

## Report of the OGC WMS Interoperability session at EGOWS 2014

Contributions from:

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- Conny Claus, DWD
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### Aim

The aim of this session was to test various Web Map Service (WMS) clients against various WMS servers providing meteorological maps and collect the experiences. This was the first interoperability session after the *OGC Best Practice for using Web Map Services (WMS) with Time-Dependent or Elevation-Dependent Data (1.0)* was finalized. The final version of the document is available at

<http://www.opengeospatial.org/standards/wms>

*(please be aware the MetOcean Wiki has outdated versions!)*

Only two service providers had yet implemented the new recommendation. These were the services by KNMI and IBL.

Beside the services listed on the MetOcean Wiki at

[http://external.opengeospatial.org/twiki\\_public/MetOceanDWG/MetocWMS\\_Servers](http://external.opengeospatial.org/twiki_public/MetOceanDWG/MetocWMS_Servers)

the following servers were tested:

- **ECMWF**  
<http://wrep.ecmwf.int/wms/?token=MetOceanIE&request=GetCapabilities&version=1.1.1>
- **MET Norway**  
<http://thredds.met.no/thredds/catalog/arome25/catalog.html>  
<http://bw-wms.met.no/barentswatch/default.map?service=WMS&request=GetCapabilities&version=1.3.0>  
<http://public-wms.met.no/verportal/verportal.map?service=WMS&request=GetCapabilities&version=1.3.0>  
<http://bw-wms.met.no/mapproxy/barentswatch/wmts/1.0.0/WMTSCapabilities.xml>  
(The 2<sup>nd</sup> and 3<sup>rd</sup> server are developed using Mapserver)
- **KNMI**  
[http://geoservices.knmi.nl/cgi-bin/restricted/HARM\\_N55.cgi](http://geoservices.knmi.nl/cgi-bin/restricted/HARM_N55.cgi)
- **IBL**  
<http://ogcie.iblsoft.com/metocean/wms>

This was the list of tested clients:

- NinJo 1.9 Development version
- Metview 4.4.7
- Visual Weather 3.6
- Online Weather 1.6
- KNMI ADAGUC 2.0 web interface
- QGis 2.0
- Google Earth 7.1.2

The last two are non-meteorological GIS clients. They show no support for the TIME dimensions required to animate through forecast data.

### Findings

This is the list of findings during the session:

- Orientation and size of legends makes it difficult to place them in display
  - ECMWF & IBL are horizontal

- KNMI are vertically oriented with a lot of whitespace
- Best Practices can perhaps clarify Req 37 for "units"
  - KNMI uses "hpa"
  - IBL uses "isobaric-surface" (inspired by other example in document "computed\_surface")
- No isolines makes it harder to overlay with other maps
  - e.g. MET Norway radar versus Arome model
  - e.g. what areas of no precipitation are not transparent
  - At least one needs to be flexible ;-)
- Styles in layers might not only be purely graphical
  - Some server also offer different interpolations methods of the data
- Some layers offer extended time frames for years (e.g. 1903-2037)
  - This is because some statistical layers are actually valid for a selected month irrelevant of a year
  - In WMS 1.1 it was not compulsory to give a year, but 1.3 requires a year in the date.
  - Does ISO 8601 have a solution for this?
- Projections need to be checked carefully
  - Best for this are coastlines
  - E.g. ECMWF ecCharts/WMS
- It would be useful to recommend all server for limited list of projections
- Some servers do not correctly express the projection extents (i.e. mapserver), meaning that a request using the default bounding box will fail
- Recommendation to show the extent of the data area
  - E.g. is hard to say if there is no precipitation or out of area.
- Do not cache maps which are sent as error (i.e. ones with error message)

## Recommendations to the MetOcean DWG

These are the recommendations from the event:

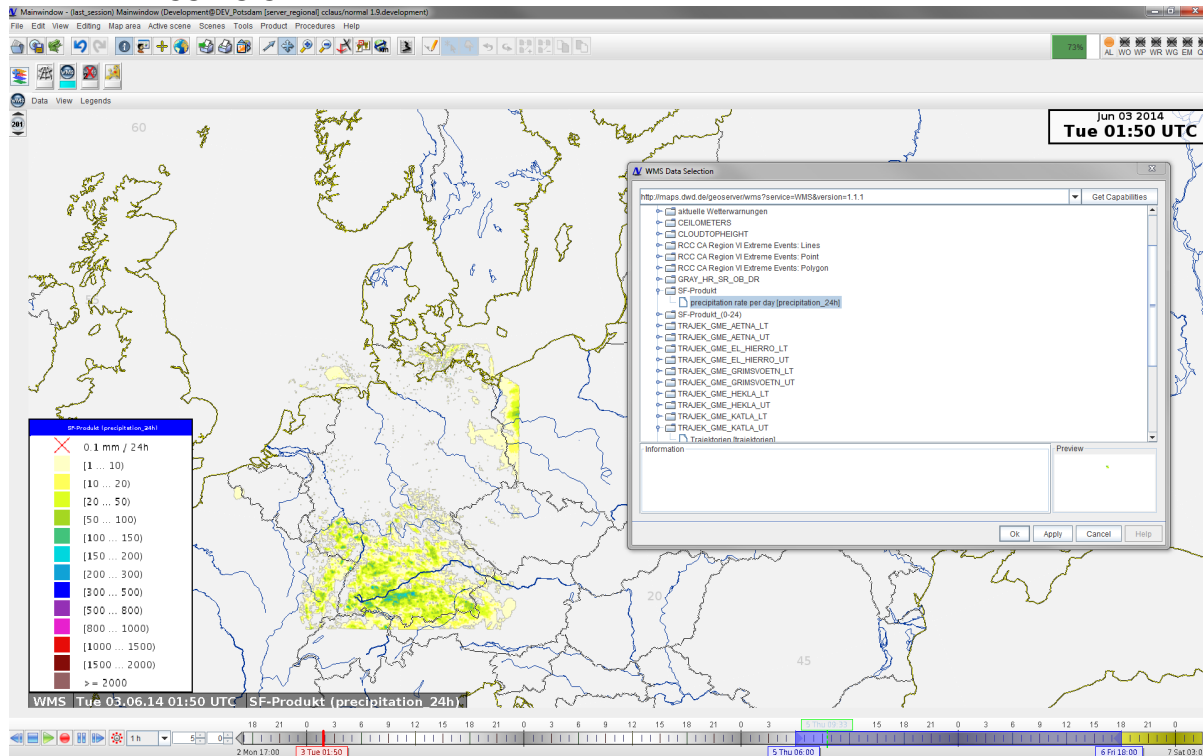
- It would be beneficial to organise a blog to allow everyone to contribute test cases without waiting for IE events.
- The Best Practice document should take the comments above into account
  - Clarify unit naming
  - Clarify more what should (and shouldn't) happen in an error case
    - E.g. suggest not to send blank images as an error
  - Encourage layers to be more transparent for better overlays
    - Do not shade no-precipitation
    - Offer more contour line layers

## Appendix - Examples

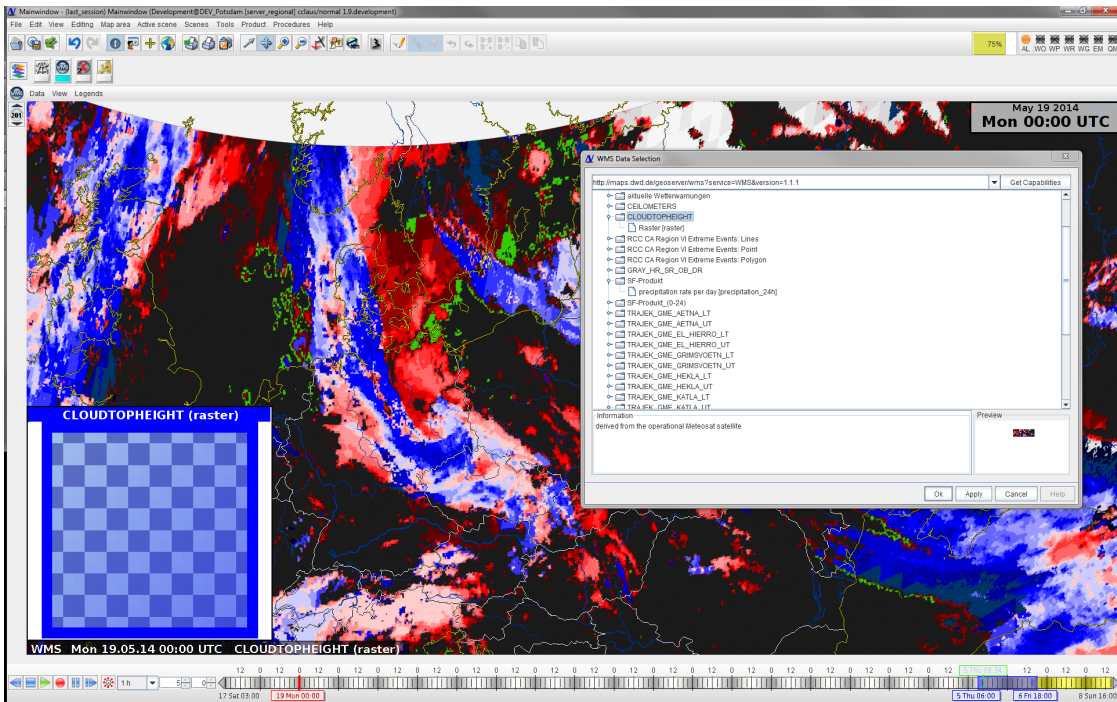
Here are some results from the interoperability experiment. Since clients should be able to overlay multiple layers the results are grouped by the clients used.

