Alternate Projections

for OpenLayers map applications

Will Fisher

Geographic Information Network of Alaska

University of Alaska Fairbanks

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Overview

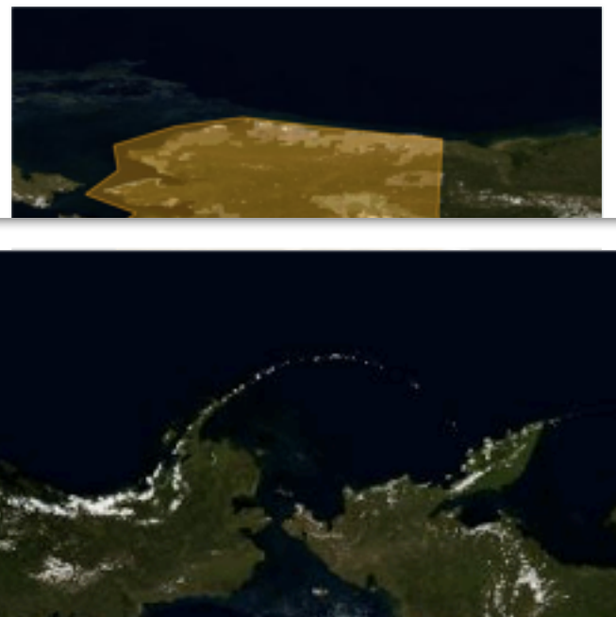
- OpenLayers & Projections
- GINA Map Layers
- Transforming Features

