



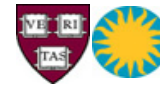
# Atmospheric Data Access for the Geospatial User Community

European Geosciences Union  
General Assembly 2007  
Vienna, Austria  
13 – 18 April 2008



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Space for Geo-Information  
[www.rgi.nl](http://www.rgi.nl)



# Project Goals



## Bridging GIS and Atmosphere

- ◆ **People** > *workshops/conferences*
- ◆ **Knowledge** > *website/publications*
- ◆ **Technology** > *software/services/data*

ADAGUC @ EGU:

EGU2008-A-02157 Web service infrastructure

EGU2008-A-02095 International collaborations

EGU2008-A-02106 The gap between atmospheric and Geo community

EGU2008-A-00491 Overview of ADAGUC

EGU2008-A-03509 Web mapping service for soil moisture products

EGU2008-A-03570 From satellite data to GIS application



# Who we are



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B. Domenico

## University of Florence

S. Nativi

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J.F. Meirink -> KNMI

## Harvard University

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## University of Heidelberg

C. Frankenberg -> SRON

## European Space Agency

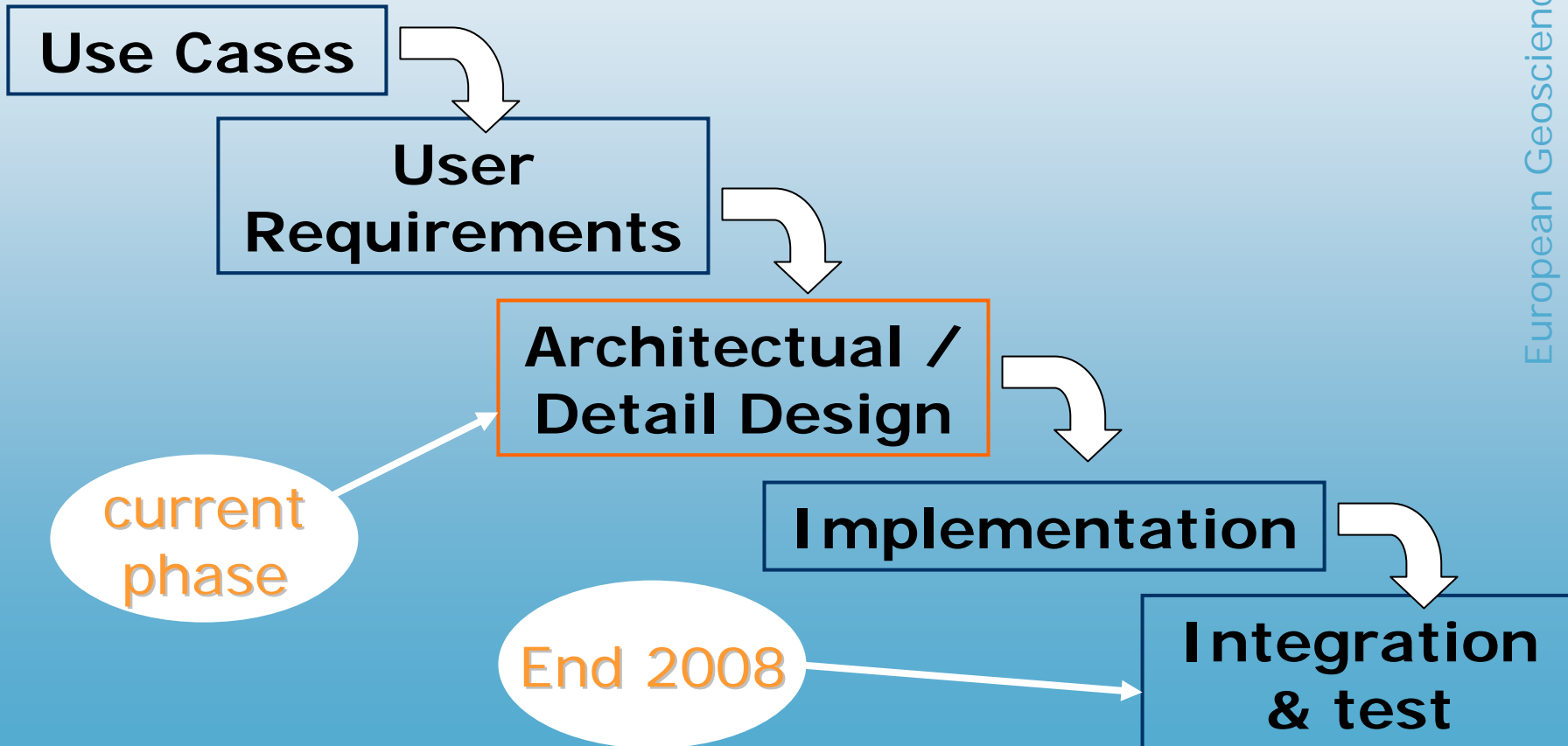
C. Zehner

Different fields:  
**Earth/Atmospheric sciences**  
**GIS knowledge**  
**IT knowledge**  
**Various end users**