### 1. NinJo workstation

#### 1.1. DWD servers

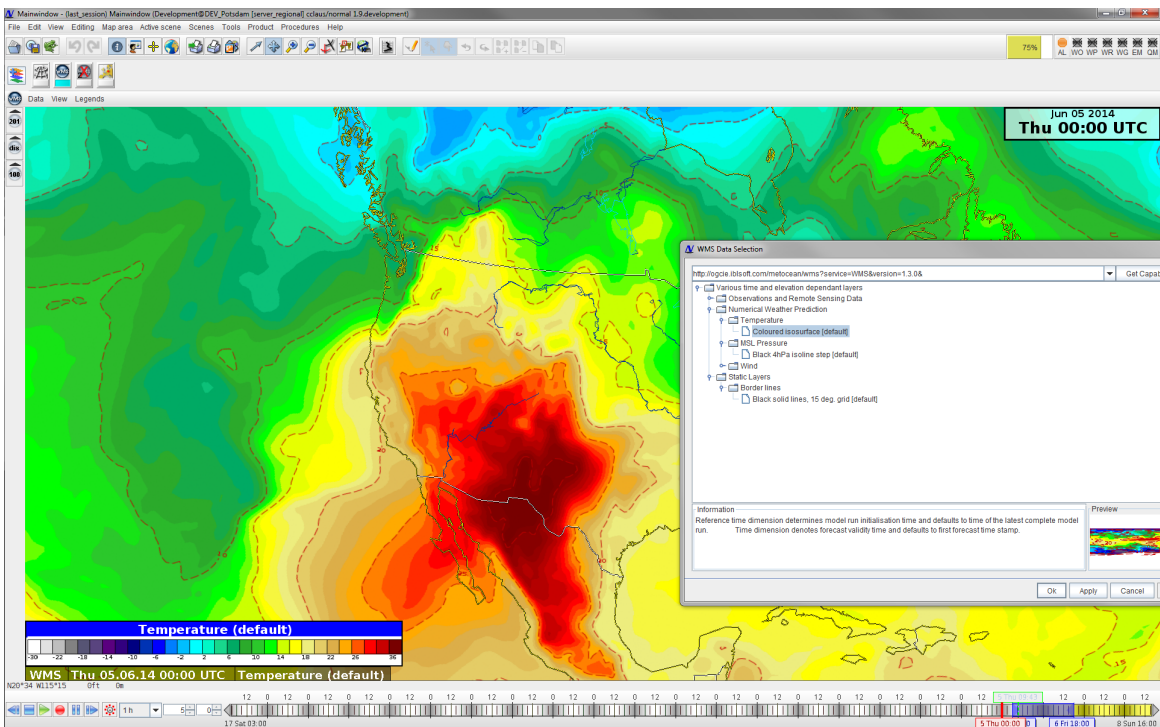


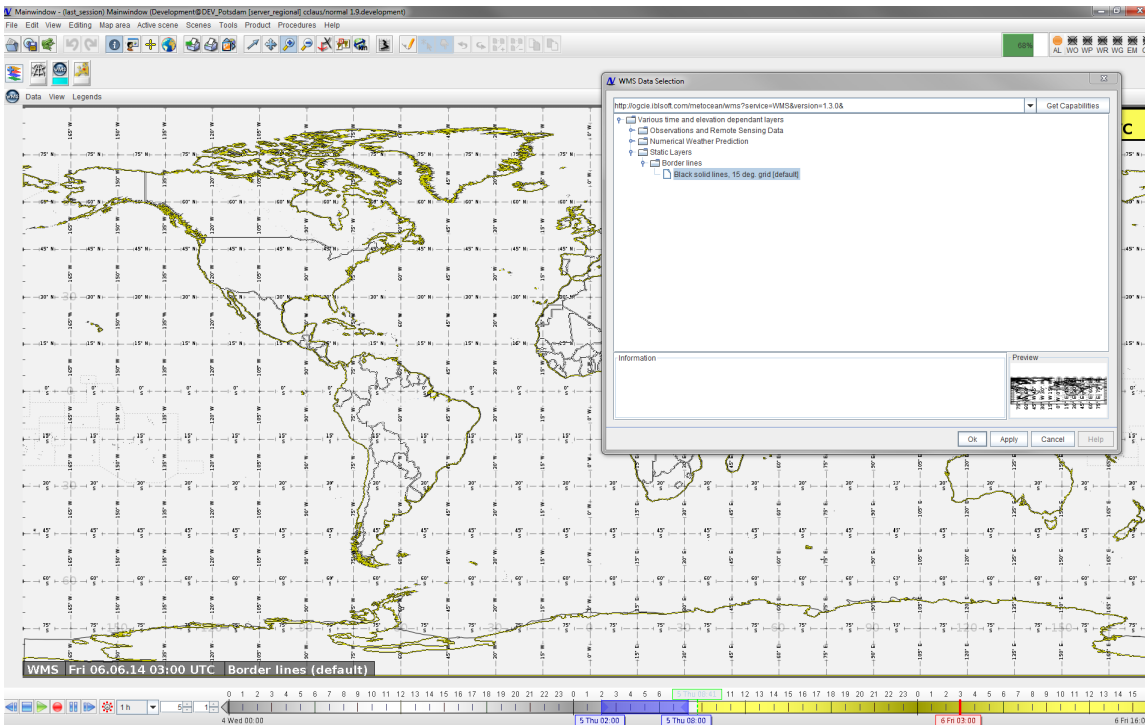
- no default time values for dimensions - when selecting a layer the client does not know which value to specify for these dimensions, user always has to do this manually
- too small legend dimensions (Capabilities says just 10 pixel in width and height)
- content of some legend images is not useful



## 1.2. IBL services

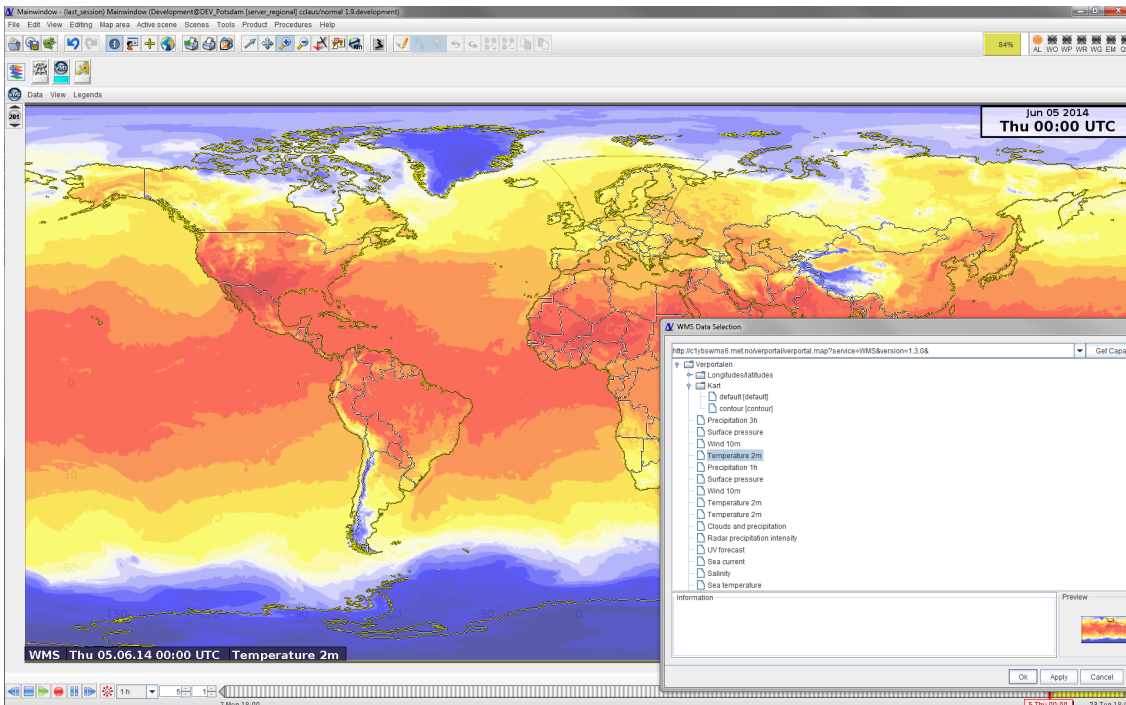
- works (after fixing projection problem in NinJo client)
- missing dimensions in legends of some layers caused problems when parsing Capabilities (was fixed in NinJo client)

