

Deltares

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Delft-FEWS

Basic Configuration Course

Module 12: Using the Explorer and Spatial Display

Module Motivation

- The Explorer Map display is the first thing users will see when they open the application.
- Use of Spatial Displays can be incredible effective in communicating information.
- This can come from visualizing numerical weather predictions, spatial patterns of variables, accumulation of precipitation and even the internal states of models.
- Use of GIS data, such as watershed boundaries, allows the look and feel of the system to be highly customized.

Learning Objectives

By the end of this module, you will have met the following learning objectives:

- 1) Be able to update basic components of the Explorer, including captions, spatial extents and GIS data
- 2) Understand how data is referenced in the Spatial Display, and how this can be updated.
- 3) Have an improved understanding of how to navigate the Explorer and Spatial Display, including functions that don't need to be configured

FEWS Explorer

- The FEWS Explorer (controlled by the SystemConfigFiles/Explorer.xml file) contains core setting for the FEWS system, as well as controlling aspects of the Map display seen on opening the application.
- The Explorer.xml also contains a great deal of system information, including:
 - Timezones
 - Cardinal Timestep (i.e. system timestep)
 - View Extents
 - Map Layers (i.e. OpenStreetMaps)
 - GIS Data
 - Explorer Tasks (i.e. what items are available in the Tool bar)
- This is very far from complete!
- Google “Delft-FEWS Explorer” for complete documentation

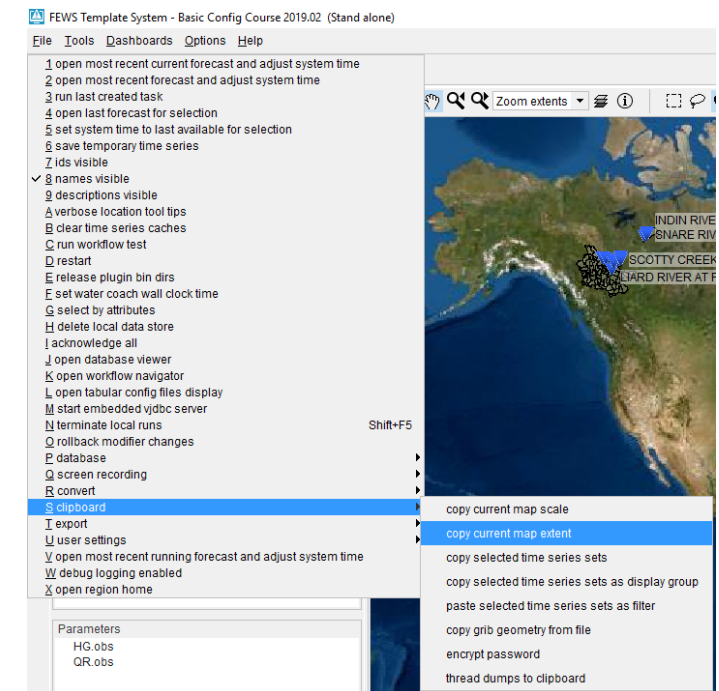
Spatial Display

- The SpatialDisplay (controlled by the DisplayConfigFiles/SpatialDisplay.xml file) hold the key configuration for visualizing gridded and GIS data.
- The SpatialDisplay.xml also contains many common elements with the Explorer.xml, including
 - View Extents
 - Map Layers (i.e. OpenStreetMaps)
 - GIS Data
- It extends to additional views of gridded data, such as:
 - Satellite Data
 - Numerical Weather Prediction products (i.e. weather forecasts)
 - Scalar data shown at locations on a map
- Google “Delft-FEWS Explorer” for complete documentation

View Extents

- The View Extent is the geographic extent shown on the map. There is a default option, and others configured available.
- This can be defined manually or by using an option in Delft-FEWS
- To use the Delft-FEWS option, press F12 → S → Copy current Map Extent
- If the F12 option does not give the full options, click in the log messages area and try again.
- You can paste this in the Explorer.xml of SpatialDisplay.xml with minor editing.

```
<defaultExtent id="$REGION$">  
  <left>-149</left>  
  <right>-82</right>  
  <top>71</top>  
  <bottom>57</bottom>  
</defaultExtent>
```

