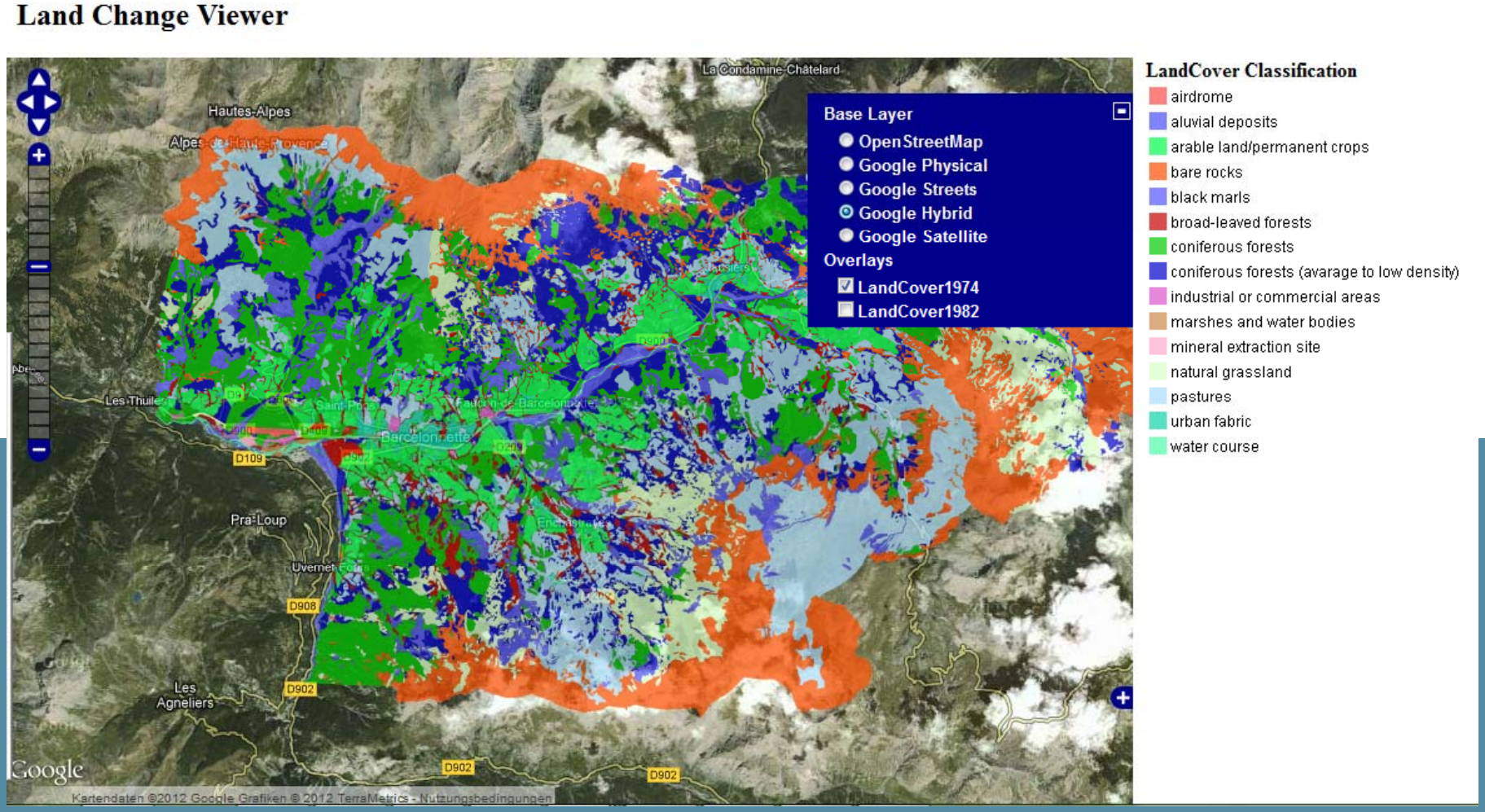
