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Technical Workshops | July 2011

Under the Hood of the Esri Hydro Viewer

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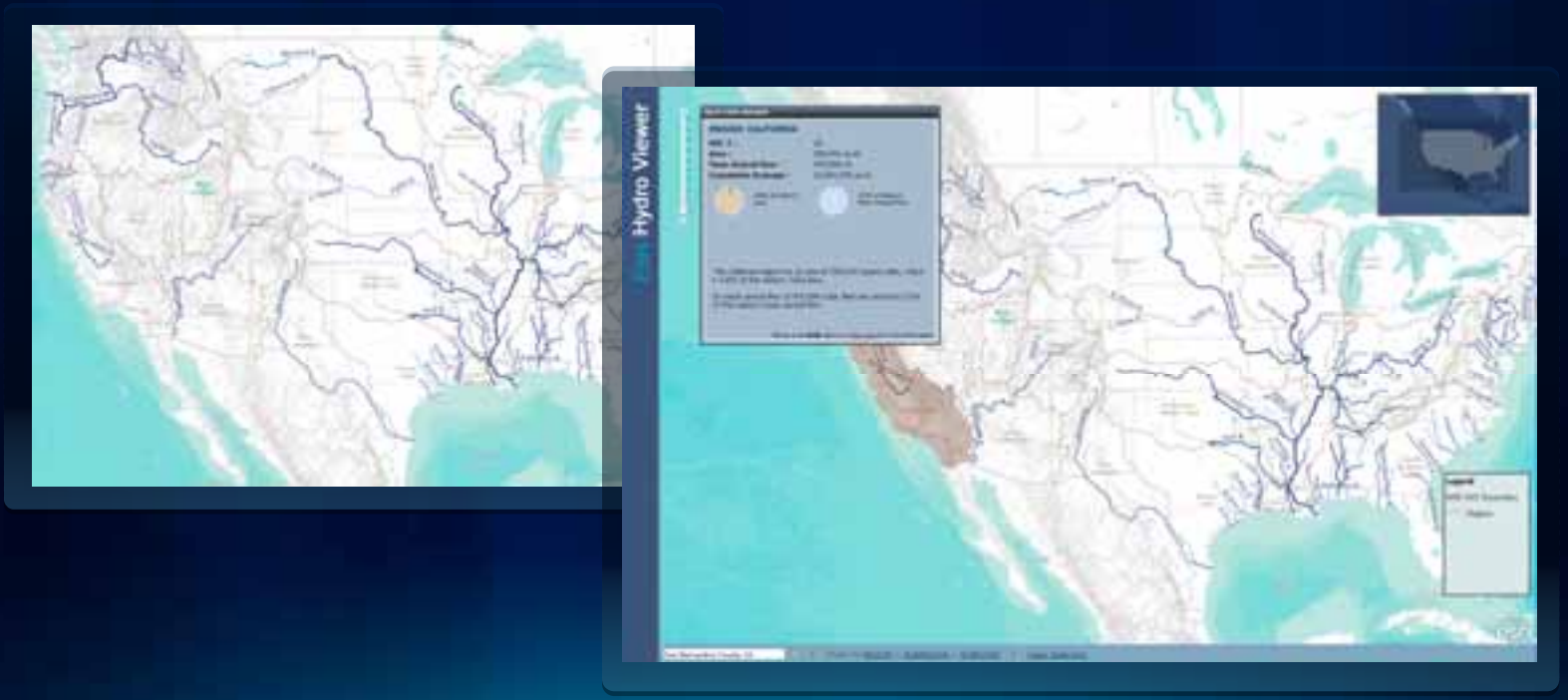
Presentation Outline

- Hydro Basemap: multi-scale web map
  - Value: Reference map
- Web Mapping Application: Hydro Viewer
  - Adds functionality to the map



Hydro Basemap

- Hydro Reference Overlay
  - Hydro-centric reference map built to support operational hydro data layers for medium- and regional-scale analyses.
  - Cached, multi-scale web map
  - Uses NHD and NHDPlus data
  - Reference layer just like the World Topo Map
- World Terrain Base
- Hydro Basemap
  - built with rich and complex NHD dataset

Hydro Basemap

- What is it used for?
  - Reference map for hydro related projects, maps and applications
- How to use it?
  - ArcGIS.com
  - Web Mapping Application

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Hydro Basemap

Hydro Reference Overlay with Terrain Base
Web Map by coscopel (last modified: May 23, 2011)
(0 ratings, 54 views)
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Description

The Hydro Basemap is a multi-scale web map comprised of the Hydro Reference Overlay cached map service and the World Terrain Basemap from ArcGIS Online. The two combine to make the Hydro Basemap of the United States for ~147M to 18K scales.

