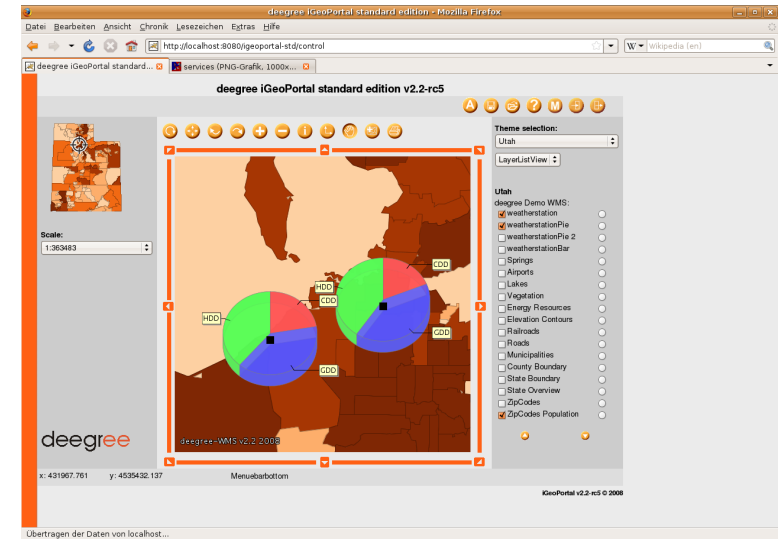


# Using SLD definitions to display charts in a deegree WMS



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# agenda

- short introduction
- aims & approach
- realisation
- some working examples
- outlook

deegree

**.org**

joint project between AG GIS, Dept. of Geography, Uni Bonn and lat/lon  
free software in terms of FSF: LGPL

**.aim**

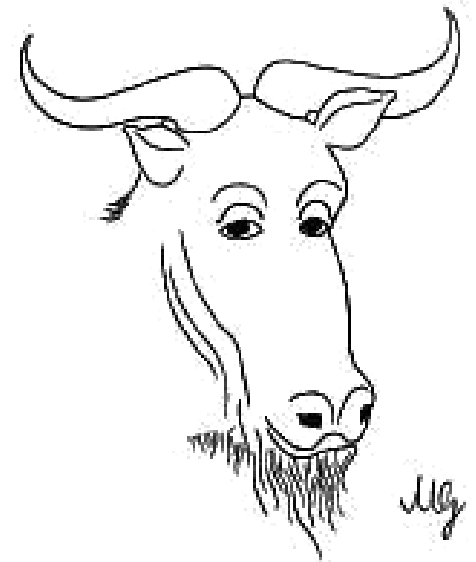
interoperability  
management of geospatial data  
setup of Spatial Data Infrastructure (SDI)

**.how**

ISO-models and OGC-interfaces  
abstraction from data sources  
~ 2000 classes

**.now**

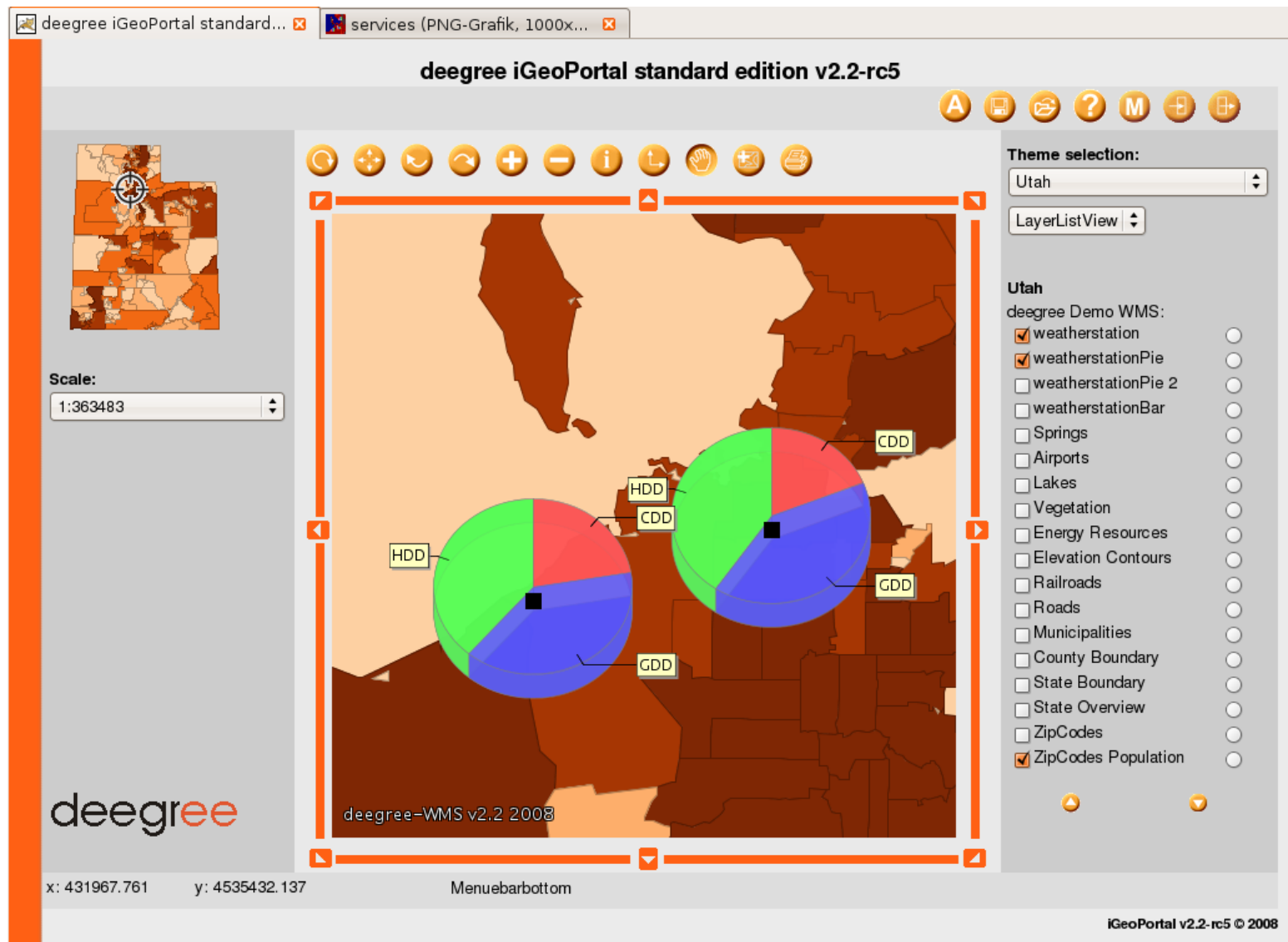
most comprehensive implementation of OGC/ISO-standards in free software:  
WMS & WCS (OGC reference implementations), WFS, CSW, WTS/WPVS, SLD, WPS



