



# Gaps Assessment and Impacts Document (GAID)

**D6.2; Version 1.0 – September 2015**

Michiel van Weele (KNMI)

<http://www.gaia-clim.eu/page/gaid>





## GAIA Objectives

...to identify and assess user needs ('gaps') in the sub-orbital observation capability of a selected set of ECVs

... to discuss their impact as well as strategies to remedy these gaps

Through collection and analysis of both existing and envisaged user needs with a focus on (but necessary not limited to) the six GAIA-CLIM primary atmospheric ECVs:

**Temperature**

**CO<sub>2</sub>**

**H<sub>2</sub>O**

**CH<sub>4</sub>**

**O<sub>3</sub>**

**aerosols**





# Approach to GAIA-CLIM gap assessment

## GAIA-CLIM WP 6

Task 6.1	User Survey and User Workshops
Task 6.2	GAID
Task 6.3	Gap remedies priority setting and recommendations

## Input to the GAID

### Internal

- Project deliverables (for GAID V1: D1.1; D2.1; D3.1; D.4.1; D5.1)
- User Workshops and User Survey

### External

- GAID website with specific input template
- Parallel projects/external activities





## Gap Identification (Step 1)

input materials through the use of a template and specific deliverables per work package (start photo):

Gap Identifier	Gap Type	Keywords	ECV(s)	Gap Description	Trace	Gap Impacts	Envisaged Remedy	Remedy addressed in GAIA-Clim
G<wp>.<no>								

=> A first list of ~80 gaps





## Similarities/overlap between gaps? (Step 2)

### Seven generic gap types / categories:

1. Gaps in spatiotemporal coverage
2. Gaps in vertical resolution
3. Uncertainty gaps (uncertainty budget and calibration)
4. Uncertainty gaps in relation to comparator measures
5. Missing parameters and/or missing auxiliary information
6. Pure technical issues
7. Non-technical governance gaps



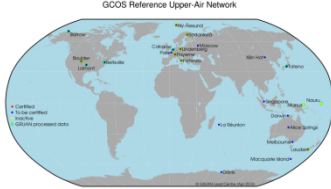


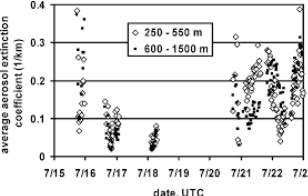
# Some examples





# Gaps in coverage (#13): 2 examples

G1.07	Coverage	H <sub>2</sub> O, O <sub>3</sub> , T, CO <sub>2</sub> , CH <sub>4</sub> , aerosols	Need for a <b>scientific approach</b> for the assessment of gaps in the existing networks measuring ECVs	WP1	
-------	----------	------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------	-----	-------------------------------------------------------------------------------------

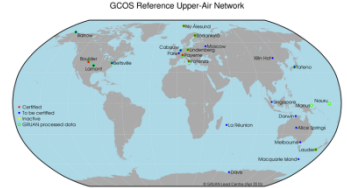
G1.08	Coverage	H <sub>2</sub> O, O <sub>3</sub> , T, CO <sub>2</sub> , CH <sub>4</sub> , aerosols	Evaluation of the effect of <b>missing data or missing in temporal coverage</b> of full traceability data provided by ground-based networks	WP1	
-------	----------	------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------	-----	---------------------------------------------------------------------------------------





## Uncertainty gaps (#35): 2 examples

G2.11	Uncertainty	O <sub>3</sub>	Lack of rigorous tropospheric O <sub>3</sub> lidar error budget availability	Leblanc et al., 2008 WP2
-------	-------------	----------------	------------------------------------------------------------------------------	-----------------------------

G4.05	Uncertainty	T, H <sub>2</sub> O	Limited knowledge about how to propagate uncertainty from well-characterized locations and parameters to other locations and parameters.	WP4 (+ Task 1.4/1.5) 
-------	-------------	---------------------	------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------







## Uncertainty gaps related to comparator measures (#9): 2 examples

G3.02	Comparator unc.	H <sub>2</sub> O, O <sub>3</sub> , T, CO <sub>2</sub> , CH <sub>4</sub> , aerosols	Limited quantification of the impact of co-location criteria.	D3-1 (incl. Annex 1, 2 and 3)
-------	-----------------	------------------------------------------------------------------------------------	---------------------------------------------------------------	-------------------------------

G3.05	Comparator unc.	H <sub>2</sub> O, O <sub>3</sub> , T, CO <sub>2</sub> , CH <sub>4</sub> , aerosols	Representativeness uncertainty assessment missing for higher-level data based on averaging of individual measurements.	D3-1 (incl. Annex 1, 2 and 3)
-------	-----------------	------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------	-------------------------------





## Further gaps

Vertical resolution (#2)

Technical (#9)

Parameter (#1)

Governance (#14), 2 examples:

G5.01	Technical Governance	H <sub>2</sub> O, O <sub>3</sub> , T, CO <sub>2</sub> , CH <sub>4</sub> , aerosols	Access to data in multiple locations with different data policies and accessibility (e.g. speed of retrieving and unpacking, passwords)	<a href="http://www.gruan.org">http://www.gruan.org</a> <a href="http://tccon.ornl.gov/">http://tccon.ornl.gov/</a> <a href="http://www.ndsc.ncep.noaa.gov/data/">http://www.ndsc.ncep.noaa.gov/data/</a>
-------	----------------------	------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

G2.04	Governance	Aerosols	Missing continued intercomparison with reference systems	D2.2 Wandinger et al., 2015
-------	------------	----------	----------------------------------------------------------	--------------------------------





# The GAID is a Living Document

~half yearly updated during the 3-yr GAIA-CLIM project lifetime

- **Gaps Identification** Continued collection and regroupings
  - traceability / acknowledgement
- **Gaps Assessment** Reformulate to make the gaps more
  - 'SMART'
- **Impact Analysis** From deliverables, + evolution, e.g.
  - discussion with service providers
  - new papers, etc
- **Remedies** optimized strategies incl. cost/time estimates for priority setting





# Outlook to the next GAID version

Improvements to the process? Could improving the current GAID help structuring both GAIA-CLIM and the climate user needs in a complex world?

