



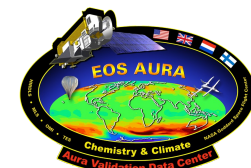
GEOMS and support to NDACC LIDAR

Christian Retscher (USRA/GESTAR, NASA/GSFC)



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NDACC LIDAR Working Group meeting, Potsdam, Jun 7 – 10, 2011





AVDC, GECA, and DCIO

GEOMS

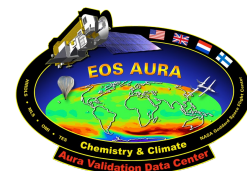
GEOMS LIDAR data generation

Outlook



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The Aura Validation Data Center

- AVDC started in 2004, hosted at NASA/GSFC
- Support of **Aura** and other **A-Train**, NPP/OMPS validation
- Support of **validation** campaigns
- **Collection, harmonization** of satellite and correlative data:
 - A-Train, N7, EP, NOAA16-18, ACE, ERS, Envisat, MetOp
 - NDACC **LIDAR**, MWR, FTIR, sondes, UVVIS, ...
- Collaboration with Envisat Validation and ESA **GECA** project through **DCIO**
- Generation of **data subsets**, **field-of-view** predictions
- Analysis of satellite, ground-based, balloon, aircraft data
- Leading **GEOMS** evolution and support for PIs on GEOMS data production



Generic Environment for Cal/Val Analysis

ESA GECA Objectives:

- Support cal/val **inter-comparison** activities with tools
- Support **collocation** detection: match-up of satellite and correlative datasets
- **Access** to satellite data centers: demonstration via GENESI-DR, possibly HMA in the future
- Access to **correlative data** centers via DCIO
- Assist correlative data submitters:
data conversion tools, data upload portal
- **Harmonize** correlative data standards:
GEOMS and GEOMS tools



Data Center InterOperability



dcio
data centre inter-operability

DCIO Objectives:

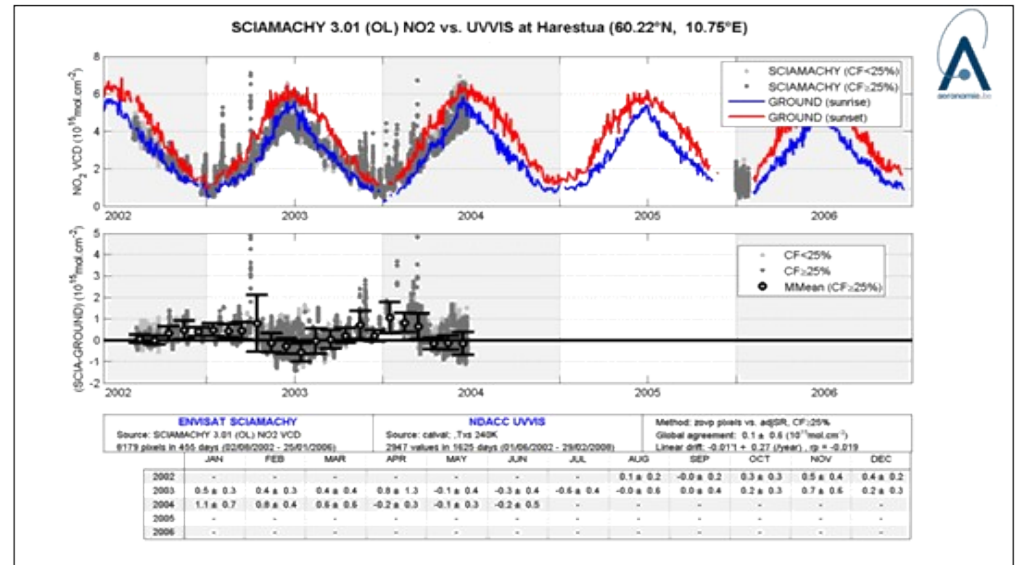
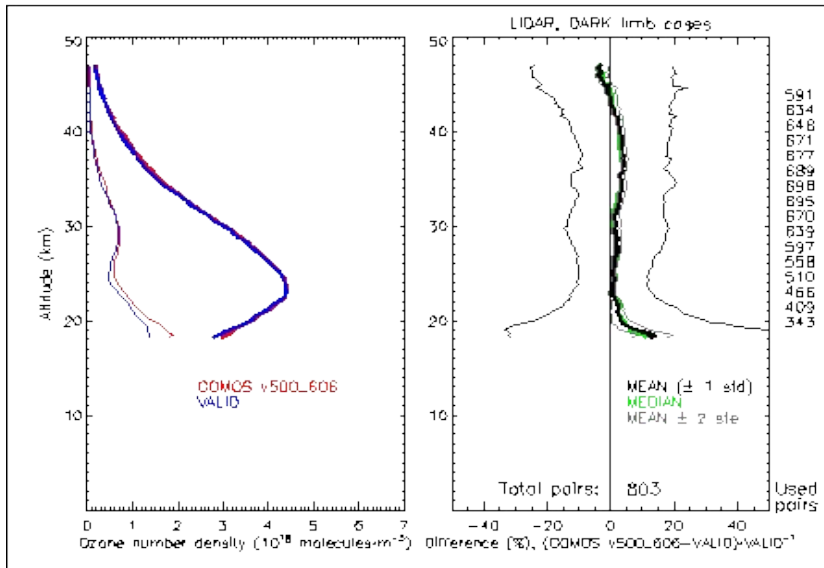
- **Harmonize** metadata standards for EO
- Provide data discovery and search for distributed resources
- Develop joint **data exchange** agreements
- Enable uniform **user authentication**
- Allow systematic **exchange** of cal/val **data**
- Provide **feedback** on data use
- **Expose data** in each data center to more users
- More DCIO information at e.g.:

<http://avdc.gsfc.nasa.gov/DCIO> (status June 2011)

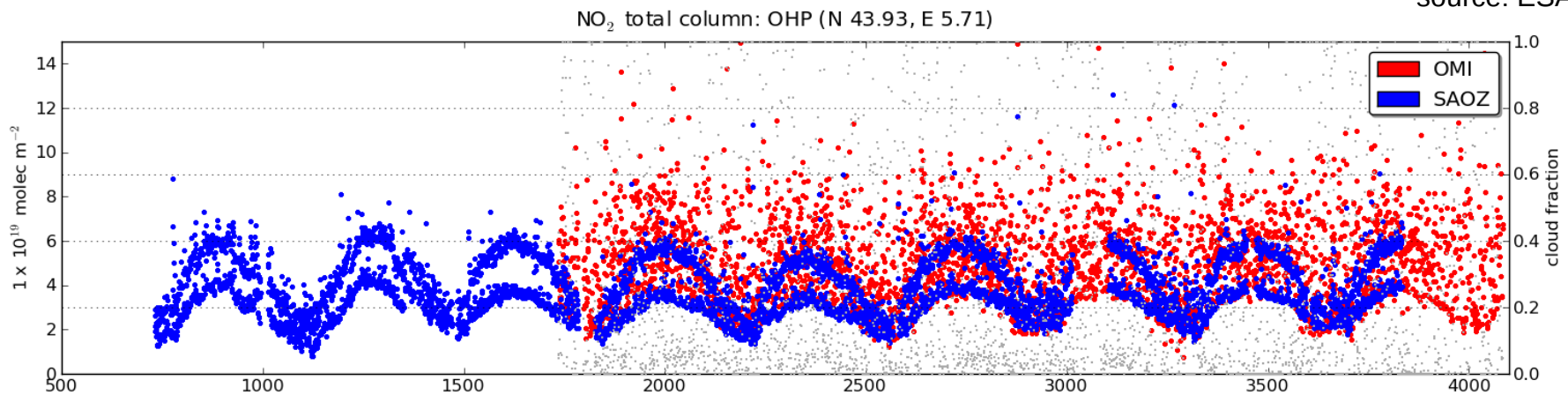
Main partners: ESA, NASA, NDACC, WMO, EARLINET



Operational data validation examples



source: ESA



source: AVDC



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Generic Earth Observation Metadata Standard

- Latest release **GEOMS v1.0**, March 2011
- Open **discussion group** (email list):
subscribe to geoms-subscribe@yahoogroups.com
- Central GEOMS website for standard and tools evolution:
<http://avdc.gsfc.nasa.gov/GEOMS>
- Many partners involved:
 - **NDACC** working groups for **LIDAR**, MWR, sondes, FTIR, UVVIS, (Brewer to be re-established 2011)
 - **SHADOZ**, Wallops Flight Facility, Globwave, MyOcean,
 - ...



