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

```javascript
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();
});
```
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- Widgets
  - Overview map
    - Design
      - Layers
        - Scale dependencies
      - Color Scheme
Esri Hydro Viewer

- Widgets
  - Legend
    - How to format in ArcMap

Layer Name
Labels
Legend
NHD HUC Boundary
- Subbasin
- Subregion
- Region
Esri Hydro Viewer

- Widgets
  - Legend
  - How to format in ArcMap

```javascript
var legend = new esri.djit.Legend({
  map: map,
  layerInfos: [{layer: referenceLayer, title: "Legend"}],
  arrangement: esri.djit.Legend.ALIGN_LEFT,
}, "legendDiv");
legend.startup();
```
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- Search functionality
  - Bing Maps key with ArcGIS Server
Esri Hydro Viewer

- Search functionality
  - Bing Maps key with ArcGIS Server

```javascript
veTileLayer = new esri.virtualearth.VETileLayer({
  bingMapsKey: 'An6SgqsInViLijKakhhLhfPzEPkluv_HRoW0fqXBeKZVd19bgtoVedIs0vnT6jF',
  mapStyle: esri.virtualearth.VETileLayer.MAP_STYLE_AERIAL
});
map.addLayer(veTileLayer);
veTileLayer.hide();

veGeocoder = new esri.virtualearth.VEGeocoder({
  bingMapsKey: 'An6SgqsInViLijKakhhLhfPzEPkluv_HRoW0fqXBeKZVd19bgtoVedIs0vnT6jF'
});
```
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

```javascript
function showLargerArea(area, areaType) {

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

  if (areaType=='subregion') {
    queryTask2 = new esri.tasks.QueryTask("http://hydro_bm.esri.com/arcGIS/rest/services/Hydro/HUCS_QueryService/WspServer/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

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

var chart1 = new google.visualization.PieChart(document.getElementById('chart_div1'));
chart1.draw(dataTable, {backgroundColor: '#A6BCD', 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
- Hydro Viewer Application
  - http://hydro_bm.esri.com/HydroViewer/HydroViewer.html