Open Geospatial Consortium Meteorology and Oceanography Domain Working Group progress report

Thirteenth Workshop on Meteorological Operational Systems
ECMWF November 2011

Marie-Françoise Voidrot-Martinez, *Co-chair OGC Met Ocean DWG*

The questions….

- What
  - OGC
  - Interoperability
- Why a Met Ocean Domain Working Group
- How

- Where are we ? : progress report

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What is the Open Geospatial Consortium : OGC ?

- A non-profit international organization founded in 1994,
- Develop publicly available interface standards for geospatial data and services
- Based on consensus from governments, private Industry, Academia, NGOs
- Some standards fast tracked in ISO

- The aim : ensure <u>interoperability for geospatial data and services</u>

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Interoperability

INCOMPATIBLE

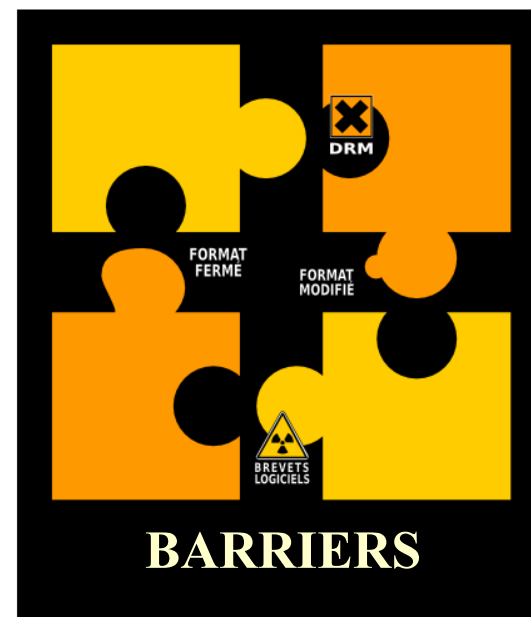COMPATIBLE

INTEROPERABLE

BARRIERS

Interoperability allows to open your information system

- In input : to meteorological or non meteorological data

- In output : towards other informations systems

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OGC Standards Working Groups (2011)

Standards Working Groups

Standards Working Groups (SWG) have specific charter of working on a candidate standard prior to approval as an OGC standard or on making revisions to an existing OGC standard.

Name	Lead **
Catalogue Services 3.0 SWG (Cat 3.0 SWG)	Doug Nebert, US Geological Survey (USGS)
CF-NetCDF 1.0 SWG (CF-NetCDF1.0SWG)	Ben Domenico, National Center for Atmospheric Research (NCAR)
CityGML SWG (CityGML SWG)	Carsten Roensdorf, Ordnance Survey
ebRIM AP of CSW SWG (ebRIM AP of CSW)	Frédéric Houbie, ERDAS, Inc.
ebXML RegRep SWG (ebXMLRegRepSWG)	Frédéric Houbie, ERDAS, Inc.
GeoAPI 3.0 SWG (GeoAPI 3.0 SWG)	Martin Desruisseaux, GEOMATYS
Geographic Linkage Service 1.0 SWG (GLS 1.0 SWG)	Peter Schut, GeoConnections - Natural Resources Canada
GeoSPARQL SWG (GeoSPARQL SWG)	Carl Reed III, Open Geospatial Consortium, Inc.
GeoSynchronization 1.0 SWG (Geosync SWG)	Panagiotis (Peter) A. Vretanos, CubeWerx
GeoXACML SWG (GeoXACML SWG)	Jan Herrmann, Technische Universität München, Dept. of Informatics
GML 3.3 SWG (GML 3.3 SWG)	Clemens Portele, interactive instruments GmbH
GMLJP2 1.1 SWG (GMLJP2-1.1SWG)	David Burggraf, Galdos Systems Inc.
O&M 2.0 SWG (OM 2.0 SWG)	Simon Cox, CSIRO
OLS 1.3 SWG (OLS 1.3 SWG)	Carl Stephen Smyth, MAGIC Services Forum
Open GeoSMS SWG (Open GeoSMS SWG)	Kuo-Yu Chuang, Industrial Technology Research Institute
Ordering Services for Earth Observation Products SWG (order-eo1.0.swg)	Daniele Marchionni, European Space Agency (ESA)
OWS Common 1.2 SWG (OWSCommon1.2SWG)	James Greenwood, SeiCorp, Inc.
OWS Context SWG (OWScontextSWG)	David Wesloh, US National Geospatial-Intelligence Agency (NGA)
PubSub SWG (PubSub SWG)	Johannes Echterhoff, International Geospatial Services Institute (iGSI) GmbH
PUCK 1.0 SWG (PUCK 1.0 SWG)	Thomas O'Reilly, Monterey Bay Aquarium Research Institute
Sensor Model Language (SensorML) 2.0 SWG (SensorML2.0SWG)	Mike Botts, Botts Innovative Research
Sensor Observation Service (SOS) 2.0 SWG (SOS SWG)	Arne Broering, 52° North Initiative for Geospatial Open Source Software GmbH
Simple Features SWG (SF SWG)	John Herring, Oracle USA
Styled Layer Descriptor and Symbology Encoding 1.2 SWG (SLDSE 1.2 SWG)	Olivier Ertz, School of Business & Engineering Vaud (HEIG-VD)
SWE Common SWG (SWECommonSWG)	Alexandre Robin, Spot Image
WCS 2.0 SWG (WCS 2.0 SWG)	Steven Keens, PCI Geomatics Inc.
Web Mapping Service 1.4 SWG (WMS 1.4 SWG)	Satish Sankaran, ESRI
Web Processing Service 2.0 SWG (WPS 2.0 SWG)	Bastian Schäffer, University of Muenster - Institute for Geoinformatics
WFS Gazetteer Profile 1.0 SWG (WFSgaz1.0 SWG)	Doug Nebert, US Geological Survey (USGS)

** - There may be Co-Chairs or Vice-Chairs that are not listed in this table

« Core » OGC standards

- Catalogue Service for the Web (CSW)

- Web Map Service (WMS)
- Web Feature Service (WFS)
- Web Coverage Service (WCS)
- *Web Processing Service (WPS)*

- Sensor Observation Service (SOS)
- Sensor Planning Service (SPS)
- Sensor Alert Service (SAS)