<http://www.deegree.org/>

# aims & approach

# thematic web maps (carto diagram)



# WMS:GetFeatureInfo

deegree WMS - Mozilla Firefox

http://localhost:8080/GWSMapService/services?VERSION=1.1.1&REQUEST=

## deegree 2 Demo Feature Info

available time series

- ☐ CDD
- ☐ HDD
- ☐ GDD
- ☒ Minimum Temperature
- ☒ Maximum Temperature
- ☐ Precipitation
- ☐ Snow Fall
- ☐ Snow Depth

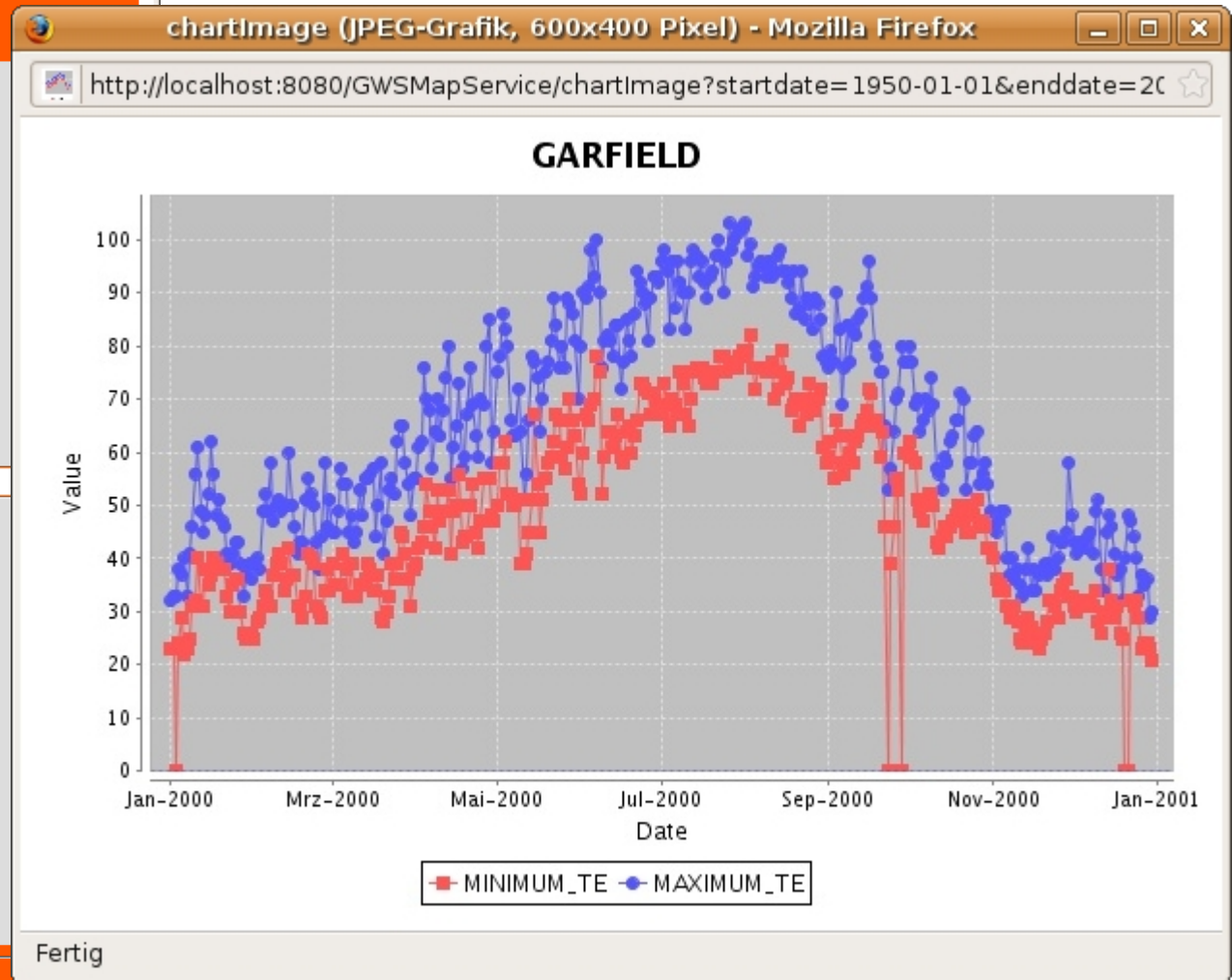
Start Date: 1950-01-01 End Date: 2000-12-31

