Development Log Week 7 /8

AWS and ArcGIS Server

Task 2: Using ArcGIS Server hosted on an EC2 in AWS

To be able to start exploring EC2's and AWS, a user and password was set up and during the Lab period and then logged in for the first time to start exploring the AWS UI.

Using the EC2

The EC2 console only has rights to start and stop certain services. I was able to start/ stop an instance under my username by first going to the instances tab and finding my item. Then, under the actions tab I went to the Instance state and choose start/ stop. It is good practice to shut down your system when not using it to ensure no extra charges occur or going over your allowance. If no instances are showing it may be due to which data center they are running on. This can be changed in the top right corner to the correct location of the data center.

Accessing the Virtual desktop.

Once the Instance is running you get an IPv4 address. This can be used to access the Virtual computer by going through remote desktop app on a windows computer. The IPv4 address changes to a new address each time the instance is started. Added :444 onto the end of the IP address and connected to the remote windows computer to see what can be done and how to access it.
Note: For fully disconnecting from the Virtual machine, it has to be shut down via the windows menu just as the shutdown process works for local machines.

Accessing ArcGIS server

To access ArcGIS Server through this, in a web search URL bar the IPv4 address(followed by :6080) can be inputted. This results in the Rest services page being displayed. HOWEVER …6080 port is not secure, so instead we use 6443 and https:// to ensure a secure connection. When using the secure connection a warning Pops up that it is unsecure with no certificate- this can be ignored because the certificate has been signed ourselves.

From here I was able to change the URL to IPv4:6443/ArcGIS/manager and log into the ArcGIS Server Manager where I had previously published a Canada map. As the IP address will change every time when starting an instance/session, we can use Duck DNS instead.

Duck DNS = Free dynamic DNS hosted on AWS. Simple tool.

It can associate a name URL to the IP address you chose. So that you can replace in the name URL and it will not need to be changed when the IP changes.

Other Notes:

Can copy files from the local computer to remote computer.

Resources:

Watched and followed the video.
https://www.youtube.com/watch?v=IIBy6d2whEg&ab_channel=ShawnatGeomaticsFleming

AWS and ArcGIS Server

Task 3: Deep Dive Into Services

Reading 1:
https://enterprise.arcgis.com/en/server/latest/publish-services/windows/services-in-arcgis-enterprise.htm

Services in ArcGIS Enterprise

A web services is not a map/layer and its not an end product. The Client Apps QUERY the service to receive info that they can use in GIS products.

Geospatial services available:

- Maps
- Scenes
- Geoprocessing tools
- GDBs
- Imagery

Web services run on ArcGIS Server sites and are normally come from ArcGIS Pro/ Map. The services in ArcGIS Server receive queries and then return responses based on their data and configurations. Some examples of apps/tools that use ArcGIS Server Services are: The enterprise portal, ArcGIS online , Esri apps.
Services that have been published to ArcGIS Server site can be managed e.g Sharing It or changing settings. Service management can be done in the ArcGIS Server Manager App and the ArcGIS Server Administrator Directory.

Services and the ArcGIS Enterprise Portal.

Federated – The integration of ArcGIS Server site and a portal. This allows services published to a federated server are automatically shared with the portal too. Workflows such as sharing a map for ArcGIS Pro use a federated server to power the content accessed from the portal.

Services and data sources

ArcGIS Server works with many types of data and data stores. You can register your own data stores so services can reference the data in them without having to copy the data out of the source. ArcGIS Enterprise can host your data.

Cached Services

Tiles = Process of caching a static GIS output that is divided into small unites (aka tiles).
The benefit of cached content= reduces the amount of time and effort to display an output because the cached item was drawn and frozen during the cache creation. So instead of drawing each feature of a layer of a feature or a pixel of an image, the server will display the pre-drawn cache tiles. Caches are often drawn at multiple scales to allow zooming. When using cached services, you cannot dynamically draw and update the service in exchange for the benefit of faster performance.
The four primary types of cached outputs in ArcGIS:

- Map caches
- Image or raster caches
- Elevations and terrain caches
- Vector tile caches.

ArcGIS Server Rest API

Services and admin controls in server can be accessed by the REST API.
REST API allows a wide range of client apps to query ArcGIS Server services.
ArcGIS Server includes the REST API Directories.

- ArcGIS Server Services Directory
  - Provides access to the services in a site and is intended for users and publishers.
- ArcGIS Server Admin Directory
  - Admin operations and resources related to all aspects of the server site . Includes service management. Should only be accessed by admins.

ArcGIS Server Manager

Most common admin tasks are available I the ArcGIS Server Manager App.
The URL format for this is :

```
https://gisserver.domain.com/server/manager
or
https://gisserver.domain.com:6443/arcgis/manager.
```

The app includes a Service Editor that can be used to view and modify the settings of the services for a site.
Server Manager also allows you to register data sources with the server site , change/create service folders and control sharing settings.

Reading 2:

https://enterprise.arcgis.com/en/server/latest/publish-services/windows/relationships-between-web-services-and-portal-items.htm

Services and portal items.

ArcGIS Enterprise portal is the most common destinations for the services run through ArcGIS Server. This is strengthened by the process of federations that integrates security and sharing models of the server and that of the portal.

Content Sources and Conditions

Content is most often created in ArcGIS Enterprise when a GIS item is published from ArcGIS Pro / Map. (This action is for a GIS Service to be published to ArcGIS Server and represents the resource as it appears in ArcGIS Pro/Map.

In Arc Pro – this happens when you share a web map or web layer to the ArcGIS Enterprise porta. This process includes publishing GIS Services to an Arc server site federated with the portal. Sharing will preserve most aspects of the map/layer config from Arc Pro (including base maps and symbology)

Hosted – In comparison some services are HOSTED in ArcGIS Enterprise which means the resources data is managed by ArcGIS (e.g as in a ArcGIS Data Store or on the ArcGIS Server site that serves as a hosting server for the portal)

You specify when sharing(Arc Pro) / publishing(ArcMap), whether the service will reference data from the same source as your desktop or whether the data should be copied by the server to ArcGIS Enterprise. Choosing o copy the data means it will be stores in an ArcGIS Server folder or in a data store.

Resource Connections

Desktop Resource – what you work with n ArcGISPro / ArcMap.
ArcGIS Server service – the services that are published from the resource types toa ArcGIS Server site
ArcGIS Enterprise portal item- the portal item created when the server site is federated with an Enterprise portal.

Desktop GIS resource	ArcGIS Server service	ArcGIS Enterprise portal item
Feature class or raster dataset	Map service (dynamic or cached)	Map image layer
Feature class	Feature service	Feature layer
Feature class	Vector tile service	Vector tile layer
Mosaic or raster dataset	Image service (dynamic or cached)	Imagery layer
Address locator	Geocode service	Geocoder
Geoprocessing tool	Geoprocessing service	Web tool
3D data	Cached scene service	Scene layer

Hosted Services published to the Portal

Hosting server – gives the ability to publish hosted services.
If the portal has been set up with a hosting server, you can publish a service to the portal either using the My hosted services option or another client that works with the portal.
When this is done, both a portal item and a service are created.
All services are placed in a ArcGIS Server folder called HOSTED and the data is copied over from the data source.
Service types are listed differently in the Hosted folder compares too other server folders:

ArcGIS Server service type	Hosted folder/portal item type
Cached map service	Tile Layer
Cached map service with feature service	Tile Layer and Feature Layer
Feature service	Feature Layer
Image service*	Imagery Layer
Scene service	Scene Layer
WFS service	WFS layer
Vector tile service	Vector Tile Layer

Deleting Hosted Services

When deleting an item from the portal that references a hosted service… it and its data are automatically deleted from the server site.

Publishing Services from ArcGIS Pro

The type of layer published and whether you copied data when publishing will decide where you will edit/delet a published layer.

- Tile layers, vector tiles and scene layers published to the portal will be in the hosted folder on the portals hosting service and the data for these are always copied. Therefore, these must be deleted/edited from the portal.

- Published map image layers to a federated server: these layers reference data. This would have been done by sharing as a web layer in the content tab and choosing a federated server. To delete you do this in the portal. The associated map service will also be deleted but the data in the data source remains.

- If published with enabling feature access or WMS: a wms/feature layer associated with the map is created in the portal and these will be enabled on the map service on the federated server. These can be deleted in the portal without deleting the map image layer. However, to delete the map image layer you will need to first delete the associated WMS or feature layer before being able to delete the image layer.

- Imagery layers published in Pro published to the folder specified on the portals federated server. To delete these you must delete in the service manager for it to be removed from the portal.

To determine whether a feature service is hosted or not you can go to the Item details page for the layer.
If feature layer was published directly to the portal and has no associate map image layer is will be listed as hosted when viewed by the creator or admin. Feature layers published from ArcGIS Pro that do not have the Hosted note are therefore associated with a map image layer.

Further Examples of Publishing and deleting

https://enterprise.arcgis.com/en/server/latest/publish-services/windows/relationships-between-web-services-and-portal-items.htm

Task 7: Video – Managing Portal from ArcGIS Pro

To access in URL use

/server/manager

AWS and ArcGIS Server

Task 5: Duck DNS

The How to!

Using:
https://www.duckdns.org/domains

Signed in with my GitHub to login. Then I started an instance on my AWS EC2 to gain the IPv4 to allow me to enter into DuckDNS. I added a domain and assigned the IPv4 to this so I can use the DuckDNS for logging into the remote desktop and ArcGIS Pro etc.. When logging into remote desktop still had to apply the :444.

This is super handy to use and going forward will be making use of DuckDNS for task such as these. As running a new instance creates a new IPV4 this has to also get updated with the domain in DuckDNS.

Using Duck DNS to create a SSL Certificate

To use EC2 server with ArcGIS Online etc. an SSL certificate is required.
Achieved this by using Win-acme using Lets- encrypt. Let's encrypt provides short term certificates for SSL certificates on websites- for free. Approx. lasts for 3 months.

The Process:

First we need to get the host bindings working. Can do this by going to ISS (internet info services) in the start menu (windows). Then go to sites- bindings. Select port 443 and edit site binding. This is where the DuckDNS comes into play. Put this into the Hostname.
Next:

1. Right click on Win Acme and run as admin.
2. Chose N from the menu. It then allows us to perform the create certificate option
3. Then hit 1: default website.
4. Pick all bindings (A)
5. It displays the duckdns we put into the binding settings earlier. We select Y to continue with this option.
6. Agree for terms of service – yes.
7. It grabs the entry and authorizes it and makes sure it is all good.
8. The certificate is updated and adds a service to the computer that will check everyday the certificate is updated.
9. DONE- SSL Cert created

AWS and ArcGIS Server

Task 4: Publishing to AWS EC2 from Pro

This was a learning curve in achieving this task. It took a lot of trying and referencing to finally get it going! However, the troubleshooting made me understand the process a lot better.

The troubleshooting:

All the first steps of running an instance , logging into Remote desktop and registering server in ArcGIS Pro went okay. However, I was unable to publish within ArcPro even though the server connection appeared to be connected. After a lot of troubleshooting, it was simply the server URL being used to add the server in ArcGIS Pro that was the problem.

Here are the steps I took to complete this task.

1. Started an instance in my AWS EC2 and logged in to the remote desktop using duckDNS.
2. Added the map to publish in ArcGIS Pro. Then went to insert- ArcGIS Server.
3. The URL to connect to the server was in this format.
    a. https://MYDUCKDNS:6443/arcgis
    b. Entered the authentication username and password for the ArcGIS Server.
4. Once the connection was established, I then right clicked on the server in ArcGIS Pro catalog and selected the publish option.
5. Filling in the service details with a name, summary, and tags. I selected the Reference registered data option. As this would be reference data on the remote machine, I had to copy the original shapefile folder over to a folder location on the remote machine so that the map service has the data to reference.
6. When hitting Analyze it gave me warning that the data was not referenced. This was easily resolved by right clicking and selecting the folder it would be referencing. However, this wasn't quite enough. The folder permissions needed to be changed so that it was set to Modify.
7. Once published, I went to the rest site and the map service had made it!
8. The last part of this task was to register it in the data store. This was already in the ArcGIS server and just needed to be validated.

These steps allowed me to successfully publish a service from ArcGIS Pro to my AWS EC2 running ArcGIS Server whilst also registering the shapefile data and storing it into a directory on the EC2 Server directly.

Leaflet JavaScript API

https://leafletjs.com/index.html

Open-source JavaScript library for mobile friendly interactive maps.

Small file size (38kb of JS)

Works across desktop and mobile platforms.

Lots of plugins including:

- Tile/image layers- base maps
- Map interaction p layer switching, sync maps, events
- Overlay interaction.

https://leafletjs.com/plugins.html

ESRI has a port to allow leaflet use ArcGIS Server services. This is a simpler alternative to ERI JS API's
GeoJSOn can be used with Leaflet.

Alternative Available Technologies

OSM (Open Street Map)

Open-source mapping that anybody is able to update edit and use.

Kobo Toolbox

Tools for data collection. Similar components as Survey 123 but the data is stored in an internal MongoDB (NoSQL Database). Good open source alternative to Survey123.

qField for Android Devices

Based on QGIS. It allows you to work on your GIS data outdoors. Simple mobile interface.

Development Log Week 9

Mapbox

Mapbox is a mapping and location cloud platform for developers.

Mapbox demos – Create a STYLE

Created a Mapbox account and referenced tutorials to help create my own style in Mapbox studio in order to get familiar with Mapbox and how it works.

Tutorials and help used for guidance:

https://docs.mapbox.com/help/tutorials/create-a-custom-style/
https://docs.mapbox.com/help/tutorials/create-3d-terrain-map-hypsometric-tinting-studio-video/

My styles

My first style I experimented and kind of just went at it and played with the tools.