- **Geography Markup Language (GML)**

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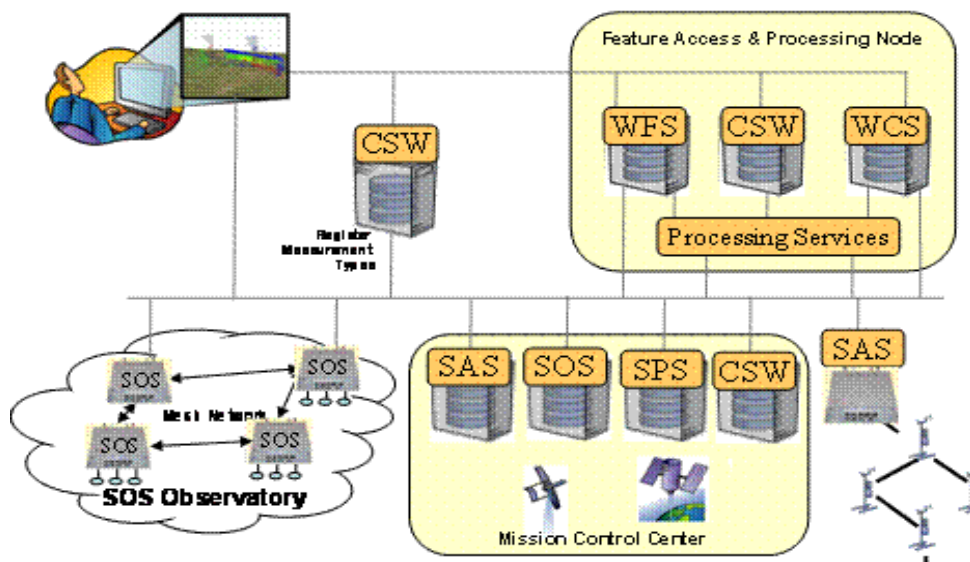
OGC Domain Working Groups (2011)

Domain Working Groups

Domain Working Groups (DWG or WG) provide a forum for discussion of key interoperability requirements and issues, discussion and review of implementation specifications, and presentations on key technology areas relevant to solving geospatial interoperability issues.

Name	Lead **
3DIM WG (3DIM WG)	Tim Case, Case, Tim
Architecture DWG (Arch DWG)	Doug Nebert, US Geological Survey (USGS)
Aviation DWG (Aviation DWG)	Navin Vembar, FAA System Operations Airspace and AIM Office
Catalog WG (Cat WG)	Doug Nebert, US Geological Survey (USGS)
Coordinate Reference System WG (CRS WG)	Victor Minor, Blue Marble Geographics
Coverages WG (Cover WG)	Peter Baumann, FORWISS (Bavarian Research Centre for Knowledge-Based Systems)
Data Preservation WG (PreservWG)	Steve Morris, North Carolina State University
Data Quality WG (DQ WG)	Victor Minor, Blue Marble Geographics
Decision Support WG (DS WG)	Stan Tillman, Intergraph Corporation
Defense and Intelligence DWG (D and I DWG)	Richard Pearsall, US National Geospatial-Intelligence Agency (NGA)
Earth Systems Science DWG (ESS WG)	Phillip Dibner, Ecosystem Research
Emergency & Disaster Management DWG (EDM DWG)	Lewis Leinenweber, Evolution Technologies, Inc.
Geo Rights Management (GeoRM) WG (GeoRM WG)	Roland Wagner, BHT-Berlin (Beuth Hochschule für Technik Berlin)
Geography Markup Language (GML) WG (GML WG)	Ron Lake, Galdos Systems Inc.
Geometry WG (GeometryWG)	John Herring, Oracle USA
Geosemantics DWG (Semantics)	Joshua Lieberman, Traverse Technologies, Inc.
Hydrology DWG (Hydrology DWG)	David Lemon, CSIRO
Location Services WG (LS WG)	Marwa Mabrouk, ESRI
Mass Market Geo WG (MassMarket)	Ed Parsons, Google
Metadata WG (Metadat WG)	David Danko, ESRI
Meteorology & Oceanography DWG (Met Ocean DWG)	Chris Little, UK Met Office
Oblique Imagery DWG (ObliqueImageryD)	Shayne Urbanowski, Lockheed Martin
Security DWG (SecurityDWG)	Andreas Matheus, University of the Bundeswehr - ITIS
Sensor Web Enablement WG (SensorWeb)	Mike Botts, Botts Innovative Research
University WG (Univ WG)	Chris Higgins, Open Grid Forum
Web Feature Service WG (WFS WG)	Martin Daly, cadcorp (Computer Aided Development Corp.) Ltd.
Workflow DWG (Workflow DWG)	Stan Tillman, Intergraph Corporation

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Why

1. INSPIRE recommends to use ISO or OGC standards

2. After some WS implementations in Met services, it appeared clearly that these implementations present a very high risk to be **non interoperable**

IF

we don't agree on best practices recommendations

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Met Ocean Domain Working Group

- <u>2007</u> : proposal from the ECMWF MOS workshop to do a workshop on the use of GIS/OGC standards in Met

- <u>2008</u> : GIS/OGC standards in Met workshop recommended to create a Met Ocean DWG within OGC

- <u>2009</u> :
  - **April :** Creation of the Met Ocean Domain Working Group within OGC, rapidly extended to Oceanography

  A public email list open to everyone (OGC member or not) set up : https://lists.opengeospatial.org/mailman/listinfo/meteo.dwg

  A twiki space set up : http://external.opengis.org/twiki_public/bin/view/MeteoDWG/WebHome

  - **December :** MoU between OGC and WMO

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Met Ocean Domain Working Group

- <u>2010/2011</u> : Works

1. Communication towards OGC Standard Working Groups
2. Communication towards the Met Ocean Community
3. Modelling activities
4. WMS best practices
5. Interoperability experiments (« *to test solutions in reality* »)

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1-Communication towards OGC SWG

- Identify
  - what can be solved by Best Practices
  - what requires a standard evolution

- Check our understanding of the standards and benefit from OGC experts background

- Make future releases of the standards fit more naturally our needs
  - specific multi-dimensional meteorological visualisations presented to the WMS SWG : spatial and temporal cross sections, tephigrams, spectral wave diagrams, hodographs…
  - Specific plottings presented to SLD/SE SWG
  - …

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WMO / Met Ocean DWG main Interests

- WMS – Currently Proactive
  - Time – proposals now documented
  - Elevation
  - Map Projections
  - SLD/SE – Aviation SigWx and standard WMO Plots Use Cases
  - Tiling – WMTS now a separate standard – jigsaw edges
- Conceptual Modelling - Currently Proactive
  - WXXM
  - GML3.2.1, KML2.2
- WCS/WFS –- Currently Reactive
  - 4D, CRS,
  - payload formats,
  - vector vs raster
- CSW – compatibility with ISO23950, OpenSearch - Currently Reactive
- O&M, SWE increasing in importance - Currently Passive

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2- Communication towards the Met Ocean community