The Hydro Basemap is a hydrography-centric web map created with the following:

Hydro features:

NHDPlus Flowlines, which contain mean annual flow values,
NHD Hydrographic Units,
NHD Waterbodies,
NHD Areas, and
Dams

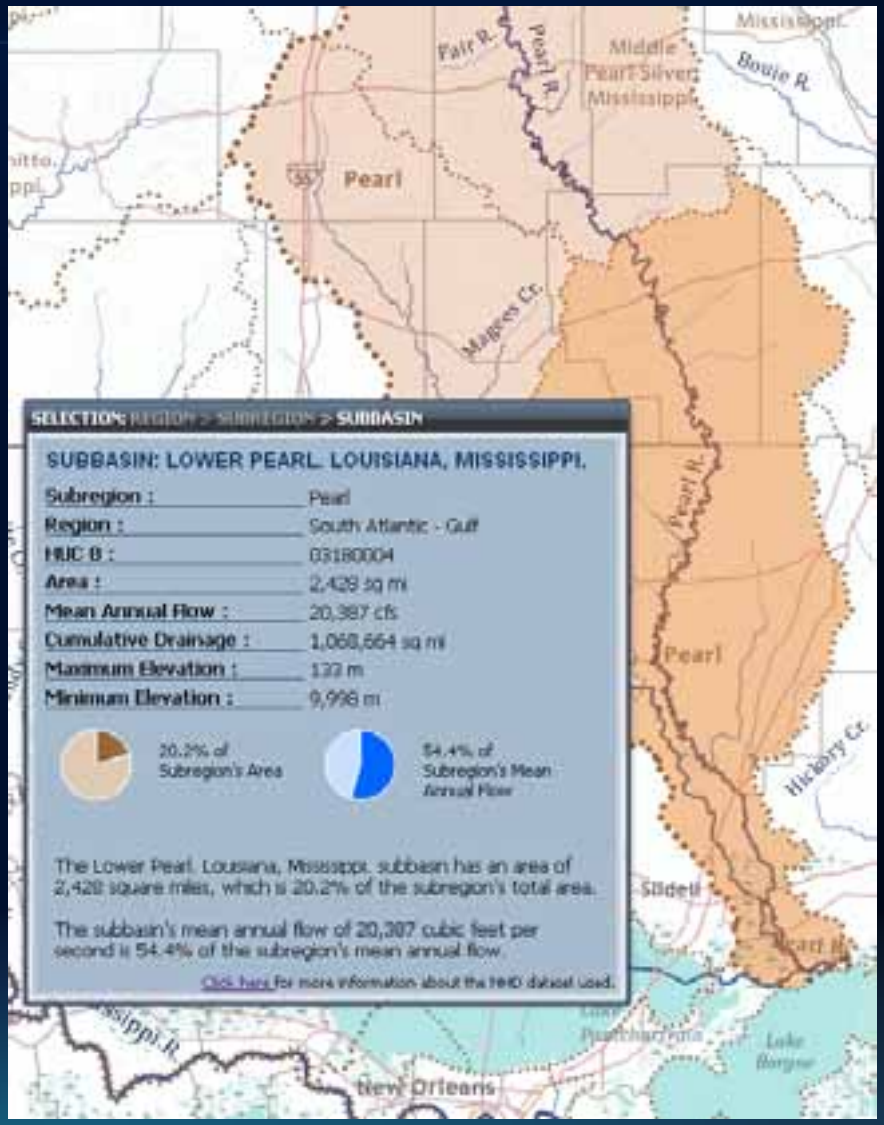
enence features:

TeleAtlas administrative boundaries,
U.S. Census cities,
TeleAtlas streets, and
TeleAtlas airports

map was designed to highlight hydrography in context with less prominent reference ormation.
it as a basemap for online hydro mapping applications OR as a basemap in ArcGIS Desktop jects

Esri Hydro Viewer

- Why create the viewer?
  - Showcase the maps
  - User interaction
  - Easy navigation
  - Visualize the data
  - User interface
- What's the big deal?
  - Adds value to the basemap
  - Turns the map from a static object into an interactive information center
- Demo



Esri Hydro Viewer

- Application architecture
  - Javascript API
  - Dojo, Sencha/ExtJS toolkits
  - Google Charts
- 4 map services
  - Reference
  - Terrain
  - Overview
  - HUC query

Query

Esri Hydro Viewer

- **Widgets**
  - **Overview map**
    - **How to add overview map that is different from base map**


```
var overviewLayer = new esri.layers.ArcGISTiledMapServiceLayer(overviewUrl, {visible:false});
var terrainLayer = new esri.layers.ArcGISTiledMapServiceLayer(terrainUrl);
var referenceLayer = new esri.layers.ArcGISTiledMapServiceLayer(referenceUrl);
```

```
map.addLayers([overviewLayer, terrainLayer, referenceLayer]);
```

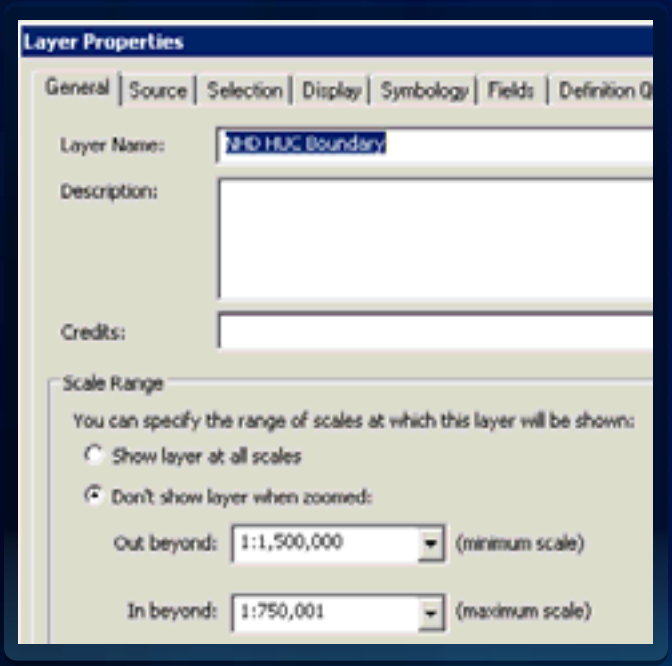
```
dojo.connect(map,'onLayersAddResult',function(results){
overviewMapDijit = new esri.dijit.OverviewMap({ map: map, opacity: 0.2, expandFactor: 0.8 }, dojo.byId("overview-control"));
overviewMapDijit.startup();
});
```

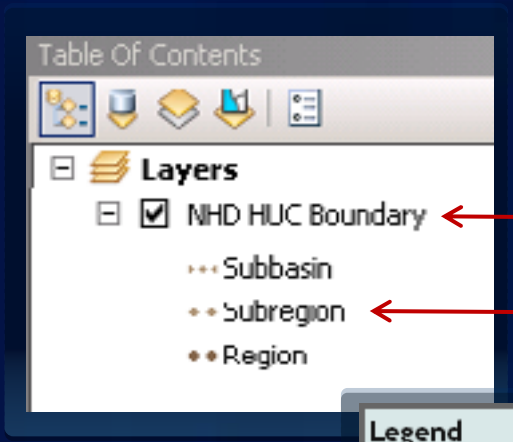
Esri Hydro Viewer

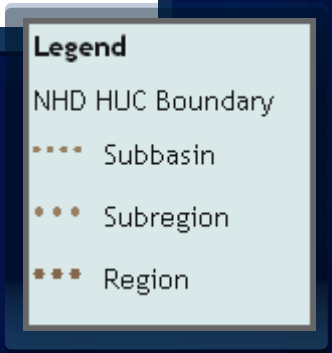
- Widgets
  - Overview map
    - Design
      - Layers
        - Scale dependencies
      - Color Scheme