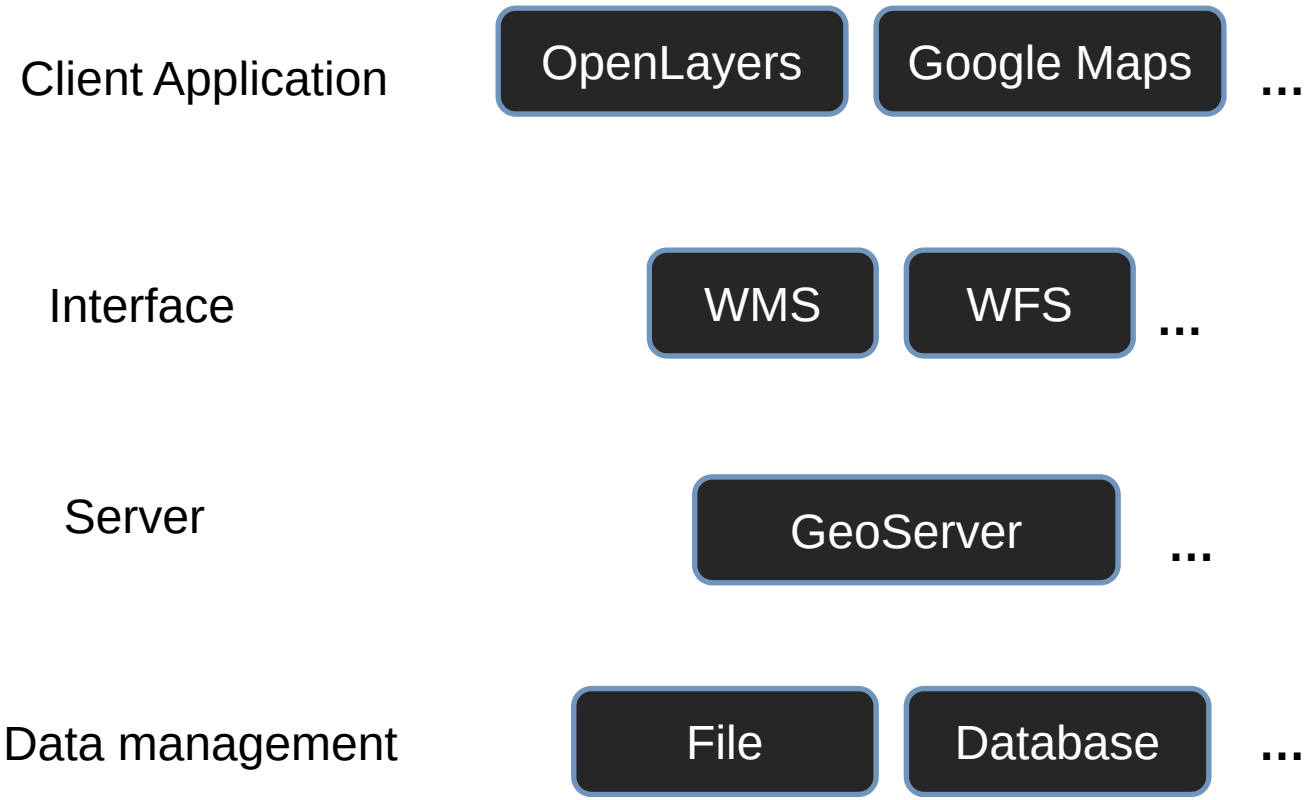
WebGIS exercise
Land Change Viewer