- In workshops (ECMWF, EGOWS, GIS/OGC standards in met…,)
- Via the twiki,
- Via the email list,
- Via the teleconferences

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WMS

1. it is the simpllest

2. It covers a lot of needs

3. It provides a support to work on the most complex specifities : time, CRSs, vertical levels, controlled vocabulary…

Asynchronous data : PubSub Capabilities frequent update …

WCS, WFS

Models

O&M 2.0 as a base reference

Consistently with :

-IPET-MDI
-INSPIRE
-- SESAR / NEXTGEN
-…

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3- Modelling : INSPIRE : Three drafts

- Atmospheric Conditions –Meteorological Features draft

- http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_AC-MF_v2.0.pdf

- Sea Regions draft

- http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_SR_v2.0.pdf

- Oceanographic geographic Feature draft :

-   http://inspire.jrc.ec.europa.eu/documents/Data_Specifications/INSPIRE_DataSpecification_OF_v2.0.pdf

Will impact European Implementations of web servers for environnemental providers

End of review and testing : 21 Octobre 2011

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4- Met Ocean Best Practices for WMS 1.3

- Choices made for the first draft
  - Draft Best Practices for WMS 1.3
  - Build a BP document sticking to the specification doc
- A first proposal for the time handling issue
  - Time (observations, forecasts) ➔ climatologie, climate change reacted
- Looking for volunteer for pending issues
  - Layers naming => need of a controlled vocabulary machine readable
  - Projections/CRS
  - Vertical coordinates or compound CRSs
  - Styling
  - GetFeature Info standardisation or definition of new operations
- To benefit from support from the other groups or OGC experts
  - Asynchronous and dynamic delivery
  - How to serve extra metadata about WMS layers ans maps
  - How to advertise compliancy with a best practices or profile
  - How to define a timestamp for the getcapabilities in order to handle the permanent update of the met ocean data?

5- Interoperability Experiments

- To check the proposals for the Best Practices,

- To check the performances

- To identify new issues

- To validate implementations

- To facilitate the learning curve on the standards and the existing implementations

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Egows I.E Report

Tested servers:	Tested clients
DWD / Ninjo	*Specialised in Meteorology*
IBL /Visual Weather, Meteo-France /Synopsis	IBL/Visual Weather KNMI/ Agaduc
ECMWF / ecChart Dresden UCAR/motherlode	ECMWF / Metview Meteo-France / Synergie ------------------------ *General purpose :* gvSIG Gaia
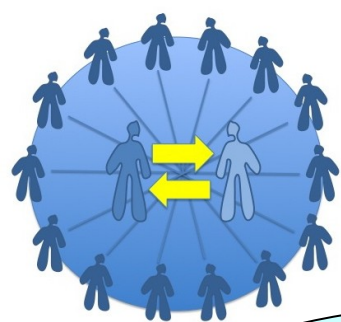
6 WMS servers
4 WMS clients specialised in meteorology
2 general purpose clients

1- Free tries
2- Validate the responses to the requests
3- Test a real use case defined by forecasters
4- Test the TU Dresden server serving WMS Climate Change products

Which tests

Feebacks

Participants would like to make it more often : maybe remotely at predefined dates

Fasten the learning curve,

Helps validate implementations, identify issues for BP

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Metview WMS Client – KNMI satellite and radar layers

Type of product : *Radar composite image overlayed on top of Geostationnary Satellite*
WMS implementation issues : *time definition, transparency*

Metview WMS Client – Meteo-France satellite and radar layers

Type of product : *Radar composite image overlayed on top of Geostationnary Satellite*
WMS implementation issues : *time definition, threshold for the radar echos, transparency*

Ninjo Client- Meteo-France radar layer

Type of product : *Radar product*

WMS implementation issues : *time definition*
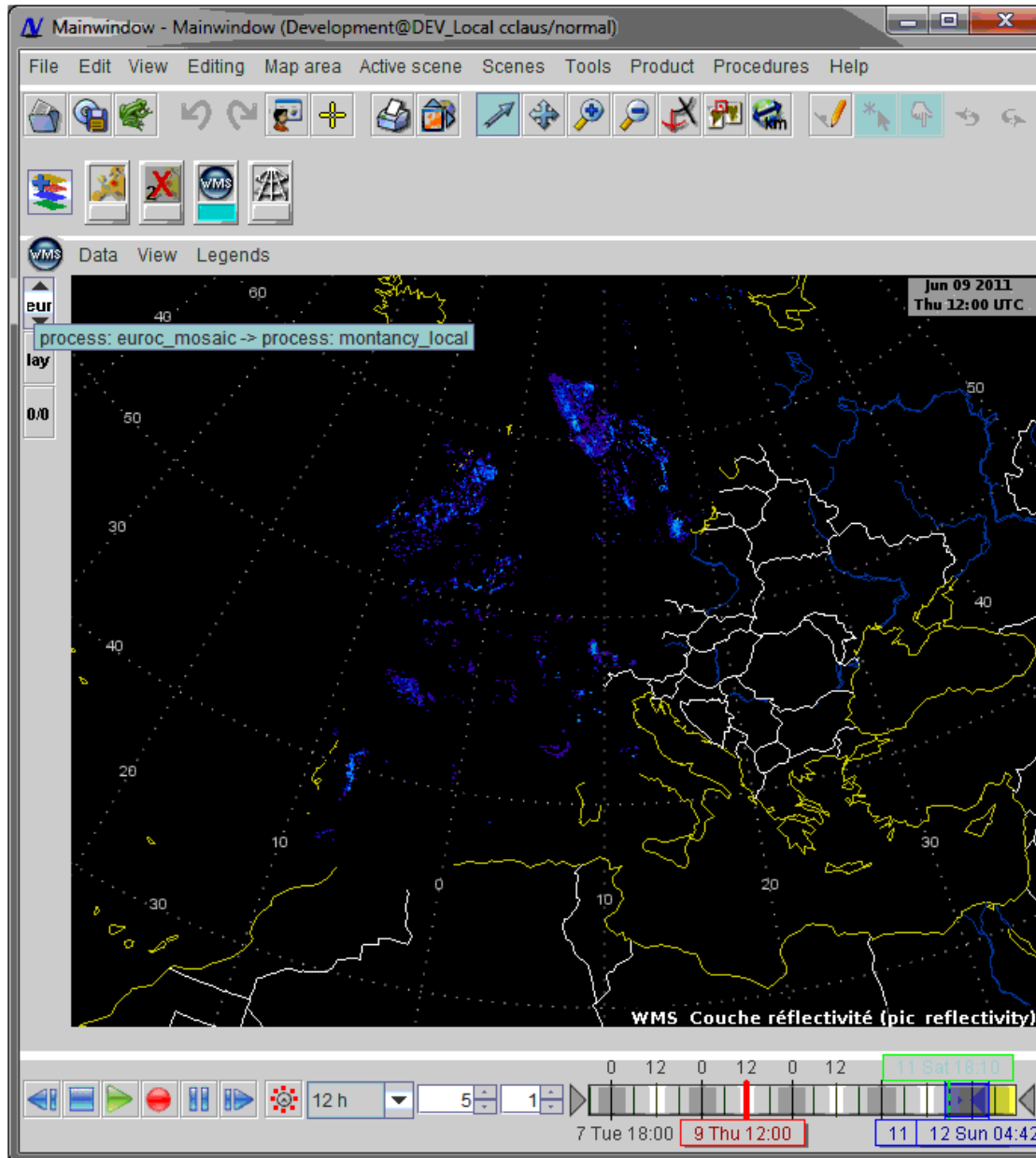
Ninjo Client- IBL Significant weather layer

