

# **TRAINING GUIDE II**

# Establishing Web GIS Portal

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# Establishing Web GIS Portal

## Outline

1. Automatic Generation of WMS
2. Review: HTML document structure , Google Maps and OpenLayers API
3. Dynamic WMS layers integration using javascript and AJAX
4. Base maps and overlays manipulation using javascript
5. SQL formulation and online database queries
6. Query results handling

# Automatic Generation of WMS

URL: [http://ccop-geoinfo.org/utility\\_training/training\\_wms\\_generator.html](http://ccop-geoinfo.org/utility_training/training_wms_generator.html)

The screenshot shows a web form titled "WMS Service Formulation Form". It contains several input fields and dropdown menus for configuring a WMS service. The fields are: "Your Group Name" (Group 1), "Data Type" (Polygon), "Image File Name" (image filename), "Image Dimensions" (width,height), "Image Extent" (minLong,minLat,maxLong,MaxLat), "Database" (JICA\_DB1), "Database Table Name" (cambodia\_geology\_table), "Class Item Column" (area), "Description Column" (area), and "Legend Color Assignment" (Automatic). Below these is a section for "Table Columns for Red, Green and Blue" with three dropdown menus set to "NA". There is also an "Available Legend Tables" dropdown and a "Legend Table Name" field set to "jica\_db1\_cambodia\_geology\_table". Two buttons, "Create and Show Legend" and "Load and Show Legend", are present. A section titled "Testing the Generated WMS" contains three buttons: "GetCapabilities", "GetMap/Preview Map", and "Download Map". Below this, the "Service Title" is "Cambodia Geological map" and the "WMS URL" is "http://10.4.153.24/cgi-bin/wms/group/training\_ithm\_group". The WMS URL is circled in red. At the bottom are "REGISTER WMS" and "CLOSE" buttons.

WMS URL



# HTML Document

## OpenLayers API

### Google API

```
<html>
<head>
<title>Integrating GeoSpatial Information Using AJAX</title>
<meta http-equiv="Content-Type" content="text/html; charset=Shift_JIS">
<style type="text/css"> #map { width: 100%; height: 100%; border: 1px solid gray; } </style>

<script src="http://openlayers.org/api/2.10/OpenLayers.js"></script>
<script src="http://maps.google.com/maps/api/js?v=3.2&sensor=false"></script>

</head>
<body>
<div id="map" style="position:absolute; top:0px;left:0px;"></div>
</body>
</html>
```

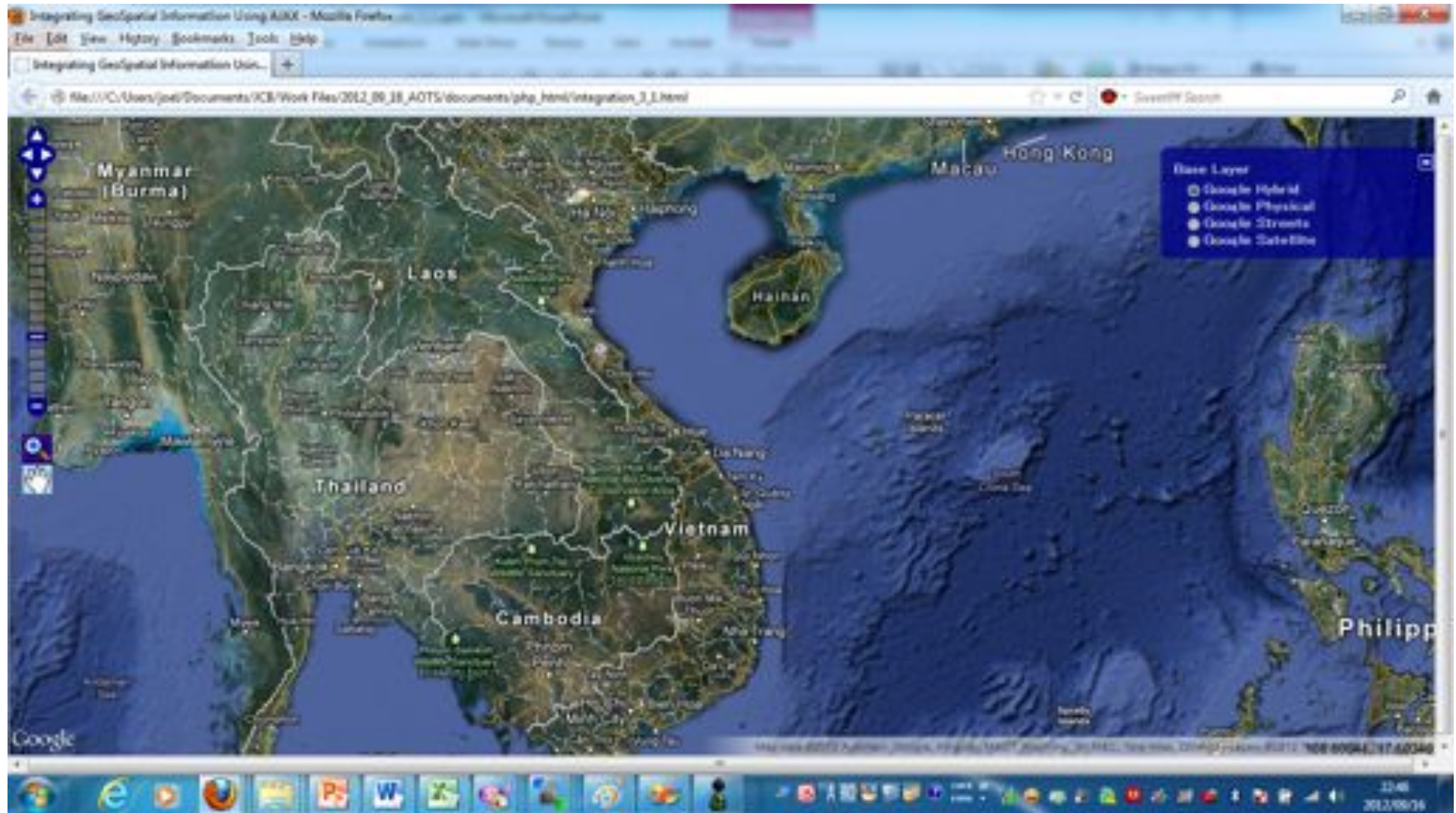
```
<title>Integrating GeoSpatial Information Using AJAX</title>
<meta http-equiv="Content-Type" content="text/html; charset=Shift_JIS">
<style type="text/css"> #map { width: 100%; height: 100%; border: 1px solid gray; } </style>
<script src="http://openlayers.org/api/2.10/OpenLayers.js"></script>
<script src="http://maps.google.com/maps/api/js?v=3.2&sensor=false"></script>
<script type="text/javascript">
var map;
function init()
{
    var options = {controls: [], projection: "EPSG:900913", units: "m",maxResolution: 156543.0339,
displayProjection: new OpenLayers.Projection("EPSG:4326"),units: "m",
maxExtent: new OpenLayers.Bounds(-20037508, -20037508,20037508, 20037508.34)};

var gphy = new OpenLayers.Layer.Google("Google Physical",{type: google.maps.MapTypeId.TERRAIN});
var gmap = new OpenLayers.Layer.Google("Google Streets",{numZoomLevels: 20});
var ghyb = new OpenLayers.Layer.Google("Google Hybrid",{type: google.maps.MapTypeId.HYBRID,
numZoomLevels: 20});
var gsat = new OpenLayers.Layer.Google("Google Satellite",{type: google.maps.MapTypeId.SATELLITE,
numZoomLevels: 22});
}
</script>
</head>
<body onload="init();">
<div id="map" style="position:absolute; top:0px;left:0px;"></div>
</body>
</html>
```

```
var map;
function init()
{
    var options = {controls: [], projection: "EPSG:900913", units: "m",maxResolution: 156543.0339,
        displayProjection: new OpenLayers.Projection("EPSG:4326"),units: "m",
        maxExtent: new OpenLayers.Bounds(-20037508, -20037508,20037508, 20037508.34)};
    var gphy = new OpenLayers.Layer.Google("Google Physical",{type: google.maps.MapTypeId.TERRAIN});
    var gmap = new OpenLayers.Layer.Google("Google Streets",{numZoomLevels: 20});
    var ghyb = new OpenLayers.Layer.Google("Google Hybrid",{type: google.maps.MapTypeId.HYBRID,
        numZoomLevels: 20});
    var gsat = new OpenLayers.Layer.Google("Google Satellite",{type: google.maps.MapTypeId.SATELLITE,
        numZoomLevels: 22});

    map = new OpenLayers.Map('map', options)
    map.addLayers([ghyb,gphy,gmap,gsat]);
    map.addControl(new OpenLayers.Control.MousePosition());
    map.addControl(new OpenLayers.Control.PanZoomBar({zoomStopHeight:9}));
    map.addControl(new OpenLayers.Control.MouseToolbar());
    map.addControl(new OpenLayers.Control.LayerSwitcher());
    jlonlat = new OpenLayers.LonLat(108.15,15.402).transform(new OpenLayers.Projection("EPSG:4326"), new
    OpenLayers.Projection("EPSG:900913"));
    map.setCenter (jlonlat,6);
}
</script>
</head>
<body onload="init();">
<div id="map" style="position:absolute; top:0px;left:0px;"></div>
</body>
</html>
```