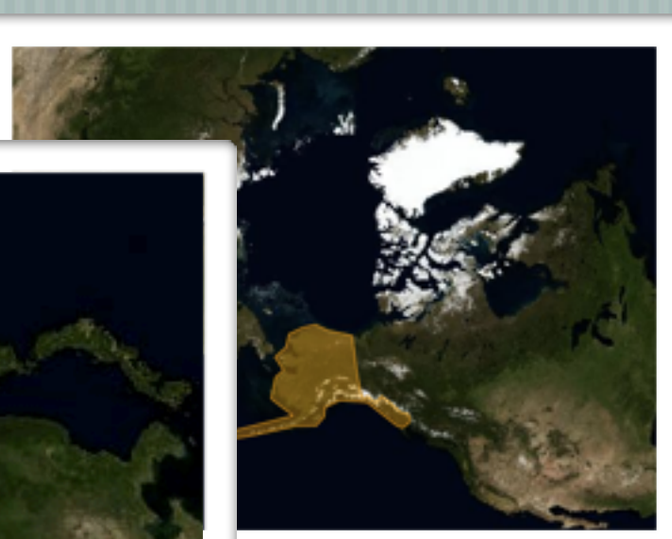
OpenLayers

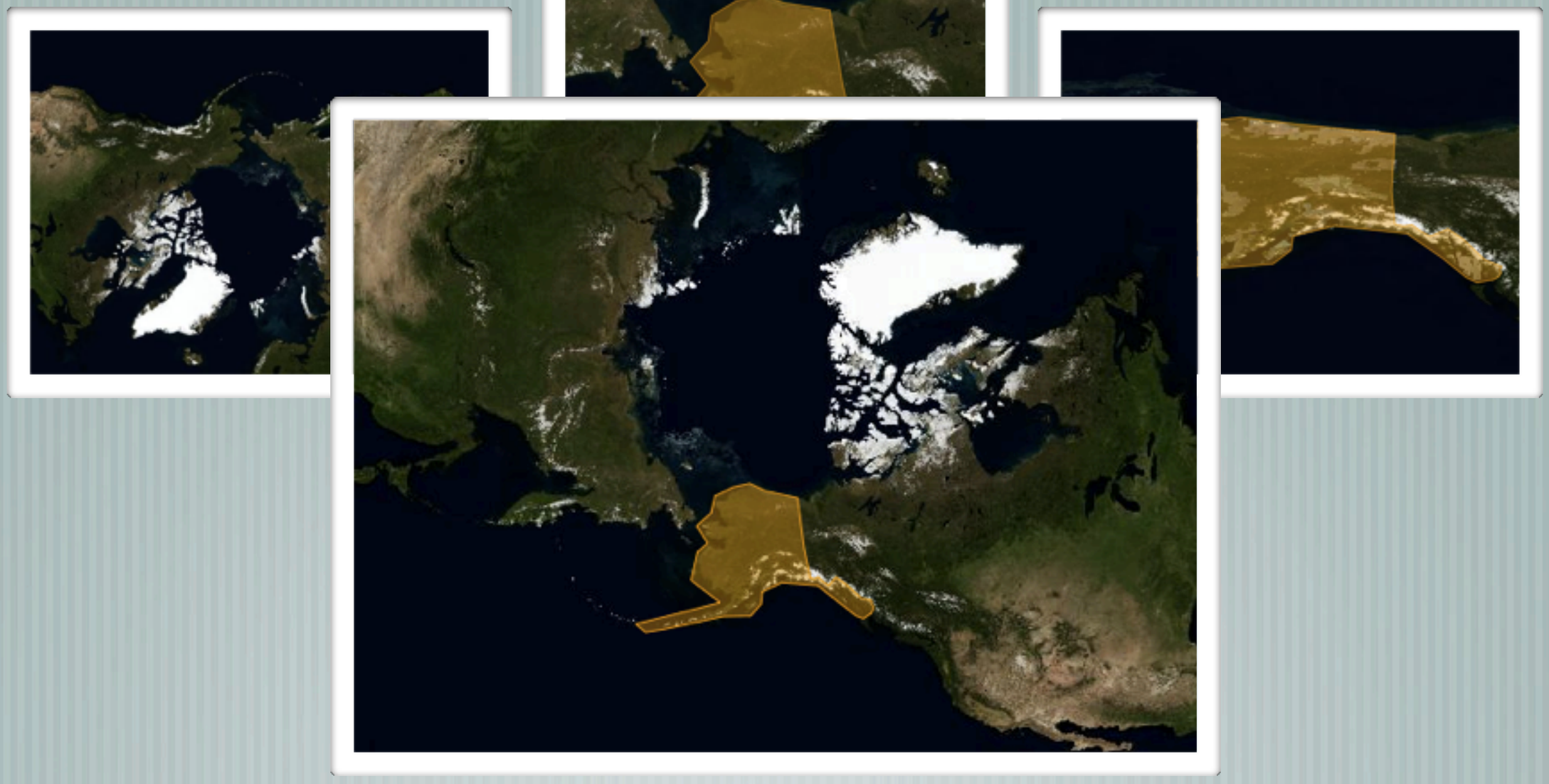
- Download code and access documentation @
  - http://www.openlayers.org
- Lots of examples available online

Projections

- Geographic (EPSG:4326)
- Spherical Mercator (EPSG:3857,900913,102100)
- Alaskan Albers (EPSG:3338)
- North Pole LAEA Alaska (EPSG:3572)