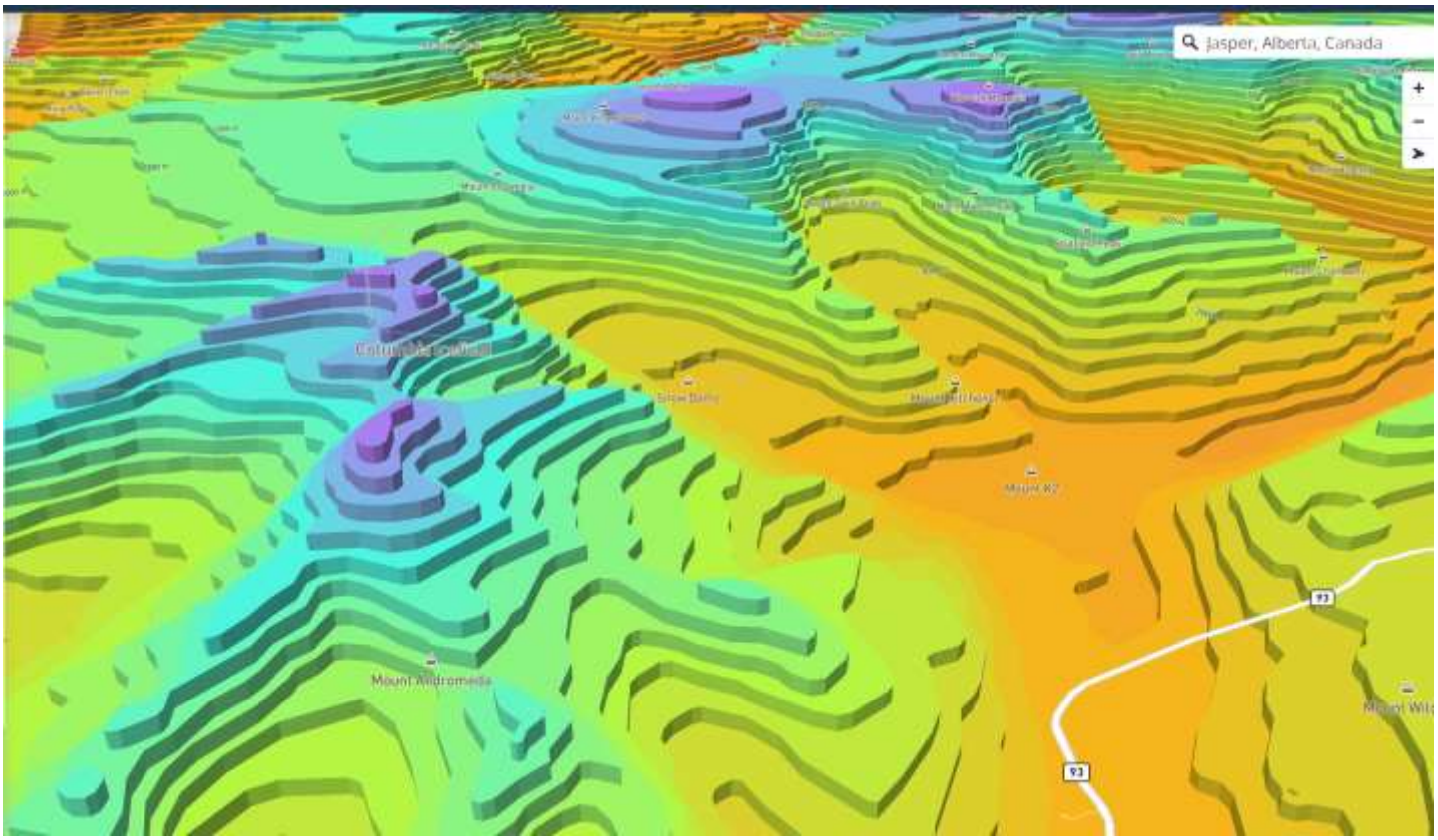
https://api.mapbox.com/styles/v1/holzegg/ckmfgqwvo13gj17pfdl5fishc.html?fresh=true&title=view&access_token=pk.eyJ1IjoiaG9semVnZyIsImEiOiJja21mZHlhZzIzNTN3Mm9vajhyN29lbGJzIn0._4npVCDEqBf_DpPfYc56ng

Mapbox

My Style 2

After have an initially play around on mapbox I wanted to delve in deeper to the different things that could be created so I opted to follow a tutorial to dive deeper. This 3D tinting tutorial really stood out to me, so I gave it a shot and really enjoyed learning how to do this. This was the result (tutorial link posted above). I varied the location and colours and elevations height from that of the tutorial so I could further explore these options.

https://api.mapbox.com/styles/v1/holzegg/ckmfhr77p0z3v17p8w4pt1f1b.html?fresh=true&title=view&access_token=pk.eyJ1IjoiaG9semVnZyIsImEiOiJja21mZHlhZzIzNTN3Mm9vajhyN29lbGJzIn0._4npVCDEqBf_DpPfYc56ng



When first exploring mapbox, I did not find these options that allow changing style depending on the elevation fields. This is definitely like an option you would get in ArcGIS.

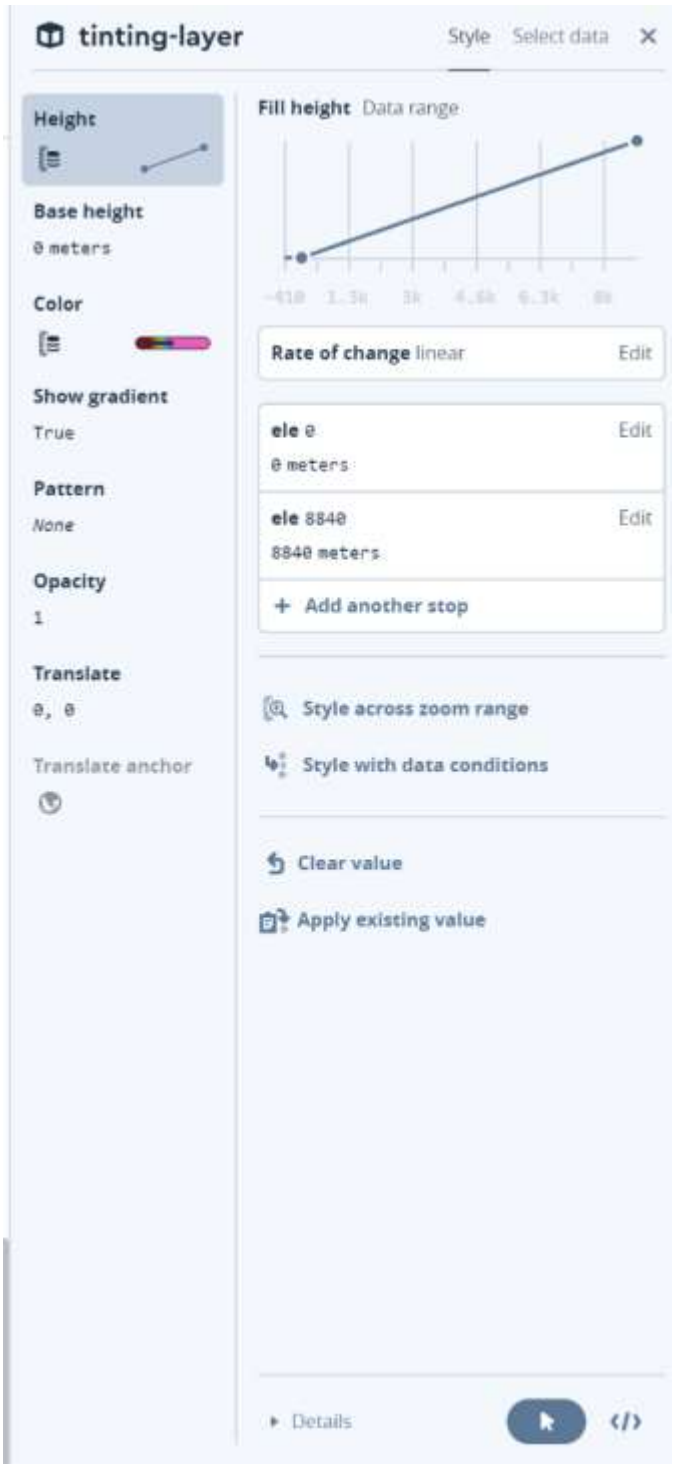
The Method

- Duplicate the contour layer for tinting/applying colours.
- Setting the different colours for the elevations that I wanted.
- Then selecting the fill height for this.

After exploring this, I feel like there is a lot more that can be done in Mapbox and this is a technology I want to further explore as a possible option to final projects.

Mapbox

Screenshots of Tinting layer options that were used.



Development Log Week 9

Mapbox

ArcGIS Server Map Service

Accessing my published Canada demo map from previous weeks by accessing Luna server to use Mapbox and then hosting in my GitHub.

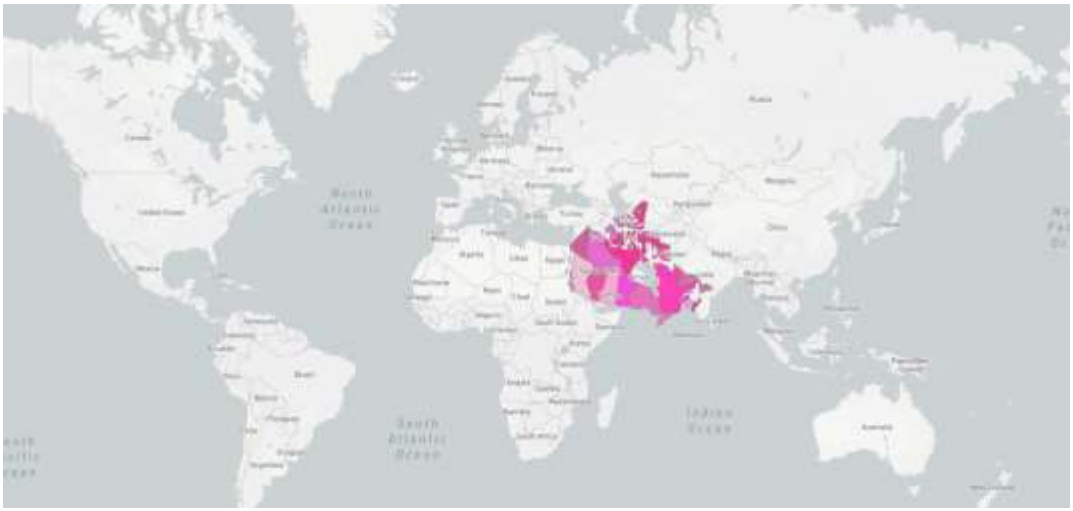
This first example was by using my mapbox access token and the Luna URL for my Canada map .

https://hollieegg.github.io/activitylog/mapboxdemo.html

Troubleshooting

I encountered several problems when doing this. The first was getting a few server errors when trying to use my Luna URL and no longer being able to log into Server Manager.

The second was getting the projection correct. I had attempted to change the SR IMAGE Parameter in the URL however this did not change the projection. It appears I am stuck in Africa.



From the rest API (its not in

Initial Extent:

XMin: 3217922.2228878634
YMin: 430201.3561449996
XMax: 9487253.419912133
YMax: 5471226.440955
Spatial Reference:
PROJCS["PCS_Lambert_Conformal_Conic",GE

Full Extent:

XMin: 3689439.0113999993
YMin: 659338.8599999994
XMax: 9015736.631399997
YMax: 5242088.937100001
Spatial Reference:
PROJCS["PCS_Lambert_Conformal_Conic",GE

By Changing the bboxSR=EPSG%3A3857 in the URL to bboxSR=102100 I was able to get it better located but this did affect the graphics of the map.

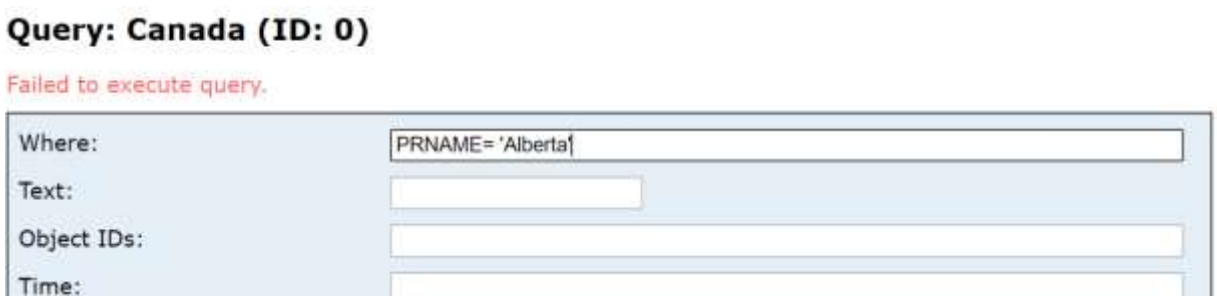
Finally got it working by also updating the SRImage Parameter in the URL to also reflect 102100.

Mapbox

ArcGIS Server Map Service

Using JSON with Luna and mapbox.

Went to the rest point for the layer and ran a query to get the JSON. At First it failed… because I had a space between the = and the 'Alberta'.



My JSON URL

https://luna.flemingcollege.ca/arcgis/rest/services/Geom99lab1/HEggletoCanada/MapServer/0/query?where=PRNAME%3D%27Alberta%27+OR+PRNAME%3D%27Manitoba%27&text=&objectIds=&time=&geometry=&geometryType=esriGeometryPolygon&inSR=102100&spatialRel=esriSpatialRelIntersects&distance=&units=esriSRUnit_Foot&relationParam=&outFields=&returnGeometry=true&returnTrueCurves=false&maxAllowableOffset=&geometryPrecision=&outSR=&havingClause=&returnIdsOnly=false&returnCountOnly=false&orderByFields=&groupByFieldsForStatistics=&outStatistics=&returnZ=false&returnM=false&gdbVersion=&historicMoment=&returnDistinctValues=false&resultOffset=&resultRecordCount=&returnExtentOnly=false&datumTransformation=&parameterValues=&rangeValues=&quantizationParameters=&featureEncoding=esriDefault&f=pjson

I Shortened this URL to what parameters were needed as most of these are not specifying a value.