Type of product : *Significant weather Forecast*
WMS implementation issues : *time definition*
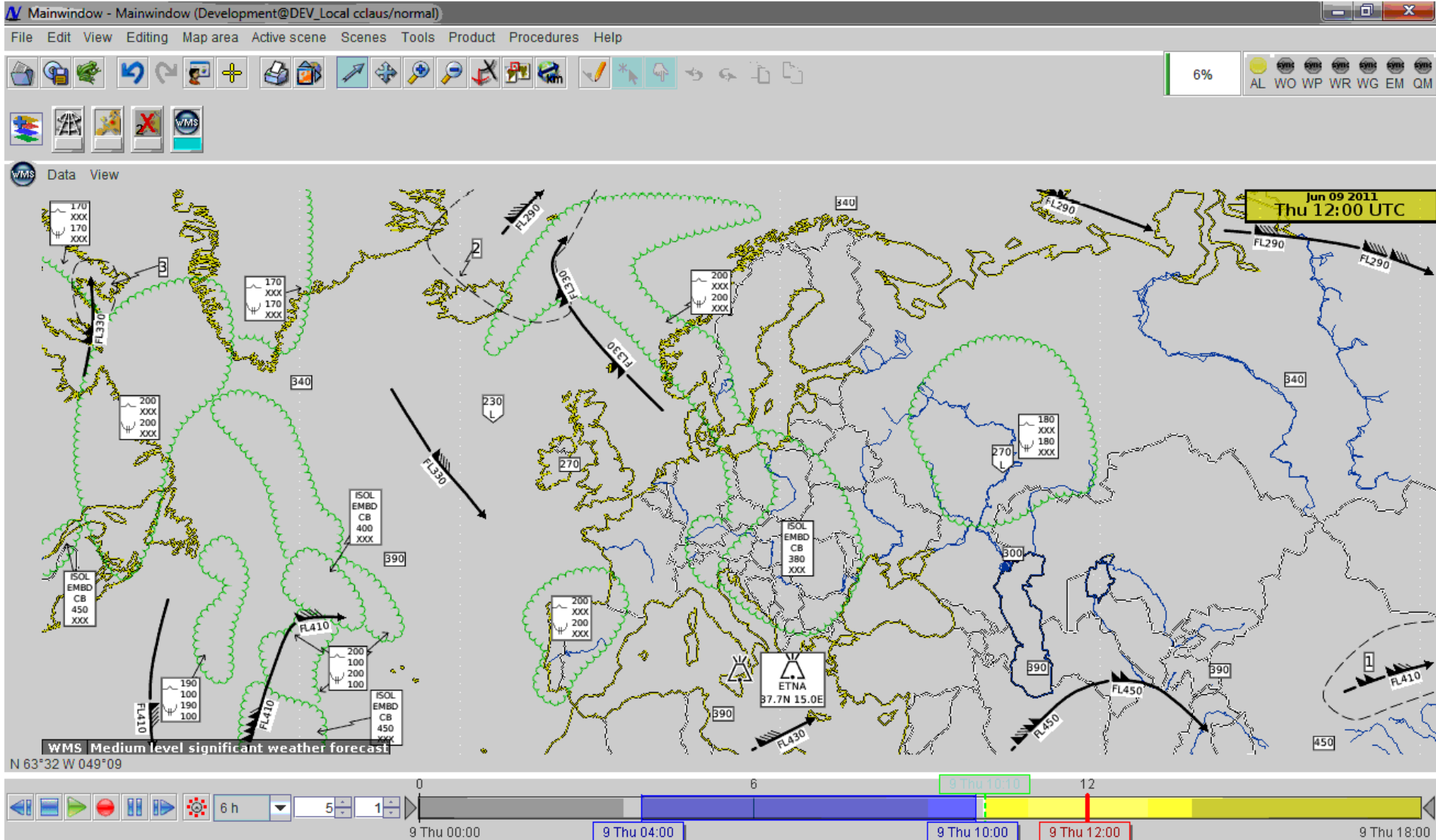
Ninjo Client- ECMWF WMS layers

