Rule Your Geometry with the **Terraformer Toolkit**

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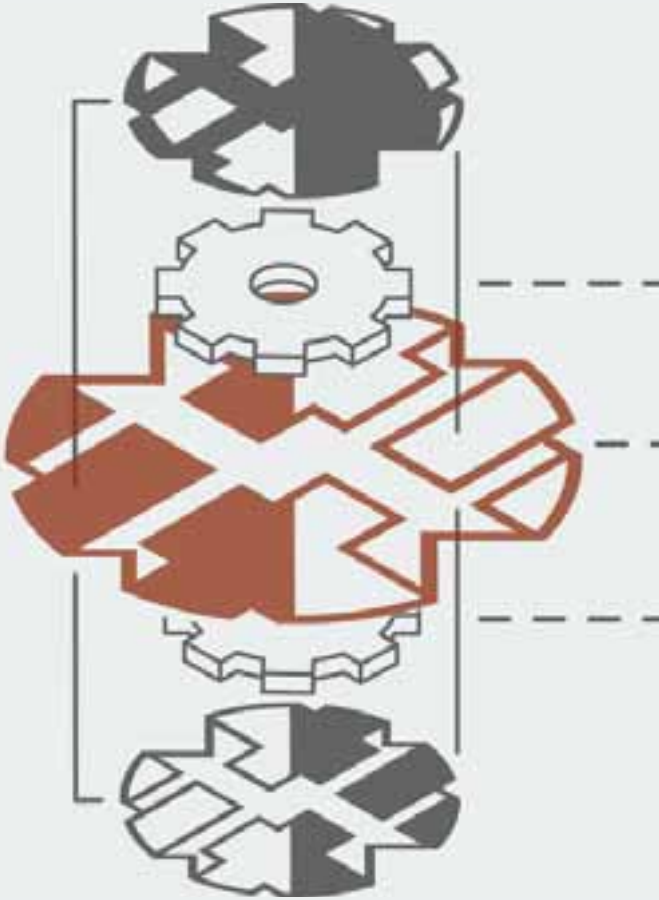
Terraformer

Open Source
JavaScript Geometry Library



Terraformer

- Open source geometry and geodata library
- Node.js and client-side JavaScript
- Key features
  - Geometry format conversions (GeoJSON)
  - Geometry operations
  - Coordinate system conversion
  - Store and access data

github.com/Esri/Terraformer

Terraformer: Geometry and Features

```
// create a typed primitive from GeoJSON
var point = new Terraformer.Primitive({ "type": "Point",
"coordinates": [ 100, 1 ] });

// create a Geometry from coordinates or GeoJSON
var point = new Terraformer.Point( [ 10, 10 ] );
var ls = new Terraformer.LineString([ [ 10, 10 ], [ 20, 20 ]]);
var poly = new Terraformer.Polygon([
    [[100.0, 0.0], [101.0, 0.0], [101.0, 1.0], [100.0, 1.0]]]);
var circle = new Terraformer.Circle([-122.6764, 45.5165], 1000);

// creates a feature from a valid GeoJSON Object
var feature = new Terraformer.Feature({"type": "Point",
"coordinates": [ 10, 10 ]}, "properties": {"prop0": "value0"});
```

Terraformer: Geometry Operations

```
// output to Web Mercator and WGS84
primitive.toMercator();
primitive.toGeographic();
```