# Project phases



According to ESA's PSS-05 standard for software development



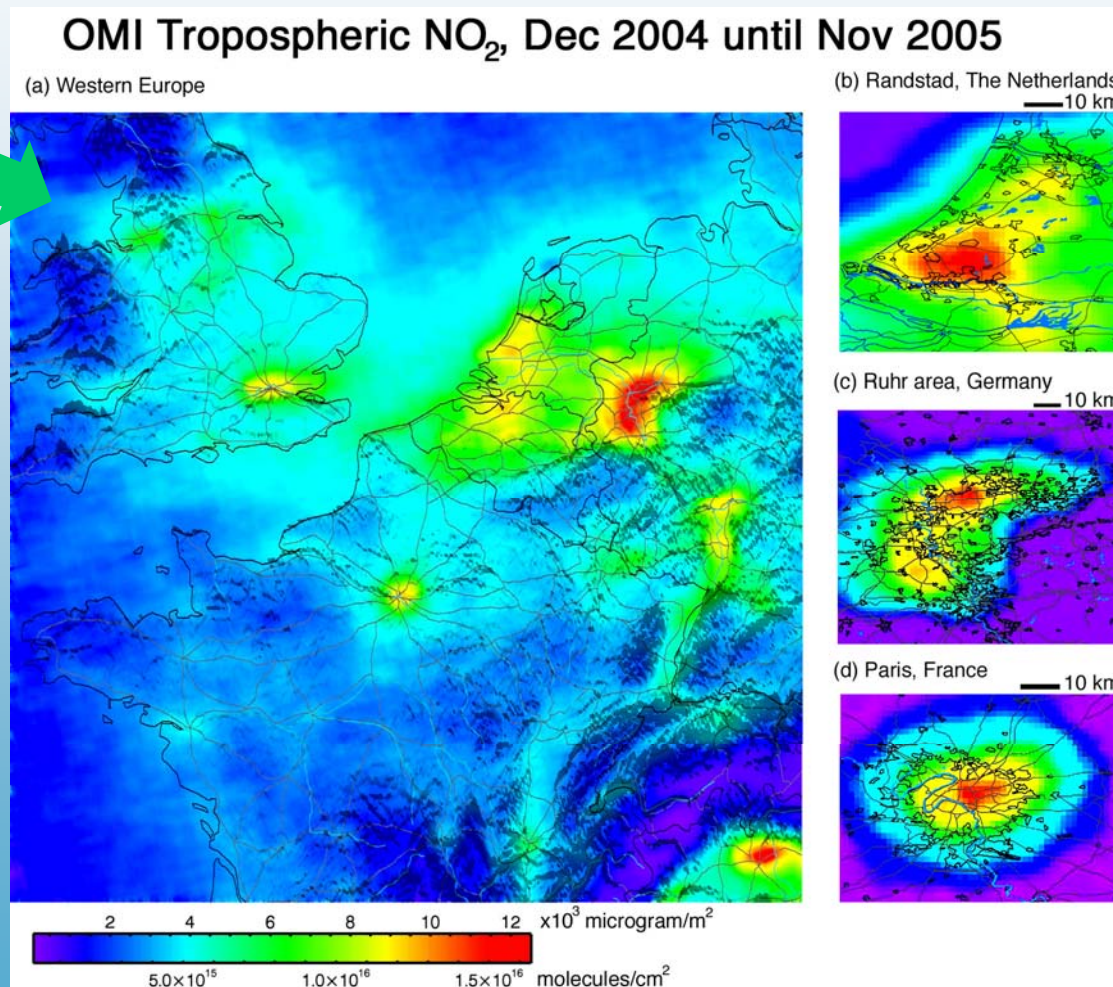
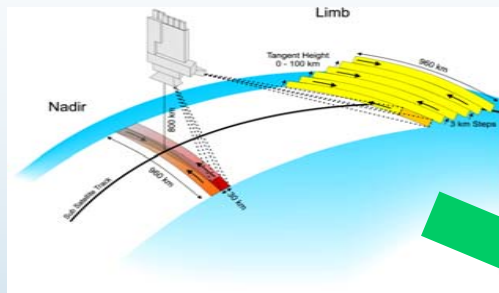
# Use Cases