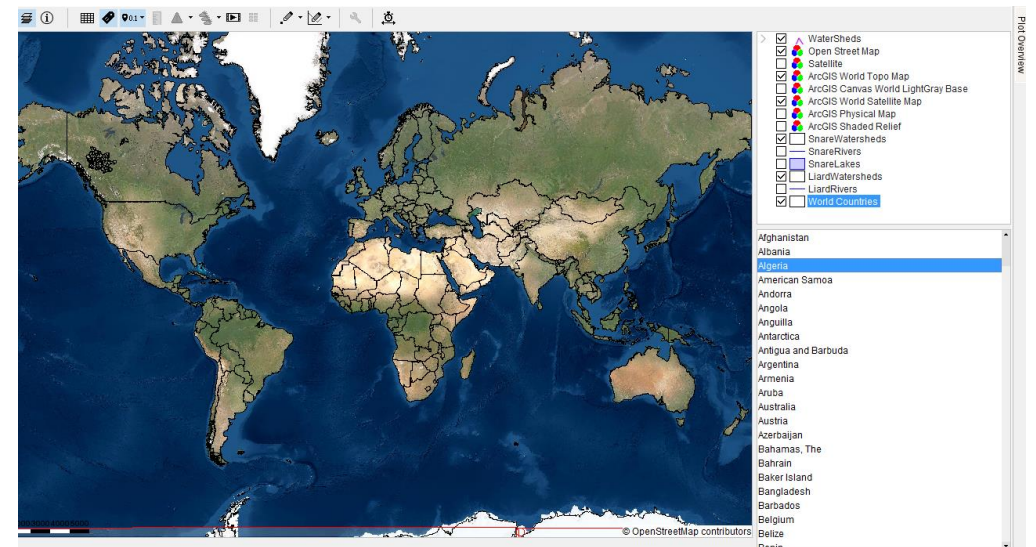


Shape Files

- Shapefiles (.shp) can be used directly in FEWS Map and Spatial Display
- The Shapefiles should be stored in the MapLayerFiles (using sub-directories is no issue).
- If additional meta-data is available, this can be used for a Tooltip when hovering over the shapefile.
- Since 2019.02, shapefile attribute data will also be read automatically, displayed and available for use.
- Press the Layers button to select what data is displayed



```
<esriShapeLayer id="World Countries">  
  <description>World</description>  
  <file>WorldCountries.shp</file>  
  <geoDatum>WGS 1984</geoDatum>  
  <visible>false</visible>  
  <toolTip>%CNTRY_NAME%</toolTip>  
  <lineColor>black</lineColor>  
</esriShapeLayer>
```



Web Mapping Service (WMS) Layers

- Web Mapping Service (WMS) Layers such as Open Street Map data can be added directly to the Map and Spatial Display.

```
<openStreetMapLayer id="Open Street Map">  
  <url>http://tile.openstreetmap.org</url>  
  <visible>true</visible>  
  <cacheDir>$MAPLAYERSCACHE_FOLDER$/OSM</cacheDir>  
</openStreetMapLayer>
```

- In some cases, it is very straight forward.

- In some a bit more detail may be needed or can be added.

```
<layer id="World" name="ArcGIS World Satellite Map">  
  <className>nl.widelft.libx.openmap.GenericTileServerLayer</className>  
  <visible>true</visible>  
  <properties>  
    <string key="tileUrlPattern" value="http://server.arcgisonline.com/arcgis/rest/services/World_Imagery/MapServer/tile/%ZOOM%/%ROW%/%COLUMN%"/>  
    <string key="cacheDir" value="$MAPLAYERSCACHE_FOLDER$/World_Imagery"/>  
    <int key="minZoomLevel" value="1"/>  
    <int key="maxZoomLevel" value="19"/>  
    <int key="topZoomLevel" value="21"/>  
    <int key="tileSize" value="256"/>  
  </properties>  
</layer>
```

- Google “Delft-FEWS GeoMap” for more complete documentation and examples

Spatial Display – Data Display

- The Spatial Display configuration file contains two type of elements
 - Default settings: These are properties that will be used when displaying the spatial time series (grids). Can be organized per parameter group, plotgroup, etc..
 - Note: Class Breaks can also be defined in the TimeSeriesDisplayConfig.
 - Grid Plot Groups: These contain the folder structure and time series to display

gridDisplay

= xmlns	http://www.wldelft.nl/fews			
= xmlns:xsi	http://www.w3.org/2001/XMLSchema-instance			
= xsi:schemaLoca...	http://www.wldelft.nl/fews http://fews.wldelft.nl/schemas/version1.0/gridDisplay.xsd			
⌘ title	Spatial Display			
defaults (2)				
	⌘ plotGroupId	⌘ geoMap	⌘ timeDisplayLab...	⌘ commentPositioning
1	WSC_Scalar_Download	▼ geoMap	bottomRight	
2				topLeft
gridPlotGroup (7)				
	= id	= name	⌘ gridPlot	⌘ gridPlotGroup
1	E2O_Gridded_Data	Earth2Observe Re-analysis Data	▼ gridPlot (3)	
2	WSC_Scalar_Download	WSC Stations	▼ gridPlot (1)	
3	ECCC_Scalar_Download	ECCC Meteo Stations	▼ gridPlot (4)	
4	ECCC_Grid	ECCC Grids - GeoMet		▼ gridPlotGroup (4)
5	ECCC_Processed	ECCC Grids - Processed		▼ gridPlotGroup (4)
6	\$MODELNAME1\$_Results	\$MODELNAME1\$		▼ gridPlotGroup (3)
7	\$MODELNAME2\$_Results	\$MODELNAME2\$		▼ gridPlotGroup (4)