Terraformer: Geometry Operations

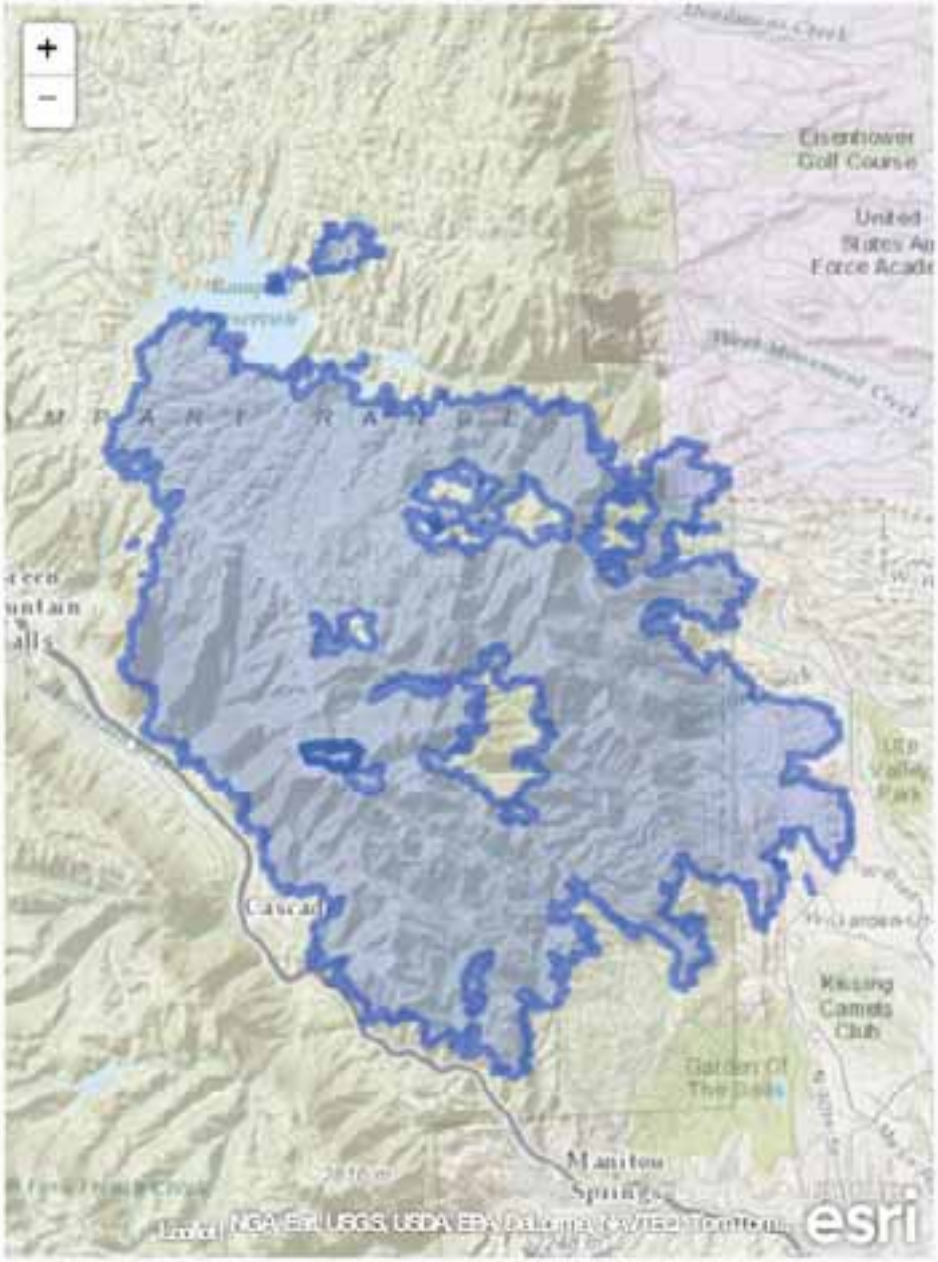
```
// add and remove individual points to geometries
multi.addPoint([ 10, 10 ]);
multi.insertPoint([ 10, 10 ],1);
multi.removePoint(1);
multi.get(1);
```

Terraformer: Geometry Operations

```
// compute GeoJSON bounding box
bbox = poly.bbox();

// compute x,y,w,h envelope
env = polygon.envelope();
```

