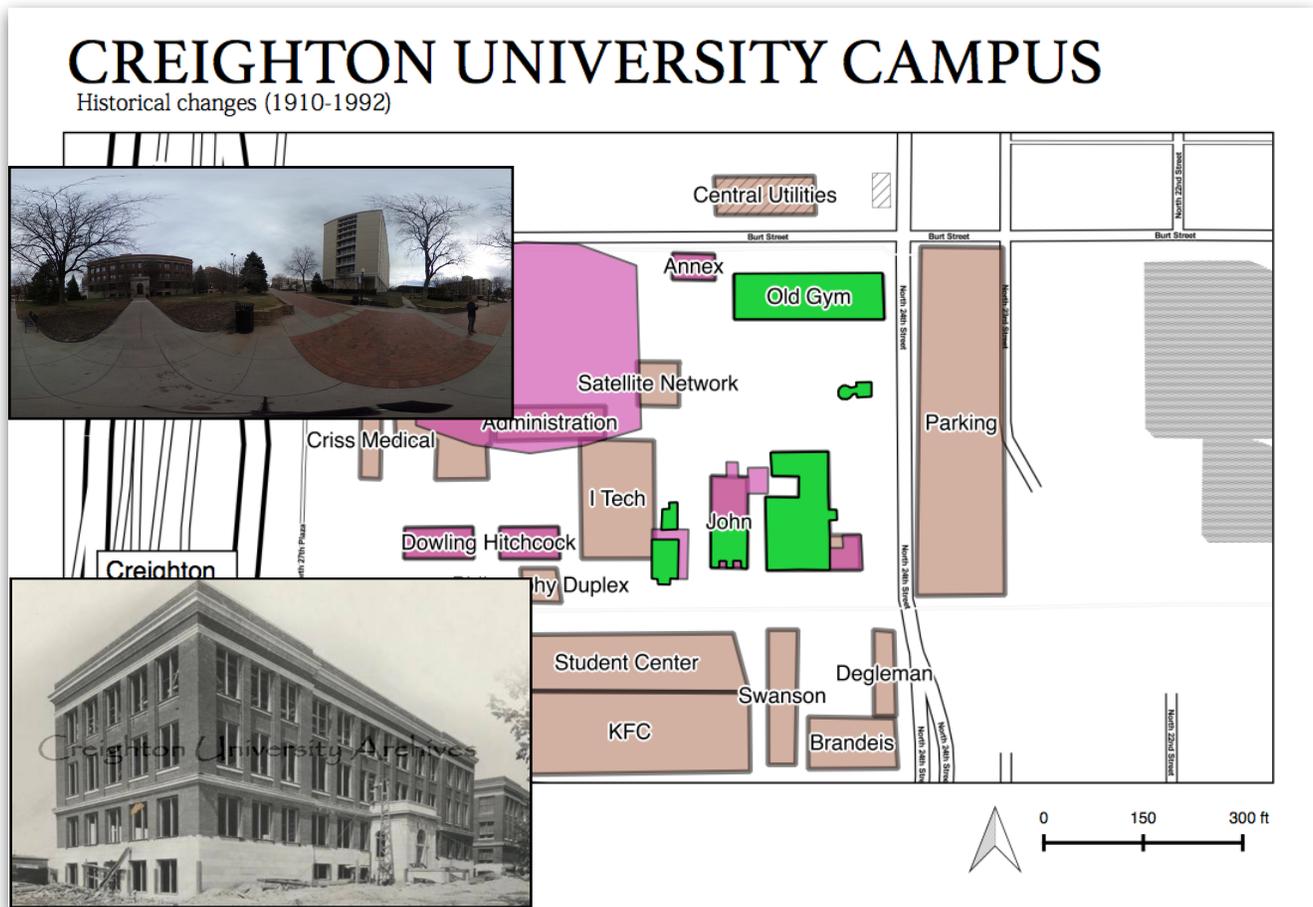


Mapping Creighton: Then & Now

Digitizing Historical Maps, Virtual Reality, Drones, and Cartography



INTRODUCTION

This two week practicum is the culmination of the previous weeks' exercises and the last before your final project. We will be using a variety of data capture methods to produce a static and interactive map of Creighton's campus across time. You will be working in your final project teams, so feel free to divide up the work accordingly. This project is worth double the points of the typical weekly assignment and it is group work, so *the expectations will be correspondingly higher*. The majority of the assignment is open-ended, though I will give you instructions related to the use of the 360 Camera/Drone, the use of QGIS cartography software, and integrating VR imagery into web apps.

There are three goals for this project:

1. Gather modern data from Creighton's campus using 360 Camera/Drone
2. Create 3 static maps (or one with 3 layers) in QGIS highlighting land use change on Creighton's campus
3. Create an interactive web application highlighting change to locations on Creighton's campus across time.

HISTORICAL CREIGHTON CAMPUS IMAGES

SANBORN MAPS OF OMAHA (1887, 1890, 1901-1918, 1934, 1962) - **OPL card required**
http://0-sanborn.umi.com.discover.omahalibrary.org/cgi-bin/auth.cgi?command=IP_Auth

BAIST'S REAL ESTATE ATLAS, SURVEYS OF OMAHA, 1910
<http://cdm16747.contentdm.oclc.org/cdm/compoundobject/collection/p16747coll4/id/260>

ATLAS - CITY OF OMAHA, 1937
<http://cdm16747.contentdm.oclc.org/cdm/fullbrowser/collection/p16747coll4/id/1044/rv/compoundobject/cpd/1246>

AERIAL PLAT BOOK OF OMAHA, 1958
<http://cdm16747.contentdm.oclc.org/cdm/compoundobject/collection/p16747coll4/id/666>

ADDITIONS TO THE CITY OF OMAHA, CIRCA 1967
<http://cdm16747.contentdm.oclc.org/cdm/compoundobject/collection/p16747coll4/id/1036>

CREIGHTON UNIVERSITY BULLETIN - CREIGHTON UNIVERSITY ARCHIVES
