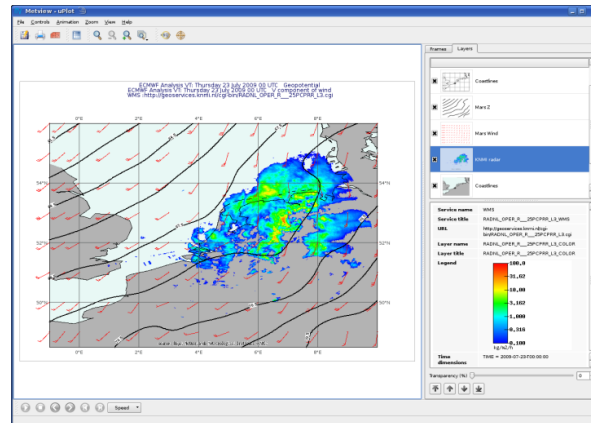


# Metview 4

## Bringing OGC Services to the Desktop



**Sándor Kertész**

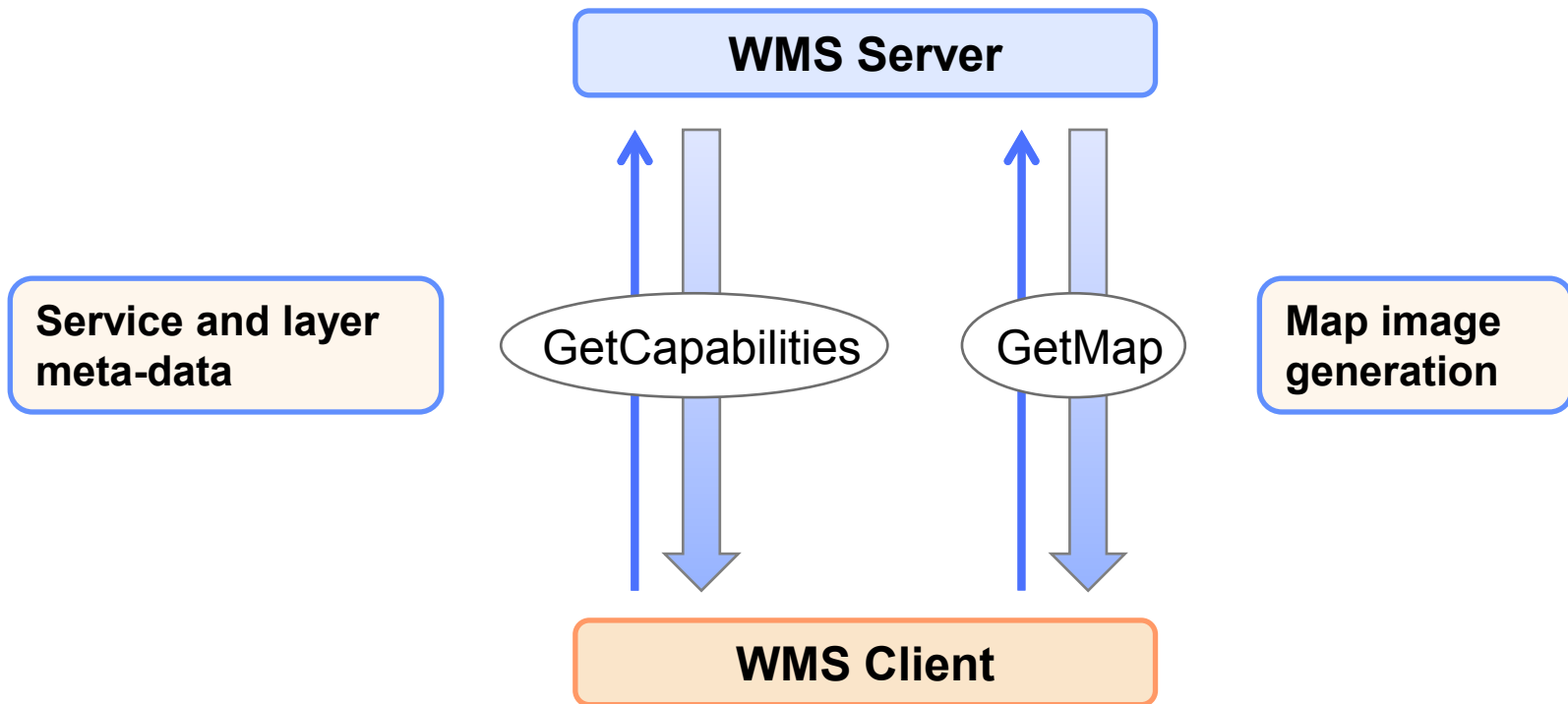
***Meteorological Visualisation Section***