Elisabeth Weinke – Department of Geoinformatics – University of Salzburg

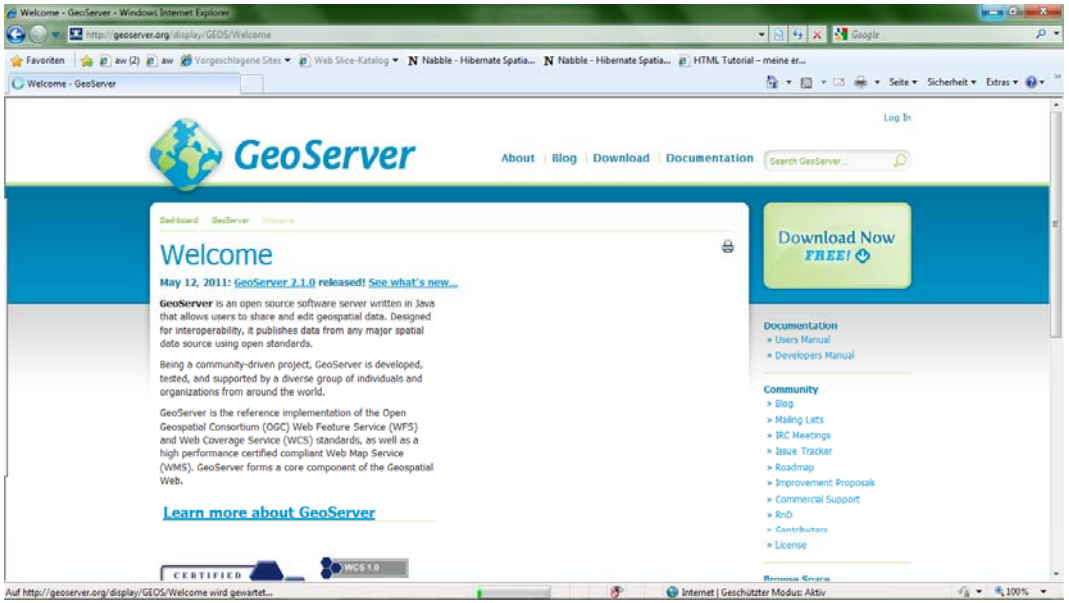
UNIVERSITÄT SALZBURG

Overview



UNIVERSITÄT SALZBURG

Publish Geodata with GeoServer



- Download and installation of the newest Java-Development-Kits (JDK) from the homepage → http://java.sun.com/javase/downloads/index.jsp
- GeoServer needs JDK to run
- Download the current and stable GeoServer Version from the project homepage: www.geoserver.org

UNIVERSITÄT SALZBURG

Projections and EPSG-Codes

- Projections in GIS are commonly referred to by their “EPSG” codes, identifiers managed by the European Petroleum Survey Group.
- One common identifier is “**EPSG:4326**”, which describes maps where latitude and longitude are treated as X/Y values.
- Spherical Mercator has an official designation of **EPSG:3857**. However, before this was established, a large amount of software used the identifier **EPSG:900913**. This is an unofficial code, but is still the commonly used code in OpenLayers. Any time you see the string “EPSG:4326”, you can assume it describes latitude/longitude coordinates. Any time you see the string “EPSG:900913”, it will be describing coordinates in meters in x/y.

UNIVERSITÄT SALZBURG

WMS of GeoImage Austria

Create a getCapabilities Request to get Information to the WMS:

- http://gis.lebensministerium.at/wmsgw/?key=721bc79213ed9fa99730a48e8af7c552&VERSION=1.1.1&REQUEST=GetCapabilities&SERVICE=WMS

Create a getMap-Request to get a map in a specific region:

- http://gis.lebensministerium.at/wmsgw/?key=721bc79213ed9fa99730a48e8af7c552&VERSION=1.1.1&REQUEST=GetMap&SERVICE=WMS&LAYERS=Orthophoto&SRS=EPSG:4326&BBOX=12.991852698572,47.773938071743,13.089871344812,47.819257268474&WIDTH=571&HEIGHT=393&FORMAT=image/png