<http://sherman.creighton.edu/dropbox/sundbergapril2016/campusmaps.html>

PLANNING

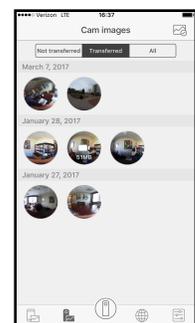
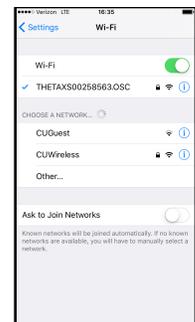
1. **As a group**, look through the historical images of Creighton's campus. **Choose three specific dates.** You will download a .jpg image of Creighton's campus from each of these data sources (hint - these will likely be useful sources of historical geographic information for your final project as well). Make sure the dates are far enough apart that there are noticeable differences 1. between each other 2. between then and now.
 2. **As individuals**, download one of each of the images and georeference it. Make sure that it is as accurate as possible! Overlay it on top of an OpenStreetMaps base layer.
 3. **As a group**, note the location of buildings or other features on campus that have either changed or are completely different. These will be the locations that your group takes pictures of today. Note as many as possible and write them down.
 4. The following activities will need to be completed during the next two classes, though some can be completed earlier than others. It will be up to you to delegate responsibility to complete them.
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- a. Data gathering - they will be going to the locations you've identified, taking images, noting lat/long coordinates.
- b. Digitizing - Creating shapefiles of the historical Creighton campus buildings for each of the three dates
- c. Map and App Design - Will choose the layout for the ArcGIS online web app, the layout for the static maps, load the data and style the finished products

DIGITAL PHOTOGRAPHY

Your task will be to take images using the 360 degree camera and the drone. The Ricoh Theta S 360 Camera requires a smart phone app, which you can get from the apple or android store (free). You can use this app to take images and videos and export your photos from the camera to your phone (which you can then save to your computer).