I additionally adjusted the Query so that two provinces would be added by using:

PRNAME='Alberta' OR PRNAME='Manitoba'

Final JSON Mapbox with Luna

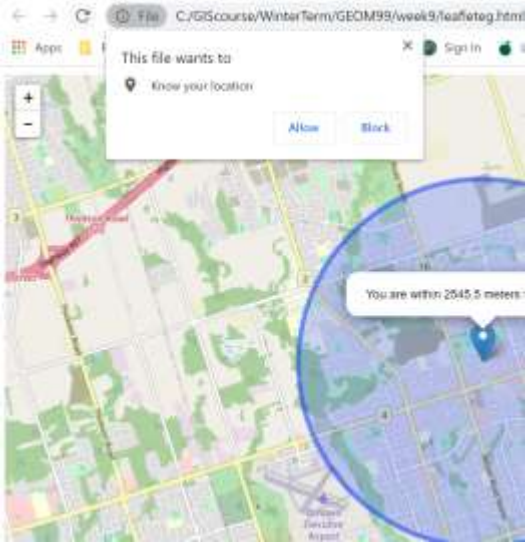
https://hollieegg.github.io/activitylog/mapboxgeojson

Leaflet

Experimenting with Leaflet

After reading the leaflet information and with the possibility of using this for the final collab I decided to explore the coding side of this and looking into possible tracking options with it. From looking at tutorial and examples on the Leaflet site I was able to load a basic map, then request the user's location. When experiment with geocoding….i was able to get the map to request the user location at a particular time interval e.g. every 5 seconds. From here I would like to further explore if this can be done without a prompt where the user must respond, but rather do this automatically.

The one issue I ran into with this is deploying this on my GitHub to work. It works fine from my own desktop. This is another thing I would like to look further into to figure out the solution.



The coding

```
<!DOCTYPE html>
<html>
   <head>
      <title>Leaflet sample</title>
      <link rel = "stylesheet" href = "http://cdn.leafletjs.com/leaflet-0.7.3/leaflet.css"/>
      <script src = "http://cdn.leafletjs.com/leaflet-0.7.3/leaflet.js"></script>
   </head>
   <body>
      <div id = "map" style = "width: 900px; height: 580px"></div>
      <script>
         // Creating map options
         var mapOptions = {
            center: [17.385044, 78.486671],
            zoom: 7
         }
         // Creating a map object
         var map = new L.map('map', mapOptions);
         // Creating a Layer object
```

```
        var layer = new L.TileLayer('http://{s}.tile.openstreetmap.org/{z}/{x}/{y}.png');
        // Adding layer to the map
        map.addLayer(layer);
            // placeholders for the L.marker and L.circle representing user's current position and accuracy
    var current_position, current_accuracy;
    function onLocationFound(e) {
      // if position defined, then remove the existing position marker and accuracy circle from the map
      if (current_position) {
          map.removeLayer(current_position);
          map.removeLayer(current_accuracy);
      }
      var radius = e.accuracy / 2;
      current_position = L.marker(e.latlng).addTo(map)
        .bindPopup("You are within " + radius + " meters from this point").openPopup();

      current_accuracy = L.circle(e.latlng, radius).addTo(map);
    }

    function onLocationError(e) {
      alert(e.message);
    }
    map.on('locationfound', onLocationFound);
    map.on('locationerror', onLocationError);
    // wrap map.locate in a function
    function locate() {
      map.locate({setView: true, maxZoom: 16, watch:true});
    }
    // call locate every 5 seconds... forever
    setInterval(locate, 5000);
      </script>
   </body>
</html>
```

References used

https://leafletjs.com/index.html
https://gis.stackexchange.com/questions/182068/getting-current-user-location-automatically-every-x-seconds-to-put-on-leaflet
https://leafletjs.com/examples/quick-start/

Vertigis Geocortex

Paid add on software for Esri's enterprise solutions.

Geocortex

- Created by Vertigis.
- Add on to ArcGIS Server.
    - Easy to deploy, configure and maintain.
- Can be describes as a 'google maps' style interactive like interface that is an alternative to ArcGIS Online and Portal.
- Two main products
    - Geocortex Essentials 4
    - Geocortex 5 Series products

Geocortex Essentials 4 (used with ArcGIS Server directly)
This predates the portal and ArcGIS Online.
Examples using it:
https://maps.kelowna.ca/public/mapviewer/
https://www.mapping.cityoflondon.gov.uk/geocortex/mapping/?viewer=compass

Marketing Video: https://www.youtube.com/watch?v=nLtWz9iP3H0&ab_channel=Geocortex

- Alternative to custom development
- Works across most devices
- Lots of features
- Web based configuration
- API's

Intro to Geocortex: https://www.youtube.com/watch?v=olp1q9bRuoU&ab_channel=ShawnatGeomaticsFleming

- Web solution with 3 tiers- data tier, middle tier, web tier.
- Very configurable.
- Multiple map services coming together.
- Easy and dynamic to use.
- I want to menu ….

Product Architecture Overview https://www.youtube.com/watch?v=0iDtvIEiw7k&ab_channel=ShawnatGeomaticsFleming

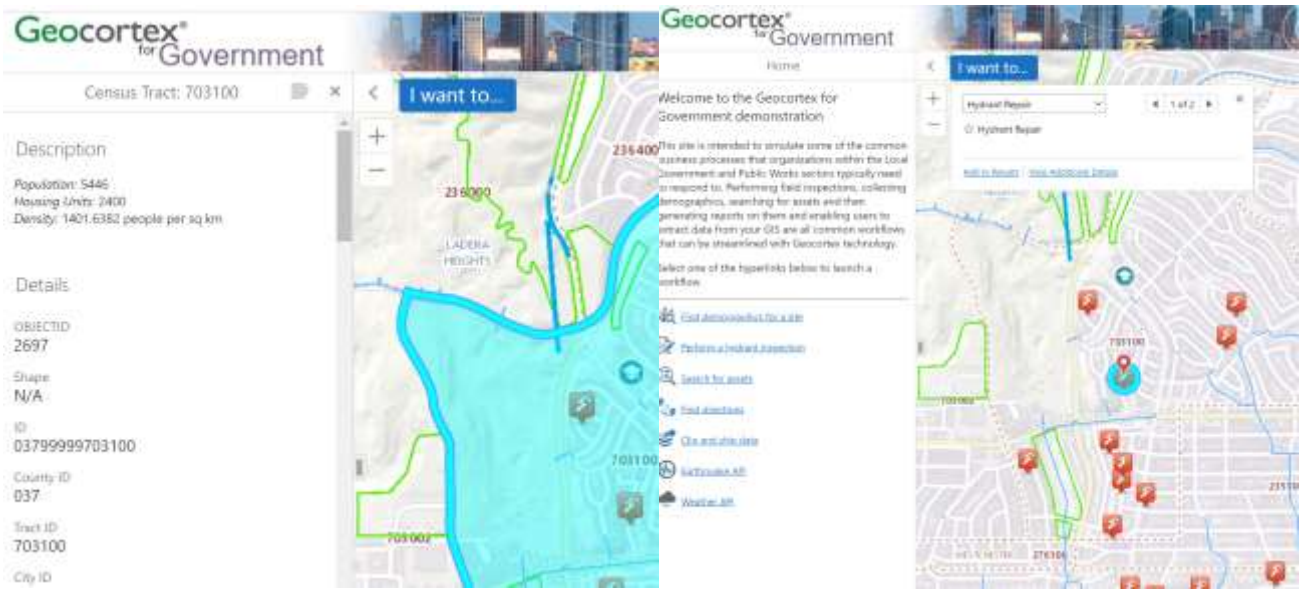
- 3 main parts- website, site editor and the viewer editor
- Sites folder on the server – organises the files for you. A new folder is created when someone makes a new site.
- Have to click 'Save Site' for that file (in the above point) to be updated and content added.
- Site editor part only works on the server side.
- Hit the green chain icon to bring up the rest end point.
- Need to add the viewer side. Have to enter a unique name. This opens up the viewer . creates/uses JSON files in the backend.
- Launch in browser option that opens an URL for it. (This is a shortcut URL)

Vertigis Geocortex

Geocortex in Practice - What can be done.

Examples

https://gedemo.geocortex.com/Html5Viewer/index.html?viewer=Government



Geocortex 5 "versions" are integrated into ArcGIS Online and their configuration is stored in items. It requires ArcGIS Online or an ArcGIS Enterprise implementation to use it, and thus has been slow in its adoption.

https://gedemo.geocortex.com/GeocortexDemos/

A Demo that I really liked using the Gecortex 5 is this Covid-19 Dashboard.

https://apps.geocortex.com/webviewer/?app=8bd2b7f7c4e943bd8c465edce58ffaf6

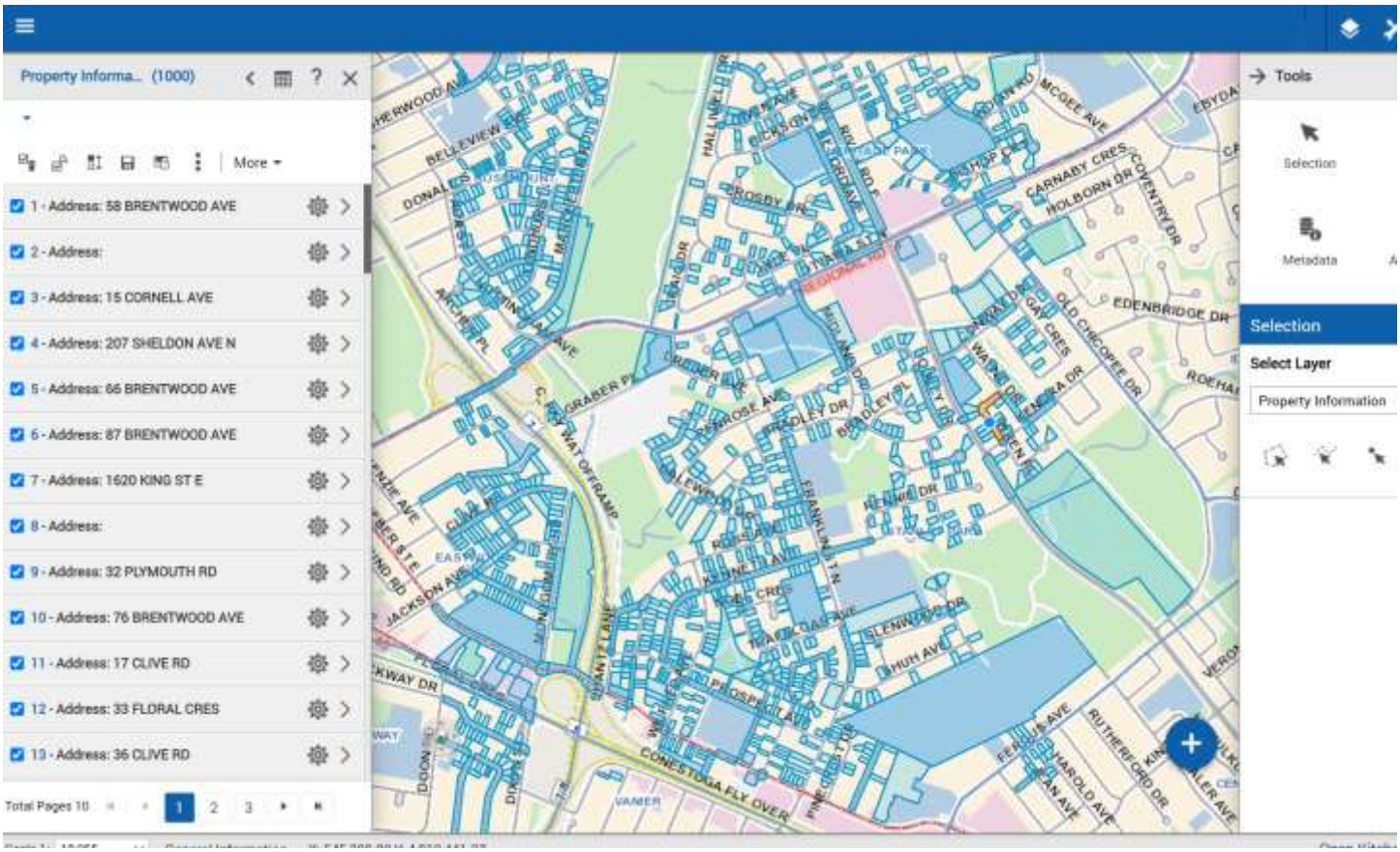
Looking at this demo however, there are so many similarities to using the ArcGIS Online Dashboards.

Rolta's OnPoint

Rolta OnPoint is a Canadian Product that was formally Orion Technologies (Richmond Hill). Focusing mainly on Large multinational companies as clients. First client ever was municipal- Kitchener who still a client today.
It is also a configurable add on to ArcGIS Server.

Example: City of Kitchener

https://map.kitchener.ca/OnPointExt/WebPages/Disclaimer.aspx?ReturnUrl=%2fOnPointExt%2fWebPages%2fLanding%2fPublic.aspx



Strava API

Strava ia a live tracking GPS based app to track sports activities such as Cycling and running. They also have a free AI to integrate with webpages and apps.
As part of the group project I am researching into the basics of the Strava API for possible integration of live tracking.

The Strava REST API includes:

- Data on Athletes
- Segments
- Routes
- Clubs and gear

It does not allow you to get data for all public athletes. Instead, will need to make an application request for athletes to sign in with Strava and grant your application permissions Using OAuth 2.0.