# Client Ready for Integrating WMS Maps





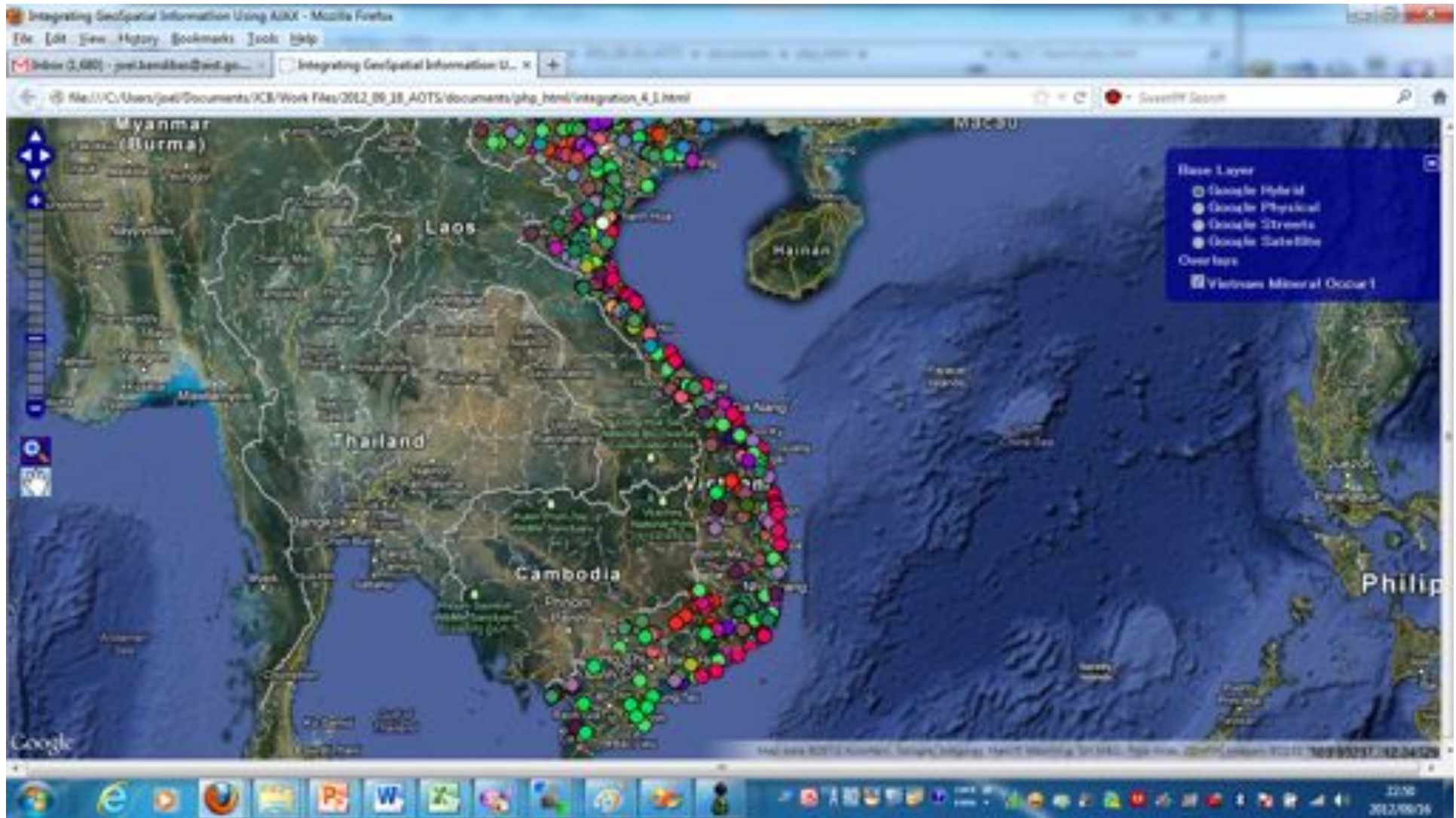
# Static Client

```
var map;
function init()
{
    var options = {controls: [], projection: "EPSG:900913", units: "m",maxResolution: 156543.0339,
        displayProjection: new OpenLayers.Projection("EPSG:4326"),units: "m",
        maxExtent: new OpenLayers.Bounds(-20037508, -20037508,20037508, 20037508.34)};
    var gphy = new OpenLayers.Layer.Google("Google Physical",{type: google.maps.MapTypeId.TERRAIN});
    var gmap = new OpenLayers.Layer.Google("Google Streets",{numZoomLevels: 20});
    var ghyb = new OpenLayers.Layer.Google("Google Hybrid",{type: google.maps.MapTypeId.HYBRID,
        numZoomLevels: 20});
    var gsat = new OpenLayers.Layer.Google("Google Satellite",{type: google.maps.MapTypeId.SATELLITE,
        numZoomLevels: 22});

    var wms1=new OpenLayers.Layer.WMS("Vietnam Mineral Occur1","http://192.168.0.3/cgi-bin
/minerals_wms/vietnam_mineral_occur1_wms",{layers: "vietnam_mineral_occur1",
transparent:"true",format: 'image/gif',{isBaseLayer:false, reproject:false,
opacity:1,'wrapDateLine': true}});

    map = new OpenLayers.Map('map', options)
    map.addLayers([ghyb,gphy,gmap,gsat,wms1]);
    map.addControl(new OpenLayers.Control.MousePosition());
    map.addControl(new OpenLayers.Control.PanZoomBar({zoomStopHeight:9}));
    map.addControl(new OpenLayers.Control.MouseToolbar());
    map.addControl(new OpenLayers.Control.LayerSwitcher());
    jlonlat = new OpenLayers.LonLat(108.15,15.402).transform(new OpenLayers.Projection("EPSG:4326"), new OpenLayers.Projection("EPSG:900913"));
    map.setCenter (jlonlat,6);
}
```

