



Atmospheric Data Access for the Geospatial User Community

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<http://adaguc.knmi.nl>

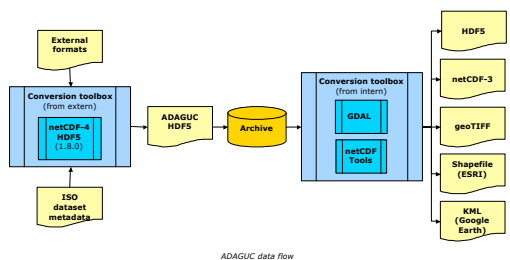
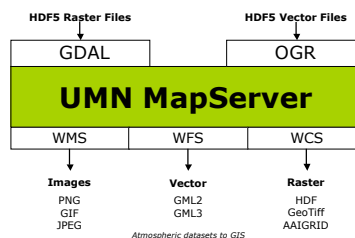
To disseminate atmospheric data to the geospatial user community is very cumbersome: the geospatial community uses other data formats and uses GIS for analyses. Therefore time-consuming and inefficient conversions are needed when using atmospheric data. The ADAGUC project (Atmospheric Data Access for the Geospatial User Community) thus strives to provide space borne atmospheric and land datasets using web services. These datasets will be usable for data comparison, resampling, selection, manipulation and visualization in GIS. ADAGUC will also increase the accessibility of satellite products for GIS users and scientists by defining a standard format for all ADAGUC products and by providing a conversion tool for the most commonly used formats: HDF5, netCDF-3, GeoTIFF, ESRI Grid/Shapefile and Google's KML.

At the final ADAGUC Workshop (December 4-5 2008, Amsterdam) the project results will be presented. On this poster the main results and 3 use cases are presented.

1

Web service Infrastructure

For providing temporal atmospheric and land dataset products the following OGC compliant web services are used: WMS for visualization, WFS for downloading vector data and WCS for downloading raster data. The UMN MapServer is used as a basis and other Open Source solutions like THREDDS are used when needed. The main challenge encountered is: the ADAGUC datasets are dynamic, temporal and huge, while most OGC solutions are optimized for small static datasets.



ADAGUC data flow

2

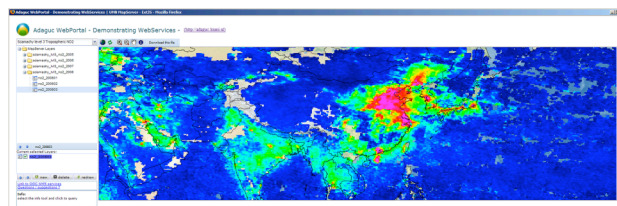
ADAGUC Data Products Standard

Besides 'just' providing data, an important requirement is a standardized, clearly defined and structured format. The HDF5 ADAGUC data products standard has been defined for this purpose, which includes structured metadata (ISO 19115). All ADAGUC data will be archived in this format. Tools for converting these data into the most commonly used formats in the atmospheric and geospatial communities, are developed within the project. Supported formats include GeoTIFF, netCDF3/4, HDF5, ESRI's Grid, GML, Shapefile, Google's KML and all formats supported by the GDAL/OGR library.

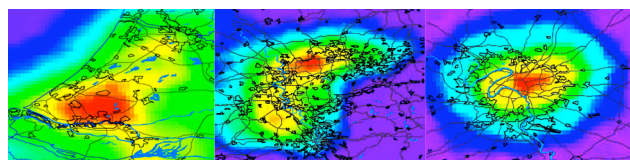
3

Use case - Trend monitoring of air quality on regional scale (China)

Long term air quality monitoring is important for local, regional and international governments. For this, long term data series are vital. Satellite data products available from GOME, SCIAMACHY and OMI combined (1995-present) form a useful dataset for this kind of analyses. Such a dataset will be produced and used within the AMFIC project (Air Quality Monitoring and Forecasting in China).



Sciamachy Tropospheric NO₂ over China, March 2008. WMS displayed in a web browser.

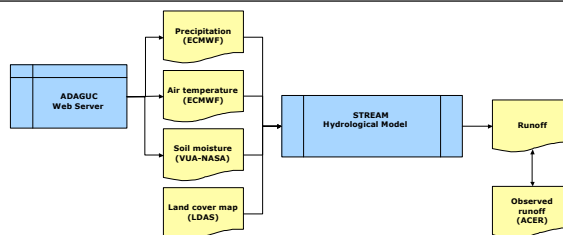


OMI Tropospheric NO₂ in Western Europe (December 2004 - November 2005)
 Left: Randstad, The Netherlands; Middle: Ruhr area, Germany; Right: Paris, France

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Use case - Relating Remote Sensing Data to Vegetation/Roads/Land Cover/Land Use Change

Though global annual reactive oxidized nitrogen (NO_x) emissions are relatively well known, the spatial-temporal deposition schemes remain largely uncertain. Using a unique combination of satellite products and models, wet and dry oxidized nitrogen will be assessed for the large and relatively constant nitrogen loading of Western Europe and the highly variable nitrogen loading of the Amazonian region.



Data flow: ADAGUC will provide the data for the hydrological model STREAM. The simulated runoff will be compared to the observed runoff.

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Use case - Improving the Performance of River Basin Simulation Models

Uncertainty in stream flow simulations can be reduced by using additional data for an improved initialization of model state variables. This method will be applied to large river basins like the Rhine, Nile and Mississippi and use the hydrological STREAM model (Aerts et al. 1999). Datasets delivered by ADAGUC will include ECMWF precipitation and temperature, land cover characteristics and satellite derived soil moisture.