1. When you take an image, you can either connect the camera to your phone (so you can work it wirelessly, or click the button on the camera. Both will save the image. If you want to connect wirelessly, make sure the camera is on and the wireless symbol is blue. Go to your phone and find the camera's wireless signal. You should then be able to wirelessly control the camera.
2. Remember to also check the exact latitude and longitude (X,Y in the spreadsheet) of the location where you are standing and make a note for later (ex. in front of Dowling Hall, South Side, 41.265047, -95.950571). If you have an iPhone, you can use apple maps to located the lat long by click on your location (the information is located at the bottom). Your compass app also has this information. Android devices are more difficult, come see me. This information will be used later to edit the digital map.
3. When you're done taking your photos, connect the wireless app and "transfer" the camera images to your phone or other device. Save the images in the "Images" folder associated with your group. Make sure you also input the names of your images along with the associated location descriptions and lat-long information in a copy of the "data template" spreadsheet provided on the google drive. You will need to download this data template and save a new copy with your information in the group images folder.
4. Lastly, do an online search for historical images of the buildings you've identified on your historical maps. The Creighton archives have an online repository of images. Add image descriptions and urls to your spreadsheet. <http://cdm16272.contentdm.oclc.org/cdm/search/collection/p4044coll6/searchterm/buildings/field/creato/mode/all/conn/and/order/title/ad/asc>