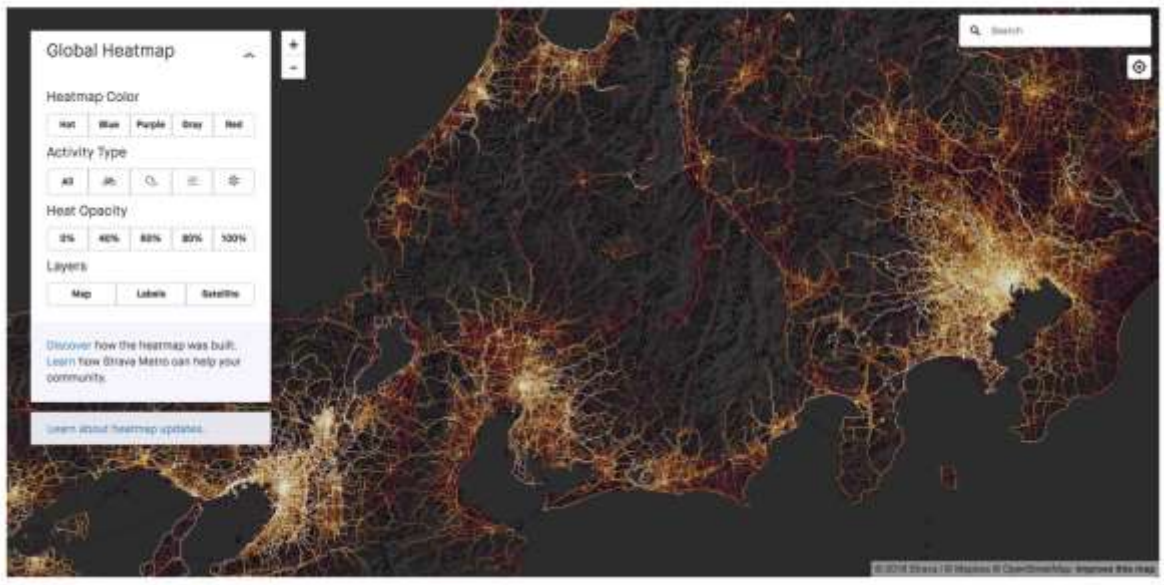
There are some usage limits.

Examples of Strava API being used.
https://printmyroute.xyz/

Full in-depth instruction to setting up API
https://developers.strava.com/docs/getting-started/#account
https://developers.strava.com/playground/#/Routes/getRouteById

Resource for OAuth
https://oauth.net/2/

Integrating it with Mapbox
https://www.mapbox.com/showcase/strava
Great example of mapbox/Strava product



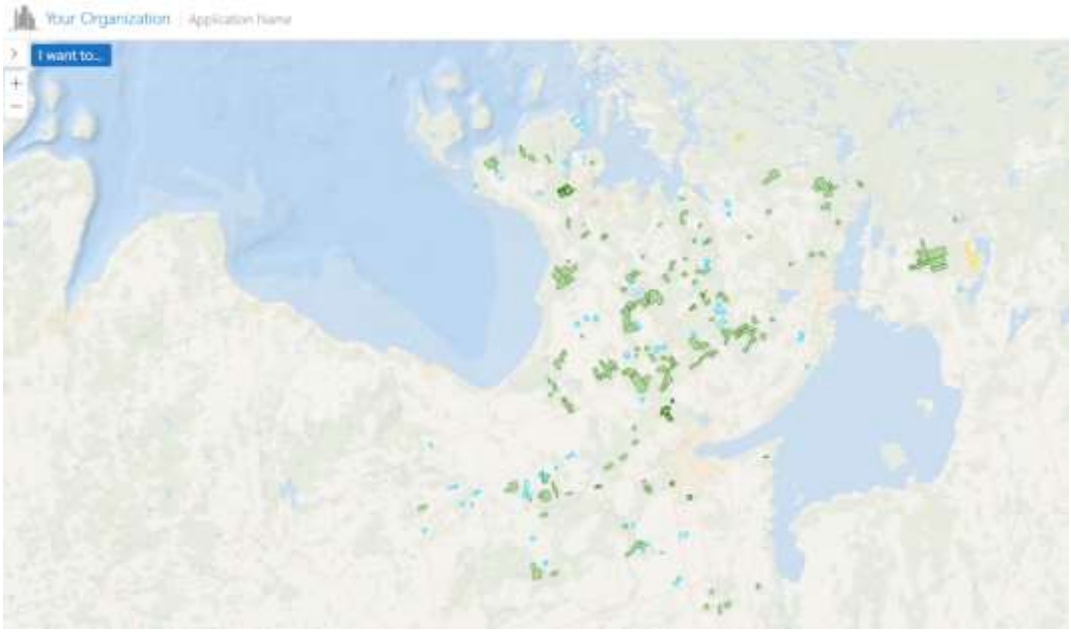
Geocortex Intro

Create a Site

Followed provided Geocortex tutorial provided.
All configured items stored in site.xml file and stored in the path created for my unique site.

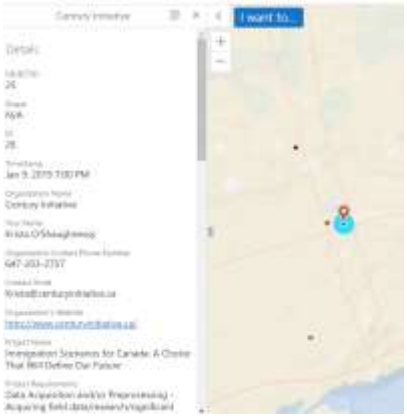
The Steps Taken:

- Added a new site
- Gave it a unique name
- Added a map service (provided URL)
- Then added another new map service as a base map
- Set the initial map extent to focus on the recreational areas
- Clicked on the save button after making this change.
- Added a viewer with a unique display name
- Launched the viewer

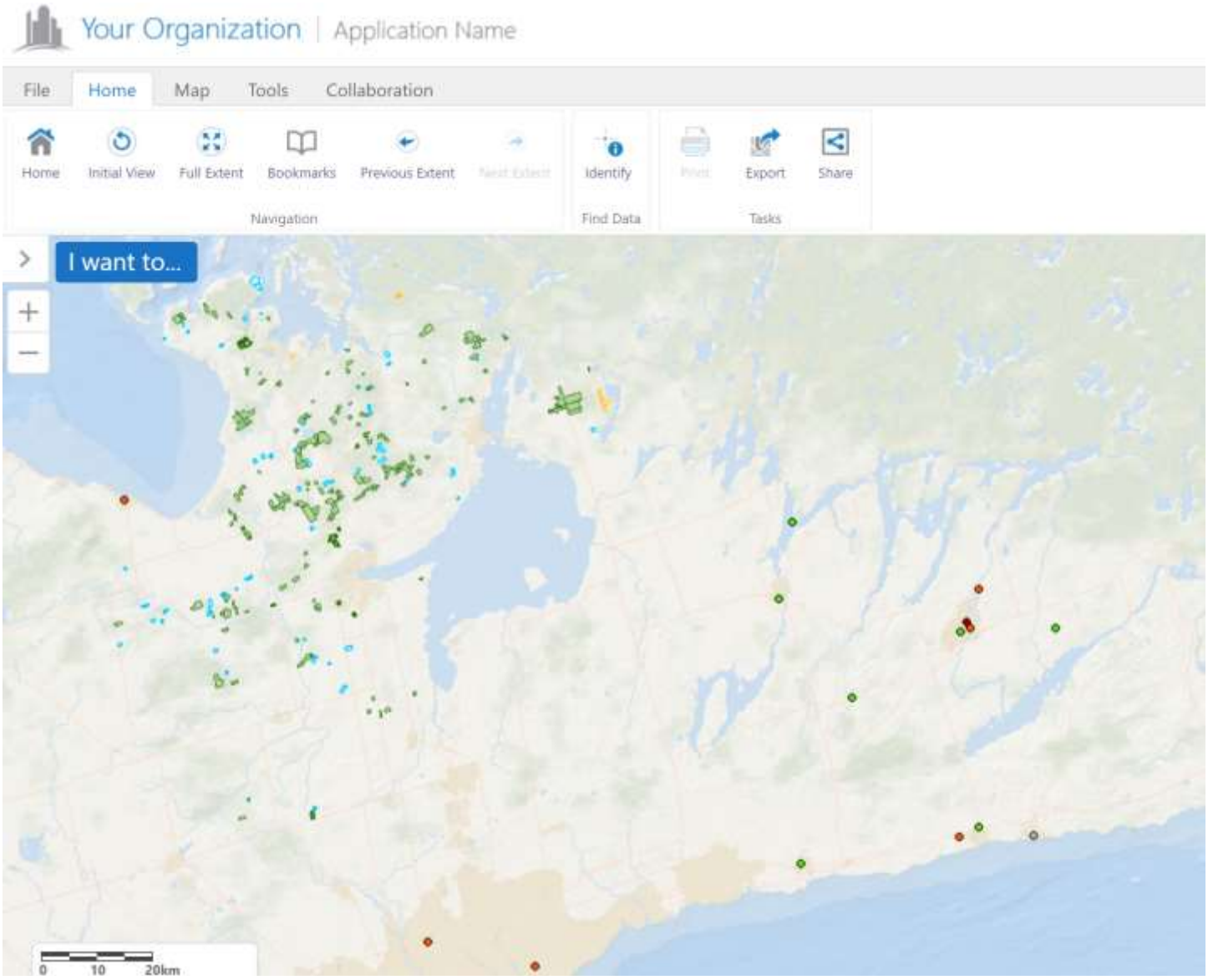


Adding Custom Workflow Script:

- Added the workflow URL (provided for this tutorial) by adding it in a new map service.
- Next, I clicked on the Workflows icon in the toolbar and clicked add workflow
- Entered the information provided (e.g. Display name)
- Clicked on the 'Browse' button. Resources > Workflows > The .xaml file provided.
- The workflow is added to the site portion of my configuration. Saved Site to commit the changes.
- Edited the Viewer to add the workflow search to the 'I want to' menu.
- Clicked the Add Menu Item button and filled in parameters etc..
- Clicked Apply changes and then saved again.
- Tested this newly configured site out by I Want to.. > Search Collab > 'Canada'. Which returned a list of items.



- Loaded in the Web GIS Full toolbar to the viewer to get the more comprehensive tools on the map.



Handy tips:
Clicking the green chain button opens up the REST Endpoint in a new tab.

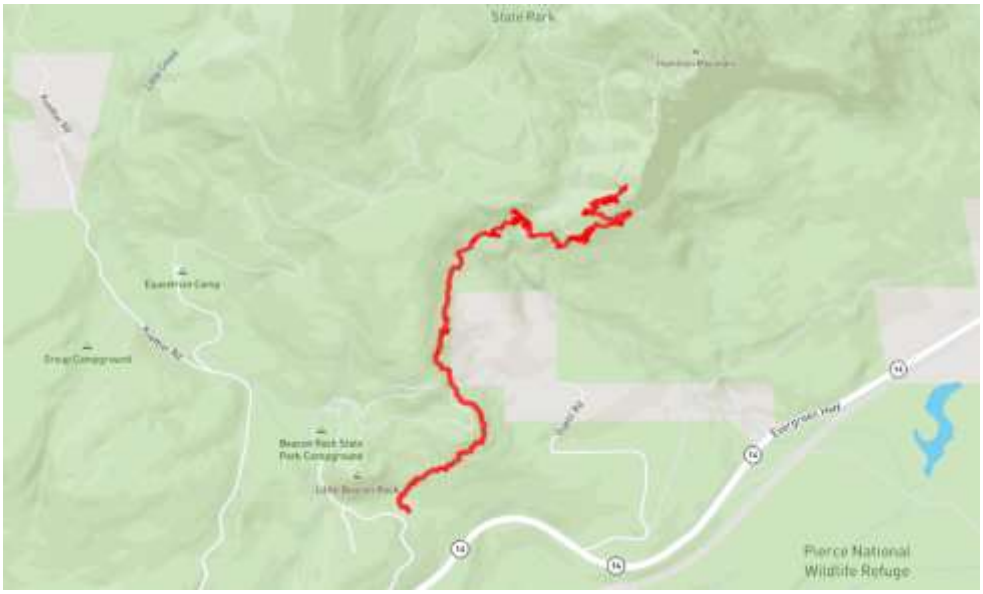
Route Animation

Tutorial

As part of the group research process, I explored animating GeoJSON files to represent a real time route being drawn.

Mapbox Tutorial
https://docs.mapbox.com/mapbox-gl-js/example/live-update-feature/
This is a great approach for visualizing real time data sources and having got this example working and playing around with it, it is a very well suited approach for the animation we are wanting to achieve in this project. Calling the data (setData) makes a new rendering cycle which makes the updates appear in real time – without creating an animation as the first approach does when it is creating an animated layer.

My Example hosted on Github
https://hollieegg.github.io/activitylog/exploration/RealTimeGeoLine.html
I experimented on customizing within this tutorial with styled maps and basic things such as the colour of the polyline and at what time it should start after the page is visited.



Route Animation

Tutorial

Taking it Further
Wanting to further customize this tutorial by adding in a different GeoJSOn- of the route that will actually be used in the collab project. Originally from the mapbox website (https://docs.mapbox.com/help/troubleshooting/uploads/) I looked into uploading a GeoJSON, however a lot of errors were generated. Mainly due to Size and point limit. I figured as the code allows for an URL to link to uploaded GeoJSON's to mapbox that I could host a GeoJSON in my personal github and reference that and BOOM- Itworked!

GeoJSON: Created by Jennifer Debano of my group in ArcGIS PRO from original data provided to us from our Collab Client.

Animating PolyLines Research

Mapbox

Diving deeper into animating a route in Mapbox. I stumbled across a different approach than the previous tutorial I tried.

LINK: http://www.formerspatial.com/scrolly-drive

This is essentially using storytelling in mapbox. The above example in particular uses the Scrollytelling template and Turf.js. This example is taking a GeoJSON and then customizing the animation by altering things like the smoothness of the line, whether it is following a specific point and zoom control ect. IT also can pause at a particular point if required. Finding this example has led me to exploring the whole concept of Mapbox storytelling and how it can actually be used for animating.