Esri Hydro Viewer

- Widgets
  - Legend
    - How to format in ArcMap

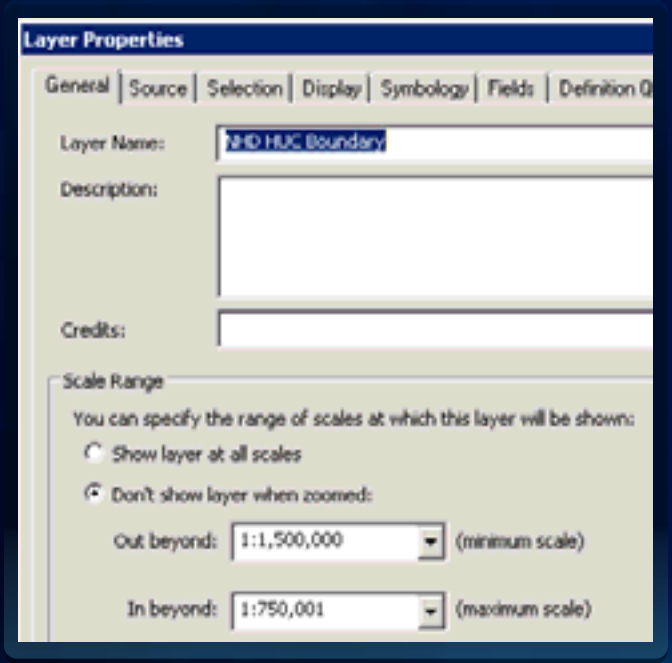


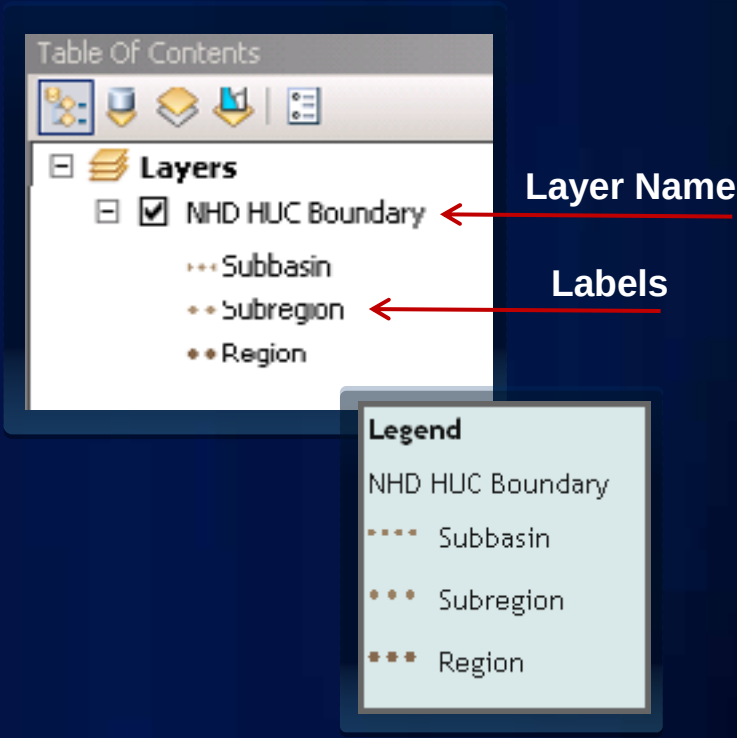




Esri Hydro Viewer

- Widgets
  - Legend
    - How to format in ArcMap

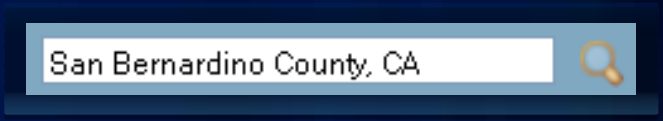


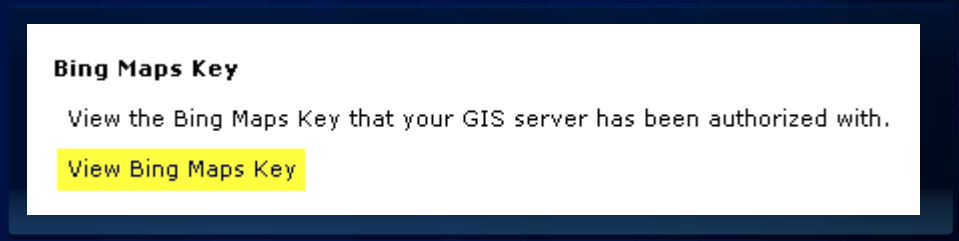



```
var legend = new esri.dijit.Legend({
  map:map,
  layerInfos:[{layer:referenceLayer,title:"Legend"}],
  arrangement:esri.dijit.Legend.ALIGN_LEFT,
},"legendDiv");
legend.startup();
```

Esri Hydro Viewer

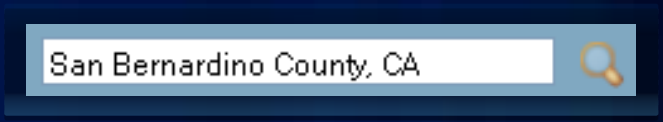
- **Search functionality**
  - **Bing Maps key with ArcGIS Server**





Esri Hydro Viewer

- **Search functionality**
  - **Bing Maps key with ArcGIS Server**




```
veTileLayer = new esri.virtualearth.VETiledLayer({
  bingMapsKey: 'An6SgqsInViLijKakhLhIFdFzEPkluv_HRoW0fqXBekZVdl9bgtoVedIs0vnT6jF',
  mapStyle: esri.virtualearth.VETiledLayer.MAP_STYLE_AERIAL
});
        map.addLayer(veTileLayer);
        veTileLayer.hide();

veGeocoder = new esri.virtualearth.VEGeocoder({
  bingMapsKey:'An6SgqsInViLijKakhLhIFdFzEPkluv_HRoW0fqXBekZVdl9bgtoVedIs0vnT6jF'
});
```

Esri Hydro Viewer

- Map interaction
  - Navigate scale levels
  - Click for unit report
    - Information in static window, not InfoWindow
