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Tech Report

ArcGIS API for JavaScript

API stands for application program interface and it is a set of routines, protocols, and tools for building software applications. The ArcGIS API for JavaScript is designed to maximize your productivity for building engaging, beautiful web mapping applications. The API combines modern web technology and powerful geospatial capabilities enabling you to create high performing apps and smarter visualizations of your data. (ArcGIS API for JavaScript 3.20, 2017) From my personal opinion, ArcGIS JavaScript API is bigger, more complex JavaScript mapping library comparing to the Leaflet JavaScript API. Unlike Leaflet, it won't need lots of plugins to customize the map. As of now, there are mainly two versions of ArcGIS API available for using. One is version 3.20 which is better to build 2D web map; and the other is version 4.3 which is for 3D web mapping. Although version 4.3 is more updated, it only partially support 2D web mapping. One of the benefits to use ArcGIS API for JavaScript is because it works well with other Esri ArcGIS products.

To create a web map with ArcGIS API for JavaScript. The first step is to get the API. There are three ways to get the API: CDN (content delivery network), using Bower for custom builds and download API. The reference for version 4.3 is:

```
  <link rel="stylesheet" href="https://js.arcgis.com/4.3/esri/css/main.css">
<script src="https://js.arcgis.com/4.3/"></script>
```

The JavaScript used to create the map in 3D view is below:

```
1
2   // Create map
3 require([
4   "esri/Map",//create map
5   "esri/views/SceneView", //allow to view map in 3D
6   "dojo/domReady!" //ensure the DOM is available before executing code
7 ], function(Map, SceneView) {
8  var map = new Map({
9     basemap: "hybrid", //satellite, streets, topo, gray, dark-gray, oceans, osm,  national-geographic
10    ground: "world-elevation" //property of map
11  });
12 //create 3D view
13  var view = new SceneView({
14    container: "map",
15    map: map  //
16  });
17 });
18
```

The outcome is available here. This is the link to 2D map.

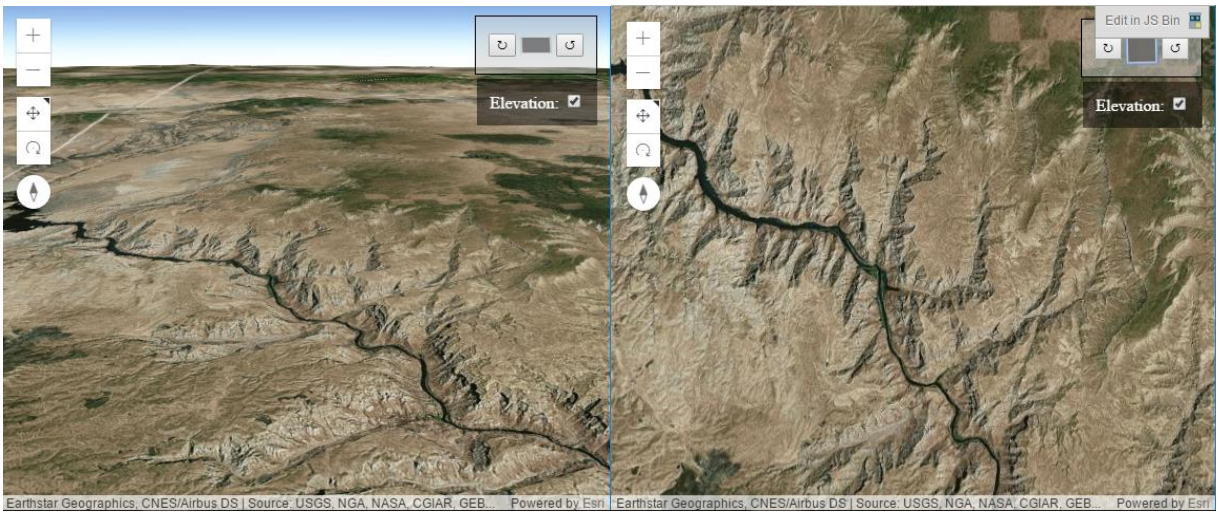
Based on what data you have and what kind of map you would like to create, there are many functions, tools available in this API. One thing to keep in mind is that when you type in latitude and longitude, longitude comes first.

One thing I like about ArcGIS API is it works with lots of different types of layers. For example, there is a layer called “CSVLayer”. Basically, when you have a csv file (contain geographic points features), you can load it in API and query features you want. Data available online are in all kinds of format, however, sometime you won’t be able to find the format you want. You could save time to convert the data, especially when you have a dataset contains huge information.

There is a new feature for version 4.3 called to edit the feature layer. You can add the point to the map with some descriptions and you could also delete it. I find this may apply to the police work very well. For example, if a crash happened, and the police could update the crash information to the database for feature use. It can also be used for 911 operators, they can catalog the type of incidents, the detail of the incidents and more other information if adding more field to it. With the technology developing, everything is digitalized. The data is costly, not only to

analysis them but to collecting them. Once the data are in the nice shape, it can make the analysis much faster and make the researches more convenience.

Visualization of this API is really great for all kinds of geometry types. Based on the data type, it comes to two scenarios: one is for location and another is thematic data-driven symbolization. ArcGIS API for JavaScript is one of the few APIs with 3D visualization. Here is an example of Grand Canyon to show you the location, you can also view the 3D map as well as 2D map by clicking the grey square in the middle of two rotation symbols. By looking at two maps, you could easily find the difference between these two. 3D map definitely will provide better visualization than 2D map. Again, based on what kind of data you have and what type of information you would like to present, 3D maps aren't always better than 2D maps.



ArcGIS API for JavaScript can not only to show the data or maps, but also to analysis the data. It can create geodesic buffers, calculate the view shed, hotspot and general route task. These are all good applications we can use to deal with our problems. For example, based on the contours map, we can calculate the flood boundary easily. Although it might not be 100% accurate, it could save a lot of time to manually collect the data.

In conclusion, ArcGIS API for JavaScript is a very power tools with lots of available resources to help you create an awesome web mapping application with very amazing visualization. It might be a little difficult to get start with, but once you are familiar with some basic context, ArcGIS API for JavaScript can help you to create any kinds of web mapping applications.

Reference:

ArcGIS API for JavaScript. (n.d.). Retrieved April 12, 2017, from https://developers.arcgis.com/javascript/3/