Extreme Forecast Index
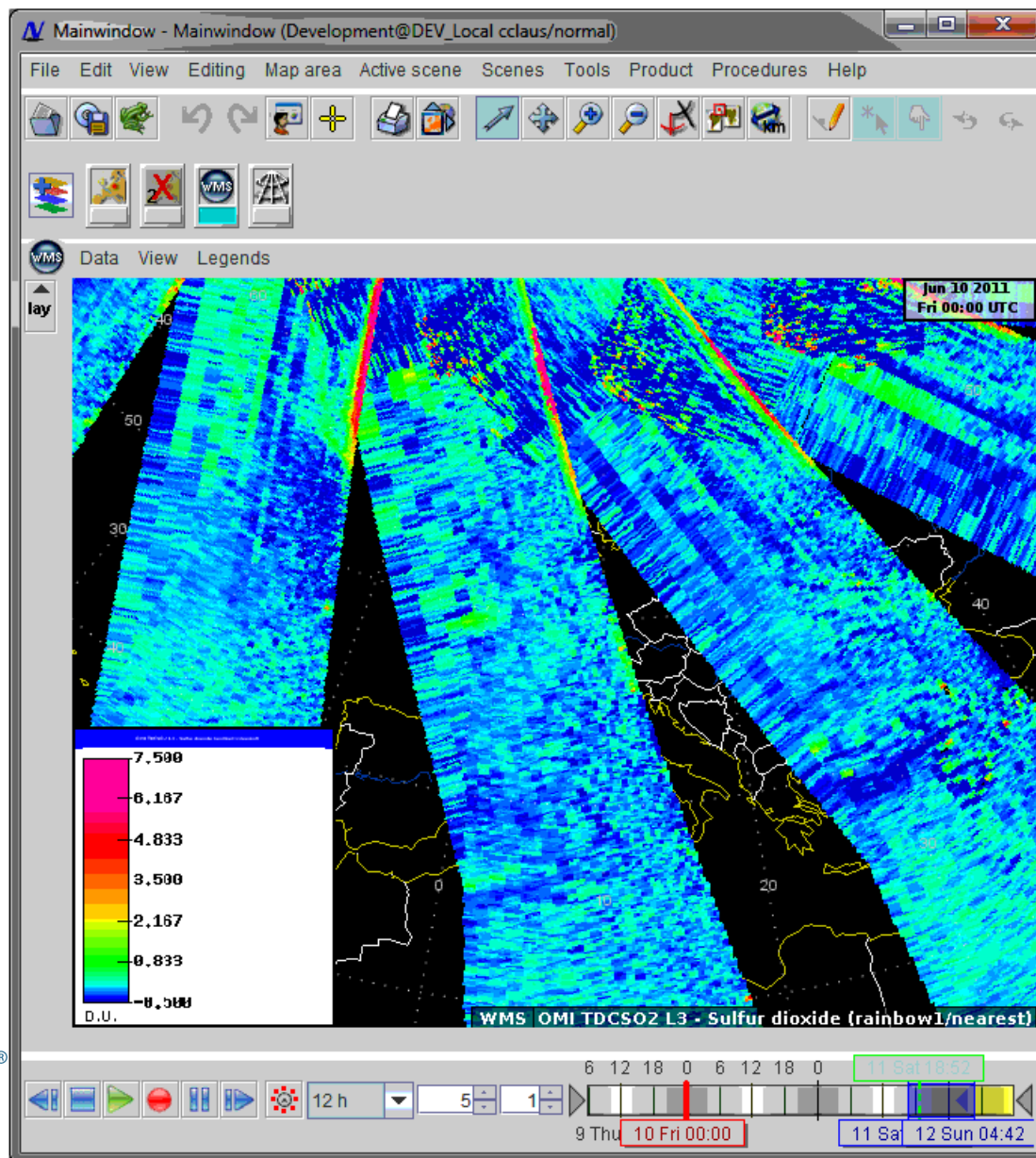*Type of product* : climate change simulations
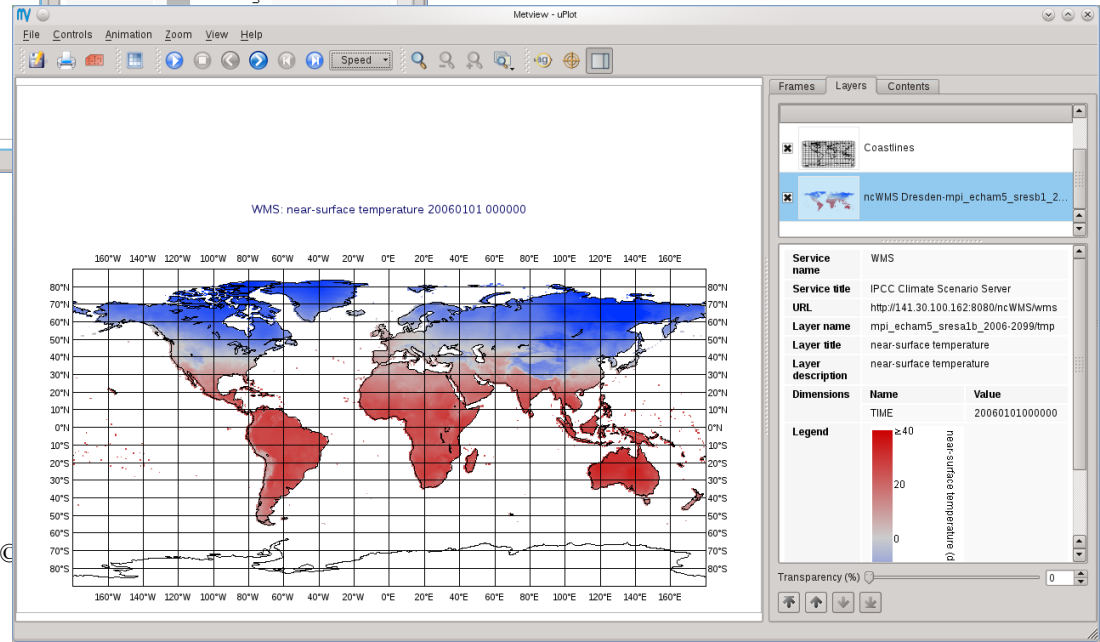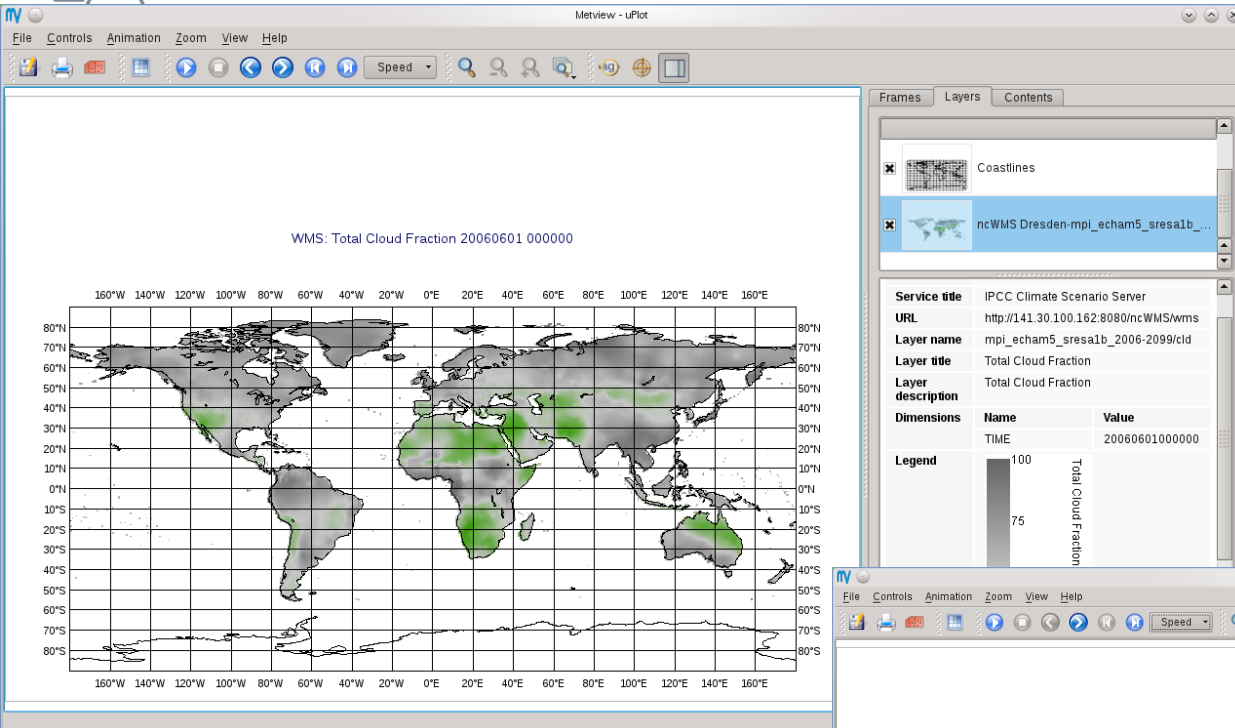*WMS implementation issues* : time definition, transparency
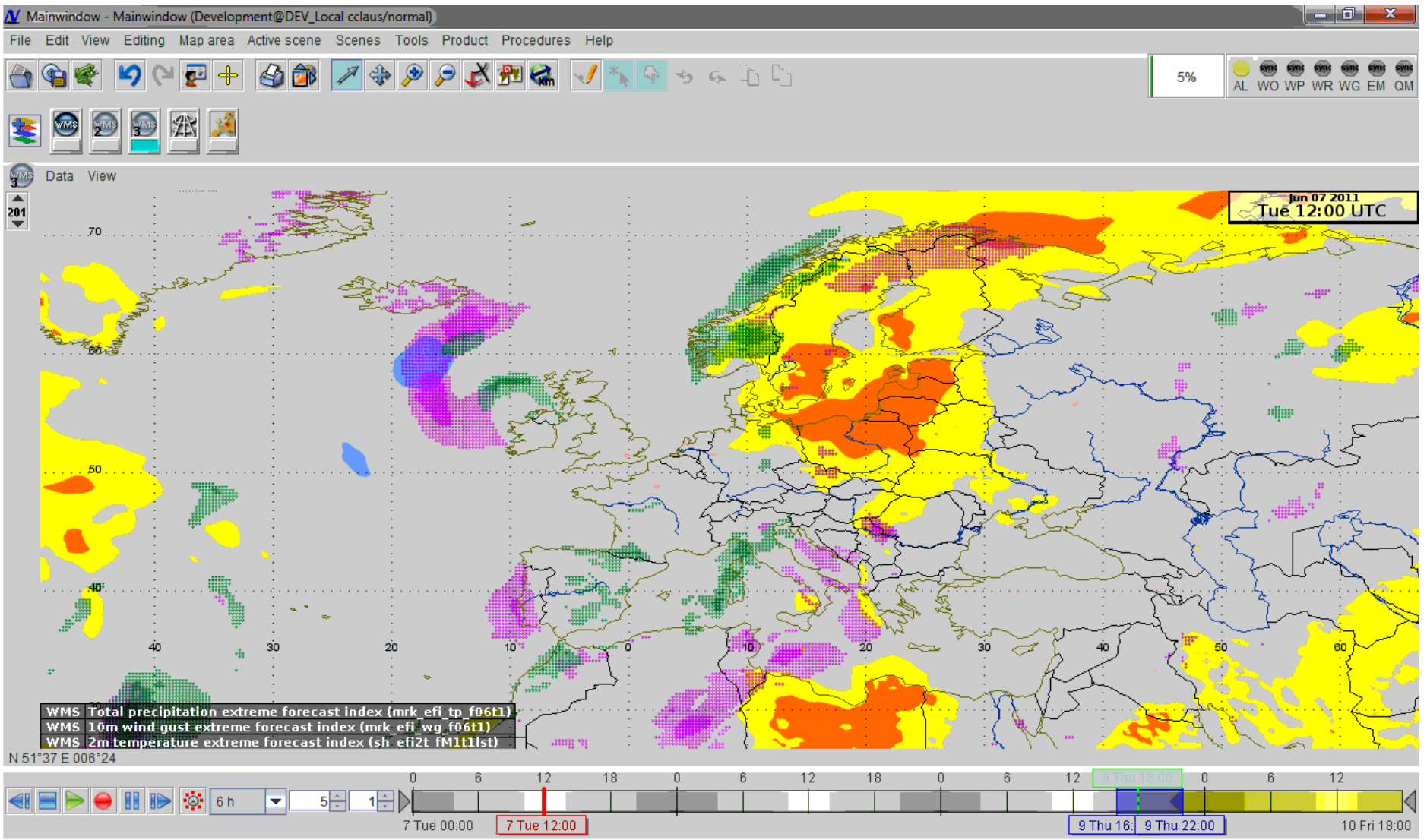
Ninjo Client- KNMI satellite layer with legend

