



地图

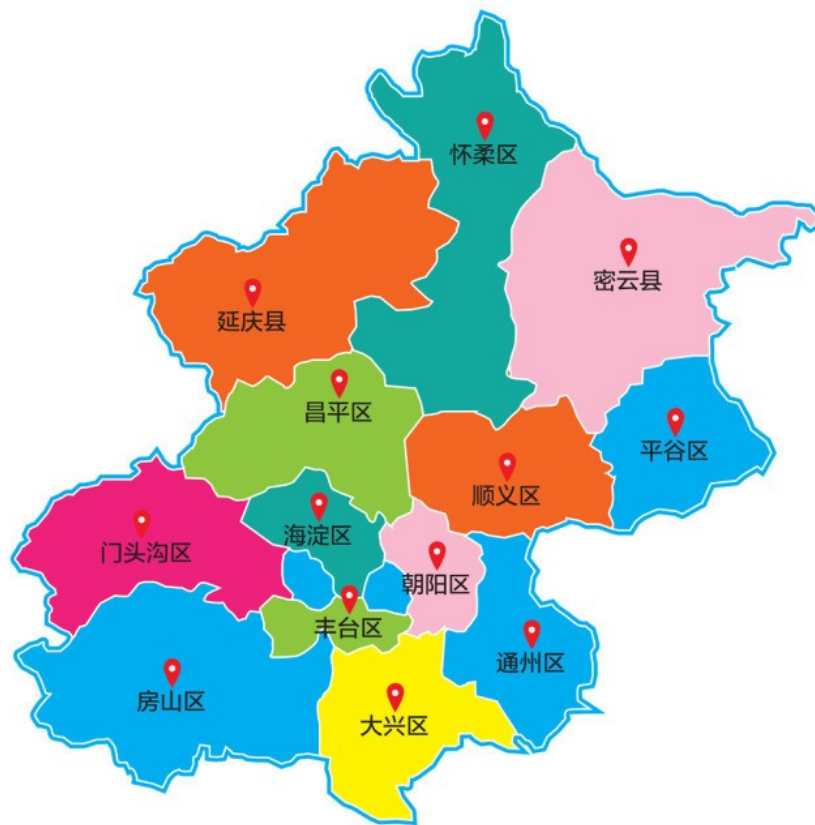
Let's Make a Map

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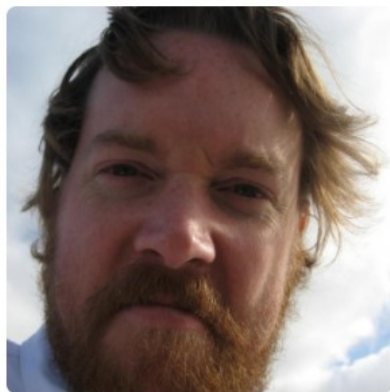
地图



地图数据



- 数据：JSON
- 两种：
 - GeoJSON：可以直接下载使用
 - 将 JSON 的格式应用于地理上的文件，叫做 GeoJSON 文件
 - TopoJSON（D3 作者创建，Mike Bostock）
 - <http://naturalearthdata.com/> 慎用！
 - <https://bost.ocks.org/mike/>



Mike Bostock

mbostock

Trying to make code and data more human. Creator of **@d3**. Former **@nytgraphics** editor. Pronounced BOSS-tock.

Block or report user

📍 San Francisco, CA

🌐 <https://bost.ocks.org/mike/>

Organizations



Overview

Repositories 53

Stars 40

Followers 15.3k

Following 13

Pinned repositories

d3/d3

Bring data to life with SVG, Canvas and HTML. 📊 📈 🍦

JavaScript ★ 65.2k 🍴 17.1k

topojson/topojson

An extension of GeoJSON that encodes topology! 🌐

JavaScript ★ 2.9k 🍴 610

d3/d3-scale

Encodings that map abstract data to visual representation.

JavaScript ★ 809 🍴 107

shapefile

A cross-platform streaming parser for the ESRI Shapefile spatial data format.

JavaScript ★ 333 🍴 68

d3/d3-shape

Graphical primitives for visualization, such as lines and areas.

JavaScript ★ 1.4k 🍴 114

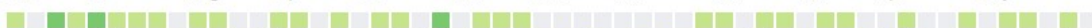
d3/d3-geo-projection

Extended geographic projections for d3-geo.

JavaScript ★ 512 🍴 112

3,346 contributions in the last year

Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May





TopoJSON

<https://bost.ocks.org/mike/>

Projects

Most of my recent projects are listed on my [GitHub profile](#). If you want help using any of my libraries, please post questions to [Stack Overflow](#) with the appropriate tag (or the [d3.js group](#)) and I will endeavor to answer them.