UNIVERSITÄT SALZBURG

GeoServer

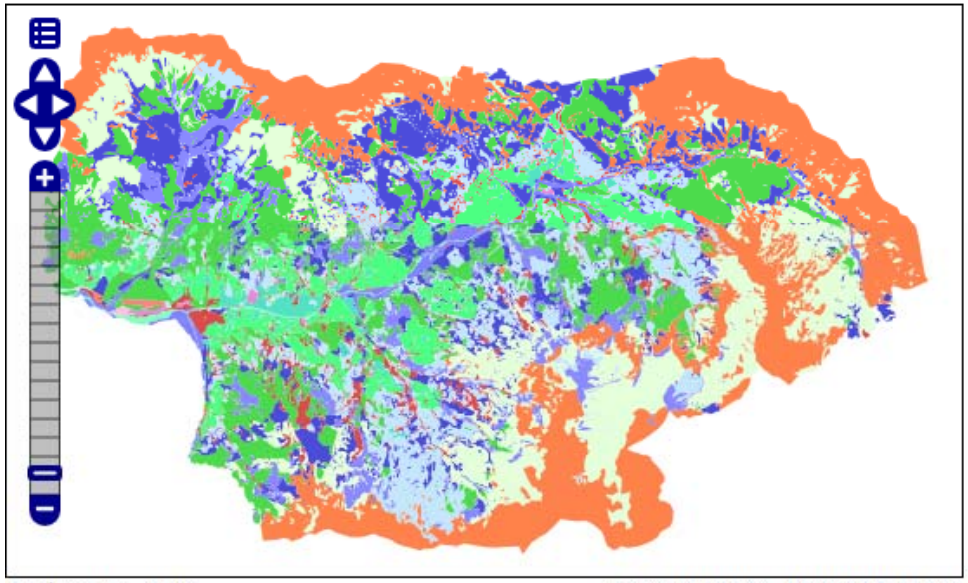
Test environment for the lecture

- GeoServer: http://212.227.53.106:8181/geoserver/web/
  - User: geobrowser
  - pwd: geobrowser2012

UNIVERSITÄT SALZBURG

Exercise: WMS

- Publish the ESRI Shapefile „LandChange1974.shp“ and create a WMS-Layer.
- Look at it in the Geoserver Layer-Preview.



UNIVERSITÄT SALZBURG

Styles in Geoserver

How to create a new style:

http://docs.geoserver.org/latest/en/user/webadmin/data/styles.html

SLD-Cookbook:

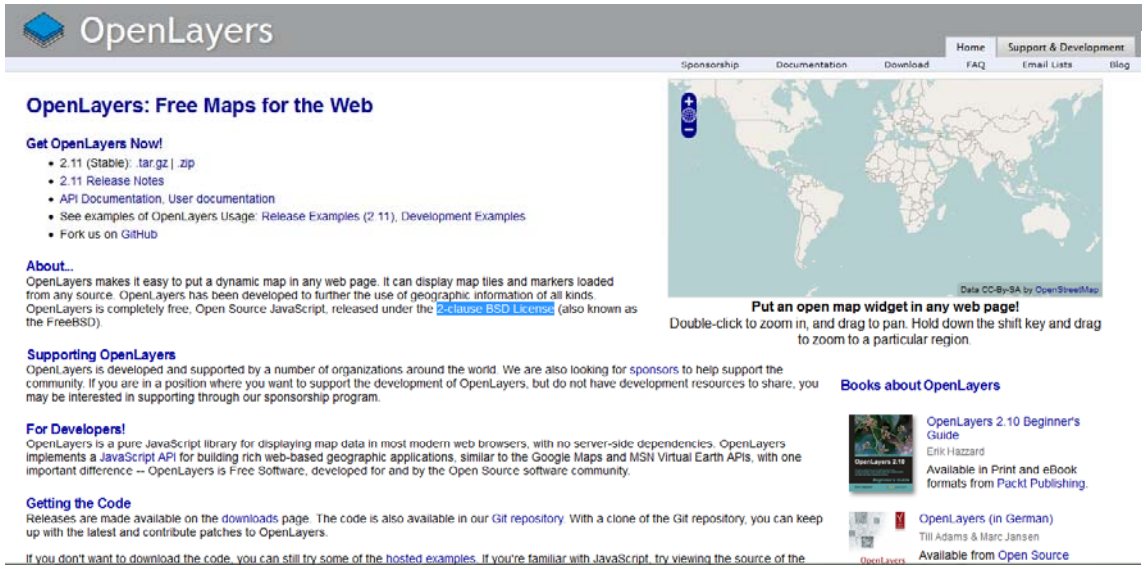
http://docs.geoserver.org/latest/en/user/styling/sld-introduction.html