  - Highlight selected unit AND larger unit

Esri Hydro Viewer

- **Map interaction**
  - **Query by attribute, not by spatial relationship**

Click on map
-Execute Query 1
-Highlight unit

End of Query 1
-Execute Query 2
- Highlight larger unit

Esri Hydro Viewer

- **Map interaction**
  - **Query by attribute, not by spatial relationship**

```
showLargerArea(attr.BasinName, 'subregion');
```

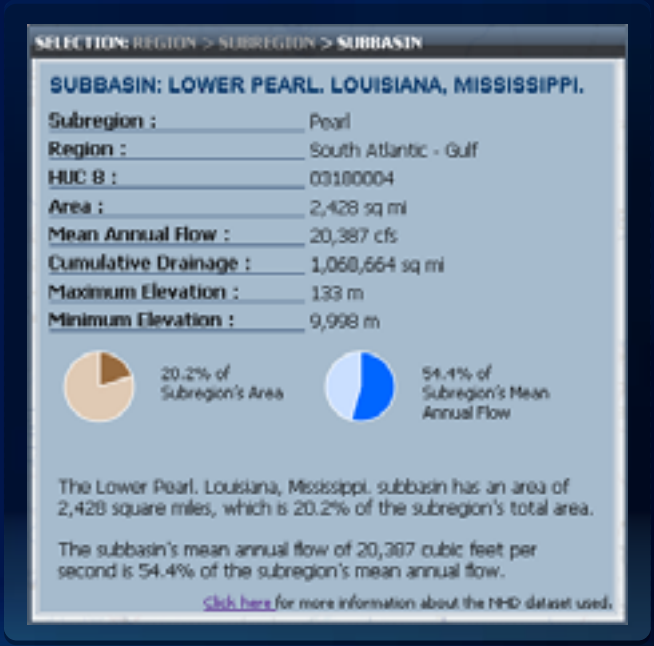
```
function showLargerArea(area, areaType) {

  if (areaType=='region') {
  queryTask2 = new esri.tasks.QueryTask("http://hydro_bm.esri.com/ArcGIS/rest/services/Hydro/HUCS_QueryService/MapServer/5");
  query2 = new esri.tasks.Query();
  query2.returnGeometry = true;
  query2.outFields = ["FIRST_RegionName"];
  query2.where = "FIRST_RegionName = " + "'" + area + "'";
  }

  if (areaType=='subregion') {
  queryTask2 = new esri.tasks.QueryTask("http://hydro_bm.esri.com/ArcGIS/rest/services/Hydro/HUCS_QueryService/MapServer/3");
  query2 = new esri.tasks.Query();
  query2.returnGeometry = true;
  query2.outFields = ["FIRST_BasinName"];
  query2.where = "FIRST_BasinName = " + "'" + area + "'";
  }
  queryTask2.execute(query2, function(fset) {
      showFeature2(fset.features[0], areaType);
  });
}
```