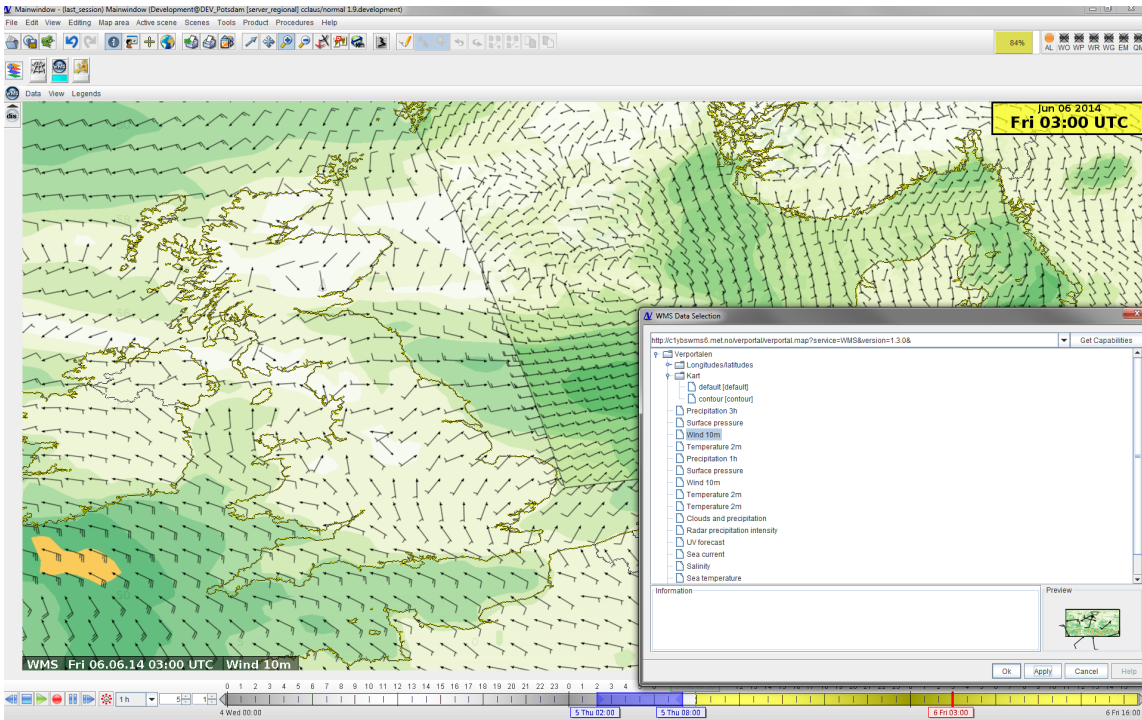




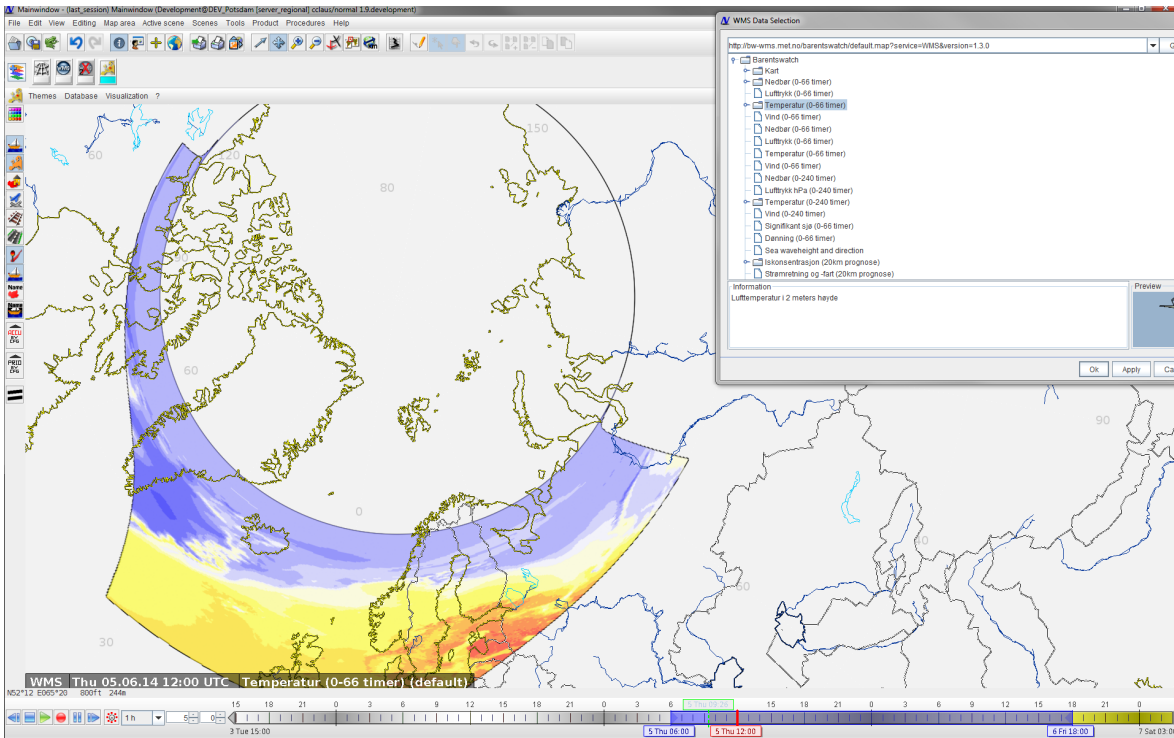
### 1.3. MET Norway services

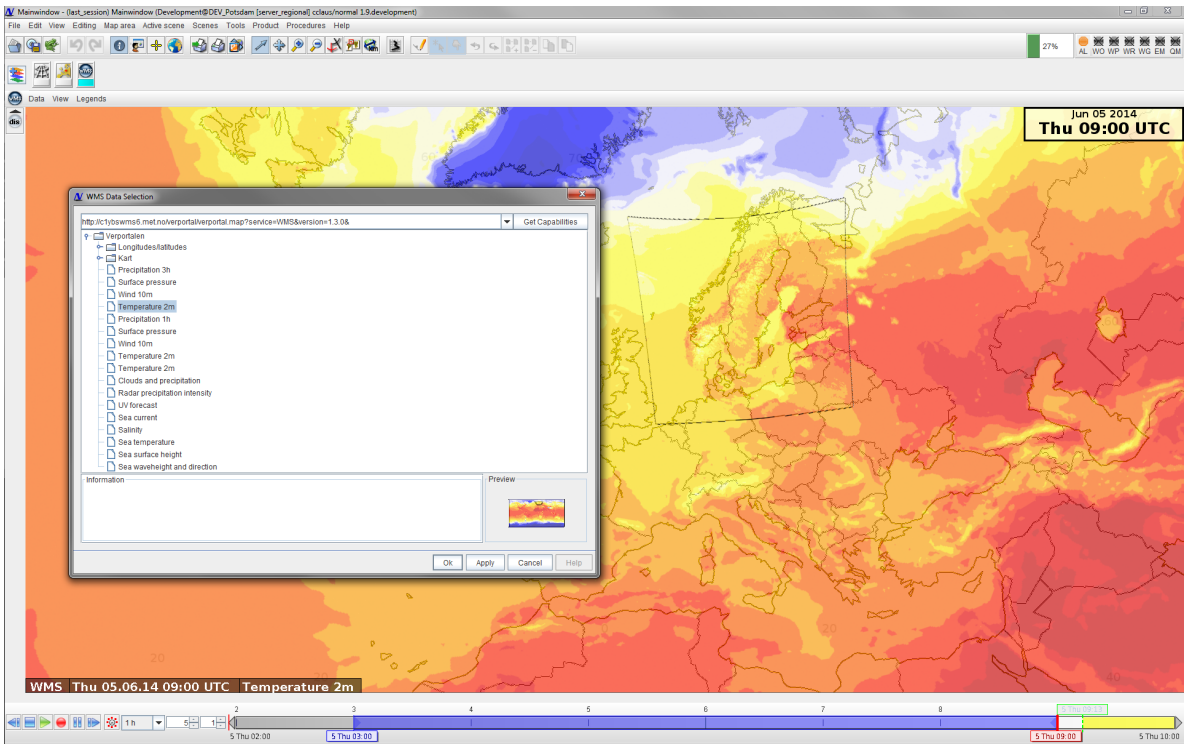
- works when using WGS84 map after minor fix for parting times in capabilities document (see next point)
- problem with time pattern in Capabilities (fixed in the NinJo client by now supporting this additional time pattern)