UNIVERSITÄT SALZBURG

OpenLayers

http://openlayers.org/

- Open Source Java Script API
- Examples: http://openlayers.org/dev/examples/
- Documentation: http://trac.osgeo.org/openlayers/wiki/Documentation
- Download API to include it in Applications: http://trac.osgeo.org/openlayers/wiki/HowToDownload



HTML

```
<!doctype html>
<html lang=en>
<head>
    <meta charset=utf-8>
    <title>Javascript Test Web Page</title>


</head>
<body onLoad="alert('Hello World!');">


</body>
</html>
```

Open file: index.html

UNIVERSITÄT SALZBURG

Java Script Variables

- Variables are "containers" with a name
- Variables are used to store data (e.g. input values, results, ...)

- Declaration: var number;
- Initialization: assign a value to a variable: number = 12;
- Declaration and initialization: for example var lat = 34 333;

- Data types of variables
  - var number: year=2012;
  - String: var name=“Lisa“;
  - Boolean: var found = true; found= false;

UNIVERSITÄT SALZBURG

Functions

- smaller sub-programs or program components
- Functions are blocks, which can be used more times
- Function Statements are not executed immediately
- only if the function is called explicitly, then the instructions are interpreted in the function

```
<head>
    <meta charset=utf-8>
    <title>Javascript Test Web Page</title>
    <script>
        function calc(){
          var digit1 = 2;
          var digit2 = 4;
          var sum = digit1 + digit2;
          alert("Sum : " + sum);
        }
    </script>
</head>
<body onLoad="calc()">
```

UNIVERSITÄT SALZBURG

First Sample

```
<!DOCTYPE html>
<html>
<title>OpenLayers Sample</title>
<script src="http://maps.google.com/maps/api/js?sensor=false"></script>
<script src="http://www.openlayers.org/api/OpenLayers.js"></script>
<script type="text/javascript">
function init(){

    var lonlat    = new OpenLayers.LonLat(13.04, 47.8);
    var zoom = 6;
    var map;
    var world = new OpenLayers.Bounds(-180, -90, 180, 90);
    var options = {
        controls: [] ,
        maxExtent: world,
        projection: "EPSG:4326"

    };

    map = new OpenLayers.Map('map', options);
    map.addControl(new OpenLayers.Control.LayerSwitcher());
    map.zoomToExtent(world);
}
 </script>
 </head>
 <body onload="init()">
 <div id="map" style="height: 400px; width: 600px;"></div>
 </body>
 </html>
```

Open file: ol_template.html

UNIVERSITÄT SALZBURG

WMS in OpenLayers

```
var  layer= new OpenLayers.Layer.WMS(
        “Layer-Name",
        “URL",
        {
                layers: “workspace:layername“
                transparent: true,
                format: "image/png"

        },
        {
            visibility: true,
            isBaseLayer: true
        }
);
```

UNIVERSITÄT SALZBURG

Google Layers

Include the Google Layers to the Map.

Constants

Google Physical: google.maps.MapTypeId.TERRAIN

Google Hybrid: google.maps.MapTypeId.HYBRID

Google Satellite google.maps.MapTypeId.SATELLITE

UNIVERSITÄT SALZBURG

Upload with Filezilla

- Server: 212.227.53.106
- Benutzer: geobrowser
- Password: geobrowser2012

UNIVERSITÄT SALZBURG

APIs for WebMapping

- **2D Map Viewer**
  - Google Maps: https://developers.google.com/maps/
  - OpenLayers: http://openlayers.org/
  - Bing Maps: http://www.microsoft.com/maps/developers/web.aspx
  - Nokia Maps API: http://api.maps.nokia.com/en/overview.html

- **Virtual Globes**
  - Google Earth API: https://developers.google.com/earth/
  - NASA World Wind Java SDK: http://goworldwind.org/demos/
  - OSM-3D: http://www.osm-3d.org/home.de.htm