Mapbox storytelling

https://github.com/mapbox/storytelling

This has been an informative resource to look at. Even though the storytelling is a more template based option, there is room for customization- especially for animation.

This storytelling mode offers mainly animation options for transitioning between chapters and transitioning between locations. These included ‘FlyTo’ ‘EaseTo’. On top of this, camera animations can also be added for how the viewer is being animated. This has given a detailed overview of the controls available within storytelling templates in mapbox- a feature that could be very much used as an option for this group project and customized to suit.

Animating Points Research

Mapbox

To better understand the code I wanted to do some basic animation tutorials that I can start exploring by also customizing and changing things. The one I started off with is to animate a point along a line.

Tutorial: https://docs.mapbox.com/mapbox-gl-js/example/animate-point-along-route/

Completing the tutorial and exploring the code

The code uses to co-ords for point (start and end) then has a line going from start to finish. I decided to add in some more points labelled pit stop to get familiar with this. I then also changed the icon (pulled from github Maki) and played around with theme ect. I reference my style that I created in the previous week tasks. This is helping me to understand more about the basics of mapbox and JS coding. The code also uses Turf: which helps to smooth the animation so its not jerky.

https://hollieegg.github.io/activitylog/exploration/AnimateointLine.html

Point following line

Tutorial: https://docs.mapbox.com/mapbox-gl-js/example/animate-point-along-line/

This example animates a point on a circle path that has been specified. This may be handy to experiment with and customize by adding this point to paint. This would be very similar to the very first example I did with the route animation.

Completing tutorial.

https://hollieegg.github.io/activitylog/exploration/AnimatePoint.html

Animating in Mapbox

Examples

Looking at some other examples of ways to animate in Mapbox. Here are some resources and example for reference that I may wish to explore at a later date or reference back too.

Animate Images

Example: https://docs.mapbox.com/mapbox-gl-js/example/animate-images/

Although this involves animation using imagery, it is interesting to compare the code.

Dash animation

Example: https://medium.com/@gpj/visualizing-power-lines-with-mapbox-8590aec57022

I really like this powerlines examples. It uses GeoJSON data of the powerlines and then creates animated dashes.

Point animations – multiple

Demonstrates multiple points being animates on the map.

Example: https://github.com/misterfresh/mapbox-animation

Animating in Mapbox

GeoJSON Notes

Adding URL sources

```
var url = 'geojson/power_lines.geojson';
map.addLayer({
    'id': 'power_lines',
    'type': 'line',
    'source': {
        'type': 'geojson',
        'data': url
    },
```

GeoJSON and Mapbox: Do's and Don't's.

https://source.opennews.org/articles/how-we-made-our-broadband-map-using-mapbox/

This is an enjoyable and fascinating read into a real life project example of using GeoJSONs with MApbox. IT highlights key tips in ensuring using them in the most successful way with MApbox GL JS. Mentioning the upload limit in this article for GeoJSON to mapbox is an issue already encountered when exploring mapbox. The way we have dealt with it is to host the GEoJSON separately on github, however the suggestions here are great to know, which include decimal place precision, in the case of the data for the broadband project- reduced the file size by 40%.

Mapbox Discussion

In Lab task

Mapbox discussion with a peer group.

Jim, Chris and Kezia

Food Banks project

Showed our current Mapbox research and examples. (animated line, scrollytelling) to a peer group for discussion and feedback. Along with this we showed other examples that I really liked and that had inspired the direction my group were going towards.

Examples shown

https://interactive.aljazeera.com/aje/2020/saving-the-nile/index.html

https://map.huttrip.com/

https://www.mapbox.com/impact-tools/interactive-storytelling

Peer Groups use of Mapbox

The group showed their progress with the food banks project. Although this map was not using mapbox, the group were further exploring Mapbox to use as a secondary map within their project and were wanting to see how it can be used and examples. This was a good discussion for both groups to help generate ideas and showcase examples to help further explore.

GeoJSON Discussion

One of the big topics that came from our discussion was GeoJSONs. Both groups have hit limitations of uploading these to Mapbox. Due to prior research and exploration, we were able to show the group that these GeoJSONS can be hosted on their github and still used with Mapbox.

Group Project

Web Design

To showcase our group work on animating routes with GeoJSON's , I started to research and play with possible designs and layouts that could work with the branding and team. One thing I wanted to look into were Landing pages as I felt this could work pretty well here.

I researched home pages and landing pages and looked at examples.

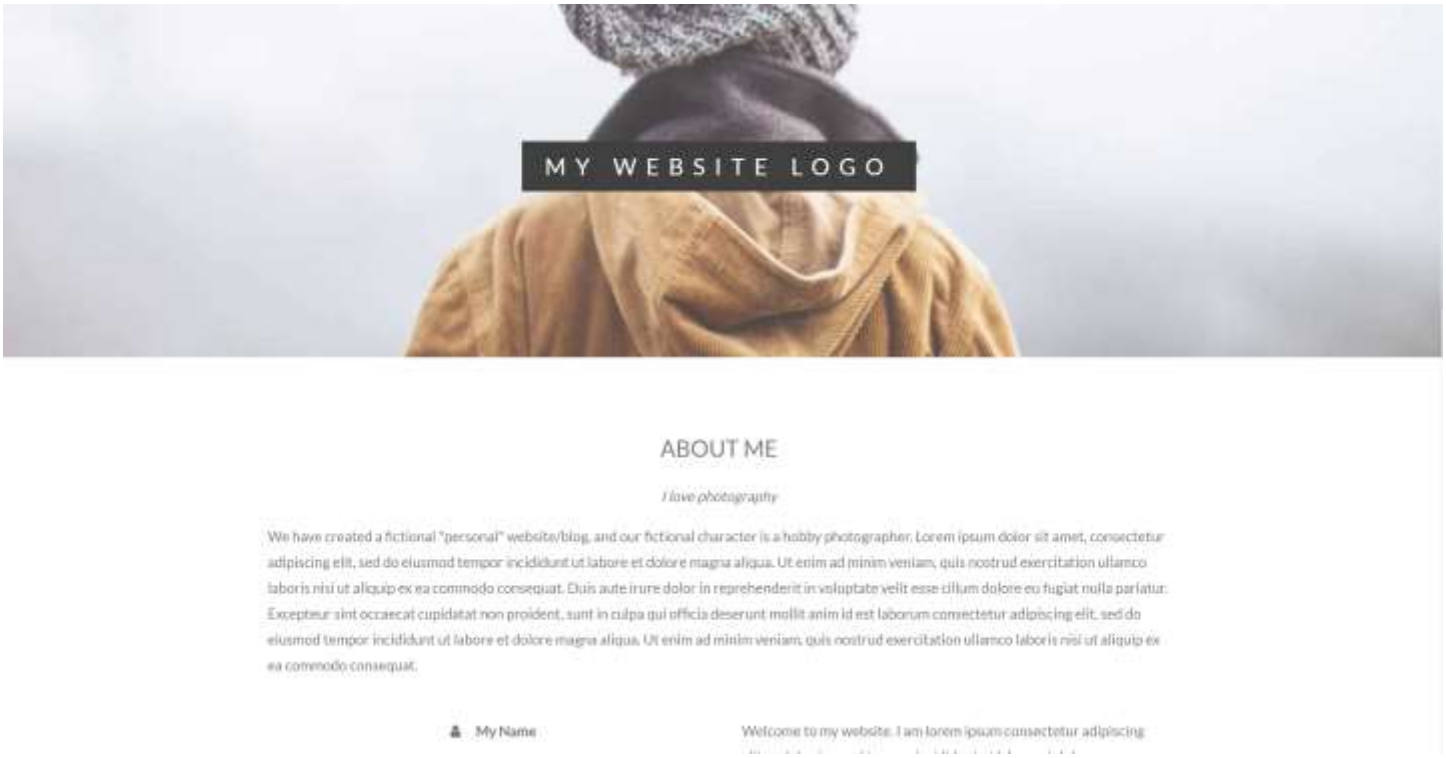
https://www.creativebloq.com/web-design/landing-page-design-6133358

I am inspired with a nice simple layout and design that has one main image or graphic for the page. As the Logo for the Liberty Project that is the client our groups Animated routes would be displayed, I felt I wanted to explore this idea more.

My main resource for code reference and a starting point was at the W3schools website templates

https://www.w3schools.com/w3css/w3css_templates.asp

One example really caught my eye that looked clean and simple.



However, this template used a scrolling feature. All pages are on this page and continue as you scroll down with different background set ups as you scroll. I wanted to take the style features of this to then customize into a site that would work for us. Whilst looking at the code I realized icons were used from Ff fonts awesome. This is something that I have used before in previous projects and feel it works very well in this simple layout.

Group Project

Web Design

I took the Logo of our client and put this as the main element to the home to get a landing page feel here. The grey and pink in their logo fits in with a simple monochrome/greyscale theme. To make the name stand out I added some colour that would compliment the logo.

My next step was to start creating a footer to incorporate both our groups logo and the client logo. This is a great starting point.

Challenges:

After sharing this with the group, I wanted to carry on more and explore this idea to see if we could use this. I also would like to further explore resizing imagery dynamically for web browser resizing as this is a problem am I struggling with for the above landing page.

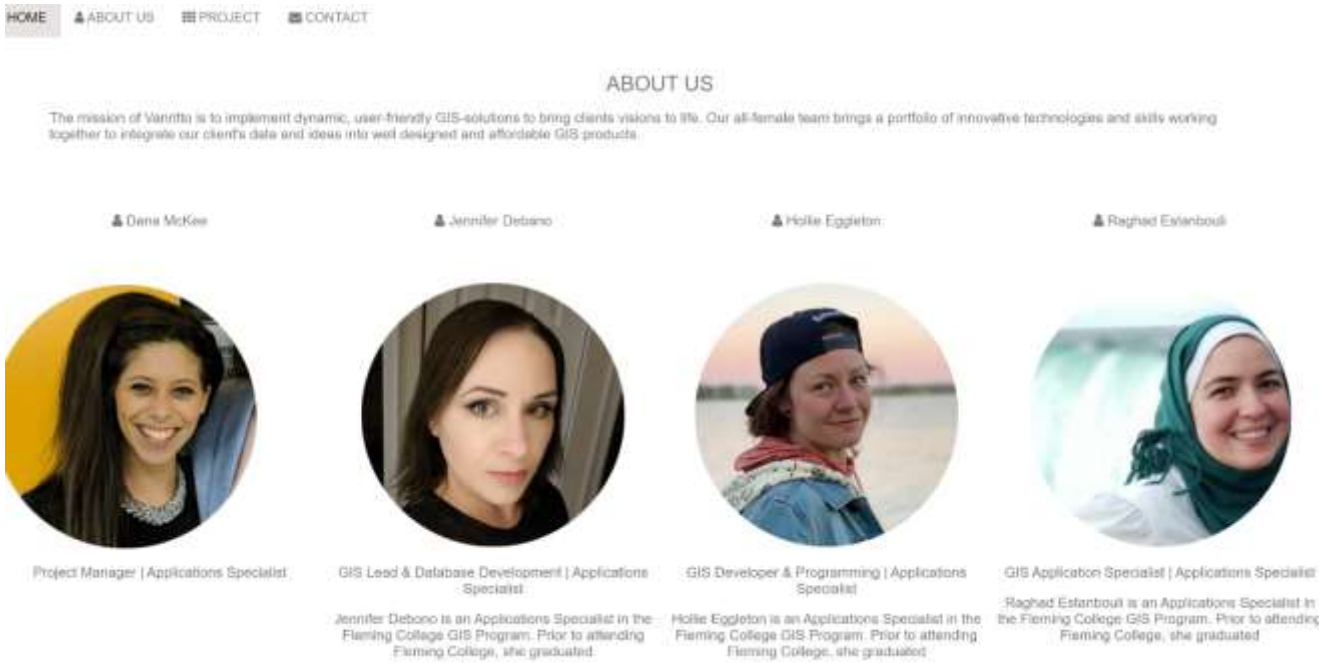
https://hollieegg.github.io/web1/99/eggedits/creative/simple.html

Group Project

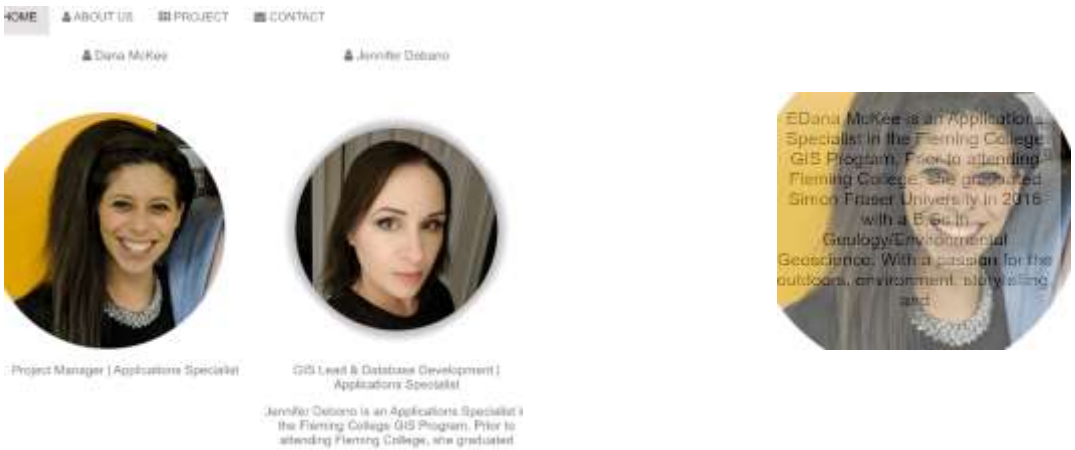
Web Design

Taking it further!