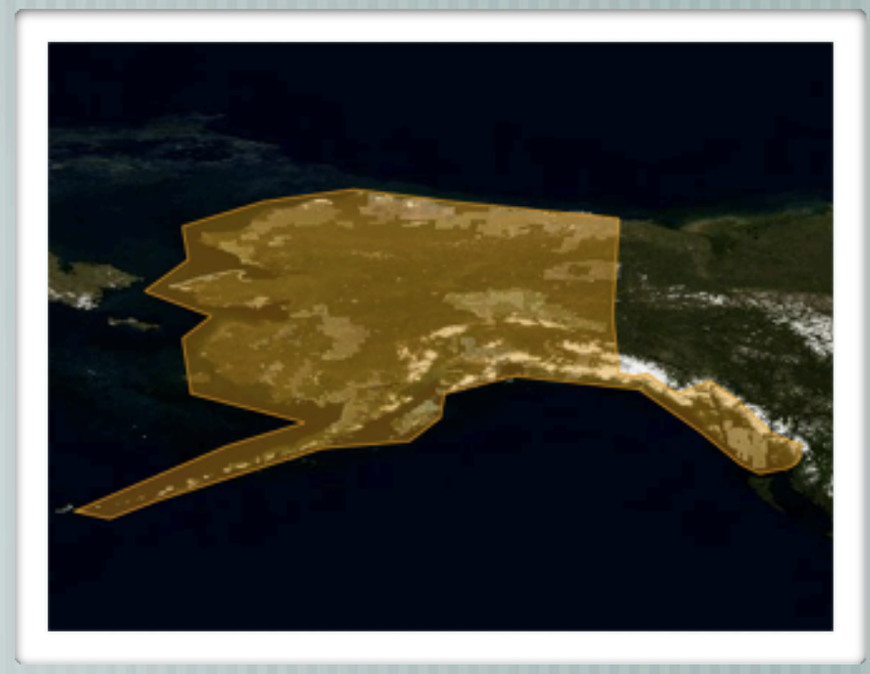






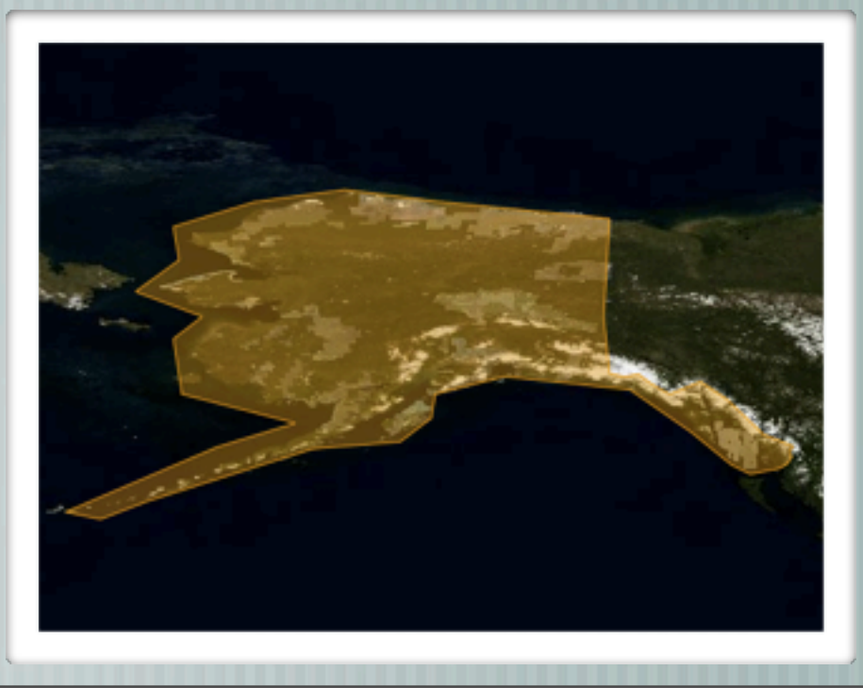
OpenLayers Defaults

- Projection: EPSG:4326
- Extent: (-180, -90, 180, 90)
- Units: degrees
- Max Resolution: 1.40625 deg/px



Web Mercator

- Projection: EPSG:3857
- Extent: (-20037508, -20037508, 20037508, 20037508)
- Units: meters
- Max Resolution: 156543.0339 m/px



Alaskan Albers

- Projection: EPSG:3338
- Extent: (-3500000, -3500000, 3500000, 3500000)
- Units: meters
- Max Resolution: 27343.75 m/px
- Note: Requires Proj4JS

North Pole LAEA: Alaska

- Projection: EPSG:3572
- Extent: (-12742200.0, -7295308.34278405, 7295308.34278405, 12742200.0)
- Units: meters
- Max Resolution: 78271.516964 m/px
- Note: Requires Proj4JS

OpenLayers Example

```
<!DOCTYPE html>
<html>
  <head>
    <title>AKSMC - 2012</title>
    <link rel="stylesheet" href="/application.css" type="text/css">
    <script src="OpenLayers-2.11/OpenLayers.js" type="text/javascript"></script>
    <script src="gina-map-layers/gina-openlayers.js" type="text/javascript"></script>
    <script type="text/javascript">
      var map;
      function initialize() {
        map = new OpenLayers.Map("map");
        Gina.Layers.inject(map, 'TILE.EPSG:3857.BDL');
        map.addControl(new OpenLayers.Control.LayerSwitcher());
        map.zoomToMaxExtent();
      }
    </script>
  </head>
  <body onload="initialize()">
    <div id="page">
      <h1>OpenLayers Example</h1>
      <div id="map"></div>
    </div>
  </body>
</html>
```