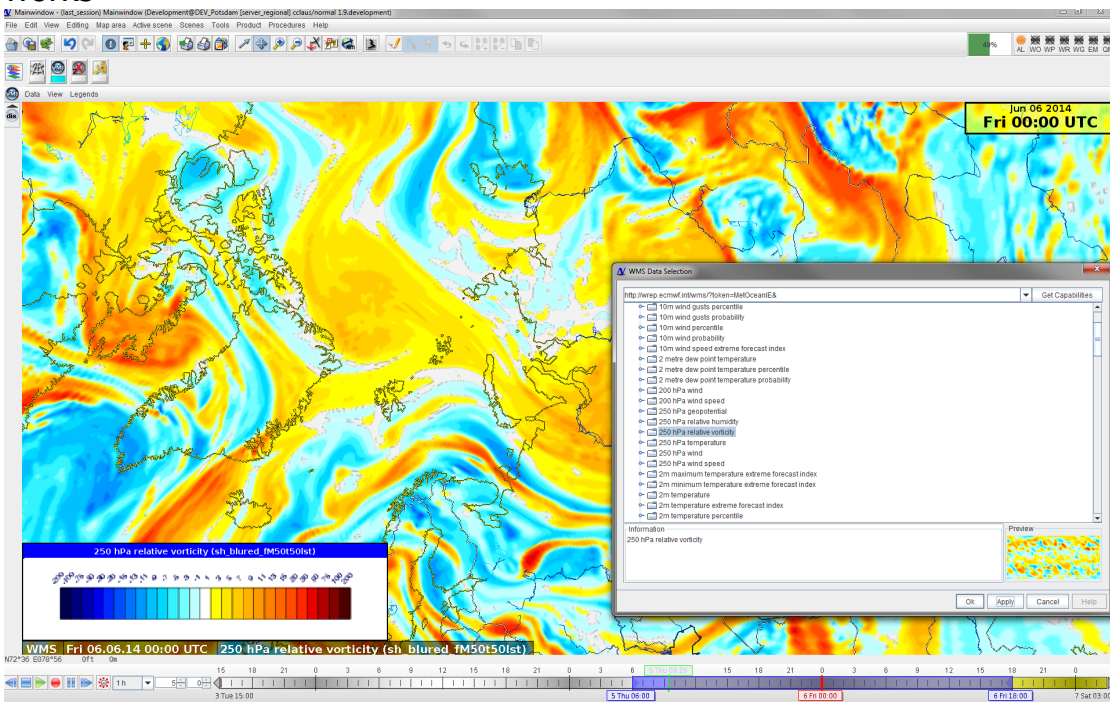


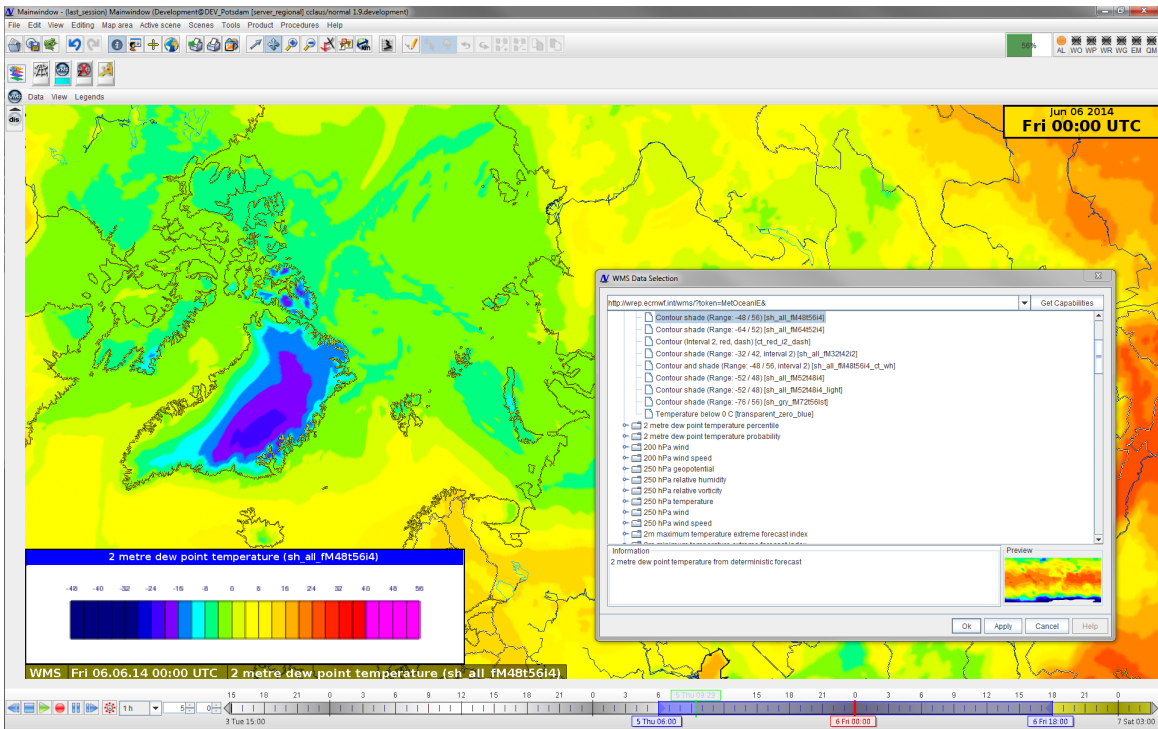
- (client side?) projection problems when using none WGS84 map (the image below should be a HIRLAM in stereographic projection)



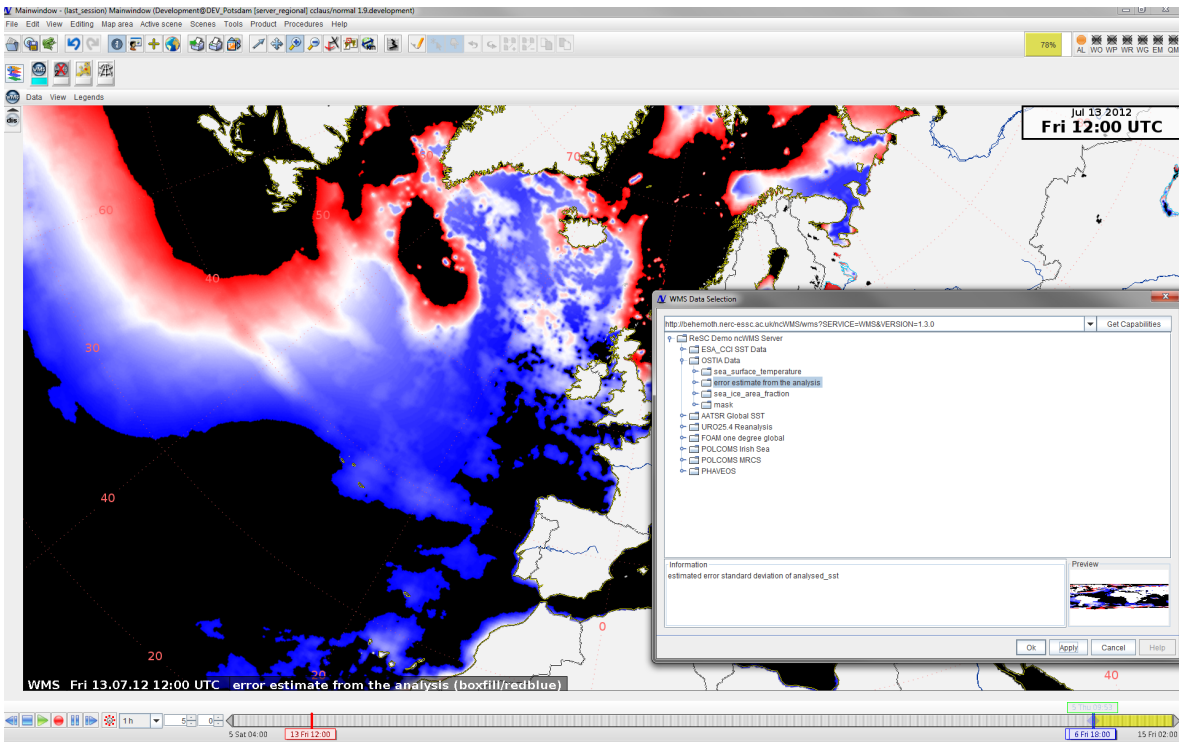


#### 1.4. ECMWF ecCharts/WMS 1.1.1 server works





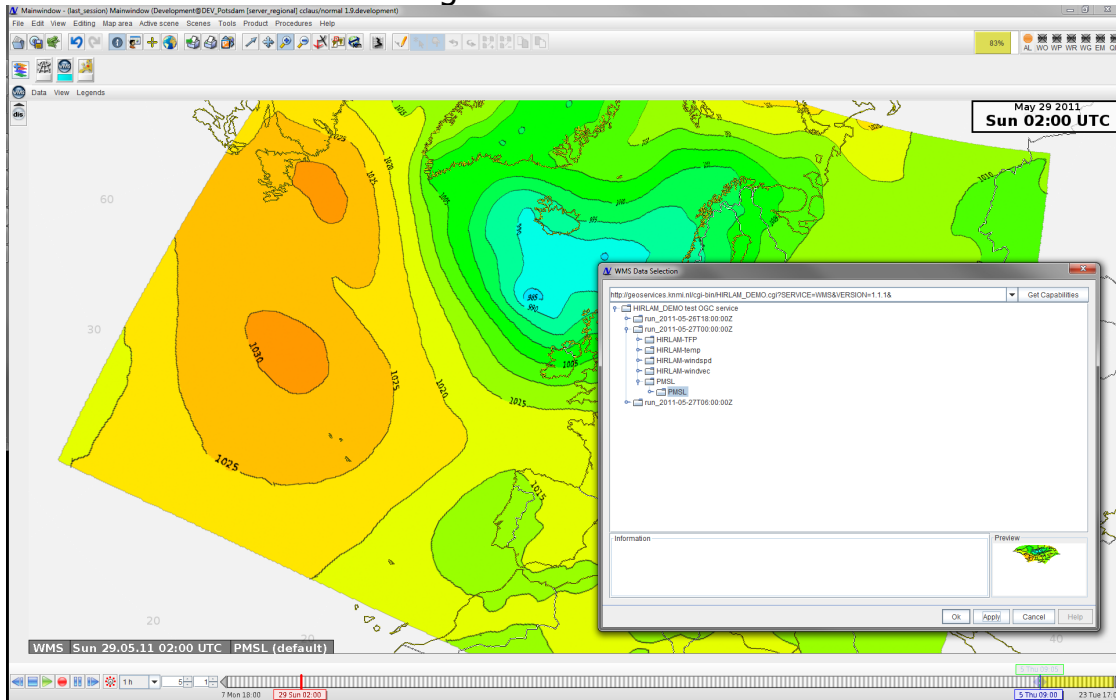
### 1.5. University Reading ncWMS server - works