Terraformer: Geometry Operations

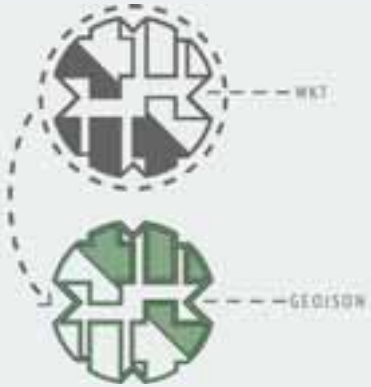
```
// Test whether geometries intersect

polygon1.within(polygon2);

polygon.intersects(line);

polygon.contains(point);

circle.contains(point);
```



Parsing ArcGIS JSON


```
{
  "rings": [
    [ [-104.9478,38.9148],[-104.9477,3
    [ [-104.9479,38.92725],[-104.9473,
    [ [-104.928,38.89225],[-104.928,38
    [ [-104.9553,38.9178],[-104.955,38
    [ [-104.9524,38.93893],[-104.9529,
    [ [-104.9324,38.95985],[-104.9326,
    [ [-104.9217,38.95779],[-104.9217,
    [ [-104.9265,38.93449],[-104.9267,
    [ [-104.9794,38.97993],[-104.9793,
    [ [-104.951,38.99266],[-104.9509,3
    [ [-104.9615,38.986],[-104.9613,38
    [ [-104.965,38.98431],[-104.9649,3
    [ [-104.9497,38.97368],[-104.95,38
    [ [-104.965,38.98469],[-104.9656,3
    [ [-104.937,38.9513],[-104.9366,38
    [ [-104.9465,38.98915],[-104.9464,
```


Add to Map



WKT Conversion

terraformer-wkt-parser.js

```
// take a WKT representation and convert it into a primative
<script>
  var primitive = Terraformer.WKT.parse('LINESTRING (30 10, 10 30, 40 40)');
</script>

// take a primitive and convert it into a WKT representation
var polygon = Terraformer.WKT.convert(
  {
    "type": "Polygon",
    "coordinates": [
      [ [100.0, 0.0], [101.0, 0.0], [101.0, 1.0], [100.0, 1.0], [100.0, 0.0] ],
      [ [100.2, 0.2], [100.8, 0.2], [100.8, 0.8], [100.2, 0.8], [100.2, 0.2] ]
    ]
  }
);
```