Web Mercator - EPSG:3857

```
map = new OpenLayers.Map("map", {
  projection: 'EPSG:3857',
  maxExtent: new OpenLayers.Bounds(-20037508, -20037508, 20037508, 20037508),
  maxResolution: 156543.0339, /* (20037508.0*2/256) */
  units: 'm'
});
Gina.Layers.inject(map, 'TILE.EPSG:3857.BDL');
map.addControl(new OpenLayers.Control.LayerSwitcher());
map.zoomToMaxExtent();
```

Alaskan Albers - EPSG:3338

```
map = new OpenLayers.Map("map", {
  projection: "EPSG:3338",
  maxExtent: new OpenLayers.Bounds(-3500000, -3500000, 3500000, 3500000),
  maxResolution: 27343.75, /* (3500000 * 2.0 / 256.0) */
  units: 'm'
});
Gina.Layers.inject(map, 'TILE.EPSG:3338.*');
map.addControl(new OpenLayers.Control.LayerSwitcher());
map.zoomToMaxExtent();
```

NP LAEA - EPSG:3572

```
map = new OpenLayers.Map("map", {
  projection: "EPSG:3572",
  maxExtent: new OpenLayers.Bounds(-12742200.0, -7295308.34278405,
34278405, 12742200.0),
  maxResolution: 78271.516964, /* (7295308.34278405-12742200.0) / 256.0) */
  units: 'm'
});
Gina.Layers.inject(map, 'TILE.EPSG:3572.*');
map.addControl(new OpenLayers.Control.LayerSwitcher());
map.zoomToMaxExtent();
```

Proj4js

"Proj4js is a JavaScript library to transform point coordinates from one coordinate system to another, including datum transformations."

Proj4js

- Doesn't require any external tools or programs
- Can automatically download projection definitions from http://spatialreference.org
- OpenLayers requires no configuration to use.

```
<script src="proj4js/lib/proj4js-compressed.js" type="text/javascript"></script>
<script src="OpenLayers-2.11/OpenLayers.js" type="text/javascript"></script>
<script src="gina-map-layers/gina-openlayers.js" type="text/javascript"></script>
<script type="text/javascript">
  Proj4js.defs["EPSG:3857"] = "+proj=merc +lon_0=0 +k=1 +x_0=0 +y_0=0 +a=6378137 +b=6378137
+towgs84=0,0,0,0,0,0,0 +units=m +no_defs";
  Proj4js.defs["EPSG:3572"] = "+proj=laea +lat_0=90 +lon_0=-150 +x_0=0 +y_0=0 +ellps=WGS84
+datum=WGS84 +units=m +no_defs";
  Proj4js.defs["EPSG:3338"] = "+proj=aea +lat_1=55 +lat_2=65 +lat_0=50 +lon_0=-154 +x_0=0
+y_0=0 +ellps=GRS80 +datum=NAD83 +units=m +no_defs";

  var map;
  function initialize() {
    map = new OpenLayers.Map("map", {
      projection: "EPSG:3338",
      maxExtent: new OpenLayers.Bounds(-3500000, -3500000, 3500000, 3500000),
      maxResolution: 27343.75, /* (3500000 * 2.0 / 256.0) */
      units: 'm'
    });
    Gina.Layers.inject(map, 'TILE.EPSG:3338.*');
    map.addControl(new OpenLayers.Control.LayerSwitcher());
    map.zoomToMaxExtent();
  }
</script>
```

```
<script src="proj4js/lib/proj4js-compressed.js" type="text/javascript"></script>
<script src="OpenLayers-2.12/OpenLayers.js" type="text/javascript"></script>
<script src="gina-map-layers/gina-openlayers.js" type="text/javascript"></script>
<script type="text/javascript">
  Proj4js.defs["EPSG:3857"] = "+proj=merc +lon_0=0 +k=1 +x_0=0 +y_0=0 +a=6378137 +b=6378137
+towgs84=0,0,0,0,0,0,0 +units=m +no_defs";
  Proj4js.defs["EPSG:3572"] = "+proj=laea +lat_0=90 +lon_0=-150 +x_0=0 +y_0=0 +ellps=WGS84
+datum=WGS84 +units=m +no_defs";
  Proj4js.defs["EPSG:3338"] = "+proj=aea +lat_1=55 +lat_2=65 +lat_0=50 +lon_0=-154 +x_0=0
+y_0=0 +ellps=GRS80 +datum=NAD83 +units=m +no_defs";

  var map;
  function initialize() {
    map = new OpenLayers.Map("map", {
      projection: "EPSG:3338",
      maxExtent: new OpenLayers.Bounds(-3500000, -3500000, 3500000, 3500000),
      maxResolution: 27343.75, /* (3500000 * 2.0 / 256.0) */
      units: 'm'
    });
    Gina.Layers.inject(map, 'TILE.EPSG:3338.*');
    map.addControl(new OpenLayers.Control.LayerSwitcher());
    map.zoomToMaxExtent();
  }
</script>
```

```
<script src="proj4js/lib/proj4js-compressed.js" type="text/javascript"></script>
<script src="OpenLayers-2.11/OpenLayers.js" type="text/javascript"></script>
<script src="gina-map-layers/gina-openlayers.js" type="text/javascript"></script>
<script type="text/javascript">
  Proj4js.defs["EPSG:3857"] = "+proj=merc +lon_0=0 +k=1 +x_0=0 +y_0=0 +a=6378137 +b=6378137
+towgs84=0,0,0,0,0,0,0 +units=m +no_defs";
  Proj4js.defs["EPSG:3572"] = "+proj=laea +lat_0=90 +lon_0=-150 +x_0=0 +y_0=0 +ellps=WGS84
+datum=WGS84 +units=m +no_defs";
  Proj4js.defs["EPSG:3338"] = "+proj=aea +lat_1=55 +lat_2=65 +lat_0=50 +lon_0=-154 +x_0=0
+y_0=0 +ellps=GRS80 +datum=NAD83 +units=m +no_defs";

  var map;
  function initialize() {
    map = new OpenLayers.Map("map", {
      projection: "EPSG:3338",
      maxExtent: new OpenLayers.Bounds(-3500000, -3500000, 3500000, 3500000),
      maxResolution: 27343.75, /* (3500000 * 2.0 / 256.0) */
      units: 'm'
    });
    Gina.Layers.inject(map, 'TILE.EPSG:3338.*');
    map.addControl(new OpenLayers.Control.LayerSwitcher());
    map.zoomToMaxExtent();
  }
</script>
```