[D3.js](#)

A JavaScript library for visualizing data and manipulating the document object model.

[TopoJSON](#)

An extension of GeoJSON that encodes topology.



Downloads

Data themes are available in three levels of detail. For each scale, themes are listed on Cultural, Physical, and Raster category pages.

Stay up to date! Know when a new version of Natural Earth is released by subscribing to our [announcement list](#).

Overwhelmed? The [Natural Earth quick start kit](#) (165 mb) provides a small sample of Natural Earth themes styled in an ArcMap .MXD document and in a QGIS document. Download all vector themes as [SHP/GeoDB](#) (279 mb) or as [SQLite](#) (222 mb).

Natural Earth is the creation of many [volunteers](#) and is supported by [NACIS](#). It is free for use in any type of project. [Full Terms of Use »](#)

Large scale data, 1:10m

[Cultural](#)[Physical](#)[Raster](#)

The most detailed. Suitable for making zoomed-in maps of countries and regions. Show the world on a large wall poster.

1:10,000,000
1" = 158 miles
1 cm = 100 km

Medium scale data, 1:50m

[Cultural](#)[Physical](#)[Raster](#)

Suitable for making zoomed-out maps of countries and regions. Show the world on a tabloid size page.

1:50,000,000
1" = 790 miles
1 cm = 500 km

Small scale data, 1:110m

[Cultural](#)[Physical](#)

Suitable for schematic maps of the world on a postcard or as a small locator globe.

1:110,000,000
1" = 1,736 miles
1 cm = 1,100 km



GeoJSON : 描述地理空间信息 JSON

- 对象 Object
- 几何体 : Geometry
- 特征 : Feature
- 特征集合 : FeatureCollection

- 点
- 多点
- 线
- 多线
- 面
- 多面
- 几何体
- 特征
- 特征集合

```
{“type”:“FeatureCollection”,“features”:  
[{"type”:“Feature”,“properties”:{"id":1,“name”:“ 甘  
肃” },“geometry”:{"type”:“Polygon”,“coordinates”:  
[[[104.35851932200904,37.40123159456249],  
[104.46450768428224,37.440247301072134],.....
```

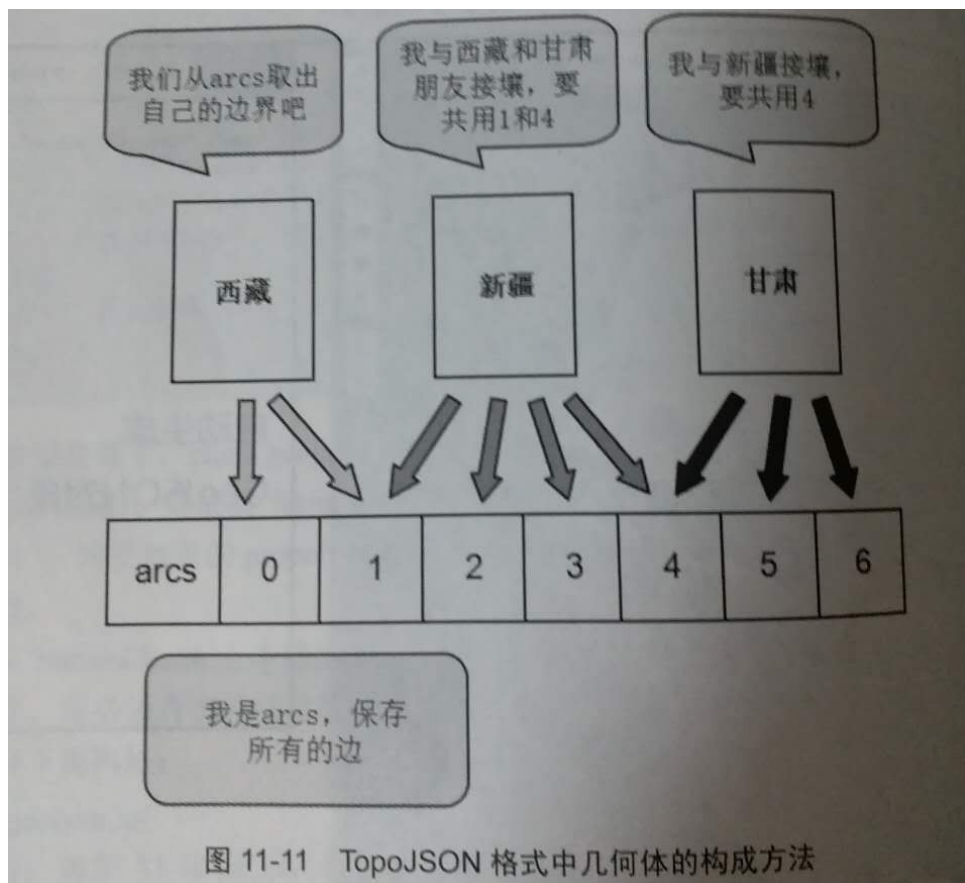


TopoJSON

- GeoJSON 按拓扑学编码后的扩展形式，由 D3 作者 Mike Bostock 制定
- 边界线只记录一次
- 地理坐标使用整数，非浮点数
- 缩小 80% 数据量

