



WMO/IOC/UNEP/ICSU  
GLOBAL CLIMATE OBSERVING  
SYSTEM (GCOS)

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**11th GRUAN Implementation-  
Coordination Meeting (ICM-11)**

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Session 7

Singapore

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## GRUAN Site Report for Cabauw

*(Submitted by Arnoud Apituley)*

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### **Summary and Purpose of this Document**

Report from the GRUAN site Cabauw for the period January to December 2018.

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## Overview

1. The routine RS41 launches (0 UTC) are contributing to the GRUAN data stream, as well as the data from RS41 launches attached to the weekly (Thursday-noon) ECC ozone sondes.
  - The RsLaunchClient is still not used. The configuration of the ground station PC has been changed during the transition to RS41. The implementation of the RsLaunchClient via an alternative procedure is ongoing in collaboration with the Lead Centre.
  - A formal test launching a small number (3-5) RS92 sondes shortly before or after an RS41 still needs to be completed
2. GNSS data are available.
3. Water vapour Raman lidar data are available for the data stream under development in the task team ancillary measurements. However, due to limited manpower over the reporting period no new data could be collected.

## Change and change management

No changes have been made during the current reporting period.

## Resourcing

During the reporting period limited resources and personnel were available. The available funding (internal resources) was used to maintain and carry out the routine sonde programme, both radiosondes and ozone sondes.

A large infrastructure project was won, Ruisdael Observatory <http://ruisdael-observatory.nl> that is now starting up. The new resources will be used to reinforce in particular the remote sensing observation programme carried out in Cabauw, that includes Raman lidar water vapour observations. Implementation will be ongoing in 2019.

## Operations

The RsLaunchClient is still not used. The configuration of the ground station PC has been changed during the transition to RS41. The implementation of the RsLaunchClient via an alternative procedure is ongoing in collaboration with the Lead Centre.

Helium shortage may develop into an operational problem for the balloon operations. Operational requirements to switch to hydrogen are under investigation.

Other than that, no operational challenges are faced.

## Site assessment and certification

Not applicable.

## GRUAN-related research

- The Cabauw team contributes to the development of the Water Vapour Raman lidar data stream under in the task team ancillary measurements. Part of this work was funded through the EC H2020 project Gaia-Clim, in particular the documentation of the traceability chain.
- The Cabauw team is following the WMO WIGOS metadata developments, although from a distance.

Deliverables from the (finished) Gaia-Clim project are available through this link: <http://www.gaia-clim.eu/page/deliverables>.

## WG-GRUAN interface

Not at this time.

## Items for ICM-11 plenary discussions

KNMI as main contributor to the GRUAN station Cabauw/De Bilt is also involved in the development of the observation site in Paramaribo (Surinam) that is operated by the Meteorological Service of Surinam (MDS). Collaboration also exists at MDS with IUP-Bremen and NASA. KNMI is interested in the development of the Paramaribo station for GRUAN. A matter to discuss is how the governance could be arranged.

## Other archiving centers

ACTRIS (EARLINET and Cloudnet), ICOS, GAW, NDACC, BSRN, EVDC

## Participation in campaigns

- Sentinel-5p/TROPOMI validation. In 2016 a pre-validation campaign was held for intercomparison and calibration of UVVIS instruments (CINDI-2). These efforts are closely linked to Copernicus, NDACC, ACTRIS, ICOS and GRUAN. Provision of data of (fiducial) reference

quality is paramount. In September 2019 a TROPOMI geophysical validation campaign will be held (TROLIX19), again involving observations included in the GRUAN programme.

- A further satellite project is the calibration and validation of ADM-Aeolus. Radiosondes at the Cabauw/De Bilt site are part of this effort. In addition, a radio sondecampaign (following GRUAN recommendations) is conducted in Paramaribo.

## **Future plans**

- Implementation of the RsLaunchClient
- Publication of Water Vapour Raman lidar calibration results for the Cabauw site.
- Collaboration in the development of a Water Vapour Raman lidar data stream and implementation of the LidarRunClient.
- Further development of the Paramaribo station towards a GRUAN station.



# GRUAN Site Report for Cabauw (CAB), 2018

Reported time range is Jan 2018 to Dec 2018

Created by the Lead Centre

Version from 2019-05-09

## 1 General GRUAN site information

Object	Value
Station name	Cabauw
Unique GRUAN ID	CAB
Geographical position	51.9700 °N, 4.9200 °E, 1.0 m
Operated by	KNMI   Koninklijk Nederlands Meteorologisch Instituut
Main contact	Apituley, Arnoud
WMO no./name	06260 DE BILT AWS
Operators	currently 0, changes +0 / -0
Sounding Site	1
GNSS	1

### 1.1 General information about GRUAN measurement systems

System	Name	Type	Setups	Measurements
CAB-GN-01	GNSS Site CABW	GNSS	0	not operational
CAB-RS-01	Radiosonde Launch Site (De Bilt)	Sounding Site	4	316

### 1.2 General comments from Lead Centre

No comments available from Lead Centre.