Spatial Reference

epsg projection 3338 - nad83 / alaska albers

Home | Upload Your Own | List user-contributed references | List all references

Search

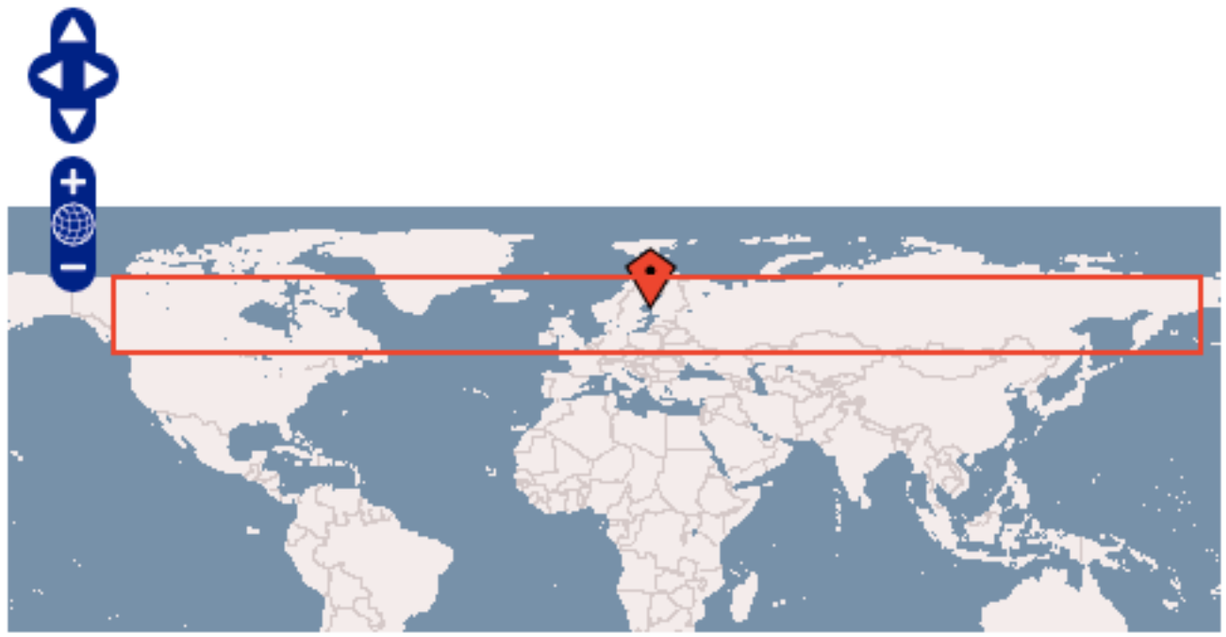
Previous: EPSG:3337: Le Pouce 1934 / Mauritius Grid | Next: EPSG:3339: IGCB 1955 / Congo TM zone 12 Link to this Page

