

## A View from the Network for the Detection of Atmospheric Composition Change

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# Steering Committee

Co-Chair

Co-Chair

Executive Secretary

## Working Group Representatives

Dobson & Brewer

FTIR

LIDAR

Microwave

Sondes

Spectral UV

UV-Visible

Satellites

Theory & Analysis

Peer, Ex Officio, and Cooperating Network Representatives



## Working Groups and Science Teams

Dobson & Brewer

FTIR

LIDAR

Microwave

Sondes

Spectral UV

UV-Visible

Satellite

Theory & Analysis

Water Vapour

Ozone

Measurement Strategies & Emphases

## Quality Assurance

Protocols

Instrument and Algorithm Intercomparisons

Instrument Validation

## Goals & Results

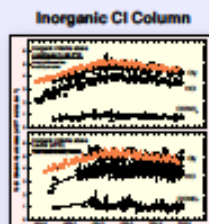
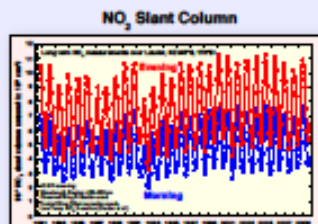
Long-term time series for detection of changes and trends

Establish scientific links and feedbacks between climate change and atmospheric composition

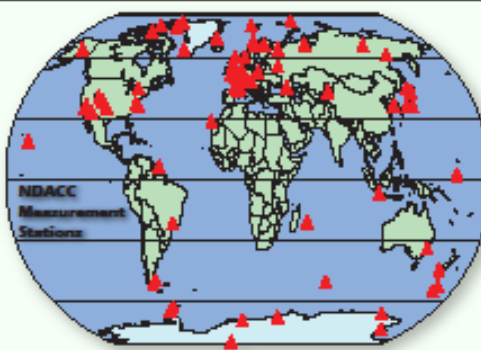
Satellite calibration and validation

Support to scientific field campaigns

Model validation



## Station Network



## Cooperating Networks



## Data Archiving and Outreach

### Data Host Facility



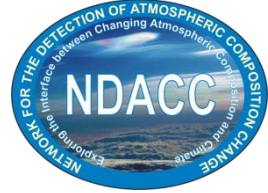
### Web Sites



Newsletter  
Brochure  
Leaflet



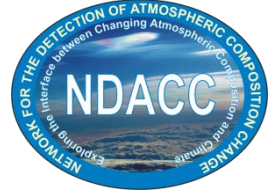
# NDACC Working Groups per Instrument / Technique



Responsible for

- Data Quality Protocols
- Protocol Verification
  - exchange of data
  - intercomparison campaigns
  - verification of calibration
- Certification of New Affiliates
- Follow-up of Data Archiving

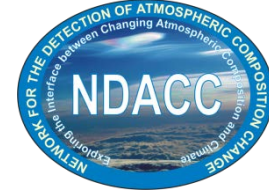
# NDACC Working Groups per Theme



*Current Themes: water vapour, ozone, ...*

Working Group is responsible for

- Making coordinated studies of the same species using different techniques
- Verifying consistency and intercomparability between techniques
- Assisting in measurement campaign development
- Interacting with international efforts (e.g., ACSO, SI<sup>2</sup>N)
- ...



# Ad hoc Working Groups

- E.g., Working group on measurement strategies and emphases

→ To deal with evolution of the network, the instrument techniques, follow-up of the ‘user’ requirements, etc.

Who are typical users ? How to satisfy them better ? Etc.

*This is also linked to sustainability and funding issues*

# Present Evolution (1/3)

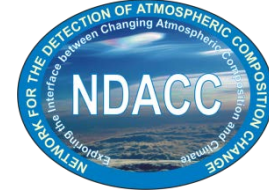
## Evolution towards

- A single (or a few) **standard retrieval algorithms** within an instrument WG, especially for more 'routine' processing of the data

*This does not exclude research-oriented alternative retrieval algorithms and developments !*

- Agreements within a WG on **common data acquisition procedures, retrieval strategies, and choices of ancillary and auxiliary data**
- A more homogeneous network (**consistency** between the data products at different stations)

# Present Evolution (2/3)



Evolution towards

- Commonly agreed evaluations of **uncertainty budgets** within a WG

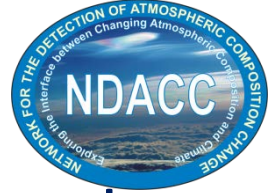
In some cases, uncertainty budget evaluations are an integral part of (standard) retrieval algorithms

- **More operational** data acquisition, timely data processing and archiving (e.g., NORIS project)

*Distinction is made between fully consolidated data and rapid delivery data*

- More **automation** of the acquisition, processing and archiving functions

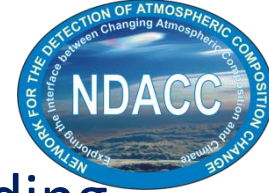




## Present Evolution (3/3)

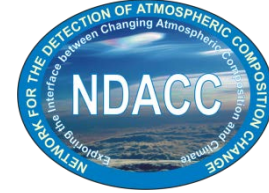
- Development of **generic tools** (across instrument WGs) for the characterisation and exploitation of the data
  - Better **documentation** of the data
    - HDF format including GEOMS metadata standard
    - Guide for data users
    - Technical notes about uncertainty budgets, data representativeness, etc. on the NDACC web pages
- *objective: peer-reviewed papers in open literature*





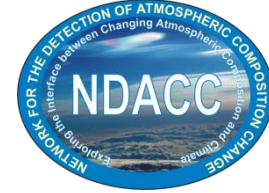
# Encountered Obstacles

- Funding Continuity (short-term vs. long-term, or funding cessation) → loss instruments / stations / **data**
- Most NDACC stations are linked to research organisations, not operational centres – so a more operational mode of functioning is not well supported.
- Atmospheric conditions at different stations can be very different from each other → this precludes a completely common retrieval strategy, making the verification of network consistency not obvious.
- Data archiving and data traceability must still be improved (cf. different formats in use, lacking metadata, etc...). How to deal with format changes and historical data ? How to make sure that historical data can be traced back ? Reprocessing of historical data ?



# Current Challenges

- Accuracy Issues: calibration to SI standards ?
- Consistency between the same data products acquired by different techniques
  - This depends not only on spectroscopic uncertainties, but also on the fact that different remote sensing techniques have different smoothing errors, averaging kernels, etc. generating additional comparison uncertainties
- Lack of funding opportunities for long-term monitoring; valorisation of PIs (cf. discussions about doi of a data set)
- Interruption/ cessation of historical time-series



# Conclusions

NDACC and GRUAN have very similar general objectives and as such, face very similar challenges .

They can therefore learn from each other and should support each other (e.g., for funding opportunities; for establishing new sites, ...).

The existing cooperation between both networks should definitely be pursued further. In an effort to effect this, NDACC and GRUAN have signed a Cooperating Network MOU.