GEOMS Background

- History of related metadata, data centers, and projects: COSE (1998), EVDC (2000+), AVDC (2004+), GECA (2007+)
- **GEOMS** harmonizes all previously used related metadata and is maintained as a single standard from **2011** on
- GEOMS supports the **Envisat** and **Aura** cal/val projects and reaches out into missions supported by the ESA **GECA** project (EE, Sentinels) as well as NASA **A-Train** instruments



GEOMS Features

- Generic **metadata guidelines** for Earth Observation data
- GEOMS guidelines describe the standard metadata definitions for **satellite**, **correlative**, and **model** data
- **Controlled** metadata attributes and vocabulary; Nonstandard attributes are allowed
- Supported **data formats** are HDF4, HDF5, and netCDF
- Data from selected instruments reported according to **templates**
- Tools supporting data **production** and **conversion**, **quality assurance**, **template checking**, and **harmonization** are available



GEOMS Tools

GEOMS tools currently maintained and available at AVDC:

- **idlcr8 v4.01** HDF4/5 (not yet netCDF) production tool (IDL code and sav files)
- **geoms_qa v0.9** quality assurance and template checker tool (IDL sav file and online tool)
- **geoms_harmon v0.9** data harmonization tool for data from prior versions of Envisat/Aura and GEOMS into most recent GEOMS (IDL sav file)
- **CDS v2.0b10** Conversion Data Suite: conversion from original data into GEOMS: LIDAR, sonde, and buoy data. (IDL sav file and online tool)

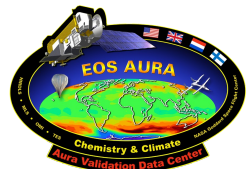


GEOMS Implementation

Supporting data centers have different strategies and timelines for the implementation of GEOMS:

- **EVDC** remains Envisat metadata standard compliant only
- **AVDC** is the current central GEOMS site; remains Aura metadata standard compliant until end of 2011; GEOMS data upload and distribution portal open by mid 2011
- **NDACC** since March 2011 full GEOMS compliance for supported data (LIDAR, MWR, FTIR); old HDF not accepted anymore
- **GECA** full GEOMS compliance once operational by Fall 2011

GEOMS announcement to the community will be sent out soon



GEOMS LIDAR support

Current support mainly from NASA AVDC (C. Retscher and I. Boyd).
ESA GECA (GVDC) plans to start Fall 2011

- **Template** hosting, validity checks, and updates
- Direct **PI support** in the GEOMS file generation, template checking, and QA
- **Harmonization** from Envisat/Aura into GEOMS HDF files
- **Conversion** from/to ASCII/HDF4/HDF5 data
- **AVDC data portal:**
 - Aura metadata LIDAR files still accepted
 - GEOMS LIDAR files accepted by mid 2011
- Planned introduction of LIDAR data into **operational** OMI and OMPS O3 time series and **validation**.

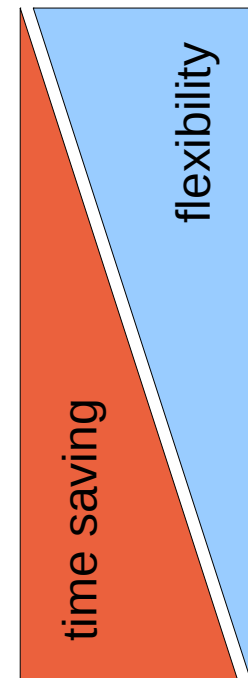


GEOMS LIDAR data generation

There are **four supported options** for GEOMS LIDAR data production:

- 1) Use AVDC **idlcr8hdf** and have metadata/data in GEOMS compliant format
- 2) Use **TL** provided IDL **routines** and TL/AVDC **metadata** together with idlcr8hdf
- 3) Use AVDC provided **cds_convert**, TL/AVDC provided **templates** and **metadata**
- 4) Use AVDC **webtool**, which provides a wrapper to cds_convert. Only web access needed.