EPSG:3338

NAD83 / Alaska Albers (Google it)

- **WGS84 Bounds**: -129.9900, 51.3500, 172.4000, 71.3500
- **Projected Bounds**: -2255938.4795, 449981.1884, 1646517.6368, 2676986.5642
- **Scope**: Small scale mapping and state planning.
- **Last Revised**: 2006-11-11
- **Area**: USA - Alaska

Input Coordinates: 21.205, 61.35 Output Coordinates: 1708088.321233, 7905538.361715



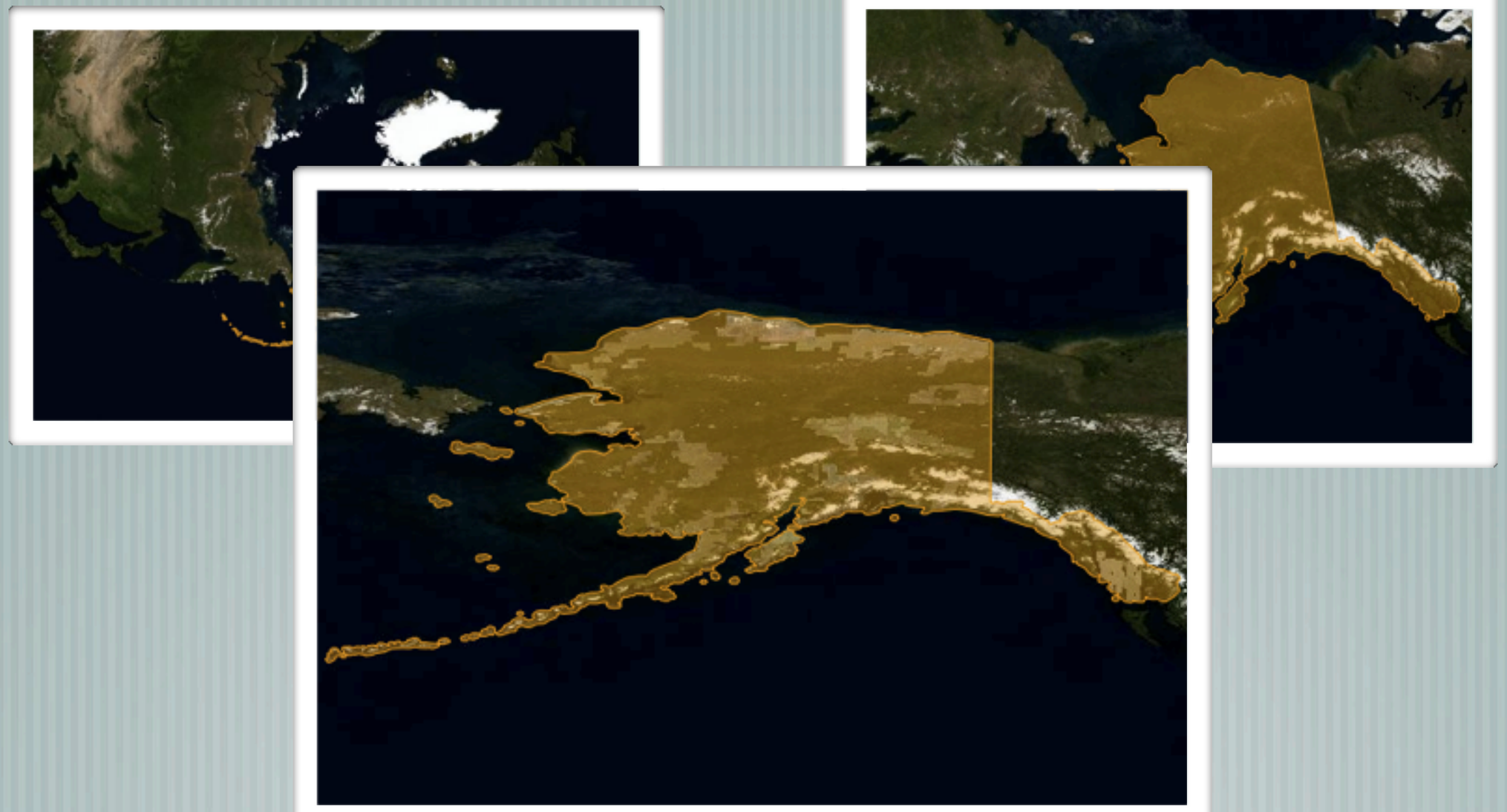
- Well Known Text as HTML
- Human-Readable OGC WKT
- Proj4
- OGC WKT
- JSON
- GML
- ESRI WKT
- .PRJ File
- USGS
- MapServer Mapfile | Python
- Mapnik XML | Python
- GeoServer
- PostGIS spatial_ref_sys INSERT statement
- Proj4js format