Esri Hydro Viewer

- Reporting the data
  - Report tailored to each scale
    - Multi-scale map = Multi-scale data
  - Make numbers meaningful
  - Visualize the information
  - Contextualize the information

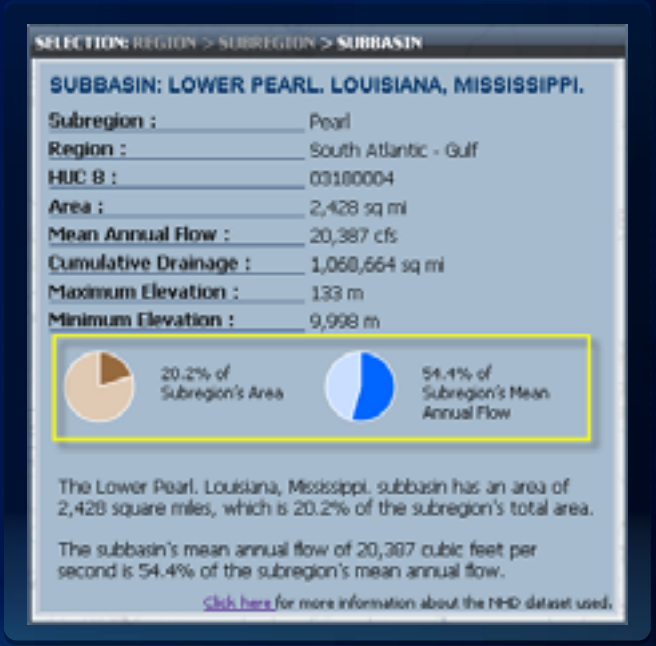


Esri Hydro Viewer

- **Reporting the data**
  - **Google Charts**

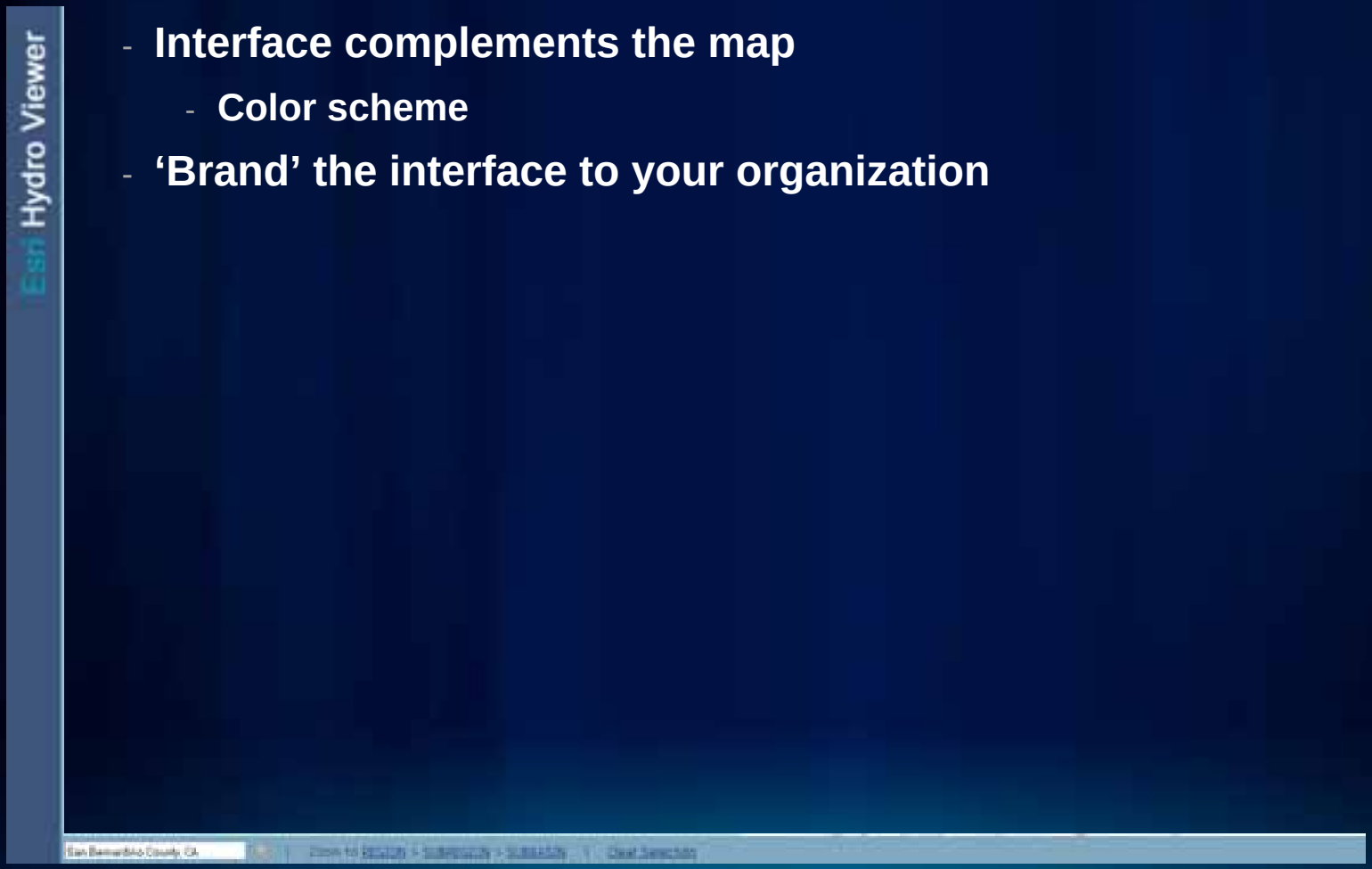
```
var data1 = new google.visualization.DataTable();
data1.addColumn('string', 'Unit');
data1.addColumn('number', '% of Subbasin's Area');
data1.addRows(2);
data1.setValue(0, 0, 'Subbasin');
data1.setValue(0, 1, subbasinArea);
data1.setValue(1, 0, 'Other');
data1.setValue(1, 1, 100-subbasinArea);
```

```
var chart1 = new google.visualization.PieChart(dojo.byId('chart_div1'));
chart1.draw(data1, {backgroundColor: '#A6BBCD', width: 75, height: 75,
chartArea:{left:10,top:10}, pieSliceText:'none', colors:['#976A3E','#E0CAB4'],
legend:'none', fontSize: 9});
```



Esri Hydro Viewer

- Packaging the app
  - Interface complements the map
    - Color scheme
  - ‘Brand’ the interface to your organization



Where to find the Hydro Viewer

- ArcGIS.com
- Hydro Resource Center – Map/App Gallery
- ArcGIS Javascript API Gallery

- Template

Thanks for attending!

Resources:

- **Mapping Center**
  - http://mappingcenter.esri.com
- **Hydro Resource Center**
  - http://resources.esri.com/hydro/
- **ArcGIS Javascript API Resource Center**
  - http://help.arcgis.com/en/webapi/javascript/arcgis/
- **Hydro Viewer Application**
  - http://hydro_bm.esri.com/HydroViewer/HydroViewer.html