***ECMWF***

# Outline

- **Web Map Service Client**
- **Web Coverage Service Client**

# Web Map Service (WMS)



**The concept fits very well into Metview's client-server architecture!**

# WMS Client icon



- It was designed to be as **generic** as possible: it simply stores a **GetMap** request and some meta-data
- Metview actions associated with this icon:



**Edit:** build and modify the request and generate a preview



**Visualise:** run the request and plot the resulting map image

# WMS Editor

The screenshot shows the WMS Editor application window titled "Metview - WMS Client Editor- NASA loop". The interface includes a menu bar (File, View, Help), a browser-style address bar with the URL "http://neowms.sci.gsfc.nasa.gov/wms/wms", and a "Version" dropdown set to "Default". Below the address bar are fields for "Format" (set to "image/png") and "Extra getCap param:". The main area is divided into several panels:

- Layer tree:** A list of layers with expandable icons. A red arrow points to "Sea Surface Temperature 1981-2006 (1 month - AVHRR)".
- Layer settings:** A panel for configuring the selected layer. It includes:
  - Styles:** A dropdown menu set to "RGB Style".
  - CRS:** A dropdown menu set to "CRS:84".
  - Time:** A date range selector set to "2006-01-01/2006-12-01/P1M". Below it, a list of time slices is shown, with "1981-09-01/2006-12-01/P1M" selected.
- Individual requests (maximum 128):** A table with columns "Frame" and "Request". It contains six rows of generated WMS GetMap requests, each corresponding to a frame. A red arrow points to the first request.

Callouts in blue rounded rectangles highlight key features:

- URL:** Points to the address bar.
- Layers:** Points to the Layer tree.
- Layer properties, dimensions:** Points to the Layer settings panel.
- Automatically generated GetMap requests:** Points to the Individual requests table.

# WMS Editor - Preview

The screenshot shows the 'Metview - WMS Client Editor- NASA loop' application window. The browser address bar displays 'http://neowms.sci.gsfc.nasa.gov/wms/wms'. The interface is divided into several sections:

- Layer tree:** A list of layers on the left, with 'Sea Surface Temperature 1981-2006 (1 month - AVHRR)' selected.
- Layer information panel:** A detailed view of the selected layer's metadata, including:
  - Title:** Sea Surface Temperature 1981-2006 (1 month - AVHRR)
  - Name:** AVHRR\_SST\_M
  - Abstract:** Sea surface temperature is the temperature of the top millimeter of the ocean's surface. Sea surface temperatures influence weather, including hurricanes, as well as plant and animal life in the ocean. Like Earth's land surface, sea surface temperatures are warmer near the equator and colder near the poles. Currents like giant rivers move warm and cold water around the world's oceans. Some of these currents flow on the surface, and they are obvious in sea surface temperature images. These data are collected by an ongoing series of National Oceanic and Atmospheric Administration (NOAA) satellites.
  - CRS:** CRS:84
  - Style:** RGB Style
  - Preview:** A world map showing sea surface temperature data with a color scale from -2 to 35 degrees Celsius.
  - Legend:** A color scale legend for the temperature data.
  - Logo:** A small logo for the service.
- Callout box:** A blue rounded rectangle on the left contains the text 'Layer meta-data, preview and legend', with a red arrow pointing to the selected layer in the tree.

# WMS Editor - Manual Editing

The screenshot shows the 'Metview - WMS Client Editor- NASA loop' window. The interface is divided into several sections:

- Editable request parameters:** A form on the left with fields for URL, Version (1.3.0), Layer (AVHRR\_SST\_M), Style (rgb), CRS/SRS (CRS:84), BBox (-180.0,-90.0,180.0,90.0), Width (1024), Height (512), Format (image/png), Transparent (TRUE), Extra params, Time (2006-01-01/2006-12-01/P1M), and Elevation.
- Individual requests (maximum 128):** A table with 9 rows, each containing a 'Frame' number and a 'Request' URL. The URLs are identical, following the pattern: `http://neowms.sci.gsfc.nasa.gov/wms/wms?SERVICE=WMS&VERSION=1.3.0&REQUEST=GetMap&LAYERS=AVHRR_SST_M&STYLES=rgb&CRS=CRS:84&BBOX=-180.0,-90.0,180.0,90.0&WIDTH=1024&HEIGHT=512&FORMAT=image/png&TRANSPARENT=TRUE&TIME=2006-01-01`
- Preview:** A small image showing a global map with a color scale, representing the AVHRR SST data.

Annotations with red arrows and blue callout boxes highlight key features:

- Editable request parameters:** A callout box on the left points to the parameter form.
- GetMap requests:** A callout box on the right points to the list of requests.
- Preview:** A callout box at the bottom right points to the map preview image.