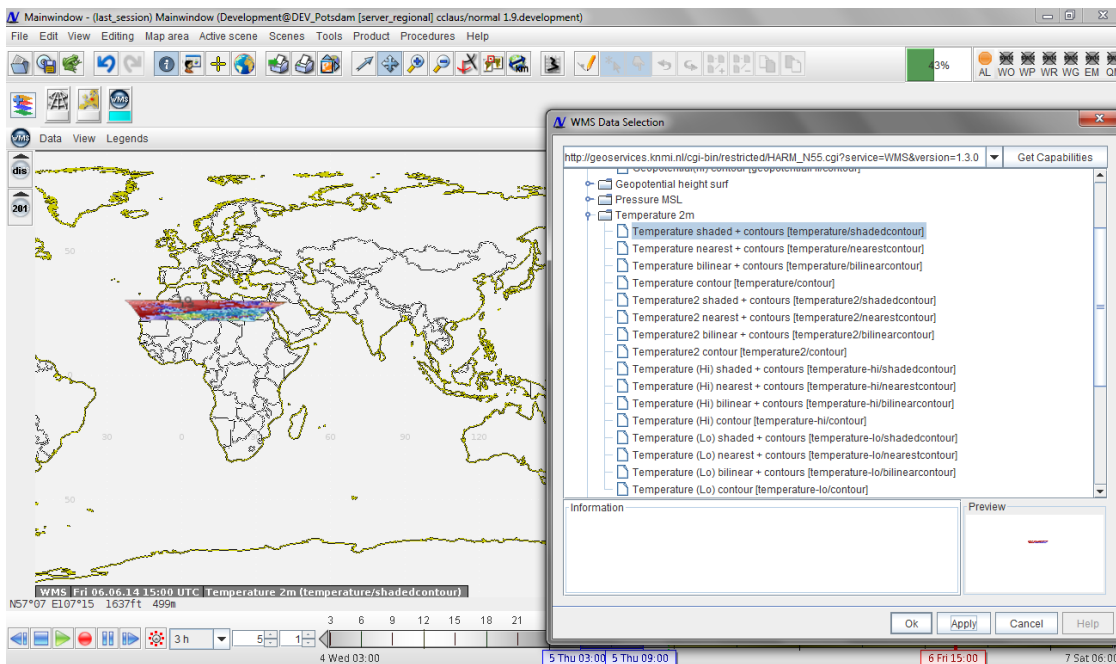


## 1.6. KNMI server

WMS 1.1.1 version is working fine

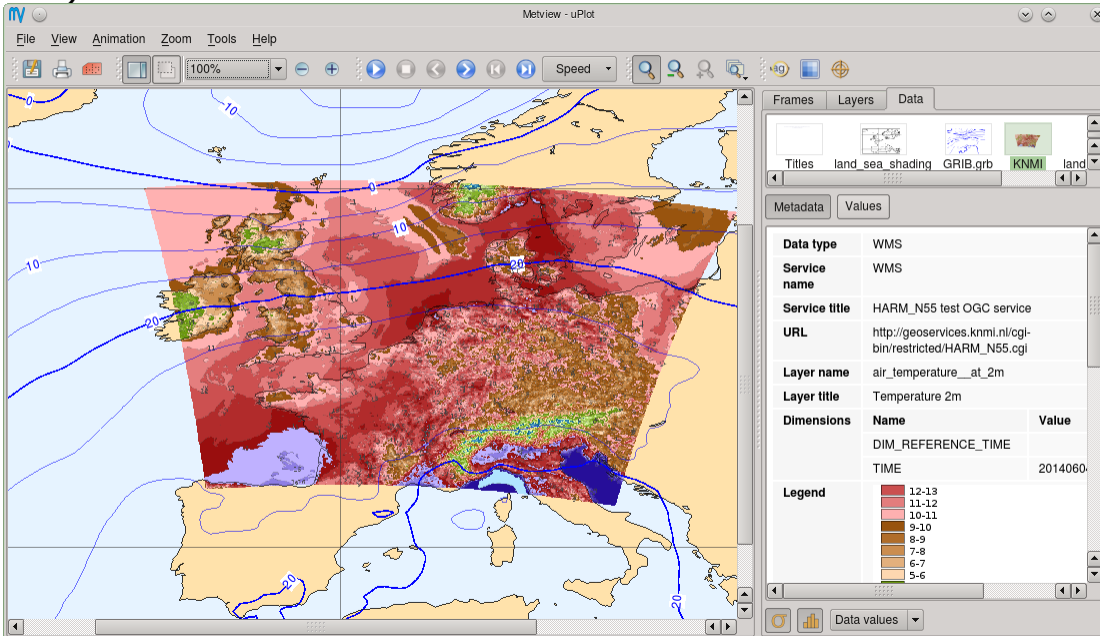


WMS version 1.3.0 server images are not correctly placed caused by missing CRS:84 support of the server

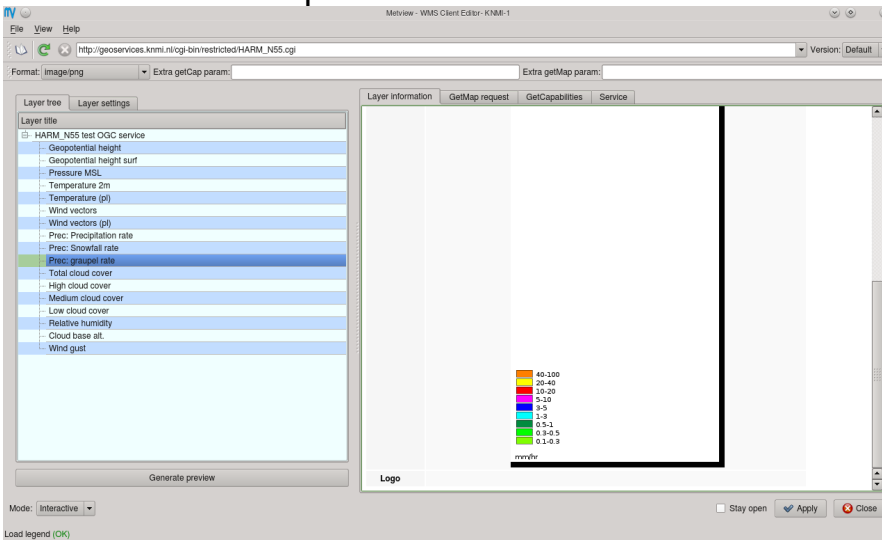


## 2. Metview workstation

### 2.1. KNMI server (version 1.3.0) projection works (here overlaid with a GRIB field)

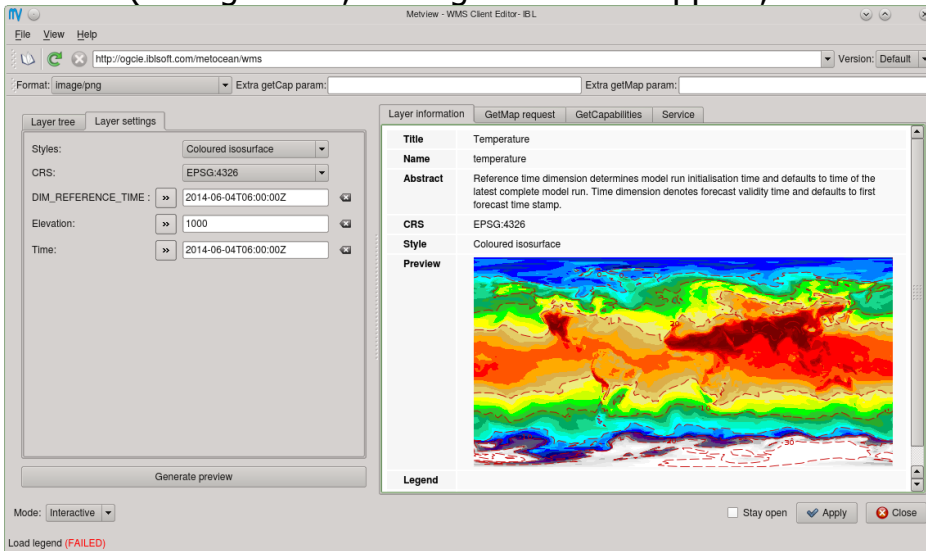


Legends are the same size regardless of content, meaning that they could have a lot of whitespace:



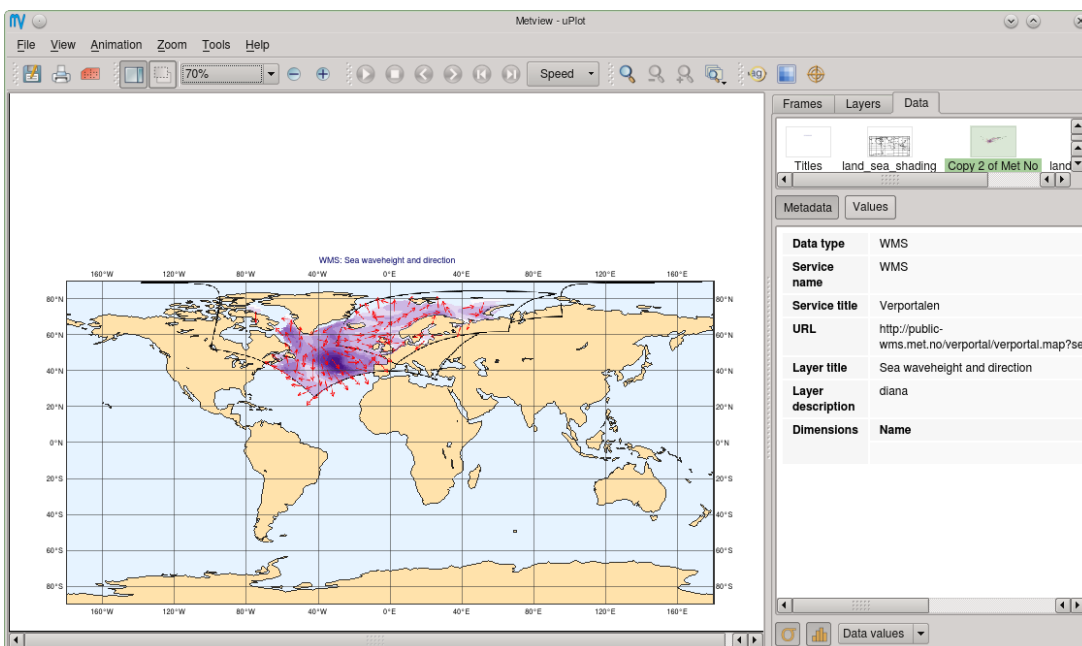
## 2.2. IBL servers

- works (during the IE, the legend did not appear, but later it was ok)



## 2.3. MET Norway services

- works with Metview client, but could not use non-EPSG-4326 projections due to issues with the MapClient server and also restrictions in Metview/Magics.



Metview's WMS request editor did not correctly display the character encoding of the layer names and descriptions:

Metview - WMS Client Editor - Copy 1 of Met No

File View Help

http://bw-wms.met.no/barentswatch/default.map Version: Default

Format: image/png Extra getCap param: Extra getMap param:

Layer tree Layer settings

Layer title

- Barentswatch
  - Kart
  - NedbÅr (0-66 timer)
  - Luftrykk (0-66 timer)
  - Temperatur (0-66 timer)
  - Vind (0-66 timer)
  - NedbÅr (0-66 timer)
  - Luftrykk (0-66 timer)
  - Temperatur (0-66 timer)
  - Vind (0-66 timer)
  - NedbÅr (0-240 timer)
  - Luftrykk hPa (0-240 timer)
  - Temperatur (0-240 timer)
  - Vind (0-240 timer)
  - Signifikant sjÅ (0-66 timer)
  - DÅnning (0-66 timer)
  - Sea waveheight and direction
  - Iskonsentrasjon (20km prognose)
  - SrÅ, mretning og -fart (20km prognose)
  - Sattinnhold og sjÅ, temperatur (20km prognose)
  - Sea current
  - Salinity
  - Sea temperature
  - Sea surface height
  - Ising pÅv fartÅ, y (0-66 timer)
  - Ising pÅv fartÅ, y (0-66 timer)

Generate preview

Mode: Interactive

Load GetCapabilities (OK)

Layer information GetMap request GetCapabilities Service

```
<!--Exception-->
<VendorSpecificCapabilities>
<UserDefinedSymbolization SupportSLD="1" UserLayer="0" UserStyle="1" RemoteWFS="0"/>
<Layer>
<Name>diana</Name>
<Title>Barentswatch</Title>
<Abstract>VÅr/kart fra PROFF datasett, viser fem ulike felt fra atmosfÅremodeller. Disse vil gi et bilde av vÅret 0-66 timer frem i tid
<SRS>EPSG:3575</SRS>
<SRS>EPSG:4326</SRS>
<SRS>EPSG:32633</SRS>
<SRS>EPSG:3857</SRS>
<SRS>EPSG:900913</SRS>
<LatLonBoundingBox minx="-180" miny="-90" maxx="180" maxy="90"/>
<BoundingBox SRS="EPSG:3575" minx="0" miny="0" maxx="2.21263e+06" maxy="1.25484e+07"/>
<BoundingBox SRS="EPSG:4326" minx="-180" miny="-90" maxx="180" maxy="90"/>
<BoundingBox SRS="EPSG:32633" minx="500000" miny="-9.99796e+06" maxx="500000" maxy="9.99796e+06"/>
<BoundingBox SRS="EPSG:3857" minx="-2.00375e+07" miny="-6.18601e+07" maxx="2.00375e+07" maxy="6.18601e+07"/>
<BoundingBox SRS="EPSG:900913" minx="-2.00375e+07" miny="-6.18601e+07" maxx="2.00375e+07" maxy="6.18601e+07"/>
<Attribution>
<Title>Meteorologisk institutt</Title>
<OnlineResource xmlns:xlink="http://www.w3.org/1999/xlink" xlink:href="http://met.no"/>
</Attribution>
<Layer queryable="0" opaque="0" cascaded="1">
<Name>kart</Name>
<Title>Kart</Title>
<SRS>EPSG:3575</SRS>
<SRS>EPSG:4326</SRS>
<SRS>EPSG:32633</SRS>
<SRS>EPSG:3857</SRS>
<SRS>EPSG:900913</SRS>
<LatLonBoundingBox minx="-180" miny="-90" maxx="180" maxy="90"/>
</Layer>
</Layer>
</VendorSpecificCapabilities>
```