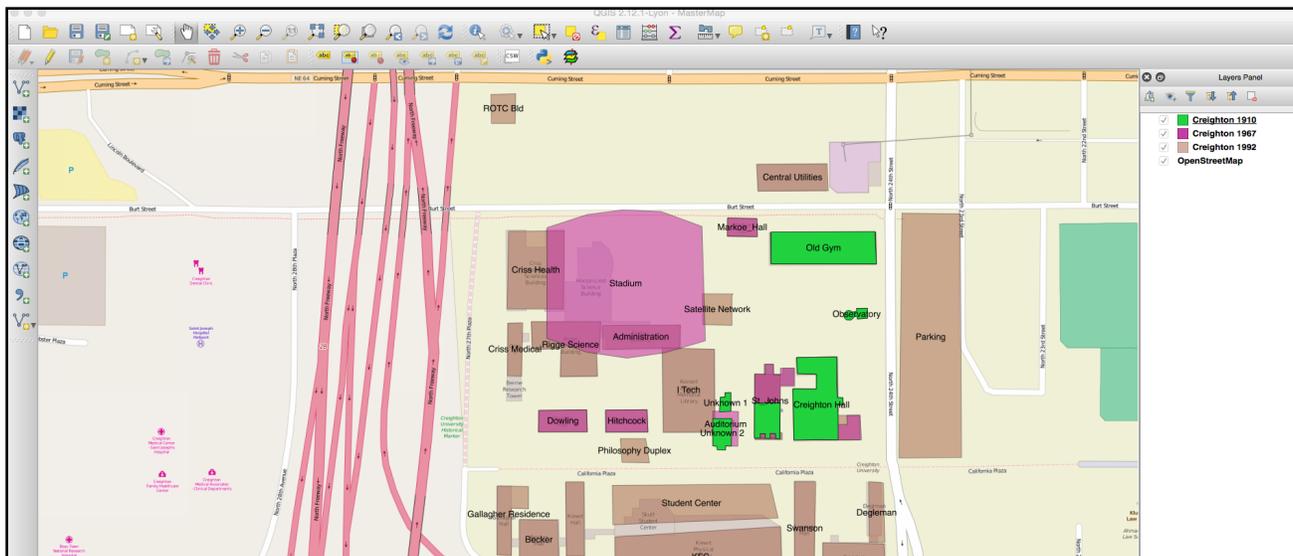
DIGITIZING YOUR BUILDING OUTLINES

1. If you need the reminder, instructions for digitizing (creating polygon/line/point shapefiles) can be found in Week 5's "Creating Vector Layers" practicum.
2. Before you begin, it will be useful to think about how you will want to visualize the differences between the three years in your maps. What attributes do you foresee being useful in a static map? These files will also be imported into ArcGIS online. What attributes would you like an interactive pop-up to feature? (Year of layer? Name of Building? Location on campus? anything else?) You will need to add these attribute columns when you create your shape file layer.
3. You may create as many vector layers as you like, but it may make the most sense to have each layer contain all of the buildings associated with a particular year since you will be making a different static map for each year. If you wish to create one shape file polygon layer, you should remember to include "year" as an attribute.

CREATING A STATIC MAP IN QGIS

Once you've finished digitizing your buildings (even if only for one year) another student may want to begin designing your first static map (the other maps or layers may be added as more files are created). Use the google drive to share shape file data with each other.

1. Open QGIS, add a base map you think will serve the purpose of your map most effectively (it doesn't have to be OSM, pictured below). Next, add your first collection of shape file from your group's shared google folder.



2. This is less a map than a collection of data at this point. It's cluttered, has confusing labels (if any at all). There is no sense of where this is, no legend, and it has an unclear color scheme.
3. Furthermore, this view cannot be *exported* as a static map, although an image of this view can be exported as an image. To add conventional map elements (like a scale bar, title, legend, etc.) we



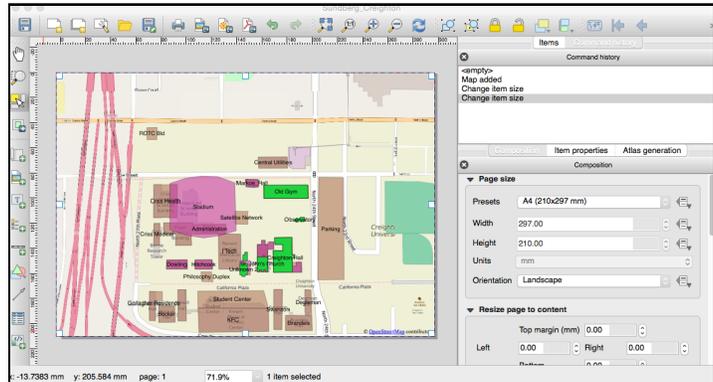
will need to use the “print composer.”

4. You can open the print composer by either going to the “project” menu at the top of the window and selecting “new print composer” or by simply clicking the composer icon.



5. Give the map a name, call it “yourgroupnumber_CreightonMap”

6. A new window will appear. Explore some of its capabilities. Hover your cursor over some of the symbols bordering the large white composition window. Many of these features will be intuitively understood.



7. We need to add our map from the main window to the print composer. Click the “add new map” icon on the right hand side of the window.

8. Click and drag from the upper left hand of the main window to the lower right. Your map now fills the composition space.

9. This is probably not the size we want since it won't leave much room for additional non-cartographic elements (though feel free to be creative). Go ahead, for now, and reduce the size of the map image by clicking on the white box in the lower right hand corner and reducing the size of your map image so that it doesn't take up the whole space. If the map appears fuzzy afterwards, click the refresh symbol. Save your project.



10. Let's add some conventional symbols. Add a legend, a north arrow, a scale bar, and a title.

11. On the left hand side, click add scale bar. On the right hand side, you'll see that there is not only a “command history” so you can keep track of what you've been doing to your map, but there are also options to fine tune your map elements below it. Under “item properties” you can change the “style of the legend,” the units, and labels. You can add a “frame” around your scale bar, change its color and position, and add a background. Play around with some of the options until you arrive at a scale bar that seems appropriate.