# WMS Visualisation



execute

examine

save

analyse

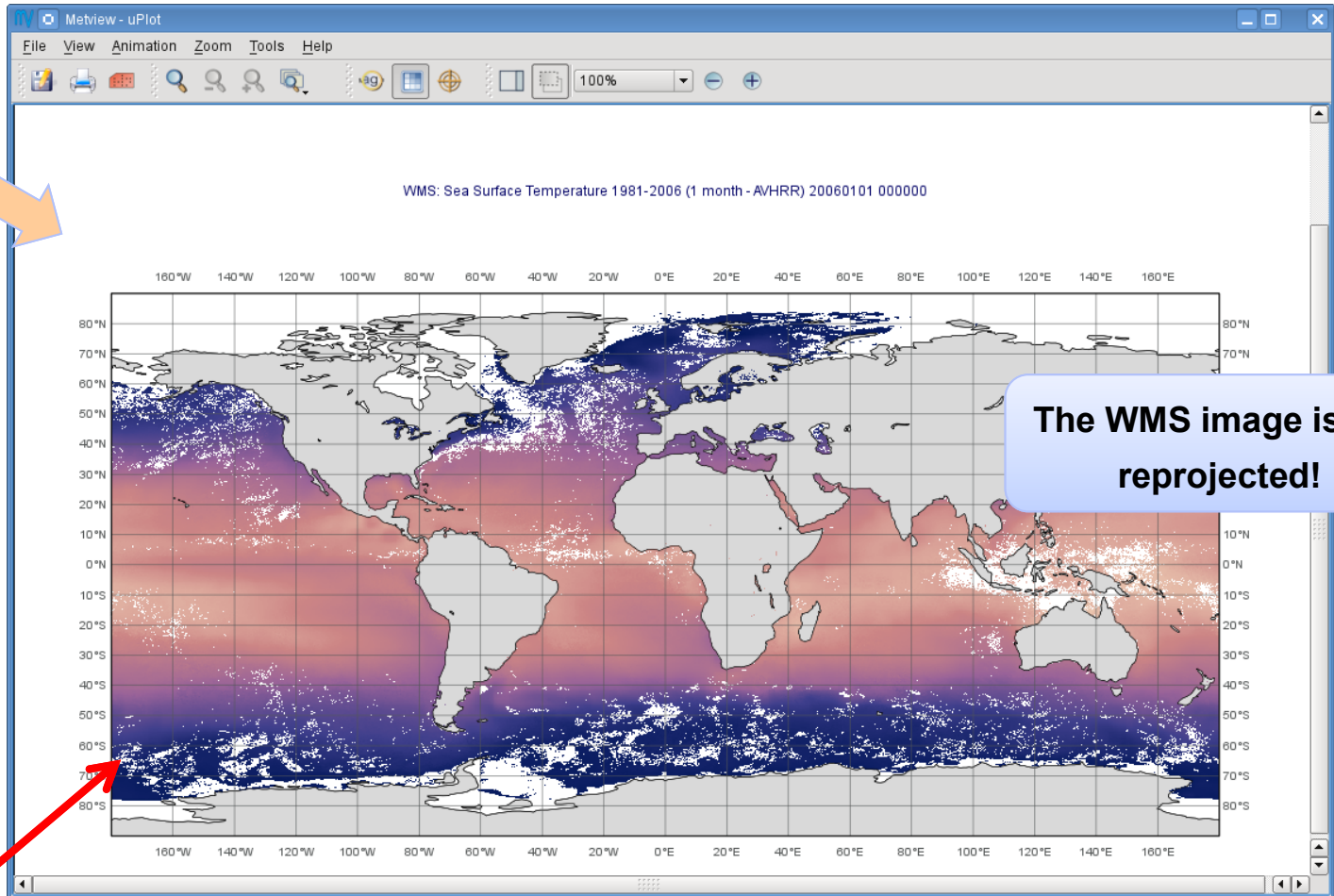
edit