# Static client with one WMS layer



# Establishing Web GIS Portal

## Syntax for WMS Layer Definition in OpenLayers

```
var wms1=new OpenLayers.Layer.WMS("Title of the Layer ", "URL of WMS", {layers:  
"Layer Name", transparent:"true", format: 'image/gif'}, {isBaseLayer:false,  
reproject:false, opacity:1, 'wrapDateLine': true});
```

```
map.addLayers([wms1]);
```

# Dynamically Adding WMS Layer

## Syntax for WMS Layer Definition in OpenLayers

```
var wms1=new OpenLayers.Layer.WMS("Title of the Layer ", "URL of WMS", {layers:
"Layer Name", transparent:"true", format: 'image/gif'}, {isBaseLayer:false,
reproject:false, opacity:1, 'wrapDateLine': true});

map.addLayers([wms1]);
```

## Function for WMS Layer Definition in OpenLayers

```
function add_wms_layer()
{
var wms_url="http://192.168.0.3/cgi-bin/minerals_wms/vietnam_mineral_occur1_wms";
var layer_title="Vietnam Mineral Occurrence";
var layer_name="vietnam_mineral_occur1";

var wms=new OpenLayers.Layer.WMS(layer_title,wms_url, {layers:layer_name,
transparent:"true", format: 'image/gif'}, {isBaseLayer:false, reproject:false, opacity:1,
'wrapDateLine': true});

map.addLayers([wms]);
}
```

# Dynamically Adding WMS Layer Using Form

Values could be set by  
using form

```
function add_wms_layer()
{
  var wms_url="http://192.168.0.3/cgi-bin/minerals_wms/vietnam_mineral_occur1_wms";
  var layer_title="Vietnam Mineral Occurence";
  var layer_name="vietnam_mineral_occur1";

  var wms=new OpenLayers.Layer.WMS(layer_title,wms_url,{layers:layer_name,
  transparent:"true",format: 'image/gif',{isBaseLayer:false, reproject:false,opacity:1,
  'wrapDateLine': true});

  map.addLayers([wms]);
}
```

```

<body onload="init();">
<div id="the_form" style="position:absolute;top:0px;left:0px">
    <TABLE id="table_id" align="center" style="border-style:solid;border-color:black;">
        <tr>
        <td colSpan="2" align="center">Adding WMS Layer</td>
        </tr>
        <tr>
            <td align="right">Layer Title:</td>
            <td><input type="text" id="layer_title"></td>
        </tr>
        <tr>
            <td align="right">WSM URL</td>
            <td><input type="text" id="wms_url"></td>
        </tr>
        <tr>
            <td align="right">Layer Name</td>
            <td><input type="text" id="layer_name"></td>
        </tr>
        <tr>
            <td colSpan="2" align="center"><input type="button" value="Add Layer"
onclick="add_wms_layer();"></td>
        </tr>
    </TABLE>
</div>
<div id="map" style="position:absolute; top:0px;left:250px;"></div>