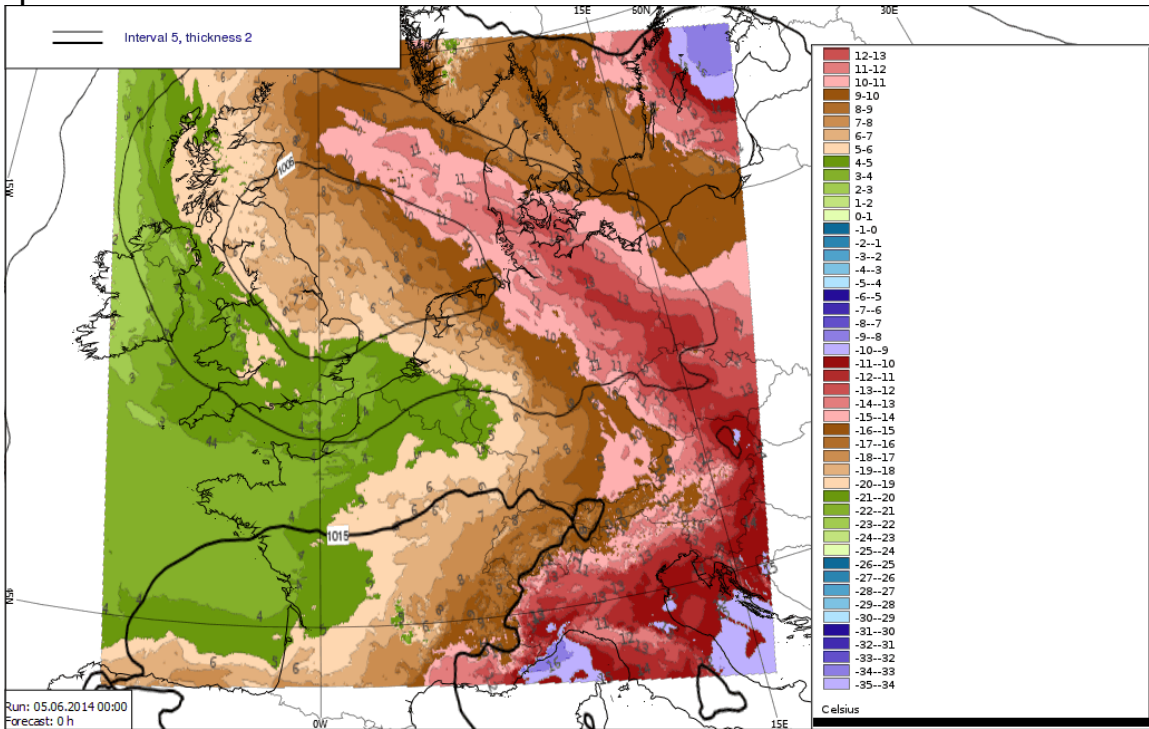
Find epsg Next Previous

Stay open Apply Close

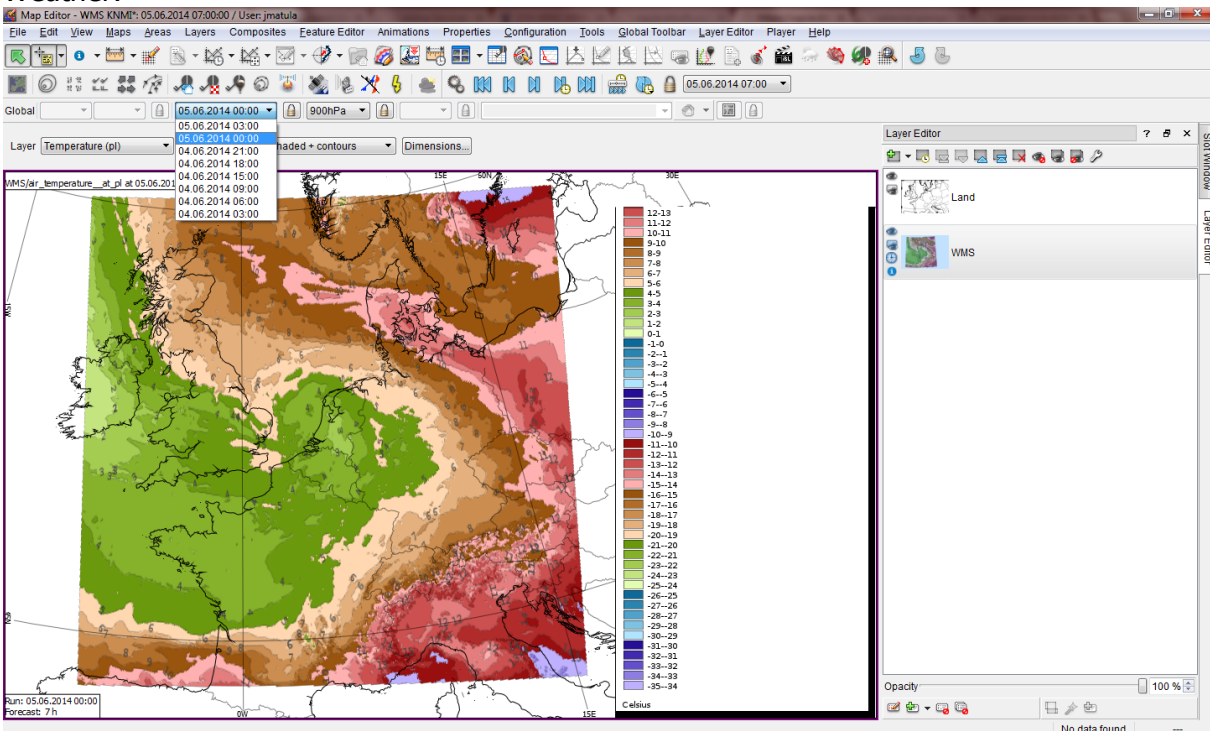
### 3 Visual Weather workstation & Online Weather

#### 3.1 ECMWF server & KNMI server

worked fine and was able to animate. KNMI legend contains much white space.

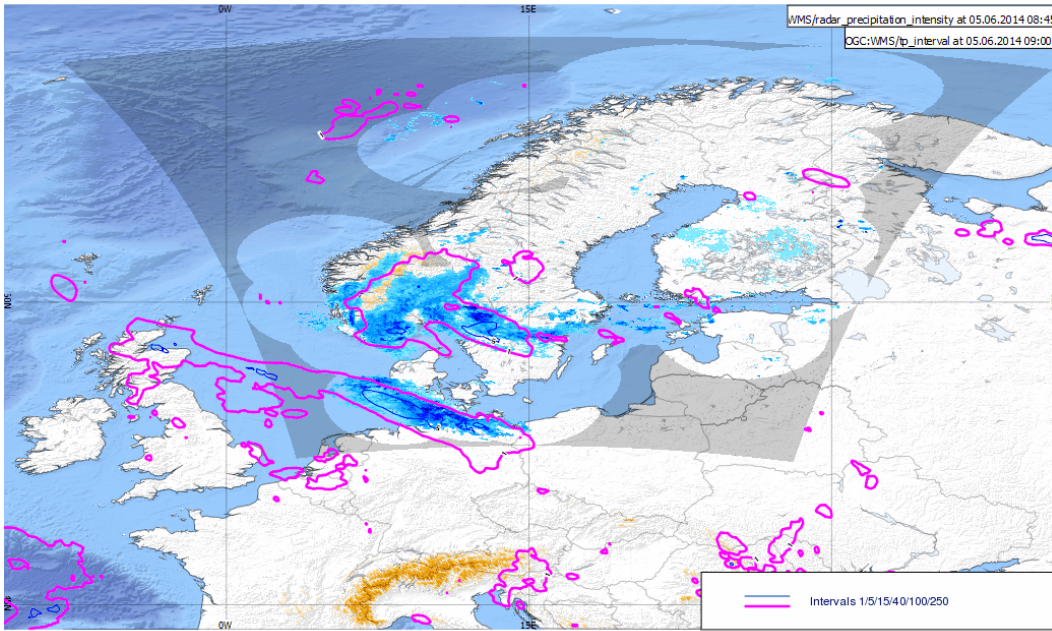


Visual Weather understood REFERENCE\_TIME dimension and ELEVATION dimensions and allowed user to navigate in TIME and ELEVATION together with other data sources in Visual Weather:

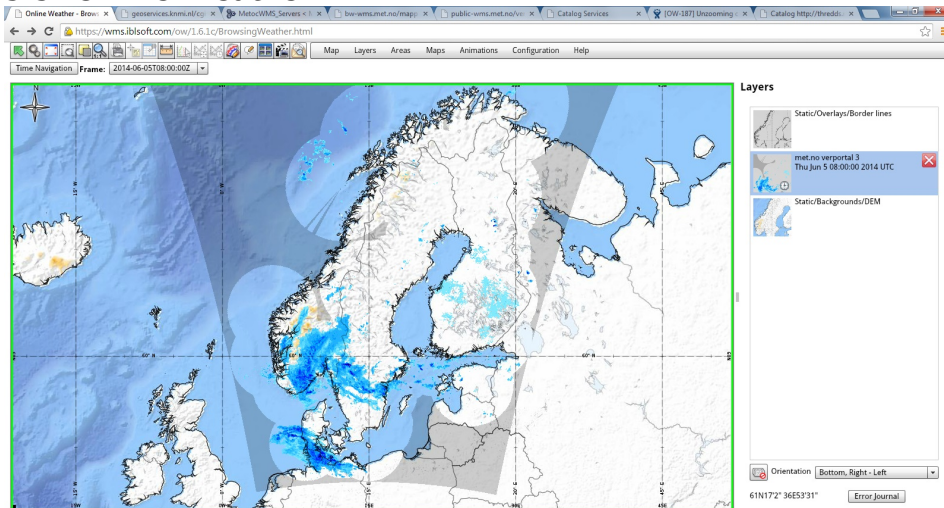


### 3.2 MET Norway radar overlaid with ECMWF forecast

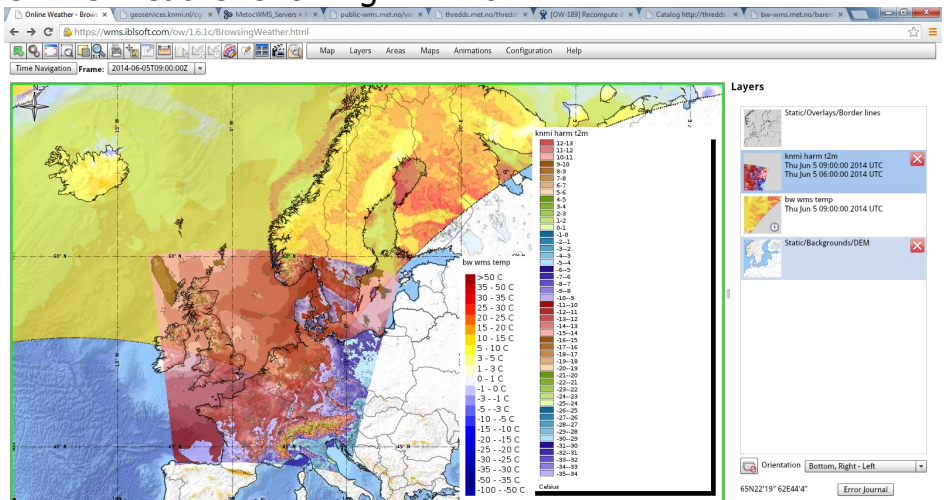
Shows good agreements and was able to animate.