duplicate

delete

empty

output

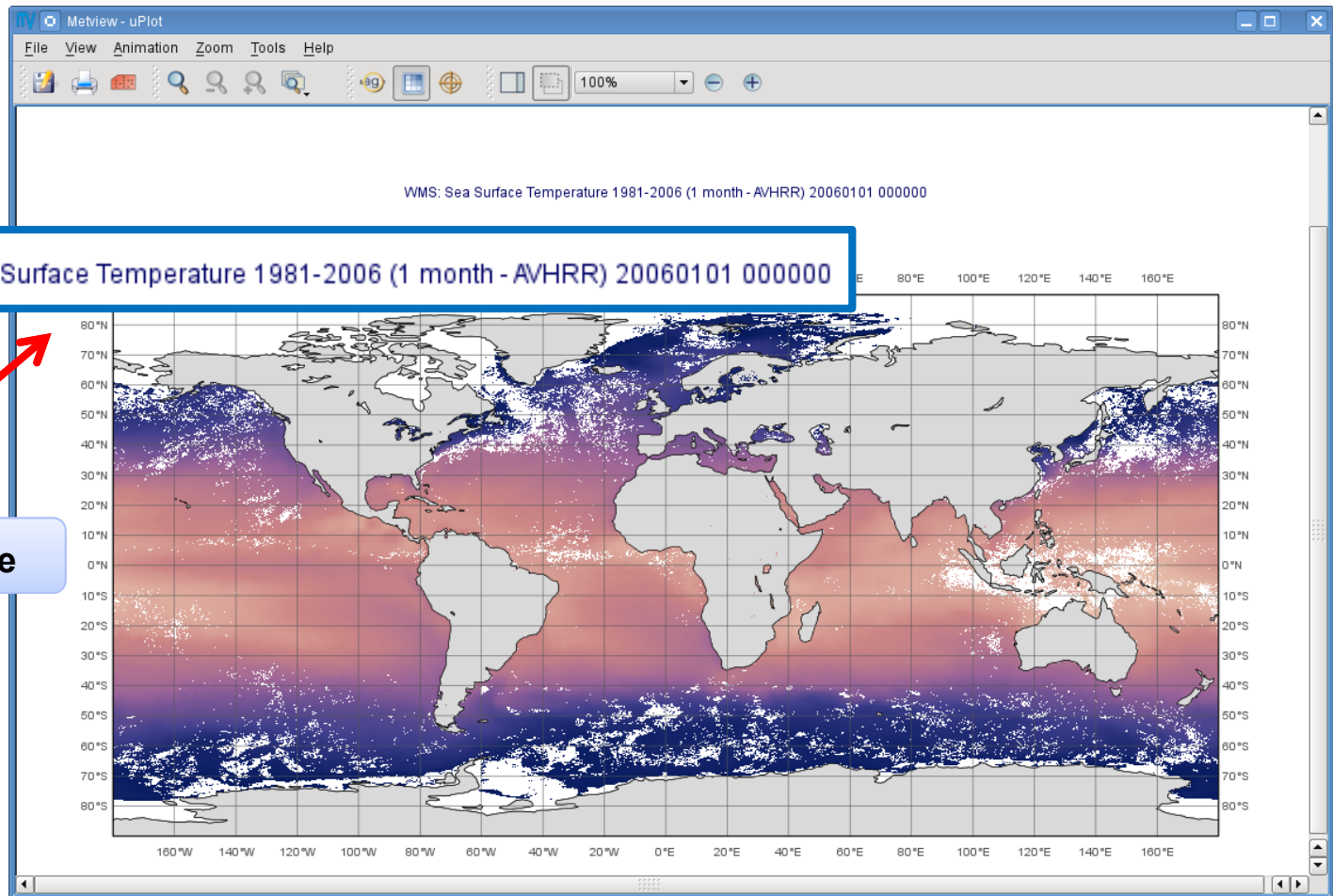


The WMS image is not reprojected!