```

## Form for adding WMS Layer

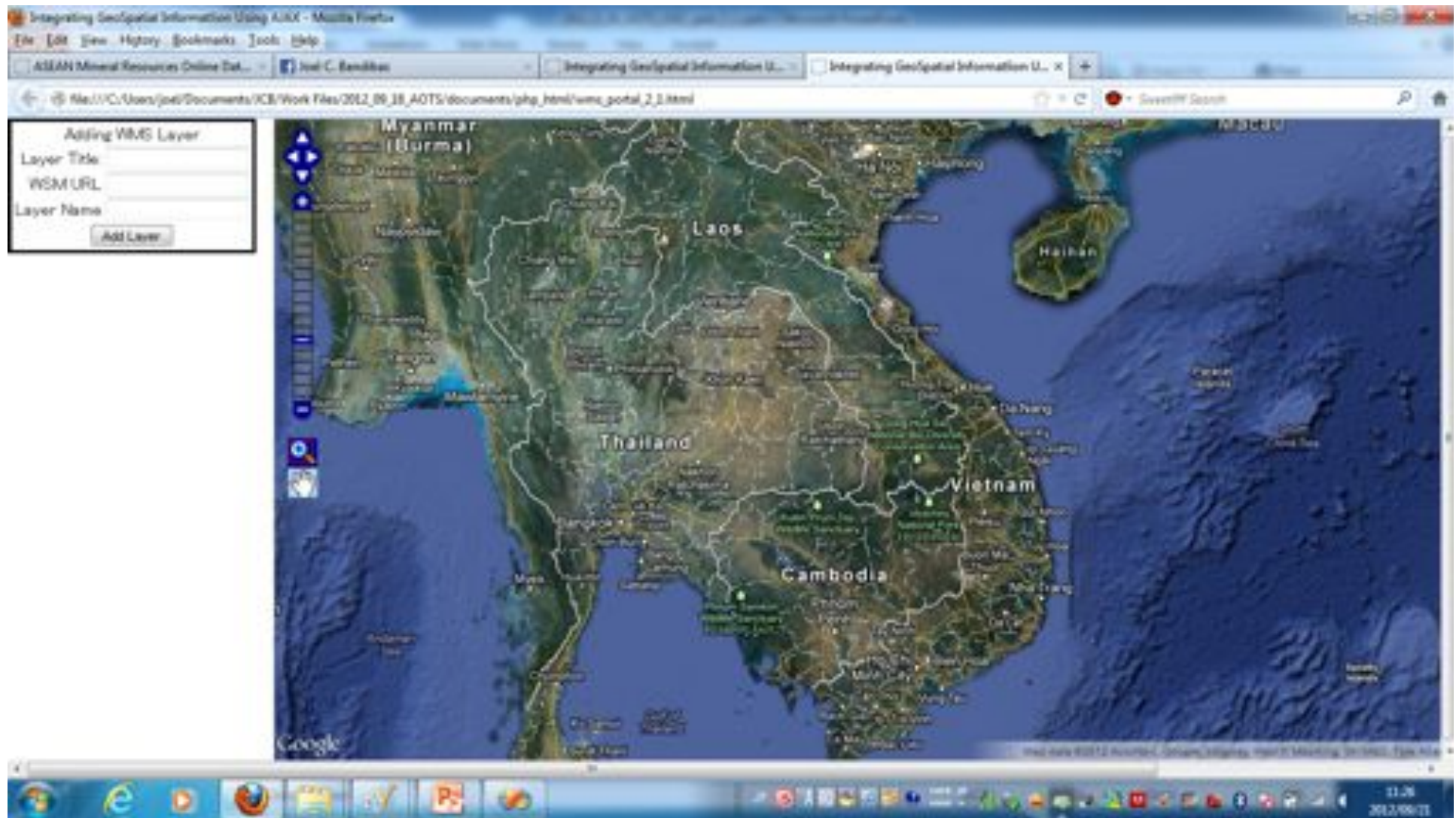
# Function for adding WMS Layer

```
function add_wms_layer()
{
  var wms_url=document.getElementById("wms_url").value
  var layer_title=document.getElementById("layer_title").value;
  var layer_name=document.getElementById("layer_name").value;

  var the_wms=new OpenLayers.Layer.WMS(layer_title,wms_url,
  {layers:layer_name,transparent:"true",format: 'image/gif'},{isBaseLayer:false,
  reproject:false,opacity:1,'wrapDateLine': true});

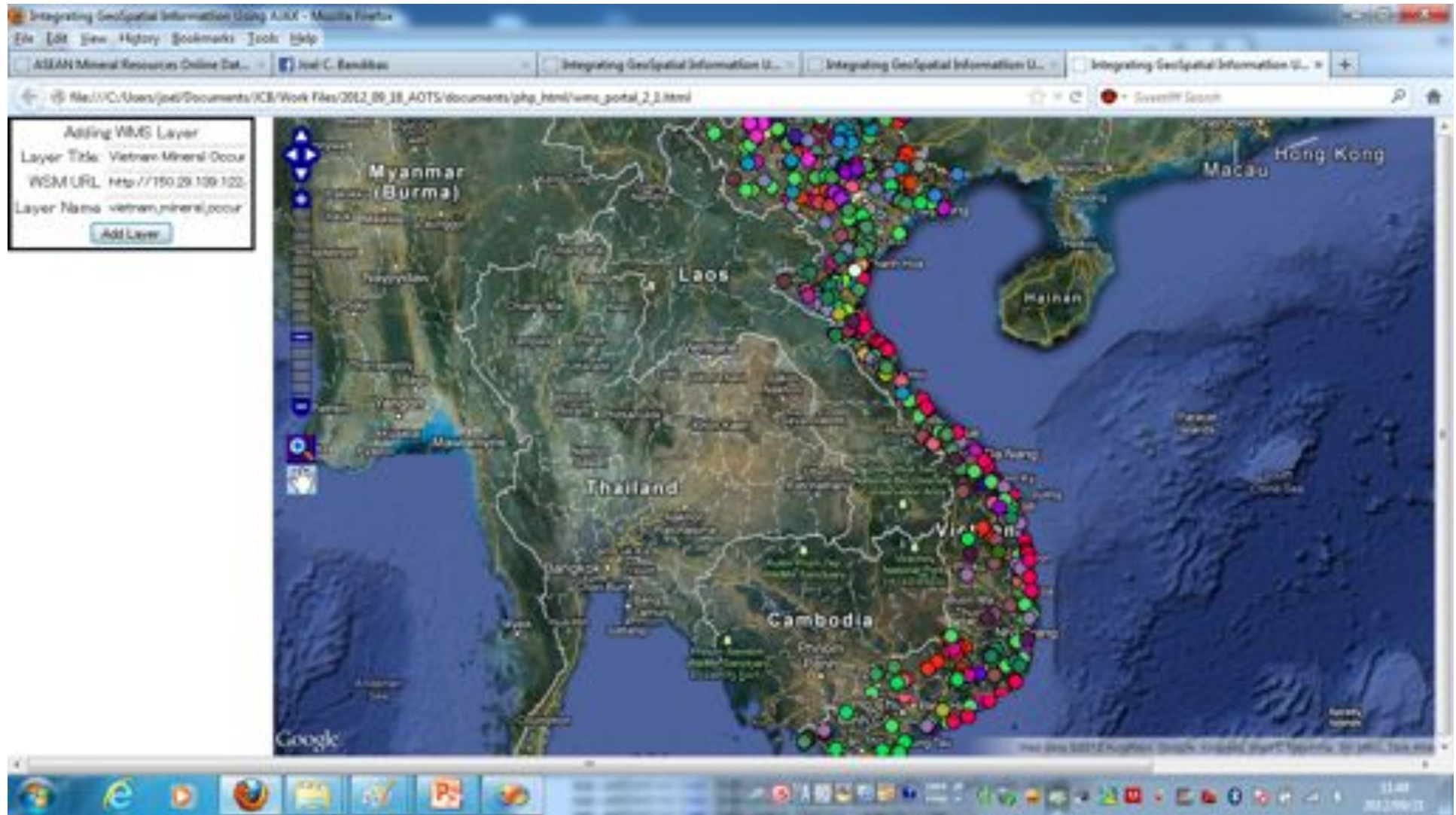
  map.addLayers([the_wms]);
}
```