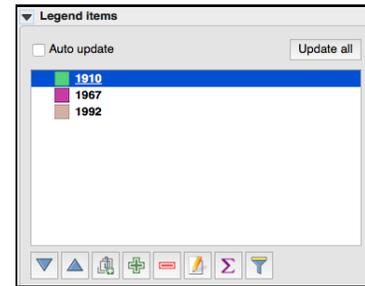
12. There are a couple of ways to add a north arrow. You can use the tool on the left, but it's very basic. Your map is already oriented to the north, so you can also just insert a north arrow image. You can find one on the internet that you like and download it to your desktop. Then, insert the image by clicking “add image.” In the resulting menu on the left, under “image source” add your downloaded image. You can also select images that are preloaded with QGIS. In that same “add image dialogue” click “search directories” under “image properties,” then select one of the symbols you like. Add it to your map. Save your project.



13. Now let's add a legend. Click the add legend icon on the left. You may want to change the font, size, and content of the legend. For instance, I'm only interested in the colors highlighting the changing year values (including Creighton is redundant). We can change the title of the legend to “Creighton Main Campus” and alter the content in other ways by looking to the right hand side again. You don't have to follow these rules exactly. Be creative.



14. Under “legend items” you’ll notice all of the content of our legend. Click “auto update” so that it is not checked. Now we can change the text. Below it, you’ll see an edit button (the pencil icon). Change the text include just the years. You can also remove the open street map layer from the legend since it is just our base map.



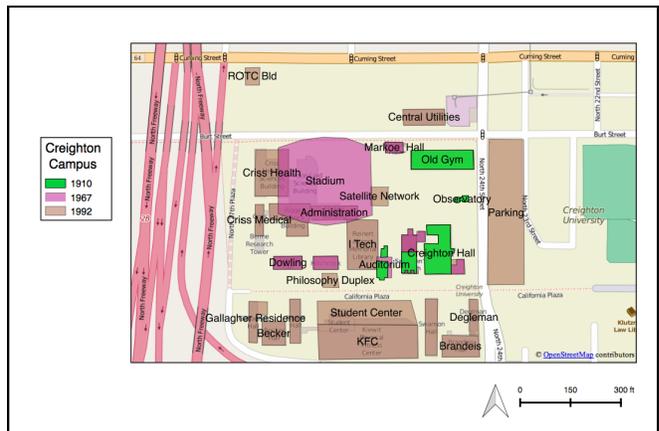
15. While I’m at it, I might as well add a frame to my main image by going through the same process on the right hand side. Save your map.

16. The map is beginning to come together, but it still needs a title.

17. Click the “add text” icon on the far right. Change the font to something appropriate for your map and change the size. You can also add a descriptive subtitle if you’d like.



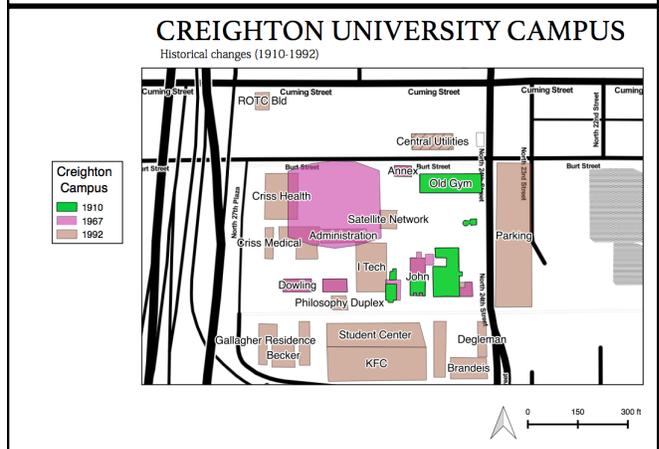
18. I like the way the map is shaping up, but the content is far too crowded. I don’t need all of the labels that I’m seeing. To change this, we minimize the composer window and remove all of the label that we don’t want to see from our main QGIS window. I added buffers to increase visibility as well. I also don’t like how many additional colors the base map adds to my map product, so I replaced with a more neutral B&W Stamen base map.



19. I’m getting there, but there is still a lot of negative space in the map. I think I want to increase the size of my map and move the legend into the actual map space to tighten things up. You now have all of the basic map elements in place, use your discretion to produce the most visibly appealing product.