Metview coastlines + grid



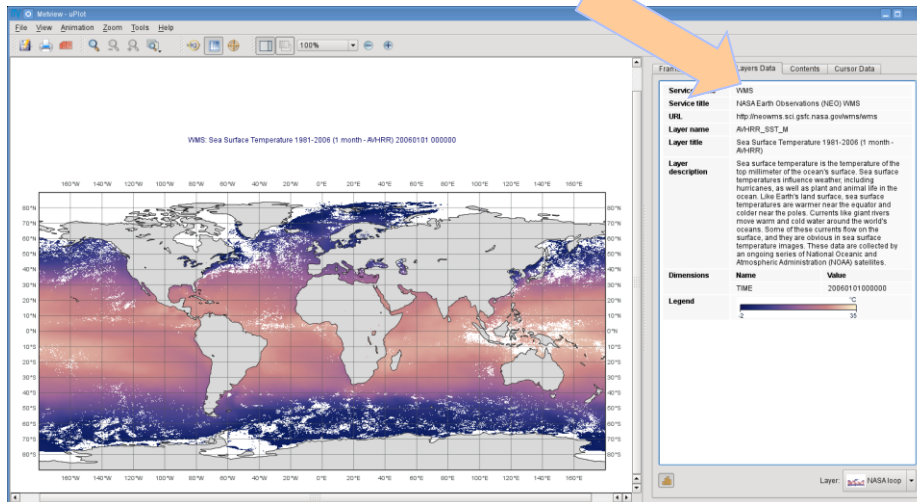
# Using WMS Meta-data



Automatic title

# Using WMS Meta-data

## Layer Data panel

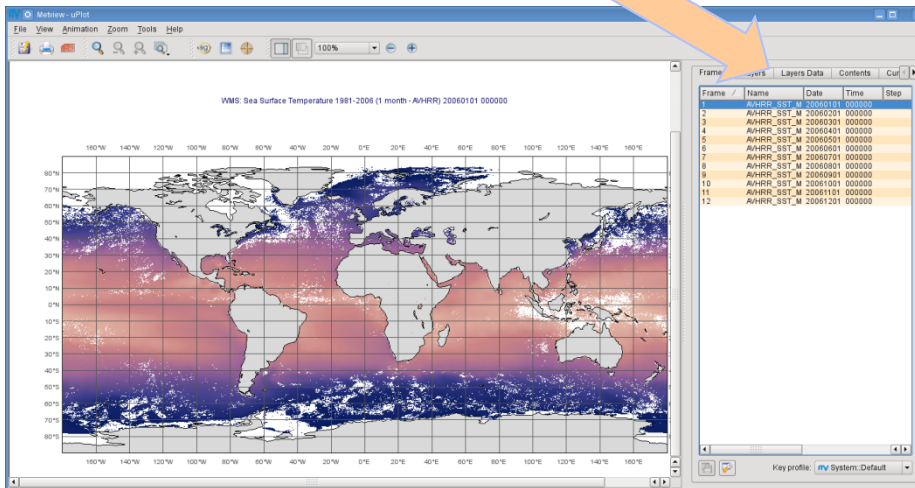


## Detailed information and legend

Frames	Layers	Layers Data	Contents	Cursor Data
<b>Service name</b>	WMS			
<b>Service title</b>	NASA Earth Observations (NEO) WMS			
<b>URL</b>	<a href="http://neowms.sci.gsfc.nasa.gov/wms/wms">http://neowms.sci.gsfc.nasa.gov/wms/wms</a>			
<b>Layer name</b>	AVHRR_SST_M			
<b>Layer title</b>	Sea Surface Temperature 1981-2006 (1 month - AVHRR)			
<b>Layer description</b>	<p>Sea surface temperature is the temperature of the top millimeter of the ocean's surface. Sea surface temperatures influence weather, including hurricanes, as well as plant and animal life in the ocean. Like Earth's land surface, sea surface temperatures are warmer near the equator and colder near the poles. Currents like giant rivers move warm and cold water around the world's oceans. Some of these currents flow on the surface, and they are obvious in sea surface temperature images. These data are collected by an ongoing series of National Oceanic and Atmospheric Administration (NOAA) satellites.</p>			
<b>Dimensions</b>	<b>Name</b>	<b>Value</b>		
	TIME	20060101000000		
<b>Legend</b>	<p>Legend:  °C -2 35</p>			

# Using WMS Meta-data

Animation frames panel



A close-up view of the "Frames" panel table. A red arrow points from the "WMS meta-data is mapped to generic keys" text to the table.