Other group members have also been experimenting with other ideas and design. This is great to compare and share to help us decide what works and what doesn't. With content created by Dana Mckee- I started putting this content into my design to see how it would look. Starting with the About Us team page.



The photos were originally in a square format. Using photoshop I was able to frame them as above, resize and also making the background transparent. Then I explored by adding coloured borders to see if this would help further progress the design and experimented with the accompanying text into rollover layers.



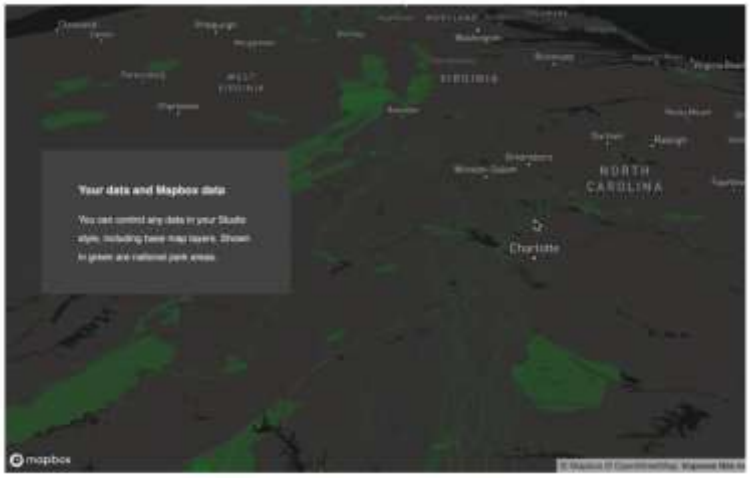
Project Research

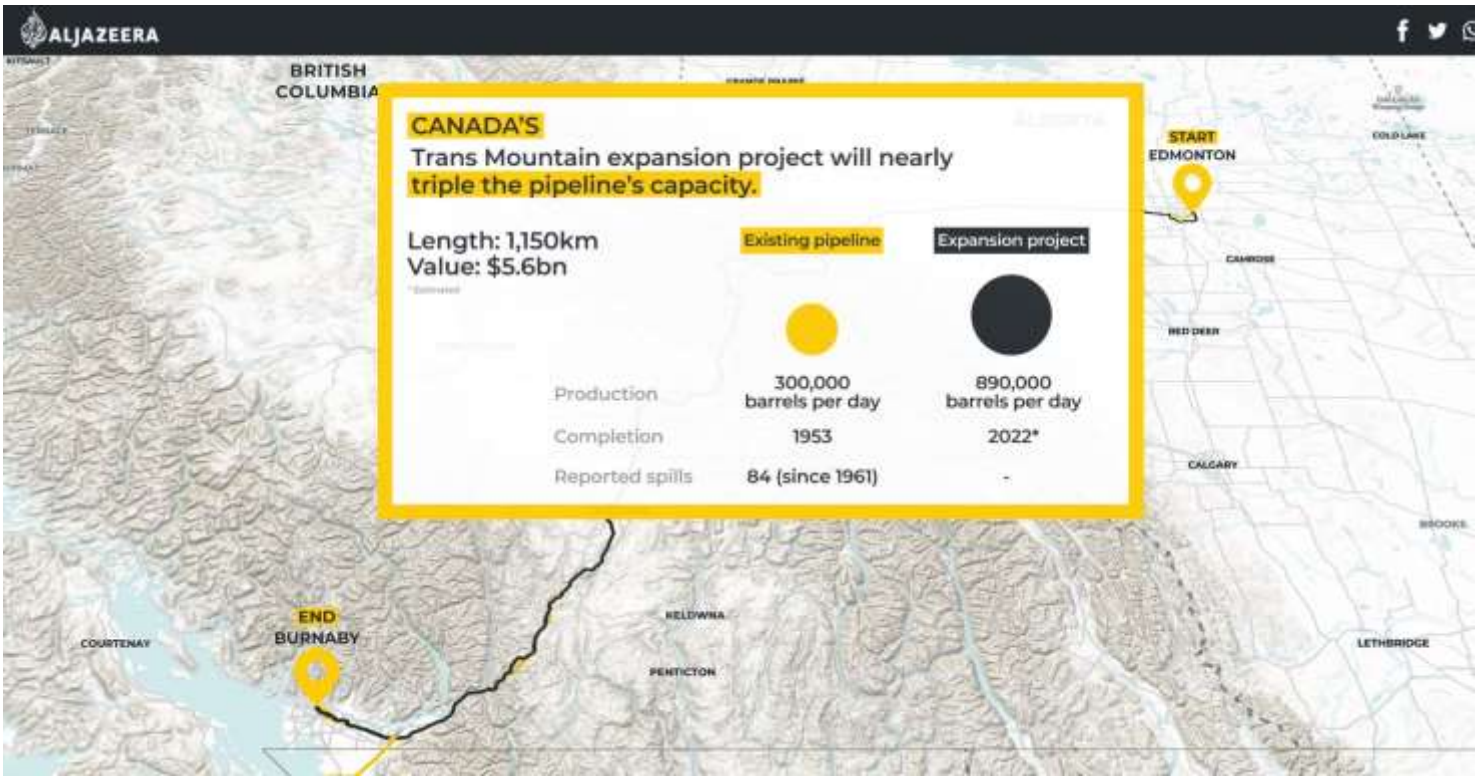
Mapbox: Interactive Storytelling

https://www.mapbox.com/impact-tools/interactive-storytelling

The storytelling and scrolly example previously explored is a very relevant example of animating in mapbox. I want to look at more examples so to being able to create a basic example. The Storytelling maps can guide through narratives by scrolling and can include text, image and video to make it interactive. Each animation is a new chapter.

Examples





Mapbox

Creating A Storytelling Example

From some of mapbox's storytelling examples, I explored github for example code to work from and explore how the chapters work and the whole storytelling mode in general.

Example Code:

https://github.com/mapbox/storytelling

I took the Bike-Philly example to try! Looking at the code is super helpful to see how it is working. To keep it simple I decided to dwindle it down to just 2 chapters to grasp a clear understanding. These will be the start of the route and the end of the route.

The Chapter Code:

```
chapters: [
    {
        id: 'start',
        alignment: 'right',
        title: 'Start Location',
        image: '',
        description: 'The start Location for the Bike fundraiser',
        location: {
            center: [-89.2477, 48.3809],
            zoom: 9.83,
            pitch: 0.00,
            bearing: 0.00
        },
        onChapterEnter: [
            {
                layer: 'phl-city-limits',
                opacity: .45
            }
        ],
        onChapterExit: [
            {
                layer: 'phl-city-limits',
                opacity: 0
            }
        ]
    },
```

Tips

Each chapter needs a comma at the end before the next chapter },

Animations can be changed on enter and exit e.g flyby

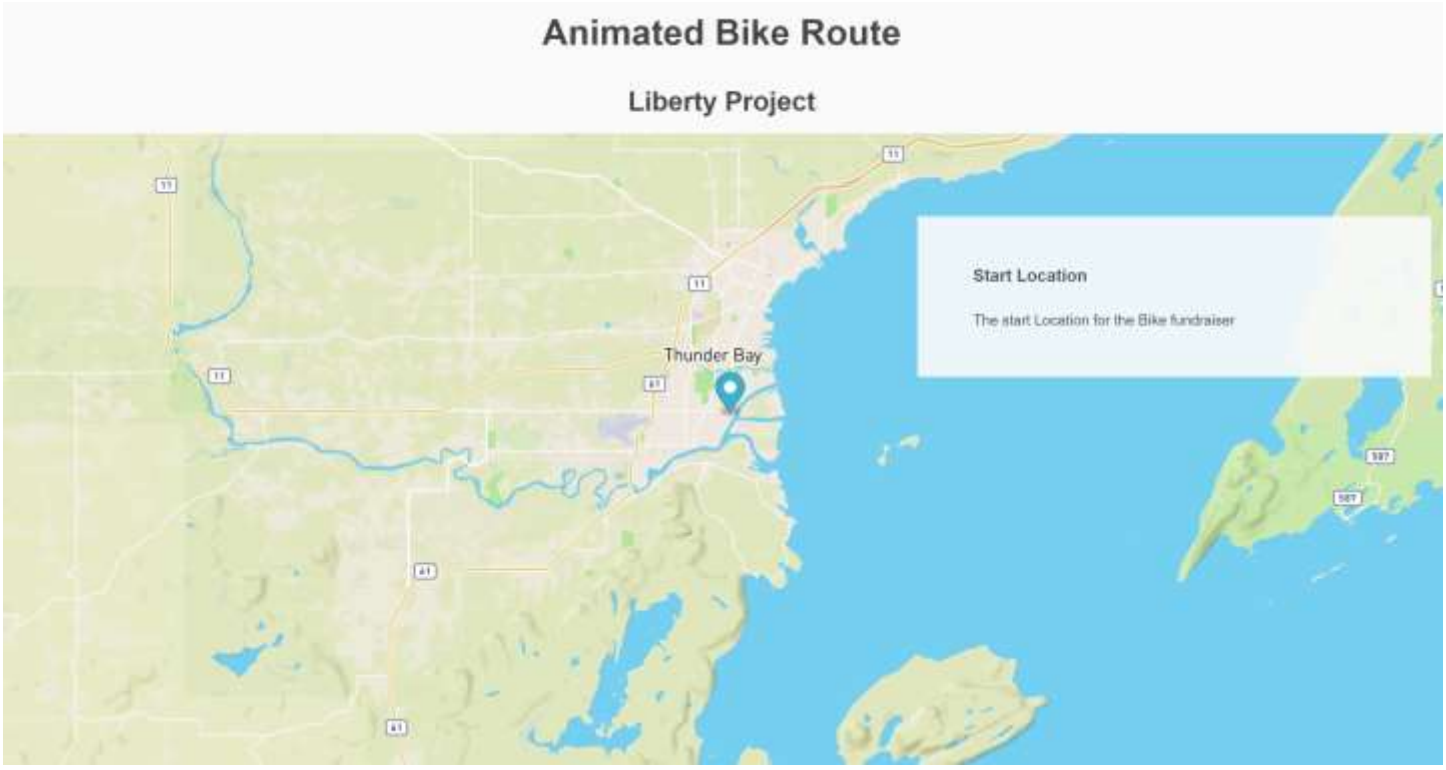
This example brings up a text box with the text in.

Mapbox

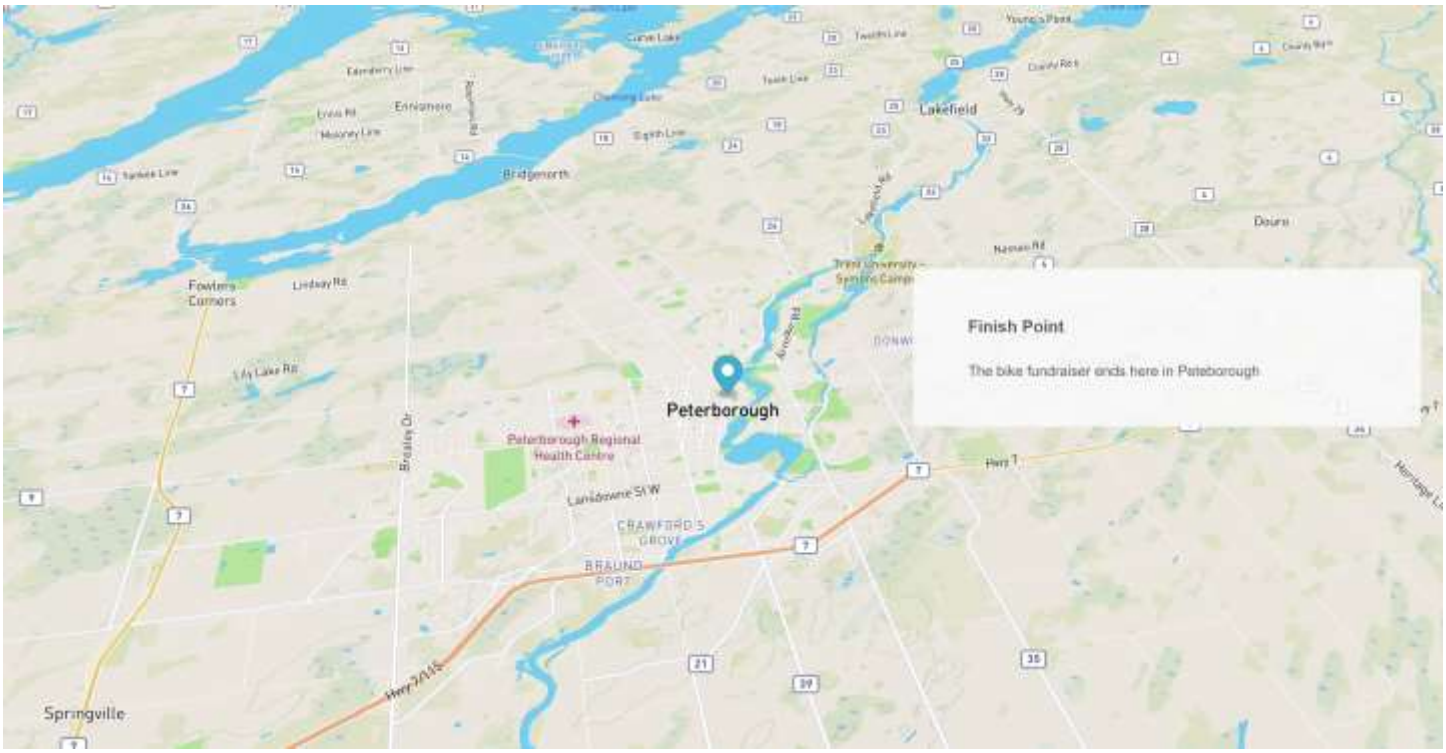
Creating A Storytelling Example

My Example so far. https://hollieegg.github.io/web1/99/Storytelling/

The start point to the route in Thunder Bay.