Type of product *: Satellite product*
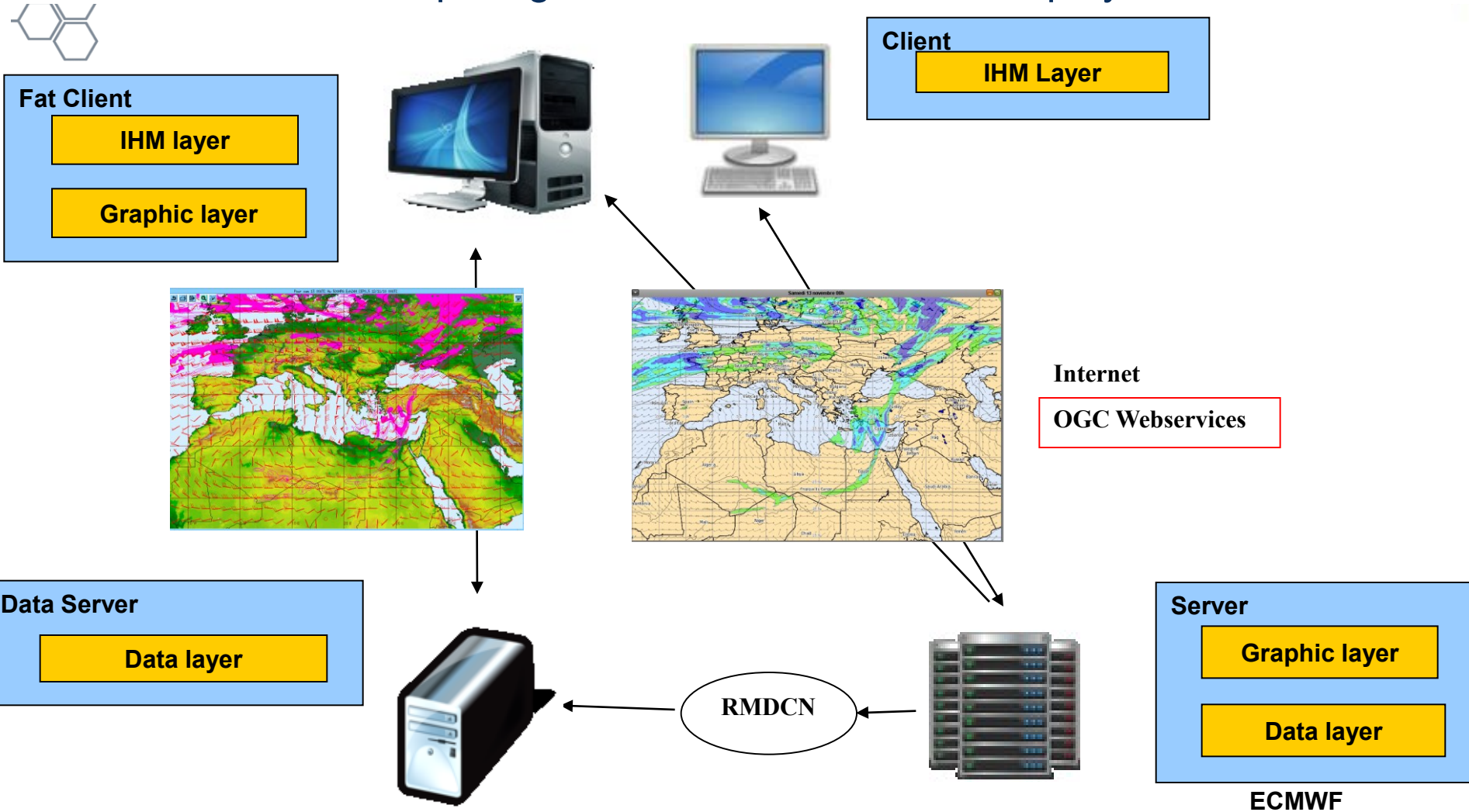***WMS implementation issues*** *: time definition, transparency*