display

name = GARFIELD  
state = UT  
elevation = 4314  
maximum\_Temperature = 1947  
minimum\_Temperature = 1946  
observation\_Temperature = 1947  
precipitation = 454  
snow\_Fall = 87  
snow\_Depth = 259  
GDD = 1232  
HDD = 1232  
CDD = 710

(c) deegree WMS 1.1.1 Fri Aug 15 2008 16:54:22 GMT+0200 (CEST)

Fertig



# aims

- display charts in a WMS map

- OGC compliant
- valid against SLD schema
- based on feature properties

- display detailed charts via get feature info

- get measurements from SOS, data base or file

```
<?xml version="1.0" encoding="UTF-8"?>
<StyledLayerDescriptor version="1.0.0" xmlns="http://www.opengis.net/sld"
  xmlns:gml="http://www.opengis.net/gml" xmlns:ogc="http://www.opengis.net/ogc"
  xmlns:app="http://www.deegree.org/app" xmlns:xlink="http://www.w3.org/1999/xlink">
  <NamedLayer>
    <Name>default:weatherstationPie</Name>
    <UserStyle>
      <Name>default:weatherstationPie</Name>
      <FeatureTypeStyle>
        <Name>default:weatherstation</Name>
        <Rule>
          <Name>default:weatherstationPie</Name>
          <MaxScaleDenominator>1.7976931348623157E308</MaxScaleDenominator>
          <PointSymbolizer>
            <ExternalGraphic>
              <OnlineResource xmlns:xlink="http://www.w3.org/1999/xlink"
xlink:type="simple" xlink:href="http://localhost:8080/deegree/chart?chart=Pie3D&title=&
legend=false&width=250&height=220&format=image/png&GDD=$GDD$&HDD=$HDD$&
CDD=$CDD$"/>
              <Format>image/png</Format>
            </ExternalGraphic>
            <Size>250</Size>
            <Rotation>0</Rotation>
          </Graphic>
        </PointSymbolizer>
      </Rule>
    </FeatureTypeStyle>
  </UserStyle>
```

# approach

- deegree WMS
  - define layer
  - define user style with external graphic (SLD)
- deegree Charts
  - deegree library (deegree2.jar)
  - HTTP GET request with KVP
    - containing the data
    - containing info on where to get the data
- JFreeChart library
  - drawing the charts



# realisation

# deegree Charts

- provides simplified access to charting library
- responsible for generating carto diagrams
- currently supports seven configurable chart types:
  - pie (2D, 3D)
  - bar (2D, 3D)
  - line (2D, 3D),
  - XY-line
- OGC compliant by utilizing SLD specification
  - named layer -> user style -> external graphic
- benefits from great variety of deegree data sources

# WMS - define style for layer

```
<UserStyle>
```

```
...
```

```
  <ExternalGraphic>
```

```
    <OnlineResource
```

```
      xmlns:xlink="http://www.w3.org/1999/xlink"
```

```
      xlink:type="simple"
```

```
      xlink:href="http://localhost:8080/deegree/chart?"
```

```
      chart=Pie3D&title=&legend=false&
```

```
      width=250&height=220&format=image/png&
```

```
      GDD=$GDD&HDD=$HDD&CDD=$CDD"/>
```

```
    <Format>image/png</Format>
```

```
  </ExternalGraphic>
```

```
...
```

```
</UserStyle>
```