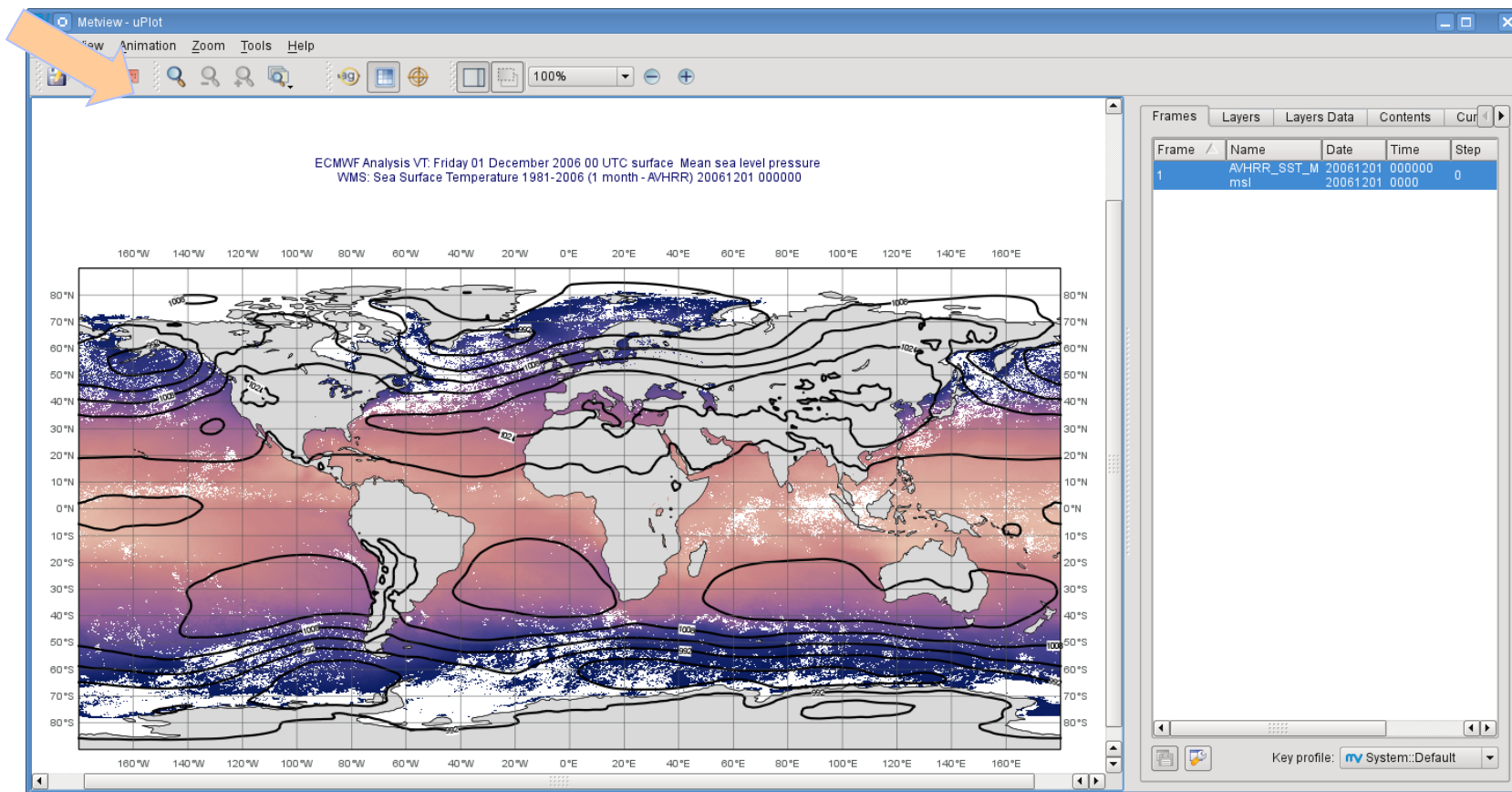
Frame	Name	Date	Time
1	AVHRR_SST_M	20060101	000000
2	AVHRR_SST_M	20060201	000000
3	AVHRR_SST_M	20060301	000000
4	AVHRR_SST_M	20060401	000000
5	AVHRR_SST_M	20060501	000000
6	AVHRR_SST_M	20060601	000000
7	AVHRR_SST_M	20060701	000000
8	AVHRR_SST_M	20060801	000000
9	AVHRR_SST_M	20060901	000000
10	AVHRR_SST_M	20061001	000000
11	AVHRR_SST_M	20061101	000000
12	AVHRR_SST_M	20061201	000000

WMS meta-data  
is mapped to  
generic keys

# WMS Overlay



ECMWF MSLP analysis from MARS (GRIB)