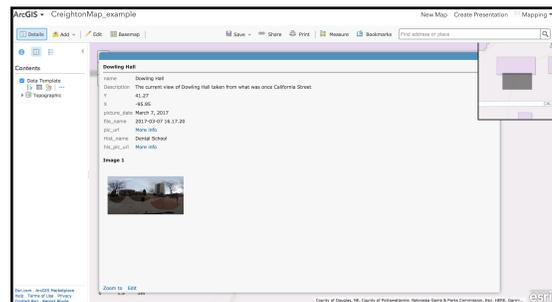
20. Lastly, you can export this image as a PDF, SVG, or other image format by clicking one of the icons at the top of the screen.

21. These are the minimum requirements for a map. You’ve been evaluating maps all semester, however. How would you critique your own product? Make as many changes as you can (remember, you can ask me for help as well) to produce the best possible product. Export your maps(s) and post them to the blog and name 3 things that you should add or change about your finished product.

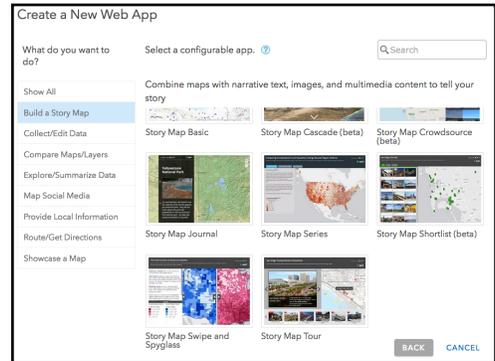


CREATING A WEBAPP

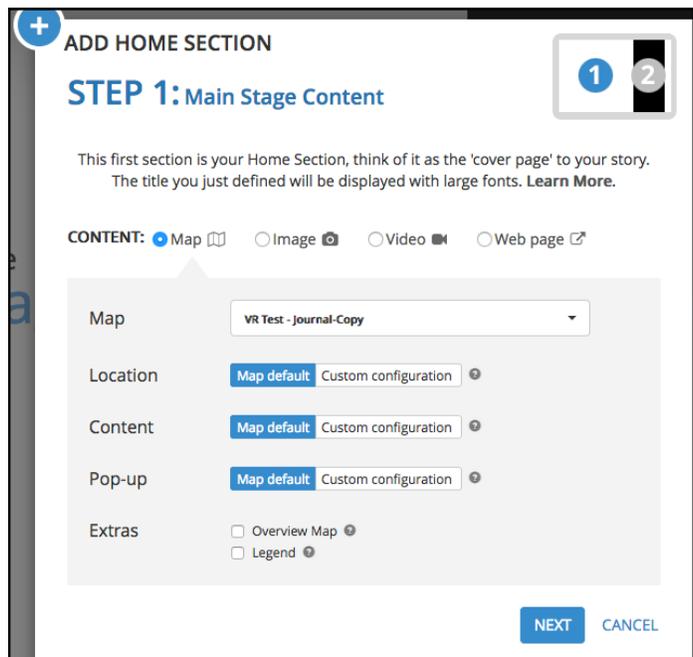
1. Go to www.arcgis.com/home/index.html
2. Click "sign in" - Username: Mapping History; Password: h0981_Vc
3. Go to "My Content" at the top of the screen. Click the "HIS317 (SP17) folder. Click "create," "map" and name it appropriately. Add the tags "HIS317" and "MappingCreighton"
4. You have already explored the web map builder and app builder during week 10's "Mapping Flooding" practicum. If you require reminders about how to work the two windows, see the previous worksheet.
5. The one exception from that week that you will be making is that you will be inputting not only shapefiles of buildings created in QGIS, but point data of historic and modern photos from your spreadsheet. **REMEMBER - shapefiles must be zipped files with the appropriate file extensions. Your spreadsheet must be in .csv format.**
6. Look to the top left of the screen for the yellow "Add" button with the gray plus sign.
7. Before we add data, its important to look at what kind of data you will be inputting. Open the .csv file "locations" that we shared with you in excel (or whichever .csv viewer you have installed on your computer).
8. Click "Add" and scroll down to "Add Layer from File." Add your zipped shapefiles. Find the .csv template file ("DataTemplate") under "browse" and add it to the map.
9. With the file data inputted, you can see a number of different point locations appear on your map.
10. First things first, lets choose an attribute to show. Look to the menu bar under "content." You'll see four different icons. The first shows the legend, the second shows the attribute table (your .csv data), the third shows options for symbology, and the fourth gives you a larger menu which we will be exploring. To change data in your attribute table, you can click the fourth icon and select "enable editing." Now you can change the lat_long, description etc.
11. Before we move to the story mapping component of the project, let's first edit how our popups will look. Go ahead and click on a point on the map. You'll see all of the information from the .csv pop up here.
12. To change what appears on a popup, click the fourth icon over under the "DataTemplate" menu. Scroll down to "configure popup." "Name" is fine for a popup title. For pop-up media, click "add" "image." For "title" click on the small plus sign to the right of the title bar. Scroll down to name. For "caption" scroll down to "description," for URL scroll down to "pic_url"
13. Click okay until you get back to your map. Now if you click on a pop up, it will look much more simple and the photosphere image will appear. You may want to switch this image with a 2D historical image or modern photo. You now know how this works, so feel free to do so. This photosphere URL will be important when we create the app.
14. Save the map.
15. We also want to include *interactive* VR photospheres in this project. This isn't possible in map view, but we can do this with the Map Journal story mapping platform. To create a story map, click "share" next to save. Click "everyone (public)," then "create a webapp."