# SLD - external graphic (URL)

`http://localhost:8080/deegree/chart?`

`&chart=Pie3D`

`&title=`

`&legend=false`

`&width=250`

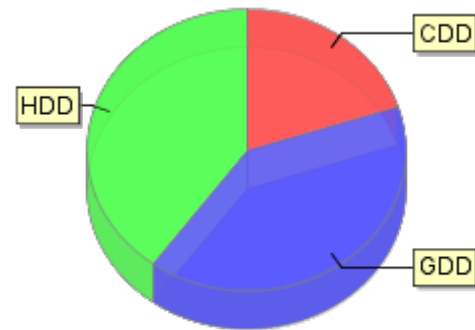
`&height=220`

`&format=image/png`

`&HDD=$HDD$`

`&CDD=$CDD$`

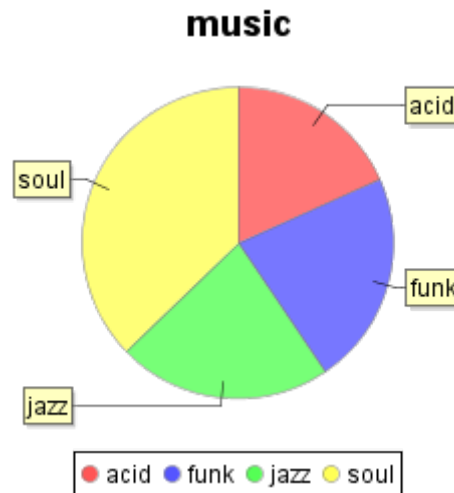
`&GDD=$GDD$`



# some working examples

# sample request (1)

`http://localhost:8080/deegree/chart?chart=Pie&  
title=music&legend=true&width=250&height=250&  
format=image/png&acid=33&funk=40&jazz=40&soul=67`