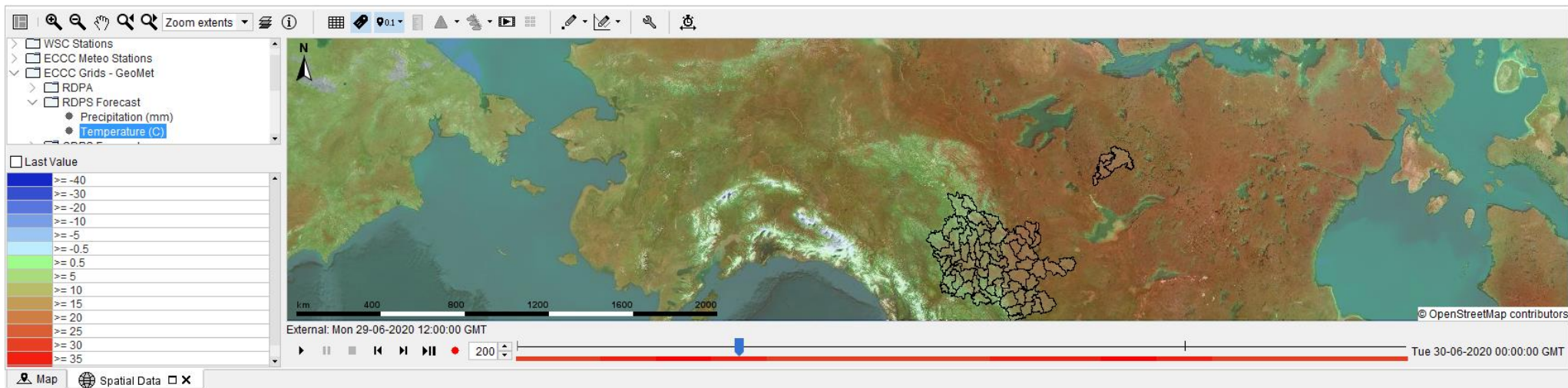
Spatial Display – Grid Plot and Class Break Example

GridPlot Example (SpatialDisplay.xml)


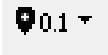


```
<gridPlotGroup id="RDPS" name="RDPS Forecast">
  <gridPlot id="RDPSTemperature" name="Temperature (°C)">
    <timeSeriesSet>
      <moduleInstanceld>ImportRDPS</moduleInstanceld>
      <valueType>grid</valueType>
      <parameterId>TA.nwp</parameterId>
      <locationId>RDPS</locationId>
      <timeSeriesType>external forecasting</timeSeriesType>
      <timeStep unit="hour" multiplier="3"/>
      <readWriteMode>read complete forecast</readWriteMode>
    </timeSeriesSet>
    <showThumbnailsPanel>true</showThumbnailsPanel>
    <numberOfRecentForecasts>4</numberOfRecentForecasts>
    <classBreaksId>Class.Temperature</classBreaksId>
  </gridPlot>
</gridPlotGroup>
```

Class Breaks Example (TimeSeriesDisplayConfig.xml)

```
<classBreaks id="Class.Temperature">
  <lowerColor>blue3</lowerColor>
  <upperColor>light blue1</upperColor>
  <lowerOpaquenessPercentage>40</lowerOpaquenessPercentage>
  <upperOpaquenessPercentage>40</upperOpaquenessPercentage>
  <lowerValue>-40</lowerValue>
  <lowerValue>-30</lowerValue>
  <lowerValue>-20</lowerValue>
  <lowerValue>-10</lowerValue>
  <lowerValue>-5</lowerValue>
  <lowerValue>-0.5</lowerValue>
  <lowerColor>pale green1</lowerColor>
  <upperColor>red</upperColor>
  <lowerOpaquenessPercentage>40</lowerOpaquenessPercentage>
  <upperOpaquenessPercentage>40</upperOpaquenessPercentage>
  <lowerValue>0.5</lowerValue>
  <lowerValue>5</lowerValue>
  <lowerValue>10</lowerValue>
  <lowerValue>15</lowerValue>
  <lowerValue>20</lowerValue>
  <lowerValue>25</lowerValue>
  <lowerValue>30</lowerValue>
  <lowerValue>35</lowerValue>
  <lowerValue>40</lowerValue>
</classBreaks>
```



Spatial Display – Options in the Interface

- There are also many options for controlling the Spatial Display directly from the Delft-FEWS Interface.
- For example, thumbnail tabs to see a comparison of forecasts 
- Control over labels and units 
- Additional data at locations, or over spatial domains. 
- Change the display time without changing the system time 
- These options are best to play with and explore yourself!

Module Summary

- The Map Display (Explorer.xml) and Spatial Display (SpatialDisplay.xml) allow for high configurable views of spatial data, both static and dynamic.
- The Explorer.xml contains additional system information, including what tasks are available in the interface.
- The SpatialDisplay.xml is used specifically for dynamic, spatial data. This can be gridded data along with, for example, scalar data that is location specific.
- External Web Mapping Services (WMS) and Map Layers can also be included.
- Multiple tools are built within FEWS to assist with the building of these displays.

Additional Resources

🏠 Google [“Delft-FEWS WIKI”](#)

🏠 Google [“Delft-FEWS Configuration Guide”](#)

🏠 Google [“Delft-FEWS Forum”](#)

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