- 41KB VS 250KB

TopoJSON



2. 投影函数

```
4 var projection = d3.geo.mercator()  
  .center([107, 31])    // 地图中心经纬度  
  .scale(850)           // 放大比例  
  .translate([width/2, height/2]); // 平移坐标  
  原点
```

- 球形墨卡托投影

- 由于 GeoJSON 文件中的地图数据，都是经度和纬度的信息。它们都是三维的，而要在网页上显示的是二维的，所以要设定一个投影函数来转换经度纬度。如上所示，使用 `d3.geo.mercator()` 的投影方式。
- 怎么映射：<https://hujiulong.github.io/what-is-the-mercator-projection/>
- 常用纸质地图，百度地图，高德地图都用墨卡托投影

各种投影函数

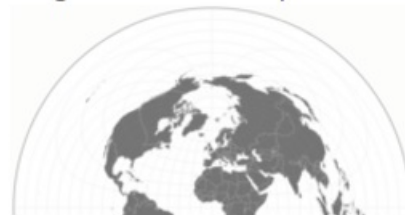
d3.geo.albersUsa



d3.geo.azimuthalEqualArea



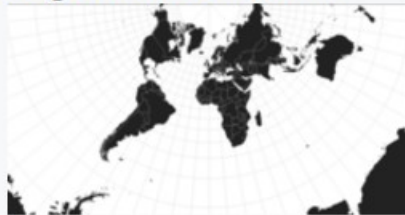
d3.geo.azimuthalEquidistant



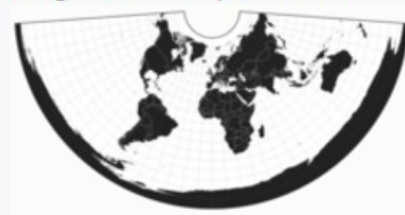
d3.geo.conicEqualArea



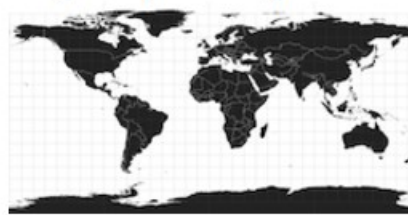
d3.geo.conicConformal



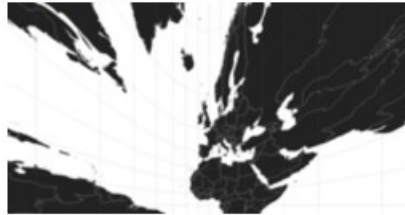
d3.geo.conicEquidistant



d3.geo.equirectangular



d3.geo.gnomonic



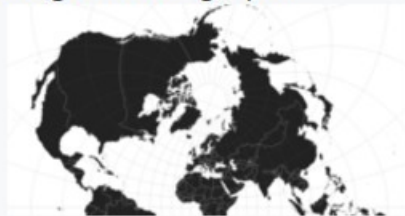
d3.geo.mercator



d3.geo.orthographic



d3.geo.stereographic



d3.geo.transverseMercator



3. 地理路径生成器

- 为了根据地图的地理数据生成 SVG 中 path 元素的路径值，需要用到 `d3.geo.path()`，我称它为地理路径生成器。

```
1 var path = d3.geo.path()  
2   .projection(projection);
```

- `projection()` 是设定生成器的投影函数，把上面定义的投影传入即可。以后，当使用此生成器计算路径时，会自己加入投影的影响。


```
d3.json("china.json", function(error, root) {  
  
  if (error)  
    return console.error(error);  
  console.log(root.features);  
  
  svg.selectAll("path")  
    .data( root.features )  
    .enter()  
    .append("path")  
    .attr("stroke", "#000")  
    .attr("stroke-width", 1)  
    .attr("fill", function(d,i){  
      return color(i);  
    })  
    .attr("d", path ) // 使用地理路径生成器  
    .on("mouseover",function(d,i){  
      d3.select(this)  
        .attr("fill", "yellow");  
    })  
    .on("mouseout",function(d,i){  
      d3.select(this)  
        .attr("fill", color(i));  
    });  
});
```

感谢