## 2 System: GNSS Site CABW (CAB-GN-01)

<b>Object</b>	<b>Value</b>
System name	GNSS Site CABW
Unique GRUAN ID	CAB-GN-01
System type	GNSS (GN - GNSS)
Geographical position	51.9690 °N, 4.9260 °E, 2.4 m
Operated by	KNMI   Koninklijk Nederlands Meteorologisch Instituut
Instrument contact	Apituley, Arnoud
Started at	-
Defined setups	-
Possible streams	-

### 2.1 Lead Centre comments

#### 2.1.1 Dataflow

No GNSS dataflow to GRUAN LC as yet.

### 3 System: Radiosonde Launch Site (De Bilt) (CAB-RS-01)

Object	Value
System name	Radiosonde Launch Site (De Bilt)
Unique GRUAN ID	CAB-RS-01
System type	Sounding Site (RS - Radiosonde)
Geographical position	52.1000 °N, 5.1800 °E, 1.0 m
Operated by	KNMI   Koninklijk Nederlands Meteorologisch Instituut
Instrument contact	Apituley, Arnoud
Started at	-
Defined setups	4 (ROUTINE, OZONE, ROUTINE2, OZONE2)
Possible streams	RS41, RS92

#### 3.1 Lead Centre comments

##### 3.1.1 Dataflow

Sonde dataflow to the GRUAN LC was operational in a fully automated mode from January 2011 until 15 January 2017.

Since 15 January 2017, data flow is not correctly functional because change of operational sonde from Vaisala RS92 to RS41.

Restart of operational data flow is in preparation and will be implemented finally soon.

#### 3.2 GRUAN data products

Product	Version	Soundings received	Available at LC	Distributed by NCEI
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##### 3.2.1 Stream: RS41

RS41		316	316	
RS41-RAW	001		316	
RS41-EDT	001		314	
RS41-GDP-ALPHA	002		307	



### 3.3 Data availability of data products

Available (green): All steps of processing have been successfully completed. The data file is available at LC (e.g. unapproved or uncertified GRUAN data products) and at NCEI (approved and certified GRUAN data products).

Unprocessed (yellow): The raw data file has been successfully converted to a GRUAN standardized raw data file format (NetCDF). The processing (e.g. GRUAN data processing) has not yet been done, or has not been completed. Reason may be a processing routine which does not yet exist, or software errors.

Original (red): The original raw data file is available (e.g. MWX). The raw data file was not converted to a GRUAN standardized raw data file format (NetCDF). Reason may be a converting routine which does not yet exist, or a corrupt original raw data file, or software errors.

#### 3.3.1 Stream: RS41



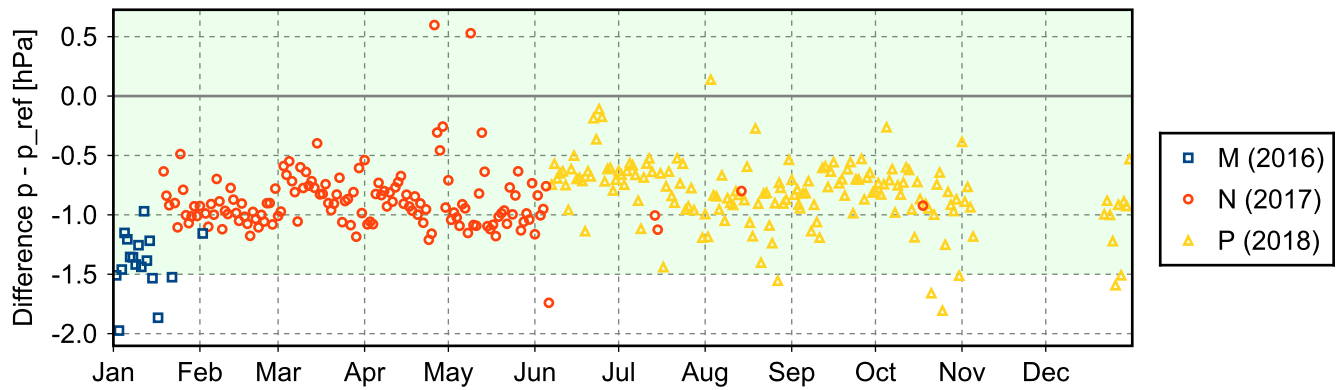
### 3.5 Instrument combinations of CAB-RS-01

Count	Instrument combination
316	RS41

### 3.6 Instrument ground check

#### 3.6.1 Stream: RS41

##### (1) GroundCheck: GC-R141



### 3.7 Measurement events