When the mouse is scrolled it then flys to the end point (the next chapter) with the camera angle also changing.



Config or Custom

The benefits and downfalls

The pro's and cons of configuration and custom.

Configuration:

- No knowledge of code needed
- Can be faster
- Support when it breaks
- Ease of setup
- Rapid deployment

But configuration options can limit what you can do and can actually be less flexible.

Custom:

- Knowledge and experience of code is required
- Flexible
- Can take up more time to create
- Can completely customize elements.

Some of these points could be seen as both Pro's and cons to each option. I feel when it comes to choosing between it is ultimately going to come down to the project, resources and technical experience.

Mapbox

Article

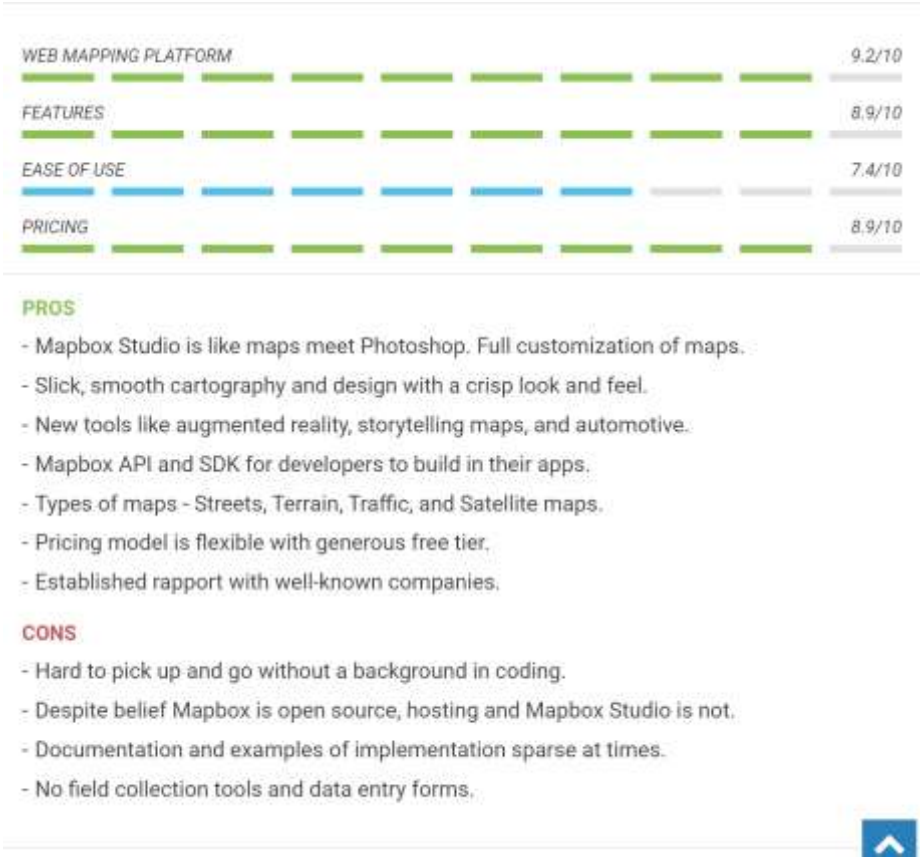
Stumbled upon this article via LinkedIn about Mapbox and some of its best features, the pros and the cons!

Resource: https://gisgeography.com/mapbox/

The 5 features of Mapbox that the article highlights as its best features are:

- Mapbox Studio
  - An interface with tools to customize maps and create the style. I like the quote here 'it's like maps meet Photoshop'.
- Web Cartography
  - Can produce high quality aesthetically pleasing maps.
  - You can personalize and change their look.
- Augmented Reality
  - Has great AR features to enhance/add 3D features. (powered by ARKit)
- Storytelling Maps
  - Each chapter is a location.
  - Very immersive and great way of telling a story.
- Solutions
  - Logistics, routing, geocoding

Note: Mapbox is only partially open source. There are free tiers but there is paid options for hosting.



Group Project

Web Design

Design updates for the website of the group project. I experimented more with the Navbar. The original white background did not make it the easiest of bars to navigate too. Also wanted to incorporate the Vanritto branding colours for brand consistency.

These colours are:

- Vanritto Blue: #88abc6
- Vanritto Grey: # 58595b

The grey for the Navbar and the blue for the title work well and compliment the white, grey and pink tones of the Liberty Projects Logo.

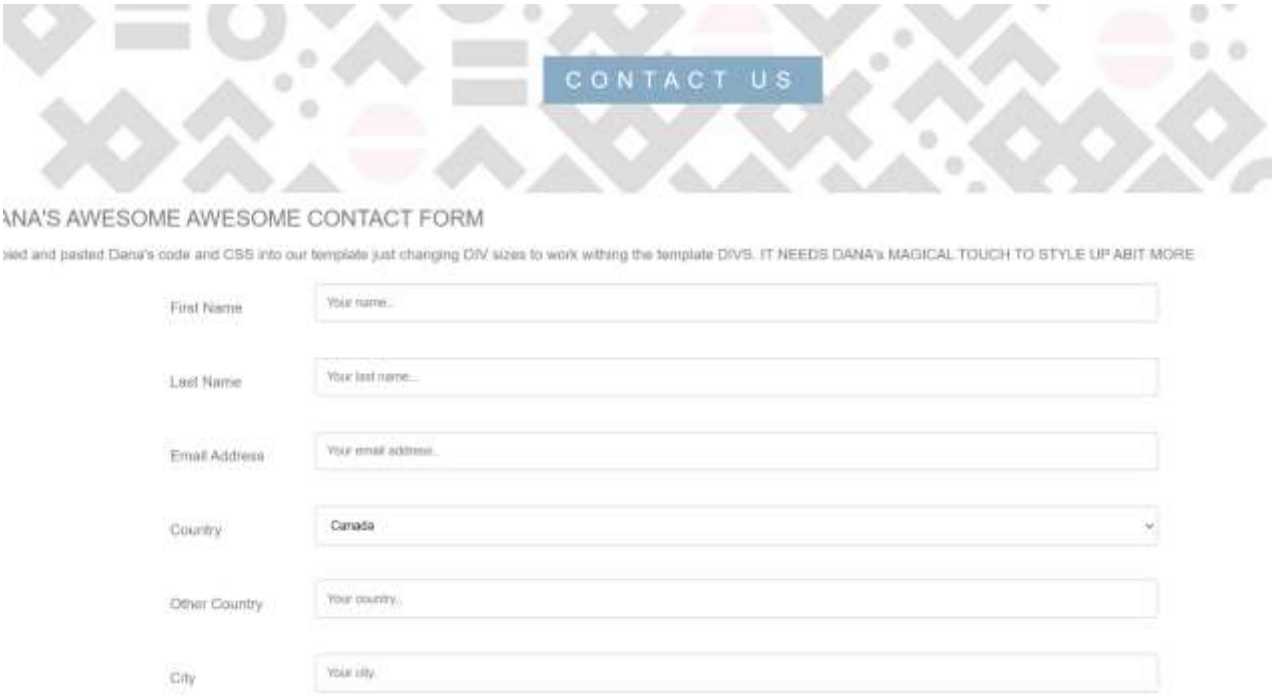
Header

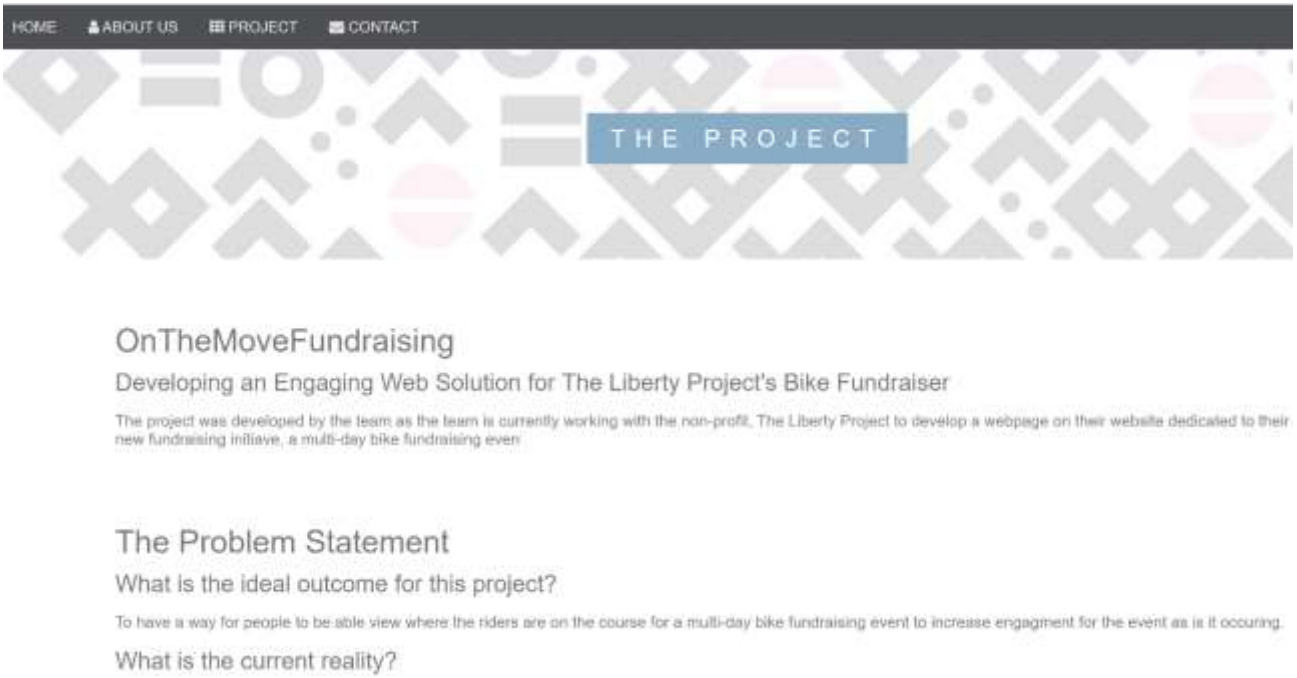
Although the site was looking quite slick to begin with the idea of putting a header in with some of the logo would be a great look for the rest of the sites pages. Using photoshop I was able to create the header graphic. For consistency and look, it also made sense to use the blue text box for page titles. It really produces an overall theme and solid template.

Group Project

Web Design

This header displayed on other pages:





Ne

Group Project

JavaScript Features

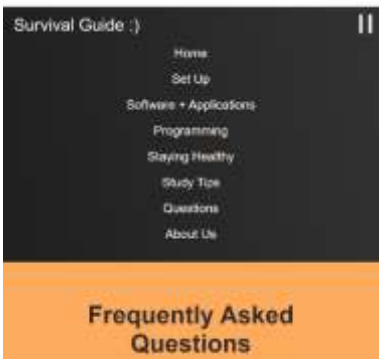
The next steps and goals wanting to implement onto the site are:

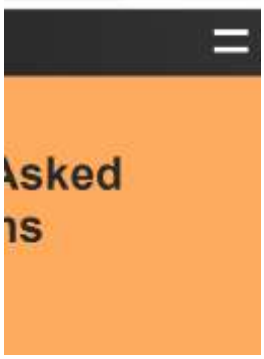
- JS Pop up for the contact form to 'dummy' a submission
- A JS drop down for the nav bar under the Project tab. This is to include 3 drop down options.

Initial Research

Looking back on my own previous work was my starting point for brushing up with JavaScript for these items. This previous group site I made a questions and answers page where clicking on the plus sign reveals the answer to the question below.

Whilst researching this, it led me to also consider Responsive Nav bar options using JS for smaller screens. Within the same past project this was also implemented and serves as a really good example of how it could be implemented to this group site for Vanritto. Using CSS, when the menu button is pressed in the top right the symbol changes position and reveals all the nav bar links. This is definitely Something I can experiement and implement into this project.





Other examples include W3schools
https://www.w3schools.com/howto/tryit.asp?filename=tryhow_js_topnav
Some JS research – pop ups
https://www.w3schools.com/js/js_popup.asp
Extra Research on Responsive Images
https://www.w3schools.com/howto/howto_css_image_responsive.asp

Group Project

Design Research

Project pages on the site are going to include both images (maps) and accompanying text. To find a good way of combining these and deciding on layout I decided to take a look at some examples for inspiration and guidance.