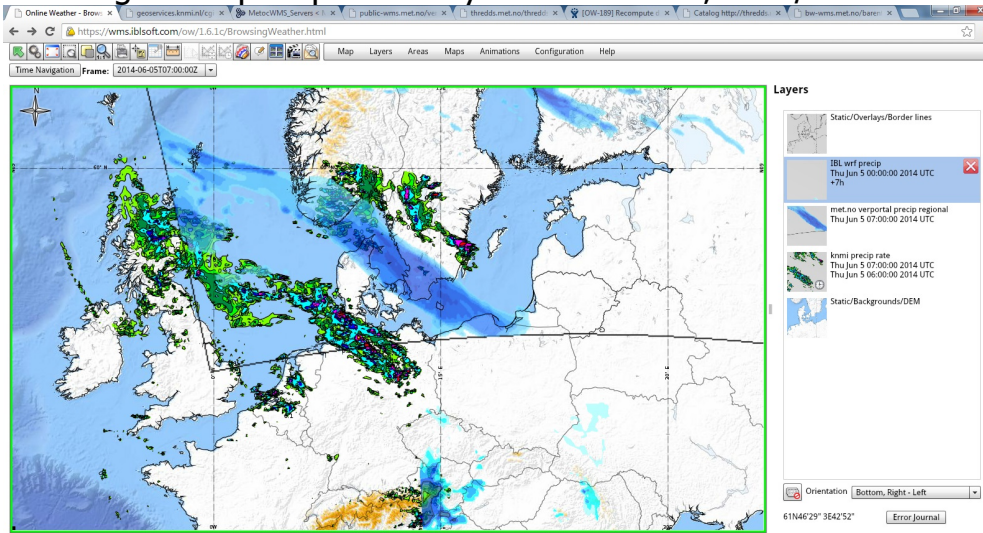
### 3.3. Online Weather



### Online Weather showing KNMI t2m:



# Showing KNMI precipitation layers from KNMI, WRF/IBL and MET Norway:

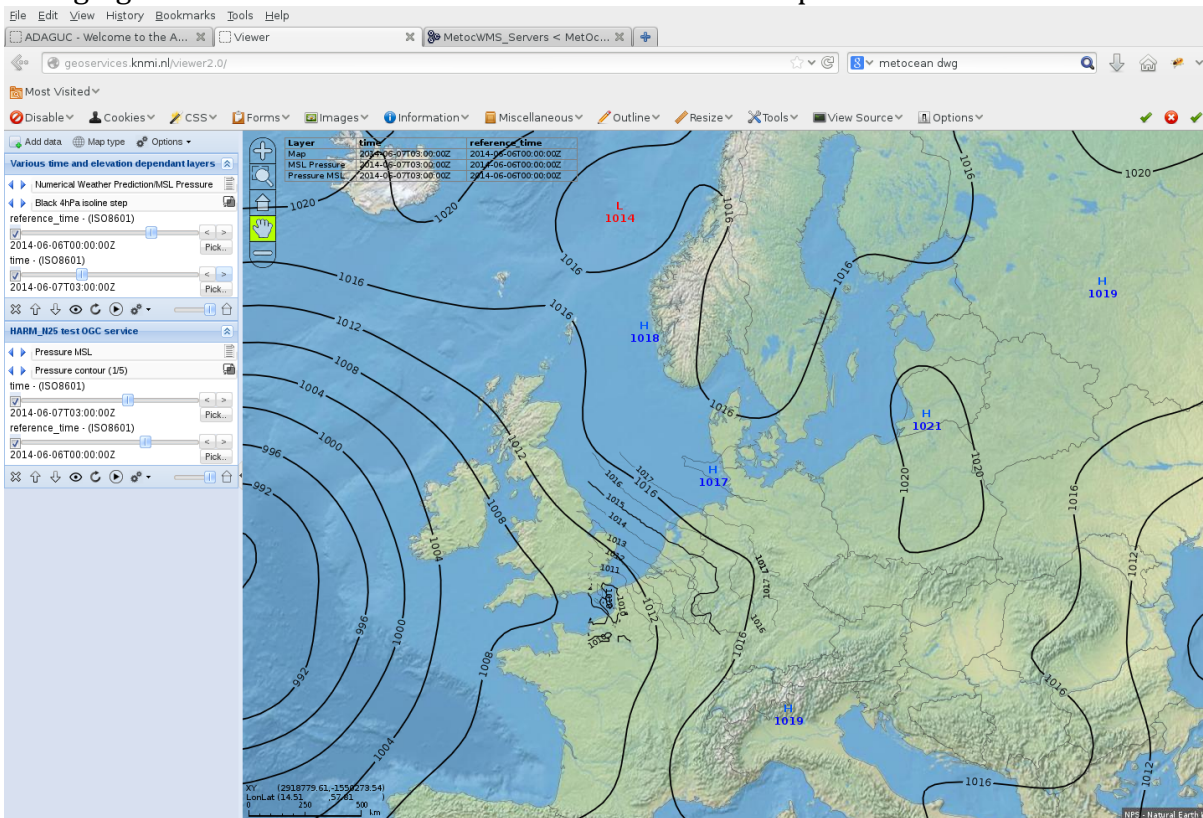


## 4. KNMI ADAGUC web client

Successes found:

The ADAGUC client can handle MetOcean BP servers as is shown by the example where a layer from IBL's server and a layer from KNMI are combined in single presentation.

Changing the reference time works for both servers. Example:

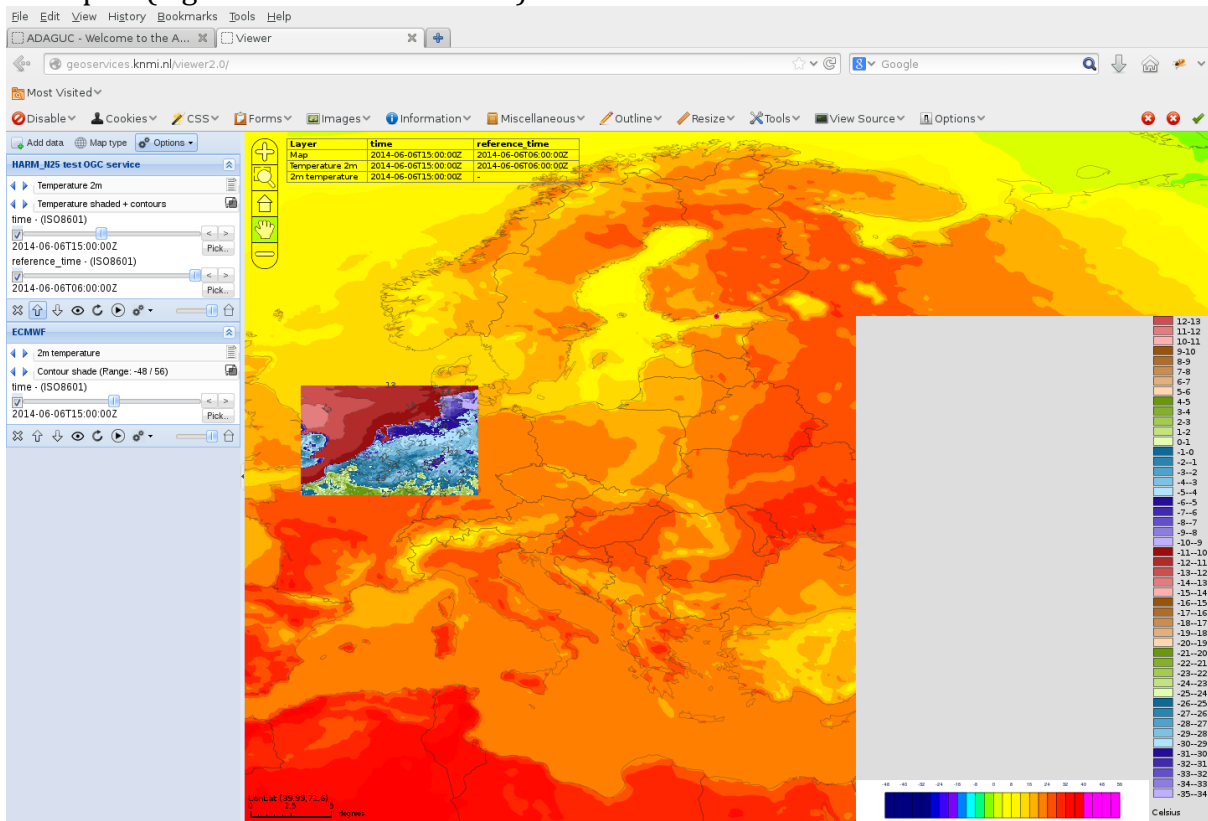


Problems found:

1. The ADAGUC client only correctly handles timestamps in ISO8601 format if they are fully specified including the (often irrelevant) seconds field. For example a timestamp like 2014-06-03T12:30Z is not handled correctly. This problem was found in working with several met.no WMS servers
2. ECMWF server does not support EPSG:3857 ("so called Google Maps") projection, and generates an error message text.
3. ECMWF servers seems to support EPSG:32661, but returns incorrectly projected products.
4. Legends can be any shape: vertical bars, horizontal bars, square shapes. The ADAGUC client just puts these shapes next to each other, which in the case of horizontal legend yields a screen with a very large legend.
  - a. The client should place these legends in a smarter way
  - b. The client should be able to switch legend display off (entirely or per layer)
  - c. A legend width/height parameter might be added to the BP for legends
5. ECMWF server generates a legend for all layers, even for the map background, which is unneeded (and contains the map of the whole earth repeated a few times).



# Examples (legends next to each other)



# Example: ECMWF projection 32661 incorrect and map layer legends

