/>

2. How to create a Website?

- Watch the first 30 minutes of this video to learn about the basic website implementation procedures and WordPress:
<https://www.youtube.com/watch?v=2cbvZf1jIJM>
- Watch this video for the Introduction to Google Site:
<https://www.youtube.com/watch?v=w05NIgHNzWs>
- Complete the tutorial in the G Suite Learning Center (20 mins):
<https://gsuite.google.com/learning-center/products/sites/get-started/#/>

Create your own project website using either WordPress or Google Site.

Note: Limitations of Google Site:

- No open use of Cascading Style Sheets (CSS) or JavaScript. JavaScript can be used within the confines of an embedded gadget or the HTML box. Inline CSS can be used within the webpage content area.

- Limited e-store capabilities, have to use the Google i-store gadget to add a shopping cart, iframe a third-party e-store provider such as Amazon, or use a Google Buy Now button.
- Limited use of HTML coding. HTML is checked and modified when saved, Javascript is made safe with Caja. CSS cannot be incorporated in the theme templates; however, inline CSS can be used within the webpage content area.
- Sites that are hosted on Google Sites are not available to residents of countries where Google services are blocked.

After finishing this Web Course, Please use your own words to answer the following questions (next page): (DO NOT COPY any web resources or Wikipedia texts. We will check your answers with Blackboard tools to verify that your responses are uniquely yours.) By submitting your answers (paper) to Blackboard, you agree: (1) that you are submitting your paper to be used and stored as part of the SafeAssign™ services in accordance with the [Blackboard Privacy Policy](#); (2) that your institution may use your paper in accordance with your institution's policies; and (3) that your use of SafeAssign will be without recourse against Blackboard Inc. and its affiliates.

SafeAssign accepts files in .doc, .docx, .docm, .ppt, .pptx, .odt, .txt, .rtf, .pdf, and .html file formats only. Files of any other format will not be checked through SafeAssign.

LAB-5 Questions:

1. How many different types of content can you save in your ArcGIS online account? (Tips: go to the "Content" in the top menu. Then click on "Item Type".) What are the differences between "Maps" and "Apps" in ArcGIS online? (3)
2. Describe the two new map layers you added and the share link (URL) of your new ArcGIS online map. (2)
3. What is your role and responsible tasks in your group project (2)
4. Include the Source Codes and Screenshots of the myfirstHTML.htm (2)
5. What is the URL of your Project Website? Please also include a Screen shot of the Project Website Home Page. (3)
6. Introduce the **WordPress** web authoring tool and compare the differences between WordPress and Google Site (3).

Please submit your LAB-5 Answers (in a MS Word or a PDF file format only) to the Blackboard System BEFORE the DUE DATE/TIME.