Examples of photos/text together

Example 1: https://nicepage.com/s/42686/travel-with-your-dog-css-template

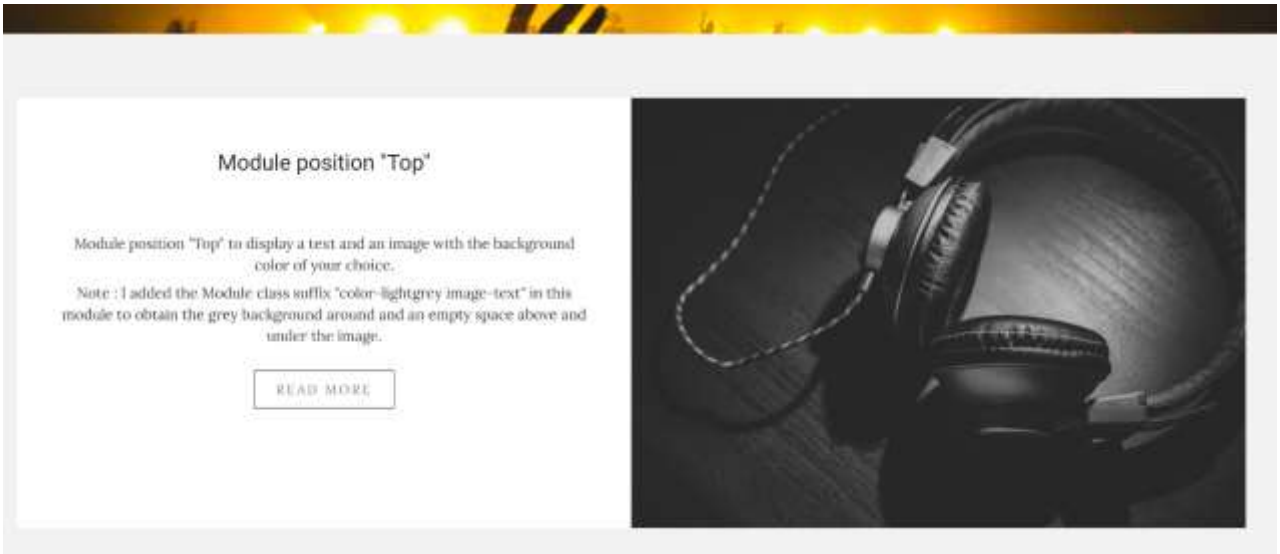
Example 2: https://www.joomspirit.com/template-joomla/template-126/typography/image-with-text

Group Project

Design Research

Continued

Example 3: https://www.joomspirit.com/template-joomla/template-126/typography/image-with-text



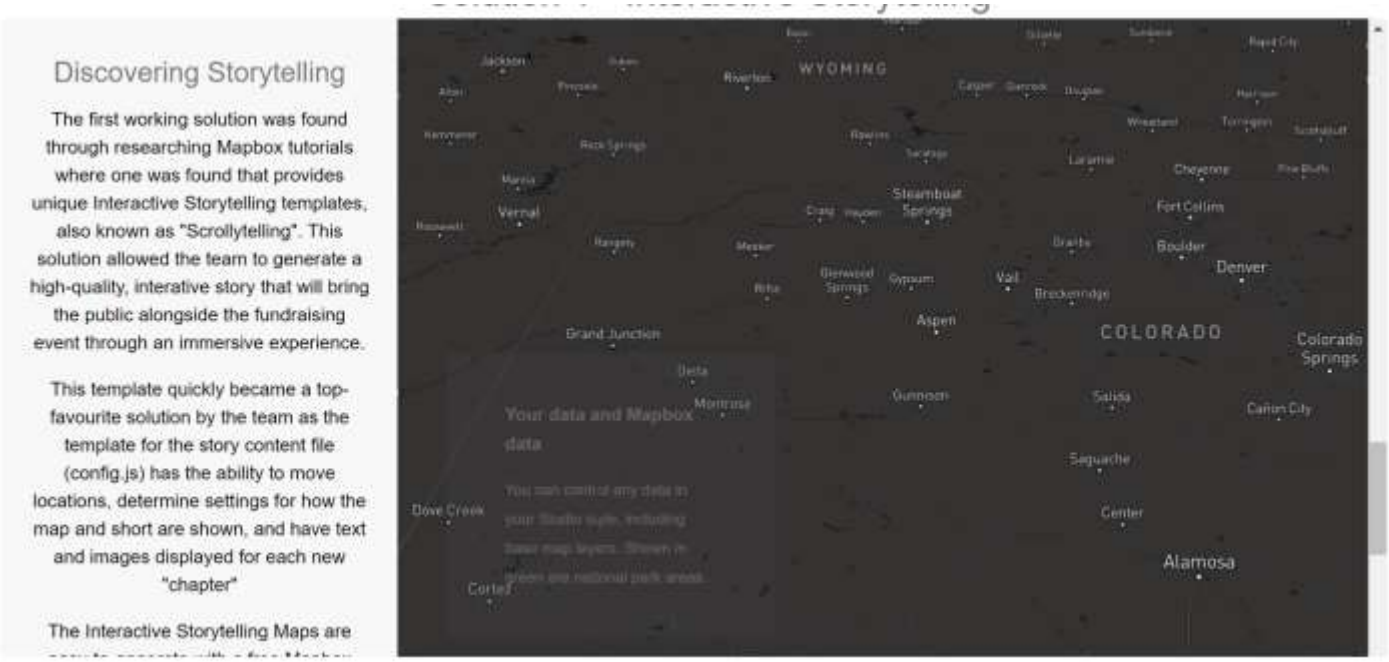
These examples look clean and slick and feel like this style of two columns one for text and one for the image/map may be a good option for the site.

Implementation

Wanting to put these ideas into practice.

Option 1:

Making a Smaller text column to the left and the map on the right.



Group Project

Design Research

Option 2:

Text under the map.

After discussion with team we all opted for the Option 1 for the design and layout of the site.

Group Project

JavaScript Navbar

After previous research and wanting to build upon my Navbar by adding a dropdown menu in JavaScript I used my previous work and W3 schools to help incorporate this into the site.

Keeping in theme with the rest of the Navbar, I used an arrow icon from Font Awesome. For housekeeping, I wanted to ensure the JS code is in a JS file so it easy to link to all other pages and keep code o the HTML pages to a minimum / following best practices.

Left image: JS file code

```
/* When the user clicks on the button,
toggle between hiding and showing the dropdown content */
function myFunction() {
  document.getElementById("myDropdown").classList.toggle("show");
}

// Close the dropdown if the user clicks outside of it
window.onclick = function(event) {
  if (!event.target.matches('.dropbtn')) {
    var dropdowns = document.getElementsByClassName("dropdown-content");
    var i;
    for (i = 0; i < dropdowns.length; i++) {
      var openDropdown = dropdowns[i];
      if (openDropdown.classList.contains('show')) {
        openDropdown.classList.remove('show');
      }
    }
  }
}
```

Below: HTML page

Using `<script src="vanritto.js"></script>`

```
<li><a href="index.html">HOME</a></li>
<li><a href="aboutus.html"><i class="fa fa-user"></i> ABOUT US</a></li>
<li><div class="dropdown">
    <button class="dropbtn" onclick="myFunction()"><i class="fa fa-caret-down"></i> PROJECT
    </button>
    <div class="dropdown-content" id="myDropdown">
        <a href="project.html">THE PROJECT</a>
        <a href="solutions.html">SOLUTIONS</a>
        <a href="discoveries.html">DISCOVERIES</a>
    </div>
</div></li>
<li><a href="contact.html"><i class="fa fa-envelope"></i> CONTACT</a></li>
```

Although a team member is taking over the navbar for a task, It has been great starting it of to hand over to the team to complete!

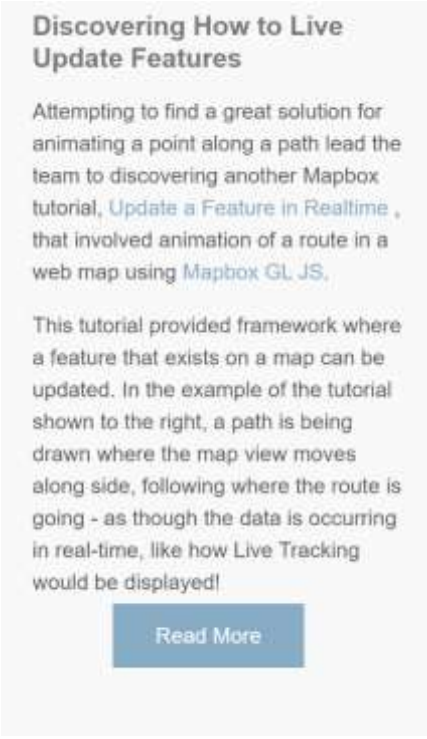
Group Project Website

Final development stages of building the final group website has led to mainly styling and layout touches. One of the things I decided to change and tweak to tidy up the text were the links within. I decided that it looked a lot cleaner without being underlined and instead being in one of our teams colours that also blend well with the sites theme. I had referred to w3 schools for examples. I used some similar styling to make some buttons within some pages.

https://www.w3schools.com/css/css_link.asp

The Trouble shooting!

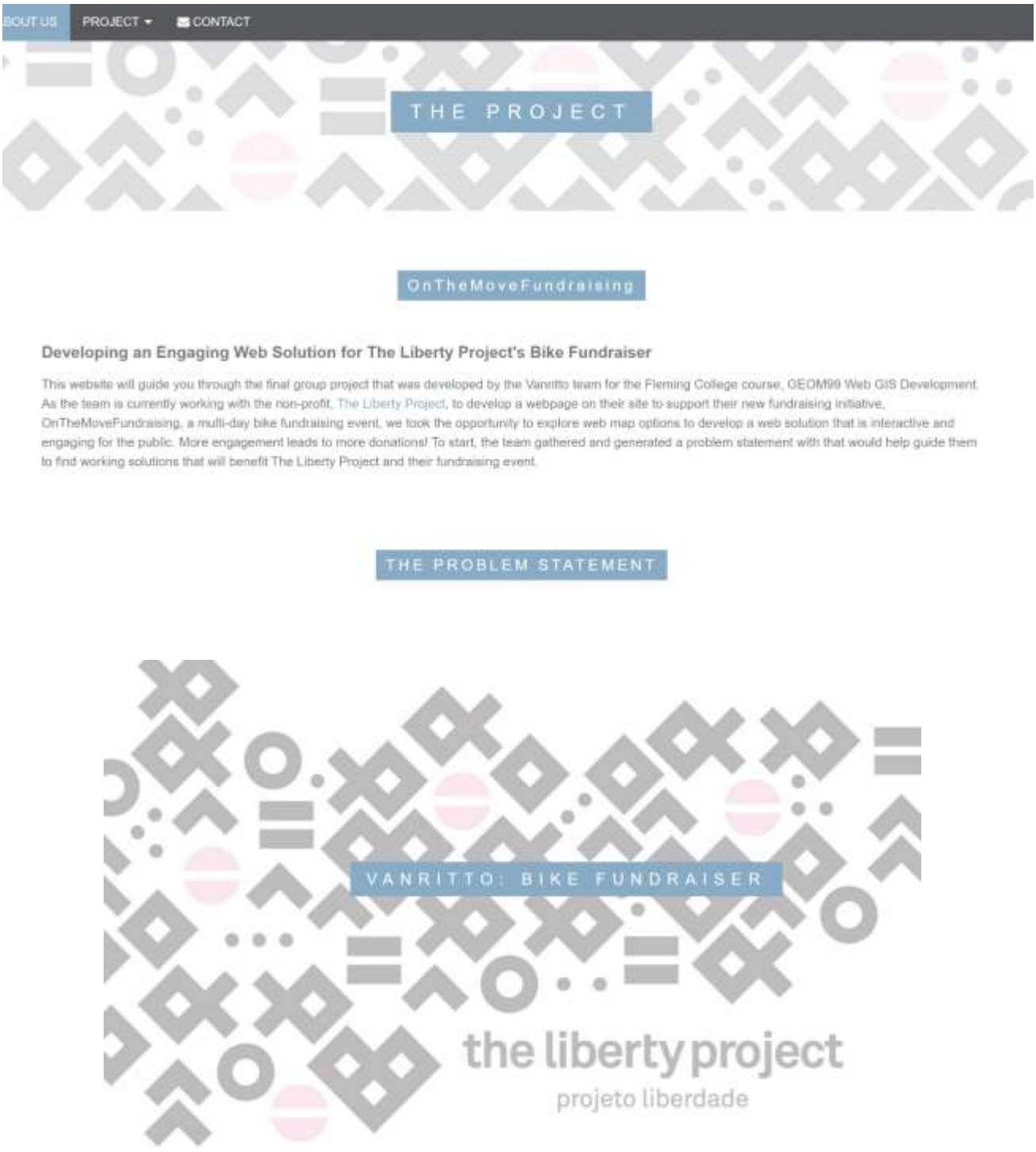
When trying to style all in paragraph links with the same Id class I ran into issues where some buttons I had put into place would then break. After some investigating, I realized the css code was clashing with the link styling for the buttons. Easy fix, set the Id for the links withing the <a tag that they were in and give them a separate class id. Worked a charm!



Group Project Website

CSS Final adjustments.

Last stages to complete the group project website was to go through and ensure styling was in theme, sleek and nicely completed. I took this time to ensure headings were consistent, change the colour/ sizing of text in paragraphs and rearrange some content on the pages. This was all being done whilst other team members were finishing up their tasks and making last tweaks. I am very happy with the final results of some of the CSS I worked.



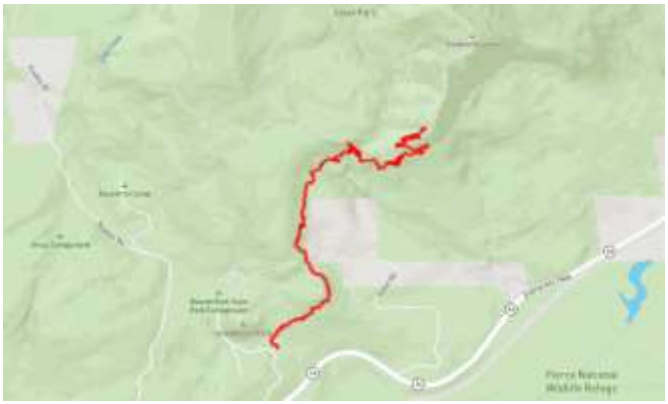
Final Product and highlights

Link to finished site hosted on Github:
https://hollieegg.github.io/web1/99/vanritto/index.html

Personal Reflection

There has been a lot of things during my personal web development and research that I have learnt, but there are definitely some that stand out for me. Here are my top 3.

1. Route Animation in Map Box



2. Diving into non ESRI platforms

It has been fun to learn about all the other platforms that exist out there like Leaflet for example and I have particularly enjoyed researching into Mapbox, especially with the things that can be done with it.

3. Discovering Mapbox Storytelling!

Excited to get using this in the collab projects and getting stuck in. It is similar to ESRI's Story Maps. Looking at the examples out there with the storytelling in Mapbox being used, it is incredible how these look and work!

https://www.washingtonpost.com/graphics/2020/climate-solutions/wyoming-wildlife-corridor/

https://demos.mapbox.com/scrollytelling/