# Dynamically Adding WMS Layer (Using Form)





# Dynamically Adding WMS Layer (Submitting the Form)



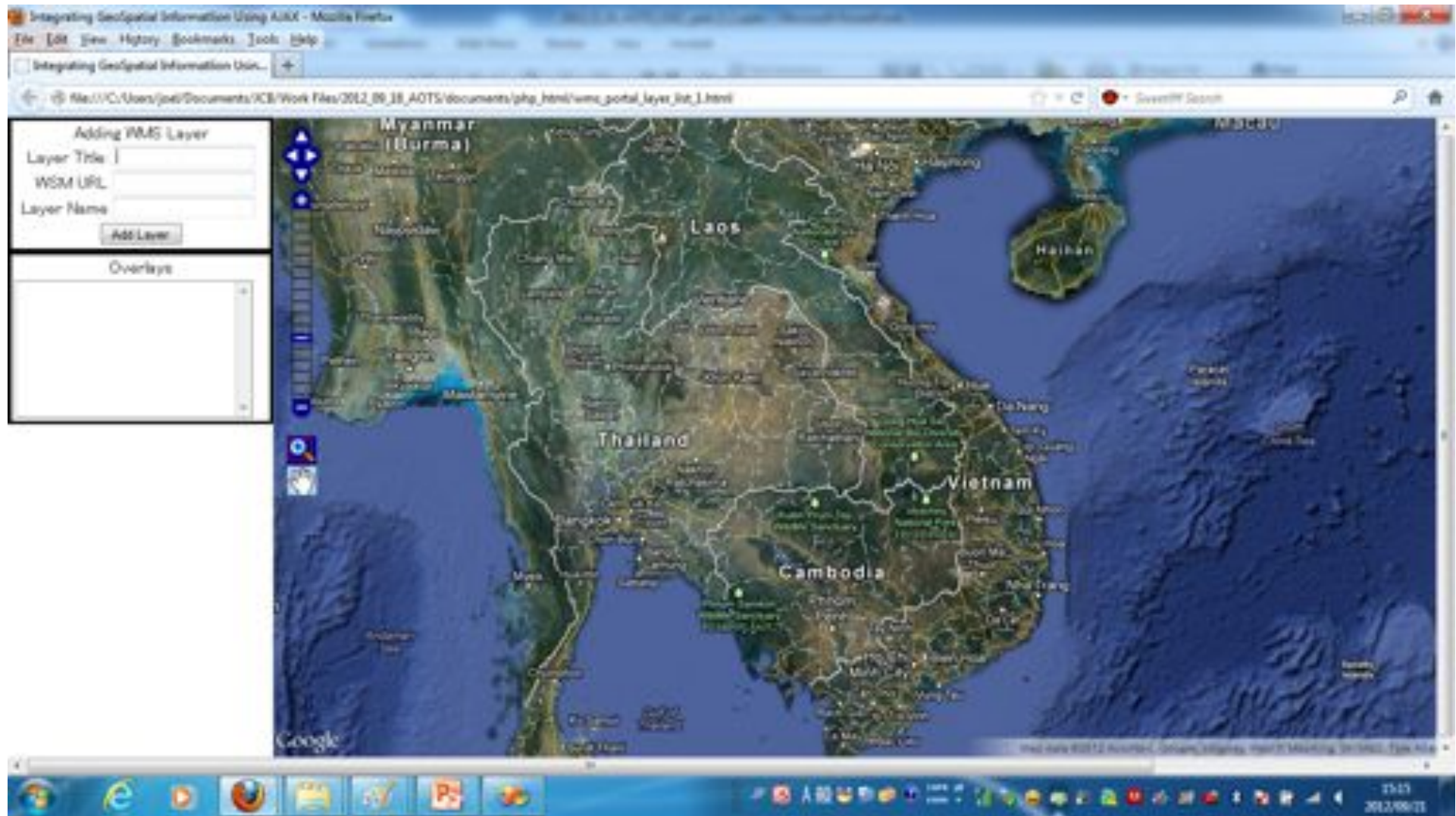
## Adding Layer List Display (HTML Fragment)

```
<TABLE id="layer_list_table" align="center" style="border-  
style:solid;border-color:black;width:250px" >  
  <tr>  
    <td align="center">Overlays</td>  
  </tr>  
  <tr>  
    <td>  
      <select id="layer_list" size="9" style="width:240px">  
        </select>  
    </td>  
  </tr>  
</TABLE>
```