# sample request (2)

`http://localhost:8080/deegree/chartImage?  
columns=MINIMUM_TE,MAXIMUM_TE,`

`&id=423097`

`&startdate=2002-01-01`

`&enddate=2002-12-31`

|

`&id=427598`

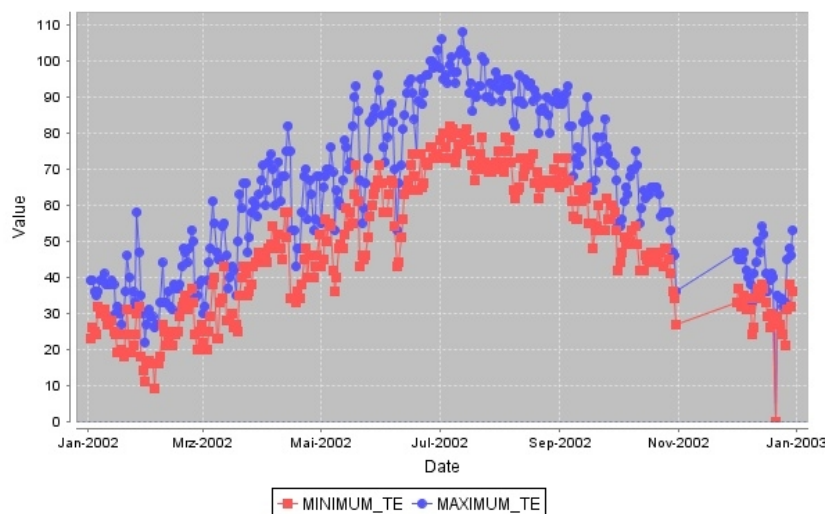
|

`&startdate=2005-01-01`