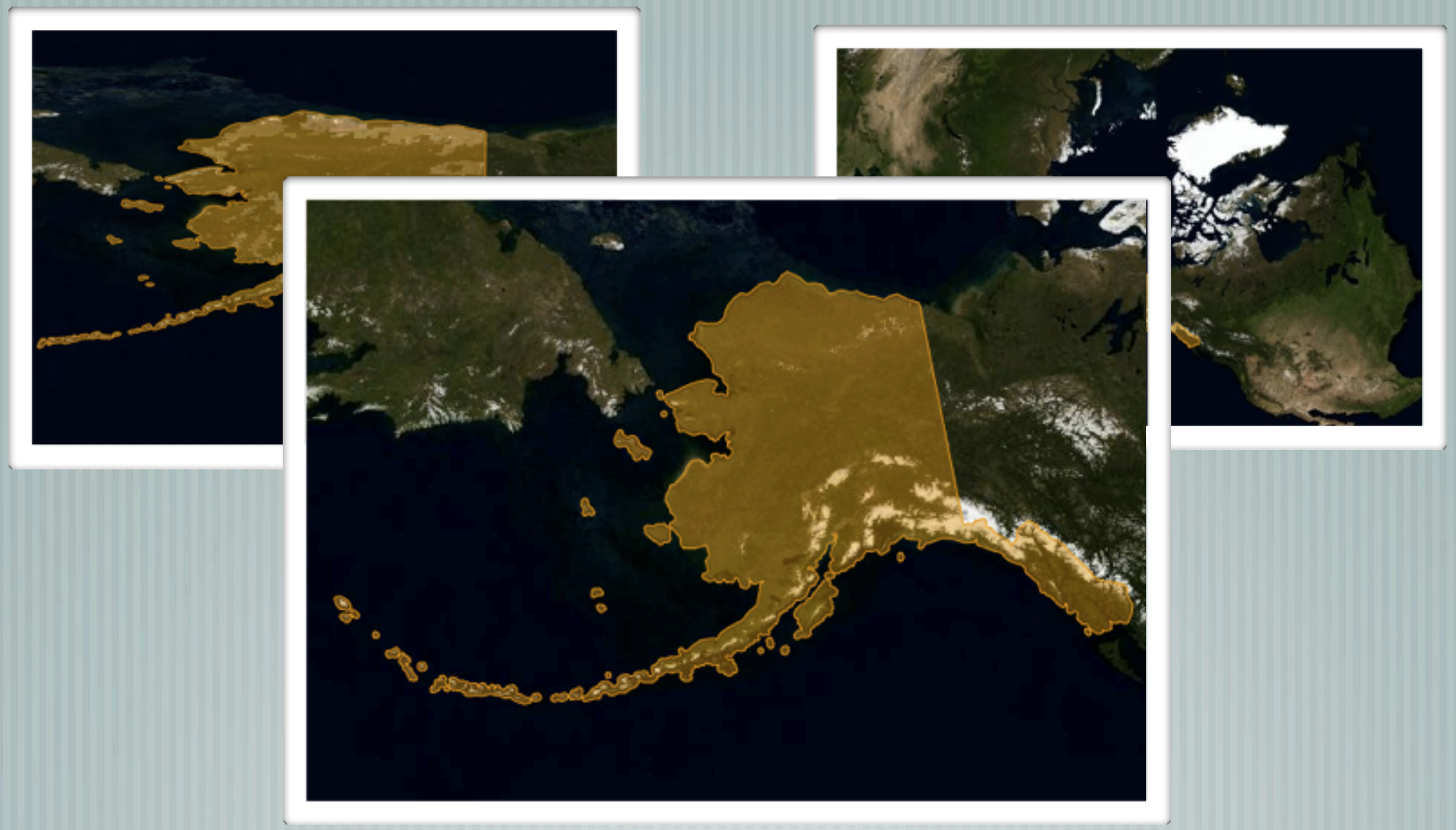
http://spatialreference.org/ref/espg/3338