# WMS in Macro

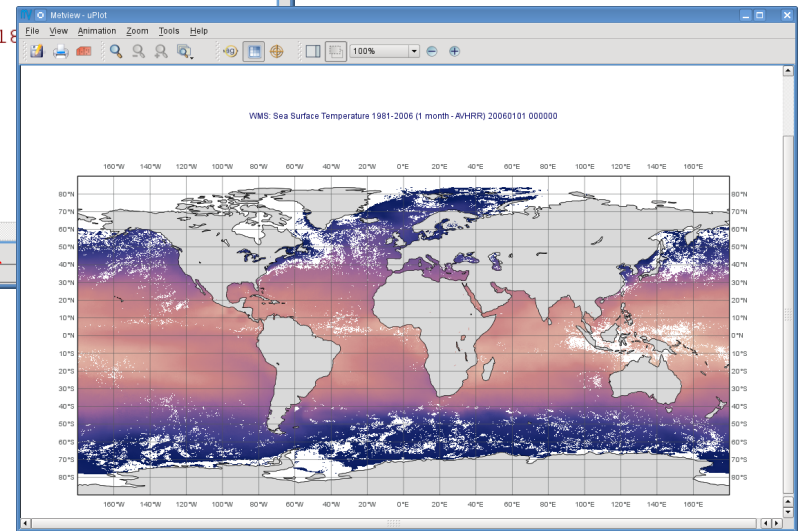


## Macro Editor

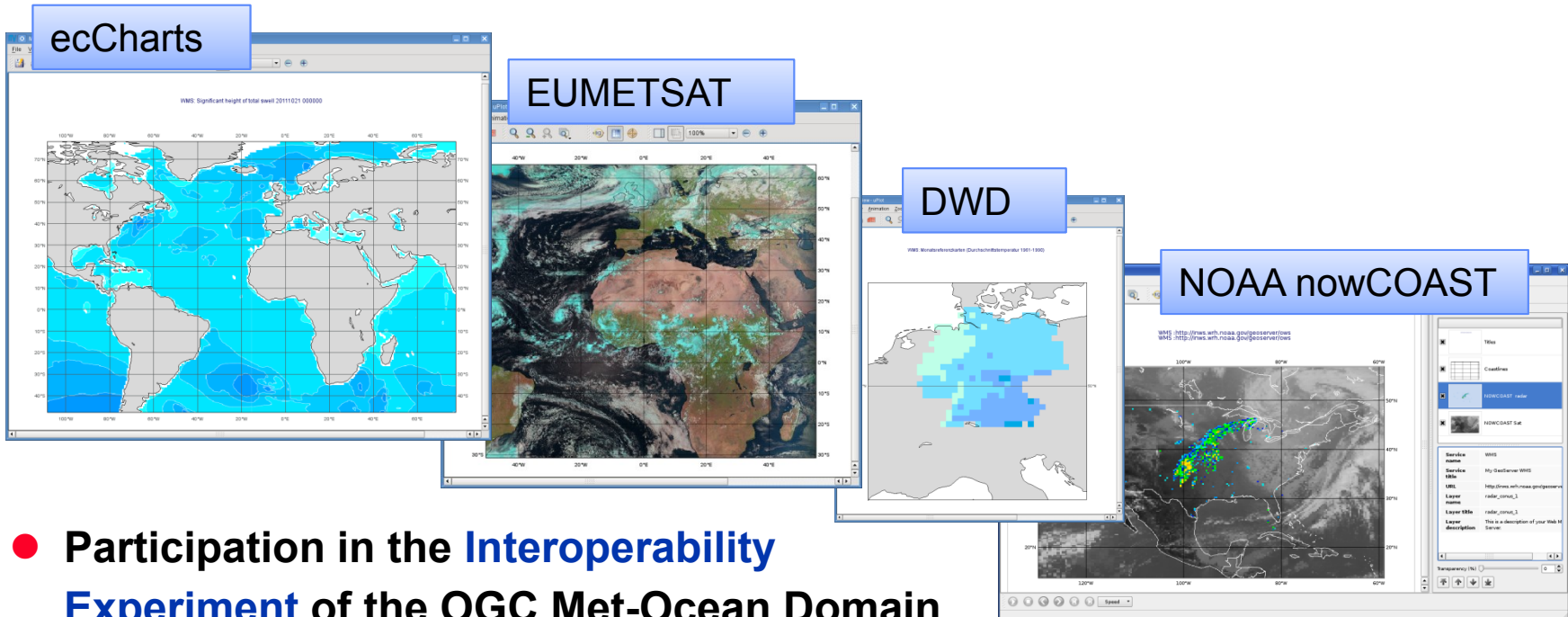
```
Macro* - /home/graphics/cgr/...
File Edit View Insert Program Settings Help

tview Macro
2
3 nasa_wms = wmsclient(
4     server : "http://neowms.sci.gsfc.nasa.gov/wms/wms",
5     version : "Default",|
6     request : "http://neowms.sci.gsfc.nasa.gov/wms?SERVIC
7     layer_title : "Sea Surface Temperature 1981-2006 (1 month
8     layer_description : "Sea surface temperature is the tem
9     service_title : "NASA Earth Observations (NEO) WMS",
10    layer_legend : "http://neo.sci.gsfc.nasa.gov/palettes/
11    time_dimensions : "TIME",
12    max_bounding_box : "-180.0/-90.0/180.0/90.0"
13    )
14
15 plot(nasa_wms)
16
```

Macro code  
automatically  
generated for the  
icon



# Many Tested Services

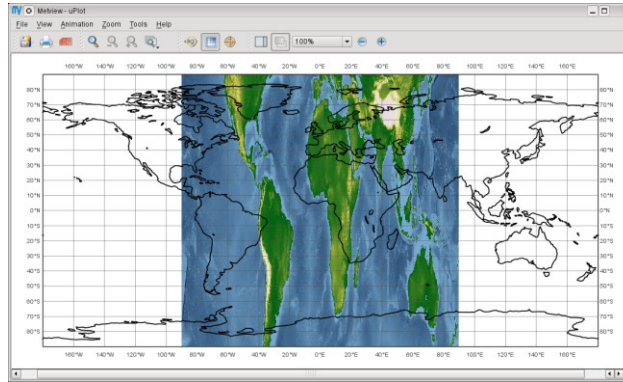


- Participation in the **Interoperability Experiment** of the OGC Met-Ocean Domain Working Group
- Helped us improve our client
- Feedback for service providers