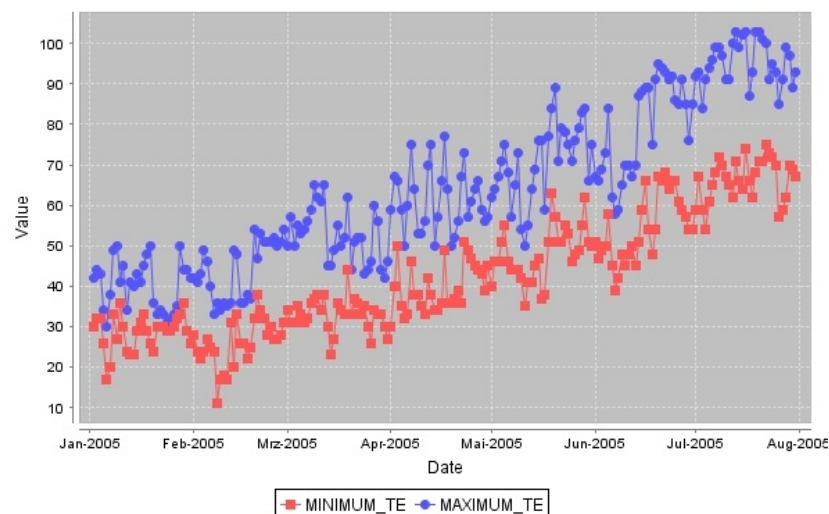
|

`&enddate=2005-12-31`

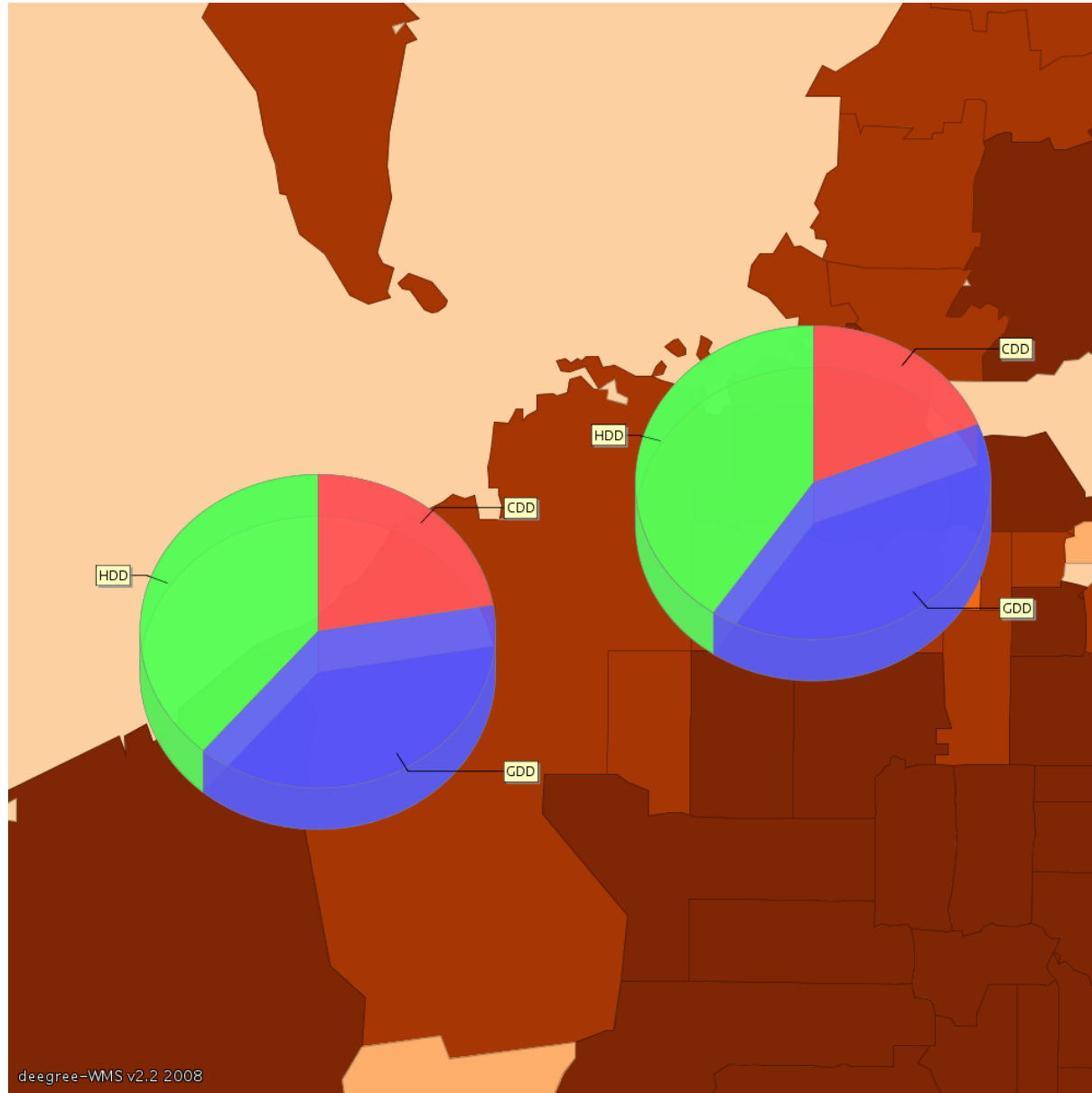
GARFIELD



SALT LAKE C

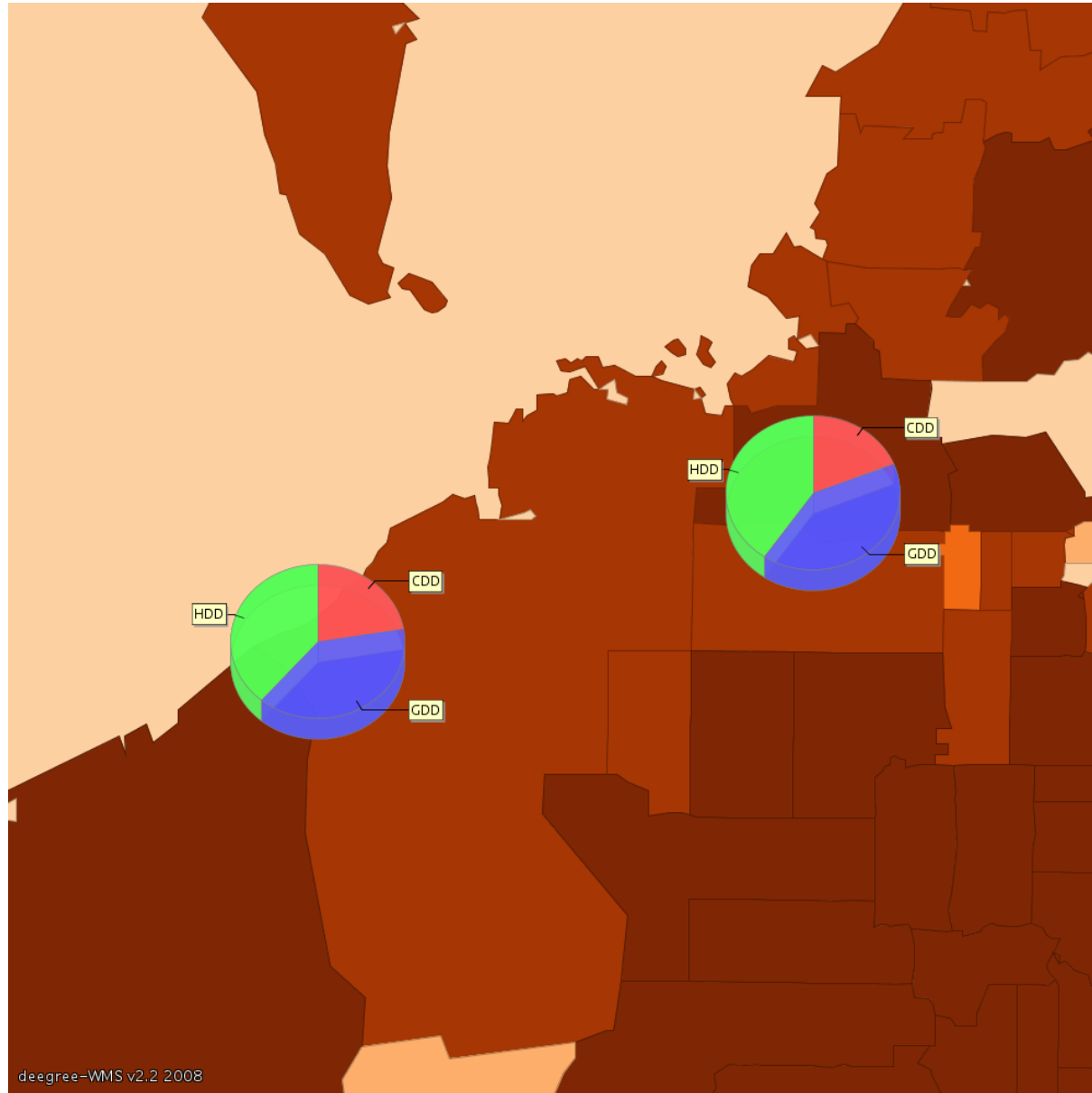


# large pie chart

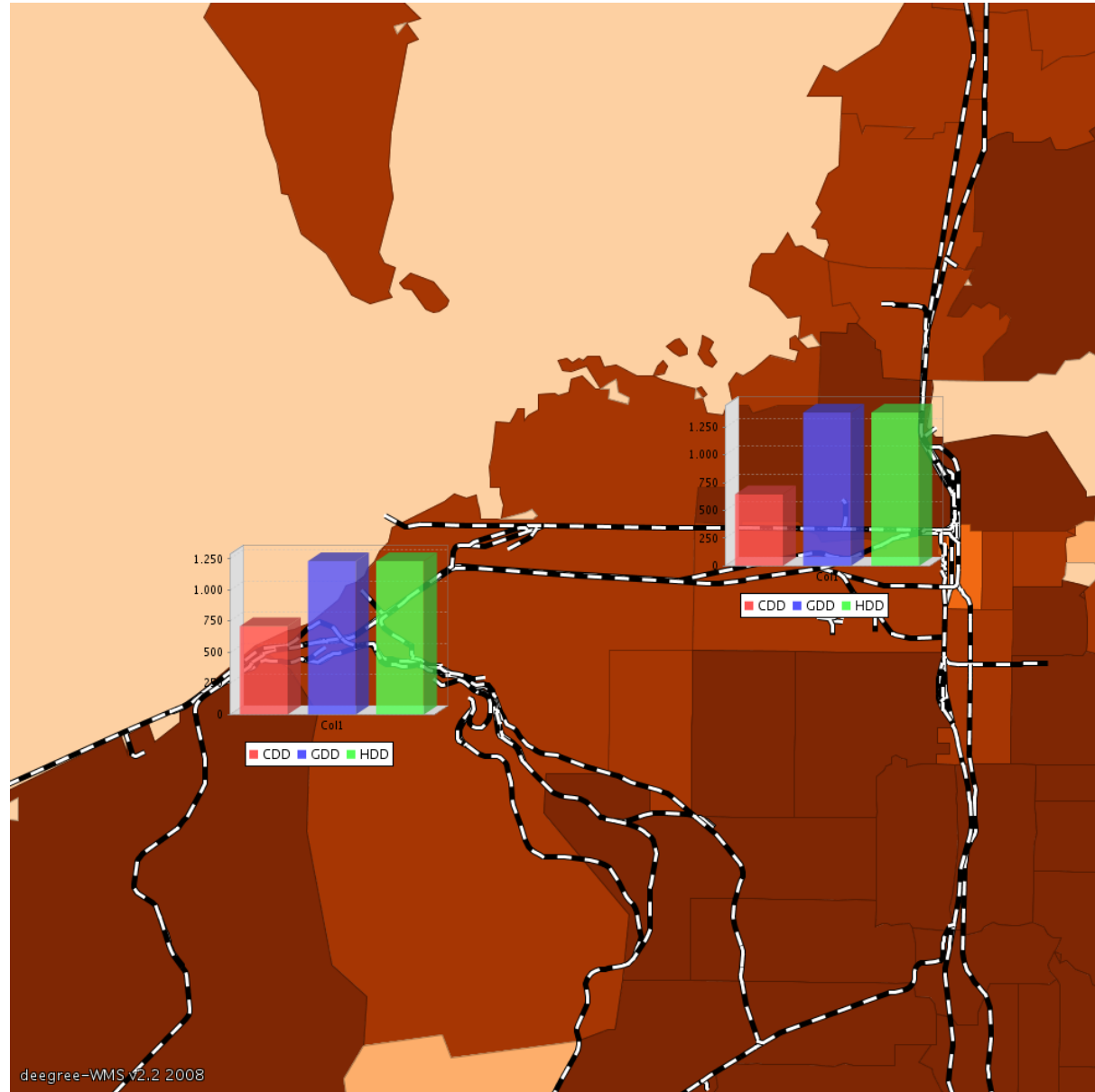