# Metview Client : TU Dresden WMS server with climate change products

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Validation

comparing a WMS with a fat client display

Fat Client
- IHM layer
- Graphic layer

Client
- IHM Layer

Internet

OGC Webservices

Data Server
- Data layer

RMDCN

Server
- Graphic layer
- Data layer

ECMWF

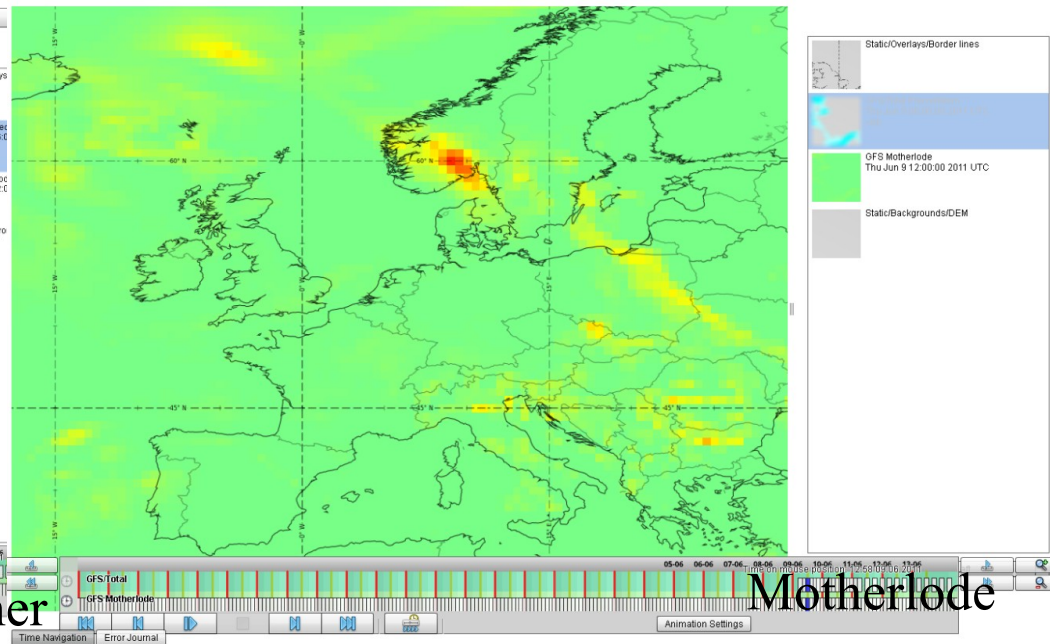*Helping the World to Communicate Geographically*

Validation : Comparing 2 implementations over same data
IBL Client : Visual Weather & Motherlode gfs-grid
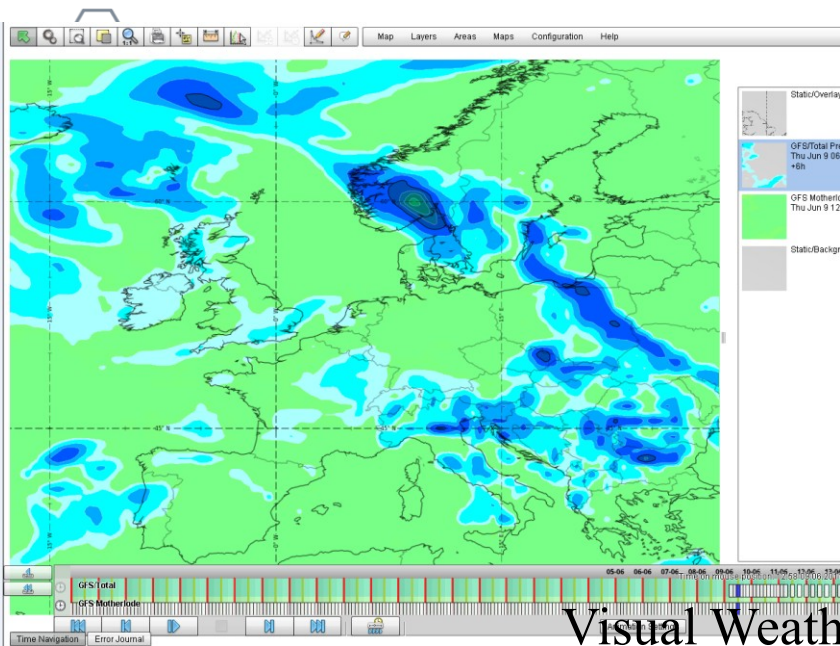
Visual Weather