- ♦ **Policy Makers** – are interested in Level 3/4 products, maps, archived for easy access. Many national and international stakeholders provide atmospheric data to their governments that deal with social and political impact of climate change.
- ♦ **Earth System Scientists and Atmospheric Scientists** – are interested in Level 2/3 data, both archived and real-time. The atmospheric users are particularly interested in fast tracers like aerosols, and trace gases like NO<sub>2</sub> and SO<sub>2</sub>.
- ♦ **GIS Users** – are interested in Level 2/3 data, including archived access. GIS users are characterized as being non-experts in the field of atmospheric research, their focus is more on earthbound features and earth-atmosphere interactions.
- ♦ **Risk assessment community** – is interested in mapped Level 2/3 data, preferably in (near-)real time. These users are interested in products at an urban scale that are focused on industrial calamities, like gas leakage or chemical fires. Combinations with other data sources provides input to crisis information teams.

Use Case document can be found on the ADAGUC website

# use case: Atmospheric scientist making maps



Generation of daily L3 files from the L2 files

Generation of yearly average from the daily L3 files

Visualizing the yearly averaged data

Adding boundaries, roads and rivers

Applying topography using a ray tracer

Adding legends and enhancing the image

# Data Products



- ◆ **SCIAMACHY: O3, No2, Fresco, CH4, CO**, both in level 2 (vector) and level 3 (raster). In the level 3 case there is not only the requested for the information itself but also count, standard deviation, expected error for each cell in the raster.
- ◆ ECMWF model: **Precipitation, Air temperature, Tropospheric Height, Boundary Layer Height, Wind speed/direction, Pressure, Soil Moisture/Temperature, Water Vapor (0-7 cm)**, every 6 hours in full horizontal and vertical resolution.
- ◆ **AMSR Soil Moisture, Surface Temperature and Vegetation Index.**

# Product Standard I



- ◆ **One standard for all products**
- ◆ **User friendly: many applications in various communities**
- ◆ **Meta data: we have to adhere to INSPIRE**
- ◆ **Meta data: what makes the data even more usable: Climate Forecast convention**
- ◆ **Self describing content**
- ◆ **Flexible content: raster and vector with optional time dimension**
- ◆ **Platform independent and stable for the coming years..**
- ◆ **The standard is free to use by everyone**

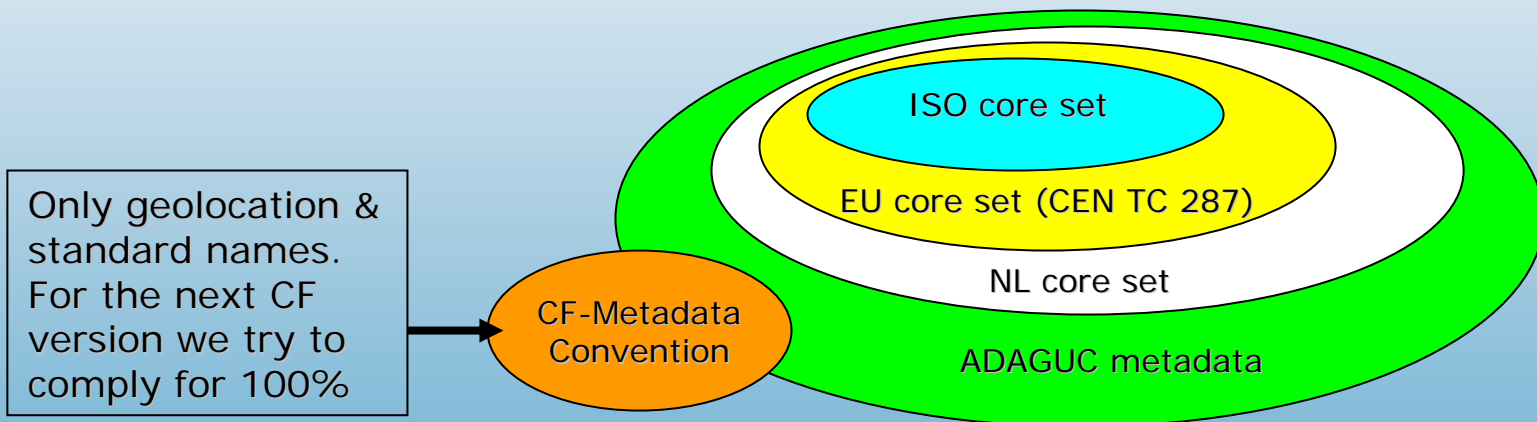
See EGU2008-A-03570 (S. de Witte, et al) for the ADAGUC data products standard