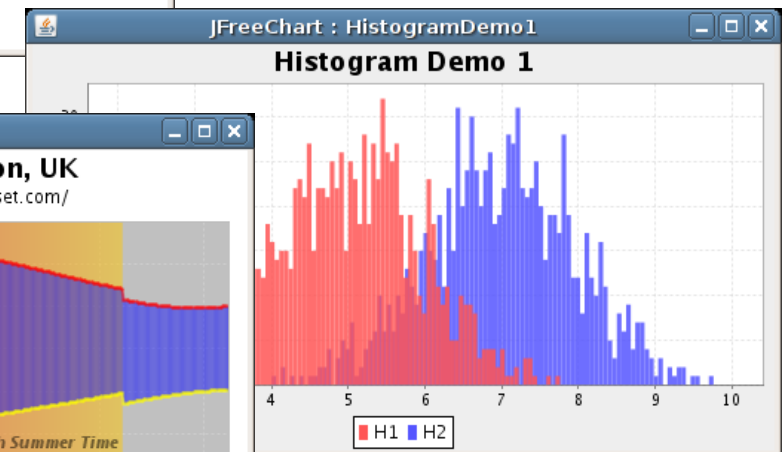
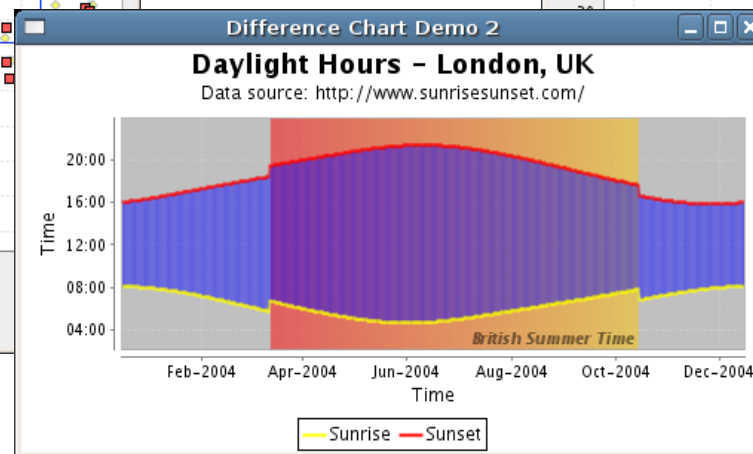
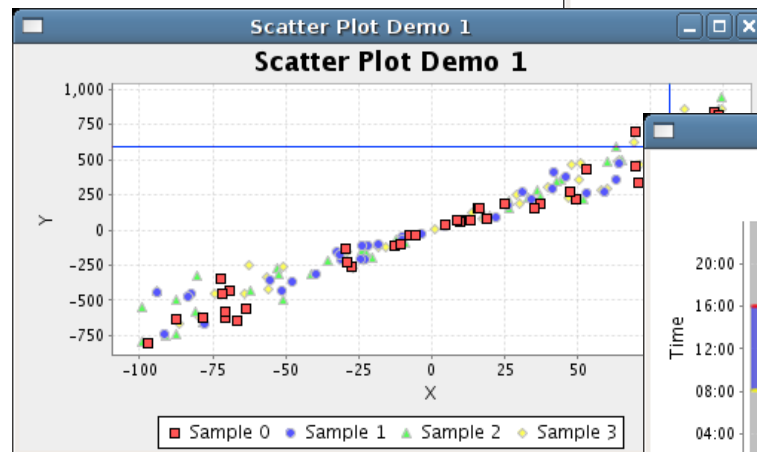
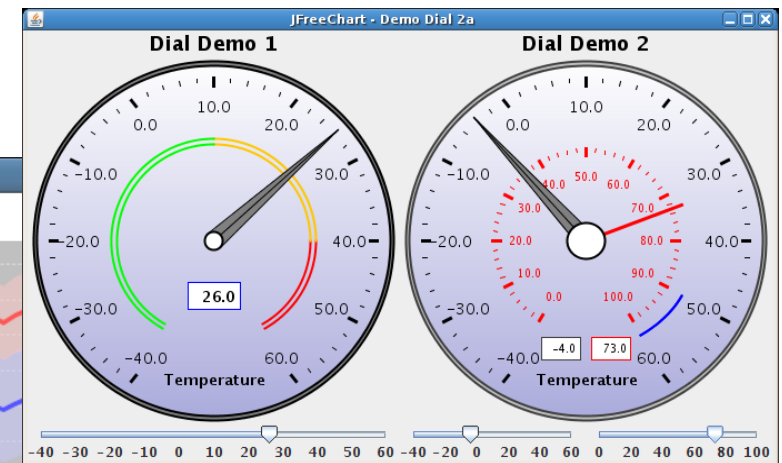
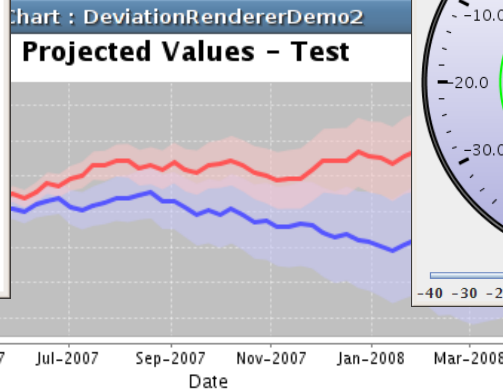
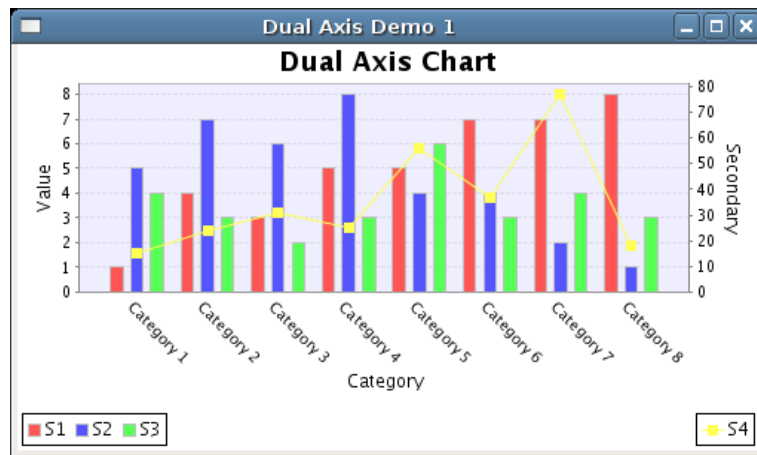
# small pie chart