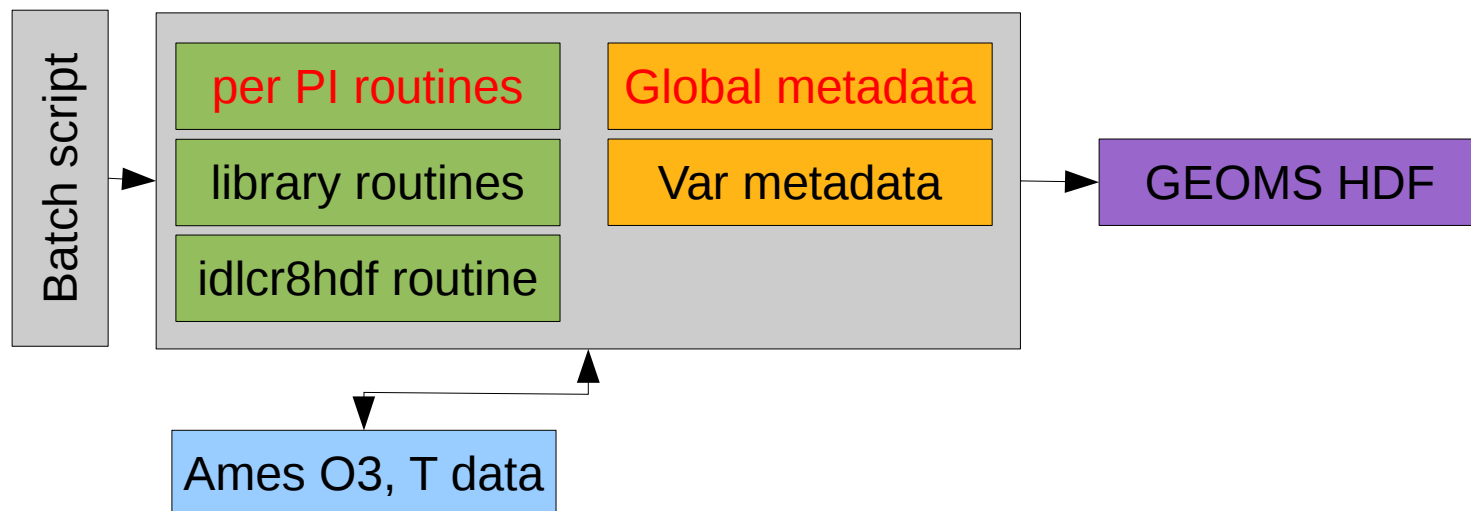
implementation
from side of PI



Details about GEOMS LIDAR data generation 1

What you need for 2) (in **red** to be maintained by PI):

- Supported list of **PIs**: an, go, ha, hg, md, mg, na, sb, sw
- **Individual conversion** routines per each PI
- Current supported input data products in Ames format: **O3, T**
- **Generic** metadata for variable attributes, **individual metadata** for global attributes for each PI/station, and GEOMS TAV
- **idlcr8hdf**, and other support routines



Details about GEOMS LIDAR data generation 2

What you need for 3) and 4) (in **red** to be maintained by PI):

- **cds_convert** IDL sav file
(wrapper around TL and idlcr8hdf routines)
- GEOMS LIDAR **template** file
- **Generic** metadata for variable attributes, **individual metadata** for global attributes for each PI/station, and GEOMS TAV

CDS does automated QA and template checks on resulting files

Central CDS website for data conversion and supplied routines: <http://avdc.gsfc.nasa.gov/CDS>



Outlook

- GEOMS LIDAR templates and routines will be reviewed after data **uncertainties** and **vertical resolution** are final
 - GEOMS LIDAR **aerosol** and **H2O** templates yet to be finalized. Review metadata support for EARLINET.
 - NDACC GEOMS portal open since March 2011
 - NASA AVDC GEOMS portal open by mid 2011
 - ESA GECA portal open in Fall 2011
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- Will GEOMS data replace Ames data submission to NDACC?





Thank you



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