Motherlode

Visual Weather & Motherlode overlayed

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Roadmap

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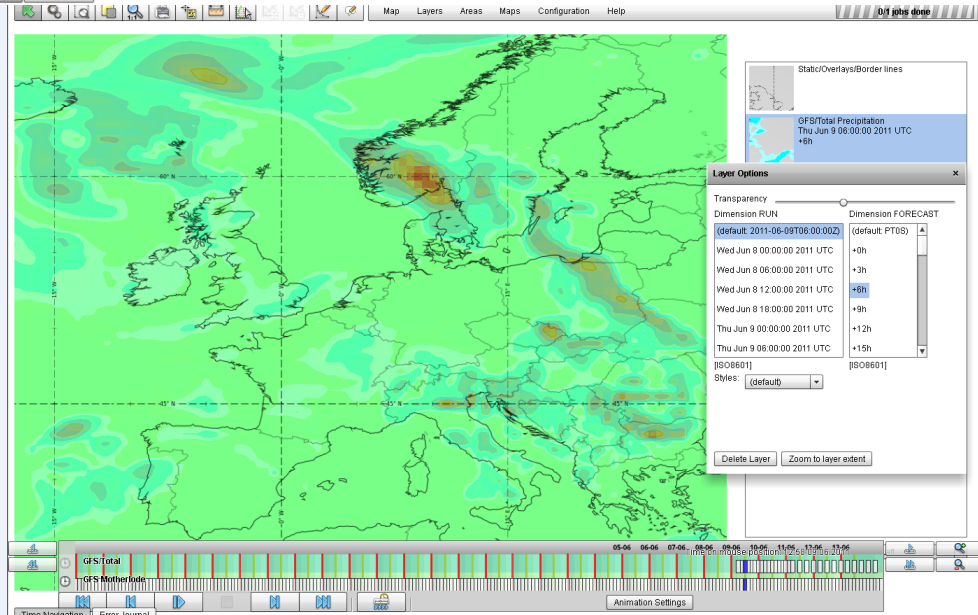
Next steps

- Met Ocean DWG telecon: check the twiki

- Next OGC Technical Comittee in Brussels, End November 2011 : a new best practices wording for the time handling, then vertical levels, …

- A 4th Workshop on the use of GIS/OGC Standards in Meteorology maybe in NOAA Washington next spring (to be confirmed)
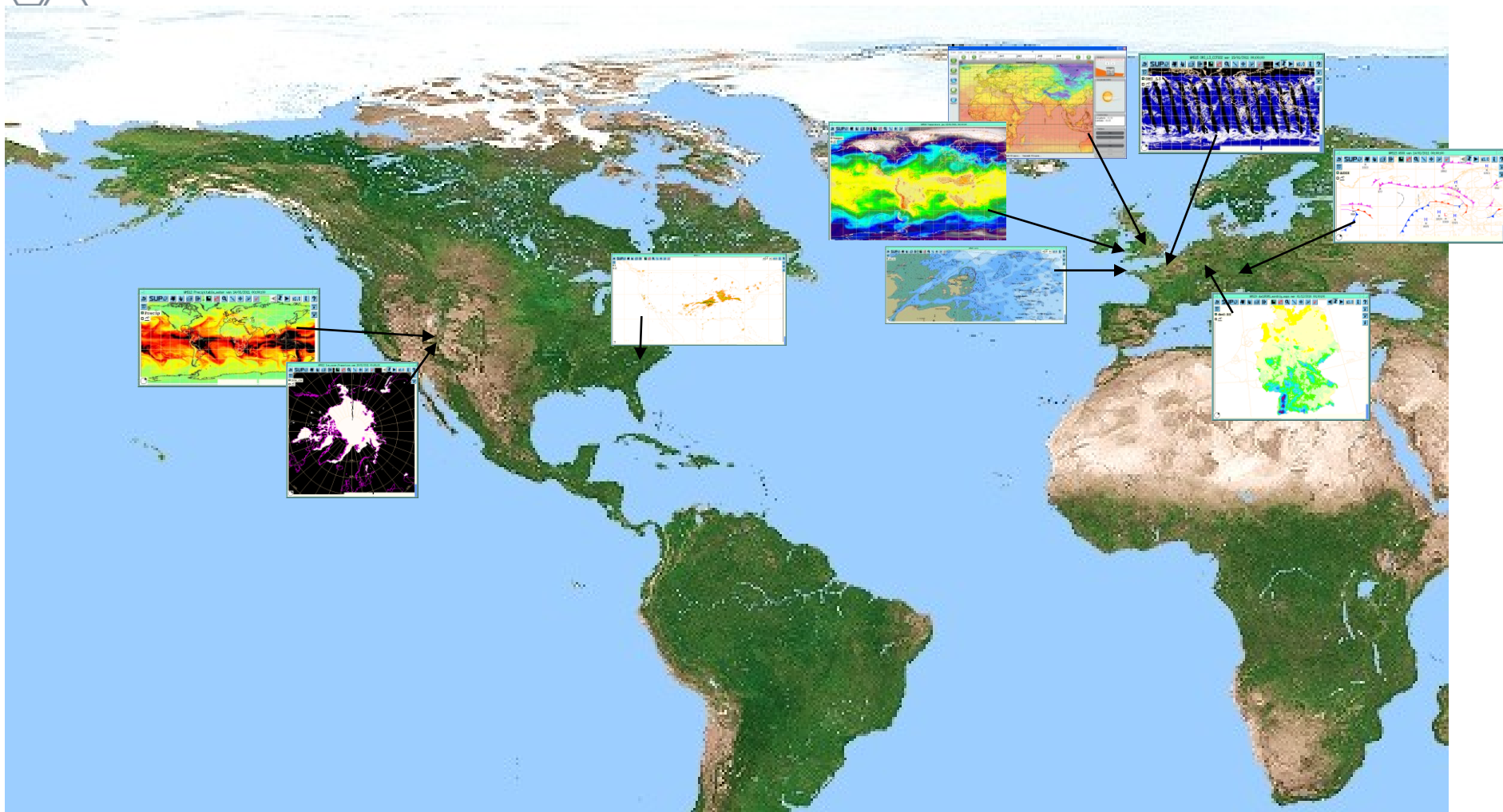
- More Experiments

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Conclusion

- Public Websites :
  - OGC : (Standards, Programs, Press and Events announcements…)

    http://www.opengeospatial.org/

  - Met Ocean DWG Twiki :

    http://external.opengeospatial.org/twiki_public/bin/view/MetOceanDWG/WebHome

  - Met Ocean DWG email list :

    https://lists.opengeospatial.org/mailman/listinfo/meteo.dwg

- Meetings, Teleconferences

The working means are efficient

The charter is done, the OGC-WMO MoU is there

We need manpower

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A blooming of servers

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Having some servers and clients available

A growing dynamic

Volunteers always welcome