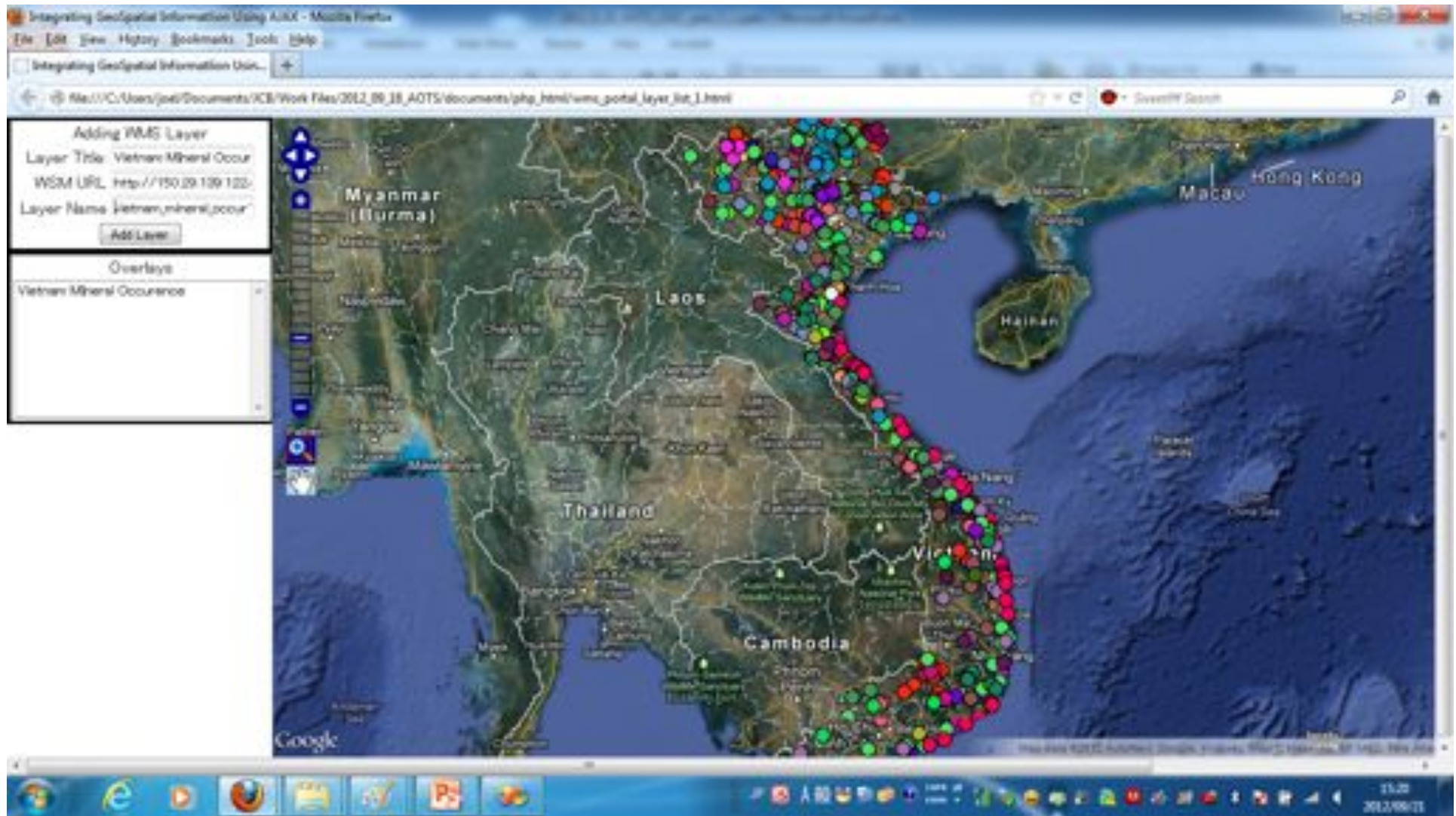
## Adding Layer List Display (Javascript Fragment)

```
function add_to_layer_list()  
{  
    var layer_title=document.getElementById("layer_title").value;  
    var n_overlays=document.getElementById("layer_list").length;  
    document.getElementById("layer_list").options[n_overlays]=new  
Option(layer_title,layer_title);  
}
```

# Adding Layer List Display



# Adding Layer List Display



# Adding Opacity Control

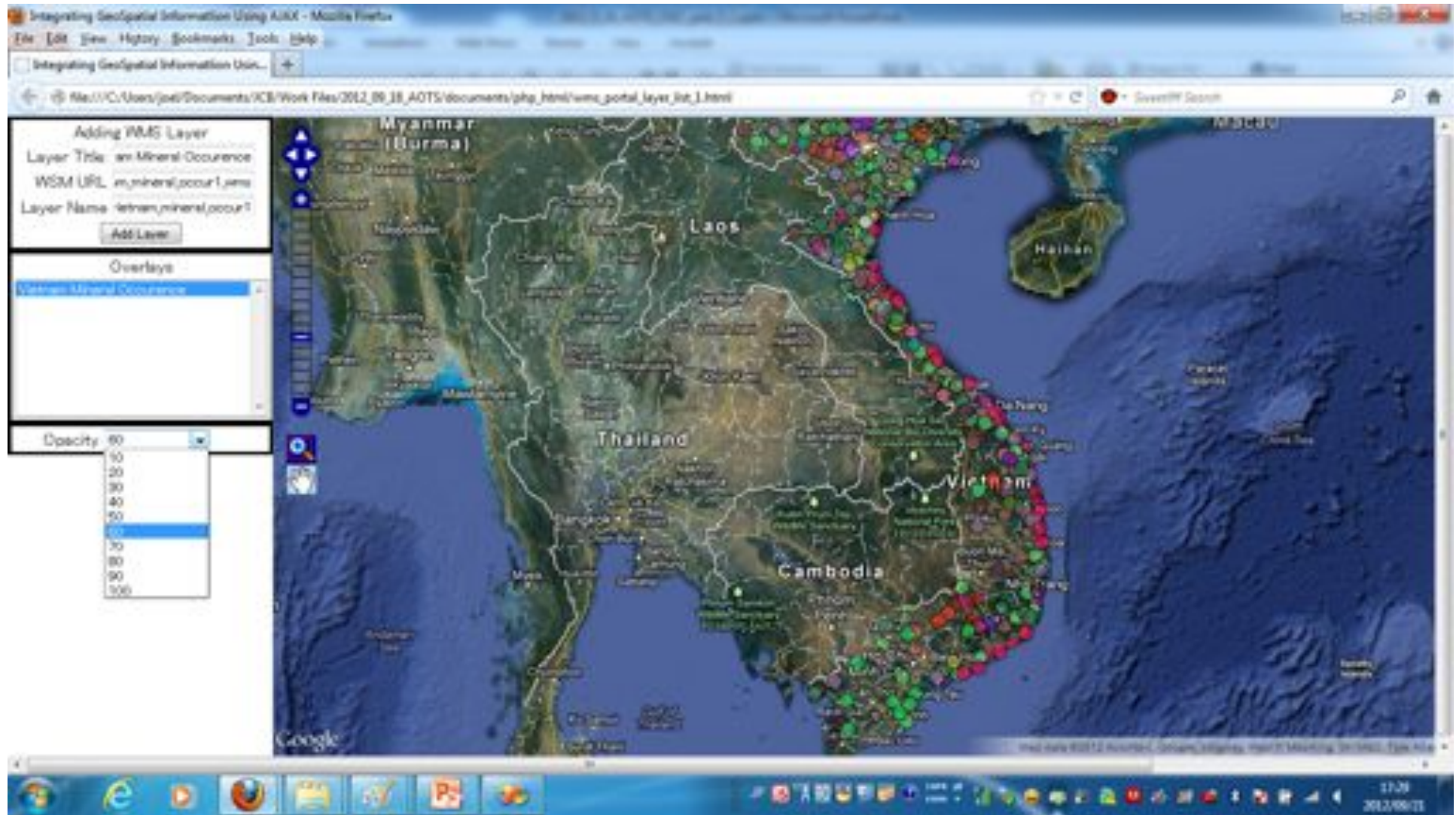
## (HTML Fragment)

```
<TABLE id="Opacity" align="center" style="border-style:solid;border-color:black;width:250px" >
  <tr>
    <td align="right">Opacity</td>
    <td colSpan="2" align="left">
      <select id="apacity_values" style="width:100px" onclick="change_opacity();">
        <option>10</option>
        <option>20</option>
        <option>30</option>
        <option>40</option>
        <option>50</option>
        <option>60</option>
        <option>70</option>
        <option>80</option>
        <option>90</option>
        <option selected>100</option>
      </select>
    </td>
  </tr>
</TABLE>
```

