From satellite data to GIS application

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http://adaguc.knmi.nl

Satellite products are distributed in many different formats. The formats used depend on the agency and are often mission specific. In addition, some formats are not self describing and can therefore not be supported by applications such as IDL or Matlab. Self describing formats, such as netCDF and HDF have the advantage that a wide number of applications used by scientists are able to read these formats. Many satellite products contains valuable information, such as air pollution, which could be exploit using GIS applications. However, the formats used in the science community are not supported by GIS applications. The aim of the ADAGUC project is to improve the accessibility to satellite products for both GIS users and scientists by defining a standard file format for all ADAGUC products, and to provide a conversion tool to the most commonly used formats: netCDF-3, GeoTIFF, ESRI Grid/Shapefile, and Google's KML.
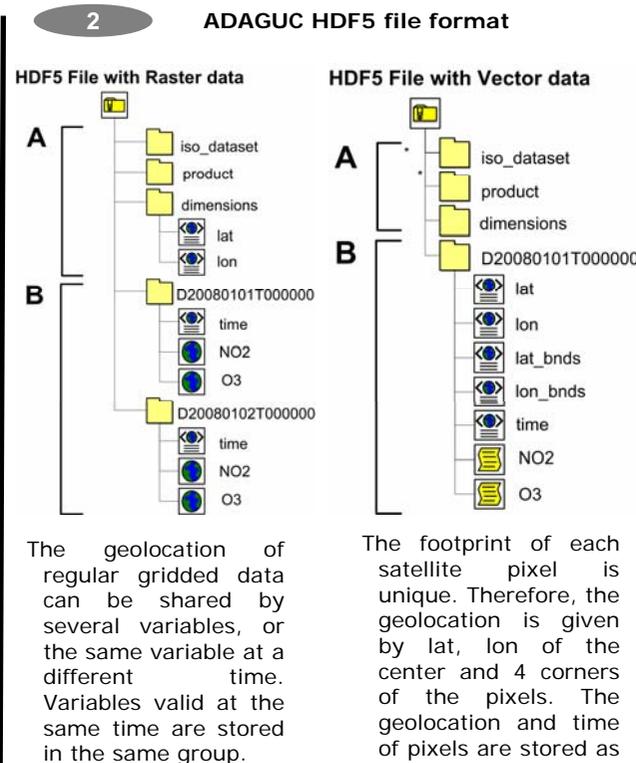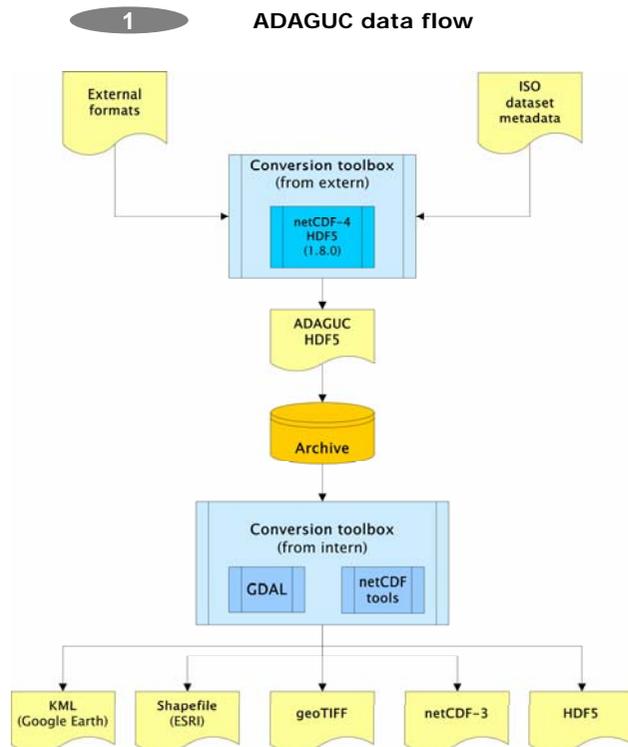
1 **ADAGUC data flow**

2 **ADAGUC HDF5 file format**

The geolocation of regular gridded data can be shared by several variables, or the same variable at a different time. Variables valid at the same time are stored in the same group.

The footprint of each satellite pixel is unique. Therefore, the geolocation is given by lat, lon of the center and 4 corners of the pixels. The geolocation and time of pixels are stored as dimension scales.

Figure 1 shows how the data of an input product (read with format specific I/O routines) is written in ADAGUC file format using the netCDF-4 library (a wrapper around the HDF5 library). These products are stored in the NL-SCIA-DC archives. On user request, these products can be converted to various formats using the GDAL applicator.

Figure 2 shows the ADAGUC HDF5 file format in more detail. Each ISO dataset (a collection of the same product type) has set of metadata, compliant with the ISO19115:2003 standard. This information is stored as attributes of the HDF5 group *"iso_dataset"*. Metadata of individual products are attached to the HDF5 group *"product"*. Coordinate variables and time are stored as dimension scales and shared by the HDF5 datasets.

We have chosen for the usage of the recently released versions of HDF5 (v1.8.0) and netCDF (v4). These formats have many advantages above previous releases: faster data access, dimension scales, ... And we expect these formats to be supported and widely accepted in the near future.