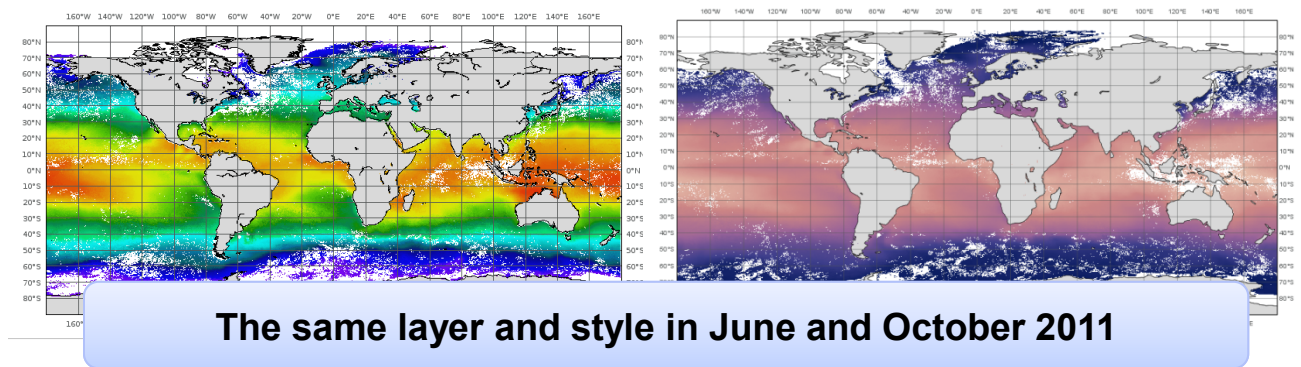
Please send us a link to test!

# Experiences so far

- Hard to find services (catalogues are missing)
- Errors in GetCapabilities



- Insufficient meta-data
- Changing services

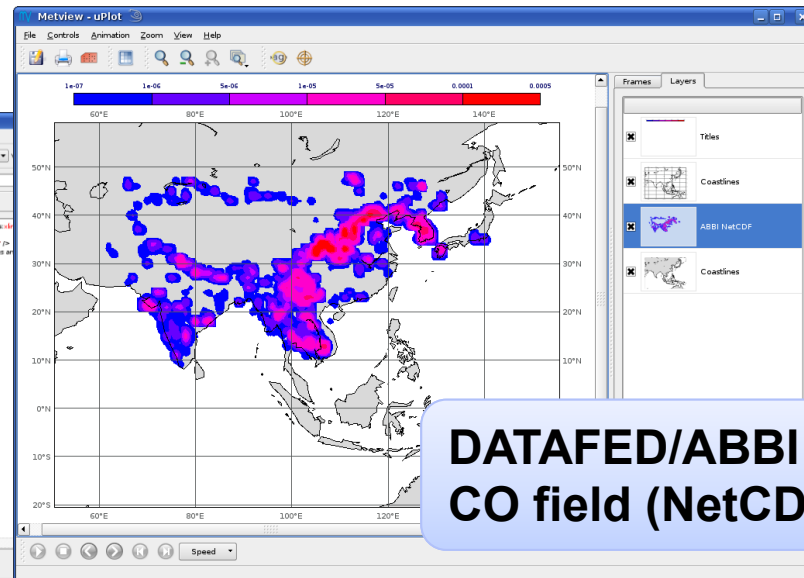
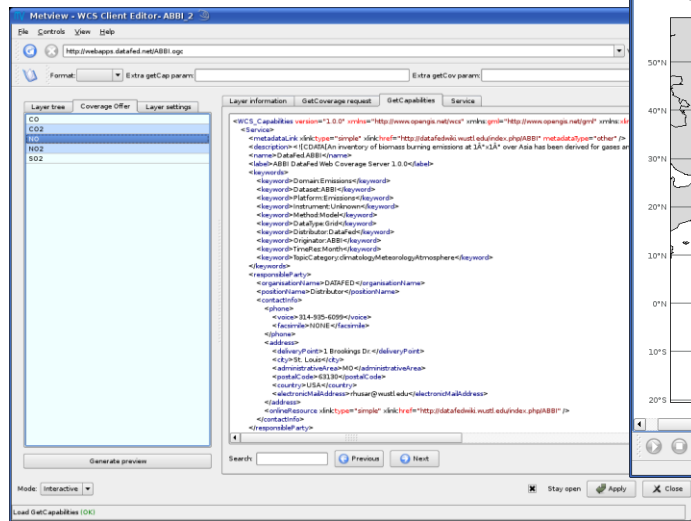


# Web Coverage Service

- WCS serves coverages (gridded datasets)

- WCS Client icon: 

- Still under development



**DATAFED/ABBI –  
CO field (NetCDF)**

- GRIB and NetCDF support



# Further plans

- Continue WMS testing
- Tiling for WMS
- WCS Client prototype in 2012

# For more information ...

email us:

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visit our web pages:

 <http://www.ecmwf.int/publications/manuals/metview/>

subscribe to our RSS feed:

 <http://www.ecmwf.int/publications/manuals/magics/news/graphicsnews.rss>

**QUESTIONS?**