## Changing Opacity (Javascript Fragment)

```
function change_opacity()  
{  
  if (document.getElementById("layer_list").length<=0)  
  {  
    alert("Choose a layer first!");  
    return;  
  }  
  var index=document.getElementById("layer_list").selectedIndex;  
  var opacity_value=document.getElementById("apacity_values").value;  
  the_layers[index].setOpacity(opacity_value/100);  
}
```

# Changing Opacity





# Deleting, Hiding, Showing Layers (HTML Fragment)

```
<TABLE id="layer_list_table" align="center" style="border-style:solid;border-color:black;\n!50px" >\n  <tr>\n    <td align="center" colSpan="2">Overlays</td>\n  </tr>\n  <tr>\n    <td colSpan="3">\n      <select id="layer_list" size="9" style="width:240px">\n        </select>\n      </td>\n    </tr>\n  <tr>\n    <td align="center"><input type="button" value="Delete" onclick="delete_a_layer()"\n    <td align="center"><input type="button" value="Hide" onclick="hide_layer()"></td>\n    <td align="center"><input type="button" value="Show" onclick="show_layer()"></td>\n  </tr>\n</TABLE>
```

## Deleting Layer (Javascript Fragment)

```
function delete_a_layer()
{
  var the_index=document.getElementById("layer_list").selectedIndex;
  if (the_index<0)
  {
    alert("Choose a layer first!");
    return;
  }
  map.removeLayer(the_layers[the_index]);
  the_layers.splice(the_index,1);
  var the_layer_list=document.getElementById("layer_list");
  the_layer_list.remove(the_index);
  n_overlays--;
}
```

## Showing Layer (Javascript Fragment)

```
function show_layer()
{
  var the_index=document.getElementById("layer_list").selectedIndex;
  if (the_index<0)
  {
    alert("Choose a layer first!");
    return;
  }
  the_layers[the_index].setVisibility(1);
}
```

# Hiding Layer

(Javascript Fragment)

```
function hide_layer()
{
  var the_index=document.getElementById("layer_list").selectedIndex;
  if (the_index<0)
  {
    alert("Choose a layer first!");
    return;
  }
  the_layers[the_index].setVisibility(0);
}
```

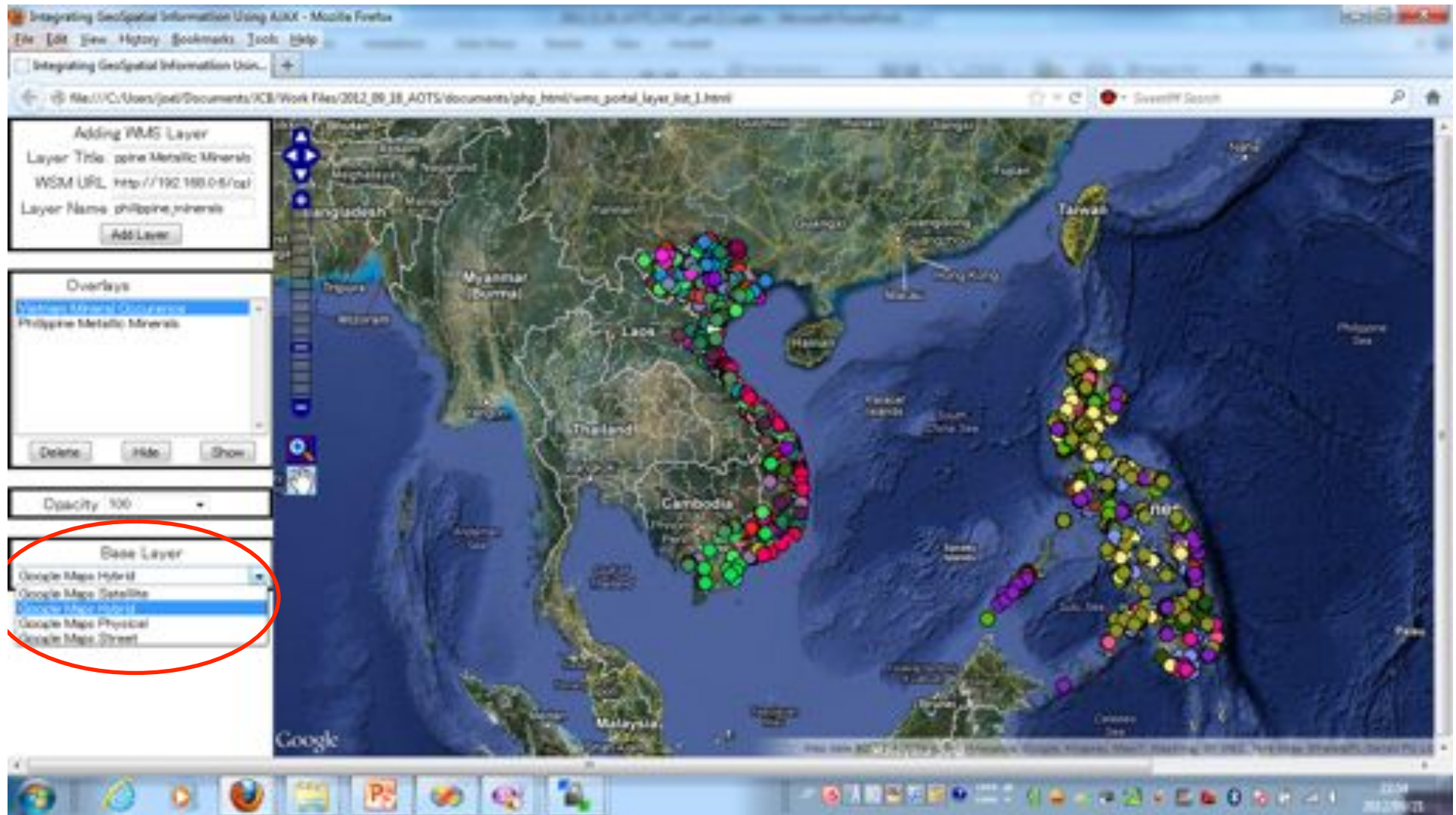
# Choose Base layer (HTML Fragment)

```
<TABLE id="TABLE1" align="center" style="border-style:solid;border-color:black;width:25
  <tr>
  <td align="center">Base Layer</td>
</tr>
  <tr>
  <td>
    <select id="base_layers" style="width:240px" onclick="change_basemap();">
      <option selected>Google Maps Satellite</option>
      <option>Google Maps Hybrid</option>
      <option>Google Maps Physical</option>
      <option>Google Maps Street</option>
    </select>
  </td>
</tr>
</TABLE>
```