# Product Standard II



- ◆ **INSPIRE > ISO-19115**
- ◆ **NL Metadata Standard**
- ◆ **OGC > WMS, WFS, WCS**
- ◆ **Climate and Forecast metadata convention**



**Currently the standard only supports regular grids and polygons with 4 corners**

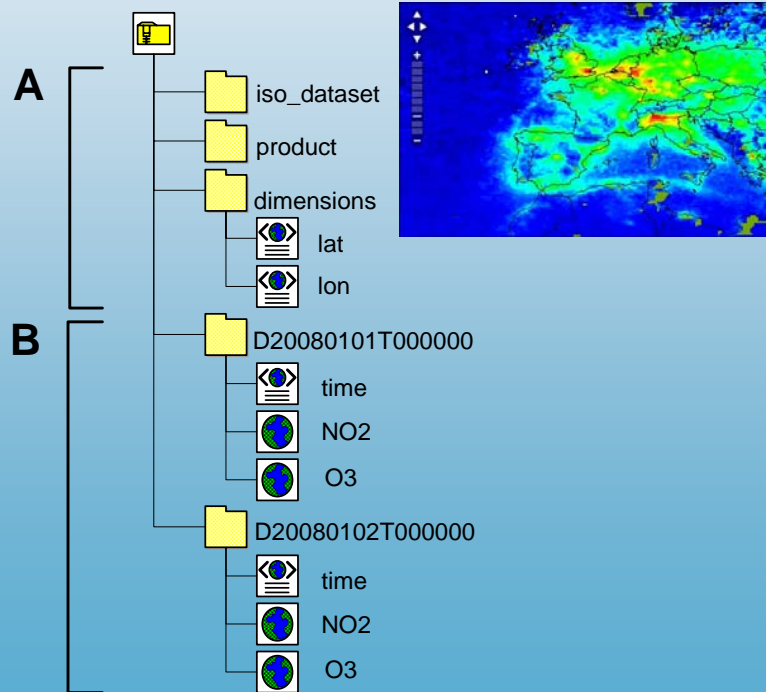
See EGU2008-A-03570 (S. de Witte, et al) for the ADAGUC data products standard

# Product Standard III

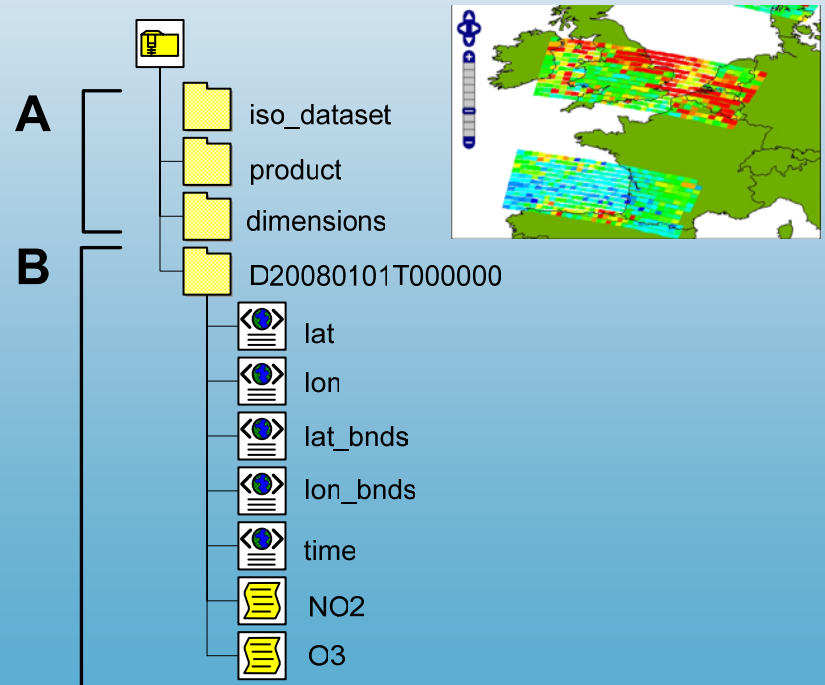


- ◆ HDF5 is selected
- ◆ Release 1.8.0: dimension scales
- ◆ NetCDF4 will use HDF5