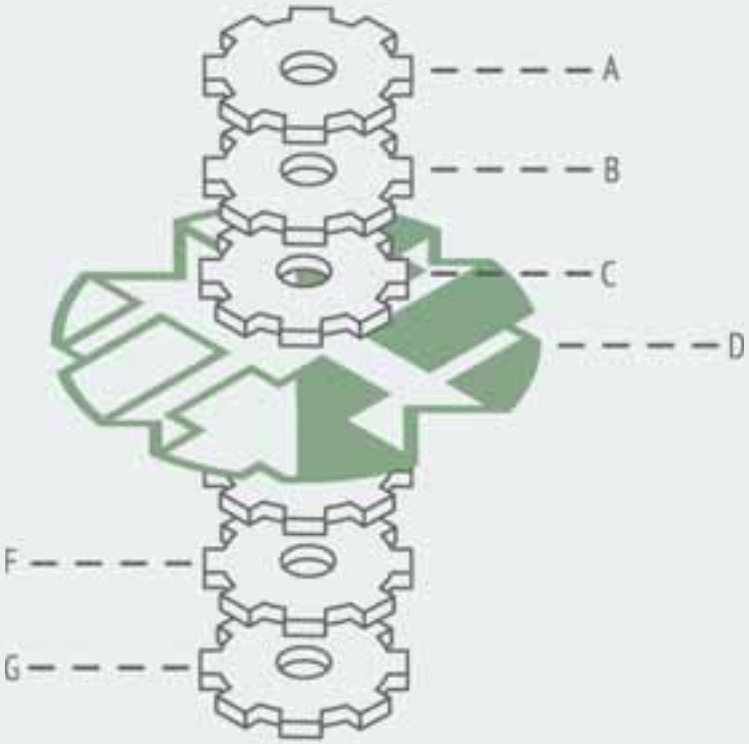
ArcGIS JSON to GeoJSON

terraformer-arcgis-parser.js

```
<script>
   // take ArcGIS JSON and convert to Primitive or GeoJSON
   var primitive = Terraformer.ArcGIS.parse({
     x:"-122.6764",
     y:"45.5165",
     spatialReference: {
       wkid: 4326
     }
   });

   // take a Primitive or GeoJSON and convert it to ArcGIS JSON
   var point = Terraformer.ArcGIS.convert({
     "type": "Point",
     "coordinates": [45.5165, -122.6764]
   });
</script>
```

Geostore

For Terraformer



Terraformer: GeoStore

A set of building blocks for managing spatial data as a GeoJSON Feature or FeatureCollection.

Includes functionality for storing and querying data spatially.

Works server-side (Node.js) and in browsers!

Terraformer: GeoStore

- Data Stores
- Spatial Indexes
- Alternate Indexes

Terraformer: GeoStore

Create a new Store and include both a Data Store and a Spatial Index.

```
// create a new GeoStore using Memory and an RTree Index
var store = new Terraformer.GeoStore({
  store: new Terraformer.Store.Memory(),
  index: new Terraformer.RTree()
});
```

Terraformer: GeoStore

Add objects to the store!

```
store.add(geojson, function (err, res) {
  // Node.js style callback
});
```

More Examples

Terraformer: GeoStore

Query the data store using the “within” method

```
store.within(geojson, function (err, res) {
  // Node.js style callback
});
```

More Examples

Terraformer: GeoStore

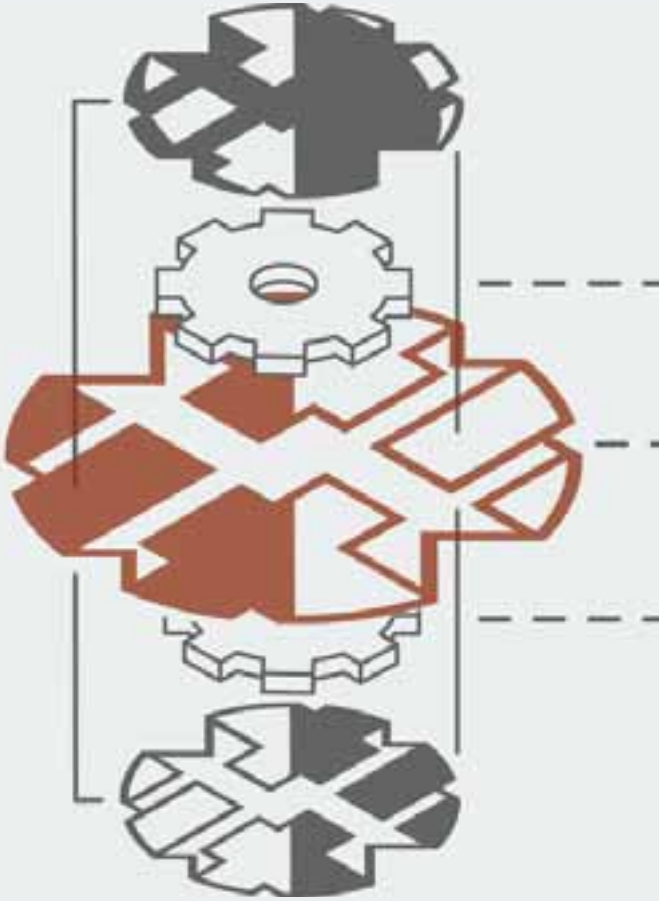
Alternate Storage Backends

- LocalStorage – browser only
- Memory – browser and Node.js
- LevelDB – Node.js only
- Future: ??

In Progress:

Terraformer for Ruby!

github.com/esripdx/terraformer-ruby



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