# bar chart



# variety of chart types

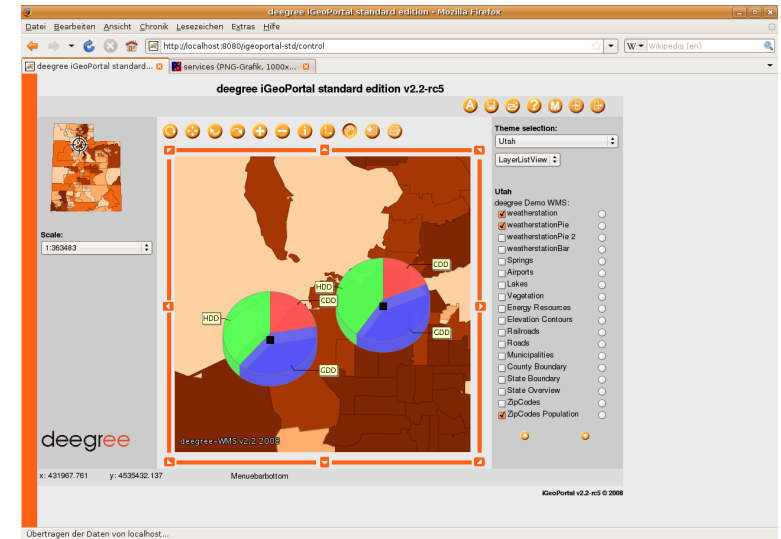


# outlook

- consider generalisation matters
- enhance documentation
- support greater variety of chart types
  - restricted to types offered in JFreeChart library:
  - JFreeChart supports pie charts (2D and 3D), bar charts (horizontal and vertical, regular and stacked), line charts, scatter plots, time series charts, high-low-open-close charts, candlestick plots, Gantt charts, combined plots, thermometers, dials and more.

# any questions?

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