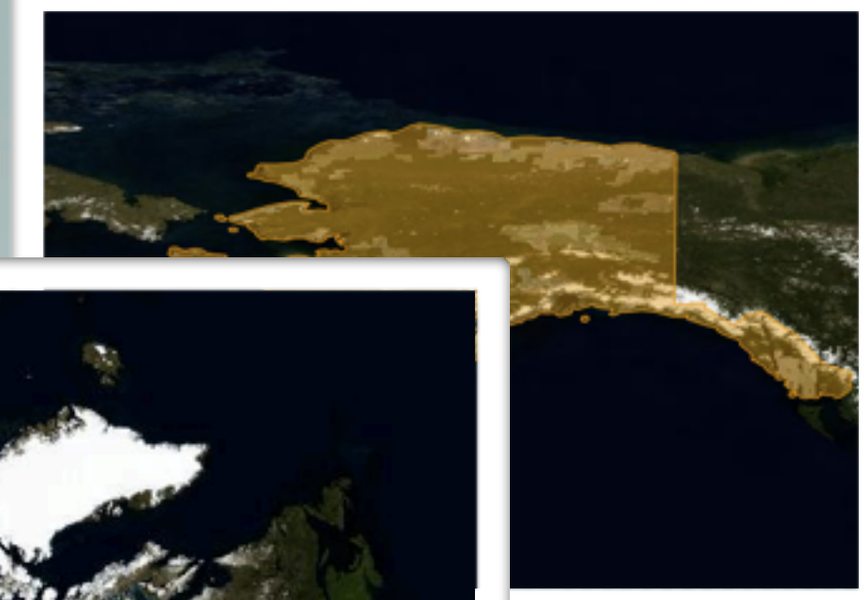
Transforming Features

- On the server
  - ogr2ogr, qgis, etc...
- In the browser
  - Requires proj4js

```
var config = Gina.Projections.get('EPSG:3338');
if(!config) { alert('Unknown projection!'); }

map = new OpenLayers.Map("map", {
  projection: config.projection,
  maxExtent: config.maxExtent,
  maxResolution: config.maxResolution,
  units: config.units
});
Gina.Layers.inject(map, 'WMS.BDL');
map.addControl(new OpenLayers.Control.LayerSwitcher());
map.zoomToMaxExtent();

var vector = new OpenLayers.Layer.Vector('alaska');
map.addLayer(vector);

var wkt = new OpenLayers.Format.WKT();

var ak = wkt.read("POLYGON((-151.5234375 59.1759282492714,-147.3046875...");

var epsg4326 = new OpenLayers.Projection('EPSG:4326');
var epsg3338 = new OpenLayers.Projection('EPSG:3338');
ak.geometry.transform(epsg4326, epsg3338);
vector.addFeatures([ak]);
```







GINA
www.gina.alaska.edu

Will Fisher
will@alaska.edu

Questions?