HDF5 File with Raster data



HDF5 File with Vector data

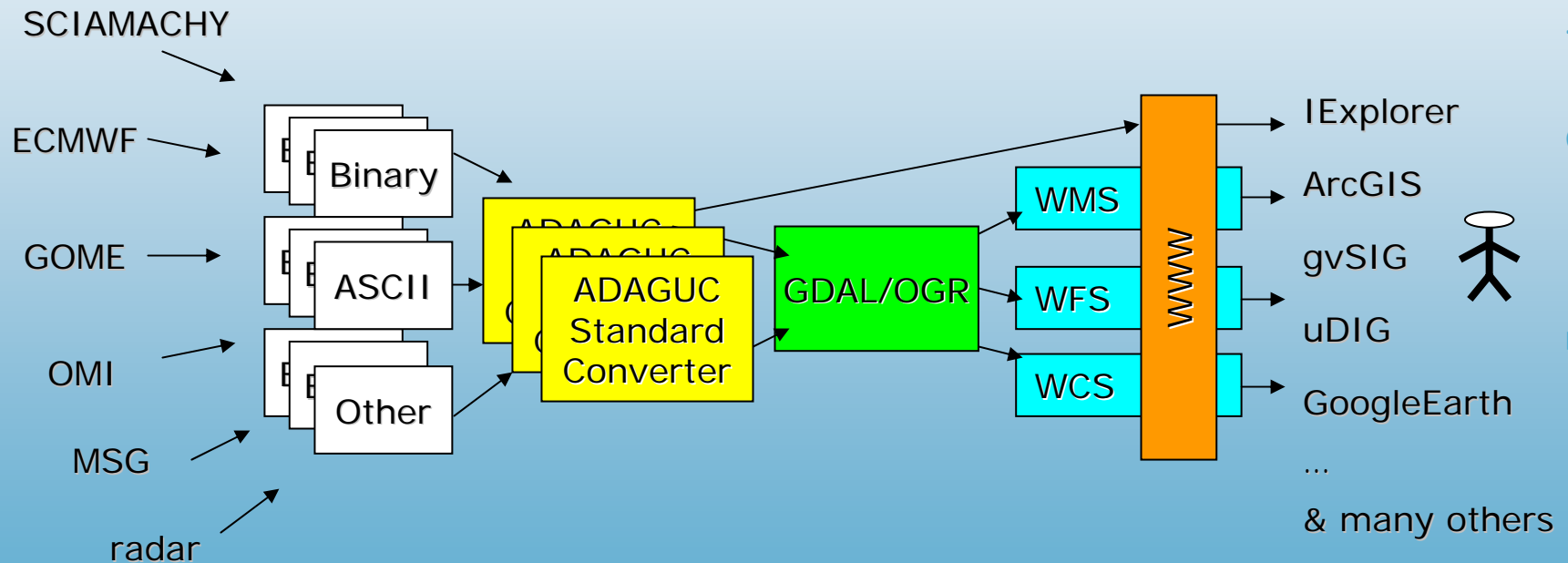


See EGU2008-A-03570 (S. de Witte, et al) for the ADAGUC data products standard

# OGC Web Services



DATA → PRODUCTS → SERVICES

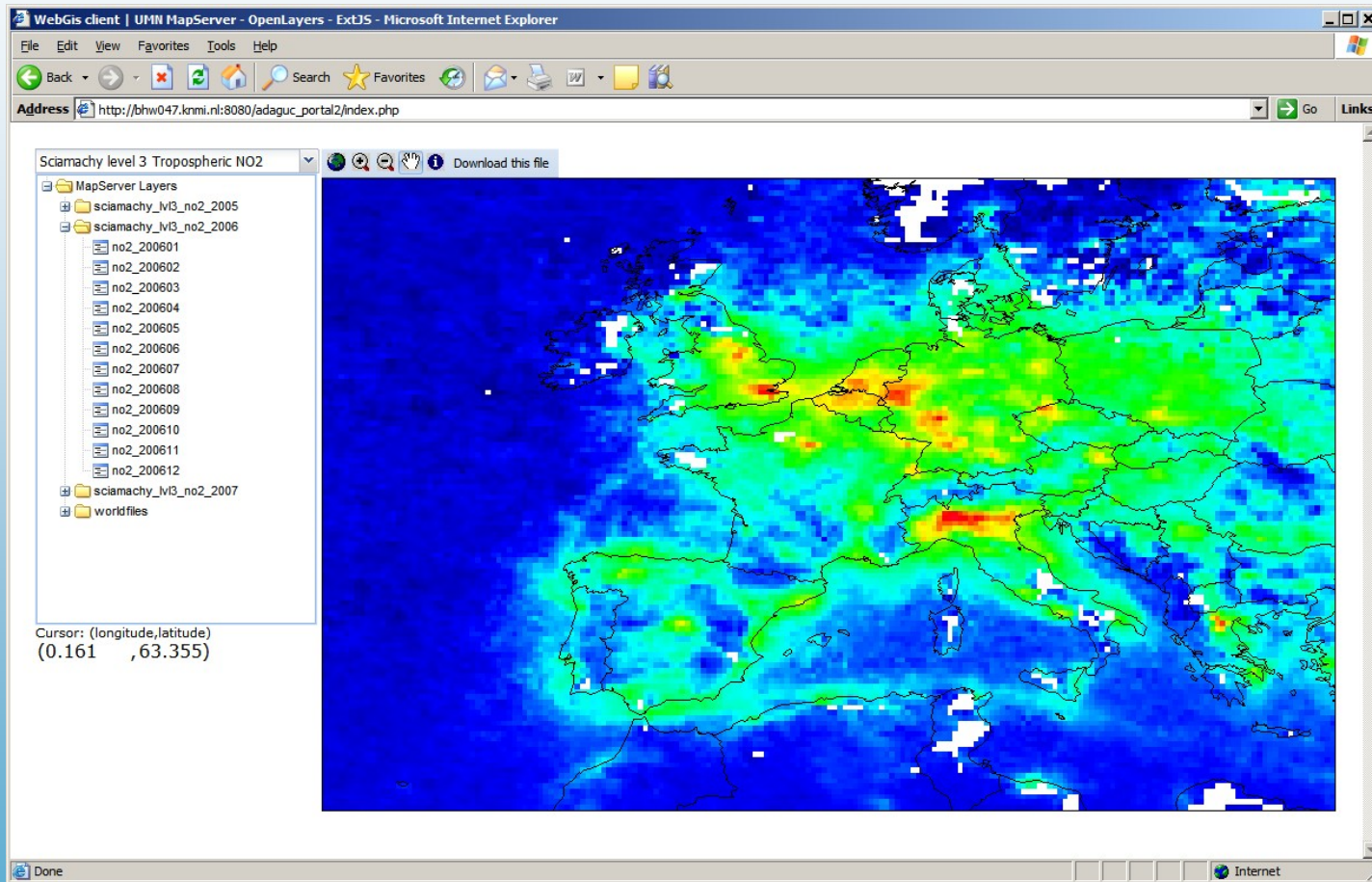


See EGU2008-A-02157 (M. Plieger, et al) for the ADAGUC Web service infrastructure

# Demonstrator WMS/WFS/WCS



European Geosciences Union 2008



This demonstrator service can be found on the ADAGUC website

# Next steps



- ◆ Finalization of data formats standard
- ◆ Implement (reusable) software components
- ◆ Assess scalability / security
- ◆ Scale this onto hardware requirements
- ◆ Integrate the developing software
- ◆ Test, test & test again
- ◆ Convert the archive datasets to the ADAGUC standard
- ◆ Promote the web services to operational status
- ◆ Integration with other GEO portals

# Challenges



- ◆ **WFS Time aspects**
- ◆ **Growing datasets**
- ◆ **Huge datasets**
- ◆ **WMS client animations**
- ◆ **Combining all metadata into 1 standard**
- ◆ **Think of a gift for the final workshop 😊**

# Summary



- ◆ **Users know what products they want ... and how**
- ◆ **Product standard is converging to it's first release**
- ◆ **Much experience gained with GDAL/OGR**
- ◆ **Only 8 months to go...**

# Questions?



Final ADAGUC Workshop  
4-5 Dec 2008  
Amsterdam



Hosted by VU University

Faculty of Earth and Life Sciences