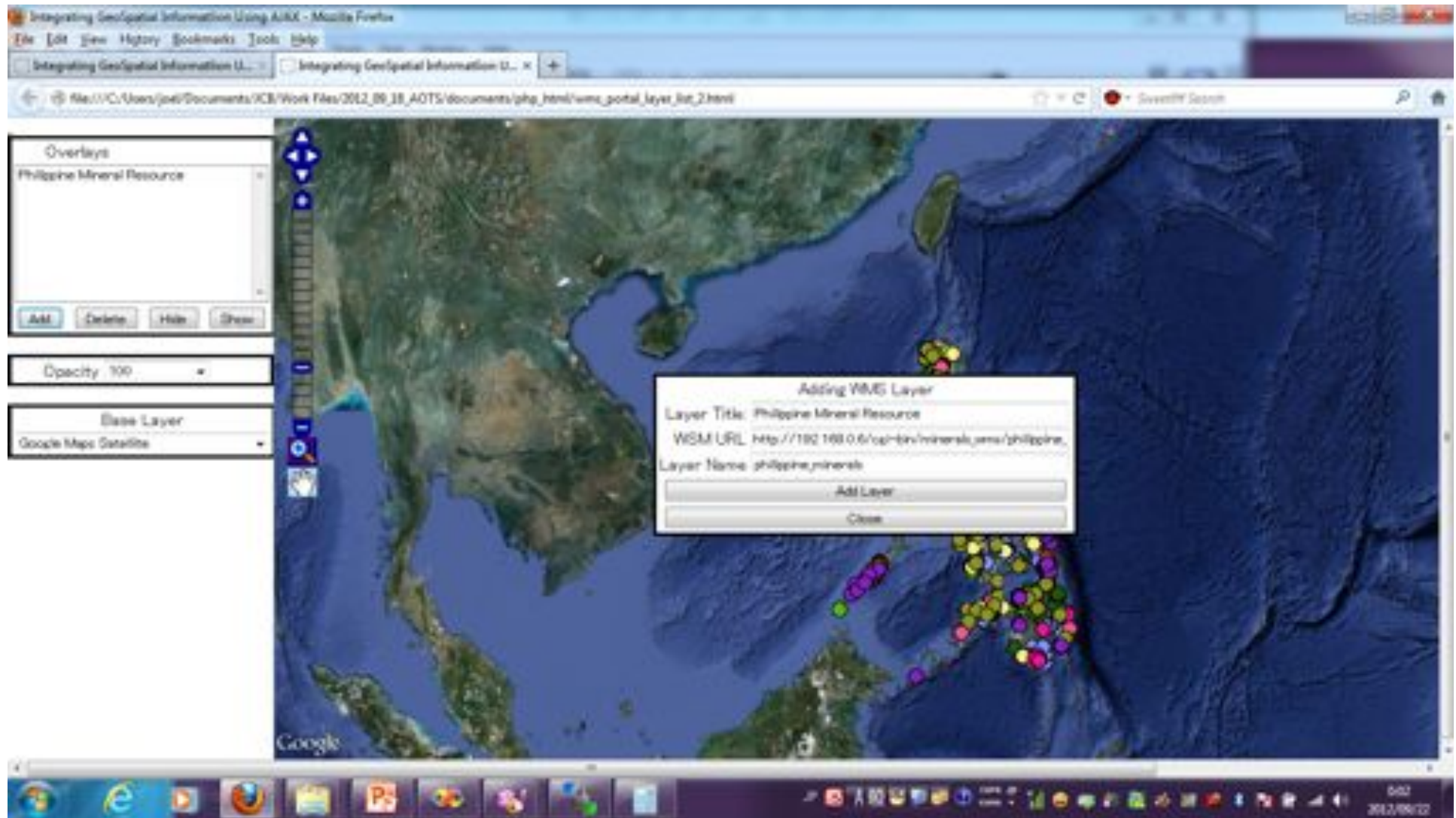
# Choose Base layer (HTML Fragment)

```
function change_basemap()  
{  
    var n=document.getElementById("base_layers").selectedIndex;  
    switch(n)  
    {  
        case 0:map.setBaseLayer(gsat);break;  
        case 1:map.setBaseLayer(ghyb);break;  
        case 2:map.setBaseLayer(gphy);break;  
        case 3:map.setBaseLayer(gmap);break;  
    }  
}
```

# Choose Base layer (Displayed Page)



# Final Portal (Add layer form)





# Final Portal (Layer List Display)