16. Select Story Map Journal, create web and name your app.
17. One the next screen, make sure to select “Floating Panel,” photospheres will not work otherwise. Click start.
18. Name your map journal and feel free to “take a tour” to get a sense of how the Map Journal Builder works if you didn’t use this platform for your disaster story map. There are a number of different functions to explore. Take the time to look through this tour. Also, please look to the tutorial available at <https://storymaps.arcgis.com/en/app-list/map-journal/tutorial/>. If you have questions about the Map Journal, please look to these resources and/or google your questions. ArcGIS has done a very good job of documenting tips and troubleshooting online.



19. I will help you set up your first panel with a photosphere. You can also embed images and videos and websites. The “main stage” should be your background map. This will also be your home section since it is the first slide. (hint - this is also a good place to have a static image, perhaps of Creighton as your main background image, you can then zoom to a map as the background for your second “section.”) For now, lets just work with a map. From the dropdown menu, select the map you just created. If you’d like, add an overview map and a legend at the bottom. Click next.



20. Now you will be taken to the “floating panel” content on the the right. Here we will add a photosphere you created with the 360 camera. These images are hosted by me in my Public

dropbox folder. On the upper right, you will see an icon that allows you to change the “source” code. If you know html, you can customize your panel here. We will customize it enough to add our image. Click the source button



21. In the dialogue box, paste the following code (exactly):


```
<div class="iframe-container mj-frame-by-frametag fit"><iframe allowfullscreen="" data-unload="true"
frameborder="0" height="" src="https://storage.googleapis.com/vrview/index.html?image=https://
dl.dropboxusercontent.com/u/2320583/2017-01-28%2011.10.03.jpg" width="100%"></iframe></div>
<p>&nbsp;</p>
```

22. This code initiates an “iframe” (a way to view a website inside another website) and connects to a javascript API from google that allows us to visualize a dynamic photosphere viewer in the side panel. Click add.

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23. We now have a background page (as homepage) and a photosphere that we can use to view our VR images in with google cardboard if we access this site with a phone.
 24. Make sure to click “save” at the upper right on the screen. Edit your app to your liking. You can view and share this story. At this point, it will be time to go back to your original web map and start editing the content. When you are finished, share the URL to the blog.

